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Strategic Initiative on the Human Dimension in Integrated Ecosystem Assessments (SIHD)

2016/2/ACOMSCICOM03 The ICES Strategic Initiative on the Human Dimension in Integrated Ecosystem Assessments (SIHD), chaired by Eva-Lotta Sundblad (Sweden), Alan Haynie (US) and Jörn Schmidt (Germany), will conduct activities over the period 2015 to 2019, coordinated by a core group to:

- a) Strengthen the expertise in human and social sciences by identifying and linking activities undertaken within ICES
- b) Strengthen or develop links with existing organisations and initiatives outside ICES dealing with human and social science in the marine realm
- c) Provide a point of entry for non-natural scientist to participate in ICES IEA work
- d) Develop ways to integrate the humanities and social sciences within Integrated Ecosystem Assessment groups by working with social scientists to:
 - i) Make use of existing and further developing participatory processes to engage across disciplines and involve the wider civil society
 - ii) Specify key components of ICES IEA and identify how this work can benefit from the involvement of the humanities and social sciences
 - iii) Develop an integrated, interdisciplinary discourse in support of an effective communication between human, social and natural science
 - iv) Make use of existing and further developing social, cultural and economic indicators and models and extending the use of empirical quantitative and qualitative methods to characterize the state of and changes in the human dimension of ecosystem-based management
- e) Identify approaches on how to enable the integration of this knowledge in ecosystem based management and how to give advice.

Supporting Information

Priority	High. ICES has committed to an Ecosystem Based Approach to Management (EBM) and has put Integrated Ecosystem Understanding at the core of its Strategic Plan and the Implementation Plans (Goal 2 Understand the relationship between human activities and marine ecosystems, estimate pressures and impacts, and develop science-based, sustainable pathways). This Integrated Ecosystem Understanding requires not only the physical and ecological, but also the human dimension to be an integral part of ICES work.
Scientific justification	<p>The Human Dimension encompasses the social, cultural, economic and governance aspects of the Ecosystem Based Approach to Management (EBM). For an integrated understanding of marine socio-ecological systems, methodologies from the natural and the social sciences need to be applied as well as methodologies integrating across disciplines to be developed. Whereas the natural sciences are strongly developed within ICES, social sciences are considerably less well developed and not used to their full extent. Further, if the understanding is to be translated into advice and management, the interface between science and policy, including the involvement of wider civil society, needs to be taken into account.</p> <p>Objective</p> <p>To explicitly address the Human Dimension in Integrated Ecosystem Assessment, not only considering the pressures of human activities on the ecosystem but to take into account social, cultural, economic and governance conditions when assessing the marine system and giving advice on its use.</p>

Key Questions

Eight key questions were formulated to start the discussion on defining this strategic initiative.

- 1) Who are the actors impacted by or interacting with the marine environment, what is the nature of these interactions and how have they developed?
- 2) Which are the actors (individuals or organizations) that directly or indirectly drive the use of marine resources or influence the pressure on the marine environment?
- 3) Which methods should be used to develop social, cultural and economic indicators of relevance for marine management and what are the data sources needed?
- 4) How can social and economic indicators be linked to pressures on and changes in the state of marine ecosystems?
- 5) Which drivers of the marine pressures can be controlled? How can these drivers be identified and what actions can be meaningfully taken?
- 6) What empirical methods can be used to describe indirect pressures?
- 7) What could be the practical role of humanities and social sciences in ICES work? What could be the role in the yearly science-policy cycle? How could the human dimension be incorporated in each individual management advice?
- 8) What are the social and perceptual transformations needed to successfully address complex, multidimensional management processes involving multiple actors at different spatial and temporal scales?

Resource requirements	Secretariat support for running theme sessions, workshops, and conferences
Participants	10–15 core members
Secretariat facilities	Assistance with organising workshops and symposia (the latter being dependent on successful symposia resolutions)
Financial	<p>Funding provided by Council for the period 2017-2019:</p> <p>2017 ACOM/SCICOM Workshop on Societal Considerations in Integrated Assessments (WKSCIA) Travel money for SIHD co-chairs and members for preparatory WK (10'000 DKK); Travel money for SIHD co-chairs, members and invited experts for WK (20'000 DKK); This WK is a key strategic element of the Strategic Initiative on the Human Dimension in Integrated Ecosystem Assessments to build up the knowledge base for providing advice containing social, cultural, economic considerations. It will be a stock tacking activity to identify knowledge existing analyses, data, information, knowledge on social, economic and other 'non-natural' science for one eco-region in ICES.</p> <p>2018 Follow up workshop Travel money for SIHD co-chairs and members (10'000 DKK); Depending on the outcome of WKSCIA, this workshop will serve as a milestone for SIHD to reflect on the follow up processes and intersessional work.</p> <p>2019 ACOM/SCICOM Workshop on the future of SIHD Travel money for SIHD co-chairs + invited experts (20'000 DKK); This WK will synthesise the work done in SIHD and develop a strategy for further work on social, cultural and economic issues within ICES. Produce outreach material including a brochure on demonstration advice (8'000 DKK)</p>
Linkages to advisory committees	ACOM
Linkages to other committees or groups	IEASG, EPDSG, EPISG, WGMARS, WGIMM, WGSEDA, WGRMES, WGMP CZM
Linkages to other organizations	PICES, EC, EEA, Regional Seas Conventions, FAO, World Bank, large marine science programs (e. g., IMBER, Too Big To Ignore), International Institute of Fisheries Economics and Trade (IIFET), EAFE, IPBES, STECF, JRC, IASC (International Association of the Study of the Commons), MARE

