OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic

Working Group on Monitoring and on Trends and Effects of Substances in the Marine Environment (MIME)
Copenhagen: 19–23 November 2018

Contents of the Summary Record

Annexes

MIME summary record

Agenda Item 0 – Opening and representation at the Meeting

MIME 18/0/1, MIME 18/0/Info.1

0.1 The meeting of the Working Group on Monitoring and on Trends and Effects of Substances in the Marine Environment (MIME) was held from 19-23 November 2018 at the International Council for the Exploration of the Sea (ICES) in Copenhagen, Denmark.

0.2 The meeting was chaired by Dag Øystein Hjermann (Norway) and was attended by representatives from the following:

Contracting Parties: Belgium, Denmark, the European Commission represented by the Joint Research Centre (JRC), France, Germany, Ireland, the Netherlands, Norway, Spain, Sweden and the United Kingdom;

Inter-governmental Observer Organisations: the International Council for the Exploration of the Sea (ICES) and Arctic Monitoring and Assessment Programme (AMAP);

Guests: Werner Wosniok (Germany), Rob Berbee (the Netherlands, by remote connection) and Jesper Anderson (European Topic Centre, ETC, for the European Environment Agency, EEA).

0.3 A list of participants is at **Annex 1**.

Agenda Item 1 – Adoption of the Agenda

MIME 18/1/1 Rev.1, MIME 18/1/1 Add.1 Rev.1, MIME 18/1/Info.1

1.1 The draft agenda for the meeting (MIME 18/1/1 Rev.1) was adopted and the provisional timetable was adopted with minor changes (MIME 18/1/1 Add.1 Rev.1). The Heads of Delegation (HoDs) noted the four late documents and agreed to address them all. A copy of the agenda with the revised document list submitted to the meeting is at **Annex 2**. A list of actions arising from the meeting is at **Annex 3**.

1.2 The Secretariat reminded MIME of its Programme of Work 2018/19 for the Hazardous Substances and Eutrophication Committee (HASEC) (MIME 18/1/Info.1). MIME noted all products would be addressed during the meeting and were on track to be met by the stated deadlines for delivery. The Secretariat informed MIME that OSPAR's CoG and HOD had met 6-8 November 2018 and those meetings had advanced the review of progress in OSPAR's North-East Atlantic Environment Strategy (NEAES) 2010-2020, and further developed the NEAES 2020-2030. MIME noted that ICG-QSR had developed a draft timetable and the ICG was finalising a guidance document for the production of the QSR 2023.

Agenda Item 2 – JAMP and Contracting Parties' evolving monitoring as drivers for development of OSPAR monitoring of substances and their effects

MIME 18/2/Info.1

Progress in the JAMP

2.1 The Secretariat presented the Theme H products of the JAMP 2014-2020, to recall the specifications that required work by MIME and the timetable for the work (MIME 18/2/Info.1). The Secretariat informed MIME that OSPAR Commission 2018 had agreed to an extension of the JAMP to 2023, to align with OSPAR's

QSR in 2023. MIME proposed several edits and additions to the Theme H products and timetable towards the production of the QSR (**Annex 4**) and agreed **the Chair of MIME would present the proposed JAMP changes to HASEC 2019**.

Review of Contracting Parties' implementation of the CEMP

2.2 In a tour de table Contracting Parties provided information on their CEMP-related national monitoring programmes. In summary:

Contracting Party	Change to current monitoring	Additional information
Belgium	From January 2019 there would be a reduction in monitoring stations from 10 to 5 stations; 3 stations will be on a transect from Scheldt to English Channel that will be monitored on a monthly basis across whole tidal cycles (13 hours).	During 2018 Belgium undertook trials to test the proposed transect monitoring programme. A new sampler for SPM had been developed
Denmark	Since 2017 sediment sampling was only monitoring nonylphenyls and phthalates. Mussels, only monitoring metals, TBT and PAH. Fish, monitoring other organic substances.	
France	Minor change	Maintaining three different stations where the integrated approach biological effects & chemistry guidelines are used for fish, mussels and sediment. Atlantic Coast: 1 station in Loire estuary, and 1 station in Seine estuary. Mediterranean sea: 1 station near Marseilles.
Germany	No change	
Ireland	No change	An imposex survey was completed in 2018, which was in line with the usual 6-year monitoring cycle. Ireland was investigating how to incorporate the data into the roll-over assessment. Also a project on evaluating sea-bird eggs as a monitoring matrix for offshore waters.
Netherlands	No change	In coastal waters the Netherlands was measuring priority substances in whole fish for WFD & MSFD purposes, and in fish-fillets for OSPAR.
Norway	No change	Mostly the same as previous. Two more stations in Spitsbergen, Svalbard; one station for fish and one for eider duck. Also one more city harbour station for blue mussels & fish.
Spain	No change was planned	However, in 2017/18 there was no mussel sampling
Sweden	No change	Swedish EPA planned to revise its biological effect monitoring, looking at requirements of HELCOM and OSPAR and MSFD/WFD
United Kingdom	*Scotland*: sites at BAC were monitored every 6 years, with more frequent monitoring of sites identified as above EACs	In 2018 started using scallop sampling cruises to collect contaminants data

Contracting Party	Change to current monitoring	Additional information
	England and Wales: monitoring every 2 years, with no planned change. Taking whole fish within 12 nautical miles for conversion factors PFCs in biota assessed in 2018/19.	However, the dedicated survey cruise might be lost and monitoring will be undertaken as part of other surveys, which could affect the observation dates. Conducted a 4-yearly imposex survey in 2018

2.3 The Secretariat and Contracting Parties used the information to review and revise the descriptions of their national programmes in the pre-CEMP and CEMP appendices (**Annex 15**).

