EUROPEAN
COMMISSION

Brussels, 13.9.2021
SWD(2021) 252 final

COMMISSION STAFF WORKING DOCUMENT

Second River Basin Management Plans – Member State: Greece

Table of contents

Acronyms and definitions

EQS Directive	Environmental Quality Standards Directive
FD	Floods Directive
Km	Kilometre
km^2	Kilometre squared
KTM	Key Type of Measure
PoM	Programme of Measures
QA/QC Directive	Quality Assurance / Quality Control Directive
RBD	River Basin District
RBMP	River Basin Management Plan
WFD	Water Framework Directive
WISE	Water Information System for Europe
Annex 0	Member States reported the structured information on the second RBMPs to WISE (Water Information System for Europe). Due to the late availability of the reporting guidance, Member States could include in the reporting an Annex 0, consisting of a short explanatory note identifying what information they were unable to report and the reasons why. This Annex was produced using a template included in the reporting guidance. If Member States reported all the required information, this explanatory note was not necessary.

Foreword

The Water Framework Directive (WFD) (2000/60/EC) requires in its Article 18 that each Member State reports its River Basin Management Plan(s) (RBMPs) to the European Commission. The second RBMPs were due to be adopted by the Member States in December 2015 and reported to the European Commission in March 2016.

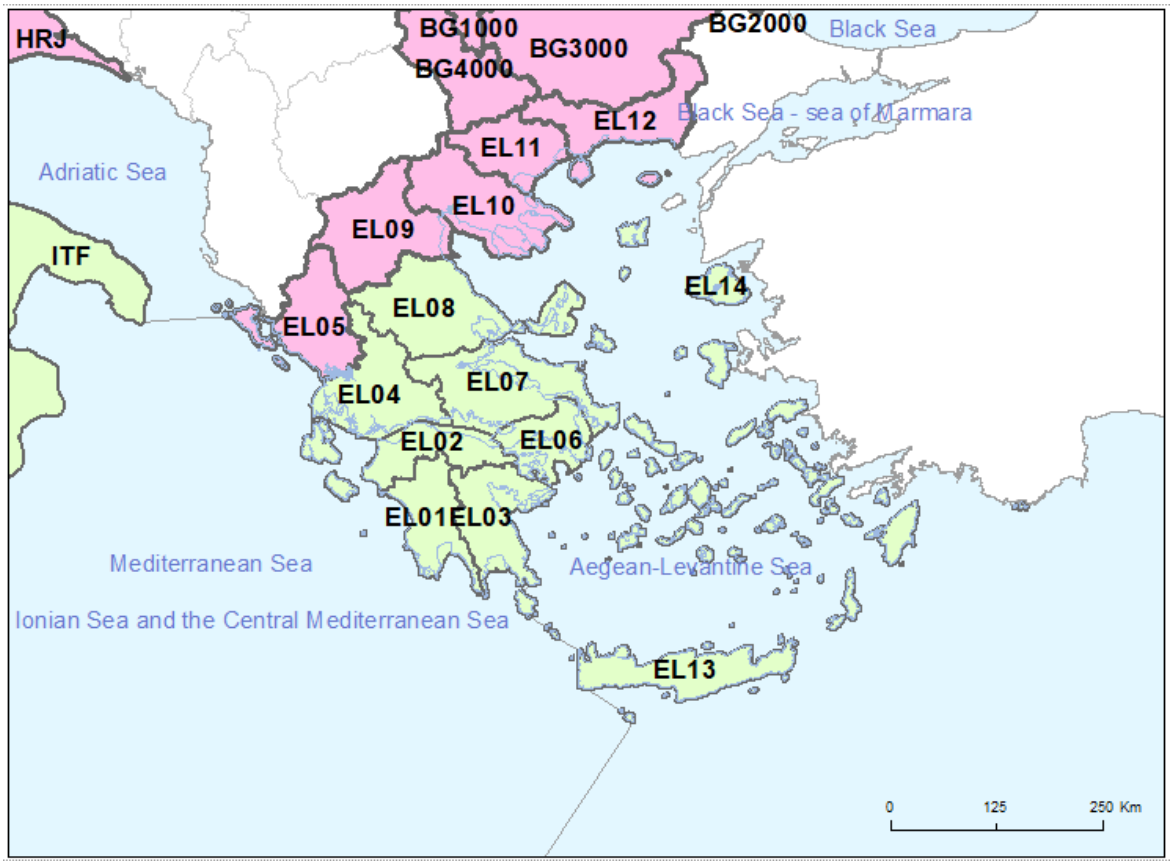
This Member State Assessment report was drafted on the basis of information that was reported by Member States through the Water Information System for Europe (WISE) electronic reporting.

The Member State Reports reflect the situation as reported by each Member State to the European Commission at the time of reporting and with reference to River Basin Management Plans (RBMP) prepared earlier. The situation in the Member States may have changed since then.

General Information

Greece (Map A) has a population of 10.725 million[1] and an area of 131,957 km^2.

Map A: Map of River Basin Districts (RBD)



Source: WISE, Eurostat (country borders)

International River Basin Districts (within European Union)
International River Basin Districts (outside European Union)
National River Basin Districts (within European Union)
Countries (outside European Union)
Coastal Waters

Since 2010 Greece has established and maintained 14 River Basin Districts (RBD) of a total area of 169 754 km^2 (including coastal waters), which are identical to the country's water districts, first established in 1987 and amended in 2010. The RBDs include 46 river basins (RB).

Five river basins (Epirus, Western Macedonia, Central Macedonia, Eastern Macedonia and Thrace) are transboundary. All RBDs include coastal waters covering a total 37 823 km^2 surface. Table A lists the areas of the national RBDs, including countries sharing parts of the RBDs.

[1] Eurostat data for 2019

Table A: Overview of Greece's RBDs

RBD	Name	Size[2] (km²)	Size excl. coastal waters (km²)	Countries sharing RBD
EL01	Western Peloponnese	8,280	7,235	
EL02	Northern Peloponnese	9,825	7,397	
EL03	Eastern Peloponnese	11,130	8,443	
EL04	Western Sterea Ellada	12,844	10,492	
EL05	Epirus	11,097	9,973	AL
EL06	Attica	6,947	3,189	
EL07	Eastern Sterea Ellada	18,495	12,295	
EL08	Thessalia	14,080	13,137	
EL09	Western Macedonia	14,744	13,616	AL, NMK
EL10	Central Macedonia	13,981	10,163	NMK
EL11	Eastern Macedonia	8,052	7,319	BG
EL12	Thrace	11,971	11,240	BG, TK
EL13	Crete	10,351	8,327	
EL14	Aegean Islands	17,957	9,105	

Source: WISE electronic reports

Table B: Transboundary river basins by category and % share in Greece

Name of the international river basin	National RBD	Countries sharing RBD	Coordination category			
			2		3	
			km²	%	km²	%
Aoos/Vjosa International River Basin	EL05	AL	11 097	25 [3]		
Axios/Vardar International River Basin, Lake Prespa (Part of Drin/Drim Sub-basin)	EL09	AL, NMK			6 391	N/AV[4]
Axios/Vardar International River Basin	EL10	NMK			13 981	N/AV[5]
Strymon/Struma International River Basin	EL11	BG	8 052	40,3		
Nestos/Mesta International River Basin, Evros/Maritsa/Meric International River Basin	EL12	BG, TK[6]	11 971	25,4		

Source: WISE electronic reports

Category 1: International agreement, permanent co-operation body and international RBMP in place.
Category 2: International agreement and permanent co-operation body in place.
Category 3: International agreement in place.
Category 4: No co-operation formalised.

Status of second river basin management plan reporting

A total of 14 RBMPs were contracted in the last quarter of 2016, drawn up in 2017, approved on 21 December 2017 and reported on 28 December 2017. Data on RBD and sub-units and an Annex 0 were published in January and April 2018. Additional data were published in January and February 2020. Documents are available from the European Environment Agency (EEA)

[2] Area includes coastal waters
[3] Approximately, according to the RBMP (§11.1, third par.). No figure was reported in WISE.
[4] N/AV: not available. Not included in the RBMP or provided in WISE.
[5] Central Macedonia RBMP mentioned that 69% of the sub-basin of Doirani lake was in Greece
[6] TK was provided only in the RBMP. No figure reported for the part of Evros IRB at the Greek side.

EIONET Central Data Repository (https://cdr.eionet.europa.eu/) and the relevant website of the main competent authority (http://wfdver.ypeka.gr).

Key strengths, improvements and weaknesses of the second River Basin Management Plan(s)

The main strengths and shortcomings of Greece's second set of RBMPs are as follows:

Governance and public consultation

- Clear responsibilities have been set between all competent authorities for the RBMPs and for PoM implementation and follow-up. Regional competent authorities have a significant role in implementing the RBMPs and PoMs.
- Public consultation has been strengthened in several ways. Greece organised joint consultations on both these river basin plans and the flood risk management plans. The consultation process involved the competent authorities and public authorities (also from the wider public sector), scientists and researchers. Despite these efforts, the response from certain stakeholder categories was limited. It is not clear whether the results of the consultations were taken into account in all RBMPs.
- Greece continued international cooperation activities in international/transboundary RBDs but there was no PoM international coordination activities, PoM roof reports or other PoM international coordination links. There is no information on cooperation activities with Turkey on transboundary river basins.
- Greece did not adopt or publish the RBMPs in line with the timetable in the WFD.

Characterisation of the RBDs

- Greece reported delineation data for the surface water bodies in all RBDs. New classification types and methodologies have been set in all water categories. The estuaries of river bodies are not considered as discrete transitional waters in the second cycle. Greece has also set new minimum size criteria. For GWB delineation, additional criteria have been added to the criteria used in the previous cycle.
- This brought in significant changes in RBD characterisation, the most important being the change in river reservoirs that were previously classified as lakes, and in the second cycle they are now classified as heavily modified river bodies.
- The number of lakes increased by 63% and their total area by 45%. The number and the total area of rivers fell by 1% in both cases. The number and total area of transitional waters increased by 18% and 2% respectively. Lastly, the total area of coastal waters fell by 20%. Heavily modified lakes decreased in area by 21.8% while the other two categories of heavily modified bodies (rivers and coastal) increased slightly (<0.4%). The number of GWBs increased (4%).
- There was no coordination with neighbouring countries on the characterisation of water bodies.
- Although Greece used data from the new monitoring programme to a greater extent than it did in the previous cycle in the characterisation, assessment and classification of water bodies, it drew significantly on expert judgement in both assessment and classification.
- All assessed biological quality elements (BQEs) were intercalibrated in the water categories where they are assessed, except for fish. National classification systems have been developed but they are not yet intercalibrated.
- Reference conditions were set for some aspects of biological quality, but not for all in the majority of water bodies of the river and lake categories. Reference conditions were set for all BQE in transitional and coastal waters.

- Reference conditions for aspects of hydromorphological and physicochemical quality were set only for some aspects of quality in rivers and lakes.
- Greece reported information on the geological formation of the RBDs for all RBDs and all GWBs.
- New methodologies and standards have been developed to assess all forms of pressure in all water categories. The significance of pressure has been defined in terms of threshold in all RBDs and the definition is linked to potential failure to reach the objectives.
- Pressure linked to hydromorphology has been examined only for certain projects and a large number of rivers may not have been examined in terms of the pressure on hydromorphology.
- Diffuse source pressure has fallen by 21% and point sources by 15% since the first RBMPs, but hydromorphological pressure increased by 6% in SWBs. Agriculture remains the main sector responsible for diffuse pollution, while non-IED plants not subject to the Industrial Emissions Directive are responsible for point source pressure.
- Greece has reported pressure causing quantitative risk in GWBs due to water balance and saline intrusion. Abstraction for irrigation remains the main source of pressure in GWBs.
- 15.4% of the total GWBs were reported as being at chemical risk.
- For SWBs, Greece reported 12 substances and for GWBs 14 substances that caused failure to achieve good chemical status.
- Indicator gaps were reported for both SWBs and GWBs.
- Some pressure from priority substances/pollutants causing risk/failure are not covered in detail, either by the SWBs or by the GWBs.
- Greece did not report any specific information related to the number of priority substances causing failure to achieve good chemical status for which specific measures have been planned, or for other substances for which measures are planned.
- Greece did not report an inventory for each RBD of emissions of discharges and losses of all priority substances or the eight other pollutants listed in Part A of Annex I.

Monitoring, assessment and classification of ecological status

- Additional biological quality elements (BQE) were monitored and used to assess the status since the first cycle, in all categories. For aspects of hydromorphological and physicochemical quality, only some of the required quality aspects were monitored. No hydromorphological aspects were monitored in transitional and coastal waters.
- Most aspects of quality are sampled at least at the minimum recommended frequency. There are significant variations between the RBDs and further clarification is required for *Dimethoate* monitoring surveillance frequencies.
- The new national monitoring programme (and network) has been set up and relevant information is publicly available. Data from the new national monitoring programme was used in the assessment and classification but the RBMPs report that there are still major gaps in monitoring. The total number of monitoring sites has increased but additional sites are needed in all categories. There is limited coverage of rivers/lakes/transitional and coastal water bodies from surveillance stations with gaps in data of ecological parameters. There are no monitoring sites that form part of international programmes or transboundary monitoring cooperation.
- There has been a significant increase (by 59%) in the proportion of SWBs in good ecological status, an increase of 25% of the SWBs in moderate status and a 7% increase in the SWBs in high ecological status. By contrast, there is a notable decrease (by 74%) in

the SWBs in unknown status and a 46% decrease in the SWBs in poor status.

- However, most SWBs have been classified for ecological status with a low level of confidence. The majority of SWBs in poor and bad status are classified with a high confidence level and most at good and high status are classified at a low level of confidence.
- There are still gaps in the aspects of quality used for classification. A significant proportion of SWBs are classified without BQEs, aspects of hydromorphological quality or physicochemical quality and the majority without river basin specific pollutants. Hydromorphological and physicochemical aspects of quality were not used for the assessment in lakes and transitional waters.
- Greece has developed new methods to assess BQEs. Intercalibration has been applied to the assessed BQEs in the water categories for which they are assessed, except for fish. However, the standards for aspects of physicochemical quality for rivers and coastal waters are not consistent with the good- moderate status boundary of the corresponding sensitive BQEs.
- The following gaps in assessment methods have been noted: for phytoplankton in rivers, for fish in rivers/transitional/coastal, for phytobenthos in lakes/transitional/coastal, for macrophytes in transitional/coastal, for angiosperms in rivers/lakes/transitional, for macroalgae in rivers/lakes/transitional and for other aquatic flora in rivers/lakes/coastal. Reference conditions are set for all types and all BQEs where methods have been developed. Greece has not reported whether the methods are sensitive to all relevant impacts.
- EQS values have been reported only in rivers and lakes in all RBDs. For all 47 river basin specific pollutants (RBSPs) EQS values have been reported and all are monitored in the waters of rivers and lakes in all RBD, though RBSP monitoring is lacking in transitional and coastal waters. The report also lacks monitoring on sediments and biota.
- RBSPs in waters have been used in the classification of ecological status/potential only for rivers and lakes. Greece reported 12 river basin specific pollutants causing failure to achieve good ecological status/potential of SWBs.
- The 'one- out, all- out' principle has been applied for the overall classification of the ecological status of a water body.

Monitoring, assessment and classification of the chemical status in surface water bodies

- 97% of all monitored lake sites have been used to assess and classify their chemical status, though in rivers the share falls to 44%, in coastal waters to 84% and in transitional waters to 80% of all monitored sites. Greece monitored 76% of the total number of lakes, 14% of the total number of rivers, 50% of the total number of transitional water bodies and 23% of all coastal water bodies for their chemical status.
- Data from the new national monitoring programme were used in the classification but all RBMPs noted significant obstacles.
- There are significant gaps in the spatial coverage of the monitoring network of areas with denser monitoring stations and others with more dispersed or no coverage.
- There are significant gaps in data/measurements of essential elements needed for the chemical classification of the SWBs. There is limited coverage of rivers/lakes/transitional and coastal water bodies from surveillance stations, and there are also data gaps on chemical parameters. There are no monitoring sites of chemical parameters which are part of international programmes or transboundary monitoring cooperation.
- There is limited availability of measurements for the priority substances. They have been

monitored only in water but the share of water bodies monitored varied greatly. *Mercury, hexachlorobenzene* and *hexachlorobutadiene* were not monitored in biota or sediments for status assessment.

- Greece has not carried out monitoring for long-term trend assessments due to the above-mentioned and significant lack of data/measurements.
- The share of water bodies monitored is low (approx. 18% of all SWBs) and there is a high degree of variability on the share of water bodies monitored per RBD.
- 41 priority substances were used to assess the SWBs chemical status and 13 priority substances in water were monitored once a month over the six-year period. 6 priority substances are causing failure to achieve good chemical status in SWBs and 2% of all SWBs are failing to achieve good status due to ubiquitous persistent compounds.
- Natural background concentrations for metals and their compounds, hardness, pH or other water quality parameters that affect the bioavailability of metals have not been taken into account.
- The analytical methods meet the minimum performance criteria for the strictest standard and the 'one-out-all-out' principle has been applied to the classification of the SWBs chemical status.
- Greece reports a significant increase in the number of SWBs in good condition (68%), a significant reduction in the number of SWBs in unknown status (-60%) and a reduction in the number of SWBs failing to achieve good status. Thus, 88.5% of the total monitored SWBs are in good status, 1.6% fail to achieve good status and 9.8% are in an unknown status. However, the level of confidence is low for 72% of the SWBs considered to be in good chemical status, medium for 14% and high for only 3%. 10% of the SWBs in unknown chemical status lack information. Lastly, the confidence level is medium for 1% of the SWBs that fail to achieve good status.
- By 2021, most water bodies in all categories are expected to achieve good status and by 2027, Greece expects, ambitiously, that all water bodies in all categories will achieve good status. However, there is no reference to any improvements planned in the confidence levels.

Monitoring, assessment and classification of the quantitative status of groundwater bodies

- Although almost half (45%) of the ground water bodies (GWBs) are not monitored for their quantitative status, and no GWBs have been reported to be in unknown status.
- Most GWBs (84%) are reported to be in good quantitative status and 16% fail to achieve good status.
- Drinking water protected areas are not clearly reported but safeguard zones are in place in drinking water protected areas. To avoid setting an entire area under strict measures that would affect all activities and population (e.g. an entire island), Greece considered it more appropriate to create safeguard zones at drinking water abstraction points instead of entire areas.
- GWBs are reported as associated with surface water and included in the status assessment.
- GWBs linked to terrestrial ecosystems are reported only in the Crete and Aegean Islands RBDs but the entire reported data on the issue of linkage with terrestrial ecosystems require further clarification.

Monitoring, assessment and classification of the chemical status of groundwater bodies

- The new monitoring programme has been designed to monitor, assess and classify the

GWBs in this cycle. Despite significant gaps in stations and data, there is an increase in the number of sites and development of both surveillance and operational stations in nutrient-sensitive areas and in SoE monitoring sites.

- None of the GWBs are reported as being under surveillance monitoring for the core parameters although the RBMPs note that surveillance monitoring has been set up in the nitrate vulnerable zones of all RBDs. No surveillance monitoring in GWBs has been reported, although the RBMPs do include this data.
- Greece has used a combination of expert judgement and grouping and numerical methods to monitor and assess the GWBs' chemical status. However, expert judgement and grouping have been widely used since all RBMPs report a lack of monitoring data and stations in GWBs.
- Most GWBs (85%) are reported to be in good chemical status and 15% as failing to achieve good status. Compared to the previous cycle, in the GWBs in both good status and in poor status increased by 2%.
- The confidence levels are at equal shares and work remains to be done to improve these levels by increasing the monitoring network capacity and data robustness.
- None of the WFD core parameters are reported as being monitored but the reported data require further clarification. Certain core parameters are reported as pollutants that give rise to failure risk to GWBs.
- The pollutants causing failure to GWBs have been reported but in certain RBDs the trends of the pollutants has not been calculated or reported.
- Greece has included a new basic measure for 400 monitoring stations in GWBs in the second cycle to cover the needs.
- Threshold values have been set for the protection of uses and for saline intrusion.
- The period in which the GWB chemical status was assessed has not been reported.
- 5 substances included in Groundwater Directive Annex II were not included in the assessment: *Phosphorus* (total), *Phosphate*, *Cadmium*, *Trichloroethylene*, *Tetrachloroethylene*.

Designation of heavily modified and artificial water bodies and definition of good ecological potential

- The total number of heavily modified water bodies (HMWBs) and artificial water bodies (AWBs) has slightly fallen. However, the number of heavily modified river bodies increased by 26% and heavily modified lake bodies fell by 48%, with no changes in the other two categories.
- The general common process of designating HMWBs/AWBs is clear but actual implementation and analytic information in each RBD has not been provided.
- HMWBs have been designated in all RBDs. The main uses of the heavily modified lake bodies are related to agriculture (32%) and to urban water supply (26%).
- All the in-river reservoirs that were previously classified as lakes were classified as heavily modified river bodies in the second cycle.
- Greece has not reported the specific criteria used to assess significant adverse effects and thresholds for the water uses to define significant adverse effects. Biological quality elements (BQE) together with hydrological and morphological parameters/alterations are included in the assessment of HMWBs and AWBs.
- Ecological status assessment methods sensitive to hydromorphological pressure are reported but there is still a gap in the definition and set up of good ecological potential.

- A new common method to assess good ecological potential using the 'Prague approach', i.e. the approach based on mitigation measures, has been developed but there is no information on how the approach is implemented.
- Good ecological potential has not been defined.
- River continuity issues have not been examined and the potential effects of 'smaller' modifications have not been assessed.
- A significant share (15%) of modifications is reported as 'others' with no further information.

Environmental objectives and exemptions

- All RBDs report on environmental objectives for ecological and chemical status of surface water bodies (SWBs) and groundwater bodies (GWBs). There are still, however, SWBs with an unknown ecological status and SWBs with unknown data on achieving their ecological and chemical status.
- Common methodological guidelines for the exemptions have been developed.
- The Article 4(4) exemptions have been used in all RBDs. Ecological, chemical and quantitative exemption types have been used. The number of both SWBs and GWBs in exemptions has increased significantly.
- The two main reasons for the exemptions are: the lack of required time for measures to be applied and changes to occur and the lack of information (data) on the cause of the problem and thus the solution could not be identified.
- The Article 4(7) procedure on new modifications, at its initial stage, has been used in symmetry with the procedure for the initial assessment of heavily modified water bodies. An initial assessment (screening) has been carried out for the new projects that would result in 'new modifications' to check whether they should be examined under Article 4(7).

Programme of Measures

- (KTMs) have been reported to cover all significant pressure types in all RBDs and there is a clear and detailed mapping of the national measures to address KTMs. New measures have been planned and previous measures have been adjusted.
- KTM99 is the main KTM preferred in all RBMPs, with the majority of national measures mapped to it.
- New measures on water pricing have been brought in.
- There are still priority substances causing failure that remain uncovered in specific RBDs.
- Secure and clear financial commitment has been reported.
- Win-win measures are included in all RBDs.
- Consistency between the PoMs and the FRMP measures has been noted. By contrast, consistency between the PoMs and the measures listed in the first DMPs is not clear.

Measures related to waster abstraction and water scarcity

- Water abstraction has been the cause of significant pressure. All RBMPs include water resource planning to address the issue of abstraction.
- Despite efforts to collect updated data, the response of the stakeholders was limited and thus, water volumes for agriculture and drinking water supply are estimated based on

theoretical water needs and theoretical consumption values. Water volumes for industrial purposes are considered not relevant or not significant in many RBs. In the ones that have been taken into account, the calculated industry volumes are based on empirical modelling and/or proxy values.

- Although abstraction data were not reported to WISE under SoE quantity, the RBMPs (and the strategic environmental assessment) include relevant information and estimates on the needs/abstractions per use, per river basin and RBD. Estimates are also provided for the share of abstractions from SWBs and GWBs.
- Information on water abstraction (in the form of consumptive use or net consumption) was previously reported to WISE SoE- Water Quantity only for Eastern Macedonia/Thrace.
- The Water Exploitation Index (WEI+) has not been reported and there are no quantified or estimated trends on water exploitation.
- Irrigation abstraction volumes are based on the estimated water needs for crops, not on actual data, and estimates of the actual volumes used in fields. A significant gap between estimated and actual consumption by the agricultural sector was noted during the public consultation.
- Greece has created a new register of water abstraction points and new administrative acts for the registration of all self abstractions. Nevertheless, the issue of illegal water abstractions from both SWBs and GWBs has not been examined or presented as thoroughly as it should have in the RBMPs and the strategic environmental assessments.
- There are no thresholds set under Article 11(3)(e).
- Basic measures for the efficient and sustainable use of water of Article 11(3)(c) were implemented in the previous cycle. All RBDs include new measures and/or significant changes planned as well as water reuse measures. All RBDs also report measures for prior authorisation of artificial recharge or augmentation of GWBs under Article 11(3)(f).

Measures related to pollution from agriculture

- There is a clear link between agricultural pressure and measures.
- All RBDs report that the basic measures under Article 11(3)(h) to control diffuse pollution from agriculture were adopted and the same rules apply across the whole RBD.
- Farmers' associations were included in the lists of stakeholders for the public consultation.
- There was no gap assessment for the reduction of the number of applications of pesticides but a share of the agricultural area in the country has been under measures that have affected the use of plant protection products.
- Pollution from agriculture has been estimated using both theoretical and statistical data. The means used to make the estimates and the assumptions made give a margin for a significant gap between the estimated and actual situation on site in each RBD. Significant point pollution sources from livestock husbandry units to specific water bodies may have not been taken into account.
- The financing of agricultural measures is secured.

Measures related to pollution from sectors other than agriculture

- All RBDs report on and explain the priority substances related to pollution from sectors other than agriculture that cause failure in each RBD.
- This second cycle includes and reports on new measures and modifications of measures made since the previous cycle.

- All RBDs set out a range of key types of measure (KTMs) relevant to non-agricultural sources of pressure causing a failure to reach the WFD objectives with a clear link between the KTMs and the pressure.
- All RBDs include a permitting regime to control waste water point source discharges for both surface and groundwater as well as a register of waste water discharge. There are no thresholds set and some direct discharges are authorised.

Measures related to hydromorphology

- Common methods to assess all types of hydromorphological pressure have been developed and made publicly available. However, not all types of hydromorphological pressure are assessed currently. Hydromorphological alterations are considered as significant pressure only for the HMWBs in most RBDs and for dams of >15 m height. For the other SWBs, hydromorphological alterations are considered *a priori* as not significant pressure in many cases. The potential effects of 'smaller' modifications such as dams of <15 m, dredging, river straightening, drainage, etc. including impacts to transitional and coastal waters, have therefore not been assessed. The upstream impacts on dams/reservoirs are not included.
- The RBMPs provided only summarised information on currentactual hydromorphological pressure and there is no detailed information broken down by RBD.
- In terms of river continuity, overall management objectives have been set but there are no quantitative objectives.
- Ecological flows have been derived for some relevant, at-risk water bodies but this work is still ongoing. The completed ecological flows available have been implemented.
- The second cycle includes more measures to tackle hydromorphological pressure.
- It includes measures to assess ecological flow and they are reported as partially implemented.
- Specific mitigation measures (e.g. fish ladders, bypass channels, sediment management, removal of structures) have not been reported. Only the setting of ecological flows has been in reported as a mitigation measure in two RBDs.
- Win-win measures to achieve the objectives of both the Water Framework Directive and the Floods Directive, drought management and use of natural water retention measures have been reported, but KTM23 is not used.
- Indicators on the gap to be filled for hydromorphological pressures for 2015 and 2021 have been reported for 13 RBDs.

Economic analysis and water pricing policies

- The economic analysis has been updated in all RBDs based on a common, harmonised methodology. It includes calculation of external environmental and resource costs for both drinking water/sewage and irrigation water abstraction, treatment and distribution uses.
- New legislation on water pricing and water cost recovery was drawn up in 2017.
- Water services and uses are clearly defined and specified for each RBD.
- Despite several efforts to collect real data and information, the response from stakeholders (both public and private) has been limited and the data – when provided – are fragmented. The providers do not specify all the required categories of the financial cost and as a result, several estimations had to be made.
- Financial cost recovery is low in certain cases, at <50% for irrigation and around 62-67% for drinking water use. The financial cost for agricultural use covered by private (self)

abstractions are not calculated and the relevant cost recovery was set at 100% since it was assumed that they are carried out by the individuals who make the abstractions.

- Environmental and resource cost recovery has not been reported nor estimated because the new legislation only requires providers to declare it after 2019.
- An environmental charge has been calculated and applied to drinking water together with sewage, irrigation water and self-abstraction. This cost has already been internalised for the above-mentioned services (except in Crete/Aegean Islands for drinking/sewage and irrigation water services).
- The resource cost has not been calculated or estimated for all uses in several RBDs. Several RBMPs state that the resource cost is entirely due to irrigation, with no reasoning.
- The new legislation has made it possible to assess incentives.
- The polluter pays principle is not taken into account.
- All RBDs report specific national measures mapped to the relevant KTMs for the need to tackle the gaps in water pricing and water cost recovery, in line with the Water Framework Directive.

Considerations specific to protected areas (identification, monitoring, objectives and measures)

- Protected areas are designated under all relevant Directives, with coastal waters by far the biggest category. Changes to the delineation of areas have been implemented. The size of protected areas increased by 13%.
- Designated areas for economically significant aquatic species are only in coastal waters and rivers, although there are transitional and lakes bodies where there is a significant presence of aquatic species and fishing activity in the country.
- Microbiological standards to protect shellfish have been set in two RBDs but not in the corresponding bodies for the Aegean Islands.
- Drinking water protected areas have been reported but the data require clarification. Safeguard zones in drinking water protected areas in all RBDs have been established.
- The register of protected areas has been updated.
- Most water bodies associated to protected areas are in good chemical status but there are also water bodies in a poor status. The ecological status/potential is good to moderate in most SWBs but some SWBs are in a poor or bad status.
- Specific water objectives have not been set to protect dependent habitats and bird species.
- All protected areas are equipped with monitoring sites, whose number has increased significantly since the previous cycle. However, there is little information on the current state of their network and any gaps in spatio-temporal data or in monitoring.
- Areas with exemptions from the relevant objectives or standards have been reported.

Adaptation to drought and climate change

- Climate change has been taken into consideration in the reporting and CIS Guidance Document No 24 has been used. The plans make reference to drought management, water scarcity and checks of the effectiveness of the measures taken.
- Climate change has also been factored into the FRMPs in terms of flood risk management and in terms of maximising cross-sectoral benefits and minimising the negative effects across sectors in all RBDs.
- All first drought management plans (DMPs) have been drafted and approved (including

Crete and Aegean Islands RBDs). Second cycle DMPs have not been drawn up but a new measure to update these plans has been included in the second cycle of PoMs.

- The results and the conclusions of the first DMPs have been used to assess the PoMs in the second cycle and the procedure to assess periods of prolonged drought. The strategic environmental assessments include the first DMP proposed measures/actions per alert category. However, there is no clear information on their links with the PoMs and their mapping on KTMs.
- Information provided on the steps taken to address climate change is rather general in all RBMPs (and their strategic environmental assessments). There is reference to the national strategy for adaptation to climate change and corresponding actions/measures but there is no clear mapping between action taken under the national strategy, the PoMs and the KTMs. KTM24 has been used only in three RBDs.
- There is consistency between the FRMPs and the RBMPs. The relevant measures and links are presented in the FRMPs.

Recommendations

- Greece needs to ensure that the preparation of the next cycle of RBMPs is carried out in accordance with the WFD timetable, to ensure the third RBMPs are adopted on time.
- Greece should maintain its efforts for transboundary cooperation with all neighbouring countries (non-EU countries included). Any difficulties and gaps should be mentioned in the RBMPs together with the actions taken to cover them. Joint consultations and designation of water bodies could be organised and translated into specific measures of transboundary cooperation. The precise share (in terms of area and percentage) of the International River Basins belonging to the Greek side should be clearly calculated and reported. Coordination in the typologies of the IRBDs with neighbouring countries should be developed. Joint delineation in transboundary water bodies would be welcomed.
- Greece's RBMPs should clearly mention the system (A or B) used in the typology for all water categories.
- Greece should intercalibrate all new classification systems and all BQEs assessment methods. Precise further steps taken towards filling this gap should be mentioned in the RBMPs.
- Greece should ensure that all standards/protocols and methodologies clearly take into consideration the relevant Common Implementation Strategy (CIS) guidelines and information included in the relevant EC website. Their consideration should be clearly noted in the RBMPs or the relevant supporting documents.
- The assessment of hydromorphological pressures still has major gaps. Greece should ensure that methods are improved in order to fill these gaps and assess all types and intensity of hydromorphological pressures. More efforts should be done so as to monitor and assess more hydromorphological elements in a greater number of water bodies for each RBD in all water categories.
- Greece should assess all pressures from Priority Substances/River Basin Specific Pollutants causing risk/failure in all water bodies in all RBDs and the existing gaps should be filled. Indicator gaps of the relevant substances should be reported. Clear correspondence between priority substances causing failure and national measures and KTMs should be presented in the RBMPs and reported to WISE. Data or information regarding the inventory of emissions, discharges and losses of all Priority Substances and the eight other pollutants listed in Part A of Annex I for each RBD should be reported.
- Grece should ensure that the reported data and information on ground water dependent terrestrial ecosystems are improved and data coherence with the ones in the RBMPs should be increased.
- Greece to ensure that the recommendations of the second RBMPs concerning the gaps and the needs of the new monitoring network in all water categories (and the Protected Areas) are taken into account and be implemented in the third cycle. Spatial coverage and measurements/data quality, gaps in data of quality elements and priority substances and in trends should be covered. Precise information per RBD on the actual status of the network should be included in the RBMPs (or their supporting documents).
- The number of quality elements used for the assessment has increased since the first cycle, there are however still gaps in all water categories. Greece needs to make further efforts to close these gaps and assess all relevant quality elements. All relevant River Basin Specific Pollutants should in particular be assessed in all water categories, and hydromorphological and physicochemical quality elements should be assessed in lakes and transitional waters.
- Greece should ensure that monitoring in biota and sediments are implemented in accordance with Directive 2008/105/EC, as amended by 2013/39/EU.

- Greece should justify, reduce and improve the monitoring frequencies and spatial variabilities between RBDs.
- Greece to ensure that groundwater bodies core parameters monitoring is implemented and relevant data discrepancies between those reported to WISE and the RBMPs are minimised.
- Greece should improve the confidence levels in both ecological and chemical status classification by increasing the capacities of the new monitoring network and the data robustness.
- Greece should make clear whether the following substances included in Groundwater Directive Annex II have been considered in the chemical status assessment: *Phosphorus* (total), *Phosphate*, *Cadmium*, *Trichloroethylene*, *Tetrachloroethylene*, as there are data discrepancies.
- Greece should define good ecological potential in all RBDs for the HMWB and AWBs. The significant adverse effects should be examined and specific criteria should be set as well as thresholds for the water uses to define significant adverse effects. River continuity issues should be better examined and potential effects of 'smaller' modifications should be assessed.
- Greece should clearly and precisely include in each RBMP specific information per RBD related to the reasons for the exemptions.
- Greece should develop more KTMs and national measures on hydromorphological conditions. Clear and specific information on the actual degree of implementation of the previous cycle's measures should be included in the RBMPs and their supporting documents.
- Greece should make clear whether operational and maintenance costs are included in the total amounts reported in the measures. Depreciation should be included in calculations.
- Greece should clearly examine in the RBMPs (or their Strategic Environmental Assessments) coherence of the next cycle's PoMs with the measures of DMPs and the MSFD.
- Greece should report to WISE SoE- Water Quantity for all RBDs information on water abstraction (in the form of consumptive use or net consumption). The Water Exploitation Index (WEI+) should be calculated for each RBD and quantified or estimated trends on water exploitation should be presented in the RBMPs and reported.
- Greece should further examine the issue of self-abstractions and illegal abstractions, and estimations should be presented in the RBMPs.
- Greece should continue prioritising the use of green infrastructure and/or natural water retention measures that provide a range of environmental (improvements in water quality, flood protection, habitat conservation, etc.), social and economic benefits which can be in many cases more cost-effective than grey infrastructure.
- Greece should complete a gap assessment for the reduction in the number of applications of pesticides and information provided in the RBMP.
- Greece should ensure that pollution from agriculture is calculated based on data and information from the relevant RBD of each RBMP and, as far as possible, cross checked with the actual situation. Point pollution from livestock husbandry and first processing units should be examined more thoroughly in the RBMPs as they affect specific water bodies.
- In the third RBMPs, Greece should state clearly to what extent in, terms of area covered and pollution risk mitigated, basic measures (minimum requirements to be complied with) or supplementary measures (designed to be implemented in addition to

basic measures) will contribute to achieving the WFD objectives and identify sources of funding (e.g. CAP Pillar 1, RDP), as appropriate, to facilitate implementation of these measures.

- Greece should ensure that measures related to flow metering (volumetric) in both irrigation from collective networks and from self-abstractions are included and prioritised in the RBMPs. They should be considered together with the administrative measures on establishment of maximum irrigation volumes per crop, as well as the polluter pays principle.
- Greece should report KTMs relevant to non-agricultural sources of pressures causing failure also for Central Macedonia and Thrace (as it is already included in the relevant RBMP) and such discrepancies should be avoided in the next cycle.
- Greece should consider the hydromorphological alterations as significant pressures for all water bodies and not only for the HMWB/AWB and for the dams >15m. Any *a priori* considerations of hydromorphological alterations as not significant pressures should be reconsidered. Potential effects of 'smaller' modifications such as dams <15 m, dredging, river straightening, drainage, etc., including impacts to transitional and coastal waters, should be considered assessed. Impacts upstream to dams/reservoirs should be considered.
- Greece should set for river continuity quantitative objectives and precise information on their management objectives in each RBD needs to be included in the RBMPs (or their supporting documents).
- Greece should develop specific mitigation measures in addition to the setting of ecological flows. In relation to improvements needed in the assessment of pressures, mitigation measures (fish passes, etc.) should address all types of pressures including those resulting from dams < 15m and all other relevant alterations.
- Greece should determine and implement ecological flows for all relevant water bodies. Clear and precise information and data on the evolution of ecological flows determination and implementation in each RBD need to be included in the RBMPs (or their Strategic Environmental Assessments).
- Greece needs to strengthen the response of the stakeholders on data and information provision for the needs of the economic analysis in next cycle RBMPs.
- Greece should examine the financial cost of self-abstractions and estimate these in all RBDs. The assumption that it is entirely undertaken by the users operating self-abstractions may not correspond to the actual situation (e.g. in cases of co-funded equipment, VAT and other tax exemptions for fuel/energy used in drilling, abstractions and irrigation). Self-abstraction itself, as part of an economic activity, generates a cost no matter who undertakes it.
- Greece should develop precise incentives for more efficient use of water and establish them in each RBD. The polluter pays principle should be taken into account in the water pricing studies and calculations as well as in the economic analysis in each RBMP.
- Greece should clearly present in the RBMPs information on the state of the monitoring network in the Protected Areas. This is essential in order to reduce the part of the GWBs and SWBs in poor/bad status and unknown status associated to Protected Areas.
- Greece should set microbiological standards to protect shellfish in the Aegean Islands RBD as well.
- Greece should update in a timely manner also the Flood Risk Management Plans and the Drought Management Plans and take them into account in the next RBMPs. Information and data on the level of their implementation should be presented. Both FRMPs and DMPs still need to be taken a step further in terms of implementation of their measures.

The linkages between the RBMPs' measures and DMPs' measures should be clearly presented.

- Greece should undertake a more thorough and explicit examination of the climate change impacts in the RBMPs (e.g. in terms of modelling of flows and water volumes, on quantified impacts on abstractions and volumes exported to other RBDs, flash flooding, changes in pressures and quality elements, etc.). This would be useful information in the third RBMPs.

Topic 1 Governance and public participation

1.1 Assessment of implementation and compliance with the WFD requirements in the second cycle

1.1.1 Administrative arrangements – river basin districts

Greece has established 14 RBDs that are identical to the 14 Water Districts of the 2010 Ministerial Decision, covering the entire country. All RBDs include coastal waters that cover a total of 37,823 km^2. Two RBDs, the Aegean Islands and Crete RBDs are insular, while six RBDs, Northern Peloponese, Western Sterea Ellada, Epirus, Attica, Eastern Sterea Ellada and Thrace include both mainland and insular areas.

Five RBDs, i.e. Epirus, Western Macedonia, Central Macedonia, Eastern Macedonia and Thrace are transboundary/international ones.

1.1.2 Administrative arrangements – competent authorities

Greece has a National Waters' Committee that is the interministerial, highest level decision making authority having the overall policy and strategy elaboration and management on water issues of the Water Districts (WD), and thus of the RBDs, of the country. It is comprised of the Ministers of the Ministries in the above table (with the Minister of Environment chairing). The Committee is assisted by the National Waters' Council, a 26-member panel of experts, political parties' representatives and organisations' representatives. The National Waters' Council meets at least once annually and has an advisory role to the National Waters' Committee.

The Special Secretariat of Waters (EGY) of the Hellenic Ministry of Environment & Energy has the responsibility of drawing up programmes of protection of the water resources of the country and the coordination of the services and state agencies for every issue related to waters management and protection. It draws up the national programmes of waters protection and management and follows and coordinates their implementation, in cooperation with the Water Directorates of the Decentralised Administrations.

In addition to this core role it is also responsible for reporting to the EC. The roles of the above mentioned CAs are presented at the following table:

Competent Authority (CA)	Level of Action	Roles
Ministry of Environment & Energy - Special Secretariat of Water (EGY)	National	Regulations' enforcement Implementation of coordination RBMPs' & PoMs' preparation Public participation Measures' implementation Assessment of ground water & surface water status Ground water & surface water monitoring Economic analysis Pressure & impact analysis Reporting to the EC
Ministry of Rural Development and Food	National	Measures' implementation
Ministry of Foreign Affairs	National	Regulations' enforcement
Ministry of Infrastructure and Transport	National	Measures' implementation
Ministry of Economy and Development	National	Measures' implementation
Ministry of Health	National	Measures' implementation
Ministry of Shipping and Island Policy	National	Measures' implementation
Ministry of Interior	National	Measures' implementation

Administrative Regions-13 Administrative Entities	Regional	Measures' implementation
Water Directorates of the 13 Decentralised Administrations	Regional	Regulations' enforcement Measures' implementation Implementation of coordination Public participation
Municipalities	Local	Measures' implementation

Source: WISE electronic reports

A description of the competent authorities is included in all RBMPs. Detailed descriptions of the competent authorities and their responsibilities as well as other local level authorities and organisms involved in waters' management in each RBD, are included in the Strategic Environmental Assessments (SEAs) and the Supporting Documents *"Determination and recording of the competent authorities and of their area of responsibility"* both available in RBD level and uploaded on the relevant website of the main competent authority.

1.1.3 River Basin Management plans – structure (sub-plans, Strategic Environmental Assessment)

Greece reported 14 RBMPs covering the entire RBDs with no sub-plans. Strategic Environmental Assessments (SEAs) and PoMs have been carried out for all RBMPs and they are available through the relevant website of the main competent authority.

1.1.4 Public consultation

Greece followed a common consultation procedure for all RBDs. According to the RBMPs, consultations took place between 30/11/ 2015 and 15/12/2017 in 3 phases. A steering group by the country's Water Directorates personnel was formed to support the main competent authority (EGY) and it actively participated to all phases of the RBMPs.

Interventions were also possible during the drafting of the RBMPs through email, fax or post. Workshops were also implemented between the competent authorities both at national and regional level involving the Water Directorates of the Regional and Decentralised Authorities. A 3-day workshop took place in Athens with all the Water Directorates of the country for the needs of the PoMs determination and issues of the Flood Risk Management Plans (FRMPs).

2-day events with workshops and presentation of the RBMPs were organised by the main competent authority (EGY) and took place between September and October 2017 at a main city of each RBD where stakeholders were invited to participate. The consultation of the SEAs of the relevant RBMP took place at the same events and in the cases of Western Peloponnese, Attica, Eastern Sterea Ellada, Eastern Macedonia, Thrace, Crete and Aegean Islands the consultation of the FRMPs as well.

The participation of the public administration services has been considered as satisfactory and that of the citizens and NGO as average, while a high degree of environmental sensitivity for the water resources has been noticed in all RBDs. The consultation has been considered as successful in all RBMPs since it showed all points/problems/gaps of the first RBMPs, the need for reforms and contributed to the finalisation of the RBMPs of this cycle.

Consultation documents were available in all RBDs for the required period. There was available downloadable material; documents were sent with direct mailing (e-mail), paper copies were distributed at the exhibitions and paper copies were available in municipal buildings. In all RBDs, there was use of printed material, of media (papers, TV, radio), meetings organised, direct mailing, invitations were sent to stakeholders and the local authorities and there was use of internet. Written consultation has been reported in 11 RBDs while it did not take place in 3 RBDs

i.e. in Western Sterea Ellada, Epirus and Thessalia.

Stakeholders' groups involved in the consultation comprised of the industry, agriculture/farmers, fisheries/aquaculture, NGOs/nature protection, local and regional authorities, navigation/ports, energy/hydropower and water supply and sanitation. Alliances were formed, advisory groups were established and regular exhibitions were organised. Involvement in drafting was also reported in all RBMPs.

The consultation resulted to changes and additions with regards to the redetermination of the ground waterbodies, to the reform of the final PoMs, to modifications in the description of certain Measures so as to include actions already planned by the authorities or/and the available funding instruments, to the addition of complementary measures for the achievement of specific and locally important management targets and for the increase of the current knowledge and to the improvement of the environmental and water conditions.

The methodological plan for the consultation and a presentation of the different stakeholders that should be contacted in each RBD are available online as well as a list of comments/remarks, uploaded to the main competent authority's relevant website. The Supporting Documents 13 '*Report of the Assessment of the Results of the Consultation'* include the procedure and the several stakeholders identified in each RBD but not the specific results of the consultation and their impact to each RBMP.

1.1.5 Integration with other European Union legislation: Floods Directive and Marine Strategy Framework Directive

During the time of the RBMPs drafting (2017), the Flood Risk Management Plans (FRMPs) were in their consultation phase, with the exception of the FRMP of Evros river basin in Thrace RBD that was already finalised.

Although according to WISE, there was no joint consultation between RBMPs and the FRMPs under the Floods Directive nor any carried out between the RBMPs and the Marine Strategy Framework Directive (MSFD), such events of joint consultation with the FRMPs have been mentioned in the RBMPs of 9 RBDs, i.e. of Western Peloponnese, Attica, Eastern Sterea Ellada, Western Macedonia, Central Macedonia, Eastern Macedonia, Thrace, Crete and Aegean Islands[7].

The FRMPs were completed in 2018 and took into account the RBMPs and their PoMs. All FRMPs have examined and presented clearly their coherence and complementarity with the RBMPs.

Drought Management Plans (DMP) were elaborated during the previous cycle and, always according to the RBMPs, their results and conclusions have been taken into consideration in the PoMs of the current phase as well as for the determination of the procedure of the assessment of extended drought periods for the needs of the exceptions of Art.4.6 of the WFD.

Regarding the Marine Strategy Framework Directive (MSFD), the RBMPs include an update of the current situation of the implementation of the Directive. The public consultation for the PoMs related to the achievement of the good environmental status of the marine waters, begun in April 2017, and their drafting was still ongoing during the RBMPs drafting. It has been expected that after the completion of the MSFD programme of measures, there will be an update of the initial assessment for each marine area and of the environmental targets and indicators. Furthermore, the update of the PoMs of the RBMPs has also been foreseen for the achievement of the good environmental status of marine sub-areas waters.

[7] Overall, there have been 16 consultation for FRMPs (https://floods.ypeka.gr/index.php?option=com_content&view=article&id=19&Itemid=506) and 16 consulation events of RBMPs (http://wfdver.ypeka.gr/el/consultation-gr/events-seminars-gr/)

1.1.6 International coordination and co-operation

Five international/transboundary RBDs have been reported, i.e. Epirus, Western Macedonia, Central Macedonia, Eastern Macedonia and Thrace. Three of them, i.e. Epirus, Eastern Macedonia and Thrace, belong to Category 2 as they are under an international agreement and there is a permanent co-operation body in place, while the other two international RBDs, i.e. Western Macedonia and Central Macedonia, are under an international agreement (Category 3).

There is reference to the existence of PoMs for all the international RBDs. No PoMs' coordination activities or PoMs' roof reports or other PoMs' coordination links have been reported. Information on public participation and any other active involvement of the interested parties has not been reported.