Strategic Initiative on Climate Change Impacts on Marine Ecosystems (SICCME)

2016/2/SCICOM03 The ICES-PICES Strategic Initiative on Climate Change Impacts on Marine Ecosystems (SICCME), chaired by Anne Hollowed (USA, PICES), Shin-ichi Ito (Japan, PICES), John Pinnegar (UK, ICES) and Myron Peck (Germany, ICES), will conduct activities over the three-year period from 2017 through 2019, coordinated by a core group to:

- a) Foster collaborative research between ICES and PICES to investigate the impacts of climate change on marine ecosystems, under the ICES-PICES strategic framework for cooperation;
- b) Communicate and advance our understanding of climate change and its impacts on marine ecosystems by organizing theme sessions, workshops and conferences over the next 3 years;
- c) Define and foster research activities needed to understand, assess and project climate change impacts on marine ecosystems for sustaining the delivery of ecosystem goods and services;
- d) Define and quantify the vulnerability of marine ecosystems and key living marine resources to climate change, including the cumulative impacts and synergetic effects of climate and marine resource use;
- e) Build global ocean prediction frameworks, through international collaborations and research, building on ICES and PICES monitoring programs;
- f) Synthesize knowledge achieved through experts groups, workshops and symposia in reports, publications and other high level communications;
- g) Provide state-of-the-art scientific advice to the scientific community, global and national advisory bodies such as the IPCC and IPBES, on the impacts of climate change on marine ecosystems.

SICCME will report to SCICOM midterm meeting and at the Annual Science Conference.

Annual meetings are planned as part of the 2017, 2018 and 2019 ICES ASC. Additional meetings will be held opportunistically in associated with (as side events) at ICES-PICES sponsored symposia. A key event is the 4th Effects of Climate Change on the World's Oceans Symposium (June 2018). Additional, intersessional communication will occur via email, Skype, etc.

Supporting information

Priority	High. ICES has several strategic research plans and documents related to understanding and investigating the impacts of climate change on marine ecosystems, and wants to strengthen collaborative ties with PICES. This initiative will address both issues and contribute to a joint ICES-PICES of becoming the leading international organization providing science and advice related to the effects of climate change and variability on marine resources and ecosystems.
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Since its inception, SICCMEMBERS have been designing and implementing climate-ocean-social-ecological research projects that address the complex and dynamic aspects of evolving scientific understanding and marine policy and management. Both ICES and PICES recognize that great strides in new science have emerged from collaborative work and the SICCMEMBERS/S-CCME has been an integral part of this successful collaboration.

During its first two phases (2012-2014, 2015-2017), SICCMEMBERS has helped coordinate climate change research activities across PICES and ICES member nations through multiple workshops, meetings, and organized sessions. These coordinated efforts have helped disseminate emergent results and novel methodologies, advancing science on the effects of climate change on the world's oceans, fisheries, and marine-dependent human communities. Phase 1 and 2 activities were focused on building the SICCMEMBERS community, evaluating climate change impacts and potential adaptive strategies, and coordinating comparative studies across regions. Review of the program shows SICCMEMBERS activities since 2012 revealed an impressive suite of accomplishments:

- SICCMEMBERS sponsored or contributed to 22 intersessional workshops or symposia on climate change and marine ecosystems.
- SICCMEMBERS members convened at least 1 topic/theme session at every ICES or PICES Annual Science Conference.
- SICCMEMBERS/S-CCME members (Anne Hollowed, Svein Sundby and Sukgeun Jung) served the IPCC as lead authors, several SICCMEMBERS/S-CCME members served as contributing authors, and several served as reviewers for the 5th Assessment Report.
- SICCMEMBERS members serve on scoping panels for the IPCC Special Report on Oceans and the Cryosphere (Shin-ichi Ito, William Cheung and Manuel Barange) and for the IPCC sixth assessment report (AR6) (Anne Hollowed).
- SICCMEMBERS members (Manuel Barange, and Jacquelynne King served as convenors of the 3rd Effects of Climate Change on the World's Oceans meeting in Santos, Brazil.
- SICCMEMBERS members are serving as either a symposium convenor (Shin-ichi Ito and Manuel Barange) or scientific steering committee members (Anne Hollowed, Kirstin Holsman, Myron Peck, John Pinnegar, Angelica Pena, and Motomitsu Takahashi) for the 4th Effects of Climate Change on the World's Ocean meeting which will be held in Washington D. C., USA.
- Regional nodes (n = 20) have been identified with climate change projects (n >35) involving SICCMEMBERS members, providing an unparalleled opportunity to compare climate change impacts within and outside ICES and PICES member nations.