Agenda Item 3 – Assessment activities

MIME 18/3/1, MIME 18/3/2, MIME 18/3/3, MIME 18/3/4, MIME 18/3/5, MIME 18/3/6, MIME 18/3/7

CEMP rollover assessment

3.1 The United Kingdom (Rob Fryer) informed MIME that the preparation of the 2018/19 CEMP rollover assessment was underway (MIME 18/3/1) and a draft was available on the ICES server, at http://dome.ices.dk/OSPARMIME2018/main.html. MIME noted the assessment was on the same basis as last year and the help-files would be updated in due course.

3.2 Particular attention was drawn to the issue of correcting errors. Contracting Parties recalled that after the annual extraction of ICES data, any data corrections to address known errors were carried out by bespoke code before statistical analysis. Subsequently such corrections were not reflected in the data in ICES DOME, unless the relevant Contracting Party resubmitted its corrected national data to ICES. The United Kingdom explained that an improved process was required for the longer term to ensure the data in the ICES database were accurate, especially as this had implications for when other organisations downloaded the data from ICES website. ICES Data Centre explained the processes for amending or deleting any incorrect entries.

3.3 After discussion, MIME agreed:

a. **the United Kingdom**, **Rob Fryer**, **would send information to Contracting Parties on which of their data had been changed for the annual CEMP assessment, by 21 December 2018**;

b. as a first step **Contracting Parties would endeavour to correct or delete data in their national databases and resubmit it**;

c. as a second step if difficulties were encountered in using the automated service, **Contracting Parties could contact ICES for help with submission** (accessions@ices.dk).

Uncertainty and limits of detection or quantification

3.4 The United Kingdom (Rob Fryer), introduced the issue of estimates of uncertainty and less than values, in relation to limits of detection and limits of quantification. He highlighted the importance of uncertainties for the statistical analyses in the assessment; if uncertainties were larger than necessary then data were given less weight than they should, and if uncertainties were too small the data were more heavily weighted than they should be. MIME noted there was substantial legacy data without uncertainty estimates and there had been different national approaches to estimates of uncertainty. It was clear that there were some gross errors appearing in the data and MIME could make sensible corrections to these, with Contracting Parties subsequently resubmitting their data. There were also differences in the way

Contracting Parties reported values below limits of detection (LOD), with divergence from the way the Marine Chemistry Working Group (MCWG) had originally advised these should be reported. In 2015 MIME examined all the uncertainty data in the database, estimated the typical relative and constant error for each contaminant, and used these to 'fill-in' missing uncertainties. Contracting Parties considered a proposal to update the estimates of relative and constant error annually, using all the uncertainties reported in the last 20 years of data. It was also proposed to update the estimates of species-specific conversion factors annually, again using all the data reported in the last 20 years.

3.5 The United Kingdom, Rob Fryer, presented plots of relative uncertainty against concentration for biota, sediment and water data to inform the discussion on uncertainties. In discussion the following points were made:

a. the United Kingdom explained that Contracting Parties should submit LODs associated with the analysed sample. Parties can report measured values that are below the LOD provided that the sample-specific LOD is submitted and the appropriate QFLAG used;

b. in response to a question the United Kingdom explained that QUASIMEME files (up to 2011 inclusive) were used to weight legacy data with missing uncertainty information

c. a Contracting Party noted that there could be problems with the 'use-name' of additional parameters and asked if there could be a test in the submission process for naming. MIME noted this issue had come up in the HELCOM assessment with Germany submitting some sediment organic carbon data incorrectly as TOC rather than CORG.

3.6 A drafting group worked further on the issue of uncertainties and LOD.

3.7 Denmark and the United Kingdom drafted an advice document (**Annex 5**) on how data to report less-than and uncertainties to ICES DOME database and MIME agreed **Annex 5 of the summary record would be added to the FAQs in the CEMP assessment platform, as soon as possible**. **The United Kingdom would annually update the automated estimation of missing uncertainties based on the most recent 20 years of monitoring data**.

Developing methods of assessment, assessment criteria and indicators

3.8 The Secretariat presented an overview of HASEC 2018 requests for several items of work by MIME (MIME 18/3/3). These included developing methods of assessment, such as: temporal trends for compounds; distance to target (threshold values and/or background concentration) e.g. estimate of how long it would take to reach background concentrations or simple ratios of concentration to BC, and; spatial distribution and identification of areas of most elevated concentrations. MIME was informed that HASEC had approved MIME's recommended priorities for developing OSPAR indicators and thematic assessments for use in the OSPAR Quality Status Report (QSR) 2023: to continue to assess the biota and sediment indicators separately but for the QSR to present biota and sediment assessments for a parameter in one assessment sheet; to achieve greater spatial coverage of all OSPAR Regions; to meet the revised Commission Decision (EU) 2017/848 as appropriate; to further develop assessment values for PBDEs in sediment and biota based on trial values developed during MIME 2017, and; to review other BACs as necessary. Regarding development of EACs for metals in biota, MIME had no plans for developing these at this moment, but recognised it was a significant gap in the suite of assessment criteria. Spatial coverage for extending the indicators to more of the OSPAR maritime area was discussed further under Agenda Item 4.1.

Distance to target

3.9 Contracting Parties recalled that MIME 2017 had initiated distance-to-target work for metals and PAHs, for HASEC 2018. Parties were asked to provide feedback, particularly in relation to the plots and any proposals for further development. After discussion, Contracting Parties expressed satisfaction that the maps for metals and PAHs showed expected outcomes. One Party asked whether pairs of distance to time and distance to target maps could be displayed side-by-side and the United Kingdom, Rob Fryer, agreed to explore options for the best presentation.

