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BICEpS
ANNUAL REPORT

Reinforcing Belgian ICES people

2019

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ILVO
Flanders Research Institute for Agriculture, Fisheries and Food

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Royal Belgian Institute of Natural Sciences

www.naturalsciences.be

International Council for the Exploration of the Sea

www.ices.dk

Flanders Research Institute for Agriculture, Fisheries and Food

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BICEpS

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2019

- BICEpS activities in 2019
- Summary of the BICEpS19 colloquium
- Perspectives for BICEpS in 2020

Annexes:

- BICEpS19 Programme, Abstracts and Participants
- Belgian ICES members 2019
- BICEpS presentation poster

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TABLE OF CONTENTS

FOREWORD

BICEpS – Reinforcing Belgian ICES people, is a joint ILVO – RBINS initiative launched in 2018. Composed initially of Belgian ICES experts, the BICEpS community has progressively grown and encompasses now about a hundred junior and senior members from different horizons (Ph.D. students, researchers and advisers from research institutions, universities, and Federal and Regional administrations). Some of the key activities of the initiative are to promote Belgian membership in ICES expert groups, improve collaboration and share information, and the organisation of an annual colloquium. If you want to know BICEpS members better, have a look at the compilation of Mini CV's or browse through BICEpS web page!

On 2 December 2019, the second edition of the BICEpS Colloquium attracted more than 50 participants proud to share their experience with, and contributions to ICES with the BICEpS community. I am happy to see the attendance to the annual colloquium is growing and attracting new faces, including some juniors and policy makers. This indicates the initiative is on track to reach its goals. One of the aims is exactly to attract Belgian scientists that are not yet involved in ICES, to create a better insight in the Belgian contribution to ICES, and to highlight ICES role and governance to scientists and policy makers.

BICEpS19 based the colloquium programme on the ICES Science Plan. The Belgian scientists involved apparently had no problem in covering all the different topics, including emerging topics like aquaculture. Many of the contributions were beyond fisheries. This demonstrates that the Belgian ICES community has already diversified along the lines set out by ICES!

I am convinced this initiative will improve visibility of the work done and lead to future collaborations among experts, across institutes. The intention of the BICEpS initiative has always been to raise awareness and interest from other Belgian scientists to contribute to the work of ICES. For the time being we mainly reach the ones already active in ICES. It really is my hope and intention to reach out to the rest of the Belgian scientific community. We hope we can spread our enthusiasm about ICES and convince people on the added value of this vibrant international scientific community!

Even though the activities of BICEpS are just at the start, the initiative has already raised interest in other Member States. I am curious to see how these new collaborations and thinking will influence the evolution of ICES in future years. We have already seen that ICES is an ambitious organisation, broadening its scope and lifting the scientists involved to a higher level just as the scientists push ICES up to a world-leading marine science organisation and advisory body.

Hans Polet,

Flanders Research Institute
for Agriculture, Fisheries and Food,

Belgian delegate to ICES Council

PREFACE

The International Council for the Exploration of the Sea (ICES) is a more than centenary intergovernmental scientific organization (1902) that brings together the efforts of 20 Member States, bordering the North Atlantic, Baltic and the Arctic Circumpolar Zone. Through strategic partnerships, its work extends into the Arctic, the Mediterranean, the Black Sea and the North Pacific. This global organization develops science and advice to support the sustainable use of the seas and oceans. In our rapidly changing world, the ICES work answers the needs of managers and society as they are actively seeking credible, salient, and legitimate evidence to help them understand and respond to a broader range of risks and opportunities. ICES Strategic Plan for the period 2019-2024 defines priorities relating to science, data and advice, and to develop the capacity needed to fulfil ICES commitments. A Science Plan and an Advisory Plan support the implementation of the Strategic Plan.

ICES Vision

To be a world-leading marine science organization, meeting societal needs for impartial evidence on the state and sustainable use of our seas and oceans.

ICES Mission

To advance and share scientific understanding of marine ecosystems and the services they provide and to use this knowledge to generate state of the art advice for meeting conservation, management and sustainability goals.

The seven interrelated scientific priorities of ICES Science Plan for the 2020s. Source: ICES 2019.

On 1st November 2018, ICES became an observer to the United Nations General Assembly, paving the way for this intergovernmental organisation to become a globally leading advisory body.

In Europe, ICES is the main international contributor to scientific advice on marine issues to decision-makers, especially to the European Commission. This independent advisory and scientific body is not only appreciated for the quality of its advice but also for its independence, its non-competitive culture and the enthusiasm of its scientific community to work together. For that reason, ICES deserves our full support.

In Belgium, more than 75 experts contribute to the daily work of the organisation. Concerned by the visibility of this important involvement of our scientists to the Belgian scientific community and to Belgian policy makers, the BICEpS Steering Committee decided in June 2018 to establish a community for a better promotion of ICES in Belgium. BICEpS is envisaged as a forum where Belgian scientists can be connected to each other, be more transparently informed on the ICES-related work being done by their colleagues, and get updated on the involvement of Belgium in ICES governance and strategic objectives.

BICEpS general aim

To offer a platform to the Belgian ICES community to get to know each other, to improve collaboration and share information, and to promote ICES to the wider scientific community in Belgium.

With BICEpS, we have the opportunity to take advantage of the common knowledge and experience of the BICEpS community to also advance our understanding of marine issues in Belgium and to foster our contributions to ICES.

WE would like to thank the ICES Secretariat for providing support to the activities of this initiative and for hosting the web platform of the BICEpS community at http://ices.dk/community/groups/Pages/BICEps.aspx. It is gateway to the BICEpS newsletters, Belgian membership list, Mini CV's of our community members, picture gallery and announcement of future BICEpS events.

The BICEpS Steering Committee

Steven Degraer (SCICOM delegate), Kris Hostens, Kelle Moreau, Hans Polet (Council delegate), Marianne Schlesser, Serge Scory (Council delegate), Els Torreele (ACOM delegate), Sofie Vandendriessche

INTRODUCTION

The demarche leading to the creation of the BICEpS community and definition of action points is covered in BICEpS 2018 Annual report.

The BICEpS community encompasses Belgian scientists involved in the work of ICES, contact persons in marine research institutions and universities and a few policy makers, totalling now about a hundred persons. Even though the activities of BICEpS are just at the start, the initiative has already raised interest in other ICES Member States.

This report targets marine scientists, marine managers and policy makers. It presents an overview of the activities implemented in the context of BICEpS initiative in 2019, a summary of the second BICEpS Colloquium hosted this year by ILVO on 2 December 2019 in Ghent with the programme, abstracts and list of participants, and the updated list of Belgian ICES experts.

BICEpS Annual report for 2019 is supplemented by a separate annexe published online which assembles the PowerPoint presentations of the colloquium. All documents produced by BICEpS are published online on our web page in ICES website. The web references are listed under the section “Activities”.

BICEpS ACTIVITIES IN 2019

Since 2017, regular meetings of Belgian representatives in ICES decision bodies were held to check the adequacy of our representation in SCICOM (the Scientific Committee) and ACOM (the Advisory Committee), to revise the participation of Belgian experts in the various WGs and to elaborate a common Belgian position when so requested

I. SC Meetings and BICEpS members

The Steering Committee held two physical meetings and two Skype meetings on 28/05, 18/10, 14/11, 10/12. The meetings addressed options to implement BICEpS action points identified in 2018 and provided guidance and support for the organisation of the second BICEpS Colloquium in autumn 2019. In the continuity of the initial considerations in 2018, the SC analysed steps to get ready to host the ICES Annual Science Conference in Belgium. The chairs of the BICEpS initiative attended the official meetings for which they are appointed. An overview of key decisions from the Council, ACOM and SCICOM annual meetings was presented in session 1 of BICEpS Colloquium.

BICEpS logo (design by S. Vandendriessche)

At the end of 2019, BICEpS membership list counted about 100 persons. Initially composed by Belgian ICES experts, it was enriched with participants at BICEpS18 colloquium and other interested persons from ministries and universities in Belgium. The

BICEpS membership list[1] is published on BICEpS web page.

II. Communication

In follow-up to the action plan set up at BICEpS18, the following activities could be implemented with the support of BICEpS SC and of ICES Secretariat.

1) Active dissemination by e-mails of new calls for nomination of experts to ACOM and SCICOM groups;
2) Circulation of the list of Belgian ICES experts for correction and updates;
3) Preparation of outreach material: dissemination of a first BICEpS Newsletter, design of a poster presenting the initiative, dissemination of information on Twitter with the hashtag #ICESbelgium;
4) Set up of a BICEpS group on ICES website, with BICEpS community as members. It consists basically of one web page with side links to access documents. ices.dk/community/groups/Pages/BICEpS.aspx
5) Online publication of the 2018 BICEpS annual report (containing Action points identified during a World-Café discussion at BICEpS18), of the compilation of the PowerPoint presentations at BICEpS18 colloquium and of some pictures of the event;
6) Initiation of a compilation of mini biography of BICEpS members to be published online to help members to better know Who's doing What in the ICES landscape. The compilation of Mini CV's is accessible on BICEpS web page and will be updated annually;
7) Organisation of BICEpS19 colloquium (see below);
8) BICEpS Chairs also reported on BICEpS initiative at SCICOM and the Council meeting.

III. Hosting the ASC

In 2019, the SC further evaluated the options (venues, budget) to host the ICES Annual Science Conference 2022 in Belgium. Booking options set in 2018 were kept on 4 venues for dates in 2022. A fundraising approach was drawn but could not be launched due to the absence of a Federal Government. By the end of 2019, options taken on the various venues had to be changed or lifted. Given the absence of a Belgian Federal Government in late Autumn 2019, Belgium had to withdraw its initial proposal and informed the ICES Secretariat accordingly.

The implementation of the fundraising approach to host an ASC in Belgium will continue in 2020 and further once a new Federal Government will be in place.

