BLUE GROWTH:

Motivating Innovations in Aquatic Information Management

Proceedings of the 41st IAMSLIC Annual Conference

September 7-11, 2015

FAO, Rome, Italy

Editor: Dorothy Barr

Conference Convener: Kris Anderson

IAMSLIC CONFERENCE SERIES
(ISSN:2380-0399)

41st IAMSLIC Annual Conference and 16th EURASLIC Biennial Meeting FAO, Rome, September 7-11, 2015

"Blue Growth: Motivating Innovations in Aquatic Information Management"

Group Photo 2015

(For larger image see
http://www.iamslic.org/wp-content/uploads/2015/12/Group-Photo-2015.jpg)

Blue Growth: Motivating Innovations in Aquatic Information Management

Proceedings of the 41st IAMSLIC Conference, Rome, Italy, September 7-11 2015

Table of Contents

Session 9: Linked Repositories – Theme of the Day

Session 10: Diversity in Practice

[Invitation to 42nd IAMSLIC Conference in Mérida, Mexico](#)

Editor's Note

Despite a former life as a classicist, Rome was not on my bucket list of Places I Must Visit. But the IAMSLIC Conference is always excellent, and I was happily surprised to find Rome a fascinating mixture of the old, the very old, and the modern. Every morning I walked from my hotel past the Colosseum and the Forum to the FAO headquarters. At our event on the FAO's roof we looked over the Circus Maximus to the city beyond. And once I got used to the crazy Roman drivers, it was a very walkable city. It seemed as though every street had ruins of some sort; I only wished that the signage had been better as in many places it was non-existent.

And the conference was as good as IAMSLIC conferences always are. There was a delightful mix of new people, veterans, and folks I hadn't seen for years. Of course there were lots of Europeans but also people from Tunisia, Argentina, Mexico, China, Vietnam, the Philippines, Bangladesh, India, Senegal, Malawi and Fiji among others. We are truly an international organization, not just in name only! We mingled and shared and learned from one another as always happens with IAMSLIC.

Next year – on to Mérida Mexico! The presentation by host Irene Beltran Rodriguez left me drooling with anticipation. And as always I look forward to seeing old friends and meeting new ones.

INTRODUCTION

Kristen Anderson
41st IAMSLIC Conference & Chair Convener

It was with mixed emotions that I welcomed the attendees to the 41st IAMSLIC conference in Rome. IAMSLIC has enjoyed a great working collaboration with the FAO fisheries section, especially the library. But the fisheries library has been subsumed into the main library and the fisheries specialist position has been eliminated. I think the IAMSLIC/FAO connection was great while it lasted and we are sorry to bid it farewell. We shall continue to work with ASFA and IODE. I take this opportunity to specifically thank **Maria Kalentsis** and **Armand Gribling** for pulling this conference together.

The theme for the conference was: Blue Growth: Motivating Innovations in Aquatic Information Management. **The FAO Global Initiative on Blue Growth (BGI)** in Support of Food Security, Poverty Alleviation and the Sustainable Management of Aquatic Resources, defines "**Blue Growth**" as "*sustainable growth and development emanating from economic activities in the oceans, wetlands and coastal zones, that minimize environmental degradation, biodiversity loss and unsustainable use of living aquatic resources, and maximize economic and social benefits*"**. We fully appreciated and enjoyed hearing from a number of FAO scientists on their work towards sustainability.**

The attendance by a great number of members from EURASLIC and other regional groups made this meeting shine. It is always fantastic to reacquaint with friends from afar. I thank all the presenters for their commitment to the organization and all those who worked behind the scenes to make this happen. We have such enthusiastic members – it was Stephanie Ronan's first meeting and she was our official Tweeter! - that is why IAMSLIC is the best organization in the library world. Thank you all for attending either in person or by following the recap on the blog. See you in Merida!

PRESIDENT'S WELCOME

41st IAMSLIC Conference, Rome, Italy

Guillermina Cosulich
IAMSLIC President 2014/2015

Welcome to our 41st IAMSLIC Annual Conference presentations, a great meeting that the organizing committee aligned perfectly within the FAO strategic topic: the Blue Growth Initiative (BGI), which aims at supporting food security, poverty alleviation and sustainable management of aquatic resources. From that special session, I would like to especially thank our keynote speakers, Lahsen Ababouch and Marc Taconet from the FAO Fisheries and Aquaculture Department, and guest Suzette Soomai, from Dalhousie University in Halifax, with such an interesting presentation on the Critical Role of Marine Information Use at the Science-Policy Interface. ALSO

IAMSLIC Conferences are always a success because they are born from the enthusiastic volunteer collaboration of all the members, and here I have to mention and thank our experienced host Maria Kalentsits, who together with Armand Gribling and a great working team from FAO, reached every goal, even under difficult circumstances.

It was indeed a very visible conference, trying to reach and share with members who could not attend. Bloggers and twitters were updating every moment with news and photos - http://www.iamslic.org/blog/?m=201509 and even a story after the conference was finished - https://storify.com/StephanieRonan/new-story-55f3244492765f6408ac8ed2.

Our six Regional Groups are representative of this international association, reflecting the spirit of IAMSLIC born 41 years ago. We have had talks for a long while, but for the first time during this conference a preliminary meeting was held to consider the possibility of creating another Group, an Asian one since IAMSLIC already has 17 Asian members. The meeting was coordinated by Stephen Alayon (SEAFDEC, Philippines), who showed results of a survey in the region and will continue leading the discussion.

We had attendees from all over the world: Argentina, Bangladesh, Belgium, Bulgaria, Cameroon, Canada, Cayman Islands, Croatia, China, Estonia, Fiji, France, Germany, Greece, India, Ireland, Italy, Latvia, Malawi, Mexico, Norway, Philippines, Poland, Russia, Senegal, Uganda, United Kingdom, United States, Ukraine, Vietnam, 30 countries and more than 80 participants! But it is also important is to mention the collective efforts made to bring members to the conference, and together with IODE and FAO funding 38 colleagues with total or partial grants for travelling, per diem and registrations, for a total sum of $23,000. We are thankful to both organizations for their permanent support for our librarians, as well as to ASFA-FAO for allowing us to increase our membership.

The pre and post conference meetings and workshops are always in the agenda and they are great opportunities for members to receive training, exchange opinions and do personal networking; the 16th EURASLIC Biennial Meeting was held with success starting Bart Goossens (INBO, Belgium) as the new two-years Chair; the new Joint GE-MIM (Group of Experts in Marine Information Management) met for the first time and was chaired by Linda Pikula (NOAA, EEUU), coming up with recommendations and a final report at http://ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=15995; the Work Party for Aquatic Commons was organized for the third year with 15 volunteers practicing or learning to input into our repository the documents from a previously selected institution (thanks to Pauline Simpson, it was again the Gulf and Caribbean Fisheries Institute); and a mini-meeting with the AFRIAMSLIC Regional Group with five participants and myself, focusing on future activities. During several meetings, we discussed whether we should change the annual conference format into only capacity building meetings. It was agreed that we will continue with the pre- and post-trainings as we have done until now, and to keep exploring new ideas and developments within our specialized field.

In 2005, the 31st IAMSLIC was also held within FAO and the topic was Information for Responsible Fisheries: Libraries as Mediators. Conferences at FAO in Rome are always a landmark for IAMSLIC because of the great interest that all members show in participating in such a meeting and melting pot. In my case, I will always remember how honored I felt at that time listening to the guest speaker Sydney Holt (England), so well known because of his Beverton and Holt model. I hope this 41st Conference, which I had the honor to chair, also remains as important for all those who participated.

Thank you all and see you next October 2016 in Mexico!

Keynote Speaker

**Complex Information Needs for (Mostly Inland) Fisheries
(and a little Aquaculture) to Grow Blue**

Devin Bartley
Senior Fisheries Officer
FAO Fisheries and Aquaculture Department
Rome, Italy

Abstract:
Fisheries and aquaculture, especially inland fisheries, need good information to achieve sustainable growth and development. It is important to focus on what kinds of information are needed, the concepts, and trends that should be addressed. The paper explores complex information needs, especially in inland fisheries; examples of information that is missing; information products; and food and information security.

Keywords: information needs; fisheries; aquaculture; FAO strategic objectives; ecosystem approach.

Session 1: Projects

Moderator: David Baca

**Recent Developments in European Copyright:
Introducing TDM into Copyright Regulations**

Marcel Brannemann
Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research
Bremerhaven, Germany

Abstract
After several years of stagnancy – the current "European directive on the harmonization of the copyright (Directive 2001 / 29 / EC)" dates from 2001 – the Directorate General "Connect" of the EU Commission is now working on its revision. The new regulations will certainly have a deep impact, especially on the use of text and data mining (TDM) for scientific purposes. In December 2014 LIBER (the European Library association) gathered 25 global experts in The Hague (Netherlands) to write The Hague Declaration on Knowledge Discovery in the Digital Age. The draft of the declaration has been publicly discussed and the finalized version was published May 6 2015 (http://thehaguedeclaration.com/). The paper informed about new developments on copyright in the European Union and discussed the Hague Declaration and its importance for the work of research librarians.

Keywords: Copyright, Europe.

Session 1: Projects

Moderator: David Baca

SEND 2.0 – A New Version of an Interlibrary Loan Management System

Sofija Konjevic
Rudjer Boskovic Institute
Croatia

Abstract
Rudjer Boskovic Institute (RBI) Library launched its first application for interlibrary loan, called SEND, in 2002. SEND is an acronym in Croatian for "System for electronic document delivery" and it was intended to allow Rudjer Boskovic Institute employees to place orders for items not available at RBI Library, as well as for use by other Croatian libraries for requesting documents from RBI Library. In order to modernize and expand the functionality of the service, the initial application was upgraded to a new version that was released in March 2014. The application, based on open source technologies, was developed by RBI Library. Unlike the previous version, SEND 2.0 is in the form of SaaS (Software as a Service) to other interested libraries (Croatian or foreign). As the Croatian academic community uses AAI@EduHr unique user identifier for accessing different databases and services, it was used for SEND authentication as well. For other libraries, separate registration is provided. SEND 2.0 enables communication between participating libraries, allowing users to send requests. It also automates handling and tracking of requests and enables easy delivery of digital documents when they are in accordance with copyright law, and the statistics module provides simple gathering and analyses of data.

Keywords: Libraries, interlibrary loan, Rudjer Boskovic Institute, Croatia.

Session 2: Vendors and Posters

Moderator: Marcel Brannemann

Discover Inter-Research and Solve a Puzzle

Ian Stewart

Inter-Research Science Center
Nordbünte 23, 21385 Oldendorf/Luhe
Germany
ian.stewart@int-res.com

Abstract
Inter-Research (IR), a small publisher of (mostly) aquatic science journals that have a high global impact, was a sponsor of the 2015 IAMSLIC Conference. I represented IR at the conference and gave a presentation about its products. The presentation is re-conceived here as a crossword puzzle. The search for the solutions, to be found on the IR website http://www.int-res.com, should be both fun and informative about what is available from IR.

Keywords: Inter-Research Science Center, publishers and publishing, crossword puzzles.

Introduction
Inter-Research (IR), publisher of the leading marine science journal *Marine Ecology Progress Series (MEPS)* and other journals mostly in the aquatic sciences, was honoured to be a 'Calamaro' sponsor for the 2015 IAMSLIC Conference in Rome. I was pleased to be able to represent IR at the conference for two days. In lieu of the vendor stand included in the sponsorship package but not available for this conference venue, I was offered the chance to give a presentation. This unashamed advertising presented the essential nature of IR - a small (ca. 25 employees), family-owned, independent publisher that produces high-quality journals, the majority of which have a significant, global impact as attested by Eigenfactor rankings, Impact Factors and by author contributions and subscriptions from all the inhabited continents.

For the IAMSLIC 2015 Conference proceedings, rather than disguising vendor advertising as a research article, I take an unconventional, interactive approach and present a crossword puzzle. Hopefully this will inspire you to explore IR, will be educational, and at the same time will be a fun diversion from the more serious, essential reading elsewhere in these conference proceedings. Most of you likely access IR articles via search engines or databases, and not directly through the IR website, http://www.int-res.com. All of the answers to the crossword can be found by going to the relevant page on the IR website or by using the basic search engine

there. Using the IR website to find the solutions to the puzzle should have the same outcome as my conference presentation: to be better informed about Inter-Research, its activities, and publications. NOTE: Thick lines separate letters (or digits) that are not part of the same word/number.

