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The Marine Environment Assessment in the Areas with Insufficient Data: The Updated Results of GES Assessment for IMAP Common Indicator 17 in the Levantine Sea Basin by Applying the CHASE+ Environmental Assessment Methodology Harmonized with the NEAT GES Assessment Methodology

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List of Abbreviations / Acronyms

ADR	Adriatic Sea Sub-region
AEL	Aegean and Levantine Seas Sub-region
BC	Background Concentration
BAC	Background Assessment Concentrations
CEN	Central Mediterranean Sub-region
CENS	Central Mediterranean Sea sub-division
CHASE	Chemical Status Assessment Tool
CI	Common Indicator
CORMON	Correspondence Group on Monitoring
COP	Conference of the Parties
CR	Contamination Ratio
CS	Contamination Score
EAC	Environmental Assessment Criteria
EMODnet	European Marine Observation and Data Network
ERL	Effects Range Low
EEA	European Environmental Agency
GES	Good Environmental Status
IMAP	Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria
IONS	Ionian Sea sub-division
LEVS	Levantine Basin Sea sub-division
MAP	Mediterranean Action Plan
MED	Mediterranean
MB	*Mullus barbatus*
MED POL	Programme for the Assessment and Control of Marine Pollution in the Mediterranean Sea
NEAT	Nested Environmental Status Assessment Tool
NPA	Non Problem Area
OOAO	One Out All Out
OWG	Online Working Group
PA	Problem Area
PAHs	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
QSR	Quality Status Report
SAU	Spatial Assessment Units
TM	Trace metals
UNEP	United Nations Environmental Program
WMS	Western Mediterranean Sea Sub-region

1. Introduction

1. Updated BC and BAC values for IMAP Common Indicator 17 (CI 17) were calculated and proposed, as presented in documents UNEP/MAP WG. 533/10, Appendix I and UNEP/MAP WG. 533/Inf.3/Rev.1. Their calculation was based on new national monitoring data received up to December 31st, 2021, that have not been previously used for the calculation of the assessment criteria in the 2017 and 2019 assessments. In addition, following the OWG on Contaminants recommendation, data since 2015 were used in the calculation as well, even if used in the previous assessment.

2. This document presents the results of the application of the above mentioned updated assessment criteria for the Levantine Sea (LEVS) sub-division within the Aegean Levantine Seas (AEL) Sub-region using the CHASE+ (Chemical Status Assessment Tool) methodology, as well as by considering its subsequent harmonization with NEAT assessment methodology, as explained in Section 2. It updates and replaces the Working Document UNEP/MED WG.533/6 as amended and approved by the Meeting of CorMon on Pollution Monitoring held on 27 and 30 May 2022 (UNEP/MAP WG. 533/10, Appendix IV).

3. In line with the Conclusions of the Meeting of CorMon on Pollution Monitoring, the present update is based on the assessment of new data reported by the CPs into IMAP IS by October 31st, 2022, the cutoff date for data reporting. Older data, (from 2013-2016) were not taken in consideration in the cases were new data were reported to IMAP-IS. Further to approval provided by the Meeting of CorMon on Pollution Monitoring regarding the use of CHASE+ assessment methodology in the areas with insufficient data for NEAT GES assessment, its comparison with the traffic light system methodology is not included in the present update. Instead, this update is based on the application of the CHASE+ assessment methodology further to its harmonization with the NEAT assessment methodology as presented below in Section 2, and furthermore elaborated in the SIDA project document[1] and UNEP/MED WG. 556/Inf.7, Section 2.

4. The CHASE+ methodology is applied for GES assessment only in the Sub-divisions and Sub-regions with insufficient data reported, in which the NEAT GES assessment methodology cannot be applied due to lack of data.

2. CHASE+ assessment methodology and its adaptation for the use in the 2023 MED QSR Assessment

5. The CHASE+ (Chemical Status Assessment Tool) methodology was used by the European Environmental Agency (EEA) to assess environmental status categories for the European Seas (Andersen et al. 2016, EEA, 2019). This assessment methodology uses just one threshold, compared to the two used in the traffic light system.

6. The first step in this tool is to calculate the ratio $C_{measured}/C_{threshold}$ called the contamination ratio (CR) for each assessment element in a matrix. Then a contamination score (CS) is calculated as follows[2]:

$$CS=\frac{1}{\sqrt{n}}\sum_{i=1}^{n}CR_i$$

where n is the number of elements assessed for each matrix.

[1] Technical paper on the comparison of the assessment findings for CI 17 in the Adriatic Sea Sub-region generated by an application of the NEAT and the CHASE+ assessment methodologies already tested in the Levantine Sea Basin (chapter 6), the SIDA Project Meeting (10 November 2022, Tunisia).

[2] The contamination sum minimizes the problem of 'dilution' of high values when several substances from an area are analyzed, and takes to some extent possible synergistic effects of contaminants into account by using square root of 'n' instead of 'n'.

7. Based on the contamination ratio (CR) or on contamination score (CS), the elements are assessed. In line with the results of assessments, the stations/areas can be classified into non problem area (NPA) and problem area (PA), by applying 5 categories: NPAhigh (CR or CS=0.0-0.5), NPAgood (CR or CS =0.5-1.0), PAmoderate (CR or CS =1.0-5.0), PApoor (CR or CS =5.0-10.0) and PAbad (CR or CS > 10.0). NPA areas are considered in GES while PA areas are considered as non-GES. The boundary limit of 1 between GES and non-GES is based on the choice that only values that are equal or below the threshold are considered in GES.

8. Both methodologies need to define decision rules to determine the quality status. One decision rule used is the "One out all out approach" (OOAO) that says that if one element of the assessment is not in good status, the whole area is described as not in GES. This decision rule is very stringent. An additional approach is based on setting a limit, such as a proportion (%) of elements, that should each be in GES for the area to be classified as in GES. Here we recommend that if at least 75% of the elements are in GES, the station should be considered in GES. The same recommendation is given when assessing certain areas or the whole Sub-region or Sub-division i.e., when 75% of the stations are in GES for a certain parameter, the whole sub-region is in GES for this particular parameter and not the overall status of the Sub-region or sub-division. This more lenient approach for the GES-non GES decision rule compensates for stricter thresholds applied within the CHASE+ methodology (See section 4.3). This approach was discussed and confirmed by the Meeting of CorMon Pollution by approval of UNEP/MED WG. 533/10, Appendix IV, and therefore it is also applied in this updated assessment of the LEVS.

9. The regional Mediterranean assessment regarding CI-17 is based on the assessments provided for the sub-divisions within the four sub-regions of the Mediterranean. The sub-division assessments are performed using the two methodologies, i.e, NEAT and CHASE+. Therefore, there was a need to harmonize the two methodologies in order to prevent a bias in the Mediterranean regional assessment and assure compatibility.

10. For this purpose, the following assessments and comparison were performed: i) assessment of the Adriatic Sea (ADR) Sub-region (UNEP/MED WG.533/10, Appendix III) ensuring a comparison between applications of the NEAT and the CHASE+ assessment methods in the ADR; ii) assessment of the Levantine Sea (LEVS) sub-division using the CHASE+ assessment methods, including its comparison to the traffic light system (UNEP/MED WG.533/10, Appendix IV); iii) assessment of the Western Mediterranean Sea (WMS) Sub-region by applying the NEAT and CHASE+ assessment methods.

11. Comparison of the NEAT and CHASE+ assessment methods by using available data as reported by the CPs, showed that the two assessment methodologies are compatible only at the level of very basic assessment per contaminant, per SAU. Still at this level some discrepancies appeared for the non-GES categories moderate and poor. When aggregation of all contaminants data was attempted to obtain the overall pollution (CI17) assessment (NEAT overall value and contamination score (CS) by applying CHASE+ assessment methodology), the two methods behaved differently. These discrepancies were related to different calculations within the two assessment methods for the aggregation of contaminants, as well as differences in setting the boundary limits between the moderate/poor, and poor/bad classes.

12. To overcome the above-described discrepancies and to ensure compatible assessments for all four sub-regions of the Mediterranean Sea on the SAU and on station level for the purposes of the 2023 MED QSR, the approach described here-below is followed. The approach is based on the application of a tailor-made assessment along the general rationale of the CHASE+ tool while ensuring compatibility with the NEAT tool:

- For Sub-regions where the CHASE+ assessment methodology is applicable: Calculation of contamination ratios (CRs) based on the (xBAC) thresholds;.
- For Sub-regions where the CHASE+ assessment methodology is applicable: Calculation of the CS for the overall CI17 aggregated assessment per station as a simple average of CRs and not as

used by the EEA, where CS is calculated as the sum of CR divided by the square root of the number of CRs in the sum (Section 2, paragraph 4).

- For all Sub-regions and for both NEAT and CHASE+ assessment methodologies: The GES/non-GES boundaries are based on the BAC values. The BAC values (xBAC) multiplied by 1.5 for Cd, Hg, Pb and by 2 for PAHs and PCBs were approved by the Meeting of CorMon Pollution (27 and 30 May 2022). This approach was chosen because it is based on the Mediterranean sub-regional background concentrations of contaminants, therefore having the boundary limits based on the values calculated form monitoring data reported by the CPs, and second because it is more stringent than the Med_EAC approach. approach. At the same time, it corresponds with the definition of GES target according to the concentrations of specific contaminants needs to be kept below Environmental Assessment Criteria (EACs) or below reference concentrations **(**UNEP/MED WG 473/7). In many cases the Med_EAC thresholds are higher than the maximum value recorded for a particular contaminant, resulting in a very lenient classification of the SAUs/stations. In this way biased assessments in different Mediterranean sub-regions are avoided.
- For all Sub-regions: Alignment is ensured of the moderate/poor and the poor/bad boundary limits/ thresholds between the two assessment methodologies. For the moderate/poor class, the use of 2(xBAC) value as boundary is proposed and for the poor/bad class, the 5(xBAC) value. In this way, a fine classification in line with the precautionary principle is ensured. The NEAT tool is flexible and accepts either the thresholds values calculated by the tool itself (based on the GES/ non-GES and the maximum concentration of contaminants), or threshold values predefined by the user. In the present assessment all thresholds will be user defined. In the CHASE+ assessment methodology , the CR or CS ratios for the moderate/poor and poor/bad classes are set at 2x and 5x times the GES/ non-GES threshold, instead of x5 and x10 that are used in the previous application of the tool. The boundary limits between the assessment classes are updated as shown in Table 1 below.

13. A comparison between the NEAT and CHASE+ results for the WMS sub-region was performed by applying above approach further to the recommendations for the harmonization of the two assessment methods as provided in the SIDA project document3 and described in UNEP/MED WG. 556/Inf.7, chapter 2. Briefly all thresholds used were identical in the two methodologies, while the CHASE+ methodology was adapted regarding the calculation of the CS score for compatibility reasons. Consolidated results on the percentage of SAUs as classified by the two assessment methodologies are presented in UNEP/MED WG. 556/Inf.7, Table 14, using the xBAC GES/nGES boundary limit/threshold. Based on these comparisons it is apparent that the harmonization of the two tools in this case gives identical results for the classification (in-GES or non-GES) of the individual contaminants assessments per SAU. There are very small differences between the statuses found for the individual contaminants per SAU, i.e., small differences in the division between high and good statuses the in-GES classification and between moderate and poor in the non-GES classification. When aggregation is conducted for all contaminants on the individual SAU level comparisons differ by 5% and still can be considered acceptable.

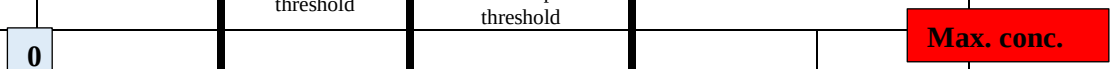
14. The harmonized application of the two assessment methodologies for the assessment of WMS Sub-region provided highly comparable results and shows that the two assessment methodologies can be used indifferently for the various sub-divisions of the Mediterranean Sea. The harmonization of the NEAT and CHASE+ assessment methodologies was as good as possible. They are still different methodologies and the results will not be identical, however the harmonization ensured their alignment to

[3] Technical paper on the comparison of the assessment findings for CI 17 in the Adriatic Sea Sub-region generated by an application of the NEAT and the CHASE+ assessment methodologies already tested in the Levantine Sea Basin (chapter 6), the SIDA Project Meeting (10 November 2022, Tunisia).

the extent which prevents bias assessment of the four Mediterranean sub-regions within the preparation of the 2023 MED QSR. The NEAT is the methodology which properly supports efforts aimed at the GES assessment in line with the Decision IG. 23/6 on the 2017 MED QSR (COP 20, Tirana, Albania, 17-20 December 2017), and therefore its further application across all four Mediterranean sub-regions should be foreseen within preparation of the future QSR. The CHASE+ assessment methodology may continue being used in specific cases, i.e., for the local areas and limited assessments with insufficient data reported for the GES assessment to guide decision making.