PBDE and trial BACs

3.10 MIME recalled its 2017 work to develop PBDE values based on Canadian Federal Environmental Quality Guidelines (FEQGs) as EAC-equivalents, noting not all Contracting Parties supported the approach. For synthetic substances the background concentration (BC) was zero (which is not measurable) and the standard approach to developing BACs has been to first establish a low concentration that is measurable (typically twice the QUASIMEME constant error) and then to construct BACs using the typical precision in the monitoring data. However, at MIME 2017, it became clear that using twice the QUASIMEME constant error resulted in BACs that were too high for many compounds (i.e. above the concentrations found at some 'contaminated' sites). Trial BACs for PBDE47 in sediment, fish and shellfish were used in the 2018 CEMP assessment (2017/2018 reporting cycle), but were to be revisited during MIME 2018.

3.11 Rob Fryer (United Kingdom) developed options for trial BACs for sediment, fish and shellfish. Contracting Parties discussed these in plenary.

3.12 MIME agreed **to apply BACs for all PBDE compounds in sediment and all in fish on a trial basis in this year's annual CEMP assessment** (2018/19), with opportunity to discuss further at MIME 2019. The trial BAC for PBDE47 in shellfish would continue to be applied, but indications were that this was probably too high. **MIME 2019 would further investigate BACs for shellfish**, which would require bringing in information from passive sampling, to work out what was a suitable value, with a view to adopting them at MIME 2019.

PBDE compound	Matrix	BACs applied in 2018/19
All PBDE compounds	Sediment	0.04 µg kg^{-1} DW
All PBDE compounds	Fish	0.012 µg kg^{-1} WW
PBDE47	shellfish	0.011 µg kg^{-1} WW

3.13 MIME agreed **Rob Fryer (United Kingdom) would update the Help-files with BAC information and would also send the information to Denmark for inclusion in the audit trail**.

Water

3.14 MIME recalled water assessments were included for the first time in the 2018 CEMP assessment, where there were assessment criteria, e.g. for cadmium, lead and nickel with filtered water samples.

3.15 MIME agreed **the Chair of MIME would gather information from Contracting Parties on; whether to include time series of metal concentrations in unfiltered samples, whether to add further determinands to the water assessment and what were the associated criteria**. **The Chair would provide the feedback to the United Kingdom by 21 December 2018**.

Birds and mammals

3.16 MIME briefly discussed the possibility of including bird and or mammal data in the CEMP assessment. There were Swedish data for two bird species and some mammal data, from Iceland and the United Kingdom, but nothing submitted on the latter since 2009. MIME agreed **Rob Fryer (United Kingdom) would investigate the possibilities for including a trend assessment on bird data by MIME 2019**.

New CEMP assessment platform

3.17 ICES presented developments in the new platform for the CEMP assessment platform (MIME 18/3/2 and 18/P01). MIME noted the components that would be finalised by the end of 2018. ICES and Contracting Parties discussed and made proposals for refining the developments and discussed possible next steps, including developing regional assessment and outlier detection. The United Kingdom, Rob Fryer, worked bilaterally with ICES to address any issues towards finalising the CEMP assessment platform by OSPAR 2019.

3.18 MIME agreed **ICES would endeavour to finalise the new platform in time for presentation to HASEC 2019** and **to publish the CEMP annual assessment for the OSPAR Commission 2019 meeting**.

3.19 AMAP collaborated with OSPAR on assessment procedures, including discussing extraction and compilation of relevant data, and methods and processes for providing AMAP's Region I information and data for the QSR 2023. For example, how to use AMAP data with OSPAR data, and how to present the data. MIME noted that whilst there were a lot of AMAP data in ICES, there were also several other datasets that would not fit easily into the ICES DOME data structure. AMAP was investigating how to format these extra datasets into a suitable structure for a statistical assessment, bypassing DOME. AMAP was also working on how to present the data, e.g. alongside OSPAR, or to put datasets together. Contracting Parties recognised that the advantage of new CEMP assessment platform was that it was modular, making it possible to build on synergies. MIME welcomed that there would be more Region I AMAP data for QSR 2023 and that the assessment products from the statistical analysis should be available for a wide variety of uses. For example, the functions that produce the graphs in the CEMP assessment platform would be available via gitHUB and high quality vector graphics could be produced.

European Commission revised EQS guidance[1]

3.20 The Joint Research Council (JRC) informed MIME the Technical Guidance Document for Deriving Environmental Quality Standards (TGD-EQS) had been revised and adopted by Water Directors' meeting in 2018. In discussion the following points were made:

a. Ireland explained it had participated in the EC working group chemicals (WG-Chemicals) in January 2018 to highlight the issues of assessing mercury in marine waters, and in particular to present MIME's report "Mercury assessment in the marine environment assessment criteria comparison (EAC/EQS)"[2]. WG-Chemicals had noted the information but there had been no further developments;

b. MIME noted the diversity in approaches for mercury e.g. some countries analysed whole fish whilst others analysed fillets, some applied Trophic Level 4 and others did not. Several Contracting Parties would welcome guidance from the EC/JRC on trophic magnification and on

[1] European Commission Guidance Document No: 27. Technical Guidance For Deriving Environmental Quality Standards. WD 2018-1-1 DOI: 10.2875/018826

[2] OSPAR publication 2016/679

the practicalities of applying a trophic magnification factor. JRC responded that it had not yet provided advice on tissue and trophic magnification, but that would be a next step;

c. a Contracting Party highlighted that there were still mercury inputs from countries outside the EU and North-East Atlantic region that needed to be tackled.

EQS_{biota} for fish secondary poisoning

3.21 Sweden presented a proposal to use HELCOM's approach for applying EQS_{biota} for fish without trophic level normalisation (MIME 18/3/5 and 18/P02). In brief the proposal was: to use EQS_{biota} for fish when possible; to use other assessment criteria for bivalves (if there was no specific EQS) in a similar way to the HELCOM secondary matrix where no fish data were available; in the assessment sheets, to present distance to target maps; to complete the status assessment with trend assessments; in the future investigate the effect of trophic position on the assessment, and; to use the results within the EU framework to improve the EQS values.

