



**United Nations
Environment Programme
Mediterranean Action Plan**

Distr.: General
17 February 2023
Original: English only

Meeting of the Ecosystem Approach Correspondence Group on Pollution Monitoring

Athens, Greece, 1-2 March 2023

Agenda item 3: 2023 Mediterranean Quality Status Report (QSR) - Pollution Ecological Objectives (EO5, EO9)

The GIS - based Layers for the Finest Areas of Assessment and the Areas of Assessment Nested to the Levels of Integration that are Considered Meaningful for Their Use Within Application of the NEAT GES Assessment Methodology for IMAP Common Indicator 17 in the Western Mediterranean Sea Sub-region

For environmental and economic reasons, this document is printed in a limited number. Delegates are kindly requested to bring their copies to meetings and not to request additional copies.

Disclaimer: The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Environment Programme/Mediterranean Action Plan concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The Secretariat is also, not responsible for the use that may be made of information provided in the tables and maps of this report. Moreover, the maps serve for information purposes only, and may not and shall not be construed as official maps representing maritime borders in accordance with international law.

Table of Contents

1. Introduction	1
2. How to use this document	1
3. Geospatial Data Sources for the Western Mediterranean Sea Subregion.....	1
4. The steps for defining the IMAP Spatial Assessment Units.....	4
5. Defining the IMAP areas of assessment (IMAP SAUs) for the West Mediterranean countries	5
Algeria.....	5
France	7
Italy.....	10
Morocco.....	13
Spain.....	15
Tunisia.....	18
6. The nesting approach for SAUs in the Western Mediterranean Sea	21
7. Geospatial data	31

Annex I: References

List of Abbreviations / Acronyms

CDR	Central Data Repository
CPs	Contracting Parties
EU	European Union
GES	Good Environmental Status
nGES	not Good Environmental Status
IMAP	Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria
MAP	Mediterranean Action Plan
MED POL	Programme for the Assessment and Control of Marine Pollution in the Mediterranean Sea
MSFD	Marine Strategy Framework Directive
MRU	Marine Reporting Unit
MSs	Member States
NEAT	Nested Environmental status Assessment Tool
SAU	Spatial Assessment Unit

1. Introduction

For a harmonized and homogenized application of the Nested Environmental Status Assessment Tool-NEAT for GES assessment related to Ecological Objectives 5, 9 and 10, the Western Mediterranean Sea Subregion was selected further to the analysis of data availability that indicates more data available in this sub-region than in other areas that were not assessed until now within preparation of the 2023 MED QSR. The work undertaken included consideration of monitoring stations distribution in order to recognize the spatial coverage of the areas of monitoring and from there to set the areas of assessment. Briefly that work included the following phases:

- Analysis and preparation for further use the GIS layers providing distribution of the monitoring stations i.e., areas of monitoring for Ecological Objective 9 i) as provided in the National IMAPs of Algeria, Morocco, Tunisia; or ii) as defined in MSFD monitoring programmes for Italy, France, Spain, and/or reported into IMAP Information System. In the case GIS-based layers were not available, their preparation was undertaken based on input information on the distribution of monitoring stations.
- The western Mediterranean Sea sub-region (WMS) was divided into 3 sub-divisions for the purposes of the present work as follows: the Alboran Sea (ALBS), the central part of the Western Mediterranean Sea (CWMS) and the Tyrrhenian Sea (TYRS).
- Setting of the spatial coverage of the areas of assessment for their insertion into the application of NEAT tool for GES assessment related to IMAP CI 17. To that purpose
 - o the GIS-based layers were prepared for i) the finest scales of assessment of the national parts of 3 subdivisions in the Western Mediterranean Sea Subregion (Alboran Sea- ALBS, Central part of Western Mediterranean Sea-CWMS, Tyrrhenian Sea-TYRS); ii) the scales of assessment nested to the level of integration that are considered meaningful for specific IMAP Common Indicators. That work included use of free open GIS information and application of the criteria for coupling the geographical information to define the appropriate areas of assessment, in line with the methodology defined in UNEP/MED WG. WG.509/Inf.10/Rev.2¹.
 - o the GIS-based layers of the areas of assessment defined for the Contracting Parties of the Barcelona Convention that are the Member States of EU, were used as available in relevant and reliable sources (EEA; Marine Regions portal).

2. How to use this document

This document is accompanied with the collected geospatial data. Open access sources have been analyzed and exploited regarding the suitability of their use for setting of the areas of assessment. The geospatial data are organized per each Contracting Party. The geospatial data are in ESRI shapefile format, open access format, readable from all available GIS software and applications. The coordinate reference system (CRS) is ETRS89-LAEA Europe, also known in the EPSG Geodetic Parameter Dataset under the identifier: EPSG:3035. The Geodetic Datum is the European Terrestrial Reference System 1989 (EPSG:6258). The Lambert Azimuthal Equal Area (LAEA) projection is centred at 10°E, 52°N. Coordinates are based on a false Easting of 4321000 meters, and a false Northing of 3210000 meters. The data can be used by various software applications, either commercial (i.e., ESRI ArcGIS Desktop and ArcGIS Pro, ERDAS, ENVI, GlobalMapper) or of open access like QGIS, Google Earth, SAGA GIS, R, etc.

3. Geospatial Data Sources for the Western Mediterranean Sea Subregion

In the view of open data and well documented use of data based on FAIR principles (Findability, Accessibility, Interoperability, and Reuse), official data sources have been explored. The portals with accessible data that have been explored and further analysed for the countries of the Western Mediterranean Sea Sub-region are the following:

- The European Environment Agency (EEA) is an agency of the European Union, whose task is to provide sound, independent information on the environment. The EEA aims to support sustainable development

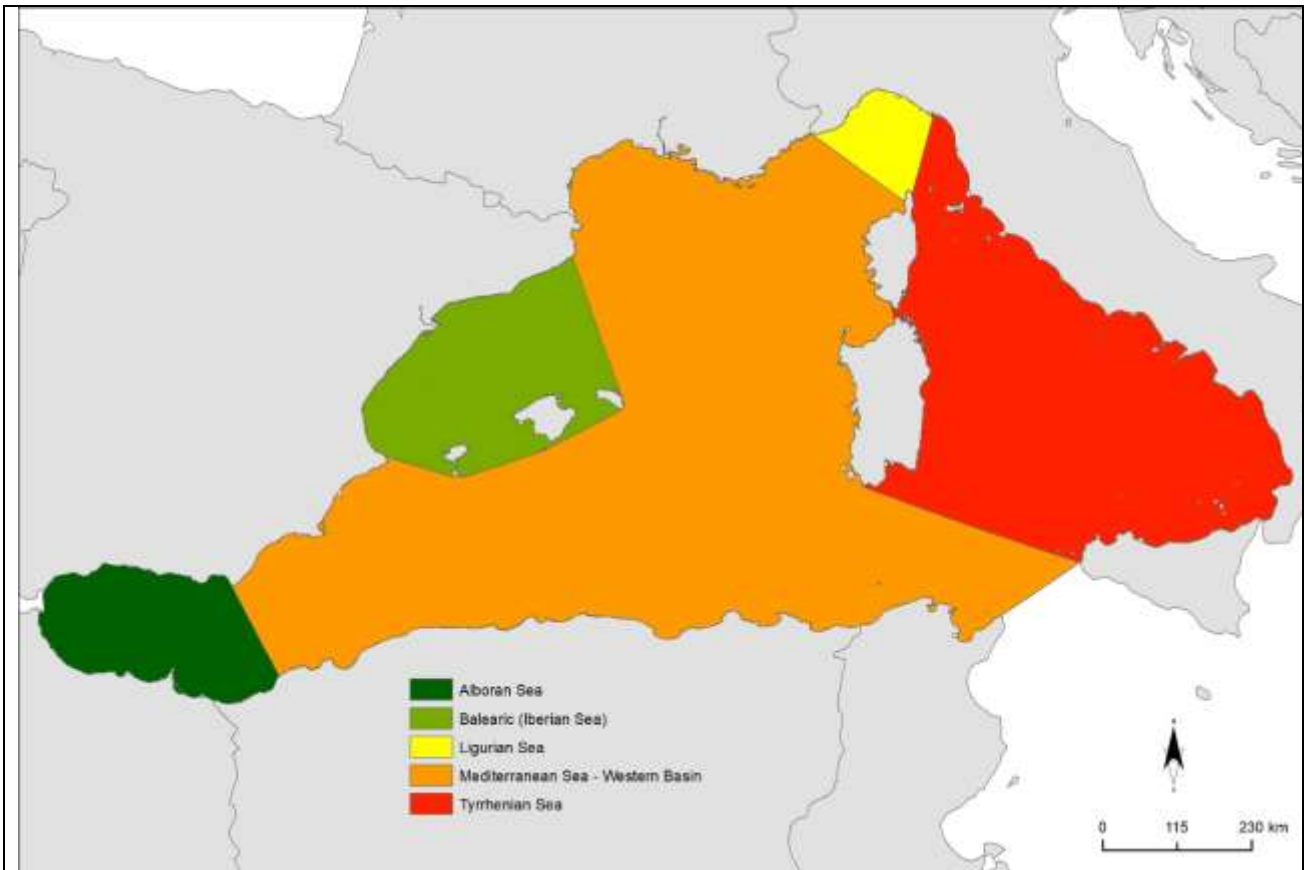
¹ For the purpose of building the methodology for aggregation and integration rules contained in this document only the scientific elements have been considered from any reference included in this document. Legal considerations are out of the scope of the present document, which serves exclusively scientific purposes.

by helping to achieve significant and measurable improvement in Europe's environment, through the provision of timely, targeted, relevant, and reliable information to policymaking agents and the public.

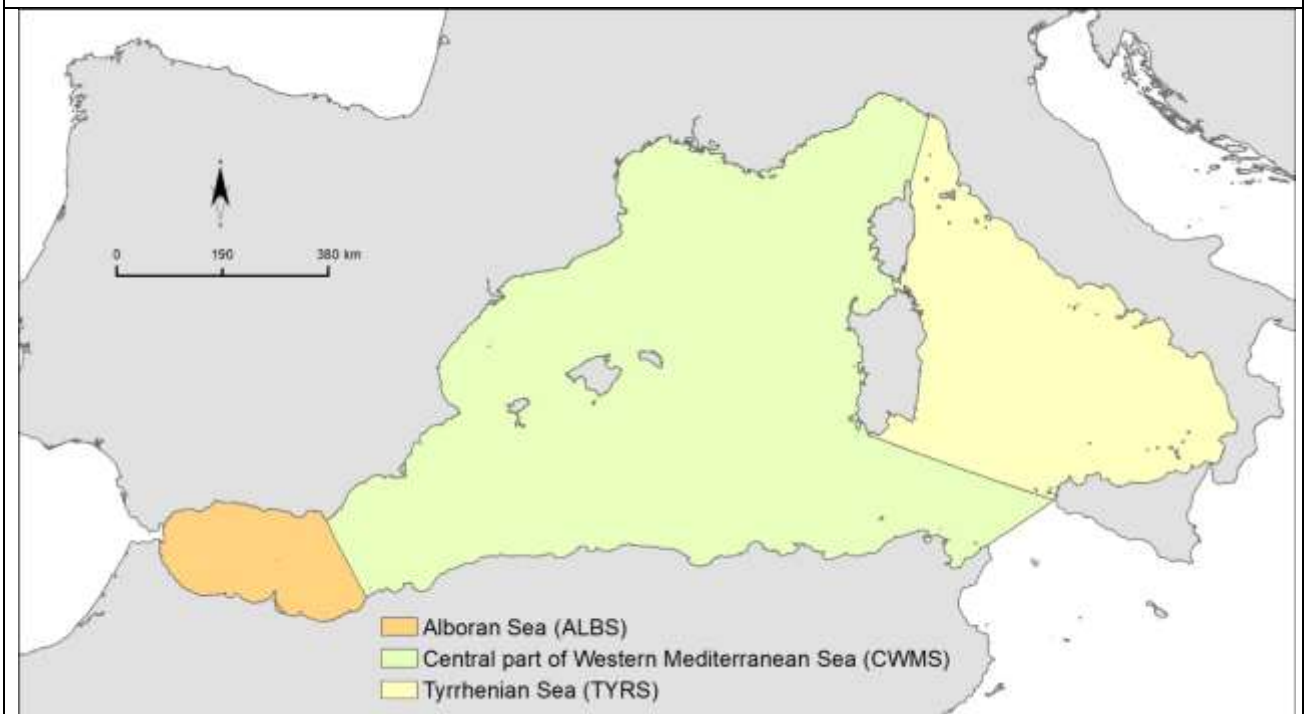
- The European Environment Information and Observation Network (Eionet) is a partnership network of the European Environment Agency (EEA) and its 38 member and cooperating countries. The EEA is responsible for developing Eionet and coordinating its activities together with National Focal Points (NFPs) in the countries. The NFPs are responsible for coordinating networks of National Reference Centres (NRCs), bringing together experts from national institutions and other bodies involved in environmental information. Eionet also includes seven European Topic Centres (ETCs). They are consortia of institutions across EEA member countries dealing with a specific environmental topic and contracted by the EEA to perform specific tasks of its work programme.
- The Marine Regions (m_regions hereafter) is a standard list of marine georeferenced place names and areas. It integrates and serves geographic information from the VLIMAR Gazetteer and the MARBOUND database and proposes a standard of marine georeferenced locations, boundaries and regions. The VLIMAR Gazetteer is a database with geographic, mainly marine names such as seas, sandbanks, seamounts, ridges, bays, or even standard sampling stations used in marine research (used for the Western Mediterranean Sub-region).
- The official Marine Reporting Units of France that are the basis for the creation of the IMAP SAUs for the needs of NEAT work.
- Discomap portal from where, detailed MRUs and subMRUs are available for Italy.
- The Spatial Data Infrastructure of European Environment Agency includes a variety of environmental data for the EU member states. Datasets are updated regularly, and the majority of the available resources are available as open access to the public domain.
- Marine Reporting Units used in Marine Strategy Framework Directive (MSFD) 2024 reporting cycle - version 1.0, Feb. 2020.

The delineation of the sub-divisions of the Western Mediterranean Sea was based on the IHO² data available by the Marine Regions portal and shown in Fig.1.a. Based on this information 3 subdivisions are proposed for the present assessment and shown in Fig.1.b.

² Limits of oceans and seas (1953). 3rd edition. IHO Special Publication, 23. International Hydrographic Organization (IHO): Monaco. 38 pp.



(a)



(b)

Figure 1. (a) Map of the Western Mediterranean Sea with limits of subdivisions as found in the Marine Regions portal and based on the IHO data. (b) Map of the Western Mediterranean subregions with subdivisions formulated for the present work (with the Ligurian and the Balearic Seas included under the CWMS)

In line with available sources as elaborated above, and with the methodology of work provided in UNEP/MED WG.533/10, Appendix III and accepted by the Meeting of CorMon Pollution Monitoring (27 and 30 May 2022), the 4 general working steps were followed in order to define the IMAP spatial assessment units (SAUs) from the areas of monitoring recognized from distribution of the monitoring stations and other relevant details as elaborated here-below per each country.

4. The steps for defining the IMAP Spatial Assessment Units

The following working steps have been followed to accomplish the objectives of the current work.

Step 1 “Defining coastal and offshore waters”. Following the approach already applied for the Adriatic Sea subregion (UNEP/MED WG.533/10, Appendix III; UNEP/MED WG. 533/Inf 4/Rev.1 and UNEP/MED 533/Inf 5/Rev.1) and in line with the IMAP methodology the two zones were defined for the purposes of the present work in the Western Mediterranean Sea subregion as follows: 1) the coastal waters: including all indentations (inlets, bays, gulfs) from the straight baseline landward, as well as the 1 nautical mile zone from the straight baseline seaward (in different literature sources, this 1 nautical mile zone is also called the buffer zone); 2) the offshore waters: including the area beyond the 1 nautical mile seaward to the most distant monitoring station defined in the national IMAP monitoring programmes.

Step 2 “Recognizing scope of IMAP areas of monitoring”: In the absence of monitoring areas reported by the CPs, the distribution of monitoring stations was investigated by considering the coordinates of their positions provided by the CPs in the IMAP Info System. IMAP monitoring stations (i.e., hotspot, coastal, offshore stations) are grouped under the two types of waters as defined under step 1 i.e. the coastal waters up to 1nm and the offshore waters, following the IMAP nesting assessment methodology as described in UNEP/MED WG. 509/Inf.10//Rev2. This was followed by the preparation of relevant GIS layers/maps containing positions of IMAP monitoring stations in the two zones; this included recognition of the monitoring areas based on distribution of the monitoring stations in the absence of the areas of monitoring (i.e., monitoring transects) defined by the CPs. As explained above, spatial coverage of the coastal waters and the offshore waters is based on available data as reported to the IMAP Info System, submitted to UNEP/MAP and defined in national IMAP programmes.

Step 3 “Setting IMAP area of assessment”: This step included defining the IMAP areas of assessment (IMAP SAUs) based on the anticipated areas of monitoring. To recognize the areas of monitoring, the criteria already set for that purpose in UNEP/MED WG. WG.509/Inf.10/Rev2 were applied to the largest possible extent. Namely, the following criteria were applied to recognize the scope of the areas of monitoring: i) spatial distribution of monitoring stations was compared with the sufficiency of quality-assured data as collated for NEAT application in order to ensure a due consideration is given to the risk-based principle; ii) representativeness/importance of the areas of monitoring for setting of the areas/zones of assessment. In addition, the interrelation of the MRUs for the CPs that are EU MSs with the IMAP monitoring areas was investigated and whether these fit for their use as IMAP SAUs, following the criteria described previously. Final results are GIS layers/maps of IMAP SAUs prepared per country from the GIS layers providing the positions of monitoring stations in recognized areas of monitoring. This was followed with equalization of the areas of monitoring with the IMAP SAUs for Algeria, Morocco, Tunisia while for Spain, France, Italy the IMAP SAUs definition was based on the MSFD MRUs. Details per each country separately are presented here - below.

