ICES WGOOFE REPORT 2012

SCICOM Steering Group on Sustainable Use of Ecosystems

ICES CM 2012/SSGSUE:06

Report of the Working Group on Operational Oceanographic Products for Fisheries and Environment (WGOOFE)

12–16 March 2012
and 6–8 November 2012

ICES HQ, Copenhagen
and Brussels, Belgium

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

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Recommended format for purposes of citation:

ICES. 2012. Report of the Working Group on Operational Oceanographic Products for Fisheries and Environment (WGOOFE), 12-16 March 2012 and 6-8 November 2012, ICES HQ, Copenhagen and Brussels, Belgium. ICES CM 2012/SSGSUE:06. 18 pp.
https://doi.org/10.17895/ices.pub.9078

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Executive summary

The Working Group on Operational Oceanographic Products for Fisheries and Environment (WGOOFE) chaired by Rosa Barciela and Bee Berx is a working group on the user/provider interface of operational oceanography products. It runs a web based portal for operational oceanographic products for users in fisheries and environmental research (www.wgoofe.org). WGOOFE met twice in 2012, once in Copenhagen with WGIPEM and once in Brussels. The group also worked intersessionally.

It further developed its website (including a migration to host it at ICES), which is maintained as a major outreach exercise. The web portal now has a working matrix of critically evaluated operational oceanographic products from both the eastern and western North Atlantic. The evaluations were on the basis of user friendliness and logistic operationality.

WGOOFE has started work on several new initiatives as part of the multi-annual Terms of Reference, with good progress. The group has started a dialogue with the ICES Training Group on the development of a training course on the application of oceanographic data. In addition, WGOOFE have also made contact with what it considers two key groups for the integration of oceanographic data in ICES advice: the Herring Assessment Working Group and the Integrated Ecosystem Assessments groups. WGOOFE submitted a document to WKBEMIA to highlight oceanographic products which may be of interest in the integrated ecosystem assessments framework. The group has also started the path to develop further index based products of environment and oceanographic change and variability.

1 The rational for WGOOFE

WGOOFE is a working group on the user/provider interface of operational oceanography products. It runs a web based portal for operational oceanographic products for users in fisheries and environmental research (www.wgoofe.org, Figure 1). It has maintained outreach to users and producers of Operational Oceanographic Products with joint meetings, flyers, articles and a published paper. The web portal now has a working matrix of operational oceanographic products that are categorized based on accessibility and user friendliness. WGOOFE met twice in 2012 and also worked intersessionally.

In 2012, WGOOFE started the first year of a three-year plan, which came out of the group's discussions on the future needs of ICES in the context of oceanographic products. In addition to continuing the management of the web-portal, the work of WGOOFE in 2012 focused on initiating several new plans: a dialogue was started with the training committee to develop a course on the application of oceanographic data products, the Herring Assessment Working Group were approached to become a "champion user" of operational oceanographic data in an ICES advice context, and a short report highlighting data products was sent to the integrated ecosystem assessments workshops (WKBEMIA and WKECOVER).

Figure 1. The WGOOFE Web-Portal.

2 The joint meeting with the Working Group on Interactive Physical-biological and Ecosystem Modelling (WGIPEM)

Ten members of WGOOFE joined the WGIPEM meeting which was held at the ICES Secretariat from 13–16 March 2012. In autumn 2011, the future of WGOOFE had been uncertain, and one of the Terms of Reference for this new working group on ecosystem modelling had been to maintain the WGOOFE website. It was established early on during the WGIPEM meeting, that with the continuation of WGOOFE this would be unnecessary. Both WGIPEM and WGOOFE could see areas of collaboration, and the joint meeting was considered successful to establish the relationships between the two groups. WGOOFE had two main interactions at the meeting.

First, the WGOOFE chairs were given the opportunity to present the group's work at a plenary session on the first day of the meeting. This presentation focused on the two main activities of the group: the WGOOFE web-portal and the outputs from the questionnaire. WGIPEM was a large meeting made up of several workshops on the modelling of physical-biological interactions and ecosystems. In a WGOOFE context, most of the members are considered "advanced users" as they are generally familiar with the specialised oceanographic data formats used in the operational oceanographic community. However, WGOOFE also presented WGIPEM with the vision that the group could be considered "data producers", as they sit on the forefront of physical-biological and ecosystem modelling, and have the ability to provide data products focusing on biological variables which a majority of respondents to the questionnaire were keen to see provided operationally.

