



**Mediterranean
Action Plan**
Barcelona
Convention

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Meeting of the MED POL Focal Points

Videoconference, 27-28 May and 6-7 October 2021

- Agenda item 8: Cross-Cutting Issues - the Integration and Aggregation Rules for IMAP Ecological Objectives 5, 9 and 10 and Assessment Criteria for Contaminants, Nutrients and Marine Litter**
- a) Integration and Aggregation Rules for Monitoring and Assessment of IMAP Pollution and Marine Litter Cluster;**
 - b) Updated Baseline Values and Proposal for Threshold Values for IMAP Common Indicator 22;**
 - c) Background (Assessment) Concentrations (BC/BAC) for Common Indicator 17 and Upgraded Approach for Environmental Assessment Criteria (EAC) for IMAP Common Indicators 17, 18 and 20;**
 - d) Assessment Criteria Methodology for IMAP Common Indicator 13: Pilot Application in Adriatic Sub-region.**

The overview of the technical proposals provided by the Integrated Meetings of the Ecosystem Approach Correspondence Groups on IMAP Implementation and the Meeting of CorMon on Pollution Monitoring

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1 Introduction

1. In line with the Programme of Work 2020-2021 adopted by COP21 the MED POL Programme has prepared the Monitoring Guidelines related to IMAP Common Indicators 13, 14, 17 and 20 for consideration of the Integrated Meeting of the Ecosystem Approach Correspondence Groups on Monitoring (Videoconference, 1-3 December 2020).
2. The Monitoring Guidelines for IMAP Common Indicator 18, along with the Monitoring Guidelines related to data quality assurance and reporting have been prepared for consideration of the Meeting on CorMon on Pollution Monitoring (Videoconference, 26-28 April 2021).
3. In accordance with the Conclusions and Recommendations of the Integrated Meetings of the Ecosystem Approach Correspondence Groups on IMAP Implementation (1-3 December 2020), and in particular paragraph 22, this Meeting requested the Secretariat to amend the Monitoring Guidelines related to IMAP Common Indicators 13, 14 and 17, by addressing agreed technical proposals that were described in the Report of the Meeting in line with its agreement to proceed with submission of these documents to the Meeting of MEDPOL Focal Points. Requested amendments included technical written suggestions provided by several Contracting Parties up to 10 days after the Integrated Meeting of CORMONs, as presented in Table 1. The amended documents were shared by the Secretariat on 19 February 2021 for a period of 2 weeks for the non-objection by the Integrated Meetings of CORMONs on the introduced changes. Further to no objection from the Integrated Meeting of CORMONs, these Monitoring Guidelines are submitted for consideration of the present Meeting of MEDPOL Focal Points.
4. The Monitoring Guidelines related IMAP Common Indicator 18, along with the Monitoring Guidelines related to data quality assurance and reporting, were reviewed by the Meeting of CorMon on Pollution Monitoring (26-28 April 2021) for consideration of the Meeting of MEDPOL Focal Points. Further to the conclusion of the Meeting of CorMon on Pollution Monitoring, the revised documents contain the changes introduced to address the technical proposals provided by several Contracting Parties, as presented in Tables 2-6. The changes introduced are marked in track mode in the Meeting documents UNEP/MED UNEP/MED WG.509/27; UNEP/MED WG.509/28; UNEP/MED WG.509/29; UNEP/MED WG.509/32 and UNEP/MED WG.509/33.

2 Tabular overviews of the technical proposals provided by the Meetings of the Integrated Meetings of the Ecosystem Approach Correspondence Groups on IMAP Implementation and CorMon on Pollution Monitoring

5. Technical proposals provided by the Integrated Meetings of CORMONs and related responses of the Secretariat – MEDPOL are presented in Table 1.

6. Technical proposals provided by the Meeting of CorMon on Pollution Monitoring and related responses of the Secretariat – MEDPOL are presented in Tables 2-6.

Table 1: Technical proposals provided by the Integrated Meetings of CORMONs on the Meeting documents: UNEP/MED WG. 482/5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18

INTEGRATED MEETINGS OF THE ECOSYSTEM APPROACH CORRESPONDENCE GROUPS ON IMAP IMPLEMENTATION (CORMONS) VIDEOCONFERENCE, 1-3 DECEMBER 2020 PARALLEL CORMON SESSION FOR POLLUTION		
Meeting documents: UNEP/MED WG. 482/5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18		
REQUESTS/PROPOSALS OF THE PARTICIPANTS PROVIDED DURING THE MEETING		
NAME OF CP AND REPRESENTATIVE OF CP PROVIDING THE PROPOSALS	PROPOSALS/REQUESTS OF CPs	RESPONSES OF THE SECRETARIAT/POINTS AGREED AT THE MEETING
Croatia. P. Tutman	WD 482/5, 6, 7, 8, 9, 10 Preparation of different reference stock solutions for analysis of Nitrite, nitrates, silica. It was requested to elaborate use of device manual for on board determination of ammonia that was not included in document. Written detail comment will be provided after the meeting	The comments are general; they will be addressed upon receiving written comments. The use of manual method for ammonia on board as suggested can be accepted only for the laboratories that analyses nutrients on board. The changes in analytical strategy will be addressed when more detailed comments will be provided as stated by the country representative.
France, Tunisia, Turkey, Israel	WD 482/5, 6, 7, 8, 9, 10 Provide positive feedback on the content of document, explaining that after the meeting eventual additional comments may be shared pending clearance from monitoring experts.	Written comments that will be received until 11 December will be taken into consideration.
France. E.Thiesse	WD 482/11, 12, 13, 14, 15, 16, 17, 18 It is recommended to combine and not to separate sampling form analysis Guidelines	It was decided to follow this structure for the preparation of the Guidelines, since UNEP/MAP rules request a maximum page number of 16 per each working document. However, once the Guidelines are adopted by the Contracting Parties, they will be merged in one document per Common Indicator, bringing together sampling and analysis Guidelines.

France. E.Thiesse	WD 482/14, 16 and 18 More methods could be provided to the IMAP labs with more details (e.g. HELCOM or OSAPR have much more detailed methods in their guidelines).	IMAP guidelines are not mandatory procedures but an assistance to Mediterranean laboratories to implement the pollution monitoring programme. Several equally acceptable procedures are presented in the Guidelines, which were drafted by IAEA, OSPAR, HELCOM and US EPA. Laboratory are encouraged to develop their own analytical methodologies based on the guidelines, assuring appropriate data quality. However, following this request more methods respectively protocols are provided during a review of monitoring guidelines and protocols.
Spain. V.M. Leon	WD 482/12 Total Organic Carbon (TOC) can be interesting to characterize the nature of sediments but it is not useful for normalization purposes for organic contaminants. The TOC normalization is adequate if a good correlation exists between the organic contaminant concentration and TOC. This is correct in localized survey areas but not in areas with different characteristics, being more relevant the distance of PAHs sources than the sediment nature. In fact, in a recent study developed in 11 different coastal areas (León et al., 2014) statistically significant positive correlation between PAHs and TOC was only found in 5 of them. No correlation between PAHs and TOC was also observed in other Mediterranean (El Nemr et al., 2002; Martínez-Lladó et al., 2007) and Atlantic areas (Viñas et al., 2010). The low correlation between PAHs concentrations and TOC in coastal sediments in comparison to offshore ones has been attributed to their higher heterogeneity (Viñas et al., 2010). Consequently the normalization is not useful for Spanish Mediterranean areas. On other hand the Environmental Assessment Criteria (EAC) for sediments proposed in OSPAR for organic pollutants such as PCBs or PAHs are normalized to 2.5% of TOC before comparing to	As rightly mentioned, normalization can only be undertaken if a good correlation exists between the organic contaminant concentrations and TOC. Therefore, if such a condition is not reached, normalization cannot provide useful results. Understanding this restrictions, normalization of organic contaminants to TOC in sediments is not a mandatory parameter to be reported in the framework of IMAP, but is to the Party to decide if such an exercise is useful in assisting pollution detection in a specific area. However, it is useful to include normalization procedures in the Guidelines, making clear that the method should be tested before being applied, using sufficient data from the area under investigation. To address the concerns of Spain, a clarification will be included in relevant Guidelines on the prerequisites for applying normalization to TOC.

	assessment criteria. This normalization used in the North Sea is not applicable to sediments from the Mediterranean Sea and the Iberian area. In marine sediments collected from the Mediterranean Spanish coast mean values of TOC are around 0.5 %. In these areas with low TOC content, pollutant concentrations and sediment toxicity can be ‘artificially’ increased applying the normalization.	
Spain. V.M. Leon	WD 482/14 Normalization using lipid contents requires linear correlation between the concentration of contaminant and the lipid content, but this is not the case of PAHs. It can be useful for specific areas with similar oceanographic conditions and/or for contaminants with a predominant diffuse input in the marine environment (i.e.: biphenyl polychlorinated), but not to compare areas subjected to different exposition to pollutants, food availability, etc. In fact, the concentration of PAHs in mussels along the Spanish Mediterranean coast is not correlated with lipid content (León et al., 2013). Other factors such as the proximity of pollution sources are more relevant for PAHs, as it has been stated in this study. Food availability is different in coastal areas with upwelling and/or nutrient inputs (i.e.: South-Western Mediterranean Sea) than typical oligotrophic areas in the Mediterranean Sea (North-Western Sea).	The comment is valid, as well as the pre-requisites in order to proceed to a normalization exercise. As it was mentioned previously, normalization of organic contaminants in biota to the lipid content is not a mandatory parameter to be reported in the framework of IMAP, but is to the Party to decide if such an exercise is useful in assisting pollution detection in a specific area. However, it is useful to include normalization procedures in the Guidelines, making clear that the method should be tested before being applied, using sufficient data from the area under investigation. To address the concerns of Spain, a clarification will be included in relevant Guidelines on the prerequisites for applying normalization to lipid content.
Italy. N. Calace	WD 482/12 and WD 482/14 In our opinion the TOC in sediments and the lipid content in biota must be analysed as a mandatory parameter in order to evaluate the capability of matrix to bind organic contaminants. Moreover, in the case of sediments the total organic carbon allows to predict the potential risk to bound contaminant mobilization.	The analysis of TOC and lipid content is suggested to be undertaken by the IMAP laboratories as an additional parameter given normalization of organic contaminants to TOC in sediments is not a mandatory parameter to be reported in the framework of IMAP. However, Parties may decide to use or not to use the data for normalization purposes, according to the specificities for their marine areas.