[1] BICEpS membership list: http://ices.dk/community/groups/Pages/Members.aspx?Acronym=BICEpS

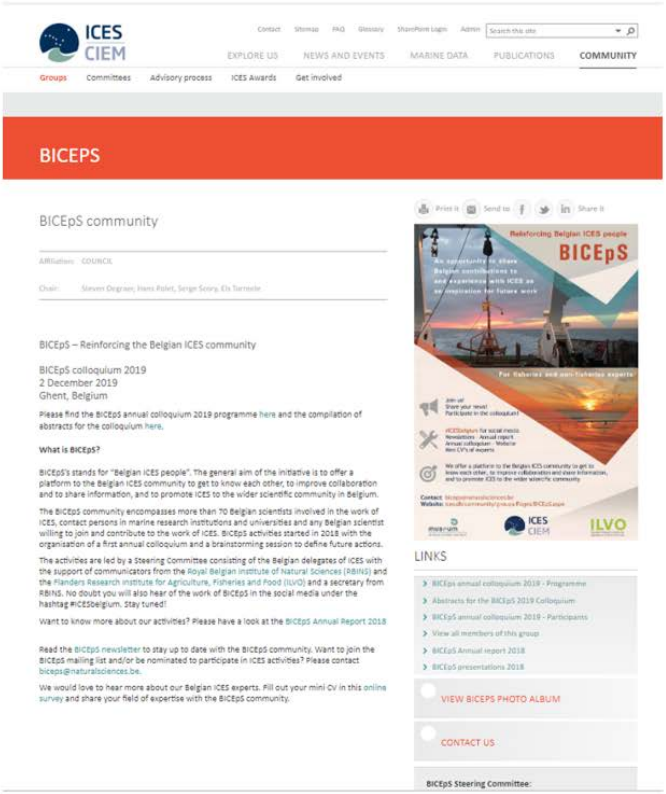
IV. Organization of BICEpS Colloquium

The second edition of the BICEpS colloquium took place on 2 December 2019 in Ghent (hosted by ILVO, co-organised by RBINS).

The programme, abstracts and participants list of BICEpS19 are in Annex 2-3-4. A summary is presented under the next section of the annual report. Session 1 informed on the ICES organisation from a Belgian perspective to highlight where Belgian experts have been active and have taken responsible roles in ICES and where they could be more active. This was complemented with three testimonies from Belgian chairs of ICES Expert Groups. The programme then covered three of the strategic themes of the new ICES Science Plan (sessions 2: Ecosystem science; session 3: Conservation and management science; session 4: Sea food production).

The day ended with a special "Cheers & Tears" session (drinks, pictures and networking) and wrap-up of the day. Informal discussions and contacts among participants could continue well beyond the closure of the meeting.

Overall, 51 participants took part to the colloquium (ILVO, RBINS, VLIZ, ULB, UGent, FPS DG Environment, FPS Mobility and Transport, Department Agriculture and Fishery of Flanders government). Among them, 26 ICES experts accepted to give testimonies and present their work with ICES. Many more shared their experience and expectations during the interactive part of each session. All are hereby warmly acknowledged.




MONDAY
02 December 2019
Koningin Maria
Hendrikaplein 70,
9000 Gent
BICEpS annual colloquium
02 December 2019
INVITATION
Second BICEpS annual colloquium
Programme
9:00 Welcome coffee
9:00 Feed-back on BICEpS initiative
Session 1: ICES organisation
Session 2: Ecosystem science
12:15 Lunch
13:30 Session 3: Conservation and management science
Session 4: Sea food production
Session 5: Cheers & tears
16:30 End of the day
BICEpS Colloquium:
Reinforcing Belgian ICES people
An opportunity to share Belgian contributions to and experience with ICES as an inspiration for future work
For fisheries and non-fisheries experts
Call for abstracts until 30 September. Registration until 25 November. Contact: biceps@naturalsciences.be
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OD Nature | OD Natuur | DO Nature
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SUMMARY OF THE BICEpS19 COLLOQUIUM

An opportunity to share Belgian contributions to and experiences with ICES as an inspiration for future work (2 December 2019, ILVO, Ghent)

The aim of BICEpS Colloquium is to attract Belgian scientists that are not yet involved in ICES to become involved, create a better insight in the Belgian contribution to ICES, create opportunities for collaboration that may not yet exist, and highlight the role of ICES to the wider scientific and policy communities in Belgium. Therefore, scientific presentations are combined with an update on the new developments under the ICES Council, the Advisory Committee (ACOM) and the Science Committee (SCICOM) to foster transparent information on ICES governance and strategic developments. The social gathering attached to the colloquium further promotes networking among (new and old) members. The colloquium is hosted in alternance by RBINS and ILVO.

The detailed programme of BICEpS19 colloquium, the abstracts and list of participants are included in Annex and the compilation of the PowerPoint presentations is published on BICEpS web page at the address http://ices.dk/community/groups/Pages/BICEpS.aspx.

Among participants, about 40 % indicated they knew people who could be involved in ICES but who are not. And 47 % didn't know what their neighbour was doing for ICES. The 2019 edition of the colloquium offered the opportunity to reach 24 new participants who could not attend last year edition. Overall, one could say that this second edition was an opportunity to meet new colleagues and get to know better who is doing what in the Belgian landscape of the ICES community. We were happy to learn that 63 % of the participants indicated they would consider a contribution to a future edition of BICEpS Newsletter.

Hereunder, sessions chairs provide a summary of their session, including the main outcomes from the interactions with the speakers and the audience, and from the discussions generated by provocative voting questions at the end of each session.

Session 1 – Updates on ICES working with a special focus on Belgium's contribution

Co-chairs: Kelle Moreau (RBINS) & Sofie Vandendriessche (ILVO)

The first session of the BICEpS 2019 Colloquium 'Updates on ICES working with a special focus on Belgium's contribution' started with introductory presentations by the Belgian representatives in the ICES Council, the Advisory Committee (ACOM) and the Science Committee (SCICOM) respectively. These presentations highlighted new information from these organisational bodies and included an update on the ICES Strategic plan and information on the newly acquired UN observer status of ICES, ICES' engagement in the Arctic, the participation of ICES in science projects and the modernisation efforts in order to cope with new challenges in the advisory process. The continuing efforts to bridge the gap between ACOM and SCICOM by increasingly focusing on the steering groups (including the newly established Fisheries Resources Steering Group) as a structural basis for science and advice, also received the necessary attention. With respect to the Belgian contribution to ICES Working Groups (WGs), it was noted that both the total number of Belgian participants to ICES WGs and the number of ICES Working Groups in which Belgian representatives were active, had increased in 2019 compared to 2018.

In the next part of this session, three Belgian scientists that are currently chairing ICES WGs presented the work of 'their WG' and testified about their chairing experiences. When the public was asked whether they consider chairing of an ICES WG to be 'a piece of cake', 89% indicated that this was certainly not the case. However, 87% replied that they could see a professional benefit in serving as a chairperson, under the form of new perspectives that are presented to them when

being contacted by other scientists, organizations, advice seekers, in relation to potential new projects, linking up to other networks etc. Although they confirmed that chairing an ICES WG adds to the workload, the current chairs indeed confirmed that this activity is generally worth the effort in a career context. The response to the question whether one is willing to take up a position as chair of an ICES WG in the future was perhaps more surprising, as no less than 58% of the respondents indicated to be willing to accept the challenge, ensuring a bright future for the Belgian involvement in ICES. As such, Belgium will remain on the forefront of the ICES science and advice production.

Session 2 – Sea food production

Co-chairs: Els Torreele and Hans Polet (ILVO)

The ICES Science Plan is covered by seven interrelated priorities, which generate ecosystem and sustainability science that advances and shapes understanding of marine ecosystems and their interactions with society and climate. The 2nd session on the BICEpS Colloquium covered one of these priorities: 'Sea Food production'. Production of seafood and associated by-products supports livelihoods and business and makes an important contribution to human nutrition and health. Securing a sufficient and sustainable supply of seafood of wild-capture fisheries and aquaculture is an ongoing challenge for society and the effective development and management of these industries relies on scientific evidence.

All seven priorities in the ICES Science Plan are described by several tasks, describing how to achieve the priority. The six presentations covering this 2nd session of the BICEpS colloquium, gave all input to the seven tasks listed under this priority. Topics presented, ranged from developing and using innovative approaches for input to stock assessment and operationalization of ecosystem-based fishery management, to assessment of the carrying capacity of aquaculture, including development scenario's, risk, and benefit assessment.

Two presentations demonstrated the use of new tools for using already existing data, in a different and highly supporting scientific way. The first presentation explores the development of a business intelligence tool for fishers and evaluate the possibility of sharing this information for research purposes, while the second one demonstrated the use of an interactive fish stock assessment tool.

In the presentation about survey data, it was clearly showed that besides biological information, also a series of abiotic parameters are collected in scientific surveys: temperature, salinity, wind speed, etc. Due to the wide range of data on a diversity of species and environmental parameters, the data can be used as input for the Marine Strategy Framework Directive (MSFD), OSPAR, the ecosystem approach or research about fish adaptation to climate change. The key value of survey data lies in the fact that data are collected every year, same period of the year with the same protocol, same area. This very valuable long-time series does not only serve many ICES working groups but also acts as the backbone in diverse science projects, MSc theses and PhDs.

The presentation about the genetic structure of sole in the Irish and Celtic Sea, addressed the use of genetic data to determine the connectivity between adult and juvenile sole. Irish and Celtic Sea sole represent a distinct genetic group, identifiable at specific loci. The results point to limited connectivity between the area and adjacent waters. It allows tracing Irish and Celtic Sea sole with molecular markers. The outcome of this research showed a distinctive benefit of using genetic data to stock assessment working groups.

An economic related topic, with the link to the WGECON, was addressed in the fifth presentation where multi-ownership was analysed in the light of the characteristics and strategies that lie at the basis of the organizational structure of French Atlantic fishing firms (i.e., fishing strategy, firm management, vessel maintenance, marketing strategy, ownership structure, etc.).

The priority 'Sea Food Production' is not only about wild-capture fish, but covers aquaculture as well. First experience in Belgium were presented, showing possibilities for farming in offshore marine waters, looking into multi-use facilities in open ocean and a first pilot in the world for growing blue mussels inside the concession of windfarms in the Belgian part of the North Sea. The presentation highlighted that this kind of innovation with the correct technical developments can be become economic reality.

Prof. Nancy Nevejan: Some points to consider for exposed aquaculture. Photo credit: Lisa Devriese (ILVO)

At the end of the session, the public discussion showed clear that aquaculture is gaining in interest, and recently picked up by ICES. However, there is still some work to do to integrate the aquaculture production and its impact on the ecosystem, as well the economic interaction with wild captured fish.

Session 3 – Conservation and management science

Co-chairs: Steven Degraer and Serge Scory (RBINS)

In the third session of the 2nd BICEpS Colloquium, five presentations were grouped that related to the priority 'Conservation and management science' of the ICES Science Plan. Under this priority, it is the intention to develop tools, knowledge and evidence for conservation and management, aiming to provide more and better options to help managers set and meet balanced objectives for the use and protection of the sea. To achieve this, not only evidence and advice based on current policies and management regimes is required, but also input on the performance of management, the status of the managed environment and information to develop future approaches and policies. It is good to note that the majority of the BICEpS audience supports ICES' role as a provider of evidence-based management advice: two-thirds of the respondents (67.57%) even indicated that they consider ICES to be the best placed body to formulate such advice.