Review of the progress to date shows that SICCMEMBERS/S-CCME is well on its way towards "Building global ocean prediction frameworks through collaborations and research". In Phases 1 and 2, SICCMEMBERS/S-CCME has accelerated the design of climate monitoring programs that address key sources of scenario, parameter and structural uncertainty in coupled end-to-end social-ecological models. These accomplishments are tangible evidence of the success of the SICCMEMBERS/S-CCME activity and they illustrate that SICCMEMBERS/S-CCME has been successful in forging linkages with the IPCC.

The remainder of this text provides a roadmap for long-term continuation of collaborative research on climate change through the formation of an ICES-PICES SICCMEMBERS.

Goals

The cooperation between ICES and PICES within SICCMEMBERS is responding to the *need for credible, objective and innovative science advice on the impacts of climate change on marine ecosystems*. This advice will foster management and policies that will effectively utilize resources today and preserve these resources and habitats for the benefit of future generations. To achieve this overarching goal, the following actions should be addressed.

- i) Define the research activities needed to understand, assess and project climate change impacts on marine ecosystems with sufficient spatial and temporal resolution to plan strategies for sustaining the delivery of ecosystem goods and services and the preservation of biodiversity. When possible predictions should include quantifying uncertainty.
 - ii) Define and quantify the vulnerability of marine ecosystems to climate change, including the cumulative impacts and synergistic effects of climate and marine resource use.
 - iii) Build global ocean prediction frameworks, through international collaborations and research, building on ICES and PICES monitoring programs.
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- iv) As the leading northern hemisphere international organizations, ICES and PICES will direct the ICES-PICES SICCMME to draw on the marine scientific expertise to make advance science to address these challenges.

Objectives:

The success of this strategic initiative has rested on:

- i) Advancing the scientific capacity on the three main challenges identified above by engaging the PICES and ICES scientific community in focused workshops, theme/topic sessions and symposia that target key uncertainties and technical barriers that impact the predictive skill of ocean models used to project the impacts of climate change.
- ii) Effectively communicating this capacity to clients, Member Countries, stakeholders and the broader scientific community.
- iii) Facilitating an international effort to design data collection networks at the spatial and temporal scales needed to monitor, assess and project climate change impacts on marine ecosystems.
- iv) Facilitating international collaboration to design and implement comparative analyses of marine ecosystem responses to climate change through modelling and coordinated process studies.

Key Questions

The overarching goal of the initiative will be to answer the following linked questions.

- i) How will the physical, chemical and biological components of regional marine ecosystems of the northern hemisphere change under future climate scenarios?
- ii) How will marine biodiversity change (and thus biodiversity conservation objectives) as a result of pressures on the physiology, behavior and ecology of individuals, populations and ecosystems within the PICES and ICES regions.
- iii) How will the demand for, and delivery of, ecosystem services change in response to human activities in the marine environment and climate-driven changes to ecosystems?
- iv) How will fishery-dependent communities and the broader society that depends on marine ecosystems be able to adapt to climate-driven changes in ecosystem services, and which management responses are most effective and consistent with an ecosystem-based approach?

Resource requirements	Secretariat support for running theme sessions, workshops, and conferences
Participants	8–10 core members including (but not limited to) John Pinnegar (UK); Myron Peck (Germany); Vince Saba (USA) representing ICES, and a similar number representing PICES (Jacquelynne King, Canada; Shin-ichi Ito, Japan, Franz Mueter, USA, Xiujuan Shan, China). Up to 75 participants at SICCMME events.
Secretariat facilities	Assistance with organising workshops and with website (increased functionality)
Financial	The budget request of SICCMME is 50,000 DK. These funds will be used over a 3-year period from 2018-2020: 1) 32,000 DK to cover rental costs (rooms and food) associated with 4 regional comparison (PI) workshops (8,000 x 4). The remaining 18,000 DK will be used to cover travel costs of early career researchers (4500 x 4) to workshops and training courses.
Linkages to advisory committees	ACOM
Linkages to other committees or groups	Ecosystem Processes and Dynamics Steering Group (EPDSG) Ecosystem Pressures and Impacts Steering Group (EPISG) Strategic Initiative on Human Dimensions (SIHD)
Linkages to other organizations	EC, EEA, Regional Seas Conventions, IPCC, FAO, IOC, World Bank, large marine science programs (e. g., IMBER, Future Earth)