However, Greece reported the meetings that took place up to the elaboration of the RBMPs in 2017. According to the RBMPs:

- Epirus RBD: on 9/01/2015 the second meeting of the Permanent Greek-Albanian Committee for Transnational Waters Issues took place in Athens, with presentations of the WFD, the RBMPs, the Monitoring Network and the first RBMPs of Epirus and Western Macedonia. The Albanian side presented the actions for water resources management and the monitoring of surface and ground waters. It was agreed to exchange information on the WFD implementation. Greece informed the Albanian side that it was advancing to the second cycle RBMPs and proposed the coordination of the Management Plans according to the WFD. The two sides proposed National Focal Points (Special Secretariat for Waters-EGY in Greece and Technical Secretariat of the National Council of Waters in Albania).

  In 14-15 December 2016 there was the 4th Drin Stakeholders Conference where members of the Ministry of Environment and Energy presented the legal framework for the Integrated Management of Lakes Prespa.

- Western Macedonia and Central Macedonia RBDs: the last activity took place in Athens the 02/12/2015 with the third meeting of the Experts for Waters and Environment between Greece and NMK (named FYROM in that period). The two sides exchanged information concerning the Axios river, the lake Doirani and the biodiversity according to EU requirements. From the Greek side it was noted the entrance of FYROM at the Convention of the Economic Committee for Europe of the UN for the Protection and Use of Transboundary Rivers and International Lakes will reinforce the bilateral cooperation on water issues. The Greek side gave copies in English of the abstracts of the first cycle RBMPs of Western Macedonia and Central Macedonia.

- Eastern Macedonia RBD: The 4th, 5th and 6th Meetings of the Joint Working Group between Greece and Bulgaria took place respectively in Athens (08/05/2015), Sandanski (13/05/2016) and Kavala (21/06/2017).

- Thrace RBD: The meetings of Joint Working Group with Bulgaria already mentioned in Eastern Macedonia also considered the common issues of Thrace. On the contrary, there is no information related to activities of the Ad Hoc Joint Committee with Turkey (established in 2010) and the relevant Joint Working Group.

1.2 Main changes in implementation and compliance since the first cycle

In Greece there have been no changes in the number of reported RBDs since the first cycle, nor changes in the surface/delineation of the RBDs. The competent authorities also remain the same.

As far as international cooperation/coordination is concerned, the coordination category of the International River Basin of Axios/Vardar (both in Western Macedonia & Central Macedonia) has been promoted to Category 3 (from Category 4).

There have been no significant differences since the first cycle at the public consultation procedures and means.

The cooperation activities that took place during the first cycle (meetings between authorities and Joint Working Groups) have been continued. It has not been clear whether the exchanged information during these activities had any impact on the RBMPs of the international RBDs but it can be seen that essential baseline data such as the part of the international catchments that belong to the Greek side have not been reported nor clearly included in the RBMPs.

1.3 Progress with Commission recommendations

Recommendation: *Ensure that the authorities responsible for water management are fully in charge of the contents and development of the RBMPs. Support from consultants and researchers is often necessary, but the authorities' ownership of the RBMP should be ensured to embed the WFD principles and obligations into practice and avoid the disconnection of the planning process from the water management reality. Long-term capacity and expertise building should be ensured in the water administration, based on sufficient resources and personnel available at all relevant administrative levels.*

Assessment: The competent authorities are fully responsible for water management and in charge of the contents and development of the RBMPs. The main competent authority is also assisted by consultants for the implementation of the requirements of the WFD (technical assistance at administrative issues). Long-term capacity and expertise building, in particular at the regional and local water administration level remain a shortcoming. Coordination issues between the national and regional/local authorities have been mentioned in the RBMPs, as they administratively belong to different Ministries. Thus, there is partial fulfilment of the recommendation.

Recommendation: *The consultation process needs to be strengthened. More efforts should be done to ensure active participation of all relevant stakeholders and the comments should be taken under consideration in a more transparent way.*

Assessment: The consultation process has been strengthened. From the comments, only those that have been uploaded to the relevant website set by the main competent authority have been available. However, all RBMPs mention that the comments from public consultation have been taken into account and have resulted to changes in the RBMPs and the PoMs. More precise results of the impact of the consultation in each RBMP/RBD have not been available. The recommendation has been partially fulfilled.

Recommendation: *"Improve transboundary cooperation, building on the progress achieved so far; additional efforts in the context of WFD-implementation are needed, so that the second RBMPs for international RBDs are developed in close cooperation with neighbouring countries".*

Assessment: Transboundary cooperation has been implemented and been improved before and during the preparations and drafting of the second RBMPs, building on the achieved progress. It is not clear whether the exchanged information during these activities has been reflected in the drafting and development of the relevant RBMPs and their PoMs for the international RBDs. The recommendation has been fulfilled to a great extent but there is room for improvement.

Topic 2 Characterisation of the River Basin District

2.1 Assessment of implementation and compliance with the WFD requirements in the second cycle

2.1.1 Delineation of water bodies

Greece reported delineation data for the surface water bodies of all RBDs. The changes in numbers and areas in each RBD are presented in Table 2.1. Between 2010 and 2016, the number of water bodies reported as lakes has increased by 63% and their total area by 45%. The number and the total area of rivers have been reduced by 1% in both cases. The number and total area of transitional waters have increased by 18% and 2% respectively. Finally, the total area of the coastal waters is reduced by 20% without any change of their total number.

Each RBMP includes a summarised presentation of changes per water body and points to its own Supporting Document 6 '*Characterisation, typology, typo-specific conditions of reference and assessment/classification of the state of all categories of surface water systems*' with a detailed analysis[8].

Table 2.1: Number and area/length of delineated surface water bodies in Greece for the two cycles

Year	RBD	Lakes		Rivers		Transitional		Coastal	
		Number	Total Area (km^2)	Number	Total Area (km^2)	Number	Total Area (km^2)	Number	Total Area (km^2)
2016	EL01	0	0.0	112	886.2	3	3.0	11	1,041.6
2016	EL02	2	4.1	65	671.2	5	18.1	19	2,426.7
2016	EL03	1	1.2	80	567.6	5	5.5	13	2,683.0
2016	EL04	6	144.5	101	1,001.3	4	268.7	9	2,188.5
2016	EL05	1	19.2	85	1,095.9	7	402.9	13	1,049.3
2016	EL06	0	0.0	16	126.2	0	0.0	14	3,757.6
2016	EL07	3	35.6	81	1,033.0	1	18.4	19	6,199.8
2016	EL08	2	35.4	73	1,387.8	0	0.0	7	944.0
2016	EL09	14	297.9	150	1,554.7	2	37.5	2	585.0
2016	EL10	6	142.9	104	1,124.9	3	68.8	11	3,295.3
2016	EL11	1	46.1	84	834.3	1	5.9	4	734.0
2016	EL12	1	1.9	181	1,724.3	5	274.8	12	731.4
2016	EL13	1	0.7	123	662.4	4	0.2	25	2,024.5
2016	EL14	0	0.0	90	484.1	0	0.0	87	8,850.0
2016	**Total**	**38**	**729.7**	**1,345**	**13,153.7**	**40**	**1,103.8**	**246**	**36,510.7**
2010	GR01	2	3.5	110	886.0	5	3.7	11	1,042.6
2010	GR02	6	28.9	63	672.6	9	19.9	19	2,418.3
2010	GR03	1	1.2	80	567.2	6	5.9	13	2,681.7
2010	GR04	6	144.6	101	1,002.5	4	270.0	9	2,183.5
2010	GR05	1	19.2	85	1,100.0	7	414.5	13	1,048.0

[8] The supporting documents have not been uploaded to WISE and their weblinks were broken. Last accessed 10/02/2021.

2010	GR06	1	3.0	14	126.0	0	0.0	14	4,032.4
2010	GR07	3	35.6	81	1,033.4	1	18.5	19	6,439.1
2010	GR08	1	34.9	74	1,387.7	0	0.0	7	938.9
2010	GR09	14	544.2	150	1,539.4	2	39.2	2	1,127.1
2010	GR10	6	165.8	104	1,108.6	3	70.4	11	3,847.0
2010	GR11	2	47.2	91	835.9	1	6.6	4	730.0
2010	GR12	6	21.4	188	1,810.2	5	279.8	12	731.5
2010	GR13	5	5.7	118	654.1	4	0.2	25	2,024.5
2010	GR14	8	n/av	75	306.8	0	0.0	87	n/av
2010	**Total**	**62**	**1,055.4**	**1,334**	**13,030.3**	**47**	**1,128.5**	**246**	**29,244.6**

Source: WISE electronic reports

Table 2.3: Size of surface water bodies in Greece in the two cycles

Year	RBD	Lake Area (km²)			River length (km)			Transitional (km²)			Coastal (km²)		
		Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
2010	GR01	0.5	3.0	1.8	0.2	39.8	8.1	0.1	1.5	0.7	1.3	344.5	94.8
2010	GR02	0.5	19.9	4.8	1.3	32.5	10.7	0.2	7.0	2.2	1.1	827.0	127.3
2010	GR03	1.2	1.2	1.2	0.5	25.8	7.1	0.4	2.2	1.0	12.1	881.3	206.3
2010	GR04	2.0	96.5	24.1	2.4	39.8	10.6	9.0	130.4	67.5	1.6	871.5	242.6
2010	GR05	19.2	19.2	19.2	1.7	46.2	13.4	0.6	241.6	59.2	9.1	406.1	80.6
2010	GR06	3.0	3.0	3.0	1.4	21.3	9.0	0.0	0.0	0.0	0.4	1,296.0	288.0
2010	GR07	5.1	19.6	11.9	1.8	38.1	12.8	18.5	18.5	18.5	3.0	2,411.5	338.9
2010	GR08	34.9	34.9	34.9	2.3	66.5	19.3	0.0	0.0	0.0	19.7	592.8	134.1
2010	GR09	0.3	281.7	38.9	1.0	127.0	10.3	4.5	34.7	19.6	112.9	1,014.2	563.6
2010	GR10	1.1	72.0	27.6	0.9	41.9	10.7	0.6	67.6	23.5	0.1	1,327.6	349.7
2010	GR11	1.1	46.1	23.6	0.8	64.1	9.2	6.6	6.6	6.6	11.4	479.7	182.5
2010	GR12	0.6	13.3	3.6	0.4	61.6	9.6	1.2	164.9	56.0	5.1	197.3	61.0
2010	GR13	0.7	2.1	1.1	0.5	17.7	5.5	0.0	0.1	0.0	6.1	247.0	81.0
2010	GR14	n/av	n/av	n/av	0.1	9.6	4.1	0.0	0.0	0.0	n/av	n/av	n/av
2016	EL01				0.2	39.8	8.1	0.0	1.5	1.0	1.1	345.2	94.7
2016	EL02	0.5	3.6	2.0	1.3	32.5	10.8	0.2	7.0	3.6	1.0	832.2	127.7
2016	EL03	1.2	1.2	1.2	0.5	25.8	7.1	0.4	2.2	1.1	12.1	882.5	206.4
2016	EL04	2.0	96.5	24.1	2.4	39.8	10.5	8.6	135.1	67.2	2.0	874.9	243.2
2016	EL05	19.2	19.2	19.2	1.7	46.1	13.4	0.6	238.2	57.6	8.7	400.1	80.7
2016	EL06				1.4	19.9	8.4				0.4	1,125.0	268.4
2016	EL07	5.1	19.6	11.9	1.8	38.1	12.8	18.4	18.4	18.4	2.9	2,176.6	326.3
2016	EL08	0.5	34.9	17.7	2.3	66.5	19.3				3.4	624.3	134.9
2016	EL09	0.3	74.7	21.3	1.0	127.0	10.4	4.5	33.1	18.8	112.4	472.6	292.5
2016	EL10	1.1	72.1	23.8	0.8	42.0	10.8	0.6	66.1	22.9	0.0	865.5	299.6
2016	EL11	46.1	46.1	46.1	0.8	63.5	10.1	5.9	5.9	5.9	12.0	482.7	183.5
2016	EL12	1.9	1.9	1.9	0.9	54.1	9.8	1.2	160.3	55.0	4.7	198.4	60.9
2016	EL13	0.7	0.7	0.7	0.6	17.7	5.6	0.0	0.1	0.0	6.1	247.0	81.0
2016	EL14				1.3	15.7	6.0				11.2	488.6	101.7

Source: WISE electronic reports

For lakes, delineation changes have been reported in 11 RBDs, i.e. except Eastern Peloponnese, Western Sterea Ellada, Epirus and Eastern Sterea Ellada. The average lake area has been reduced significantly in most cases[9] while it has been increased in one RBD[10]. The minimum lake area has changed in 11 RBDs, i.e. except Eastern Sterea Ellada, Western Macedonia and Crete. The maximum lake area changed in 13 RBDs, i.e. except Eastern Sterea Ellada.

Changes in river numbers have been reported in 8 RBDs while changes in the total area of rivers has been reported in 9 RBDs. The average river length changed significantly in three RBDs[11] mostly due to changes in the minimum length. The minimum river length changed in all but Attica and Eastern Sterea Ellada, while the maximum length changed only in Crete.

[9] Redution of average lake size in: Northern Peloponnese (-58%) / Thessalia (-49%) / Western Macedonia (-45%) / Thrace (-48%) / Crete (-37%)

[10] Increase of the average lake size in Eastern Macedonia (96%)

[11] Significant increase in te average river length: Aegean Islands (44%), Eastern Macedonia (9%) and Attica (-7%)

The average area of the transitional waters changed in 12 RBDs. It increased in 4 RBDs[12] and decreased in 5 RBDs[13]. Coastal waters average area decreased in 4 RBDs[14] while it increased in Thessalia and Eastern Macedonia by 1% respectively.

Changes in number and areas of the surface water bodies per RBD between the two cycles

RBD	Lakes		Rivers		Transitional		Coastal	
	Change in number	Change in total Area (km^2)	Change in number	Change in total Area (km^2)	Change in number	Change in total Area (km^2)	Change in number	Change in total Area (km^2)
EL01	-2	-4	2	0	-2	-1	0	-1
EL02	-4	-25	2	-1	-4	-2	0	8
EL03	0	0	0	0	-1	0	0	1
EL04	0	0	0	-1	0	-1	0	5
EL05	0	0	0	-4	0	-12	0	1
EL06	-1	-3	2	0	0	0	0	-275
EL07	0	0	0	0	0	0	0	-239
EL08	1	1	-1	0	0	0	0	5
EL09	0	-246	0	15	0	-2	0	-542
EL10	0	-23	0	16	0	-2	0	-552
EL11	-1	-1	-7	-2	0	-1	0	4
EL12	-5	-20	-7	-86	0	-5	0	0
EL13	-4	-5	5	8	0	0	0	0
EL14	-8	n/av	15	177	0	0	0	n/av
Total	**-24**	**-326**	**11**	**123**	**-7**	**-25**	**0**	**7,266**

Source: WISE electronic reports

According to the RBMPs, the observed changes are mainly due to the new typologies for rivers and lakes between the two cycles, as follows:

The artificial lakes that have been formed due to dam construction on the riverbeds have been classified as heavily modified bodies in the river category. In addition, certain river water bodies have been unified and correction has been applied to their delineation.

For the delineation, the minimum size criteria reported were 10 km^2 catchment for rivers and 0.5 km^2 surfaces for natural lakes. For the delineation of river bodies in Crete and Aegean Islands and due to the insular character of the areas, the river bodies with <10km^2 catchment have also been considered.

In Aegean Islands, the reservoirs with <0.5 km^2 surface, covering drinking water needs and of particular importance at island level and in Western Macedonia and Central Macedonia the reservoirs for particularly important uses, such as drinking water, have also been taken into account.

[12] Increase in average length of transitional waters: Western Peloponnese (34%), Northern Peloponnese (63%), Eastern Peloponnese (12%), Crete (4%) and Aegean Islands

[13] Decrease in average length of transitional waters: Epirus (-3%), Western Macedonia (-4%), Central Macedonia (-2%), Eastern Macedonia (-9%) and Thrace (-2%)

[14] Decrease in average area of coastal waters in: Attica (-7%), Eastern Sterea Ellada (-4%), Western Macedonia (-48%), Central Macedonia (-14%)

Although the water reservoirs are reported as heavily modified river bodies in the second cycle, according to the RBMPs, their assessment and their classification are done according to data and tools for the lake category (since lake is the category of natural surface waters to which they mostly look alike).

The estuaries of river bodies with average annual flow over 100 million m^3 that are not clearly formed and are within a radius of 500m from the sea, are not considered as discrete transitional water bodies[15].

The ISO codes have also been modified (GR to EL) in order to be compatible with the EC databases.

Table 2.4 summarises the information provided on how water bodies have evolved between the two cycles.

Table 2.4: Type of change in delineation of groundwater and surface water bodies in Greece between the two cycles

Type of water body change for second cycle (WISE evolution type)	Lakes	Rivers	Transitional	Coastal	Groundwater
Aggregation	0	2	0	0	2
Splitting	0	0	0	0	34
Change	20	393	17	163	211
Change Code	1	62	0	2	19
Change Extended area	0	34	0	3	29
Change Reduced area	0	13	0	8	6
Creation	0	33	0	0	23
Deletion	1	41	0	8	19
No change	17	808	23	70	267
Total water bodies before deletion	39	1,386	40	254	610
Delineated for second cycle (after deletion from first cycle)	38	1,345	40	246	591

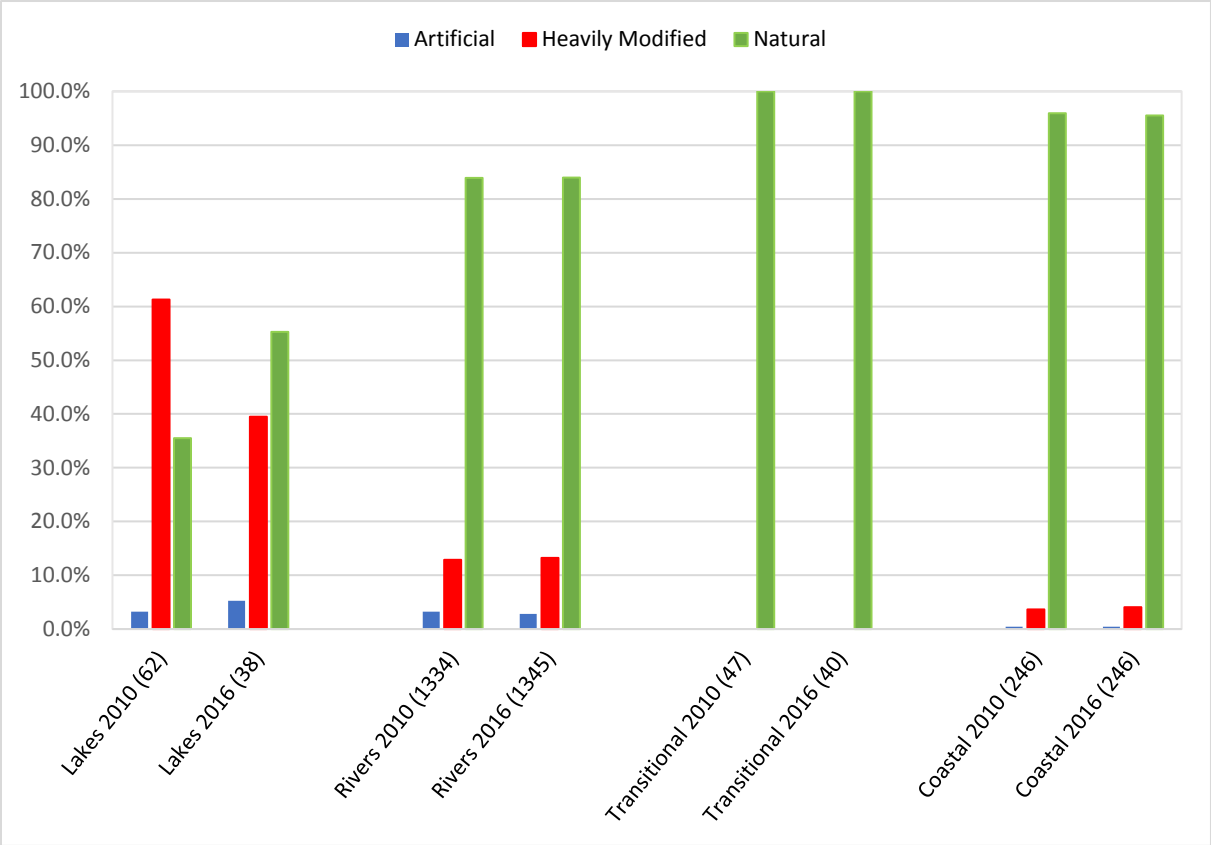
Source: WISE electronic reports

2.1.2 Designation of heavily modified and artificial water bodies

Due to methodological changes mentioned previously (reservoirs moved from lake to river HMWB category), between 2010 and 2016 the percentage of heavily modified lakes has decreased by 21.8%, while the rivers' HMWBs has increased by 0.3% and that of the coastal HMWBs has increased by 0.4%.

Figure 2.1: Proportion of surface water bodies in Greece designated as artificial, heavily modified and natural for the second and first cycles. *Note that the numbers in parenthesis are the numbers of water bodies in each water category.*

[15] In the first cycke these estuaries were classified as transitional. According to the National Centre of Marine Researches (ELKETHE), these estuaries are not transitional waters and they have been incorporated to the relevant coastal water body where they belong.



Source: WISE electronic reports

2.1.3 Delineation of groundwater bodies (GWBs)

The changes in the delineation of the groundwater bodies (GWBs) between the two cycles are presented in Table 2.5. The number of groundwater bodies (GWBs) has increased by 4% (from 570 to 591 in total). Their number has increased in 7 RBDs with highest changes in Epirus, Northern Peloponnese and Eastern Peloponnese and it has been reduced in 3 RBDs, i.e. Western Macedonia, Eastern Sterea Ellada and Central Macedonia. Finally, in 4 RBDs their number has remained unchanged (Attica, Eastern Macedonia, Thrace and Crete).

Main changes are due to changes in the delineation, insertion of areas not defined as GWB previously in existing or new ones, splitting and grouping of small GWB with similar hydro-geological characteristics (although some have different aquifer types -karst, granular or fractured).

According to the RBMPs, the number of the GWBs has been re-examined based on the available data from the monitoring network or/and special studies that have been elaborated since the first RBMPs' approval. The criteria are the same as those of the previous cycle[16] as well as the results of the monitoring programme, the quality approach of the pressures, the existing land uses, the importance of the aquifer, the vulnerability, pumping data, surface data, etc.

The RBMPs do not include precise and explicit descriptions of changes for each RBD. Each RBMP refers to its background document 7 '*Characterisation and assessment/classification of the*

[16] According to the RBMPs, the criteria used in the first cycle, were the hydro-geological character of geological formations, the capacity of underground aquifers, the uses of the groundwater system, the interdependence of the groundwater system with surface waters and terrestrial ecosystems and the existence of areas at risk due to pressures (e.g. overpumping, salinisation), the bad quality condition and the existence of increased natural background.

state of GWBs' which, nevertheless, have not been available[17].

Table 2.5: Number and area of delineated groundwater bodies in Greece for the two cycles

2010					2016				
RBD	Number	Area (km^2)			RBD	Number	Area (km^2)		
		Min.	Max.	Average			Min.	Max.	Average
EL01	26	18	982	262	EL01	27	18	981	258
EL02	26	14	828	284	EL02	33	13	813	229
EL03	27	26	1,454	297	EL03	34	18	1,454	250
EL04	25	25	3,907	410	EL04	26	25	3,921	404
EL05	26	11	1,622	349	EL05	40	1	1,618	240
EL06	24	2	445	129	EL06	24	8	382	132
EL07	46	11	945	268	EL07	43	30	945	288
EL08	32	37	1,262	392	EL08	33	37	1,262	385
EL09	62	1	2,812	275	EL09	54	3	2,797	250
EL10	39	1	1,946	348	EL10	37	1	1,598	269
EL11	15	19	2,246	456	EL11	15	19	2,247	458
EL12	18	26	2,416	578	EL12	18	26	2,425	643
EL13	91	0.98	582	92	EL13	91	0.98	582	92
EL14	113	0.6	920	79	EL14	116	0.529	929	76

Source: WISE electronic reports

2.1.4 Identification of transboundary water bodies

A total of 112 transboundary water bodies (i.e. 3 lakes, 84 rivers, 2 coastal and 23 groundwater bodies) were reported in 5 RBDs (Epirus, EL09, Central Macedonia, Eastern Macedonia and Thrace).

2.1.5 Typology of surface water bodies

As previously mentioned, in the second cycle, changes in delineation of water bodies are mainly due to the change in the typology. In the previous cycle, System B was reported in 13 RBDs (i.e. except GR13). During the second cycle, although the system used for the typology of lakes and rivers has not been clearly reported, according to the reported data and general information described in the RBMPs, it is considered that System B has been used for both cases. On the contrary, the RBMPs clearly mention that System B has been used in the case of transitional and coastal waters. There is no coordination of typologies with neighbouring countries for the transboundary/international water bodies.

Greece belongs to the Mediterranean Intercalibration Group (MED GIG). All Biological Quality Elements have been intercalibrated in the water categories used in the assessment except fish. During the second cycle, national, not intercalibrated, classification systems have also been developed, for lakes, reservoirs and transitional waters[18]. In total, 73 water bodies, i.e. 4%, are

[17] Not uploaded to WISE and not available on the relevant websites (inactive). Last accessed 10/02/2021.

[18] The natural lakes are classified in 3 types on the basis of phytoplankton and macrophytes. For 2 types, national methods of classification have been developed, while for one type there is a need for more data. Their compatibility with the WFD has been checked and approved but they are not intercalibrated because of lack of sufficient number of water bodies at the Mediterranean countries. The reservoirs are classified in 2 intercalibrated types on the basis of their geological background and the typology proposed in the first cycle, except those of average depth <15m. Artificial lakes of average depth <15m are

classified according to national, not intercalibrated types, of which 21 lakes, 15 rivers and 37 transitional waters. A comparison between the two cycles per RBD is shown in Table 2.6.

Table 2.6: Number of surface water body types (intercalibrated) in RBD level in Greece for the two cycles

RBD	Rivers		Lakes		Transitional		Coastal	
	2010	**2016**	**2010**	**2016**	**2010**	**2016**	**2010**	**2016**
EL01/GR01	6	6	1		2	2	3	1
EL02/GR02	6	5	4	2	2	1	4	1
EL03/GR03	5	5	1	1	2	1	4	1
EL04/GR04	10	8	2	4	2	2	1	1
EL05/GR05	7	6	1	1	2	2	1	1
EL06/GR06	1	4	1				1	1
EL07/GR07	5	4	1	3	1	1	1	1
EL08/GR08	9	5	1	2			1	1
EL09/GR09	10	6	4	4	2	2	1	1
EL10/GR10	7	6	4	5	2	2	1	1
EL11/GR11	6	6	2	1	1	1	1	1
EL12/GR12	7	7	2	1	2	2	1	1
EL13/GR13	6	6	2	1	1	1	1	1
EL14/GR14	1	5	1				3	1
Total	**39**	**9**	**18**	**11**	**7**	**7**	**9**	**2**

Source: WISE electronic reports

2.1.6 Establishment of reference conditions for surface water bodies

Type specific reference conditions have been established and are presented in Table 2.7. For 85% of the rivers, reference conditions have been set for some biological quality elements (BQE). Only 5% of rivers have reference conditions for all (BQE), while for 10% of the rivers no reference conditions have been set for any BQE. Reference conditions have been set for some of the hydromorphological and the physicochemical quality elements for all rivers.

Reference conditions have been set for all BQE for 16% of the lakes, and for the remaining 84% they have been set for some BQEs. Reference conditions have been set for some hydromorphological elements for all lakes. Reference conditions have been set for some physicochemical quality elements in 83% of the lakes and for all physicochemical elements in 17% of the lakes.

Finally, reference conditions have been set for the BQE of all transitional and coastal water bodies. There are no reported data on the hydromorphological and physicochemical quality elements of transitional and coastal waters.

classified in 1 national type (here belong important artificial lakes and the reservoirs of the Aegean islands). Special national lake types are also reported in 7 RBDs. Transitional waters are classified in 2 national types: lagoons and rivers' deltas/estuaries. Their final typology is based on System B of the WFD, the 'Venice System', the system of Guelorget & Perthuisot (1983; 1992) and the distinction of lagoons based on their area.

Table 2.7: Percentage of surface water body types in Greece with reference conditions established for all, some and none of the biological, hydromorphological and physicochemical quality elements.

Water category	Water types	Biological quality elements	Hydromorphological quality elements	Physicochemical quality elements
Lakes	All	16%		17%
	Some	84%	100%	83%
	None			
Rivers	All	5%		
	Some	85%	100%	100%
	None	10%		
*Transitional	All	100%		
	Some			
	None			
*Coastal	All	100%		
	Some			
	None			

**Only biological quality elements reported. WISE electronic reportsSource: WISE electronic reports.*

2.1.7 Characteristics of groundwater bodies

Information on the geological formation of the RBDs has been reported for all RBDs and for all GWBs. All GWBs are reported as non-layered, with the exception of one water body in Epirus. A total of 568 GWBs in 12 RBDs have been reported as associated to SWBs, while in 2 RBDs, (i.e. Attica and Eastern Sterea Ellada), no GWBs have been reported as being associated to SWBs. Dependence of terrestrial ecosystems with GWBs has been reported only in Crete (18 GWBs) and Aegean Islands (74 GWBs).

2.1.8 Significant pressures on water bodies

When comparing the evolution of pressures of SWBs between the 2 cycles, it should be taken into account that there have been significant changes in the monitoring systems and in the methodologies.

The estimated shares of the most significant pressures on SWBs and GWBs are presented in Figure 2.2. Figure 2.3 presents the 10 most significant pressures affecting SWBs and GWBs.

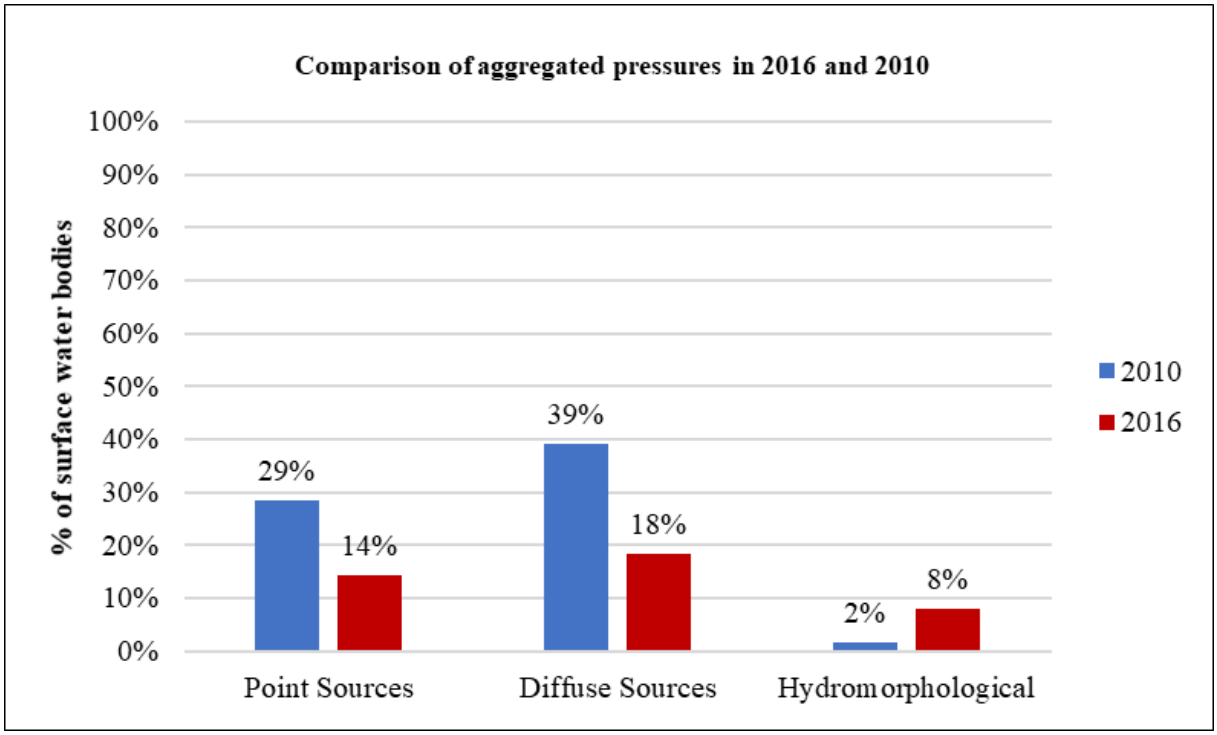
In the first RBMPs, pressures due to point sources were reported in 29% of the total SWBs, due to diffuse sources in 39% of the SWBs and hydromorphological pressures in 2% of the total of SWBs. In the second RBMPs, pressures due to point sources are reported in 14% of the total SWBs, diffuse sources in 18% of the SWBs and hydromorphological pressures in 8% of the SWBs.

The most significant pressures affecting SWBs are diffuse pollution; agriculture (in 14% of the SWBs), point pollution due to non Industrial Emission Directive (IED) plants (in 12% of the SWBs), other types of diffuse pollution (8%). Other types of pressure which affect a smaller proportion of water bodies are in particular abstractions and flow diversions for agricultural use - mostly irrigation- (4%), also diffuse pollution due to discharges not connected to sewerage networks (3%), physical alterations of channels/beds/riparian areas/shores (3%) and point pollution from urban waste waters and IED plants (2%).

For GWBs, abstractions (in 25% of the GWBs) and diffuse pollution (in 26%) due to agricultural uses are by far the most significant pressures, followed by the abstractions for the needs of industry (in 9%) and for drinking water supply (in 8% of the GWBs). Pollution due to urban runoff has been reported in 5% of the GWBs.

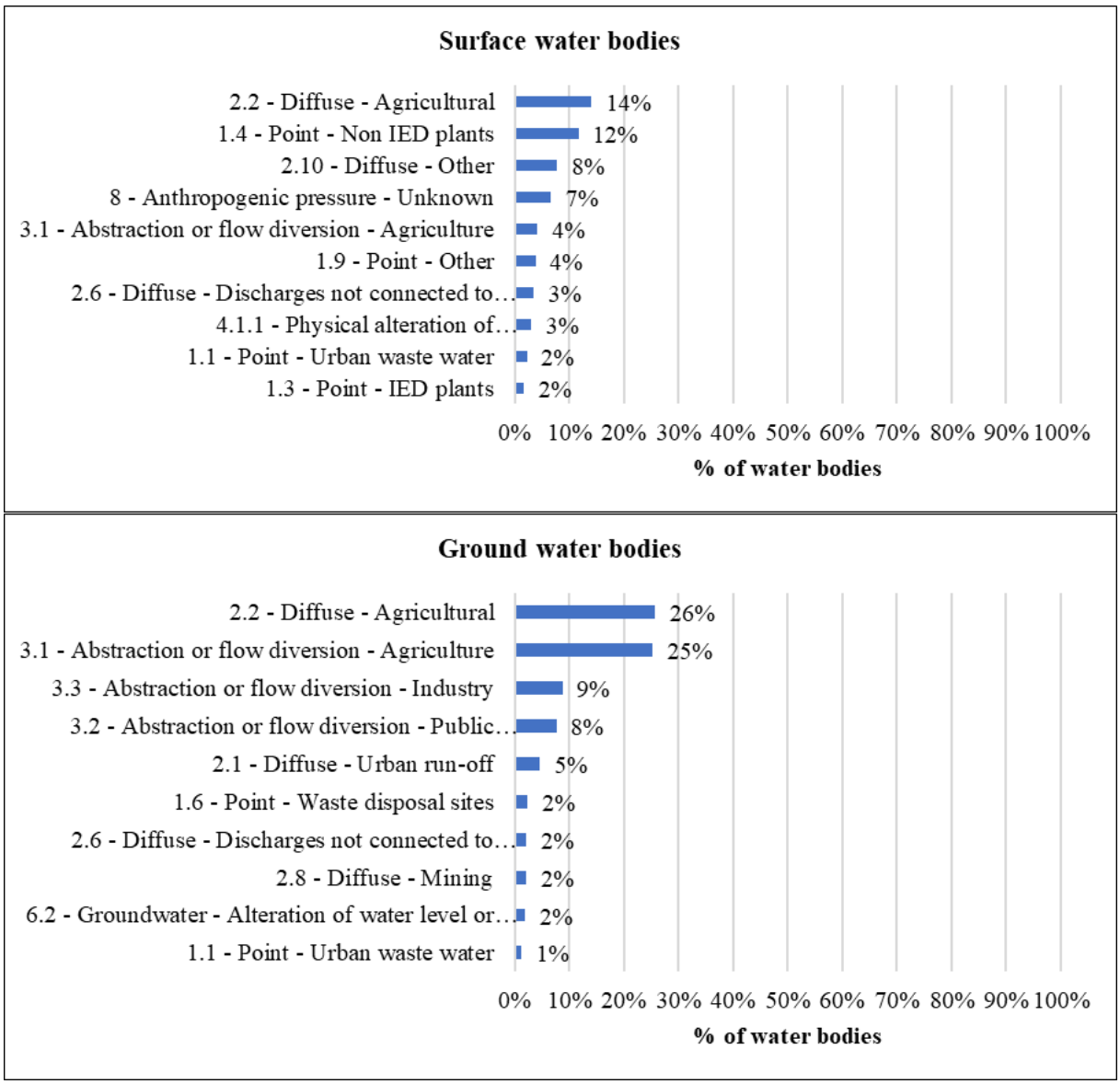
In addition, point source pollution due to waste disposal sites, diffuse pollution due to discharges not connected to sewerage systems and due to mining activities as well as point pollution due to urban waste waters are reported as significant pressures for a few GWBs.

Figure 2.2: Comparison of the pressure sources on SWBs in Greece between the two cycles



Source: WISE electronic reports

Figure 2.3: The 10 most significant pressures on SWBs and GWBs in Greece for the second cycle



Source: WISE electronic reports

2.1.9 Definition and assessment of significant pressures on surface and groundwater

A combination of experts' judgement together with numerical tools has been used to assess the significance of the several pressures on the SWBs and GWBs in all RBDs.

Significant pressures in SWBs from point source, diffuse source pollution, water abstraction and in water flow have been assessed using combination of both experts' judgement together with numerical tools in all RBDs.

Significant pressures in GWBs from point source pollution, diffuse source and water abstraction have been assessed in using combination of both experts' judgement together with numerical tools in all RBDs. Pressures on GWBs due to artificial recharge have been assessed with a combination of both experts' judgement together with numerical tools in 12 RBDs i.e. except Crete and Aegean Islands.

Significant pressures due to other sources in SWBs have not been assessed in 9 RBDs. and in

GWBs in 13 RBDs. For the remaining RBDs, the use of a combination of experts' judgement together with numerical tools has been reported.

"Significance" has been defined in terms of threshold in all RBDs and its definition has been linked to potential failure of objectives.

New common methodologies have been developed and they are available on the relevant website of the main competent authority. The assessment of the water bodies has been based on the monitoring data of the new national monitoring network to a greater degree than in the previous cycle. According to the RBMPs, experts' judgement has been used in several cases when there were no data or when data were problematic.

According to the RBMPs and their supporting documents, in most RBDs, the pressures related to hydromorphology have been examined only in projects that cause hydromorphological alterations to SWBs resulting in their initial characterisation (screening) as HMWBs or Artificial Water Bodies. Thus, a big number of SWBs Rivers may have not been examined for pressures linked to hydromorphology

2.1.10 Significant impacts on water bodies

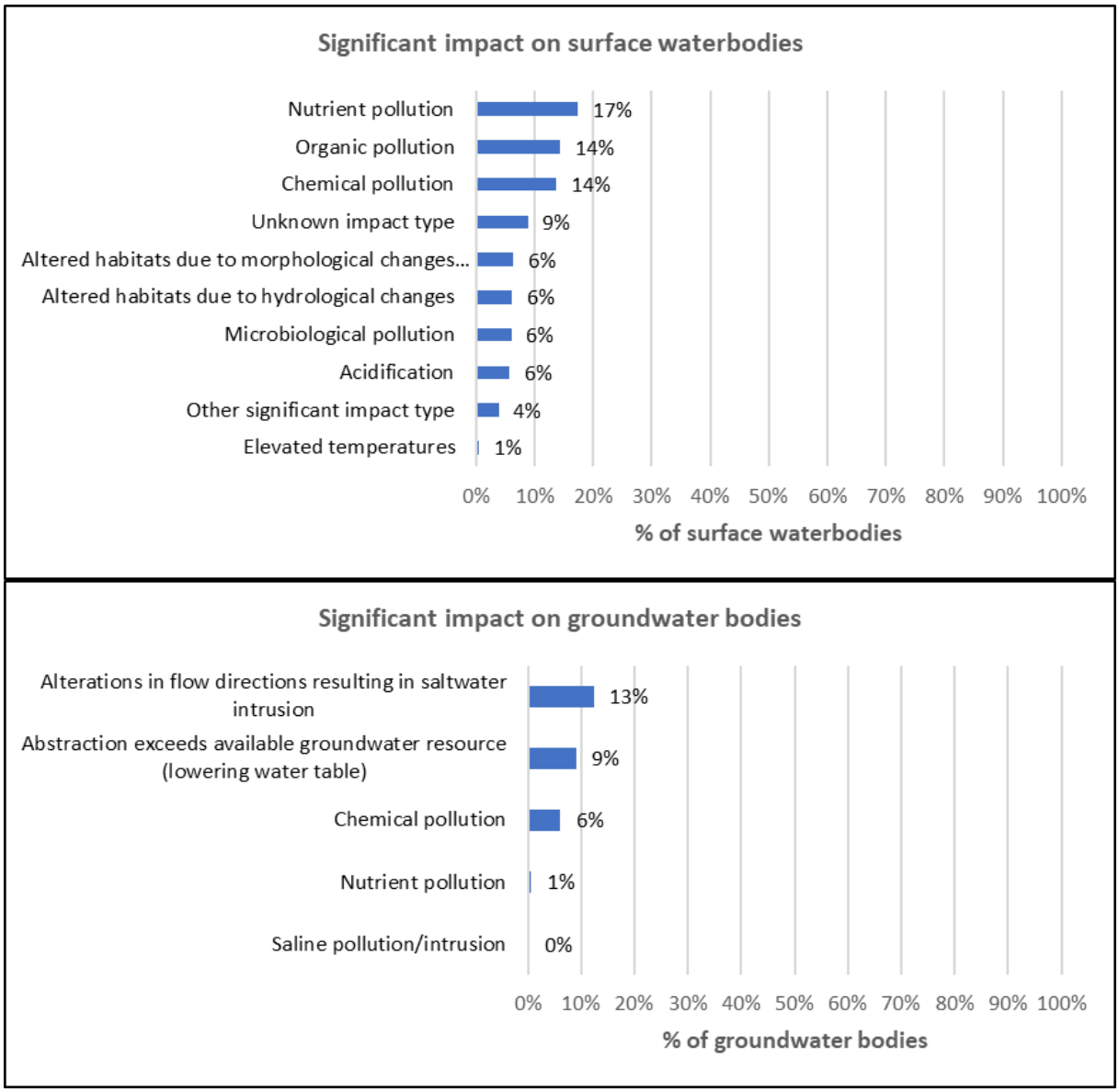
Nutrient pollution (in 17% of the SWBs) with organic pollution (in 14%) and chemical pollution (in 14%) are the most significant impacts of the previously mentioned pressures to the SWBs. Alterations to habitats due to morphological and hydrological changes (in 6% of the SWBs respectively), microbiological pollution, acidification have also been reported in 6% of the SWBs respectively and elevation in temperatures in 1%. Unknown impact type pressures and other significant impact types have been reported in 9% and 4% of the SWBs respectively.

According to the RBMPs, the situation of abstractions from the SWBs is critical in certain RBDs and in certain cases it does not allow even to reach ecological flow values[19].

The impacts from abstractions (for both irrigation and drinking/urban water uses) are the most significant ones in the GWBs, resulting in saltwater intrusion due to changes in flow directions (at 13% of the GWBs), to lowering of the water table (in 9%). Chemical pollution (in 6%) and nutrient pollution (in 1%) are also reported mostly of agricultural origin. Saline pollution/intrusion is reported in some GWBs (<1%).

Figure 2.4: Significant impacts on surface water and groundwater bodies in Greece for the second cycle. *Percentages of numbers of water bodies*

[19] For instance, in Thessalia, many SWBs are at a status of excessive use due to summer over-abstractions, when river flows are also at their lowest level. 9 SWBs are under high abstraction and 7 in average abstraction on an annual basis, all of which together make up 20% of the RBD's hydrographical network. At Pinios river from the monitoring site 'Ali-Efenti' up to its estuaries, the summer abstractions are >50% of its total flow and at other 7 rivers are >30%. These SWBs all together consist approximately 54% of the Thessalia hydrographical network. According to the RBMP, this situation results to extremely low (up to zero) flow levels at several river bodies during summer and it is impossible to maintain healthy ecosystems and respect the environmental requirements.



Source: WISE electronic reports

2.1.11 Groundwater bodies at risk of not meeting good status

A total of 91 GWBs (15.4% of the total GWBs) have been reported at qualitative chemical risk in all RBDs. Attica has the highest proportion of GWBs at risk with approximately 33%, followed by Northern Peloponnese with 27.3%, Eastern Peloponnese with 26.5% and Aegean Islands with 24.1%. The RBDs with the lower shares are Western Sterea Ellada with 3.8% of its GWBs at risk, Epirus with 5% and Western Macedonia with 5.6%.

Nitrate, Nitrite, Ammonium, Chloride, Chlorite, Sulphate, Electrical Conductivity, Iron, Aluminium and *Manganese* are the main substances causing risk. *Molybdenum, Arsenic, Nickel, Chromium and their compounds* are also causing risk mainly in Central Macedonia and partially in Western Macedonia.

A total of 93 GWBs (17.4% of the total GWBs) in 12 RBDs (i.e. except Epirus and Thrace) have been reported at quantitative risk. Water balance risks and saline intrusions are reported as main reasons causing risk of failing good quantitative status. 9 RBDs present significant shares of their

GWBs in both qualitative and quantitative status failing.

Table 2.8 presents the number and share of GWBs at qualitative chemical and quantitative risk and the causing risk substances/reasons for each RBD.

Table 2.8: Number of groundwater bodies at risk and substances causing risk in the second cycle in Greece

RBD	Number of GWBs at qualitative risk	% of GWBs at qualitative chemical risk	Number of GWBs at quantitative risk	% of GWBs at quantitative risk	Nitrate	Nitrite	Ammonium	Chloride	Chlorite	Sulphate	Electr. Conduct.	Iron.	Aluminium	Manganese	Molybdenum	Arsenic	Nickel	Chromium	Water balance	Saline or intrusions	Not specified
EL01	2	7.4	1	3.7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
EL02	9	27.3	6	18.2	7	0	0	8	0	1	0	0	0	0	0	0	0	0	6	0	0
EL03	9	26.5	6	17.6	5	0	0	7	0	3	6	0	0	0	0	0	0	0	6	0	0
EL04	1	3.8	2	7.7	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1
EL05	2	5.0	0	0	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
EL06	8	33.3	5	20.8	6	0	0	7	0	4	5	0	0	0	0	0	0	0	0	0	1
EL07	5	11.6	5	11.6	4	0	0	2	0	0	1	0	2	0	0	0	0	0	4	1	0
EL08	4	12.1	10	30.3	4	0	0	2	0	1	0	0	0	0	0	0	0	0	10	0	0
EL09	3	5.6	12	22.2	1	1	1	0	0	0	0	1	1	0	0	0	0	2	8	2	2
EL10	6	16.2	8	21.6	4	1	1	0	3	0	1	3	1	3	3	5	1	0	3	0	5
EL11	1	6.7	1	6.7	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
EL12	4	22.2	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0
EL13	9	9.9	9	9.9	3	0	0	7	0	0	2	0	0	0	0	0	0	0	9	0	0
EL14	28	24.1	28	24.1	1	0	0	27	0	0	10	0	0	0	0	0	0	0	28	0	0
Total	**91**	**15.4**	**93**	**17.4**	**37**	**4**	**3**	**64**	**3**	**9**	**29**	**4**	**4**	**3**	**3**	**5**	**1**	**2**	**76**	**3**	**10**

Source: WISE electronic reports

2.1.12 Quantification and apportionment of pressures

Considering chemicals pollution, for SWBs 12 substances and for GWBs 14 substances causing failure of good chemical status have been reported.

