

Measures and actions required to achieve GES

The knowledge gaps common to IMAP Ecological Objectives 5 and 9

Lack of data for nutrients, contaminants and biomarkers, as well as the lack of capacities of National IMAP Pollution competent laboratories:

733. There was a vast improvement in the spatial coverage of data reported for IMAP Pollution Common Indicators into IMAP IS since the last 2017 MED QSR. However, data availability is characterized by significant data inhomogeneity, and uneven data distribution along the Mediterranean region, with areas with satisfactory data availability and with areas for which only a few or no data were reported. The following key observations pertain to specific IMAP Pollution Common Indicators:

- CI 13&14. The data most lacking are for total phosphorous. Data for all mandatory parameters i.e., the concentration of ammonium, nitrite, nitrate, total nitrogen, orthophosphate, total phosphorus, orthosilicate and chlorophyll a, temperature, salinity, dissolved oxygen and water transparency (Secchi depth), are needed for the Central Mediterranean Sea Sub-region (CEN); the southern part of the Levantine Sea, the sub-division of the Aegean-Levantine Sea Sub-region; and the southern part of the Central part of the Western Mediterranean Sea Sub-region (WMS) which are underrepresented in the IMAP database.
- CI 17. The data most lacking were for organic contaminants in sediments and biota for all four Mediterranean Sub-regions, followed by trace metals in biota (*M. galloprovincialis* and *M. barbatus*). As well as for CIs 13&14, data for all the parameters of CI 17 are needed for the CEN Sub-region; the southern part of the LEVS sub-division; and the southern part of the Central part of the Western Mediterranean Sea (CWMS) sub-division.
- CI 18. No data were available in IMAP IS for the preparation of the 2023 MED QSR. Therefore, no improvement in the assessment of CI 18 was achieved since the 2017 MED QSR, and the GES assessment was impossible within the preparation of the 2023 MED QSR. Instead, the assessment was performed based on bibliographic studies, as in the 2017 MED QSR, using newer available scientific literature i.e., the studies on biomarkers in the Mediterranean Sea since 2016. It should also be emphasized that data from studies could not be compared to BACs and EACs values as agreed for CI 18 by Decisions IG.22/7 (COP 19) and IG.23/6 (COP 20) as they were not measured in the specific tissue of *M. galloprovincialis*. Moreover, comparison among the bibliographic studies was mostly impossible. This is due to using different biomarkers, with different biota species, using different tissues, and different methodologies. The confounding factors that hinder environmental status assessment i.e., species, gender, maturation status, season, and temperature were re-confirmed as found in the 2017 MED QSR. In addition, an inherent bias exists in publications toward studies showing an effect. Authors and journals do not usually publish studies showing the lack of effect or response.
- CI 20. No data were available in IMAP IS to undertake GES CI 20 assessment within the preparation of the 2023 MED QSR. Therefore, the environmental assessment could only be performed by combining the two approaches: i) assessment of the status based on data reported to IMAP IS for CI 17 contaminants in biota, and ii) assessment of the present status based on bibliographic studies, following the same approach applied for preparation of the 2017 MED QSR; however, by using newer available scientific literature. It should also be recognized that due to the lack of data, the rule was not set for assigning the GES/non-GES to the areas assessed further to the use of the EU maximum levels for certain contaminants in foodstuffs, approved as the assessment criteria for CI 20.
- CI 21. Very limited data were available in IMAP IS to undertake GES CI 21 assessment within the preparation of the 2023 MED QSR. Most of the data were available through EEA and not through IMAP IS.

734. The lack of data reporting is likely to be related to:

- Lack of expertise and/or instrumentation and/or funding to perform the sampling and analytical determination of the contaminants and nutrients.

- The lack of consistency with monitoring programmes adopted at the national scales as well as with routine measurements undertaken on parameters (e.g. for nutrients).
- The mandatory species for monitoring i.e., the mussel *M. galloprovincialis* and the fish *M. barbatus*, may not have a harmonized presence or have low availability in different sub-regions and/or sub-divisions. Therefore, these species could not be sampled and analyzed in all areas, and lack of monitoring data were evident.
- There is an evident lack of accessibility to quality assurance tools, such as interlaboratory comparisons (ILCs), proficiency tests (PTs), or certified reference materials (CRMs), along with a lack of knowledge for use of adequate laboratory equipment.
- Deviations from the IMAP monitoring methodologies, for example, inconsistent biota sampling and discrepancy in the samples preparation negatively affect the performance of IMAP Pollution competent laboratories.