The solution to the puzzle is available from Ian Stewart on request.

Acknowledgements

Puzzle clues

The solutions can be words, abbreviations, acronyms, values (digits), or a mixture of both. They can all be found on the IR website: http://www.int-res.com.

Discover also the mystery word(s) that run(s) vertically between I and R.

<u>Across</u>

2. Official abbreviation of the Institute funded by Inter-Research dedicated to fostering ecological knowledge and awareness (3 letters).

4. Genus of the rare toad that is found in the Inter-Research Ecological Park (7 letters).

6. Page number on which Michel Loreau's article "Reconciling utilitarian and non-utilitarian approaches to biodiversity conservation" in *Ethics in Science and Environmental Politics* Volume 14 ends (2 digits).

7. Guidone et al. (2010; *Mar. Ecol. Prog. Ser.* 420: 83–89) studied grazing on microalgal films by this animal (5 letters).

8. The year in which Inter-Research was founded (4 digits).

9. Riisgård et al. (2014; *Mar. Ecol. Prog. Ser.* 517:181–192) grew mussels *Mytilus trossulus* at 7 and 20 of this unit (3 letters).

11. Arranged by Eigenfactor, *Marine Ecology Progress Series* occupies a clear "————" position in the categories 'Marine & Freshwater Biology' and 'Oceanography' (3 letters and digits).

12. Species (without genus) of starfish studied in the Feature Article in *Marine Ecology Progress Series* Vol. 540 (6 letters).

15. Acronym for the Environmental Sciences Center of the Universidad de Concepción which published articles in Inter-Research journals between 2000 and 2013 (4 letters).
16. Concentrations of this substance were found to vary between 0.15 and 0.20 μM in the study by Nausch et al. (2004; *Mar. Ecol. Prog. Ser.* 266: 15–25) p. 18 (3 letters).

17. Surname of the third author of the article Seymour et al. (2000; *Aquat. Microb. Ecol.* 22(2): 143–153) (7 letters).

19. Abbreviation of the *y*-axis parameter presented in Fig. 2c of Mundy et al. (2014; *Mar. Ecol. Prog. Ser.* 497: 39–49).

20. Title of the book by Daniel Pauly in the book series *Excellence in Ecology* (+ 18 down + 16 down + 25 down) (7 + 4 + 7 + 6 letters).

21. Manuscripts submitted to Inter-Research for publication are usually "evaluated by at least 3 reviewers in a single blind _____ review process" (4 letters).

22. Number of total cites (rounded up and divided by 1000) for *Marine Ecology Progress Series*, according to the latest Journal Citation Reports (2 digits).

23. First name of the founder of Inter-Research (4 letters).

24. Smale (2013; Mar Ecol Prog Ser 482:29–41) studied "——— assemblage structure" (7 letters).

26. The authors of Ballester-Moltò et al. (2015; *Aquat. Environ. Interact.* 7(3): 193–205) are all from this country (5 letters).

28. Surname of a *Climate Research* author whose first name is Anwar and who worked for the University of Maryland (3 letters).

29. Abbreviation of the model used in the study by Mitter et al. (2015; *Clim. Res.* 65: 205–220) (4 letters).

30. Full title of *AB* (+ 4 down) (7 + 7 letters).

33. Acronym for the prize awarded by the Ecology Institute honouring young ecologists (4 letters).

37. A method for enumerating this object is presented in the article by Ichinomiya et al. (2004; *Aquat. Microb. Ecol.* 37(3): 305–310) (4 letters).

38. _ _ _ V, the acronym for a viral disease found in salmon that causes anemia (3 letters).

39. Abbreviation of one of the 3 Inter-Research journals that are not in the field of aquatic science (2 letters).
Down

1. Street number of the Inter-Research main building (2 digits).

3. Output submitted by authors for review and publication (10 letters).

4. See 30 across.

5. Abbreviation of journal founded to update the multi-volume book *Marine Ecology* (4 letters).

7. Genus of the blue-footed booby (4 letters).

9. Abbreviation for an abyssal plain named after something prickly (3 letters).

10. Studies in *Climate Research* find this eagle has rapidly advanced the timing of its spring migration

13. The study by Justice et al. (2001*; Clim. Res.* 17(2): 229–246) is set in this basin (5 letters)

14. Common abbreviation for a virus infecting salmonid fish that causes pancreatic necrosis (4 letters).

16. See 20 across.

18. See 20 across.

23. Publication model indicated by the acronym CCBY (+ 27 down) (4 + 6 letters).

25. See 20 across.

27. See 23 down.

30. ____ *alba*, a deposit-feeding bivalve (4 letters).

31. Surname of the Editor taking responsibility for the article Hartmann et al. (2015; *Mar. Eco.l Prog. Ser.* 536: 163–173) (4 letters).

32. In the box at the lower right of the web-abstract page of Inter-Research articles is the instruction "____ this article as:" (4 letters).

34. Abbreviation of the Inter-Research journal that was founded because of 4 across (3 letters).

35. Production of this substance (acronym) by *Emiliana huxleyi* was the focus of the study by Hovland et al. (2013; *Mar. Ecol. Prog. Ser.* 484: 17–32) (3 letters).
36. Abbreviation of journal published by IR with a focus on pathogens (3 letters).

Session 2: Vendors and Posters

Moderator: Marcel Brannemann

NHBS

Anneli Meeder
NHBS Ltd.
Devon, UK
Ameeder@nhbs.com

Abstract
NHBS began as the Natural History Book Service in London in 1985 selling ornithology books. Now based in a warehouse on the outskirts of Totnes, Devon, the collection includes wildlife, science and conservation books – more than 122,000 individual titles from all over the world. NHBS sells to more than 180 countries, more than half outside the United Kingdom. They now sell a range of products including ecology and biodiversity survey equipment.

Session 3: Posters From Outside Europe

Moderator: Marcel Brannemann

**Diagnostic Information Literacy and Information Literacy Action Plan ALFIN
In the Academic Community of CICIMAR-IPN**

Teresa de J. Barriga Ramírez, José Luis Ortíz Galindo and Laura M. Pérez Rojas
Instituto Politécnico Nacional, CICIMAR-IPN
Mexico

The expansion in the creation of information is a trigger for the evolution and development of knowledge societies through a transformation in all sectors of society. To this end, information management must ensure the quality of information through information literacy programs such as ALFIN that allow institutions of higher education to meet the challenges of preparing scientific researchers in the marine sciences.

The information skills of the academic community (teachers/researchers and students) and librarians at CICIMAR-IPN were assessed through surveys; the study was completed with interviews of managers and coordinators of graduate programs. We found that the teachers/researchers required information literacy programs to promote the use of TICs and the recognition of intellectual property rules in virtual environments. On the other hand, students have information skills but need both technical knowledge and values to recognize intellectual property rules. Librarians need to develop management and teaching skills to enable them to transmit this knowledge. The results of the study helped to create an action plan, ALFIN, which contributes to the generation and transfer of knowledge.

_____

**The Important Role of FAO Fishery Publications in Marine Research
at the Vietnam Institute of Oceanography (VNIO).**

Dang Thi Hai Yen
Library of Vietnam Institute of Oceanography - VAST
haiyenhdh@gmail.com
VIetnam

As in other developing countries, the lack of database development and information systems in marine science in Vietnam limits the national research capacity to develop and expand

sustainable approaches or make informed decisions on fisheries management and wise utilization of natural resources. In response to these problems, the VNIO Library has worked since 1978 with the Food and Agriculture Organization (FAO) and received FAO fishery publications on a regular basis. From 1978 to 2014, VNIO's library received 450 items of 15 FAO fishery publications, including serials. FAO fishery publications have assisted VNIO's scientists in developing research strategies for sustainable aquaculture development and integrated coastal zone management because FAO fishery publications can guide appropriate research in fisheries including biology, ecology, technology, environmental science, economics, social science, aquaculture, and nutritional science.

Many important changes in publication methods are taking place. These include Open Access and widespread use of the Internet in developing diverse publication methods and forms of access. Despite these changes, the FAO fisheries publications maintain an important position in fisheries research in developing countries because these documents provide high quality scientific information at minimal cost.

In FAO fisheries publications, the number of users in VNIO accessing Aquatic Sciences and Fisheries Abstracts (ASFA) has declined in the last 10 years. As the largest integrated database in aquatic sciences, ASFA can continue to be the extremely valuable, but it must respond to the changing needs of the aquatic research community. In essence, ASFA owns the largest fisheries database and manages a network of partners over the world. We suggest that ASFA's role in working with networks of fisheries libraries should be to improve access to full text documents. This can be very useful for researchers, continuing AFSA's outstanding contribution in supporting scientific research in marine sciences.

There have been several Vietnam initiatives to protect the environment of coastal areas and ensure sustainable development since the country has suffered from natural disasters. These include:
- Marine Protected Area (MPA)
- Mangroves For the Future – MFF – IUCN – 11 countries, investing in coastal ecosystems
- Green Fins (Reef World Foundation), promoting environmentally responsible diving and snorkeling
- Marine Spatial Planning, MSP (IOC and MAB): A management approach for nature conservation to achieve both economic and environmental objectives.

We suggest that FAO publish documents relating to these issues in order to support the above projects and share our experiences among developing countries.

We also suggest that IOC/IODE and IAMSLIC play a role in capacity building by promoting marine information management, open knowledge and open science.

_____

Sustainable Aquatic and Marine Resources Management in Africa:
The Contribution of IAMSLIC Over the Years

Arame Ndiaye Keita
Direction des Peches Maritimes
Ministère de la Pêche et de l'Economie Maritime
Senegal

Aquatic and marine resources and areas are important issues in Africa. In fact, they provide the basis for a substantial proportion of economic and social activities in Africa, including improving livelihoods, fishing, tourism, navigation, and other industries. For sustainable management of these resources and activities, the availability of reliable, up-to-date, accessible information, based on sound scientific knowledge, is essential.

To support these activities, libraries and information centers have to play key roles to enable better and easier access to scientific and technical information for end users (decision makers, resource managers, researchers, etc.). IAMSLIC as an international framework contributes to empowering aquatic and marine libraries and information centers throughout the world and particularly in Africa through its regional group via capacity building, exchange of expertise, participation in regional and international projects, resource sharing, and promotion of local resources and expertise. The poster traced the history, activities, achievements, challenges and new opportunities of AFRIAMSLIC over the years. It also included some recommendations to strengthen the regional group and enable it to face new challenges.

_____

How E-resources and Databases Projects at the INSTM Library Have Helped the Library Provide Improved Services to its Users, Resulting in Greater Satisfaction

Saida Messaoudi
National Institute of Marine Sciences & Technologies
Tunisia

The library of the National Institute of Marine Sciences & Technologies (INSTM) was created in Tunisia in 1924. It targets different users interested in aquatic sciences. The main mission of the library is to contribute in an effective manner towards the development of aquatic sciences by facilitating access to relevant information for research and sustainable management of oceans, seas and coasts. The INSTM library is always open to proposals for collaborative activities and welcomes projects on sustainable information management. Below is an overview of some experiences.

1. At the international level:
- IAMSLIC: The INSTM library became an IAMSLIC member in 2001. It makes good use of IAMSLIC's distributed library to satisfy its users' requests. It also makes the *Bulletin* of the institute available in the IAMSLIC union catalogue of serials for sharing with other members and provides documents as requested. IAMSLIC conducts activities at the international level from which INSTM has benefitted and that it publicizes at the national level.
- ASFA: The INSTM library became a national ASFA partner in 2002 and monitors the aquatic science literature published in Tunisia. The AFSA database contains more than 570 Tunisian items. Most of them are linked in full text in the OceanDocs repository, including the articles published in the *Bulletin* of the institute (from 1924 to present) and also the grey literature (theses and masters' theses). ASFA is a useful tool in the field of aquatic sciences and for this reason the library offers search services in ASFA to its various users (students, researchers and professionals) and mentions the utility of this database to colleagues in order to recruit collaborating centers and increase the number of Tunisian inputs.