Certain pressures arising from priority substances/pollutants in SWBs causing risk/failure have not been specifically addressed. Indicator gaps have not been reported for several substances[20] causing pressures. On the contrary, an indicator gap has been reported for some substances which are not reported as causing a failure risk[21].

Certain pressures from priority substances/pollutants in GWBs causing risk/failure have not been specifically addressed in some RBDs[22].

Greece did not report any specific information related to the number of Priority Substances causing failure of good chemical status for which specific measures have been planned or other substances for which measures are planned. The indicator gap has not been reported.

However, in the RBMPs there is a range of measures that target, *inter alia*, the entire Priority Substances causing failure. Specific measures corresponding to specific substances have not been planned but the supplementary measures are referring more generally to the priority substances giving thus, the possibility to the competent authorities to specify on a case by case basis.

Pressures causing quantitave risk in GWBs due to water balance and saline intrusion have been reported in 93 GWBs of 12 RBDs (i.e. except Epirus and Thrace). In Thessalia 30.3% of its total GWBs is under pressures causing quantitative risk, in Aegean Islands 24.1%, in Western Macedonia 22.2%, in Central Macedonia 21.6%, in Attica 20.8%, in Northern Peloponnese 18.2%, in Eastern Peloponnese 17.6%, in Eastern Sterea Ellada 11.6%, in Crete 9.9%, in Western Sterea Ellada 7.7%, in Eastern Macedonia 6.7% and in Western Peloponnese 3.7% of its total GWBs.

Pressures due to water balance have been reported in 66 GWBs of 12 RBDs (i.e. except Epirus and Thrace). Pressures due to saline intrusions have been reported in 3 water bodies of 2 RBDs (Eastern Sterea Ellada and Western Macedonia). Other (non specified) pressures causing quantitative risk have been reported in 14 GWBs of 5 RBDs (Western Sterea Ellada, Attica, Western Macedonia, Central Macedonia and Eastern Macedonia).

Indicator gaps have been reported for both SWBs and GWBs. For SWBs, PO99-'Other Indicator' (not specified) has been used in 12 RBDs, while more precise case-specific indicators have been used in Eastern Macedonia and Thrace. For GWBs, PO99-'Other indicator' has been used in all RBDs. However, an indicator gap has been reported for water balance in Thrace with no such risk reported.

---

[20] Indicator gaps not reported for: *Molybdenum & its compounds* (in Western Peloponnese, Western Macedonia, Central Macedonia, Eastern Macedonia, Thrace) / *Copper & its compounds* (Western Peloponnese, Western Sterea Ellada) / *Fenitrothion* (Western Peloponnese) / *Fenthion* (Western Peloponnese, Central Macedonia, Thrace) / *Malathion* (Western Sterea Ellada, Central Macedonia, Eastern Macedonia, Thrace) / *Azinphos-ethyl* (Western Macedonia) / *Chromium VI & its compounds* (Western Macedonia) / *Bentazone* (Central Macedonia) / *Tin & its compounds* (Eastern Macedonia, Thrace) / *Parathion-methyl* (Thrace).

[21] Indicator gap reported for the following substances not reported as causing a failure risk: *Mercury & its compounds* (in Western Peloponnese, Western Macedonia, Central Macedonia, Eastern Macedonia, Thrace) / *DDT* (*Total DDT, DDT p,p'*) and *DEHP* (Epirus) / *Cadmium & its compounds* (Attica, Western Macedonia, Central Macedonia) / *Chlorfenvinphos, Mercury, Nickel and their compounds* (Thessalia).

[22] Indicator gaps in GWBs not reported for: *Nitrates* (in Western Peloponnese, Northern Peloponnese, Eastern Peloponnese, Attica, Eastern Sterea Ellada) / *Chlorides* (Northern Peloponnese, Eastern Peloponnese, Eastern Peloponnese, Attica, Eastern Sterea Ellada) / *Sulphates* (Northern Peloponnese, Eastern Peloponnese, Attica) / *Aluminium and its compounds* (Eastern Sterea Ellada) / *Electrical Conductivity* (Eastern Peloponnese, Attica, Eastern Sterea Ellada, Eastern Macedonia).

In addition, there is a range of measures targeting pressures related to quantitative status failure of GWBs in RBDs with significant pressures from abstractions.

Article 5 of the Environmental Quality Standards Directive (EQS Directive[23]) requires Member States to establish an inventory of emissions, discharges and losses of all Priority Substances and the eight other pollutants listed in Part A of Annex I for each RBD, or part thereof, lying within their territory. This inventory should allow MS to further target measures to tackle pollution from priority substances. It should also inform the review of the monitoring networks and allow the assessment of progress made in reducing (or suppressing) emissions, discharges and losses for priority substances.

There are no reported data or information regarding the above-mentioned inventory in Greece. The RBMPs include no information on the issue.

2.2 Main changes in implementation and compliance since the first cycle

Between 2010 and 2016, the number of lakes has increased by 63% and their total area by 45%. The number and the total area of rivers was reduced by 1% in both cases. The number and total area of transitional waters have increased by 18% and 2% respectively. Finally, the total area of the coastal waters is currently reduced by 20% without any change of their total number.

New typologies for rivers and lakes have been set. The artificial lakes that have been formed as a result of dam construction on the riverbeds are considered as heavily modified river water bodies in the second cycle. New minimum size criteria have been set for the delineation of the water bodies.

The estuaries of river bodies with an average annual flow over 100 million m^3 that are not clearly formed and are within a radius of 500m from the sea, are not considered as discrete transitional water bodies in the second cycle.

The percentage of heavily modified lakes has decreased by 21.8%, that of the rivers' HMWBs has increased by 0.3% and that of the coastal HMWBs has increased by 0.4%.

The number of groundwater bodies (GWBs) has increased by 4%. Main changes are due to changes in the delineation, insertion of areas not defined as GWB previously in existing or new ones, splitting and grouping of small GWB with similar hydro-geological characteristics. Additional criteria to the ones of the previous cycle have been added for the delineation of the GWBs.

Intercalibration has been developed and implemented in the BQEs in the water categories where they have been assessed. National, not intercalibrated classification systems have been developed in the second cycle. Reference conditions have partially been set for the BQEs and for some physicochemical elements in SWBs.

The diffuse source pressures have been reduced by 21% in the second cycle and the point sources by 15%. In the second RBMPs, point sources represent 14% of the total SWBs (reduced by 15% since the first cycle), diffuse sources 18% of the SWBs (reduced by 21% since the first cycle) and hydromorphological 8% of the SWBs (increased by 6% since the first cycle). It should however be noted that the methodologies to assess pressures have changed since the first cycle.

In both cycles, the main activity responsible for diffuse pollution has been agriculture. Similarly, the activities mainly responsible for point source pressures have been from Non IED plants for the

[23] Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council http://eur-lex.europa.eu/legalcontent/EN/TXT/?uri=CELEX:02008L0105-20130913

SWBs and abstraction for irrigation in GWBs, in both cycles.

New common methodologies have been developed, implemented and they have also been available. The assessment of the water bodies has been based on the monitoring data of the new national monitoring network to a greater degree than in the previous cycle. According to the RBMPs, experts' judgement has been used in several cases when there were no data or when data were problematic. More risks have been identified and more elements have been taken into account for the identification and assessment of the risks in the second cycle.

2.3 Progress with the Commission recommendations

Recommendation: *Ensure in the updated RBMPs a better understanding and identification of the main risks and pressures in each river basin, based on detailed harmonised methodologies, and underpinned by consolidated and robust data.*

Assessment: There has been a better understanding and identification of the main risks and pressures in each river basin based on harmonised methodologies. The methodologies and standards have been publicly available. Data robustness has increased. The recommendation has been fulfilled to a great extent.

Recommendation: *No clear link between measures and status assessment is made. In order to address this, the gaps in the steps leading to the Programme of Measures, such as pressure and impact assessment, monitoring and status classification, should be addressed. This is important in order to implement measures where they are needed to reach the WFD objectives.*

Assessment: Pressure and impact assessment, monitoring and status classification have been elaborated. However, certain pressures from priority substances/pollutants causing risk/failure have not been specifically addressed. Despite their pressures, indicator gaps have not been reported for several substances. The gaps in steps leading to PoMs remain. The recommendation has been partially fulfilled.

Recommendation: *In relation to chemical pressures, the intention to compile inventories of emissions in accordance with Directive 2008/105/EC needs to be carried out, but does not in itself count as a measure against chemical pollution. More information on relevant measures needs to be included in the second RBMPs.*

Assessment: There is still a gap on the development of the clear and concrete measures corresponding on a one-to-one basis to the priority substances and other pressures causing failure risk according to the specific needs of each RBD. No inventory of emission has been reported. The recommendation has been partially fulfilled.

Topic 3 Monitoring, assessment and classification of ecological status in surface water bodies

3.1 Assessment of implementation and compliance with the WFD requirements in second RBMPs

3.1.1 Monitoring of ecological status/potential

Monitoring programmes

Article 8.1 of the WFD requires Member States to establish monitoring programmes for the assessment of the status of surface water and of groundwater in order to provide a coherent and comprehensive overview of water status within each RBD.

The National Monitoring Network has gradually been systematized and expanded the previous network in order to be in accordance with the WFD and other relevant Directives (such as Dir. 91/676/EEC, Dir. 2006/118/EC and Dir. 2008/105/EC). It includes both operational and surveillance monitoring programmes and it has a separate, distinct monitoring programme for SWBs and GWBs. It has a total of 2008 monitoring stations[24], of which 616 in SWBs (449 in rivers, 53 stations in lakes, 34 in transitional, 80 in coastal waters) and 1392 in GWBs.

It monitors all relevant quality elements and the quantitative characteristics of all categories of water bodies (rivers, lakes, transitional, coastal and groundwaters). It is aimed at the assessment/classification of their ecological, chemical and quantitative status together with the estimation of the long-term changes occurring from anthropogenic factors and from the PoMs' implementation.

Information on the network and the National Monitoring Programme is available in the relevant website http://nmwn.ypeka.gr. The website includes also geographical information on a geoportal, the location of the monitoring stations in each river basin and RBD together with other GIS information (rivers, lakes, etc.) as well as the water system associated with the station. The monitored data and their values per station are available online. The National Monitoring Programme is part of the RBMPs and is revised every 6 years.

Each RBMP includes the total number of monitoring stations per water type (rivers, lakes, transitional coastal, groundwaters), the numbers of operational and surveillance stations and the numbers of stations that provided data on ecological and chemical status. A general statement is presented in all RBMPs about the important lack of monitoring data to assess pressures. All RBMPs have noted the gaps in spatial coverage and the need for 400 new sites for GWBs and 60 for SWBs to be added through the relevant measure of PoMs.

Monitoring sites and monitored water bodies used for surveillance and operational monitoring

Overall, for the second RBMPs a total of 597 monitoring sites have been reported in the SWBs, of which 455 rivers, 33 lakes, 30 transitional and 79 coastal (Table 3.1).

Since the first cycle, the total number of monitoring sites (surveillance and operational) has increased by 3%. It has decreased significantly in lakes (20%) while it has increased in rivers (4%), in transitional (7%) and coastal (3%) water bodies. The total number of sites has decreased in 4 RBDs[25] and increased in 7 RBDs[26], while it remained unchanged in 3 RBDs[27]. The changes

[24] According to its website http://nwmn.ypeka.gr. Last accessed 15/02/2021.
[25]Decrease in number of monitoring sites in: Aegean Islands (-23%), Crete (-20%), Thrace (-4%), Eastern Macedonia (-5%).
[26] Increase in number of monitoring sites in: Western Peloponnese (30%), Northern Peloponnese (19%), Western Macedonia (15%), Eastern Peloponnese (8%), Epirus & Central Macedonia (6% respectively), Eastern Sterea Ellada (2%).

are mostly due to changes in the characterisation of water bodies[28].

Table 3.2 presents the number of monitoring sites per purpose (surveillance and operational) and water category. The number of surveillance sites has increased by 3% in total. It has decreased by 19% in lakes, while it has increased by 3% in rivers and 11% in coastal waters. There is no surveillance station for transitional waters. The total number of operational sites has increased by 2%; it has increased by 6% in rivers and 11% in transitional waters while it has decreased by 20% in lakes and 9% in coastal waters.

Table 3.1: Number of sites used for SWBs' surveillance and operational monitoring in Greece for the second and first RBMPs. *Note that for reasons of comparability with data reported in the first RBMPs, data for the second RBMPs did not take into account whether sites were used for ecological and/or chemical monitoring*

	Rivers		**Lakes**		**Transitional**		**Coastal**		**Total**
	Surv.	**Op**	**Surv.**	**Op**	**Surv.**	**Op**	**Surv.**	**Op**	
Second RBMPs									
EL01	18	19	0	0	0	2	4	0	43
EL02	25	11	1	1	0	4	4	5	51
EL03	12	10	0	0	0	0	3	2	27
EL04	21	26	4	2	0	5	1	2	61
EL05	35	5	0	1	0	6	2	4	53
EL06	4	5	0		0	0	3	6	18
EL07	37	6	2	1	0	1	3	6	56
EL08	25	33	1	0	0	0	4	1	64
EL09	19	11	2	10	0	2	1	0	45
EL10	22	5	2	3	0	1	3	2	38
EL11	25	10	0	1	0	1	1	0	38
EL12	36	6	0	1	0	8	3	1	55
EL13	19	3	1	0	0	0	4	1	28
EL14	7	0	0	0	0	0	13	0	20
Total by type of site	**305**	**150**	**13**	**20**	**0**	**30**	**49**	**30**	**597**
Total number of monitoring site used for both uses	*455*		*33*		*30*		*79*		***597***
First RBMPs									
GR01	12	14	1			2	4		33
GR02	22	9	2	1		4	1	4	43
GR03	11	10					2	2	25
GR04	20	27	4	2		5	1	2	61
GR05	34	3		1		6	2	4	50
GR06	4	4		1			3	6	18
GR07	37	6	2	1			3	6	55
GR08	25	33	1				4	1	64
GR09	16	11	2	10					39
GR10	21	5		3	1	1	3	2	36

[27] The number of monitoring sites remained stable in Western Sterea Ellada, Attica and Thessalia.

[28] For instance, the one lake station in Western Peloponnese was added to rivers due to the change in the characterisation of the artificial lake of Ladona, from the lake to the river category.

GR11	26	10	1	1		1	1		40
GR12	36	4	2	3		8	3	1	57
GR13	21	5	1	2			5	1	35
GR14	10						12	4	26
Total by type of site	**295**	**141**	**16**	**25**	**1**	**27**	**44**	**33**	**582**
Total number of monitoring site used for both uses	*436*		*41*		*28*		*77*		***582***

Source: WISE electronic reports

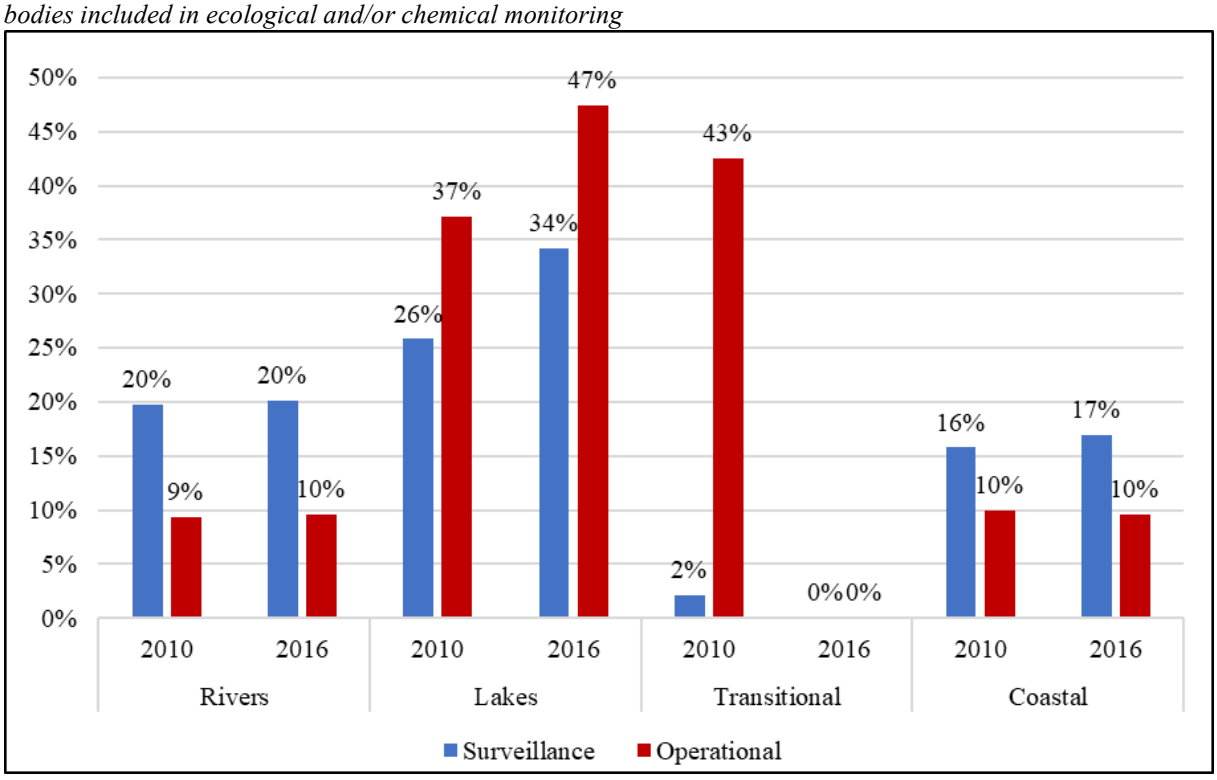
Table 3.2: Number of monitoring sites in relevant SWBs' categories used for different purposes for the second RBMPs in Greece.

Monitoring Purpose	Lakes	Rivers	Transitional	Coastal	Total per purpose
OPE - Operational monitoring	20	150	30	30	230
SUR - Surveillance monitoring	13	305	0	49	367
Total sites	**33**	**455**	**30**	**79**	**597**

Source: WISE electronic reports

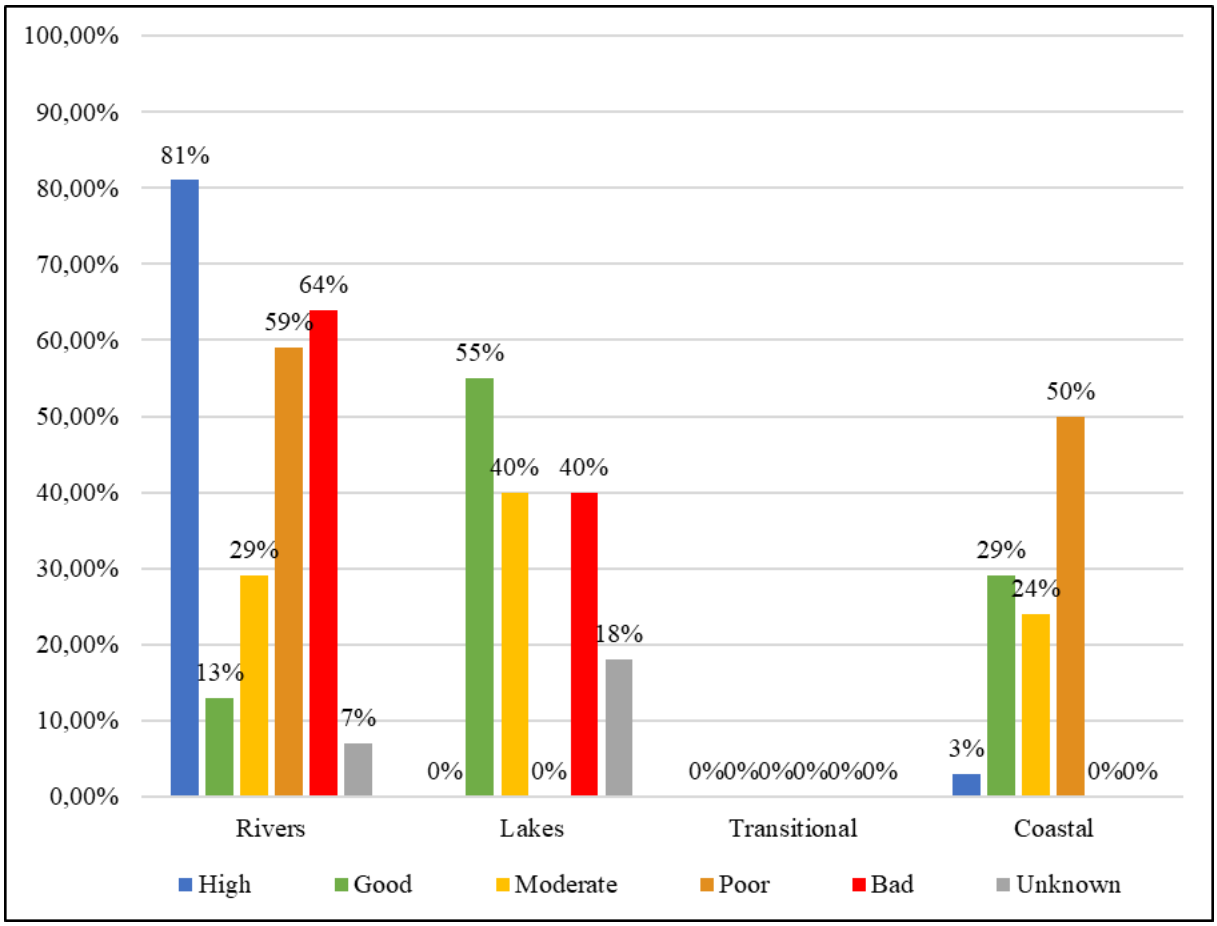
The proportion of SWBs monitored per water category and the monitoring purposes for the two cycles are presented in Figure 3.1. The proportion of SWBs in each ecological status/potential class that was included in surveillance monitoring is presented in Figure 3.2.

Figure 3.1: Percentage of surface water bodies included in surveillance and operational monitoring in Greece for the first and second RBMPs. *Note no differentiation is made between water bodies included in ecological and/or chemical monitoring*



Source: WISE electronic reports

Figure 3.2: Proportion of surface water bodies in each ecological status/potential class included in surveillance monitoring in Greece



Source: WISE electronic reports

A differentiated presentation between ecological status and potential and including all types of quality element can be viewed here – https://tableau.discomap.eea.europa.eu/t/Wateronline/views/WISE_SOW_QualityElement_Status_Compare/SWB_QualityElement_Group?iframeSizedToWindow=true&:embed=y&:display_count=no&:showAppBanner=false&:showVizHome=no

International surface water body monitoring

There is no information in WISE and the RBMPs on the number of sites being part of international monitoring networks. Although transboundary water bodies have been reported in 5 RBDs, there is no monitoring site part of international programmes or transboundary monitoring cooperation. No reasons have been given for this absence of cooperation.

Quality elements monitored (excluding River Basin Specific Pollutants)

The data used for the first RBMPs originated from the old monitoring network. In the second cycle data from the new National Monitoring Programme have been used together with new approved methodologies.

Table 3.3 presents the quality elements reported to be monitored for the second RBMPs for each water category.

Regarding the biological quality elements (BQE) in rivers, for the second RBMPs the phytoplankton, macrophytes, phytobenthos, and fish have been added to benthic invertebrates that were the only elements monitored for the first RBMPs. In lakes, macrophytes, benthic invertebrates and fish have been added to phytoplankton (the only element monitored for the first

RBMPs). In transitional waters, phytoplankton and benthic invertebrates are the elements monitored (similarly to the previous cycle). Finally in coastal waters, angiosperms have been added to the 3 elements previously monitored i.e. to phytoplankton, benthic invertebrates and macroalgae.

It has not been possible to assess the changes per RBD in terms of the BQEs assessed since aggregated data per RBD for the first RBMPs were not available (not reported nor included in the RBMPs).

Regarding the hydromoprhological quality elements (HYMO) in rivers, according to the RBMPs all required HYMO have been monitored (hydrological or tidal regime, river continuity conditions and morphological conditions). However, only morphological conditions have actually been used for the assessment. In lakes, hydrological or tidal regime is the only monitored element but it has not actually been used in the assessments. In transitional and coastal waters, there is no monitoring of HYMO for the second RBMPs, which was also the case for the first RBMPs.

For the assessment of the hydromorphological quality of rivers, the River Habitat Survey (RHS) has been implemented and the Habitat Modification Score (HMS) has been calculated which expresses the hydromorphological degradation from human interventions (bridges, dams, pipelines, etc.). However, it is not clear whether all relevant pressures in all rivers have been assessed since in the supporting documents of the RBMPs it is mentioned that the pressures related to hydromorphology have been examined only for projects that had caused hydromorphological alterations to SWBs resulting in their initial characterisation (screening) as HMWBs or AWBs (e.g. in Western Peloponnese, Western Sterea Ellada etc.). Thus, a large number of SWBs rivers may have not been examined for pressures related to hydromorphology.

Regarding the physicochemical quality elements (PHYSCHEM), transparency, salinity, thermal, oxygenation, acidification status, nitrogen and phosphorus have been reported as being monitored in all water categories. However, thermal conditions and acidification status have not been used in the assessments. In addition, there has been no use of PHYSCHEM elements in lakes' and transitional waters' assessments.

Table 3.3: Quality elements monitored for the second RBMPs in Greece (excluding River Basin Specific Pollutants). *Note; quality element may be used for surveillance and/or operational monitoring*

	Biological quality elements (BQE)									**Hydromorphological quality elements (HYMO)**		
	Phytoplankton	Macrophytes	Phytobenthos	Benthic invertebrates	Fish	Angiosperms	Macroalgae	Other aquatic flora	Other species	Hydrological or tidal regime	River continuity conditions	Morphological conditions
Rivers	Yes	Yes	Yes	Yes	Yes	No	No	No		Yes	Yes	Yes
Lakes	Yes	Yes	No	Yes	Yes	No	No	No		Yes	No	No
Transitional	Yes	No	No	Yes	No	No	No	No		No	No	No
Coastal	Yes	No	No	Yes	No	Yes	Yes	No		No	No	No

	General physicochemical quality elements (PHYSCHE)								
	Transparency conditions	Thermal conditions	Oxygenation conditions	Acidification status	Nitrogen conditions	Phosphorus conditions	Salinity conditions	Silicate	Other deteminants for nutrient conditions
Rivers	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Lakes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Transitional	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Coastal	Yes	Yes	Yes	Yes	Yes	Yes	Yes		

Source: WISE electronic reports

Annex V of the WFD provides guidance on the frequency of monitoring of the different quality elements. Surveillance monitoring should be carried out for each monitoring site for a period of one year during the 6-year period covered by a RBMP. For phytoplankton, this should be done twice during the monitoring year and for the other biological quality elements once during the year. Operational monitoring should take place at intervals not exceeding once every six months for phytoplankton and once every three years during the 6-year cycle for the other biological quality elements. Greater intervals may be justified on the basis of technical knowledge and expert judgement.

Regarding the BQE monitoring frequencies, it has been reported that 80% of the phytoplankton monitoring sites, 87% of the macrophytes monitoring sites, 91% of the phytobenthos monitoring sites, 97% of the benthic invertebrates monitoring sites and 89% of the fish monitoring sites are sampled at least at the minimum recommended frequency. Concerning the hydromorphological quality elements, 98% of the morphological conditions monitoring sites are sampled at least at the minimum recommended frequency. There are no reported data for the river continuity and hydro/tidal regime[29]. Concerning general physicochemical elements, 97% of the nitrogen,

[29] According to the national monitoring network's website, river continuity sampling frequency is 6 years, hydrology sampling in rivers is continuous and in lakes 1 month. Morphology sampling frequency is 6 years in all four water categories. Source http://nmwn.ypeka.gr/. Last accessed 16 February 2021.

phosphorus, oxygenation and thermal conditions respective monitoring sites and 96% of the acidification status, salinity and transparency conditions monitoring sites are sampled at least at the minimum recommended frequency.

River Basin Specific Pollutants and matrices monitored

All 47 river basin specific pollutants (RBSPs) are monitored in the waters (matrix) of the rivers and lakes of each RBD and their sites' numbers are presented in Table 3.4. No differences between RBDs or categories of water bodies are reported.

Table 3.4: Number of sites used to monitor River Basin Specific Pollutants reported in the second RBMPs and non-priority specific pollutants and/or other national pollutants reported in the first RBMPs in Greece. *Note: the data from both cycles may not be fully comparable as different definitions were used and also not all Member States reported information at the site level meaning that there were no equivalent data for the first RBMPs.*

RBMPs		Lakes	Rivers	Transitional	Coastal
first RBMPs	Sites used to monitor non-priority specific pollutants and/or other national pollutants	0	0	0	0
second RBMPs	Sites used to monitor River Basin Specific Pollutants	32	176	22	66

Source: WISE electronic reports

Annex V of the WFD provides guidance on the frequency of monitoring of the different quality elements: once every three months is recommended for 'other pollutants' which are taken here to equate to river basin specific pollutants. Surveillance monitoring should be carried out for each monitoring site for a period of one year during the period covered by a river basin management plan i.e. six years. For river basin specific pollutants this would equate to four times for the surveillance year; and for operational monitoring four times a year for each year of the cycle.

Annex V, section 1.3.4 of the WFD does not explicitly define the matrices to which the recommended minimum frequency of monitoring of River Basin Specific Pollutants ("Other Pollutants") applies. Recommended minimum monitoring frequencies are specified for Priority Substances in biota in Article 3(2)(c) of EQS Directive 2008/105/EC: this is once per year for operational and surveillance monitoring purposes. For consistency, this recommended minimum frequency of once per year has been applied to the monitoring of River Basin Specific Pollutants in biota/sediment.

Greece reported that all substances are monitored in water and there is no monitoring reported in sediments and biota. All substances are sampled at least at the minimum frequencies for surveillance monitoring. [30] The reported monitoring frequencies for *Dimethoate* require further clarification since they varied from 1 to 6 in a 6 years' cycle.

Use of monitoring results for classification

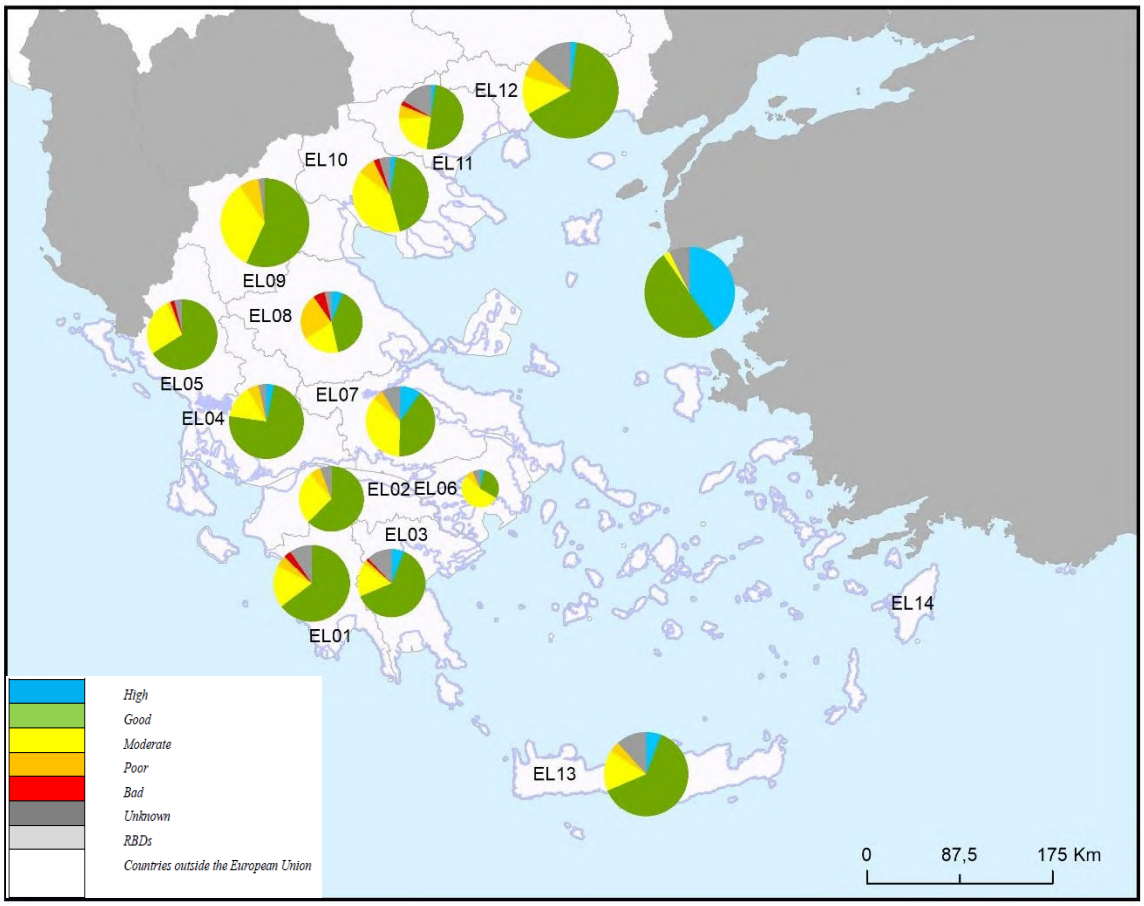
A combination of both experts' judgement together with data from the monitoring network has been reported for status assessment in all RBDs. For the second RBMPs monitoring data have been used to a greater extent for classification than for the first RBMPs. Experts' judgement was mostly used when there were no data and/or when data quality was poor. For the non monitored SWBs, 'grouping' has been used according to their typology and their pressures.

[30] According to the national monitoring network's website, priority substances sampling frequency is 1 month. Source http://nmwn.ypeka.gr/. Last accessed 16/02/2021.

3.1.2 Ecological Status/potential of surface water

Overall water status and ecological status

Map 3.1: Ecological status or potential of surface water bodies in Greece



Note: Standard colours based on WFD Annex V, Article 1(4)(2)(i)
Source: WISE, Eurostat (country borders)

A differentiated presentation of this data between ecological status and potential and including all types of quality element can be viewed here:
https://tableau.discomap.eea.europa.eu/t/Wateronline/views/WISE_SOW_QualityElement_Status_Compare/SWB_QualityElement_Group?iframeSizedToWindow=true&:embed=y&:display_count=no&:showAppBanner=false&:showVizHome=no

In the second RBMPs, there are 116 water bodies in high status, 949 bodies in good status, 355 in moderate, 95 in poor, 20 in bad and 134 bodies in unknown status. In the previous cycle there were 112 bodies in high status, 595 in good, 285 in moderate, 176 in poor, 15 in bad and 506 bodies in unknown status.

Thus, compared to the previous cycle, in the second RBMPs, there has been a significant increase by 59% in the proportion of SWBs in Good ecological status, an increase by 25% of the SWBs in moderate, and by 7% of the SWBs in high status. On the contrary, there is a remarkable decrease by 74% of the SWBs in unknown status, a decrease by 46% of the SWBs in poor status.

Crete, Western Peloponnese, Eastern Peloponnese, Western Sterea Ellada and Thrace are the RBDs with the highest number of SWBs in Good status and Aegean Islands by far the RBD with the bigger number of SWBs in high status. Thessalia and Central Macedonia have the biggest

shares of SWBs in Moderate and Bad status followed by Western Macedonia, all with significant pressures related to agricultural and urban uses.

Changes in the monitoring network and the methodology between the first and second cycles have influenced the assessment results. In particular, those changes include the shift to a new monitoring network, new methodologies used for the assessment and classification, changes in typology and designations of water bodies, use of 'grouping' and the extent of the use of experts' judgement (expected to be at a lesser degree than in the previous period due to the development and use of data from the new monitoring programme).

Confidence in ecological status assessment

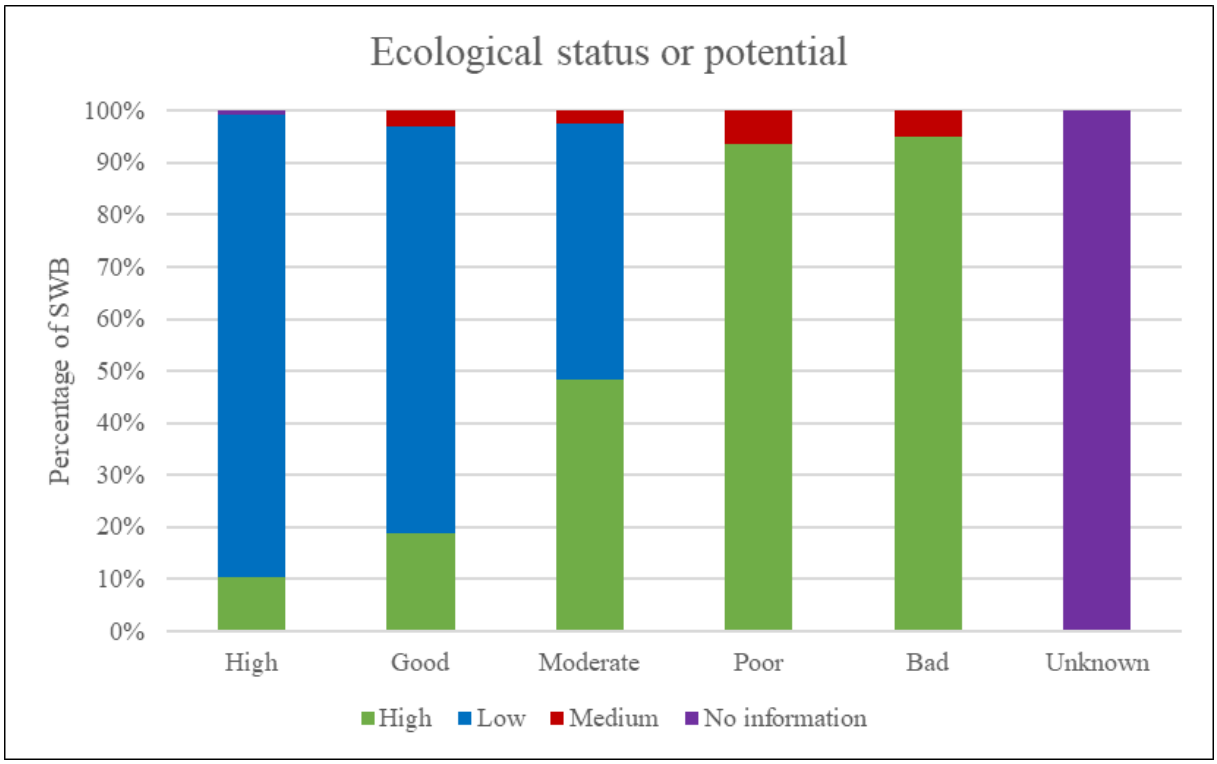
Overall, in the second cycle there are 472 SWBs (31% of the total assessed SWBs) classified with high confidence level, 46 (3% of the total assessed SWBs) with medium and 1,016 (66% of the total assessed SWBS) with low confidence level in ecological status assessment. There is no explanation for the high number of low confidence SWBs in the RBMPs[31].

As it can be seen in Figure 3.3 the classification of the surface water bodies in Poor and Bad ecological status has been done with high confidence level: 94% of these in poor and 95% of these in bad status has been classified with high level of confidence. On the contrary, 78% and 89% of the SWBs in Good status and High Status respectively have been classified with low level of confidence.

Aegean Islands with 88%, Eastern Peloponnese with 78%, Central Macedonia with 75%, Thrace 74% and Western Macedonia with 73% are the RBDs with the highest proportion of SWBs in low confidence level on the total assessed SWBs. On the contrary, Thessalia with 41% and Attica with 43% are the RBDs with the lower proportions of SWBs assessed with low confidence level.

Figure 3.3: Confidence in the classification of ecological status or potential of surface water bodies in Greece

[31] It could be because of the lack of proper time series data from the network and the use of grouping and experts' judgement that increased uncertainty.



Source: WISE electronic reports

Classification of ecological status at the quality element level

From the hydromorphological quality elements (HYMO), hydrological or tidal regime and river continuity conditions have not been used in any RBD. On the contrary morphological conditions have been used for classification in 331 SWBs (22% of the total assessed SWBs) in all RBDs. Morphological conditions have been used in 49% of the total assessed SWBs of Thessalia, 39% of Eastern Macedonia, 33% of Epirus. On the other hand, they have been used in 5% of the total assessed SWBs of Aegean Islands, 13% of Central Macedonia, 14% of Crete, 16% of Western Macedonia, 17% of Eastern Peloponnese and 18% of the total assessed SWBs of Thrace.

The use of BQEs for classification is highly variable among the RBDs and the water categories. Benthic invertebrates have been used in 425 SWBs (28% of the total assessed SWBs) in all RBDs. They have been used in 50% of the assessed SWBs in Attica, in 48% in Thessalia, 45% in Epirus, 42% in Western Sterea Ellada 40% in Northern Peloponnese, 37% in Eastern Sterea Ellada and Eastern Macedonia respectively, 31% in Western Peloponnese, 22% in Thrace, 21% in Western Macedonia and Eastern Macedonia respectively, 16% in Crete, 14% in Eastern Peloponnese and 12% in Aegean Islands.

Phytobenthos has been used in 144 SWBs (9% of the total assessed SWBs) in 13 RBDs, i.e. except Eastern Macedonia. Phytoplankton has been used in 118 SWBs (7.6% of the total assessed SWBs) in all RBDs and with high variability among the RBDs. Fish has been used in 110 SWBs (7% of the total assessed SWBs) in 10 RBDs (i.e. except Attica, Eastern Sterea Ellada, Thrace and Crete). Macroalgae have been used in 60 SWBs (4% of the total assessed SWBs) in the coastal waters of 12 RBDs. Macrophytes in 68 SWBs (4.5%) in coastal waters of 11 RBDs. Angiosperms have been used in 12 SWBs (<1%) in 8 RBDs. There is also great variability in the use of each element between the RBDs[32].

[32] Taking into account that the WFD does not require microalgae and angiosperms to be monitored in lakes and rivers.

Transparency conditions have been used in 70 SWBs (4.5% of the total assessed SWBs) only in coastal waters in all RBDs. Acidification status and thermal conditions have not been used. Oxygenation (in 27.7% of the total assessed SWBs), salinity (23%), nitrogen (28%) and phosphorus (28%) conditions have been used in rivers, coastal and lakes in all RBDs.

River Basin Specific Pollutants have been used in rivers and lakes but with high variability between the RBDs. (e.g. from 1% of the total assessed SWBs of Aegean Islands, up to 27% of the total assessed SWBs of Epirus) and 5 SWBs in Attica to 31 SWBs in Western Sterea Ellada and 25 in Thrace).

Ecological status change

As mentioned previously, in the second cycle, there is a significant increase of 59% in the proportion of SWBs in Good ecological status, an increase of 25% of the SWBs in moderate, and of 7% of high status SWBs. On the contrary, there is a remarkable decrease of 74% of the SWBs in unknown status, a decrease of 46% of the SWBs in poor status.

Several RBMPs have stated that there has been significant reduction in the number of SWBs with Unknown status due to the 'more reliable' and 'more complete' identification of their status. A comparison between the two cycles at water category level is not possible due to a lack of available relevant data in the previous cycle.

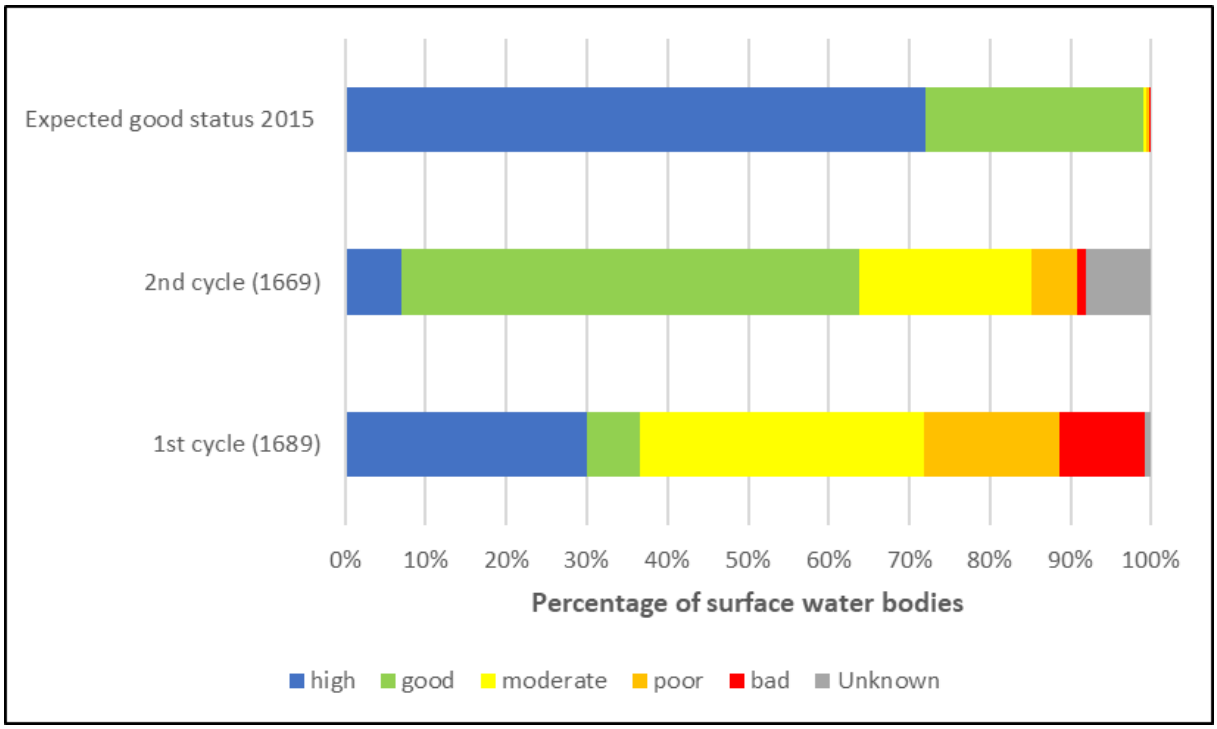
It can be noted that in the relevant tables in the RBMPs, there has been a change in the classification status of a large number of water bodies from Unknown to Good (or to Medium/Moderate) between the two cycles, although their classification has been again based on experts' judgement for their chemical status[33]. In general, a large number of water bodies in previous Unknown status changed classification in the second cycle (they mostly changed from unknown to moderate and good status. Only a few water bodies changed to poor/bad status following use of monitoring data).

However, there are some cases that require clarification since, for instance, it is not known how the combination of 'bad' ecological and 'unknown' chemical resulted in 'unknown' overall status in a river body while the 'bad' ecological and 'good' chemical resulted in 'bad' status in neighbouring river body[34].

The expected SWBs in good status in 2015 was estimated to be >70% of the SWBs and >25% to be in moderate status, both overestimated as it can be seen in Figure 3.4 from the information reported for the second RBMPs.

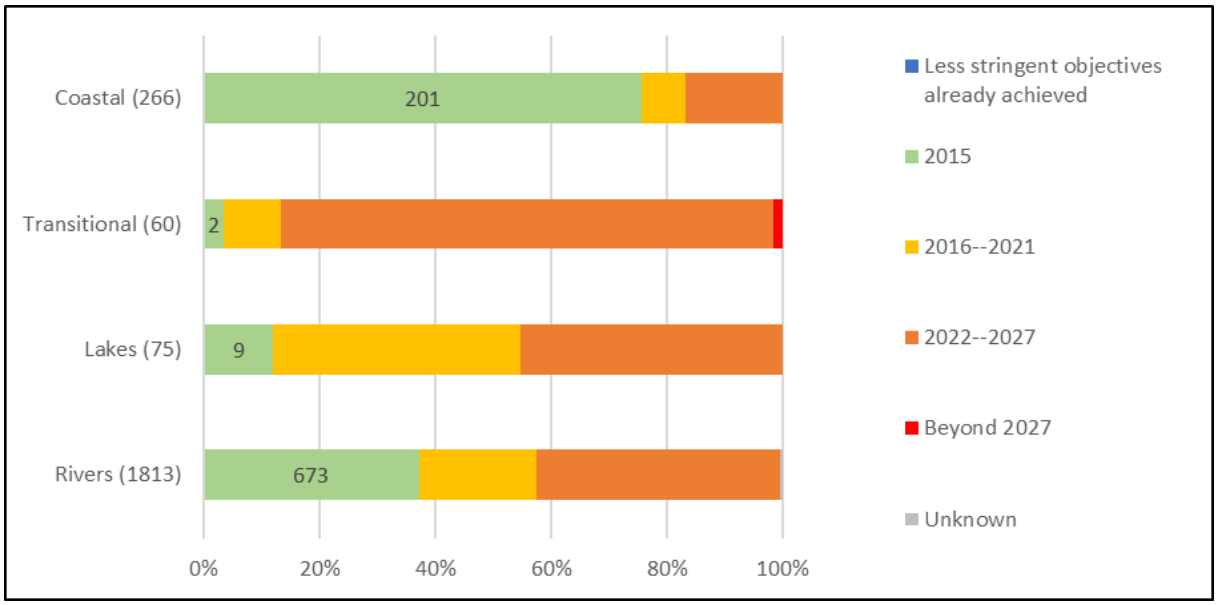
Figure 3.4: Ecological status or potential of surface water bodies in Greece for the second RBMPs, for the first RBMPs and expected in 2015[35]. The number in the parenthesis is the number of surface water bodies for both cycles. Note that the period of the assessment of status for the second RBMPs was 2012-2015. The year of the assessment of status for the first RBMPs is not known

[33] For instance, in Aegean Islands, the chemical status of most coastal bodies has changed from Unknown in the previous cycle at Good in the second cycle with no further details and despite their big number.
[34] Example: cases of Elisson_R_1 river body and Elisson_R_2 river bodies in Western Peloponnese RBD.
[35] Greece nevertheless completed the 2nd RBMPs in late 2017.