Table 1. Proposed updated assessment classification boundary limits/thresholds for a harmonized application of NEAT and CHASE+ tools in the Mediterannean Sea sub-regions.

	GES		**non-GEs**		
IMAP – traffic light approach	Good	Moderate	Bad		
NEAT tool	High	Good	Moderate	Poor	Bad
	0< meas. conc. ≤ BAC	BAC<meas. conc. ≤GES/nGES threshold	GES/nGES<meas. conc. ≤ moderate/poor threshold	moderate/poor threshold <meas. conc. ≤ max. conc.	
Boundary limits and NEAT scores	1 < score ≤0.8	0.8<score≤ 0.6	0.6<score ≤ 0.4	0.4< score ≤0.2	Score<0.2
Thresholds	**BAC**		**(xBAC)**	**2 (xBAC)**	**5 (xBAC)**
CHASE+ tool	High	Good	Moderate	Poor	Bad
Thresholds	**1/2(xBAC)**		**(xBAC)**	**2(xBAC)**	**5(xBAC)**
CHASE+ Scores	0 <CR,CS ≤0.5	0.5<CR,CS≤ 1	1<CR,CS ≤ 2	2< CR,CS ≤5	CR,CS> 5



3. Available data and location of sampling stations

15. The available data for the assessment of the Levantine Sea are presented in Table 2. Data were available for TM (Cd, Hg and Pb) in sediments as available for Cyprus, Greece, Israel, Lebanon, Turkiye; TM in the fish *M. barbatus* as available for Cyprus, Israel, Lebanon, Turkiye; PAHs in sediments as available for Greece, Israel, Lebanon and Turkiye; some PAH compounds for *M. barbatus* as available for Cyprus and Turkiye; organochlorinated contaminants in sediments as available for Lebanon and Turkiye; and organochlorinated contaminants in *M. barbatus* as available for Cyprus, Lebanon and Turkiye.

16. No data were available for the southern coast nor for the southern offshore area of the LEVS.

17. The most data were available for TM in sediments. There were 136 data points in the database, with 135 data points for Cd, 133 for Hg and 136 for Pb. Data for TM in *M. barbatus* were as follows: 83 data points for Cd, 85 data points for Hg and 53 data points for Pb. Data for PAHs in sediments were available for 112 stations. Data on total 16 PAHs (Σ_{16} PAHs) in sediments were reported for 75 stations

while for 33 stations the data available were for Σ_5 PAHs[4]. Data for some of the PAHs compounds in *M. barbatus* were reported in 18 specimens. Data for total PCBs (Σ_7 PCBs[5]) in sediments were available for 52 stations. Data for Lindane and Dieldrin in sediments were available for 33 stations. In *M. barbatus* data for Σ_7 PCBs, Lindane, Dieldrin, Hexachlorobenzene and p,p'DDE were available in 12 samples.

18. The locations of the sampling stations are presented in Figures LEVS1-LEVS5 (Annex I). The data were compiled from the IMAP-IS, as reported by 31st October 2022. As mentioned, additional data from the scientific literature were also used (Astrahan et al. 2017, Ghosn et al, 2020).

Table 2. Data availability by country and year for the assessment of EO 9 – CI 17 (contaminants) in the Levantine Sea Sub-division (LEVS) Sub-division of AEL, as available by up to 31st Oct 2022.

Source	IMAP_File	Country	Year	Cd	Hg	Pb	Σ_{16} PAHs	Σ_5 PAHs	Σ_7 PCBs	Lindane	Dieldrin
Sediment											
IMAP_IS	497	Cyprus	2017	7	7	7					
IMAP_IS	497[6]	Cyprus	2018	4	4	4					
IMAP_IS	634	Cyprus	2019	2	2	2		2			
IMAP_IS	634	Cyprus	2020	6	6	6		6			
IMAP_IS	634	Cyprus	2021	6	5	6					
IMAP_IS	652	Greece	2019	3	0	3	4*	4			
MED POL		Israel	2017	14	14	14					
IMAP_IS	585	Israel	2018	11	11	11					
IMAP_IS	531[7]	Israel	2019	16	16	16					
IMAP_IS	588	Israel	2020	14	14	14					
Lit[1]		Israel	2013&				52*	52			
IMAP_IS	118	Lebanon	2019	17	17	17	19		19		
Lit[2]		Lebanon	2017	2	3	3					
IMAP_IS	445	Türkiye	2018	33	33	33		33	33	33	33
M. barbatus											
IMAP_IS	636	Cyprus#	2020	6	6	6		6	8	8	8
IMAP_IS	636	Cyprus#	2021	8	8	8		6	4	4	4
IMAP_IS	585[8]	Israel	2018	13	13	0					
IMAP_IS	410	Israel	2019	7	7	0					
IMAP_IS	588	Israel	2020	10	12	0					
IMAP_IS	152	Lebanon	2019	14	14	14		6	3		
IMAP_IS	323	Türkiye	2015	25	25	25	25^				

[1]Astrahan et al. 2017; [2]Ghosn et al, 2020; * Data for individual concentrations for all congeners are available; ^Data for 8 congeners available for 25 samples in 5 stations; # Additional data available for Hexachlorobenzene and DDE(p,p'). & Data from 2013 were used because no newer data were available; In addition, the stations are located offshore, at depths deeper than 100 m, so that temporal changes are not expected.

19. Based on the available data, the assessment was performed for TM, Σ_{16} PAHs and Σ_7 PCBs in sediment and for TM in *M. barbatus*. In addition, the LEVS was assessed regarding Σ_5 PAHs as well.

[4] Σ_5 PAHs is the sum of the concentrations of Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Indeno(1,2,3-cd)pyrene and Benzo(ghi)perylene. Turkiye reported also the concentration of Σ_4PAHs that is the sum of the first 4 compounds in Σ_5 PAHs. Both Σ5 PAHs and Σ4 PAHs are non-mandatory parameters for CI 17, whereby Σ16 PAHs, is a mandatory parameter.

[5] PCBs congeners 28,52,101,118,132,153,180
[6] Replaced IMAP file 125
[7] Replaced IMAP file 410
[8] Replaced IMAP file 71

This is not a mandatory parameter, but it was included in the assessment given data availability for Turkiye, that increased the coverage of the assessment over a larger area of the LEVS. Therefore, an exception was made to possibly increase confidence of the assessment. When possible, a qualitative description was provided for the additional parameters or stations.

4. Details of CHASE+ assessment methodology application in the LEVS

4.1 Setting the GES/non GES thresholds and boundary values for the CHASE+ application in the LEVS

20. The thresholds used for the CHASE+ assessment methodology were the updated sub-regional BACs when available. If the Sub-regional BAC was not available, the regional MED_BACs were used as thresholds in the present assessment (UNEP/MED WG. 533/10, Appendix I)[9]. A comparison of the results of the assessments using AEL_BACs and MED_BACs as thresholds is also shown for information in Appendix I. Table 3 summarizes the thresholds values, the same ones used in the assessment of AEGS sub-division within the Aegean Levantine Seas Sub-region (AEL).

Table 3 Summary of the threshold values used in present pilot application for GES assessment of the Levantine and Aegean Seas sub-divisions. MedEACs are presented for comparison.

	AEL_BAC	MED_BAC	MedEAC
Sediments, µg/kg dry wt			
Cd	118	161	1200
Hg	47.3	75	150
Pb	23511	22500	46700
Σ_{16} PAHs	41	32	4022*
Σ_5 PAHs^	17.2	31.8	
Σ_7 PCBs	0.19	0.40	68+
***M. barbatus*, µg/kg wet wt**			
Cd	7.2	7.8	50
Hg	67.4	81.2	1000
Pb	27	36.6	300

* ERL value derived for the sum of 16 PAHs by Long et al., 1995, do not appear in the Decisions of COP; + sum of the individual MedEACs values of the 7 PCB compounds as they appear in Decision IG.23/6;^Values are not set by Decision IG.23/6, therefore the BAC value for Σ5 PAHs is calculated as a sum of the individual BAC values as provided for the 5 PAHs compounds in UNEP/MED WG. 533/10, Appendix I.

21. The boundaries between the 5 environmental classification classes (i.e. high, good, moderate, poor and bad) are given in Table 1.

4.2 Integration of the areas of assessment for the LEVS

22. The locations of the sampling stations were sorted by group of contaminants. TM, PAH and Organochlorinated contaminants in sediments for Lebanon and Turkiye were determined in samples collected from the same stations at the same date. PAHs in sediments from Israel were collected from stations different from the stations sampled for TM in sediments and at a different date. The sampling sites for the fish *M. barbatus* in Lebanon, Israel and Turkiye were located in the areas close to the sediment samples, but did not encompass one specific station, only a fishing area. In Cyprus, one of the two sampling sites for the fish *M. barbatus* was located close to sediment stations and one far from sediment stations.

[9] MED_BACs were adopted by 2017 COP, while the use of sub-regional BACs within the preparation of the 2023 MED QSR was approved by adoption of UNEP/MED WG.533/10, Appendix I by the Meeting of CorMon Pollution held on 27 and 30 May 2022

23. Further to IMAP implementation, the monitoring stations were considered for grouping in the two main assessment zones i.e., the coastal (within 1 nm from the shore) and offshore zones. The sampling stations for TM in sediments for Israel can be considered all coastal, except 2 stations that can be considered offshore stations. In Lebanon, 5 out of 20 stations can be considered offshore stations. In Cyprus, 8 stations can be considered coastal and 3 stations as offshore. In Greece, 1 station was coastal, and 3 stations were offshore stations. In Turkiye, four stations can be considered offshore stations. The stations in Iskenderun Bay, Antalya Bay, the bay off Mersin and Erdemli and inlets can be considered coastal stations. No stations with data for PAHs in sediments in Israel can be considered coastal i.e. there were 52 stations that can be considered offshore stations. The grouping of stations for PAHs and organochlorinated contaminants in sediments for Lebanon and Turkiye was the same as for TM. TM in *M. barbatus* were determined in samples collected from stations that can be considered offshore stations in Israel, Cyprus and Lebanon. In Turkiye all stations can be considered coastal, with exception of one station that can be classified as offshore station. Due to the limited number of data points, more so if dividing into coastal and offshore stations, the spatial nesting of stations in spatial assessment units (SAUs) to the level considered meaningful for IMAP CI 17 was not possible in LEVS. Spatial nesting would decrease the reliability and the representativeness of each station for the assessment of the Levantine Sea Sub-division. Therefore, at this stage, the assessment was based on specific stations irrespective of their positions either in offshore or coastal zones.

5. Results of the CHASE+ Assessment of CI 17 in the LEVS

24. Data were grouped per parameter, matrix, station location and sampling year. In the cases where a station was sampled during various years, and/or there were more than one data point for the station at a certain year, the average concentrations (i.e., arithmetic mean) were calculated and used in the CHASE+ assessment. Average concentrations were also used in the NEAT application in the ADR (UNEP/MED WG.533/10, Appendix III; UNEP/MED WG.556/Inf.6) and in the WMS (UNEP/MED WG.556/Inf.7).

25. For each measured parameter at each station a contamination ratio (CR) was calculated. Thresholds were the updated sub-regional AEL_BACs (Table 3). CHASE+ methodology in the LEVS was provided without spatial integration and aggregation of the areas of assessment and assessment results. Instead, aggregation was possible only for TM in sediments and in *M. barbatus*. A contamination score (CS) aggregating 2-3 metals was further calculated. Table 4 summarizes the results of the CHASE+ application, while Tables LEVS1-LEVS5 in Annex II provide detailed calculation of the assessment results.

Table 4. Number of data points and their percentage from the total number of data points in each category based on the CHASE+ tool, calculated using the new AEL_BACs (UNEP/MED WG.533/10, Appendix I; UNEP/MED WG.533/Inf.3/Rev.1).