2. At the regional level:
- The library continues to work on the development of information products within the framework of the OdinAfrica project (IOC/UNESCO).
- The INSTM library submitted the full text of more than 275 records including articles and grey literature to OceanDocs, the repository of marine publications that is one of a number of complementary aquatic repositories including the Aquatic Commons (supported by IAMSLIC). According to Google Analytics there were 1,876 pages viewed on OceanDocs-INSTM between 22 Nov. 2013 and 23 Nov. 2014. These statistics show the visibility of research results ensured by OceanDocs repository.
- AFRILIB: the INSTM catalog (8,408 records) was merged into AFRILIB, the union catalogue of marine libraries. The databases were initially developed using INMAGIC software and were later converted to AgriOcean/DSpace.

3. At the national level:
- BIRSA: http://www.birsa.agrinet.tn, the Virtual Library of Scientific and Agricultural Resources, is a unique tool and is the point of access to all the library holdings of institutions belonging to the Ministry of Agriculture. BIRSA is not only a collective catalogue but also provides full texts of grey literature. The INSTM catalogue is merged into this OPAC with links to OceanDocs-INSTM.
- TUNIPER: www.cnudst.rnrt.tn is the national catalogue of serials that is used to localize titles and avoid duplicated acquisitions, and also to centralize national electronic subscriptions.

In conclusion: The involvement of the INSTM library in these various projects has improved its services and increased the overall satisfaction of researchers by providing them with information within the field of marine ecosystems, conservation and sustainable management of oceans, seas and coasts. In fact, via IAMSLIC's distributed library, we can answer requests for very useful items not available in either INSTM library or in other libraries in Tunisia. We obviously are able to fulfill many requests for documents. The full texts of some documents were obtained by using the scanner provided by ASFA. PDFs were deposited into OceanDocs

repository and/or used for document delivery and ILL services in order to satisfy information requests of users and collaborating partners such as ASFA, ODINs and IAMSLIC members.

_____

**Keep Calm and Be a Librarian! Ten Steps to Starting Up a Specialized Library
(The Case of an Aquatic Science Library)**

Carolina Monti
Institute of Limnology 'Dr. Raúl Ringuelet'
Buenos Aires
Argentina

The Library of the Institute of Limnology Dr. Raúl Ringuelet (CONICET-UNLP Argentina) is a new member of the community of the International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC). The poster provided ideas and resources on how to start a library or center of documentation specializing in a certain type of information – in this case aquatic and marine sciences. The poster emphasized certain aspects that were considered key and marked the path the library took in this period of reorganization and startup through collaboration and library partnerships, user satisfaction, collection development and the use of technology and free software. I took charge of this library a year ago and these are the steps we took to create a self-sufficient and functional library for the research and activities conducted in the Institute.

Some of the points:
1. Know your institution.
2. Know your users, for example through a survey to find out user types, areas of interest, usual ways of finding information, and preferred ways of communication.
3. Know the library resources – the various collections and digital resources.
4. Determine what the library already has and what it needs.
5. Define primary objectives – services that users need and want, collection management, technological resources, etc.
6. Define the main services.
7. Plan collection management through audits, weeding and technological processes.
8. Determine past scientific production and plan for the future – raising awareness, calling for participation from researchers, etc.
9. Prepare technological resources: online catalog, internal repository, etc.
10. Plan networking! This includes other networks and organizations, arranging sharing and exchanges, standardization of data, promotion of services such as Interlibrary Loan, developing cooperative systems, encouraging training and enabling exchange of information resources and remote access to databases.

_____

Information Management at Chinese Academy of Fishery Sciences (CAFS)

Ningsheng Yang and Xue Yan
Chinese Academy of Fishery Science
Beijing
China

1) What is CAFS?
The Chinese Academy of Fishery Science (CAFS) was established in 1978. Its mission is to promote the development of Chinese fishery and aquaculture industries by conducting scientific research. CAFS, with its headquarters in Beijing, currently has 13 research institutes located across 11 cities and covering all the major sea areas and river reaches in China.

2) Information Management at CAFS
Since its establishment, the information center of CAFS has devoted itself to the co-construction and sharing of information resource. Apart from traditional library services, CAFS has established a number of information systems to meet the need of scientific researchers. These include the National Infrastructure of Fishery Germ Plasm Resources, an information network of seaweed culture industry, a freshwater fish breeding platform, a production management information system, a fishery scientific data platform, a fishing vessel ASF system, an inland fishing vessel information management system, an aquaculture disease diagnosis system and aquatic product safety monitoring system, etc.

3) A brief introduction to some information systems
The National Infrastructure of Fishery Germplasm Resources, Information Network of Seaweed Culture Industry, Freshwater Fish Breeding Platform and the Production Management Information System are four of the main aquatic information systems developed by the Chinese Academy of Fishery Sciences.
- National Infrastructure of Fishery Germplasm Resources (http://zzzy.fishinfo.cn/) is an administrative entity that aims to collect and conserve national fishery germ information. Its portal website contains 129 databases storing 35,000 genetic resource items. It plays a fundamental role in co-construction and sharing of such information resources. It is open to the public and users can search by name, region, reference, or institution. It also includes breeding cases and achievements as models in this system.
- Information Network of Seaweed Culture Industry (http://haizao.fishinfo.cn/haizao/ Default.aspx) is the work of the main algae research institution. Its portal website provides seaweed information about 117 seaweeds, including scientific names, morphological features, classifications, culture techniques, processing techniques, market information, statistical data, experimental data, composition data, etc.
- Freshwater Fish Breeding Platform (http://breed.fishinfo.cn:8080/index.asp) is a system that aims to support the construction and evaluation of the Aquatic Germplasm Resources Group, the breeding of new varieties and the large- scale breeding of famous and special varieties. Users can search the research report on the breeding process, get

the evaluation information about different germ plasm resources, and also watch videos about breeding technics.

- Production Management Information System of Prawn (http://shrimp.fishinfo.cn/) collects aquatic information about prawn in 100 square kilometer areas that is managed and updated dynamically. It established a three-tier information management structure for modern management of prawn, and the raisers can manage their own production data to improve their productivity while the governments at the provincial level can see and analyze the data of their own provinces and the government at the national level can get data for the whole system. All these information systems extend the power of aquaculture in a sustainable way and unlock the potential of seas and oceans.

Session 3: EURASLIC Posters

Moderator: Marcel Brannemann

A Successful Library Partnership: IOF Library as a Collaborating ASFA Centre

Ingrid Čatić, Anita Marušić
Institute of Oceanography and Fisheries
Split
Croatia

The 16th EURASLIC Biennial Meeting and 41st IAMSLIC Annual Conference took place at the Food and Agriculture Organization (FAO), with which Croatia and our Institute for Oceanography and Fisheries (IOF) collaborate successfully. The IOF is 85 years old and is the first national institute for marine research in Croatia. The FAO-ADRIAMED Project is one of the FAO's cooperative projects for supporting responsible fisheries and resource management in the Adriatic Sea. The Aquatic Sciences and Fisheries Abstracts (ASFA) bibliographic database works with the international network of ASFA partners to capture and disseminate the world's aquatic science literature. Our Institute has become a collaborating ASFA center by cooperating with FAO-ADRIAMED, one of the international ASFA partners. ASFA bibliographic references are usually prepared in the libraries or information units of institutions dealing with aquatic environments. The IOF Library, among its numerous activities, prepares ASFA input and submits to FAO-ADRIAMED the bibliographic references that are finally included in the ASFA Database.

By participating in this partnership for aquatic information management, our library also provides information services to our users with free ASFA products. The library, as a participating center of ASFA, helps the scientists increase their visibility since the references in the ASFA Database are disseminated all over the world. The library is also closely connected to the IOF publishing department and our serial publication *Acta Adriatica* is included in the ASFA Database. *Acta Adriatica* is the only Croatian national scientific journal that publishes papers dealing with all aspects of marine sciences, preferably from the Adriatic and Mediterranean Sea. The journal's policy was created to enable scientists to publish their research papers at no cost, and we are enormously proud that our journal from 1932 up through today is a true Open Access journal. Currently, the journal is in the process of acquiring new technologies in publishing.

Information Support of Fisheries Research and Library Cooperation in Czech Republic

Vladimira Bendova
Academic Library of the University of South Bohemia
České Budějovice
Czech Republic

This poster described the information support of fisheries and hydrobiology research in the Czech Republic, its development and its current state. The Research Institute of Fish Culture and Hydrobiology (RIFCH) is the largest and most comprehensive facility focusing on basic and applied research in fish culture in the Czech Republic. The institute library was established in 1921. Currently the Research Institute of Fish Culture and Hydrobiology is part of the Faculty of Fisheries and Protection of Waters of the University of South Bohemia in České Budějovice, and the library falls under the Academic Library of the University of South Bohemia (AL USB). The AL USB branch is the largest Czech research library in the field of fisheries, aquaculture, hydrobiology and related disciplines. The library also serves students and teachers at the faculty and fulfills the functions of the university library. The poster also covered other Czech libraries that provide information support for fisheries research.

_____

Blue Economy Means Also Ecology: Let Us Develop a Blue Communication Between Librarians and Readership

Małgorzata (Maggie) Grabowska-Popow
National Marine Fisheries Research Institute
Gdynia
Poland

The concept of a "blue economy" emphasizes conservation and sustainable management, based on the premise that healthy ocean ecosystems are more productive and a must for sustainable ocean-based economies. Communication between a librarian and a reader should also be healthy, productive, and ecological! However, although libraries exist for their users and librarians strive to provide services that satisfy their users' needs, sometimes conflicts arise. Patrons, for instance, may be disappointed with the library's collections or services or even with the librarian, and this can lead to accusations on both sides - "difficult readers" and "difficult librarians."

"Difficult readers" may be categorized in several ways. For example:
- Chatterbox – a person who treats a librarian as a confessor, telling her/him all about experiences that have nothing to do with what they are reading.
- Dawdler – someone who complains and criticizes everything.
- Wiseacre – a person who knows everything much better than the librarian.

- Seducer – someone who wants to prove his/her attractiveness and establish close relations with the librarian. This person tends to be excessively polite, agrees with everything, and requires a lot of attention.
- Sweet Scatterbrain – this is the forgetful person who might, for example, ask for a book read previously that had a blue cover and "fish" in the title.
- Spitfire – this person wants everything quickly with no delays.
- Aggressor – someone who takes out her/his fury on the librarian.
- Bashful – a person who may be too shy to ask for what is wanted.
- Lazybones – someone who wants everything presented. This may include copying entire works.

In dealing with such patrons, the librarian should remember that they want and need to be heard. These people should be allowed to speak and only be interrupted kindly but firmly. The librarian must always be polite and keep answers short and to the point so that patrons listen and feel that they have been heard and their needs have been addressed.

Of course there are also "difficult librarians" such as these:
- Researcher – the person for whom the library is a place to do her/his own research and is careless and cursory in dealing with patrons.
- Tired Martyr – someone who finds working in the library exhausting. This person often complains about salaries and the employer's underestimation.
- Disappointed and frustrated – someone who considers library work beneath his or her aspirations, and who likely treats patrons as if they should be honored by his/her services.
- Warrior – this person regards the library as a battlefield and a reader as a kind of enemy. This librarian is the kind who enforces absolute silence in the reading room and who likes to underline her/his power.
- Castle Guard – someone who regards an ideal library as an empty one and considers readers as potential barbarians or vandals and guards all the collection zealously.

Good communication on both sides is essential to prevent the sorts of problem readers and librarians outlined above. This includes non-verbal communication.

In conclusion, librarians should remember that:
1. It is much easier to keep an old reader than to win a new one.
2. Satisfied readers come back.
3. Satisfied readers bring new ones.
4. A good library service makes a library competitive with other sources of information.
5. A good library service gets and keeps the good opinion of its patrons and so justifies its existence.