The first presentation in this session gave an impression of how ICES can provide scientific advice on the marine ecosystem to governments and international regulatory bodies that manage the North Atlantic Ocean and adjacent seas, by focusing on the OSPAR-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. It was concluded that ICES can accommodate such requests, by setting up specific workshops, bringing together the relevant experts and creating an appropriate advisory framework. Advice based on the results of hypothesis-driven research and taking into account the link between structural components and the functioning of marine ecosystems was advocated, 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.

A question to the audience, aligned with this first presentation, yielded an overwhelming result: 90% of the respondents agreed that this is a good way for ICES to work and that ICES should even increase its contribution to evidence-based management advice (OSPAR, MSFD,…). Another – more provocative – question, urged the audience to consider whether ICES' role should go even further, in the sense that ICES should amalgamate all technical OSPAR working groups. This appears to be a bridge to far, as 80% did not agree with this statement.

In the following four presentations, other concrete examples were described of how evidence base and assessment tools from very different nature and scientific disciplines add to the support for existing and potential demands for advice on conservation and management. The following subjects were discussed successively: 1) the data automatization perspective (highlighting the Eurofleets Automatic Reporting System that is developed for use on research vessels, and helps to put data and operations in a global environmental context), 2) international efforts towards a coherent and coordinated monitoring of marine mammals, 3) the application of genetic tools for the assessment of ecosystem health in the North Sea region, and 4) the interpretation of seascape-mediated patterns and processes of population differentiation to provide key information for fisheries and the conservation management of individual species, *in casu* the European seabass *Dicentrarchus labrax*.

Session 4 – Ecosystem science

Co-chairs: Kris Hostens (ILVO) and Steven Degraer (RBINS)

The 4th session of the 2nd BICEpS colloquium covered 6 presentations on the topic 'ecosystem science', one of the main scientific priorities in the ICES science Plan for the coming years. Although ICES has long been focusing on fish and fisheries, throughout the last decade it has become clear that ecosystem science is really at the basis of the ICES mission. Ecosystem science is about advancing and shaping our knowledge of the structure and functioning of the marine ecosystem, in order to increase our understanding of the interactions between the biological underwater world and the physical and chemical environment, and the interactions of humans with the sea. More than 80 % of the audience were convinced that ICES really needs to tackle this fundamental ecosystem understanding. However, only 50 % thinks that ICES science currently forms the best foundation for ecosystem advice. It is clear (>90 % votes) that we need to develop and (re-)vitalize basic and advanced marine ecosystem science within ICES, to underpin sound management of human activities and sustainable management of the marine environment.

All six presentations of this session nicely fit within one or more of the nine tasks put forward under the ecosystem science topic of the ICES Science plan, and are produced with or within one or more ICES expert groups. Actually, all presentations dealt with long term data and proved the importance of gathering and grouping different types of data in different marine ecosystems, of making these data publicly available through easy searchable databases and by means of added-value data services.

The first presentation showed that it was possible to detect decadal changes by grouping data on harmful algal events in the ICES area in the HAEDAT database, proving an important tool and essential source of information for both scientists and legislators. Similarly, the presentation on EMODnet products and the LifeWatch Species Information Backbone showed how machine learning methods are used to update our knowledge on zooplankton dynamics. Another presentation showed how old data can lead to new insights when looking at human impacts, for example the impact of Tributyltin[2] (banned in 2008) as an aggressive bottom-up stressor on growth and reproduction of *Crangon crangon*.

The presentation on marine macro- and microplastics showed the importance of harmonizing sampling and analysing protocols at national level with international standards and guidelines. Two presentations showed temporal and structural patterns and correlations between fish and changes in the marine environment, including climate change. In the modelling study on juvenile sole growth and survival in coastal nurseries, it was shown that growth rates will increase with changed climate conditions, leading to larger sizes at the end of the first growth season, but equally suggests reduced survival rates. In the presentation on long-term changes in demersal fish abundance, a combination of statistical methods and data transformations was used to highlight the most important drivers linked to climatic and anthropological stressors. As such they fit nicely within the ICES task 'Describing links between the physical and biological environment and their influence on production, biogeochemical cycles, and other ecosystem functions, and consequences for the stability and resilience of ecosystems and the services they provide', and the task 'Developing and using methods to map and predict the distribution of seabed and pelagic habitats and biodiversity and their sensitivity to environmental variation and change'.

From the public discussion at the end of the session, it is clear that ecosystem science is already picked up in different ICES expert groups, however we still have a long way to go to fully understand the marine ecosystem. Furthermore, ICES still has lots of work to do to keep track of the translation of fundamental ecosystem research into sound management advice, in close synergy with other main advisory bodies, such as EU MSFD and OSPAR.

[2] Tributyltin: A Bottom–Up Regulator of the *Crangon crangon* (Parmentier *et al.*, 2019) https://doi.org/10.3389/fmars.2019.00633

Session 5 – Cheers and Tears

Co-chairs: Sofie Vandendriessche (ILVO) & Kelle Moreau (RBINS)

The fifth and last session of the BICEpS 2019 Colloquium 'Updates on ICES working with a special focus on Belgium's contribution' was all about personal ICES experiences. The rationale was that ICES is a working environment, but one that can promote personal development. The session chair argued that ICES is also about the power of face-to-face interaction, about kindred spirits, about unbridled enthusiasm, about exploring new places and cultures and even about real friendship. The participants were challenged to reject or confirm that statement by answering questions using an anonymous voting system. The response to the statement "ICES allows people to meet face-to-face, rather than through reports, articles or e-mail", was clear: 93% confirmed that statement.

More than half of the participants confirmed that they were able to publish work through their ICES network. A few questions also referred to the travelling done to join ICES meetings: 87% of the participants confirmed that this travelling allowed them to discover wonderful locations, and 65% of the participants discovered tasty and surprising dishes and drinks during meetings and conferences. And last but not least: 71% of the participants confirmed that their ICES work resulted in one or more real friendships. All considered, we can conclude that ICES is a community in which people make discoveries and develop friendships. **In other words: it's work, but it's also fun! #ICESbelgium**

Group picture taken during the 2nd BICEPS Colloquium (2/12/2019). Photo credit: Kelle Moreau (RBINS)

PERSPECTIVES FOR BICEpS IN 2020

By strengthening the dialog among participants, BICEpS paves the way for improved collaborations of this network at national level. In 2019, the BICEpS community grew by no less than twenty percent. The second BICEpS Colloquium attracted about half new participants, including an increasing number of Belgian scientists, young researchers, policy makers and members of administrations. Discussions addressed more thoroughly a number of scientific topics and organisational issues (see the summary in the report and the abstracts in Annex 2).

The main output of the Colloquium was the enthusiasm and interest of its participants! BICEpS19 interactive sessions also revealed that talking to people is the first source of ICES news for the participants, even before ICES website! Possibly the source of their dedication, ICES meetings give to experts the opportunity to meet collaborators (even real friends!) and to publish scientific work they could never had done on their own. This shows the relevance for scientists to participate in gatherings like the Annual Science Conference (ICES ASC), or the BICEpS Colloquium on a smaller scale. We still hope Belgium may even host the ICES Annual Science Conference in a near future.

During the meeting, a bit less than half of the participants did not know the contribution of the participant sitting next to them to ICES. Even more interesting, about sixty percent of the participants indicated they knew people who could or should be involved in ICES but who are not. Chairing an ICES working group opens new perspectives: sixty percent of the participants indicated they would consider chairing and ICES group – this leave room for further mentoring activities among BICEpS community to get ready to do the job!

Altogether, I believe the common contribution of the BICEpS community to ICES has the potential to make a difference beyond the Belgian borders at a time where marine scientific advice produced by ICES is growing in diversity with the development of the blue economy and the full implementation of ecosystem-based management. We engage to continue sharing BICEpS outputs with the ICES Secretariat and to keep the momentum set by all of us.

In 2020, we will further work on the definition of BICEpS vision, mission and recurrent activities. We remind members to keep us informed about their contributions to ICES and encourage them to complete or update their Mini C.V. Any of their ICES-related work can be shared by e-mail with the BICEpS secretariat to feed future Newsletters, and social media posts. We are also happy to announce that the next annual BICEpS Colloquium will be organized in Autumn 2019 at RBINS in Brussels.

By the time of drafting the prospects for 2020, we unfortunately were hit by the Covid-19 crisis. Aside of the many challenges to one's personal life, it will also turn BICEpS plans for 2020 upside down but should not halt its activities! The BICEpS SC is currently working on an alternative for the Colloquium and is setting up a mentoring programme. More about this in Autumn in our next newsletter and on Twitter with the hashtag #ICESBelgium!

Serge Scory,

Royal Belgian Institute of Natural Sciences,

Belgian delegate to ICES Council

ANNEX 1: PROGRAMME OF BICEpS19

Second BICEpS Colloquium 2/12/2019, ILVO, VAC - Ghent

9:00 Welcome coffee

9:30 Introduction to the day and the technics for the interactions (voting system)

9:40 **Session 1: Updates on ICES working with a special focus on Belgium's contribution**

Co-chairs: Kelle Moreau (RBINS) and Sofie Vandendriessche (ILVO)

Latest news from ICES Council and feedback on BICEpS initiative *(Hans Polet, ILVO, ICES Council representative & Marianne Schlesser, RBINS)*

Good to know from ACOM *(Els Torreele, ILVO, ACOM representative)*

Some thoughts from a SCICOM representative *(Steven Degraer, RBINS, SCICOM representative)*
How much is Belgium involved? Pitch testimonies from chairs of ICES working groups

- ✓ **WGMEDS** – *Sven Sebastian Uhlmann (ILVO):* How discard survival research is shaping European policy?
- ✓ **WGFBIT** – *Gert Van Hoey (ILVO):* Trading off benthic impacts and fisheries through integrative modelling
- ✓ **WGCSE** – *Sofie Nimmegeers (ILVO):* The Working Group for the Celtic Seas Ecoregion: Drafting advice for 40 demersal stocks across the Celtic Seas Ecoregion

10:45 Coffee break

11:15 **Session 2: Sea food production**
Generate evidence and advice for management of wild-capture fisheries and aquaculture — to help sustain safe and sufficient seafood supplies

Co-chairs: Els Torreele and Hans Polet (ILVO)

VISTools - Fishing vessels as automatic data-gathering platforms – a win-win for fishers and scientists *(Lancelot Blondeel, ILVO)*

Scientific surveys: the backbone to fisheries science *(Lies Vansteenbrugge, ILVO)*

Some points to consider for exposed aquaculture: first experiences in Belgium - WGOOA *(Nancy Nevejan, Ghent)*

Hackaton: An interactive fish stock assessment tool *(Kevin Decoster, ILVO)*

Understanding vessel ownership and firm organization in French Atlantic fisheries: a typology *(Arne Kinds, IFREMER/Ghent University/ILVO)*