Hindered data use by missing database management tools:

735. IMAP IS platform operates as a repository of data in Excel file format. It is not a quarriable database, with no data export formats or mapping capability. The platform is easy to use for searching and retrieving files, but no QC/QA categories and data flagging are available. All these imposed additional workloads to create the offline databases in order to ensure data control and use for the preparation of the 2023 MED QSR IMAP Pollution and Marine Litter assessments. The files reported by the CPs do not always report all the necessary metadata and data, as specified in the DDs and DSs. At the same time, the CPs reported that the preparation of the files for an upload into the IMAP IS was complicated and time-consuming, lacking an inter-facing modality to ensure data transfer to IMAP IS from national databases.

Absence of optimal integration and aggregation among CIs and EOs:

736. Given the lack of data reporting as required by Decision IG. 23/6 (COP 20), it was impossible to ensure optimal application of the integration and aggregation rules in order to provide the integrated assessments of the EOs and CIs.

The measures to address the common knowledge gaps related to IMAP Ecological Objectives 5 and 9, as well as IMAP Ecological Objectives 10

737. The measures to address common knowledge gaps include the policy and technical measures that are common at the level of IMAP Pollution and Marine Litter Cluster, as provided here below.

The policy measures to address the common knowledge gaps

Increase of data availability and capacity building programmes to address the knowledge and technical gaps of national IMAP Pollution competent laboratories:

738. Submission of good quality data, striving for their uniform distribution across the Mediterranean Sub-regions should be encouraged, and support given to the CPs to enable it. A thorough mapping of the specific needs of each CP should be performed and a tailored capacity building process drawn and executed. The following specific knowledge, technical and financial needs of IMAP Pollution competent laboratories should be addressed:

- i) further harmonization of laboratories' performance in line with the IMAP Monitoring Guidelines in order to increase the representativeness and accuracy of the analytical results for generation of quality-assured monitoring data;
- ii) improving availability of appropriate analytical equipment to strengthen technical capacities of national IMAP Pollution competent laboratories;
- iii) increasing consistency of biota sampling along with the application of Quality Assurance measures;

- iv) increasing accessibility to quality assurance tools, such as inter-laboratory comparisons (ILCs), proficiency tests (PTs), or certified reference materials (CRMs).

739. The assessment of the capacities of national IMAP Pollution competent laboratories should continue as a biennial effort aimed at gradual improvement of their performances with a view of reaching optimal compliance of data processing and reporting with the methods provided in Monitoring Guidelines for IMAP Common Indicators 13,14,17, 18, 20 and 21.

740. Further to the results achieved in proficiency testing over a 25-year period, the UNEP/MAP-MED POL in collaboration with the IAEA/MESL continues implementation of the traditional proficient testing (PT) related to the determination of trace metals and organic contaminants in sediment and biota matrixes, along with the organization of the training courses;¹²⁸ however, by ensuring their adjustment to the requirements of IMAP CI 17. Along with the continual strengthening of the quality assurance for trace metals and organic contaminants, national capacities need to be further upgraded by undertaking regular inter-laboratory comparisons/proficiency testing for the analysis of nutrients, biomarkers, and contaminants in commonly consumed seafood and intestinal enterococci in bathing waters within ongoing and planned activities of UNEP/MAP - MED POL. The technical missions organized to the IMAP competent laboratories in the greatest need should continue addressing specific technical knowledge gaps.

741. Capacity building needs of the Contracting Parties regarding the use of the IMAP Pollution and Marine Litter assessment methodologies need to be also addressed.¹²⁹ This could be in the form of additional training courses, including the use of environmental assessment tools (NEAT and CHASE+), as well as by supporting the purchase of analytical instrumentation.

Improve DPSIR analysis:

742. DPSIR analysis needs to be improved by supporting the CPs to regularly provide relevant information and share the knowledge which in principle may be ensured by i) reporting information on DPSIR, along with national monitoring data, and compatibly with data reporting for National Action Plans' indicators; ii) ensuring assistance of the local experts, through the CPs, regarding the identification of specific DPs and their impacts; and iii) complementing DPSIR information reporting with data from the scientific literature and national reports.

