ICES WGCOMEDA REPORT 2015

ACOM/SCICOM Steering Group on Integrated Ecosystem Assessments

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Second Interim Report of the Working Group on Comparative Analyses between European Atlantic and Mediterranean marine ecosystems to move towards an Ecosystem-based Approach to Fisheries (WGCOMEDA)

5–8 May 2015

Palma de Mallorca, Spain

ICES International Council for the Exploration of the Sea
CIEM Conseil International pour l'Exploration de la Mer

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Executive summary

The Working group on comparative analyses between European Atlantic and Mediterranean Ecosystems to move towards an Ecosystem-based Approach to Fisheries (WGCOMEDA) has **consolidated** a collaborative platform of research with scientists form the Atlantic and Mediterranean working at different levels from population, through community to ecosystem level. The group was established in 2014 and works in cooperation with other groups within the ACOM/SCICOM Steering Group on Integrated Ecosystem Assessments (SSGIEA) such as ICES/HELCOM Working Group on Integrated Assessments of the Baltic Sea (WGIAB). The group, chaired by Marta Coll, France, Hilmar Hinz and Manuel Hidalgo, Spain, met for the second time in Palma de Mallorca, Spain, 5–8 May 2015, with 20 scientists from European Atlantic and Mediterranean countries attended the meeting (Denmark, France, Greece, Italy, Spain, Sweden, UK and Portugal).

The objective of the second-year meeting was to consolidate the work developed by WG through the main scientific pillars previously discussed and established. Particularly, the specific objective for this second-year meeting was to discuss further the preliminary analyses of the main questions to establish the future routes. Thus, the group focused in-deep discussion on sensitive ecological processes (from species and population processes, thorough interspecific relationships, to trophic flows) to climate variability and fishing impact on Atlantic and Mediterranean ecosystems with the following five main topics.

1) **Key population traits that stabilize and shape fish community dynamics: a portfolio effect analytical framework across Mediterranean and Atlantic ecosystems.** The discussion of the group circulated around the preliminary results of cross-systems comparison of the portfolio effect. The group decided to divide the outputs of this topic on two studies: methodology and the investigation of the potential influence of functional diversity and environmental heterogeneity across geographic gradients.

2) **Investigating the resilience – resistance at different levels through the patterns and drivers of functional diversity of fish communities across Mediterranean and Atlantic Seas.** The group discussion focused on the data availability and feasibility of calculating traits and taxonomic based diversity indices for the demersal fish communities across Mediterranean and Atlantic. The group agreed to use standardized surveys to calculate snapshot diversity indices on regional scales. A bigger, regional, scale was established to avoid overlaps with other studies in the Mediterranean and to be more consistent with the geographical scale across topics (1 and 3). Once calculated, the indices could be used as explanatory variables for topics 1 and 3 and compared with benthic diversity (topic 5).

3) **Biodiversity, community and ecosystem traits changes at regional scales.** The discussion of the group within the ecosystem level framework was focused on the comparative study of ecosystem traits between Mediterranean and Atlantic areas and the comparison of these ecosystem traits with portfolio effect and other community-based metrics (topic 1). The group decided to start with a study using ecosystem model static results crossed with data from topic one, and then move to ecosystem model dynamic results performing simulations

4) **Exploring a demographic portfolio using pelagic forage species across Mediterranean and Atlantic ecosystems.** Preliminary results on the analysis of the portfolio effect on forage fish species across ecosystems were presented. Portfolios were calculated for a selection of representative cohabiting stocks using age-based abundance data across systems. The preliminary results and future development of the analyses were discussed.

5) **Investigating patterns and drivers of functional diversity of benthic ecosystems.** The group was introduced to the inclusion of a new topic into the working frame of WGCOMEDA. The principle idea is to compare functional traits of benthic communities across the two systems; using regional data as replicate samples. This study would have to rely upon snapshot information of different one-off surveys run within regional seas, as there is no continuous, coordinated sampling for benthic communities within EU waters. The discussion of the group focused on how to set up such a study, to identify potential limitations and to decide on specifics with respect to traits to be used and indicators that will be compared across regions.