Genetic structure of sole in the Irish and Celtic Sea *(Filip Volckaert, KU Leuven)*

12:25 Lunch

13:30 **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

Co-chairs: Steven Degraer and Serge Scory (RBINS)

Providing ICES advice to OSPAR – an impression of the process *(Jan Vanaverbeke & Bob Rumes, RBINS)*

Highlighting EARS: putting data and operations in the global environmental context *(Thomas Vandenberghe, RBINS)*
Towards a coherent and coordinated monitoring of marine mammals? *(Jan Haelters, RBINS)*

Genetic tool for Ecosystem health Assessment in the North Sea region – the GEANS project *(Annelies De Backer, ILVO)*

Seascape-mediated patterns and processes of population differentiation in European seabass *(Pascal Hablützel, KU Leuven & VLIZ)*

14:30 Session 4: Ecosystem science

Advance and shape understanding of the structure, function and dynamics of marine ecosystems — to develop and vitalize marine science and underpin its applications

Co-chairs: Kris Hostens (ILVO) and Steven Degraer (RBINS)

Decadal changes in harmful algal events from the ICES area found in the HAEDAT database *(Maarten De Rijcke, VLIZ)*

The fate of juvenile sole growth and survival in coastal nurseries under climate change scenarios *(Geneviève Lacroix, RBINS)*

Marine plastics: aligning national research and monitoring with international guidelines *(Bavo De Witte, ILVO)*

Long-term changes in demersal fish abundance and distribution in the Belgian part of the North Sea *(Jolien Buyse, ILVO)*

Tributyltin: an aggressive bottom-up stressor in a marine multistressor environment. A quality status report *(Koen Parmentier, RBINS)*

Towards open science products for ecosystem science *(Lennert Schepers & Lennert Tyberghein, VLIZ)*

15:40 Session 5: Cheers & Tears

An opportunity to network, share souvenirs and pictures, learn anecdotes on our work with ICES and let know your expectations for future BICEpS activities

Co-chairs: Sofie Vandendriessche (ILVO) and Kelle Moreau (RBINS)

What do cheers and tears have to do with ICES, which is all about work, right? Well, it's not! ICES is also about the power of face-to-face interaction, about kindred spirits, about unbridled enthusiasm, about exploring new places and cultures and even about real friendship! Do you think this is a load of sentimental crap? Let's find out during this final session.

Interactive social session with the participants and group picture

16:30 Wrap-up of the day and closing remarks

Serge Scory (RBINS, ICES Council representative)

16:45 End of the day

ANNEX 2: ABSTRACTS OF BICEpS19

BICEpS Colloquium - An opportunity to share Belgian contributions to, and experiences with ICES as an inspiration for future work
2 December 2019 (ILVO, Ghent)

The abstracts of the second BICEpS colloquium are supplemented by a separate online annex[3] which assembles the PowerPoint presentations of the meeting.

Session 1: Updates on ICES working with a special focus on Belgium's contribution

(1) Latest news from ICES Council and feedback on BICEpS initiative

Hans Polet[1] (ILVO, ICES Council representative) and **Marianne Schlesser**[2] (RBINS)

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ICES Council meeting: Every year, in October, ICES holds its council meeting with two delegates of each member country attending. An update on the ICES Strategic plan has been given with, amongst others, the status on the UN observer status of ICES, ICES' engagement in the Arctic and participation of ICES in science projects. The financial status has been reviewed and strategic decisions have been taken to modernise ICES in order to cope with new challenges in the advisory process, using ICES' equity financial reserve. Furthermore, an update has been given on the advisory and science plan, plans for the ASC, Data and Information Services and the ICES CO2 footprint.

BICEpS Initiative: Even though the activities of BICEpS are just at the start, the initiative has already raised interest in other Member States. The BICEpS community encompasses Belgian scientists involved in the work of ICES, contact persons in marine research institutions and universities and a few policy makers, totalling now about a hundred persons. Launched in November 2018, the aim of the initiative is to offer a platform to get to know each other, to improve collaborations and to share information, and to promote ICES to the wider scientific community in Belgium. The presentation will give an overview of the diversity of topics where we are active and those we are not and shed light on newly nominated experts. We will come back to the ideas identified during the brainstorming session of the 2018 BICEpS colloquium and priority actions. Since then, a website hosted by ICES has been created. It serves as a central node for information for our community. There, you can find the annual report of activities, announcement of our activities, the newsletter and soon, a compilation of mini CV's of our experts. At the end of 2018, a reflection was initiated on the opportunity for Belgium to take her turn in hosting the ICES Annual Science Conference. The group will also be invited to position himself on this opportunity. No doubt the 2019 edition of the colloquium will raise new ideas, set priorities and get more researchers in ICES sphere!

(2) Good to know from ACOM – ICES Advisory Committee

Els Torreele[1] (ACOM representative)

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The **Advisory Committee (ACOM)** translates ICES science into advice on the sustainable use and protection of marine ecosystems. All advice produced is based on the precautionary principle and the ecosystem approach, and is reached by consensus. During 2018, ICES gave advice

[3] http://ices.dk/community/groups/Pages/BICEps.aspx

on fishing opportunities for 224 stocks, which represents approximately 90% of all fish catches in the North East Atlantic and Baltic Sea. 38 special requests & 9 technical request were additionally taken in by ICES, on impact of fisheries, in-year advice of fishing opportunities, F_{msy} ranges, MSFD guidance, pressures and impact on bycatch, mixed fisheries, fishing footprints, data quality, MSFD, VMEs&MPAs, biodiversity, etc. Additionally, 45 Advice Drafting Groups (ADG) and 51 ACOM WebEx took place. The ADG attendance has improved in 2018, mostly due to the new development of allocating nations to ADGs. Communication between the expert groups and ADGs is seen to be a perennial issue that could still be improved.

In 2019, a discussion started within ACOM, different from past ones aiming at the creation of a framework for ecosystem advice, not fisheries advice but advice that concerns the whole picture and has a fisheries part. Assessing the impact of the implementation of the advice becomes clearer when considering that this framework will be used to advise on management of human activities. Presenting ecosystem risks and trade-offs to management is different to including ecosystem parts into fisheries advice.

The new ICES Strategic Plan consists of a Science Plan and an Advice Plan. The Advice Plan has the objective to translate the knowledge created on science. ICES advice aims to **effectively meet** societal needs based on credibility, legitimacy, trust & transparency, quality and relevancy & reachability. For the new Advice Plan, six priority areas are proposed: assuring quality, incorporating innovation, profiling benefits, sharing advice, evolving advice and revealing needs.

The key areas to be further developed on the short term for ACOM are:

Mixed-fisheries and multi-species: the work on mixed fisheries is an important direction for ICES and is progressing.

Fisheries and Ecosystem Overviews new Fisheries and Ecosystem Overviews need to be highlighted further to show how important these are to the stakeholders. A clearer direction for the Ecosystem Overviews is needed, whilst the Fisheries Overviews are more on track.

Benchmarks, ADGs and guidelines. The importance of the benchmark system is fundamental to ACOM. There are still difficulties in explaining the big changes in advice after a benchmark and this needs to be properly addressed. ICES need to work further on the technical guidelines, particularly concerning what is a rule and what is a guideline.

The ICES community: there is a need to train new alternates to support a national ACOM member. This requires the investment of considerable time and it is not always evident to find experts willing to become alternates, as there is quite some workload required for an alternate, as well.

(3) Some thoughts from a SCICOM representative

Steven Degraer[1] (SCICOM representative)

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E-mail: steven.degraer@naturalsciences.be

Attending ICES Scientific Committee (SCICOM) meetings always makes me start reflecting on the diversity of ICES; this from a content point of view but not surprisingly even more so from a participant point of view. With more than 5000 scientists from over 700 marine institutes in 20 member countries and beyond allocated to 200+ expert groups and committees, ICES unites a huge diversity in expertise, expectations and viewpoints. You can hence imagine it is quite a challenge to overview ICES' complexity and grasp it with both hands, but that is exactly what SCICOM tries to achieve. Questions like how to best integrate all that into a logic Science Plan without losing focus on the ICES Mission, how to best organise an Annual Science Conference that is appealing to the whole community, how to stimulate interest and particularly participation in what we are doing, how to balance the top-down advice-oriented and the unrestrained bottom-up workload of expert groups, how to balance fisheries and wider ecosystem-level work, how to position the Community in the international science, management and policy landscape,… are all fundamental to SCICOM's work. Worth some further consideration, I would say, and that is exactly what I want to share with you…

(4) Working Group on Methods for Estimating Discard Survival (WGMEDS): How discard survival research is shaping European policy?

Sven Sebastian Uhlmann[1] and Noémi Van Bogaert[1]

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With the phasing in of the Landing Obligation law between 2015 and 2019, and its exemption rule of "high survival", a need was established for stakeholders to scientifically demonstrate whether any species that is commercially caught-and-discarded stands a chance to survive this process. To guide practitioners in the field with collecting data, an ICES workshop (now working group, WGMEDS) was set up upon request by the European Commission. Since 2015, exemptions are being put forward by member states, judged and put into legislation within discard plans and delegated acts. How does this matter for European fisheries management?

Work related to ICES via WGMEDS (Working Group on Methods for Estimating Discard Survival)

(5) Working Group on Fisheries Benthic Impact and Trade-offs (WGFBIT): Trading off benthic impacts and fisheries through integrative modelling

Gert Van Hoey[1] and Jochen Depestele[1]

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For striving towards a more sustainable fishery, one of the major challenges, i.e. flatfish-directed beam trawling, is to comply to the requirements to achieve Good Environmental Status (GES) of the seafloor (D6, seafloor integrity), as defined in the Marine Strategy Framework Directive (MSFD D6 on Seafloor integrity). Potential fisheries measures to achieve GES of the seafloor may include gear-based technical measures (e.g. alternative catch stimulation, less-bottom contacting gear components), habitat quota regulation or spatial management measures. The assessment of the effectiveness of management scenarios requires both a quantitative assessment framework to assess the benthic impact of bottom-contacting fishing gears as well as an approach to evaluate the impact on the fisheries.

A quantitative framework to assess benthic impact by bottom-contacting fishing gears was developed in the EU BENTHIS project and further developed in the ICES Workshops WKBENTH, WKTRADE and WKSTAKE and working group FBIT (2018 onwards). Three main components are taken into account: fishing pressure (footprint) and benthic habitat sensitivity. Fishing pressure is assessed on a fine-scale spatial grid (0.05 by 0.05 degrees). Pressure is estimated from the fishing effort (swept area ratio) in combination with abrasion (characterised by penetration depth). Penetration depth directly relates to benthic mortality which is combined with community recovery potential (based on longevity or population dynamics). The resulting benthic impact is characterised by a change in the relative benthic state. The assessment framework is developed for four generic gear groups, including beam trawls.