CHASE+		**Blue High**	**Green Good**	**Yellow Moderate**	**Brown Poor**	**Red Bad**
		NPA or GES		**PA or non-GES**		
Sediment	Total number of data points					
		CS=0.0-0.5	**CS =0.5-1.0**	**CS =1.0-2**	**CS =2-5**	**CS >5**
*Cd, Hg, Pb	83	19	38	24	2	0

CHASE+		**Blue High**	**Green Good**	**Yellow Moderate**	**Brown Poor**	**Red Bad**
		NPA or GES		**PA or non-GES**		
% from total number of data points		*23*	*46*	*29*	*2*	*0*
		CR=0.0-0.5	**CR=0.5-1.0**	**CR =1.0-2**	**CR =2-5**	**CR>5**
Σ_{16} PAHs	75	45	16	7	3	4
% from total number of data points		*60*	*21*	*10*	*4*	*5*
Σ_{5} PAHs	97	75	13	8	1	0
% from total number of data points		*77*	*14*	*8*	*1*	*0*
Σ_{7} PCBs	52	18	20	3	4	7
% from total number of data points		*35*	*38*	*6*	*8*	*13*
M. barbatus	Total number of data points					
		CS=0.0-0.5	**CS =0.5-1.0**	**CS =1.0-2**	**CS =2-5**	**CS >5**
Cd, Hg, Pb	15	11	3	0	1	0
% from total number of data points		*73*	*20*	*0*	*7*	*0*

* Without anomalous Cd concentrations for Cyprus

5.1 Assessment of Trace metals in sediments of the LEVS

26. Data were reported for all the 3 TMs in 80 stations, while for 3 stations data were reported only for Cd and Pb. However, the concentrations of Cd in Cyprus were much higher than the MedBACs and even higher than the MedEAC agreed upon in Decision IG.23/6 (Table 3). Consultation with national representatives and experts of Cyprus provided the explanation that although anomalously high, the concentrations are natural, probably due to specific local minerology. Therefore, Cd concentrations in sediments from Cyprus were excluded from this updated assessment, as in the pilot assessment of the LEVS (UNEP/MED WG.533/10, Appendix IV).

27. Out of the 83 stations, 57 (69%) were in-GES (high and good statuses) and 26 (31%) in non-GES classification. Out of the 26 non-GES stations, 24 were classified as in moderate status, with 4 stations borderline to good (green) status (CSs of 1.00-1.01) (Figure LEVS 1, Annex I and Table LEVS1, Annex II). Two stations were classified as in poor status. It should be mentioned that the moderate status is the least affected status among the 3 PA (corresponding to non-GES) classification. Examination of the CRs for the individual metals found that 21% of the stations were non-GES regarding Cd, 21% of the stations were non-GES regarding Hg and 7% of the stations were non-GES regarding Pb.

28. The non-GES stations were present in all the countries that reported data: Cyprus, Greece, Israel, Lebanon and Turkiye. A detailed examination of the CSs and CRs (Table LEVS1, Annex II) found that stations in moderate status in Cyprus were located in Larnaka Bay, off Zygi and in Chrisochou Bay. Pb concentration in sediments contributed to classification in the moderate status[10]. In Greece, two stations were found in moderate status (Koufonisi (S. Crete), Kastelorizo), with Pb and Cd concentrations contributing to this classification. In Israel, the area classified as moderate status was limited to the northern part of Haifa Bay and concentration of Hg contributed to this classification. The area is known to be still contaminated by legacy Hg, even though there was a vast improvement of the environmental status following pollution abatement measures (Herut et al, 2016, 2021). In Lebanon, the main area in moderate status was off Beirut, in particular the Dora region (with two station in bad status), followed by area in the North Lebanon, with Cd and Hg concentrations contributing equally to the moderate classification. The Beirut area is densely populated and industrialized (Ghosn et al., 2020). In Turkiye, 4 stations were classified as in moderate status: Akkuyu, Taşucu, Anamur, Göksu River mouth. The concentration of Hg contributed to this classification.

29. The decision rule agreed for application of the CHASE + assessment methodology by the Meeting of CorMon Pollution (27 ad 30 May 2022) recommends that only if at least 75% of the stations are in-GES, the area should be considered in-GES. Therefore, the northern and eastern LEVS should be classified as non-GES regarding TM in sediments, i.e. in moderate status, as only 69% or the stations were in GES. As explained in Section 3, no data were available for the southern part of the LEVS.

30. This classification is a result of the contribution from the 2 very limited affected areas i.e., (1) seven stations in the Northern Haifa Bay, and 2) three stations in the Dora region (Beirut). When data from these affected areas, that constitute less than 0.1% of the LEVS, are not taken into account, then 78% of the stations (57 out of 73 stations) are in GES, and the northern and eastern LEVS can be classified as in GES. These 57 stations are distributed evenly across the northern and eastern LEVS, providing a good coverage of this area of the sub-division.

31. Key findings. Regarding TM in sediments, non-GES stations were identified across the northern and eastern LEVS and the area was assessed as non-GES, i.e., in moderate status. No assessment could be performed for the southern LEVS as no data were available. When the contribution of two very limited affected areas i.e. (1) the Northern Haifa Bay, and 2) the Dora region (Beirut) are not taken into account, the northern and eastern LEVS can be classified as in-GES.

5.2 Assessment of Σ_{16} PAHs and of Σ_5 PAHs in sediments of the LEVS

32. <u>Σ16 PAHs in sediments:</u> There were 75 stations with data for Σ_{16} PAHs in sediments reported by Greece, Israel and Lebanon. Out of the 75 stations, 61 (81%) were classified in-GES in high and good statuses and 14 (19%) stations classified as non-GES (Table 4, Figure LEVS2, Annex I and Table LEVS2, Annex II). Out of the non-GES stations, 7 stations were classified as moderate, 3 stations as poor and 4 stations as in bad status.

33. There was no large specific area with non-GES status. Two small, geographically limited areas with non-GES status were identified i.e., one in Israel, at stations close to the locations of drilled wells for gas exploration (Astrahan et al., 2017) and one off in Beirut, in Lebanon. Two stations in Greece, off Lindos and Kastelorizo were also classified in moderate status.

34. Data on Σ_{16} PAHs in sediments were not distributed evenly across the LEVS, therefore the sub-division could not be assessed regarding Σ_{16} PAHs concentrations in sediments. As more than 75% of the stations were in GES it is possible to classify the areas with available data as in-GES. Given the limited data availability no conclusion could be provided on GES status at the level of the Levantine Sea Basin.

[10] Local minerology should be studied to decide if the high values are anthropogenic or originate from natural sources as for Cd.

35. Key findings. Given the limited data availability, it was not possible to classify the LEVS Sub-division regarding data reported for Σ_{16} PAHs in sediments. As more than 75% of the stations were in GES, it is possible to classify the areas **with available data** as in-GES regarding Σ_{16} PAHs in sediments.

36. Σ_5 PAHs in sediments: There were 97 stations with data for Σ_5 PAHs in sediments, reported by Cyprus, Greece, Israel and Turkiye. Although Σ_5 PAHs is not a mandatory parameter for CI 17, the assessment based on it was performed due to significant more data availability for Σ_5 PAHs compared to Σ_{16} PAHs encompassing a larger assessment area of the LEVS. Therefore, an exception was made in order to increase confidence of the assessment.

37. Out of the 97 available stations, 88 (91%) were classified as in-GES (75 stations in high status and 13 in good status) and 9 stations (9%) were classified as non-GES, 8 in moderate status and 1 in poor status (Table 4, Figure LEVS 3, Annex I and Table LEVS 3, Annex II).Therefore, the northern and the eastern part of the LEVS can be classified as in-GES regarding Σ_5 PAHs in sediments.

38. Key findings. The northern and the eastern part of the LEVS can be classified as in-GES regarding g Σ_5 PAHs in sediments.

5.3 Assessment of Σ_7 PCBs in sediments and in *M. barbatus* of the LEVS

39. Data on Σ_7PCBs in sediments were reported only by Lebanon (19 stations) and Turkiye (33 stations). Out of the 52 stations, 38 (73%) were classified in-GES and 14 stations (27%) were classified as non-GES. Out of the non-GES stations, 3 were in moderate status, 4 in poor status and 7 in bad status (Table 4, Figure LEVS4, Annex I and Table LEVS 4, Annex II).

40. The non-GES stations were located mainly at the Dora region (Beirut), as for TM in sediments, but also in additional stations. However, given the limited data availability no conclusion could be provided on environmental status of the LEVS concerning Σ_7 PCBs in sediments.

41. Data on Σ_7PCBs in 12 samples of *M, barbatus* were reported by Cyprus. All data were bdl,

42. Key finding. The LEVS sub-division could not be classified based on assessment of Σ_7 PCBs in sediments due to lack of data and their uneven spatial distribution for sediments and essentially no data for *M. barbatus*. A few affected areas for sediments could be indicated.

5.4 Assessment of Organochlorinated contaminants other than PCBs in sediments and *M. barbatus* of the LEVS

43. Sediment. Data for Organochlorinated contaminants other than PCBs were reported only by Turkiye. Dieldrin in all 33 stations were below detection limit (reported as 0 μg/kg dry wt) while data for γ-HCH (Lindane) ranged from below detection limit to 0.14 μg/kg dry wt with both average and median concentrations of 0.05 μg/kg dry wt. The BAC value is not set for Lindane. Only EAC of 3 μg/kg dry wt was adopted by Decision IG.22/7. The concentrations reported for Lindane were well below the EAC value.

44. *M. barbatus*. Cyprus reported concentrations of Dieldrin, Lindane, Hexachlorobenzene, p,p'DDE in 12 samples of *M. barbatus*. All data, except one data point for Σ_7PCBs were bdl. Lebanon reported 3 data points for total PCBs, with concentrations in the range of 122-306 μg/kg dry wt. No BACs were calculated for these organochlorinated contaminants in *M. barbatus* due to lack of data (UNEP/MED WG.533/10, Appendix I).

45. Key findings. The LEVS Sub-division could not be classified based on assessment of organochlorinated contaminants other than PCBs in sediments nor in *M. barbatus*.

5.5 Assessment of Trace metals in *M. barbatus* of the LEVS

46. TM in *M. barbatus* were available at15 stations from Cyprus, Israel, Lebanon and Turkiye. As explained above, the CHASE+ assessment was performed based on average concentrations calculated for specimens sampled at the same station in different years.

47. Out of 15 stations, 14 (93%) were classified in-GES and 1 (7%) station as non-GES in poor status. The station in poor status was located off Paphos and this classification was due to the concentration of Hg. Therefore, the northern and the eastern part of the LEVS can be classified as in-GES concerning TM in *M. barbatus*.

48. Key findings. The northern and the eastern part of the LEVS can be classified as in-GES concerning TM in *M. barbatus*.

Annex I

Maps providing spatial visualization of CHASE+ assessment results for IMAP CI-17 in the Levantine Sea (LEVS) sub-division of the Aegean and Levantine Seas (AEL) Sub-region