The group defined the objectives for next year that mainly focus on develop complete and final analyses and/or first drafts of scientific documents (depending on the topic) for all these studies. Having set this basis, the group agreed to meet in May 2016 in Bilbao (Basque Country, Spain).

1 Administrative details

Working Group name

WGCOMEDA – Working Group on Comparative Analyses between European Atlantic and Mediterranean marine ecosystems to move towards an Ecosystem-based Approach to Fisheries

Year of Appointment

2014

Reporting year within current cycle (1, 2 or 3)

2

Chair(s)

Marta Coll, France

Manuel Hidalgo, Spain

Hilmar Hinz, Spain

Meeting venue

Spanish Institute of Oceanography
(Balearic Oceanographic Centre, COB-IEO),
Palma de Mallorca, Spain

Meeting dates

5–8 May 2015

Participants group photo of the WGCOMEDA meeting in Palma de Mallorca (IEO-COB). From the upper left to the right back row: T. Morato, M. Casini, P. Vasilakopoulos, A. Ligas, S. Heymans, H. Hinz, B. Merigot, F. Le Loch, and M. Hidalgo. Front row from left to right: L. Outeiro, D. Pedreschi, M. Torres, E. Andonegi, S. Niiranen, M.T. Farriols, J. Claudet, L. Pécuchet, S. Vaz, A. Gårdmark, I. Catalán, M. Coll, T. Blankner.

2 Terms of Reference a) – d)

ToR	Description	Background	Science Plan topics addressed	Duration	Expected Deliverables
a	Provide a **comparative synthesis** of current understanding, data and tools available to move towards an ecosystem-based approach in Atlantic and Mediterranean European Seas.	a) The ToR requires an integrated view on what are the drivers and functions shaping marine ecosystems in both seas (Atlantic and Mediterranean), in addition to data available and methodologies used to date. b) This ToR requires a broad knowledge of the topic for all specific regions from the different scientists attending the WG. c) ToR A will benefit from the attendance of scientists from other WGs from SSGIEA such as WGIAB, WGEAWESS or WGINOSE. c) ToR also requires a good coordination with other WGs of other institutions carrying out parallel work on EAF such as SFTEC – EAF, INDESEAS initiatives, CREAM EU FP7 action.	1.1	Year 1	**1.1.** First section of Working Document synthesising available information, highlighting challenges in data and methodological approaches for each sea.
b	Identify key **sensitive ecological processes** (from species and population processes, thorough interspecific relationships, to trophic flows) to climate variability and fishing impact in Atlantic and Mediterranean exploited ecosystems.	a) The ToR requires the participation of experts with a good knowledge of ecological processes in both seas. b) ToR B will benefit from the attendance of scientists from other WGs from SSGIEA such as WGIAB, WGEAWESS or WGINOSE.	1.2	Year 1	**2.1**. Second section of the working document synthesising available information and sensitive ecological processes in each sea. **2.2**. Design the analyses to be performed in the next future (ToR C)

c	Analyse the **role of climate and fishing** drivers to explain the potential commonalities and differences in structural and functional ecosystem properties using results from both available indicators and models.	a) The ToR requires the access to datasets and previously developed analysis and models to perform further analysis and integration of data. b) ToR also requires a good coordination with other WGs of other institutions carrying out parallel work on EAF such as SFTEC – EAF or INDESEAS initiatives.	2.1	Year 2	**3.1.** Implementation of analyses. **3.2.** Comparative synthesis of results. **3.3.** Paper with both a reviewing and an analytical component.
d	Identify how **knowledge gained in previous and current work at different seas can provide feedback** among regional systems to improve the scientific support for an integrated assessment of the Mediterranean and Atlantic regions for ecosystem approaches to science and management.	a) Outreach of this ToR will be provided in close collaboration with SFTEC – EAF WG (*'Linkages to other committees or groups'* below) and other WGs from SSGIEA such as WGIAB, WGEAWESS or WGINOSE.	3.1	Year 3	4.1. Document to be disseminated to several management and assessment institutions and agencies in Europe.