The quantitative framework of the FBIT tool is developed from a biological perspective. The trade-off between the protection of benthic communities with fisheries, however, necessitates the effect of these management measures on the fisheries itself. The trade-off is currently based on the assumption that most fishing effort is located in the most profitable areas. The 'value of an area to fisheries' is therefore based on swept area ratio as a approximate indicator. The ICES workshop WKTRADE2 has suggested a series of social and particular economic factors to improve this estimate, as well as a series of predictive (bio-economic) modelling approaches (dynamic or static) that take the displacement of fishing activities into account following fishing measures and how these may affect both benthic communities as well as the fisheries itself through feedback loops in the long term. These scientific approaches may be complemented with stakeholder engagement processes. The assessment of the socio-economic value of areas to fisheries is currently developing.

Work related to ICES via **WGFBIT, co-chaired by Gert Van Hoey** (ILVO, B), Tobias Van Kooten (WMR, NL) and Ole Eigaard (DTU, DK) **WKTRADE2, co-chaired by Jochen Depestele** (ILVO, B) and François Bastardie (DTU, DK)

(6) Working Group for the Celtic Seas Ecoregion (WGCSE): Drafting advice for 40 demersal stocks across the Celtic Seas Ecoregion.

Sofie Nimmegeers, Bart Vanelslander, Lies Vansteenbrugge

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The submitted abstract is related to the ICES Working Group for the Celtic Seas Ecoregion (WGCSE). Belgian fisheries data are submitted by ILVO to the WGCSE and other assessment working groups (WGNSSK, WGBIE, HAWG, WGEF). The WGCSE is yearly attended by ILVO where we conduct the assessment of 2 sole stocks. Moreover, for the period 2019-2021, **Sofie Nimmegeers** (ILVO) **is co-chair for WGCSE**. In this abstract, the advice drafting process is clarified.

The Common Fisheries Policy (CFP) is the EU policy for managing EU fishing fleets and for conserving fish stocks. This management relies on data collected and supplied by EU countries under the Data Collection Framework (DCF). For Belgium, the ILVO Fisheries Biology unit is responsible for collecting these data, which include age and length composition of the catch sampled by observers at sea onboard commercial vessels, data on fish landings and fishing effort, etc.

ILVO provides the Belgian data to several ICES expert groups (i.a. WGCSE) where they are used in stock assessments. Besides experts from Belgium, also France, Ireland, the Russian Federation and the UK have scientific representatives in the WGCSE. These ICES scientists compile the national data to investigate the size and condition of the fish stocks and their exploitation patterns.

This allows them to forecast catches and evaluate the stock status against reference points to formulate advice following the maximum sustainable yield (MSY) principle. For stocks with a limited amount of data, precautionary advice on future fishing opportunities is provided.

The WGCSE is tasked to update fisheries data and assessments, and to draft advice for 40 demersal stocks across ICES subareas 6 and 7. Among these stocks there are gadoid species (cod, haddock, whiting, saithe and pollack), flatfish (sole, plaice and megrim), Norway lobster, sea bass and anglerfish.

Of the 40 stocks assessed, 13 had an unknown status and approximately 60% met the MSY targets (fishing mortality and spawning stock biomass) in 2019.

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Session 2: Sea food production

Generate evidence and advice for management of wild-capture fisheries and aquaculture — to help sustain safe and sufficient seafood supplies

(7) VISTools - Fishing vessels as automatic data-gathering platforms – a win-win for fishers and scientists

Lancelot Blondeel[1], Pedro Rappé, Brahim Al Farisi, Wim Allegaert

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A skipper of a fishing vessel has access to various sources of information that help him manage his work. Sensors track the location (e.g., GPS/VMS), monitor any fishing activity (e.g., towing force, depth), fuel use and register landed catch (i.e., via an electronic weighing scale). These sensors gather valuable data, but none of that are of any use, if data are not integrated, stored or processed.

By automating data collection from conventional equipment on-board and coupling this information with economic parameters (e.g. fish prices and fuel prices), the VISTools-project aims to (1) develop a business intelligence tool for fishers and (2) evaluate the possibility of sharing this information for research purposes. With this approach, we hope fishers gain new insight in the economic performance of their fishery. This could trigger behavioural changes that increase the efficiency of the vessel and simultaneously reduce the impact on the environment. Additionally, the business intelligence tool incentivizes fishers to keep gathering information that have great scientific relevance, and share this information under clearly defined conditions. This data could open new research possibilities including catch prediction models, decision support tools, avoidance of sensitive areas, and real time closures. This high resolution of spatial information can also lead to better advice to fisheries management and governmental bodies (e.g., real time monitoring of quota usage).

The first results of this project have led to the development of a proof-of-concept business intelligence tool that logs the landings of a single test vessel and automatically tracks economic performance. With this tool, a vessel owner can evaluate the economic performance and catches of a vessel at haul level. Since all sensor data have a geographic component, all landings data can be tracked to a certain location and provide insights in the economic performance of the fishing grounds (heat map). The six months' worth of data have already proven to provide interesting insights for the skippers and vessel owner, and is very promising for scientific research.

Work related to ICES via WK SCINDI (Workshop on Science with Industry Initiatives)

(8) Scientific surveys: the backbone to fisheries science

Loes Vandecasteele[1] and **Lies Vansteenbrugge**[1]

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Within the EU Data Collection Framework, Belgium is responsible for 2 scientific surveys, both supported by ICES: the Belgian beam trawl survey (BTS) and the demersal young fish survey (DYFS). The surveys occur in the third quarter and serve as a data gathering platform to increase knowledge on the marine ecosystem.

During the BTS, 62 stations are sampled along the south-east coast of the UK by RV Belgica. The initial purpose of this survey is to monitor trends in demersal fish stocks, especially sole (Solea solea) and plaice (Pleuronectes platessa) by collecting information on length, weight, age, sex and maturity. The Belgian BTS survey index is used in the assessments of both North Sea sole and plaice. However, all fish species are weighted and measured and since 2009 also epi-benthos is collected, counted and weighted by species. Since 2011, marine litter is collected, categorized and weighted and this data is supplied to OSPAR and WGML.

The DYFS is concentrated in the Belgian Part of the North Sea where 33 stations are sampled by RV Simon Stevin. The purpose is to monitor trends in mainly juvenile flatfish such as sole (Solea solea), plaice (Pleuronectes platessa), dab (Limanda limanda) and round fish such as whiting (Merlangius merlangus) and brown shrimp (Crangon crangon). Catch numbers are used as input for the assessments of both North Sea sole and plaice. Since 2018 also age information of sole and plaice is collected. Since 2018, marine litter is collected, categorized and weighted.

Besides biological information, also a series of abiotic parameters are collected in both surveys: temperature, salinity, wind speed, etc. Due to the wide range of data on a diversity of species and environmental parameters, the

data can be used as input for the Marine Strategy Framework Directive (MSFD), OSPAR, the ecosystem approach or research about fish adaptation to climate change.

The key value of survey data lies in the fact that data are collected every year, same period of the year with the same protocol, same area. This very valuable long-time series does not only serve many ICES working groups but also acts as the backbone in diverse science projects (e.g. EMFF project IRIS2, Pulsvisserij Vlaamse Kust Deel 1, Marine Litter), MSc theses and PhDs.

Work related to ICES via SCICOM, ACOM, EOSG, WGBEAM, WGNSSK, WGISDAA, WGISUR, DATRAS, WGCRAN, PGDATA, WGBIOP, WKREO, WKBECOSS, WKPETSAMP, WKSHARK, WGEF, WGCSE, WGDG, WKICDAT, WGTIFD, WGBYC, WGMEDS, WGML.

(9) Some points to consider for exposed aquaculture: first experiences in Belgium

Nancy Nevejan[1]

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Marine aquaculture presents an opportunity for increasing seafood production in the face of growing demand for marine protein and limited scope for expanding wild fishery harvest. With the convergence of environmental and aesthetic concerns, aquaculture, which was already competing for space with other more established and accepted uses, is having an increasingly difficult time expanding in nearshore waters. Farming in offshore marine waters has been identified as one potential option for increasing seafood production and has been a focus of international attention for more than a decade. Investment in robust technologies and investigation in system designs for high energy environments has started but is still in its infancy. Despite the technical challenges for farming in the hostile open ocean environment, there is sufficient rational for pursuing the development of offshore farming.

When mapping the existing human uses, the ocean is a crowed place. Therefore, it is worthwhile to explore possibilities for co-location of facilities, like in this case wind turbines and shellfish farms. Although not obvious, one benefit to be gained is the reduction of the overall footprint of human uses in the ocean. Meeting challenges of multi-use facilities in the open ocean definitely requires innovation. The concept is intriguing however and is consistent with the goals of the Belgian Marine Spatial Plan (2020-2026).

The project “Edulis” (FIVA/EFMZV 16/UP2/05/Aqua) was the first pilot in the world to explore the possibilities to grow blue mussels inside the concession of windfarms in the Belgian part of the North Sea. It was coordinated by Ghent University and involved partners from the private and public sector. Besides the technical challenges, possible synergies were looked at between the production of sustainable seafood and renewable energy as well as the economic reality to grow seafood under exposed conditions in windfarms.

Work related to ICES via WGOOA (newly created Working Group on Open Ocean Aquaculture)

(10) Hakaton: An interactive fish stock assessment tool

Kevin Decoster[1]

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Built as a web application, the interactive fish stock assessment displays a map and allows the user to choose the fish species and the timeline. Once these are chosen, the advice for that time will display with a traffic light system, by displaying an area as green, orange, or red. If there are many years of data available, the data series can be displayed as an animation. If the user clicks on a certain stock, the data that the advice is based on appears. The tool is based on ICES advice, and the user could link through to the actual advice or the Advice drafting group report if they wanted more information.

(11) Understanding vessel ownership and firm organization in French Atlantic fisheries: a typology

Arne Kinds[1,2,3], Olivier Guyader[1], Pascal Le Floc’h[1]

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The European fishing industry is largely perceived as existing of a multitude of individually owned, locally operated fishing vessels, despite growing evidence of concentration through vertical integration and companies

owning fishing vessels across multiple Member States. The drivers behind capital accumulation and concentration in the fishing sector remain poorly understood, however. Most studies on investment behaviour have looked at entry and exit of vessels from two angles. First, they consider that investment decisions depend on current economic incentives (e.g., anticipated levels of returns, current profits, stock-dependent costs of harvesting). Second, they consider that changes in the regulatory environment may shift these economic incentives, causing new investment patterns. Widely studied examples of such changes are government interventions aimed at reducing excess capacity: subsidies, buyback programs and access regulations. However, reducing this question to a matter of investment behaviour is limiting, and it has been suggested that the organizational structure of fishing firms must be taken into account to better understand the strategies behind vertical integration and the investment in multiple fishing vessels. In this paper, we analyse multi-ownership in the light of the characteristics and strategies that lie at the basis of the organizational structure of French Atlantic fishing firms (i.e., fishing strategy, firm management, vessel maintenance, marketing strategy, ownership structure, etc.). Research questions include: (1) which organizational forms exist (and co-exist) today in the French Atlantic fishing sector (2) what defines them, (3) how did they emerge and (4) what can be expected from them in the future (in terms of their evolution and persistence). A typology was constructed based on 80 semi-structured interviews with vessel owners along the French Atlantic coast, in which both qualitative and quantitative information was collected. Multiple Correspondence Analysis (MCA) in combination with hierarchical clustering was used to construct the typology.