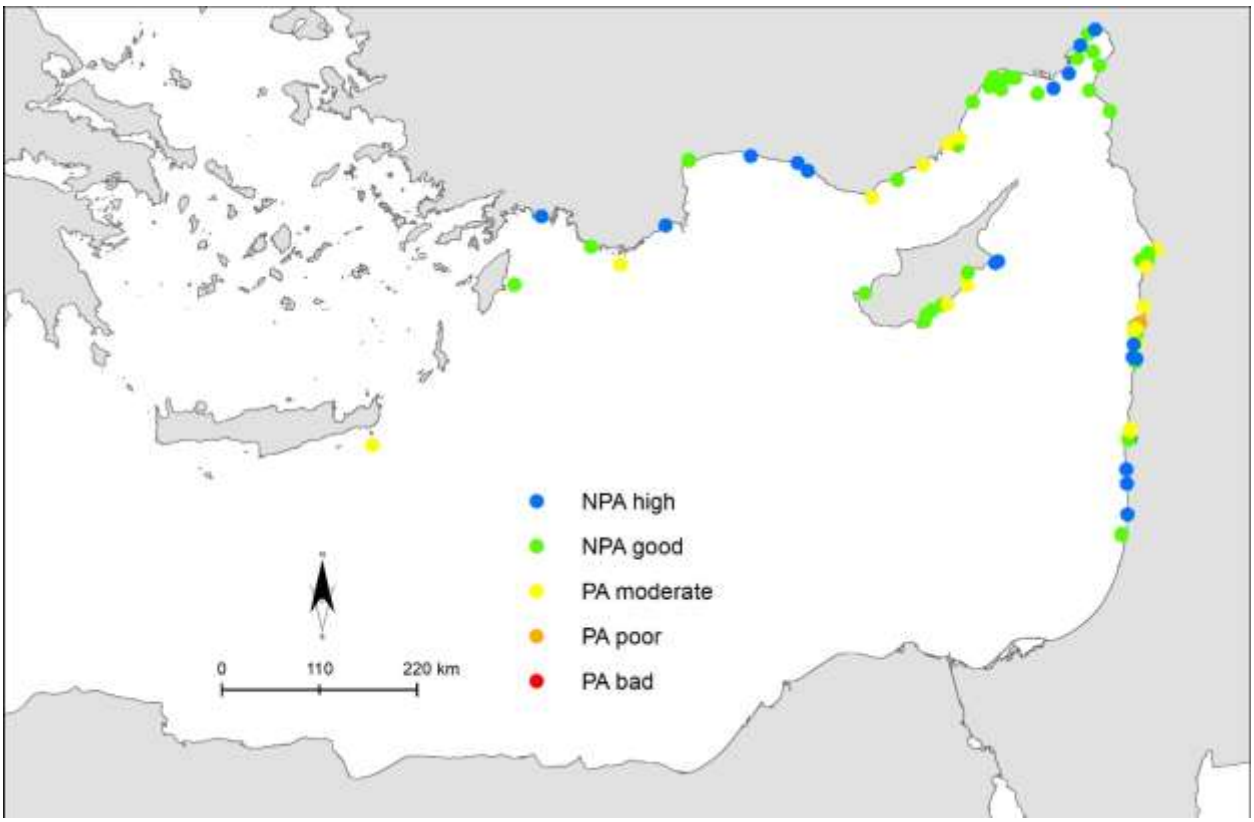


Figure LEVS 1. Results of the CHASE+ assessment methodology application to assess the environmental status of TM in sediments in the LEVS, using AEL_BACs as thresholds. Stations in blue - NPAhigh (CS=0.0-0.5); stations in green- NPAgood (CS =0.5-1.0); Stations in yellow- PAmoderate (CS =1.0-2.0); stations in brown - PApoor (CS =2.0-5.0) and stations in red - PAbad (CS > 5.0). Blue and green stations are considered in GES; yellow, brown and red stations are considered non-GES.

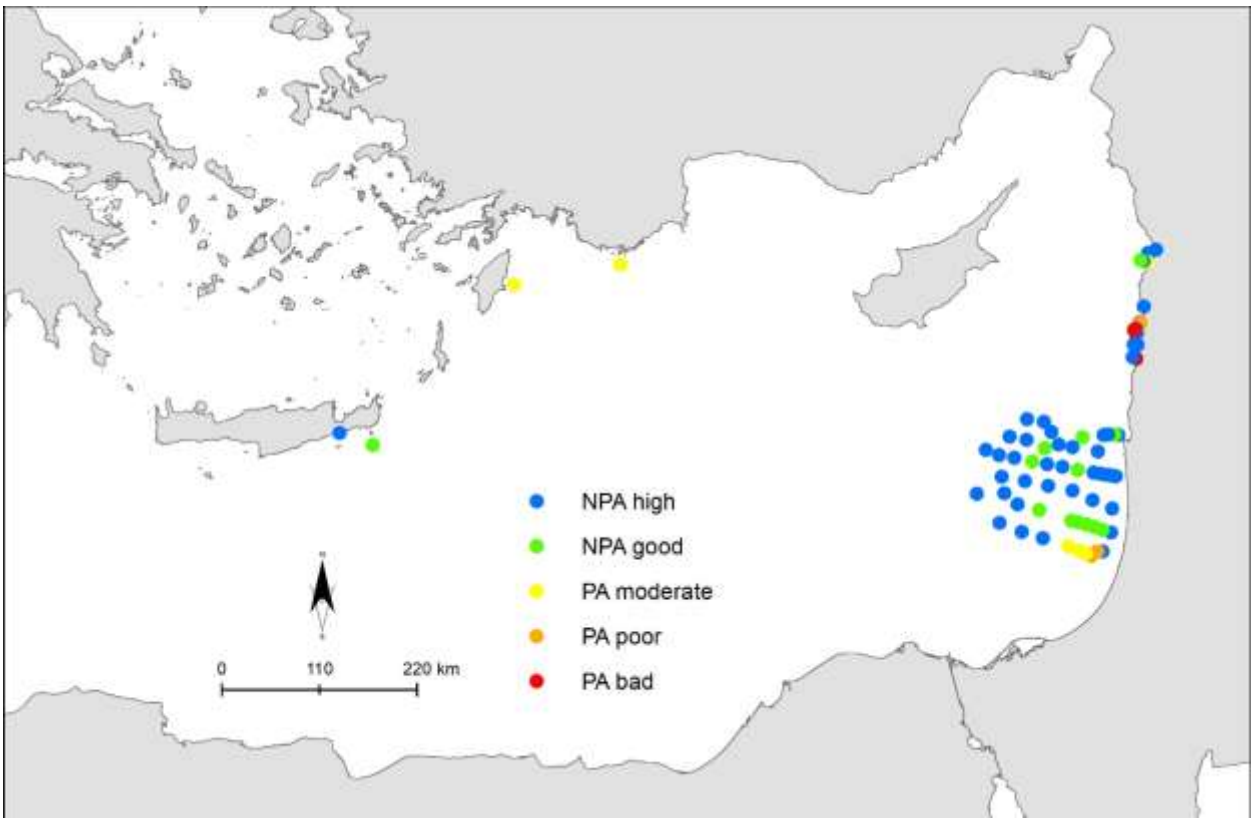


Figure LEVS 2. Results of the CHASE+ assessment methodology application to assess the environmental status of Σ_{16} PAHs in sediments in the LEVS, using AEL_BACs as thresholds. Stations in blue - NPAhigh (CR=0.0-0.5); stations in green- NPAgood (CR =0.5-1.0); Stations in yellow- PAmoderate (CR =1.0-2.0); stations in brown - PApoor (CR =2.0-5.0) and stations in red - PAbad (CR > 5.0). Blue and green stations are considered in GES; yellow, brown and red stations are considered non-GES.

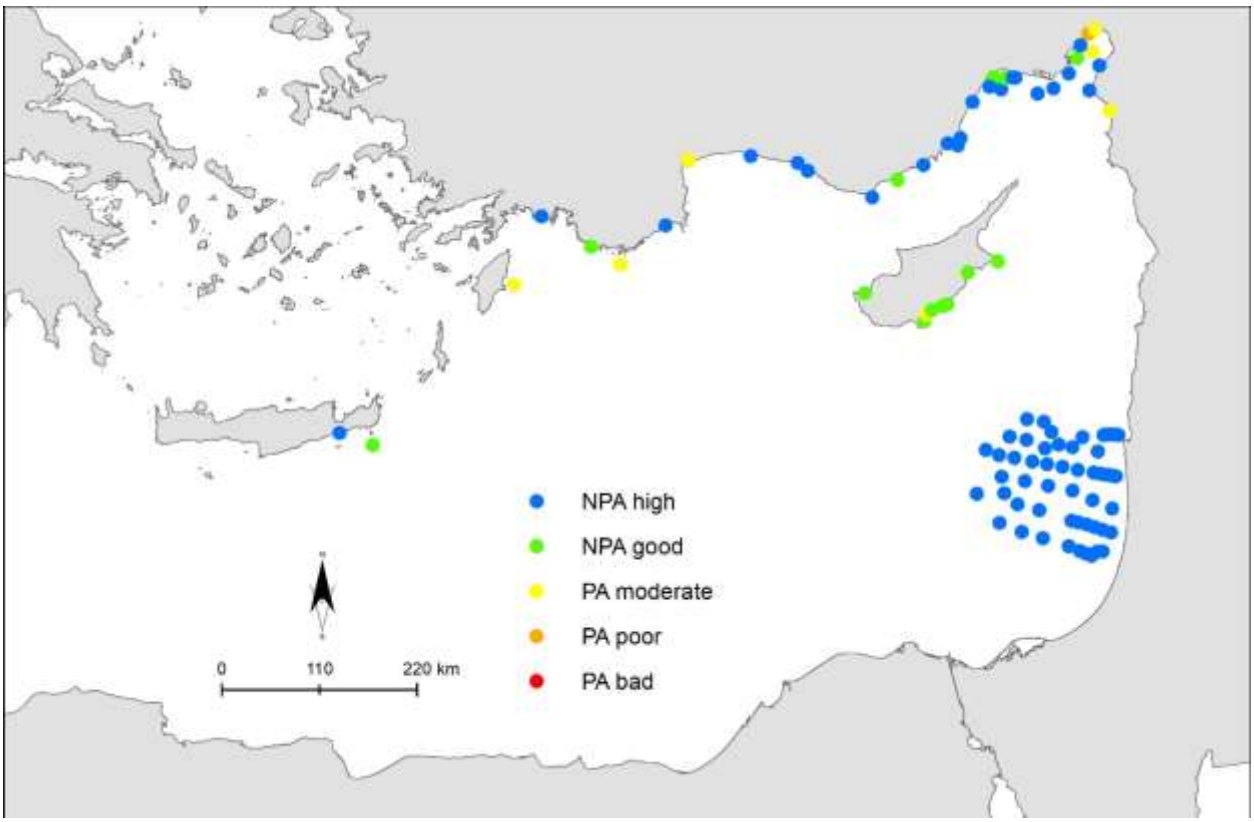


Figure LEVS 3. Results of the CHASE+ assessment methodology application to assess the environmental status of Σ_5 PAHs in sediments in the LEVS, using AEL_BACs as thresholds. Criteria for Σ_5 PAHs were not adopted in Decisions IG.22/7 and IG.23/6 (COP 19 and COP 20) and not addressed in UNEP/MED WG. 533/10, Appendix I. Here we used the sum of the individual BAC values as provided for the 5 PAHs compounds in UNEP/MED WG. 533/10, Appendix I as Σ_5 PAHs_BAC. Stations in blue - NPAhigh (CR=0.0-0.5); stations in green- NPAgood (CR =0.5-1.0); Stations in yellow- PAmoderate (CR =1.0-2.0); stations in brown - PApoor (CR =2.0-5.0) and stations in red - PAbad (CR > 5.0). Blue and green stations are considered in GES; yellow, brown and red stations are considered non-GES.

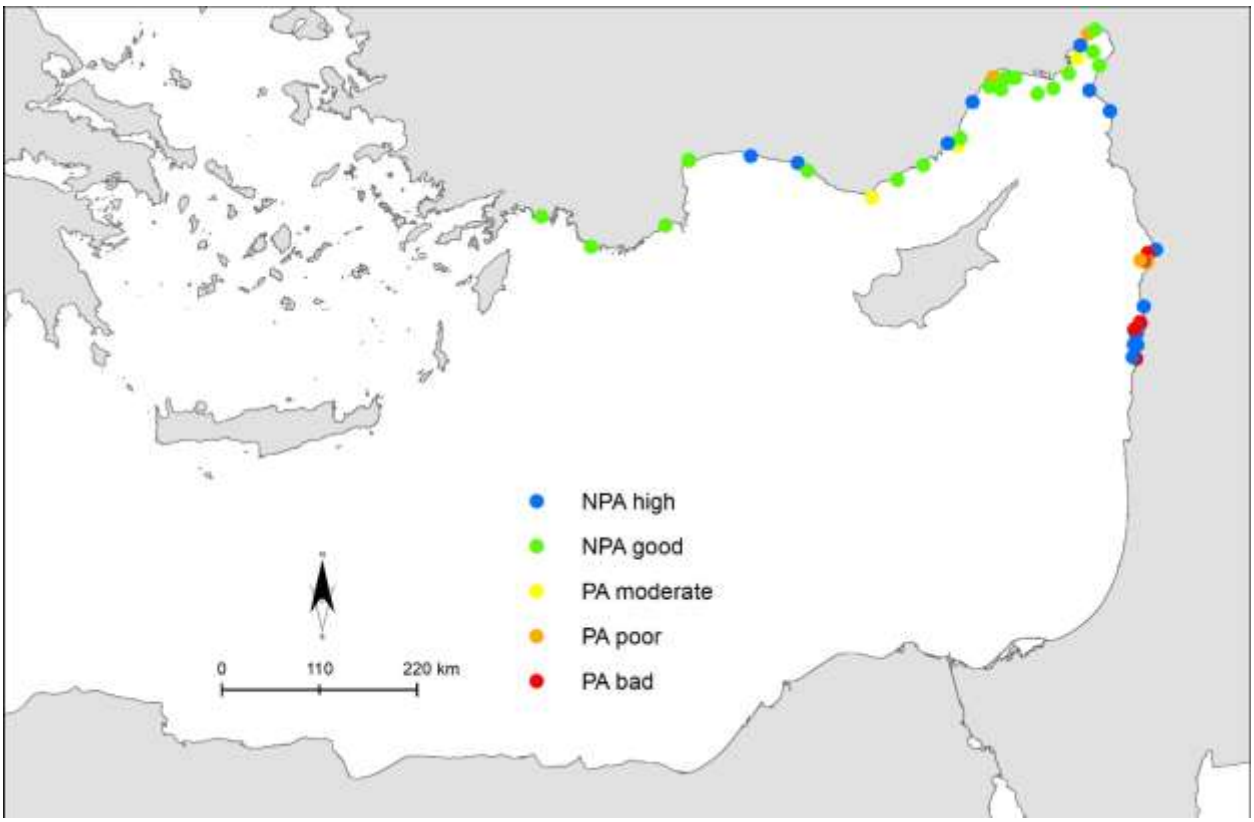


Figure LEVS 4. Results of the CHASE+ assessment methodology application to assess the environmental status of Σ_7 PCBs in sediments in the LEVS, using AEL_BACs as thresholds. Stations in blue - NPAhigh (CR=0.0-0.5); stations in green- NPAgood (CR =0.5-1.0); Stations in yellow- PAmoderate (CR =1.0-2.0); stations in brown - PApoor (CR =2.0-5.0) and stations in red - PAbad (CR > 5.0). Blue and green stations are considered in GES; yellow, brown and red stations are considered non-GES.