Source: WISE electronic reports

Figure 3.5: Expected date of achievement of good ecological status/potential of surface water bodies in Greece. The number in the parenthesis is the number of water bodies in each category.



Source: WISE electronic reports

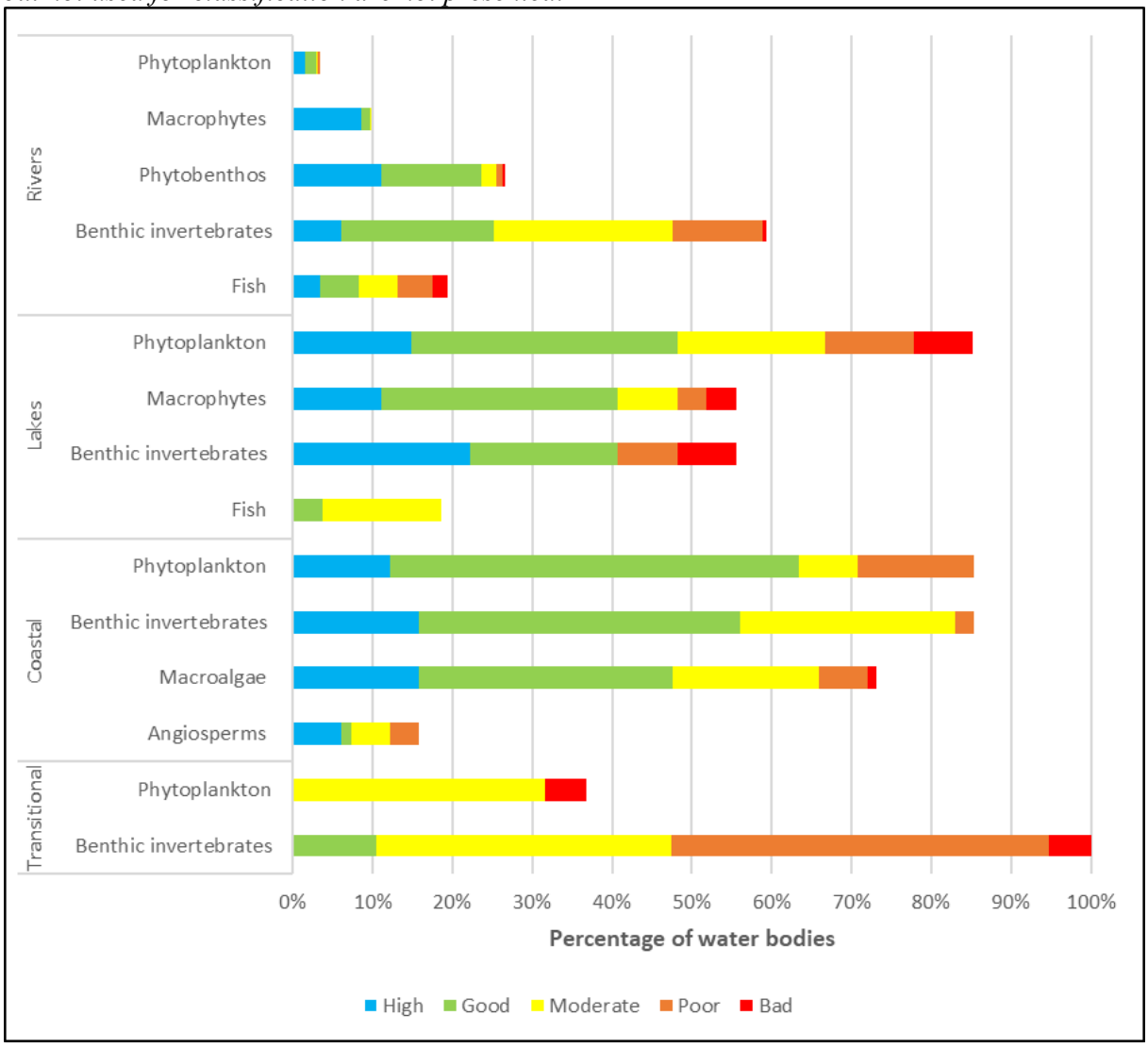
Classification of ecological status in terms of each classified quality element

Phytoplankton and benthic invertebrates in all water categories, macrophytes and fish in rivers and lakes, phytobenthos in rivers and macroalgae in coastal waters are the BQEs used in the classification of the SWBs. They have not been used to the same extent for all water categories as

it can be seen in Figure 3.6.

Benthic invertebrates have been used in 58% of rivers, 55% of lakes, 85% of coastal and 100% of transitional waters. Phytoplankton has been used in 2% of rivers, 85% of lakes, 85% of coastal and 37% of transitional waters. Macrophytes have been used in 10% of rivers and 55% of lakes. Fish has been used in 19% of rivers and 19% of lakes. Phytobenthos has been used in 26% of rivers. Microalgae have been used in 73% of the coastal waters. Angiosperms have been used in 16% of the coastal waters.

Figure 3.6: Ecological status/potential of the biological quality elements used in the classification of surface water bodies in Greece. *Note that water bodies with unknown status/potential or those where the quality element was reported as not applicable or monitored but not used for classification are not presented.*



Source: WISE electronic reports

A differentiated presentation of this data between ecological status and potential and including all types of quality element can be viewed here: https://tableau.discomap.eea.europa.eu/t/Wateronline/views/WISE_SOW_QualityElement_Status_Compare/SWB_QualityElement_Group?iframeSizedToWindow=true&:embed=y&:display_count=no&:showAppBanner=false&:showVizHome=no

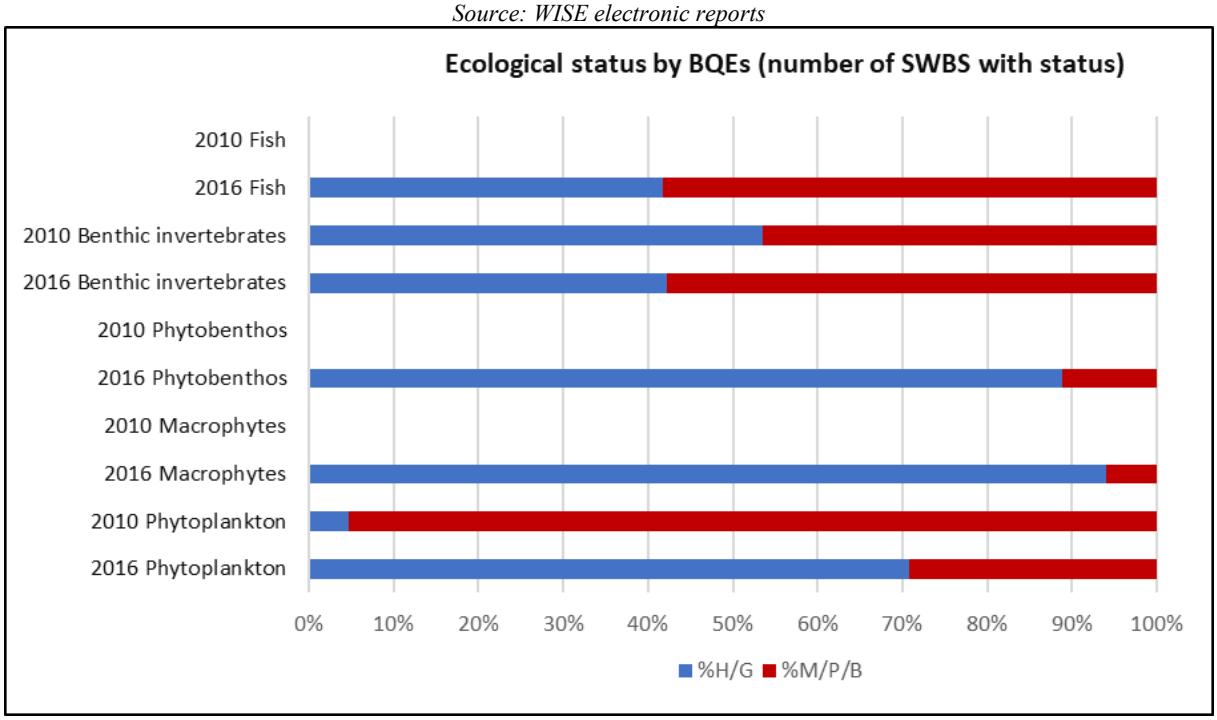
In the second cycle, the new national monitoring programme has been used and more protocols and methodologies have been developed, intercalibrated and implemented at national level. The

assessment has been based on the monitoring data of the new monitoring network at a higher extent than in the previous cycle. Experts' judgement has been used mostly for the chemical status and when there were no data or/and poor quality data. Water bodies' grouping has also been used for their ecological status assessment. In general, from a more detailed look of the RBMPs and their Strategic Environmental Assessments, the above changes resulted to water bodies of previous Unknown status being classified mostly in Moderate/Good status.

The comparison of the ecological status of the BQEs in rivers and lakes between the two cycles according to the classified BQEs is presented in Figure 3.7. From the total number of rivers and lakes with ecological status in the second cycle, the percentages of water bodies in High/Good is: 42% for the total benthic invertebrates (reduced by -11% since the first cycle), 94% for the total macrophytes (no data for the first cycle), 71% for the total phytoplankton (increased by 66%), 42% for the total fish (no data for the first cycle), 89% for the total phytobenthos (no data for the first cycle). This comparison should be treated with caution as there are differences between the numbers of surface water bodies classified for individual elements and differences in methodologies from the first to the second RBMPs.

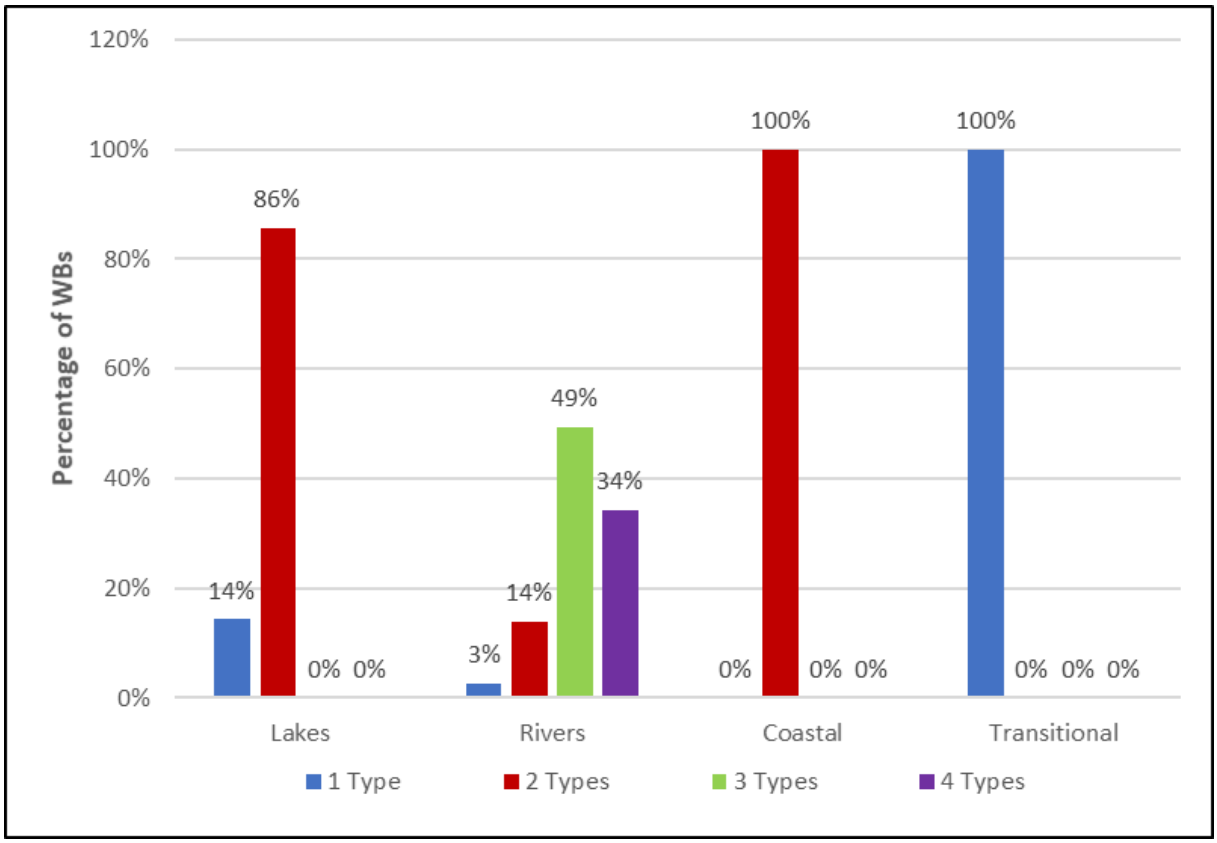
Figure 3.7: Comparison of ecological status/potential in Greece according to classified biological quality elements in rivers and lakes from the first to the second RBMPs

Source: WISE electronic reports



As it is shown in Figure 3.8, 86% of the lakes have been classified using two types of quality elements and 14% using one type. 49% of the rivers have been classified using three types of quality elements, 34% four types, 14% two types and 3% one type. All transitional waters have been classified using one type and all coastal waters using two types of quality elements.

Figure 3.8: Classification of the ecological status or potential of surface waters in Greece using 1, 2, 3 or 4 types of quality element.

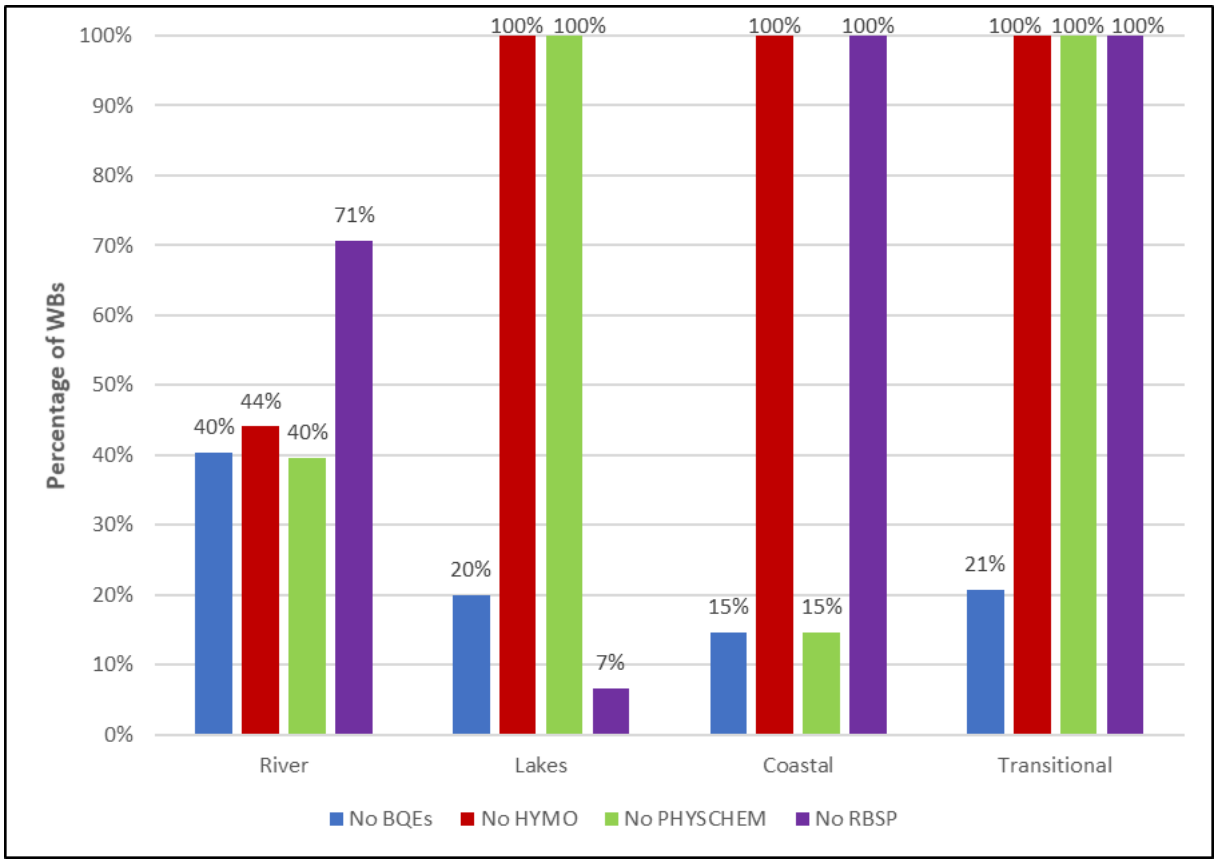


Source: WISE electronic reports

As it is presented in Figure 3.9, River Basin Specific Pollutants (RBSPs) have not been used for the classification of ecological status for coastal and transitional waters, for 71% of the rivers and 7% of the lakes. Biological Quality Elements (BQEs) have not been used for 40% of rivers, 20% of lakes, 15% of coastal and 21% of transitional waters. Hydromorphological (HYMO) elements have not been used for lakes, coastal and transitional waters and for 44% of rivers. Physicochemical (PHYSCHEM) elements have not been used for lakes and transitional waters, for 40% of rivers and 15% of coastal waters.

Figure 3.9: The percentage of surface water bodies in Greece where no biological quality elements (BQEs) or no hydromorphological (HYMO) or no general physicochemical (PHYSCHEM) or no River Basin Specific Pollutant (RBSP) has been used in the classification of ecological status or potential

Source: WISE electronic reports



The uses of experts' judgement and grouping have been reported for 19 and 15 quality elements respectively but with no details on the number of concerned surface water bodies per category. Nevertheless, the RBMPs mention the use of both experts' judgement and grouping for several surface water bodies and the existence of analytical data in their supporting documents.

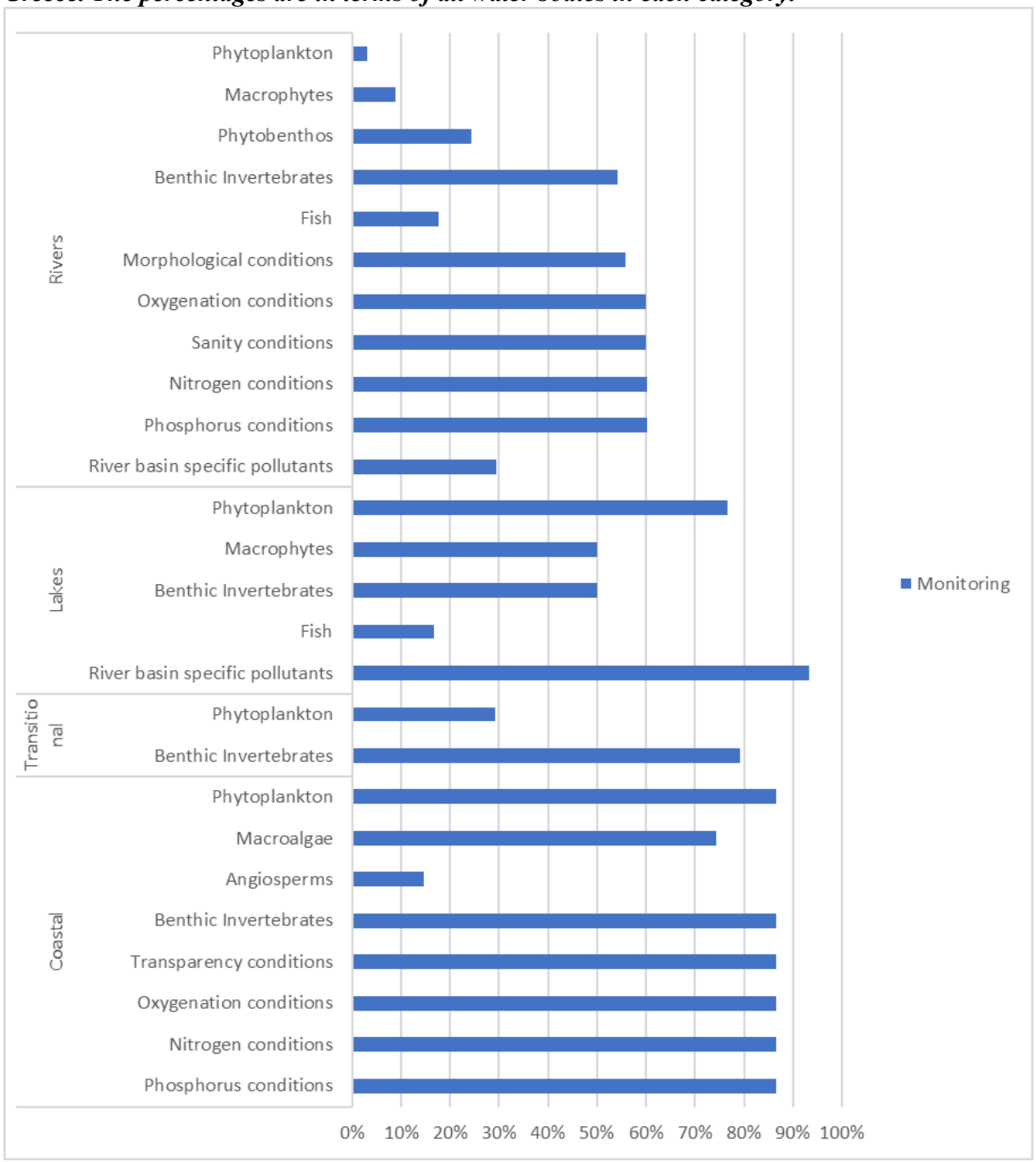
The reported data referring to the use of monitoring for the classification of each quality element in the surface water bodies are presented in Figure 3.10. In transitional waters, the two BQEs used for classification have been monitored: benthic invertebrates have been monitored in 79% and the phytoplankton in 29% of the transitional waters.

In lakes, all 4 BQEs used in classification have been monitored: phytoplankton in 77%, benthic invertebrates in 50%, macrophytes in 50% and fish in 17% of lakes. RBSPs have been monitored in 93% of lakes.

In rivers, all 5 BQEs used in classification have been monitored: benthic invertebrates in 54%, phytobenthos in 24%, fish in 18% macrophytes in 9% and phytoplankton in 3% of rivers. Morphological conditions have been monitored in 56% of rivers and from the physicochemical elements, the oxygenation, salinity, nitrogen and phosphorus conditions in 60% of the rivers respectively. RBSPs have been monitored in 29% of rivers.

In coastal waters, all 4 BQEs used in classification have been monitored: macroalgae in 74%, angiosperms in 15%, phytoplankton in 87% and benthic invertebrates in 87% of the coastal waters. From the physicochemical elements, transparency, oxygenation, nitrogen and phosphorus conditions have been monitored in 87% of the coastal water bodies respectively.

Figure 3.10: Basis of the classification of ecological status/potential of surface water bodies in Greece. The percentages are in terms of all water bodies in each category.



Source: WISE electronic reports

Assessment methods and classification of biological quality elements

17 methods for the assessment and classification of BQEs have been reported. Compared to the first RBMPs, in the second cycle more methods have been developed for the assessment of BQEs.

Assessment methods have been developed for all the reported BQEs in all respective water categories where they have been reported. The following gaps in assessment methods have been noted: for phytoplankton in rivers, for fish in rivers/transitional/coastal, for phytobenthos in lakes/transitional/coastal, for macrophytes in transitional/coastal, for angiosperms in rivers/lakes/transitional, for macroalgae in rivers/lakes/transitional, for other aquatic flora in

rivers/lakes/coastal. Reference conditions have been set for all types and all BQEs where methods have been developed. It has not been reported whether the methods are sensitive to all relevant impacts.

Intercalibration of biological quality element methods

Intercalibration has been applied to the assessed BQEs in the water categories where they have been assessed, except for fish. The information related to intercalibration of SWBs was presented in section 2.1.5. Approx. 96% of the SWBs are linked to common intercalibration types, among which 82% rivers, 15% coastal waters, 2% lakes and <0.2% transitional waters. On the contrary, most transitional and lake water bodies are not linked to intercalibrated types but to national types.

Assessment of hydromorphological quality elements

Morphological conditions, oxygenation conditions, salinity conditions and nutrient conditions have been assessed in the rivers of 12 RBDs, i.e. except in Crete and Aegean Islands where only morphological conditions have been assessed. Transparency, oxygenation and nutrient conditions have been assessed in the coastal waters of 12 RBDs (i.e. except Crete and Aegean Islands). Morphological conditions related to the sensitive BQEs have been reported in the rivers of Crete and Aegean Islands.

Classification methods for physicochemical quality elements

Standards have been reported for the physicochemical quality elements, their values have been set and they and have been applied to rivers and to coastal waters of all RBDs. The standards for Physicochemical (PHYSCHEM) elements are not consistent with the good-moderate status boundary of the relevant sensitive biological quality elements.

Selection of River Basin Specific Pollutants (RBSPs) and use of Environmental Quality Standards (EQS)

EQS Values have been reported for 47 RBSPs in rivers and lakes in all RBDs. The analytical methods used meet the minimum performance criteria laid down in Article 4.1 of the Quality Assurance/Quality Control Directive (2009/90/EC) for the strictest standard applied. For *Molybdenum & its compounds*, *Tin & its compounds* and *Other chemical parameter* (not specified), in both lakes and rivers and in all RBDs, the analytical methods used do not meet the above mentioned criteria of Art.4.1 but they comply with the requirements laid down in Art.4.2.

There is no information as to whether the used standards have been derived in accordance with the Common Implementation Strategy Technical Guidance Document No 27. There is no reference to the above guidance document in the RBMPs or in the standards/protocols and the approved methodologies.

River Basin Specific Pollutants (RBSPs) in waters (matrix) have been used in the classification of ecological status/potential of rivers and lakes. The following 12 RBSPs causing failure of good ecological status/potential of SWBs have been reported:

- In lakes: *Malathion* in 2 lakes (Western Sterea Ellada, Central Macedonia), *Copper & its compounds* in 1 lake (Western Sterea Ellada), *Molybdenum & its compounds* in 1 lake (Central Macedonia), *Detergents* in 1 lake (Crete).
- In rivers: *Fenthion* in 4 rivers (Western Peloponnese, Eastern Sterea Ellada, Central Macedonia, Thrace), *Malathion* in 6 rivers (Central Macedonia, Eastern Macedonia, Thrace), *Fenitrothion* in 1 river (Western Peloponnese), *Chromium VI* in 2 rivers (Thessalia, Western Macedonia), *Bentazone* in 1 river (Central Macedonia), *Parathion-*

methyl in 1 river (Thrace), *Molybdenum & its compounds* in 9 rivers (Western Peloponnese, Epirus, Western Macedonia, Eastern Macedonia, Thrace, Crete), *Tin & its compounds* in 7 rivers (Epirus, Eastern Macedonia, Thrace), *Copper & its compounds* in 1 river (Western Peloponnese), *Detergents* in 2 rivers (Attica, Crete), *Disulfoton* in 1 river (Thessalia) and *Azinphos-ethyl* in 1 river (Western Macedonia).

Overall classification of ecological status (one-out, all-out principle)

In all RBDs, the 'one- out, all- out' principle has been applied in deriving the overall classification of the ecological status of a water body.

3.2 Main changes in implementation and compliance since the first RBMPs

Since the first cycle, the total number of monitoring sites has increased by 3%. It has decreased by 20% in lakes while it has increased by 4% in rivers, 7% in transitional and 3% in coastal water bodies. The total number of sites has decreased in 4 RBDs, increased in 7 RBDs, while it remained unchanged in 3 RBDs.

The number of surveillance sites has increased by 3% in total. It has decreased by 19% in lakes, while it has increased by 3% in rivers and 11% in coastal waters. There is no surveillance station for transitional waters. The total number of operational sites has increased by 2%; it has increased by 6% in rivers and 11% in transitional waters while it has decreased by 20% in lakes and 9% in coastal waters.

Compared to the previous cycle, in the second RBMPs there has been a significant increase of 59% in the proportion of SWBs in Good ecological status, an increase of 25% of the SWBs in moderate, and of 7% of the SWBs in high status. On the contrary, there is a remarkable decrease of 74% of the SWBs in unknown status, a decrease of 46% of the SWBs in poor status.

In the second RBMPs, a new national monitoring program has been used. New approved methodologies and standards have been developed and implemented. Reference values also have been set.

More monitored biological quality elements (BQE) have been used in the classification in the second cycle. Regarding the biological quality elements (BQE) in rivers, for the second RBMPs the phytoplankton, macrophytes, phytobenthos, and fish have been added to benthic invertebrates that were the only elements monitored for the first RBMPs. In lakes, macrophytes, benthic invertebrates and fish have been added to phytoplankton (the only element monitored for the first RBMPs). In transitional waters, phytoplankton and benthic invertebrates are the elements monitored (similarly to the previous cycle). Finally in coastal waters, angiosperms have been added to the 3 elements previously monitored i.e. to phytoplankton, benthic invertebrates and macroalgae.

Regarding the hydromoprhological quality elements (HYMO) in rivers and lakes there is no change in the monitored elements or in the ones used in the assessment. Similarly to the previous cycle, in the second RBMPs there is no HYMO monitoring in transitional and coastal waters.

River Basin Specific Pollutants (RBSPs) have not been used in transitional and coastal waters' classification in none of the two cycles.

In the second cycle, the new national monitoring programme has been used and more protocols and methodologies have been developed, intercalibrated and implemented at national level. The assessment has been based on the monitoring data of the new monitoring network at a higher extent than in the previous cycle.

Fish, phytobenthos and macrophytes have been monitored and have been used in the classification

of the water bodies in the second cycle whilst they were not monitored nor used in the previous one.

From the total number of rivers and lakes with ecological status in both cycles and compared to previous cycle, in the second cycle there is a reduction of 11% in the benthic invertebrates in High/Good status in rivers and lakes, an increase of 66% of the phytoplankton in High/Good status. However, this comparison should be treated with caution as there are differences between the numbers of surface water bodies classified for individual elements and differences in methodologies from the first to the second RBMPs. There are no data for the other BQEs for the previous cycle in order to make comparisons.

Compared to the previous cycle, in the second RBMPs the overall status classification of the water bodies has been done with combination of the ecological status and the chemical status.

3.3 Progress with Commission recommendations

Recommendation: *Make fully operational the new National Monitoring Programme (NMP). All outstanding assessment methods should be developed and made operational as soon as possible. All water bodies should be classified according to WFD compliant methods. The one-out all-out principle should be used across the board. Data must be collected on a regular basis for all relevant quality elements. The recommendations of the RBMPs regarding the proposed modifications to the NMP need to be carefully considered and actions for their implementation pursued. The data of the new NMP must be quality assured, organised and archived. It is recommended that these data are made available to all users and the general public through easily accessible formats.*

Assessment: The new National Monitoring Programme has been implemented and has been operational and publicly available online. The sampling and assessment methods, standards/protocols have been developed and are available. It is not known whether the new monitoring programme's data are quality assured. The use of monitoring in assessment and classification has been extended since the previous cycle but there are still important gaps to fill. There are important gaps in the spatial coverage and the data for the chemical classification of the SWBs. The RBMPs used the data and information from the national monitoring programme. RBMPs have also identified the urgent need to expand the monitoring stations (all RBDs have a relevant measure) and improve its state of operation. All water bodies are classified according to WFD compliant methods but there is still a need to intercalibrate the national classification types or develop new ones. There are still important gaps in elements assessment and monitoring. Standards and assessment methods should be expanded to include more elements and for all water categories (in particular in transitional and coastal). There is also a need to increase the use of monitored elements in the assessment and the classification in all water categories. RBSPs are not monitored in transitional and coastal waters. The one-out all-out principle has been used across the board. Thus, the recommendation has been fulfilled partially but there is need for improvement.

Recommendation: *Develop publicly available WFD compliant National Guidance Documents, addressing the key implementation steps where significant weaknesses have been identified (characterisation of pressures, typology, reference conditions, monitoring and grouping of water bodies, methods for the status classification, HMWB designation, application of exemptions and in particular regarding Article 4.7, etc.), necessary to ensure WFD compliance and increased comparability and transparency.*

Assessment: Greece has developed and is using, publicly available, WFD compliant National Guidance Documents for the methodologies and standards/protocols for the monitoring, sampling and the assessments of elements, substances and water bodies status classification, the application

of exemptions, HMWB designation, typology and pressures' characterisation. There is no information whether or not the used standards have been derived in accordance with the Common Implementation Strategy Technical Guidance Document No 27. The recommendation has been fulfilledfulfilled to a great extent but there is need for improvement.

Recommendation: *Particularly urgent is the development of sound methodologies to address hydromorphological pressures. The current combination of weak pressure analysis (with not precautionary enough thresholds of significance), lack of ecological status assessment methods sensitive to hydromorphological pressures, unclear process for designation of HMWB and lack of development of good ecological potential makes it very likely that significant hydromorphological pressures are completely overlooked in the implementation process. Potential effects of 'smaller' modifications such as dams lower than 15 m, dredging, river straightening, drainage, etc., including impacts to transitional and coastal waters, should be assessed.*

Assessment: Common approved methodologies have been developed at national level for the hydromorphological pressures and they have been publicly available. For the assessment of the hydromorphological quality of rivers, the River Habitat Survey (RHS) has been implemented and the Habitat Modification Score (HMS) has been calculated which expresses the hydromorphological degradation from human interventions (bridges, dams, pipelines, etc.).

However, it is not clear whether all relevant pressures in all rivers have been assessed as in the supporting documents of the RBMPs it is mentioned that the pressures related to hydromorphology have been examined only for projects that have caused hydromorphological alterations to SWBs resulting in their initial characterisation (screening) as HMWBs or AWBs (e.g. in Western Peloponnese, Western Sterea Ellada etc.). Thus, a large number of SWBs rivers may have not been examined for pressures related to hydromorphology.

Furthermore, the approved methodology considers as significant pressure only the hydromorphological alterations occurring in HMWBs and for dams >15m in height. In other cases, hydromorphological alterations have been considered *a priori* as not significant pressures. Greece implements a type of co-assessment of the hydromorphological alterations taking also into account the available results of the new National Monitoring Programme. Thus, the recommendation has been partially fulfilled.

Topic 4 Monitoring, assessment and classification of chemical status in surface water bodies

4.1 Assessment of implementation and compliance with WFD requirements in the second cycle

4.1.1 Monitoring of chemical status in surface waters

Monitoring sites and monitored water bodies used for monitoring of chemical status

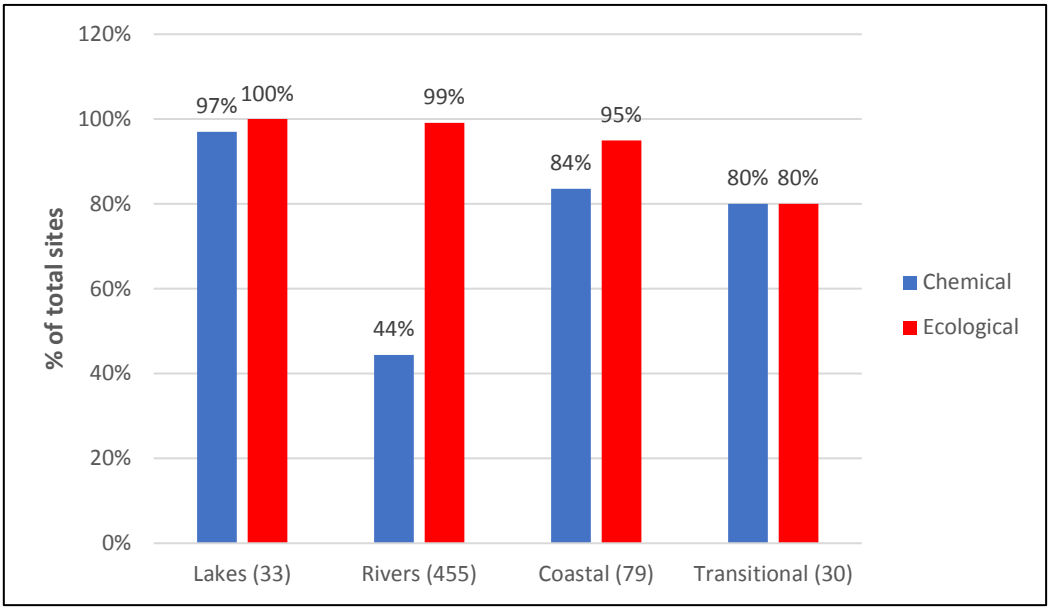
Member States have to implement surveillance and operational monitoring programmes in accordance with the requirements of the WFD and of the EQS Directive, for the assessment of ecological status/potential and chemical status.

Surveillance monitoring programmes should allow Member States to supplement and validate the impact assessment procedure, to efficiently and effectively review the design of their monitoring programmes, and to assess the long-term changes in natural conditions and those resulting from widespread anthropogenic activity. For operational purposes, monitoring is required to establish the status of water bodies identified as being at risk of failing to meet their environmental objectives, and to assess any changes in the status of such water bodies resulting from the PoM.

Section 3.1.1 of this report summarises the characteristics of the surveillance and operational monitoring programmes in Greece for the second RBMP. As shown in Figures 4.1 and 4.2, 97% of the lakes' total monitored sites have been used for their chemical status, while in rivers 44%, in coastal waters 84% and in transitional waters 80% of their total monitored sites. 76% of the total lakes' number, 14% of the total rivers' number, 50% of the total number of transitional water bodies and 23% of the total coastal water bodies have been monitored for their chemical status.

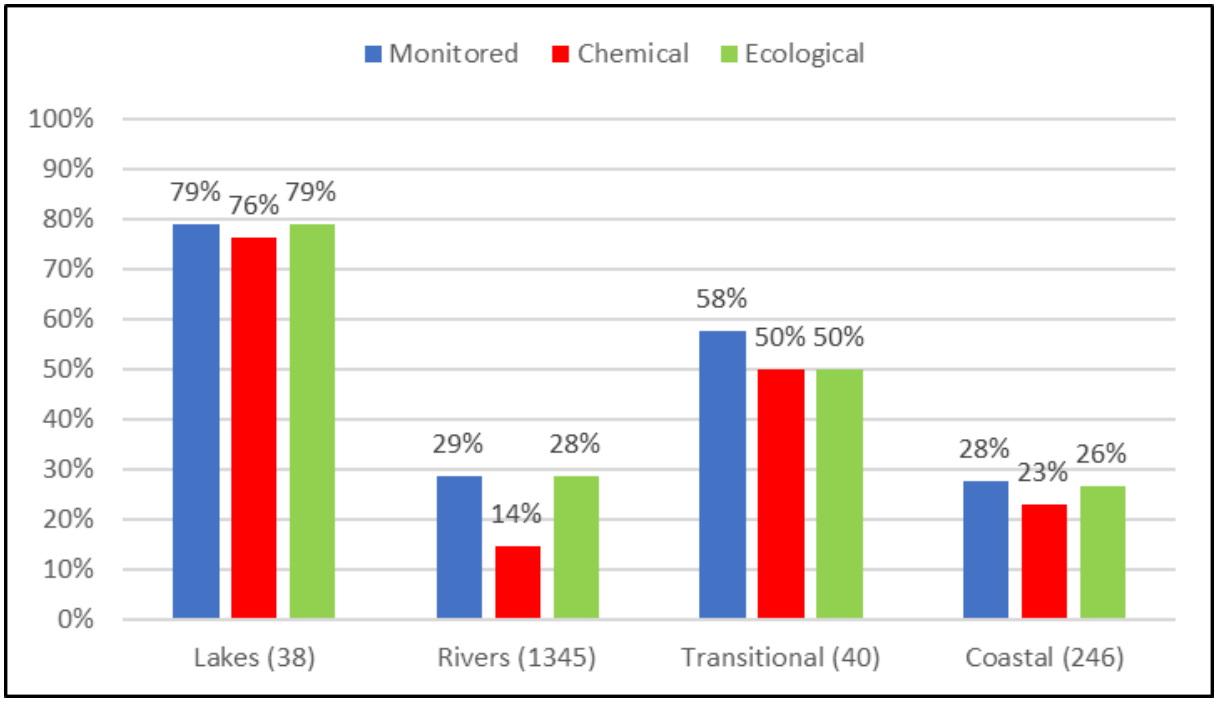
Although the new National Monitoring Programme has been developed, all RBMPs note the obstacles due to important gaps (e.g. in spatial coverage of the monitoring network, areas with more dispersed stations or without coverage, in data/measurements of the essential elements). These gaps also make it impossible to provide a long term trends analysis and cause the limited availability of measurements for the Priority Substances, the limited coverage of rivers/lakes/transitional and coastal water bodies from surveillance stations with gaps in data of both ecological and chemical parameters.

Figure 4.1: Proportion of sites used for monitoring of chemical status and, for comparison, ecological status, in Greece. The number in parenthesis next to the category is the total number of monitoring sites irrespective of their purpose



Source: WISE electronic reports

Figure 4.2: Proportion of total water bodies in each category which are monitored for chemical status and for ecological status, in Greece. The number in parenthesis next to the category is the total number of water bodies in that category.



Source: WISE electronic reports

Long-term trend monitoring and monitoring of Priority Substances in water, sediment and biota for status assessment

Monitoring for status assessment

Requirements

Article 8(1) of the WFD requires Member States to establish monitoring programmes in order to provide *inter alia* a coherent and comprehensive overview of water status within each RBD. The amount of monitoring undertaken in terms of priority substances, frequency and number of sites should be sufficient to obtain a reliable and robust assessment of status. According to the EQS Directive (version in force in 2009), *mercury, hexachlorobenzene* and *hexachlorobutadiene* have to be monitored in biota for status assessment, unless Member States derived a standard for another matrix, which is at least as protective as the biota standard.

Spatial coverage

Priority Substances have been monitored only in water (matrix) in all RBDs but the % of the water bodies monitored varies greatly. The following table provides an overview of the % of water bodies monitored in each RBD for priority substances and the number of substances monitored in each water body category.

The % of the monitored water bodies has been low (18% of the total surface water bodies) and there is high variability on the % of water bodies monitored per RBD (in Aegean Islands and Crete 4.5% and 7.2% respectively of their water bodies have been monitored[36] while in Attica 36.7% and Western Sterea Ellada 32.5% respectively).

The number of priority substances varies as well between the water body categories and the RBDs. In general, substances in rivers and coastal waters are better covered and at secondary level in the lakes of certain RBDs (e.g. in Northern Peloponnese, Western Sterea Ellada, Epirus, Eastern Sterea Ellada, Western Macedonia, Central Macedonia, Eastern Macedonia, Thrace, Crete). The number of monitored substances in transitional waters presents high variability.

RBD	% surface water bodies monitored	Number of Priority Substances Monitored			
		Rivers	Lakes	Transitional	Coastal
EL01	21.4	35	0	26	26
EL02	34.1	36	35	26	27
EL03	14.1	36	0	0	27
EL04	32.5	36	35	0	26
EL05	29.2	36	29	26	27
EL06	36.7	36	0	0	26
EL07	23.1	36	35	0	27
EL08	28.0	27	0	0	26
EL09	11.3	35	36	2	31
EL10	15.3	35	36	1	33
EL11	10.0	36	29	13	13
EL12	15.6	36	35	12	26

[36] The reasons are not available. It might be due to their high number of coastal waters since both RBDs are insulars.

RBD	% surface water bodies monitored	Number of Priority Substances Monitored			
		Rivers	Lakes	Transitional	Coastal
Crete	7.2	36	35	0	25
EL14	4.5	31	0	0	26

Source: WISE electronic reports

Frequencies

The WFD indicates that, for the surveillance and operational monitoring of Priority Substances in water, the frequency of monitoring should be at least monthly for one year during the RBMP cycle and at least monthly every year, subsequently. Monitoring in biota for status assessment should take place at least once every year according to the EQS Directive. In all cases greater intervals can be applied by Member States if justified on the basis of technical knowledge and expert judgement.

13 priority substances are monitored once per month within the 6-year period in water. These substances are (in parenthesis their number of monitoring sites):

- Surveillance monitoring: *Cadmium (9 sites), DEHP (1 site), Hexachlorobenzene (1) Hexachlorobutadiene (1), Lead (14), Nickel (24), Nonylphenol (9), Pentachlorophenol (2), Benzo(a)pyrene (2),*
- Operational monitoring: *Cadmium (13 sites), Hexachlorobenzene (10) Hexachlorobutadiene (2), Lead (9), Nickel (18), Nonylphenol (7), Pentachlorophenol (2), Anthracene (1), Fluoranthene (1), Mercury (1), Naphthalene (1).*

Further information per RDP has not been reported nor included in RBMPs/SEAs.

Mercury, hexachlorobenzene and *hexachlorobutadiene* have not been monitored in biota or sediments for status assessment.

Monitoring for long-term trend assessment

Requirements

Article 3.3 of the EQS Directive (version in force in 2009) requires Member States to monitor 14 priority substances[37] that tend to accumulate in sediment and/or biota, for the purpose of long-term trend assessment. Monitoring should take place at least once every three years, unless technical knowledge and expert judgment justify another interval.

Spatial coverage

Monitoring for long term trend assessment has not been implemented.

Frequencies

Monitoring for long term trend assessment has not been implemented.

Monitoring of Priority Substances that are discharged in each RBD

Annex V of the WFD states, in Section 1.3.1 (Design of surveillance monitoring), that 'Surveillance monitoring shall be carried out for each monitoring site for a period of one year during the period covered by a river basin management plan for [*inter alia*]: priority list pollutants

[37] *Anthracene, brominated diphenylether, cadmium, C10-13 chloroalkanes, DEHP, fluoranthene, hexachlorobenzene, hexabutadiene, hexachlorocyclohexane, lead, mercury, pentachlorobenzene, PAH, Tributyltin.*

which are discharged into the river basin or sub-basin.' Section 1.3.2 (Design of operational monitoring) of the Directive states that 'In order to assess the magnitude of the pressure to which bodies of surface water are subject Member States shall monitor for those quality elements which are indicative of the pressures to which the body or bodies are subject. In order to assess the impact of these pressures, Member States shall monitor as relevant [*inter alia*]: all priority substances discharged, and other pollutants discharged in significant quantities.'

Member States are therefore required to monitor all Priority Substances which are discharged into the river basin or sub-basin. Greece has not reported any priority substances discharged in each RBD.

Performance of analytical methods used

According to WISE the analytical method meets the minimum performance criteria laid down in Art.4.1 of the technical specifications for chemical analysis and monitoring of water status Directive (2009/90/EC) [38] for the strictest standard applied for all 41 substances at the entire RBDs. There is no RBD where analytical methods are reported not to meet either Art.4.1 or Art.4.2 of the aforementioned Directive.

4.1.2 Chemical Status of surface water bodies

Member States are required to report the year on which the assessment of chemical status is based. This may be the year that the surface water body was monitored. In case of grouping this may be the year in which monitoring took place in the surface water bodies within a group that are used to extrapolate results to non-monitored surface water bodies within the same group.