Second, the group had the opportunity to meet for a morning workshop session. This longer session was attended by 10 WGOOFE members (several via WebEx), as well as 6 members of WGIPEM and one member of the ICES Secretariat.

At the WGOOFE workshop, Hans Mose Jensen from the ICES Secretariat gave a presentation on the ICES geospatial data facility. This is a GIS system which provides reference layers, and also takes in output from other Expert Groups. The services can provide both data and metadata and is currently feeding into the EMODNET project.

The group also discussed the WGOOFE web-portal, and the recent Workshop to Define the Ocean Observing Needs for ICES (WKOOI), which was held at ICES Secretariat in the preceding week.

WGOOFE spent some time discussing the development of index-based data products, one of the group's multi-annual ToRs and how this would be taken forward. The group considered two subsets of this kind of product: "indices warning of change" and "regional overviews". Both are of value to other ICES Expert Groups, and WGOOFE considered the Herring Assessment Working Group (HAWG) to be a good candidate to approach as a Champion User. Mark Payne who is a member of both groups will work with HAWG to suggest a list of oceanographic products which would interest them and which they would be keen to test.

3 New products and developments in the Operational Oceanography Community

WGOOFE received presentations and updates at their meeting in Brussels on the following:

- The Previmer Project in France by Lucia Pineau-Guillou
- EMODnet Physics by Patrick Gorringe
- EHYPE and OPERR projects by Morten Skogen
- The activities at NIVA, especially ferryboxes by Lars Golmen
- MetOffice projects by Rosa Barciela
- BarentsWatch and Norwegian Marine Data Centre by Henning Wehde
- MUMM's Operational Oceanographic Products by Dimitry Van der Zande
- An update on EuroGOOS and importance of promotion of monitoring at national level by Hans Dahlin

4 The WGOOFE website

In collaboration with the ICES Data and Information Section WGOOFE agreed in November 2011 to move the WGOOFE website hosting from Ifremer to ICES. Martin Huret (Ifremer) and Nasrullah Iqbal (ICES) worked closely to make this possible, and WGOOFE are very grateful for their efforts. Since April 2012, the website has been accessible in its new version (http://groupsites.ices.dk/sites/wgoofe/Pages/default.aspx). At the meeting in Brussels, WGOOFE spent some time reviewing the new website and the visitor statistics. Below is a summary of the statistics on website access over the last 6 months of operation (May–October 2012).

Table 1. General statistics on the website access.

Traffic	
Total Number of Page Views	2266
Average Number of Page Views per Day	13
Total Number of Daily Unique Visitors	1102
Average Number of Unique Visitors per Day	6
Total Number of Referrers	187
Average Number of Referrers per Day	1

Over the last 6 months, an average of 6 unique visitors per day visited the WGOOFE website (Table 1). This number increased to 11 over the last month (Figure 2). The visiting frequency was constant until the end of summer and increased during September. WGOOFE think peaks often correspond to a specific meeting when the WGOOFE website was presented to users.

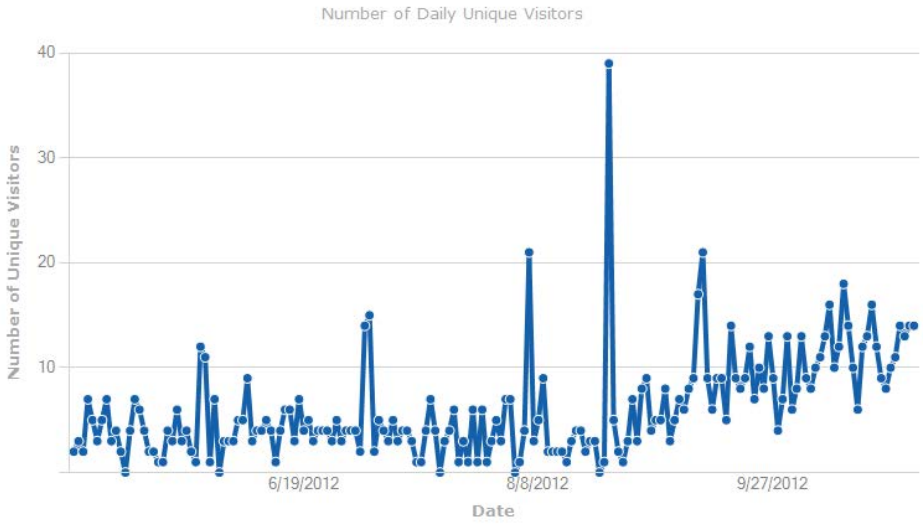

Figure 2. Number of daily unique visitors to the WGOOFE website over the last six months.