PINRO Publications Database:
Evolution From the First Institute Duplicating Machine (Rotaprint) Until Today

Irina Iniaeva
Polar Research Institute of Marine Fisheries and Oceanography
Murmansk
Russia

The Polar Research Institute of Marine Fisheries and Oceanography (PINRO) is the oldest fisheries institution in northern Russia (it was established in 1921 as Ship-based Marine Research Institute) and is the only scientific library in Murmansk. By 1934 it already had a library. Later in the 1930s a systematic card catalog was created, and all PINRO papers were included. In the 1960s work started on creating a specific catalog of PINRO scientists' publications. The first bibliography "PINRO Publications" was devoted to the 50th anniversary of V.I. Lenin's Decree on the establishment of the Ship-based Marine Research Institute. Articles, brochures and books by PINRO workers published from 1936 to 1969 were included, sorted and systematized manually. This edition launched a series of bibliographies. The next ones were released at intervals of five years and covered publications for previous 5 years. One weakness of these early issues was that they only included papers published by PINRO. Starting in 1992 the indices covered all printed works of PINRO scientists, including those published in foreign sources.

The first issues were printed on the institute duplicating machine (rotaprint), then from 1990 on a xerographic machine. The first computer was purchased in 1999, and in 2000 three new p.c.'s were acquired. In 2003 special library software, IRBIS, was purchased and an electronic database of PINRO scientists' publications was established, making most of the work of bibliographic indices automatic. In 2011 a project on digitization of books and articles was started. Now with a new version of library net software, we can create electronic collections of PINRO publications. Every scientist can get full text from the database inside the local institute intranet, which now includes over 7,045 records with direct links to the full text in 2,370 records. The creation of an open PINRO repository is next.

_____

From Information to Knowledge:
The Value and the Role of Special Libraries in Research Organizations

Natalya Kondratyeva
Institute of Food Safety, Animal Health and Environment "BIOR"
Riga
Latvia

Special libraries in research institutes provide for the information needs of their scientific communities, helping researchers and scientists who act both as information users and creators of new knowledge. Understanding of information needs is integrated into every research

process as a very important part of it. Information and communication technologies of the 21st century affect the information behavior of researchers and their expectations in relation to a library's services. It is necessary for a special library to demonstrate its value and the new role of subject librarians in its scientific community to the parent organization.

As the number of available scholarly resources continues to increase, literature data indicate that researchers prefer metasearch tools with easy interfaces, and the scientific search via Google dominates on the international scale. Undoubtedly Google has important benefits. However, case studies show that researchers are relatively unconcerned about differences between selectivity and completeness of the sources retrieved from the Internet. Subject librarians have to increase their visibility as consultants and demonstrate that they can add value to researchers' efforts when they are seeking new information.

Special libraries in research institutes maintain and develop collections of scientific reports, conference proceedings, theses, bibliographic sources and various unpublished materials. From a researcher's point of view grey literature is an important source of scientific information. These materials reflect the long-term history of the relevant branch of science. The collections of a special library are very important for young researchers and students to familiarize them with the background for their future work. At the same time scientific books in print format have not become a less important part of library's holdings.

In the first decade of the 21st century a number of special libraries in state research organizations were closed due to implementation of cost-saving government programs. In cases when institutes are merged or streamlined, special libraries are usually centralized. Scientists are mostly worried about scientific and technical reports and other documents that have not been published elsewhere, and will likely never be put in digital collections and accessible online.

In spite of the lack of staff and other problems, small libraries in research institutes have many tasks. The value of unique resources in library's holdings should be emphasized. In order to survive and be successful in future, librarians need to re-consider the development and service strategy of special libraries as information providers and be aware of the current needs of researchers. Libraries should compete to play a vital role in forming and enhancing intellectual and knowledge assets in their research institutes.

The library of the Fish Resources Research Department of the Institute "BIOR" in Riga serves a small community of researchers involved in studies of fish resources in the Baltic Sea and inland waters in Latvia. The library holds books and periodicals in aquatic ecology, oceanography, fish biology and aquaculture. This is the only collection of publications related to fisheries and fishery science in Latvia. The library has been an institutional member of EURASLIC/IAMSLIC since 2002.

In the 21st century the collection of new scientific books has been developing mainly via the library's participation in projects with the financial support of the Fish Fund of Latvia. In 2015 the library acquired 16 new scientific books.

The library has many tasks in the optimal organization of its printed and electronic information sources. The first step in implementing digital preservation of the library's materials is participation in the Central and Eastern European Marine Repository at http://ceemar.org, where there are now two digital collections. In spite of the lack of human resources, the plan is to continue the creation of digital collections according to priorities based on the scientific and historical value of printed materials and manuscripts as well as on their physical state. The current collection (the reports of the Institute's earliest research cruises to the Baltic Sea) started being digitized in 2014. In recent years the department's researchers have become more active users of new scientific monographs in the library. Some researchers still request older editions and various historical materials.

Librarian participation in the research project "Fish migration and natural reproduction in the River Daugava" in 2013 resulted in the creation of a special collection of printed and electronic materials. We hope to continue these joint activities in future in order to enrich the library's holdings with collections that play a role in the knowledge assets of the parent institute.

_____

Our Open Roads: Ruđer Bošković (RBI) Library Open Access Activities

Marina Mayer
Ruđer Bošković Institute
Library
Zagreb
Croatia

The Ruđer Bošković Institute Library (RBI) has been actively promoting Open Access (OA) for many years, implementing it in all aspects of library work. The poster presented various Library activities including:
- Development of FULIR – Full-text Institutional Repository of the Ruđer Bošković Institute (fulir.irb.hr).
- Participation in EU projects connected with OA:
  - FP7 project Support for Establishment of National/Regional Social Sciences
  - Data Archives (SERSCIDA)
  - FP7 project OpenAIREplus (2nd Generation of Open Access Infrastructure for Research in Europe)
  - Horizon2020 project OpenAIRE2020
  - FP7 project Facilitate Open Science Training for European Research – FOSTER
- Participation in Croatian OA projects:
  - HRČAK - central portal of Croatian scientific journals published in Open Access (hrcak.srce.hr)

- o DABAR (Digital Academic Archives and Repositories) – the project will provide an infrastructure for setting up various digital repositories to all institutions-members of Croatian academic community (www.srce.uniza.hr/dabar)
- Student education at the university level – library staff is holding courses covering OA topics on several faculties
- Successful advocating for self-archiving mandate on institutional level for RBI
- Education about OA for RBI staff (workshops, lectures, one-to-one counseling…)
- Participation in the Croatian Declaration on Open Access – www.fer.unzg.hr/oo2015/declaration)
- Promoting OA during RBI Open Days
- Marketing Open Access Week
- Education about OA for RBI staff

_____

Sustainable information management by the Library of the Institute of Fish Resources-Varna, Bulgaria

Elitsa Petrova; Daniela Klisarova
Institute of Fish Resources
Bulgaria

The Institute of Fish Resources (IFR) was established in 1932 as a marine biological station with an Aquarium. From the beginning in 1932 until now the Institute has had a library - the oldest marine library in Bulgaria, storing literature about the Black Sea basin. It has more than 30,000 units of scientific and special literature, manuals, periodicals and publications of other marine institutes from Europe, America and Asia, as well as archival marine cards. The first edition of *IFR - Proceedings of the Marine Biological Station* was printed in 1933. The library archives, research data from previous years and constantly incoming new literature provide the necessary basis for sustainable management of the library and opportunities for development of education in marine science in Bulgaria.

_____

Introducing the Irish Marine Institute & the Oceanus Library

Stephanie Ronan
Oceanus Library
Marine Institute, Galway
Ireland

This presentation introduced the Irish Marine Institute and library to the IAMSLIC community. This is the first time that the Institute, located in Galway, has participated in the IAMSLIC annual conference. The Marine Institute (Foras na Mara) is the state agency responsible for marine research, technology development and innovation in Ireland. The Marine Institute provides scientific and technical advice to the government to help inform policy and support the sustainable development of Ireland's vast and diverse marine resources – the seabed territory covers about 880,000 km^2, more than ten times Ireland's landmass. The coastline of 7,500 km is longer than that of many European countries. The Marine Institute works across a wide range of areas to ensure the sustainable development of these marine resources to improve our understanding and to safeguard them for future generations.

The Oceanus Library is a specialist library that holds an extensive collection of scientific literature relating to marine and freshwater resources. An important element of this collection is the archive, with material dating from ca. 1840, consisting of scientific reports, books and publications prepared by Irish and international researchers. The library supports the Marine Institute researchers with their information needs and makes their research available through OAR, the Marine Institute's Open Access Repository. The library also supports the Marine Institute's educational outreach Explorers' program. The poster provided an overview of the solo librarian's role in the Marine Institute and its evolution.

Session 4: Open Source

Moderator: Steve Watkins

"Doctor-Doc:" An Open Source Tool to Handle Library Literature Requests

Christina Fromm[1]
Olivia Diehr[2]

[1]Leibniz Center for Tropical Marine Ecology, Fahrenheitstrasse 6, 28359 Bremen, Germany
[2]Leibniz Institute for Baltic Sea Research, Seestrasse 15, 18119 Rostock, Germany

Abstract:
Doctor-Doc is an open source tool to handle literature requests, especially ordering and managing interlibrary loan requests. The software is freely available for libraries and information centers, and can be implemented easily. This paper introduces the features of Doctor-Doc as well as its interface, which is multilingual. We demonstrate how to activate Doctor-Doc as an Open URL link resolver in scientific databases like Web of Science, ScienceDirect and PubMed. A link resolver button links to the full text. In case the full text from publisher is not available, Doctor-Doc creates a request with complete bibliographic data to the library. The technology offers statistics and an appropriate overview of all order requests, which are useful data for the acquisition policy.

Keywords: Open URL, link resolver, interlibrary loan, open source software, library catalogs, library users.

Background
Our libraries, the library in Warnemuende at the Leibniz Institute for Baltic Sea Research and the library in Bremen at the Leibniz Center for Tropical Marine Ecology, collaborate with each other. The institutions are members of the Leibniz Association. The two libraries have similiar environments and both are located in institutions for marine research in the north of Germany. The access to all electronic resources is IP-address based; the Web of Science is the most important subscribed scientific database.

Library at the Leibniz Institute for Baltic Sea Research	Library at the Leibniz Center for Tropical Marine Ecology
• scientists: 100 FTE	• scientists: 100 FTE
• 6000 electronic journals	• 8000 electronic journals
• library staff: 1 librarian full-time and 1 technical assistant half-time	• library staff: 1 librarian full-time and 1 technical assistant full-time
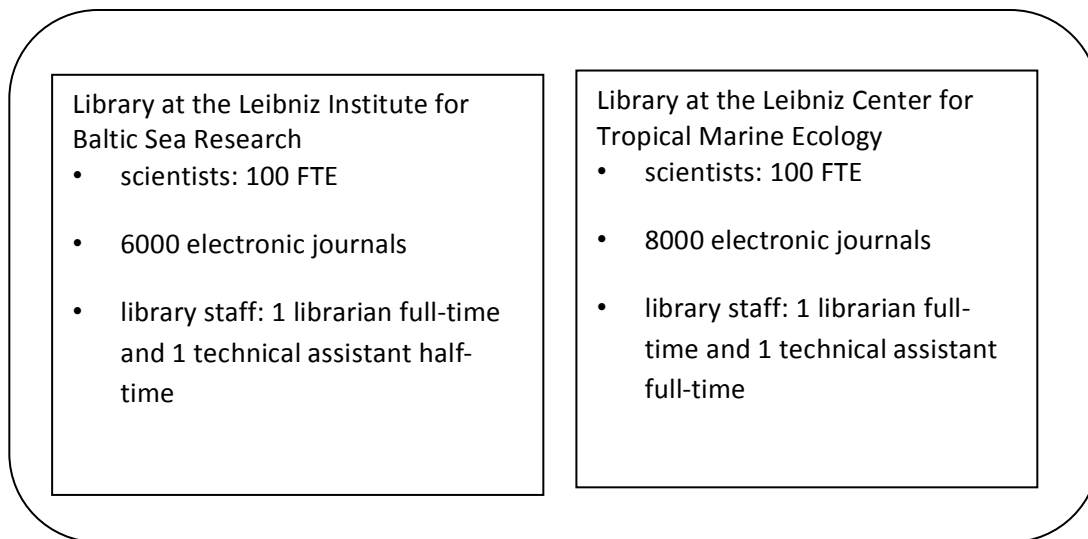
Introducing "Doctor-Doc"

Do you know this situation? A scientist is coming into your library. He or she wants to read an article and asks you for some help getting it. The reference data are written on a tiny sheet of paper. The scientist only knows for sure that the book was green. Finally you find out that it was red. Or your library receives article requests by phone or in best case by email. In every case, you have to spend a great deal of time verifying the bibliographic data and checking your library's holdings.