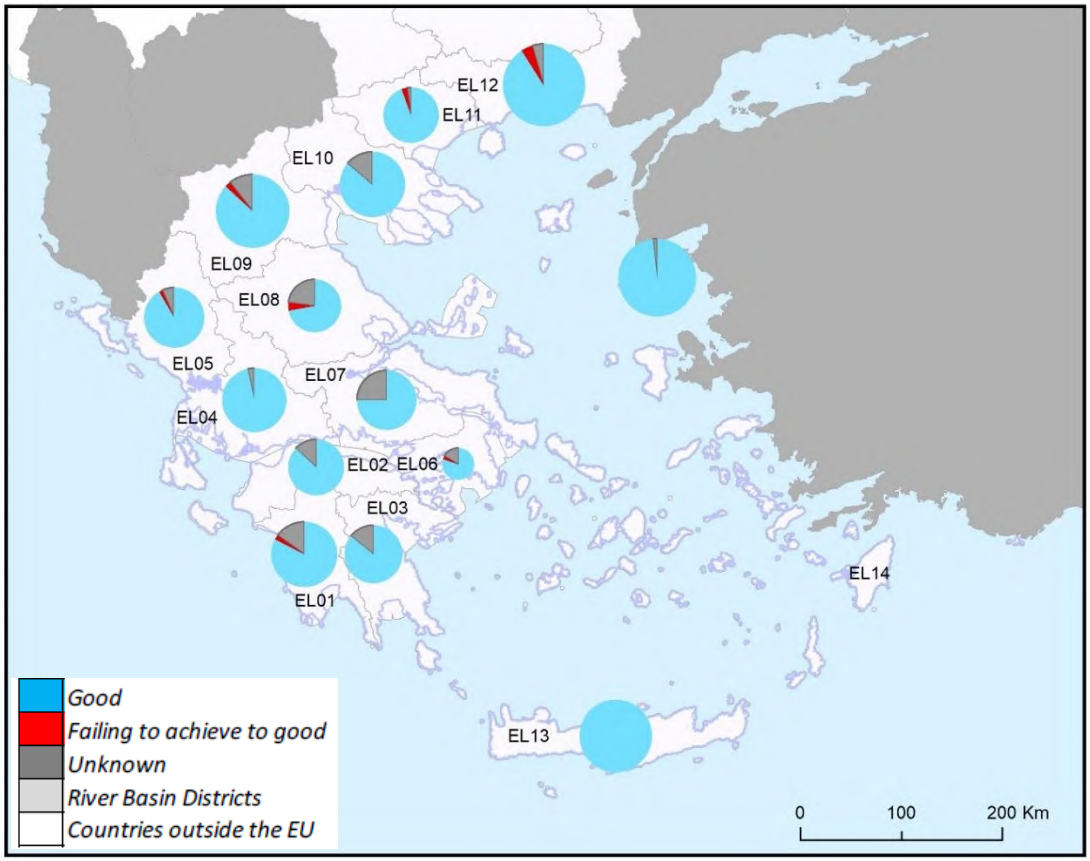
For Attica and Eastern Sterea Ellada the reference years for status assessment are 2013-2015. For all other RBDs, the reference years are 2012-2015. A total of 1,478 SWBs have been reported as being assessed during these periods (1,197 rivers, 27 lakes, 24 transitional and 230 coastal water bodies) but some reported data require clarification[39].

Overall, 88.5% of the total monitored SWBs are in good status, 1.6% are failing to achieve it and 9.8% in unknown status. 71% of the monitored lakes are reported in good status, 5% as failing to achieve good status and 24% in unknown status. 89% of the river bodies are in good status, 9% in unknown status and 2% in failure. 60% of the transitional waters are in good status and 40% in unknown status. 93% of the coastal waters are in good status and 7% in unknown status. Important parts with unknown status have been reported in Western Peloponnese, Eastern Peloponnese, Eastern Sterea Ellada, Thessalia, Western Macedonia, Central Macedonia (that is, all areas with significant pressures from agriculture). Thrace, Eastern Macedonia, Thessalia, Western Macedonia, Western Peloponnese, Epirus and Attica have water bodies that fail to achieve good status. The situation looks very good at the insular RBDs of Crete and Aegean Islands.

Compared to the previous cycle, there is a significant increase in the number of SWBs in good condition (68%), a significant reduction in the number of SWBs in unknown status (-60%) and a reduction in the number of SWBs failing to achieve good status. The results are mostly due to the improvement and development of the new monitoring network, the establishment of new methodologies, the new typology and the use of bodies' grouping and experts' judgement.

[38] https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:201:0036:0038:EN:PDF
[39] Disagreement between the reported data and the ones included in the RBMPs.

Map 4.1: Chemical status of surface water bodies in Greece based on the most recently assessed status of the surface water bodies



Source: WISE, Eurostat (country borders)
Note: Standard colours based on WFD Annex V, Article 1.4.3

Table 4.1: Chemical status of surface water bodies in Greece for the second and first RBMPs. Note: the number in parenthesis next to the water body category is the number of water bodies. Note: Chemical status assessment is based on the standards laid down in EQS Directive 2008/105/EC (version in force on 13 January 2009). Some Member States did not implement the Directive in the first RBMPs as the transposition deadline was in July 2010, after the adoption of the first RBMPs.

Category	Good		Failing to achieve good		Unknown	
	Number	%	Number	%	Number	%
Second RBMP						
Lakes (246)	27	71%	2	5%	9	24%
Rivers (38)	1,197	89%	25	2%	123	9%
Coastal (40)	230	93%	0	0	16	7%
Transitional (1345)	24	60%	0	0	16	40%
Total	*1,478*	*88%*	*27*	*2%*	*164*	*10%*
First RBMP						
Lakes (246)	7	11%	11	18%	44	71%
Rivers (62)	341	26%	129	10%	864	65%
Coastal (47)	4	2%	2	1%	240	98%
Transitional (1334)	0	0	5	11%	42	89%

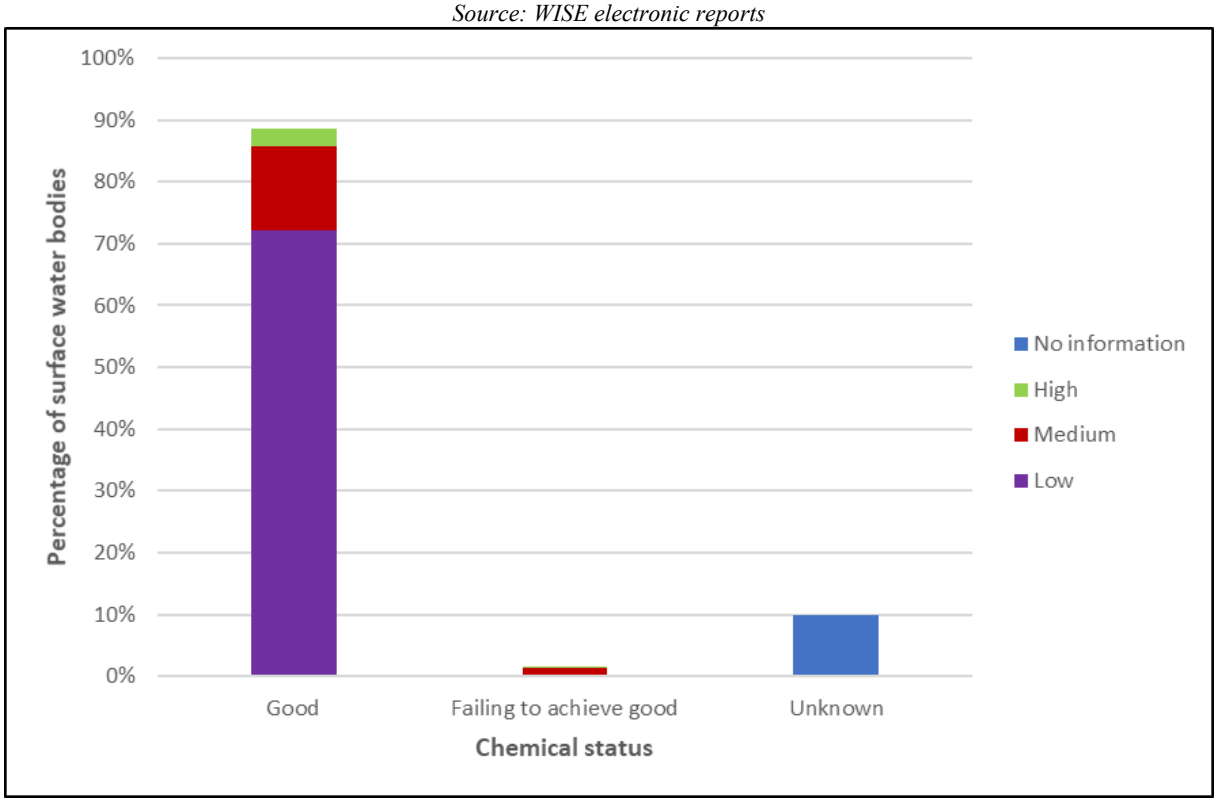
Total	*352*	*21%*	*147*	*9%*	*1190*	*70%*

Source: WISE electronic reports

The level of confidence is low for 72% of the SWBs considered in good chemical status, medium for 14% and high for only 3% of them. For 10% of the SWBs in unknown chemical status there is no information. Finally, the confidence level is medium for 1% of the SWBs failing to achieve good status.

Figure 4.3: Confidence in the classification of chemical status of surface water bodies in Greece based on the most recently assessed status/potential

Source: WISE electronic reports

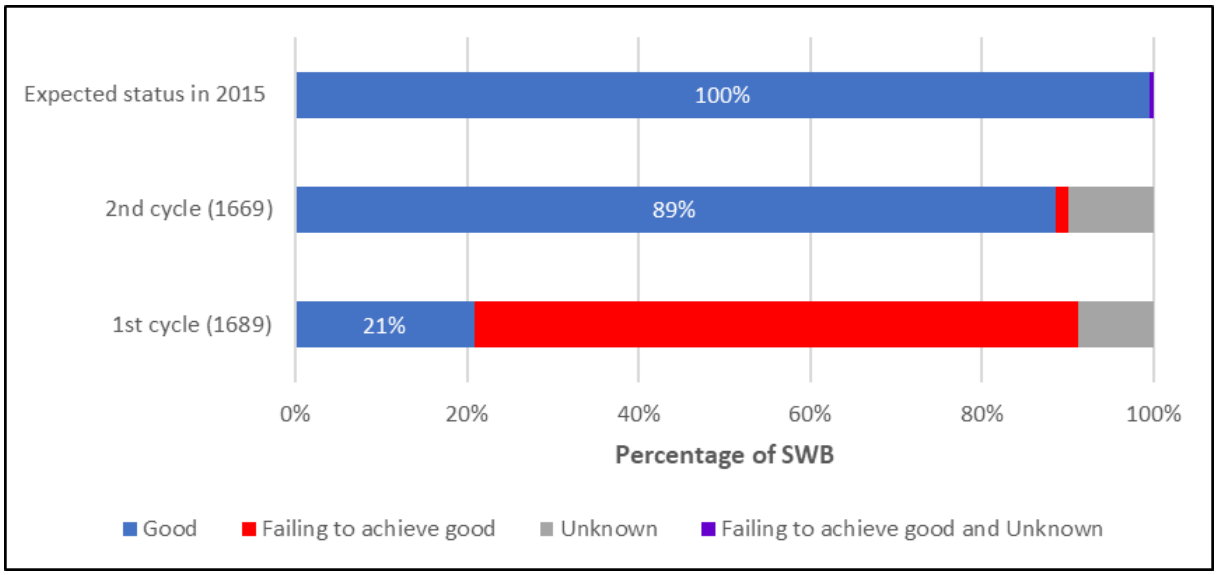


WISE electronic reports

Classification of chemical status is intended to be assessed according to the 'one-out-all-out' principle, according to which the failure of one Priority Substance Environmental Quality Standard in a water body results in failure to achieve good status classification for that water body.

In all RBDs the classification of the SWBs chemical status has been done according to the 'one-out-all-out' principle.

Figure 4.4: Chemical status of surface water bodies in Greece for the second RBMPs, for the first RBMPs and expected in 2015. The number in the parenthesis is the number of surface water bodies for both cycles. Note the period of the assessment of status for the second RBMP was 2012-2015.



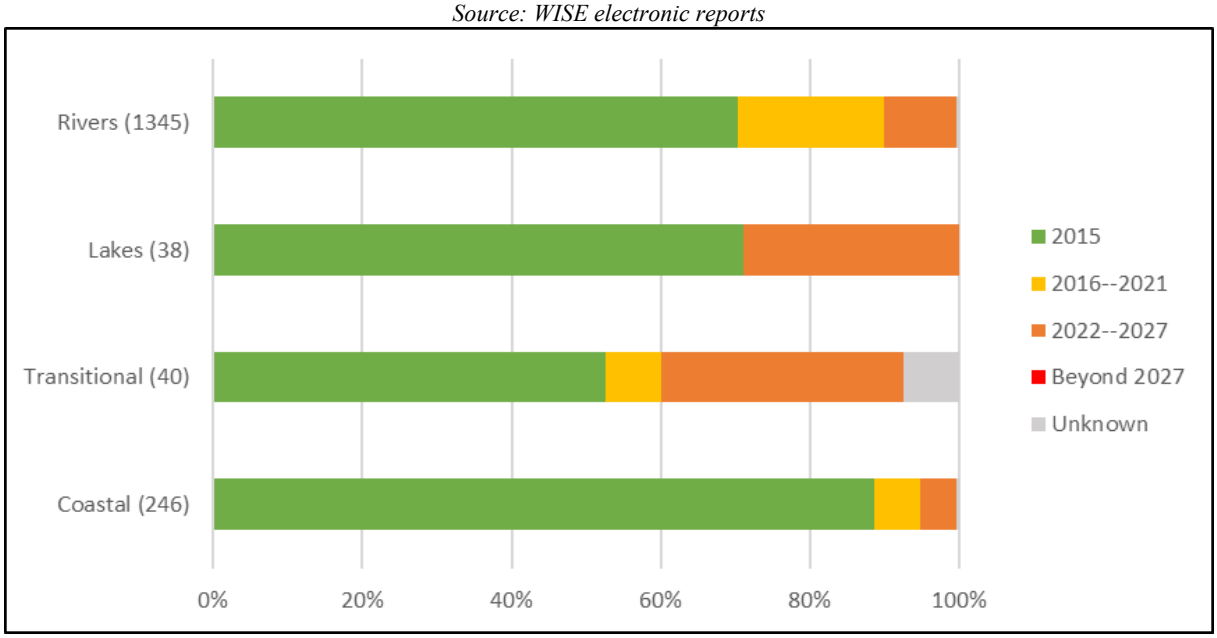
Source: WISE electronic reports

Member States were asked to report the expected date for the achievement of good chemical status. These dates for Greece are presented in Figure 4.5. Taking into account that 2015 was the end of the reference period, by 2021 89% of the river bodies are anticipated to achieve good status (19% than 2015), 71% of the lakes (no change since 2015), 61% of the transitional (8% since 2015) and 95% of the coastal (6% since 2015) water bodies.

During the period 2022-2027, it is expected to have an additional 10% in rivers, 29% in lakes and 33% in transitional and 5% in coastal water bodies in good status. 8% of the transitional waters is expected to have unknown status at the end of 2027. There is no reference to foreseen improvement of the confidence levels.

Figure 4.5: Expected date of achievement of good chemical status of surface water bodies in Greece. The number in the parenthesis is the number of surface water bodies in each category.

Source: WISE electronic reports



WISE electronic reports

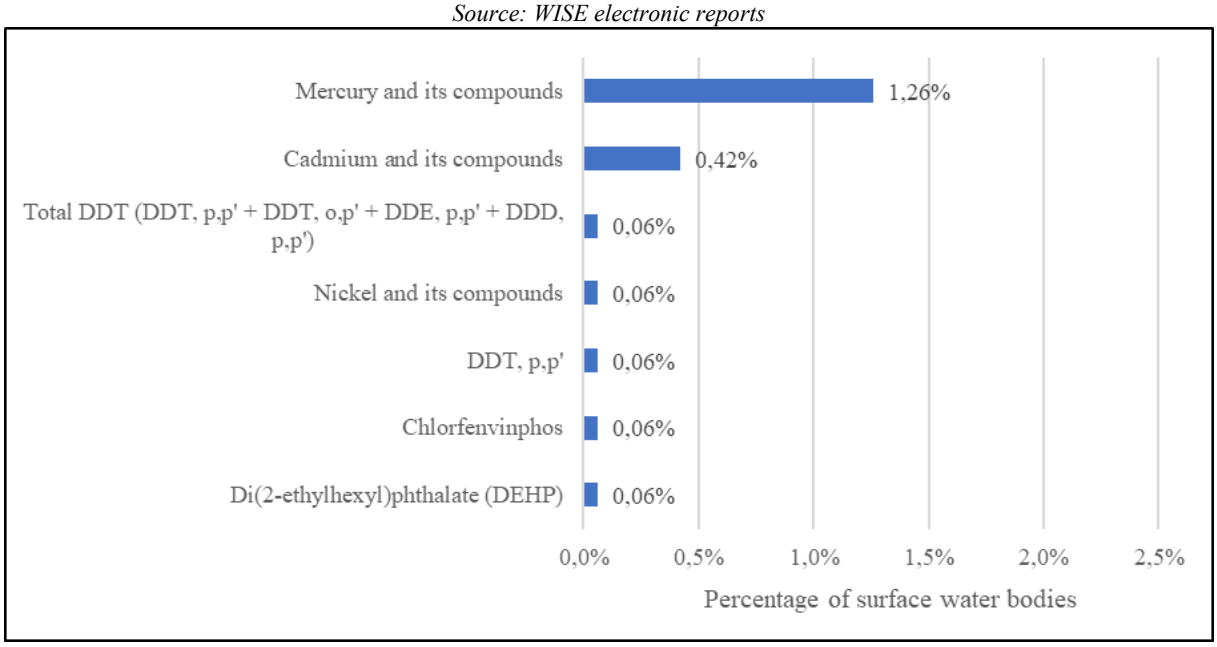
Priority Substances causing the failure of good chemical status

Member States were expected to report exceedances for individual substances on the basis of the revised, more stringent standards from Directive 2013/39/EU.

Figure 4.6 provides information on the seven priority substances reported as causing failure of good chemical status in Greece. *Mercury and its compounds* have been reported as the main failing cause substance in 21 water bodies (1.26% of total SWBs) followed by *Cadmium and its compounds* in 7 bodies (0.42% of the SWBs) and by *DDT, Nickel and its compounds, Chlorfenviphos* and *DEHP* each affecting 1 water body (0.06% of the SWBs) respectively.

Figure 4.6: The Priority Substances causing failure to achieve good chemical status in surface water bodies in Greece

Source: WISE electronic reports



WISE electronic reports

Ubiquitous persistent, bioaccumulative and toxic Priority Substances

According to article 8(a) of the EQS Directive[40], eight priority substances and groups of priority substances are behaving as ubiquitous, persistent, bioaccumulative and toxic substances[41]. These substances are generally expected to cause widespread exceedances, and their emissions can be challenging to tackle (e.g. due to long-range atmospheric transport and deposition). In order to show the progress made in tackling other priority substances, Member States have the possibility to present the information related to chemical status separately for these substances.

Thirty (30) surface water bodies have been reported in failing good status with ubiquitous persistent compounds, i.e. 2% of the total SWBs.

Priority Substances used in the assessment of chemical status compared to those monitored

A total of 41 priority substances have been reported as used in the assessment of chemical status of the SWBs. 40 substances have been used in 12 RBDs (except Crete and Aegean Islands) and 1

[40] Amended by Directive 2013/39/EU.

[41] *Brominated diphenylether, Mercury and its compounds, Polyaromatic hydrocarbons (PAH), Tributyltin, PFOS, Dioxins, Hexabromocyclodecane* and *Heptachlor*.

more substance, i.e. 41 in total, in Crete and Aegean Islands RBDs. The following 40 substances have been reported commonly at all 14 RBDs and, in addition, *Tributyltin-cation* has been reported for Crete and Aegean Islands:

Hexachlorocyclohexane , Cadmium, Trichloroethylene, Total Benzo(g,h,i)-perylene (CAS_191-24-2) + Indeno(1,2,3-cd)-pyrene (CAS_193-39-5, Alachlor, Atrazine, Benzo(a)pyrene, Mercury, Chloroalkanes C10-13, Hexachlorobenzene, Simazine, Trifluralin, Nickel, Dichloromethane, Octylphenol (4-(1,1',3,3'-tetramethylbutyl)-phenol), Total Benzo(b)fluor-anthene (CAS_205-99-2) + Benzo(k)fluor-anthene (CAS_207-08-9), 1,2-Dichloroethane, Tetrachloroethylene, Diuron, DDT, p,p', Lead, Endosulfan, Trichlorobenzenes (all isomers), Pentachlorophenol, Brominated diphenylethers (congener numbers 28, 47, 99, 100, 153 and 154), Chlorpyrifos, Isoproturon, Total DDT (DDT, p,p' + DDT, o,p' + DDE, p,p' + DDD, p,p'), Total Cyclodiene pesticides (Aldrin + Dieldrin + Endrin + Isodrin), Di(2-ethylhexyl)phthalate (DEHP), Anthracene Hexachlorobutadiene, Chlorfenvinphos, Carbon tetrachloride, Pentachlorobenzene, Benzene, Nonylphenol, Fluoranthene, Trichloromethane, Naphthalene.

Application of alternative environmental quality standards for water, biota and sediment

Water has been the only matrix used in Greece. Biota and sediments have not been used. According to the EQS Directive, Member States may opt to apply environmental quality standards for another matrix than the one specified in the Directive for a given substance. If they do so, they have to ensure the environmental quality standard they set in the other matrix (or matrices) offers at least the same level of protection as the standard established in the Directive. This option has not been used in Greece.

Use of mixing zones

Greece has not used the option of designating mixing zones adjacent to points of discharge in surface waters according to Article 4 of the EQS Directive. Concentrations of priority substances may exceed the relevant environmental quality standard within such mixing zones if they do not affect the compliance of the rest of the surface water body with those standards. Member States that designate mixing zones are required to include within their RBMPs a description of the approaches and methodologies applied to define such zones, and a description of the measures taken to reduce the extent of the mixing zones in the future.

Background Concentrations and Bioavailability

The EQS Directive stipulates that Member States have the possibility, when assessing the monitoring results against the environmental quality standard, to take into account:

- natural background concentrations for metals and their compounds, if they prevent compliance with the environmental quality standard, and;
- hardness, pH or other water quality parameters that affect the bioavailability of metals.

According to the reported information, these stipulations have not applied in any RBD in Greece.

4.2 Main changes in implementation and compliance since the first cycle

The changes in the number of sites and water bodies monitored for operational and surveillance purposes between first and second RBMPs were presented in section 3.2. The number of surveillance sites increased by 3% in total. It has been reduced by -19% in lakes, while it increased by 3% in rivers and 11% in coastal waters. There is no surveillance station in transitional waters.

The number of operational sites has increased by 2% in total. It has increased by 6% in rivers and 11% in transitional while it has been reduced by -20% in lakes and -9% in coastal waters.

Compared to the previous cycle, there is significant increase (68%) in the number of surface water bodies in good condition, significant reduction (-60%) in the number of surface water bodies in unknown status and a reduction in the number of surface water bodies failing to achieve good status.

The results are mostly due to the improvement and development of the new monitoring network, the establishment of new methodologies, the new typology and the use of bodies' grouping together with experts' judgement.

Taking into account that 2015 was the end of the reference period, by 2021 89% of the river bodies are anticipated to achieve good status (19% more than 2015), 71% of the lakes (no change since 2015), 61% of the transitional (8% more since 2015) and 95% of the coastal (6% more since 2015) water bodies.

4.3 Progress with Commission recommendations

Recommendation: *Make fully operational the new National Monitoring Programme (NMP). All outstanding assessment methods should be developed and made operational as soon as possible. All water bodies should be classified according to WFD compliant methods. The one-out all-out principle should be used across the board. Data must be collected on a regular basis for all relevant quality elements. The recommendations of the RBMPs regarding the proposed modifications to the NMP need to be carefully considered and actions for their implementation pursued. The data of the new NMP must be quality assured, organised and archived. It is recommended that these data are made available to all users and the general public through easily accessible formats.*

Assessment: The monitoring network has been developed but –as it is also stressed out in the RBMPs – there are important gaps in spatial coverage, lack of fully functioning stations, lack of time-series data, lack of data collected on regular basis etc. In general, there is still a great lack in functioning stations and in consistent time-series data. This has been reflected in the low confidence level, the persistent use of experts' judgement and the inability to calculate any long-term trends according to the RBMPs. Although now reported as in 'combination of both', a closer look in the RBMPs shows that almost all criteria previously assessed with 'experts' judgement' changed to 'combination of both' without any further information. The one-out all-out principle has been used across the board. Common approved methodologies for the classification of the SWBs have been developed by approved institutes/organisations. For transitional and coastal waters although having monitoring stations for RBSPs and other important elements, they have not been used in their classification. Hydromorphological elements monitoring requires further development in all water categories. It is not known whether the data of the new monitoring network are quality assured. Information on the national monitoring programme, the positions of the stations, the collected data and the institutes/organisations responsible per station are publicly available on the relevant website together with the stations' data. However, the available online data require regular updating. There is no precise information on gaps of time-series data and/or fully functioning stations per RBD. The RBMPs suggestions on the network actual state and the expansion of the use of monitored elements for the classification of all water categories need to be taken seriously into consideration. The recommendation has been partially fulfilled but there is need for improvement in several issues.

Recommendation: *The information obtained regarding chemical pollution needs to be extended (particularly for GR13 and 14) by filling gaps in monitoring, including the monitoring of mercury*

and other relevant pollutants in biota, and trend monitoring in biota and/or sediment

Assessment: Crete (EL13) and Aegean Islands (EL14) monitoring data and information have been reported. The new monitoring programme has been developed with additional monitoring sites. Monitoring of *Mercury* has also been developed. However, water has been the only monitoring matrix and there is no monitoring in biota and sediments. There are important gaps in the spatial coverage and the data for the chemical classification of the SWBs as well as limited availability in the data/measurements of Priority Substances monitoring. There are still gaps in monitoring. There is still no biota pollutants monitoring and trend monitoring in biota and/or sediment. Thus, the recommendation has been partially fulfilled.

Topic 5 Monitoring, assessment and classification of quantitative status of groundwater bodies

5.1 Assessment of implementation and compliance with WFD requirements in the second cycle

5.1.1 Monitoring of quantitative status in groundwater

There are 591 groundwater bodies (GWBs) in the second cycle, 4% more than the previous cycle in which 570 GWBs were reported.

Table 5.1 presents the number of water bodies directly monitored and the purpose of monitoring according to the reported information while Table 5.2 the proportion of groundwater bodies (GWBs) monitored for quantitative status and Table 5.3 the number of groundwater monitoring sites according to the reported information and the RBMPs and their purpose.

A total of 324 GWBs (55% of the GWBs) have been monitored for their quantitative status, leaving thus 267 GWBs (45%) without monitoring. Western Peloponnese is the RBD with the highest share of GWBs monitored (81.5% of its total), followed by Northern Peloponnese (75.8%) and Thessalia (72.7%). On the other hand, it is Aegean Islands (37.1%), Western Macedonia (42.6%) and Central Macedonia (43.2%) with the lower share of GWBs monitored. The total GWBs area in the second cycle is 130,509 km^2, reduced by 3% since the previous cycle's area of 134,644 km^2.

There is no explicit information on the number of monitoring sites for quantitative status other than a common statement to all RBMPs that all GWBs monitoring stations have been providing both chemical and quantitative data.

There is no information about entire GWBs established as Drinking Water Protected Areas. This is likely due to the fact that it has been considered as more adequate to set and establish Drinking Water Protected Areas at the points of drinking water abstractions instead of setting an entire area under strict measures that would affect all activities and population (e.g. entire islands).

Thus, it has been preferred to determine the zones of protection of the drinking water abstraction projects, the detailed delimitation of the protection zones of the drinking water abstraction points (sources, drills) for drinking water abstractions >1 mil. m^3 annually and the determination of the protection zones for the SWBs for drinking water abstraction.

Grouping of GWBs for status classification has not been reported nor mentioned in the RBMPs.

Table 5.1: Number of water bodies in Greece directly monitored and the purpose of monitoring

RBD	Total Ground water monitoring sites	Monitoring Purpose												
		AGR – Ground water abstraction site for irrigation	CHE - Chemical status	DRI – Ground water abstraction site for human consumption	DWD - Drinking water - WFD Annex IV.1.i	HAB - Protection of habitats or species depending on water - WFD Annex IV.1.v	IND – Ground water abstraction site for industrial supply	INV – Investi-gative monitoring	NID - Nutrient sensitive area under the Nitrates Directive - WFD Annex IV.1.iv	OPE – Opera-tional monitoring	QUA – Quanti-tative status	SOE - EIONET State of Environment monitoring	SUR - Surveillance monitoring	TRE - Chemical trend assessment
EL01	22	0	0	0	0	0	0	0	11	21	0	16	0	0
EL02	25	0	0	0	0	0	0	0	22	24	0	6	0	0
EL03	23	0	0	0	0	0	0	0	18	23	0	7	0	0
EL04	18	0	0	0	0	0	0	0	8	18	0	10	0	0
EL05	24	0	0	0	0	0	0	0	18	24	0	12	0	0
EL06	11	0	0	0	0	0	0	0	9	11	0	2	0	0
EL07	28	0	0	0	0	0	0	0	24	27	0	6	0	0
EL08	24	0	0	0	0	0	0	0	9	24	0	18	0	0
EL09	23	0	0	0	0	0	0	0	13	23	0	17	0	0
EL10	16	0	0	0	0	0	0	0	13	16	0	5	0	0
EL11	7	0	0	0	0	0	0	0	2	7	0	6	0	0
EL12	9	0	0	0	0	0	0	0	3	9	0	6	0	0
EL13	51	0	0	0	0	0	0	0	33	51	0	22	0	0
EL14	43	0	0	0	0	0	0	0	24	43	0	21	0	0

Source: WISE electronic reports

Table 5.2: Proportion of groundwater bodies (GWBs) in Greece monitored for quantitative status

RBD	Number of GWBs with quantitative monitoring	Total number of GWBs	% of total GWBs of the RBD monitored for quantitative status
EL01	22	27	81.5
EL02	25	33	75.8
EL03	23	34	67.6
EL04	18	26	69.2
EL05	24	40	60.0
EL06	11	24	45.8
EL07	28	43	65.1
EL08	24	33	72.7
EL09	23	54	42.6
EL10	16	37	43.2
EL11	7	15	46.7
EL12	9	18	50.0
EL13	51	91	56.0
EL14	43	116	37.1

Source: WISE electronic reports

Table 5.3: Number of groundwater monitoring sites in Greece and their purpose

RBD	Total groundwater monitoring sites		Monitoring Purpose														
	According to WISE	According to RBMPs	AGR - Groundwater abstraction site for irrigation	CHE - Chemical status	DRI - Groundwater abstraction site for human consumption	DWD - Drinking water - WFD Annex IV.1.i	HAB - Protection of habitats or species depending on water - WFD Annex IV.1.v	IND - Groundwater abstraction site for industrial supply	INV - Investigative monitoring	NID - Nutrient sensitive area under the Nitrates Directive - WFD Annex IV.1.iv	OPE - Operational monitoring (according to WISE)	OPE - Operational monitoring (according to RBMPs)	QUA - Quantitative status	SOE - EIONET State of Environment monitoring	SUR - Surveillance monitoring (according to WISE)	SUR - Surveillance monitoring (according to RBMPs)	TRE - Chemical trend assessment
EL01	85	85	0	0	0	0	0	0	0	58	82	58	0	27	0	27	0
EL02	110	109	0	0	0	0	0	0	0	100	97	86	0	10	0	23	0
EL03	125	126	0	0	0	0	0	0	0	111	121	113	0	14	0	13	0
EL04	65	65	0	0	0	0	0	0	0	42	64	42	0	23	0	23	0
EL05	92	92	0	0	0	0	0	0	0	73	92	73	0	19	0	19	0
EL06	80	n/av	0	0	0	0	0	0	0	74	69	n/av	0	6	0	n/av	0
EL07	161	170	0	0	0	0	0	0	0	150	154	n/av	0	11	0	n/av	0
EL08	92	92	0	0	0	0	0	0	0	61	92	61	0	31	0	31	0
EL09	86	88	0	0	0	0	0	0	0	45	86	44	0	41	0	44	0
EL10	114	111	0	0	0	0	0	0	0	107	114	106	0	7	0	5	0
EL11	48	48	0	0	0	0	0	0	0	32	45	n/av	0	16	0	n/av	0
EL12	75	75	0	0	0	0	0	0	0	49	75	n/av	0	26	0	n/av	0
EL13	111	112	0	0	0	0	0	0	0	76	107	36	0	35	0	76	0
EL14	131	132	0	0	0	0	0	0	0	107	127	108	0	24	0	21	0

Source: WISE electronic reports

5.1.2 Assessment and classification of quantitative status for groundwater

In the second cycle, 498 GWBs (84% of total GWBs) have been reported in good quantitative status, while 93 GWBs are failing good quantitative status (17.4% of total). Approx. 11% (13,962 km^2) of the total GWBs area is failing good quantitative status and 89% (116,547 km^2) is in good status. GWBs in quantitative risk are in 12 RBDs (i.e. except Epirus and Thrace) with the highest poor status share in Aegean Islands (24%), Thessalia (30%), Western Macedonia (22%) and Central Macedonia (22%). There is no GWB in unknown status.

Compared to the previous cycle (Figure 5.1) whereas 105 GWBs (18% of the GWBs) were in poor status and 465 (82%) in good status, there is a reduction of 2% in the GWBs in poor status and a 7% increase of the GWBs in good status at this cycle.

Concerning the confidence level in status classification (Figure 5.2), 28% of the total GWBs have been classified as good with high confidence level, 24% with medium and 32% with low level. On the other hand, 6% of the total GWBs have been classified as poor with high confidence level, 4% with medium and 6% with low level.

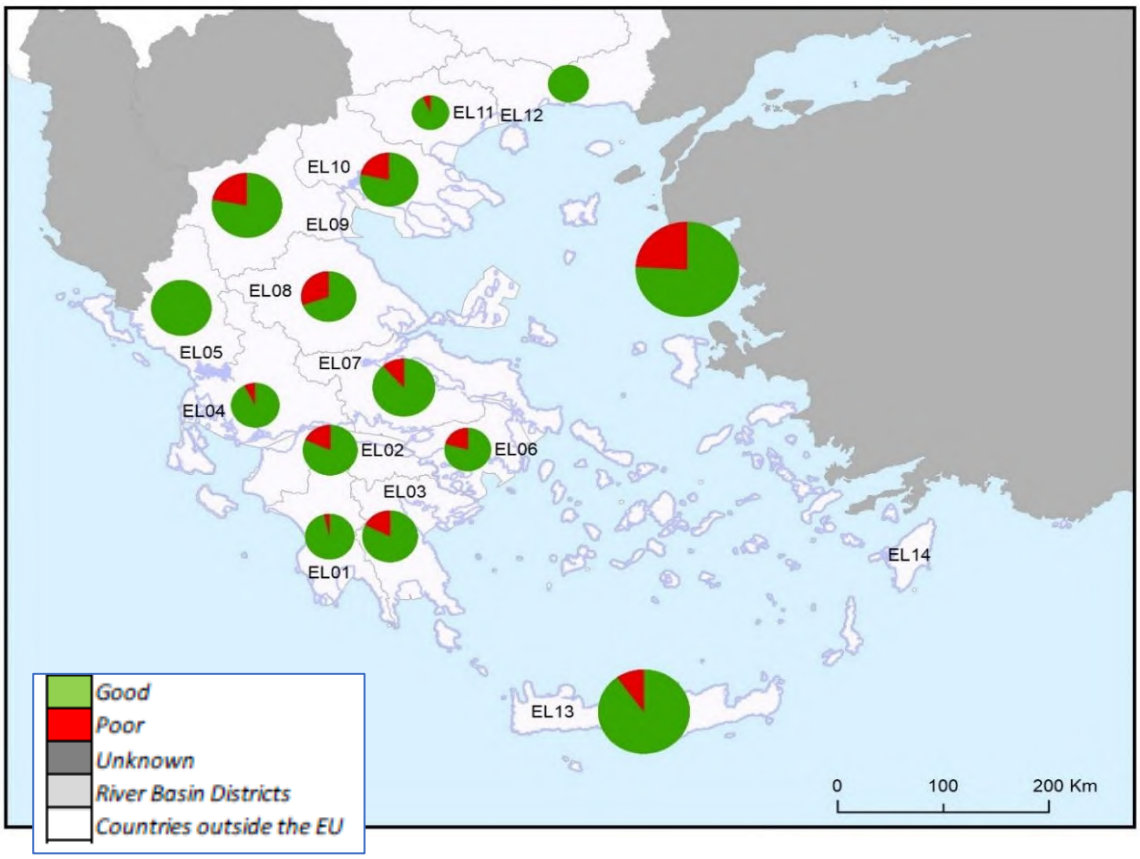
For 90 GWBs (15.2% of the total GWBs) in 12 RBDs, water balance is the reason for failing good status, while in 17 GWBs (2.9% of the total) in 6 RBDs it is because of saline intrusion (Figure 5.3). There are no GWBs failing good status due to surface water or to groundwater dependant terrestrial ecosystems. The expected date of achieving good chemical status is shown in Figure 5.4.

At RBD level, there is a significant reduction of 10.5% of the GWBs in good status in Northern Peloponnese and an increase of 16.7% in Attica. Smaller changes are noticed in Central Macedonia (an increase of 6.6% of the GWBs in good status), Western Peloponnese (increase of 4%) and Western Sterea Ellada (increase of 3.8%). There are no changes in Central Macedonia and Eastern Macedonia. The precise reasons for these changes in each RBD have not been provided. However, it seems that the main reasons are the use of the changes in designation, new monitoring network and the applied methodology.

Greece reported that for the assessment of the GWBs quantitative status in all RBDs it has been taken into account whether the available groundwater resource is (or not) exceeded by the long term annual average rate of abstraction. A comparison of annual average groundwater abstraction against 'available groundwater resource' has been reported to be calculated for every GWB. According to the RBMPs, the abstractions have been mostly estimates based on water needs from theoretical and research data as well as previous years' studies and some data collected from questionnaires. According to the RBMPs and the common methodology, the determination of the quantitative status of a GWB has been based mainly on the assessment of the groundwater level and more precisely, the estimation of the multi-annual recorded trends. In addition, in cases of coastal or next to the sea GWBs, the fluctuation of the Electrical Conductivity or/and the Chlorides (Cl^-) have also been used. The fluctuation of the flow rate of GWBs discharging through sources for which there were reliable time-series data has also been taken into account. All RBMPs point to their Supporting Documents for precise information on the implementation of the methodology and its results in each RBD[42].

[42] These documents have not been uploaded to WISE and their weblinks have been broken. Last accessed 15/02/2021.

Map 5.1: Map of the most recently assessed quantitative status of groundwater bodies[43]

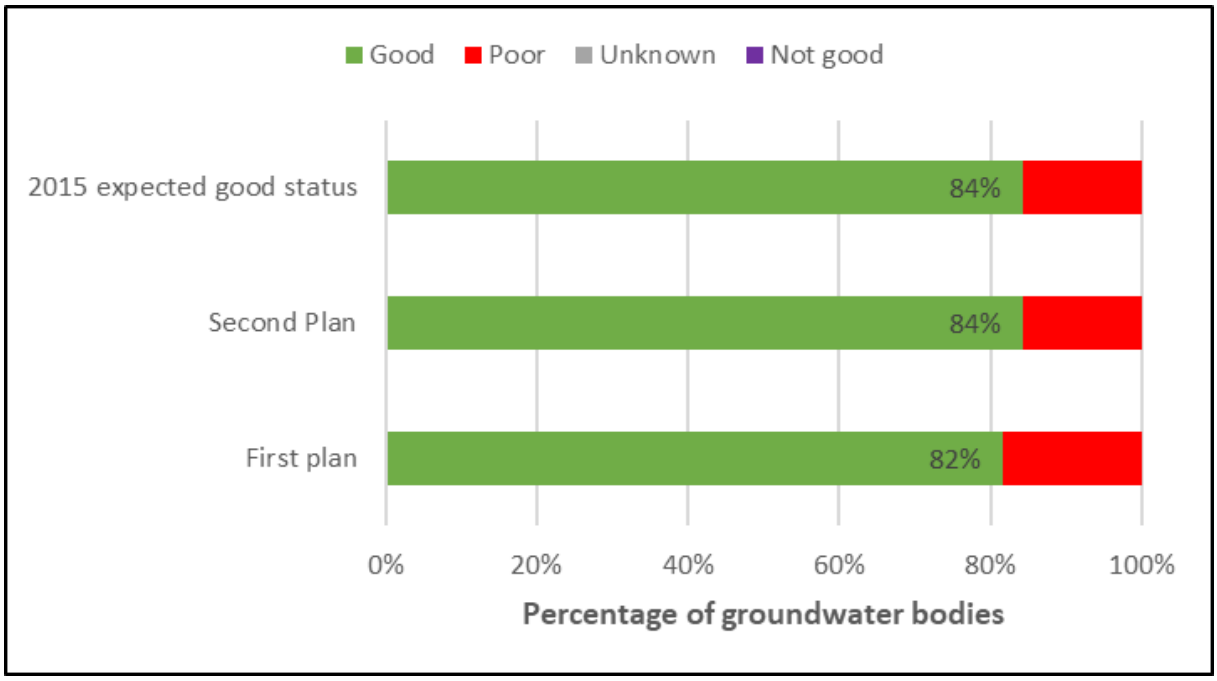


Note: Standard colours based on WFD Annex V, Article 2 (2) (4).
Source: WISE, Eurostat (country borders)

Figure 5.1: Quantitative status of groundwater bodies in Greece for the second RBMPs, for the first RBMPs and expected in 2015. The number in the parenthesis is the number of groundwater bodies for both cycles. Note the period of the assessment of status for the second RBMPs was 2012-2015. The year of the assessment of status for first RBMPs is not known

Source: WISE electronic reports

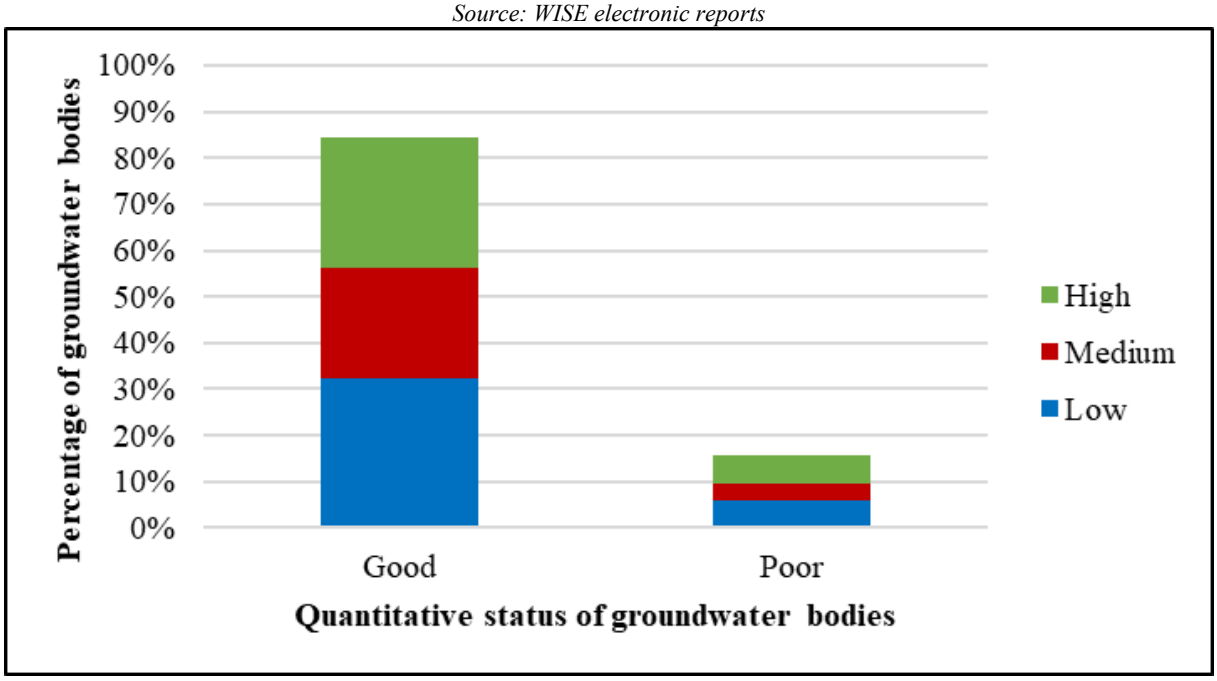
[43] The coastal waters although being there, are so close the coastline that are not visible on this map, due to the map size and format.



WISE electronic reports

Figure 5.2: Confidence in the classification of quantitative status of groundwater bodies in Greece based on the most recent assessment of status

Source: WISE electronic reports



WISE electronic reports

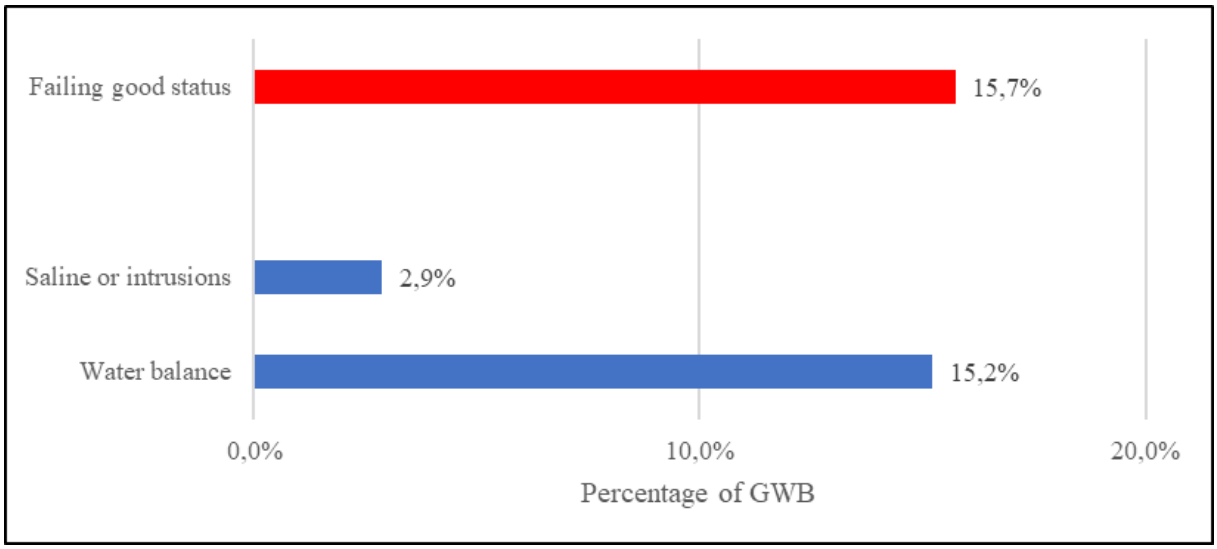
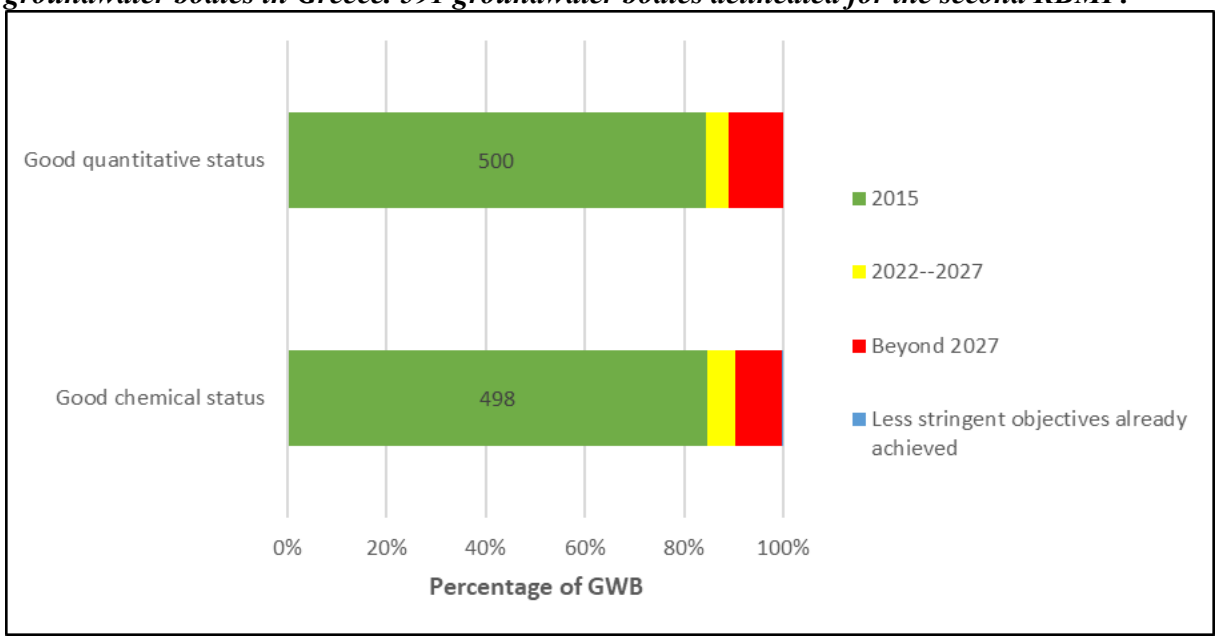


Figure 5.3: Reasons for the failure of good quantitative status of groundwater in Greece based on the most recent assessment of status

WISE electronic reportsSource: WISE electronic reports

Notes:
'Water balance' = long-term annual average rate of abstraction exceeds the available groundwater resource which may result in a decrease of groundwater levels.
'Surface water' = Failure to achieve Environmental Objectives (Article 4 WFD) for associated surface water bodies resulting from anthropogenic water level alteration or change in flow conditions; significant diminution of the status of surface waters resulting from anthropogenic water level alteration or change in flow conditions.
'Groundwater dependent terrestrial ecosystems' = Significant damage to groundwater dependent terrestrial ecosystems resulting from an anthropogenic water level alteration.
'Saline or other intrusion' = Regional saline or other intrusions resulting from anthropogenically induced sustained changes in flow direction.