Monitor the effectiveness of the technical and policy measures:

743. Areas classified as likely non-GES were identified in the 2023 MED QSR Pollution assessments (UNEP/MED WG. 563/Inf.11) for EOs 5 and 9 in the four Sub-regions of the Mediterranean. However, only for a few non-GES areas, DPs were identified. The CPs should identify DPs affecting the environmental classification along the contaminants found responsible for the non-GES classification, therefore, ensuring responses to be derived from integral consideration of GES/environmental assessment findings and DPSIR analysis. Once the DPs are identified, practical measures, both technical and policy oriented should be put in place. For example, if the area will be found in non-GES due to the high concentration of Hg in sediment, the source of Hg should be traced, and pollution abatement measures undertaken. Following the introduction of the measures, tailored to tracing the DP impacts responsible for the non-GES status of the area, their effectiveness should be monitored, to make sure that they improve the environmental status of the non-GES areas. This needs to be provided through environmental monitoring, and reassessment of the environmental status of the non-GES areas.

¹²⁸ UNEP/MED WG. WG.492/10

¹²⁹ UNEP/MED WG.556/4/L.2.

Optimally address the impacts of DPs and tailor the responses within the regional plans and national action plans to the needs of continual improvement of the marine environment status:

744. Within the IMAP Pollution Cluster assessments, the most important DPs which negatively impacted the status of the Mediterranean marine environment were related to: agriculture, industry, aquaculture, tourism including sporting and recreational activities, utilization of specific natural resources, infrastructure, energy facilities, ports and maritime works and structures, and maritime activities. Multiple DPs may be present in a specific area, while measures and responses may be common to various DPs. Although the evaluation of the responses i.e. the measures was hindered by the lack of specific local information, the overall responses and measures to abate and prevent pollution, and improve environmental status were already mapped in the UNEP/MAP documents. The regional policies are in place and present a framework for the responses in line with the Barcelona Convention and its Protocols¹³⁰. The present proposals of the Regional Plan for Agriculture Management, the Regional Plan for Aquaculture Management and the Regional Plan for Stormwater Management, along with the adopted Regional Plan for Urban Wastewater Treatment and the Regional Plan for Sewage Sludge Management, as well as the updated Regional Plan for Marine Litter Management in the Mediterranean and the National Action Plans to implement the LBS Protocol and Regional Plans provide the measures of relevance for addressing impacts of drivers and pressures which badly affect the status of marine environment.

745. Further elaboration of the below proposed overall and specific measures should primarily target the likely non-GES areas found within the assessment of IMAP Pollution Cluster (UNEP/MED WG. 563/Inf.11).

a) The general measures to prevent and abate pollution towards the good environmental status of the Mediterranean

746. Pollution prevention needs to be encouraged instead of environmental remediation. This could be achieved by reducing and eliminating the use and discharge of known harmful substances, regulating the emergence of new substances with mandatory environmental and social impact assessments, recycling and using biodegradable green compounds, along with planning emergency responses in case of accidental pollution events.

747. Identification of legacy pollutants¹³¹ in the environment is needed, whereby it should be ensured that they are not currently being introduced into the environment. While the mitigation of current pollutants entails measures at the source of pollution, the mitigation of legacy pollutants takes place *in situ*. The latter includes the study of transport and distribution of pollutants in the environment, the use of technologies for pollutants removal from the environment, and bioremediation.

748. Strengthened use of the Best available technology (BAT) is needed to prevent and control pollution, along with the Best environmental Practice (BEP) to support the most appropriate combination of environmental control measures and strategies to prevent and control pollution.

749. Transition to the blue economy needs to support the sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of the ocean ecosystem.

¹³⁰ The Land-Based Sources Protocol, Dumping Protocol, Hazardous Wastes Protocol, Offshore Protocol, Prevention and Emergency Protocol and Integrated Coastal Zone Management Protocol.

¹³¹ Legacy pollutants are substances that remain in the environment long after they were introduced and after pollution abatement measures were applied or their use was banned.

750. Move towards the circular economy and sustainability needs to support the achievement of zero pollution through recycling. It entails markets that give incentives to reusing products, rather than disposing and then extracting new resources. Major changes in production and consumption patterns are needed, with a focus on climate change concerns, biodiversity protection and ecosystem restoration.

