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Interim Report of the Working Group on Resilience and Marine Ecosystem Services (WGRMES)

12–13 March 2015

Vigo, 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 Resilience and Marine Ecosystem services (WGRMES) was estab-lished in 2014 in response to the high priority research areas of the ICES Science Plan: "Development of options for sustainable use of ecosystems", and it is also transversally related with the first and second thematic areas "Understanding Ecosystem Functioning" and "Understanding Interactions of Human Activities with Ecosystems". After the kick-off meeting hold in A Coruña during the ICES Conference 2014, the WGRMES meeting was successfully held at CETMAR in Vigo, Spain, 12–13 March 2015. Members from Ar-gentina, France, Denmark, Portugal and Spain, including representatives from different marine sectors (industrial fisheries, small-scale fisheries, and aquaculture), were present at the meeting.

During the meeting, members of the WGRMES focused on three central topics: a) Marine ES under the Blue Growth Agenda and socioeconomics of marine ES, b) Synergies and trade-offs between marine ES, and c) Small-scale fisheries and marine ES. Under these three topics, WGRMES decided to identify and investigate what research priorities are transversal and key to develop scientific knowledge necessary to understand different drivers (ecological, economic, social and institutional) that impact the spatial distribution of marine ES at multiple scales (local, regional, national and international). WGRMES also developed and validated a questionnaire (ToR a) to identify survey marine ES practi-tioners globally with the aim of identifying the key research priorities for marine ES to determine crucial knowledge gaps that need to be addressed. The results of this study show that topics related to Linking ES and wellbeing, and Integrating economics, natural and social sciences into ecosystem services assessments are the most important research issues. Clearly, the two research topics Linking ES and wellbeing and Integrating natural science, economics and social sciences into ES assessments rose to the top of the list, and were regarded by stakeholders as crucial topics to advance practical application of the ES approach in coastal and marine social-ecological systems. The research done also indicate that questions concerning the interplay between ecosystems and people were found to be more important than instrumental questions. The top ten research questions prioritized by respondents fell into six research topics (ordered by importance) are as follows: Well-being, Trade-offs, Function, Integration, Metrics, Drivers, Tools, and Valuation.

The WGRMES also agreed that understanding the drivers and impacts of them on marine ES will help to know the type, magnitude and scales of the changes experienced by the social groups using marine ES. Ultimately, this will help to better understand how trade-offs affect the well-being of marine activities in the European Union.

1 Administrative details

Working Group name

Working Group on Resilience and Marine Ecosystem Services (WGRMES)

Year of Appointment within the current cycle

2015

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

1

Chair(s)

Sebastian Villasante, Spain

Gonzalo Macho, Spain

Meeting venue

Vigo, Spain

Meeting dates

12–13 March 2015

2 Terms of Reference a) – z)

ToR	Description	Background	Science Plan topics addressed	Duration	Expected Deliverables
a)	Identify the emerging tools and methodologies of socio-economic dimension of marine ES	Information and data on marine ES is scarce and not organized. Links to ICES Science Plan 1st, 2nd and 3rd thematic areas, and WGs described above.	Resilience properties of marine ES. Marine living resource management tools	2 years	-Interim report after 1 year -List of potential needs from clients and stakeholders from an online questionnaire -Theme Session at ACS-Conference Spain (2014) -Special Issue "*Resilience and marine ecosystem services*" ICES Journal of Marine Science (to be published during 2015) -Scientific paper about research priorities of marine ES in Europe
b)	Understand the dynamics of spatial distribution and potential conflicts between marine ES and users	Regional and local data is lacking in Europe. Links to ICES Science Plan 1st and 2nd Thematic Areas; and WGs	Biodiversity and the health of marine ecosystems. Marine spatial planning.	3 years	-Interim report after 2 years -Scientific paper about spatial distribution of marine ES in ICES ecoregions -Create a Database for ICES with detailed information of

