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Report of the Working Group on Data and Information Management (WGDIM)

12–14 February 2008

ICES Headquarters,
Copenhagen, Denmark

ICES International Council for the Exploration of the Sea

CIEM Conseil International pour l'Exploration de la Mer

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Executive summary

The ICES Working Group on Data and Information Management met for the first time in June 2007. WGDIM was established to provide ICES with advice on all aspects of data management including technical, data policy, data strategy and user-oriented guidance. The group reports directly to the Consultative Committee, and consists of data managers and data users.

This second meeting focussed on improving user interaction and membership of the group, and several initiatives to achieve these aims were proposed.

WGDIM is the steering group for the EcoSystemData project within the Data Centre, progress with the project was presented.

It was noted in several discussions that providing user friendly data products is one of the most effective methods for boosting user interaction. WGDIM encourages ICES to provide the resources within the Data Centre to allow development of products such as Web Maps and meta-data harvesting.

The importance of data stewardship is emphasised, ICES plays a vital role in this and should continue to do so. ICES' legacy data plan is an important component of data stewardship and its progress, problems and successes were reported.

The issue of storage and management of Model data was discussed with the group agreeing to look further at 3 specific issues.

A draft plan was conceived to focus the work of WGDIM on encouraging user involvement in the development and ongoing success of the ICES Data Centre

1 Opening of the meeting

The second meeting of WGDIM took place at ICES Headquarters, Copenhagen, Denmark from 12 to 14 February 2008. The working group were welcomed by representatives from the ICES Secretariat and the chairs, H. Sagen and R. Ayers.

Members of the working group present were: R. Ayers (United Kingdom, co-chair), G. Dawson (United Kingdom), G. Evans (United Kingdom), R. Gelfeld (USA), L. Hansson (Sweden/HELCOM), S. Jans (Belgium), M. M. Larsen (Denmark/OSPAR), E. Mortensen (Faroe Islands), F. Nast (Germany), L. Rickards (United Kingdom), J. Rissanen (Finland/HELCOM), H. Sagen (Norway, co-chair), A. South (United Kingdom), E. Tel (Spain), M. Wichorowski (Poland), C. Zimmermann (Germany).

E. J. Green and N. Holdsworth (ICES Data centre manager) participated as observers from the ICES Data Centre. Members of staff from the ICES Data Centre participated during the meeting when items of the agenda matched their area of expertise or current role; H. M. Jensen, C. Pinto, M. Sørensen.

Apologies for absence were received from P. Alenius (Finland), S. Almeida (Portugal), M. Bel Hassen-Abid (UNESCO/IOC/IODE), E. van den Berghe (Belgium), M.F. Borges (Portugal), T. de Bruin (Netherlands), M. Danielsen (Iceland), J. Egekvist (Denmark), R. Eisner (Canada), M. Fichaut (France), O. Folmer (Denmark), L. Fyrberg (Sweden), M-J. Garcia (Spain), D. Gregory (Canada), K. Larsen (Faeroes), G. Moiseenko (Russia), M-D Lilover (Tallinn), C. Maillard (France), T. O'Brien (USA), R. Olsonen (Finland), H. Parner (Denmark), P. Pissierssens (UNESCO/IOC/IODE), G. Reed (UNESCO/IOC/IODE)Y. Sagarminaga (Spain), A. M. Santos (Portugal), D. Schaap (the Netherlands), R. Schlitzer (Germany), S. Scory (Belgium), I. Shevchenko (Russia), G. Slesser (UK), J. Szaron (Sweden), H. Valdimarsson (Iceland) P. Wiebe (USA).

A complete list of names, addresses and contact points of participants is listed in Annex 1.

2 Adoption of the agenda

The Terms of Reference (Annex 3) for the WGDIM meeting was adopted as a resolution of the 95th ICES Statutory Meeting in Helsinki, Finland (C.Res. 2007/2/CONC02). The agenda addressing the ToRs (Annex 2) was adopted by the group at the beginning of the meeting (see Annex 5 for a list of acronyms). The last meeting generated 50 action items; the progress on each is reported within its parent topic in the report.

3 Presentation of EcoSystemData status

Responsibility to act as the DOME steering group was given to WGDIM last year. The system name has changed from DOME to EcoSystemData. A presentation on current status of the project was given followed by an operational demonstration.

It should be noted that ICES supports free format data submissions, although at present the data is stored in ICES's own ASCII format; ICES Oceanographic Format (IOF).

ICES plans to move to a relational database by the end of 2008.

At present the data does not contain quality flags (bad or suspect data is not added to the database) but the Data Centre is looking at documented best practices to enable

implementation of QC flags in the new database. The new database would also include the data owner's own QC flags and cruise numbers.

It was considered important that the Data Centre accepts, stores and re-distributes the data submitter's QC flags. There is an implied requirement for the Data Submitter to provide ICES with descriptions of their flags to enable other users to make use of them.

L. Rickards suggested that it may be worthwhile for ICES to consider the SeaDataNet QC flag proposals; it was sensible to standardise.

New Action 1: L. Rickards to supply the SeaDataNet QC flag investigation file to ICES Data Centre by 1 April 2008

L Rickards suggested that the IODE and GTSPP work on QC would also be a useful feed into ICES.

New Action 2: L. Rickards to include N. Holdsworth on the mailing list for IODE and GTSPP QC discussions; by 30 March 2008.

ICES plans to provide web services so that data can be queried. Download formats would vary, CSV would be kept and others such as ODV would be supported.

When initially populating the new database, ICES Data Centre planned to concentrate on their traditional North Atlantic areas and would endeavour to make useful data products for WGs. Although, this year, the focus was on putting the database to work, new products were planned for 2009.

The data management part of the system was limited to ICES staff, other users would be able to query, browse and download data.

Data managers can see the content of files, navigate files, see details, filter etc. Users outside can browse (but not manage) data, download files selected from the database, see Google maps with files and station descriptions displayed in balloons.

Checking for duplicates is a simple check using time, position and the data owner's name to identify duplicate records.

EcoSystemData on maps was presented using Google Maps, however this was designed for land use and its projection was not ideal for marine use. Google Maps had been chosen because it was free, it was agreed that this was a good system but that ICES should, long term, seek the resources to implement a map server.

G. Dawson commented on the excellent progress that the Data Centre had made over the past year. N. Holdsworth said that their purpose at present was to make the data visible and available to the users. Additional services and facilities would come especially with user feedback which was most welcome.

New Action 3: ICES Data Centre to investigate the potential use and resource implications of web map servers and report back to WGDIM by 30 September 2008

L. Rickards noted that her review of the oceanographic database had shown a lower number of users than expected. We all need to direct users to ICES and to encourage feedback on improvements.

H. Sagen asked whether the EcoSystemData database would provide metadata to harvester software. This could be a web service or software

New Action 4: H. Sagen to provide ICES Data Centre with guidance on the best way to enable metadata harvesting using tools such as DIGIR or OAI by 1 June 2008.

New Action 5: (continuation of 07/08 action 36) M. Wichorowski to advise ICES on the use of WMS as required by ICES.

It had been noted that some fishery data types were missing from the database. N. Holdsworth said that these data types would be loaded later in Phase 3.

New Action 6: ICES will inform WGDIM when the database is ready for testing. They anticipate that it will be ready for testing by June 2008 and so members are to provide feedback by the 31 August 2008 in time for ICES ASC.

R Ayers asked about the level of use of SQL Server specific functionality, this effectively restricts ICES to Microsoft database platforms. R. Ayers wondered whether we should try to be as platform independent as far as possible. N. Holdsworth said that they will make new systems as generic as possible but cannot avoid use of SQL Server functionality.

H. Sagen noted that WGDIM continues to be the steering group for EcoSystemData and, as such, ICES could call on members for help on an ad-hoc basis with problems and other issues during development.

New Action 7: WGDIM members to respond to requests from ICES for help with EcoSystemData problems within 30 days of receiving the request.

4 TOR b) Availability and accessibility

Report on last year's action items.