Step 4 “Nesting of the areas of assessment within application of NEAT tool”: For the step of nesting, the areas of assessment were first classified under the 3 subdivisions of the Western Mediterranean Sea (i.e. ALBS, CWMS, TYRS). A nesting scheme approach was followed. In UNEP/MEP WG. 533/Inf.4/Rev.1 related to the Adriatic Sea Sub-region, the nesting of the areas was made in a 4 levels’ scheme where 1st level is the finest and 4th level is the highest. Similarly, it is proposed for the Western Mediterranean Sub-region, as follows:

- 1st level provided nesting of all national IMAP subSAUs within the two key IMAP assessment zones per country i.e., coastal and offshore zone;
- 2nd level provided nesting of the assessment areas set in IMAP assessment zones i.e., coastal and offshore, on the subdivision level i.e., i) ALBS coastal, ALBS offshore; ii) CWMS coastal, CWMS offshore; iii) TYRS coastal, TYRS offshore);

- 3rd level provided nesting of the assessment zones within the 3 subdivisions (ALBS, CWMS, TYRS);
- 4th level provided nesting of the areas of assessment within the Western Mediterranean Sub-region.

After setting of the finest IMAP areas of assessment and their nesting under a hierarchical scheme, the integration of the assessment results was conducted following the respective 4 levels nesting approach:

- 1st level: Detailed assessment results provided per subSAUs and SAUs;
- 2nd level: Integrated assessment results provided per: i) ALBS coastal, ALBS offshore; ii) CWMS coastal, CWMS offshore; iii) TYRS coastal, TYRS offshore);
- 3rd level: Integrated assessment results provided per subdivision ALBS, CWMS, TYRS;
- 4th level: Integrated assessment results provided for the Western Mediterranean Sea Sub-region.

The description of the IMAP SAUs and details on specificities for each country are provided here-below.

5. Defining the IMAP areas of assessment (IMAP SAUs) for the West Mediterranean countries

Algeria

The below shown map (Fig. 2) provides an overview of the distribution of the monitoring stations of Algeria in the Western Mediterranean Sub-region. Coordinates of monitoring stations positions are from the National IMAP programme.

Following the IMAP nesting assessment methodology for CI17 assessment (UNEP/MED WG. 509/Inf.10//Rev.2) the coastal and offshore waters have been defined for Algeria in the WMS based on the positions of the monitoring stations. Coastal waters are defined using the 1 nm distance from the baseline, including internal waters, as explained above; offshore waters are defined by the position of the most distant monitoring station seaward. The relation of the monitoring stations to the coastal and offshore waters for Algeria is shown in Fig. 3.

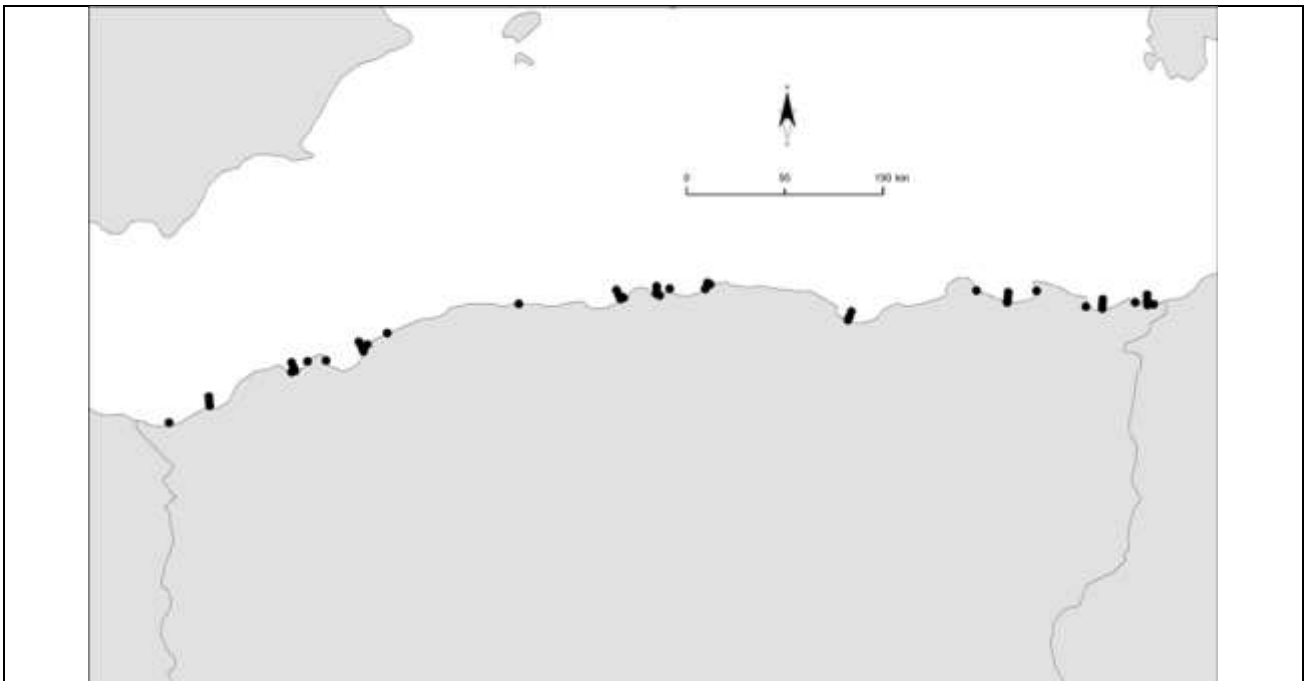


Figure 2. The distribution of the monitoring stations of Algeria for CI17 in the Western Mediterranean Sub-region as defined in the National IMAP programme.

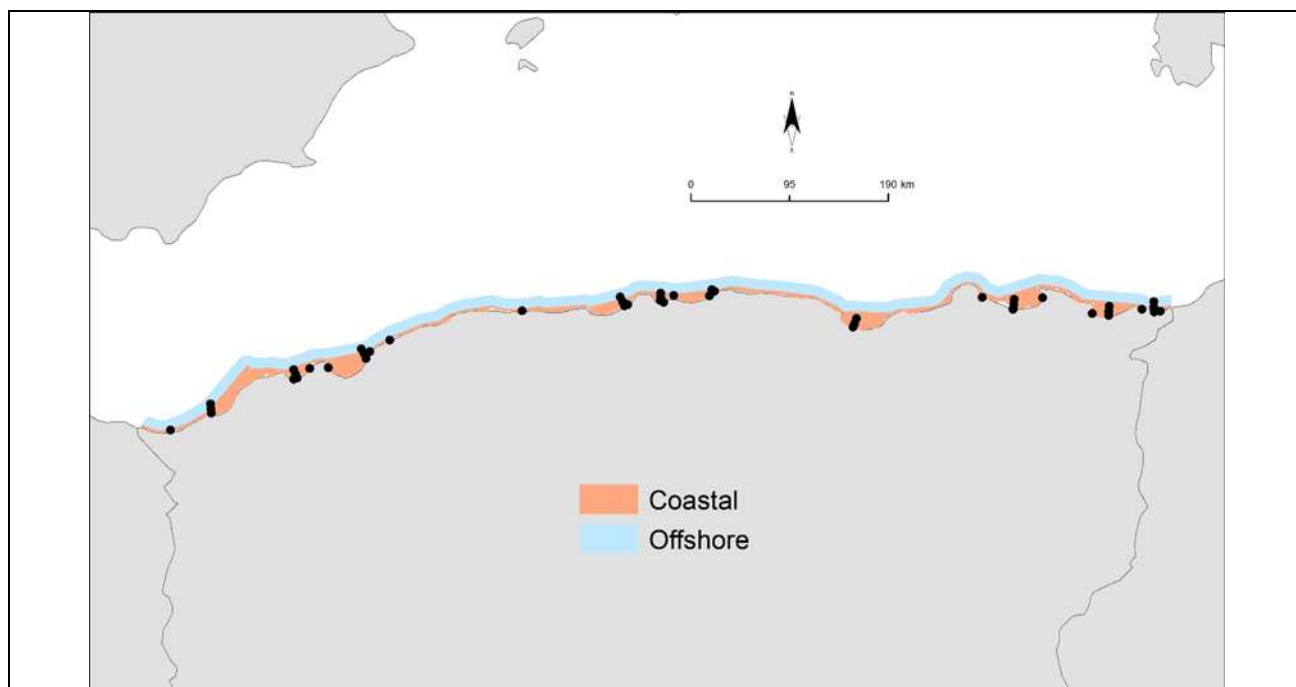


Figure 3. The coastal and offshore waters of Algeria defined in line with the IMAP methodology and based on the Marine Regions data and resources described above in the section 3, overlaid on the distribution of monitoring stations.

The national IMAP monitoring programme of Algeria sets 11 areas of monitoring namely: Ain Temouchent, Oran, Mostaganem, Chef, Tipaza, Alger, Bourmerdes, Bejaia, Skikda, Annaba, El Tarif. By considering these monitoring areas along with related distribution of monitoring stations the following 11 coastal and 11 offshore IMAP SAUs are defined and shown in Fig. 4. One coastal and one offshore SAU fall into the ALBS and the rest onto the CWMS subdivision. All IMAP SAUs are listed in Table 1.

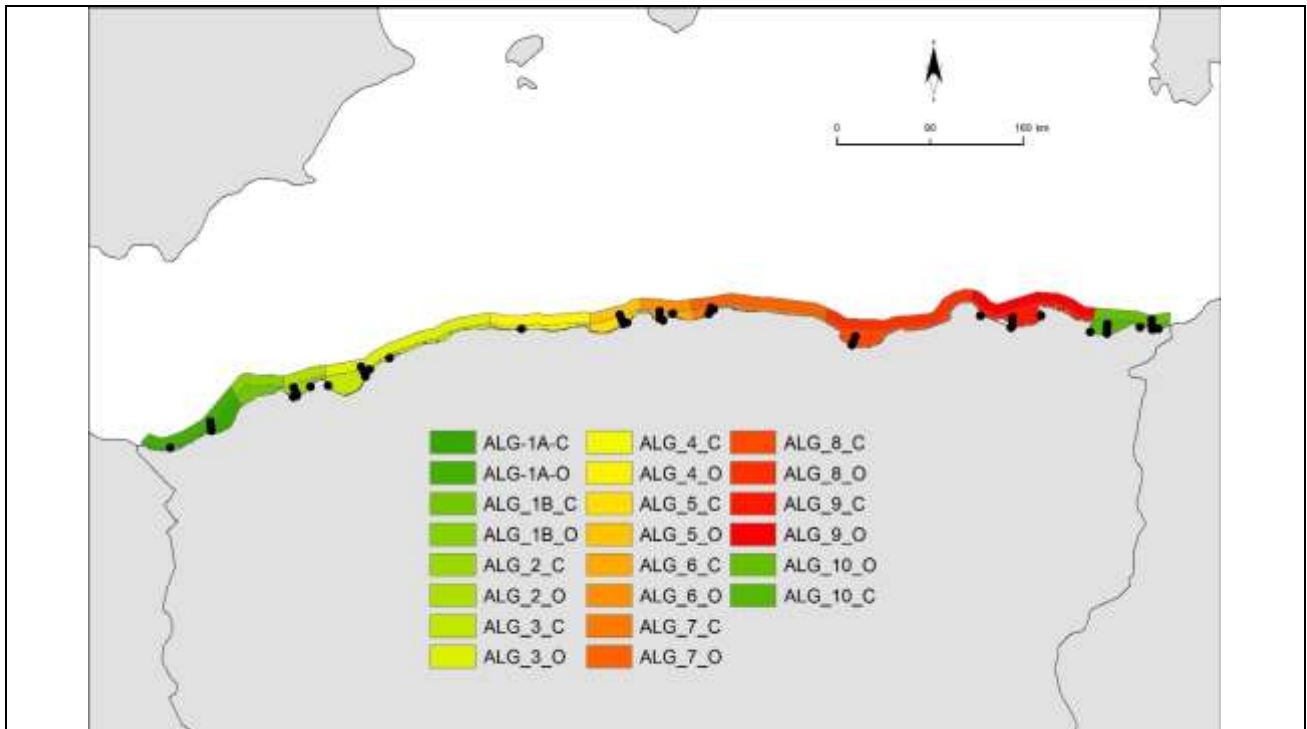


Figure 4. The final IMAP SAUs for Algeria, overlaid on the distribution of the monitoring stations. IMAP SAUs Codes of IMAP SAUs ALG-1A & ALG-1B refer to the same monitoring area split into the 2 subdivisions ABLs and CWMS for the assessment purposes.

France

In Figure 5 is shown the distribution of monitoring stations of France in the Western Mediterranean subregion, for IMAP CI 17 as directly submitted to UNEP/MAP and reported in IMAP IS.

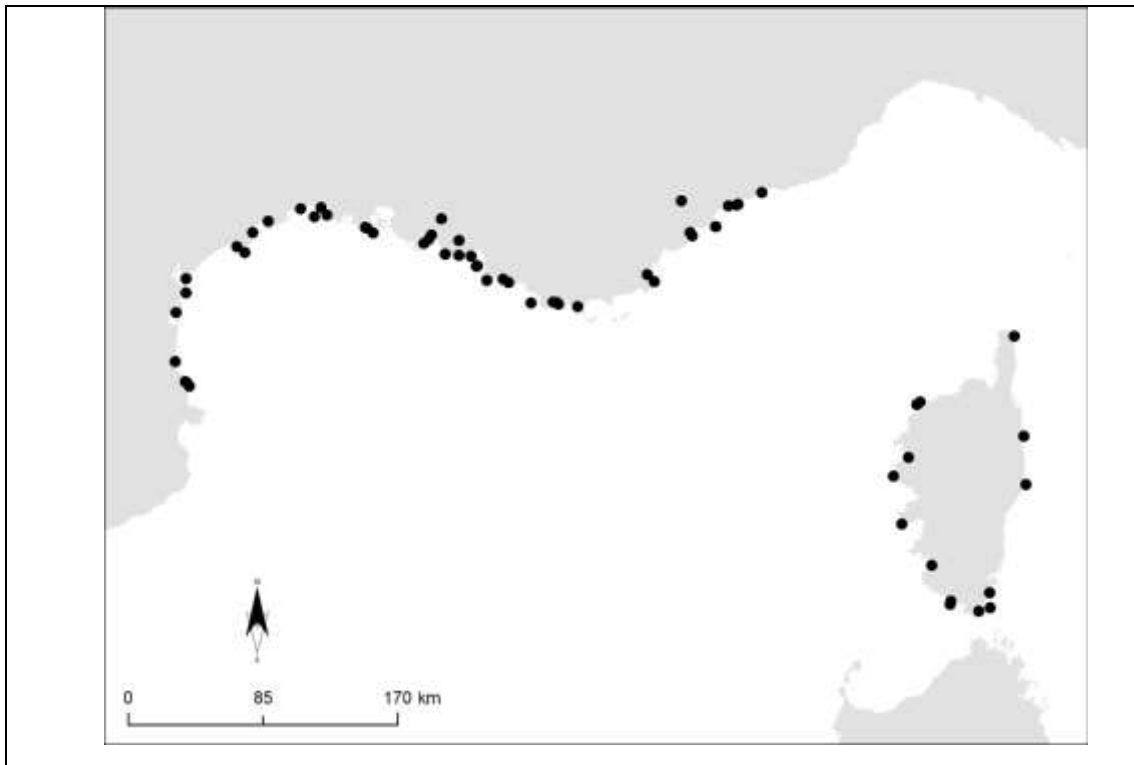


Figure 5. The distribution of the monitoring stations of France for CI17 in the Western Mediterranean Sub-region in line with the coordinates of the monitoring stations as submitted to UNEP/MAP and reported in IMAP IS.

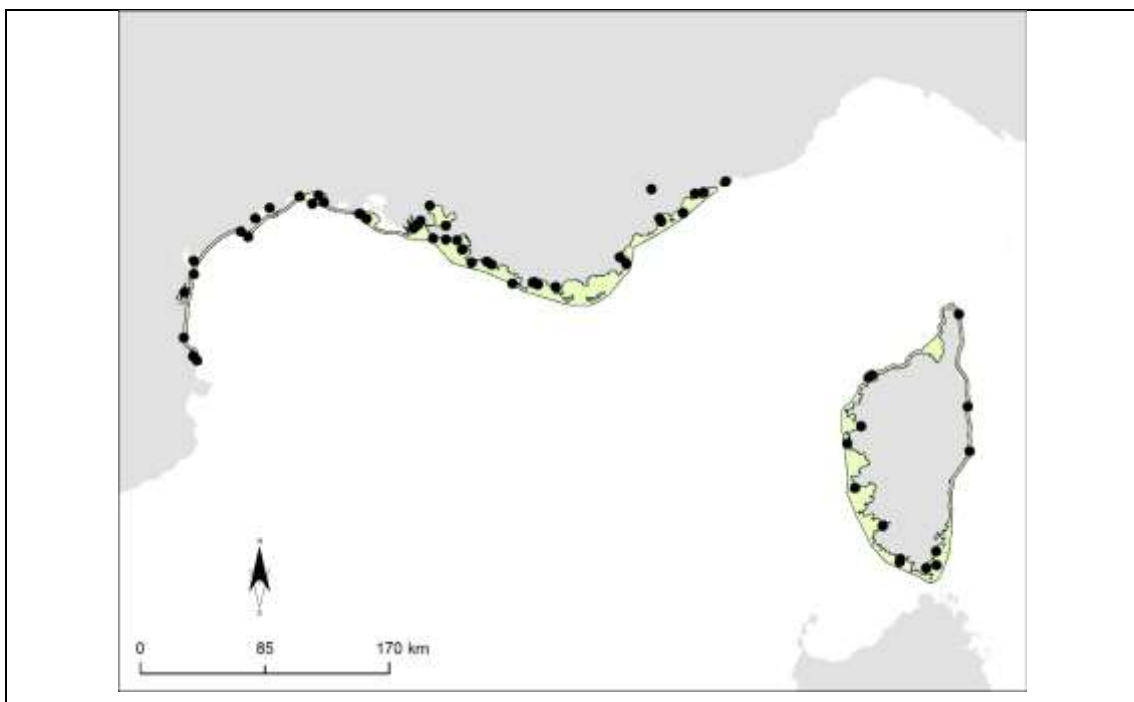


Figure 6. The coastal waters of France defined for the present assessment of CI 17 by using the Marine Regions data and resources described above in the section 3 and overlaid on the distribution of monitoring stations.