The top visited pages of the website are shown in Figure 3 and Table 2. The homepage which referrers link to is the top visited page, followed by the product matrix (the main WGOOFE-portal product). From the parameters, temperature is the top visited page, which was of no surprise to the group, but more surprisingly the "fish larvae" page is the second-most visited.

WGOOFE is aware that this may be disappointing for website users since only one product is available. "Mesoscale indices" also scores high in the list of visited parameters, and the recently added page on "Particle transport tools" (Lagrangian tools) is also visited often; suggesting these products are of interest to the users.

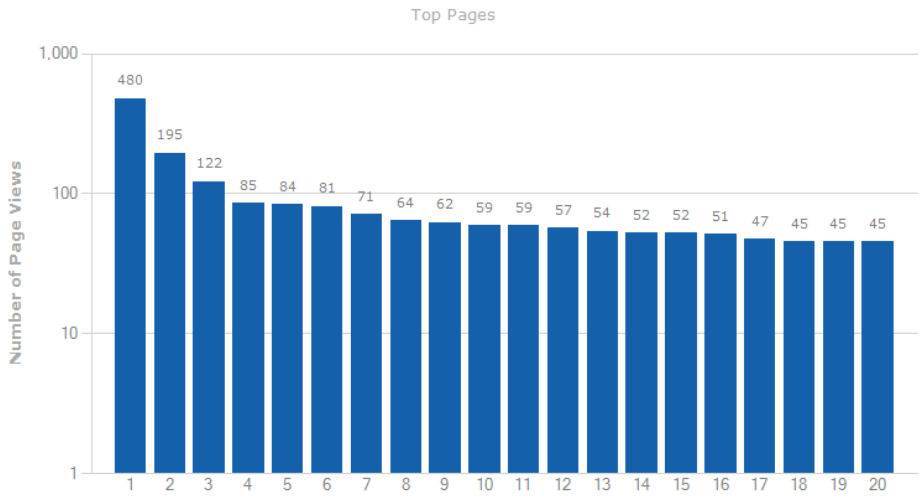

Figure 3. Top pages in the WGOOFE website visited over the last 6 months. See Table 2 below for reference to page number.

Table 2. Top pages visited. 1: website homepage. 2: matrix of product page.

	Page URL	Number of Page Views	Percentage of Overall
1	/pages/default.aspx	480	21.18 %
2	/operationalocenography/pages/default.aspx	195	8.61 %
3	/operationalocenography/pages/temperature.aspx	122	5.38 %
4	/operationalocenography/pages/fish-larvae.aspx	85	3.75 %
5	/particletransporttools/pages/default.aspx	84	3.71 %
6	/obj/pages/default.aspx	81	3.57 %
7	/operationalocenography/pages/salinity.aspx	71	3.13 %
8	/operationalocenography/pages/mesoscale-indices.aspx	64	2.82 %
9	/operationalocenography/pages/chlorophyll.aspx	62	2.74 %
10	/operationalocenography/pages/currents.aspx	59	2.60 %
11	/obj/pages/why-such-a-site-.aspx	59	2.60 %
12	/browsethebulletins/pages/default.aspx	57	2.52 %
13	/_layouts/webanalytics/report.aspx	54	2.38 %
14	/browsethebulletins/pages/northwest-atlantic.aspx	52	2.29 %
15	/obj/pages/feed-back-form.aspx	52	2.29 %
16	/operationalocenography/pages/water-turbidity.aspx	51	2.25 %
17	/operationalocenography/pages/primary-production.aspx	47	2.07 %

The top referrer to the site is still our old website at Ifremer (www.wgoofe.org), as Google still refers first to the former website (Figure 4; Table 3). The second referrer is the ICES website where a link was set up from several of its pages. This is followed by Google, which should eventually come first when the new website is better referenced.