11	Report the results of the discussion between WDC Silver Spring and ICES on how they could cooperate more effectively and improve data exchange	R. Gelfeld, N. Holdsworth

Complete. A letter of agreement between ICES and WDC had dealt with improving co-operation. R. Gelfeld had issued an open invitation for ICES Data Centre staff to visit NODC within 6 months.

12	Request the WDC Silver Spring to help ICES Data Centre to overcome the backlog of uncompleted QC/QA on submitted datasets	Chairs, R. Gelfeld

Action superseded. The backlog of data that was awaiting processing had reduced and plans for the future are clear.

13	Request members to send their quality controlled data to ICES Data Centre giving priority to datasets like IBTS data needed for the NORSEPP report and currents meter inventory to be included in the BODC International Currents Meter Inventory	All

The progress on this item was discussed. ICES Data Centre staff had mapped the legacy data sets and systems were now in place to complete the action. BODC has still not received everyone's current meter data.

New Action 8: Members are requested to supply their quality controlled current meter data to BODC for inclusion in their inventory; by 31 August 2008.

L. Rickards reported that the current meter inventory would go live within two months and members would be asked to help with testing the web application which would follow.

New Action 9: Members are requested to be helpful in testing the web application of the current meter directory when released spring 2008; by 30 September 2008

R. Gelfeld (US/NODC) reported an important change to US/NODC's procedures. From1 March 2008 new data would be available online every three months rather than the 4 yearly period used until now. These early release data have not have undergone full quality control but have had most checks completed, including those for duplicates and gross ranges but excluding those related to climatology.

The importance of sending data to ICES and US/NODC to ensure its continued availability from these long term archives was emphasized. An additional benefit of submitting to both institutes is that the data would undergo two periods of Quality Control.

ICES said that at present they had a backlog of oceanographic data which had not been data-based so they were not seeking more data, but by the end of the year they would be seeking new data again.

R. Gelfeld confirmed that US/NODC will accept any file format providing metadata and format descriptors are supplied. The WODC concentrates on physical oceanography, data on chemistry and biology was needed but WODC could not handle these types of data, these are held by elsewhere in US. The important point was get data into a long-term archive. The group felt that it was important to avoid duplication of work but that long term stewardship of data is essential.

ICES reported that it would make the annual report summarising data submissions available.

The ICES Data Centre is not chasing data which it cannot handle at present but would be looking to pull data from SeaDataNet in the future.

Acoustic and video data is currently not published by the majority of data centres as the very large data volume was a concern. The Norwegian Data Centre may be able to put some examples of the data outside their firewall for others to see.

It was commented that SeaDataNet was very ambitious and marine geophysics and video could be part of it in the future.

New Action 10: ICES Data Centre to make available the annual report detailing data supplied. The first to be issued by 30 January 2009 to cover data received to 31 December 2008.

New Action 11: All members to review their supply of data to ICES and WODC and to report on improvements made to data supply to the 2009 meeting of WGDIM.

New Action 12: ICES to consider how it could proactively pursue cruise data and to report its conclusion to WGDIM Chairs by 31 December 2008.

5 Presentation of HELCOM view on data management

J. Rissanen gave a presentation on HELCOM and its data requirements. HELCOM started with 7 countries providing data; there are now 9. Initially the data centre for the project was at FIMR, subsequently EDC, and it is now at ICES. ICES undertakes the QC on the data and provides standard outputs from the database for meetings and assessments. All HELCOM data is public and electronic formats are used for all data exchange. Data types include airborne lead, water pollution, radioactivity and oil spills. Assessments have increased in number and the approach now is holistic and focuses on eutrophication and biodiversity. J. Rissanen said that 411 datasets have been submitted, 170 are complete, 240 pending and 772 stations for biological

data had been collected. Data products ranged from time series to distribution of datasets. HELCOM is devising new tools and a graphical interface to the database.

HELCOM's policy is that there should be free and open access to data.

It was noted that the assessment was different in the Baltic and some data had by-passed the data centres. This also raised the question as to what had happened to historic data, since 1979, with the new political boundaries, many data centres had changed and full copies of historic data may not be held in the country of origin. ICES did have the data but as it was largely incomplete it could not be entered into EcoSystemData. ICES would need to contact the data submitters to complete the process.

Part of ICES' legacy data plan was to go back to data providers and try to get enough information to load and flag the data accordingly.

It was agreed that ICES needed to continue working with HELCOM to make best use of the data and assessments.

New Action 13: HELCOM to be invited to report to and attend the 2009 WGDIM meeting. The percentage of HELCOM data submissions completed by ICES to be reported to WGDIM chairs by 31 December 2008 as a measure of progress.

6 Presentation on IODE/JCOMM Forum on Oceanographic Data Management and Exchange Standards

The results of the first IODE/JCOMM Forum on Oceanographic Data Management and Exchange Standards held in Ostend, Belgium 21-25 January 2008 were presented by R. Gelfeld.

The forum was convened to agree on standards to facilitate exchange between organisations in oceanographic data management and to influence national standards. The meeting discussed scope, rules for conversion to new standards, metadata, code lists, ontologies QC flags etc. Experts in each field presented and discussed their subject in detail. Discussion included descriptions of what we mean by metadata and why we need vocabularies to ensure we all use the same terminology. For example the platform code lists used by ICES and US NODC were, until 4yrs ago, identical since when the lists have diverged. R. Gelfeld reported that they are now working towards using a standard list again so that only 200–300 of the codes, out of a total of 8500, don't agree. Other topics covered included position, time and country codes the meeting agreed that there would need to be much discussion regarding QC flags. IODE have established a website (www.oceandatastandards.org), a wiki page on standards and plan co-operation with other organisations to promote standards. Biological and chemical issues were not discussed but will be covered by future meetings. Work is continuing on time and date, instruments, data dictionaries, sea level, temperature, salinity and on a comparison matrix to aid the process.

New Action 14: R. Gelfeld to inform WGDIM when the summary meeting report is available. All members to review the report and to comment on it within 60 days of the report being available.

7 ToR c) Quality and transparency

Report on last year action items.

14	Report to ConC and WGOH the outcome of the CTD questionnaire	Chairs, T. de Bruin

T. de Bruin was consulted after the meeting regarding status of the action item. He reported that no action was taken.

15	Distribute the CTD questionnaire to new members and those members not responding the first time	T. de Bruin, all

T. de Bruin was consulted after the meeting regarding status of the action item. He reported that no action was taken.

16	Prepare a questionnaire to be used to identify differences among member countries regarding QC/QA procedures important in relation to products	G. Dawson, T. de Bruin, All

It was proposed that WGDIM await the SeaDataNet QC manual and outcomes of IODE Forum on QC. WGDIM can then endorse these outcomes, recommend that members follow Sea Data Net and IODE procedures and issue a questionnaire to ask members how their procedures differ from the recommendations.

New Action 15: WGDIM to issue a recommendation and QC questionnaire following the issue of the Sea Data Net QC manual.

17	Request the ICES Data Centre extend the list of mandatory fields in the DAD database to include data submitter and data owner	P. Wiebe

Completed by ICES.

18	Request the ICES Data Centre include an information or metadata file to be supplied with every data extract from ICES databases containing general and special conditions together with acknowledgments and quality flag definitions	P. Wiebe

Ongoing activity. N. Holdsworth is drafting text to go with the data delivered by ICES Data Centre to users. The text will be distributed for comments among WGDIM members.

8 TOR d) Metadata and dictionaries

R. Gelfeld commented that standards for metadata had been reviewed by the IODE/JCOMM expert group and are covered by ISO 19016. WMO has a new version of its own metadata standard, WIS, and there are others in the marine community. ISO 19115 is becoming widely used and will probably be adopted by IODE/JCOMM.

R. Gelfeld explained how work on ontology was essential to ensure that everyone uses the same term to describe the same organism or parameter. Roy Lowry, BODC, has set-up a web service (http://vocab.ndg.nerc.ac.uk/client/vocabServer.jsp) for this purpose as have MARIS.

43	The WGDIM members are requested to update their information in the EDIOS database maintained in the SeaDataNet project	All

This is an ongoing action for all members

New Action 16: WGDIM members are requested to update their information in the EDIOS database maintained by the Sea Data Net project**.**

44	Report to the ICES Data Centre activities in the MMI project that are relevant	All

Action completed during the meeting.