3 Summary of Work plan

Year 1	1.1 Comparative synthesis of current data and tools available to move towards an ecosystem-based approach in Atlantic and Mediterranean European Seas The first step will aim at providing a review of all the data available and all the methodologies used in regional seas to present an accurate state-of-the-art to advance science for EAF to be used as a white document of the WG. This work needs to be performed in close collaboration with complementary initiatives already in place such as the ones lead by SFTEC – EAF WG, IndiSeas initiative, or CREAM EU FP7 action. 1.2 Identify sensitive ecological processes to climate variability and fishing impact in both Atlantic and Mediterranean exploited ecosystems The success of EAF measures relies on an effective assessment and management of the most sensitive ecological processes to be potentially affected by fishing and/or climate. This work will be performed using a comparative platform of research including Atlantic and Mediterranean systems. The group will identify key sensitive processes at the species and population level, thorough interspecific relationships, to trophic flows. The outreach of this review will complement the work document to be provided after the first year of WG. During this first year we will also plan the analyses to be performed during Year 2 in order to provide the opportunity to the WG participants to prepare before the second meeting in 2015.
Year 2	2.1. Analyse the role of climate and fishing drivers to explain the potential commonalities and differences in structural and functional ecosystem properties using results from both available indicators and models, The group will use the knowledge obtained during the first year to specifically analyse those sensitive ecological processes previously identified and assess the role that climate and fishing play in driving them. Results should lead to the development of a publication with both a review and an analytical component.
Year 3	3.1. Identify how knowledge gained in previous and current work in other seas can provide feedback among regional systems to improve the scientific support for an integrated assessment of the Mediterranean and Atlantic regions for ecosystem approaches to science and management. During the third year, the WG participants will produce an integrative synthesis of all the knowledge gain by the group that can improve the effectiveness of EAF. The group will emphasize the feedback of knowledge between regions in the Atlantic and Mediterranean Sea. The group will provide a document to be disseminated to all the management and assessment institutions in Europe. This work needs to be performed in close collaboration with SFTEC – EAF WG ('Linkages to other committees or groups' bellow) and other WGs from SSGIEA such as WGIAB, WGEAWESS or WGINOSE to avoid work overlapping.

4 Supporting information

The 'Working Group on Comparative Analyses between European Atlantic and Mediterranean marine ecosystems to move towards an Ecosystem-based Approach to Fisheries (WGCOMEDA)' aims to investigate and improve the EAF of European Seas.

Moving forward from analytical and theoretical EAF to efficient and applied management of marine living resources based in the ecosystem knowledge is the main challenge of marine and fisheries ecologists in the 21st century. This needs an intensive effort of integrating knowledge from different ecosystems and approaches to link eco-

system knowledge to the assessment procedures. The degree of success of such integrative procedures is inherently linked to capability to identify the more sensitive species and/or ecological processes to be managed within the ecosystem dynamics, and thus assessing their potential responses to exogenous forcing.

There are important challenges to deal with EAF in both the Mediterranean and Atlantic areas, and different ways of approaching the challenges in both regions. However, since they are partially in European Seas we should have an integrated view on what the drivers and functions shaping ecosystems in both seas are, and what is common or specific from each region. This working group aims at generating comparative knowledge of processes and knowledge in both regions to inform EAF. It also aims to strengthen the scientific basis for regional and integrated ecosystem approach through a comparative platform of research.

A comparative approach of marine ecosystems is essential to learn how Mediterranean and Atlantic ecosystems are structured, how they function, and which are the more sensitive species or ecological processes to be managed within the ecosystem dynamics. This working group will investigate common processes and scientific challenges to contribute to the comparative knowledge of both systems within the context of regional European Seas.

5 List of Outcomes and Achievements of the WG in this delivery period

As this is a new working group and as this was the second-year meeting, the WG has as yet not produced outcomes aside from communications to ICES ASC in 2013 (Session G, "Integrating scientific efforts among regional areas of the Atlantic and the Mediterranean towards EBM: the WGCOMEDA initiative" and authored by Coll and Hidalgo) and 2014 (Session N, "The ICES Working Group on Comparative Analyses between European Atlantic and Mediterranean marine ecosystems – a new effort towards developing Ecosystem-based Fisheries Management, WGCOMEDA" and authored by all the participants to the first meeting of WGCOMEDA meeting: M. Hidalgo, M. Coll, H. Hinz, I. C. Catalán, J. Claudet, M. Demestre, M. Giannoulaki, J. J. Heymans, F. Le Loch, M. Lindegren, C. Möllmann, A. Muntadas, J. Navarro, P. Olivar, J. Otero, I. Palomera, C. Piroddi, J. Steenbeek, K. Tsagarakis and other WGCOMEDA participants).