The solution can be "Doctor-Doc." We use this tool to handle literature requests in our libraries. It is an open source software, freely available, developed by a librarian in Switzerland, Markus Fischer.

Features of Doctor-Doc

Doctor-Doc is a tool useful for both librarians and library users.

Imagine you are a scientist at your institute: in their workflows they search for a specific topic through the Internet, e.g. in Web of Science, ScienceDirect or PubMed. Your patron wants to read an article, but he or she cannot access it because your library does not have a subscription. Usually at this point, users have to interrupt their work and send a literature request to their library, via email or online form. They have to copy and paste the specific information to send. Afterwards, they may have to start again with their search. This is time-consuming, error-prone, and interrupts the patron's workflow.

With Doctor-Doc, users don't have to interrupt their work if they end up without immediate access. Your users find an additional button with your library's or institute's logo on the specific research databases. Only users within your IP-range will see the library button, because it is IP-based. That means that the users don't have to sign in. Via this button, your users can submit the article request directly to their librarian.
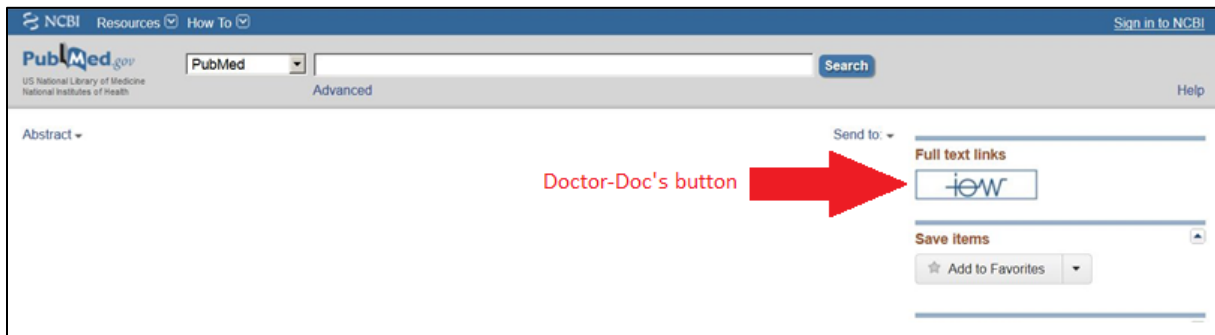
Figure 1: This is an example from http://www.ncbi.nlm.nih.gov/pubmed.

Altogether we have had positive experiences, as Doctor-Doc is an efficient instrument that streamlines the workflow in our research institutions. Also, it is a good opportunity to promote your library, because scientists find your logo in their scientific databases.

How Does It Work?
Your logo on the specific databases serves as a request button. While registering for Doctor-Doc, the responsible librarian has to name the library holdings, e.g. on the basis of the institution's WorldCat entries. The system harvests and transfers the bibliographic reference data via a link resolver, which creates a connection for the user between their research results and your local inventory information.

With a click on the button, Doctor-Doc automatically checks the availability of your user's search results. An order form will be filled automatically; your users don't have to enter the data any more.

Figure 2: Screenshot of Doctor-Doc's article request form.

The user just has to add his or her name and send the order and then it arrives at the librarian's desk. So there is benefit for both the user and you, the librarian.

If the user submits the order via Doctor-Doc, both the person requesting and the library receive an email with the request. The librarian can access the order on the Doctor-Doc librarian administration page, edit the order and choose the appropriate or best supplier.
The number of half-filled user requests that you are not able to decode will be reduced.

Figure 3: Screenshot of Doctor-Doc's Order Tracking Page.

Doctor-Doc Statistics Tool

There are various ways of getting statistics about the requests. You have an overview of the order requests, so you may use it as an analyzing tool for the library's holdings acquisition management. For example, if you realize that you have a specific journal requested more times than average, this would be a sign to subscribe this title. You may also use the statistics for interlibrary loans as evidence for the library's performance without having to collect these data separately.

About Doctor-Doc

Doctor-Doc is multi-lingual. At the moment your library can implement Doctor-Doc in English, French and German. The standard language is the language of your IP-range. All the big players collaborate with Doctor-Doc: bibnet.org, Carelit, CINAHL / EBSCO HOST, Query-String, CSA, Endnote, ISI Web of Science, Ovid, PubMed, Refworks, ScienceDirect, Scopus and Springer.

An alternative tool to Doctor-Doc is SFX by ExLibris.

Link Resolver in the Web of Science, PubMed, and ScienceDirect

The library of the Leibniz Institute for Baltic Sea Research registered for an account and implemented Doctor-Doc in 2009. In the beginning, the program was used as an administration and monitoring tool for interlibrary loan requests only. In 2015, we implemented the link resolver in Web of Science, PubMed and ScienceDirect. The patrons have been very interested in this, and there has been high usage. The implementation of the tool took no more than 20 hours.

Easy Implementation Road Map

1. Register an account for your library on http://www.doctor-doc.com and register your IP-address.

2. Create an image of your logo and a location URL. You will need this image for the link resolver button on the databases' websites. Supplying your logo is not mandatory; however, we would recommend it. It makes it easier for your scientists to find your local holdings.
3. Submit your request for full text linking using Open URL on the website of the chosen database provider.

The implementation needs some IT know-how, but it is doable for a librarian or information specialist. It is not necessary to be an IT expert. Find more information concerning the implementation on the website of the database provider and visit the How-to page on Doctor-Doc's website.

You can subscribe to a mailing list. Any communication regarding the tool will be sent through this mailing list. https://lists.sourceforge.net/lists/listinfo/doctor-doc-general

References
http://www.doctor-doc.com/[Retrieved 02 Nov 2015]
http://sourceforge.net/projects/doctor-doc/[Retrieved 25 Nov 2015]
http://www.sciencedirect.com/[Retrieved 25 Nov 2015]
http://webofknowledge.com/[Retrieved 25 Nov 2015]
http://www.ncbi.nlm.nih.gov/pubmed[Retrieved 25 Nov 2015]
http://www.exlibrisgroup.com/category/SFXOverview[Retrieved 25 Nov 2015]

Session 4: Open Source

Moderator: Steve Watkins

Research Institute for Nature and Forest (INBO):
(R)evolution Towards an Open Research Institute

Bart Goossens
Geraardsbergen, Belgium

Abstract

The Research Institute for Nature and Forest (INBO) is the Flemish research and knowledge center for nature and its sustainable management and use. The INBO conducts research and supplies information to all those who prepare or make policies or are interested in them. As a leading scientific institute, the INBO works for the Flemish government primarily, but also supplies information for international reporting and deals with questions from local authorities. In support of this research, the INBO collects and manages a wealth of biodiversity data, mainly species observation records – the what, when and where of a species.

One of our strategic aims is to make this research data publicly available. Our journey to opening our data started in 2010 with the publication of our first datasets on the Global Biodiversity Information Facility (GBIF), a network that strives for free and Open Access to biodiversity statistics with over five million species observation records, as well as geographical and other research data, and are also involved in the open data movement. It is within this context that the organization started to evolve towards an open data research institute. Recently we signed the Bouchout declaration for Open Biodiversity Knowledge Management and approved, as one of the first Flemish institutes, our open data policy. The presentation discussed the barriers, highlights and setbacks encountered during this journey.

Keywords: Biodiversity data, INBO, Belgium, GBIF, open biodiversity knowledge management.

Session 5: Blue Growth FAO Invited Speakers

Moderator: Pauline Simpson

The FAO Blue Growth Initiative

Lahsen Ababouch
Marc Taconet
FAO Fisheries and Aquaculture Department

Session 5: Blue Growth FAO Invited Speakers

Moderator: Pauline Simpson

Advancing the Global "Blue Growth" Agenda:
The Critical Role of Marine Information Use at the Science-Policy Interface

Suzuette Soomai
Dalhousie University
Halifax, N.S.
Canada

Abstract
Modern governance espouses evidence-based policy-making, but while knowledge about marine environments is growing, the state of these environments continues to deteriorate. Understanding the role of information at the science-policy interface is critical and international commitment has intensified, e.g., at the 2012 Rio +20 conference, where improved access to and use of information were considered priorities for addressing problems at the interface. Since 2002, the Environmental Information: Use and Influence Research Program (EIUI) at Dalhousie University has been studying the role of marine scientific information in public management settings. Research is conducted primarily through case studies of governmental, intergovernmental, and non-governmental organizations representing national, regional, and global settings. Case studies utilize mixed methods (citation analysis, content analysis of policy documents, interviews of public sector actors, direct observations at meetings, discourse analysis, surveys, and network analysis to understand the pathways of information from production to use. This paper described highlights of the EIUI research, including recent case studies of Fisheries Organization (NAFO), and the Canada Department of Fisheries and Oceans (DFO). Our studies show that many organizations use their own publications as a primary source of information for decision-making. Although a range of tools is used to disseminate information, awareness promotion is limited. Drivers of and barriers to communication include, e.g., characteristics of scientists and managers, organizational structures and cultures, attributes of information, and political influences, among others. Application of research insights can improve the flow of information at the interface and increase the visibility of information. Understanding the complexities of the interface can further the global agenda on "Blue Growth" by ensuring that the best available scientific information is used to achieve conservation and sustainable fisheries management goals. This paper informed library and information specialists and practitioners about the complexities of the science-policy interface and challenges to communicating marine scientific information in policy- and decision-making contexts.

Keywords: Blue Growth, fisheries management, FAO, environmental information.

Session 5: Blue Growth FAO Invited Speakers

Moderator: Pauline Simpson

iMarine Support to Dataset Citation

Anton Ellenbroek
FAO Fisheries and Aquaculture Department
Rome, Italy

Abstract
The iMarine project uses Virtual Research Environments to produce collaborative results, often in the form of dynamic datasets and dynamic reports. To ensure that the results (and the authors) can be properly cited, the project developed an infrastructure policy for data access, sharing and citation.

The policy is still being implemented, as it was quite ahead of the available technologies and tools. Our focus is on a mechanism to produce an open dataset through a workflow, collecting business metadata on the go. This metadata record becomes a rich resource after a few operations on a dataset such as merging, geo-referencing, harmonizing, and aggregating.

Typical metadata we collect are inspired by Dublin Core, Darwin Core, the INSPIRE Directive, and SDMX. We have developed user interfaces for their maintenance, and can publish in a variety of repositories. When publishing data, iMarine finds the proper metadata required by the repository. The iMarine infrastructure hosts a set of repositories, such as GeoNetwork for geospatial data and SDMX for statistical data, and we can rely on their metadata schemes to ensure that the data produced are citable. For other data, such as dynamic reports and fact sheets and the data shared in the infrastructure, we rely on the business metadata to define how they can be further used, e.g. by locking for editing based on user rights and the license. The project helps scientific data managers store and organize datasets and manage ownership in shared applications.

Keywords: Virtual research environments, iMarine, datasets.

Session 5: Blue Growth FAO Invited Speakers

Moderator: Pauline Simpson

The OpenAIRE Initiative: Fostering Open Science For European Researchers

Alessia Bardi
alessia.bardi@isti.cnr.it
Donatella Castelli
donatella.castelli@isti.cnr.it
Paolo Manghi
paolo.manghi@isti.cnr.it

Abstract
The mission of the OpenAIRE initiative is to foster an Open Science e-Infrastructure that links people, ideas and resources for the free flow, access, sharing, and re-use of research outcomes, services and processes for the advancement of research and the dissemination of scientific knowledge. Its scope goes beyond scientific articles, recognizing that to achieve its full potential, hence enable reproducibility and repeatability of scientific process, scholarly communication should ensure access to the whole range of digital products generated by such process, such as research data, software and models. This paper describes the sequence of enhancements applied over the years to the OpenAIRE infrastructure in order to support this vision of scholarly communication. OpenAIRE offers services to collect information about publication, dataset, and software research products from authoritative data sources (e.g. publication/data repositories, CRIS systems) and to reconstruct by mining the semantic links between them, enabling the reconstruction of a research context.