9 TOR e) Products, integration and guidelines

Report on last year action items.

19	Set up a list of products on the WGDIM SharePoint site	G. Evans

Complete; S. Jans has updated the list.

New Action 17: G. Evans to review the list and to make it available on Share Point by 31 December 2008, ICES Data Centre to incorporate the list or reformatted document into appropriate page on the ICES web site.

25	Request ICES to adopt the WGMDM Guidelines as the ICES guidelines	Chairs

Not completed, will be actioned by ICES Data Centre as a result of the meeting

New Action 18: Guidelines to be reviewed by G. Dawson and others as requested by 31 December 2008.

26	Contact IOC/IODE Secretariat to make them an official member of the WGDIM working group	Chairs

Complete. H. Sagen explained that it was not possible for organisations to be official members of ICES WGs, WGDIM chairs will need to invite representatives each year.

27	Promote the guidelines at the ICES ASC 2007	ICES Data Centre

Not completed, taken forward to ASC 2008

New Action 19: G. Evans and G. Dawson to refurbish guidelines poster and take to IMDIS and ASC.

28	Promote data integration within ICES community	P. Wiebe

Not completed; 2008 ASC theme session will complete this action

29	Request IODE GE-BICH to cooperate on identifying guidelines on biodiversity by writing a letter from the WGDIM to IODE	Chairs

In progress and will be completed before ASC.

New Action 20 Chairs request IODE GE-BICH to cooperate on identifying guidelines on biodiversity by writing a letter from the WGDIM to IODE before 2008 ASC.

30	Request ICES Data Centre to supply WGDIM with exact web statistics on guidelines web pages	G. Evans, N Holdsworth

Complete; an update was placed on the 07/08 Share Point site. Analysis shows 60 to 70 hits per month on the guidelines after their move to the present position on the website.

46	Recommend to ICES the addition of a mandatory data originator field in the Dome database and request the data model of the DOME database to be distributed among WGDIM members	Chairs

Complete.

50	Request the ICES Data Centre to provide WGDIM with updates on DOME development	P. Wiebe, Chairs

This was completed using an email newsletter to WGDIM chairs.

A review of new actions was completed and one more was tabled.

New Action 21 Web services to be added to the product list on Share Point by 31 December.

10 Discussion on national activities in IPY Data Management

Members reported on their countries activities with regard to IPY. A UK data manager has been appointment for stewardship of UK generated IPY data. In Norway, collaborative data management is being coordinated by four institutions and a catalogue of IPY metadata has been produced. Norway is investigating the possibility of providing an OAI web resource (Open Archives Initiative) on top of the database so metadata can be harvested. There are many IPY dedicated projects that are headed up by the Polar Institute in Bremerhaven. A structure will be put in place so that in the long term data are transferred to NODCs and WDCs. As part of the IPY project each nation will have specified an IPY data management plan, however currently no WGDIM members are directly involved in the programme. The IPY data policy can be accessed at http://classic.ipy.org/Subcommittees/final_ipy_data_policy.pdf.

No actions were recorded.

11 TOR f) Interoperability

Report on last year action items

4	Make the WGDIM mission statement more visible to the ICES community	All

The mission statement has been referred to by N Holdsworth at ICES steering group meeting but no other action has been taken by members. WGDIM was presented in the ICES Insight Magazine in September 2007, for details look at the URL: http://www.ices.dk/products/insight.asp

20	Request ICES Data Centre maps its RECO system to common vocabularies such as Marine Metadata Interoperability (MMI)	G. Evans, P. Alenius

The mapping of RECO to common vocabularies is something that should be addressed but in 2007/2008 had not been advanced. RECO has been used by ICES for some time so it is not anticipated that they change (as similarly, DOD or BODC would not be in position to change either). Mapping will be something to be addressed in the future for under interoperability.

22	Request ICES Data Centre to set up a Web Service for ship codes	Chairs

Complete through collaborative effort between BODC, SeaDataNet and ICES. The work on cruise summary reports had revealed many problems associated with coding, for example, metadata for ships with multiple ship codes depending on the coding system used. SeaDataNet have progressed the platform codes list to address this

issue and have now completed the ports gazetteer, available at http://seadatanet.maris2.nl/v_bodc_vocab/search.asp?name=(C381)%20Ports+Gazetteer&l=C381.

23	Promote international metadata and cruise summary report systems to the PICES community	F. Nast

Not completed.

35	Request the ICES Data Centre to make use of the CSR XML Schema to exchange CSRs with the German Data Centre	Chairs

Both parties have taken steps to reactivate the exchange of CSRs between ICES and BSH. ICES is working with BSH to use the XML schema and to harmonise the use of fields storing CSR information.

36	Follow the discussions and activities of the IOC MarineXML Steering GroupReport	M. Wichorowski, chairs

M. Wichorowski reported that R. Lowry (BODC) had suggested the setting up of a Marine XML Steering Group for which R. Lowry is Chair. L. Rickards referred to SeaVox which is an open online forum to discuss vocabularies. This is open to all and those interested in joining should contact L. Rickards.

Proposed new actions for 2008/2009.

New action 22: All to send cruise schedules to L. Rickards, BODC for the POGO database. (L. Rickards noted that Belgium had sent through cruise schedules for inclusion in the database but none had been received by Germany and Norway.)

New action 23: B. Gelfeld to send paper copies of CSRs held at NODC to BSH.

New action 24: F. Nast to send latest xml schema for CSR to N. Holdsworth.

New action 25: WGDIM co-chair R. Ayers to send an email to P. Pissierssens to request that ICES are invited to be a member of the steering group.

New action 26: Review the CSRs databases at DOD and ICES to investigate the differences in number and content of CSRs. L. Rickards noted that it is important to keep this as an action as there are differences in UK CSRs resulting from BODC updates. UK plans to resubmit their CSRs at the end of the current updating initiative. DOD and ICES databases have had small changes made to CSRs internally.

New action 27: Interested parties to contact L. Rickards to be registered on SeaVox. H. Parner and E. J. Green to contact/register on advice of N. Holdsworth.

New action 28: R. Gelfeld to send letter to ICES data centre in draft form to send on to IODE to request that, in association with ICES, the problem of ship names and the differences in translation of especially Russian and Chinese ship names be owned and progressed by IODE Forum on Oceanographic Data Management and Exchange Standards.

New action 29: ICES Secretariat to add guidelines for producing articles for 'Insight Magazine' to Share Point.

New action 30: F. Nast to produce article for next 'Insight Magazine' on CSRs and new vocabularies. The magazine is published once a year and will go to print about April 2008.

12 TOR g) Taxonomy

The problems surrounding taxonomy were presented; amongst the issues highlighted were;

The rate of discovery of new species is not slowing but increasing, any system for coding of species names has to be dynamic.

There are synonyms to contend with, as taxonomists update the hierarchical position of a species, leading to one taxon having multiple names and therefore may be referred to differently in separate code lists.

Updating code lists is problematic, for ITIS the waiting time is two years for a new taxon to be approved and added to the code list.

ICES uses ERMS, ITIS, RUBIN and other species code lists.

The problem of any list is that a valid code one year for a taxon may become invalid the next year as the name becomes a synonym.

ERMS maps well to ITIS but there is not good mapping between ERMS and RUBIN.

Code lists may be restrictive in coverage i.e. no estuarine species in ERMS, the focus is on marine taxa.

It was agreed to keep Taxonomy as a TOR not least that it provides a useful forum for finding out about new taxonomic initiatives.

13 TOR h) Metadata GIS

Thirteen GIS usage questionnaires were returned; eleven institutions use ESRI products (mainly ARCGIS and ARCIMS) and no one uses open source products.

Norway will be holding a workshop on open source GIS in March 2008.

Currently no open source GIS is available with all the functionality that is required by the majority of those who responded. MANIFOLD is not free but cheaper than ESRI and the Norwegian data centre holds 20 licences currently. The Norwegian data centre is not entirely happy with ARCIMS; it incurs heavy usage of servers and licences per server are getting expensive. They are also using MapServer.