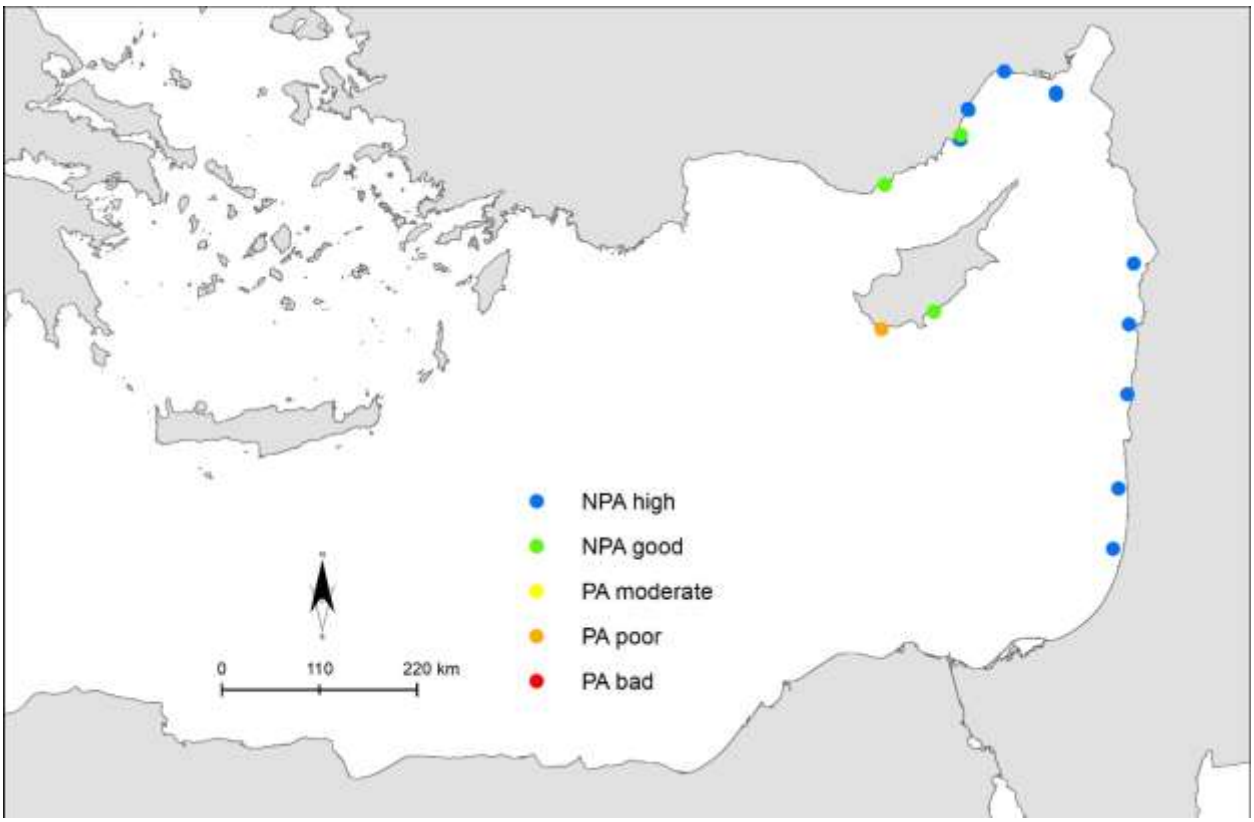


Figure LEVS 5. Results of the CHASE+ assessment methodology application to assess the environmental status of TM in *M. barbatus* in the LEVS, using AEL_BACs as thresholds. Stations in blue - NPAhigh (CS=0.0-0.5); stations in green- NPAgood (CS =0.5-1.0); Stations in yellow- PAmoderate (CS =1.0-2.0); stations in brown - PApoor (CS =2.0-5.0) and stations in red - PAbad (CS > 5.0). Blue and green stations are considered in GES; yellow, brown and red stations are considered non-GES.

Annex II

Tables of the results of application of the CHASE+ assessment methodology in the Levantine Sea (LEVS) sub-division of the Aegean and Levantine Seas (AEL) Sub-region using AEL_BACs, and comparison to the assessment results using MED_BACs as thresholds

Table LEVS1. Results of the CHASE+ assessment methodology application to assess the environmental status of TM in sediments in the LEVS, using AEL_BACs as thresholds. The results of the assessment using MED_BACs as thresholds are given for comparison. Blue - NPAhigh (CS=0.0-0.5); Green-NPAgood (CS =0.5-1.0); Yellow- PAmoderate (CS =1.0-2.0); Brown - PApoor (CS =2.0-5.0) and Red - PAbad (CS > 5.0). Blue and green stations are considered in GES, yellow, brown and red stations are considered non-GES. Averages are presented for stations sampled during several year

Source	File	Country	Station	Year	Cd_CR	Hg_CR	Pb_CR	CS		Cd_CR	Hg_CR	Pb_CR	CS
					AEL_BAC used as threshold					MED_BAC used as threshold			
IMAP	585	Israel	ISRTMH12	2018	0.22	2.56	0.15	0.98		0.16	1.61	0.15	0.64
IMAP	531	Israel	ISRTMH12	2019	0.29	2.81	0.12	1.07		0.21	1.78	0.12	0.70
IMAP	588	Israel	ISRTMH12	2020	0.16	3.01	0.16	1.11		0.12	1.90	0.17	0.73
		Average	**ISRTMH12**		0.22	2.80	0.14	1.05		0.16	1.76	0.15	0.69
IMAP	585	Israel	ISRTMH2	2018	0.25	4.01	0.16	1.47		0.19	2.53	0.16	0.96
IMAP	531	Israel	ISRTMH2	2019	0.32	4.46	0.13	1.63		0.23	2.81	0.13	1.06
IMAP	588	Israel	ISRTMH2	2020	0.17	3.91	0.18	1.42		0.12	2.46	0.18	0.92
		Average	**ISRTMH2**		0.25	4.12	0.15	1.51		0.18	2.60	0.16	0.98
MedPOL		Israel	ISRTMH27	2017	0.83	1.21	0.26	0.76		0.61	0.76	0.27	0.55
IMAP	585	Israel	ISRTMH27	2018	0.71	0.69	0.25	0.55		0.52	0.44	0.26	0.41
IMAP	531	Israel	ISRTMH27	2019	1.27	0.87	0.29	0.81		0.93	0.55	0.30	0.59
IMAP	531	Israel	ISRTMH27	2019	1.30	0.78	0.31	0.80		0.96	0.49	0.32	0.59
IMAP	531	Israel	ISRTMH27	2019	1.25	0.79	0.31	0.78		0.91	0.50	0.32	0.58
IMAP	588	Israel	ISRTMH27	2020	1.83	0.86	0.47	1.06		1.34	0.54	0.50	0.79
		Average	**ISRTMH27**		1.20	0.87	0.31	0.79		0.88	0.55	0.33	0.58
MedPOL		Israel	ISRTMH8	2017	0.39	3.13	0.16	1.23		0.29	1.97	0.17	0.81
IMAP	585	Israel	ISRTMH8	2018	0.15	2.45	0.13	0.91		0.11	1.55	0.14	0.60
IMAP	531	Israel	ISRTMH8	2019	0.30	3.19	0.15	1.21		0.22	2.01	0.16	0.80
IMAP	588	Israel	ISRTMH8	2020	0.08	2.58	0.17	0.94		0.06	1.63	0.17	0.62
		Average	**ISRTMH8**		0.23	2.84	0.15	1.07		0.17	1.79	0.16	0.71
MedPOL		Israel	ISRTMH9	2017	0.19	3.39	0.17	1.25		0.14	2.14	0.18	0.82
IMAP	585	Israel	ISRTMH9	2018	0.23	2.68	0.16	1.02		0.17	1.69	0.16	0.67
IMAP	531	Israel	ISRTMH9	2019	0.29	3.41	0.14	1.28		0.22	2.15	0.15	0.84
IMAP	588	Israel	ISRTMH9	2020	0.13	3.95	0.17	1.42		0.10	2.49	0.18	0.92
		Average	**ISRTMH9**		0.21	3.36	0.16	1.24		0.16	2.12	0.17	0.81
IMAP	118	Lebanon	AKK-10	2019	1.97	1.41	0.25	1.21		1.45	0.89	0.26	0.87
IMAP	118	Lebanon	AKK-60	2019	1.26	0.35	0.34	0.65		0.92	0.22	0.36	0.50
Lit_Ghosn		Lebanon	Beirut	2017		0.99	0.21	0.60		0.00	0.62	0.21	0.28
IMAP	118	Lebanon	COSTA-30	2019	0.76	1.41	0.17	0.78		0.56	0.89	0.18	0.54
IMAP	118	Lebanon	COSTA-60	2019	0.68	1.41	0.32	0.80		0.50	0.89	0.33	0.57
IMAP	118	Lebanon	DAM-10	2019	1.70	1.41	0.11	1.07		1.25	0.89	0.12	0.75
IMAP	118	Lebanon	DAM-60	2019	0.95	0.32	0.22	0.50		0.70	0.20	0.23	0.38
IMAP	118	Lebanon	DORA-10	2019	2.88	2.11	0.77	1.92		2.11	1.33	0.80	1.42
IMAP	118	Lebanon	DORA-100	2019	3.38	3.30	1.00	2.56		2.48	2.08	1.05	1.87
IMAP	118	Lebanon	DORA-30	2019	3.00	2.96	0.76	2.24		2.20	1.87	0.79	1.62
IMAP	118	Lebanon	Nhr Ib	2019	1.53	1.41	0.11	1.01		1.12	0.89	0.11	0.71
IMAP	118	Lebanon	RAMLET-10	2019	1.50	1.41	0.11	1.01		1.10	0.89	0.11	0.70
IMAP	118	Lebanon	RAMLET-100	2019	1.58	1.41	0.31	1.10		1.16	0.89	0.33	0.79
IMAP	118	Lebanon	RAMLET-40	2019	1.81	1.41	0.60	1.27		1.33	0.89	0.62	0.95
Lit_Ghosn		Lebanon	Saida	2017	0.73	0.99	0.09	0.61		0.54	0.62	0.10	0.42
IMAP	118	Lebanon	SDA-10	2019	0.70	0.16	0.12	0.33		0.51	0.10	0.13	0.25
IMAP	118	Lebanon	SDA-60	2019	0.81	0.30	0.23	0.44		0.59	0.19	0.24	0.34
IMAP	118	Lebanon	TRI-10	2019	0.66	1.41	0.19	0.75		0.48	0.89	0.20	0.52
IMAP	118	Lebanon	TRI-60	2019	0.73	1.41	0.49	0.88		0.54	0.89	0.52	0.65
Lit_Ghosn		Lebanon	Tripoli	2017	1.81	1.69	0.49	1.33		1.33	1.07	0.51	0.97
IMAP	445	Turkiye	AKKUYU	2018	2.16	0.55	0.42	1.04		1.58	0.35	0.44	0.79
IMAP	445	Turkiye	AKNSW1	2018	1.13	0.38	0.40	0.64		0.83	0.24	0.42	0.50
IMAP	445	Turkiye	ALBSW1	2018	0.41	0.08	0.29	0.26		0.30	0.05	0.30	0.22
IMAP	445	Turkiye	ANASW1	2018	1.83	0.40	0.52	0.91		1.34	0.25	0.54	0.71
IMAP	445	Turkiye	ANASWR	2018	2.24	0.56	0.71	1.17		1.64	0.35	0.74	0.91
IMAP	445	Turkiye	ANBSW1	2018	0.92	0.49	0.56	0.66		0.67	0.31	0.58	0.52
IMAP	445	Turkiye	ANBSWR	2018	0.84	0.48	0.47	0.60		0.62	0.30	0.49	0.47
IMAP	445	Turkiye	BTCSW1	2018	1.41	0.78	0.75	0.98		1.03	0.49	0.79	0.77
IMAP	445	Turkiye	CEYSWR	2018	0.75	0.28	0.35	0.46		0.55	0.17	0.36	0.36
IMAP	445	Turkiye	DALSW1	2018	0.59	0.88	0.21	0.56		0.43	0.55	0.22	0.40
IMAP	445	Turkiye	DALSW2	2018	0.60	0.44	0.17	0.40		0.44	0.28	0.18	0.30
IMAP	445	Turkiye	DILSWR	2018	0.45	0.43	0.43	0.44		0.33	0.27	0.45	0.35
IMAP	445	Turkiye	ECSW1	2018	0.76	0.55	0.31	0.54		0.56	0.35	0.33	0.41
IMAP	445	Turkiye	ERDSWR	2018	1.05	0.44	0.56	0.68		0.77	0.28	0.58	0.54
IMAP	445	Turkiye	FIBSW1	2018	0.52	0.36	0.47	0.45		0.38	0.23	0.49	0.37
IMAP	445	Turkiye	GRESW1	2018	1.21	0.30	0.23	0.58		0.89	0.19	0.24	0.44
IMAP	445	Turkiye	GRESW2	2018	3.11	0.36	0.36	1.28		2.28	0.22	0.37	0.96
IMAP	445	Turkiye	ISKSW2	2018	0.76	0.92	0.28	0.65		0.56	0.58	0.29	0.47
IMAP	445	Turkiye	ISKSW3	2018	0.67	0.44	0.38	0.50		0.49	0.27	0.40	0.39
IMAP	445	Turkiye	ISKSWR	2018	1.19	0.45	0.66	0.77		0.88	0.29	0.69	0.62
IMAP	445	Turkiye	KARSW1	2018	0.72	0.26	0.41	0.46		0.53	0.16	0.43	0.37
IMAP	445	Turkiye	MERSİN-DOGU	2018	1.19	0.41	0.67	0.76		0.88	0.26	0.70	0.61
IMAP	445	Turkiye	MERSWR	2018	1.41	0.51	0.61	0.84		1.04	0.32	0.63	0.66
IMAP	445	Turkiye	MRESW1	2018	0.87	0.10	0.18	0.39		0.64	0.07	0.19	0.30
IMAP	445	Turkiye	MRSYB6	2018	1.28	0.44	0.79	0.84		0.94	0.28	0.83	0.68
IMAP	445	Turkiye	SAMSWR	2018	1.64	0.39	0.24	0.76		1.20	0.24	0.25	0.57
IMAP	445	Turkiye	SEYSW1	2018	1.31	0.55	0.67	0.84		0.96	0.35	0.70	0.67
IMAP	445	Turkiye	SEYSW2	2018	1.38	0.38	0.72	0.83		1.01	0.24	0.75	0.67
IMAP	445	Turkiye	SEYSW3	2018	1.49	0.46	0.75	0.90		1.09	0.29	0.78	0.72
IMAP	445	Turkiye	TASSW1	2018	2.70	0.35	0.40	1.15		1.98	0.22	0.42	0.87
IMAP	445	Turkiye	TIRSW1	2018	1.49	0.64	0.65	0.93		1.09	0.40	0.68	0.72
IMAP	445	Turkiye	YUM-REF	2018	1.07	0.49	0.47	0.68		0.78	0.31	0.49	0.53
IMAP	445	Turkiye	YUMSW1	2018	0.74	0.21	0.33	0.43		0.54	0.13	0.34	0.34