3.22 In a first round of discussion the following points were made:

a. Sweden addressed several scientific and technical questions to clarify the proposed approach, including: an assumption that organic contaminants would be equally distributed in the fat and then normalised to represent a whole fish of 5% lipid weight, and; no correction for trophic level;

b. a Contracting Party and the JRC expressed support for the approach stressing the importance of trying to harmonise across OSPAR, HELCOM and European Commission;

c. other Contracting Parties highlighted a range of problems with using the EQS, for example: freshwater and marine environments resulted in different uptake of contaminants by biota; applying the EQS as proposed could inflate the uncertainty; EU member states used different thresholds, even member states within HELCOM; HELCOM was not adopting the whole EQS approach but was only applying it as far as step 2 (tropic level and magnification steps were not applied); it was necessary to normalise to dry weight and lipid weight as OSPAR had been doing for many years, which was the same as Step 2;

d. a Party highlighted that a generic biomagnification factor would not be accurate and AMAP agreed, noting that biomagnification factors had to be region-specific and species-specific, which was too much work to apply. Another Party proposed a baseline trophic magnification factor for each sub-region could be established as a starting point;

e. a Party proposed continuing to use OSPAR's assessment values where they existed, for example, for mercury present both the BAC, the EQS and the health limit, without judging which was the critical value. However, it was questioned as to whether this would take the full assessment methodology into consideration. Another Party suggested using the EQS as it was and to compare it with the measured concentrations, noting that decision rules would be needed;

f. recognising that there was no easy solution, a few Parties suggested it was necessary to start and to have caveats, then subsequently to build on that starting point as information becomes available. For the previous QSR there were many caveats but having tentative values was better than having none. Even if the assessment results were red, the distance to target and heat maps made the results more visible in terms of changes and the direction of the trends;

3.23 A drafting group worked extensively to set out MIME's considerations of using EQS_{biota} to assess OSPAR data (**Annex 6**). In conclusion MIME agreed:

a. **the Chair would present MIME's considerations of using EQS_{biota} for OSPAR assessments to HASEC 2019** (**Annex 6**);

b. **the Chair would ask for HASEC's advice on developing OSPAR assessments based on EQS_{biota}.**

3.24 Contracting Parties noted Belgium would participate in WG-Chemicals in January 2019 and would present the MIME discussions on EQS_{biota}, and supported the proposal for the Chair of MIME to also participate in the 2019 WG-Chem meeting to raise MIME's concerns regarding the EQS_{biota} guidance. MIME drafted a Request for ICES special advice on new biota assessment criteria (EAC) based on EU $QS_{secondary\ poisoning}$ (**Annex 16**) and agreed **the Chair of MIME would recommend the request for ICES advice on EQS to HASEC 2019**.

Quality standard for TBT in sediment

3.25 Sweden presented its background report on the Swedish quality standard for TBT in sediment (MIME 18/3/4 and 18/P03) towards developing an assessment criterion for OSPAR. Sweden has established a national EQS for TBT in sediment from a $QS_{sediment}$ based on ecotoxicity studies on benthic organisms. Three chronic freshwater studies and four marine studies had been considered in the derivation of $QS_{sediment}$. The freshwater Gastropoda *Potamopyrgus antipodarum* was the critical study used to determine the QS. MIME noted that HELCOM used the quality standard.

3.26 A drafting group discussed the $QS_{sediment}$ in detail as summarised in **Annex 7**. Contracting Parties were asked to report TBSN+ values and further guidance on reporting tributyltin was drafted (**Annex 8**).

3.27 MIME concluded that the study provided reasonable, detailed information concerning the derivation of the $QS_{sediment}$. Within MIME there was a general acceptance of the $QS_{sediment}$ for TBT. MIME agreed **to trial the $QS_{sediment}$ for TBT in sediment in the CEMP roll-over assessment 2018/19**.

3.28 MIME added to the draft Request for ICES special advice (**Annex 16**), for new sediment assessment criteria based on EQS, which the Chair of MIME would recommend to HASEC 2019.

Ecotoxicological tests for marine environment

3.29 Following a request from HASEC 2018, Belgium presented preparatory work to collate and analyse cost-estimates for a suite of suitable chronic ecotoxicological tests on organisms relevant to the marine environment (MIME 18/3/6). MIME was invited to initiate work to identify for which indicators there was a lack of ecotoxicological data to develop proper assessment criteria, not limited to the indicators for which EQS-values were available.

3.30 In discussion the following points were made:

a. in response to a question as to whether there should be tests for single substances when substances did not occur singly in the environment, Belgium suggested at least there would be some information as a starting point;

b. in response to a question as to what kind of substances, those on the priority list or those already measured in CEMP, Belgium clarified it was for all substances for which there were EQS;

c. a Contracting Party highlighted it was important to note OSPAR adopted a risk-based approach, by evaluating toxicity of compounds separately.

3.31 Contracting Parties provide any further information to Belgium on tests and costs. MIME agreed that **Belgium would present further information on ecotoxicological tests to HASEC 2019**. This item was further discussed with Agenda Item 5.3 on OSPAR List of Substances of Possible Concern (LSPC) and List of Chemicals for Priority Action (LCPA).

EAC audit trail

3.32 Denmark presented the most recent version of the EAC audit trail and informed MIME that HASEC 2018 had requested MIME to update it, including expanding the table with additional information and making background documents available (MIME 18/3/7).

3.33 In discussion Sweden requested the audit trail included additional information, e.g. supporting parameters and information on what the threshold was intended to protect, to be able to track how the thresholds had been set, e.g. ecotoxicology or something else.