In order for WGDIM to provide ICES with advice regarding GIS it needs to develop a strategy for its level of use; much depends on money and time available and personnel skills.

A. South stated that ESRI may not be so popular in the future and it's dominance is waning. The Chair remarked that this TOR was based on the demand on countries data centres to have data presented on a map hence the expectation that the ICES data centre will do the same.

There are data centre personnel with GIS expertise but no one solely responsible for this function.

38	Request the ICES Data Centre to become familiar with the use of WMS software MapServer	M. Wichorowski, chairs

N. Holdsworth will be investigating using MapServer at ICES. ICES are using Google Maps to display data for specific types of user at the moment. However Google Maps does not have the range of functionality of other applications hence the need to transfer to using a different GIS tool.

39	Investigate possibilities of the Open Source GIS system GRASS	M. Wichorowski, P. Alenius

GRASS (Geographic Resources Analysis Support System) is an open source GIS. It can be powerful but to be most effective the user needs to develop it further. Tools and advice are possibly available online to do this development. At the Polish Institute, GRASS is used on occasions but they also have ESRI available, this is used extensively as they have relevant ESRI expertise.

WGDIM is not in a position to recommend GRASS.

Proposed new actions for 2008/2009

New action 31: WGDIM Chairs to propose to CONC the creation of ICES data centre GIS specialist post.

New action 32: S. Jans to contact Dick Schaap directly to ask about Humboldt and their view on GIS systems (S. Jans contacted country representatives but gained no responses so a new action to contact D. Schaap directly as a member of WGDIM and having involvement with Humboldt).

14 Tour de ICES Data Centre

Datras, IBTS, Oceanography and OSPAR databases were presented by ICES personnel. This provided an excellent opportunity to hear from the people on the frontline.

15 TOR i) Data Users

CONC requested this TOR from WGDIM as they hold the opinion that WGDIM is too technically biased and not sufficiently user focused. OSPAR and HELCOM represent data users and were in attendance at the meeting, however SGMID membership has fallen away considerably.

Engagement with users could be facilitated through a workshop organised by WGDIM. Conferences such as the ASC and ASLO (American Society for Limnology and Oceanography) could be used as platforms/fora for advertising WGDIM and engaging users. The next ASLO meeting is in 2009 and is to be held in southern France.

A. South suggested that we should design products to attract users.

There is urgency to get on and provide an advisory service to WG groups in terms of integrating biology, hydrography, chemistry data and providing ecosystem approach advice to individuals and groups.

Norway creates products (not in response to user requests) and find this is a good system to generate user interest as it creates a requirement the user had not known they had.

HELCOM would like to see an easy online data submission product, this could be included in the 5 year plan for WGDIM.

Meeting action: small working group come up with headline plan to include an annual report that outlines how we see a five year plan evolving, the strategy for its development and how it could be implemented.

16 Presentation of netCDF

H. Sagen presented some information from the EU DAMOCLES project, and showed a list of netCDF tools available through the project website at: http://damocles.met.no/data_management/software.html.

The netCDF format is a self describing file containing all the information and data in the one file. The DAMOCLES project does not accept data files that are not self describing.

Links to this web page will be included at the WGDIM Share Point site.

17 Presentation of OSPAR and OSPAR data management

The presentation was about the use of data in MON (Monitoring), i.e. the environmental hazardous substances part of the database, including the use of QA/QC data.

The SIME and MON results were presented. SIME is a set of maps showing planned surveys versus reported data..

The results of the MON assessment (10000 datasets analyzed) were presented. The assessment process includes checking the QA status for each point, plotting the spatial distribution on maps, producing time trend calculations and comparison with ecological and background assessment criteria. The MON process uses a station dictionary to link the data together.

QA check process: For Biota data the process is automated via QUASIMEME, however for Sediment data a less automated process is used, effectively the data is sifted and corrected or excluded manually (currently undertaken by Foppe Smedes).

The following areas will be more prominent in the next MON assessment:

- One dimensional analysis (Imposex in mussels)
- More advanced GIS: for integrated data, interpolation for some selected areas and data types
- Integration with biological effects, hydrography, inputs/deposition etc
- Statements for regions instead of statements for stations, more focused on biological effects

The holistic assessment report is planned for 2010.

Presentation of the work and processes of OSPAR by a data user was informative and prompted wide ranging debate, the continued presence of OSPAR data users should be encouraged at future WGDIM meetings.

18 TOR a) Work status

The only action point not covered in other sections of this report is;

Action 13. All members to submit quality controlled data to ICES in time for compilation of the NORSEPP report.

Data is being submitted, sometimes not it time for the report, some surveys simply finish too close to the report deadline for quality controlled data to be submitted. This action is still applicable for future years (All members).

19 TOR h) Other action items

Action items: 1, 2, 3, 5, 6, 7, 8, 9, 10, 33, 45, 47

1	Add a "Quick Launch" menu on Data products including CDROM products, links to online databases and portals coordinated with IOC/IODE	G. Evans

Links are now there – DONE and ongoing.

2	Request the ICES Secretariat to prolong the time span for documents on SharePoint beyond the current two year limit	Chairs

Extend life of SharePoint – DONE. Concerning the 2007 documents, G. Evans will check if everything needed for the future has been moved to the 2008 site before we close the 2007 SharePoint. This action needs to continue for each meeting of WGDIM.

3	Write a recommendation to ConC to continue the management of oceanographic data at ICES, but with a changed focus	L. Rickards, H. Sagen

This has been discussed and inserted into the executive summary and then passed on to ConC. Discussed during the meeting before the ASC, H. Sagen presented this to ConC.

ConC conclusion: Anyone that wants to send oceanographic data can do it. ICES will include them into the database where possible.

5	Request the ICES Data Centre to develop a single access point on the ICES web portal for access to ICES data holdings	Chairs

ICES agreed. It is necessary to do something about the web portal. Last year they began to redesign the website: http://www.ices.dk/data. It is a radical redesign, but it should be completed for the whole ICES website… it is an ongoing project. It is planned to use the EcoSystemData web application as the entry point to as many products as possible.

6	Request the ICES Data Centre to develop graphical products like maps and time series plots in ICES data holdings for the ICES user community	Chairs

This has already been discussed during the GIS session… This will be taken into account in the EcoSystemData application and web portal redesign.

7	Request the ICES Data Centre to make available a Web Service on ship codes	Chairs

Action completed.

8	Investigate in cooperation with the ICES Data Centre the possibilities in using WMS techniques in presenting and accessing research data.	All

This has already been discussed: it depends on the requirements for the mapping services. The requirements should be specified, agreed by users and then an appropriate product can be sourced. WMS will be present for many years, and will become a more prominent feature of data portals, ICES should embrace the technology to remain in its position as a preferred source of quality data.

9	Request the ICES Data Centre to participate actively in the QC/QA workshop in Oostende 15-19 October 2007	Chairs

Action completed, ICES attended the workshop (rescheduled).

10	Request the ICES Data Centre and the WDC Silver Spring to work together in overcoming the backlog of data at ICES awaiting QC/QA in order to be served to the community	Chairs
12	Request the WDC Silver Spring to help ICES Data Centre to overcome the backlog of uncompleted QC/QA on submitted datasets	Chairs, R. Gelfeld

Items 10 and 12 are identical action points. ICES have taken affirmative action to reduce the backlog of data and provide extra data management and programming resources.

33	Request ICES Secretariat to make a web link on the ICES web pages to the EU/EuroGOOS SEPRISE project at http://www.eurogoos.org/sepdemo/.	Chairs

Ongoing; Will be completed as part of the useful link inks list on the WGDIM SharePoint site.

45	Seek contact with IMARES to clarify issues with data contribution under the new ICES Data Policy	Data Centre Manager C. Zimmermann

Ongoing - Contact has been made with the Netherlands, advice has been provided by WGDIM members to ICES on the way to approach this action.

Action point to be continued until conclusion with report to next WGDIM meeting.

Continued action 33: Seek contact with IMARES to clarify issues with data contribution under the new ICES Data Policy, Data Centre Manager , C. Zimmermann.