Figure 5.4: Expected date of achieving good quantitative and good chemical status of groundwater bodies in Greece. 591 groundwater bodies delineated for the second RBMP.



Number of water bodies indicated in the bars. No values reported for 2016-2021
Source: WISE electronic reports

5.1.3 Consideration of groundwater associated surface waters and/or groundwater dependent ecosystems

A total of 151 GWBs have been reported as associated with surface water, in 13 RBDs (i.e. except Eastern Sterea Ellada). Aegean Islands with 42 and Western Macedonia with 41 GWBs are the RBDs with the biggest numbers followed by Central Macedonia (25) and Crete (27). All other RBDs reported 1-3 associated GWBs.

Groundwater associated surface waters have been considered for status assessment in 13 RBDs (i.e. except Eastern Sterea Ellada). However, clarification is required on the reported data on GWB dependent terrestrial ecosystems[44]. Furthermore, taking into account the above reservation on data gaps, no data have been reported for any dependent terrestrial ecosystem related to a risk.

5.2 Main changes in implementation and compliance since the first cycle

There are 591 GWBs in the second cycle, i.e. 4% more than the previous cycle in which 570 GWBs were reported. The total GWBs area in the second cycle is 130,509 km^2 and is reduced by 3% since the previous cycle's area.

It has not been possible to quantify the number of GWBs that remained unchanged since the first RBMPs due to a data gap for the total area of GWBs in each RBD.

The number of monitored GWBs in the previous cycle is unknown and any comparison would be inaccurate since in the first RBMPs the old monitoring network was used. In all RBDs there are reported changes or updates and specific examples of changes concerning groundwater bodies (delineation, number, method used for assessing the status, changes in status, etc.).

Compared to the previous cycle, there is a reduction of 2% in the GWBs in poor status and an increase of 7% of the GWBs in good status at this cycle. The overall GWBs area failing good status in the previous cycle was not available to compare with the second cycle. The precise reasons for these changes in each RBD have not been provided. However, it could be due to the use of the changes in designation, new monitoring network and the applied methodology.

5.3 Progress with Commission recommendations

Recommendation: *Regarding GW quantity issues, very limited information about actual abstractions has been used. The latter are based on estimates. Even if the revised NMP will provide better information the issue of illegal abstractions/boreholes, their potential effects and ways to deal with them needs to be considered most thoroughly.*

Assessment: Estimates have been used to a great extent and there is limited information on actual abstractions. According to the RBMPs, despite the effort to collect such data the response from stakeholders was very limited. An important step has already been taken through the establishment of the registry of abstractions from groundwaters (register of boreholes, wells) during the second cycle and is under implementation. The procedure to ensure the provision of time-series data and to face illegal abstractions needs strengthening. Although there has been progress, the recommendation remains pertinent.

[44] Greece reported no data for GWBs dependent terrestrial ecosystems in this part of WISE, although 18 GWBs in Crete and 74 GWBs in Aegean Islands were reported to be linked to terrestrial ecosystems in another part of WISE (see Topic 2).

Topic 6 Monitoring, assessment and classification of chemical status of groundwater bodies

6.1 Assessment of implementation and compliance with WFD requirements in the second cycle

6.1.1 Monitoring of chemical status in groundwater

Greece has delineated 591 groundwater bodies (GWBs), none of which was reported with surveillance monitoring for the core parameters (see Table 5.1). However, according to the RBMPs, surveillance monitoring has been placed in 207 sites of Nitrate Vulnerable Zones that are related to GWBs. 321 bodies have been reported under operational monitoring but the number requires verification[45]. The monitoring of 154 GWBs has been reported to the State of Environment (SoE). For monitoring and assessment of the GWBs chemical status, a combination of both (i.e. experts' judgement and grouping) has been applied in all RBDs. 93 GWBs are at risk in all RBDs (15.7% of the total GWBs).

The number of groundwater monitoring sites and their purposes in the second cycle were presented in Table 5.3. In the second cycle, there has been a more systematic recording of these stations and development of both Surveillance and Operational stations, development of sites in the Nutrients Sensitive Areas and the SoE monitoring sites.

Concerning the WFD core parameters, Greece reported that none of the WFD core parameters (nitrate, ammonium, electrical conductivity, oxygen and pH) have been monitored. However, the reported data require clarification since all RBMPs mention certain core parameters (e.g. nitrates, ammonium) as monitored failure risk pollutants to GWBs[46].

6.1.2 Assessment and classification of chemical status in groundwater

The mapping of the chemical status of the groundwater bodies in Greece (Map 6.1) shows that in five RBDs, the share of GWBs in poor chemical status is significant.

During the second cycle (Figure 6.1), 498 GWBs (85% of the total GWBs) have been reported in good chemical status and 93 GWBs i.e. 15% were failing to meet the good status. In terms of GWBs areas, 116,547 km^2 have been in good status and 13,962 in failing good status during the second cycle.

As it is shown in Figure 6.2, the percentage of GWBs classified in good chemical status with high confidence level (i.e. based only on monitoring data) is 29% of the total GWBs and is quite low. 23% of the total GWBs have been classified in good chemical status with medium confidence level and 33% with low confidence levels.

The percentage of GWBs classified in poor chemical status with high confidence level (i.e. based only on monitoring data) is 5% of the total GWBs. 5% of the total GWBs have been classified in poor chemical status with medium confidence level and another 5% in poor chemical status with low confidence level.

In 67 GWBs (11% of the total GWBs) the general assessment[47] of the chemical status for the

[45] Reported data on the number of GWBs that are subject of operational monitoring do not agree with data from the RBMPs.
[46] And have even been reported to WISE as such but in other places of the database. In addition, both RBMPs and WISE data in other databases provide the numbers of Nitrate Vulnerable Zones monitoring stations and the GWBs related to them.
[47] This assessment considers the significant environmental risk from pollutants across a groundwater body and a significant impairment of the ability to support human uses.

GWB as a whole has failed. The reasons for the failure are shown Figure 6.3 where it can be seen that 5% of the total GWBs failed at the general water quality assessment and 10% of the total GWBs due to saline or other intrusion. There is no information related to GWBs failing the drinking water test [48]and the groundwater associated surface water test[49].

There are no GWBs failing the groundwater dependent terrestrial ecosystem (GWDE) test[50] since there have not been reported any GWBs' dependent ecosystems. However, the existence of threshold values for the protection of ecosystem and protection of GWDE has been reported in Eastern Macedonia and Thrace. The reported data on the issue of GWDE require clarification[51].

Threshold values for Protection of Uses have been set in all RBDs as well as for the Saline Intrusion. The method reported for the calculation of the extent of exceedance of a groundwater quality standard or a groundwater threshold value is common to all RBDs and is the % of the number of monitoring sites exceeding a groundwater quality standard or threshold value compared to the total number of monitoring sites in the whole GWB. The proportion of exceedance allowed has been set to 20%.

The top pollutants in the GWBs causing failure are presented in Figure 6.3. For all RBDs, background levels have been considered in the groundwater status assessment but not in the threshold value establishment.

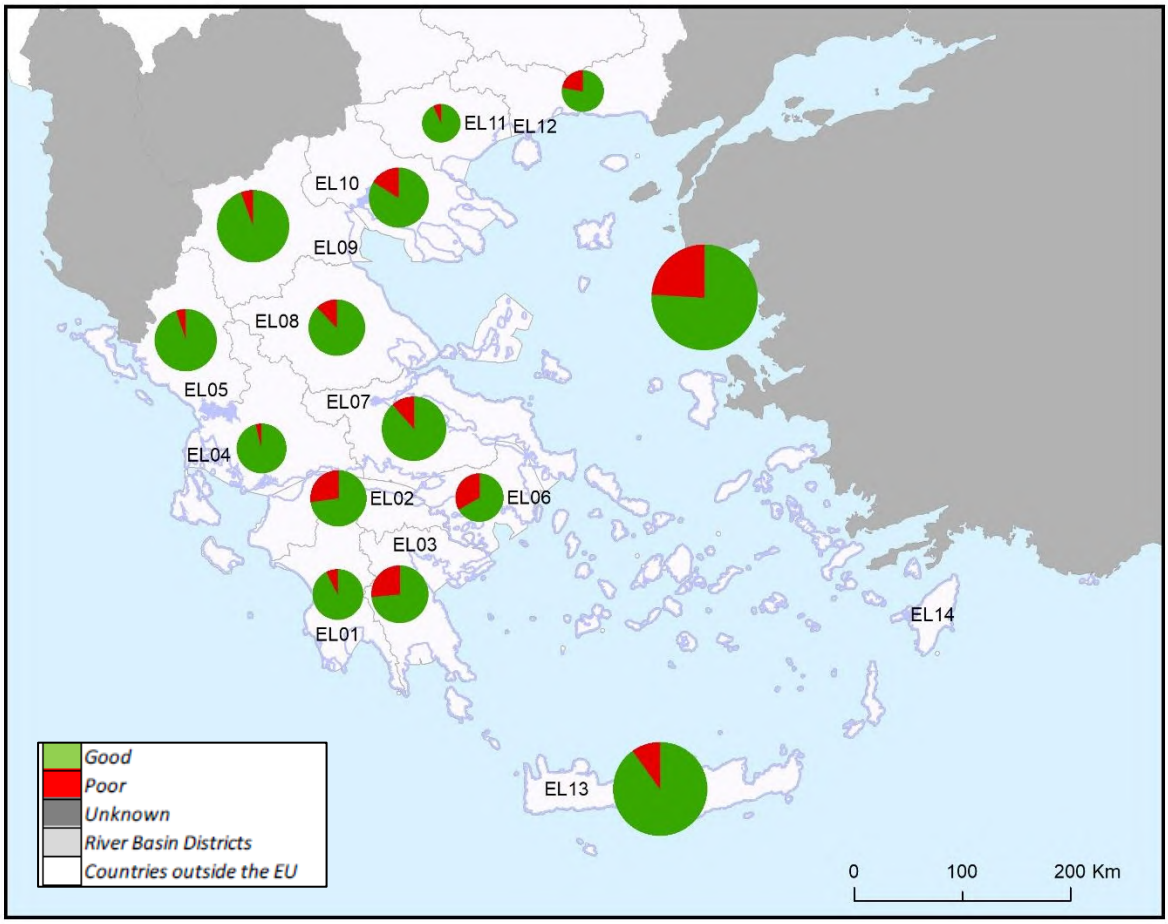
Groundwater threshold values have been established for all pollutants or indicators of pollution causing a risk of failure of good chemical status, but not for all substances mentioned at the Annex of the Groundwater Directive and not for the entire RBDs. A selection has been done with no further information on the criteria used.

The following substances included in Groundwater Directive[52] Annex II have not been considered (likely because they are not substances with failure risk): *Phosphorus (total)* and *Phosphate*, *Cadmium*, *Trichloroethylene* and *Tetrachloroethylene*. There is no information on any active substances in pesticides including their relevant metabolites, degradation and reaction products.

The trends of the above pollutants in the GWBs have not been calculated nor reported.

Map 6.1: Map of chemical status of groundwater bodies in Greece based on their most recently assessed status

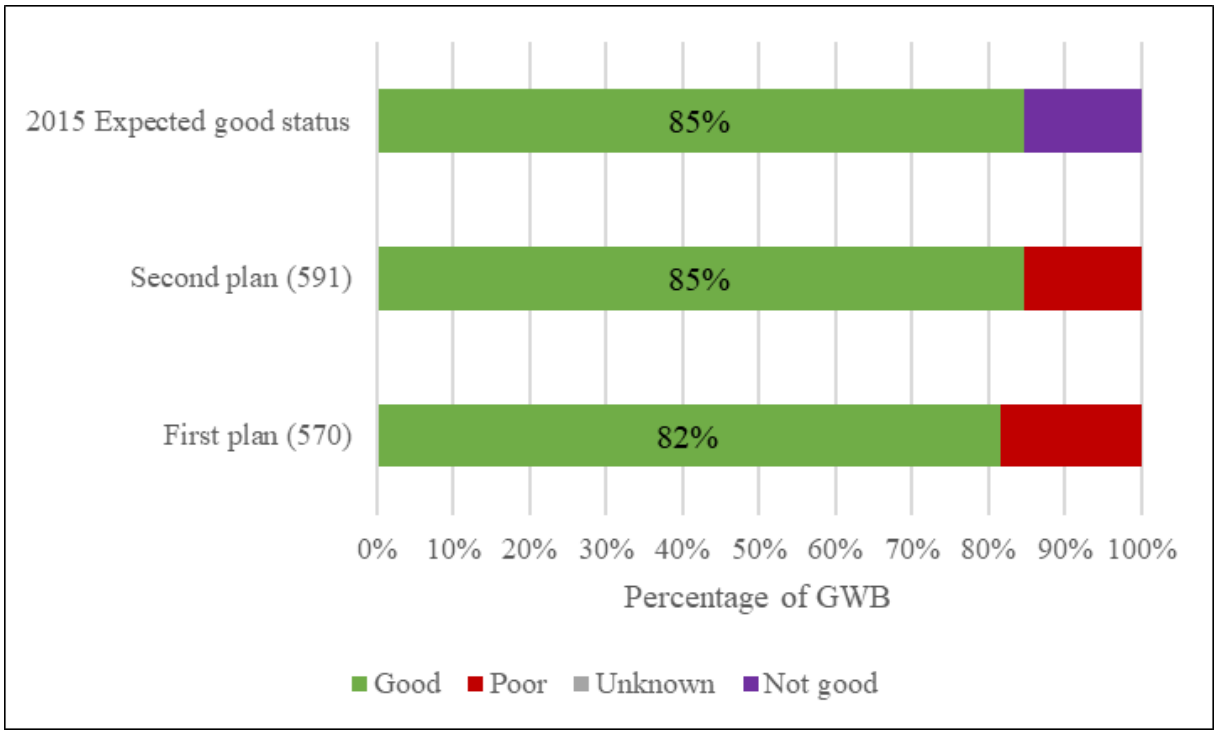
[48] Which means that the requirements of Drinking Water Protected Areas have not been met.
[49] Which means that there is diminution of the status of groundwater associated surface water.
[50] Which means that there is damage to groundwater dependent terrestrial ecosystems.
[51] There is data disagreement between the reported to WISE data and data of the RBMPs.
[52] Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration
http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02006L0118-20140711



Note: Standard colours based on WFD Annex V, Article 2.4.5.
Source: WISE, Eurostat (country borders)

Figure 6.1: Chemical status of GWBs in Greece for the second RBMPs, for the first RBMPs and expected in 2015. The number in the parenthesis is the number of GWBs for both cycles. Note the period of the assessment of status for the second plan was 2012-2015. The year of the assessment of status for the first RBMPs is not known.

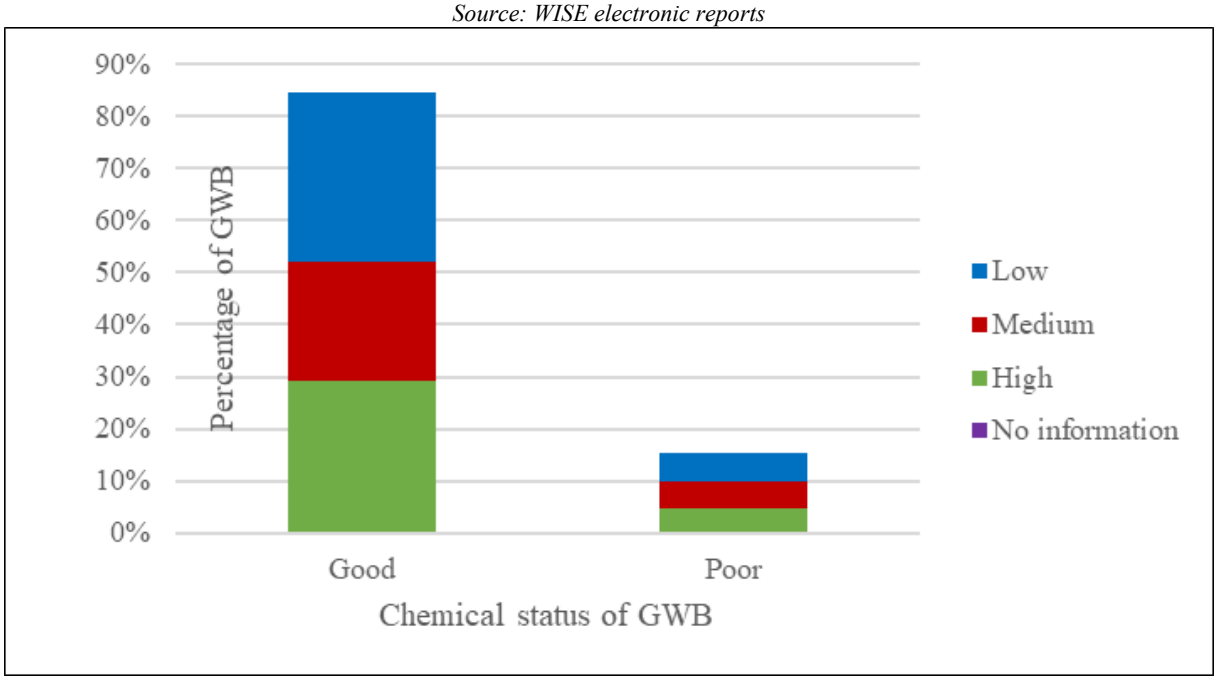
Source: WISE electronic reports



WISE electronic reports

Figure 6.2: Confidence in the classification of chemical status of groundwater bodies in Greece based on the most recent assessment of status

Source: WISE electronic reports



WISE electronic reports

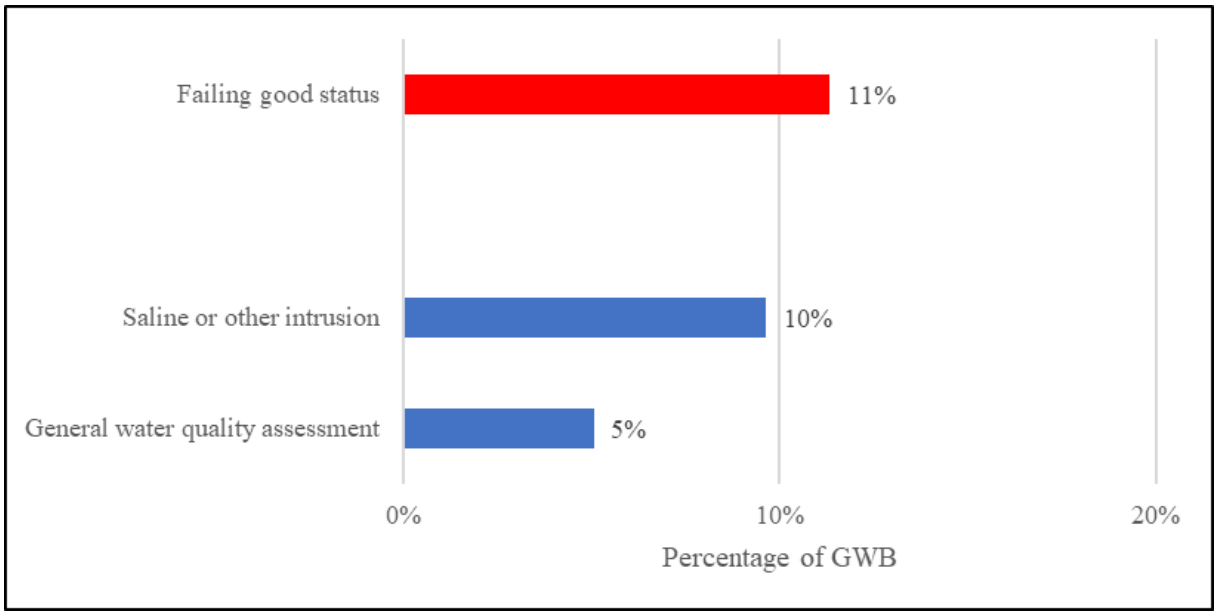


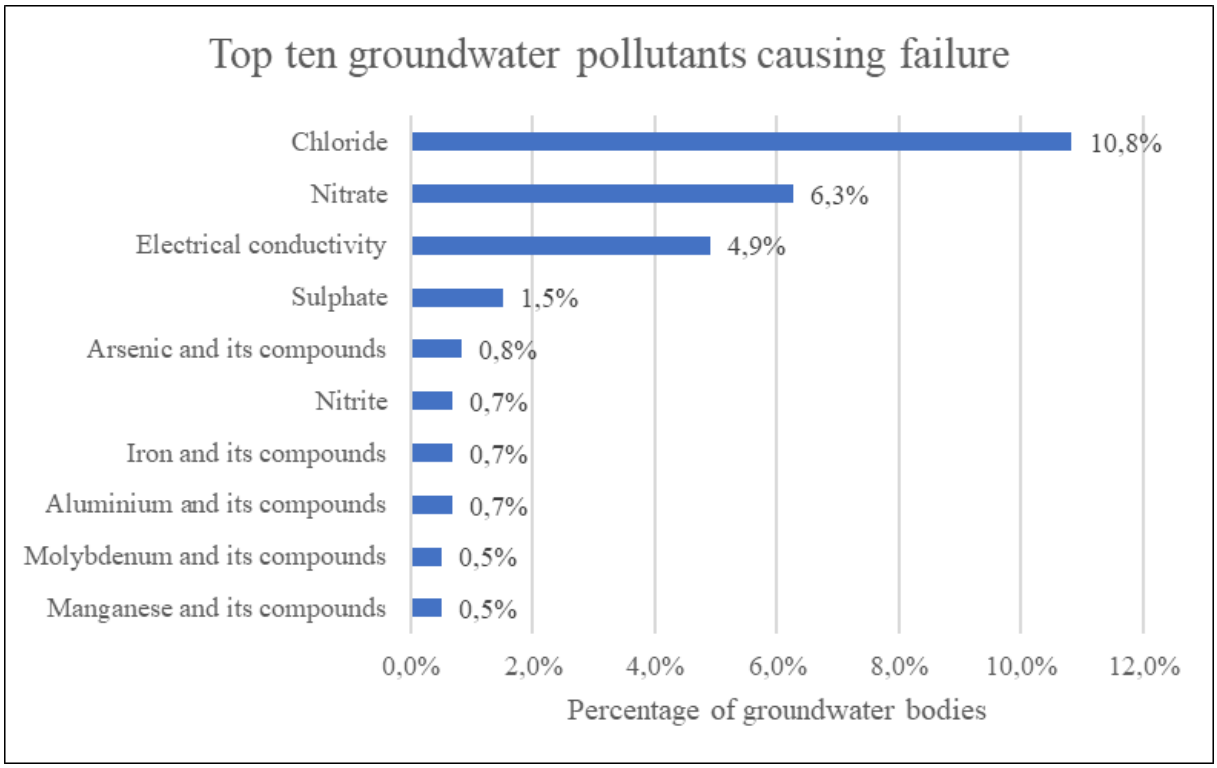
Figure 6.3: Reasons for failing good chemical status in Greece for the most recent assessment of status

Source: WISE electronic reports

Notes: 'Surface water' = Failure to achieve Environmental Objectives (Article 4 WFD) in associated surface water bodies or significant diminution of the ecological or chemical status of such surface water bodies.
'Groundwater dependent terrestrial ecosystems' = Significant damage to terrestrial ecosystems which depend directly on the groundwater body.
'Saline or other intrusion' = Regional saline or other intrusions resulting from anthropogenically induced sustained changes in flow direction.
'Drinking Water Protected Area' = Deterioration in quality of waters for human consumption.
'General water quality assessment' = Significant impairment of human uses; significant environmental risk from pollutants across the groundwater body.

Figure 6.4: Top ten groundwater pollutants causing failure of good chemical status in Greece

Source: WISE electronic reports



WISE electronic reports

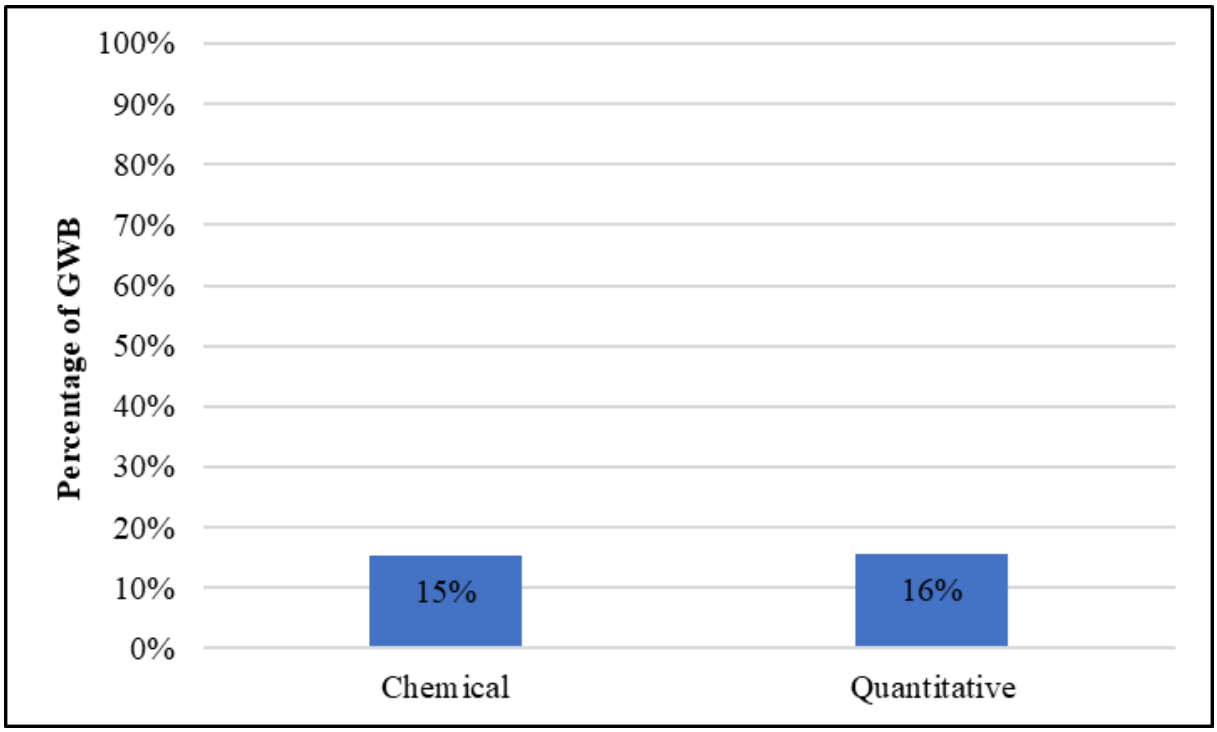


Figure 6.5: Percentage of GWBs in Greece at risk of failing good chemical status and good quantitative status for the second plans

Source: WISE electronic reports

6.1.3 Consideration of groundwater associated surface waters and/ or groundwater dependent ecosystems

Groundwater associated with surface waters was reported in 12 RBDs (i.e. except Attica and

Eastern Sterea Ellada) and in 4 of them (Western Macedonia, Central Macedonia, Crete and Aegean Islands) they have been related to risk. As mentioned previously, it concerns 30 GWBs, where general water quality assessment failed on the associated surface waters and 57 GWBs for saline or other intrusion failure at the associated surface waters. Nevertheless, the reported data on the issue of groundwater associated surface waters and/or GWDE require clarification[53].

6.2 Main changes in implementation and compliance since the first cycle

There are 591 GWBs in the second cycle, i.e. 4% more than the previous cycle in which 570 GWBs were delineated.

Compared to the previous cycle, where 473 GWBs (83% of the total GWBs) were in good chemical status and 97 GWBs (17% of the total GWBs) in poor status, in the second cycle there has been an increase by 3% in the GWBs in good chemical status (498 GWBs) and a reduction by 3% in poor status (93 GWBs) respectively.

In the previous cycle, only the number of monitoring stations for groundwater drinking water per RBD (298 stations in total) was available. The number of monitored GWBs in the previous cycle is unknown and comparison between the first and second cycle is impossible. In the second cycle, with the development of the new monitoring programme, there has been a more systematic recording of these stations and development of both Surveillance and Operational stations, development of sites in the Nutrients Sensitive Areas and the SoE monitoring sites.

6.3 Progress with Commission recommendations

There were no recommendations based on the first RBMPs for this topic.

[53] There are data discrepancies between WISE data reported for the needs of §6.1.3 and §5.1.3 on the same issue. In this section, there are no GWDE terrestrial ecosystems reported nor any information on GWBs associated aquatic ecosystems but and RBMPs data and information on the issue.

Topic 7 Designation of Heavily Modified and Artificial Water Bodies and definition of Good Ecological Potential

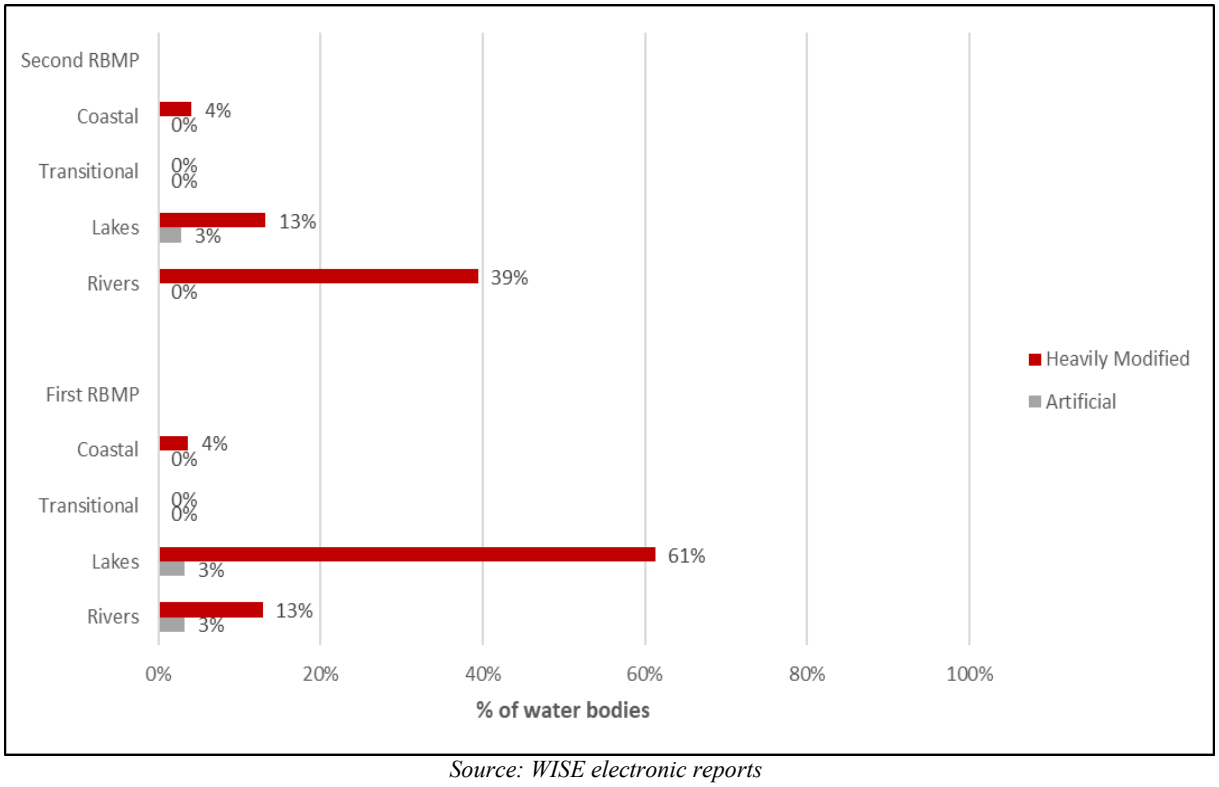
7.1 Assessment of implementation and compliance with WFD requirements in the second cycle for designation

7.1.1 Designation of Heavily Modified and Artificial Water Bodies

Heavily Modified Water Bodies (HMWBs) have been designated in all RBDs for both cycles. 203 HMWBs have been designated in the second cycle (12.2% of the total water bodies). In the second cycle, 41 (2.5% of the total water bodies) Artificial Water Bodies (AWBs) have been designated in 10 RBDs (i.e. except Western Sterea Ellada, Attica, Crete and Aegean Islands)

As shown in Figure 7.1 in the second RBMPs, heavily modified river bodies make up 39% of the total rivers (13% of the total rivers in the previous cycle) while there are no artificial river bodies (3% of the total river bodies in the first RBMPs). Heavily modified lake bodies and artificial lake bodies represent 13% and 3% respectively of the total number of lakes (61% and 3% respectively in the previous cycle). Heavily modified coastal bodies represent 4% of the total coastal water bodies in both cycles while there have not been any artificial coastal bodies in any of the two cycles. Finally, there have not been any heavily modified or artificial transitional bodies in any of the two cycles.

Figure 7.1: Proportion of total water bodies in each category in Greece that have been designated as heavily modified or artificial



Source: WISE electronic reports

In the previous cycle, all the reservoirs in rivers were classified as heavily modified lake bodies while in the second cycle they are classified as heavily modified river bodies. Keeping in mind that a significant number of Heavily Modified & Artificial rivers and lakes are used for double purposes (e.g. irrigation & flood protection or irrigation & urban water uses) that are separately

reported, 40% of the heavily modified river bodies are for flood protection, 35% for irrigation and for drainage (agriculture) and 12% for urban uses (mainly drinking water supply).

The main uses of the heavily modified lake bodies are related to agriculture (32%) and urban water supply (26%). Nevertheless, in Western Macedonia hydropower is also an important use together with drinking water supply and agriculture for irrigation. The main use of heavily modified coastal bodies is transport – navigation and ports.

The main physical alterations of heavily modified river bodies consist of channelization/straightening/ bed stabilisation/ bank reinforcement and reservoirs/weirs/dams with 47% and 36% respectively of the heavily modified river water bodies' alterations. However, there have been another 15% of 'Others' alterations without any further information. All heavily modified lakes are related to reservoirs/dams/weirs while all heavily modified coastal bodies are related to coastal modifications and ports.

For the determination and designation of the HMWBs and the AWBs, a Supporting Document has been reported where a common methodology for the assessment of the hydromorphological alterations as pressures is developed, in order to cover the existed gaps and to manage the hydromorphological pressures and alterations with a consistent and common method. The methodology has also been used to make an initial designation of the HMWBs according to the classes of pressures where they belong.

Thus, a number of water bodies have initially been classified as 'temporary HMWB' based on their hydromorphological alterations and they were finally assessed to determine if they had to be classified as HMWB (that would take into account the ecological and chemical status as well). The same Supporting Documents also include the methodology that should be followed for the initial assessment (screening) of new projects that would result in 'new modifications' and to determine whether they should, or not, be examined under Art.4(7).

The common methodology that has been developed and the issued guidelines have been available on the relevant website of the main competent authority. All RBMPs used the guidelines of the Supporting Document No 3b *'Methodology and specifications for the determination of the HMWBs and the AWBs'* including also guidelines for the Good Ecological Potential (GEP).

The RBMPs point to the Supporting Documents No 8 *'Definite designation of the HMWBs and the AWBs'* for analytical information including the final designation of HMWBs for each RBD[54].

For the HBWBs already designated in the first RBMPs, the assessment for the second cycle has been based, to a significant extent, on the basis of the existing monitoring network. Consequently, the presence of monitoring stations was of particular importance for the determination of the conditions of the HMWBs and AWBs. For the HMWBs and AWBs without station, the examination has been based on the assessment of hydromorphological pressures, alterations and modifications, done at the framework of the pressures' and impacts' analysis.

Criteria for the determination of the HMWBs and AWBs have been clearly established. Specific criteria for the assessment of significant adverse effects and thresholds for the water uses to define significant adverse effects have not been reported.

The steps that should be followed for the assessment of significant adverse effects are included in the Supporting Documents (Supporting Document No 3b) with the Methodologies and they are publicly available. They all similarly include the steps that should be followed according to the WFD provisions, the Art.4(3)b and the steps 7 and 8 from the Guideline Document 4. Tables with the alternatives ("other means") have also been developed and included. Nevertheless, none of the above documents include specific information per HMWB or per RBD.

[54] These documents have not been uploaded to WISE and their weblinks have been broken. Last accessed 20/01/2021.

7.1.2 Definition of Good Ecological Potential for Heavily Modified and Artificial Water Bodies

Good Ecological Potential (GEP) has not been defined in any RBD and the RBMPs Strategic Environmental Assessments do not include any relevant information.

The Supporting Document No 3b (in its chapter 6.3) proposes the determination of the GEP using the 'Prague approach' (based on the identification of mitigation measures) and presents a step-by-step procedure and the way GEP values are set for HMWBs or AWBs. There is no information, however, on the implementation of this methodology in each RBD as there is no related specific information in the RBMPs Strategic Environmental Assessments. Nevertheless, mitigation measures (setting ecological flows) for defining GEP have been reported in 2 RBDs (Attica and Eastern Sterea Ellada).

Biological Quality Elements (BQE) together with hydrological and morphological parameters/alterations have been taken into consideration for the assessment of HMWBs and AWBs in all RBDs.

7.2 Main changes in implementation and compliance since the first cycle

Compared to the previous period, in the second cycle there is a small reduction by 0.8% of HMWBs (16 less HMWBs than in the previous period) and by 0.2% of AWBs (5 AWBs less than in the previous period).

Heavily modified river bodies are increased by 26% and heavily modified lake bodies are reduced by 48%. There is no change in the % of heavily modified coastal bodies and in the transitional water bodies between the two cycles (no transitional HMWBs in both cycles).

The main reason of these changes is the classification of rivers' reservoirs as heavily modified river bodies in the second cycle while in the first cycle they were classified as lakes.

Finally, GEP has not been defined in Greece for any of the two cycles but some elements of method for the classification, corresponding to the Prague approach, were reported for the second cycle.

New approved methodologies and guidelines for the assessment, determination and designation of HMWBs and AWBs have been developed, are implemented in all RBDs and have been publicly available in the second cycle.

7.3 Progress with Commission recommendations

Recommendation: No recommendations specific to HMWBs and AWBs were included in the first RBMPs' assessment, but these issues were mentioned in more general recommendations, i.e.:

Develop publicly available WFD compliant National Guidance Documents, addressing the key implementation steps where significant weaknesses have been identified (characterisation of pressures, typology, reference conditions, monitoring and grouping of water bodies, methods for the status classification, HMWB designation, application of exemptions and in particular regarding Article 4.7, etc.), necessary to ensure WFD compliance and increased comparability and transparency.

Assessment: New approved national methodologies and guidelines for the assessment, determination and designation of HMWBs and AWBs have been developed, are implemented in all RBDs and have been publicly available in the second cycle. However, the supplementary documents, with the analytical information on the implementation of these guidelines in each RBD and HMWB/AWB, have not been available. The recommendation has been fulfilled to a

great extent.

Particularly urgent is the development of sound methodologies to address hydromorphological pressures. The current combination of weak pressure analysis (with not precautionary enough thresholds of significance), lack of ecological status assessment methods sensitive to hydromorphological pressures, unclear process for designation of heavily modified water bodies and lack of development of good ecological potential makes it very likely that significant hydromorphological pressures are completely overlooked in the implementation process. Potential effects of "smaller" modifications such as dams lower than 15 m, dredging, river straightening, drainage, etc., including impacts to transitional and coastal waters, should be assessed.

Assessment: Sound methodologies have been developed and are available online (see above recommendation). However, thresholds of significance for significant impact on uses have not been set. Ecological status assessment methods sensitive to hydromorphological pressures have been set but the good ecological potential has not been set. The methodologies for the assessment and determination of the heavily modified water bodies and artificial water bodies (HMWBs/AWBs) cover all hydromorphological pressures. The general common process of HMWBs designation is clear but specific information on its actual implementation in each RBD (and HMWB/AWB) has not been made available. River continuity issues have been not examined and potential effects of 'smaller' modifications have not been assessed in the RBMPs strategic environmental assessment. The recommendation has been partially fulfilled.

Topic 8 Environmental objectives and exemptions

8.1 Assessment of implementation and compliance with WFD requirements in the second cycle

8.1.1 Environmental objectives

The environmental objectives are defined in Article 4 of the WFD. The aim is long-term sustainable water management based on a high level of protection of the aquatic environment. Article 4(1) defines the WFD general objective to be achieved in all surface and groundwater bodies, i.e. good status by 2015. Within that general objective, specific environmental objectives are defined for surface water bodies (good ecological status and good chemical status[55]), for heavily modified water bodies (good ecological potential and good chemical status by 2015), groundwater (good chemical and quantitative status by 2015) and for Protected Areas (achievement of the objectives of the associated Directive by 2015 unless otherwise specified in the Community legislation under which the individual protected areas have been established.

Assessments of the current status of surface and groundwater bodies in Greece are provided elsewhere in this report: for ecological status/potential of surface water bodies (Chapter 3); chemical status of surface water bodies (Chapter 4); quantitative status of groundwater bodies (Chapter 5); chemical status of groundwater bodies (Chapter 6); Objectives of surface and groundwater bodies associated with Protected Areas (Chapter 15).

Environmental objectives for the SWBs and GWBs status have been set in all RBDs. Environmental objectives for their ecological status have been set for 1,535 SWBs (92% of the total SWBs) and for their chemical status for all 1,669 SWBs. The ecological status of 134 SWBs (8% of the total SWBs) is unknown and it is not clear whether their objectives have been set or not.

For the second cycle plans, Member States are required to report the date when they expect each surface and groundwater body to meet its environmental objective. This information is summarised for Greece elsewhere in this report: for ecological status/potential of surface water bodies (Chapter 3); chemical status of surface water bodies (Chapter 4); quantitative status of groundwater bodies (Chapter 5); chemical status of groundwater bodies (Chapter 6).

Concerning the SWBs, the dates of achievement of their ecological and chemical status objectives have been set for 1,660 SWBs. The dates of achievement of ecological status objectives' are unknown for 9 SWBs and the dates of achievement of their chemical status are unknown for 11 SWBs.

Concerning the GWBs' environmental objectives, the objectives for quantitative and chemical status have been set for 591 GWBs. The expected date of achievement of the quantitative status objectives has been set for 591 GWBs and for their chemical status objectives for 590 of them.

8.1.2 Exemptions

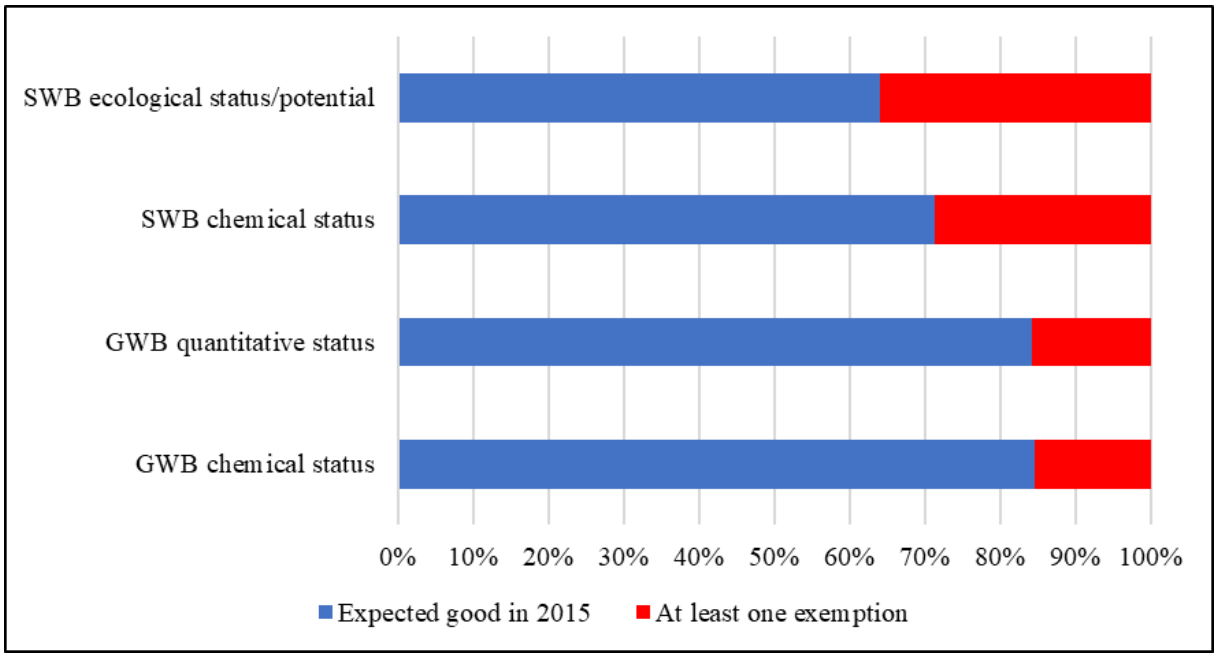
Where environmental objectives are not yet achieved exemptions can be applied in case the respective conditions are met and the required justifications are explained in the RBMP.

Figure 8.1 summarises the percentage of water bodies expected to be at least in good status in

[55] For priority substances newly introduced by Directive 2013/39/EU, good status should be reached by 2027, and for the 2008 priority substances, for which the Environmental Quality Standards were revised by Directive 2013/39/EU, good status should be reached in 2021.

2015 and those subject to the use of at least one exemption in Greece for the four main sets of environmental objectives.

Figure 8.1: Water bodies in Greece expected to be in at least good status in 2015 and use of exemptions. *For some water bodies the date for achievement of good status is unknown.*



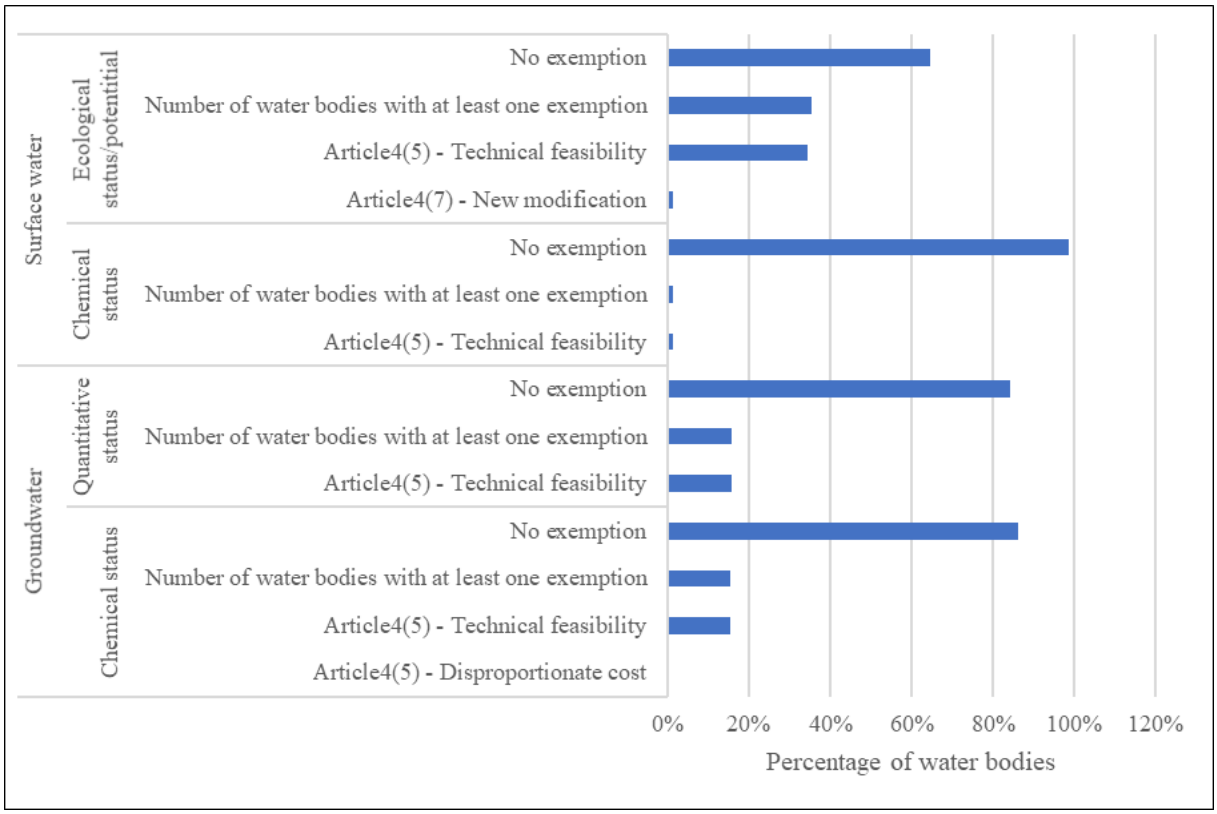
Source: WISE electronic reports

Article 4 of the WFD allows under certain conditions for different exemptions to the objectives. The exemptions under WFD Article 4 include the provisions in Article 4(4) - extension of deadline beyond 2015, Article 4(5) – lowering of objectives, Article 4(6) - temporary deterioration and Article 4(7) - new modifications / new sustainable human development activities allowing for deterioration of status/potential. Article 4(4) exemptions may be justified by: disproportionate cost, technical feasibility or natural conditions, and Article 4(5) by disproportionate cost or technical feasibility. In addition, Article 6(3) of the Groundwater Directive allows Member States to exempt inputs of pollutants to groundwater under certain specified circumstances.