		described above.		ecosystem services locations by using case studies across ICES ecoregions
c)	Economic valuation of marine ES under a changing climate	The analysis of spatial economic valuation patterns will provide robust scientific evidence on how services are distributed across the seascape. Links to ICES Science Plan 3rd Thematic Area; and WGs described above.	Socio-economic understanding of ecosystem goods and services. 3 years	-Interim report after 2 years -Create a Database for ICES with detailed information of economic valuation of marine ecosystem services -Theme Session "*Managing marine ecosystem services in a changing climate*" at 2015 ICES Conference (Denmark) -Scientific paper about the socioeconomic contribution of marine ES to coastal communities in ICES ecoregions -Plan a Workshop to inform policy makers and clients -Plan to publish a Special Issue "*Impacts of climate changes on marine ES"*
d)	Understand the ecological, economic, cultural and social factors undermining the use of marine ES	Spatial patterns of socio-economic factors are key to understand the use of ES. Attitudes and perceptions towards marine ecosystem services. Links to ICES Science Plan 3rd Thematic Area, and WGs described above.	Socio-economic understanding of ES. 3 years	-Interim report after 2 years -Create a Database for ICES with detailed information of socio-economic uses of ES by using different case studies across ICES ecoregions -Scientific paper on attitudes and perceptions about the economic, social and cultural factors influencing marine ES in ICES ecoregions -Potential participation of the WGREMS in EU funding call for research project
e)	Inform decision makers on alternative strategies for the use of ES under different scenarios	Decision makers have limited knowledge and capacity to understand how they may manage complex interactions between ES. Links to ICES Science Plan 1st, 2nd and 3rd thematic areas, and WGs described above.	Socio-economic understanding of ES. 2-3 years	-Interim report after 2 years -Development of guidelines to manage marine ES for policy makers and industry -Plan a Workshop to inform policy makers and clients at ICES Secretary (Denmark).

3 Summary of Work plan

Year 1	Review of existing methodologies and tools of socio-economic dimensions of marine ecosystem services.
Year 2	Spatial estimates of economic valuation of marine ecosystem services.
Year 3	Undestanding of ecological, economic, cultural, social factors and uses of marine ecosystem services and locations.

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

The Working Group on Resilience and Marine Ecosystem services (WGRMES) was established in 2014 responding to the high priority research areas of the ICES Science Plan: "Development of options for sustainable use of ecosystems", and it is also transversally related with the first and second thematic areas "Understanding Ecosystem Functioning" and "Understanding Interactions of Human Activities with Ecosystems". After the kick-off meeting hold in A Coruña during the ICES Conference 2014, the WGRMES meeting was successfully held at CETMAR in Vigo, Spain, 12–13 March 2015. Members from Argentina, France, Denmark, Portugal and Spain, including representatives from different marine sectors (industrial fisheries, small-scale fisheries, and aquaculture), were present at the meeting.

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The WGRMES decided to carry out a meta-analysis of cultural marine ecosystem services (CES) in Europe globally. This research will be the first contribution directly related to cultural services in the marine science. The objective of this global study will be to:

a) Analyse and review the state of research of marine and coastal cultural ecosystem services (CES) worldwide, with a focus on European Union;

b) Build on the conceptual background of CES, proposed elsewhere (e.g., de Groot et al 2005; Chan et al 2012);

c) Propose a CES framework for practical application in the marine and coastal environment by managers and decision makers;

d) Revise the evolution of the definition/classification of CES;

e) Propose a classification that integrates the full rationale of marine and coastal CES found in the literature. We will use a systematic literature review methodology and search for all peer-reviewed papers, reports and theses, in relevant databases, with the key-words "cultural ecosystem services" or similar (e.g., each of the CES categories, "landscape values", "community values", "social values", "landscape services", "visual qualities", "experiential values", and "amenity values", etc.), and the key-words "coastal" or "marine" or similar (e.g., "sea", "ocean", etc.).

The expected outcomes of this research are to:

- Overview of the state of the art of marine and coastal CES research worldwide,
- Identify key factors/variables to take into account in marine and coastal CES assessments,
- Analyse of the main drivers of change in marine and coastal CES potentials, flows, and demands,
- Advance in the elicitation of the intangible and subjective nature of certain CES categories,
- Identify the main knowledge gaps in the literature,
- Advance in the development of a CES conceptual framework,
- Propose of a suitable CES classification,
- Carry out a comparative analysis between the state of marine and coastal CES research in EU countries and the rest of the world,
- Identification of the actions taken by EU to implement marine and coastal CES in its policy and propose recommendations for future actions,
- Provide recommendations to advance marine and coastal CES research worldwide, with emphasis in the EU.

The WGRMES also agreed that understanding the drivers and impacts of them on marine ES will help to know the type, magnitude and scales of the changes experienced by the social groups using marine ES. Ultimately, this will help to better understand how trade-offs affect the wellbeing of marine activities in the European Union.

In terms of addressing other activities established in the ToRs of the WGRMES, the group developed the following outputs:

- Participation in ICES Conference

A Theme Session at ACS ICES Conference 2014 in A Coruña entitled "*Resilience and Marine Ecosystem Services*" has been co-organized by Dr Sebastian Villasante and Gonzalo Macho

- Publications in scientific journals

Rivero-Rodriguez, S., Villasante, S. 2016. What are the research priorities for marine ecosystem services. *Marine Policy* 66:104–113.