This year, some members of the group have submitted to the ICES ASC 2015 (session D) entitled "Taxonomic and functional diversity patterns of fish assemblages in the European Seas" and authored by Pécuchet L., Hidalgo M., Lindegren M and other WGCOMEDA participants). Several scientific publications have already been envisioned for the different topics of the WG (see below).

Finally, for the development of this WG the Chairs received a 5000 € fellow from the European Consortium **EUROMARINE** (http://www.euromarinenetwork.eu/call2014/) to partially support the attendance of some of the participants. Young scientists were prioritized, but help for travelling (flight) was finally provided to all the participants that requested.

6 Progress report on ToRs and workplan

The WG has already **identified key sensitive ecological processes ToR B** that will investigate with respect to **climate variability and fishing ToR C,** for different hierarchical stage (populations, communities or ecosystems) from the benthic to the pelagic realm. Although initially a key sensitive ecological component that had been selected as a starting point for a **comprehensive system comparison ToR A** was the forage fish compartment, analyses have been expanded to all the fish groups as a more general starting point to detect common patterns. The term forage species was initially defined relatively broadly as small fish that are highly abundant and can therefore be considered of key importance to maintaining ecosystem functioning and productivity. As Atlantic and Mediterranean ecosystems may be differently structured with respect to forage fish community, differences in the response to climate and fishing stressors may be expected. Thus, WG considered more reasonable to expand the analysis to the whole community while focusing some specific questions to pelagic species. Within this context, five topics defined above have been developed by focusing questions to different compartments: demersal, benthic and pelagic.

a) Key population traits that stabilize and shape fish community dynamics: a portfolio effect analytical framework across Mediterranean and Atlantic ecosystems. (Lead: M. Hidalgo).

Within this subtopic, the WG aims at investigating the link between population indicators and life-history traits of species, and characteristics at community level across geographic gradients. Within this framework, the objective is to evaluate both general and system-specific patterns that influence the harvested demersal communities at a geographical scale. We apply the portfolio analytical framework to compare Mediterranean and Atlantic demersal communities investigating role of community response diversity to environmental complexity. Species-rich communities are thought to be temporally more stable as the complementary or independent dynamics among populations. We will assess this by comparing demersal communities from the north Europe to the east Mediterranean Sea.

As a first step, we run preliminary analyses to text the sensitivity of portfolio effect (PE) estimates to the length of the time-series and the number of species. Our preliminary results show that PE estimates are generally robust to the length of the time-series while they were, as expected, sensitive to the number of species (Figure 1).

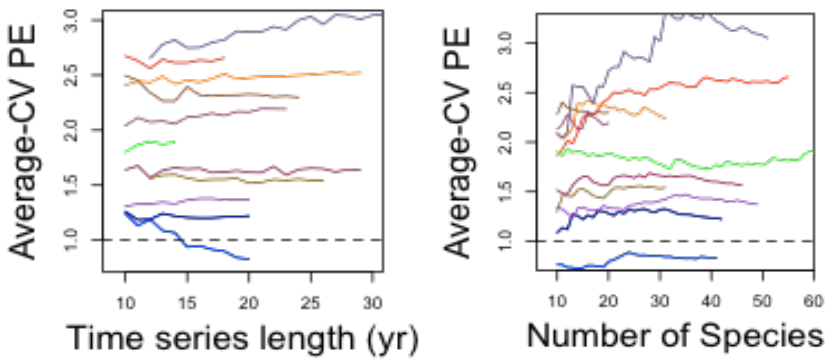

Figure 1. Sensitivity analyses of the Average-CV PE estimates to the length of the time-series (left) and the number of species (right) for a series of regions.