Italy. D. Berto	WD 482/18 For foodstuff analysis additional PAHs should be included (benzo(a)pyrene, benzo(a)anthracene, benzo(b) fluoranthene, and chrysene.	This is valid comment. The Commission Regulation 836/2011 amended the Regulation 333/2007 including PAHs as the sum of benzo(a)pyrene, benzo(a)anthracene, benzo(b) fluoranthene, and chrysene. Guideline is amended accordingly.
Italy. D. Berto	WD 482/12 As a normalizing element Fe could also be used	Several elements have been used as normalizing factors, including Al, Li, Sc and Fe, as long as they can be used as a proxy for the fine grained and metal rich sediment fraction. Al was selected because it is the most widely used normalizer and because of its strong relationship with the fine-grained and metal-rich aluminosilicates.
Italy. D. Berto	WD 482/17 Methods for foodstuff sampling and analysis are also presented in Commission Regulation (EC) No 333/2007 of 28 March 2007 (trace elements and PAHs) and Commission Regulation (EU) 644/2017 for dioxins, dioxin-like PCBs and non-dioxin-like PCBs	This is correct and references are made to these Commission Regulations No 333/2007 and No 644/2017/644 in WD 482/17 and 482/18. The sampling methods are similar to the methods presented in Commission Regulation 1881/2006. Of course, amendments to the Regulations are made from time to time, therefore laboratories have to keep their methodologies updated.
Italy. D. Berto	WD 482/17 The area of origin of seafood (i.e. the FAO fishing area coding system) should be reported (origFishAreaCode)	This is a very valid comment. The FAO fishing area code should be included in the Reporting Template for CI20. The amendment is provided in para 11 of WD 482/17.
Israel, Dror Zurel	The documents are very professionally prepared. Given present unavailability of monitoring scientists, Israel will provide comments, if needed, after the meeting.	Written comments that will be received until 11 December will be taken into consideration.
Turkey, H.SELAMOĞLU ÇAĞLAYAN	Ask for integration of good laboratory practices/QA/QC into protocols to support accreditation of the laboratories.	The main levels of QA both at the level of IMAP Info System and at national level, are discussed and agreed by the CorMon on Pollution monitoring, April 2019. During current biennium MEDPOL continues, the further actions have been undertaken to support strengthening of QA and QC capacities at national level, by preparing monitoring guidelines and protocols for EO5 and EO9 related to analytical process: sampling and sample preservation; sample preparation and analysis; data reporting and QA; the later will be presented for consideration of CorMon on Pollution Monitoring in 2021, whilst another 14 documents are submitted for discussion during present CorMon Pollution session. Monitoring guidelines/ protocols guide countries how to improve their practice, ensuring harmonized approach as much as possible over Mediterranean.

		However, countries are invited to test and verify all recommended in the scope of their work. Written comments that will be received until 11 December will be taken into consideration.
Montenegro, Ivana Stojanovic, Ivana Bulatovic, Danijela Sukovic	Prepared documents are very useful for practical implementation of IMAP. They will be reviewed in order to adapt present practice to suggested methods.	
Tunisia, Ines Hourabi Ben Salah	After the constitution of the national committee for implementation of IMAP, all the docs will be reviewed by the experts.	Written comments that will be received until 11 December will be taken into consideration.
WRITTEN COMMENTS OF THE PARTICIPANTS PROVIDED AFTER THE MEETING		
NAME OF CP PROVIDING PROPOSAL	PROPOSALS/REQUESTS OF CPS	RESPONSES OF THE SECRETARIAT/POINTS ADDRESSED/EXPLANATIONS
1. France	General comments for all Documents Need to reorganize technical guidelines to the concise and precise methodological documents – should be done to all documents 11/12/13/14 /15 and 16 Separation of sampling from analysis in separate document should be avoided that is doc11 should be merged with 12, doc 13 with 14 and doc 15 with 16... Furthermore it is better to join sampling/analysis and determinants – that is guideline is given for instance for the “Mercury in Biota samples”, “Metals in biota samples”, “PAH in biota samples” “PCBs in biota samples” etc.	The structure followed in the preparation of the Guidelines is in line with the indicator analysis method proposed in the document UNEP/MED WG.467/5/2019, “Updated IMAP Guidance Factsheets for Common Indicators”, which was presented during the CORMON meeting on 08/08/2019. The indicator definition proposes to measure the concentration of key contaminants in different matrices (biota, sediment, seawater). In line with this structure the Guidelines were prepared per matrix. Presentation of sampling and analysis in different Guidelines was decided because of the UNEP/MAP rules requesting a maximum page number of 16 per each Working Document. However, once the Guidelines are adopted by the Contracting Parties, they will be merged in one document per indicator, bringing together sampling and analysis Guidelines, as requested.
2. France	General comments for all Documents The references made to OSPAR documents do not seem to refer to the latest version of the CEMP	Reference made to OSPAR CEMP document has been addressed by referring to the latest version of CEMP documents for sediments and biota sampling, along with analysis (revision 2018).

	documents (reference to the 2002-16 document, but revision made in 2018 at least). More generally the question is on how to harmonize RSCs technical guidelines – these monitoring methods should be similar for OSPAR, HELCOM and Barcelona and common documents could be agreed.	Harmonization of analytical methodologies is common task for RSCs. MAP/Barcelona Convention provided its contribution by integrating the best available practices of OSPAR and HELCOM, as appropriate, in present Guidelines/Protocols. We look for further progress regarding harmonization of the procedures, counting on leading role of Parties, and with understanding that it cannot be completely achieved between regions, countries and laboratories, which are using different analytical equipment and applying different analytical methods. The aim of the Guidelines prepared from MAP is to assist Mediterranean laboratories to achieve a comparable level of good Data Quality, therefore important issues on sampling, sample preservation, pretreatment and analysis are presented. Procedures proposed by OSPAR, HELCOM and US EPA are considered, as well reference is made to useful international scientific literature.
3. France	UNEP/MED WD.482/6 Hydrographic Physical Parameters Température Page 6 (ou 10 du pdf) Attention à l'utilisation des mots : 'Precision' et 'accuracy'. On ne peut pas avoir une exactitude 100 fois plus faible que la fidélité des mesures. Cela n'a pas de sens. De même, on ne peut pas étalonner un thermomètre à 0,0001 °C. Ça correspond plus à la résolution ou à la répétabilité pour les meilleures sondes. La même erreur est faite pour les autres grandeurs. Paragraphe 2.2 thermomètres à mercure : L'utilisation du mercure est interdite sauf cas exceptionnel. Page 8 (ou 12 en pdf) Dans l'équation donnant la correction « c », on additionne un volume et une température : il manque une constante entre les 2. Par ailleurs, dans l'équation de « c » il y a une autre erreur: on additionne un coefficient d'expansion	The comment related to temperature has been accepted and related modification has been included in the Working document (UNEP/WD.482/6). The comment related to thermometer in paragraph 2.2 has been accepted and related modification has been included in the Working document (UNEP/WD.482/6). The comment indicated at page 8 has been accepted and related modification has been included in the Working documents(UNEP/WD.482/6).

	thermique avec des températures et un volume.... Ce n'est pas possible.	
4. France	UNEP/MED WG.482/10 Protocoles de surveillance pour la détermination de la concentration de la chlorophylle a dans les eaux marines Pour la chlorophylle-a, 3 protocoles différents sont détaillés pour des mesures via fluorimétrie, spectrométrie, HPLC. Il n'est pas fait mention d'exercices d'inter-calibration pour vérifier si ces méthodes peuvent être utilisées simultanément dans le même programme de surveillance en méditerranée ? Page 8 - paragraphe c – procedure et note 16. « The filter, stored in pure acetone, must be triturated and homogenized for a maximum of 2 min by carefully rinsing the pestle of the homogenizer several times” Nous proposerions les corrections suivantes : "The filters are note always stored in acetone. After filtration, filters are either often frozen in liquid nitrogen (after being wrapped in cryotubes) and transferred at minus 80°C until analyses or directly placed in the freezer at minus 80°C. For pigment extraction, frozen filters are directly,	The comment related to chl-a has been considered; accordingly a short paragraph is written on the comparability of the methods and suggestion made on the simultaneous use of the methods in the same programs in Med. Region. The comment related to use of filter at page 8 was accepted; Accordingly, rewritten paragraphs is integrated in the text.
5. Croatia	UNEP/MED WG.482/10 The modifications for NITRITES, NITRATES, ORTHOSILICATES are according to recommended procedure methods of the device, Auto Analyzer 3: SEAL Analytical Manual /Silicate	Suggestions of Croatia are welcomed; however, these details cannot be inserted into Protocol; if all details related to specific instrumentation used by specific laboratory, then instrumentation methods of many laboratories in Med need to be addressed. Instead the protocol provided the common elements of the methods which than can be adjusted to specific practice of each laboratory.

	in water and seawater (Method No. G-173-96 Rev.8). /Nitrite in water and seawater (Method No. G-173-96 Rev.9); /Nitrate/nitrite in water and seawater (Method No. G-173-96 Rev.10). Furthermore, for the determination of the orthophosphate and ammonia we apply manual colorimetric determination (on board). In relation to the document, modifications in preparation of reagents and stock solutions as well as in wavelengths, are applied according to Parsons T. R, Maita Y., Lalli C.R 1984 (A Manual of Chemical & Biological Methods for Seawater Analysis). Standard solutions are also modified according to previously determined concentrations obtained during long term investigations at the Adriatic Sea area (Croatia).	Regarding the comment of Croatia, the text is further elaborated. The multiplicity of methods reported in the literature is more related to the optimization of methods for different environments. In the Protocols dedicated to the individual methods, some specific aspects are mentioned. On the general principles of SFA systems, in addition to the documentation provided by the manufacturers to the classic textbooks of Strickland and Parsons (1965) and Grasshoff et al. (1999) can be referred. Equally, numerous technical reports of the various laboratories are produced to homogenize the methods within international programs like JGOFS or WOCE. In the Protocols only the most essential indication on the most frequently used method are provided. Important notes on the critical parts of the methods for its successful performance is also indicated. Regarding the use of tailored standard solution according to previously determined concentrations obtained during long term investigations at the Adriatic Sea area (Croatia), it should be noted that they are used for a specific area of the Adriatic. It is complicated to address suggested details due to the differences encountered around the Mediterranean; therefore, it is not advisable to specify the concrete cases in the Protocol, such as the case of east Adriatic ranges. In the automated method finding related to the standard solution is already included: <i>“The concentration of the standards is chosen based on the amount of xxx salt expected to be found covering the entire range of expected concentrations”</i>. Regarding the manual methods the prepared standard solutions are the mostly used.
6. Croatia	UNEP/MED WG.482/8 Ad 2. Technical note for determination of concentration of NITRITE d. Preparation of stock solutions: f. Analytical procedure: Standard solutions are modified according to previously determined concentrations obtained during long term investigations at the Adriatic Sea	The previous comment also addresses the suggestions provided for UNEP/MAP WG.482/8. The comment related to proficiency testing will be considered in a separate QA guideline/protocol that is in the preparation for consideration of the CorMon on Pollution Monitoring foreseen in April 2021.

	area (Middle and south Adriatic) (0.10 – 1.0 $\mu\text{mol/L}$). Ad 2.2. Protocol for automated colorimetric determination of concentration of nitrite The modifications in reagents and analytical procedure are according to recommended procedure methods of the Auto Analyzer 3: SEAL Analytical Manual. /Nitrite in water and seawater (Method No. G-173-96 Rev.9). Ad 3.2. Technical note for determination of concentration of NITRATE The same as for nitrites; The modifications are according to recommended procedure methods of the Auto Analyzer 3: SEAL Analytical Manual. /Nitrate/nitrite in water and seawater (Method No. G-173-96 Rev.10). Standard solutions are modified according to previously determined concentrations obtained during long term investigations at the Adriatic Sea area (Middle and south Adriatic) (1 – 10.0 $\mu\text{mol/L}$) (river mouths 1-20) Proficiency testing Quasimeme Laboratory Performance studies is conducted for those nutrients. Ad 4. Technical note for determination of concentration of AMMONIA In relation to the document, modifications in preparation of reagents and stock solutions are applied according to: Parsons T. R, Maita Y., Lalli C.R 1984 (A Manual of Chemical & Biological Methods for Seawater Analysis) - Wavelength: 635 nm	
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	- For the range of concentrations: 0.03-5 µmol/L Standard solutions are modified according to previously determined concentrations obtained during long term investigations at the Adriatic Sea area (Middle and south Adriatic) (0.5 – 10 µmol/L) Proficiency testing Quasimeme Laboratory Performance Studies are conducted for those nutrients. 4. Technical note for the combined determination of concentration of total nitrogen and total phosphorous 4.2. Protocol for combined manual colorimetric determination of concentration of total nitrogen and total phosphorous In relations to document, modifications that are applied are according to recommended procedure methods of the Auto Analyzer 3: SEAL Analytical Manual /Total P in persulfate (Method No. G-173-96 Rev.13). Standard solutions for TN are modified according to previously determined concentrations obtained during long term investigations at the Adriatic Sea area (Croatia) (1 – 20 µmol/L). Standard solutions for TP are modified according to previously determined concentrations obtained during long term investigations at the Adriatic Sea area (Croatia) (0,12 – 1.2 µmol/L).	
7.	UNEP/MED WG.482/9 2. Technical note for the determination of concentration of ORTHOPHOSPHATE	The previous comment related to UNEP/MAP WG.482/6 also addresses the suggestions provided for UNEP/MAP WG.482/9.