Keywords: Scholarly communication, Open Access, Open Science, e-infrastructure, research life cycle

The OpenAIRE initiative is the point of reference for Open Access in Europe. Its mission is to foster an Open Science e-Infrastructure that links people, ideas and resources for the free flow, access, sharing, and re-use of research outcomes, services and processes for the advancement of research and the dissemination of scientific knowledge.

OpenAIRE operates an open, participatory, service-oriented infrastructure that supports:
- The realization of a pan-European network for the definition, promotion and implementation of shared interoperability guidelines and best practices for managing, sharing, re-using, and preserving research outcomes of different typologies.

- The promotion of Open Science policies and practices at all stages of the research life-cycle and across research communities belonging to different application domains and geographical areas.
- The development and operation of a technical infrastructure supporting services for the discovery of and access to research outcomes via a centralized entry point, where research outcomes are enriched with contextual information via links to objects relevant to the research life-cycle.
- The provision of measurements of the impact of Open Science and the return on investment of national and international funding agencies.
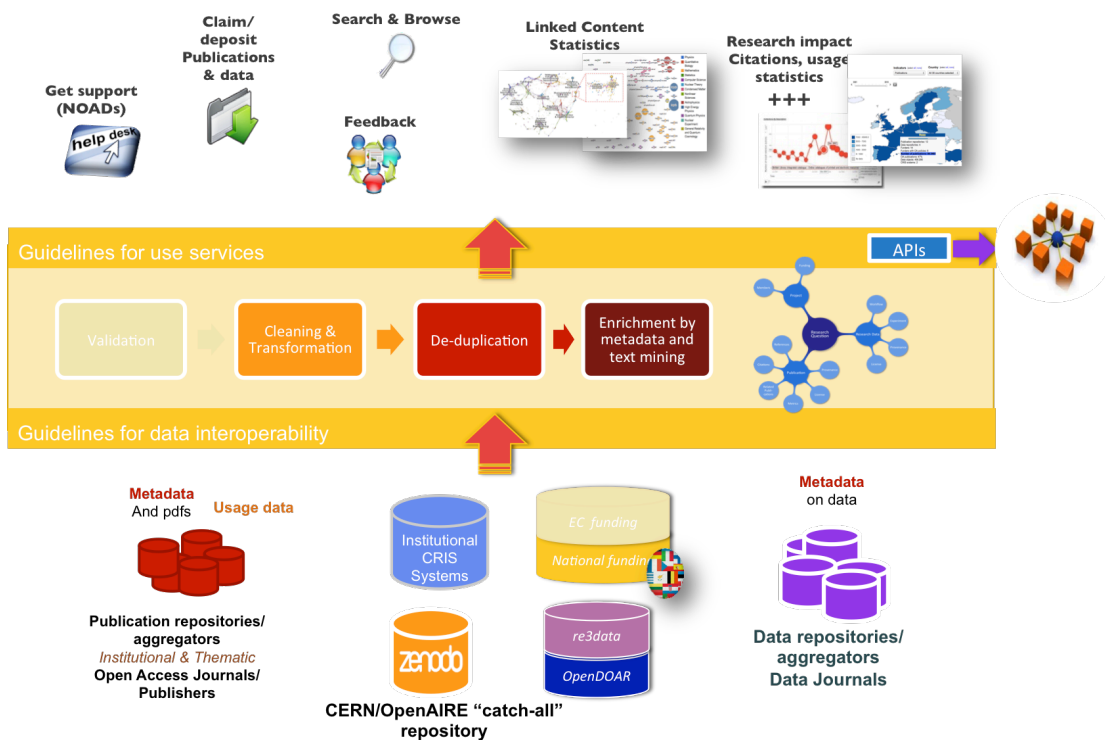
Figure 1. The OpenAIRE infrastructure.

The OpenAIRE technical infrastructure (Figure 1) collects information about objects of the research life-cycle from different types of data sources:

1. Article metadata and full-texts are collected from institutional and thematic repositories, Open Access journals and publishers.
2. Dataset metadata are collected from data repositories and data journals.
3. Metadata about data sources, organizations, projects, and funding programs are collected from entity registries, i.e. authoritative sources such as CORDA for FP7 and H2020 projects, OpenDOAR for publication repositories, DOAJ for Open Access journals.

4. Metadata about publications, datasets, persons, organizations, projects, funding, equipment and services are collected through CRIS systems (Common Research Information System) (Houssos et al. 2014, Houssos et al. 2015).

To support the implementation of interoperability guidelines, the OpenAIRE technical infrastructure provides repository managers with a Validation Service, which verifies if metadata records are exported according to the guidelines and, if not, suggests corrections. Infrastructure services collect, harmonize and enrich metadata records compliant to the guidelines, to finally create a graph in which objects of the research life cycle are contextualized thanks to semantic relationships. Relationships between objects are collected from the data sources, but also automatically detected by inference algorithms (Kobos et al. 2014) and added by users, who can insert links between publications, datasets and projects via the claiming procedure available from the OpenAIRE web portal (www.openaire.eu). These "objects in context" are available for human and machine consumption via the OpenAIRE web portal and different kinds of APIs (http://api.openaire.eu).

OpenAIRE also features national contact points, the National Open Access Desks (NOADs), the aim of which is to support researchers, project managers, funders, and repository administrators in implementing Open Access policies (to comply with National and European Open Access mandates) and research data management plans for the EC H2020 Open Data Pilot (https://www.openaire.eu/ordp/ordp/pilot).

The current OpenAIRE infrastructure is the result of a sequence of enhancements and extensions applied over the years to better support the scholarly communication and to respond to the needs of research communities and funding agencies (Figure 2).
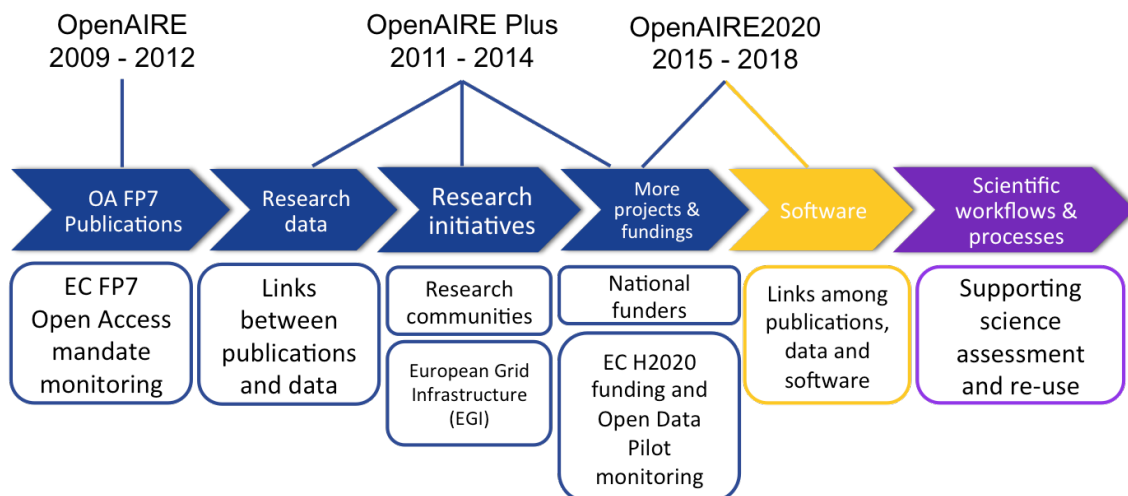
Figure 2 Evolution of the OpenAIRE infrastructure

In its earlier stage, back in 2009, OpenAIRE started as a pilot project funded by the 7th Framework Program (FP7) of the European Commission (EC), to form a network of interoperable institutional and thematic repositories for the exchange of metadata records about publications deposited according Open Access (OA) policies (Budapest Declaration 2002) and reporting research activities funded by FP7. Thanks to interoperability guidelines for metadata exchange (https://guidelines.openaire.eu), OpenAIRE was able to aggregate metadata records from the network of repositories and monitor the Open Access mandates of the EC (European Commission 2008) and the European Research Council (ERC) (European Research Council 2014).

In 2011 a new EU project, OpenAIREPlus (Manghi et al. 2012a), was funded that enabled OpenAIRE to perform a first step to satisfy requirements of research communities willing to share research data related to publications. New interoperability guidelines were established among the OpenAIRE network to foster the exchange of metadata records about research data. New services were integrated into the infrastructure to enable the deposition of research data (the Zenodo repository: http://www.zenodo.org) and to identify data citation links in the full-texts of publications.

The OpenAIRE network of repositories grew over the years and also embraced, together with institutional and thematic repositories, data repositories (registered in re3data) and OA journals (registered in DOAJ, the Directory of Open Access Journals). In addition, services for the curation and enrichment of aggregated research outcomes were enhanced to detect duplicate publications (which can be possibly collected from different repositories) (Manghi *et al.* 2012b) and to infer descriptive properties (e.g. classification subjects) and links among research outcomes and projects (Kobos et al. 2014).

The richness in terms of quantity and quality of research outcomes available from OpenAIRE attracted a number of stakeholders of scholarly communication interested in the analysis of project impact and return of investment of national and international funding agencies. Some examples are the Portuguese Fundação para a Ciência e a Tecnologia, Wellcome Trust and the European Grid Infrastructure (EGI), for which OpenAIRE enabled the computation of statistics to monitor the impact of their projects in terms of OA and non-OA publications.

In 2015, the EC started the new funding program Horizon2020 (H2020) and launched the Open Research Data Pilot, whose goal is to promote best practices on research data management to finally support research reproducibility and effective science assessment (European Commission 2015). The EC endorsed OpenAIRE (now funded through the OpenAIRE2020 project) both for monitoring the pilot and for supporting researchers and project managers in being compliant to the new EC guidelines and best practices.

As of December 2015, OpenAIRE collects from more than 600 data sources, 13 millions (de-duplicated) publications and 10,000 datasets featuring 180,000 links to projects from five different funders: EC FP7 and H2020, Wellcome Trust, Fundação para a Ciência e a Tecnologia, the Australian Research Council, and the Australian National Health and Medical Research

Council. Collaborations with Science Foundation Ireland and the government of Croatia are on going and their projects will be integrated in OpenAIRE in the next months.

OpenAIRE is continuously evolving to embrace and advocate new methods of scholarly communication towards achieving Open Science. The next phase will focus on including further typologies of research outcomes, produced or used at different stages of the research life cycle. Since the advent of data-intensive science and the diffusion of Virtual Research Environments (VREs) (Candela et al., 2013) and Research Infrastructures (RIs), software has become a fundamental tool for researchers for carrying out their activities (e.g. the acquisition and elaboration of research datasets, the execution of in-silico experiments and data analysis). As such, scholarly communication workflows should include software first, hence fostering its publishing, assessment, and re-use. Software publishing, though, is just one of the milestones on the road towards Open Science. In fact, Open Science fosters reproducibility of the scientific process, which can only be supported when all research products and tools used and produced during research investigations are made available according to agreed on polices and practices.

Still, current scholarly communication practices are far from these objectives. A few digital products are available for scholarly communication (e.g. research data in several sciences, models for some sciences), and best practices and workflows for publishing are generally missing. On top of that, current publishing workflows (Figure 3), conceptually and de-facto separate the place where research is conducted, the RIs, and the place where research products are assessed, published, and shared (marketplace services such as journals and conferences) (Assante et al. 2015). This separation causes products generated in the RI to be published as product copies (snapshots) on marketplace services, these products being rarely described or interlinked with each other like they were in the RI (e.g. links between papers and datasets). Published products therefore lose their contexts, since their links are missing or doomed to degenerate over time, their original version in the RI possibly evolving to more mature or up to date versions and therefore diverging from their published copies. As a consequence, reproducibility of science is generally mined at its foundations and a lot of work is ahead of us to ensure effective Open Science principles are achieved.