We also performed preliminary comparison of PE estimates and the degree of community synchrony as one of the main drivers contributing to the stabilizing capability of the community complexity. Our results show similar relationships between synchrony and PE for both Atlantic and Mediterranean communities (Figure 2.), which support our expectations. Further analyses leaded by Anna Gådmark and Christian Möllmann will look at the non-stationary pattern of PE in log time-series with described and known regimen shift such as the North Sea using IBTS information.

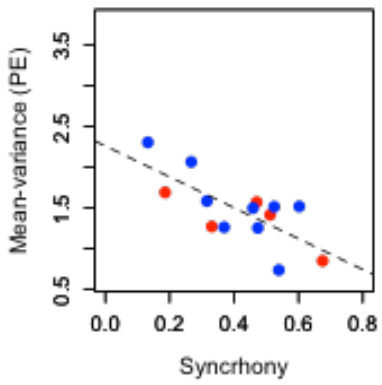

Figure 2. Relationship between Mean-variance PE and synchrony estimates. Blue dots codes for Atlantic and red for the Mediterranean areas.

b) Investigating the patterns and drivers of functional diversity of demersal fish communities across Mediterranean and Atlantic Seas. (Lead: L. Pécuchet).

The topic aims at calculating and comparing fish demersal communities from the Atlantic and the Mediterranean by studying the traits composition of the communities. Single traits (e.g. size, trophic level) and multi-traits (e.g. functional richness, evenness) indices will be calculated for various ecosystems, spanning from Boreal to Mediterranean communities (Figure 3). The different facets of diversity will be calculated and compared between these ecosystems and attempt to be related to the productivity of the eco-systems, such as fisheries catch, but also the resilience/resistance by linking it for example to the portfolio effect study (topic 1). The functional diversity indices derived from this study have therefore the potential to be used in other topics (1 and 3) and can further be linked to the benthic diversity study (topic 5).

The working group discussed the study feasibility due to the use of different gears in the different surveys, which could impact the composition of the sampled communities. However, it was emphasized that these standardized scientific bottom-trawl surveys in the Atlantic and the Mediterranean are the best data available for such a study. It was agreed nonetheless to be careful with the surveys data and to get the data checked by knowledgeable people for each surveys. The traits database was also importantly discussed to know which traits to include and how to deal with species with no trait information. The group decided to be pragmatic and agreed on a set of traits thought to describe well the fish ecological niches and with information that should be available for most of the species. For both the surveys and the traits database, it was agreed that sensitivity analysis would have to be performed to be reassured on the data quality and results significance.

For the next WG meeting, the aim is to present an advanced analysis of the topic.

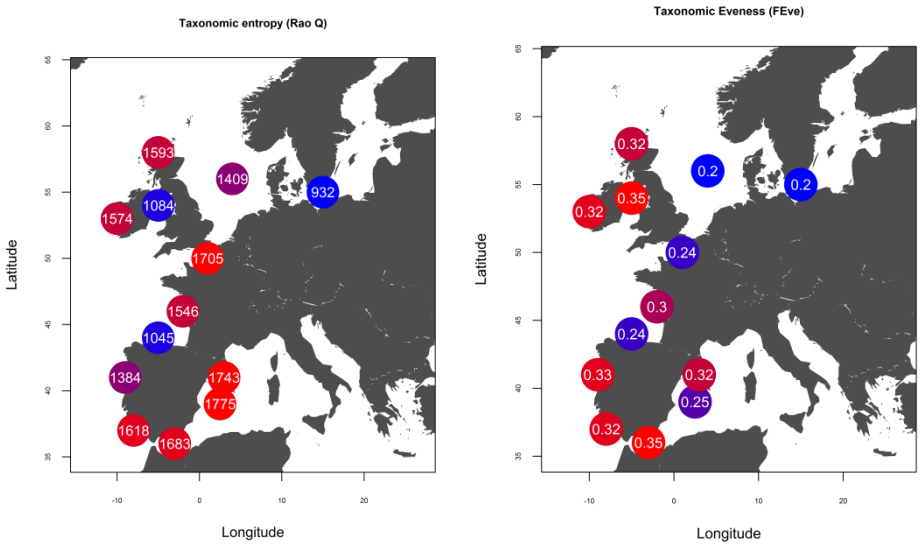

Figure 3. Example of diversity indices of demersal fish communities at the ecoregion scales with (left) taxonomic entropy, a multidimensional index taking into account the relative abundance of species and their pairwise taxonomic differences, high values corresponding to communities with rich and complex interactions and low values communities with poor interactions and (right) taxonomic evenness, a multidimensional index taking into account the regularity of the biomass distribution across the functional space, low values depict communities with uneven biomass distribution. For the next step, more areas are intended be added (Barents Sea, Iceland and other Mediterranean regions) and the indices will be also calculated based on traits.

c) Biodiversity, community and ecosystem traits changes at regional scales. (Lead: M. Coll).