In Figure 6 is shown the relation of the monitoring stations of France to the coastal waters zone as defined for the present analysis and based on the Marine Regions data portal and resources described above in the section 3. It is clearly shown that all monitoring stations for CI17 fall within the coastal waters.

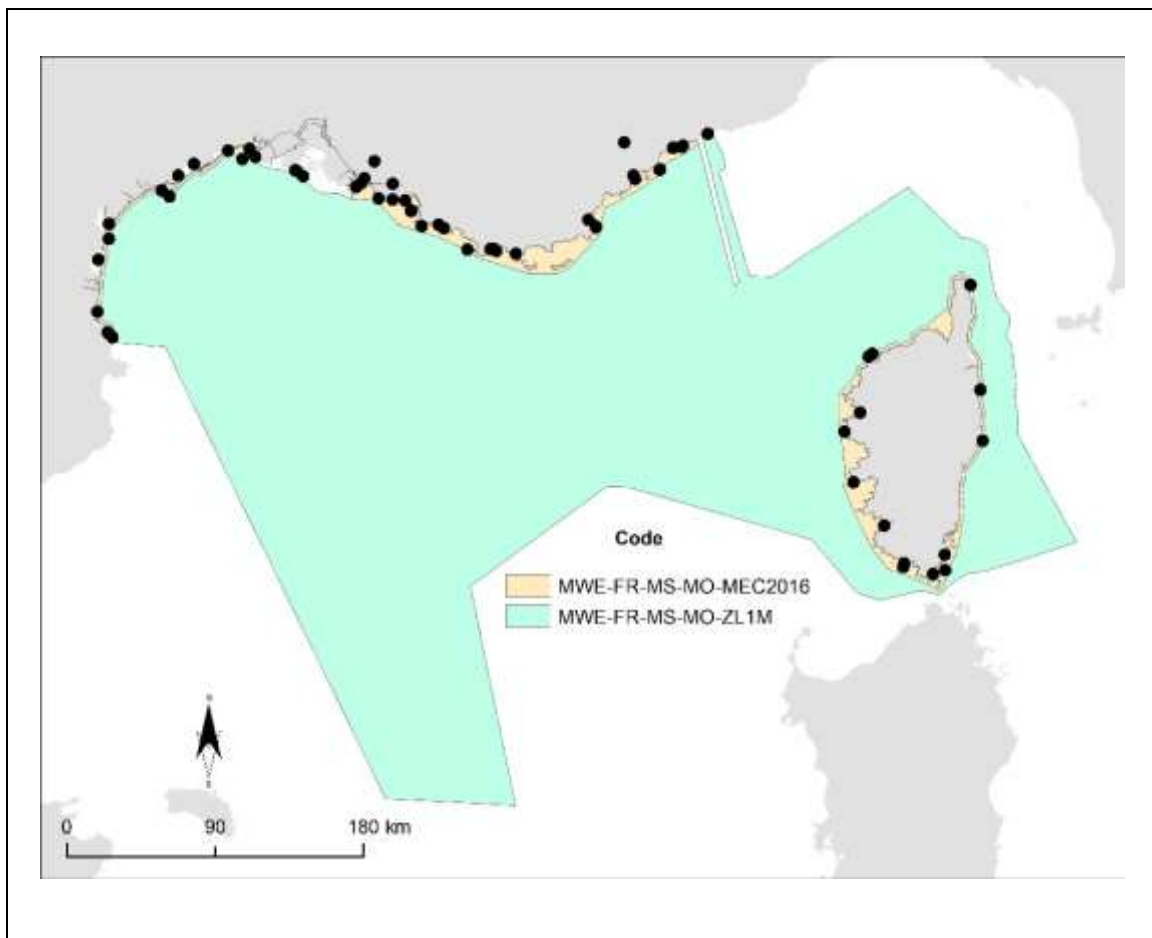


Figure 7. The officially defined MRUs of France in the Western Mediterranean Sub-region: the two MRUs related to CI 17 covering coastal and offshore waters CI17 assessment;

To reach a common, harmonized IMAP spatial scales among all Western Mediterranean countries, that are under consideration in the present work the French marine reporting units were further checked against the coastal and offshore waters in order to derive the IMAP coastal and offshore assessment SAUs. Given that France has set coastal monitoring stations and no stations are reported beyond 1 nm in offshore waters, as well as obligation of all CPs to undertake monitoring in offshore waters in line with IMAP, for the present work MRUs [MWE-FR-MS-MO-MEC-2016] and [MWE-FR-MS-MO-ZL1M] are considered as the potential areas of coastal and offshore monitoring respectively (Fig. 7(a)). The MRU [MWE-FR-MS-MO-MEC-2016] corresponds to the coastal waters up to 1nm including the coasts of Corsica (shown in yellow in Fig.7) and is used for the delineation of the coastal assessment zone for the purposes of the present analysis. The MRU [MWE-FR-MS-MO-ZL1M] extends up to 12nm from coast and is used for the delineation of the offshore assessment zone for the purposes of the present analysis. Further to the delineation of the coastal and offshore assessment zones, finer assessment units were defined within each of them. The coastal IMAP SAUs of Corsica were separated from the [MWE-FR-MS-MO-MEC-2016] MRU and divided between the subdivisions of CWMS and TYRS. The remaining part of [MWE-FR-MS-MO-MEC-2016] MRU along the coast of the French mainland corresponds to one coastal SAU. Similarly for the offshore IMAP SAUs, the [MWE-FR-MS-MO-ZL1M] was divided into 2 SAUs: one corresponding to Corsica offshore waters belonging to the TYRS and a second one for offshore waters belonging to the CWMS. This led to the derivation of 5 IMAP assessment areas (3 coastal and 2 offshore IMAP SAUs) in the waters of France by considering the official MRUs (Fig.8)

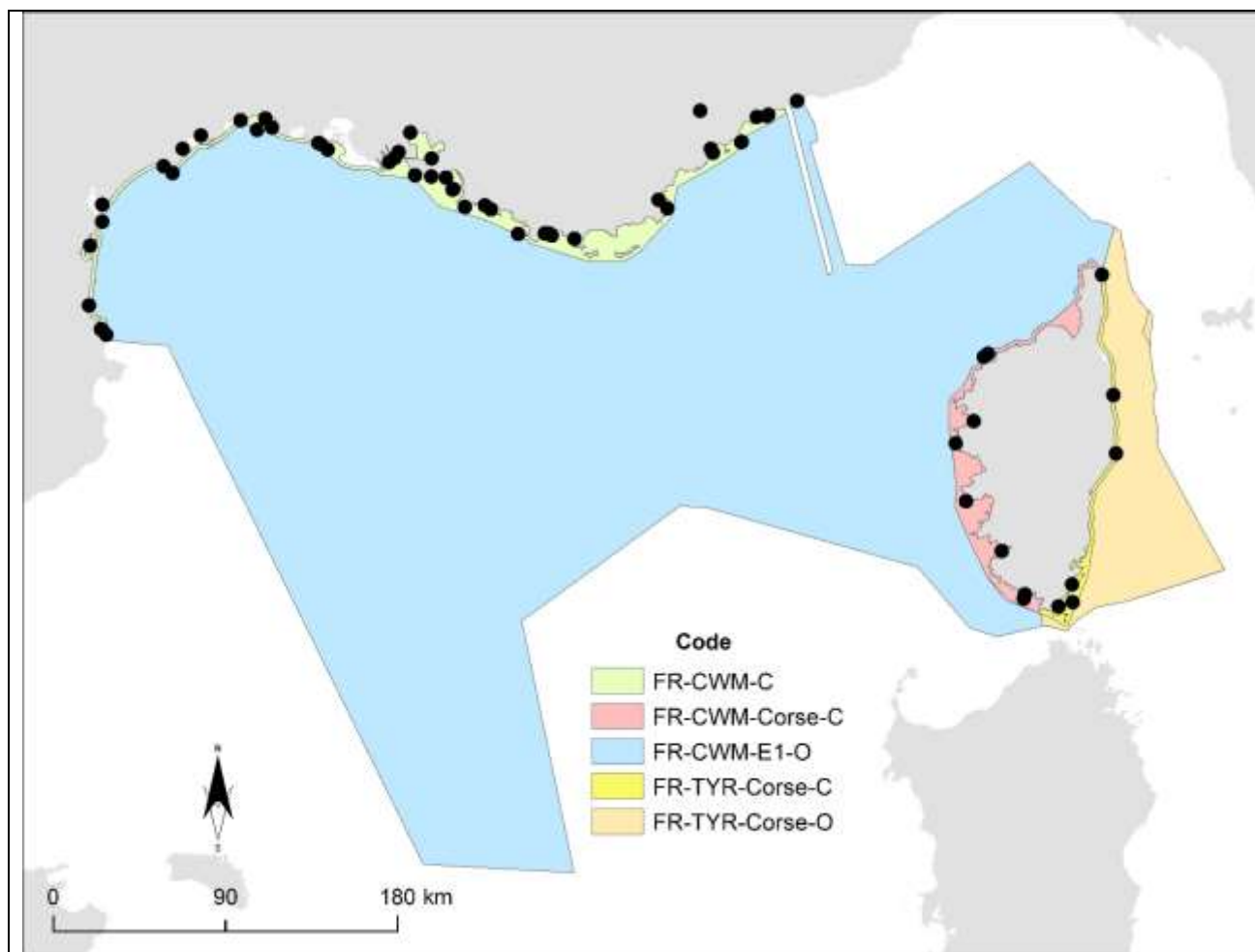


Figure 8. The IMAP SAUs for France defined for the purposes of the IMAP CI17 assessment, overlaid on the distribution of monitoring stations.

For France, the five coastal and the five offshore IMAP SAUs fall in the CWMS subdivision and the one coastal and the one offshore in the TYRS subdivision. All IMAP SAUs are listed in Table 1. As stated, offshore SAUs will not be considered for the present assessment due to absence of stations/data reported for the monitoring stations in the offshore IMAP SAUs for the scope of CI17 assessment.

Italy

In Figure 9 the distribution of monitoring stations of Italy, as reported to IMAP IS and submitted to UNEP/MAP is shown and in Figure 10 along with their relation to the coastal and offshore waters as defined using the Marine Regions data and resources described above for the present assessment of CI 17.



Figure 9. The distribution of the monitoring stations of Italy for IMAP CI 17 in the Western Mediterranean Sub-region in line with the coordinates of the monitoring stations as submitted to UNEP/MAP and reported in IMAP IS.



Figure 10. The coastal waters of Italy defined for the present assessment of CI 17 by using the Marine Regions data and resources described above in the section 3, and overlaid on the distribution of monitoring stations.

To reach a common, harmonized IMAP spatial scales among all Western Mediterranean countries, that are under consideration in the present work the marine reporting units of Italy were further checked against the coastal and offshore waters and the position of the monitoring stations in order to derive the IMAP coastal and offshore assessment SAUs.

For the purposes of contaminants monitoring, the 4 official MRUs are defined namely IT-WMS-8B06-0001; IT-WMS-8B06-0002; IT-WMS-8B06-0003, as shown in Fig. 11.

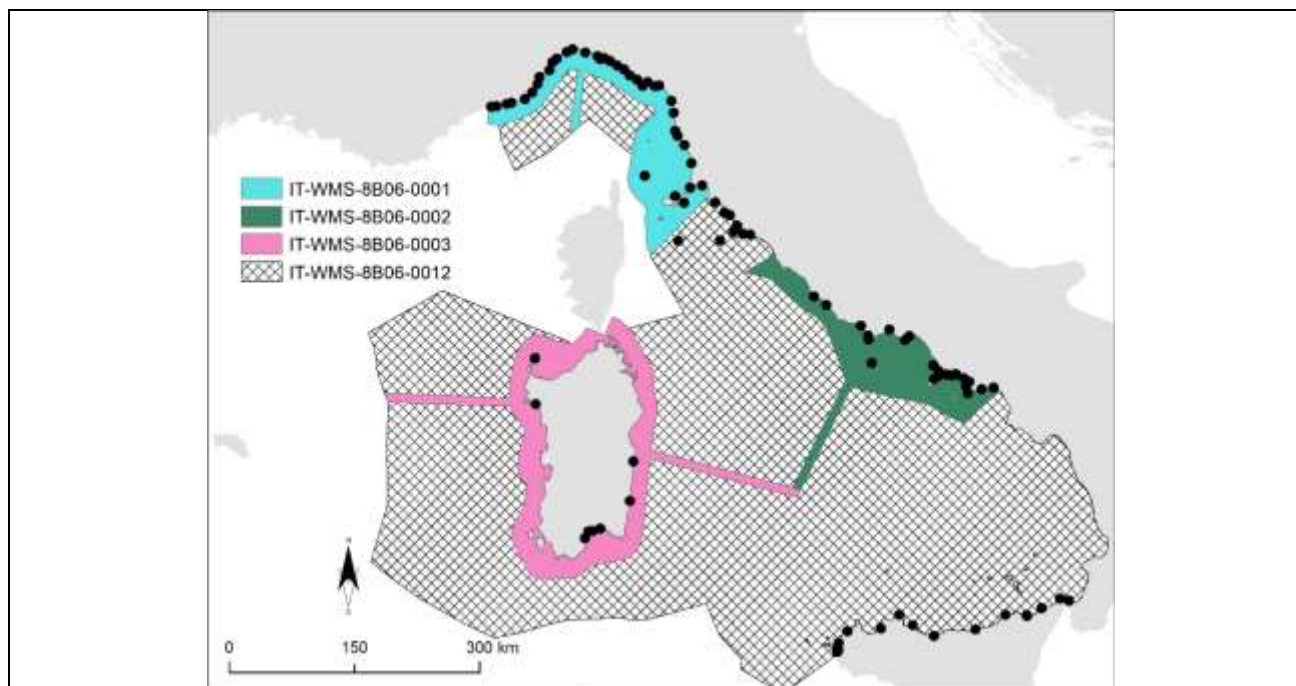


Figure 11. The officially defined MRUs of Italy overlaid on the distribution of the monitoring stations.

Given that Italy has set coastal monitoring stations and information on setting monitoring stations beyond 1 nm in offshore waters, as well as obligation of all CPs to undertake monitoring in offshore waters in line with IMAP, for the derivation of the IMAP SAUs the following process, as described here-below, was undertaken.

For Italy the official MRUs [IT-WMS-8B06-0001; IT-WMS-8B06-0002; IT-WMS-8B06-0003] cover an area larger than the 1nm coastal zone (Fig. 11), while some parts of the Italian coastline correspond to a very large MRU [IT-WMS-8B06-0012]. The 1nm coastal waters zone for Italy was subdivided into coastal IMAP SAUs according to the limits of the 3 official MRUs [IT-WMS-8B06-0001; IT-WMS-8B06-0002; IT-WMS-8B06-0003]. The remaining parts of the coastal zone (falling the large MRU [IT-WMS-8B06-0012] were further subdivided based on their geographical position along the coast of the Italian mainland and along the coasts of Sicily resulting to another 3 coastal IMAP SAUs. In addition, the coastal zone of Sardinia was divided between the CWMS and the TYRS into the two coastal IMAP SAUs. In total 9 coastal IMAP SAUs were defined as shown in Fig. 12. The respective 5 offshore IMAP SAUs were defined by subtracting the surface area of the coastal IMAP SAUs from the surface area the MRUs. The final IMAP SAUs and stations distributions are shown in Figure 12 and their relationship to the official MRUs in Table 2.