Work related to ICES via WGECON (Working Group on Economics)

(12) Genetic structure of sole in the Irish and Celtic Sea

Sophie Delerue-Ricard[1,2], Loes Van de Casteele[2], Gregory Maes[1,3], Henrik Christiansen[1], Hans Polet[2] and **Filip A.M. Volckaert**[1]

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Sole (*Solea solea*) is a species with a complex life cycle evolving between the spawning grounds where adults release gametes, nursery grounds where juveniles settle and metamorphose, and feeding grounds were (sub)adults feed. Spawning stock biomass in the Irish Sea (ICES area 7a) and Celtic Sea-Bristol Channel (ICES area 7g) has reached an all time low leading to concerns for its recruitment and future viability. We address here the connectivity of adult and juvenile sole based on an intensive sampling campaign between 2003 to 2009 (adults) and 2016 (juveniles). Fish were genotyped either with 426 gene-linked single nucleotide polymorphisms or with 5000 Single Nucleotide Polymorphisms (SNPS) obtained through ddRAD (double digest Restriction site Associated DNA markers) sequencing. Irish and Celtic Sea sole represent a distinct genetic group, identifiable at specific loci. The results point to limited connectivity between the area and adjacent waters. It allows to trace Irish and Celtic Sea sole with molecular markers. In addition, juveniles of Liverpool Bay, Cardigan Bay and Bristol Channel represent distinct subpopulations, again pointing to restricted gene flow within the area, linked to 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 (WGNSSK).

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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 Benthal 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 Benthal 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)

Annelies De Backer[1] and GEANS consortium

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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
2. To implement standardised genetic tools and SOPs in routine biological assessments
3. To develop a framework to apply and implement DNA-based tools in policy and transnational management of the NSR.

To this end, field pilots have been set-up to clearly demonstrate the benefits and/or added value of DNAbased methods and to validate the SOPs. The final output integrating all outputs will be a decision support framework for application of genetic tools in routine biological monitoring, and implementation of the outputs in ecosystem health assessment in support of policy and transnational management. ICES has endorsed this project at the start as they see a clear advancement into the

current benthic monitoring for seafloor ecosystems. Furthermore, the ICES network can be used to further spread the developed methods by for instance publishing the SOPs in the ICES TIMES series in which state-of the-art description of methods and procedures relating to chemical and biological measurements in the marine environment are presented.

Work related to ICES via:

- WGEXT (Working Group on the Effects of Extraction of Marine Sediments on the Marine Ecosystem);
- BEWG (Benthos Ecology Working Group);
- WGIMT (Working Group on Integrated Morphological and Molecular Taxonomy).

(17) Seascape-mediated patterns and processes of population differentiation in European seabass

Jasmien E. J. Hillen[a]*, **Pascal I. Hablützel**[a,b]*, Gregory E. Maes[a,c,k], Koen Herten[c], Bart Hellemans[a], Anurag Chaturvedi[a], Rob Ogden[d], Martin I. Taylor[e], Francesco Maroso[f], Dorothy Verheyden[a], Giulia Cambiè[g], Konstantinos Gkagkavouzis[h], Alexander Triantafyllidis[h], Sabina De Innocentiis[i], Aquatrace Consortium, Ilaria Coscia[a,j] and Filip A. M. Volckaert[a]

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Identifying biologically relevant levels of population structure and demographically independent populations is imperative for sustainable fisheries management but challenging because of high levels of gene flow and large population sizes leading to weak genetic structure. However, increasingly good access to genome-wide variation and architecture have facilitated accurate determination of fine scale genetic population structure. Here, we studied the population structure of European seabass (Dicentrarchus labrax L.), a commercially exploited and farmed fish with high dispersal capacity. In addition, we examined the influence of geographic distance and abiotic environmental variables on the observed genetic structure with a seascape genomics approach. Seabass showed a largely panmictic pattern within the Atlantic Ocean, whereas several genetic clusters were distinguished within the Mediterranean Sea based on 2,549 SNP markers genotyped using ddRAD (Restriction site Associated DNA markers) sequencing. Introgression of Atlantic alleles was detected throughout the western Mediterranean Sea, but introgression of Mediterranean alleles was only found in a restricted area in the Atlantic Ocean off the Strait of Gibraltar. Seascape analysis suggested that genetic population structure is mediated by both dispersal limitation and environmental gradients, indicating local adaptation. As such the study provides key information for fisheries and conservation management of European seabass.

Work related to ICES via WKBASS (the benchmark Workshop on Seabass).

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Session 4: Ecosystem science

Advance and shape understanding of the structure, function and dynamics of marine ecosystems — to develop and vitalize marine science and underpin its applications

(18) Decadal changes in harmful algal events from the ICES area found in the HAEDAT database

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Scientists and aquaculturists alike are worried about an apparent increase in the size, frequency and global distribution of harmful algal blooms (HABs). Studies have shown that multiple anthropogenic pressures such as overfishing, eutrophication and global transport could interact with climate change to promote or enhance HAB occurrences. Yet, to date, it is unclear whether observed changes in HAB abundances should be attributed to environmental change or increased vigilance through improved monitoring programs. To enhance our understanding of these natural phenomena, the International Council for the Exploration of the Sea (ICES) - Intergovernmental Oceanographic Commission of UNESCO (IOC) Working Group on Harmful Algal Bloom Dynamics (WGHABD) has entered HAB-data into the Harmful Algal Event (HAEDAT) database for the last 20 years. Contained within are (only) harmful algal events that result in management actions with economic impact – such as closures of shellfish areas or touristic beaches – and events which had clear negative environmental impacts like mortality of marine organisms. These data, collected mainly from routine monitoring programmes, provide a wealth of information that is not routinely accessible for scientific assessment. Based on HAEDAT, the WGHABD is producing a HAB status report on all HAB events in the ICES area, which will contribute to the Global HAB Status report of IOC-UNESCO's intergovernmental panel on Harmful Algal Blooms (IPHAB). The HAEDAT data reveal that changes in the regional distribution of harmful algal events in the North Atlantic area have occurred over the past decades. On the east coast of the USA and Canada, the majority of issues have been caused by paralytic and amnesic shellfish toxins. In contrast, diarrhetic shellfish toxins was the dominant cause of problems in Europe while cyanobacteria events were restricted to the Baltic. Fish mortality – be it farmed or wild – appears to be uncommon within the ICES area, though some instances have been recorded. Overall, HAEDAT provides an essential source of information to legislators and scientists alike. In recent years, Flanders Marine Institute (VLIZ) ensured that the Belgian contribution to HAEDAT is up to date and promoted the use of this tool to several local stakeholders.

Work related to ICES via the WGHABD (the ICES - IOC Working Group on Harmful Algal Bloom Dynamics).

(19) The fate of juvenile sole growth and survival in coastal nurseries under climate change scenarios

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This study shows the effect of climate change on the growth and survival of juvenile common sole (Solea solea) in different nursery areas in the North Sea. The climate change scenarios tested are are based on IPCC scenario for 2040. Two climate change scenarios are used, one with only abiotic changes and one with also a climate driven timing of spawning. Comparisons are done between a baseline scenario, with current conditions, and the two climate change scenarios, for multiple years and multiple nursery areas.
Under climate change conditions the early arrival of fish larvae in their nurseries results in larger young of the year at the end of summer, but the initially slow growth, despite warmer winter and spring temperatures, causes higher mortality for early arrivals. The combination of arrival densities and arrival day determines which nursery has the highest absolute numbers surviving. Overall, under climate change conditions juveniles have increased growth rates leading to larger size at the end of the first growth season yet reduced survival.

Work related to ICES via WGIPEM (the Working Group on Integrative, Physical-biological and Ecosystem Modelling).

(20) Marine plastics: aligning national research and monitoring with international guidelines

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The project Marine Plastics, funded by the European Maritime and Fisheries Fund (EFMZV), focuses on the presence of litter at the Belgian fisheries areas and the Belgian Part of the North Sea (BPNS), comprising both macro- and microlitter. Within the part on macrolitter, the main goals are to assess the presence of seabed litter at the Belgian fisheries areas, to identify impact of specific anthropogenic sources and to detect time trends in litter pollution. The part on microlitter concerns the identification of microplastics in seafood and the initiation of a Belgian monitoring approach for microplastics in seawater and sediment of the BPNS, in accordance with MSFD descriptor 10.

Many standardization issues remain. Macrolitter data collection and reporting differs between EU countries, the use of different gears for macrolitter sampling highly effects the extraction efficiency, there is a lack of standardization of macrolitter data assessment. The same range of issues, and even more, have to be clarified before a harmonized approach for microlitter monitoring and evaluation is reached. Which methods should be applied for microplastics sampling, separation, detection, identification and reporting? What size range and classes should be considered? What quality measures should be taken and how can we align international monitoring laboratories?

The interaction with the ICES working group on marine litter and microplastics (WGML) is of primary importance for the Marine Plastics project. WGML data assessments on international macrolitter datasets, collected within the International Bottom Trawl Surveys (IBTS) and Beam Trawl Surveys (BTS), influence the Marine Plastics project assessment approach, as similar statistical methods can be used. Vice versa, Belgian data has a unique value since marine litter is collected with the same fishing gear on a large area within the Belgian BTS. Besides the BTS, a second unique dataset is obtained within Belgian environmental monitoring at the BPNS. The latter has a large sampling density in an area with many human activities.

For microplastic research, the interaction with ICES WGML is also essential, as method alignment, standardization and quality assurance for monitoring purposes are key issues of this working group. Currently, methods for microlitter monitoring are not yet fixed and it will be a big challenge to align protocols between different EU member states in order to reach comparable results for MSFD descriptor 10. The active role of Belgian researchers at ICES WGML ensures that the Marine Plastic project is in accordance with newest guidelines and state-of-the-art protocols. Finally, the Marine Plastics project will provide the first integrated environmental monitoring assessment for microplastics in Belgium. This will be the necessary knowledge base for follow-up processes and actions by policy makers, the blue economy and the marine experts.