3.34 Denmark led on revising the audit trail during the week, working with Contracting Parties and in particular Sweden.

3.35 MIME agreed **Denmark would finalise the update of the audit trail by 28 February 2019** and **the Chair of MIME would recommend to HASEC that the audit trail be published on the OSPAR website, with background documents and references to publications and scientific papers**.

Collaboration with the Arctic Monitoring and Assessment Programme (AMAP)

3.36 The AMAP representative, Simon Wilson, participated in MIME and collaborated on assessment procedures, including extraction and compilation of relevant data, and on methods and processes for providing AMAP's Region I information and data for the QSR 2023, under Agenda Item 3. AMAP also collaborated on harmonisation of AMAP and OSPAR CEMP guidelines under Agenda Item 6.

Agenda Item 4 – Concentrations and effects of hazardous substances

MIME 18/4/1, MIME 18/4/2(L), MIME 18/4/3(L)

CEMP monitoring programme coverage

4.1 The United Kingdom, Rob Fryer, explained that the CEMP monitoring coverage should be reviewed to identify spatial and temporal gaps, and to recommend sites for extra sampling that would improve geographical coverage for regional-scale assessments. MIME recognised that for the QSR 2023 it was too late to change monitoring programmes because at least 3 years of observations would be needed for a time series to be included in a regional assessment. Nevertheless, for future assessments and QSRs it was important to locate gaps in monitoring coverage and to determine whether there was scope for improving coverage in those sub-regions where currently regional assessments could not be conducted. For example, could more parameters be measured at existing stations, and/or could new stations be introduced to fill in the gaps.

4.2 Rob Fryer also highlighted that it was important to give further consideration to the rules on which individual time series were assessed. For example, currently a time series requires some data in the most recent 6 monitoring years, and no gap of 6 years or more between data submissions. A decision needed to be made as to whether these rules should be changed.

4.3 Contracting Parties discussed a range of issues concerning stations, observation methods, spatial and temporal gaps and assessment rules. The Chair of MIME produced a summary table of MIME sub-regions

and contaminant group assessments; metals, PAHs, PBDEs, PCBs, TBT and imposex (**Annex 9**). This identified sub-regions with sufficient or insufficient monitoring coverage for regional assessments, based on current rules. MIME agreed **to further discuss the spatial coverage and adequacy of the monitoring programme at MIME 2019**.

Developing a biological effects approach contribution for the QSR

4.4 MIME noted that HASEC 2018 had not agreed to move the biological effects approach from pre-CEMP to CEMP component. HASEC had proposed that MIME could develop a specification for a biological effects contribution to the QSR 2023. France presented the background to the integrated biological effects approach; the key components necessary for an integrated monitoring and assessment framework, and; initial proposals for an indicator or case study demonstration of the integrated biological effects approach, based on the ICON project and the addition of other data sets (MIME 18/4/1 and 18/P04). During discussion France addressed questions from Contracting Parties to clarify what could be possible in terms of drafting an indicator or case study. As well as the ICON data, Contracting Parties confirmed possible other datasets that could be used:

a. Sweden confirmed its long term data series from a pristine area could be considered for inclusion in a possible indicator or case study demonstration of the integrated biological effects approach;

b. Ireland confirmed the Irish data could be considered for inclusion, noting the data were from 2012;

c. Spain confirmed its national studies that used a spatial approach could be considered for inclusion;

d. Norway informed MIME that it regularly monitored biological effects at 3 or 4 stations and it had blue mussel data from oil installation sites in the North Sea that could be considered for inclusion.

4.5 In conclusion, MIME recognised that in the final indicator or case study demonstration, it was important to highlight the additional benefit gained from applying the integrated biological effects approach in monitoring and assessment. France made a first draft of a technical specification sheet (**Annex 10**) and MIME agreed **the Chair of MIME would present to HASEC 2019 the initial specification for an integrated biological effects approach contribution to the QSR, and MIME 2019 would further develop the proposal**.

Fish disease index trial assessment

4.6 Germany presented its trial assessment of data on fish diseases, as a step towards promoting the component from pre-CEMP to CEMP and to agree next steps (MIME 18/4/2(L) and 18/P05). Germany presented the results of status and long-term assessment focusing on the inner OSPAR area for *Limanda limanda* (common dab). MIME discussed the conclusions and recommendations from the trial, in particular that MIME should include the analysis of FDI data in its regular annual CEMP assessment. MIME noted further development of the indicator was required, and that ICES WG on Pathology and Diseases of Marine Organisms could be tasked to take the lead. In discussions:

a. Germany answered several technical and scientific questions about the FDI, the rationale as to what data had been included and excluded, the location of sampling stations, and the methods used for the trial assessment;

b. a Contracting Party highlighted the importance of fish disease as a biomarker, particularly for combined effects. OSPAR had a long-term data series, but only four countries were routinely involved in FDI monitoring and to expand on this OSPAR should move the component from pre-CEMP to CEMP, noting that all the CEMP elements were in place for FDI to be adopted as full CEMP;

c. the United Kingdom informed MIME that it was trialling work teaching fish survey scientists to also assess for fish disease;

d. Rob Fryer confirmed it was possible to incorporate FDI into the CEMP annual assessment, provided Germany could provide the R code and answer any questions arising;

e. several Contracting Parties expressed support for including an FDI indicator assessment in the QSR 2023;

f. some Contracting Parties expressed support for moving FDI from pre-CEMP to a full CEMP component.

4.7 Germany drafted a technical specification sheet for an FDI assessment as a contribution to the QSR (**Annex 11**). In conclusion MIME agreed: **to include the FDI data for dab, cod and flounder in the roll-over assessment, beginning at MIME 2019**; **the MIME Chair would recommend to HASEC 2019 a FDI assessment as a contribution to the QSR** and as a step towards it becoming a full CEMP component.