Comparison of the assessment of TM in sediments using AEL_BACs as threshold to the results using MED_BACs as thresholds to calculate the contaminations scores (CS) showed an increase in the percentage of the stations in-GES using from 69% using AEL_BACs to 93% using MED_BACs. The change was due to the higher MED_BACs for Cd and Hg compared to the AEL_BACs (Table 3). This change is also due to the stations that were classified in borderline moderate status (very close to good status) using AEL-BACs that are now classified as good using MED-BACs.

Table LEVS2. Results of the CHASE+ assessment methodology application to assess the environmental status of Σ_{16} PAHs in sediments in the LEVS, using AEL_BAC as threshold. The results of the assessment using MED_BAC as threshold are given for comparison. Blue - NPAhigh (CS=0.0-0.5); Green- NPAgood (CR =0.5-1.0); Yellow- PAmoderate (CR =1.0-2.0); Brown - PApoor (CR =2.0-5.0) and Red - PAbad (CR > 5.0). Blue and green stations are considered in GES, yellow, brown and red stations are considered non-GES.

Source	File	Country	Station	Year	CR_Σ16P AH _AEL	CR_Σ16P AH _MED	Source	File	Country	Station	Year	CR_Σ16P AH_AEL	CR_Σ16P AH _MED
IMAP	652	Greece	CW69	2019	0.45	0.35	Lit1		Israel	G24	2013	0.67	0.53
IMAP	652	Greece	MSFD-5	2019	0.98	0.76	Lit1		Israel	G25	2013	0.38	0.30
IMAP	652	Greece	MSFD-6	2019	1.44	1.12	Lit1		Israel	G26	2013	0.40	0.31
IMAP	652	Greece	MSFD-7	2019	1.74	1.35	Lit1		Israel	G27	2013	1.40	1.09
IMAP	152	Lebanon	AKK-10	2019	0.12	0.10	Lit1		Israel	G28	2013	0.44	0.34
IMAP	152	Lebanon	AKK-60	2019	0.27	0.21	Lit1		Israel	G29	2013	0.39	0.30
IMAP	152	Lebanon	COSTA-10	2019	0.00	0.00	Lit1		Israel	G3	2013	0.31	0.24
IMAP	152	Lebanon	COSTA-30	2019	0.27	0.21	Lit1		Israel	G30	2013	0.35	0.27
IMAP	152	Lebanon	COSTA-60	2019	0.19	0.15	Lit1		Israel	G31	2013	0.40	0.31
IMAP	152	Lebanon	DAM-10	2019	0.01	0.00	Lit1		Israel	G32	2013	0.38	0.29
IMAP	152	Lebanon	DAM-60	2019	0.28	0.22	Lit1		Israel	G4	2013	0.45	0.35
IMAP	152	Lebanon	DORA-10	2019	1.81	1.41	Lit1		Israel	G5	2013	0.38	0.29
IMAP	152	Lebanon	DORA-100	2019	5.36	4.19	Lit1		Israel	G6	2013	0.48	0.37
IMAP	152	Lebanon	DORA-30	2019	2.43	1.89	Lit1		Israel	G7	2013	0.45	0.35
IMAP	152	Lebanon	Nhr Ib	2019	0.02	0.01	Lit1		Israel	G8	2013	0.30	0.23
IMAP	152	Lebanon	RAMLET-10	2019	0.02	0.02	Lit1		Israel	G9	2013	0.57	0.44
IMAP	152	Lebanon	RAMLET-10(	2019	5.43	4.24	Lit1		Israel	S11	2013	0.41	0.32
IMAP	152	Lebanon	RAMLET-40	2019	6.19	4.83	Lit1		Israel	S12	2013	0.76	0.59
IMAP	152	Lebanon	SDA-10	2019	5.24	4.09	Lit1		Israel	S13	2013	0.65	0.51
IMAP	152	Lebanon	SDA-60	2019	0.16	0.12	Lit1		Israel	S14	2013	0.49	0.38
IMAP	152	Lebanon	TRI-10	2019	1.22	0.95	Lit1		Israel	S21	2013	0.50	0.39
IMAP	152	Lebanon	TRI-40	2019	0.20	0.15	Lit1		Israel	S22	2013	0.42	0.33
IMAP	152	Lebanon	TRI-60	2019	0.71	0.55	Lit1		Israel	S23	2013	0.42	0.32
Lit1		Israel	G1	2013	0.49	0.38	Lit1		Israel	S24	2013	0.50	0.39
Lit1		Israel	G10	2013	0.42	0.32	Lit1		Israel	S25	2013	0.43	0.34
Lit1		Israel	G11	2013	0.39	0.31	Lit1		Israel	S31	2013	0.43	0.34
Lit1		Israel	G12	2013	0.67	0.52	Lit1		Israel	S32	2013	0.59	0.46
Lit1		Israel	G13	2013	0.44	0.34	Lit1		Israel	S33	2013	0.60	0.47
Lit1		Israel	G14	2013	0.32	0.25	Lit1		Israel	S34	2013	0.73	0.57
Lit1		Israel	G15	2013	0.61	0.48	Lit1		Israel	S35	2013	0.72	0.56
Lit1		Israel	G16	2013	0.35	0.28	Lit1		Israel	S41	2013	0.49	0.38
Lit1		Israel	G17	2013	0.37	0.29	Lit1		Israel	S42	2013	2.36	1.84
Lit1		Israel	G18	2013	0.49	0.38	Lit1		Israel	S43	2013	2.99	2.33
Lit1		Israel	G18a	2013	0.48	0.38	Lit1		Israel	S44	2013	1.15	0.90
Lit1		Israel	G19	2013	0.39	0.31	Lit1		Israel	S45	2013	1.56	1.22
Lit1		Israel	G2	2013	0.56	0.44	Lit-Astrahan et al. 2017						
Lit1		Israel	G20	2013	0.36	0.28							
Lit1		Israel	G21	2013	0.32	0.25							
Lit1		Israel	G22	2013	0.36	0.28							
Lit1		Israel	G23	2013	0.60	0.47							

Comparison the results of the assessment of Σ_{16} PAHs in sediments using AEL_BAC as threshold to the results using MED_BACs as thresholds showed them to be very similar – from 81% of the stations in GES using AEL_BACs to 84% of the stations in-GES using MED_BACs. The main change was the improvement of status from good to high. This is due to the similar values of the BACs, 32 and 41 μg/kg dry wt for AEL_BAC and MED_EAC, respectively (Table 3).

Table LEVS 3. Results of the CHASE+ assessment methodology application to assess the environmental status of Σ_5 PAHs in sediments in the LEVS, using AEL_BAC as threshold. Criteria for Σ_5 PAHs were not adopted in Decisions IG.22/7 and IG.23/6 (COP 19 and COP 20) and not addressed in UNEP/MED WG. 533/10, Appendix I. Here we used the sum of the individual BAC values as provided for the 5 PAHs compounds in UNEP/MED WG. 533/10, Appendix I as Σ_5 PAHs_BAC. The results of the assessment using MED_BAC as threshold are given for comparison. Blue - NPAhigh (CR=0.0-0.5); Green- NPAgood (CR =0.5-1.0); Yellow- PAmoderate (CR =1.0-2.0); Brown - PApoor (CR =2.0-5.0) and Red - PAbad (CR > 5.0). Blue and green stations are considered in GES, yellow, brown and red stations are

considered non-GES.