Villasante, S., Lopes, P. Coll, M., 2015. The role of marine ecosystem services for human well-being: Disentangling synergies and trade-offs at multiple scales. *Ecosystem Services* 17:1-4.

Outeiro, L. et al (including Villasante). 2015a. Framing local ecological knowledge to value marine ecosystem services for the customary sea tenure of aboriginal communities in Southern Chile. *Ecosystem Services* 16:354-364.

Outeiro, L. et al. (including Villasante). 2015. Using ecosystem services mapping for marine spatial planning in Southern Chile under scenario assessment. *Ecosystem Services* 16:341-353.

Roldán, V., Villasante, S. 2015. Linking marine and terrestrial ecosystem services through governance social networks analysis in Central Patagonia (Argentina). *Ecosystem Services* 16:390-402.

Stefansky, S., Villasante, S. 2015. Whales vs. gulls: Assessing trade-offs in wildlife and waste management in Patagonia, Argentina. *Ecosystem Services* 16:294-305.

Coll, M. et al. (including Villasante). 2015. Modelling dynamic ecosystems: venturing beyond boundaries with the Ecopath approach. *Reviews in Fish Biology and Fisheries* 25(2): 413-424.

- Organization and publication of Special Issues

Co-organization a Special Issue in the Journal Ecosystem Services by S. Villasante, M.Coll and P. Lopes "*Synergies and trade-offs between marine ecosystem services*", in which members of the group published several papers (see above) around topics related to the WGRMES.

- Policy dialogue

Members of the WGRMES have organized a meeting with the regional government of Galicia (Xunta de Galicia) to develop jointly a Regional Strategy of Marine Ecosystem Services in Galicia (NW Spain). The development of the document and the strategy is currently underway and preliminary outcomes will be presented at the next WGRMES meeting (2016).

- Methodological developments

At the 2015 meeting the Working Group decided that the development of a new conceptual framework for the understanding of adaptive actions of social groups would be best achieved by the creation of a driver-impact database of marine ES. To further highlight the results from the database detailed case studies are being compiled and presented on a number of ES and activities, providing examples in Europe and globally of the effects of drivers and the results of changes (including transformations) of marine ecosystem services. Members of the WGRMES has started to develop a new conceptual framework to

analyse the social changes. The results of this research will be publishing as a positioning paper in the next months.

- Datasets

The WGRMES has started to develop a database for ICES with detailed information about social changes and transformations of marine ES. Preliminary results of the database will be presented at the ICES/PICES Symposium on "Understanding marine socio-ecological systems: including the human dimension in Integrated Ecosystem Assessments" that will take place from 30 May to 3 June 2016 in Brest (France).

5 Progress report on ToRs and workplan

For the progress by ToRs, see the description of the tasks developed during 2014 above. Regarding the changes of ToRs, the WGRMES decided to advance in the understanding of social changes experienced by users and managers of marine ecosystem services which are considered key to analyse the human dimension of the oceans. Taking into account his, the WGRMES decided to create a new conceptual framework for the analysis of social changes associated with marine ES in order to identify fundamental and critical changes which facilitate transformations of social groups (see the new objective suggested in the ToRs highlighted above).

In order to exchange scientific information and increase the cooperation between WGs, the WGRMES also started to explore cooperation with the WGSEDA, WGEAWESS and WGCOMEDA.

6 Revisions to the work plan and justification

See a new objective proposed in the ToRs to be developed during the year 2016. If approved, the timeline of the work plan would be as follows:

Summary of the revised Work Plan

Year 1	Review of existing methodologies and tools of socio-economic dimensions of marine ecosystem services.
Year 2	Social changes of marine ecosytem services. Spatial estimates of economic valuation of marine ecosystem services.
Year 3	Undestanding of ecological, economic, cultural, social factors and uses of marine ecosystem services and locations.

7 Next meetings

WGRMES aims to meet again in O Porto, Portugal, 13–15 June 2016. A report on the activities of WGRMES in 2015 including future activities will be presented there.

Annex 1: List of participants

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* Participated by videoconference

Annex 2: Recommendations

RECOMMENDATION	ADRESSED TO
1. ASC Theme Session "Integrating assessment to manage marine ecosytem services"	ICES Secretariat
2. New ToR "Social changes of marine systems"	ICES Secretariat