

the local physical oceanography. In conclusion, the rebuilding of the Irish and Celtic Sea stocks of sole will depend to a large extent on local recruitment dynamics.

Work related to ICES via Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGSSK).

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### Session 3: Conservation and management science

Develop tools, knowledge, and evidence for conservation and management — to provide more and better options to help managers set and meet objectives

#### (13) Providing ICES advice to OSPAR – an impression of the process

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One of the core tasks of ICES is to provide scientific advice on the marine ecosystem to governments and international regulatory bodies that manage the North Atlantic Ocean and adjacent seas. At the end of 2018, ICES received a ‘Request for advice on the current state and knowledge of studies into the deployment and environmental impacts of wet renewable technologies and marine energy storage systems’, a request subsequently passed on to the Working Group on Marine Benthic Energy Developments (WGMBRED) and the Working Group on Marine Renewable Energy (WGMRE). Due to a restructuring process at ICES, and a shift in chairs in both WGMBRED and WGMRE, and the strict deadline, this proved to be a challenging process. The ICES secretariat supported the process by providing a suitable workspace (both physical and digital) and convened a specific workshop (WKWET, chair: Jan Vanaverbeke) attended by WGMBRED and WGMRE (Belgian) members, and external specialists in the field. This workshop was used to create a conceptual framework to unify the assessment of a wide range of wet renewable energy devices on a wide variety of marine receptors. The assessment showed that key receptors constraining the deployment of wet renewable devices are marine mammals, seabirds and fish. In addition, the review revealed that cumulative impact assessments with regards to wet renewables are in a very early stage of development causing a lot of uncertainty in decision making processes. The report provides the strong recommendation to move towards receptor-based assessments that consider both the ecological links between the abiotic and biotic components of the marine ecosystem and the feedback links between the different biotic components. This should be achieved by hypothesis-driven research, taking into account the link between structural components and the functioning of marine ecosystems, as this ultimately determines the provisioning of marine ecosystem services to society. This calls for cross-border coordination and cooperation in setting standards for data collection, sharing information, and setting research agendas.

Work related to ICES via WGMBRED (Working Group on Marine Benthic and Renewable Energy Developments), WGMRE (Working Group on Marine Renewable Energy), WKWET is chaired by Jan Vanaverbeke (RBINS).

#### (14) Highlighting EARS: putting data and operations in the global environmental context Highlighting the EARS software

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The Eurofleets Automatic Reporting System (EARS v2) software is a set of services that allows the Principal Investigators or any person authorised to do so, to log their sampling events in a way that is helpful both for the scientific goals of the programme and for the data management that follows the cruise, for instance the OSPAR data reporting to ICES. The software has been available on the R/V Belgica since 2017-2018 for users wanting to test the software. Its software development has restarted thanks to the H2020 Eurofleets+ project, and the problems discovered during test runs dating

from 2017-2018 have been solved in the meantime. An explicit outcome of Eurofleets+ is to enable the creation of complete CSRs based on the cruise and full event details any PI enters into EARS. This removes the burden of manually creating the CSR by the cruise Chief Scientist, and finding out the sampling details of other PIs partaking in the cruise. This, and other improvements, will be released in EARS v3 by the end 2020. CSR creation for instance relies on using international standards from the start and providing a summarising view on the events. The R/V Belgica will function as a test environment for the Eurofleets+ software developments. A newer version of the EARS v2 software will be installed on the ship in December 2019. The goal of our contribution to BICEpS 2019 is to encourage attendants to use the software (both EARS v2 and especially EARS v3 later on) on the R/V Belgica. A training is foreseen in the first quarter of 2020.

Work related to ICES via DIG – the Data and Information Group.

## (15) Towards a coherent and coordinated monitoring of marine mammals?

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For marine mammal populations, it is generally agreed that ideally a coherent and coordinated monitoring is in place across their area of distribution. Such an approach is especially required in the frame of our reporting obligations under the European Commission (EC) Marine Strategy Framework Directive (and consequently also under OSPAR: IA 2017, QSR 2023), possibly leading to conservation and management action. Especially countries such as Belgium, with small marine areas and small marine mammal populations, can hardly provide stand-alone assessments.

Member States of the European Union and Parties to OSPAR only recently initiated efforts to streamline indicators, targets and monitoring methods. Data on marine mammals collected within the North Sea, and jointly assessed, include those on population abundance, distribution and bycatch. Apart from (inherent) methodological and reporting difficulties, an additional complication to the data collection and assessment is the fact that many similar initiatives are being taken, or obligations exist, in several fora, including those of EC Environment, EC Mare, ASCOBANS, OSPAR and ICES Working groups (WG MME and WG BYC). This not only means a dilution of effort (eg. replicate data calls), but also the possibility of deviating conclusions being made and a lack of responsibility.

We will present, specifically for Belgium, an overview of the data requirements on marine mammals and of the fora that use such data for assessments.

Work related to ICES via WGMME (Working Group on Marine Mammal Ecology) and WG BYC (Working Group on Bycatch of Protected Species).

## (16) Genetic tools for Ecosystem health Assessment in the North Sea Region (GEANS)

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To conserve and manage seafloor ecosystem health, proper management measures need to be taken, which depend on fast and accurate monitoring. Appropriate measures should be based on joint, standardized monitoring, using cost-effective, early-warning and accurate methods. Traditional benthic assessments are often time-consuming, labor-intensive and expensive: seafloor samples are taken, sediment washed out, animals fixed in formalin and then sorted, identified and counted using microscopes, requiring trained experts and taking up to a couple of days per sample. Quality assurance is often not guaranteed due to different analyst expertise, surely when comparing results from different institutes or countries. The use of DNA-based tools can circumvent many of these shortcomings. DNA-based monitoring promises faster and cheaper methods to assess environmental health, as animals are not processed individually and allow simultaneous analysis of tens to hundreds of samples. In addition, DNA-based methods can be standardized across institutes and countries through standard operating procedures (SOPs), being less subject to expert judgement.

Currently, several institutions experiment with genetic approaches, but a concerted, harmonized, routine implementation in biological monitoring and management is lacking. Within the GEANS (Interreg-North Sea region) project, 7 countries from around the North Sea collaborate for the moment, with an overall aim:

1. To develop joint time- and cost-reducing genetic monitoring tools that feed into existing indicators to assess ecosystem health