751. Regional policy integration is of utmost importance since marine pollution has no borders, and therefore strengthening regional cooperation is necessary, advocating common environmental policies.

b) The specific measures to prevent and abate pollution towards the good environmental status of the Mediterranean:

752. Aquaculture. There are several strategies and guidelines developed by FAO to assist a sustainable growth for aquaculture sector, including the Ecosystem-based Approach to Fisheries and Aquaculture aiming to assist and set limits for aquaculture production given the environmental limits and social acceptability of sector. In this context it is recommended to apply the following key three principles of the FAO/GFCM strategy:

- Aquaculture development and management should take account the full range of ecosystem functions and services and should not threaten the sustained delivery of these to society;
- Aquaculture should improve human well-being and equity for all relevant stakeholders; and
- Aquaculture should be developed in the context of other sectors, policies and goals. In this regard, UNEP/MAP-MED POL is preparing a Regional Plan for Aquaculture Management for adoption by COP 23 advocating the below measures.

753. Nutrient reduction, of relevance to addressing several DPs, should follow a more cyclic approach to produce, use and treat nutrients in treatment plants, where recycling and reuse are enhanced instead of environmental discharge. This is true for nitrogen and in particular for phosphorus, which has finite reserves in the environment. Policy and regulatory instruments could include more strict regulation of nutrient removal from wastewater, mandatory nutrient management plans in agriculture, and enhanced regulation of manure.

754. Tourism and Coastal urbanization. Measures should focus on the improvement of waste treatment, sustainable management of coastal areas to reduce disruption of coastal ecosystems, investment in habitat conservation and restoration to provide ecosystem services, along with implementation of the ICZM tools. Sustainable tourism and urbanization require monitoring and decision-making feedback, improvement of communal infrastructure, environmental coastal spatial and marine spatial planning, as well as the optimal environmental impact assessments, carrying capacity, adaptation to impacts of climate changes, etc.

755. Industry. Measures should focus on the improvement of waste treatment and on upgrade of the industry to the use of BAT and BEP. In addition, resources should be used in the context of a circular economy, with the reduction, reuse and recycling of waste, and shifting towards the production and use of greener substances.

756. Agriculture. Responses to the impacts of agriculture are difficult to manage because of the diffusive i.e. non-point sources introduction of nutrients and agrochemicals into the marine environment. Responses should include the management of river runoffs, the reduction of the use of toxic and bio accumulative agrochemicals, the transition to greener fertilizers and biodegradable pesticides and organic farming.

757. Marine traffic and marine and port operations. The responses should focus on improving the technology of ships and ports operations and of ports infrastructure. Use of BAT and BEP to ensure effective onboard and port pollution control facilities, to prevent accidental discharges and spillages. Specifically, for marine traffic, the designation of restricted areas for anchorage and protection of

sensitive areas are encouraged. Implementation of the measures related to the designation of the Mediterranean Sea as a Sulphur emission control area (SECA) is expected to generate significant benefits in both pollution reduction and ecosystem protection. However, the introduction of exhaust gas cleaning systems EGCS – scrubbers on ships in the Mediterranean, as alternative abatement technology for air emission of Sulphur region, may generate a new stream of shipping liquid wastes, in which metals and PAH discharges dominate from ships, that is the chemical pollution transferred from air to marine waters.

Strengthen the science policy interface:

758. In order to improve the delivery of IMAP the following measures should guide addressing the gaps identified during the preparation of the 2023 MED QSR:

- a) Strengthen the use of unprecedented achievements in science and technology in order to ensure that the growing development demands and a healthy ocean co-exist in harmony by identifying the most relevant innovative knowledge and technologies that are of utmost importance for reliable and cost-effective monitoring and assessment of the state of Mediterranean Sea with a focus on:
 - i) Promotion of inter-disciplinary research aimed at understanding and prediction in the Mediterranean Sea;
 - ii) Mapping of all components of the Mediterranean marine environment, along with the anthropologic pressures across time scales;
 - iii) Application of observing and remote techniques to strengthen the IMAP-based monitoring practices and improve forecasts of the state of the marine environment;
 - iv) Application of holistic view within the “source-to-sea” framework to structure the assessment of the land-based pressures in conjunction with their impacts on the oceans.
- b) Enhance partnerships and support the transfer of ocean knowledge for science-based management, with a focus on strengthening:
 - i) The national capacities related to monitoring and data analysis;
 - ii) The use of the scientific networks to support the objectives of partnerships for the science-policy interface;
 - iii) The synergies for marine science in the Mediterranean.
 - iv)