Work related to ICES via WGML (the Working Group on Marine Litter).

(21) Long-term changes in demersal fish abundance and distribution in the Belgian part of the North Sea

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Climate change and other anthropological influences such as fisheries have long-term effects on fish abundance and distribution. To study the combined effects of these stressors on demersal fish species in the Belgian part of the North Sea, autumn beam trawl survey data from 1985-2018 were analysed. Common trends in fish density over time were identified for the most important species using complementary multivariate techniques and linked to environmental variables. Further, changes in abundances of singular species were analysed using univariate linear models, which can explain patterns over time by the addition of explanatory variables to the models. Lastly, changes in length over time were also modelled for commercially interesting species. Using such a combination of different methods and data gives a good general overview of the most important drivers of local fish abundances linked to climatic and anthropological stressors. Information about such drivers are key for better understanding the marine environment and thereby influencing policy in terms of fisheries management and climate change mitigation.

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

(22) Tributyltin: an aggressive bottom-up stressor in a marine multistressor environment. A quality status report

Koen Parmentier,[1,2] Yves Verhaegen,[1,3], Bavo De Witte,[1] Daan Delbare,[1] Stefan Hoffman,[1] Patrick Roose,[2] Ketil Hylland,[4] Thierry Burgeot,[5] Guy Smagghe,[3] Kris Cooreman[1]

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The restrictions and the concerted action of the global ban on the use and presence of tributyltin (TBT) in marine applications to protect ecosystems in the marine environment in 2008 was mainly based on the economic impact on shellfish industries and the dramatic extinction of local mollusc populations in the past. In contrast to the vast datasets on effects on molluscs, the knowledge on impacts on species from other taxa remained in the uncertain until almost two decades ago. The assumption on a long-term TBT-mediated pernicious metabolic bottom–up regulation of the crustacean *Crangon crangon* population was provoked by the outcome of an EU-project 'Sources, Consumer Exposure and Risks of Organotin Contamination in Seafood.' This work reports high TBT body burdens in *C. crangon* in 2003, at the start of the transition period to the global ban. Experimental research on the TBT impact in *C. crangon* focused on agonistic interference with natural ecdysteroid hormones at the metabolic pathways regulating growth and reproduction and the biogeochemical distribution of the chemical. Metabolic, topical and population-relevant biological endpoints in *C. crangon* and other crustaceans are evaluated in relation to the temporal and spatial trends on TBT's occurrence and distribution in the field during and after the introduction of the tributyltin restrictions and endocrine-related incidents. Arguments are forwarded to relate the German Bight incident on growth and reproduction failure in the *C. crangon* population, despite the lack of direct evidence, to the pernicious impact of tributyltin in 1990/91 and previous years. The extreme occurrence of TBT in *C. crangon* from other parts of the southern North Sea and evidence on the high body burdens as dose metrics of exposure also feeds the suspicion on detrimental impacts in those areas. We further demonstrate the complexity of distinguishing and assessing the individual roles of unrelated stressors on a population in an integrated evaluation at the ecosystem level.

The Marine Chemistry Working Group **(MCWG) is chaired by Koen Parmentier** (RBINS). This group got considerable input from the Working Group on Biological Effects of Contaminants (WGBEC) and to a lesser extent from Working Group on Crangon Fisheries and Life History (WGCRAN).

(23) Towards open science products for ecosystem science

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Ecosystem science needs to integrate a variety of (biological) data sources and to use state-of-the-art methods to improve the knowledge of complex marine ecosystems. In this talk, we demonstrate how the Data Centre of Flanders Marine Institute (VLIZ) is organizing an open science data flow from collecting data to the development of biological products on Essential Ocean Variables (EOVs) that serves ecosystem assessments.
VLIZ collects, integrates and standardizes European biological data in the framework of EMODnet Biology using the LifeWatch Species Information Backbone. ICES and other BICEpS partners provide data to expand the EurOBIS database, from which EMODnet Biology data products have been created. Since 2017 these zooplankton products have been incorporated in the ICES Operational Oceanographic Products and Services (OOPS), and the ICES WGFBIT is using the EMODnet Biology benthic products.
In the next two years, we will build further on our expertise and use machine learning methods to update our plankton products in the European Open Science Cloud. Scientific validation and ecosystem modelling will result in deeper understanding of complex plankton dynamics. These new products can be provided to ICES to be used in their advisory processes.

Work related to ICES via DIG (Data and Information Group), OOPS (Operational Oceanographic Products and Services), WGFBIT (working group on Fisheries Benthic Impact and Trade-offs)

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ANNEX 3: LIST OF PARTICIPANTS

Second BICEpS Colloquium, 2/12/2019, ILVO, VAC - Ghent

BEKAERT Karen (ILVO)

BLONDEEL Lancelot (ILVO)

BUYSE Jolien (ILVO)

DE BACKER Annelies (ILVO)

DE CAUWER Karien (RBINS)

DE COSTER Kevin (ILVO)

DE RIJCKE Maarten (VLIZ)

DE SCHRIJVER Coline (RBINS)

DE VILLE Nicolas (RBINS)

DE WITTE Bavo (ILVO)

DEFEVER Justin (ILVO)

DEGRAER Steven (RBINS)

DEVRIESE Lisa (VLIZ)

FESTJENS Felien (ILVO)

HABLÜTZEL Pascal (VLIZ)

HAELTERS Jan (RBINS)

HOSTENS Kris (ILVO)

HUGE Jean (ULB, RBINS & UHasselt)

KINDS Arne (Université de Bretagne Occidentale, ILVO, UGent)

LACROIX Geneviève (RBINS)

LAGRING Ruth (RBINS)

LE Hong Minh (RBINS)

LEFRANC Charles (ILVO)

LEQUEUE Gauthier (FPS for Mobility and Transport)

MAERTENS Bart (Departement Landbouw en Visserij)

MOREAU Kelle (RBINS)

NEVEJAN Nancy (Ghent University)

NIMMERGEERS Sofie (ILVO)

PARMENTIER Koen (RBINS)

PINT Steven (VLIZ)

POLET Hans (ILVO)

ROOSE Patrick (RBINS)

RUMES Bob (RBINS)

SCHEPERS Lennert (VLIZ)

SCHLESSER Marianne (RBINS)

SCHMIDLIN Sarah (VLIZ)

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ANNEX 4: BELGIAN ICES MEMBERS 2019

	ICES Group	Long Name	Member (Belgium)
1	ACOM	Advisory Committee	Els Torreele
2	BEWG	Benthos Ecology Working Group	Steven Degraer
3	BEWG	Benthos Ecology Working Group	Jan Vanaverbeke
4	BEWG	Benthos Ecology Working Group	Gert Van Hoey
5	BEWG	Benthos Ecology Working Group	Carl Van Colen
6	BEWG	Benthos Ecology Working Group	Hans Hillewaert
7	COUNCIL	ICES Council	Hans Polet
8	COUNCIL	ICES Council	Serge Scory
9	DIG	Data and Information Group	Lennert Tyberghein
10	DIG	Data and Information Group	Wim Allegaert
11	DIG	Data and Information Group	Thomas Vandenberghe
12	JWGBIRD	Joint OSPAR/HELCOM/ICES Working Group on Seabirds	Eric Stienen
13	MCWG	Marine Chemistry Working Group	Koen Parmentier
14	MCWG	Marine Chemistry Working Group	Alberto Vieira Borges
15	MCWG	Marine Chemistry Working Group	Bavo De Witte
16	MCWG	Marine Chemistry Working Group	Patrick Roose
17	PGDATA	Planning Group on Data Needs for Assessment and Advice	Sofie Nimmegeers
18	PGDATA	Planning Group on Data Needs for Assessment and Advice	Els Torreele
19	SCICOM	SCICOM	Steven Degraer
20	SCRDB	Steering Committee of the Regional Fisheries Database	Sofie Nimmegeers
21	SCRDB	Steering Committee of the Regional Fisheries Database	Els Torreele
22	WGAGFA	Working Group on Application of Genetics in Fisheries and Aquaculture	Federico Calboli
23	WGAGFA	Working Group on Application of Genetics in Fisheries and Aquaculture	Johan Robbens
24	WGAGFA	Working Group on Application of Genetics in Fisheries and Aquaculture	Filip Volckaert
25	WGAGFA	Working Group on Application of Genetics in Fisheries and Aquaculture	Peter Bossier
26	WGAGFA	Working Group on Application of Genetics in Fisheries and Aquaculture	Sofie Derycke
27	WGBEAM	Working Group on Beam Trawl Surveys	Loes Vandecasteele
28	WGBEC	Working Group on Biological Effects of Contaminants	Lisa Devriese
29	WGBEC	Working Group on Biological Effects of Contaminants	Johan Robbens
30	WGBEC	Working Group on Biological Effects of Contaminants	Kris Cooreman
31	WGBEC	Working Group on Biological Effects of Contaminants	Patrick Roose
32	WGBIE	Working Group for the Bay of Biscay and the Iberian Waters Ecoregion	Lies Vansteenbrugge
33	WGBIE	Working Group for the Bay of Biscay and the Iberian Waters Ecoregion	Sofie Nimmegeers
34	WGBIE	Working Group for the Bay of Biscay and the Iberian Waters Ecoregion	Bart Vanelslander
35	WGBIODIV	Working Group on Biodiversity Science	Gert Van Hoey
36	WGBIODIV	Working Group on Biodiversity Science	Olivier Beauchard
37	WGBIODIV	Working Group on Biodiversity Science	Jan Mees