	2.1. Protocol for manual colorimetric determination of concentration of orthophosphate In relation to the document, modifications in preparation of reagents and stock solutions are applied according to Parsons T. R, Maita Y., Lalli C.R 1984 (A Manual of Chemical & Biological Methods for Seawater Analysis) - 885 nm wavelength - For the range of concentrations: 0.03-5 µmol/L Standard solutions are modified according to previously determined concentrations obtained during long term investigations at the Adriatic Sea area (Croatia) (0.12 – 1.2 µmol/L). Proficiency testing Quasimeme Laboratory Performance Studies is conducted for those nutrients. 3.2. Protocol for automated colorimetric determination of concentration of ORTHOSILICATE In relation to the document, modifications in preparation of reagents and stock solutions are applied. The modifications are according to recommended procedure methods of the Auto Analyzer 3: SEAL Analytical Manual /Silicate in water and seawater (Method No. G-173-96 Rev.8).	The comment related to proficiency testing by applying the Quasimeme Laboratory Performance Studies will be considered in a separate QA guideline/protocol that is in the preparation for consideration of the CorMon on Pollution Monitoring foreseen in April 2021.
8. France	UNEP/MED WG.482/11 • Sediment sampling methods for metals and organic should be separated... • The revisions may also be done according to the most recent CEMP guidelines... • The question of freeze drying need more technical consideration and discussion;	• Separation between metals and organic contaminants analysis was done within the text of the Guideline, because many of the sampling steps are identical for both contaminants. • Revisions were done according to the 2018 CEPMP update. • Freeze drying procedures were updated providing additional technical details.

	• Use of glass containers for samples for metal analysis can also be questioned	• Use of glass containers for samples for metal analysis is proposed by both OSPAR and HELCOM.
9. France	UNEP/MED WG.482/12 Annex V: Normalisation of metals: is a pivot value derived in Med?	Mediterranean Sea has a very diverse sediment mineralogy and the granulometry of the monitoring sampling sites (shallow coastal areas and offshore sites) is also adding to the diversity of the samples. With available data no common pivot value for normalization is proposed. The implementation of IMAP by Mediterranean laboratories will generate adequate data to better tackle this very important issue.
10. France	UNEP/MED WG.482/12 The normalization for metals and also for organic compounds should be clearly explained	Normalization for metals is presented in detail and a very instructive OSPAR document is presented as Annex. Normalization for organic contaminants is also presented in detail; However, there was certain reservation expressed from Spain on the usefulness of this method based on the results of several studies in the Mediterranean coast of Spain that was addressed on documents as explained above (see responses to comments provided during the Meeting). It has to be mentioned that normalization of organic contaminants to TOC in sediments is not a mandatory parameter to be reported in the framework of IMAP. However, it is useful to measure TOC in sediment and check if normalization of organic contaminants generates information on pollution patterns in the area under investigation.
11. France	UNEP/MED WG.482/12 There is no clear recommendation for sediment sub-sampling for auxiliary parameter determination and related methods : grain size determination, organic carbon, Al, Li etc	The recommendation for sediment sub-sampling for auxiliary parameters determination has been more clearly presented in revised document. The analytical method for grain size determination is presented the Guideline 482/11, paragraphs 70-75. The analytical method for organic carbon is presented in the Guideline 482/12 paragraphs 80-82. Al and Li analysis are not specifically mentioned but it is part of the methods for the analysis of heavy metals as presented Guideline 482/12.
12. France	UNEP/MED WG.482/13 As above, sampling for metals and organic contaminants should be separated	Explanation is provided in comment 3.
13. France	UNEP/MED WG.482/13 Page 9. Point 48: “Under these conditions, samples may be archived and stored for 10-15 years. (EC, 2010).” => why is this limit of 10-15 years ? Note that the ROCCH sample bank is more than 40 years and very useful to perform retrospective analysis.	The Guideline adopted the storage conditions as provided by European Commission (2010). Contracting Parties may decide to change the time limit for storage (with appropriate storage conditions).

14. France	UNEP/MED WG.482/13 In this document 482/13 annexes are giving a number of analytical method – i.e. doc /14	Thank you. The editorial mistake is corrected.
15. France	UNEP/MED WG.482/14 Point 66 and 67: clarify the recommendation regarding normalisation, for fish and shellfish depending on the contaminant. Some propositions have been made at the last MIME/OSPAR (23-27 Nov 2020).	Recommendations were made based on European Commission and EFSA Documents. The propositions made by MIME/OSPAR meeting of 23-27 November 2020 were not available during the preparation of the Guidelines.
16. France	UNEP/MED WG.482/14 In this document, annexes are giving a number of assessment methods. This is confusing and not right place.	The Background Assessment Criteria which are recommended to be used to assess concentrations in Mediterranean sediments, mussel (<i>Mytilus galloprovincialis</i>) and fish (<i>Mullus barbatus</i>) presented in Annex XII are taken from COP Decisions on IMAPs and QSR since they should be kept in mind when analysis of monitoring data is undertaken.
17. France	UNEP/MED WG.482/14 More generally, many annexes are outdated and not useful; the compilation of old methodologies may be presented elsewhere?	An effort was made to update methodologies, where appropriate. However, in the Annexes are presented different valid analytical methods proposed by IAEA, HELCOM COMBINE Programme, OSPAR CEMP and US EPA, which cannot be categorized as “old methodologies”. Of course, more recently developed methods have been used in many laboratories, which is a very good development. However, the methods presented are very useful to many Mediterranean laboratories which are not yet all equipped with state of the art analytical equipment.
18. France	UNEP/MED WG.482/15 Seawater sampling and analysis of metals and organic contaminants may be conducted only by specialized laboratories; it is good to have such document and references for the Mediterranean labs	This is a very valid comment. Having that in mind related guideline/protocols were prepared. For that purpose it is written in the Guideline (paragraph 1) “Therefore, if a country decides to implement a seawater monitoring programme, it has to develop and test a very strict sampling and preservation protocol, using appropriate equipment and shipping infrastructure. Also, laboratory facilities should be adapted accordingly for the quality assured analysis of ultra-low contaminant’s concentrations in seawater samples.”
19. France	UNEP/MED WG.482/15 The passive sampling is missing	The sampling methodologies for seawater were mainly based on the GEOTRACES (2017), ICES/OSPAR (2012) and HELCOM COMBINE (2012) relevant documents. Because of the very low concentrations of contaminants in seawater large volumes of seawater have to be collected and processed. Therefore, seawater is usually collected with appropriate

		samplers (such as GO FLO) or with in situ pumping (from the ship or using a submersible water pump).
20. France	UNEP/MED WG.482/16 The filtration and the determination of dissolved and particulate contaminants should be recommended. The whole water sample analysis is not right protocol.	Filtration of seawater is presented in detail and it is the preferable pretreatment procedure for the analysis of seawater (filtrate and SPM). However, both ICES/OSPAR and HELCOM present as an alternative the use of unfiltered seawater ("The need for filtration of samples is mainly determined by the monitoring programme which typically will specify the analysis of either filtered or unfiltered water" ICES/OSPAR 2012). The alternative of using unfiltered seawater was included in the Guideline.
21. France	UNEP/MED WG.482/17 Page 1 – 2 <i>« However, in order to attempt providing a comparison between CI20 and CIs 17 and 18, it is advisable to include the above mentioned sentinel species in the monitoring programme for CI20. »</i> Is it to compare or rather to merge/pool sampling plans to evaluate these indicators? A simple comparison would probably generate a high cost for a relatively low level of information.	The idea is to compare data received from the same marine area, especially for CI17 and CI18. However, sampling for CI20 is done on a much broader scale than sampling for CI17, since it includes fishing fleets, fish landing harbors and fish markets, which cannot be directly related to sampling for CI17. Furthermore, sampling for CI17 is limited to <i>Mullus barbatus</i> and <i>Mytilus galloprovincialis</i> (mandatory), while sampling for CI20 is extended to a great variety of commercial species. Therefore, merging sampling plans seems unpractical. Of course, each Contracting Party will draw a sampling plan in such a way as to reduce cost, where possible.
22. France	UNEP/MED WG.482/17 Page 1 – 4 <i>« only edible tissues of seafood are to be selected for analysis (the flesh of fish, the whole body of bivalves, the mantle and tentacles of cephalopods and the tail meat without the cehalothorax of crustaceans»</i> Even though crabs are seldom found/eaten in the Mediterranean sea, I am not sure it is so straightforward for crustaceans. The flesh found in the thorax of crabs can be eaten. White and brown flesh have very different contamination levels and this could lead to the underestimation of contamination levels.	This is a matter of discussion. For crabs this recommendation is made by the US EPA. However, if the future decision of the Parties would recommend use of the flesh in the thorax of the crabs, this change could be accepted.
23. France	UNEP/MED WG.482/17 Page 4 – 15	The inclusion of dioxins and dioxin-like PCBs as mandatory contaminants for CI20 has not been agreed by the Contracting Parties, therefore the mentioned paragraph reflects this fact. However, if future decision of the

	« <i>Dioxins and dioxinlike PCBs, which are included in the list of EC regulated contaminants for seafood monitoring, are not yet included in the list of IMAP mandatory contaminants for CI20.</i> » Why is that? Because of the technical requirements for analysis or a lower safety concern? Should be made explicit in the text.	Parties would recommend inclusion of these contaminants in the list of mandatory contaminants for CI20 (as is the case for the EC Regulations on seafood safety), this paragraph could be omitted in some future revision of this document.
24. France	UNEP/MED WG.482/17 Page 4 – 18 «<i>The aggregate sample shall be at least 1 kg except where it is not possible e.g. when the sample consists of 1 package or unit.</i> » Seems very unrealistic/unnecessary for contaminant analysis. Where does this figure (1kg) come from?	It comes from the European Commission Regulations (EC) No 333/2007 and (EC) No 836/2011.
25. France	UNEP/MED WG.482/17 Page 5 – 24 & 25 This seems unrealistic unless we consider we would/should analyse organic and metallic contaminants on different samples. This would imply to have sampling plans for both types of contaminants and potentially sample twice for CIs 17/18 and CI20. This amounts to a lot. Could we not list other materials (e.g. glass containers) that could be used to minimize contamination and enable sample pooling	Samples for CI17, CI18 and CI 20 should be taken from different individuals and cannot be pooled together. In order to avoid contamination from the environment and the handling of samples, different specimens have to be used for metal and for organic contaminants analysis. It is not a matter of containers only (they could be made of glass) but also of the subsequent handling (dissection bench and tools) in order to avoid cross contamination.
26. France	UNEP/MED WG.482/17 Page 6 – 34 « <i>In all procedures, the method requires the removal of the epidermis and the collection of a sample from the dorso-lateral muscle in order to ensure uniformity of samples (Figure 1).</i> » Again, I would be more cautious as fish skin is often consumed. Not sure what the consequences of skin removal are in terms of contamination?	It is true that skin of some commercial fish is often consumed. In other cases, whole fish could be consumed (such as anchovies). For that reason, Regulation (EC) 1881/2006 states (note 25) “Where fish are intended to be eaten as a whole, the maximum level shall apply to the whole fish”. In order to standardize the method of dissection, which will be used for most fish species, it is suggested to remove the skin including the scales of the fish, as it is also recommended for pollution monitoring (OSPAR, HELCOM and IMAP Guidelines). If the removal of the skin is done with appropriate tools no contamination will happen.