Micro-plastic candidate indicator

1. On behalf of ICG-ML the Secretariat presented developments by ICG-ML and EIHA of a candidate indicator on microplastics in sediment (MIME 18/4/3(L)). ICG-ML asked MIME to review and revise as appropriate, the following indicator recommendations: parameter/metric, baseline and reference level, assessment criteria, spatial scope and aggregation, monitoring requirements, and reporting. A drafting group provided some comments and feedback.

4.8 MIME agreed **the Secretariat would provide MIME's feedback on the draft micro-plastics in sediment technical specification to ICG-ML as soon as possible**.

Agenda Item 5 – Strategic issues

MIME 18/5/1 Rev.1, MIME 18/5/1 Add.1 Rev.1, MIME 18/5/1 Add.2, MIME 18/5/2, MIME 18/5/2 Add.1, MIME 18/5/3(L), MIME 18/5/3(L) Add.1, MIME 18/5/3(L) Add.2, MIME 18/5/3(L) Add.3, MIME 18/5/3(L) Add.4

North-East Atlantic Environment Strategy (NEAES) review and renewal

5.1 The Secretariat introduced OSPAR's review and renewal of the hazardous substances theme of the North-East Atlantic Environment Strategy (NEAES) and explained the process and timeline for the work. MIME noted HASEC 2018's draft review of progress in the NEAES 2010-2020 at a medium- and detailed-level (MIME 18/5/1 Rev.1) and the hazardous substances paragraph in the draft high-level evaluation of progress (MIME 18/5/1 Add.2).

5.2 Using the Strategy Task Group (STG) reviewing guidance (MIME 18/5/1 Add.1 Rev.1) MIME developed and refined the draft reviews of progress and agreed **the Chair of MIME would recommend MIME's proposed revisions to the high-, medium- and detailed-level reviews of progress in the NEAES 2010-2020 to HASEC 2019** (**Annexes 12** and **13**).

5.3 The Secretariat presented HASEC 2019's initial proposals for hazardous substances operational objectives in the NEAES 2020-2030 (MIME 18/5/2). MIME used the STG operational objectives guidance (MIME 18/5/2 Add.1) to review and revise the proposals.

5.4 MIME agreed **the Chair of MIME would recommend MIME's proposed revisions to the NEAES 2020-2030 draft operational objectives, to HASEC 2019** (**Annex 14**).

OSPAR List of Chemicals for Priority Action (LCPA) and List of Substances of Possible concern (LSPC)

5.5 The Netherlands informed MIME that HASEC 2018 had discussed new problematic substances in the marine environment (summary record HASEC 18/9/1, Annex 4), which was the follow-up from ICES special advice[3]. HASEC had requested MIME's advice on substances for potential inclusion on OSPAR's List of Substances of Possible Concern and List of Chemicals for Priority Action (MIME 18/5/3(L)). The Netherlands had made an inventory of substances it analysed in the water column in 2016 and 2017, in its part of the coastal zone of the Greater North Sea.

5.6 Contracting Parties entered initial national information to the Excel file. MIME agreed:

a. **Contracting Parties would add national project information to the initial information provided by the Netherlands (MIME 18/5/3(L) Add.1)** by: stating which of the substances they measured on a project base or were continuously monitoring, and; stating the matrix in which the substances were analysed, biota or sediments;

b. **the Netherlands and the Secretariat would lead a written procedure during December 2018 to gather further information from Contracting Parties on substances for potential inclusion in OSPAR's LCPA and LSPC**;

c. **the Netherlands would present the information to HASEC 2019**.

Agenda Item 6 – Review and revision the Coordinated Environmental Monitoring Programme (CEMP)

MIME 18/6/1, MIME 18/6/2, MIME 18/6/3, MIME 18/6/4, MIME 18/6/5

6.1 Contracting Parties reviewed and revised as necessary the MIME-related CEMP and pre-CEMP appendices (MIME 18/6/1), to reflect any changes in their national monitoring programmes (**Annex 15**).

6.2 Denmark presented a draft revision of the guidelines on Quality Assurance for biological monitoring in the OSPAR area[4] (MIME 18/6/3). This was mainly updating JAMP to CEMP and references to the new JAMP/CEMP Agreements and HELCOM COMBINE manual (2014-2017). Prior to the meeting, Denmark had invited Contracting Parties to ask their national taxonomists to check the review. A few Contracting Parties provided proposals for further revisions, which were discussed in plenary.

6.3 MIME agreed **Denmark would further amend the revised QA guidelines to reflect agreed changes, by 28 February 2019**, and **the Chair of MIME would recommend the revised guidelines to HASEC 2019 for publication**.

[3] ICES Advice – OSPAR request on information for use in selecting and deselecting hazardous substances of concern, December 2017

[4] Agreement 2002-15

6.4 Germany presented a draft revision of the PFOS in seawater guideline[5] (MIME 18/6/4). Germany informed MIME that publication of a revised international standard, the ISO CD 21675 for the analysis of PFAS in water, was scheduled for 2019. Contracting Parties discussed postponing the final revision of the OSPAR guideline until this new standard was available, thereby avoiding the need for a second revision in the short-term, in 2019.

6.5 MIME agreed to postpone finalising the revision until after the ISO had been published. **Contracting Parties were invited to send comments and proposals for refining the revised PFOS in seawater guidelines (Agreement 2010-08) to Germany as soon as possible**; **Germany would forward the revised guidelines to ICES MCWG for expert feedback, and MIME 2019 would further consider a new revision**.

6.6 France recalled it had been tasked with reviewing the guidelines for contaminant-specific biological effects and general biological effects monitoring. France highlighted the historical evolution of the biological effects monitoring guidelines, and progress in the ICES Working Group on Biological Effects of Contaminants (WGBEC) for checking and updating the general and specific biological effects (18/P06). Contracting Parties discussed France's proposals for a new approach to the biological effects guidelines and harmonisation of the mode of action and biological response. France proposed drafting new biological effects guidelines covering: general biological effects for a 'cocktail' of contaminants based on biological mechanisms and physiological functions, and; specific biological effects for imposex/TBT, PAH metabolites and ALA-D heavy metals. This would harmonise the requirements of WFD and MSFD.