Figure 8.2 summarises the percentage of water bodies subject to each type of exemption (and reason) in relation to the four types of environmental objectives in Greece.

Figure 8.2: Type of exemptions reported to be applied to surface water and groundwater bodies for the second RBMPs in Greece. *Note: Ecological status and groundwater quantitative status exemptions are reported at water body level. Chemical exemptions for groundwater are also reported at the level of each pollutant causing failure of good chemical status, and for surface waters also for each Priority Substances that is causing failure of good chemical status.*

Source: WISE electronic reports



WISE electronic reports

Application of Article 4(4)

As in the previous cycle, Greece made again use of the Art.4(4) exemptions in all RBDs. Comparison of the data of the two cycles should be done with caution since there were significant data discrepancies in the previous cycle.

Thus, in the second cycle, a total of 644 SWBs in all RBDs have been reported to apply an Art 4(4) exemption for achieving good ecological status. Thrace with 98, Western Macedonia with 75 and Central Macedonia with 67 SWBs are the RBDs with the higher numbers.

A total of 47 SWBs in 8 RBDs have been reported to apply an Art 4(4) exemption for achieving good chemical status, with Thrace (15) and Thessalia (7) the RBDs with the higher numbers.

A total of 297 GWBs in 12 RBDs (i.e. except Epirus and Thrace) have been reported to make use of an Art 4(4) exemption for achieving good quantitative status. The RBDs with the higher numbers are the Aegean Islands (87 GWBs), followed by Central Macedonia (48) and Attica (36).

A total of 300 GWBs in all RBDs have been reported to apply an Art 4(4) exemption for achieving good chemical status, with Aegean Islands (76), EL (48) and Attica (40) the RBDs with higher numbers.

Technical feasibility reasons have been reported for the use of exemptions in all cases. According to the RBMPs, there are cases of SWBs for which an Art.4(4) exemption has been applied because of more time required than the one given. For the rest of the SWBs, it is due to lack of information for the cause of the problems and thus, the solution cannot be identified. Thus, similarly to the previous cycle, the use of these justifications is not sufficiently clear.

As shown in Table 8.1, the main pressures to SWBs leading to exemptions are from diffuse pollution from atmospheric depositions (with 12 bodies affected by 2 failing priority substances); diffuse pollution of agricultural origin (with 5 bodies affected by 2 failing priority substances) and point pollution from IED plants (with 5 bodies affected by 4 failing priority substances). Point

pollution from waste disposal sites has been reported to 3 SWBs with 3 failing priority substances.

Table 8.1 Pressure resulting from exceedances of thresholds for Priority Substances in Greece, causing failiure to achieve good chemical status and for which exemptions have been applied

Significant pressure on SWBs	Number of Failing Priority substances	Number of Art.4(4) - Technical feasibility	Number of Art.4(5) - Technical feasibility
1.1 - Point - Urban waste water	2	2	0
1.3 - Point - IED plants	2	2	0
1.4 - Point - Non IED plants	4	5	0
1.6 - Point - Waste disposal sites	3	3	0
2.10 - Diffuse - Other	2	2	0
2.2 - Diffuse - Agricultural	2	5	0
2.7 - Diffuse - Atmospheric deposition	2	12	0
4.3.1 - Hydrological alteration - Agriculture	1	1	0
4.3.3 - Hydrological alteration - Hydropower	1	1	0
8 - Anthropogenic pressure - Unknown	2	3	0

Source: WISE electronic reports

In GWBs, the main issues are by large from diffuse pollution and abstractions of agricultural origin with 13 failing pollutants affecting 74 water bodies subject to exemptions and 4 pollutants affecting 86 water bodies subject to exemptions. 2 failing pollutants at abstractions for public water supply are related with 21 exemptions and 8 pollutants due to urban run-off with 25 exemptions. Finally, 19 groundwater bodies are subject to exemptions because of exceedances by 5 pollutants due to water level or volume alteration.

Table 8.2: Pressure resulting from exceedances of thresholds for pollutants in Greece causing failure to achieve good chemical status in groundwater and for which exemptions have been applied

Significant pressure on GWBs	Number of failing pollutants	Number of exemptions				
		Art.4(4) - Technical feasibility	Art.4(4) – Dispropo-rtionate cost	Art.4(4) - Natural conditions	Art.4(5) - Technical feasibility	Art.4(5) – Dispropo-rtionate cost
1.1 - Point - Urban waste water	1	1	0	0	0	0
1.6 - Point - Waste disposal sites	5	13	0	0	0	0
1.7 - Point - Mine waters	2	4	0	0	0	0
2.1 - Diffuse - Urban run-off	8	25	0	0	0	0
2.2 - Diffuse - Agricultural	13	74	0	0	0	0
2.6 - Diffuse - Discharges not connected to sewerage network	4	17	0	0	0	0
2.8 - Diffuse - Mining	3	4	0	0	0	0
3.1 - Abstraction or flow diversion - Agriculture	4	86	0	0	0	0
3.2 - Abstraction or flow diversion - Public water supply	2	21	0	0	0	0
3.3 - Abstraction or flow diversion - Industry	3	6	0	0	0	0
6.2 - Groundwater - Alteration of water level or volume	5	19	0	0	0	0

Source: WISE electronic reports

Application of Article 4(5)

Art. 4(5) exemptions have not been applied at this cycle.

Application of Article 4(6)

Art. 4(6) exemptions have not been applied at any of the two cycles. At the relevant chapters, the RBMPs similarly describe the provisions of the Article, comment on the term of 'prolonged' drought and give information for the Standardized Precipitation Index (SPI) indicator. Certain RBMPs (e.g. of Thrace) give more precise proposals on the monitoring of the SPI.

Application of Article 4(7)

Greece has developed common methodological guidelines for the determination of the exemptions of Art. 4(7) which are available online (Supporting Document *'Determination of the exemptions of par.7 of Art.4 of the WFD'*). In addition, a chapter with the methodology that should be followed for the initial assessment of new projects that would result in 'new modifications' whether they should, or not, be examined under Art.4(7), is also included in the Supporting Document with the Methodology of the determination and assessment criteria of hydromorphological alterations. It has been considered that the procedure for the implementation of Art.4(7) on new modifications, at its initial stage has to be in symmetry with the procedure of the initial determination of the HMWBs.

In the RBMPs, the changes are presented in a general, common way, with a description of the administrative procedure required for the projects and the related water bodies to be eligible of the Art.4(7) exemptions. All projects must have an issued environmental permit in order to be eligible.

Art.4(7) exemptions are applied in 8 RBDs. Although the type of the project has not been reported to WISE for all RBDs, the RBMPs include more precise information[56]. Thus, according to the RBMPs:

- Western Sterea Ellada: 4 river bodies with projects of hydropower plants.
- Epirus: 2 river bodies with projects of hydropower plants.
- Thessalia: 3 river bodies with projects of hydropower plants.
- Western Macedonia: 3 river bodies with projects of reservoirs (dams) for drinking/irrigation water.
- Central Macedonia: 2 river bodies with projects of reservoirs (dams) for drinking water and 2 GWBs with table level lowering due to minerals' extraction activities.
- Eastern Macedonia: 1 river body with project of reservoir (dam) for irrigation water needs.
- Thrace: 1 river body with projects of reservoir (dam) creation for irrigation needs with environmental permit, 7 river bodies related with projects of reservoirs (dams) construction for irrigation needs with their environmental permit in suspension. 3 more river bodies related with projects of water abstraction for irrigation use have been examined but they have finally been considered not having to apply for the Art.4(7) exemptions.
- Crete: 3 river bodies for which there is no information on the related projects. In the

[56] They also include the % that these affected bodies represent on the total of the RBD and for rivers, their length and their % on their total length of rivers of the RBD.

previous cycle, there were 5 river bodies exempted from which only these 3 were maintained under the Art.4(7).

Compared to the previous cycle, the exemptions are applied to one RBD less (i.e. except in Aegean Islands) with no additional information on this change.

Application of Article 6(3) of the GWD

There is no information on exemptions under Art.6 (3) of the GWD.

8.2 Main changes in implementation and compliance since the first cycle

Compared to the previous cycle, in the second cycle, 12 RBDs present significant increase by 86% in the number of SWBs subject to time exemptions and only 2 RBDs present a reduction (Thessalia and Eastern Macedonia).

Thus, in the second cycle, a total of 644 SWBs have been subject to an exemption for achieving good ecological status and a total of 47 SWBs for achieving good chemical status. In the previous cycle, there was a total of 372 SWBs subject to exemption for both ecological and chemical status.

Compared to the 125 total GWBs subject to an exemption in the previous cycle, there is also a significant increase in the second cycle in the number of GWBs subject to exemptions, in all RBDs. The precise increase could not be presented since there must have been many cases of GWBs subject to exemptions for both quantitative and chemical status and respective numbers have not been provided.

During the second cycle, Greece has developed common methodological guidelines, for the examination and the determination of the exemptions of paragraph.4 to 6 of Art.4 and the ones of par.7 of Art.4 on new modifications. These supporting documents are available on the relevant website of the main competent authority:

As for exemptions under Art.4(7)[57] there is 1 RBD less in Aegean Islands, 7 river bodies less in Western Sterea Ellada, 1 less in Thessalia, 1 less in Thrace and 2 less in Crete.

There are no changes concerning exemptions under Art.4(5), Art.4(6) of the WFD and Art.6(3) of the GWD. They have not been applied in any of the two periods.

8.3 Progress with Commission recommendations

Recommendation: *Regarding exemptions, overall and even if a large number of WBs are in "unknown" status, there is a limited number of exemptions, linked to the fact that only a limited number of WBs "fail" the objectives of the WFD. This needs to be significantly re-considered after monitoring information becomes available – and consequently, most probably, more measures will need to be taken.*

Assessment: The number of both SWBs and GWBs subject to exemptions has significantly increased. The increase is due to technical feasibility reasons but it seems that the two principal reasons are the lack of required time for measures to be applied, the time needed for any changes /improvements to take place and the lack of information about the cause of the problem and thus, an inability to identify the appropriate solution. The recommendation has been partially fulfilled.

[57] Ccompared to the numbers according to the RBMPs in Table 11.4.1 of the Commission's Staff Working Document SWD (2015)54 final 2, 17.7.2018.

Recommendation: *The application of exemptions needs to be more transparent and the reasons for the exemptions should be clearly justified in the plans. This especially holds true for a coherent and complete approach regarding Article 4.7 exemptions. The use of exemptions under Article 4.7 should be based on a thorough assessment of all the steps as requested by the WFD, in particular a proper assessment of whether the project will cause deterioration or prevent the achievement of good status, whether the project is of overriding public interest, whether the benefits to society outweigh the environmental degradation, and regarding the absence of alternatives that would be a better environmental option. Furthermore, these projects may only be carried out when all possible measures are taken to mitigate the adverse impact on the status of the water.*

Assessment: The reasons for the exemptions are clearly presented in the RBMPs and together with their supporting documents; the application of exemptions is more transparent. Both WISE and the RBMPs (and their Strategic Environmental Assessments) include information/data regarding the Art.4(7) exemptions but they are limited. A thorough assessment procedure has been established for all steps as requested by WFD. However, there is no information whether alternative solutions have been assessed and if all possible measures have been taken to mitigate the adverse impacts. The recommendation has been fulfilled to a great extent.

Topic 9 Programme of measures

The aim of this chapter is to provide an overview of the Programmes of Measures reported by Member States; more specific information on measures relating to specific pressures (for example arising from agriculture) is provided in subsequent chapters.

The Key Types of Measure (KTM) referred to in this section are groups of measures identified by Member States in the Programme of Measures, which target the same pressure or purpose. The individual measures included in the Programme of Measures (being part of the RBMP) are grouped into Key Types of Measure for the purpose of reporting. The same individual measure can be part of more than one Key Type of Measure because it may be multi-purpose, but also because the Key Types of Measure are not completely independent silos. Key Types of Measure have been introduced to simplify the reporting of measures and to reduce the very large number of Supplementary Measures reported by some Member States (WFD Reporting Guidance 2016).

A Key Type of Measure may be one national measure but it would typically comprise more than one national measure. The 25 predefined Key Types of Measure are listed in the WFD Reporting Guidance 2016.

The Key Type of Measure should be fully implemented and made operational within the RBMP planning period to address specific pressures or chemical substances and achieve the environmental objectives.

9.1 Assessment of implementation and compliance with WFD requirements in the second cycle

9.1.1 General issues

An indication as to whether or not measures have been fully implemented and made operational is when they have been reported as being planned to tackle significant pressures (at the KTM level). Significant pressures are also reported at the water body level. It would therefore be expected that there would be measures planned in the RBMP to tackle all significant pressures.

Greece reported that all RBDs face significant pressures considered to be causing failure of good status for GWBs and SWBs. KTMs have been reported to cover significant pressure types in all RBDs but there are certain pressures from priority substances causing failure that are uncovered.

Regarding SWBs, 1 priority substance causing failure *(Mercury & its compounds)* is not covered in Western Peloponnese, 3 substances (*DEHP*, *DDT p,p'* and *Total DDT)* in Epirus, 1 (*Cadmium & its compounds)* in Attica, 3 (*Mercury & its compounds, Nickel & its compounds, Chlorfenviphos)* in Thessalia, 2 (*Mercury & its compounds, Cadmium & its compounds)* in Western Macedonia, 2 (*Mercury & its compounds*, *Cadmium & its compounds)* in Central Macedonia and from 1 substance (*Mercury & its compounds)* in both Eastern Macedonia and Thrace RBDs.

Regarding GWBs, 1 pressure type in Western Peloponnese and 1 in Eastern Sterea Ellada are not covered but the precise pressures were not reported. In addition, 1 priority substance causing failure (*Nickel and its compounds*) is not covered in Central Macedonia RBD.

As shown in Table 9.1 (Chapter 9.1.3) a total of 780 national basic measures and 407 supplementary measures linked to 20 KTMs have been reported. The second RBMPs in their PoMs include a clear mapping of the national measures to the KTMs. A basic or supplementary measure may be mapped to more than one KTMs.

Most KTMs (15 out of 20 KTMs) have a more or less horizontal character, i.e. they are applied to almost all RBDs. KTM99 – 'Other key type measure reported under PoM' is the measure where

most of the basic measures have been mapped on, followed by KTM8 and KTM13.

On the contrary, few national basic measures are mapped to KTM5 (only 1 measure in 1 RBD) and to KTM17- 'Measures to reduce sediment from soil erosion and surface run-off' (9 basic nationals to 9 RBDs). There are no basic measures linked to KTM12, KTM16 and KTM20 and there is no explanation for this gap in the RBMPs.

National measures related to KTM10 and KTM11 on water pricing policy for the recovery cost implementation from industry (5% of the total basic measures) and agriculture (6%) have also been reported in 12 RBDs.

Supplementary measures have been planned to tackle specific pressures to RBDs. KTM14-'Research, improvement of knowledge base reducing uncertainty', KTM8-'Water efficiency, technical measures for irrigation, energy and households' and KTM99 are the KTMs where most of the supplementary measures have been mapped on.

In general, KTMs for tackling substances causing failure in SWBs have been developed corresponding to the priority substances mentioned previously but there are cases of uncovered substances (as it was noted above).

KTMs mapped to tackle SWBs specific pollutants have been reported in 5 RBDs. They consist of: KTM1-Construction or upgrades of wastewater treatment plants (in 1 RBD), KTM2-Reduce nutrient pollution from agriculture (1 RBD), KTM15-Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances (4 RBDs), KTM13-Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc) (2 RBDs), KTM14-Research, improvement of knowledge base reducing uncertainty (3 RBDs), KTM21-Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure (4 RBDs), KTM3-Reduce pesticides pollution from agriculture (1 RBD), KTM8-Water efficiency, technical measures for irrigation, industry, energy and households (1 RBD) and KTM99-Other key type measure reported under PoM (5 RBDs)

KTMs mapped to tackle GWBs specific pollutants have been reported in 8 RBDs (in Western Sterea Ellada, Epirus, Thessalia, Western Macedonia, Central Macedonia, Thrace, Crete and Aegean Islands). They consist of: KTM2-'Reduce nutrient pollution from agriculture' (in 6 RBDs), KTM3-'Reduce pesticides pollution from agriculture' (2 RBDs), KTM8-'Water efficiency, technical measures for irrigation, industry, energy and households' (3 RBDs), KTM9 – 'Water pricing policy measures for the implementation of the recovery of cost of water services from households' (1 RBD), KTM10 – 'Water pricing policy measures for the implementation of the recovery of cost of water services from industry' (1 RBD), KTM11 – 'Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture' (3 RBDs), KTM12 – 'Advisory services for agriculture' (4 RBDs), KTM14-'Research, improvement of knowledge base reducing uncertainty' (8 RBDs), KTM15- 'Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances' (3 RBDs), KTM16 – 'Upgrades or improvements of industrial wastewater treatment plants (including farms)' (1 RBD), KTM99-'Other key type measure reported under PoM' (8 RBDs).

Concerning the progress of the KTMs, the PO99-'Other Indicator' in the form of 'number of measures required to face the particular pressure' has been widely used with few exemptions despite the existence of more precise predefined indicators to measure progress clearly. Indicator gaps to good status for significant pressures have been reported in all cases and for all RBDs. Indicator gap values have been set for 2015 and 2021 in all RBDs. Values for 2027 have been reported for 2 RBDs. It has to be noted that the setting of 2027 values was optional for all Member States.

Timetables for the measures/actions implementation are included in the PoMs. The Strategic

Environmental Assessments (SEAs) examined 3 scenarios for the measures' implementation. Taking into account the overall required budget, the socioeconomic crisis of the period and the environmental issues, the SEAs commonly concluded that, the proposed in the RBMPs priority to the basic measures of administrative, horizontal character and measures related to research and improvement of the degree of uncertainty is the optimum solution. The implementation of most other measures is expected to begin during the second half of the second cycle.

A combination of the use of cost-effectiveness/cost benefit analysis and an updated economic analysis has been carried out for the measures in all RBDs. A common methodology has been implemented. The methodology is taking into account several factors and is also used for the measures' prioritisation. The undertaken steps and the results have been available in the supporting documents.

According to the implemented methodology, the measures' cost has been a major factor in the way measures are prioritised. As a result, the measures with zero budgets are significantly favoured and they tend to be always in the highest positions in prioritisation. In all RBDs, the above system has been significantly in favour of the administrative acts and other administrative measures which have been considered as of 'zero cost' measures and they have not been budgeted.

Flood protection and navigation service costs have been taken into account in Western Sterea Ellada, Epirus, Attica, Eastern Sterea Ellada, Thessalia, Western Macedonia, Central Macedonia, Eastern Macedonia and Thrace.

For the first RBMPs (2009-2015), the investment amounts (i.e. the total investment expenditure of measures) under Art.11(3)a that were effectively implemented during the first planning cycle, have been reported at 1,657 million € at Member State level. There were no amounts for total investments in measures required by Articles 11(3)b-l, 11(4) and 11(5).

For the second RBMPs (2015-2021), the total investment expenditure planned for Article 11(3)(a) measures has been reported at 642 million € at Member State level. The total capital investment planned for Art.11(3) (b-l), Art.11(4) and Art.11(5) measures has been reported at 1,224 million € at Member State level. There are no any annual operation and maintenance costs reported. Depreciation has not been included in calculations.

A clear financial commitment has been secured in all RBDs. As far as the sectors/uses concerned, secured finance has been reported for agriculture in all RBDs, for industry in 12 RBDs (i.e. except Thessalia and Western Macedonia as not relevant in these RBDs), for urban in 9 RBDs (i.e. except Western Sterea Ellada/Epirus/Thessalia/Western Macedonia/Central Macedonia as not relevant in these RBDs). Secured finance for recreation related measures was reported to Western Peloponnese, Northern Peloponnese, Eastern Peloponnese, Eastern Macedonia, Thrace, Crete and Aegean Islands. Financing for transport, hydropower, energy, aquaculture and flood protection measures has been reported as not relevant in any RBD.

Although according to the RBMPs there were no joint consultations between the RBMPs and the Marine Strategy Framework Directive (MSFD), a certain type of coordination with MSFD has been reported to WISE. KTMs, 14 basic and 18 supplementary, relevant to or in coordination with the MSFD are listed in specific RBDs, i.e. in Western Sterea Ellada, Epirus, Attica, Eastern Sterea Ellada, Thessalia, Western Macedonia, Crete and Aegean Islands. Considering that most of these measures are related to pollution from agriculture and surface priority substances, the coordination with the MSFD has actually been a side issue of the RBMPs.

RBMPs and Flood Risk Management Plans (FRMPs) have not been integrated into single plans in any RBD, since FRMPs were actually drafted after the RBMPs of this cycle, but joint consultations have been carried out (as mentioned in Topic 1). Specific win- win measures in terms of achieving the objectives of the WFD and Floods Directive, drought management and use of Natural Water Retention Measures (NWRM) have been included in the PoMs of all RBDs.

Financial commitments have been reported as not relevant. WFD Article 9(4) to impoundment for flood protection has been applied in 9 RBDs (Western Sterea Ellada, Epirus, Attica, Eastern Sterea Ellada, Thessalia, Western Macedonia, Central Macedonia, Eastern Macedonia and Thrace).

9.1.2 Measures related to other significant pressures

Concerning the other significant pressures, anthropogenic pressures (unknown or other, not specified) all related to SWBs have been reported to Eastern Sterea Ellada, Central Macedonia, Eastern Macedonia, Thrace and Crete RBDs. KTM14 and KTM99 have been used to tackle the above other (unknown or not specified) pressures.

Indicator gap values have been reported for all cases for 2015 and 2021. Values for 2027 have not been reported (except in Eastern Macedonia and Thrace) but, in every case, they were optional for all Member States.

9.1.3 Mapping of national measures to Key Types of Measure

It was expected that Member States would be able to report their PoM by associating their national measures with predefined Key Types of Measure. Key Types of Measure are expected to deliver the bulk of the improvements through reduction in pressures required to achieve WFD Environmental Objectives. A Key Type of Measure may be one national measure but it would typically comprise of more than one national measure. Member States are required to report on the national measures associated with the Key Types of Measure, and whether the national measures are basic (Article 11(3)(a) or Article 11(3)(b-l)) or supplementary (Article 11(4)).

Table 9.1 summarises the number of national measures that have been mapped to the relevant Key Types of Measure in Greece. The number of RBDs for which the Key Type of Measure has been reported is also shown. Table 9.2 then summarises the type of basic measures associated with the national measures mapped against the Key Type of Measure.

Table 9.1: Mapping of the types of national measures to Key Types of Measure in Greece

Key Type Measure	National basic measures	National supple-mentary measures	Number of RBDs reported
KTM1 - Construction or upgrades of wastewater treatment plants	13		13
KTM10 - Water pricing policy measures for the implementation of the recovery of cost of water services from industry	38		12
KTM11 - Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture	46		12
KTM12 - Advisory services for agriculture		24	12
KTM13 - Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc)	71		12
KTM14 - Research, improvement of knowledge base reducing uncertainty	36	83	12
KTM15 - Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances	59	10	12
KTM16 - Upgrades or improvements of industrial wastewater treatment plants (including farms).		19	12
KTM17 - Measures to reduce sediment from soil erosion and surface run-off	9	2	9

Key Type Measure	National basic measures	National supple-mentary measures	Number of RBDs reported
KTM2 - Reduce nutrient pollution from agriculture	48	36	12
KTM20 - Measures to prevent or control the adverse impacts of fishing and other exploitation/removal of animal and plants		4	2
KTM21 - Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure	13	10	11
KTM24 - Adaptation to climate change	64	21	3
KTM3 - Reduce pesticides pollution from agriculture.	12	24	12
KTM5 - Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams)	1		1
KTM6 - Improving hydromorphological conditions of water bodies other than longitudinal continuity	37	14	12
KTM7 - Improvements in flow regime and/or establishment of ecological flows	22	6	11
KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households	104	75	12
KTM9 - Water pricing policy measures for the implementation of the recovery of cost of water services from households	36	1	12
KTM99 - Other key type measure reported under PoM	171	78	12
Total number of Mapped Measures	**780**	**407**	

Source: WISE electronic reports

Table 9.2: Type of basic measures mapped to Key Type of Measures in Greece

Key Type Measure	Basic Measure Type														
	Accidental pollution	Controls water abstraction	Cost recovery water services	Efficient water use	Habitats or Birds	Hydromorphology	IPPC IED	Nitrates	Other	Point source discharges	Pollutants diffuse	Protection water abstraction	Recharge augmentation groundwaters	Surface Priority Substances	Urban Waste Water Treatment
KTM1 - Construction or upgrades of wastewater treatment plants															13
KTM10 - Water pricing policy measures for the implementation of the recovery of cost of water services from industry		2	33	3											
KTM11 - Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture			43	3											
KTM13 - Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc)		6		12						9	3	35	6		
KTM14 - Research, improvement of knowledge base reducing uncertainty					12	11				5			8		
KTM15 - Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances	12						11		1	11				24	
KTM17 - Measures to reduce sediment from soil erosion and surface run-off						6								3	
KTM2 - Reduce nutrient pollution from agriculture								24			24				
KTM21 - Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure										12			1		
KTM24 - Adaptation to climate change		4	10	23		10				1		9	5	2	
KTM3 - Reduce pesticides pollution from agriculture.											12				
KTM5 - Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams)						1									
KTM6 - Improving hydromorphological conditions of water bodies other than longitudinal continuity						31								6	
KTM7 - Improvements in flow regime and/or establishment of ecological flows						22									
KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households		6	1	82						3		12			
KTM9 - Water pricing policy measures for the implementation of the recovery of cost of water services from households			33	3											
KTM99 - Other key type measure reported under PoM		11	44	7	12	6				36	15		12	12	12

Source: WISE electronic reports

Key

'Accidental pollution' = Article 11(3)(l): Any measures required to prevent significant losses of pollutants from technical installations and to prevent and/or reduce the impact of accidental pollution incidents.
'Controls water abstraction' = Article 11(3)(e): Controls over the abstraction of fresh surface water and groundwater and impoundment of fresh surface waters including a register or registers of water abstractions and a requirement for prior authorisation of abstraction and impoundment.
'Cost recovery water services' = Article 11(3)(b): Measures for the recovery of cost of water services (Article 9).
'Efficient water use' = Article 11(3)(c): Measures to promote efficient and sustainable water use.
'Hydromorphology' = Article 11(3)(i): Measures to control any other significant adverse impact on the status of water, and in particular hydromorphological impacts.
'IPPC IED' = Integrated Pollution Prevention Control Directive (96/61/EC) and the Industrial Emissions Directive (2010/75/EU).
'Nitrates' = Nitrates Directive (91/676/EEC).
'Other' = Other Directives mentioned in Part A of Annex VI of the WFD.
'Point source discharges' = Article 11(3)(g): Requirement for prior regulation of point source discharges liable to cause pollution.
'Pollutants diffuse' = Article 11(3)(h): Measures to prevent or control the input of pollutants from diffuse sources liable to cause pollution.
'Protection water abstraction' = Article 11(3)(d): Measures for the protection of water abstracted for drinking water (Article 7) including those to reduce the level of purification required for the production of drinking water.
'Recharge augmentation groundwaters' = Article 11(3)(f): Controls, including a requirement for prior authorisation of artificial recharge or augmentation of groundwater bodies.
'Surface Priority Substances' = Article 11(3)(k): Measures to eliminate pollution of surface waters by Priority Substances and to reduce pollution from other substances that would otherwise prevent the achievement of the objectives laid down in Article 4.
'Urban Waste Water' = Urban Waste Water Treatment Directive (91/271/EEC).

9.1.4 Pressures for which gaps are to be filled to achieve WFD objectives and the Key Types of Measure planned to achieve objectives

As presented in Chapter 9.1.1, Greece has reported the gaps that need to be filled to achieve the WFD Environmental Objectives in terms of all significant pressures on surface waters and groundwaters, in terms of Priority Substances causing failure of good chemical status and in terms of River Basin Specific Pollutants causing failure of good ecological status/potential.

Predefined indicators of the gaps to be filled or other indicators have been set where relevant. Values for the gap indicators have been set for 2015 and 2021. They have not been set for 2027 but it is optional.

The reported information on the gaps to achieve good ecological status includes data on the significant pressures on surface and groundwaters that may cause failure on the environmental objectives. For chemical status, Greece has reported the specific chemical substances causing failure.

The KTMs that are to be made operational to reduce the gaps to levels compatible with achieving WFD environmental objectives have been reported as well as the chosen indicators. Values of the indicators for the second cycle have also been reported to give an indication of the expected progress and achievements[58]. The 2027 values have not been reported but they are optional for all Member States.

All the above mentioned information has been reported in RBDs level (Chapter 9.1.1).

Delays (in 9 RBDs), governance (in 9 RBDs), lack of finance (in all RBDs) and lack of mechanisms (in all RBDs) have been reported as the main expected obstacles to the implementation of the PoMs. The lack of measures has also been reported to 2 RBDs (Crete and Aegean Islands) with no further details.

All RBMPs have noted as potential obstacles/risks related to PoMs development and elaboration/implementation, the general lack of funding due to the socioeconomic crisis, some administrative issues due to gaps (lack of personnel at the regional and decentralised authorities, lack of IT) and lack of coordination due to the different Ministries where the regional authorities belong compared to the main competent authority.

9.2 Main changes in implementation and compliance since the first cycle

New measures (both basic and supplementary) have been added in the second cycle in addition to the ones of the first RBMPs that have been modified and/or extended to better tackle the noted pressures.

As mentioned in the previous report on the implementation of the WFD for Greece[59], in the first RBMPs, cost-effectiveness calculation of measures was not mentioned at any PoM or RBMP. In each RBD a cost-effectiveness calculation was done in a separate document with diverging methodologies but all of them seem not to have been used for the actual prioritisation of the measures. In general, there were several issues on the way measures' financing was calculated, elaborated and presented.

In the second RBMPs, the budget measures have been provided in the PoMs but with limited

[58] Member States had to choose from a list of predefined indicators per KTM. The value of the indicator is expected to be reduced with time as measures are implemented. A value of zero is comparable with 100 % good ecological status or potential or good chemical status.
[59] Commission Staff Working Document SWD(2015) 54 final/2, 17.7.2018.

information on the way they have been estimated. Cost-effective calculations have been reported in the second cycle in all RBDs using a common methodology. The methodology takes into account several factors and has also been used for the prioritisation of measures. The undertaken steps and the results for each RBD have been available in the supporting documents.

In the second cycle, the measures cost is a major factor in the way measures are prioritised. As a result, the measures with zero budgets are significantly favoured in all RBDs. The above system has been in benefit of the administrative acts and other administrative measures which have been considered as of "zero-cost" measures.

9.3 Progress with Commission recommendations

Recommendation: *PoM in RBMPs: the limited level of ambition, and lack of clarity regarding expected effects, need to be rectified. The PoM includes mostly administrative acts that may not make a difference (particularly if implementation is not enforced). Many projects that are in apparent conflict with the WFD (e.g. new dams not properly justified, new irrigation network projects) are included in the PoM (e.g. for improving GW quantitative status since the irrigation water will come from a new reservoir in the future). A thorough check of such projects that are included in the PoM is needed in order to check if they really are WFD-relevant measures (linked also to the Article 4.7 issue above). This inclusion of new dams/irrigation schemes, etc. in most of the PoM also affects the costs indicated: a part of the costs of the PoM-supplementary measures (as defined up to 2015) come for such projects (often financed through the EU). Otherwise, there is very limited financing included for "core" WFD-measures to achieve the environmental objectives (e.g. restoration/mitigation, etc.) without clear commitments for after 2015. There needs to be a clear separation of measures designed to achieve WFD environmental objectives from measures designed to increase water supply and other objectives.*

Assessment: There is still a lack of clarity regarding expected effects. PoMs include both administrative acts (most of them of a horizontal character) and a range of more specific and focused actions for each RBD (most of them in the group of Supplementary Measures). Priority is given to the implementation of the measures of administrative type (acts).
Again, there is forecast for projects of new irrigation networks and dams/reservoirs but they have to be properly justified and, in some RBDs, such projects have already been abandoned during the initial screening. However, since such projects are still included in the supplementary measures of some of the main agricultural areas in the country, they require further examination.
In the insular areas, such projects for the collection of runoff water (e.g. reservoirs) remain a principal water source for both irrigation and drinking water uses and thus, they are essential.
Information and data related to measures' budgeting and financing has been limited in the PoMs.
Clear separation of measures designed to achieve WFD environmental objectives from measures designed to increase water supply and other objectives has partially been done.
PO99-'Other indicator' in the form of 'number of measures required to face the particular pressure' has been widely used with few exemptions despite the existence of a range of predefined indicators that cover better and more precisely the gaps and the PoMs' progress.
There has been significant progress since the previous cycle and the recommendation has been fulfilled to a great extent.

Topic 10 Measures related to abstractions and water scarcity

10.1 Assessment of implementation and compliance with WFD requirements in the second cycle and main changes in implementation and compliance since the first cycle

10.1.1 Water exploitation and trends

Water abstraction has been identified as a significant pressure in all RBDs and water resources planning in relation to abstractions is included in all RBMPs.

Information on water abstraction (in the form of consumptive use or net consumption) has been reported to WISE SoE- Water Quantity only for Eastern Macedonia and Thrace. No abstraction data have been reported to the SoE for the rest RBDs.

Information and aggregated estimates on the abstractions per use, per river basin and per RBD as well as estimates for the abstractions from SWBs and GWBs, have been included in the RBMPs and have been reported to WISE. For the analytical calculations of the needs and abstractions per RBD, all RBMPs point to the Supporting Documents '*Analysis of Anthropogenic Pressures and their impacts at the SWBs and GWBs*'[60].

The Water Exploitation Index (WEI+) has not been reported in the second RBMPs. There are no quantified or estimated trends on water exploitation. The RBMPs mention that according to the National Strategy for Adaptation to Climate Change (2016), there is a trend to over-exploitation that will further increase because of the climate change and the increasing needs for drinking water and irrigation due to drought.

10.1.2 Main uses for water consumption

The main water uses are for the agricultural sector (irrigation, livestock husbandry), for drinking water, industry and other needs and abstractions.

The agricultural sector (mainly irrigation) consumes a total of 7,890 mil. m^3 or 75.9% of the total consumed quantities. 40% of these volumes are from SWBs and 60% from GWBs.

Human consumption (drinking water) consumes a total of 1,004 mil. m^3 or 10.3% of the total consumed volumes. 29% of these volumes are from SWBs and 71% from GWBs.

Industry consumes a total of 118.42 mil. m^3 or 1.2% of the total consumed quantities. 45% of these volumes are from SWBs and 55% from GWBs.

Water exports for consumption in other RBDs are 1,122 mil. m^3 or 11.5% of the total consumed quantities. The vast majority of the exported volumes are for human consumption and for the industry.

Energy sector consumes 98 mil. m^3 or 1% of the total consumed quantities.

An overview of the consumption per use and RBD according to the origin water body is presented in Table 10.

Table 10: Consumption (mil. m^3) per use according to the origin water body in Greece for the second cycle

	SWBs			GWBs			Other	
RBD	**Agriculture (irrigation)**	**Human consumption**	**Industry**	**Agriculture (irrigation)**	**Human consumption**	**Industry**	**Water exports**	**Energy**

[60] These documents have not been uploaded to WISE and their weblinks have been broken. Last accessed 07/02/2021.

EL01	72	2	0	208	41	0	0	15
EL02	162	7	0	353	73	0	0	0
EL03	12	0	0	365	32	0	0	0
EL04	390	10	0	128	29	2	569	0
EL05	280	7	0	96	66	5	3	0
EL06	0	20	0	40	1	3	0	0
EL07	213	10	0	89	5	0.62	0	0
EL08	298	0	0	843	80	9	0	0
EL09	103	61	39	541	55	12	550	73
EL10	354	92	14	606	85	26	0	0
EL11	579	0	0	195	59	4	0	0
EL12	413	12	0	453	49	3	0	10
EL13	37	39	0.27	446	88	0.48	0	0
EL14	8	29	0	106	52	0.05	0	0
Total	**2,921**	**289**	**53.27**	**4,469**	**715**	**65.15**	**1,122**	**98**

Whereas 0= water quantity use not relevant or not significant.
Source: WISE electronic reports

Quantities for agriculture and drinking water supply have been calculated or estimated based on theoretical water needs and theoretical consumption values. In particular irrigation abstraction quantities have been based on estimations on crops' water needs and less on actual data and estimates of the actual quantities used in the fields.

Industry quantities have been considered as not relevant or not significant in many RBDs despite the presence of significant industrial areas/activities or mining activities in some of them (e.g. in Attica). Furthermore in other RBDs, although there is significant industrial activity, industrial areas and water consuming mining activities, the share of industry in the abstractions and the uses seems low (for instance, in Central Macedonia). The reasons for this gap are not available. The industry volumes, when considered, are based on empirical modelling and/or proxy values (e.g. water rights allocation and permits, average water production). Finally, the experience of consultants/experts from other areas and cases has also been used, as well as certain studies elaborated in the previous period.

10.1.3 Measures related to abstractions and water scarcity

Regarding the basic measures (Article 11(3)(e)), there is an authorisation and permitting regime to control water impoundment and a register of impoundments is also in place (Register of Water Abstraction Points) for both SWBs and GWBs. There are no thresholds set under Article 11(3)(e). The details of the permitting system are included in the RBMPs. Specific time periods have been set for water abstraction permit reviews.

The legislation regarding illegal abstractions has been established. The RBMPs and their Strategic Environmental Assessments mention the issue of illegal abstraction and point to the Register of the Water Abstraction Points and the administrative procedures set for the registration of all self-abstractions. More precise data or estimations or other information on the distribution or volumes of illegal abstractions are not included in the RBMPs. The inspection system has been established and its details are presented but data on the results of the inspections are not included in the RBMPs.

Basic measures for the efficient and sustainable use of water of Article 11(3)(c) have been implemented in the previous cycle and new measures and/or significant changes are planned for the second cycle, as well as measures of water reuse in all RBDs.

Measures for the prior authorisation of artificial recharge or augmentation of groundwater bodies, under Article 11(3)(f) have also been implemented in the previous cycle and new measures or significant changes are planned in the second cycle in all RBDs.

Measures under KTM8 – 'Water efficiency, technical measures for irrigation, industry, energy

and households' have been mapped to significant pressures (abstractions and scarcity) and they have been reported for all RBDs (468 measures for 2015 and 409 for 2021).

Additional measures are reported for addressing water abstraction pressures under KTM9 – 'Water pricing policy measures for the implementation of the recovery of cost of water services from households' (54 measures in total were planned for 2015 and 32 for 2021, in 7 RBDs, i.e. Western Peloponnese/Northern Peloponnese/Eastern Peloponnese/Western Sterea Ellada/Epirus/Attica/Eastern Sterea Ellada), under KTM10 – 'Water pricing policy measures for the implementation of the recovery of cost of water services from industry' (57 planned for 2015 and 33 for 2021, in 10 RBDs, i.e. in Western Peloponnese/Northern Peloponnese/Eastern Peloponnese/Attica/Eastern Sterea Ellada/Western Macedonia/Central Macedonia/Thrace/Crete and Aegean Islands), under KTM11 – 'Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture' (111 planned for 2015 and 46 for 2021 in all RBDs) and under KTM12- 'Advisory services to agriculture' (124 planned for 2015 and 119 for 2021 in all RBDs).

10.2 Main changes in implementation and compliance since the first cycle

There are no significant changes between the two cycles in terms of the main consumptive uses and sectors and their shares. Although in the second cycle the RBMPs made clear efforts to collect actual and precise data, there has been again significant lack of data provision and response from several stakeholders (both public and private) in all RBDs. Thus, in the second cycle as well the methods for the quantities consumed have been based mostly on estimations.

New legislation on illegal abstractions has been established and it is in implementation. A Register of Water Abstraction Points has been set and is in force. New measures for the prior authorisation of artificial recharge or augmentation of groundwater bodies have been set. New basic measures for the sustainable and efficient use of water have been planned and significant changes have been set to previous measures.

10.3 Progress with Commission recommendations

Recommendation: *Regarding GW quantity issues, very limited information about actual abstractions has been used. The latter are based on estimates. Even if the revised NMP will provide better information the issue of illegal abstractions boreholes, their potential effects and ways to deal with them needs to be considered most thoroughly.*

Assessment: Although in the second cycle, the RBMPs have made clear efforts to collect data, the response from all stakeholders (public and private) has been very limited and any provided data have been very fragmented. Thus, in all RBDs, quantities for agriculture and drinking water supply have been estimated based on theoretical water needs and theoretical consumption values as well as values from comparable stakeholders when they gave such data. Despite the presence of significant industrial areas and activities, industry abstraction quantities have not been considered as relevant, nor significant in many RBDs, while for the ones taken into account, the calculated industry volumes were based on empirical modelling and/or proxy values.

The issue of illegal abstractions has been taken into consideration by establishing the new legislation, the Register of the Water Abstraction Points and the administrative procedures set for the registration of all self-abstractions. Although both RBMPs and its Strategic Environmental Assessments have mentioned the issue of illegal abstractions, they avoided dealing thoroughly with it and only referred to the ongoing procedure for the elaboration of the Register.

In the third cycle, it would be good to provide data and information on the evolution of permits and registered abstractions per RBD in the supporting documents, as well as more information on the evolution of illegal abstractions.

The recommendation has been partially fulfilled and further improvements are needed.

Topic 11 Measures related to pollution from agriculture

11.1 Assessment of implementation and compliance with the WFD requirements in the second cycle

Agriculture has been considered as a significant pressure in all RBDs, mainly for diffuse pollution, point source pollution, the over-abstraction in both surface and ground water bodies but also the total number of actual self-abstractions (drills, boreholes, wells, direct abstractions from SWBs), the physical alterations of channel/bed/riparian area/shore and hydrological alterations.

All RBMPs note in particular the pressures from agriculture in Protected Areas.

All RBMPs mention that there are quantitative and qualitative degradations of the GWBs, mainly due to their over-abstraction for irrigation (and drinking water) and that, in particular at the coastal aquifers, over-abstraction has led to salinisation of the GWBs due to sea water intrusion.

For GWBs, diffuse pollution from agriculture has been reported as the only significant pressure type in all RBDs. Although data for Central Macedonia, a major agricultural area of the country, have not been reported, the relevant RBMP notes that there are e.g. alterations in flow directions resulting in saltwater intrusion at 17 GWBs of the RBD with over abstraction (for irrigation as well) as the main cause[61].

Taking into account the lack of reported data for the Central Macedonia RBD, the following pressures have been reported: chemical pollution has been reported in 8 RBDs affecting a total of 29 GWBs, alterations in flow directions resulting in saltwater intrusion due to over-abstraction have been reported in 11 RBDs affecting a total of 29 GWBs and saline pollution/intrusion in Eastern Macedonia (reported in 1 GWB). Pressures from nutrient pollution have been reported only in 2 RBDs (Crete/Aegean Islands) but all RBMPs Strategic Environmental Assessments clearly mention the established Nitrate Vulnerable Zones in an effort to tackle the nutrients pollution of GWBs. Over-abstractions lowering the water table have not been reported but all RBMPs have identified clearly the issue and its importance. Finally a total of 101 GWBs (17% of the total GWBs) in 8 RBDs have been reported to have no significant impact from agriculture

For SWBs, physical alterations of channels/beds/riparian areas/shores have been reported in 3 RBDs, hydrological alterations in 7 RBDs and diffuse pollution from agriculture in all RBDs. Chemical pollution has been reported in all RBDs (97 SWBs), altered habitats due to morphological changes (including connectivitiy) in 9 RBDs (39 SWBs) and due to hydrological changes in 10 RBDs (47 SWBs), microbiological pollution in 8 RBDs (60 SWBs), acidification issues in 6 RBDs (68 SWBs), nutrient pollution in all RBDs (164 SWBs), organic pollution in 12 RBDs (100 SWBs) and impact to temperatures in 1 RBD (1 SWB). Other significant impact type unknown (unspecified) pressures have been reported in 2 RBDs (62 SWBs) and of unknown impact type in 3 RBDs (10 SWBs).

Pollution from agriculture has been calculated using theoretical data and estimates[62]. According to the methodology, in cases where the precise place of the livestock husbandry units was unknown,

[61] According to the RBMP, in the river basin of Halkidiki (EL1005) from the 21 GWBs, 2 of them are in poor quality and 5 in poor quantity status due to over-abstraction (over-pumping) with agriculture as a pressure. In the river basin of Axios (EL1003) from the 11 GWBs, 1 is in poor quality and 2 in poor quantity status due to over-abstraction with agriculture (farming, livestock husbandry and poultry) mentioned as pressure.

[62] Estimations on the livestock's number have been made using national statistical data and data from the Integrated Accounts and Controls Service for the Single Payment Application per RBD. The quantities of nitrogen/phosphorus/potassium used in fertilisation have been taken from a relevant Record/Guide of Good Fertilisation Practice issued by the Direction of Agricultural Economy of one Regional Entity and has been considered as representative for the entire country. The Biochemical Oxygen Demands (BODs) and other parameters related to pollution from livestock husbandry have been taken from the tables of the Good Agricultural Practices issued by the Ministry of Rural Development and Food.

their generated pollution has been considered as diffuse pollution and has been distributed to the entire RBD. The extent to which this consideration has been used in each RBD is not known. Thus, a gap between the estimates and the actual situation is possible in each RBD since certain point source pollution from livestock husbandry units to specific water bodies may not have been taken into account.

Measures to address diffuse agricultural pressures or impacts to both SWBs and GWBs are reported in all 14 RBDs, the links between pressures and measures are established and the RBMPs set clear links between the pressures from agriculture and the measures in all RBDs.

The following KTMs have been reported to tackle the pressures from agriculture: KTM1 – 'Construction or upgrades of wastewater treatment plants' in 2 RBDs, KTM2 – 'Reduce nutrient pollution from agriculture' in all RBDs, KTM3 – 'Reduce pesticides pollution from agriculture' in all RBDs, KTM8 – 'Water efficiency, technical measures for irrigation, industry, energy and households' in 6 RBDs, KTM12 – 'Advisory services for agriculture' in all RBDs, KTM13 – 'Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc)' in 9 RBDs, KTM14 – 'Research, improvement of knowledge base reducing uncertainty' in 11 RBDs, KTM15 – 'Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances' in 9 RBDs, KTM16 – 'Upgrades or improvements of industrial wastewater treatment plants (including farms)' in 4 RBDs, KTM20 – 'Measures to prevent or control the adverse impacts of fishing and other exploitation/removal of animal and plants' in 2 RBDs and KTM99 – 'Other key type measure reported under PoM' in 11 RBDs.

No gap assessment has been reported for the reduction in the number of applications of pesticides.