27. France	UNEP/MED WG.482/17 « <i>Collected bivalves that are alive should be left to void the gut contents and any associated contaminants</i> » I am not sure this is commonly done for oysters / mussels before commercialization unless they are contaminated with bacterial pathogens. Conditions should mimic what the consumer is exposed to.	EU Regulations require purification of bivalves before marketing but do not prescribe any minimum purification time. For example, in the UK a minimum recommended period of 42 hours is used, but no information was readily available on the relevant legislation in the Mediterranean countries. This is an issue requiring further investigation.
28. France	UNEP/MED WG.482/17 Page 8 -42 Cf. comment above. As crabs are not the most consumed crustaceans, this is not that critical but it would be worth mentioning a common methodology to follow.	As previously noted, if the future decision of Parties would recommend use of the flesh in the thorax of the crabs, this change could be accepted.
29. France	UNEP/MED WG.482/17 Page 9 -44 Ink of cephalopods is often consumed. Not sure the ink sac should be removed and discarded...	This is valid comment. However, ink sac is often damaged during handling at market places and, furthermore, it is a difficult matrix to be dissected and handled. Although it is often consumed along the rest of the cephalopod, it is proposed to be discarded and not being analyzed.
30. Spain	UNEP/MED WD 482/11 In Spain, box-corer sampling is used for first surface sediment layer (0-1 cm), attending to the low sedimentation rates along the Spanish Mediterranean coast.	This procedure is very appropriate for areas with low sedimentation rate and could be used by Contracting Parties collecting sediments in such marine areas.
31. Spain	UNEP/MED WD 482/12 Total Organic Carbon (TOC) can be interesting to characterize the nature of sediments but it is not useful for normalization purposes for organic contaminants. The TOC normalization is adequate if a good correlation exists between the organic contaminant concentration and TOC. This is correct in localized survey areas but not in areas with different characteristics, being more relevant the distance of PAHs sources than the sediment nature. In fact, in a recent study developed in 11 different coastal areas (León et al., 2014) statistically significant positive correlation between PAHs and	The comment is valid and supported by strong scientific evidences collected at the Mediterranean coast of Spain. Thank you for the contribution. As rightly mentioned, the use of TOC as a normalizing factor should be used cautiously and only if field data support the usefulness of normalizing organic contaminants concentrations, as a means to enhance environmental information for pollution assessment. Therefore, if such a condition is not reached, normalization cannot provide useful results. Understanding this restrictions, normalization of organic contaminants to TOC in sediments is not a mandatory parameter to be reported in the framework of IMAP, but is right of each Contracting Party to decide if such an exercise is useful in assisting pollution detection in a specific area.

	TOC was only found in 5 of them. No correlation between PAHs and TOC was also observed in other Mediterranean (El Nemr et al., 2002; Martínez-Lladó et al., 2007) and Atlantic areas (Viñas et al., 2010). The low correlation between PAHs concentrations and TOC in coastal sediments in comparison to offshore ones has been attributed to their higher heterogeneity (Viñas et al., 2010). Consequently the normalization is not useful for Spanish Mediterranean areas, as it has been also applied in OSPAR. León, V.M. et al. 2014. Marine Pollution Bulletin, 87, 352-363.	However, it is useful to include normalization procedures in the Guidelines, making clear that the method should be tested before being applied, using sufficient data from the area under investigation. Therefore, Parties are encouraged to analyse TOC in sediments as an additional information, which could be used in better understanding pollution processes in the areas under investigation in the framework of IMAP. To address the concerns of Spain, a clarification was included in relevant Guidelines on the prerequisites for applying normalization to TOC.
32. Spain	UNEP/MED WD 482/12 The Environmental Assessment Criteria (EAC) for sediments proposed in OSPAR for organic pollutants such as PCBs or PAHs are normalized to 2.5% of TOC before comparing to assessment criteria. This normalization used in the North Sea is not applicable to sediments from the Mediterranean Sea and the Iberian area. In marine sediments collected from the Mediterranean Spanish coast mean values of TOC are around 0.5 %. In these areas with low TOC content, pollutant concentrations and sediment toxicity can be ‘artificially’ increased applying the normalization. In fact, Bellas et al. (2011) studied the toxicity of sediments from the Spanish coasts through elutriate embryo-larval bioassays, using a 10-year database, and concluded that the toxicity was correlated with the concentrations of pollutants, but not with the content of TOC (Bellas et al., (2011). Continental Shelf Research 31 (2011) 448-456). Additional comment:	The comment made by Spain, which is supported by field data from the Mediterranean coast of Spain is very constructive. The Annex XIV of the UNEP/MED WD 482/12 on the Background Assessment Criteria recommended to be used to assess concentrations in Mediterranean sediments was taken from the COP Decisions on IMAPs and QSR since they should be kept in mind when analysis of monitoring data is undertaken. The Contracting Parties have to decide if EACs for PAHs will be set using (or not) TOC normalised values. However, in the framework of the IMAP, analytical contaminants’ data should be reported by the laboratories, without normalisation to TOC. As suggested by Spain, normalization should be only applied once significant statistical correlations were confirmed at regional or sub-regional level.

	We agree with Italy that organic carbon in the sediment is relevant for the distribution of contaminants, but it is not the only one and other factors and processes are also relevant in the distribution (granulometry, distance to pollution sources, etc). In fact, significant correlations can be found in a specific area between concentration of organic contaminants and TOC, fine grain fraction and/or distance to pollution sources. However, the problem can be to compare TOC normalized concentrations among areas with very different environmental conditions which can alter the observed distribution profiles and offer an uncorrect interpretation of the observed patterns, particularly if these data are used for comparison with environmental assessment criteria. The normalization using TOC, consider only one of the parameters, which could not be the most relevant for the distribution of contaminants in many areas. Probably the normalization with TOC can be useful for PCBs because they have a predominant diffusive input in the marine environment (air deposition), but not for other contaminants for which other relevant factors (i.e.: for PAHs concentrations in sediments frequently are more relevant, such as the distance to main pollution sources or fine fraction than TOC). For these reasons we suggest that normalization should be only applied once significant statistical correlations were confirmed at regional or sub-regional level.	
33. Spain	UNEP/MED WD 482/13 (1.1., 12) The proposed fish sampling frequency is at least once per year. However, it is not possible to perform an integrated ecosystem approach analyzing contaminants and biological effects with the proposed frequency due to the wide coastal	Frequencies for marine biota sampling was undertaken from the UNEP document UNEP/MED WG.467/5 “Updated IMAP Guidance Factsheets for Common Indicator 13, 14, 15, 16, 17, 18, 20 and 21: New proposal for Candidate Indicator 25, 26 and 27” as agreed by the 7th meeting of EcAp Coordination Group, 10 September 2019. Depending on the area and the maturation stage of the national monitoring programme, fish sampling

	extension. In our strategy both fish and sediment are collected in the same campaigns for practical reasons. In the Spanish Monitoring program, samples were obtained every two years till 2016 and after this year lower sampling frequencies have been applied. At this moment chemical (Sediment and red mullet) and biological (red mullet, Mullus sp.) monitoring is carried out every four years.	could be done every 3 years. The Guideline was amended to clarify this issue.
34. Spain	WD 482/14 (3.5, 66) Normalization using lipid contents requires linear correlation between the concentration of contaminant and the lipid content, but this is not the case of PAHs. It can be useful for specific areas with similar oceanographic conditions and/or for contaminants with a predominant diffuse input in the marine environment (i.e.: biphenyl polychlorinated), but not to compare areas subjected to different exposition to pollutants, food availability, etc. In fact, the concentration of PAHs in mussels along the Spanish Mediterranean coast is not correlated with lipid content (León et al., 2013). Other factors such as the proximity of pollution sources are more relevant for PAHs, as it has been stated in this study. Food availability is different in coastal areas with upwelling and/or nutrient inputs (i.e.: South-Western Mediterranean Sea) than typical oligotrophic areas in the Mediterranean Sea (North-Western Sea). León et al., 2013. Environmental Monitoring and Assessment, 185, 2, 1055-1070.	The comment is valid. Using lipid contents for normalization purpose may not always be appropriate, because it requires a linear correlation between the concentration of contaminant and the lipid content, which may not be true the case for PAHs. Amendments were done in the Guideline to clarify this point. It has to be mentioned that normalization of organic contaminants to lipid content is not a mandatory parameter to be reported in the framework of IMAP, but is to each Contracting Party to decide if such an exercise is useful in assisting pollution detection in a specific area. However, it is useful to include normalization procedures in the Guidelines, making clear that the method should be tested before being applied, using sufficient data from the area under investigation.

Table 2: Technical proposals provided by the Meeting of CorMon on Pollution Monitoring on the Meeting document UNEP/MED WG. 492/3

**Meeting of the Ecosystem Approach Correspondence Group on Pollution Monitoring
VIDEOCONFERENCE, 26-28 APRIL 2021**

Meeting document: UNEP/MED WG. 492/3

**REQUESTS/PROPOSALS PROVIDED DURING THE MEETING SHARED IN WRITTEN FORM (I.E. COLLATED IN
WORD FILES AND /OR INTRODUCED IN PDF VERSION OF THE DOCUMENTS) FROM THE CPs WITH THE
SECRETARIAT**