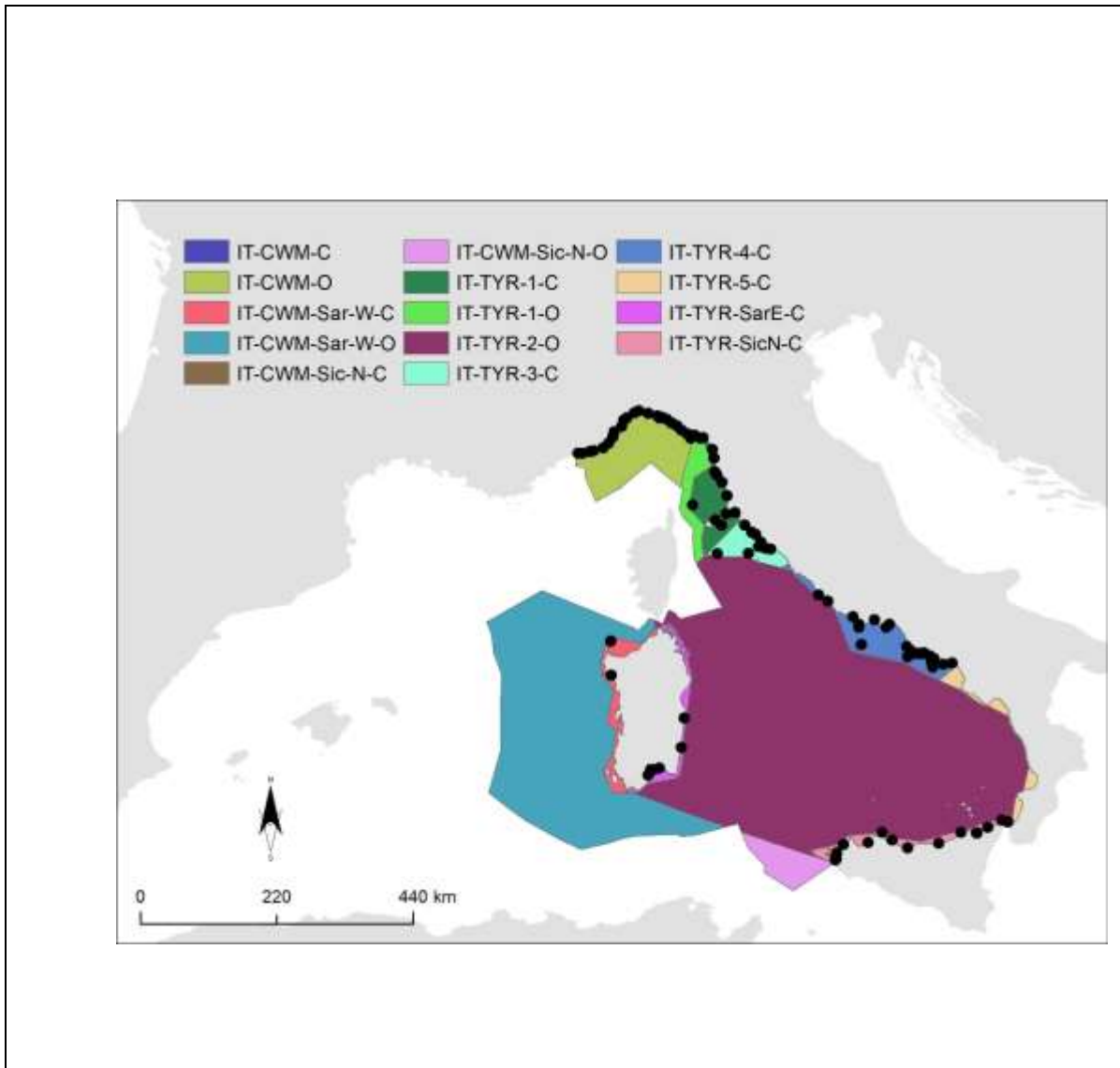


Figure 12. Final IMAP SAUs for Italy defined for the purposes of the IMAP CI17 assessment, overlaid on the distribution of the monitoring stations.

For Italy, the 2 coastal IMAP SAUs fall in the CWMS subdivision, and the 8 coastal IMAP SAUs in the TYRS. Three offshore IMAP SAUs fall in the CWMS and two IMAP SAUs in the TYRS subdivision. All IMAP SAUs are listed in Table 1.

As stated, offshore SAUs are not considered for the present assessment due to absence of monitoring stations/stations/data reported for the monitoring stations in offshore SAUs for the scope of CI17 assessment.

Morocco

The below shown map (Fig. 13) provides an overview of the distribution of the monitoring stations of Morocco in the Western Mediterranean Sub-region. Coordinates of monitoring stations positions are as reported to IMAP IS (2018 data files) and from the National IMAP programme.

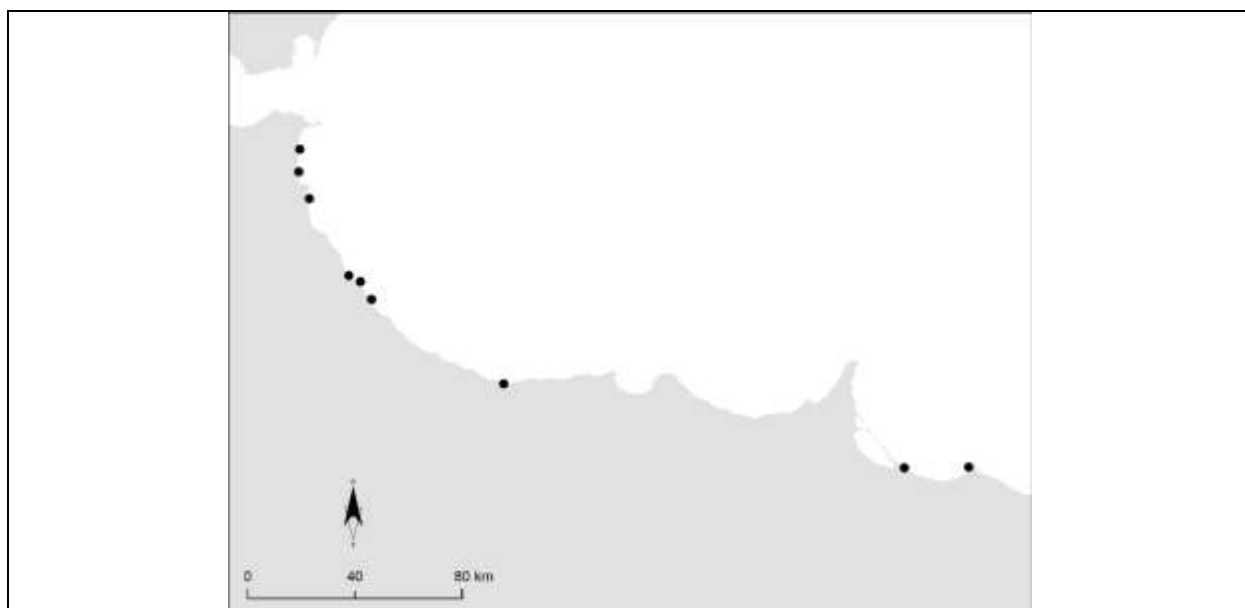


Figure 13. The distribution of the monitoring stations of Morocco for CI17 in the Western Mediterranean Sub-region.

Following the IMAP methodology for CI17 nesting and assessment (UNEP/MED WG. 509/Inf.10/Rev2) the coastal and offshore waters have been defined for Morocco based on the positions of the monitoring stations. Coastal waters are defined using the 1 nm distance from the baseline, including internal waters, as explained above; offshore waters are defined by the position of the most distant monitoring station seaward. The relation of the monitoring stations to the two coastal and offshore waters for Morocco is shown in Fig. 14.

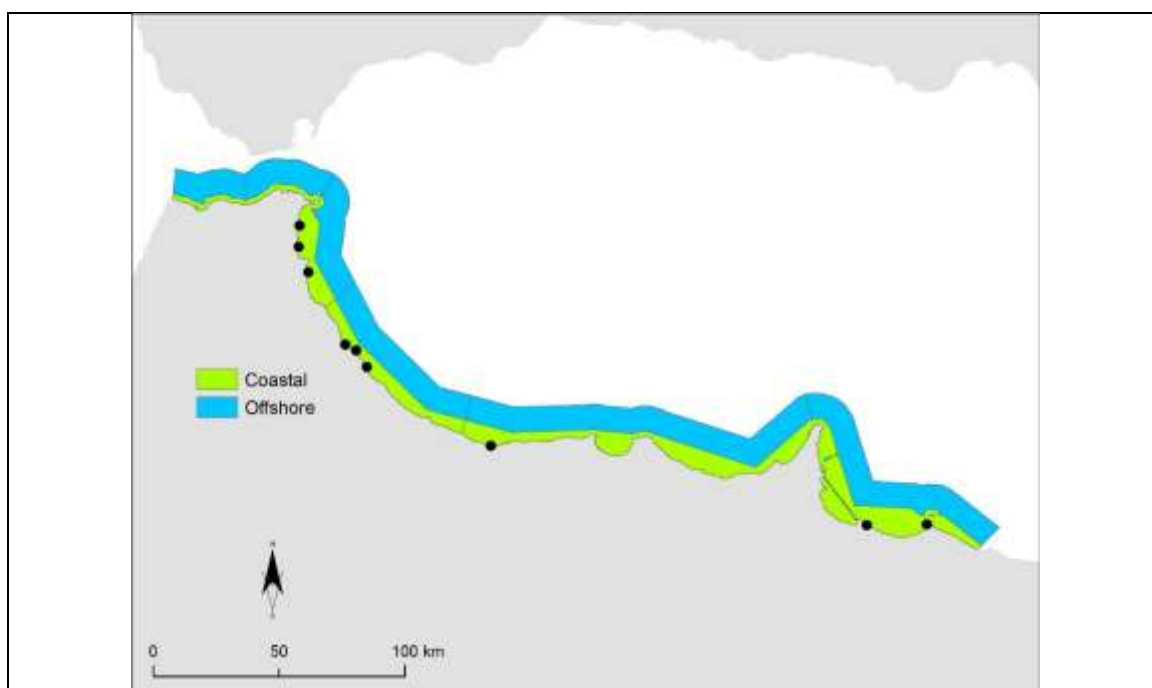


Figure 14. The coastal and offshore waters of Morocco defined for the present assessment of CI 17 in line with the IMAP methodology and based on the Marine Regions data and resources described above in the section 3, and overlaid on the distribution of monitoring stations. Only stations with data reported in the IMAP IS are shown.

The national IMAP monitoring programme of Morocco sets 5 areas of monitoring namely: Tanger (coastal waters), Oued Martil (hot spot), Oued Laou (hot spot), Al Hoceima (reference), Oued Malouya (hot spot). By

considering these monitoring areas along with related distribution of monitoring stations, the IMAP SAUs are defined and shown in Fig. 15. All IMAP SAUs for Morocco fall into the ALBS subdivision and are listed in Table 1.

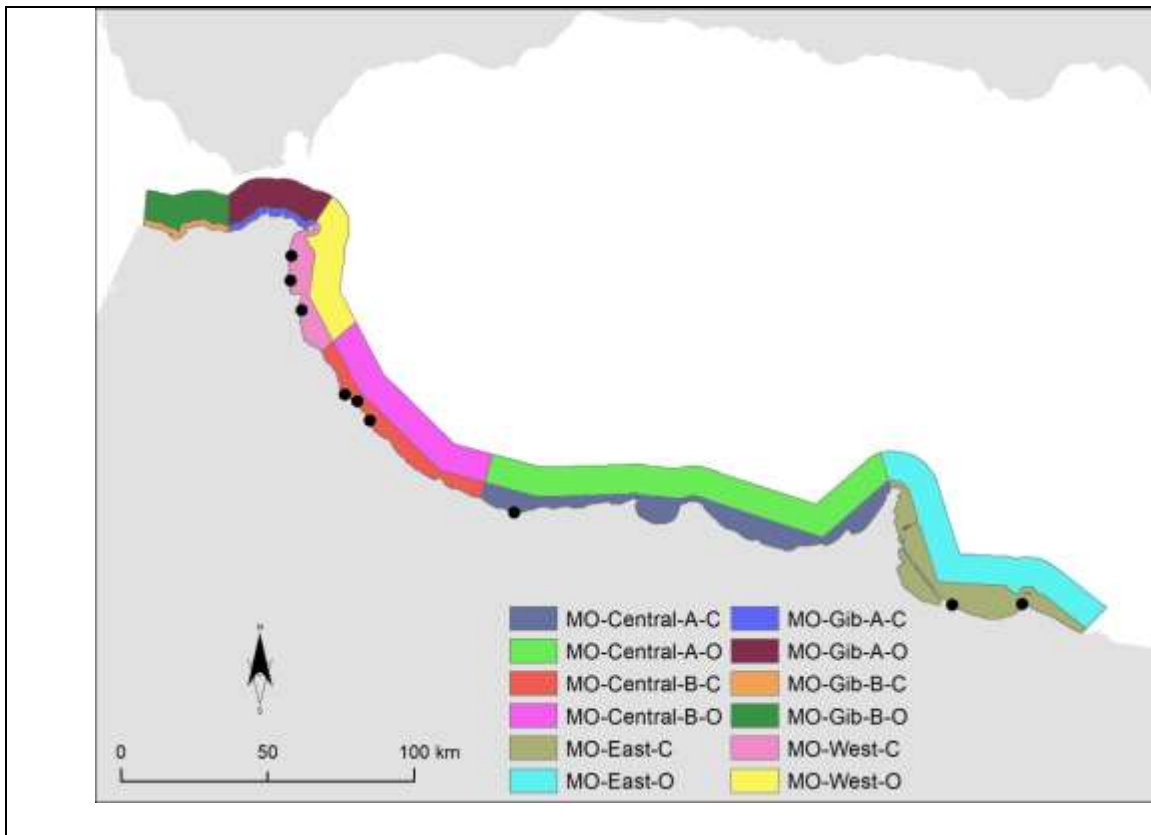


Figure 15. The final IMAP SAUs for Morocco defined for the purposes of the IMAP CI17 assessment, overlaid on the positions of monitoring stations. Codes of IMAP SAUs MO-Gib-A & Mo-Gib-B refer to the same monitoring area split into 2 IMAP SAUs for the assessment purposes due to the limited availability of monitoring stations.

Spain

The network of monitoring stations of Spain for IMAP CI 17, as reported to IMAP IS is shown in Fig. 16, while their relation to the coastal and offshore waters is shown in Fig. 17.

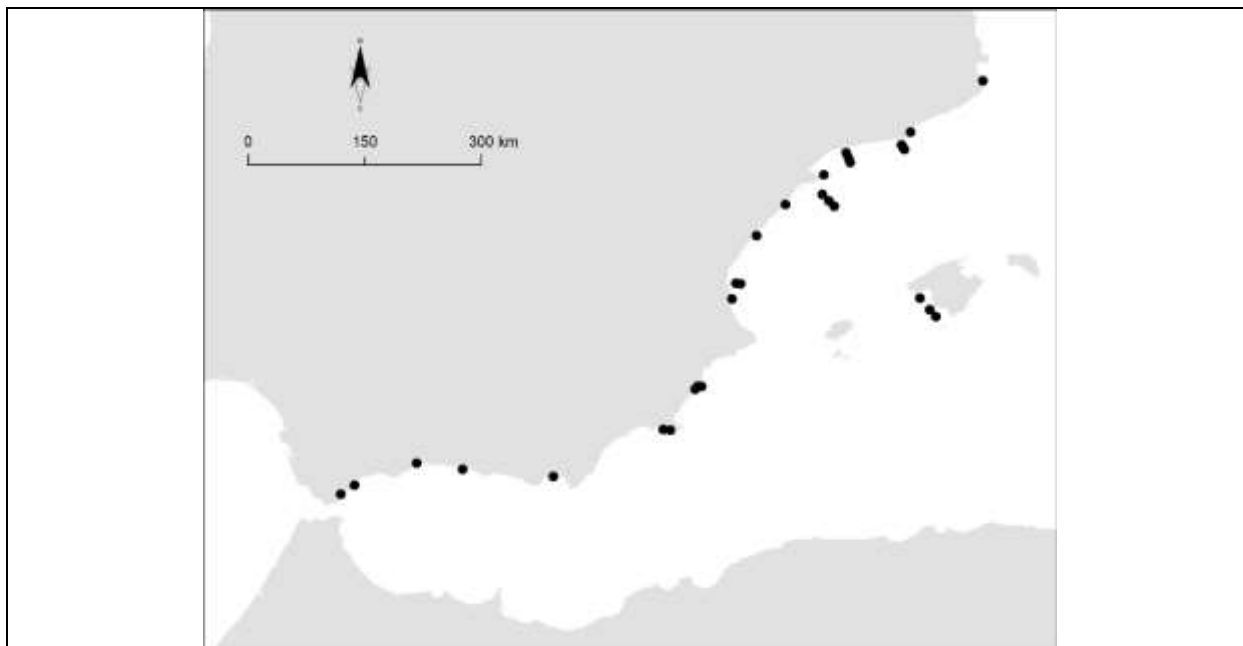


Figure 16. The distribution of the monitoring stations of Spain for IMAP CI17 in the Western Mediterranean Sub-region in line with the coordinates of the monitoring stations as reported to IMAP IS.

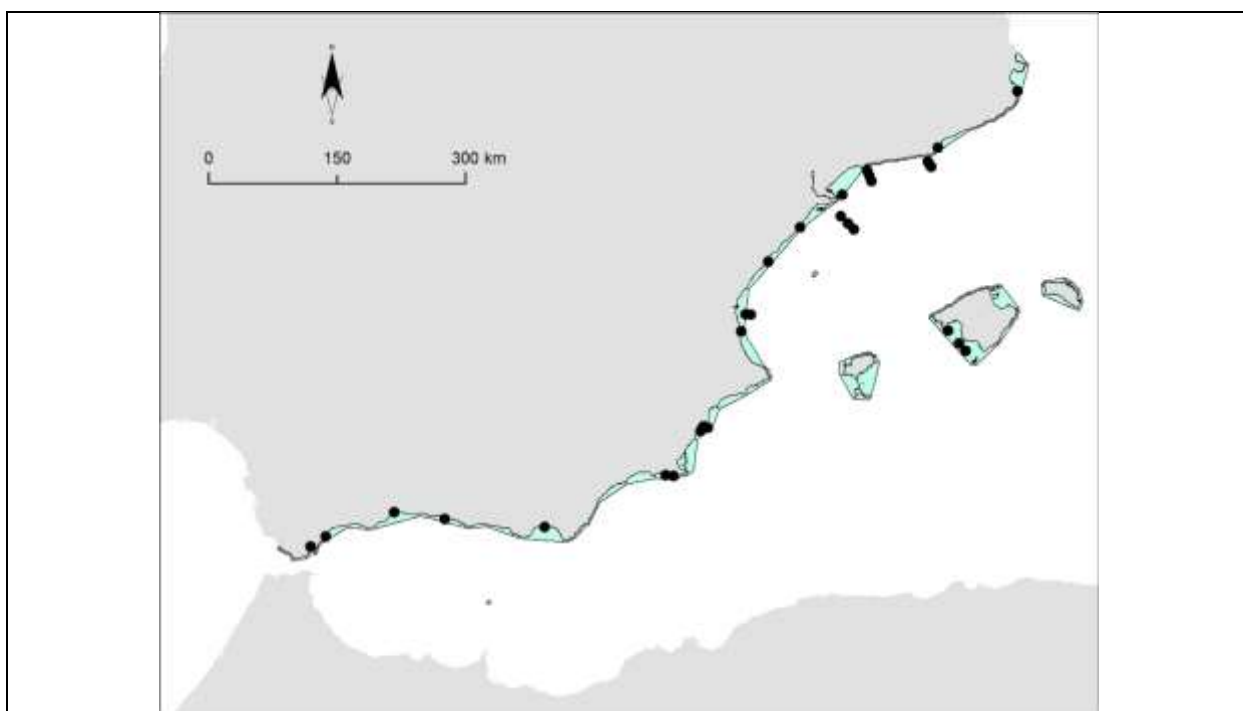


Figure 17. The coastal waters of Spain defined for the present assessment of CI 17 by using the Marine Regions data and resources, described above in the section 3, and overlaid on the distribution of monitoring stations.