Update the IMAP Pollution and Marine Litter Cluster:

759. The IMAP Pollution and Marine Litter Cluster needs to be updated to include the following:

- i) The achievements within the implementation of the IMAP initial phase, both regarding the monitoring and assessment practices and methodologies.
- ii) The revision of the list of common indicators and addressing the knowledge gaps as identified within the preparation of the assessments for the 2023 MED QSR.
- iii) The transition from the present five-year assessment cycle to the eight-year assessment cycle; such revised frequency of Mediterranean marine assessment should be guided by the current practice of most CPs which set their national programmes based on a 3 years cycle of data collection and reporting which is not in line with the present phase of IMAP implementation.
- iv) A multi-fold increase of the resources of the Secretariat, as well as the support to CPs’ capacity building within the implementation of the IMAP Pollution and Marine Litter.

The technical measures to address the common knowledge gaps

Increase the efficiency of IMAP implementation regarding Pollution and Marine Litter Cluster:

760. To increase the efficiency of the monitoring and assessment of the Mediterranean marine environment, the following specific actions need to be enforced:

- Advance integrated implementation of the National IMAPs pertaining to Pollution, Biodiversity and Coast and Hydrography Clusters, as well as the GES assessments at the regional/sub-regional level by applying the rules for integration of monitoring efforts within relevant monitoring units. For example, integration can be explored between EO9 and EO1. If based on monitoring of EO1, CI 2 – Condition of the habitat's typical species and communities, an effect on the benthic community is found, EO9, CI 17 can be useful to complement the findings, in terms of the identification of pressures. Conversely, if contamination is identified based on CI 17 monitoring, it could guide the selection of monitoring areas for the species and communities within EO1. Moreover, any impact on the infaunal community structure can be considered a biological effect and be integrated with EO9, CI18. The importance of the interrelation between seafood safety and quality i.e., EO9, CI 20 and the presence of microplastics in the marine environment i.e., EO10, CI 23 should be further pursued. In addition, there may be an interrelation between EO9, CI 13 and EO9, CI 21. Namely, the introduction of nutrients into the marine environment can be attributed to the marine discharge of untreated domestic waste, which in turn can introduce intestinal enterococci (IE) to the bathing waters.
- Pilot implementation of the Joint Monitoring Surveys within the specific sub-divisions, as appropriate, to increase equitable access to resources and balance in strengthening of human and technical capacities of the CPs. Pilot implementation of the Joint Monitoring Surveys should be strongly supported by detailed implementation plans.
- Support collaboration among the countries to promote a transfer of knowledge.

Improve IMAP IS database management:

761. IMAP-IS should be significantly improved. It should be restructured from the repository of data reported by the CPs into an advanced information system which supports integrated assessments and ensure the validation of uploaded data, first technically and then scientifically. It needs to provide a queryable database, with export formats (vertical and horizontal) for scientific evaluation and presentation, therefore allowing IMAP users and data evaluators to sort, retrieve and export data based on any available parameter of the metadata and data. The formats of the extracted data should be compatible, to the extent possible with other standard analysis methodologies and presentation/mapping tools.

762. Most importantly, the QA/QC mechanism of the IMAP IS needs to be significantly strengthened including operational and scientific quality control of data. The implementation of QC/QA controls and data flagging is necessary. The online tools supporting assessments should also be integrated into IMAP IS.

763. DDs and DSs should be updated, as appropriate, further to the experience built during the present IMAP cycle of data reporting and the preparation of the 2023 MED QSR Pollution and Marine Litter assessments.

764. It is also necessary to invest significant resources to ensure IMAP IS interoperability with national databases This has to be followed by significant improvement of data quality control and quality assurance at the national level.