NAME OF THE CP/ THE REPRESENTATIVE OF THE CP PROVIDING PROPOSAL	PROPOSALS/REQUESTS OF THE CPs	RESPONSES OF THE SECRETARIAT/POINTS AGREED AT THE MEETING TB FURTHER ADDRESSED
France. J Tronczynski	General remark: Both now and dec, excellent docs, but to make them more consisten as complet package. Restructuring of docs for this. Docs should be broken down to technical documents usable by laboratories incl lab technicians. Technical methodologies should look at (all we have covered). For implementation of monitoring to be made very succinct and consistent.	The documents are currently in this form to comply with UNEP/MAP working documents requirements, however, they will be repackaged to make a more cohesive set of guidelines
France. J Tronczynski 1	UNEP/MED WG.492/3 List of Abbreviations/Acronyms CI Condition Index cannot be same: suggest to add indices like CI _{env}	Condition Index has been changed to: CInd
France. J Tronczynski 2	UNEP/MED WG.492/3 -§ 1 It is suggested to produce stand-alone document, which will cover rational for the integrated chemical-biological effects monitoring; this will eventually refer to what benefits may be brought by an integrated approach involving both chemical and biological effects measurements in the context of EO9 (CI17 and CI18); this may go along with	Self-standing document for integrated chemical and biological monitoring has been prepared (doc UNEP/MEF 492/6). It provides an initial basis that should be further developed, as it is explained in this document,

	further clarification of technical solutions on how to organized and implement such approach (also presented in the guideline documents, including data integration and assessment tools) and the contributions made by the integrated program such as: i) an increase of the interpretive value of measurements...ii) an ecosystem cross-interdisciplinary approach.... iii) technical advantages and iv) economic benefits of the integrated monitoring...etc.	
Spain (IEO),. Dr. Martínez-Gómez, C. and Dr. Fernández Galindo, B. 3	UNEP/MED WG.492/3 -§ 3 Should be highlighted that at the present stage of IMAP implementation SoS biomarker has been updated from sub-indicator (UNEP/MAP 2019 WG467/5) to regular monitoring biomarker.	Indeed, SoS it is not mandatory. Para 3 is amended to read as follows: “...and d) stress on stress (SoS), not mandatory biomarker suitable to reveal the reduced capacity of the organisms to survive to the action of further environmental stressors.”
Spain (IEO),. Dr. Martínez-Gómez, C. and Dr. Fernández Galindo, B. 4	UNEP/MED WG.492/3 -§ 4 Concerning implementation of LMS in fish, Spanish experts consider it is a good contaminant-related biomarker but that implementation within the framework of monitoring program is expected a long process, as no data have been published yet on this biomarker in this fish species, no specific guidelines are developed, no fish intercalibration exercises have been ever organized in the Mediterranean and there is a lack of BACs or EACs. Furthermore, data in the scientific literature from other fish species are scarce. Consequently, it will require a substantial increase of the effort and costs to the competent laboratories to implement this biomarker in the coming years. Spain indicates its will to participate in intercalibration exercises as a first step until capabilities are gained.	It is correct finding. LMS in fish will represent an additional cost in term of marine facilities and the lab will need a cryostat. However, it is important to build knowledge and capacities for LMS analysis in fish as well. In order to address concerns of Spain, both documents WG. 492/3 and 4 will be amended as to highlight present gaps, as listed by Spain; but also to indicate importance of training courses proposed for CI 18, along with proficiency testing for gradual improvement of present capacities in order to address present gaps. The following formulation was added “It should be noted that LMS in <i>Mullus barbatus</i> may be considered for inclusion as a mandatory parameter only if the capacities will be strengthen enough though the Inter-laboratory comparison to guarantee the correct use of this biomarker. See the changes at pag. 11 § 4 in 492/3
France. J Tronczynski 5	UNEP/MED WG.492/3 -§ 7 Please consider to revise this paragraph: The biomarkers and chemical analysis should be done	The following sentence has been added:

	on the same samples. This will allow better integration of biological effects and contaminants monitoring. But the sample treatments, precautions and preservation may be different for chemical and toxicological determinations as stated in the relevant guideline manuals (refer also to Monitoring Guidelines/Protocols for Sampling and Sample Preservation of Marine Biota for IMAP Common Indicator 17). ii) consider to remove starting from: Molluscs (Mytilus sp.) ...such paragraph is to be put into scientific justification document.	‘Whenever possible the biomarkers and chemical analysis should be done on the same samples. This will allow better integration of biological effects and contaminants monitoring.’
France. J Tronczynski 6	UNEP/MED WG.492/3 -§ 8 Consider revision put into one sentence : In biomonitoring programme, when wild mussels are used it is recommended to evaluate the stage of gonadal development in the sampled mollusks, a parameter that can greatly change the physiological status of the organisms. Part of the comments to be put into scientific justification document and to be clarified;	It is correct: when wild mussels are used it is recommended to evaluate the stage of gonadal development in the sampled mollusks; The following text has been added: “Consequently, when wild mussels are used, it is recommended to evaluate the stage of gonadal development in the sampled molluscs, a parameter that can greatly change the physiological status of the organisms”
France. J Tronczynski 7	UNEP/MED WG.492/3 -§ 9 i) New “problems” occur with caged mussels use; the two techniques “wild and caged” are suppletive and complementary methods, and they are not substitutive ; when possible wild native mussels sampling should be organized ii) the minimum time of exposure used by French network is 2,5 months iii) The stress generated by caging and deployment may also result in mussel’s mortality. It is not possible to distinguish the causes of mussels mortality, which may be related to caging manipulation itself and also by environmental conditions – including contamination.	i) Based on the results of MEDPOL IV Biomonitoring and other relevant experiences, the biological effects of the toxic chemicals on the selected biomarkers are the same in wild and caged mussels. However, we amended by providing the following formulation “For these reasons, the use of caged organisms, when possible, is highly recommended; however, this does not eliminate sampling of wild native mussels” ii) 2.5 months is a possible caging time but in this case, it needs to evaluate the stage of gonad maturation because in a so long period of time some differences in the animals caged in the different coastal areas may occur. The following formulation has been added “It should be noted that also longer time of exposure (2 months or longer) may be applied: in this case it is necessary to evaluate the stage of gonad development to reduce the effects of the confounding factors” iii) In the past biomonitoring activities a stress due to the caging bags was never found. The following footnote was added “It should be noted that a

		stress due to the caging bags was not found during realization of MEDPOL IV Biomonitoring activities”
France. J Tronczynski 8	UNEP/MED WG.492/3 -§ 10 Polyethylene bags and PVC structures may introduce a bias in the mussels exposure (especially for hydrophobic organic contaminants that will sorb to plastics); the deployment time used in French RINBIO scheme is 2.5 month; more instructions should be given on the choice of mussels cohorts for caging monitoring;.	There is a large amount of water in flux in the bags ...it should be demonstrated that the bags are able to quantitatively decrease the content of toxic chemicals in the water filtered by the molluscs; however the amendment was added to clarify this point: “The mussels have to be caged in containment structures (e.g. polyethylene bags, or better, non plastic bag, mounted on PVC tubing)”
France. J Tronczynski 9	UNEP/MED WG.492/3 -§ 13 French guideline frequency is less once per three years (caged mussels); indeed the frequency may be reduced as more cost-effective monitoring scheme - however impact on the trend analysis should be assessed; French RINBIO: the period of sampling is between mid-March until beginning of July	The frequency is in line with the chemical monitoring. A sentence has been added to the text: “The selected frequency for the biomonitoring activities is also in line with the practice exercised during MEDPOL IV Biomonitoring”.
France. J Tronczynski 10	UNEP/MED WG.492/3 -§ 15 French guideline is 6-8 m for caged mussels deployment;	It is possible to suggest collecting mussels at 5-7 m water depth to homogenize the different approach. A comment has been added to the text.
France. J Tronczynski 11	UNEP/MED WG.492/3 -§ 17 There is no instruction on which period auxiliary environmental data should be monitored – for instance on a whole period of caged mussels, immersion; Chla should be added to the list of parameters.	The sampling information concerning the environmental parameters may not be able to describe what happened the weeks before the mussel collection; the Chla content was never listed in the studied parameters but could be suggested to integrate the description of the sampling site. This information has been added answering to the comment.
Spain (IEO)., Dr. Martínez-Gómez, C. and Dr. Fernández Galindo, B. 12	UNEP/MED WG.492/3 -§ 19 Spain points the logistic and physiological problems (induction of spawning) caused by maintaining mussels for 24 h after sampling at ambient water temperature (transported at 4-8 °C) to eliminate gut content.	The procedure provided in para 19 was introduced in line with OSPAR recommendations for chemical monitoring of the chemical contaminants in mussels. On the other end, if the animals are analyzed in the lab without any treatment, the concentration of toxic chemicals in the ingested food will contribute to alter the result. However, we will add the following footnote in order to address concern expressed by Spain:

		“It should be noted that in some cases the logistic problems and physiological impacts on animals may be caused by maintaining mussels for 24 h in clean, aerated seawater to eliminate gut contents ”
France. J Tronczynski 13	UNEP/MED WG.492/3 -§ 19 i) This paragraph should be clarified. It may be understood that extra chemical analysis should be done! whereas the idea should be about an integrated chemical-biological effects monitoring and thus joint sampling scheme...with all necessary precautions concerning technical aspects... ii) In the French RINBIO protocol (caged mussels) samples of mussels are not purged to eliminate gut content; the samples immediately after sampling are dissipated on board in clean lab conditions...	No extra chemical analysis is necessary; the Integrative approach uses the data obtained during the chemical monitoring activities. The protocol proposed is in line with ICES/OSPAR. One point was added to clarify meaning: “In this regard it should be noted that additional chemical analysis are not necessary, but the integrative approach uses the data obtained during the chemical monitoring activities.”
Spain (IEO)., Dr. Martínez-Gómez, C. and Dr. Fernández Galindo, B. 14	UNEP/MED WG.492/3 -§ 20 8 hrs are not sufficient for mussels transportation to the lab	This is the time request to avoid changes in the physiology of the molluscs due to the transport : the selected time is in line with ICES procedure. In order to address proposal of Spain, we reformulated last sentence of para 20 to read as follows: “The transport should be undertaken within a period of 8 hrs; however, it should be noted that in some cases transportation cannot be completed within this period of time. In this case the laboratory should collect some preliminary data showing that no changes occur in control animals maintained for the selected period of time in the transport conditions’.
France. J Tronczynski 15	UNEP/MED WG.492/3 -§ 20 if on board with clean space/lab facilities otherwise it should not be recommended?	Yes, on board with clean space/laboratory facilities are necessary. The comment has been addressed by adding “therefore, on board clean space/laboratory facilities are necessary”.
France. J Tronczynski 16	UNEP/MED WG.492/3 -§ 23 As formulated it is not well articulated statement and not in right place – see point 1 comment; on the one hand it refers to the justification and benefits of an integrated chemical-biological monitoring and on the other hand on the sampling strategy; in fact both are not discussed in this technical guideline document and it should probably be taken in a different document.	We have taken note of this recommendation, and have rewritten the paragraph slightly to make it clearer. ‘23. The integrated chemical-biological assessments of the effects of the contaminants present in the marine environment supports provision of the data needed for GES assessment. As for the chemical monitoring, sample collection for biomarkers should be focused on selected locations such as hotspots and control or reference sites.’

Spain (IEO)., Dr. Martínez-Gómez, C. and Dr. Fernández Galindo, B. 17	UNEP/MED WG.492/3 -§ 26 Another alternative to the use of FSW (filtered sea water) collected at the animal's sampling sites is the use of FSW collected previously to sampling period from clean sites of the national coast (whenever possible >40 meters). This alternative has the advantage of being ready to use in the lab immediately when samples arrive. Similar to the use of physiological saline, there is a need adjust the FSW salinity to the one recorded at the sampling site when necessary, to store the solution in a refrigerator but to use it at room temperature.	This is a possible alternative; however, it has never been suggested before; therefore, the advantages of its application have not been confirmed. To address request of Spain, we added a footnote (17) to read as follows: "In line with present experience of Spain, alternatively use of filtered sea water, collected at the clean/reference sites in national coastal waters, at the salinity found at the sampling site, can be considered".
France. J Tronczynski 18	UNEP/MED WG.492/3 -§ 29 To cope with this difficulty in the French protocol we opt for rapid dissection as soon as possible shortly after mollusks sampling (done on board in clean condition).	When possible this is the best solution The following text has been added: 'When possible, this rapid dissection should be done as soon as possible shortly after mollusks sampling (this should be done on board in clean condition).'
France. J Tronczynski 19	UNEP/MED WG.492/3 -§ 34 This protocol is now used within SUCHIMED 2021 a new French project, testing feasibility of an integrated chemical and biological caged mussels monitoring;	We have taken note on this comment, but the text has not been changed
France. J Tronczynski 20	UNEP/MED WG.492/3 -§ 34 i) dry mass; ii) in the French RINBIO protocol it is: dry soft tissues mass / dry shell mass	The following text has been added: 'alternatively, dry soft tissues mass / dry shell mass '
Spain (IEO)., Dr. Martínez-Gómez, C. and Dr. Fernández Galindo, B 21	UNEP/MED WG.492/3 -§ 36 Some references related to the presence of parasites in the soft tissues should be provided. Proposed ones: Francisco, C. J., Hermida, M. A., & Santos, M. J. (2010). Parasites and symbionts from <i>Mytilus galloprovincialis</i> (Lamark, 1819) (Bivalves: Mytilidae) of the Aveiro estuary Portugal. Journal of Parasitology, 96(1), 200-205. Robledo, J. A. F., Santarém, M. M., & Figueras, A.	The proposed references are found relevant and they are all included in the document.