47	Provide inter-sessional advice on request to the ICES Data Centre from a subgroup within WGDIM	Coordination H. Sagen, R Ayers and G. Evans

Ongoing; Advice has been provided when requested, action will remain a permanent action for the Chairs and other appointed members of the group.

Continued action 34: Provide inter-sessional advice on request to the ICES Data Centre from a subgroup within WGDIM, Coordination H. Sagen, R Ayers and G. Evans

20 New issues to be addressed in the future work

Different topics have been discussed in order to broaden the scope of WGDIM:

- The five-year plan needs to be established, with the aim of getting data users more involved. This plan should initially concentrate on data products and data submission.
- The Vessel Monitoring Systems (VMS) data, which provides data from satellite tracking of fishing vessels, are becoming more "freely" available – It is possible that this type of data will provide further input to assessment and advice processes, ICES should remain aware of this and endeavour to develop some in-house expertise regarding it's management and analysis.
- The new EcoSystemData database and associated applications will be one of ICES' major developments in the coming year, further presentations and updates on progress should be part of WGDIM's work.
- WGDIM should continue to consider the integration of the Roscop Reference codes, and other reference systems, into the ICES systems.

- The role of WGDIM; how can we develop into an advisory group? WGDIM could be more focused on responding to action points and providing answers and focus rather less on ToRs.
- A list of legacy data held at ICES data should be shared with WGDIM to identify eventual interactions.
- Fisheries biologists are increasingly seeing references to recreational fisheries in their work, the data associated with this type of fishery has not been encountered widely and may pose new difficulties in both its management and analysis. WGDIM members could provide a useful starting point for ICES and its members by developing some initial best practice and analysis suggestions.
- Many data users (researchers) are more often interested in aggregated data rather than individual data points, WGDIM should provide advice on Products (graphs, time series etc.) from ICES data that could useful for researchers.

ICES Draft 2008 Work plan:

- The ICES 2008 work plan was presented. WGDIM would like to be involved in the development of the 2009 plan.

Model Data

- ConC asked WGDIM to consider storage and management of Model data, more specifically the group discussed the results of interim model runs and working files used within model runs that do not form part of the final outputs.
- Many countries have modeling teams that manage their model data internally. Most of them keep the results and working files on their own computer, not in a database and not specifically managed.
- Data centers usually do not store the data, even when they know it exists. When large models are run multiple times the amount of storage required can be very large. It is not felt necessary in some instances to store interim runs that are discounted for use in any advisory or assessment process. It was considered to be useful to store and manage all the data and working files that went into producing a final model run. Running a model against what appears to be the same data can sometimes produce a different result, to be able to compare input data and working files from the original run can be helpful in determining the cause of a difference. It is not straightforward for modelers from different institutes to exchange the data as many different formats are used.

Recommendations:

- WGDIM to consider ways forward in 3 main areas :
    - How to exchange model data?
    - How to put together different types of model data to make them more useful for researchers?
    - What are the best practices in relation to stored model data?

21 Theme session R at ASC 2008

There will be a data management theme session at ASC in Halifax, Canada, 22–26 September 2008, convened by P Wiebe, C Zimmerman and H Sagen.

It was decided that a joint presentation between ICES Data Centre and WGDIM should be put forward to present the WGDIM five-year plan and encourage user participation and feedback.

The conveners of the Theme session on Data Management (Session R) encourage WGDIM members to submit abstracts for this session and to attend the meeting.

22 Request from WGIAB

ICES/HELCOM Working Group on Integrated Assessment of the Baltic Sea" will meet this year for the second time (in Öregrund, Sweden, 25-29 March). One of our TORs is "in consultations with WGDIM and the ICES Data Centre propose a data management strategy between ICES and HELCOM".

This issue seems to be more for ICES than for WGDIM and ICES has already taken action. The needs of HELCOM have to be more clearly defined, and the biological data (legacy) should be made more available for users.

ICES will attend the next WGIAB to identify what they really want, what currently are the problems and will report back to WGDIM. From this feedback, an intersessional task team could be put in place to give advice and move this topic forwards.

New Action 35: ICES DC to report back to WGDIM on progress regarding WGIAB.

23 The way forward

Report from the subgroup drafting the five-year plan

The plan developed by the sub-group is presented in annex 6.

It is not possible to give a detailed program for 5 years; it should be revised each year, depending of the evolution of users' and the Data Centre's needs. The users should be more involved in the WGDIM plan. The Role of WGDIM is to act as mediator between users, working groups and ICES DC.

Suggested activities for the next 1–2 years:

Utilize the theme session 2008 at ASC to further encourage user participation (interactive workshop during that session)

Specific tasks, workshops and pilot projects are proposed;

- Distributed systems: to make mackerel egg data available?
- Products: OSPAR should define what they want.
- Users: advice on how to handle particular types of data?
- Legacy data: this is a big issue for ICES; not all the data sets have been analysed yet, not all the problems have been identified, and the mapping has still to be done.
- Redesign of the website.

WGDIM should ensure that the right information is channelled to the right groups. The "5-year plan" will be available for the report when finalized by L. Rickards' group.

Terms of reference for WGDIM were discussed and are included in Annex 3.

24 Next meeting and closure

Report due by 28 March 2008 for the attention of Consultative Committee and all Science and Advisory Committees.

Place: Copenhagen, Denmark, in order to be close to ICES to facilitate coordination.

Date: to be decided, it is dependent on the availability of the meeting room in February or March.

The Chairs thanked all participating members for their contribution to the meeting. The meeting was closed thanking the ICES Secretariat for helping organise and supporting the meeting.

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Annex 2: Agenda

Tuesday 12th February – Rapporteur Garry Dawson

0900-0930	**Opening greetings by H. Sagen, R. Ayers** Welcome by ICES representative Local arrangements by ICES, Vivian Piil	*[Co-chairs]* *[V. Piil]*
0930-1030	**Review meeting schedule and items for discussion** Review action items from last year's WGDIM meeting	*[H. Sagen]* *[H. Sagen]*
1030-1100	*Coffee break*	
1100-1200	**Presentation of EcoSystemData status** The DOME steering group responsibility was given to last year. The name has changed into EcoSystemData and a presentation and demonstration of the system will be given. Status of the ICES Oceanographic Database	*[N. Holdsworth]* *[Carlos Pinto] [Hans Mose Jensen]*
1200-1300	**TOR b) Availability and accessibility** Identify major gaps in data availability or data accessibility in the ICES data management system or needed data not currently held at ICES. Action items: 11, 12, 13	*[H. Sagen]*
1300-1430	*Lunch*	
1430 - 1500	**Presentation of HELCOM** The HELCOM view on data management matters.	*[Jouko Rissanen]*
1500 - 1530	**Presentation of IODE/JCOMM FOODMES** The results of the first IODE/JCOMM Forum on Oceanographic Data Management and Exchange Standards held in Ostend, Belgium Jan 2008.	*[B. Gelfeld/L. Rickards]*
1530-1600	**ToR c) Quality and transparency** Identify and resolve issues related to transparency, traceability and quality of data in relation to their use at ICES to formulate advice. Action items: 14, 15, 16, 17, 18	*[H. Sagen]*
1600-1630	*Coffee break*	
1630-1645	**ToR d) Metadata and dictionaries** Identify and promote relevant standards for metadata, data structures, dictionaries, and the use of data quality indicators in the ICES data management system. Action items: 43, 44	*[R. Gelfeld]*
1645-1715	**ToR e) Products, integration and guidelines** Provide advice on products based on ICES data holdings, data integration, and data management guidelines. Action items: 19, 25, 26, 27, 28, 29, 30, 46, 50	*[G. Dawson]*
1745-1800	**Summary of Day 1**	*[Co-chairs]*