To reach a common, harmonized IMAP spatial scales among all Western Mediterranean countries, that are under consideration in the present work the marine reporting units of Spain were further checked against the coastal and offshore waters and the position of the monitoring stations in order to derive the IMAP coastal and offshore assessment SAUs.

The official MRUs declared by Spain in the MSFD portal for the Mediterranean Sea are shown in Figure 18, along with the position of the monitoring stations. From figure 17 it is apparent that most monitoring stations of Spain fall within the coastal waters, with the exception of 16 stations.

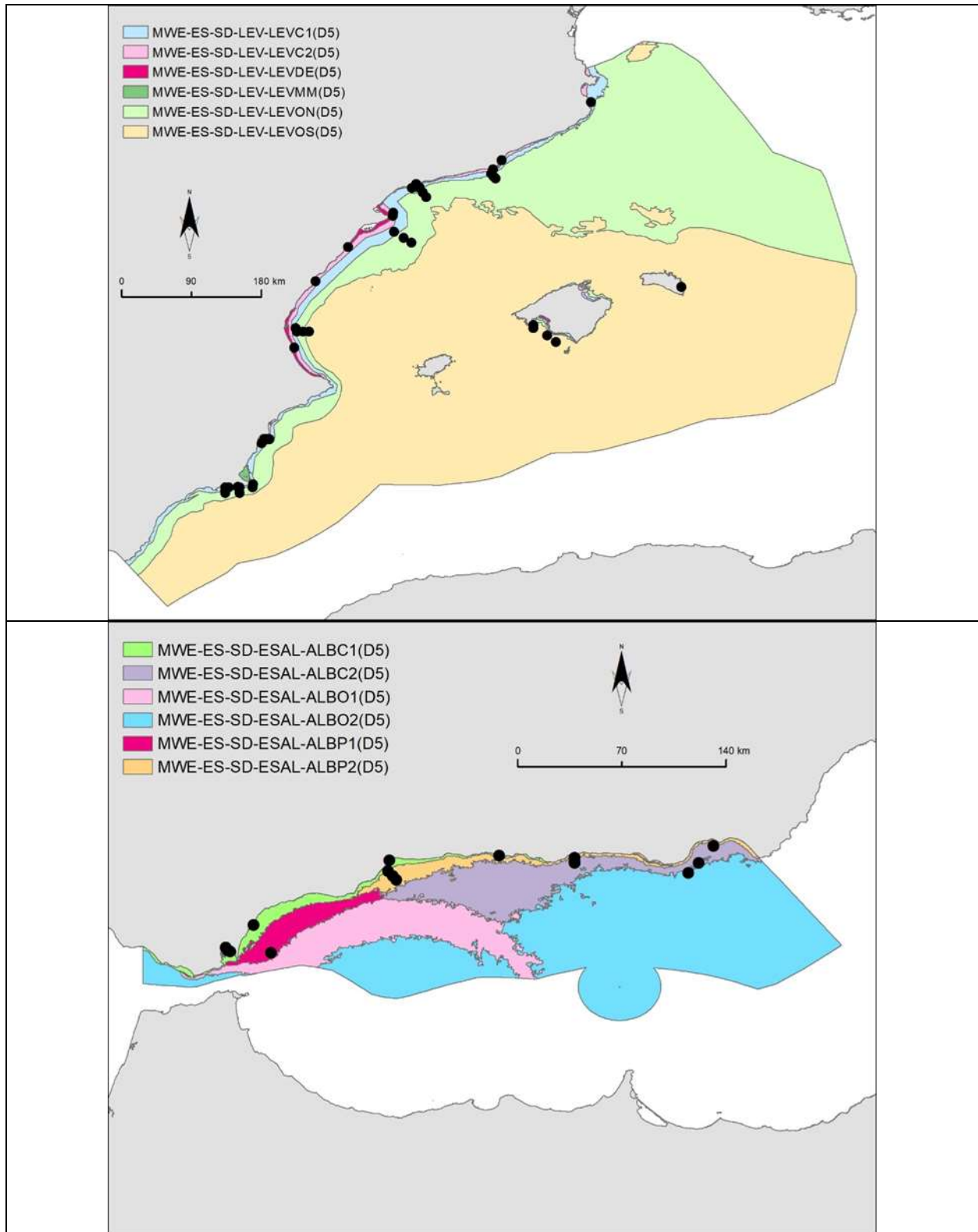


Figure 18. The officially defined MRUs of Spain overlaid on the distribution of monitoring stations; a) in the CWMS; b) in the ALBS

Spain has declared 6 MRUs along its coastline in the CWMS sub-division which are defined by the respective isobaths. Similarly, another 6 MRUs have been declared for the ALBS sub-division. As for other CPs which are the EU MSs, for defining the IMAP coastal and offshore SAUs, the relation of the Spanish MRUs and distribution of monitoring stations to the 1 nm coastal waters was investigated. Due to the fact that the MRUs

are based on the isobaths they have a variable width along the coast so that for each MRU the relation to the 1 nm coastal zone is also a variable. In order to be compatible with the IMAP methodology three coastal IMAP SAUs within the 1nm coastal waters, were defined for Spain as follows: one along its coast in the CWMS [ES-NWM-LEV1-C], a second for the coastal waters of the Balearic Islands [ES-NWM-LEVOS1-C], and a third IMAP SAU along the coast in the ALBS [ALBS-ES-C] as shown in Fig. 19.

In addition, offshore IMAP SAUs were defined following the methodology of spatial assessment unit nesting elaborated in (UNEP/MED WG. 509/Inf.10/Rev2) and here above for Italy by excluding the coastal IMAP SAUs surface area from the total surface of the official MRUs. For Spain in particular, the sum of the surface area of 4 MRUs (LEVC1; LEVC2; LEVD; LEVON) was calculated and then the surface area of the coastal IMAP SAU [ES-NWM-LEV1-C] was subtracted. This resulted to the area of the offshore IMAP SAU [ES-NWM-LEV1-O] (Fig.19). The area of the offshore IMAP SAU [ES-NWM-LEVOS-O] was calculated by subtracting the area of the coastal IMAP SAU [ES-NWM-LEVOS-C] from the area of the MRU [ES-NWM-LEVOS]. In the same manner was produced the IMAP offshore SAU [ALBS-ES-O] in the ALBS.

For Spain, the 2 coastal SAUs and 2 offshore IMAP SAUs fall in the CWMS subdivision, and 1 coastal and 1 offshore IMAP SAUs fall in the ALBS and are listed in Table 1. The relationship of the IMAP SAUs to the MRUs is explained in Table 2.

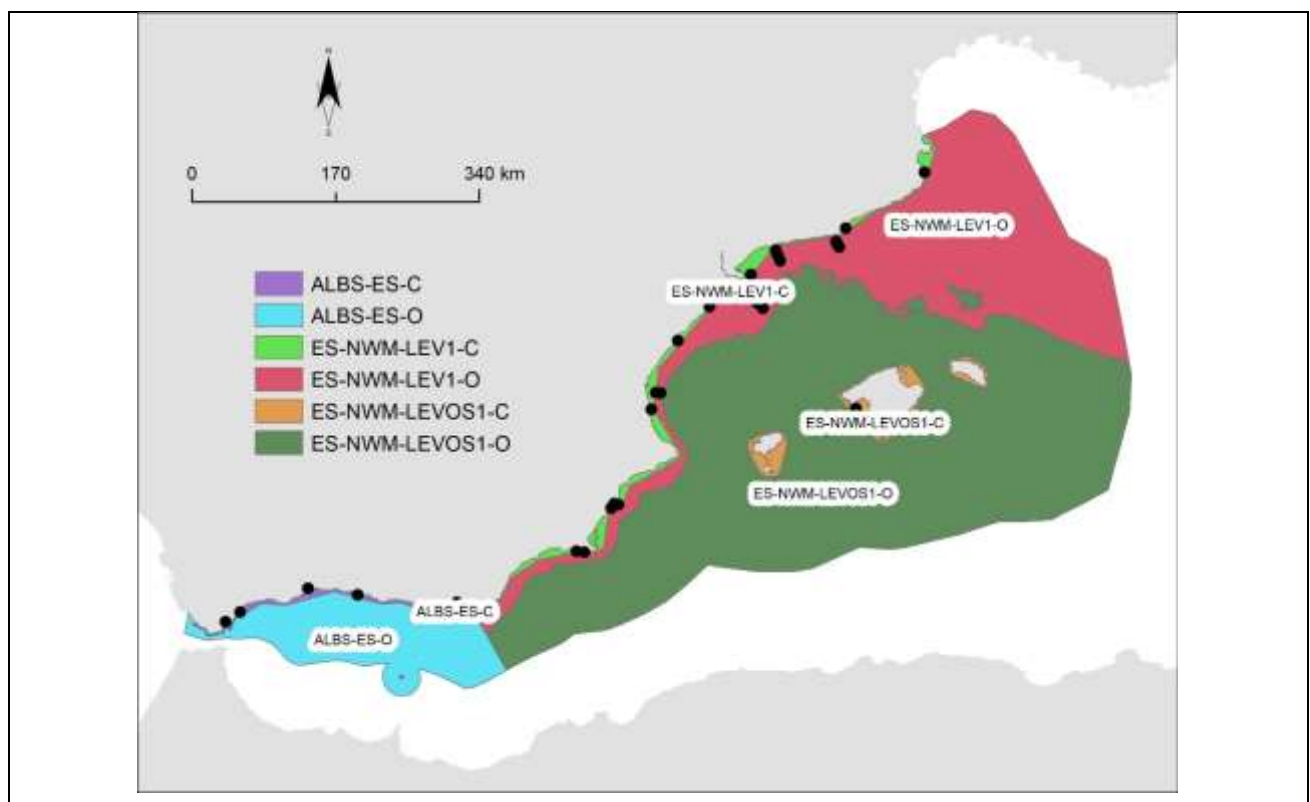


Figure 19. The final IMAP SAUs for Spain defined for the purposes of the IMAP CI17 assessment, overlaid on the distribution of the monitoring stations.

Tunisia

The below shown map (Fig. 20) provides an overview of the distribution of the monitoring stations of Tunisia in the Western Mediterranean sub-region. Coordinates of monitoring stations are from the National IMAP programme.

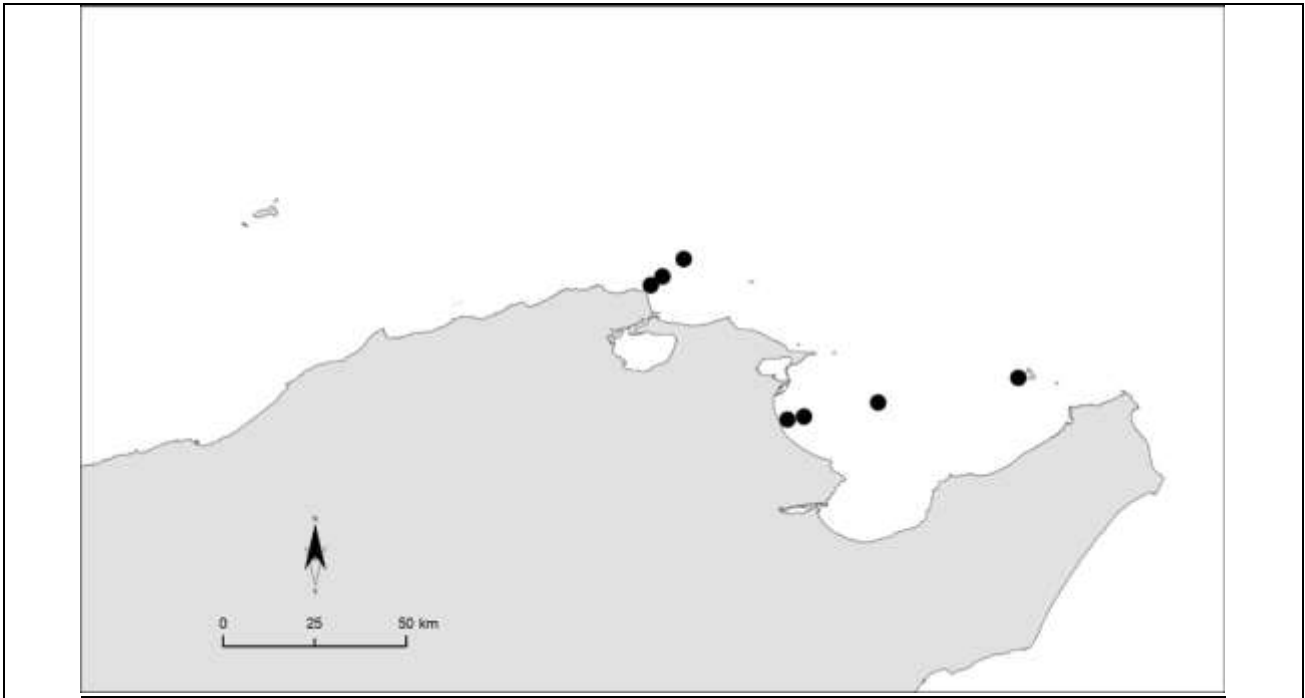


Figure 20. The distribution of the monitoring stations of Tunisia for CI17 in the Western Mediterranean Sub-region, as defined in the National IMAP programme.

Following the IMAP methodology for CI17 assessment (UNEP/MED WG. 509/Inf.10/Rev2), coastal and offshore waters have been defined for Tunisia in the CWMS based on the positions of the monitoring stations. Coastal waters are defined using the 1 nm distance from the baseline, including internal waters, as explained above; offshore zone waters are defined by the position of the most distant monitoring station seaward. The relation of the monitoring stations to the two coastal and offshore for Tunisia is shown in Fig. 21.

The national IMAP monitoring programme of Tunisia sets 2 areas of monitoring in the Western Mediterranean sub-region namely: Bizerte est and Golfe de Tunis. By considering these monitoring areas along with related distribution of monitoring stations, the following IMAP SAUs are defined and shown in Fig. 22 and listed in Table 1.

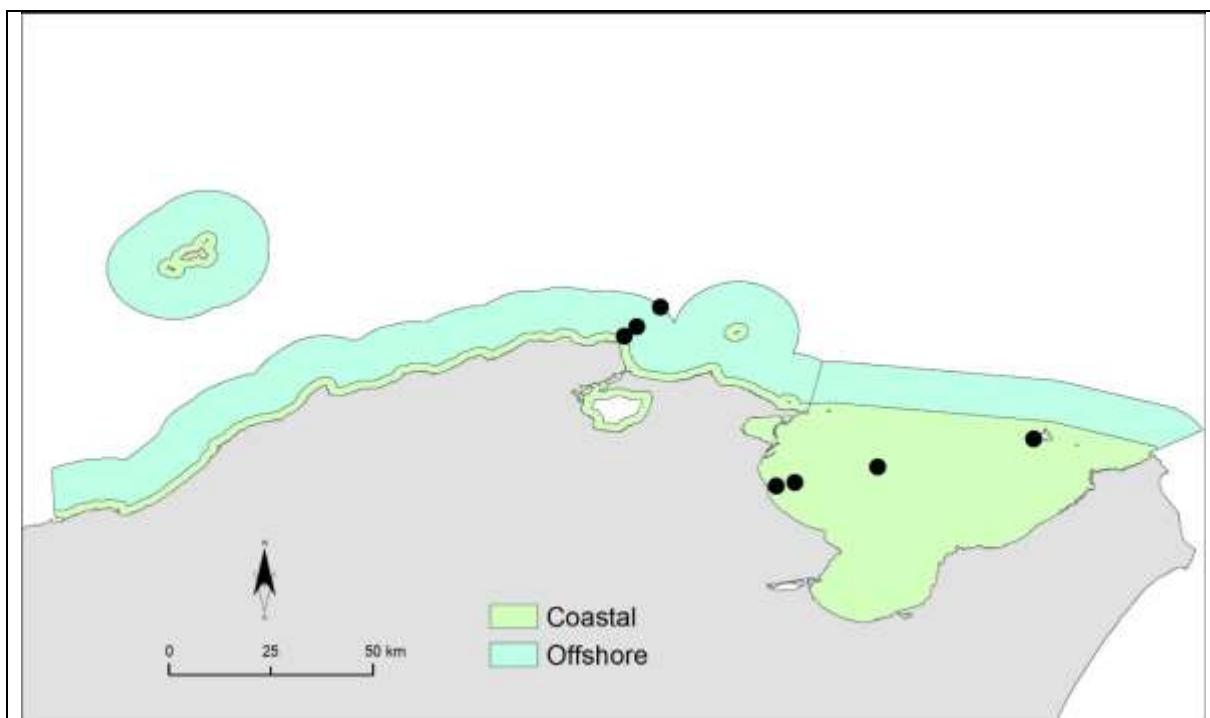


Figure 21. The coastal and offshores waters of Tunisia defined for the present assessment of CI 17 in the Western Mediterranean Sub-region, by using the Marine Regions data and resources, described above in the section 3, and overlaid on the distribution of monitoring stations.