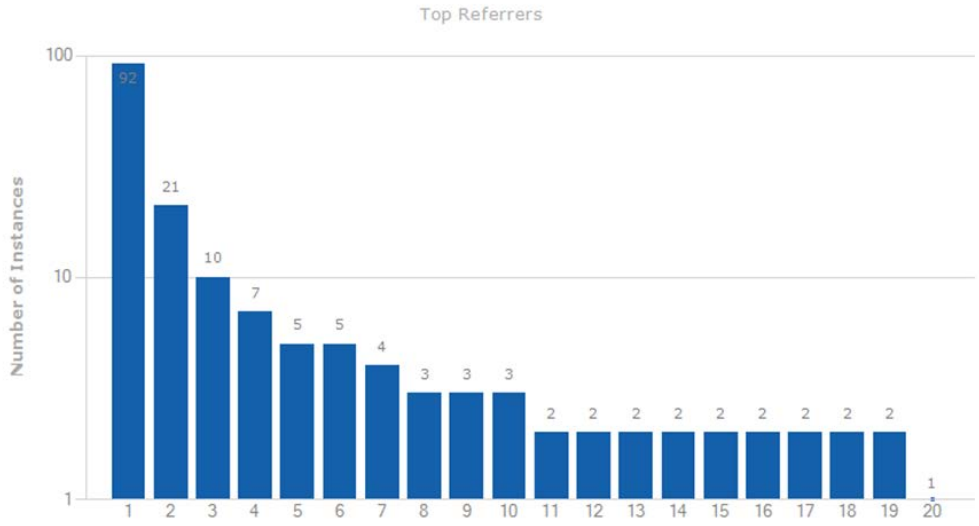

Figure 4. Top referrers linking to WGOOFE website over the last six months. See Table 3 below for reference to the numbers.

Table 3. Top referrers from where WGOOFE website is visited.

	Referring URL	Number of Instances	Percentage of Overall
1	http://www.wgoofe.org/	92	49.20 %
2	http://ocean.ices.dk/	21	11.23 %
3	http://ocean.ices.dk/tools/calculator.aspx	10	5.35 %
4	http://ocean.ices.dk/hydchem/hydchem.aspx	7	3.74 %
5	http://www.google.com/url	5	2.67 %
6	http://www.google.com.au/url	5	2.67 %
7	http://www.google.nl/search	4	2.14 %
8	http://yandex.ru/yandsearch	3	1.60 %
9	http://ocean.ices.dk/submission	3	1.60 %
10	http://www.google.com/search	3	1.60 %

5 Feedback to Data Providers

In May 2012, Morten Skogen sent a letter on behalf of WGOOFE to all produces listed on the WGOOFE web-portal. The letter (see below) gave some background on the work of WGOOFE and informed the owners that their products were listed and the accessibility had been evaluated. Only one response was received, which the group considered a little disappointing.

To whom it may concern

The ICES Working Group on Operational Oceanographic Products for Fisheries and Environment (WGOOFE) was established in spring 2008 to act as a two-way link between the producers and users of oceanographic data products. The working group consists of data producers (mostly scientists from meteorological or operational oceanographic backgrounds) and users from a diversity of fields (environmental, oceanographic, ecological modelling, and fisheries), and meets twice a year.

The main products from the group has been a questionnaire to investigate what kind of operational oceanographic products ICES scientists are really interested in, and a web portal (www.wgoofe.org) for such products. As many sources of oceanographic and environmental data are readily available, the portal is operating as a starting point where existing products are grouped (area, parameter) and linked in such a way that it should be easy for users to find the kind of oceanographic data that they are looking for. In addition the different datasets are coloured (red, yellow, green) based on the legibility and accessibility of the data products.

We are happy to inform you that some of your products are linked from the WGOOFE website. In order to enhance the use of oceanographic data we will encourage you to take a look on the website. We are happy to receive comments for improvement and information of additional web pages that we are missing, and if your products are not already coloured green we hope you will consider this in future development of your oceanographic data products,

Sincerely

Morten D. Skogen and Mark Dickey-Collas

On behalf of WGOOFE

6 Advice to Integrated Assessment Initiatives within ICES

Through Mark Dickey-Collas, Ecosystem Professional Officer at ICES, WGOOFE were asked to provide input to two new ICES initiatives: WKBEMIA and WKECOVER. After discussions at the Brussels meeting, Rosa Barciela with input from WGOOFE members produced a short report titled "From concepts to operations: using operational oceanography data in environmental and fisheries advice" (see Annex 3).