Wednesday 13th February – Rapporteur Gaynor Evans

0900-0930	**Presentation of IPY data management status** Discussion on national activities in IPY Data Management	*[H. Sagen]*
0930-1030	**ToR f) Interoperability** Develop recommendations for ICES data management interoperability with relevant international data management bodies and programme's like PICES, IOC/IODE, GOOS, SeaDataNet, IPY (International Polar Year) to ensure rational and optimal endeavors Action items: 4 20, 21, 22, 23, 24, 35, 36	*[F. Nast]*
1030-1100	*Coffee break*	
1100-1200	**ToR g) Taxonomy** Report on the progress of ITIS and ERMS/WoRMS systems in supporting and updating ICES taxonomy needs of the European community. Action items 31, 48	*[R. Ayers]*
1200-1300	**TOR h) Metadata GIS** Investigate Geographical Information Systems, GIS (Open source and commercial), with emphasis on web applications that can be used with ICES data management systems. Action items: 37, 38, 39, 40, 41, 42	*[S. Jans]*
1300-1430	*Lunch*	
1430-1600	**Presentation "Tour de ICES Data Centre"** Split into groups and go for a Data Centre tour to hear a number of short (3 minute) presentations from each of our project groups.	*[N. Holdsworth]*
1600-1630	*Coffee break*	
1630-1730	**TOR i) Data users** Prepare a five-year plan describing the engagement of data users to ensure the appropriateness of data products. Action item 49	*[R. Ayers/H. Sagen]*
1730-1800	**Summary of Day 2**	*[Co-chairs]*
1930-	*Dinner at Les Trois Coichons* *Værnedamsvej 10* *Meet at 1900 Hotel Denmark, Hotel The Square*	

Thursday 14th February – Rapporteur Siegrid Jans

0900-0915	**Presentation netCDF** Discussion if netCDF is a useful data format for oceanography data.	*[H. Sagen]*
0915 - 0930	**Presentation of OSPAR and OSPAR data management** *[Martin M. Larsen]* The use of data in MON (Monitoring), i.e. the environmental hazardous substances part of the database, including the use of QA/QC data.	
0930-1000	**TOR a) Work status** Report on the success of fulfilling action points from last year Action items 11, 12, 13	*[R. Ayers]*
1000-1030	**Other action items** Action items: 1, 2, 3, 5, 6, 7, 8, 10, 45, 47	*[R.Ayers]*
1030-1100	*Coffee break*	
1100-1200	**New items to be addressed in the future work** To broaden the scope of WGDIM Model data	*[R. Ayers]*
1200-1230	**Theme session** Data Management 2008 at ASC in Halifax, 22-26 September 2008	*[C. Zimmermann]*
1230-1400	*Lunch*	
1400-1430	**Request from WGIAB** ICES/HELCOM Working Group on Integrated Assessment of the Baltic Sea" which will meet this year for the 2nd time (in Öregrund, Sweden, 25-29 March). One of our TORs is "in consultations with WGDIM and the ICES Data Centre propose a data management strategy between ICES and HELCOM"	*[Co-chairs]*
1430-1500	**The way forward** Report from the subgroup drafting the 5 year plan	*[L. Rickards]*
1500-1530	**Summary of Day 3** Recommendations for 2007/2008 ToRs	*[Co-chairs]*
1530-1600	**Next meeting and closure** Report due by 28th March 2008 for the attention of Consultative Committee and all Science and Advisory Committees.	*[Co- chairs]*

Annex 3: WGDIM terms of reference for the next meeting

The **Working Group on Data and Information Management** [WGDIM] (Chairs: H. Sagen, Norway and R. Ayers, UK) will meet at ICES headquarters Copenhagen, Denmark from [date to be announced] 2009 to:

a) **Assess progress with, and update, users engagement plan** - the plan developed in 2008 sets out a number of activities and pilot projects - these will be evaluated and the plan updated to ensure full user engagement and appropriate development of products;

b) **Availability and accessibility** - identify major gaps in data availability or data accessibility, including legacy data, in the ICES data management system or data needed but not currently held at ICES;

c) **Quality and transparency** - identify and resolve issues related to transparency, traceability and quality (use of data quality indicators) of data in relation to their use at ICES to formulate advice;

d) **Interoperability** - identify and promote relevant standards for metadata, data structures, dictionaries and data dissemination in the ICES data management system; develop recommendations for interoperability between the ICES data management system and relevant international data management bodies and programmes (e.g. PICES, IOC/IODE, GOOS, SeaDataNet, International Polar Year) to ensure rational and optimal endeavour.

WGDIM will report by [DATE] to the attention of the Consultative Committee and all Science and Advisory Committees.

Supporting Information:

PRIORITY:	The Group provides ICES with solicited and unsolicited advise on all aspects of data management including technical, data policy and data strategy and user oriented guidance. This Group flies the flag for ICES in setting standards for global databases. It also provides an important interface for oceanographic, environmental, and fisheries data management in ICES, and promotes good data management practice.
SCIENTIFIC JUSTIFICATION AND RELATION TO ACTION PLAN:	a) Action Plan 5.13.4, 6.1, 6.4; b) Action Plan 6.1, 6.4; c) Action Plan 4.12, 6.1, 6.4; d) Action Plan 1.10, 5.13.4, 6.1, 6.4. a) It is essential to ensure needs of users are met: there are a wide range of users for ICES data and products from HELCOM/OSPAR to WGs/SGs and individual scientists. WGDIM should have a key role to act as a mediator between Users/WGs and the Data Centre to prioritise activities, to ensure appropriate experts are available and to give reasons for priorities. Proper engagement with users will allow data submission problems to be resolved and integrated data products and thus advice can be provided in an appropriate form. b) There are major gaps in the ecosystem assessments apparently caused by lack of data. However, more data are likely available for use than currently perceived either inside the ICES system or externally. Thus, groups developing the advice may not be aware of the existence of relevant data sets either because of a lack of communication or the fact that data are not being delivered on a timely basis. In addition, those environmental assessments that are now being produced by some ICES working groups are not being effectively utilized by other groups making assessments where environmental data should be considered (NORSEPP, WGRED) Conclusions: i) Communication between ICES expert groups needs to be improved. ii) Data contributors need to be encouraged to submit data when they are useful, not when they are completely quality controlled. c) Much of the data that are being used to make the environmental assessments do not reside within the ICES and little effort is being expended to track the data used to make the assessments. If the external data are being used to formulate advice, it is often difficult to later re-establish the data sets and thus the basis for the advice.

	Thus the group should provide advice as to how improve this reporting. d) To maximize interoperability data quality must be known. It is important to evaluate the appropriateness of use of data for specific applications on the basis on data quality. Coordinate work with relevant working groups or projects like SeaDataNet, ECOOP, etc. on standards for metadata, data/data structures and vocabularies. As there is limited resource available it is essential to avoid duplication of work on data management. It is thus important to engage in collaboration with international bodies and programmes especially when the 4th International Polar Year is in progress and is seeking help and guidance on data management.
RESOURCE REQUIREMENTS:	None
PARTICIPANTS:	The Group is expected to be attended by some 30–35 members and guests with half of the members from each of the two categories , data managers and data users
SECRETARIAT FACILITIES:	Meeting facilities.
FINANCIAL:	The Data Centre Manager should attend these meetings together with other employees at the data centre.
LINKAGES TO ADVISORY COMMITTEES:	Report is seen by ConC and all science and advisory committees
LINKAGES TO OTHER COMMITTEES OR GROUPS:	Oceanography and Advisory Committees.
LINKAGES TO OTHER ORGANIZATIONS:	There are linkages with relevant international bodies and programmes like PICES, IOC/IODE, GOOS, SeaDatanet, IPY, etc., with emphasis on IOC and its Working Committee on International Oceanographic Data and Information Exchange (IODE).