	(1994). Parasite loads of rafted blue mussels (<i>Mytilus galloprovincialis</i>) in Spain with special reference to the copepod, <i>Mytilicola intestinalis</i>. <i>Aquaculture</i>, 127(4), 287-302. Figueras, A. J., Jardon, C. F., & Caldas, J. R. (1991). Diseases and parasites of rafted mussels (<i>Mytilus galloprovincialis</i> Lmk): preliminary results. <i>Aquaculture</i>, 99(1-2), 17-33.	
France. J Tronczynski 22	UNEP/MED WG.492/3 -§ 39-40 consider revision : to be put into rational document...	If the purpose of this comment was to change the format of the documents, please see explanation provided above in comment number 1.
France. J Tronczynski 23	UNEP/MED WG.492/3 -§ 40 The use of the same sentinel organism across the different Mediterranean regions and sub-regions ensure more comparable toxicological results;	Thank you for confirming our recommendation. No change has been made to the text.
France. J Tronczynski 24	UNEP/MED WG.492/3 -§ 41 This might be ok but it should be kept mind that the sex difference is essential for contaminants analysis and these analyses should done on same sex pooled samples...	The following text has been added: ‘In this regard, it should be considered that the sex difference is essential for contaminants analysis and these analyses, when possible, should done on same sex pooled samples.’
Spain (IEO)., Dr. Martínez-Gómez, C. and Dr. Fernández Galindo, B 25	UNEP/MED WG.492/3 -§ 41 The sampled fish have to be alive and in good conditions. It is recommendable whenever possible that once on board, fish are kept alive in aerated tanks using clean SW before tissue dissection processing began.	This is correct but this approach may be problematic for numerous research Institutes. We amended para 7, as provided here-below: “The marine fish <i>M. barbatus</i> sampled to perform the biomarker toxicological evaluations should be also used for the chemical analysis as described in the Monitoring Guidelines/Protocols for Sampling and Sample Preservation of Marine Biota for IMAP Common Indicator 17: Heavy and Trace Elements and Organic Contaminants for CI17 (UNEP/MAP WG. 482/13). The sampled fish have to be alive and in good conditions Whenever possible, it is recommendable that once fish is on board, to keep it alive in aerated tanks using clean sea water before tissue dissection processing takes place.”
Spain (IEO)., Dr. Martínez-Gómez, C. and Dr. Fernández Galindo, B 26	UNEP/MED WG.492/3 -§ 42 The reference Martínez-Gómez et al., 2017 is missed in the list.	The reference is found relevant and was included in the document.

	Martínez-Gómez, C., Fernández, B., Robinson, C. D., Campillo, J. A., León, V. M., Benedicto, J., ... & Vethaak, A. D. (2017). Assessing environmental quality status by integrating chemical and biological effect data: The Cartagena coastal zone as a case. Marine environmental research, 124, 106-117.	
Spain (IEO)., Dr. Martínez-Gómez, C. and Dr. Fernández Galindo, B 27	UNEP/MED WG.492/3 -§ 48 Whenever possible, same specimen should be used for biomarker and chemical analysis.	This comment is accepted. . However, the chemical samples are usually collected by different research teams. The following addition was made to para 48: “Whenever possible, same specimen should be used for biomarker and chemical analysis. It must, however also be considered that the research team responsible for chemical analysis sampling is usually different from the one responsible for biomarker analysis sampling”.
France. J Tronczynski 28	UNEP/MED WG.492/3 -§ 48 Need English and narrative corrections	Done;
France. J Tronczynski 29	UNEP/MED WG.492/3 -§ 48 See comment point 23; the paragraph needs revision	Done;
Spain (IEO)., Dr. Martínez-Gómez, C. and Dr. Fernández Galindo, B 30	UNEP/MED WG.492/3 -§ 50 (please note that accidentally \$51 was specified in the report from Spain) Environmental data (water temperature, salinity and dissolved oxygen should be recorded at the same depth that fish have been collected. Whenever possible, the use of a CTD device is highly recommended.	The following addition was made to para 50: “.... Environmental data (water temperature, salinity and dissolved oxygen should be recorded at the depth of fish sampling. Whenever possible, the use of CTD is highly recommended.”
Spain (IEO)., Dr. Martínez-Gómez, C. and Dr. Fernández Galindo, B 31	UNEP/MED WG.492/3 -§ 58 Spain has been measuring AChE activity in brain tissue of <i>Mullus barbatus</i> in the past because their preliminary studies pointed a higher activity in this tissue than in muscle tissue. This approach is supported by the scientific literature. Furthermore, the number of studies on brain AChE activity conducted in the target specie <i>Mullus barbatus</i> from the Mediterranean are higher that the number of studies on muscle AChE activity.	Suggested use of the fish brain is accepted as additional tissue for evaluation of AChE activity, but not as an alternative to evaluation of AChE in muscle ; this will allow to obtain always comparable data concerning the muscle tissue. Muscle for the evaluation of AChE activity may be used as fresh tissue or rapidly frozen in liquid nitrogen and stored at -70 °C before the analysis (at this temperature the tissue preparations maintain their integrity for months).The brain tissue of <i>Mullus barbatus</i> can be considered as an additional tissue for evaluation of AChE activity, but not as an alternative to evaluation of AChE activity in muscle. However, it should be noted that the preliminary studies and

		available scientific literature confirm a high activity in brain tissue of <i>Mullus barbatus</i> ”.
Spain (IEO)., Dr. Martínez-Gómez, C. and Dr. Fernández Galindo, B 32	UNEP/MED WG.492/3 -§ 59&55 To successfully obtain blood cells from the caudal vein it is recommendable to extract them as soon as possible once the fish is on board and before any other tissue sampling has been conducted. Spain recommend to indicate information of the section 59 (concerning blood sampling) in the section 55. “Immediately after collection...”.	para55 reads now: “Immediately after collection, living fish (<i>Mullus barbatus</i>) are killed on board by severing the spinal cord and rapidly dissected to obtain the tissues for the selected biomarker analysis. To successfully obtain blood cells from the caudal vein it is recommendable to extract them immediately after collection, once the fish are on board and before any other tissue sampling has been conducted and before blood starts clotting”. therefore, para 59 has not been changed.
Spain (IEO)., Dr. Martínez-Gómez, C. and Dr. Fernández Galindo, B 33	UNEP/MED WG.492/3 -§ 60 Indicate in fish biometrics “eviscerated weight”	The proposal is accepted. The first bullet point of Para 60 reads as follows: - Fish biometrics: total length (to 0.1cm), weight (to 0.1 g) , eviscerated weight (to 0,1 g);
Italy Ginevra Molledo 34	UNEP/MED WG.492/3 -§ 60 Fullton condition factor is missing?	The Fullton condition factor = 100 has been added. This does not change the results but will simplify the use of the data.

Table 3: Technical proposals provided by the Meeting of CorMon on Pollution Monitoring on the Meeting document UNEP/MED WG. 492/4

Meeting of the Ecosystem Approach Correspondence Group on Pollution Monitoring VIDEOCONFERENCE, 26-28 APRIL 2021		
Meeting document: UNEP/MED WG. WG.492/4		
REQUESTS/PROPOSALS PROVIDED DURING THE MEETING SHARED IN WRITTEN FORM (I.E. COLLATED IN WORD FILES AND /OR INTRODUCED IN PDF VERSION OF THE DOCUMENTS) FROM THE CPs WITH THE SECRETARIAT		
NAME OF CP AND REPRESENTATIVE OF CP PROVIDING PROPOSAL	PROPOSALS/REQUESTS OF CPs	RESPONSES OF THE SECRETARIAT/POINTS AGREED AT THE MEETING
Israel, D.Zurel	I am going over the documents for next week's pollution CORMON and I have a problem with document 21wg429_04 – the monitoring guidelines/protocols for CI18 – Analysis of Lysosomal Membrane Stability. In page 5 bullets 18 and 19 the protocol requires certain solutions and buffers and then there is the catalog number of these solutions from Sigma-Aldrich, a private biotech company. This is a problem because: 1. UN mandatory monitoring protocols should not promote a private company. 2. There might be other biotech companies that manufacture similar products. Has this been checked? 3. If only Sigma-Aldrich manufactures these products than the entire monitoring of this indicator is dependent on the business survival of a private company. 4. Sigma-Aldrich products may not be available in all Mediterranean countries.	Thank you for indicating this point. Indeed, we were discussing this point during preparation of the protocols, considering that the biomonitoring is related to some specifics quite different from chemical monitoring. It should also be noted that the biological analysis are all semiquantitative i.e. the results are not absolute values. The reason to mention a product from a particular company is that not all the chemicals have been tested and the use of the same reagent will reduce the quantitative differences in the results in the country/between the countries. The typical example is use of the albumin standard to evaluate the protein content. There are obviously other products/companies, than the one mentioned in the protocol, but for the sake of data comparability we mention the most frequently used. The use of same reagent for biomonitoring is of utmost importance since it is related to semi-quantitative analysis. Even the same product sold from different companies, may

	5. by making these products a part of the mandatory protocol, national monitoring labs will have a hard time negotiating a price with Sigma-Aldrich. Has this issue been addressed?	create analytical uncertainties since their purity/ presence of contaminants/ preparation procedure could be very different. In line with above we introduced modifications in paragraphs 18 and 19; chemical formula for two compounds added; one new footnote included as follows: “A reference to “Sigma-Aldrich” was deleted, and a footnote added as follows: “Use of same solution across region is recommended, as feasible, in order to reduce quantitative differences in the results respectively to increase reproducibility of the results of analytical determination of biomarkers”.” Regarding the status of protocols, it should be noted that they recommend detailed procedures for all steps of analytical process in line with IMAP Guidance Fact Sheets. This means that different procedures are recommended, however always keeping in mind a need for their application across the entire region, therefore also taking into account capacities of stakeholders that are not always at optimal level.
France. J Tronczynski	General remark Both now and dec, excellent docs, but to make them more consisten as complet package. Restructuring of docs for this. Docs should be broken down to technical documents usable by laboratories incl lab technicians. Technical methodologies should look at (all we have covered). For implementation of monitoring to be made very succinct and consistent.	The documents are currently in this form to comply with UNEP/MAP working documents requirements, however, after approval of the guidelines, they will be repackaged to make a more cohesive set of guidelines.
Spain (IEO)., Dr. Martínez-Gómez, C. and Dr. Fernández Galindo, B	General comment: the headers of even pages are referred to UNEP/MED WG.492/5. It should be corrected to UNEP/MED WG.492/4	The headers of even pages have been corrected to UNEP/MEDWG.492/4. We apologize for this formatting error.
	UNEP/MED WG.492/4 - § 45 It is indicated to evaluate samples at 45 minutes. That is not in agreement with the original protocol, which indicated observations at 15 min, 30 mn, 60, min, and for the following 30 min for the next 2 hours (that means 120 min, 150 min and 180 min) (Moore	It should be noted that previous protocol does not exist for MEDPOL monitoring of CI18. There is only a Guidance Fact Sheet that defines overall aspects related to monitoring and assessment of CI 18, but does not elaborate detailed procedures for analytical determination of biomarkers.