The document provides background to the operational oceanographic landscape, the justification for WGOOFE within ICES, and highlights the WGOOFE Web Portal as a useful resource for these initiatives. WGOOFE hope the document can be used as a starting point for further discussions and potential collaborations, as the group sees the integrated assessment groups and their work as key users of operational oceanographic products within ICES.

WGOOFE will continue to work on developing linkages with these groups, and one avenue being explored is a joint meeting with one or more of the integrated ecosystem assessment expert groups in 2013.

7 HAWG Request for Briefing Sheets on the Physical and Biological Environment

The Herring Assessment Working Group (HAWG) was first identified as a potential "Champion User" when WGOOFE met in March 2012. HAWG were also meeting at this time, and through Mark Payne (who is a member of both groups), and a WebEx session of HAWG with the WGOOFE Chairs, the initial contact was made. Since then, HAWG recommended to ICES that annual "briefing sheets" were created, which detailed the current state of the physical and biological environment in the ecoregions of interest to the group.

In their 2012 report, HAWG specifies temperature, primary production, and zooplankton abundance on a seasonal basis, and suggests the briefing sheets should be around one page of text plus figures, for specific regions (North Sea, Celtic and Irish Seas, Malin Shelf, Western Baltic, Skagerrak and Kattegat).

At the Brussels meeting, WGOOFE discussed this request, and the group agreed to take forward a first iteration of such a briefing sheet, which will be led by Morten Skogen. WGOOFE hope to have these ready for the next HAWG meeting which is planned for 12–21 March 2013. Feedback from HAWG will then be incorporated in future versions of the briefing sheets.

WGOOFE briefly discussed the issue of having a torrent of such requests for more specific regions/parameters, and the group decided to attempt to keep these briefing sheets as general as possible, so they may be of interest to a large number of groups.

8 Index-based products of environment and oceanographic change and variability

At both meetings in 2012, WGOOFE discussed the development of index-based products, which would be representative of oceanographic and environmental processes and their variability. Discussions focused on the feasibility of such indices, and the potential pitfalls of their creation, as well as indices already developed in a research context (but not necessarily provided in an operational fashion, such as the Subpolar Gyre Index). At the Brussels meeting, an initial "shopping list" of potential index-based products was put forward (see below). The list is based in part on the ECOSMO appendix put together by Corinna Schrum, and the paper by Huret *et al.* (2010), titled "Dispersal kernels and their drivers captured with a hydrodynamic model and spatial indices".

This list is by no means final, and WGOOFE expects to further develop this in collaboration with producers of oceanographic data products, and relevant expert groups who may be interested in the application of these indices in their research and advice.

- Transport indices on NOOS/BOOS sections
- Temperature/Salinity anomalies
- Fronts (position, strength of gradient)
  - based on temperature
  - (based on density – Corinna)
- Stratification indices
  - Depth of the '-cline
- River plume index
  - Surface area of river discharge
- Nutrient fluxes through key section
- Contaminant exposure on plankton/benthos
- Timing, duration and strength of blooms
  - Timing – documented by Dimitry
  - Strength – documented by Dimitry
- Subpolar Gyre index
  - 1st EOF of the monthly SLA field in the N Atlantic – Hakkinen and Rhines
- Upwelling indices
- Lagrangian indices (Huret *et al.*, 2010)

9 Training Course on the application of Operational Oceanographic products within the ICES Community

One of the Terms of Reference for WGOOFE over the coming years is to develop a training course on the application of operational oceanographic data products within the ICES context. WGOOFE sees this as part of the continued two-way dialogue between users and producers of operational oceanographic data products: communicating user-needs to data providers, but also educating users about the best products available and their application.

The ICES Training Group (ITG) had also received a proposal from outside the ICES community with a similar remit: "Operational Oceanography: Synoptic Views of the Sea". The group evaluated the proposal, and will now continue to liaise with the ITG and the proposer of the course, with the aim of a course being organized in 2014.

WGOOFE is also aware that other projects in the Operational Oceanography community are planning training courses (e.g. MyOcean2 and JERICO). Several WGOOFE members are active in these initiatives, and it may be possible to join efforts with these projects.

10 Further work for WGOOFE

WGOOFE has just completed the first year of its multi-annual Terms of Reference, and good progress has been made on the work plan put in place to achieve these ToRs. WGOOFE considers the migration of the website to be hosted by ICES now complete, and will continue to update the portal as necessary. WGOOFE contacted the sites listed on its web-portal, but received few replies from oceanographic data providers in response.