Basic measures of Article 11(3)(h) for the control of diffuse pollution from agriculture at source are reported in all RBDs. The issues commonly tackled are nitrates, phosphorus, pesticides and organic pollution in all RBDs with the exception of Western Macedonia/Central Macedonia where only organic pollution has been reported despite the presence of established Nitrate Vulnerable Zones[63]. For Western Sterea Ellada/Western Macedonia/Central Macedonia it is reported that the same rules are applied at the entire RBD. For the other RBDs, there are differentiated rules for different parts of the RBDs.

Secured finance is reported in all RBDs. The total EU funds of planned measures are reported at €1865.8 million at national scale, of which the total investment expenditure for measures under Art.11(3)(a) during the second cycle are reported at €642.28 million, under Art.11(3)(b- l and Art.11(4) and Art.11(5) at 1223.52 million €. The total EU funds effectively implemented the previous period (2009-2015) are reported €1656.68 million at national level.

Safeguard zones around drinking water protection areas, according to Article 11(3)(d) are reported in all RBDs. These zones would significantly change as a result of the implementation of the RBMPs.

According to the RBMPs' supporting documents, an excess of the threshold limits in nitrates has been noticed in certain water systems that are, nevertheless, in good status[64]. The RBMPs do not propose any further examination of these issues since these excesses' phenomena are not extended and are related with pressures mainly from crops.

Farmers/Farmers' Unions have been consulted under the public consultation process in all RBDs.

---

[63] Greece had already established Nitrate Vulnerable Zones (NVZ) and new NVZs have been added in 2017. All established NVZs are delineated, their Action Plans are established and specific requirements have been set under the Cross-Compliance (Statutory Management Requirements-SMR1 make clear reference to the RBMPs) in implementation of the requirements of the Dir. 91/676/EEC.

[64] For instance, in Western Peloponnese and the river basin of Alfeios (EL0100010).

There is no information related to the establishment and implementation of the polluter pays principle in the agricultural sector.

11.2 Main changes in implementation and compliance since the first cycle

New measures have been added and previous measures have been modified in the second cycle. New national measures have been introduced as supplementary measures aiming at specific needs of the RBDs or introducing relevant innovations in the sector[65].

From an examination of the RBMPs, hydromorphological measures to face pressures from agriculture remain as of secondary priority measures in some RBDs.

Co-operative agreements, a measure of the previous cycle, is not mentioned in the second cycle. However, it is not clear what exactly might be included in this measure in the previous cycle[66].

There are no changes to the gaps in available information on the budgeting of the measures. Concerning the source of funding of the measures between the two cycles there is little information (mainly referring to the RDP as in the previous cycle), the total EU funds in the second cycle are increased by €209.12 million or by 12.6%.

11.3 Progress with Commission recommendations

Recommendation: *Agriculture is indicated as exerting a significant pressure on the water resource in most Greek RBDs. There needs to be further investigation regarding the hydromorphological pressures from agriculture. In addition, the measures taken as regards agriculture need to be more specific, in order to have more reliable positive results regarding the WFD-objectives.*

Assessment: Based on the aggregated reported data, hydromorphological pressures from agriculture (physical alterations and hydrological alterations) are examined in the second cycle but the relevant measures are limited and of secondary priority. The RBMPs Strategic Environmental Assessments include precise and specific measures, based mostly on the RDP measures and they are more precisely described. Certain measures are more specific and of significant impact (e.g. measure for maximum irrigation volumes per crop) but their proper implementation requires additional investments in infrastructure in irrigation metering and recording at farm/parcel level. The recommendation has been partially fulfilled and there is room for improvement.

[65] For instance, the supplementary measure MxxΣ1601 in Central Macedonia RBD for Pilot Measures for the Implementation of Precision Agriculture for the reduction of irrigation water as projects of research-development and demonstration.
[66] For instance, if it concerned the collective networks of irrigation or actions of water management through the Operational Programmes of Producers' Organisations.

Topic 12 Measures related to pollution from sectors other than agriculture

12.1 Assessment of implementation and compliance with WFD requirements in the second cycle

In the context of this topic, pollution is considered in terms of nutrients, organic matter, sediment, saline discharges and chemicals (priority substances, river basin specific pollutants, groundwater pollutants and other physico-chemical parameters) arising from all sectors and sources apart from agriculture. KTM are groups of measures identified by Member States in their Programmes of Measures which target the same pressure or purpose. A KTM could be one national measure but would typically comprise of more than one national measure. The same individual measure can also be part of more than one KTM because it may be multipurpose, but also because the KTMs are not completely independent of one another.

Key Types of Measure relevant to non-agricultural sources of pressures causing failure of WFD objectives have been reported for 12 RBDs (i.e. except in Central Macedonia/Thrace although such measures –both basic and supplementary- are included in their RBMPs). New measures and modifications of measures of the previous cycle have been reported in the second cycle.

All KTMs have been reported to tackle the pressures due to non-agricultural sources and a more thorough check has been done in the RBMPs to see if relevant national measures are included but they are mapped against other KTMs. The following KTMs have been chosen to tackle the relevant pressures: KTM1 - Construction or upgrades of wastewater treatment plants', KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households', KTM9 – 'Water pricing policy measures for the implementation of the recovery of cost of water services from households', KTM10 – 'Water pricing policy measures for the implementation of the recovery of cost of water services from industry', KTM13 – 'Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc)', KTM14 – 'Research, improvement of knowledge base reducing uncertainty', KTM15 – 'Measures for the phasing-out or for the reduction of emissions, discharges and losses of Priority Hazardous Substances', KTM16 – 'Upgrades or improvements of industrial wastewater treatment plants (incl. farms)', KTM21 – 'Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure' and KTM99 – 'Other key type measure reported under PoM'

The WFD specifies that the Programmes of Measures shall include, as a minimum, 'basic measures' and, where necessary to achieve objectives, 'supplementary measures' when basic measures are not enough to address specific significant pressures (see Chapter 9 of this report).

Data for Central Macedonia and Thrace have not been reported although such, directly related to the issue, measures are included in their RBMPs. [67] Thus, basic measures have been mapped against KTM1, KTM13, KTM14, KTM15, KTM21, KTM99 in 12 RBDs (i.e. not reported for Central Macedonia/Thrace). KTM16 data have not been reported in this section. The vast majority concerns measures under KTM99.

Greece has reported more targeted information on basic measures required under Art.11(3)(c to k). The use of an authorisation and/or permitting regime to control waste water point source discharges for both surface and groundwaters has been reported in all RBDs as well as a register of waste water discharges available for both surface waters and groundwaters. There are no thresholds set [basic measures Art11(3)(g)]. Some direct discharges are authorised in accordance

[67] E.g. measure MxxB0701 and MxxB1101 in both Central Macedonia and Thrace RBDs. Also MxxB1102, ΣO503 and ΣO504 in Central Macedonia RBD.

with Art.11(3)(j) in all RBDs. Finally, there are no basic measures under Art.11(3)(k).

The following priority substances related to pollution from sectors other than agriculture causing failure in each RBD have been reported: Western Peloponnese: *Mercury and its compounds* / Western Sterea Ellada: *Chloride* / Epirus: *DEHP, Tin and its compounds, Molybdenum and its compounds, Chloride* / Attica: *Cadmium and its compounds, Detergents* / Eastern Sterea Ellada: *Other chemical parameter* / Thessalia: *Chlorfenvinphos, Nickel and its compounds, Mercury and its compounds, Other chemical parameter, Chromium VI and its compounds, Sulphate, Chloride* / Western Macedonia: *Mercury and its compounds, Cadmium and its compounds, Aluminium and its compounds, Iron and its compounds, Chromium and its compounds* / Central Macedonia: *Mercury and its compounds, Cadmium and its compounds, Aluminium and its compounds, Iron and its compounds, Arsenic and its compounds, Chlorite, Manganese and its compounds, Nickel and its compounds, Molybdenum and its compounds* / Eastern Macedonia: *Mercury and its compounds* / Thrace: *Mercury and its compounds, Chloride* / Crete: *Detergents, Molybdenum and its compounds, Chloride* / Aegean Islands: *Chloride.*

Other priority substances/issues that cause failure such as *DDT, Nitrates, Nitrites, Ammonium* and *Electrical conductivity* are not examined here (in this Topic) because they are mainly related to agriculture. *DEHP* and *Chloride* can be related to both agricultural and non-agricultural uses and thus, they are included here since there is no more precise distinction to WISE.

Based on the above substances, the following KTMs have been reported as addressing these specific issues: KTM1, KTM8, KTM9, KTM10, KTM13, KTM14, KTM 15, KTM16, KTM21 and KTM99. In general, there is clear correspondence between the KTMs and the above substances in each RBD.

12.2 Main changes in implementation and compliance since the first cycle

New measures and modifications of measures of the previous cycle have been reported in the second cycle.

The type/number of KTM relevant to non-agricultural sources of pressures causing failure of WFD objectives in each RBD in the first cycle has not been available in order to compare with the second cycle.

In the second cycle, a range of KTMs has been reported to face significant pressures from Priority Substances and it is a step forward.

In the second cycle, there is an expansion in the use of permits and registers to control waste water discharges.

12.3 Progress with European Commission recommendations

Recommendation: *In relation to chemical pressures, the intention to compile inventories of emissions in accordance with Directive 2008/105/EC needs to be carried out, but does not in itself count as a measure against chemical pollution. More information on relevant measures needs to be included in the second RBMPs.*

Assessment: New relevant basic and supplementary measures are included in the second RBMPs as well as modifications of measures of the previous cycle all mapped to a range of KTMs. There is clear correspondence between the KTMs and the relevant pressures. Administrative acts of reinforcement of controls and inspections, monitoring and register development and update have been set. A permitting regime to control waste water discharge has been established. The recommendation has therefore been partially fulfilled.

Topic 13 Measures related to hydromorphology

13.1 Assessment of implementation and compliance with WFD requirements in the second cycle

Hydromorphological pressures have been reported in 13 RBDs, i.e. all except Eastern Macedonia. The main pressures are presented below together with the main specific sectors and drivers related to them:

1. Physical alterations for uses of flood protection (mostly) followed by agriculture, navigation, other) have been reported in 12 RBDs (i.e. except Eastern Macedonia and Thrace).
2. Dams, barriers and locks all uses, mostly irrigation as in Central Macedonia, followed by drinking water as in Western Macedonia and Northern Peloponnese, flood protection in Western Sterea Ellada, hydropower in Thessalia/Epirus/Western Macedonia, industry, other were reported in Western Peloponnese/Northern Peloponnese/Western Sterea Ellada/Epirus/Thessalia/Western Macedonia/Central Macedonia/Thrace/Crete with Western Macedonia and Central Macedonia presenting the highest numbers of related SWBs.
3. Hydrological alterations have been reported in 8 RBDs due to agriculture (in Western Peloponnese, Northern Peloponnese, Western Sterea Ellada, Epirus, Eastern Sterea Ellada, Thessalia, Western Macedonia, Thrace), hydropower (Western Peloponnese/Western Sterea Ellada, Western Macedonia, Thrace), public water supply (Northern Peloponnese, Epirus, Western Macedonia) and other (Western Sterea Ellada, Epirus, Thessalia).
4. Other hydromorphological alterations in Epirus.

Although not reported to WISE, RBMPs also mention the pressure "abstraction or flow diversion" for agriculture, public water supply, hydropower and industry. Finally, alteration of water level or volume in GWBs is noted mostly for agriculture (irrigation) and public/urban water supply.

The RBMPs provide summarized information as well as tables with the aggregated data on the hydromorphological pressures. All plans point to the supporting documents No 5 and No 8 for analytical data and information[68].

According to the RBMPs, the hydromorphological alterations have been considered as significant pressures only for the Heavily Modified Water Bodies (HMWBs) in all RBDs. For the rest of the SWBs, any hydromoprhological alterations have been *a priori* considered as not significant pressures. For the status assessment of the HMWBs, a co-assessment of the hydromorphological alterations together with the available results of the national monitoring programme has been implemented.

There are some clarity issues with the correspondence/linkage between the reported pressures and respective operational KTMs. KTMs to address the reported above hydromorphological pressures, have been reported in 11 RBDs, i.e. except Central Macedonia, Eastern Macedonia and Thrace despite that such pressures have been reported in 2 of them and have also been included in their RBMPs. The most frequently applied KTMs to tackle hydromorphological issues are:

1. KTM6 – 'Improving hydromorphological conditions of water bodies other than longitudinal continuity' in 12 RBDs (i.e. except Central Macedonia and Thrace).
2. KTM14 - 'Research, improvement base reducing uncertainty' in 11 RBDs (i.e. except Central Macedonia, Eastern Macedonia and Thrace).
3. KTM7 – 'Improvements in flow regime and/or establishment of ecological flows', in 10

[68] These documents have not been uploaded to WISE and their weblinks have been inactive. Last accessed 10/01/2021.

RBDs (Western Peloponnese, Northern Peloponnese, Western Sterea Ellada, Epirus, Attica, Eastern Sterea Ellada, Thessalia, Western Macedonia, Crete, Aegean Islands).

4. KTM17 - 'Measures to reduce sediment from soil erosion and surface run-off' in 8 RBDs (Western Sterea Ellada, Epirus, Attica, Eastern Sterea Ellada, Thessalia, Western Macedonia, Crete, Aegean Islands).
5. KTM24 – 'Adaptation to climate change' in Western Macedonia, Crete, Aegean Islands.
6. KTM5 – 'Improving longitudinal continuity' only in Western Macedonia for all above pressure types.

KTM6, KTM7 and KTM17 although of hydromorphological character have also been reported to tackle other pressures such as abstractions, failure substances or general diffusion/point pollution etc. For instance in Epirus, KTM6 has been reported also to tackle *DDT, DHEP*, *Tin and its compounds* and *Molybdenum and its compounds*.

KTMs related to GWBs' alterations of water levels or volumes have been reported in Attica and Eastern Sterea Ellada, as measures linked to the hydromorphological pressures. Although all RBDs have pressures in GWBs alterations of water levels or volumes, only for the 2 above RBDs they have been considered as hydromorphological pressures and have been reported to the respective category of KTMs.

No specific mitigation measures have been reported to address specifically significant hydromorphological pressures, except the setting of ecological flows in Attica and Eastern Sterea Ellada.

The requirement for an approved Environmental Impact Assessment (EIA) for projects such as dams, hydropower plants etc. has been considered as a guarantee for the mitigation measures of such projects. Neverthless, such EIA were already in force in the country for such projects (i.e. dams, reservoirs) even before the RBMPs implementation.

In accordance with WFD Article 11(3)i on basic measures, a permission is required to control physical modifications of the water bodies, covering their riparian area, and a register of the physical modifications has been maintained.

In terms of river continuity, overall management objectives have been set but no quantitative objectives. WISE and RBMPs point to RBD specific Supporting Documents that include the determination of the environmental objectives including the exceptions[69],

Win-win measures to achieve the objectives of the WFD and Floods Directive, drought management and use of Natural Water Retention Measures have been reported in the PoMs of all RBDs. The FRMPs present clear linkages with the relevant measures of the RBMPs. There is no further information in the RBMPs on win-win measures with the Drought Management Plans and the National Retention Measures. There is no KTM23 – 'Natural water retention measures' to tackle significant hydromorphological pressures.

Ecological flows have been derived for some relevant water bodies at risk of failing the environmental objectives due to abstractions, flow diversions or impoundments but this work is still on-going. Measures for the determination of the ecological flows have been included in all RBDs and their partial implementation has been reported. According to WISE, the already available ecological flows have been implemented in all relevant water bodies. There is no further information on the number of water bodies with derived ecological flows and their implementation.

Finally, indicators' values on the gap to be filled for hydromorphological pressures for 2015 and 2021 have been reported for 13 RBDs, i.e. except Eastern Macedonia. Indicators values for 2027

[69] These documents have not been uploaded to WISE and their weblinks have been broken. Last accessed January 2021.

have been reported only for Thrace.

13.2 Main changes in implementation and compliance in the first cycle

There have not been significant changes between the two cycles in terms of hydromorphological pressures and measures. In both cycles, the most common hydromorphological pressures are due to agriculture, public water supply, industry, hydropower, alteration of water level or volume in GWBs resulting in physical alterations, dams/barriers and locks, hydrological alterations and hydromorphological alterations.

Similarly to the previous cycle, in the second cycle the hydromoprhological alterations are considered as significant pressures only for the Heavily Modified Water Bodies in most RBDs and for dams >15m height. For the rest of the SWBs, any hydromoprhological alterations are *a priori* considered as not significant pressures in many cases. For status assessment, there has been co-assessment of the hydromorphological alterations together with the available results of the new national monitoring programme. Impacts upstream to dams/reservoirs have not been considered.

In the second cycle, however, there are more measures related to hydromorphological pressures than in the first one. Similarly to the previous cycle, measures for sediments are mostly related to gravel extraction restrictions but a new measure has been added in certain RBDs for the determination of areas where such gravel extractions would be allowed.

There are no mitigation measures related to fish passes, remeandering, removal of structures etc. As in the previous cycle, measures related to studies for the determination of ecological flows are included. However, methods to set e-flow are still under development and e-flow is still not applied in all water bodies.

13.3 Progress with European Commission recommendations

Recommendation: *Particularly urgent is the development of sound methodologies to address hydromorphological pressures. The current combination of weak pressure analysis (with not precautionary enough thresholds of significance), lack of ecological status assessment methods sensitive to hydromorphological pressures, unclear process for designation of HMWB and lack of development of GEP makes it very likely that significant hydromorphological pressures are completely overlooked in the implementation process. Potential effects of "smaller" modifications such as dams lower than 15 m, dredging, river straightening, drainage, etc., including impacts to transitional and coastal waters, should be assessed.*

Assessment: Common, sound methodologies have been developed and are publicly available to assess hydromorphological pressures in HMWBs/AWBs as well. The issue of methodologies was assessed in the relevant Topic as well as the designation of HMWBs. The hydromoprhological alterations are considered as significant pressures only for the HMWBs in most RBDs and for dams >15m height. For the rest of the SWBs, any hydromorphological alterations are *a priori* considered as not significant pressures. For the characterisation of the water bodies based on the achievement of their environmental objectives of the WFD, there is co-assessment of the hydromorphological alterations together with the available results of the new national monitoring programme. Impacts upstream to dams/reservoirs have not been considered. Thus, the recommendation has been partially fulfilled.

Recommendation: *In relation to hydromorphological pressures, and based on a sound assessment, measures should be taken to mitigate the impacts (e.g. river restoration, removal of structures, etc.).*

Assessment: Although in the second cycle there are more measures related to hydromorphological

pressures, there are no specific mitigation measures in the RBMPs to specifically address significant hydromorphological pressures (e.g. fish ladders, bypass channels, sediment management, removal of structures) other than the setting of ecological flows. The existence of an approved Environmental Impact Assessment (EIA) for projects such as dams, hydropower plants etc. is considered as a guarantee for the mitigation measures of such projects. However, such EIA were already in force in the country for such projects (i.e. dams, reservoirs) even before the RBMPs implementation. Thus, the recommendation has not been fulfilled.

Topic 14 Economic analysis and water pricing policies

14.1 Assessment of implementation and compliance with WFD requirements in the second cycle and main changes in implementation and compliance since the first cycle

An updated economic analysis has been elaborated in all RBDs and the relevant chapters are included in the RBMPs. All RBMPs are accompanied by a Supporting Document *'Economic Analysis of Water Uses'* with the precise data and calculations/estimations. All supporting documents have been available on the relevant website.

A common, harmonised methodology has been used, according to the general rules and guidelines established by the Joint Ministerial Decision 135275/2017[70] *'Approval of general rules of costing and pricing of water services. Methods and procedures for water services cost recovery at its several uses'*.

The water services and uses that have been taken into consideration are clearly defined and specified for each RBD. Drinking water abstraction (surface and/or groundwater), treatment and distribution together with sewage collection and wastewater treatment, have been considered in all RBDs as well as irrigation water abstraction, treatment and distribution. Self-abstraction has not been taken into consideration.

According to the RBMPs, the services for electrical power from surface waters and the abstractions from wells have not been considered since they are out of the field of the Ministerial Decision.

Drinking water abstraction, treatment and distribution has in many cases been taken into account together with the sewage collection and wastewater treatment. Based on the data and information from the main providers (Municipalities and Public/Municipal Enterprises of Water and Sewage) the total abstractions for drinking use at each RBD have been calculated and the percentage of surface waters and ground waters origin has been provided.

Tourism has been taken into account in all relevant RBMPs but it has been reported separately only in Attica. Drinking use and livestock farming have been taken into account in all RBMPs but the agricultural uses have been reported separately only in Eastern Sterea Ellada.

Financial cost recovery has been taken into account for all RBDs. The reported financial cost recovery per RBD varies broadly as it can be seen from Table 14.

Table 14: Financial cost recovery of water services per RBD in Greece for the second cycle

RBD	Financial cost recovery (%) for drinking/sewage	Financial cost recovery (%) for irrigation
EL01	89.1	52.4
EL02	92.8	55.7
EL03	79.1	79.7
EL04	67.0	21.6
EL05	73.9	43.4
EL06	96.0	100.0
EL07	58.7	31.4
EL08	62.8	44.7
EL09	90.2	53.1
EL10	90.2	21.6
EL11	91.6	61.9

[70] Joint Ministerial Decision 135275/2017 (Gazette 1751/B/22-05-2017).

RBD	Financial cost recovery (%) for drinking/sewage	Financial cost recovery (%) for irrigation
EL12	85.1	82.1
EL13	90.8	82.7
EL14	81.9	70.8

Source: WISE electronic reports

According to the RBMPs and their supporting documents, despite the several efforts for collection of actual data and information, the response of the stakeholders (both public and private) has been limited and the data –when provided- have been fragmented in all RBDs.

All RBMPs have noted that the providers do not disclose all the required categories of the financial cost and consequently, several estimations had to be made. For the providers with no data (e.g. a big number of irrigation organisations in the respective RBDs with collective irrigation networks), estimations have been done based on the experience from respective conditions and similar other stakeholders. Precise information per RBD, on the degree of data availability and reliability and for the use of estimations, has been included in the relevant supporting documents.

Volumetric charges have been reported in all RBDs for the drinking water and sewage collection and wastewater treatment (they are examined together) and have been based on data provided by the main providers. Volumetric charges have been partially applied for the agricultural (irrigation) use.

The importance of self-abstractions for irrigation in their RBDs has been clearly mentioned in all RBMPs. Furthermore, all RBMPs consider that in many cases (that nevertheless are not estimated or calculated), the water for agricultural uses is covered by private (self) abstractions. In these cases, the RBMPs do not calculate any financial cost and the cost recovery has been considered as 100% because it is undertaken by the individuals themselves that make and maintain such abstractions.

Only industrial use services using irrigation abstractions are reported in Attica, Western Macedonia, Crete and Aegean Islands while in Eastern Macedonia and Thrace only self-abstractions for industrial use are reported.

The category of industrial use has not been reported in Central Macedonia (an RBD with significant industrial activity, industrial areas and water consuming mining activities) and the reasons for this gap are not available.

It is also not known whether there are other similar RBDs for which the category of industrial use has not been reported but in the RBMPs there are no industrial cost calculations available even in the RBDs with important industrial activity or organised industrial areas.

Industrial use cost recovery is not separately provided in any RBD. In Attica it has been considered that the industrial use is covered partially by the big organised providers and partially from the municipalities/municipal water enterprises, from the abstractions for drinking needs and thus, the respective financial cost is incorporated at the services of provision of drinking water.

According to the RBMPs, there are no data for investments made by enterprises and for their depreciation and therefore they have not been taken into account.

According to WISE, an environmental charge has been calculated and applied in all RBDs for drinking water together with sewage, irrigation water and self-abstractions. The reported environmental charge revenues vary broadly between the RBDs and the uses (from 0 in Western Peloponnese for drinking water abstraction and Eastern Macedonia/Thrace for all uses to €29.5 million in Thessalia for irrigation water and €4 million in Eastern Sterea Ellada for drinking water). In all cases, it has been reported that the revenues obtained are dedicated to measures

linked to the achievement of the WFD's environmental objectives.

The economic analysis has been updated in all RBDs and includes calculation of environmental and resource costs for the above-mentioned water services in all RBDs except Crete/Aegean Islands for both drinking water/sewage and irrigation water abstraction, treatment and distribution uses. The environmental and resource costs are considered significant only for irrigation water in Northern Peloponnese/Eastern Peloponnese/Western Sterea Ellada/Epirus/Thessalia/Western Macedonia/Central Macedonia. They are already internalised in all RBDs for the above-mentioned services, except in Crete and Aegean Islands for both drinking/sewage and irrigation water services.

According to the RBMPs, the calculation of the environmental cost has been based on the methodology set by the Joint Ministerial Decision 135275/2017. In accordance with the Decision, the environmental cost has been calculated only for the SWBs with ecological condition and/or chemical condition less than good, with ecological and/or chemical condition in unknown state and GWBs at bad chemical state due to natural causes. The environmental cost (and the resource cost) of self-abstractions was at first estimated for each RBD and then it was divided per river basin of the RBD.

The fact that the environmental cost is not calculated for water bodies in good condition leaves out of the estimations important water bodies[71].

According to the above mentioned Joint Ministerial Decision, the determination of the environmental cost is approved by the Decentralised Administrations and shall be updated at annual basis.

The resource cost is estimated in the case of GWBs in bad quantitative status or insufficient coverage of the water needs of the main anthropogenic uses, in particular when this is because of inadequate management.

Concerning water pricing for agricultural uses, the above Joint Ministerial Decision mentions (Art.11) the case of service providers for agricultural use through collective networks, noting that the determination of the prices of the water service providers for agricultural use shall be done in such a way so that the total revenues of the providers to contribute to the improvement of the cost recovery, without reversing the viability conditions of the agricultural uses, with exemption of the years with periods of urgent needs or force majeure.

The water price shall include a fixed fee per hectare and a variable (volumetric) fee. The variable fee is increased with consumption as an incentive for more efficient use and the environmental fee is included to it.

When measuring of irrigation water is not possible in order to apply volumetric fees and up to the compliance of the providers with the relevant articles, the provider shall estimate the used volumes either per surface and crop type as well as the irrigation method or based on the time of water use depending on the available data taken into account the RBMPs and the Codes of Good Agricultural Practice and a Ministerial Decision of 1989 for the determination of the minimum and maximum thresholds of essential quantities for rational use in irrigation and other indicators.

For agricultural uses out of collective networks, water pricing should concern only the establishment of the environmental fee and should be proportional to the quantity used (volumetric charge).

[71] For instance, in Attica, the majority of users of the river basin of Attiki are supplied most of their water volumes (through the public Entreprise of Water and Sewage-EYDAP), from the RBD of Western Sterea Ellada (rivers Mornos and Evinos) and less from the RBD of Eastern Sterea Ellada (lake Yliki) and thus it is the environmental cost (and the resource cost) from these bodies that would be included in the calculations. However, since these 3 water bodies are classified in good condition, in these cases there is no environmental cost or/and resource cost.

Resource cost has not been calculated or estimated for all uses at several RBDs. Several RBMPs consider that resource cost is entirely due to irrigation (e.g. Central Macedonia, Eastern Macedonia) without reasoning.

The level of the environmental and resource cost recovery has not been reported in any RBD. It has been commonly justified by the requirement of the 2017 Ministerial Decision, that the providers shall declare to the Waters' Direction of the Decentralised Administration as from 30/06/2019 (and every 30/06 ever since) the revenues of the 'environmental fee' received by the users.

Concerning incentives, as mentioned previously, a variable volumetric fee increasing with consumption has been set as an incentive for more efficient use for the agricultural use through collective networks. In addition, the Joint Ministerial Decision establishes the possibility to determine, with administrative instruments (regulatory acts), incentives in the form of exemptions from the environmental fees to a) the users which, implement practices of rational use of waters and contribute to the maintenance and/or improvement of waters' good status, including the reuse of wastewaters, and b) the fragile, vulnerable or special, groups of citizens.

There is no consideration or discussion of the polluter pays principle neither in the RBMPs nor in WISE.

Specific basic and supplementary measures mapped to KTM9 -'Water pricing policy measures for the implementation of the recovery of cost of water services from households', KTM10 – 'Water pricing policy measures for the implementation of the recovery of cost of water services from industry' and KTM11- 'Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture' for the need to tackle the gaps in water pricing and water cost recovery in accordance to the WFD, are included in all RBMPs and have been reported.

14.2 Progress with European Commission recommendations

Recommendation: *Develop fully the economic analysis of water use (including the polluter pays principle, including a clear definition of water services, harmonising methodologies and data in all RBMPs) and ensure that the water tariffs/fees lead to adequate recovery of the costs of water services and provide incentives for users to use water resources efficiently. This is particularly important for agriculture. The implementation of measures on cost recovery and water pricing based on a common approach across RBDs is urgent, in order to fulfil the Art.9 requirements and to achieve economic sustainability.*

Assessment: An updated economic analysis of water use has been implemented in all RBDs. Clear definition of the water services has been provided as well as the harmonised common methodology established with the Joint Ministerial Decision 135275/2017. All relevant supporting documents with information and data on RBD level have been available in the relevant website.

The low level of response and data provision from both public and private stakeholders has been a major obstacle for actual data and the use of estimations has been then only possible solution in many cases. There is a need for strengthening the response of the stakeholders on the data and information provision for the next cycle RBMPs.

The relevant legislation on water pricing/water cost recovery has been established and is in force since 2017 covering all relevant aspects. National basic and supplementary measures have been mapped to the relevant KTMs in all RBDs for the implementation of the legislation and the WFD requirements.

The water tariffs/fees do not lead to adequate recovery of the costs of water services in all cases. The financial cost recovery is low in certain cases (e.g. <50% in irrigation in Western Sterea Ellada/Eastern Sterea Ellada/Epirus/Central Macedonia and around 62-67% in cases of drinking

water use e.g. in Thessalia/Western Sterea Ellada) and there are several uses for which the financial cost recovery and the environmental/resource costs have not been taken into account and not been calculated. Furthermore, self-abstraction has not been taken into consideration at all.

The relevant legislation for incentives for more efficient use of water recourses has been established and it is implemented during the second cycle.

Concerning agriculture, the new legislation has set a limitation that the upper limits of any irrigation water pricing shall not reverse the viability of the agricultural uses.

The polluter pays principle has not been examined and has not been taken into consideration in any RBMP.

Consequently, the recommendation has been fulfilled to a great extent but there is need for improvement in certain domains.

Topic 15 Considerations specific to Protected Areas (identification, monitoring, objectives and measures)

15.1 Assessment of implementation and compliance with WFD requirements in the second cycle

Greece reported designated Protected Areas under all relevant Directives. A total of 2,276 Protected Areas have been designated (Table 15.1) with coastal areas by far the biggest category (74% of the total Protected Areas) due to the high number of coastal recreational/bathing areas (66% of the total) of the country.

Of the total Protected Areas designated, 13% belong to the category for habitats, 8% to birds and 7% for drinking water (mostly ground waterbodies and rivers). Designated areas for the economically significant aquatic species are few (1%) and only in coastal waters and rivers. There are no such areas designated for lakes and transitional waters, although there are such bodies with significant presence of aquatic species and fishing activity in the country[72].

For the second cycle, Greece also added to the Register of Protected Areas the category of "proposed recreational areas of inland waters", including those areas/water bodies where recreational activities have been developed (rafting, canyoning, etc.) to a certain degree but they still have not been characterised officially as recreational waters with a permission/authorisation.

The water bodies linked to these areas are mentioned in the RBMPs together with a checklist with their association with a protected area. The relevant maps are included in the RBMPs, together with the Strategic Environmental Assessment and their Supplementary Documents No 9 '*Update of the Register of Protected Areas',* both with more detailed and specific information. The Supplementary Documents No 9 include: an analytic description of the categories of the Protected Areas together with their actual protection legal framework, the methodology for their determination and delineation, a summarized description of the Register at River Basin level with a relevant list and, finally, analytical data from the Register for each River Basin.

Several RBMPs describe in more details the impacts of pressures to SWBs directly linked with habitats and ecosystems (such as in Thessalia for the Pinios River and the impacts from over-abstractions to the downward river ecosystem and the estuaries).

Table 15.1: Number of Protected Areas of all types in each RBD of Greece, associated with surface and ground water bodies

Protected Area Type	Number of Protected Areas associated with				
	Rivers	Lakes	Transitional	Coastal	Groundwater
Abstraction of water intended for human consumption under Article 7	45	5	0	0	118
Recreational waters, including areas designated as bathing water under Directive 76/160/EEC	0	2	0	1,507	0
Protection of species where the maintenance of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 79/409/EEC (Birds)	78	16	13	69	11

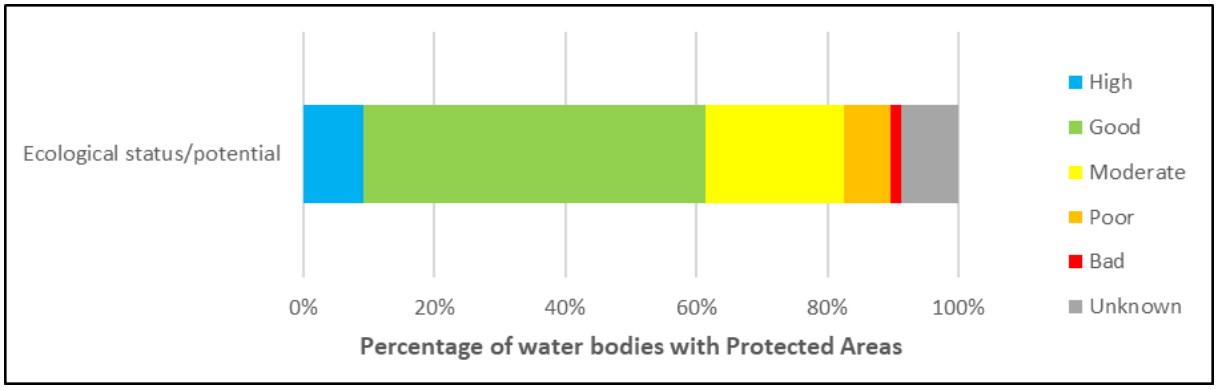
[72] For instance, the Mesologgi Lagoon in Western Sterea Ellada that is already classified in the Sensitive Areas in the RBMP.

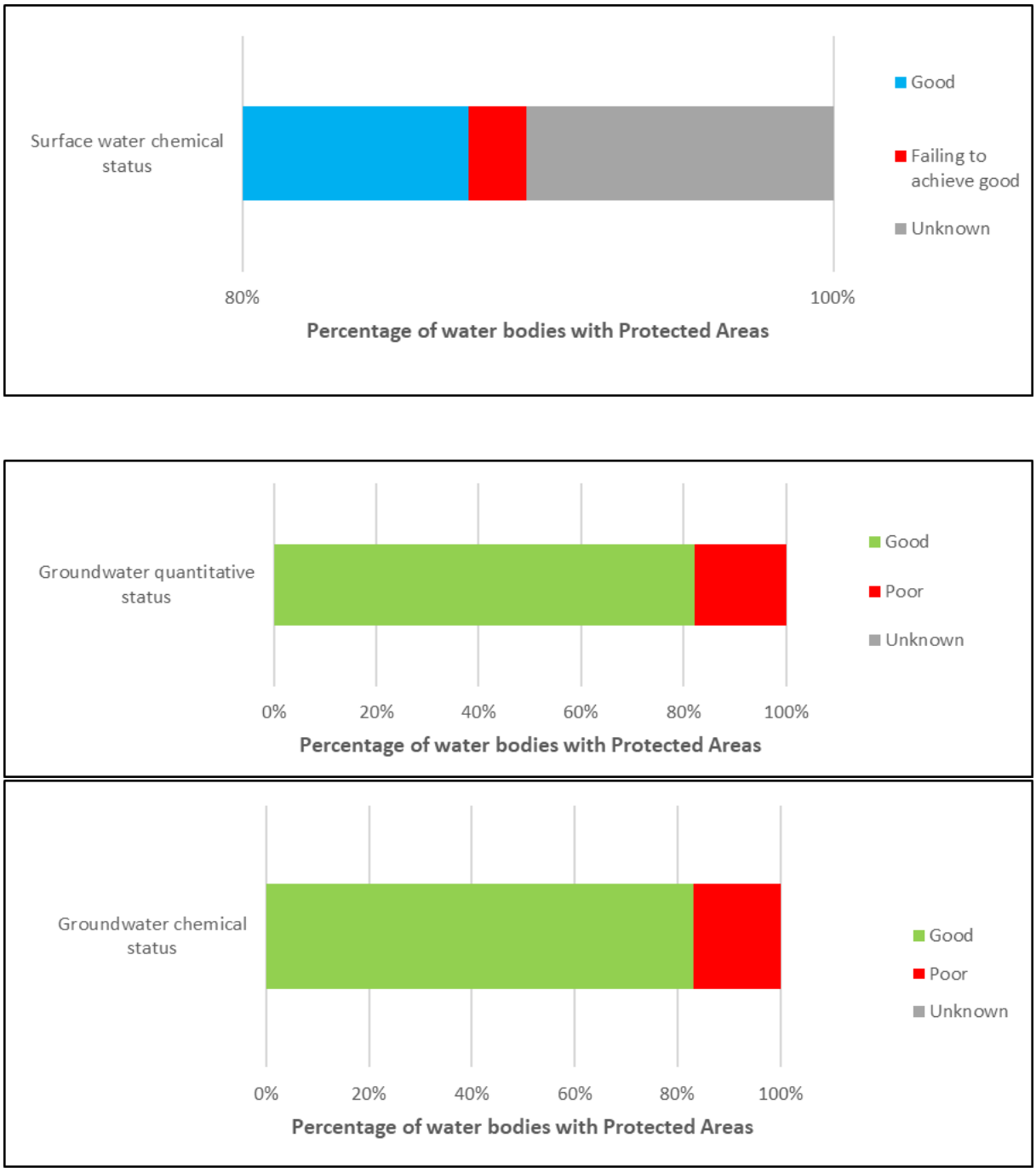
Protected Area Type	Number of Protected Areas associated with				
	Rivers	Lakes	Transitional	Coastal	Groundwater
Protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 92/43/EEC (Habitats)	102	21	27	100	39
Nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC (Nitrates Directive) and areas designated as sensitive areas under Directive 91/271/EEC (Urban Wastewater Treatment Directive)	41	9	10	5	29
Areas designated for the protection of economically significant aquatic species	13	0	0	12	0
Other	129	8	23	300	83

Source: WISE electronic reports

An overview of the status (chemical and ecological and for groundwaters also quantitative) of water bodies associated with Protected Areas has been reported (Figure 15.1).

Figure 15.1: Status of water bodies associated with the Protected Areas report for Greece. *Note: based on status/potential aggregated for all water bodies associated with all Protected Areas*





Source: WISE electronic reports

83% of the GWBs associated to Protected Areas have been classified in good chemical status and 17% in poor chemical status. 88% of the SWBs associated to Protected Areas is in good chemical status, while 2% is failing to achieve good status and 10% are in unknown status.

The ecological status/potential is high in 9% of the SWBs, good in 52%, moderate in 21%, while on the contrary 9% are in unknown status, 7% in poor and 2% in bad status/potential.

Specific water objectives have not been set to protect dependent habitats and birds species for two reasons: because the achievement of WFD good status is considered sufficient to achieve favourable conservation status (in Western Peloponnese, Northern Peloponnese, Eastern Peloponnese, Western Sterea Ellada, Epirus, Attica, Eastern Sterea Ellada, Thessalia, Western Macedonia, Central Macedonia, Eastern Macedonia, Thrace) and because additional needs are not known (in Eastern Macedonia, Thrace, Crete, Aegean Islands).

For drinking water Protected Areas linked to GWBs, specific water objectives have been set up and met in all RBDs except Crete (they are not set up). No areas linked to SWBs have been set up. Concerning shellfish production, microbiological standards are set to Eastern Macedonia (4 areas) and Thrace (7 areas) and they are identical to those in the repealed Shellfish Directive 2006/113/EC. There is no available information on whether these objectives have been met. On the contrary, specific microbiological standards to protect shellfish have not been set in the relevant area of Aegean Islands.

Monitoring sites of SWBs and GWBs associated with all Protected Areas have been reported under all relevant Directives: Article 7 of WFD, Dir. 76/160/EEC, Dir. 79/409/EEC (Birds), Dir. 92/43/EEC (Habitats), Dir. 91/676/EEC (Nitrates) and 91/271/EEC (UWW Treatment), Protection of economically significant aquatic species.

Further information on the purpose of monitoring sites for surface water and groundwater status assessment can be found in chapters 3 and 4 (ecological and chemical status of surface waters) and chapters 5 and 6 (quantitative and chemical status of groundwaters) of this report.

All Protected Areas are covered with monitoring sites. However, there is little information in the RBMPs on the actual state of their monitoring network and any specific gaps in spatio-temporal data or in monitoring elements. The RBMPs mention the gaps of the entire national network and the need in monitoring sites and time series data and a Basic Measure for the expansion of the monitoring network has been included in the PoMs. The extent to which these gaps and the network's expansion affect the monitoring sites of the Protected Areas is unknown.

Table 15.2: Number of SWBs and GWBs monitoring sites associated with Protected Areas in Greece

Protected Area Type	Number of monitoring sites associated with Protected Areas in				
	Rivers	**Lakes**	**Transitional**	**Coastal**	**Groundwater**
Abstraction of water intended for human consumption under Article 7	46	5	0	0	118
Recreational waters, including areas designated as bathing water under Directive 76/160/EEC	0	2	0	1,511	0
Protection of species where the maintenance of the status of water ia an important factor in their protection, including relevant Natura 2000 sites designated under Directive 79/409/EEC (Birds)	343	19	21	119	33
Protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 92/43/EEC (Habitats)	319	29	34	162	77
Nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC (Nitrates Directive) and areas designated as sensitive areas under Directive 91/271/EEC (Urban Wastewater Treatment Directive)	444	20	13	9	152
Areas designated for the protection of economically significant aquatic species	14	0	0	12	0

Source: WISE electronic reports

Greece reported that there are safeguard zones in drinking water Protected Areas in all RBDs but there would be significant changes to them as a result of the implementation of the RBMPs' relevant measures.

The PoMs in all RBDs include a new measure[73] belonging to the Category of Measures 'Measures for the protection of waters for human consumption (Art.7 of the WFD)'. It would determine the protection zones (with 3 foreseen protection zones) and measures for the SWBs and the abstraction points on them. A more detailed determination would be elaborated in the measure of Plans for the Water Security[74] belonging to the same category of measures (a modification of a previous measure of the first RBMPs).

Areas with exemptions from the relevant objectives or standards have been reported for 10 RBDs i.e. except Eastern Macedonia, Thrace, Crete and Aegean Islands (the only RBDs without any exemptions). Technical feasibility reasons of Art.4(4) have been reported in all RBDs with exemptions, while new modifications of Art.4(7) have been reported in Western Sterea Ellada, Epirus, Thessalia, Western Macedonia and Central Macedonia.

15.2 Main changes in implementation and compliance in the first cycle

Compared to the previous cycle, there is a reduction of the Protected Areas of 13% (338 fewer areas). However, comparison should be viewed with caution since in the first cycle there were 376 water bodies reported in the categories 'Local' and 'National' which are not in the second cycle. In addition, the category 'European Other' in the first cycle had no water bodies while in the second cycle has 543 bodies.

According to the RBMPs, this is a result of the update of the Register of Protected Areas in all RBDs based on: the new Natura 2000 areas (Birds & Habitats Directives), the results from the Monitoring of Bathing Coastal Waters and the provisions of Directive on Bathing Waters (Dir.2006/7/EC), other Directives with stricter targets such as the Drinking Water Directive (80/778/EEC), the repealed Shellfish Directive (Dir. 2006/113/EC), the Fish Directive (Dir.2006/44/EC, the Nitrates (Dir. 91/676/EEC) and the Urban Wastewater Treatment Directive (Dir.91/272/EEC). In addition, CORINE Habitats and Landscapes of Particular Natural Beauty have been taken out of the Register.

Overall, there are 10 fewer bodies of Art.7 drinking water, 18 fewer bodies in Habitats Directive, 24 fewer bodies in the Nitrates Directive and UWW Treatment Directive and 2 fewer bodies in Fish. On the contrary, there are 46 more bodies in Bathing Water Directive and 69 more bodies in Birds Directive.

The number of monitoring sites at the Protected Areas has increased significantly from 1,039 to 3,502 monitoring sites or by 237%, a remarkable increase that should be used with caution since there are monitoring sites related to two or more Directives.

15.3 Progress with European Commission recommendations

There were no specific recommendations based on the first RBMPs for this topic.

[73] MxxB0403: 'protection of drinking water abstraction projects of SWBs'.
[74] MxxB0404 'Plans for the Water Security'.

Topic 16 Adaptation to drought and climate change

16.1 Assessment of implementation and compliance with WFD requirements in the second cycle

Climate change has been considered in the second RBMPs and it is stated that the guidance on how to adapt to climate change (Common Implementation Strategy Guidance Document No. 24) was used in all RBDs. Drought management, water scarcity and check of the effectiveness of the relevant measures were considered.

The information provided on the steps taken to address climate change is rather general in all RBMPs and their Strategic Environmental Assessments (SEA). The SEAs include the first DMPs' proposed measures/actions per alert category. However, there is no clear information on their linkages with the PoMs and their mapping on KTMs.

The National Strategy for Adaptation to Climate Change (NSACC), adopted in 2016, has been considered in all RBMPs, including the incorporation of its actions, although there is no clear mapping between the National Strategy's actions, the PoMs and the KTMs.

KTM24 – "Adaptation to climate change" is reported as operational only in 3 RBDs (Western Macedonia, Crete and Aegean Islands). Nevertheless, a national measure for the monitoring, recording and restoration of the coastal erosion (directly related to the National Strategy's actions), is included in all RBMPs and has been mapped to KTM6 – "Measures for facing negative impacts from the status of SWBs in particular from hydromorphological alterations".

Even though there is no legal obligation to prepare Drought Management Plans, many Member States have prepared them in order to cope with droughts. Greece has developed Strategic Drought and Water Shortage Contingency Plans (Drought Management Plans) in the first cycle and they were included in the first RBMPs. No update of the Drought Management Plans has been reported in the second cycle but a new measure for their update has been included in all second RBMPs.

All second RBMPs include references to the first cycle Drought Management Plans mentioning that the results and the conclusions of the first Drought Management Plan of each RBD would be used for the determination of the PoMs and for the determination of the assessment procedure of the periods of prolonged drought in the second cycle.

The FRMPs present clearly their cohesion with the RBMPs[75], the relevant measures and linkages. Climate change has been considered with respect to flood risk management and for maximisation of cross-sectoral benefits and minimisation of negative effects across sectors in all RBDs.

Finally, Greece reported that the Art.4(6) exemptions are not applied in any RBD.

16.2 Main changes in implementation and compliance in the first cycle

While for the first cycle, climate change was not taken into consideration at any RBD, it has been done so in the second cycle. The National Strategy for Adaptation to Climate Change (NSACC) was adopted in 2016 and has been taken into account in all RBMPs, including the incorporation of its actions.

As for drought, the Drought Management Plans have been mentioned in the RBMPs and in a greater extent in the Strategic Environmental Assessments with the proposed measures/actions per

[75] The FRMPs were elaborated and approved in 2018, i.e. a year after the approval of the RBMPs, and have been available online on the relevant website of the main competent authority.

alert category. Drought management and water scarcity measures/actions have been taken into account.

64 basic and 21 supplementary measures mapped to KTM24 have been reported but for only 3 RBDs. Nevertheless, measures related to climate change have also been mapped to other KTMs covering the entire RBDs.

16.3 Progress with European Commission recommendations

Recommendation: *Up to now, there is no consideration of climate change – no 'climate proofing' of the RBMP/PoMs. These issues need to be dealt with urgently.*

Assessment: Climate change has been taken into account in all second RBMPs and their Strategic Environmental Assessments. Relevant measures, linked to the National Strategy for Adaptation to Climate Change, have been included in the PoMs. The recommendation has been fulfilled.

Recommendation: *The Drought Management Plans (DMP) developed as supplementary to the RBMPs are a valuable addition. However, they need to be taken a step further, be more harmonised and evolve into an operational level with the "measures proposals" being implemented in areas where relevant. For GR13/14 it would also be valuable to develop DMPs (this is also mentioned as a basic measure in the PoMs).*

Assessment: The first DMPs for Crete (EL13)/Aegean Islands (EL14) have been developed as well. DMPs have not been updated during the second cycle but the RBMPs mentioned that the first DMPs have been taken into account. There is no information on the actual degree of implementation of the relevant measures so that to check the evolvement of the first DMPs into an operational level. Basic measures for the update of the DMPs have been included in the second RBMPs as well. The recommendation has been partially fulfilled.