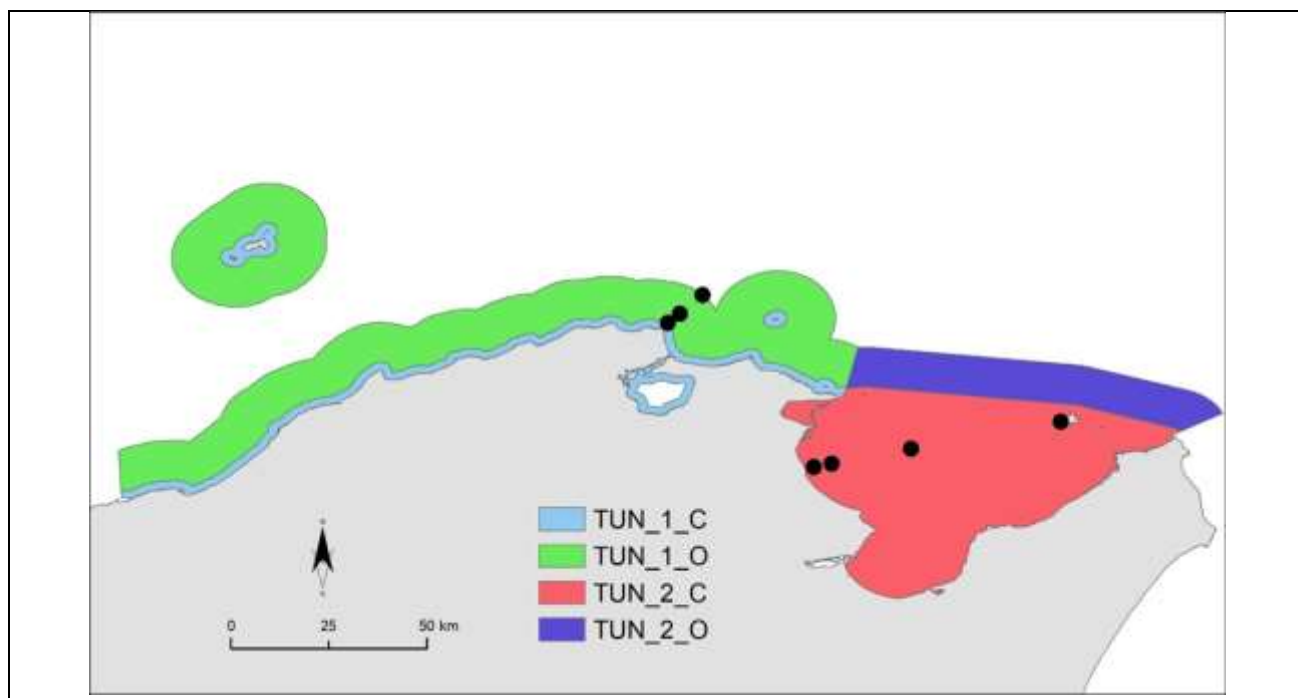


Figure 22. The final IMAP SAUs for Tunisia defined for the purposes of the IMAP CI17 assessment, overlaid on the positions of monitoring stations.

6. The nesting approach for SAUs in the Western Mediterranean Sea

SAUs and spatial data

After setting of the finest IMAP areas of assessment, their nesting within three sub-divisions of the Western Mediterranean Sub-region was undertaken. The following maps show the nested approach for the 3 sub-divisions of the Western Mediterranean Sea Sub-region; i.e. ALBS, CWMS and TYRS. For each sub-division, the IMAP SAUs of every country have been selected and showed in Figures 23, 24 and 25.

In the Alboran Sea (ALBS) subdivision (Fig. 23), Morocco has 8 IMAP SAUs (4 coastal; 4 offshore), Spain has 2 (1 coastal; 1 offshore) and Algeria 2 (1 coastal; 1 offshore).

In the central part of the Western Mediterranean Sea (CMW) (Fig. 24), Spain has 4 IMAP SAUs (2 coastal; 2 offshore), France has 10 (5 coastal; 5 offshore), Italy 4 (2 coastal; 2 offshore), Algeria 20 (10 coastal; 10 offshore) and Tunisia 4 IMAP SAUs (2 coastal; 2 offshore).

In the Tyrrhenian Sea (TYRS) subdivision (Fig. 25), France has 2 IMAP SAUs (1 coastal; 1 offshore) and Italy 7 (5 coastal; 2 offshore)

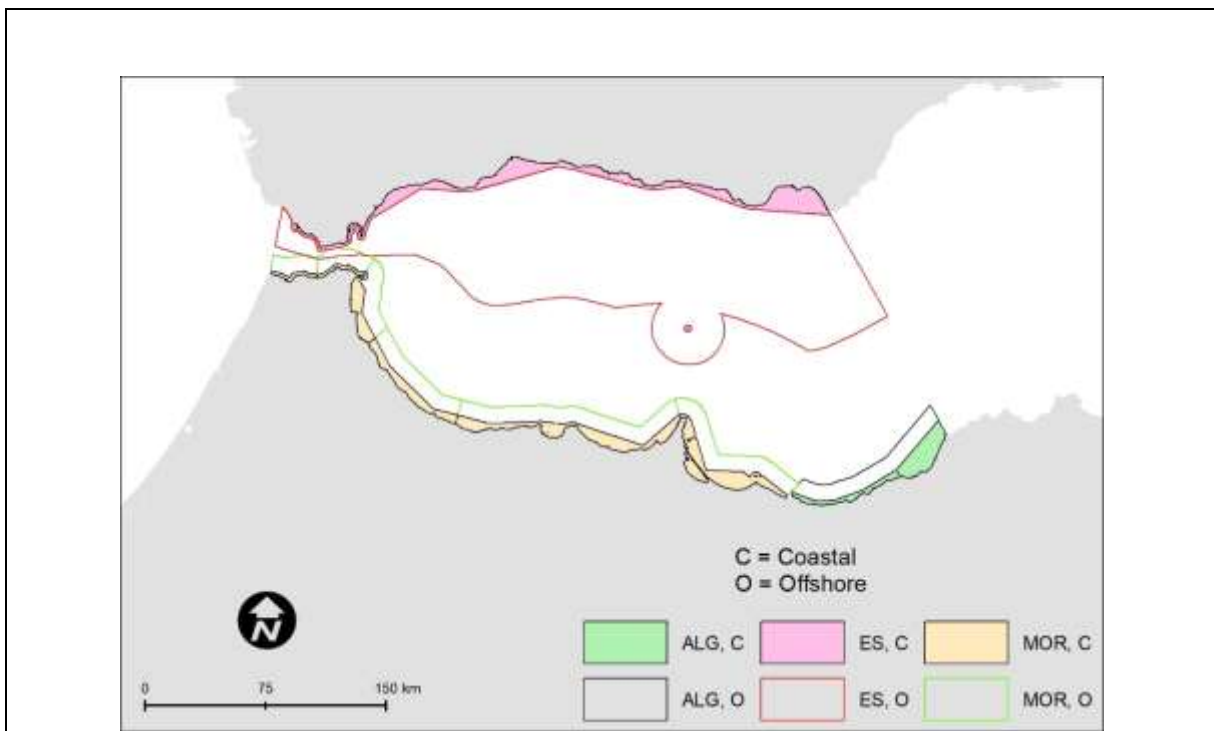
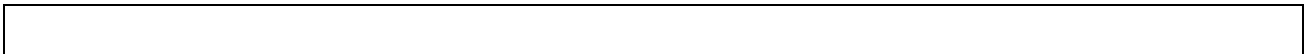


Figure 23. The nesting approach of the IMAP SAUs in the Alboran Sea (ALBS) based on IMAP SAUs defined for the application of the NEAT GES assessment in the Western Mediterranean Sea Sub-region.



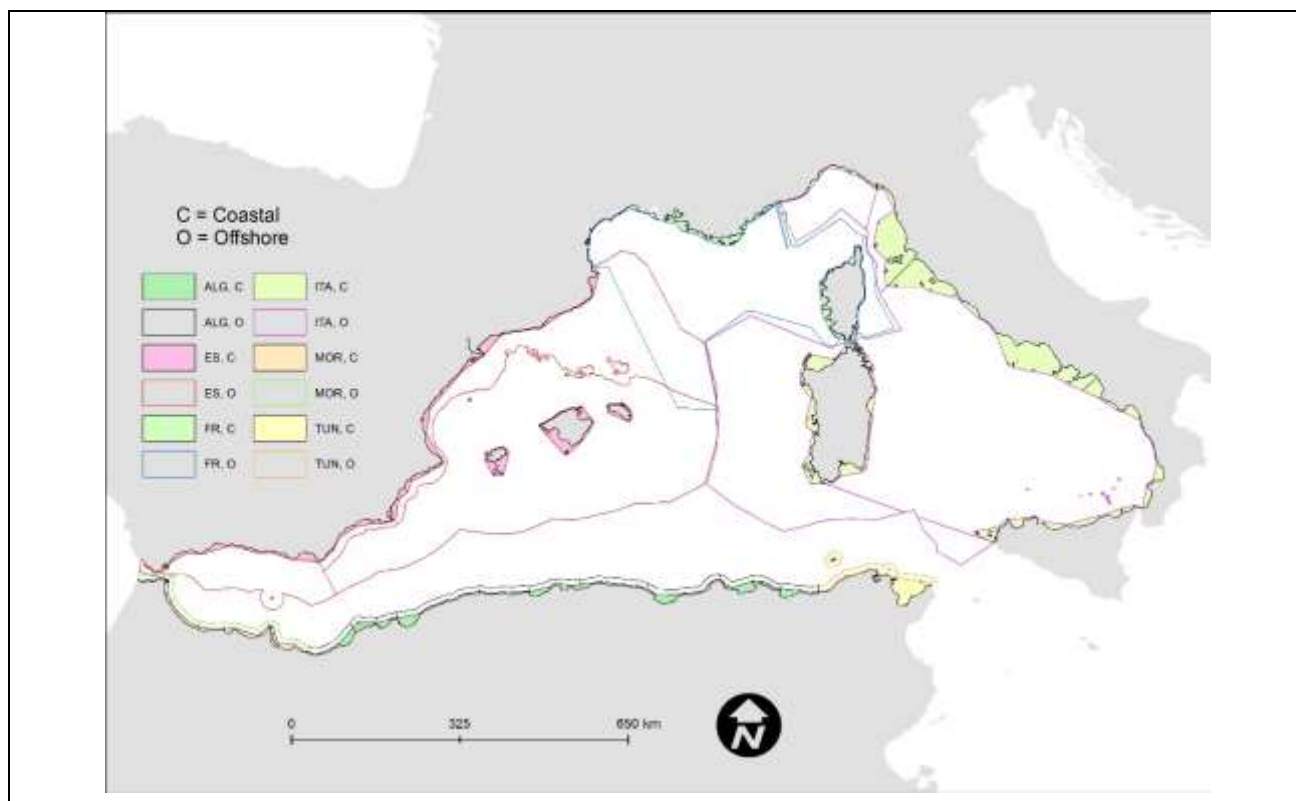


Figure 24. The nesting approach of the SAUs in the central part of the Western Mediterranean Sea Sub-division (CWMS) based on the IMAP SAUs defined for the application of the NEAT GES assessment in the Western Mediterranean Sea Sub-region.

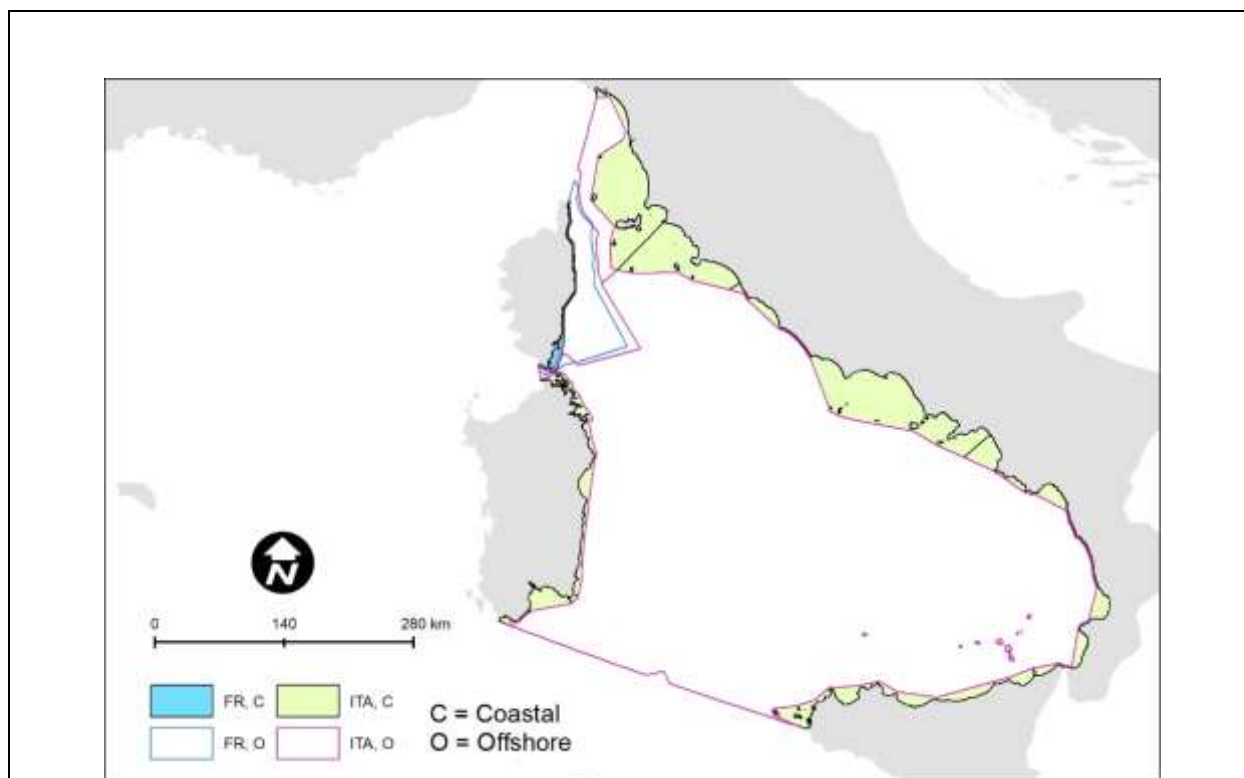


Figure 25. The nesting approach of the IMAP SAUs in the Tyrrhenian Sea (TYRS) based on the IMAP SAUs defined for the application of the NEAT GES in the Western Mediterranean Sea Sub-region.

For the scope of CI17 monitoring in the Western Mediterranean Sea, the CPs have set 91% of the monitoring stations in the coastal zone and no data on contaminants have been reported for the period 2017-2022 for any of the offshore stations. In addition, only 53% of the coastal IMAP SAUs for the CWMS have reported data (by France and Spain) which makes the integrated assessment using the NEAT tool unreliable for this subdivision. For these reasons, it is not considered meaningful to proceed with a 4 levels' nesting scheme in all 3 subdivisions as presented in chapter 4. Therefore, only the coastal SAUs will be considered and nested under a 2 levels` hierarchical scheme and the integration of the assessment results will be conducted for the coastal zone of the Alboran (ALBS) and Tyrrhenian Seas (TYRS) sub-divisions as follows:

- 1st level provided nesting of all national IMAP subSAUs within the coastal IMAP assessment zone per country;
- 2nd level provided nesting of the national coastal IMAP assessment zones on the subdivision level i.e., i) ALBS coastal; ii) TYRS coastal;

Similarly, the integration of the assessment will be conducted in 3 levels as follows:

- 1st level: Detailed assessment results provided for all national coastal subSAUs and SAUs;
- 2nd level: Integrated assessment results provided for the coastal zone: i) ALBS coastal; ii) TYRS coastal;

The assessment in the ALBS and TYRS was conducted using two alternative threshold values for defining the Good Environmental Status (GES): a) The MedEAC thresholds (UNEP/MED WG.533/10, Appendix I) which have also been used in the assessment of the Adriatic Subregion (UNEP/MED WG.533/10, Appendix I); b) The BAC values (xBAC) multiplied by 1.5 for Cd, Hg, Pb and by 2 for PAHs and PCBs as introduced in (UNEP/MED WG.533/10, Appendix IV) for the CI17 assessment in the Levantine Sea. The latter approach is more stringent.

The spatial visualization of NEAT GES assessment results

The maps provided in the figures 26, 27, 28 and 29 depict the integrated NEAT value for each SAU (i.e. aggregated value for all contaminants as provided in the 4th column of Tables 5, 6, 7 in UNEP/MED WG. 556/Inf.7.



Figure 26. The results of the NEAT assessment of the IMAP SAUs in the Western Mediterranean Sea by using the (xBAC) GES/nGES threshold and based on the spatial assessment units defined within testing of NEAT.