WGOOFE has started a dialogue with the integrated assessment working groups, the Herring Assessment Working Group, and the ICES Training Group. The group will continue its collaborations with these groups to successfully complete the work planned for 2013.

WGOOFE has also started the process of identifying index-based data products which would provide summaries of environmental and oceanographic change and variability. This is still at the early stages, and the group expects to further develop these in 2013. This will partly be done through an iterative process with interested expert groups who would use these data products in their analyses.

WGOOFE will aim to meet twice in 2013. A first meeting will either be joint or embedded within the WGEAWESS-WGINOSE meeting in Lisbon, or be a virtual meeting of WGOOFE only to touch base on progress. The second meeting will be the working group's main encounter in A Coruña, 26–28 November 2013.

Annex 1: List of participants

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*** Spring meeting. All other members participated in both meetings or only in the meeting in November.**

Annex 2: Terms of Reference for WGOOFE 2012–2014

2011/2/SSGSUE06 The **Working Group on Operational Oceanographic Products for Fisheries and the Environment** (WGOOFE) chaired by Rosa Barciela* UK and Bee Berx* UK, will meet at the ICES Secretariat, Copenhagen with WGIPEM, from 12–16 March 2012, and at the EuroGOOS Office in Brussels, 6–8 November 2012, to:

a) Develop, through an iterative process with users, further index based products of environment and oceanographic change and variability for application to and take up by the ICES integrated assessments and advice;

b) Demonstrate, through specific case studies, applications of oceanographic products in integrated assessments and advice;

c) Communicate through various mechanisms, to the ICES community the availability of oceanographic datasets, products and time-series. This should include publicizing and maintaining the WGOOFE website, developing Fact sheets for ICES expert groups and further targeted meetings with groups and workshops;

d) Act as an interface for ICES for multinational projects, networks and organizations on operational oceanographic products, such as MyOcean2, Emodnet, MarCoast2, EuroGOOS and work with producers of the expectations and abilities of users;

e) Liaise with the ICES training committee to develop an appropriate training course in the availability and use of oceanographic and environmental data;

f) Respond to ad hoc requests for advice on oceanographic products for the ICES ecosystem modelling, advisory and ocean observing communities;

WGOOFE will report on the activities of 2012 (the first year) by 1 January 2013 to SSGSUE.

Priority	A need remains within ICES to incorporate the field of operational oceanographic products to be able to support fisheries research, assessment and management advice and other ecosystem approach related activities within the organization.
Scientific justification and relation to the ICES Science Plan	**Scientific scope** The priority within ICES to integrate environmental information in research, assessment and advice, relies on operational oceanographic data products fit for purpose. WGOOFE is committed to continue its work to further develop the dialogue between the ICES user community and producers of operational oceanographic data products. WGOOFE sees a continued need for its existence to facilitate the communication between the two sides, as well as demonstrate the potential of oceanographic data integration into ICES science and advice. **Science Plan priorities to be addressed** Within the high priority research topics identified in the Science Plan, the work of WGOOFE addresses thematic area 3, entitled ***Development of Options for sustainable use of the ecosystem***, and more specifically, the research topics of operational modelling combining oceanographic, ecosystem, and population processes.
ToR justification:	**Term of Reference a)** Continue the dialogue between users and producers

	of operational products and will focus its medium to long-term objectives in becoming a fundamental part of the integrated management under the ecosystem approach. **Term of Reference b)** Further development of suitable operational data products to fit the needs of the ICES user community needs to engage users in the work of the WG, as well as operational oceanographers involved in product development. **Term of Reference c)** Available operational oceanographic products are to be used to initiate a dialogue with the users by show casing the potential applications within applied science. **Term of Reference d)** Through its work as interface between users and producers, WGOOFE has the opportunity to influence product development such that it considers the user needs appropriately. **Term of Reference e)** More focused training allows for users to improve their skills in the handling of operational data products they may not be familiar with, whilst providing data providers a platform to demonstrate the advantages and limitations of their products.
Summary of work plan	**Year 1:** - Transition the WGOOFE website to ICES to be hosted through the Share-Point system. - Inform providers of WGOOFE work in terms of visibility of their operational products and current "rankings" by users. - Establish a focused dialogue with the users, including other ICES WGs to provide a route for inclusion of operational, high-quality data in the integrated management process carried out under the ecosystem approach. **Year 2** - Liaise with the ICES training committee to develop an appropriate training course in the availability and use of oceanographic and environmental data. - Define subject matter for Fact sheets most relevant to ICES Expert Groups and begin the drafting process (outline, …) **Year 3** - Demonstrate the use of operational environmental data in the ICES integrated annual assessments. - Finalize Fact sheets for distribution to relevant Expert Groups
Working Group expected deliverables/ outputs (e.g. publications, datasets, advice, networking tools)	- WGOOFE website hosted at ICES: members of ICES expert groups interested in operational oceanographic data products and their application to science and advice [Spring 2012] - Fact sheets highlighting products, their application within the ICES community [January 2015]
Resource requirements	No specific resource requirements beyond the need for members to prepare for and participate in the meeting, and participation from ICES data centre , particularly for the website migration.
Participants	The Group should have participants from international organizations dealing with operational services and/or development of operational techniques, and participants that are identified of users of such products.
Secretariat facilities	None.