Annex 4: Recommendations

RECOMMENDATION	FOR FOLLOW UP BY:
1.ICES to provide resources within the Data Center to develop GIS and associated user-focussed data products	ICES

Annex 5: List of acronyms and terms

Acronym or Term	Description
ACE	Advisory Committee on Ecosystems
ADCP	Acoustic Doppler Current Profiler
AMAP	Arctic Monitoring and Assessment Programme
ARGO	The Array for Real-time Geostrophic Oceanography (profiling floats)
ASC	Annual Science Conference organised by ICES
AZMP	Atlantic Zone Monitoring Program (Canada)
BMDC	Belgian Marine Data Centre
BODC	British Oceanographic Data Centre
BOOS	Baltic Operational Oceanographic System
BIO	Bedford Institute of Oceanography
BIOCHEM	BIOlogy-CHEMistry system (Canada)
BSH	Bundesamt für Seeschifffahrt und Hydrography (Germany)
BWGDDP	Bureau Working Group for Data Development Project
CD-ROM	Compact Disk – Read Only Memory
CEFAS	Centre for Environment Fisheries and Aquaculture Science
COPEPOD	Coastal and Oceanic Plankton Ecology Production and Observation Database
COOP	Coastal Ocean Observations Panel (GOOS)
CSR	Cruise Summary Report (formerly known as ROSCOP)
CTD	Conductivity-Temperature-Depth
DAC	Data Assembly Centre
DBCP	Drifting Buoy Co-operation Panel
DMAC	Data Management and Communication
DOD	Deutsches Ozeanographisches Dataenzentrum
DOME	Database on Oceanography and Marine Ecosystems (Integrated ICES database)
DONAR	Data Omgang Natte Rijkswaterstaat - Database Dutch Ministry of Transport
DONBML	DONAR Basic Markup Language
DPC	Data Products Committee
EDIOS	European Directory of the Initial Ocean-observing System
EDMED	European Directory of Marine Environmental Data
EDMO	European Directory of Marine Organisations
ETDMP	JCOMM-IODE Expert Team on Data Management Practices
ERMS	European Register of Marine Species
ESRI	Environmental Systems Research Institute
EU	European Union
EUROGOOS	European Global Ocean Observing System
FIMR	Finnish Institute of Marine Research
FRS	Fisheries Research Services
GBIF	Global Biodiversity Information Facility
GE-BICH	IOC's Group of Experts on Biological and Chemical Data Management and Exchange Practices
GETADE	IOC's Group of Experts on the Technical Aspects of Data Exchange
GIS	Geographic Information System
GCMD	Global Change Master Directory (from NASA)

ACRONYM OR TERM	DESCRIPTION
GLOBEC	GLOBal ocean ECosystems dynamics
GLOSS	Global Sea Level Observing System
GODAR	Global Oceanographic Data Archaeology and Rescue
GOOS	Global Ocean Observing System
GOSUD	Global Ocean Surface Underway Data
GRASS	Geographic Resources Analysis Support System (open source GIS)
GTSPP	Global Temperature-Salinity Profile Program
HELCOM	Helsinki Commission
IBTS	International Bottom Trawl Survey
ICES	International Council for the Exploration of the Sea
IEO	Instituto Español de Oceanografía
IFREMER	Institut français de recherche pour l'exploitation de la mer
IMARES	Institute for Marine Resources and Ecosystem Studies
IMR	Institute of Marine Research (Norway)
IML	Institut Maurice Lamontagne – Canada
IOC	Intergovernmental Oceanographic Commission
IODE	International Oceanographic Data and Information Exchange
IOOS	Integrated Ocean Observing System
IOPAS	Institute of Oceanology Polish Academy of Sciences
IROC	ICES Report on Ocean Climate
ISO	International Standards Organisation
ITIS	Integrated Taxonomic Information System
JCOMM	IOC-WMO Joint Technical Commission on Oceanography and Marine Meteorology
JGOFS	Joint Global Ocean Flux Study
MASDEA	MArine Species Database of Eastern Africa
MEDAR	Mediterranean Data Archaeology Rescue Project
MEDS	Marine Environmental Data Services – Canada
MDIP	Marine Data and Information Partnership (UK)
MMI	Marine Metadata Interoperability
MODIS	MODerate resolution Imaging Spectroradiometer
MUMM	Management Unit of Mathematical Modelling for the North Sea
NAFC	Northwest Atlantic Fisheries Center – Canada
NAFO	Northwest Atlantic Fisheries Organization
NARMS	North Atlantic Register of Marine Species
NCIS	National Contaminants Information System – Canada
NERC	Natural Environment Research Council
NOAA	National Oceanic and Atmospheric Administration - U.S.A.
NODC	U.S. National Oceanographic Data Center
NORSEPP	ICES/EuroGOOS North Sea Pilot Project
NWARMS	North West Atlantic Register of Marine Species
OBIS	Ocean Biogeographic Information System
OCL	Ocean Climate Laboratory/U.S. NODC
OO	Operational Oceanography
OOPC	Ocean Observations Panel for Climate (GOOS)

Acronym or Term	Description
OSPAR	Oslo-Paris Commission
PICES	Pacific ICES
POGO	Partnerships for Observation of the Global Oceans
QC	Quality Control
ROSCOP	Report of Observations/Samples Collected by Oceanographic Programmes (now CSR)
RECO	ICES Reference Code utility http://www.ices.dk/datacentre/reco/
RIKZ	Rijksinstituut voor Kust en Zee - The Netherlands
SABS	Saint Andrew's Biological Station – Canada
SEPRISE	Sustained, Efficient Production of Required Information Services
SGMEDI	Study Group on the Marine Environmental Data Inventory
SGMID	ICES Study Group on the Management of Integrated Data
SGXML	ICES/IOC Study Group on the Development of Marine Data Exchange Systems using XML
SISMER	French National Oceanographic Data Centre
SMHI	Swedish Meteorological and Hydrological Institute
SOOP	Ship of Opportunity Programme
SQL	Structured Query Language
SST	Sea Surface Temperature
ToR	Term of Reference
TSN	Taxonomic Serial Number
UKHO	UK Hydrographic Office
UNESCO	United Nations Educational, Scientific and Cultural Organisation
URL	Uniform Resource Locator
URMO	UNESCO Register of Marine Organisms
USGS	US Geological Survey
VEINS	Variability of Exchanges in the Northern Seas
VLIZ	Flanders Marine Institute
WCRP	World Climate Research Program
WDC	World Data Centre
WGDIM	Working Group on Data and Information Management
WGMDM	Working Group on Marine Data Management
WGOH	Working Group on Oceanic Hydrography
WGZE	Working Group on Zooplankton Ecology
WMO	World Meteorological Organisation
WMS	Web Map Service
WOA	World Ocean Atlas
WOD	World Ocean Database
WOAF	World Ocean Atlas Figures
WOCE	World Ocean Circulation Experiment
WoRMS	World Registry of Marine Species
WWW	World Wide Web
XBT	Expendable Bathythermograph
XML	Extensible Markup Language

Annex 6: The WGDIM Plan, draft version from meeting group

Introduction

The WGDIM was requested by the Consultative Committee to consider how best to engage data users to ensure that data products generated by the ICES Secretariat are appropriate. In this regard, WGDIM was asked to prepare a five year plan for the engagement of users which will underpin the ICES Data Strategy. A sub-group, which included user representatives, discussed this at the WGDIM meeting. This short note describes the outcome of the discussions and provides the basis for developing a five year plan and suggests some pilot studies.

ICES Data Strategy and vision has the following goals:

- ICES will remain a focal point for marine data in the North Atlantic
- ICES will create a portal serving as a hub for distributed data
- The ICES web portal will become more attractive to the science Community

There are many different users of the data held by ICES, these include:

- ICES Working Group and Study Group members
- OSPAR, HELCOM, EEA
- ICES Secretariat
- The wider marine science community

The list above illustrates that there are many different users who have widely differing needs. The SGMID considered user needs and distributed a user questionnaire. Responses to the questionnaire were assessed by SGMID, but the conclusions reached could usefully be reviewed. As a first step towards meeting user needs and requirements it is necessary to first describe the problems the either exist or are perceived to exist and make suggestions on how to resolve them and consider what, if any, are the obstacles preventing this. Some initial thoughts include:

- Reduce sampling to data delivery time
- Integration of ecosystem knowledge into assessment and advice for fisheries
- Much data available but there is a large amount of data that are not readily accessible
- Data may not be available in a useful form for users, e.g. raw data may be available, but statistics, trends or maps may be needed

The way forward

At this point it is not possible or wise to give a detailed programme for five years as needs may change and new needs arise, but some general principles can be given. These include the following:

- Data submission issues must be resolved
- Integrated advice is required at a high level
- Data should be served in a way that allows integration
- Users need to be involved in the process; scientists need to be attracted to workshops and Working Groups and Study Group

- A two way dialogue is needed between data centre and users: it is necessary to demonstrate that the Data Centre has listened (i.e. that actions are carried through), to show results and to provide feedback
- The Data Centre should participate in Working Groups
- Role of the WGDIM should be to act as a mediator between Users/Working Groups and Data Centre; prioritise, ensure appropriate experts available; give reasons for priorities
- Determine what is needed from data => present products; output from assessments (first ensure data are made available, then quality controlled, before trying to make products)
- Improve data and data product availability through the ICES web-site
- Include evaluation and monitoring of emerging technologies
- Include evaluation and monitoring of new processes/data sources
- A priority is the integration of data, for example:
    - Making data available, distributed databases, etc
    - Products
    - Emerging technologies
- Use a variety of mechanisms including:
    - Rolling cycle of small workshops to address specific needs
    - Utilising ASC, in particular theme sessions
    - Distribute questionnaires (at ASC, on web site)
    - Ensure there is a mechanism for Working Groups to "fast track" product ideas, etc., into WGDIM

Suggested activities for first 1–2 years

A number of activities (e.g. pilot projects) for the first 1-2 years are given below. These should include users to ensure their engagement with the process and ensure that the progress made and solutions developed will meet their primary needs. At this stage no consideration has been given to the resources required from ICES, WG members or users.

1) Utilise 2008 theme session (including a separate in-session interactive workshop)

2) Hold a number of small specific workshops to address issues relating to the development of distributed systems and making data more readily available and accessible, the use of GIS systems and generation of products.

The following specific workshops and pilot projects are suggested to address a number of urgent issues:

- GIS - bring together national experts to advise ICES
- Distributed systems: set up a pilot project to make mackerel egg data through one portal. Presently these data are available through a spreadsheet (there may be other examples where data may be distributed through a number of institutes0. This workshop will bring together the

relevant experts to determine user requirements and then the technical experts to implement them. [Experts from WG on Widely distributed Stocks, Planning Group on Northeast Atlantic Pelagic Ecosystem Surveys, WGMEGS].

- Product driven: Let OSPAR define what they want and then try to solve the problem. OSPAR are struggling with integration. What should be integrated? What tools are needed? GIS products? Auto-generated plots? [Note: Theme session in Halifax should attract scientists and data managers from North America who have been involved in projects generating some exciting integrated products/maps. It will be beneficial to hear what they are doing.] GIS - bring together national experts to advise ICES
- Show users how to handle particular types of data. For example VMS data for tracking fleets and calculating effort by area.

1) Hold larger-scale workshops to address major issues, for example, how to integrate fisheries and environmental data? Particular examples suggested include: sprat in the Baltic, pelagic

2) Initiate an activity to ensure that the right information is channelled to the right groups: For example, a presentation from (EG) reports to a wider audience. Much information is available in reports, which is not used as widely as it could be, for example, in advice drafting groups. A small application should be developed in the form of a table showing what is available from which geographic area, species, and method. A small group will be set up to develop what is needed from WG reports.

3) Legacy data is a BIG PROBLEM. HELCOM, in particular pointed out problems with legacy data, e.g., biological community data, etc. The relevant resource problems and technical issues should be solved as a high priority.

4) Redesign of ICES Data Centre section of the web site.

Annex 7: Summary of Action Points

Action 1: L. Rickards to supply the SeaDataNet QC flag investigation file to ICES Data Centre by 1 April 2008

Action 2: L. Rickards to include N. Holdsworth on the mailing list for IODE and GTSPP QC discussions; by 30 March 2008.

Action 3: ICES Data Centre to investigate the potential use and resource implications of web map servers and report back to WGDIM by 30 September 2008

Action 4: H. Sagen to provide ICES Data Centre with guidance on the best way to enable metadata harvesting using tools such as DIGIR or OAI by 1 June 2008.

Action 5: (continuation of 07/08 action 36) M. Wichorowski to advise ICES on the use of WMS as required by ICES.

Action 6: ICES will inform WGDIM when the database is ready for testing. They anticipate that it will be ready for testing by June 2008 and so members are to provide feedback by the 31 August 2008 in time for ICES ASC.

Action 7: WGDIM members to respond to requests from ICES for help with EcoSystemData problems within 30 days of receiving the request.

Action 8: Members are requested to supply their quality controlled current meter data to BODC for inclusion in their inventory; by 31 August 2008.

Action 9: Members are requested to be helpful in testing the web application of the current meter directory when released spring 2008; by 30 September 2008

Action 10: ICES Data Centre to make available the annual report detailing data supplied. The first to be issued by 30 January 2009 to cover data received to 31 December 2008

Action 11: All members to review their supply of data to ICES and WODC and to report on improvements made to data supply to the 2009 meeting of WGDIM.

Action 12: ICES to consider how it could proactively pursue cruise data and to report its conclusion to WGDIM Chairs by 31 December 2008.

Action 13: HELCOM to be invited to report to and attend the 2009 WGDIM meeting. The percentage of HELCOM data submissions completed by ICES to be reported to WGDIM chairs by 31 December 2008 as a measure of progress.

Action 14: R. Gelfeld to inform WGDIM when the summary meeting report is available. All members to review the report and to comment on it within 60 days of the report being available.

Action 15: WGDIM to issue a recommendation and QC questionnaire following the issue of the Sea Data Net QC manual.

Action 16: WGDIM members are requested to update their information in the EDIOS database maintained by the Sea Data Net project**.**

Action 17: G. Evans to review the list and to make it available on Share Point by 31 December 2008, ICES Data Centre to incorporate the list or reformatted document into appropriate page on the ICES web site.

Action 18: Guidelines to be reviewed by G. Dawson and others as requested by 31 December 2008.

Action 19: G. Evans and G. Dawson to refurbish guidelines poster and take to IMDIS and ASC.

Action 20 Chairs request IODE GE-BICH to cooperate on identifying guidelines on biodiversity by writing a letter from the WGDIM to IODE before 2008 ASC.

Action 21 Web services to be added to the product list on Share Point by 31 December

Action 22: All to send cruise schedules to L. Rickards, BODC for the POGO database. (L. Rickards noted that Belgium had sent through cruise schedules for inclusion in the database but none had been received by Germany and Norway.)

Action 23: B. Gelfeld to send paper copies of CSRs held at NODC to BSH.

Action 24: F. Nast to send latest xml schema for CSR to N. Holdsworth.

Action 25: WGDIM co-chair R. Ayers to send an email to P. Pissierssens to request that ICES are invited to be a member of the steering group.

Action 26: Review the CSRs databases at DOD and ICES to investigate the differences in number and content of CSRs.

Action 27: Interested parties to contact L. Rickards to be registered on SeaVox. H. Parner and E. J. Green to contact/register on advice of N. Holdsworth.

Action 28: R. Gelfeld to send letter to ICES data centre in draft form to send on to IODE to request that, in association with ICES, the problem of ship names and the differences in translation of especially Russian and Chinese ship names be owned and progressed by IODE Forum on Oceanographic Data Management and Exchange Standards.

Action 29: ICES Secretariat to add guidelines for producing articles for 'Insight Magazine' to Share Point.

Action 30: F. Nast to produce article for next 'Insight Magazine' on CSRs and new vocabularies. The magazine is published once a year and will go to print about April 2008.

Action 31: WGDIM Chairs to propose to CONC the creation of ICES data centre GIS specialist post.

Action 32: S. Jans to contact Dick Schaap directly to ask about Humboldt and their view on GIS systems (S. Jans contacted country representatives but gained no responses so a Action to contact D. Schaap directly as a member of WGDIM and having involvement with Humboldt).

Action 33: Seek contact with IMARES to clarify issues with data contribution under the new ICES Data Policy, Data Centre Manager, C. Zimmermann.

Action 34: Provide inter-sessional advice on request to the ICES Data Centre from a subgroup within WGDIM, Coordination H. Sagen, R Ayers and G. Evans

Action 35: ICES DC to report back to WGDIM on progress regarding WGIAB., N. Holdsworth.