6.7 In discussion the following points were made:

a. a Contracting Party informed MIME of a recent EEA draft report recommended biological effects for strengthening the monitoring and protection of the marine environment;

b. AMAP had released a Biological Effects of Contaminants on Arctic Wildlife and Fish report in October 2018 that focused on mammals and seabirds assessments. The report contained useful information on new techniques. MIME noted the dominant issue in the Arctic was the effects from mercury and PCB in these top species;

c. Ireland provided information on work by the NORMAN (https://www.norman-network.net/) network and offered to provide information on the work after the project's next meeting in November 2018. This was further discussed under Any Other Business (§9.6).

6.8 In conclusion MIME agreed:

a. **Contracting Parties were invited to provide information to France on biological effects approach, as soon as possible**;

b. **France would invite WGBEC to discuss and provide advice on renewing the biological effects guidelines at its meeting in March 2019**, and;

c. **MIME 2019 would further consider revision and renewal of the guidelines**;

d. MIME drafted a Request for ICES special advice to review (i) new guidelines for monitoring biological effects and (ii) revised QA for biological effects guidelines (**Annex 17**) and agreed **the Chair of MIME would recommend the request for ICES advice on reviewing biological effects guidelines to HASEC 2019**.

[5] Agreement 2010-08

6.9 Denmark presented an overview of the suite of MIME-relevant monitoring guidelines, highlighting those that were out of date and needed to be reviewed (MIME 18/6/5). In plenary the overview table was updated to reflect recent MIME developments and work and external developments, such as project outcomes or work by the European Commission. In discussion:

a. Contracting Parties discussed drafting a new Annex on sediment passive sampling and potential sources of data;

b. AMAP informed MIME it had received requests for new guidance, for example on screening studies and the use of specimen banks. A Party responded that MIME would need to consider exactly what was required and consider how to conduct screening;

c. MIME was informed the NORMAN network had a database of 43 000 compounds that was kept up to date with new compounds and was made available to the network.

6.10 After discussion, **Contracting Parties were encouraged to offer to lead on updating the out-of-date guidelines**, and MIME agreed **Denmark would update and rationalise the overview table of MIME-relevant monitoring guidelines, for discussion at MIME 2019**.

6.11 MIME considered whether the overarching CEMP guidelines for coordinated monitoring for hazardous substances[6] (MIME 18/6/2) needed to be updated. After discussion MIME agreed:

a. **the Secretariat would update the references to reflect MIME's newly revised guidelines**, and **the MIME Chair would recommend the revised Agreement 2016-04 to HASEC 2019**;

b. **Denmark and AMAP would lead on drafting text for a high-level guideline on screening, as a potential sub-paragraph of Agreement 2016-04 for consideration by MIME 2019**.

Agenda Item 7 – Development of monitoring and assessment

MIME 18/7/1 Rev.1

International quality assurance programmes

7.1 France informed MIME of developments in WGBEC (18/P07). France highlighted that the nature of the voluntary approach meant each laboratory had to find its own resources to run the analyses. NIVA identified costs for PAH metabolites, EROD and MN could amount to around 5000€, mostly personnel hours. Administration and reporting could be another 2000€ in personnel hours. MIME noted the details and dates of the intercalibration exercise, 2018/19.

7.2 Denmark informed MIME of developments in the QUASIMEME programme. MIME noted there had been an increase in the number of group subscriptions but a slight decrease in the number of labs, and noted the range of samples to which labs were subscribing. In 2017 a new formula for calculating the Z-scores was introduced. QUASIMEME was exploring constant and proportional error determinations to come up with a more general/reasonable performance expectancy. A trial run of inorganic carbons (pH, DIC, TA) in seawater was underway. There were proposals for workshops, including; microplastics, organotins, and 25th year anniversary of QUASIMEME session in ICES annual conference. MIME was informed of the request for delivery of biota reference material for mussels for TBT, PAHs and, shrimp for PAH and whole fish or freshwater fish for PFASs and BFRs. During discussion:

a. AMAP informed on its QA activities and proposed closer collaboration with QUASIMEME;

[6] Agreement 2016-04

b. Ireland informed that it had found the QUASIMEME programme easy to work and shared its national experience and relevant information on the NORMAN network.

7.3 MIME agreed that **Denmark would be the contact point for liaison with AMAP on contaminant QA activities and AMAP would bring relevant information to MIME 2019**.

Projects and innovative approaches

7.4 Ireland presented an overview of the MONITOOL, a three-year project on passive sampler devices (DTGs) funded by the INTERREG Atlantic area European Regional Development Fund (18/P08). The purpose was to improve the protection of biodiversity and ecosystem services, specifically for DTGs. Contracting Parties discussed the technical aspects and issues of using DTGs and shared their national experiences. Ireland informed MIME of the AQUAGAPS project, global passive sampling initiative, and informed Contracting Parties that the project was seeking volunteers to deploy its samplers on moorings.

7.5 Germany presented the first results of a project on wash water release from marine ships exhaust gas cleaning systems (EGCS), funded by the German Federal Environment Agency (MIME 18/7/1 Rev.1 and 18/P09). Germany explained the regulatory framework, in particular Marine shipping sulphur emission control MARPOL Annex VI, and technical solutions and strategies for tackling the issue to be compliant. MIME noted that whilst EGCS systems improved the air quality to a certain extent, they could also result in a significant contaminant source for marine waters.