This subtopic aims to analyse changes of diversity, at regional scales, using ecosystem traits (including species richness, abundance, functional and trophic diversity; see figure below as an example of data available by ecosystem included in the analysis) and relate them with community and population traits, and with environmental and anthropogenic divers. Analysis will be developed spatially (between areas/regions comparisons) and temporally to understand changed in space and time. The aim is to find common patterns of change in both Mediterranean and Atlantic systems, and also identify regional specificities.

Figure 4. shows some data available at the ecosystem level by ecosystem included in the analysis to be compared with community and population traits coming from topics 1–2 and 4.

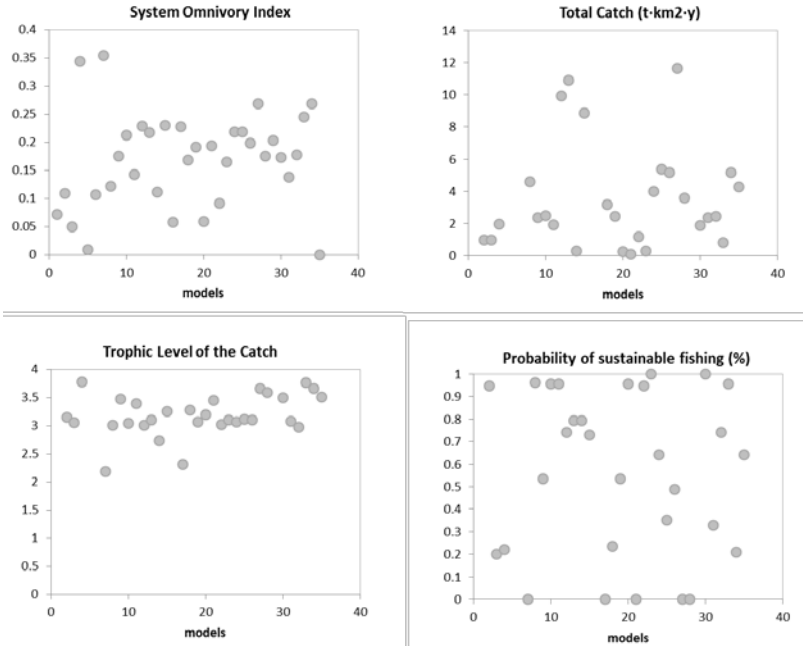

Figure 4. Potential ecosystem traits to be used in the comparative approach. From top left to bottom right: System Omnivory index, Total Catch (t km² y), Trophic level of the catch and Provability of sustainable fishing (%)

d) Exploring a demographic portfolio using pelagic forage species across Mediterranean and Atlantic ecosystems. (Lead: I. Catalán)

Comparing the response of the pelagic ecosystem fraction across ecosystems was based on a demographic portfolio. Age-based abundance time-series of forage fish was collated from different WGCOMEDA members through 2014. Portfolios were built and inspected for properties and differences across systems (Figure 5). The initial analyses provide evidence that the method may be valuable, particularly if related to appropriate environmental and fishery covariates.

A deeper work on the properties of the demographic portfolio was agreed, and further input from WGCOMEDA members was committed. Sensitivity analyses and the inclusion of several complementary datasets was advised by the participants, as well as the close collaboration with the responsible groups for management advice in both ICES and GFCM.