Improve the GES assessment:

765. For further improvement of the integrated GES assessment of IMAP Pollution and Marine Litter Cluster, it is necessary to continue streamlining the assessment methodologies applied for the environmental status assessment for the Pollution and Marine Litter Cluster within the 2023 MED QSR. To that effect the following priority needs should be addressed:

- Revise/update the Spatial Assessment Units (SAUs) in close collaboration and in agreement with the CPs.
- Eliminate uneven presentation of the assessment findings in different areas of assessment, associated not only with an inhomogeneity of monitoring data both in terms of quality and quantity, but also with the lack of the present assessment methodologies in particular related to pending agreement on :
 - i) The size of the offshore areas of assessment, by considering for example presently applied guiding principle of demarcating IMAP offshore assessment units by the most distant monitoring station set by the CPs in the offshore (open) waters;
 - ii) The representativeness of the number of stations in the areas of assessment; for example, in large pristine areas, a low number of stations might be adequate in contrast to small areas with pressures where a higher number of stations might be needed.
- Expand the monitoring to include the deep-sea environment. Although IMAP already includes offshore areas, defined as areas more than 1 nautical miles (NM) distance from the coastline, monitoring of the offshore is rarely implemented, and when implemented, is of limited areal scope. Monitoring of offshore areas in the deep-sea is especially important when non-GES areas are identified, in order to trace the possible impact of pressures away from the coastline.
- Revise the use of data reported from different types of monitoring stations for assessments. For example, this action should address the use of data reported from a) reference and master monitoring stations located in i) marine and ii) transitional waters; b) (hot spot) monitoring stations located in the modified water bodies (e.g., ports), in order to define the rules for use of data reported from different types of monitoring stations. This needs to be followed by setting the rules for the classification of monitoring stations by considering the guiding principles presently applied within the initial phase of IMAP implementation.
- Apply additional assessment tools. In that context, remote sensing (e.g., for CI 14 and CI 21) and modelling tools should be standardized for future use. Remote sensing can strengthen monitoring practices and data acquisition nationally and sub-regionally. These observations can in turn be integrated into existing assessment methodologies not only to contribute to the assessment of the present status, but also to forecast the trends in the marine environment.
- Modelling tools are often specific to a given ecosystem and are difficult to standardize. Their use should be associated to relevant uncertainties and acknowledged gaps (e.g. for CI 13 and CI 14).

The technical measures specifically related to the knowledge gaps identified for IMAP Common Indicators of Ecological Objectives 5 and 9

766. In addition to the above policy and technical measures that are common at the level of IMAP Pollution and Marine Litter Cluster, the specific knowledge gaps were identified per individual Common Indicators and therefore the specific technical measures are proposed as provided here below.

Common Indicators 13 and 14

Improve the availability of the assessment criteria for CIs 13 and 14:

767. Upon setting the reference conditions and boundary values for DIN and TP in the Adriatic Sea Sub-region, actions need to be undertaken to improve the availability of the assessment criteria for nutrients in the AEL, the CEN and the WMS Sub-regions. To that purpose three continuous years of monitoring need to be provided with a minimum monthly frequency for Water types I and II and bimonthly to seasonal for Type III. It should also be noted that other supporting parameters (i.e., temperature, salinity and dissolved oxygen) need to be available for defining the water typology. Further update of the assessment criteria for CI 14 should be undertaken as appropriate. The specific knowledge needs to be also built regarding the use of statistical tools for data validation and calculation of the assessment criteria.

Improve the GES assessment:

768. Further to the above elaborated common measures, the GES assessment for CIs 13 & 14 needs to be also improved, including the use of the remote sensing and modelling tools to complement in situ monitoring and adding additional sub-indicator i.e., the satellite-derived Chla data for GES assessment.

Upgrade present policy measures:

769. For the development of the adaptive eutrophication management strategies, the following specific actions should also be undertaken:

- Extend the scope of research and monitoring programs to characterize the effects of eutrophication;
- Implement regulations to mitigate inputs of nutrient to the marine environment, such as standards, technology requirements, or pollution caps for various sectors.
- Preserve and restore natural ecosystems that capture and cycle nutrients.

Common Indicator 17

Update of Environmental Assessment Criteria (EACs):

770. In order to update EACs, the methodology, as detailed in the European Commission Guidance Document (2018) and in Long et al. (1995), should be considered. This entails the creation of a database of scientific literature which elaborates where adverse biological effects, or no effect, are presented in conjunction with chemical data, in the environment and biota, at the same site and time. Briefly, those include but are not limited to sediment toxicity tests, aquatic toxicity tests in conjunction with equilibrium partitioning (EqP) and field, and mesocosm studies. The literature would then be analysed by experts and conclusions drawn. Laboratory results on biomarkers (CI18) are also important for the derivation of the EAC values. The emphasis should be given to the Mediterranean Sea biota species.