Financial	No financial implications.
Linkages to ACOM and groups under ACOM	A close link with WGECO and any other assessment working groups that are trying to integrate environmental drivers into the assessments.
Linkages to other committees or groups	There would be a strong interaction with other experts groups within SSGSUE, as well as SSGRSP and SSGEF. These include WGZE, WGPME, WGHABD, WGOH, WGIPEM and the regional sea programmes. Later also with the ICES Advisory Programme.
Linkages to other organizations	The WG must interact with IOC/JCOMM/GOOS/EuroGOOS (and its regional ROOSes, such as ArcticGOOS, NOOS, IbiROOS) and GMES/GEOSS. The group should also have a close relationship with MyOcean2.

Annex 3: From concepts to operations: using operational oceanography data in environmental and fisheries advice

ICES is an umbrella organization for marine scientists in the world and one of several user groups targeted by GMES (*Global Monitoring for Environment and Security;* http://www.gmes.info/) for exploitation of operational marine core data. GMES is the European Programme for the establishment of a European capacity for Earth Observation, whose main purpose is to deliver information on environment and security which correspond to identified user needs. Apart from its role in stimulating and enabling science, ICES also offers operational fisheries advice and its latest scientific strategy has evolved towards providing ecosystem advice and integrated ecosystem assessments. This is a vision that will be realized via the different working groups currently operating in ICES and the efficient exploitation of data sources that have not being traditionally used to aid environmental and/or ecosystem assessments, such as ocean forecasting model data.

The maturity of ocean forecasting systems, at global and regional scales, has in recent years, since the early 1990s, become a reality. This is the result of advances in numerical ocean modelling that led to the development of well-validated, three-dimensional Ocean General Circulation Models (OGCMs), as well as increasingly powerful computing capability. Furthermore, these developments have been fuelled by users' demands, from navies and meteorological agencies to downstream commercial sectors, such as the oil and gas industry. Another valuable, and substantial, source of data are research data from hindcasts and reanalyses that are often produced as part of collaborative international consortia.

However, only small amounts of the wealth of data available have been exploited by the fisheries and environmental community that form part of ICES. In order to bridge this gap, WGOOFE (Working Group on Operational Oceanographic products for Fisheries and Environment) was established in 2008, with the view to:

- improve the dialogue between fisheries, environmental and oceanographic researchers and, more specifically, between producers of operational oceanographic products and the potential users of those products.
- define initial oceanographic products that can be regularly delivered to identified users
- ensure that the needs of potential users of products are being heard.

WGOOFE set up a website (http://groupsites.ices.dk/sites/wgoofe/) that provides a one source route to access data (*in situ* and satellite observations as well as model-based near-real-time analysis and forecasts, hindcasts and reanalyses) from oceanographic contributors across the European marine science community. It provides a direct link to the oceanographic products held on the websites of the providers. However, the next step to make the jump, from conceptual to systematic use of routinely available data in environmental and ecosystem advice, is to have an open discussion about the physical and biological products that are currently needed and could feasibly be incorporated into the advice. As environmental variability is widely recognized as having a significant impact on both recruitment and the productivity of fish stocks, it is particularly important to identify the appropriate information (the requirements) and incorporate it into the advice-giving process, for example:

- What are the main variables of interest (e.g. temperature, salinity, river run-off, primary productivity, oxygen, etc.)?

- What type of product is required (e.g. trends, indexes, etc.)
- What level of provision is required (annual, seasonal, monthly, weekly, and daily?
- How would these data be used?