7.6 MIME recognised that open loop scrubbers in particular caused an immediate and virtually complete transfer of acidifying SO_2, PAHs and metals to the marine environment, irrespective of the vulnerability of the marine environment ships passed through. Contracting Parties elaborated on the technicalities of the issue, discussed guidelines, monitoring and assessment implications, and shared their national experiences and regional specificities. France informed MIME of the issue in Mediterranean waters and that it was looking to stimulate action at a political level. AMAP explained this was also a big issue in the Arctic and a potential impact on ocean acidification particularly in sensitive areas.

7.7 Belgium presented an overview of the 4DEMON project to valorise historical data for the Belgian part of the North Sea that encompassed chemical pollutants, eutrophication and acidification parameters (18/P10). Belgium informed MIME of a follow-up project, ASSUME, planned for 2019 that would undertake a comparative exercise applying different 4Demon approaches to inter-regional datasets. The results, strengths and weaknesses of this approach would be reported to OSPAR MIME in 2019.

Agenda Item 8 – Scientific advice and on data handling by ICES

MIME 18/8/1

Data handling matters

8.1 ICES Data Centre presented CEMP data handling matters for consideration by MIME (MIME 18/8/1). In particular, MIME noted information on and a demonstration of the Station dictionary which now supports semantic relations for use in assessment groupings (18/P11). ICES informed on plans to release an automated submission tool for the 2019 season and informed that the number of critical errors received from the automatic submission and resubmission tools will increase. If it is not possible to correct the errors, the files should be sent to accessions@ices.dk for manual handling. MIME also noted that QUASIMEME participation result files will no longer be stored at the ICES Data Centre.

Draft request for ICES Advice

8.2 MIME drafted two requests for ICES special advice: Request for advice on new environmental assessment criteria (EAC) based on EQS (**Annex 16**), and; Request for advice to review new guidelines for monitoring biological effects and review revised QA for biological effects (**Annex 17**).

Agenda Item 9 – Election of Chair and any other business

MIME 18/9/1(L), MIME 18/9/1(L) Add.1,

9.1 Denmark nominated Dag Øystein Hjermann (Norway) to continue as Chair of MIME for the period 2019/20 – 2020/21, Belgium seconded the nomination and he was re-elected by acclamation. Martin Mørk Larsen (Denmark) agreed to continue as Vice-Chair of MIME for Assessment. MIME did not select a new Vice-Chair of Monitoring, and Contracting Parties were invited to consider volunteering for the position in time for MIME 2019.

EEA draft "Contaminants in Europe's Seas" report

9.2 The Secretariat introduced the European Environment Agency's (EEA) draft report on "Contaminants in European Seas" that was undergoing a consultation process through EIONET (MIME 18/9/1 and 18/9/1 Add.1). MIME noted the EEA's draft report adopted a different approach and reached different conclusions from OSPAR's Intermediate Assessment (IA) 2017 contaminants indicator assessments. The Secretariat explained that the Chair of HASEC requested MIME experts to provide an experts' comparison of the main differences, which Contracting Parties that are EU member states could use to inform their national responses to the EIONET consultation. A representative of the European Topic Centre (ETC) of the EEA, Jesper Anderson, gave an overview of the EEA's approach and the CHASE+ tool (18/P13). He informed MIME that the EEA's report could be seen as opening a dialogue for future improvements so that in 5-6 years there could be an improved report, for example based on more data and refined assessment values. Contracting Parties were reminded that only one response to the consultation could be made per EEA member country.

9.3 In discussion the ETC representative addressed several technical questions on the CHASE+ tool and the numerical calculation for the classification, and provided further clarifications as follows:

a. where there were more than one possible assessment value for a contaminant the EEA applied a hierarchy to determine the appropriate one, which was not necessarily the most precautionary;

b. the EEA's report had greater data coverage than the IA 2017, because the EEA had used several sources of data;

c. units that had insufficient data were not assessed and were not colour coded in the assessment maps. The EEA applied rules to determine the minimum number of observations and what was 'sufficient' data for an assessment. The outcome meant some areas that were assessed e.g. in the IA2017 or HELCOM's HOLAS II, were not assessed in by the EEA;

d. new or emerging substances or species not included. A Contracting Party recommended that the EEA's report should clearly state this;

e. the EEA had not manipulated the data, for example trophic-level correction.

9.4 The ETC representative joined a drafting group to draft a comparison of the EEA assessment and the IA 2017, which was finalised in plenary (**Annex 18**). MIME agreed **the Secretariat would provide the comparison table to OSPAR Heads of Delegation as soon as possible**.

AMAP-OSPAR-ICES statistical systems workshop proposal

9.5 AMAP informed MIME of plans to try and harmonise AMAP and OSPAR work on time-series analyses. AMAP was working on a proposal for a joint AMAP-OSPAR-ICES statistical systems workshop in spring 2019, to progress harmonisation and development of the CEMP assessment platform. If harmonisation was successful it would mean AMAP and OSPAR would have the same trend assessment systems, particularly as the datasets overlapped to some degree. Also, this had the potential to make the respective systems more robust. Denmark recalled that HELCOM had undergone a similar process to align with OSPAR systems via ICES' work. A common assessment platform and process would eliminate the risk of different processes reaching different conclusions.

9.6 Recognising that OSPAR was focused on persistent mobile toxic (PMT) contaminants, MIME agreed **the Secretariat and Chair of MIME would invite a representative from the NORMAN network** (https://www.norman-network.net/) **to present their prioritisation process, to address HASEC's task on LSPC and LCPA**.

9.7 MIME proposed meeting 18-22 November 2019 at ICES.

Agenda Item 10 – adoption of the Summary Record

10.1 The Secretariat prepared a draft of the MIME part of the HASEC programme of work 2019/20, which Contracting Parties refined in plenary and agreed as part of the draft Summary Record (**Annex 19**). MIME agreed the **Chair of MIME would present the draft Work Programme to HASEC 2019 for consideration**.

10.2 The Summary Record of the meeting was adopted in written procedure.