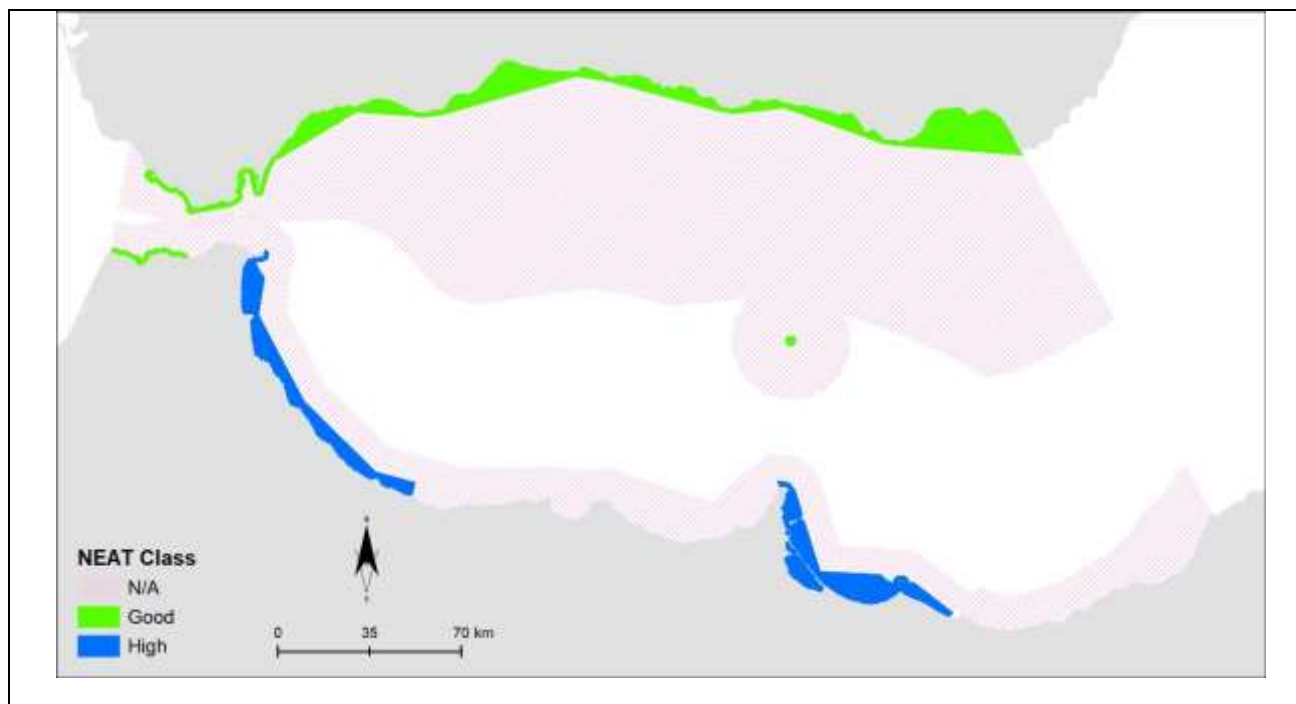


Figure 27. The results of the NEAT assessment of the IMAP SAUs in the Alboran Sea (ALBS) by using the (xBAC) GES/nGES threshold and based on the spatial assessment units defined within testing of NEAT. Data availability restricts assessment on Cd, Hg, Pb in sediments and biota as explained in UNEP/MED WG. 556/Inf.7/Rev.1.

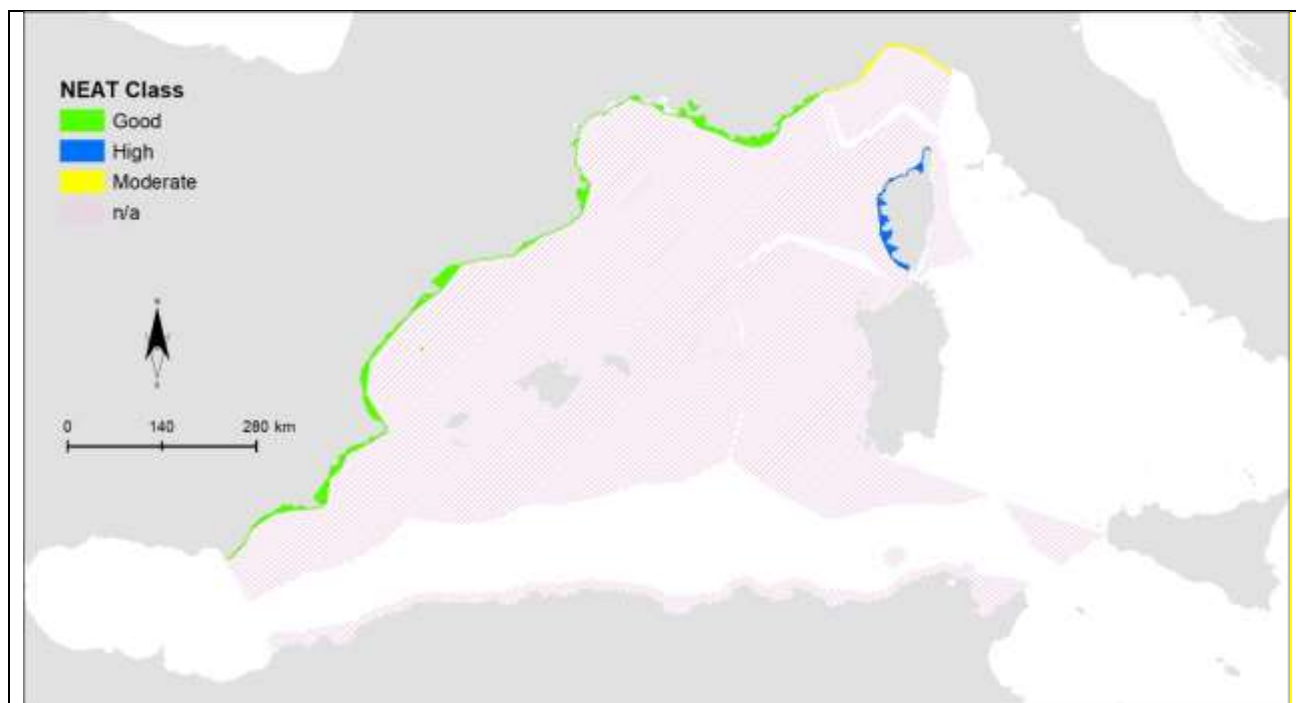


Figure 28. The results of the NEAT assessment of the IMAP SAUs in the central part of the Western Mediterranean Sea Sub-division (CWMS) by using the (xBAC) GES/nGES threshold and based on the spatial assessment units defined within testing of NEAT. Data availability restricts assessment on Cd, Hg, Pb, PCBs and PAHs in sediments and biota as explained in UNEP/MED WG. 556/Inf.7/Rev.1.

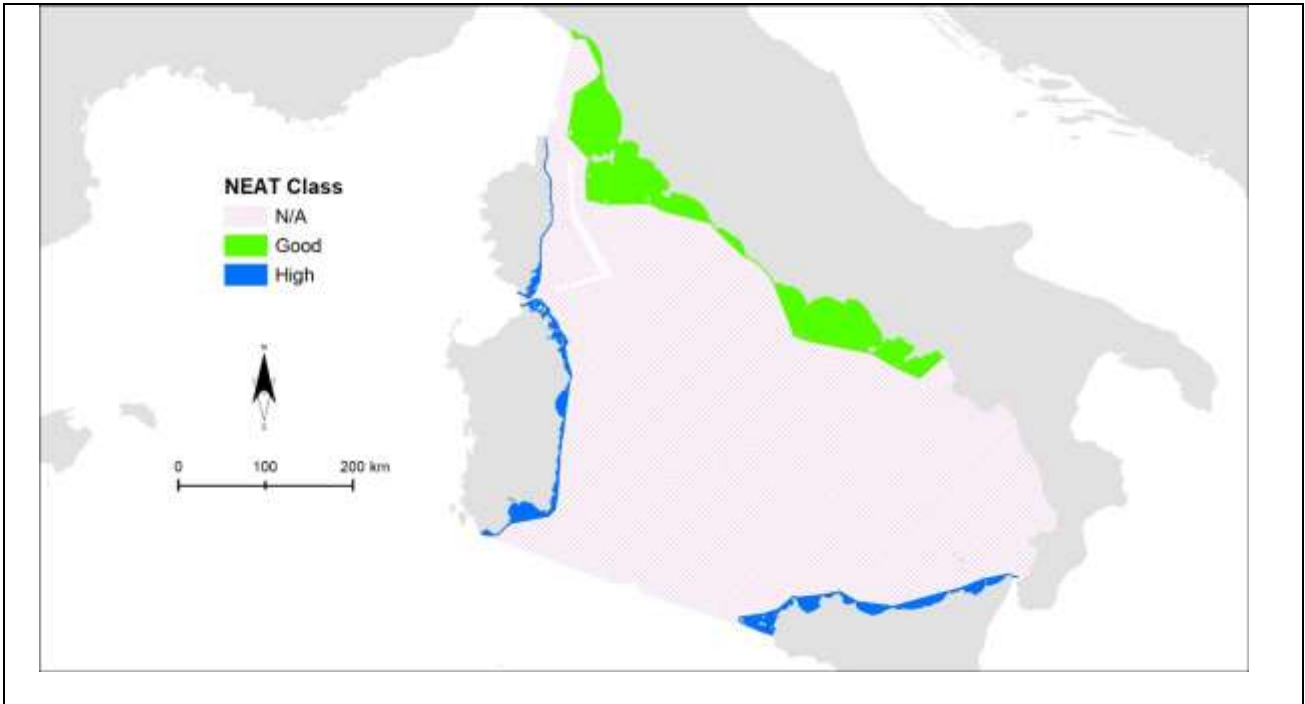


Figure 29. The results of the NEAT assessment of the IMAP SAUs in the Tyrrhenian Sea (TYRS) by using the (xBAC) GES/nGES threshold and based on the spatial assessment units defined within testing of NEAT. Data availability restricts assessment on Cd, Hg, Pb, PCBs and PAHs in sediments for most SAUs (only FR-TYR-Corse is based on mussels) as explained in UNEP/MED WG. 556/Inf.7/Rev.1.

The spatial visualization of CHASE + assessment results

The maps provided in the figures 30, 31, 32 and 33 depict the CHASE+ results for each SAU (i.e., aggregated value for all contaminants as provided in Tables 11, 12, 13 of UNEP/MED WG. 556/Inf.7/Rev.1)

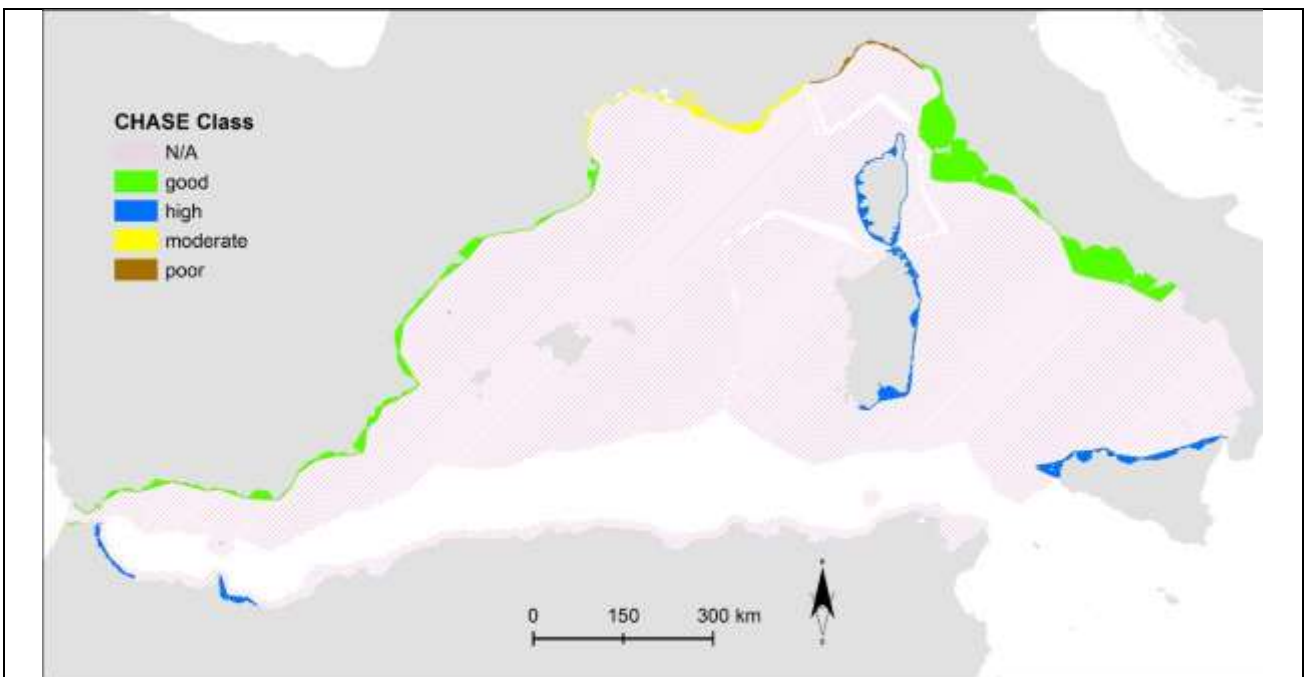


Figure 30. The results of the CHASE+ assessment of the IMAP SAUs in the Western Mediterranean Sea using the xBAC GES/nGES threshold and based on the spatial assessment units defined within testing of NEAT.

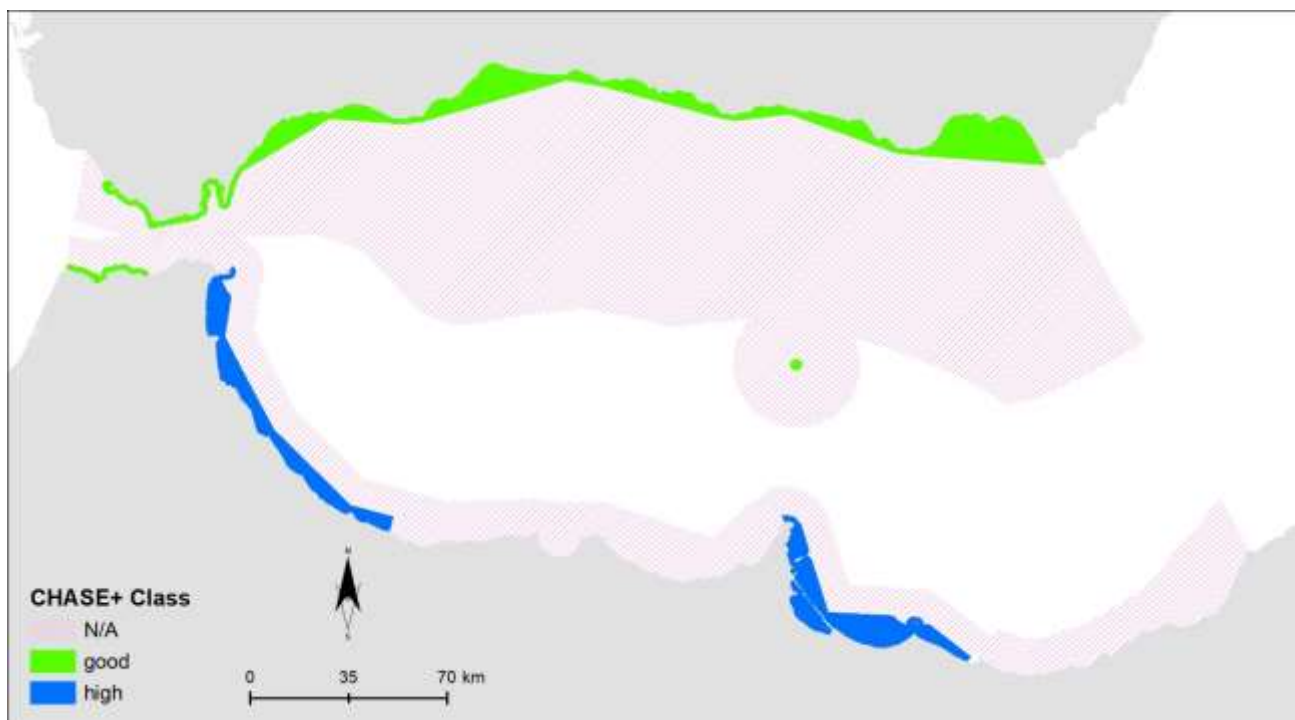


Figure 31. The results of the CHASE+ assessment of the IMAP SAUs in the Alboran Sea (ALBS) by using the xBAC GES/nGES threshold and based on the spatial assessment units defined within testing of NEAT. Data availability restricts assessment on Cd, Hg, Pb, PCBs and PAHs in sediments and biota as explained in UNEP/MED WG.556/Inf.7/Rev.1.

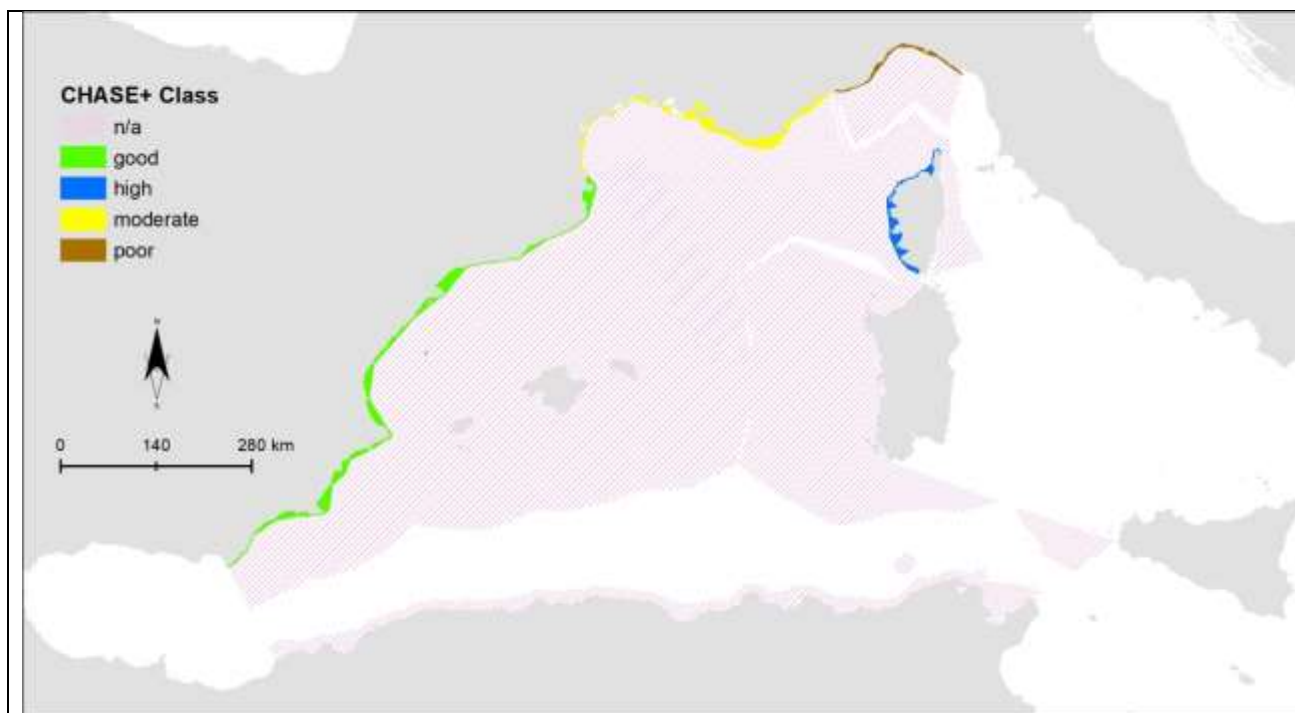


Figure 32. The results of the CHASE+ assessment of the IMAP SAUs in the Western Mediterranean Sea Sub-division (CWMS) by using the xBAC GES/nGES threshold and based on the spatial assessment units defined

within testing of NEAT. Data availability restricts assessment on Cd, Hg, Pb, PCBs and PAHs in sediments and biota as explained in UNEP/MED WG. 556/Inf.7/Rev.1.