Some initiatives, in line with the OpenAIRE vision, propose to overcome these issues by integrating the RI functionality into the assessment and publishing of research results. Science 2.0 Repositories (SciRepo) (Assante et al. 2015) represent one of those initiatives and proposes to evolve RIs to support marketplace-like functionality for the publishing and sharing of research products in context (together with related products), in place (where the research has been conducted), and during the research activities (via automatic notification of peers through a social research network). SciRepos provide users of an RI with additional functionality for science reproducibility and assessment, such as:
- Promotion of continuous, in-context, and open peer review process of all research products.
- Support for the production of "altmetrics" to measure the impact of research activities and published products.
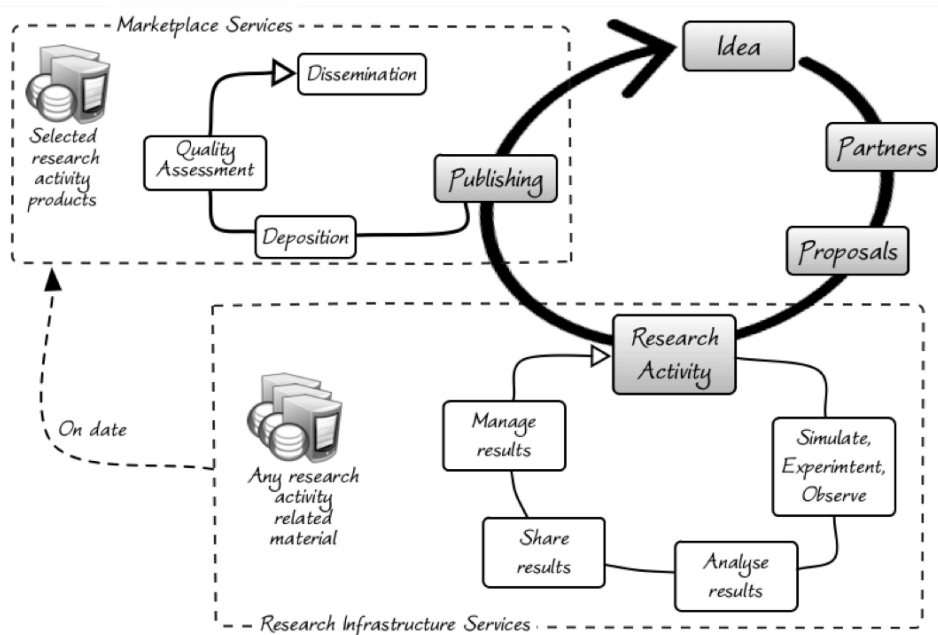
Figure 3 Research lifecycle and publishing of research products (Assante et al. 2015)

However, only a few RIs are today supporting similar tools, and in general most scientific disciplines still suffer from the separation of research and publishing environments. OpenAIRE compensates for these issues by re-constructing the context of a research a posteriori, collecting products where they are published and identifying relationships among them and with other relevant entities of the research life cycle (e.g. funders, projects, institutions, RIs).

Conclusions

The mission of the OpenAIRE initiative is to contribute to the advancement of research by means of interlinking and disseminating scientific knowledge. Thanks to its growing participatory network that includes different scholarly communication stakeholders, including institutional repositories, data repositories, OA journals, libraries, and funders, OpenAIRE has a unique opportunity to operate a European entry point to OA scientific knowledge. Thanks to its e-infrastructure services, the European (and beyond) pool of publications, research data, software, workflows, scientific processes, and other research products are aggregated, interlinked, and contextualized to be made easily and openly accessible worldwide. Future plans will track the reproducibility of science and aim at (1) increasing the amount, typology (e.g. software and patents) and linking of accessible research products, and (2) equipping the infrastructure with other end-user services to further expand the possibilities for end-users and third-party services to access and consume the OpenAIRE graph.

References

Assante, M., Candela, L., Castelli, D., Manghi, P., & Pagano, P. (2015). Science 2.0 Repositories: Time for a change in scholarly communication. *D-Lib Magazine* 21(1): 4. doi:10.1045/january2015-assante.

Candela, L.; Castelli, D., Pagano, P. (2013). Virtual Research Environments: An overview and a research agenda. *Data Science Journal* 12: GRDI75-GRDI81. doi: 10.2481/dsj.GRDI-013.

Budapest Declaration (2002). Budapest Open Access Initiative. http://www.budapestopenaccessinitiative.org.

European Commission (2008). Annex 1 - Special clauses (clause 39 on Open Access). http://ec.europa.eu/research/press/2008/pdf/annex_1_new_clauses.pdf.

European Commission (2015). Guidelines on Open Access to scientific publications and research data in Horizon 2020. http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf.

European Research Council (2014). Open Access guidelines for research results funded by ERC – revised December 2014. https://erc.europa.eu/sites/default/files/document/file/ERC_Open_Access_Guidelines-revised_2014.pdf .

Houssos, N., Jörg, B., Dvořák, J., Príncipe, P., Rodrigues, E., Manghi, P., & Elbæk, M. K. (2014). OpenAIRE guidelines for CRIS managers: Supporting interoperability of open research information through established standards. *Procedia Computer Science* 33: 33-38. doi:10.1016/j.procs.2014.06.006.

Houssos, N., Jörg, B., Dvořák, J. (2015). OpenAIRE guidelines for CRIS managers 1.0. Zenodo. doi:10.5281/zenodo.17065.

Kobos, M., Bolikowski, Ł., Horst, M., Manghi, P., Manola, N., & Schirrwagen, J. (2014). Information Inference in Scholarly Communication Infrastructures: The OpenAIREplus Project Experience. *Procedia Computer Science* 38: 92-99. doi:10.1016/j.procs.2014.10.016.

Manghi, P., Bolikowski, L., Manold, N., Schirrwagen, J., & Smith, T. (2012). Openaireplus: the European scholarly communication data infrastructure. *D-Lib Magazine* 18(9): 1. doi:10.1045/september2012-manghi.

Manghi, P., Mikulicic, M., & Atzori, C. (2012). De-duplication of aggregation authority files. *International Journal of Metadata, Semantics and Ontologies 7*(2): 114-130.

Session 5: Blue Growth FAO Invited Speakers

Moderator: Pauline Simpson

Providing Access to Codes of Practice (COP) and Better Management Practices (BMP) Documents in Aquaculture

Uwe Barg
FAO Fisheries and Aquaculture Department
Rome, Italy

Abstract

The aquaculture sector has seen a steady increase in the number of Codes of Practice (COP) and Better Management Practice (BMP) documents worldwide. FAO's Fisheries and Aquaculture Department has compiled a first set of these aquaculture COP/BMP documents into a web-based database as presented in its aquaculture website (not publicly available). It is hoped that this online compilation of aquaculture COP/BMP documents will continue to grow with contributions of such documents and/or their current online location (URL), as may be supplied by interested authors and institutions. The primary goal of this web-based database is to facilitate user-friendly access to existing documents on Codes of Conduct, Codes of Practice (COP), Better Management Practices (BMP), Good Aquaculture Practices (GAP) and other such documents to aquaculture and other stakeholders worldwide. Access to such documentation is often constrained by a range of factors. Presently, the database is supported by the Aquatic Common thematic digital repository system (http://aquaticcommons.org/). This present initiative is an example of an effort to facilitate access to mostly grey literature of often highly practical guidance sought after by the sector industry and professionals. It should also be of use to initiatives seeking to strengthen governance mechanisms in aquaculture through such soft law documentation. As such it is of critical importance that access to the online compilation is extremely user-friendly and, at the same time, sustainable.

Users who are interested or who would like to contribute to this initiative are invited to send suggestions, comments and/or their documents focusing on Codes of Conduct, COPs, BMPs, GAPs and other such documents in aquaculture, and/or their current online location (URL), to FAO by writing to Mr. Uwe Barg and Valerio Crespi (:FAO Aquaculture Service. Email addresses: uwe.barg@fao.org; valerio.crespi@fao.org.

Keywords: Codes of Practice, Better Management Practice, aquaculture, FAO.

Fishing for Information Panel

Moderator: Michelle Leonard

Aquatic and Marine Information Sources and Dissemination Programs in Asia

Stephen B. Alayon
Aquaculture Department, Southeast Asian Fisheries Development Center,
Tigbauan, Iloilo 5021, Philippines

Abstract:
Asia is projected to provide 70 percent of global fish consumption in coming years. Reliable and relevant information plays a vital role in fisheries and aquaculture research and development, and in managing aquatic resources. Several institutions in Asia have initiated various programs and services in organizing and disseminating aquatic and marine information and statistics. This study aims to present the current status of information sources available and dissemination programs in Asia. An inventory of information sources and networks, libraries and information centers, institutional repositories and other information programs will be conducted. A review of the historical development of information systems, networks and programs in Asia will also be conducted. The role of national or regional organizations, donor and funding agencies, and associations on the sustainability of the information programs will be explored. The experiences and lessons learned by the selected institutions will be presented including the challenges and issues encountered in implementing information dissemination programs.

Keywords: Fisheries, aquaculture, information systems, Asia.

Fishing for Information Panel

Moderator: Michelle Leonard

Fisheries Information Users in Bangladesh

Rizia Begum
Senior Librarian
Bangladesh Fisheries Research Institute
Mymensingh – 2201, Bangladesh

Abstract
Information is generally stored and preserved for the purpose of making it available whenever and wherever it is needed. Fisheries Information plays a vital role in fisheries research and development in Bangladesh. It is an important and valuable resource and affects societal development (Hanif 2005). Users need information in specific contexts. Bangladesh Fisheries Research Institute (BFRI) has established a Library and Documentation Centre (FRILDOC) to disseminate fisheries information to users. It has vast information resources on fish and fisheries including books, journals, reports, extension manuals, dissertations, conference proceedings and e-resources. Most of the fisheries information users in Bangladesh use FRILDOC. Ministry of Fisheries and Livestock, Department of Fisheries, Bangladesh Fisheries Research Institute, Bangladesh Fisheries Development Corporation, Agricultural Research Institutes, teachers and students of fishery-related universities, researchers, policy makers, extension workers, farmers and private entrepreneurs are the main users of this information in Bangladesh. BFRI recently participated in the Aquatic Commons project of IAMSLIC (International Association of Aquatic and Marine Sciences libraries and Documentation Centers). Facilities provided by the Aquatic Commons Digital Repository are very useful to the users. BFRI always tries to enhance the flow of information to the users. The fisheries information users of Bangladesh also eager to become familiar with technology and information generated by Southeast Asian aquaculture and fisheries scientists through BFRI. This manuscript describes the fish and fisheries related information users of Bangladesh, i.e. educators, researchers, training specialists, and NGOs and private entrepreneurs, who are responsible for fish production.

Keywords: Aquaculture, fisheries, information centers, libraries, Bangladesh, fisheries in Bangladesh.

Introduction

Fisheries in Bangladesh are very important in the economy of the country in terms of nutrition, income generation, and foreign exchange. Fisheries in Bangladesh are diverse; there are about 795 native species of fish and shrimp in the fresh and marine waters of Bangladesh and 12 exotic species that have been introduced. In addition, there are 10 species of pearl bearing bivalves, 12 species of edible tortoise and turtle, 15 species of crab and 3 species of lobster. About twelve million people are directly associated with the fisheries sector, and of those 1.4 million people depend on fisheries related activities (Shah 2003). In Bangladesh aquacultural and fisheries activities are generally managed by male members of the family. Recently women have been encouraged to participate in fish production and processing through the motivation of GOs and NGO workers and some private entrepreneurs. During 1982-2014 fish production increased from 0.75 million metric tons (mt) to 3.55 million mt as a result of technologies and dissemination (DoF 2014) Now Bangladesh is the fourth major inland fish producing country in the world (FAO, 2014). The Ministry of Fisheries and Livestock (MoFL), Department of Fisheries (DoF), Bangladesh Fisheries Development Corporation (BFDC) and the Bangladesh Fisheries Research Institute (BFRI) are the main organizations responsible for aquaculture and its development. Different universities, organizations within other ministries and local and international NGOs are also involved.

Fisheries Information Users in Bangladesh

Day by day the number of fisheries information users in Bangladesh has been increasing. Information on fisheries plays a vital role in fisheries research and development in the country. The main fisheries information users are Ministry of Fisheries and Livestock (MoFL); Department of Fisheries (DoF); Bangladesh Fisheries Development Corporation (BFDC); Bangladesh Fisheries Research Institute (BFRI); Bangladesh Agricultural Research Council (BARC); Faculty of Fisheries, Bangladesh Agricultural University; Department of Fisheries, University of Dhaka;Institute of Marine Biology, University of Chittagong; Department of Fisheries, University of Rajshahi; Marine Fisheries Academy, Chittagong; Fisheries and Marine Resource Technology Discipline, University of Khulna;Faculty of Fisheries, Sher-e-Bangla Agricultural University;Faculty of Fisheries, Chittagong Veterinary & Animal Science University; Faculty of Fisheries, Sylhet Agricultural University; Agricultural Research Institutes (ARIS); private entrepreneurs; and fish farmers.