Undertake regular updates of Sub-regional and regional Background Concentrations (BCs) and Background Assessment Criteria (BACs):

771. As more data will be submitted to IMAP IS, the Sub-regional and regional BCs should be updated. It is proposed to undertake their regular updates at least 2 years prior to the QSRs preparation. This will allow for sufficient time to analyse the data, detect data gaps and ensure the submission of missing data, to perform a more robust update of the criteria for reliable assessments.

772. The methodology for BACs calculation should be revised and updated. BACs are calculated from BCs by applying the multiplication factors. Due to the lack of Mediterranean data, UNEP/MAP adopted the pragmatic methodology used by OSPAR.¹³² Therefore, the precision of monitoring per CP should be calculated and used to set the multiplication factors specific for the Mediterranean.

Improve the GES assessment:

773. Revision of IMAP needs to support the improvement of the good environmental status assessment and contribute to a more robust analysis, and facilitate integration and aggregation of CI 17 with other CIs and EOs, by undertaking the following priority actions:

- Update list of priority pollutants. Measurements of known contaminants of concern, such as As and Cu, and emerging contaminants of concern, such as pharmaceuticals and flame retardants should be considered for inclusion in the IMAP Pollution monitoring. This process should follow the initial steps undertaken in 2019.¹³³ The updated List of Priority Contaminants could provide the basis for a prioritization of substances to be further included in the IMAP Guidance Factsheets related to Ecological Objective 9, and complement presently agreed mandatory or recommended substances for CIs 17 and 20. The decision on which contaminant to add should be based on pilot studies checking the probability of their presence in the Mediterranean Sea sub-regions.
- Extend the list of commonly agreed IMAP Pollution mandatory species. Species, other than species (*M. galloprovincialis* and *M. barbatus*) presently mandatory, should be added to the IMAP list. The species should be chosen based on their presence in the Sub-regions and their relevance as pollution indicators, which in turn will allow for an improved environmental assessment. Harmonization of the use of different species in different Sub-regions needs to be followed by setting the criteria (BCs and BACs) specific to each species.
- Utilize tools to perform Environmental Risk Analysis, to integrate chemical and biological data, as elaborated here-below for CI 18.
- Revise sediments' temporal monitoring requirements. For hot spot stations, the monitoring should remain every year or 2 years, while for other stations, the monitoring once or twice during the 6-year cycle should be considered.
- Harmonize national efforts regarding contaminants monitoring. As a minimum, it is necessary to ensure that every CP reports all mandatory parameters in mandatory matrixes, including the wet weight for mussels, LOD or LOQ values, the grain size of samples for sediments, and spatial and temporal monitoring requirements. The significant differences among the countries in terms of LOD and LOQ values, as well as differences among the areas of monitoring in the

¹³²OSPAR calculated the ratio between BAC and BC (the multiplication factor) from known parameters. The pragmatic approach used in order to have 90% probability of concluding that concentration is below provided for BAC, $BAC = BC \exp(3.18 CV)$, where CV is the precision of the monitoring program (per determinant and matrix). In the case of OSPAR, temporal monitoring data from the UK National Marine Monitoring Programme was considered.

¹³³ UNEP/MED WG.463/Inf.4. The List of Priority Contaminants under MAP/Barcelona Convention within the MED POL Monitoring Programme and IMAP have been revised according the latest lists of priority contaminants development in the EU region and internationally and shows no major changes compared to other RSCs.

same CP, need to be analyzed and drivers of the unsatisfactory analytical performance identified.

Common Indicator 18

Ensure the GES assessment for CI 18:

774. Revision of IMAP needs to support the good environmental status assessment for CI 18 and facilitate its integration and aggregation with other CIs and EOs, by undertaking the following priority actions:

- Review and update the list of CI 18 biomarkers, along with the monitoring species;
- Review and update, as appropriate, the assessment criteria as adopted by Decisions IG.22/7 (COP 19) and IG.23/6 (COP 20), as well as the assessment methodologies;
- Further to the initial work undertaken in 2021¹³⁴ towards the development of the Biomonitoring related to IMAP CI 18, the following further actions should be tested:
 - i) An application of new biomarkers should be explored to support the strengthening of CI 18 monitoring and assessment.
 - ii) Use of the Environmental Risk Analysis should be provided by combing the chemical and ecotoxicological data, to support the evaluation of the risk related to marine organisms exposed to contaminated waters and sediments. It should result in objective risk values which allow national and regional policymakers and environmental managers to decide on the actions to decrease marine contamination, or to remediate a polluted area.