	et al., 2004; Martínez-Gómez et al., 2015). Spanish experience indicates more stress in the lab to conduct the test when a high number of samples has to be done (n=12). BAC is established as 50 min and 120 min, so it can be detected by measuring at 30 min and 60 minutes and until 180 min. That should be corrected in the table as follow. <table><tr><td>Samples</td><td>0</td><td>15</td><td>30</td><td>60</td><td>90</td><td>120</td><td>150</td><td>180</td><td>NRRT</td></tr><tr><td>Control</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>+</td><td>180</td></tr><tr><td>Treatment</td><td>+</td><td>+</td><td>±</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>30</td></tr></table>	Samples	0	15	30	60	90	120	150	180	NRRT	Control	+	+	+	+	+	+	+	+	180	Treatment	+	+	±	-	-	-	-	-	30	The change proposed by Spain will not alter the methodology elaborated in this document; but it will actually streamline the protocol with ICES 36. The table 1 has consequently been changed accordingly.
Samples	0	15	30	60	90	120	150	180	NRRT																							
Control	+	+	+	+	+	+	+	+	180																							
Treatment	+	+	±	-	-	-	-	-	30																							
Spain (IEO)., Dr. Martínez-Gómez, C. and Dr. Fernández Galindo, B	UNEP/MED WG.492/4_- § 46 Images in Fig 4. The example images do not cover the wide spectrum of images that competent labs may found in field samples when LMS is assessed by using NRRT. In figure caption it should be included the following sentence. <i>“More detailed information and images about NRRT in mussel haemocytes can be found in Martínez-Gómez et al., 2015”</i>. On the other hand, the % LMS as indicated in ICES TIMES Num 56 (Martínez-Gómez et al., 2015) is highly recommended and it should be considered when assessing LMS by NRRT assay and consequently, included as an optional Field in the Reporting Formats for CI18. (Field % LMS) Units (%) Tissue (haemocytes)	The sentence “More detailed information and images about NRRT in mussel haemocytes can be found in Martínez-Gómez et al., 2015”. Has been added to fig caption 4 and text has also been added in §48 to reflect the further comment. Regarding 2nd part of the proposal, the following sentence was added in § 46 “On the other hand, the % LMS as indicated in ICES TIMES Num 56 (Martínez-Gómez et al., 2015) is highly recommended and it should be considered for future assessing LMS by NRRT assay. Consequently, (Field % LMS) Units (%) Tissue (haemocytes) was included as an optional field in the proposed Reporting Formats for CI18 (UNEP/MED WG.492/8)”, and related amendment included in UNEP/MED Wg.492/8 (Table 2 of Annex 2).																														
Spain (IEO)., Dr. Martínez-Gómez, C. and Dr. Fernández Galindo, B	UNEP/MED WG.492/4_- § 45 and Fig 2 Protocols for LMS in fish should be updated and adapted to <i>Mullus barbatus</i> by including specific image of fish cryostat sections. There is a limited data available of using LMS in fish using histochemical assay (i.e. Köhler, 1991; Köhler and Pluta, 1995; Köhler et al., 2002; Broeg et al., 2002) Köhler, A. (1991). Lysosomal perturbations in fish liver as indicators for toxic effects of environmental pollution. Comparative biochemistry and	Yes, these figures are helpful for the interpretation of LMS in fish. The images regarding LMS in fish have been added in Fig 2b and in § 23 The missing references have been added in § 22 (Köhler et al., 2002; Broeg et al., 2002)																														

	physiology. C, Comparative pharmacology and toxicology, 100(1-2), 123-127. Köhler, A., & Pluta, H. J. (1995). Lysosomal injury and MFO activity in the liver of flounder (<i>Platichthys flesus</i> L.) in relation to histopathology of hepatic degeneration and carcinogenesis. <i>Marine Environmental Research</i>, 39(1-4), 255-260 Broeg, K., Köhler, A., & Westernhagen, H. V. (2002). Disorder and recovery of environmental health monitored by means of lysosomal stability in liver of European flounder (<i>Platichthys flesus</i> L.). <i>Marine environmental research</i>, 54(3-5), 569-573. Köhler, A., Wahl, E., & Söffker, K. (2002). Functional and morphological changes of lysosomes as prognostic biomarkers of toxic liver injury in a marine flatfish (<i>Platichthys flesus</i> (L.)). <i>Environmental Toxicology and Chemistry: An International Journal</i>, 21(11), 2434-2444.	
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Table 4: Technical proposals provided by the Meeting of CorMon on Pollution Monitoring on the Meeting document UNEP/MED WG. 492/5

Meeting of the Ecosystem Approach Correspondence Group on Pollution Monitoring VIDEOCONFERENCE, 26-28 APRIL 2021		
Meeting document: UNEP/MED 492/5		
REQUESTS/PROPOSALS PROVIDED DURING THE MEETING SHARED IN WRITTEN FORM (I.E. COLLATED IN WORD FILES AND /OR INTRODUCED IN PDF VERSION OF THE DOCUMENTS) FROM THE CPs WITH THE SECRETARIAT)		
NAME OF THE CP/REPRESENTATIVE OF THE CP PROVIDING PROPOSAL	PROPOSALS/REQUESTS OF THE CPs	RESPONSES OF THE SECRETARIAT/POINTS AGREED AT THE MEETING TB FURTHER ADDRESSED
Spain. Rodrigez-Gomez	UNEP/MED WG.492/5 - § 39 (and §47) Only <u>agranular</u> hemocytes need to be considered for the scoring of genotoxic damage (MNI and other nuclear anomalies	The suggestion of Spain was adopted and the test reorganized adequately
Spain. Rodrigez-Gomez	UNEP/MED WG.492/5 - § 60 Bradford (1976) should be reccomende but not mandatory, as another methods canb used by competent laboratories (Lowry., 1975). Spain suggests including intercalibration exercise on protein determination for CI18, independently of the method used for each lab.	The selection of this method for protein determination is in line with ICES 22 and was chosen to render the MEDPOL results in line with the OSPAR data. The use of this method is suggested but not mandatory. The monitoring guidelines provide recommendations for the monitoring practice that is found in line with IMAP requirements. Therefore, also other methods may be applied, subject of proper justification by IMAP competent laboratories in terms of its compatibility to IMAP requirements.

		The text has been adequately modified. Intercalibration on protein determination is already included in WG492/6 as a part of the intercalibration exercise for AChE activity.
Spain. Rodriguez-Gomez	UNEP/MED WG.492/5 - § 64 ff section Interpretation of Results Spain indicates that affirmation of “ ... <i>a more realistic BAC value should be considered as an LT50 of 7.5 days</i>” for SoS than the currently proposed by ICES Item n 59 (Thain et al. 2019) (BAC= 5 days) should be taken with caution. This affirmation is based on studies conducted using mussels sampled from the North Sea in summer and autumn (Smaal et al., 1991) and a laboratory experimental study (Viarengo et al., 1995) conducted with water temperature ≤ 15 °C. Ambient temperature recorded in the Mediterranean mussel sampling stations during the recommended sampling period usually are above this value (i.e. Spanish Mediterranean data April-June 15-24 °C). Recent data published in the literature on SoS found values of SoS ranging between 6 and 8 days in resident mussels (17°C ambient water) with concentrations of CBs, p-p-DDEs, Chrysene, Hg and Pb above BACs in their tissues (Martínez-Gómez et al., 2017). Furthermore, the affirmation “<i>This proposal of the SoS BAC value is also in line with the data reported in ICES Item 59 (...) where the experimental data recorded show SoS control values of about 7.5 days</i>” is not correct and it is suggested to be removed. Spain does not consider that discrepancies of the LT50 established for SoS in literature data are a consequence of the QA of SoS, given the simplicity of the method, but of the temperature of the ambient water from where mussels are inhabiting. As it is mentioned in	Note: Text in paragraphs 84 and 85 has been re-organized as to improve clarity of elaboration provided. The values of BAC and EAC(BAC= 10 days and EAC=5 days) for SoS, as established by the Decision IG.23/6 on 2017 Mediterranean Quality Status Report are in line with the ICES Cooperative Research Report No. 315.277pp. However, experimental data reported from different labs indicate some difference in the SoS value of healthy animals (Smaal et al. 1991¹ and Viarengo et al. (1995). Moreover, it should be noted that, in this moment, there are not sufficient data from all the different Mediterranean areas for establishing the BAC value for this biomarker. Therefore, it is suggested to compare the SoS data obtained from animals collected in potentially polluted sites with the data obtained from mussel sampled in “clean” areas. The data that will be collected through implementation of IMAP CI 18 will support establishing the correct SoS BAC and EAC for the Mediterranean area. In line with this explanation, the text has been modified and the the missing paper Martínez-Gómez, C., Fernández, B., Robinson, C. D., Campillo, J. A., León, V. M., Benedicto, J., ... & Vethaak, A. D. (2017) has been added.

¹ Smaal A.C., Wagenvoort, A., Hemelraad, J., Akkerman, I., 1991. Response to stress of mussels (*Mytilus edulis*) exposed in Dutch tidal waters. Comp. Biochem. Physiol. C. 100, 197-200.

	Section 87, lower temperatures in the chamber and in the seawater at the sampling site allow the molluscs to survive in air for longer periods of time. Overall, concerning SoS assessment criteria, Spain suggest does not consider the proposal of 7.5 days as a more realistic BAC for SoS and that it would be best practice to maintain the Assessment Criteria based on ICES Item n 59 (Thain et al. 2019) (as they were assessed using field data from NW Mediterranean reference areas) an up-to date record of the current recommended SoS AC values and updated as new data arise from field samplings in “reference” different Mediterranean areas.	Suggested deletion has been applied. In line with above explanations text in paragraphs 84 and 85 has been adjusted.
Paragraphs 16, 59 and 60	A few changes added to harmonize text with proposed changes	Para 16: 10 % was changed in 3%:“Fixed slides are stained with 3% Giemsa solution for 10 min” Para 59: “60 µl of 10 mM DTNB (0.5 mM final concentration) and 100 µl of supernatant (about 200-500 µg proteins) are added in a total volume of 1200 µl 0.02 M phosphate buffer (pH 7);all the reagents must be brought to 20 C° before the start the analysis.”; change introduced to obtain a better data standardization. Para 60: “acclimatisation at 20 C°) in the dark:

Table 5: Technical proposals provided by the Meeting of CorMon on Pollution Monitoring on the Meeting document UNEP/MED WG. 492/7