Source	File	Country	Station	Year	CR_Σ5PAH _AEL	CR_Σ5PAH_MED	Source	File	Country	Station	Year	CR_Σ5PAH _AEL	CR_Σ5PAH_MED
IMAP	634	Cyprus	CY_11-C2_S1/B4	2020	0.73	0.39	Lit1		Israel	G1	2013	0.28	0.15
IMAP	634	Cyprus	CY_12-C2_O1/B4	2020	1.66	0.90	Lit1		Israel	G10	2013	0.19	0.10
IMAP	634	Cyprus	CY_12-C2_O4/B4	2020	0.73	0.39	Lit1		Israel	G11	2013	0.26	0.14
IMAP	634	Cyprus	CY_14-C2_S1/B4	2020	0.73	0.39	Lit1		Israel	G12	2013	0.39	0.21
IMAP	634	Cyprus	CY_15-C2_S1/B4	2020	0.73	0.39	Lit1		Israel	G13	2013	0.26	0.14
IMAP	634	Cyprus	CY_18-C2_S1/B4	2019	0.73	0.39	Lit1		Israel	G14	2013	0.16	0.08
IMAP	634	Cyprus	CY_22-C3_S1/B4	2019	0.73	0.39	Lit1		Israel	G15	2013	0.31	0.17
IMAP	634	Cyprus	CY_3-C2_S1/LT4	2020	0.73	0.39	Lit1		Israel	G16	2013	0.20	0.11
IMAP	652	Greece	CW69	2019	0.27	0.15	Lit1		Israel	G17	2013	0.27	0.15
IMAP	652	Greece	MSFD-5	2019	0.81	0.44	Lit1		Israel	G18	2013	0.21	0.11
IMAP	652	Greece	MSFD-6	2019	1.17	0.64	Lit1		Israel	G18a	2013	0.31	0.17
IMAP	652	Greece	MSFD-7	2019	1.55	0.84	Lit1		Israel	G19	2013	0.24	0.13
IMAP	445	Turkiye	AKKUYU	2018	0.24	0.13	Lit1		Israel	G2	2013	0.31	0.17
IMAP	445	Turkiye	AKNSW1	2018	0.48	0.26	Lit1		Israel	G20	2013	0.24	0.13
IMAP	445	Turkiye	ALBSW1	2018	0.09	0.05	Lit1		Israel	G21	2013	0.19	0.10
IMAP	445	Turkiye	ANASW1	2018	0.61	0.33	Lit1		Israel	G22	2013	0.20	0.11
IMAP	445	Turkiye	ANASWR	2018	0.19	0.10	Lit1		Israel	G23	2013	0.23	0.12
IMAP	445	Turkiye	ANBSW1	2018	1.93	1.04	Lit1		Israel	G24	2013	0.34	0.18
IMAP	445	Turkiye	ANBSWR	2018	1.38	0.75	Lit1		Israel	G25	2013	0.22	0.12
IMAP	445	Turkiye	BTCSW1	2018	4.76	2.57	Lit1		Israel	G26	2013	0.22	0.12
IMAP	445	Turkiye	CEYSWR	2018	0.09	0.05	Lit1		Israel	G27	2013	0.33	0.18
IMAP	445	Turkiye	DALSW1	2018	0.22	0.12	Lit1		Israel	G28	2013	0.22	0.12
IMAP	445	Turkiye	DALSW2	2018	0.22	0.12	Lit1		Israel	G29	2013	0.24	0.13
IMAP	445	Turkiye	DILSWR	2018	0.34	0.18	Lit1		Israel	G3	2013	0.19	0.10
IMAP	445	Turkiye	ECSW1	2018	0.68	0.37	Lit1		Israel	G30	2013	0.17	0.09
IMAP	445	Turkiye	ERDSWR	2018	0.23	0.13	Lit1		Israel	G31	2013	0.23	0.12
IMAP	445	Turkiye	FIBSW1	2018	0.21	0.11	Lit1		Israel	G32	2013	0.21	0.11
IMAP	445	Turkiye	GRESW1	2018	0.09	0.05	Lit1		Israel	G4	2013	0.27	0.15
IMAP	445	Turkiye	GRESW2	2018	0.13	0.07	Lit1		Israel	G5	2013	0.19	0.11
IMAP	445	Turkiye	ISKSW2	2018	0.28	0.15	Lit1		Israel	G6	2013	0.30	0.16
IMAP	445	Turkiye	ISKSW3	2018	1.15	0.62	Lit1		Israel	G7	2013	0.27	0.15
IMAP	445	Turkiye	ISKSWR	2018	1.07	0.58	Lit1		Israel	G8	2013	0.18	0.10
IMAP	445	Turkiye	KARSW1	2018	0.07	0.04	Lit1		Israel	G9	2013	0.47	0.25
IMAP	445	Turkiye	MERSİN-DOGU	2018	0.36	0.19	Lit1		Israel	S11	2013	0.29	0.16
IMAP	445	Turkiye	MERSWR	2018	0.66	0.36	Lit1		Israel	S12	2013	0.47	0.26
IMAP	445	Turkiye	MRESW1	2018	0.05	0.03	Lit1		Israel	S13	2013	0.36	0.19
IMAP	445	Turkiye	MRSYB6	2018	0.37	0.20	Lit1		Israel	S14	2013	0.28	0.15
IMAP	445	Turkiye	SAMSWR	2018	1.24	0.67	Lit1		Israel	S21	2013	0.30	0.16
IMAP	445	Turkiye	SEYSW1	2018	0.62	0.34	Lit1		Israel	S22	2013	0.21	0.11
IMAP	445	Turkiye	SEYSW2	2018	0.33	0.18	Lit1		Israel	S23	2013	0.24	0.13
IMAP	445	Turkiye	SEYSW3	2018	0.43	0.23	Lit1		Israel	S24	2013	0.28	0.15
IMAP	445	Turkiye	TASSW1	2018	0.25	0.14	Lit1		Israel	S25	2013	0.23	0.13
IMAP	445	Turkiye	TIRSW1	2018	0.48	0.26	Lit1		Israel	S31	2013	0.19	0.11
IMAP	445	Turkiye	YUM-REF	2018	0.82	0.44	Lit1		Israel	S32	2013	0.30	0.16
IMAP	445	Turkiye	YUMSW1	2018	0.17	0.09	Lit1		Israel	S33	2013	0.28	0.15
							Lit1		Israel	S34	2013	0.30	0.16
							Lit1		Israel	S35	2013	0.28	0.15
							Lit1		Israel	S41	2013	0.24	0.13
							Lit1		Israel	S42	2013	0.29	0.16
							Lit1		Israel	S43	2013	0.27	0.15
							Lit1		Israel	S44	2013	0.24	0.13
							Lit1		Israel	S45	2013	0.26	0.14
							Lit-Astrahan et al. 2017						

The assessment of Σ_5 PAHs in sediments using MED_BAC as threshold increased the number of stations classified in-GES, from 81% of the stations in-GES using AEL_BAC to 98% of the stations in-GES using MED_BACs. The LEVS was classified as in-GES using either of the BACs.

Table LEVS 4. Results of the CHASE+ assessment methodology application to assess the environmental status of Σ_7 PCBs in sediments in the LEVS, using AEL_BAC as threshold. The results of the assessment using MED_BAC as threshold are given for comparison. Blue - NPAhigh (CR=0.0-0.5); Green- NPAgood (CR =0.5-1.0); Yellow- PAmoderate (CR =1.0-2.0); Brown - PApoor (CR=2.0-5.0) and Red - PAbad (CR > 5.0). Blue and green stations are considered in GES, yellow, brown and red stations are considered non-GES.

Source	File	Country	Station	Year	CR_Σ7PCB _AEL	CR_Σ7PCB _MED	Source	File	Country	Station	Year	CR_Σ7PCB _AEL	CR_Σ7PCB _MED
IMAP	152	Lebanon	AKK-10	2019	0	0	IMAP	445	Turkiye	ANBSWR	2018	0.64	0.30
IMAP	152	Lebanon	AKK-60	2019	7.37	3.50	IMAP	445	Turkiye	BTCSW1	2018	2.06	0.98
IMAP	152	Lebanon	COSTA-10	2019	0.00	0.00	IMAP	445	Turkiye	CEYSWR	2018	0.83	0.40
IMAP	152	Lebanon	COSTA-30	2019	0.00	0.00	IMAP	445	Turkiye	DALSW1	2018	0.30	0.14
IMAP	152	Lebanon	COSTA-60	2019	0.00	0.00	IMAP	445	Turkiye	DALSW2	2018	0.69	0.33
IMAP	152	Lebanon	DAM-10	2019	0.00	0.00	IMAP	445	Turkiye	DILSWR	2018	0.94	0.45
IMAP	152	Lebanon	DAM-60	2019	0.00	0.00	IMAP	445	Turkiye	ECSW1	2018	0.72	0.34
IMAP	152	Lebanon	DORA-10	2019	17.73	8.42	IMAP	445	Turkiye	ERDSWR	2018	0.50	0.24
IMAP	152	Lebanon	DORA-100	2019	36.50	17.34	IMAP	445	Turkiye	FIBSW1	2018	0.54	0.26
IMAP	152	Lebanon	DORA-30	2019	50.02	23.76	IMAP	445	Turkiye	GRESW1	2018	1.82	0.86
IMAP	152	Lebanon	Nhr Ib	2019	0.36	0.17	IMAP	445	Turkiye	GRESW2	2018	0.58	0.28
IMAP	152	Lebanon	RAMLET-10	2019	0.00	0.00	IMAP	445	Turkiye	ISKSW2	2018	0.60	0.28
IMAP	152	Lebanon	RAMLET-100	2019	0.00	0.00	IMAP	445	Turkiye	ISKSW3	2018	0.52	0.25
IMAP	152	Lebanon	RAMLET-40	2019	10.89	5.17	IMAP	445	Turkiye	ISKSWR	2018	0.51	0.24
IMAP	152	Lebanon	SDA-10	2019	15.30	7.27	IMAP	445	Turkiye	KARSW1	2018	0.80	0.38
IMAP	152	Lebanon	SDA-60	2019	0.00	0.00	IMAP	445	Turkiye	İERSİN-DOG	2018	0.75	0.36
IMAP	152	Lebanon	TRI-10	2019	4.94	2.35	IMAP	445	Turkiye	MERSWR	2018	3.34	1.58
IMAP	152	Lebanon	TRI-40	2019	7.89	3.75	IMAP	445	Turkiye	MRESW1	2018	0.44	0.21
IMAP	152	Lebanon	TRI-60	2019	3.38	1.61	IMAP	445	Turkiye	MRSYB6	2018	0.54	0.26
IMAP	445	Turkiye	AKKUYU	2018	0.58	0.27	IMAP	445	Turkiye	SAMSWR	2018	0.33	0.16
IMAP	445	Turkiye	AKNSW1	2018	0.40	0.19	IMAP	445	Turkiye	SEYSW1	2018	0.88	0.42
IMAP	445	Turkiye	ALBSW1	2018	0.42	0.20	IMAP	445	Turkiye	SEYSW2	2018	0.58	0.28
IMAP	445	Turkiye	ANASW1	2018	0.71	0.34	IMAP	445	Turkiye	SEYSW3	2018	0.82	0.39
IMAP	445	Turkiye	ANASWR	2018	1.96	0.93	IMAP	445	Turkiye	TASSW1	2018	0.45	0.21
IMAP	445	Turkiye	ANBSW1	2018	0.57	0.27	IMAP	445	Turkiye	TIRSW1	2018	0.60	0.29
							IMAP	445	Turkiye	YUM-REF	2018	1.01	0.48
							IMAP	445	Turkiye	YUMSW1	2018	0.36	0.17

The results of the assessment of Σ_7 PCBs in sediments using MED_BAC as threshold increased the number of stations in-GES, from 38 (73%) to 42 (81%). The reason for these differences is related to the differences in the values of the BACs, 0.19 and 0.40 µg/kg dry for AEL_BAC and MED_EAC, respectively (Table 3). Although 81% are in GES, it is not possible to assess the LEVS based on Σ_7 PCBs in sediments due to the lack of data and they uneven spatial distribution.

Table LEVS 5. Results of the CHASE+ assessment methodology application to assess the environmental status of TM in *M. barbatus* in the LEVS, using AEL_BACs as thresholds. The results of the assessment using MED_BACs as thresholds are given for comparison. Blue - NPAhigh (CS=0.0-0.5); Green- NPAgood (CS =0.5-1.0); Yellow- PAmoderate (CS =1.0-2.0); Brown - PApoor (CS =2.0-5.0) and Red - PAbad (CS > 5.0). Blue and green stations are considered in GES, yellow, brown and red stations are considered non-GES. Averages are presented for replicate samples collected at the same stations sampled during several years.