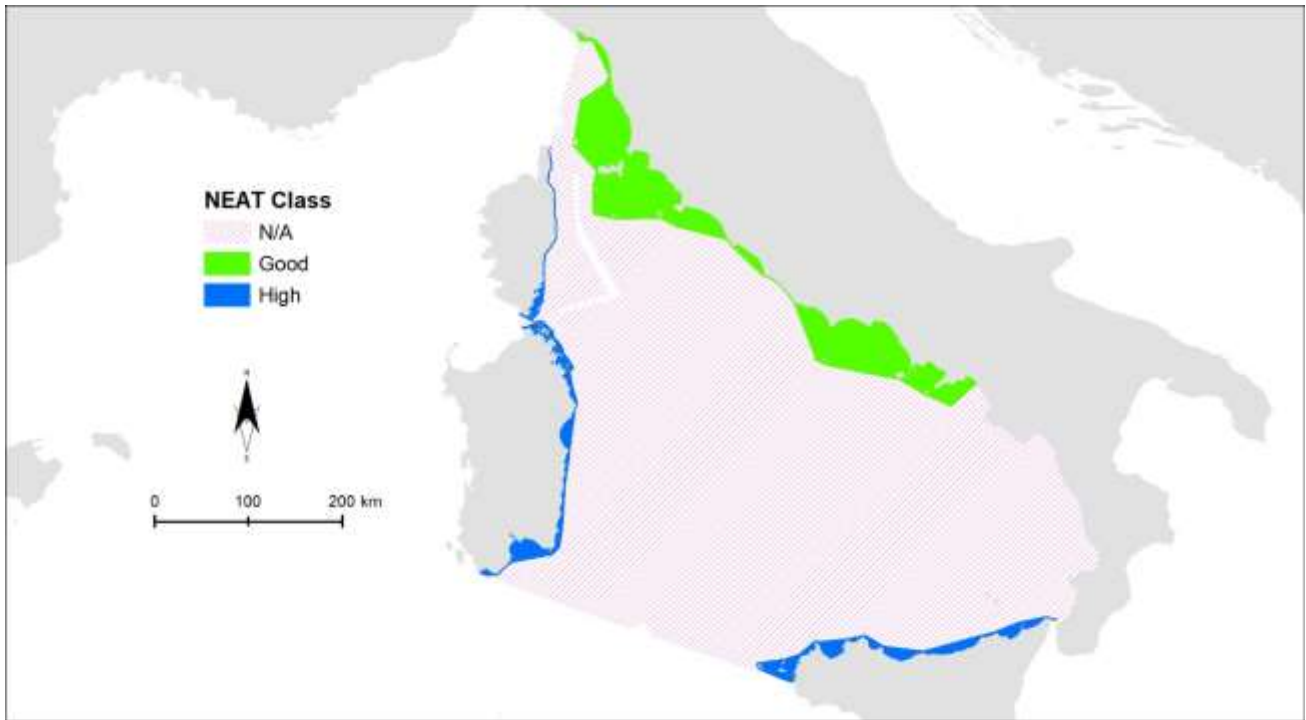


Figure 33. The results of the CHASE+ assessment of the IMAP SAUs in the Tyrrhenian Sea (TYRS) using the xBAC GES/nGES threshold and based on the spatial assessment units defined within testing of NEAT. Data availability restricts assessment on Cd, Hg, Pb, PCBs and PAHs in sediments for most SAUs (only FR-TYR-Corse is based on mussels) as explained in UNEP/MED WG. 556/Inf.7.

The below Table 1 provides consolidated spatial information shown in the maps (Figures) for further use.

Table 1. The spatial assessment units (SAUs) for the Western Mediterranean Sea Subregion and their respective surface area (km²) and number of monitoring stations located in the SAUs.

Sub-division	IMAP Assessment Zone	IMAP SAU	IMAP subSAU	Area (km ²)	No stations	No of stations with data 2016-2022	% Area covered by data	
Alboran Sea (ALBS)	ALBS coastal	ALBS-MO-C						84 %
			MO-Gib-A-C	71	-	-		
			MO-Gib-B-C	67	2	2		
			MO-East-C	700	6	6		
			MO-Central-A-C	805	-	-		
			MO-Central-B-C	361	6	6		
			MO-West-C	286	6	5		
			ALBS-ES-C	1908	12	5		
			ALBS-ALG					

Sub-division	IMAP Assessment Zone	IMAP SAU	IMAP subSAU	Area (km ²)	No stations	No of stations with data 2016-2022	% Area covered by data
			ALG-1A-C	702	3	-	
	ALBS offshore				-		0 %
		ALBS-MO-O					
			MO-East-O	1020	1	-	
			MO-Central-A-O	1449	1	-	
			MO-Central-B-O	706	1	-	
			MO-West-O	465	-	-	
			MO-Gib-A-O	363	1	-	
			MO-Gib-B-O	302	-	-	
		ALBS-ES-O		23093	6	-	
		ALBS-ALG-O					
			ALG-1A-O	547	1	-	
Central part of Western Mediterranean Sea (CWMS)							
	CWMS coastal						67 %
		CWMS-ALG-C					
			ALG-1B-C	436	-	-	
			ALG-2-C	322	5	-	
			ALG-3-C	1081	6	-	
			ALG-4-C	337	1	-	
			ALG-5-C	414	4	-	
			ALG-6-C	349	5	-	
			ALG-7-C	534	4	-	
			ALG-8-C	1022	3	-	
			ALG-9-C	980	7	-	
			ALG-10-C	596	8	-	
		CWMS-ES-C					
			ES-CWM-LEV1-C	5547	23	12	
			ES-CWM-LEVOS1-C	3774	5	3	
		CWMS-FR-C					
			FR-CWM-M-C	2938	79	34	
			FR-CWM-Corse-C	1497	12	8	
		CWMS-IT-C					
			IT-CWM-C	804	24	23	

Sub-division	IMAP Assessment Zone	IMAP SAU	IMAP subSAU	Area (km ²)	No stations	No of stations with data 2016-2022	% Area covered by data
			IT-CWM-SarW-C	3926	22	2	
			IT-CWM-Sic-N-C	6	-	-	
		CWMS-TU-C					
			TU-1-C	509	1		
			TU-2-C	2357	4		
	CWMS offshore						69 %
		CWMS-ALG-O					
			ALG-1B-O	547	-	-	
			ALG-2-O	426	-	-	
			ALG-3-O	1696	1	-	
			ALG-4-O	971	-	-	
			ALG-5-O	518	-	-	
			ALG-6-O	488	1	-	
			ALG-7-O	1327	-	-	
			ALG-8-O	1523	-	-	
			ALG-9-O	1286	-	-	
			ALG-10-O	733	2	-	
		CWMS-ES-O					
			ES-CWM-LEV1-O	67828	19	13	
			ES-CWM-LEVOS1-O	153876	1	1	
		CWMS-IT-O					
			IT-CWM-O	14239	-	-	
			IT-CWM-SarW-O	76713	-	-	
			IT-CWM-SicN-O	5842	-	-	
		CWMS-FR-O					
			FR-CWM- E1--O	15558	-	-	
		CWMS-TU-O					
			TU-1-O	2676	2	-	
			TU-2-O	742	-	-	
Tyrrhenian Sea (TYRS)							
	TYRS coastal						100% (98% for sed)
		TYRS-FR-C					

Sub-division	IMAP Assessment Zone	IMAP SAU	IMAP subSAU	Area (km ²)	No stations	No of stations with data 2016-2022	% Area covered by data
			FR-TYR-Corse-C	648	10	6	
		TYRS-IT-C					
			IT-TYR-1-C	6363	15	15	
			IT-TYR-3-C	4122	9	10	
			IT-TYR-4-C	8072	26	23	
			IT-TYR-5-C	2685	5	-	
			IT-TYR-SarE-C	2598	20	6	
			IT-TYR-SicN-C	3023	26	26	
	TYRS offshore						0%
		TYRS-FR-O					
			FR-TYR-Corse-O	5994	-	-	
		TYRS-IT-O					
			IT-TYR-1-O	4178	-	-	
			IT-TYR-2-O	178065	-	-	

Table 2. The derivation of IMAP SAUs and their relationship to the official MRUs for the CPs which are EU MSs.

Sub-division	IMAP Assessment Zone	IMAP SAU
Alboran Sea (ALBS)		
ALBS coastal		
	ALBS-ES-C	area of 1 nm along the coast of Spain in the ALBS
ALBS offshore		
	ALBS-ES-O	defined by [[MWE-ES-SD-ESAL-ALBC1]+[..ALBC2]+[..ALBO1]+[..ALBP1]+[..ALBP2] minus the surface area of [ALBS-ES-C]
Coastal part of Western Mediterranean Sea (CWMS)		
CWMS coastal		
CWMS-ES-C		
	ES-CWM-LEV1-C ES-CWM-LEVOS1-C	area of 1 nm along the coast of Spain in the CMWS
CWMS-FR-C		
	FR-CWM-M- -C	defined by the [MWE-FR-MS-MO-MEC-2016] limited at the coasts along the French mainland
	FR-CWM-Corse-C	defined by the [MWE-FR-MS-MO-MEC-2016] limited at the western coasts of Corsica
CWMS-IT-C		
	IT-CWM-C	area of 1nm delimited by [IT-WMS-8B06-0001] and the CWMS/TYRS boundary, falling in the CWMS
	IT-CWM-SarW-C	area of 1 nm along the western coast of Sardinia
CWMS offshore		
CWMS-ES-O		

ES-CWM-LEV1-O	defined by [[MWE-ES-SD-LEVC1]+[...LEVC2]+[...LEVDE]+[...LEVMM]] minus the surface area of [ES-CWM-LEV1-C]
ES-CWM-LEVOS1-O	defined by [[MWE-ES-SD-LEVOS1] minus the surface area of [ES-CWM-LEVOS1-C]
CWMS-IT-O	the [IT-WMS-8B06-0012] was split into 5 parts: in the Ligurian CWMS [IT_WMS_8B06_0012_L], west of Sardinia CWMS [IT_WMS_8B06_0012_Sar], west of Sicily [IT_WMS_8B06_0012_Sc] northern TYRS at the boundary of IT-WMS-8B06-0001 [IT_WMS_8B06_0012_N]; remaining part in the TYRS [IT_WMS_8B06_0012_S]
IT-CWM-O	Surface area derived by [IT-WMS-8B06-0012-L] minus [IT-CMW-C]
IT-CWM-Sic-O	Surface area of part [IT_WMS_8B06_0012_Sic]
IT-CWM-Sar-W-O	Surface area derived by [IT_WMS_8B06_0012_Sar] minus [IT-CWM-SarW-C]
CWMS-FR-O	the [MWE-FR-MO-ZI] is split into 2 parts according to the respective coastal IMAF SAUs
FR-CWM-M-E1-O	Surface area derived by [MWE-FR-MS-MO-ZL12M] limited in the CWMS minus the surface area of [FR-CWM-M-C]+[FR-CWM-Corse-C]
Tyrrhenian Sea (TYRS)	
TYRS coastal	
TYRS-FR-C	
FR-TYR-Corse-C	defined by the [MWE-FR-MS-MO-MEC-2016] limited at the eastern coasts of Corsica
TYRS-IT-C	
IT-TYR-1-C	area of 1nm delimited by IT-WMS-8B06-0001 and the CWMS/TYRS boundary, falling in the TYRS
IT-TYR-3-C	area of 1nm delimited between the IT-WMS-8B06-0001 and the IT-WMS-8B06-0002
IT-TYR-4-C	area of 1nm delimited by the IT-WMS-8B06-0002
IT-TYR-5-C	area of 1nm delimited south of the IT-WMS-8B06-0002 boundary and until the southern tip of the Italian peninsula
IT-TYR-SarE-C	area of 1 nm along the eastern coast of Sardinia

	IT-TYR-SicN-C	area of 1 nm along the northern coast of Sicily
TYRS offshore		
TYRS-FR-O		
	FR-TYR-Corse-O	Surface area derived by [MWE-FR-MS-MO-ZL12M] limited in the TYRS minus the surface area of [FR-TYR-Corse-C]
	TYRS-IT-O	the IT-WMS-8B06-0012 was split into 5 parts: in the Ligurian CWMS [IT_WMS_8B06_0012_L], west of Sardinia CWMS [IT_WMS_8B06_0012_Sar], west of Sicily [IT_WMS_8B06_0012_Sar] northern TYRS at the boundary of IT-WMS-8B06-0001 [IT_WMS_8B06_0012_N]; remaining part in the TYRS [IT_WMS_8B06_0012_S]
	IT-TYR-1-O	Surface area derived by [IT_WMS_8B06_0012_N] minus [IT-TYR-1-C]
	IT-TYR-2-O	Surface area derived by [IT_WMS_8B06_0012_S] minus [[IT-TYR-2-C]+[IT-TYR-3-C]+[IT-TYR-4-C]+[IT-TYR-5-C]+[IT-TYR-SarE-C]+[IT-TYR-SicN-C]]

7. Geospatial data

For the setting of the areas of assessment, the source geospatial data were collated and used as explained above. These geospatial data have been collated along with the geospatial layers of the areas of assessment to support application of NEAT tool for generation of the GES assessment findings (UNEP/MED WG. 533/10, Appendix III; UNEP/MED WG. 533/Inf.4/Rev.1). The data are in the EPSG:3035, ETRS89 / ETRS-LAEA, a single coordinate reference system (CRS) for the entire Europe which is used for statistical mapping at all scales and other purposes where true area representation is required. The maps are organized into the following four geospatial datasets:

1. **Dataset A:** This folder contains one folder for each of the countries of the West Mediterranean Sub-region: Tunisia, Algeria, Morocco, Spain, France and Italy. Every folder is composed of another two identical sub-folders:
 - Distribution of monitoring stations visualized in the shapefile format prepared in line with the coordinates that have been reported in the IMAP IS for each country;
 - Distribution of monitoring stations visualized in the high quality of JPEG image format (300 dpi image resolution); this JPEG format is designed to support use of shapefile format for NEAT tool application in order to ensure preparation of the GES assessment findings (UNEP/MED WG. 556/Inf. 7).

The data are available from the link: [Dataset A](#)

2. **Datasets B:** This folder contains data for each country organized in the two sub-folders:
 - The sub-folder containing the finest areas of assessment for each country in shapefile format, as elaborated in this document;
 - The sub-folder containing the shapefile and JPEG image format (300 dpi image resolution) of the finest areas of assessment prepared for each country to support use of shapefile format for NEAT tool application in order to ensure preparation of the GES assessment findings (UNEP/MED WG. 556/Inf. 7).

The data are available from the link: https://marineaegeangr-my.sharepoint.com/:f/g/personal/marm30616_marine_aegean_gr/Eg2uJP7e6bdKqrHxLhdtprYBJCtebToRjRLIJfgm4pZuUw?e=dpFKtz

3. **Dataset C:** This folder contains in JPEG format (300 dpi image resolution) the maps of the spatial assessment units nested for NEAT application at the sub-division levels i.e., in the Alboran Sea, West

Central Mediterranean Sea and Tyrrhenian Sea. It also includes excel file containing information on the surface (km²) of SAUs/sub-SAUs and number of monitoring stations located in the SAUs.

The data are available from the link: https://marineaegeangr-my.sharepoint.com/:f:/g/personal/marm30616_marine_aegean_gr/Es8sSeDoOcpMnICvCVEWM4QBO4YFa0sKPdBj45U1sV8Zqw?e=xmabMe

4. **Dataset D:** This folder contains two subfolders, one for NEAT and one for CHASE which contain the mxd and shapefile format and JPEG format (300 dpi image resolution) of the maps of the integrated NEAT and CHASE+ value for each SAU (i.e., aggregated value for all contaminants as provided in the 4th column of Table 11 in UNEP/MED WG.533/Inf.4/Rev.1), presented at the sub-division levels i.e., in the Alboran Sea, West Central Mediterranean Sea and Tyrrhenian Sea

The data related to NEAT application are available from the link: https://marineaegeangr-my.sharepoint.com/:f:/g/personal/marm30616_marine_aegean_gr/EmU5FKgl-wtCgQ6Q5TlSc7IBAcGPz2Qx_RFirzSdFo-V7Q?e=UBh4mG and data related to CHASE+ application are available from the link: https://marineaegeangr-my.sharepoint.com/:f:/g/personal/marm30616_marine_aegean_gr/EknmUypBjgBDsCWS1rjiGa8B0RFiTpb_OKC5kU8J0qGriQ?e=uX1syx

The above geospatial datasets will serve as input in preparing the GIS catalog of the scales of monitoring and assessment for the IMAP Pollution Cluster.

Annex I

References

Gaytan Aguilar, S., Verlaan, M., 2018. EMODnet High Resolution Seabed Mapping (HRSM), EMODnet Phase III, National coastlines and baselines – data set collection for European countries, 32 pp. www.emodnet-bathymetry.eu

Suárez de Vivero, J. I., 2010, Jurisdictional Waters in the Mediterranean and Black Seas, Directorate General for Internal Policies, Policy Department B: Structural and Cohesion Policies, Fisheries, 140 pp.

Limits of oceans and seas (1953). 3rd edition. IHO Special Publication, 23. International Hydrographic Organization (IHO): Monaco. 38 pp.