Meeting of the Ecosystem Approach Correspondence Group on Pollution Monitoring VIDEOCONFERENCE, 26-28 APRIL 2021		
WRITTEN PROPOSALS/REQUESTS/COMMENTS PROVIDED FROM THE CPs DURING THE MEETING Meeting document: UNEP/MED WG. 492/7		
Name of CP and representative of CP providing comment	PROPOSALS/REQUESTS/COMMENTS OF CP's (indicate number of document to which proposal is related)	RESPONSE OF THE SECRETARIAT/POINTS AGREED
France. D. Vincente	UNEP/MED WG.492/7 -§ 17.ii. Pre-filtration of seawater through a 250 µm mesh sieve is not always carried out and most methods in the Mediterranean Sea rely on sieving through 200 µm mesh sieve to get rid of mesozooplankton (e.g. Nunes et al. 2018; Gasol et al. 2020). 200 µm is generally the standard mesh sieve used for this purpose. Is it possible to add both possibilities for pre-sieving in the document 492/7?	Mesh size 250 µm for prefiltration is not mandatory, any mesh size that get rid of mesozooplankton (> 180 µm) can be used. Change was made in the Guideline text (mesh size > 200 µm).
France. J Tronczynski	UNEP/MED WG.492/7 -§ 16.vi. Text is highlighted without comments	No change was suggested.
France. J Tronczynski	UNEP/MED WG.492/7 - § 17.iii. Sediment samples: sieving for grain size (<2 mm only should be sufficient) but grain size distribution determination should be recommended as auxiliary parameter (determination between 2 µm - to 2 mm);	Sieving for sediment grain size < 2 mm has been decided by CORMON for contaminants' analysis. In addition, sieving though <63 µm is also proposed to define finer fraction for normalization purposes. Both sieving sizes have been accepted by Parties in the relevant sediment sampling Guidelines (UNEP/MED WG.482/11).
France. J Tronczynski	UNEP/MED WG.492/7 - § 17.iii. Seawater samples: filtration on 0.7 µm GF/F pre combusted glass fiber filters;	Clarifications were added as requested. However, detailed information on seawater filtration for the analysis organic contaminants and heavy metals are presented in detail in the relevant seawater sampling Guidelines (UNEP/MED WG.482/15).
France. J Tronczynski	UNEP/MED WG.492/7 - § 22. Limit of Detection or rather LOQ	LOQ has been added as requested.

France. J Tronczynski	UNEP/MED WG.492/7 - § 22. Limits of method detection and quantification should be given (LOD and LOQ). These limits should be sufficient for metal background concentrations (BC) determination in sediment samples	LOD and LOQ are method validation parameters that are defined in each laboratory and depend on many things (equipment used, the analytical method, blanks, sample matrix, concentrations of interfering compounds and on the mass of sediment/biota taken for analysis). When reporting monitoring data, laboratories have to include information on concentration values LOQ and concentration values < LOD, as indicated in the Data Dictionaries on contaminant concentrations (UNEP/MED 2019 WG.467/8).
France. J Tronczynski	UNEP/MED WG.492/7 - § 22 and 25. The LOQ for metals and organic contaminants in the mussels and fish samples should be reported in the document	As above. For information, achievable LOQs which are mentioned in other Regions are presented (OSPAR, HELCOM).
Spain. Rodriguez-Gomez	UNEP/MED WG.492/7 - § 17.iv. Sample processing...It should be indicated "Eviscerated weight" , "liver wieght" and "gonad weight".	Details were added.
Spain. Rodriguez-Gomez	UNEP/MED WG.492/7 - § 36 For biomarkers internal QC: It would be convenient that labs collect extra biological material during monitoring surveys to be used later in time as Biomarker internal Quality Control Material as CRM are not available.	The number of the animals suggested to collected during the sampling should be sufficient but an addition to the test was made to render clear the need to collect some extra biological material.
Turkey. S. Oksuz	UNEP/MED WG.492/7 Sampling is a very important step for data quality. Sampling and sample transporting details should be included in the Guideline.	Details on sampling and sampling processing procedures to ensure that collected samples are representative of the area under investigation, have been included in relevant Guidelines which have already been adopted by the Parties (UNEP/MED WG.482/11, UNEP/MED WG.482/13, UNEP/MED WG.482/15, UNEP/MED WG.482/17).

Table 6: Technical proposals provided by the Meeting of CorMon on Pollution Monitoring on the Meeting document UNEP/MED WG. 492/8

Meeting of the Ecosystem Approach Correspondence Group on Pollution Monitoring VIDEOCONFERENCE, 26-28 APRIL 2021 WRITTEN PROPOSALS/REQUESTS/COMMENTS PROVIDED FROM THE CPs DURING THE MEETING Meeting document: UNEP/MED WG. 492/8		
Name of CP and representative of CP providing comment	PROPOSALS/REQUESTS/COMMENTS OF CP's (indicate number of document to which proposal is related)	RESPONSE OF THE SECRETARIAT/POINTS AGREED
France. D. Vincent Annotated doc: 21wg492_08_eng-annotated_FR.pdf	UNEP/MED WG.492/8 -§ 7 <i>The Monitoring MED POL Database (ca. Microsoft Access SQL database software) was created and included some components and modules, such as plotting and mapping, trend analysis, a remote access module,</i> Comment: Is it possible to have access to the type of trend analysis carried out in this module? Is it comparable to other trend analyses developed within the frame of other sea convention (e.g. OSPAR).	The MED POL Database is no more functional. All the data have been migrated to the IMAP (Pilot) Info System. To discover more details related to previous MEDPOL Data Base please check UNEP/MED WG.463/Inf.7 that was submitted to the Meeting of CorMon on Pollution Monitoring (2-3 April 2019). More about characteristic of present IMAP Info System can be found in <u>IMAP Info System (info-rac.org)</u> and UNEP/MAP WG. 467/12. MAP Pilot Info System: Quality Assurance and Quality Controls that was discussed during 7 th Meeting of the EcAp CG held on 10 September. The Info System has been created based on the needs within BC/MAP system, considering relevant existing experiences. No change was made to document WG492/8.
France. D. Vincent Annotated doc: 21wg492_08_eng-annotated_FR.pdf	UNEP/MED WG.492/8 -§ 29. viii. <i>viii) bottom depth in meters, and</i> Comment: Not consistent with sea depth indicated in Annex I - terminology should be homogenised throughout the text and in the tables Comment in Annex I: Sea Depth: Should be modified to bottom depth to be congruent with text description page 5.	Corrected bottom depth in meters into sea depth in meters as defined in related DDs as provided in Annex I. The DDs/DSs already approved by the CPs, and consequently built into IMAP Info System, defines “SEA DEPTH in meters”; therefore correction “sea depth” has been included in para 29, while no change can be introduced in Annex I that presents approved DDs/DSs.

France. D. Vincent Annotated doc: 21wg492_08_eng- annotated_FR.pdf	UNEP/MED WG.492/8 -§ 30. iii. <i>iii) ... time of sampling</i> Comment: should be completed with GMT or EST	We agree to use the GMT as time coordinate. Until now the time coordinate was usually the local time. However, this change must be introduced through modifications of DDs/DSs that have already been approved by the CPs, and consequently built into IMAP/Info System, Therefore, the raised point cannot be addressed in this document, but proposal needs to be discussed with INFO/RAC in order to take it into account within next possible adjustments of IMAP/Info System.
France:	UNEP/MED WG.492/8 - General Comment that France are not using the Secchi disk for transparency measurement but transmission from CTD. An issue on Typology was raised, presumably related to the Area typology?	The document sets the procedure for data reporting; however, the mandatory parameters have already been set in approved IMAP Guidance Fact Sheets. The most recent update of the IMAP Guidance Fact Sheets have been undertaken in 2019, The reporting format allows also to report additional not -mandatory parameters.. The reporting system requires entering a value (R-Reference; HS-Hot Spot; C-Coastal; Other:). If the CP is not distinguishing the stations by typology, it may enter – not provided under Other.
Spain: Beatriz Fernandez 26. Apr 2021 - 14:52	UNEP/MED WG.492/8 – Annex II Table 3 There is no indication of gender (for fish) in table 3, document WG.492/8, which is a relevant biological parameters that can be taken into account in the interpretation of the biomarkers responses.	The suggestion is accepted and amendment regarding gender; it is added in the Annex II Table 3.
Spain: Martínez-Gómez, C. 26. Apr 2021 - 15:34	Document UNEP/MED WG.492/8 Annex II Table 1. data Dictionaries (station Information) for Common Indicator 18 within EO9. In the list of values related with pressure type Spain propose to include the following ones: AG = Agriculture and livestock MN = Mining Table 2. Biomarkers for which reporting of parameters is mandatory in the DD SoS appear as an additional biomarker but not as a mandatory. That should be clarified. Inclusion of the other subindicators (not mandatory) as EROD or Methallotionein as agreed on UNEP/MAP (2019). UNEP7MED WG467/5. Should be included as field under the column NOT MANDATORY	The suggestion is accepted and added into the Annex II as follows: i) Elements proposed for preparation of Data Standards and Data Dictionaries for IMAP Common Indicator 18. Table 1. Pressure type: AG = Agriculture and livestock and MN = Mining are added; ii)Table 2. SoS is not a mandatory biomarker, and therefore it is included in column “ADDITIONAL”. It is clear that ‘additional’ does not include mandatory biomarkers, but for the sake of clarity title of the column has been amended to read as follows: “Additional (Not -mandatory)”. Other additional biomarkers can be added in this column, therefore EROD or Methallotionein are added in column Additional (Not -mandatory).Therefore cell “Other” has been added in Table 2 as for country to add not mandatory biomarker.

	Table 3. DD for providing mandatory information parameters for CI18 as listed in Table 2 Overall, Spain propose the use of SE (Standard Error) instead of SD (Standard deviation). Reasoning behind is that SE takes into account the sampling size (n), allows calculation of Confidence Interval of the mean (95 % CI) and allows proper comparisons between datasets. Concerning table 3. That is referred to the fields “Specimen_lenght_sd” and “Specimen_weigth_sd” . Spain proposes to include the following Fields: Field Description List of values Sex Gender of the specimens analysed F= female M=male I= Undefined Maturation Stage Maturation degree of the gonads. It is suggested to referred according Workshop on Sexual Maturity Sampling (ICES WKMAT 2007) According to Maturity Key for demersal species I= Inactive II = Maturing III= Spawning IV= Post-spawning Specimen_weight_gonad Specimen_weight_gonad_se/sd? Specimen_weight_liver Specimen_weight_liver_se/sd?	Table 3. It is accepted to add “Field Description List of values Sex Gender of the specimens analysed; F= female M=male I= Undefined Stage Maturation degree of the gonads” It is accepted to add field Maturity Key for demersal species; Description: I= Inactive II = Maturing III= Spawning IV= Post-spawning; List of Values: Specimen_weight_gonad Specimen_weight_gonad_se/sd? Specimen_weight_liver Specimen_weight_liver_se/sd? Suggestion related to standard error” and “standard deviation” was accepted: The terms “standard error” and “standard deviation” are often confused. The contrast between these two terms reflects the important distinction between data description and inference, one that all researchers should appreciate. The standard deviation (often SD) is a measure of variability. The standard error of the sample depends on both the standard deviation and the sample size; this interrelation is provided by the simple equation $SE = SD/\sqrt{\text{sample size}}$. The standard error falls as the sample size increases, as the extent of chance variation is reduced; this underlies the sample size calculation for a controlled trial, for example. By contrast the standard deviation will not tend to change if the size of sample is increased. This explanation has been added in footnote below Table 3, while “SE” is added in relevant fields of Table 3 (Annex II). Information on statistical measure is provided in field Pooling, along with the number of pooled organisms. To the field Pooling, Pooling_N and Pooling_SD/SE are added providing information on the number of pooled specimens and statistical measure provided (SD or SE). Tissue weight and statistical term is accepted as new field in Table 3. They were included as “Tissue_weight” and “Tissue_weight_SD/SE”.
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