Source	File	Country	Station	Year	CR_Cd	CR_Hg	CR_Pb	CS		CR_Cd	CR_Hg	CR_Pb	CS
					AEL_BAC used as threshold					MED_BAC used as threshold			
IMAP	636	Cyprus	CY LIM (FISH)	2020	0.09	1.68		0.89		0.09	1.40		0.74
IMAP	636	Cyprus	CY LIM (FISH)	2020	0.09	0.91		0.50		0.09	0.76		0.42
IMAP	636	Cyprus	CY LIM (FISH)	2020	0.09	1.19		0.64		0.09	0.99		0.54
IMAP	636	Cyprus	CY LIM (FISH)	2020	0.09	0.82		0.46		0.09	0.68		0.38
IMAP	636	Cyprus	CY LIM (FISH)	2021	0.45	1.78		1.12		0.42	1.48		0.95
		Average			**0.16**	**1.28**		**0.72**		**0.15**	**1.06**		**0.61**
IMAP	636	Cyprus	CY PAF (FISH)	2020	0.19	3.46		1.82		0.17	2.87		1.52
IMAP	636	Cyprus	CY PAF (FISH)	2020	0.19	1.38		0.78		0.17	1.15		0.66
IMAP	636	Cyprus	CY PAF (FISH)	2021	0.19	14.84		7.51		0.17	12.32		6.24
IMAP	636	Cyprus	CY PAF (FISH)	2021	0.19	1.68		0.93		0.17	1.40		0.78
IMAP	636	Cyprus	CY PAF (FISH)	2021	0.19	2.87		1.53		0.18	2.38		1.28
IMAP	636	Cyprus	CY PAF (FISH)	2021	0.19	5.04		2.62		0.18	4.19		2.18
IMAP	636	Cyprus	CY PAF (FISH)	2021	0.19	3.46		1.83		0.18	2.87		1.52
IMAP	636	Cyprus	CY PAF (FISH)	2021	0.19	3.86		2.02		0.18	3.20		1.69
IMAP	636	Cyprus	CY PAF (FISH)	2021	0.19	2.37		1.28		0.18	1.97		1.07
		Average			**0.19**	**4.33**		**2.26**		**0.17**	**3.59**		**1.88**
IMAP	531	Israel	TRAWL C	2019	0.17	1.19		0.68		0.16	0.99		0.57
IMAP	531	Israel	TRAWL C	2019	0.14	0.65		0.39		0.13	0.54		0.33
IMAP	531	Israel	TRAWL C	2019	0.23	0.67		0.45		0.21	0.56		0.38
IMAP	531	Israel	TRAWL C	2019	0.21	0.62		0.41		0.19	0.51		0.35
IMAP	531	Israel	TRAWL C	2019	0.23	0.78		0.51		0.21	0.65		0.43
IMAP	531	Israel	TRAWL C	2019	0.19	0.58		0.38		0.18	0.48		0.33
IMAP	531	Israel	TRAWL C	2019	0.27	0.71		0.49		0.25	0.59		0.42
		Average			**0.21**	**0.74**		**0.47**		**0.19**	**0.62**		**0.40**
IMAP	585	Israel	TRAWL S	2018	0.07	0.97		0.52		0.07	0.80		0.43
IMAP	585	Israel	TRAWL S	2018	0.08	0.48		0.28		0.07	0.39		0.23
IMAP	585	Israel	TRAWL S	2018	0.08	0.40		0.24		0.08	0.33		0.21
IMAP	585	Israel	TRAWL S	2018	0.18	0.49		0.33		0.16	0.41		0.29
IMAP	585	Israel	TRAWL S	2018	0.19	0.59		0.39		0.18	0.49		0.33
IMAP	585	Israel	TRAWL S	2018	0.13	0.72		0.42		0.12	0.60		0.36
IMAP	585	Israel	TRAWL S	2018	0.14	0.45		0.29		0.13	0.37		0.25
IMAP	585	Israel	TRAWL S	2018	0.09	0.53		0.31		0.08	0.44		0.26
IMAP	585	Israel	TRAWL S	2018	0.14	0.49		0.31		0.13	0.41		0.27
IMAP	585	Israel	TRAWL S	2018	0.08	0.40		0.24		0.07	0.34		0.20
IMAP	585	Israel	TRAWL S	2018	0.11	0.45		0.28		0.11	0.38		0.24
IMAP	585	Israel	TRAWL S	2018	0.14	0.55		0.34		0.13	0.45		0.29
IMAP	585	Israel	TRAWL S	2018	0.11	0.40		0.26		0.10	0.33		0.22
IMAP	588	Israel	TRAWL S	2020	0.04	1.80		0.92		0.03	1.49		0.76
IMAP	588	Israel	TRAWL S	2020	0.04	1.24		0.64		0.03	1.03		0.53
IMAP	588	Israel	TRAWL S	2020	0.04	1.06		0.55		0.03	0.88		0.46
IMAP	588	Israel	TRAWL S	2020	0.04	0.99		0.51		0.03	0.82		0.43
IMAP	588	Israel	TRAWL S	2020	0.04	1.09		0.56		0.03	0.90		0.47
IMAP	588	Israel	TRAWL S	2020	0.04	1.23		0.63		0.03	1.02		0.53
IMAP	588	Israel	TRAWL S	2020	0.04	0.86		0.45		0.03	0.71		0.37
IMAP	588	Israel	TRAWL S	2020	0.06	0.71		0.39		0.05	0.59		0.32
IMAP	588	Israel	TRAWL S	2020	0.04	1.29		0.67		0.03	1.07		0.55
IMAP	588	Israel	TRAWL S	2020	0.06	0.89		0.47		0.05	0.74		0.40
IMAP	588	Israel	TRAWL S	2020		0.11		0.11			0.09		0.09
IMAP	588	Israel	TRAWL S	2020		0.11		0.11			0.09		0.09
		Average			**0.08**	**0.73**		**0.41**		**0.08**	**0.61**		**0.34**

Source	File	Country	Station	Year	CR_Cd	CR_Hg	CR_Pb	CS	CR_Cd	CR_Hg	CR_Pb	CS
					AEL_BAC used as threshold				MED_BAC used as threshold			
IMAP	152	Lebanon	MB1 TYRE	2019	0.01	0.09	0.01	0.04	0.01	0.08	0.01	0.03
IMAP	152	Lebanon	MB4 TYRE	2019	0.06	0.16	0.07	0.09	0.05	0.13	0.05	0.08
IMAP	152	Lebanon	MB6 TYRE	2019	0.07	0.86	0.23	0.39	0.07	0.71	0.17	0.32
IMAP	152	Lebanon	MB7 TYRE	2019	0.02	0.07	0.01	0.03	0.02	0.06	0.01	0.03
IMAP	152	Lebanon	MS1 TYRE	2019	0.05	0.13	0.13	0.10	0.05	0.11	0.10	0.08
IMAP	152	Lebanon	MS2 TYRE	2019	0.04	0.33	0.18	0.19	0.04	0.28	0.13	0.15
		Average			**0.04**	**0.27**	**0.11**	**0.14**	**0.04**	**0.23**	**0.08**	**0.11**
IMAP	152	Lebanon	MB10 BEY	2019	0.01	0.04	0.07	0.04	0.01	0.03	0.05	0.03
IMAP	152	Lebanon	MB2 BEY	2019	0.01	0.02	0.12	0.05	0.01	0.02	0.09	0.04
IMAP	152	Lebanon	MB4 BEY	2019	0.01	0.04	0.18	0.08	0.01	0.03	0.13	0.06
IMAP	152	Lebanon	MB5 BEY	2019	0.02	0.03	0.08	0.04	0.02	0.02	0.06	0.03
IMAP	152	Lebanon	MB7 BEY	2019	0.02	0.02	0.05	0.03	0.02	0.02	0.04	0.02
IMAP	152	Lebanon	MB8 BEY	2019	0.01	0.04	0.33	0.13	0.01	0.04	0.25	0.10
IMAP	152	Lebanon	MB9 BEY	2019	0.01	0.03	0.38	0.14	0.01	0.02	0.28	0.10
		Average			**0.01**	**0.03**	**0.17**	**0.07**	**0.01**	**0.03**	**0.13**	**0.06**
IMAP	152	Lebanon	MB5 TRIP	2019	**0.04**	**0.12**	**0.39**	**0.18**	**0.04**	**0.10**	**0.29**	**0.14**
IMAP	323	Turkiye	Anamur / Mersin 1	2015	0.80	1.90	0.69	1.13	0.74	1.58	0.51	0.94
IMAP	323	Turkiye	Anamur / Mersin 2	2015	0.43	1.71	0.69	0.94	0.39	1.42	0.51	0.77
IMAP	323	Turkiye	Anamur / Mersin 3	2015	0.60	1.54	0.65	0.93	0.55	1.28	0.48	0.77
IMAP	323	Turkiye	Anamur / Mersin 4	2015	0.46	1.25	0.61	0.78	0.43	1.04	0.45	0.64
IMAP	323	Turkiye	Anamur / Mersin 5	2015	0.58	1.49	0.49	0.85	0.53	1.24	0.36	0.71
		Average			**0.57**	**1.58**	**0.62**	**0.93**	**0.53**	**1.31**	**0.46**	**0.77**
IMAP	323	Turkiye	Göksu / Mersin 1	2015	0.23	0.86	0.38	0.49	0.22	0.71	0.28	0.40
IMAP	323	Turkiye	Göksu / Mersin 2	2015	0.14	0.73	0.29	0.39	0.13	0.61	0.21	0.32
IMAP	323	Turkiye	Göksu / Mersin 3	2015	0.15	0.88	0.47	0.50	0.14	0.73	0.34	0.40
		Average			**0.17**	**0.82**	**0.38**	**0.46**	**0.16**	**0.68**	**0.28**	**0.37**
IMAP	323	Turkiye	Göksu / Mersin 4	2015	0.32	0.77	0.44	0.51	0.30	0.64	0.32	0.42
IMAP	323	Turkiye	Göksu / Mersin 5	2015	0.37	0.86	0.36	0.53	0.34	0.71	0.27	0.44
		Average			**0.34**	**0.81**	**0.40**	**0.52**	**0.32**	**0.68**	**0.29**	**0.43**
IMAP	323	Turkiye	Tırtar / Mersin 1	2015	0.36	0.29	0.21	0.29	0.34	0.24	0.15	0.24
IMAP	323	Turkiye	Tırtar / Mersin 2	2015	0.29	0.32	0.25	0.28	0.27	0.26	0.18	0.24
IMAP	323	Turkiye	Tırtar / Mersin 3	2015	0.16	0.29	0.14	0.20	0.15	0.24	0.10	0.16
		Average			**0.27**	**0.30**	**0.20**	**0.26**	**0.25**	**0.25**	**0.15**	**0.21**
IMAP	323	Turkiye	Tırtar / Mersin 4	2015	0.13	0.26	0.15	0.18	0.12	0.21	0.11	0.15
IMAP	323	Turkiye	Tırtar / Mersin 5	2015	0.56	0.33	0.19	0.36	0.51	0.27	0.14	0.31
		Average			**0.34**	**0.29**	**0.17**	**0.27**	**0.32**	**0.24**	**0.13**	**0.23**
IMAP	323	Turkiye	Seyhan / Adana 2	2015	0.40	0.30	0.30	0.33	0.37	0.25	0.22	0.28
IMAP	323	Turkiye	Seyhan / Adana 3	2015	0.43	0.36	0.53	0.44	0.40	0.30	0.39	0.36
IMAP	323	Turkiye	Seyhan / Adana 4	2015	0.37	0.33	0.36	0.35	0.34	0.27	0.26	0.29
IMAP	323	Turkiye	Seyhan / Adana 5	2015	0.52	0.30	0.33	0.38	0.48	0.25	0.24	0.32
IMAP	323	Turkiye	Seyhan/ Adana 1	2015	0.49	0.35	0.38	0.41	0.45	0.29	0.28	0.34
		Average			**0.44**	**0.33**	**0.38**	**0.38**	**0.41**	**0.27**	**0.28**	**0.32**
IMAP	323	Turkiye	Karataş / Adana 4	2015	0.54	0.32	0.57	0.48	0.50	0.26	0.42	0.40
IMAP	323	Turkiye	Karataş / Adana 5	2015	0.38	0.39	0.68	0.48	0.35	0.32	0.50	0.39
		Average			**0.46**	**0.35**	**0.62**	**0.48**	**0.43**	**0.29**	**0.46**	**0.39**
IMAP	323	Turkiye	Karataş / Adana 1	2015	0.33	0.32	0.48	0.38	0.31	0.27	0.35	0.31
IMAP	323	Turkiye	Karataş / Adana 2	2015	0.22	0.35	0.41	0.32	0.21	0.29	0.30	0.26
IMAP	323	Turkiye	Karataş / Adana 3	2015	0.29	0.34	0.55	0.39	0.26	0.28	0.40	0.32
		Average			**0.28**	**0.33**	**0.48**	**0.36**	**0.26**	**0.28**	**0.35**	**0.30**

Comparison of the assessment of TM in *M.barbatus* using AEL_BACs as threshold to the results using MED_BACs as thresholds to calculate the contaminations scores (CS) showed them to be almost identical. The one affected station was classified as in moderate status using MED_BAC and not in poor status, using AEL_BAC.

Annex III

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