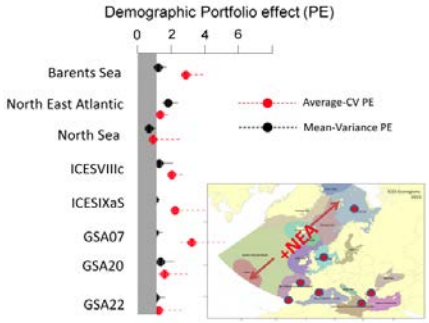

Figure 5. Preliminary results of Average CV demographic portfolio effect and Mean-variance PE for pelagic species in selected managed areas.

e) Investigating patterns and drivers of functional diversity of benthic ecosystems. (Lead: H. Hinz and Anna Törnroos)

This topic aims to compare benthic communities from both Atlantic and Mediterranean on a functional basis. Functional composition will be compared via various indices and related to the idea of resistance and resilience of the two systems. This topic was newly introduced to the working group and received vigorous interest by some of the members interested in this subject. It was also demonstrated that the subject has the potential to link back to the fish communities via a combined analysis with topic 1 in future. Furthermore, the type of analysis envisaged was identified to be useful for other currently operating European projects such as DISCARDLESS and MINOUW. As members of both projects were present in the WG, meeting this was seen as a good opportunity to work across projects on some common outputs using WGCOMEDA as a platform.

The topic will now move into the second phase where a preliminary analysis is been conducted with a subset of regional data similar as demonstrated under topic 1 and 2. After an initial proof of concept, it is planned to widen the analysis to in-cooperate as many areas from both respective systems as possible. A minimum number would be five from the Atlantic and five from the Mediterranean.

The working group discussed how to best get this topic advanced and tried to resolve technical problems concerning data standardization and comparability. Furthermore, the use of different traits and indicators was discussed, the aim being to have an initial analysis prepared for presentation at the next WG meeting

- *Cooperation with other Working Groups*

The working group has established contact to the following working groups: ICES/HELCOM Working Group on Integrated Assessments of the Baltic Sea (WGIAB), ICES Working Group on Ecosystem Assessment of Western European Shelf Seas (WGEAWESS) and ICES Baltic Fisheries Assessment Working Group (WGBFAS), and is in the process in securing collaboration with Working Group for Northeast Atlantic Continental Slope Survey (WGNEACS) among others.

In addition, from 16–17 April, Manuel Hidalgo (WG Co-Chair) attended to the annual MEDITS (the bottom-trawling surveys program of the Mediterranean countries) meeting in Menorca, where he presented the group to Mediterranean scientists and invited them both attending to the group and getting involved the ongoing work in different topics.

- *Cooperation with Advisory structures*

The WG has secured the official support from the General Fisheries Commission for the Mediterranean (GFCM). Furthermore, GFCM sees the WGCOMEDA group as a possible vehicle to ask specific scientific questions with respect to the overarching theme of the WG. Following the memorandum of understanding that exist between the two organizations; the WG can develop as an important vehicle in perusing this collaboration between both ICES and GFCM by both organizations. One of the objectives of the 2016 meeting is synthesizing which or the numerous (general and specific) scientific questions approached and answered by WGCOMEDA topic may have management implication both in the Atlantic and the Mediterranean systems.

7 Revisions to the work plan and justification

Not applicable.

8 Next meetings

The next meeting of WGCOMEDA will take place in May 2016 in Bilbao, Spain.

Annex 1: List of participants

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Annex 2: Recommendations

RECOMMENDATION	ADRESSED TO
1. WGCOMEDA acknowledges the collaboration and data accessibility of other ICES experts and regional groups, as well as ICES Data centre, in order to succeed in the ToRs and specific objectives. All Atlantic WG members agreed to check original data in addtion to ICES Data centre products as DATRAS.	Expert Groups and ICES Data Centre
2. All WGCOMEDA members agree ICES may take the innitiative to strength the MoU beween ICES and GFCM towards a more cooperative study that facilite a colaborative exploitation and open access of survey data (both demersal and pelagic information).	Council

Annex 3: Agenda

ICES Working Group on Comparative Analyses between European Atlantic and Mediterranean marine ecosystems to move towards an Ecosystem-based Approach to Fisheries

(ICES WGCOMEDA)

Second meeting

Palma de Mallorca, Spain, 5–8 May 2015

Balearic Oceanographic Center,
Spanish Institute of Oceanography (COB, IEO)

Tuesday 5/05/15

9.00. Arrival of participants

9.30 – 10.00. **Welcome, practical information, and presentation of participants.**

10.00 – 10.30. **Revision of the agenda, agreements made in the first WGCOMEDA meeting and objectives for the present year** (Marta Coll, Manuel Hidalgo, Hilmar Hinz).