38	WGBIODIV	Working Group on Biodiversity Science	Francisco Hernandez
39	WGBIOP	Working Group on Biological Parameters	Kevin DeCoster
40	WGBIOP	Working Group on Biological Parameters	Wim Allegaert
41	WGBIOP	Working Group on Biological Parameters	Karen Bekaert
42	WGBIOP	Working Group on Biological Parameters	Els Torreele
43	WGBOSV	ICES/IOC/IMO Working Group on Ballast and Other Ship Vectors	Lies Vansteenbrugge
44	WGBOSV	ICES/IOC/IMO Working Group on Ballast and Other Ship Vectors	Francis Kerckhof
45	WGBYC	Working Group on Bycatch of Protected Species	Jan Haelters
46	WGCATCH	Working Group on Commercial Catches	Justin Defever
47	WGCATCH	Working Group on Commercial Catches	Sofie Vandemaele
48	WGCATCH	Working Group on Commercial Catches	Sofie Nimmegeers
49	WGCEAM	Working Group on Cumulative Effects Assessment Approaches in Management	Steven Degraer
50	WGCRAN	Working Group on Crangon Fisheries and Life History	Mattias van Opstal
51	WGCRAN	Working Group on Crangon Fisheries and Life History	Lies Vansteenbrugge
52	WGCRAN	Working Group on Crangon Fisheries and Life History	Daan Delbare
53	WGCRAN	Working Group on Crangon Fisheries and Life History	Hans Polet
54	WGCSE	Working Group for the Celtic Seas Ecoregion	Sofie Nimmegeers
55	WGCSE	Working Group for the Celtic Seas Ecoregion	Bart Vanelslander
56	WGCSE	Working Group for the Celtic Seas Ecoregion	Lies Vansteenbrugge
57	WGDG	Working Group DATRAS Governance	Wim Allegaert
58	WGDIAD	WG on Science to Support Conservation, Restoration and Management of Diadromous Species	Claude Belpaire
59	WGECO	Working Group on Ecosystem Effects of Fishing Activities	Kris Hostens
60	WGECO	Working Group on Ecosystem Effects of Fishing Activities	Jochen Depestele
61	WGECON	Working Group on Economics	Klaas Sys
62	WGEEL	Joint EIFAAC/ICES/GFCM Working Group on Eels	Claude Belpaire
63	WGEF	Working Group on Elasmobranch Fishes	Loes Vandecasteele
64	WGEF	Working Group on Elasmobranch Fishes	Noemi Van Bogaert
65	WGELECTRA	Working Group on Electrical Trawling	Lies Vansteenbrugge
66	WGELECTRA	Working Group on Electrical Trawling	Mattias van Opstal
67	WGELECTRA	Working Group on Electrical Trawling	Annemie Decostere
68	WGELECTRA	Working Group on Electrical Trawling	Maarten Soetaert
69	WGELECTRA	Working Group on Electrical Trawling	Hans Polet
70	WGEXT	WG on the Effects of Extraction of Marine Sediments on the Marine Ecosystem	Annelies De Backer
71	WGEXT	WG on the Effects of Extraction of Marine Sediments on the Marine Ecosystem	Brigitte Lauwaert
72	WGFAST	Working Group on Fisheries Acoustics, Science and Technology	Hans Polet
73	WGFAST	Working Group on Fisheries Acoustics, Science and Technology	Kris Hostens
74	WGFBIT	Working Group on Fisheries Benthic Impact and Trade-offs	Olivier Beauchard
75	WGFBIT	Working Group on Fisheries Benthic Impact and Trade-offs	Jochen Depestele
76	WGFBIT	Working Group on Fisheries Benthic Impact and Trade-offs	Gert Van Hoey
77	WGFTFB	ICES - FAO Working Group on Fishing Technology and Fish Behaviour	Mattias van Opstal
78	WGFTFB	ICES - FAO Working Group on Fishing Technology and Fish Behaviour	Maarten Soetaert
79	WGFTFB	ICES - FAO Working Group on Fishing Technology and Fish Behaviour	Sebastian Uhlmann

80	WGFTFB	ICES - FAO Working Group on Fishing Technology and Fish Behaviour	Arne Kinds
81	WGFTFB	ICES - FAO Working Group on Fishing Technology and Fish Behaviour	Heleen Lenoir
82	WGFTFB	ICES - FAO Working Group on Fishing Technology and Fish Behaviour	Christian Van Den Berghe
83	WGFTFB	ICES - FAO Working Group on Fishing Technology and Fish Behaviour	Hans Polet
84	WGFTFB	ICES - FAO Working Group on Fishing Technology and Fish Behaviour	Jochen Depestele
85	WGFTFB	ICES - FAO Working Group on Fishing Technology and Fish Behaviour	Els Vanderperren
86	WGHABD	ICES - IOC Working Group on Harmful Algal Bloom Dynamics	Maarten De Rijcke
87	WGHABD	ICES - IOC Working Group on Harmful Algal Bloom Dynamics	Geneviève Lacroix
88	WGHIST	Working Group on the History of Fish and Fisheries	Ann-Katrien Lescrauwaet
89	WGIPEM	Working Group on Integrative, Physical-biological and Ecosystem Modelling	Leo Barbut
90	WGIPEM	Working Group on Integrative, Physical-biological and Ecosystem Modelling	Geneviève Lacroix
91	WGITMO	Working Group on Introductions and Transfers of Marine Organisms	Lies Vansteenbrugge
92	WGITMO	Working Group on Introductions and Transfers of Marine Organisms	Francis Kerckhof
93	WGMBRED	Working Group on Marine Benthal and Renewable Energy Developments	Ulrike Braeckman
94	WGMBRED	Working Group on Marine Benthal and Renewable Energy Developments	Nene Lefaible
95	WGMBRED	Working Group on Marine Benthal and Renewable Energy Developments	Jan Vanaverbeke
96	WGMBRED	Working Group on Marine Benthal and Renewable Energy Developments	Jolien Buyse
97	WGMBRED	Working Group on Marine Benthal and Renewable Energy Developments	Steven Degraer
98	WGMBRED	Working Group on Marine Benthal and Renewable Energy Developments	Kris Hostens
99	WGMBRED	Working Group on Marine Benthal and Renewable Energy Developments	Liesbet Colson
100	WGMBRED	Working Group on Marine Benthal and Renewable Energy Developments	Francis Kerckhof
101	WGMEDS	Working Group on Methods for Estimating Discard Survival	Noemi Van Bogaert
102	WGMEDS	Working Group on Methods for Estimating Discard Survival	Sebastian Uhlmann
103	WGMEDS	Working Group on Methods for Estimating Discard Survival	Jochen Depestele
104	WGMHM	Working Group on Marine Habitat Mapping	Giacomo Montereale Gavazzi
105	WGMHM	Working Group on Marine Habitat Mapping	Vera Van Lancker
106	WGMIXFISH-ADV	Working Group on Mixed Fisheries Advice	Klaas Sys
107	WGML	Working Group on Marine Litter	Coline De Schrijver
108	WGML	Working Group on Marine Litter	Lisa Devriese
109	WGML	Working Group on Marine Litter	Bavo De Witte
110	WGML	Working Group on Marine Litter	Johan Robbens
111	WGMLEARN	Working group on machine learning in marine science	Justin Defever
112	WGMLEARN	Working group on machine learning in marine science	Sam Vanhoorne
113	WGMLEARN	Working group on machine learning in marine science	Laure Van Den Bulcke
114	WGMLEARN	Working group on machine learning in marine science	Laura Hoebeke
115	WGMLEARN	Working group on machine learning in marine science	Michiel Stock
116	WGMLEARN	Working group on machine learning in marine science	Peter Rubbens
117	WGMLEARN	Working group on machine learning in marine science	Hong Minh LE
118	WGMME	Working Group on Marine Mammal Ecology	Bob Rumes
119	WGMME	Working Group on Marine Mammal Ecology	Jan Haelters
120	WGMME	Working Group on Marine Mammal Ecology	Thierry Jauniaux
121	WGMPCZM	Working Group for Marine Planning and Coastal Zone Management	Laurence Vigin
122	WGMPCZM	Working Group for Marine Planning and Coastal Zone Management	Hannelore Maelfait

123	WGMPCZM	Working Group for Marine Planning and Coastal Zone Management	Ellen Pecceu
124	WGMRE	Working Group on Marine Renewable Energy	Bob Rumes
125	WGMS	Working Group on Marine Sediments in Relation to Pollution	Elvio Amato
126	WGMS	Working Group on Marine Sediments in Relation to Pollution	Bavo De Witte
127	WGMS	Working Group on Marine Sediments in Relation to Pollution	Patrick Roose
128	WGMS	Working Group on Marine Sediments in Relation to Pollution	Lisa Devriese
129	WGNSSK	WG on the Assessment of Demersal Stocks in the North Sea and Skagerrak	Lies Vansteenbrugge
130	WGNSSK	WG on the Assessment of Demersal Stocks in the North Sea and Skagerrak	Bart Vanelslander
131	WGNSSK	WG on the Assessment of Demersal Stocks in the North Sea and Skagerrak	Sofie Nimmegeers
132	WGOOA	Working Group on Open Ocean Aquaculture	Nancy Nevejan
133	WGOOFE	WG on Operational oceanographic products for fisheries and environment	Dimitry Van der Zande
134	WGOWDF	Working Group on Offshore Wind Development and Fisheries	Jolien Buyse
135	WGRFS	Working Group on Recreational Fisheries Surveys	Thomas Verleye
136	WGRFS	Working Group on Recreational Fisheries Surveys	Justin Defever
137	WGSAM	Working Group on Multispecies Assessment Methods	Klaas Sys
138	WGSAM	Working Group on Multispecies Assessment Methods	Sofie Vandemaele
139	WGSFD	Working Group on Spatial Fisheries Data	Sofie Nimmegeers
140	WGSHIP	Working Group on Shipping Impacts in the Marine Environment	Benoit Adam
141	WGSHIP	Working Group on Shipping Impacts in the Marine Environment	Gauthier Lequeue
142	WGSHIP	Working Group on Shipping Impacts in the Marine Environment	Valérie Dulière
143	WGSMART	Working Group on SmartDots Governance	Els Torreele
144	WGSMART	Working Group on SmartDots Governance	Karen Bekaert
145	WGSMART	Working Group on SmartDots Governance	Kevin DeCoster
146	WGSMART	Working Group on SmartDots Governance	Wim Allegaert
147	WGTIFD	Working Group on Technology Integration for Fishery-Dependent Data	Justin Defever
148	WGTIFD	Working Group on Technology Integration for Fishery-Dependent Data	Sam Vanhoorne
149	WGTIFD	Working Group on Technology Integration for Fishery-Dependent Data	Wim Allegaert
150	WGZE	Working Group on Zooplankton Ecology	Jonas Mortelmans
151	WKCELTIC	Benchmark Workshop on Celtic Sea Stocks	Sofie Nimmegeers
152	WKCELTIC	Benchmark Workshop on Celtic Sea Stocks	Sofie Vandemaele
153	WKCELTIC	Benchmark Workshop on Celtic Sea Stocks	Bart Vanelslander
154	WKCELTIC	Benchmark Workshop on Celtic Sea Stocks	Lies Vansteenbrugge
155	WKFlatNSCS	Benchmark Workshop for Flatfish stocks in the North Sea and Celtic Sea	Emiel Brouckaert
156	WKFlatNSCS	Benchmark Workshop for Flatfish stocks in the North Sea and Celtic Sea	Sofie Nimmegeers
157	WKFlatNSCS	Benchmark Workshop for Flatfish stocks in the North Sea and Celtic Sea	Bart Vanelslander
158	WKFlatNSCS	Benchmark Workshop for Flatfish stocks in the North Sea and Celtic Sea	Lies Vansteenbrugge

Contact & updates: **biceps@naturalsciences.be**

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