Common Indicator 19

Improve quantity and quality of data for CI 19

- REMPEC to continue soliciting the submission of the report on incidents and spills from the Countries, underlining the importance to make use of the latest version of the Data Dictionary and Data Standard (DD&DS) prepared by REMPEC jointly with INFORAC and providing to any extent possible all the data required in DD&DS, including estimation of quantity and volume of oil or other substances released.
- The Countries to start collecting data on impacts on biota with reference to the above-mentioned updated version of DD&DS for CI 19.
- The UNEP/MAP – REMPEC to align the definition of the minimum threshold for reporting with the one used under other regional sea conventions and in the framework of MSFD.
- UNEP/MAP - REMPEC to continue to integrate newly available Lloyds data in MEDGIS-MAR database. UNEP/MAP - REMPEC to prepare a comprehensive, integrated database, considering also old data, based on these two databases, cross-checking and resolving data duplication and inconsistencies.
- UNEP/MAP - REMPEC to continue acquiring information and understanding about CleanSeaNet dataset and assessing the feasibility to integrate CleanSeaNet data for the Mediterranean in MEGIS-MAR.

Improve the GES assessment of CI 19

- The definition of "acute pollution events" is highly debated under the Marine Strategy Framework Directive and other Regional Sea Programmes and Agreements, in particular the Bonn agreement. It remains a complex issue for which consensus has yet to be reached.

¹³⁴ UNEP/MED WG.492/6

Additional work should be undertaken by UNEP/MAP - REMPEC and the Contracting Parties to define operational criteria for the identification of acute pollution events. An integrated and escalating approach should be adopted, considering, among others, factors like the spilled volume, the nature of the spilled product(s), the proximity and sensitivity of threatened areas and/or human activities, the environmental conditions (i.e. evidence of an environmental impact), and the need for response operations.

- Based on data collected on impacts on biota, UNEP/MAP - REMPEC and the Contracting Parties should work towards the definition of assessment criteria for CI 19 including biota as component, if possible, in coordination with other regional sea conventions.

Common Indicator 20

Ensure the GES assessment for CI 20:

775. A multidisciplinary approach will be needed to ensure GES assessment for CI 20 by undertaking the following priority actions:

- Agree on the maximal percentage of detected regulated contaminants exceeding regulatory limits in seafood, above which non-GES needs to be assigned to the area assessed;
- Incorporate the risk assessments to human health from consumption of seafood by calculating the estimated daily intake (EDI), the target hazard quotient (THQ), the total health risk (HI), and the cancer risk, among others;
- Incorporate into the overall evaluation the suite of contaminants analyzed, together with other factors such as synergy among contaminants, and temporal and spatial scales.
- Harmonize the choice of species among the CPs, whereby data from national reports on seafood safety and cooperation with national health authorities should be used to complement data reporting to IMAP IS;
- Examine and coordinate monitoring protocols, risk-based approaches, analytical testing, and assessment methodologies between the CPs; the national food safety authorities; research organisations and/or environmental agencies;
- Determine the applicability of CI 20 beyond food consumer protection and public health, although it intuitively reflects the health status of the marine environment in terms of delivery of benefits (e.g., fisheries industry).

Common Indicator 21

Improve the GES assessment for CI 21:

776. An optimal GES assessment for CI 21 needs to be strengthened by optimal data reporting which will ensure the confidence of the assessment. At least, 16 data points for 4 consecutive bathing seasons are needed for the application of the uniform assessment methodology across the Mediterranean; therefore, increasing the comparability and consistency of the assessment findings.

Candidate Common Indicators 26 & 27

Improve underwater noise data quality and availability

777. For the improvement of underwater noise data quality and availability, the following specific actions should be undertaken by the Parties:

778.

- A contribution should be provided to the ACCOBAMS regional register for impulsive noise sources, especially by sharing national data, along with the development of a cooperation mechanism to identify the source of long-distance underwater noise in order to address its long-distance effects;
- Reporting noise generating military activities is needed to provide an actual and precise assessment reflecting the real situation;
- An alternative approach needs to be tested by applying specific assessments for species and their habitats. For such an exercise, Important Marine Mammal Areas (IMMA) could be used as defined habitats.