10.30 – 11.00. **Fast description of specific topics of the WG** (Marta Coll, Manuel Hidalgo, Hilmar Hinz).

- ***Topic 1****: Key population traits that stabilize and shape fish community dynamics: a portfolio effect analytical framework across Mediterranean and Atlantic ecosystems (Manuel Hidalgo).*
- ***Topic 2****: Investigating the resilience – resistance at different levels through the patterns and drivers of functional diversity of fish communities across Mediterranean and Atlantic Seas (Lauréne Pécuchet – Martin Lindegren - Hilmar Hinz).*
- ***Topic 3****: Biodiversity, community and ecosystem traits changes at regional scales (Marta Coll)*
- ***Topic 4****: Exploring a demographic portfolio using pelagic forage species across Mediterranean and Atlantic ecosystems (Ignasi Catalan)*
- ***Topic 5****: Investigating patterns and drivers of functional diversity of benthic ecosystems (Hilmar Hinz – Anna Törnroos).*

11.00 – 11.30. Coffee break

11.30 – 12.00. **Introduction to focused discussion on Topic 2 (Lauréne Pécuchet – Martin Lindegren- Hilmar Hinz).**

11.30 – 13.00. **Focused discussion on Topic 2.**

13.00 – 14.30. Group lunch

14.30 – 16.00. **Continue discussion on Topic 2**

16.00 – 16.30. Coffee break

16.30 – 17.30. **Final discussions on the topic 2: summary of agreements, work to be developed, timing, people involved and definition of tasks**

17.30 – 18.00. **Introduction to focused discussion on Topic 1 (Manuel Hidalgo).**

Wednesday 6/05/15

09.00 – 10.30. **Focused discussion on Topic 1.**

10.30 – 11.00. Coffee break

11.00 – 12.30. **Focused discussion on Topic 1.**

12.30 – 13.00. **Final discussions on the topic 1: summary of agreements, work to be developed, timing, people involved and definition of tasks**

13.00 – 14.30. Lunch and group photo

14.30 – 15.00. **Introduction to focused discussion on Topic 3 (Marta Coll)**

15.00 – 16.00. **Focused discussion on Topic 3**

16.00 – 16.30. Coffee break

16.30 – 17.30. **Focused discussion on Topic 3**

17.30 – 18.00. **Final discussions on the topic 3: summary of agreements, work to be developed, timing, people involved and definition of tasks**

20.00. Group dinner

Thursday 7/05/15

09.00 – 9.30. **Introduction to focused discussion on Topic 4 (Ignasi Catalán)**

09.30 – 10.30. **Focused discussion on Topic 4**

10.30 – 11.00. Coffee break

11.00 – 12.30. **Focused discussion on Topic 4**

12.30 – 13.00. **Final discussions on the topic 4: summary of agreements, work to be developed, timing and definition of people in charge.**

13.00 – 14.30. Lunch

14.30 – 15.00. **Introduction to focused discussion on Topic 5 (Hilmar Hinz – Anna Törnroos).**

15.00 – 16.00. **Focused discussion on Topic 5.**

16.00 – 16.30. Coffee break

16.00 – 17.30. **Focused discussion on Topic 5.**

17.30 – 18.00. **Final discussions on the topic 5: summary of agreements, work to be developed, timing and definition persons in charge.**

Friday 8/05/15

09.00 – 10.30. **Presentations and proposal of new topics by participants.**

10.30 – 11.00. Coffee break

11.00 – 12.00. **Implications of the WGCOMEDA research topics on assessment, management and ICES scientific policy and strategy.**

12.00 – 13.00. **Wrapping-up of the main agreements and work to be developed during the coming year for each topic:**

- Planning of papers, tasks and working groups
- Organization – planning of next WG meeting.
- Potential funding for next meeting and future initiatives.

13.00. **Meeting closure**