Bangladesh Fisheries Research Institute (BFRI)

Fish and fisheries are an integral part of the culture and heritage of Bangladesh. This sector plays a significant role in nutrition, employment generation and foreign exchange earnings. Keeping in view the immense potential of the sector in providing better nutrition and job opportunities, particularly to the poorest of the poor, and the urgency for optimum scientific utilization of the aquatic heritage, the President of the Peoples' Republic of Bangladesh was pleased to promulgate an Ordinance entitled "The Fisheries Research Institute Ordinance, 1984" on 11 July 1984. In pursuance of this Ordinance, the Fisheries Research Institute (FRI) was established in July 1984. In 1997, the FRI has been renamed as Bangladesh Fisheries Research Institute (BFRI) through the amendment of the 1984 Ordinance (BFRI, 1997). It has five stations in five agro-ecological zones and five sub-stations, respectively. The stations of the Institute are

Freshwater Station (FS), Mymensingh; Riverine Station (RS), Chandpur; Brakishwater Station (BS), Paikgacha, Khulna; Marine Fisheries and Technology Station (MFTS), Cox's Bazar; Shrimp Research Station (SRS), Bagerhat. The sub-stations of the Institute are Sub- Station (RS), Rangamati; Sub-Station (FS), Santaher; Sub- Station (FS), Jessore; Sub-Station (FS), Khapupara; Sub-Station (FS), Sayedpur. BFRI developed more than 40 improved aquaculture, biotechnological and fisheries management technologies so far (BFRI, 2015). Developed technologies have played a vital role in increasing fish production and poverty alleviation.

Bangladesh Fisheries Research Institute (FRILDOC)
Bangladesh Fisheries Research Institute has established a Library and Documentation Centre (FRILDOC) at its headquarters because of the need to set up a formal system for documentation of all technical information in the field of fisheries research and development in Bangladesh. FRILDOC acts as a repository of literature and technical information and provides latest information on scientific research and experimental development in all branches of fish and fisheries. Most of the FRILDOC collection covers the subjects aquaculture, brackish water aquaculture, marine culture, marine science, biology, ecology, environmental science, agriculture, life sciences, sea weeds, plankton, food processing, feeds, zoology, botany, geography, economics, marketing, geology, socioeconomics and rural development.

FRILDOC acts as a central library for different stations. There are also five libraries in five stations. The library of Riverine Station (RS) contains 2,500 volumes of technical and general books, 3,000 volumes of different research reports and working documents. The library of Marine Fisheries Technology Station (MFTS) contains 975 scientific journals, reference books related to fisheries, research reports and other books. About 488 technical reports, scientific journals and different research reports are available in the library of Brackish Water Station (BS) and 2,800 volumes of technical and general books are available in the library of the Shrimp Research Station (SRS). FRILDOC is operating in a fully automated environment. The various activities of the centre have been computerized using Library Management Information System (LMIS) software.

The total collection of FRILDOC includes 10,326 technical and general books; 175 scientific periodicals; 5,078 scientific reprints; 500 theses; 76 Annual Reports; and ASFA DVDs up to 2015.The following are Special Collections: national publications; Ministry of Fisheries and Livestock publications; Department of Fisheries Publications,; Bangladesh Fisheries Development Corporation (BFDC) publications; Bangladesh Agricultural Research Council (BARC) publications; Agricultural Research Institutes (ARIs) publications; Bangladesh Agricultural University publications; Bangladesh Academy of Rural Development(BARD) publications; and Government of Bangladesh (GOBs) publications. FRILDOC also includes international publications from the following organizations: WorldFish; FAO Fisheries Aquaculture Department; Bay of Bengal Programme (BOBP; Southeast Asian Fisheries Development Center (SEAFDEC); SAARC Agricultural Centre (SAC); INFOFISH; NACA; World Bank; Center Inland Capture Fisheries Research Institute, India (CICFRI); and the Center Marine Fisheries Research Institute, India (CMFRI).

FRILDOC provides the following services: bibliographical; abstracting; SDI (Selective Dissemination Information); document delivery; current awareness; monthly accession list of books; monthly list of newspaper articles on fisheries; and digital library service (BFRI in Aquatic Commons digital repository (http://aquaticcommons.org/).

 FRILDOC maintains exchange programs with more than 60 leading national and international institutes/organizations. The main national organizations are the Ministry of Fisheries and Livestock, Department of Fisheries, Bangladesh Agricultural Research Council(BARC), Bangladesh Agricultural University (BAU), other fishery related universities, Agricultural research institutes (ARIs), Bangladesh Academy of Rural Development(BARD), and local NGOS (BRAC, Proshika, PKSF, TMSS). In addition we also maintain exchange programs with the following International organizations: World Fish Center; FAO Fisheries Aquaculture Department; Bay of Bengal Programme (BOBP); Southeast Asian Fisheries Development Center (SEAFDEC); Center Inland Capture Fisheries Research Institute (CICFRI), India; Center Marine Fisheries Research Institute, India (CMFRI); SAARC Agricultural Centre(SAC); INFOFISH; and NACA .

BFRI Publications
Bangladesh Fisheries Research Institute gives special value to publications and documentation of aquaculture technologies for wider adaptation. The Institute from time to time publishes research findings, annual reports, newsletters, journals, directories, research reports, proceedings of conferences, seminars and workshops, training manuals, extension materials, booklets, leaflets and posters. The BFRI publications are available in the FRILDOC Library and Documentation of the Institute (FRILDOC) is creating a primary database in this regard. It is important to continue to disseminate the information from the database to farmers and to stimulate discussion on how to improve performance. The channel will be through researchers, extension workers and other appropriate intermediaries. Besides research-based publications, Institute scientists always publish research findings in national and international journals for dissemination of research results to the wider scientific community.

The main BFRI publications are Fisheries Newsletter (HY), Bangladesh Journal of Fisheries Research (HY), research reports (75), proceedings (45), training manuals (25), extension manuals (23), extension leaflets (84), posters (27) and others (170).

Conclusion
Much more information flow is needed for fisheries information users. Further enrichment of the Aquatic Commons digital repository will help our users. A regional, especially Southeast Asian, aquaculture repository should be established.

References
Bangladesh Fisheries Research Institute. (2015). *Annual Report 2008-09 to 2011-2012*, Bangladesh Fisheries Research Institute, Mymensingh, Bangladesh. 20p
Bangladesh Fisheries Research Institute (1997). *BFRI at a glance*. Bangladesh Fisheries Research Institute, Mymensingh, Bangladesh. 3p.

Department of Fisheries. (2015). **In**: *Fish Fortnight Compendium 2003*. Department of Fisheries, Ministry of Fisheries and Livestock, Bangladesh, Dhaka, Bangladesh, 129-133.

FAO (2014). *The State of World Fisheries and Aquaculture 2014*. Food and Agricultural Organization of the United Nations, Rome, Italy. 18 p.

Hanif, U. M. (2005). Agricultural libraries and information systems in Bangladesh. Shaheen Redhwana, Dhaka, Bangladesh. 173 p.

Shah, M.S. (2003). Human resources and development activities in fisheries sector. In: *Fish Fortnight Compendium 2003*. Department of Fisheries, Ministry of Fisheries and Livestock, Bangladesh. Dhaka, Bangladesh: 57-59.

Figure 1. Fishing in Bangladesh.

Figure 2. Users Working in FRILDOC

Fishing for Information Panel

Moderator: Michelle Leonard

Aquaculturists: A Survey on the Information Seeking Behavior of Milkfish Farmers in Dumangas and Leganes Iloilo, Philippines

Daryl L. Superio, Elvi S. Nemiz and Mary Grace H. Oliveros
Southeast Asian Fisheries Development Center (SEAFDEC)
Tigbauan, Iloilo, Philippines

Abstract:
Milkfish farming is one of the main sectors in the Philippine aquaculture industry. For five years (2009-2013) there was a steady increase in the Philippine national milkfish production; however, it suffered a minimal decrease in 2014 (BAS, 2015) mainly due to fish kills that happened to some parts of Luzon. The steady increase in production may be attributed to intensive fish farming practices. However, these practices are also associated with incidences of algal blooms and fish kills. Although the economic benefits brought by milkfish aquaculture can never be denied, fish farmers should ensure that environmental quality is maintained. Thus policy makers should promote and implement responsible/good aquaculture practices not just for increased production but also for the preservation of the environment for the use of present and future generations.

The proposed study is to gather baseline data regarding the information-seeking behavior and the awareness of milkfish farmers in Dumangas and Leganes, Iloilo, Philippines regarding the Philippines Code of Practice for Aquaculture. Specifically it aims to determine the milkfish farmers information needs, preferred medium in searching for information and preferred sources of information in relation to:
a) water discharge and sludge/effluent management;
b) use of drugs, chemicals, potentially toxic pesticides and fertilizers;
c) stock selection, stocking practices;
d) feed use and management; and
e) fish health management as promulgated in the Philippines Code of Practice for Aquaculture.

Findings will benefit fish farmers, fish farm operators, fisheries scientists and researchers, libraries and information centers, and the Bureau of Fisheries and Aquatic Resources (BFAR), the agency responsible for the management and regulation of Philippines fisheries sector and aquatic resources. The study could reveal the

information needs of milkfish farmers, their preferred mediums and sources of information. Then fish farm owners and operators would know what training to provide; fisheries scientists and researchers would know how to focus their future research; libraries and information centers would be guided on what types of resources to procure; and BFAR would know what kind of information to produce and in what media it should be disseminated to better reach fish farmers for the promotion and implementation of good, responsible aquaculture practices.

Keywords: Milkfish farming, aquaculture, Philippines.

Session 7: Linked Repositories – Theme of the Day

Moderator: Barbara Butler

Exploring Deep-sea Data

Judith Connor
Monterey Bay Aquarium Research Institute
7700 Sandholdt Road
Moss Landing, CA 95039
USA

Abstract
The Monterey Bay Aquarium Research Institute (MBARI) has collected and archived deep-sea video from remotely operated vehicle dives since 1988. The video archive contains footage and data on the biological, chemical, geological, and physical aspects of deep regions of the Pacific. MBARI developed a software system, the Video Annotation and Reference System, to create, store, and retrieve video annotations. The system is based on a hierarchical catalog of biological, geological, and technical terms that allows consistent and rapid classification of objects seen on video. Based on knowledge collected by the annotation process, MBARI staff developed a web-based Deep-Sea Guide to the organisms and geologic features recorded on remotely operated vehicle dives into the deep sea. The searchable guide provides information about biological taxonomy, geology, and habitats, and displays dynamic histograms and useful statistics derived from the video annotations.

Keywords: Deep-sea ecology, video description, ocean engineering, viewing underwater.

The Monterey Bay Aquarium Research Institute (MBARI) collected and archived over 24,000 hours of underwater video between 1988 and 2016. The research institute currently uses three remotely operated vehicles (ROVs) with a standard suite of instruments. The vehicles vary in size and depth range from the *Doc Ricketts*, the largest and most powerful of the three, with a depth rating of 4,000 meters, to midsized *Ventana* with a depth rating of 1,800 meters, to the small, 1,500 meter-rated *MiniROV* designed and built at MBARI as a portable system for use on ships of opportunity around the world. Each of the three vehicles carries a high-definition video camera as well as detachable, mission-specific toolsleds with sampling devices. Most of the ROV dives are recorded from the vehicle's launch to its recovery at the end of the mission.

The videotape archive contains television-quality and high-definition images of animals, geologic features of the seafloor, chemical experiments, and physical aspects of the Monterey submarine canyon and other deep regions of the Pacific. To make the images more useful for research and to improve general access, research technicians at MBARI annotate and archive the videos as an institutional resource (Connor 2005), in contrast to some institutions where image archives may be maintained by and accessible only to an individual scientist or laboratory group.

As the collection of video tapes and ancillary data increased over time, it became apparent that new technology was needed to streamline the process of describing video images and to relate those descriptions to ancillary chemical and physical data, and geolocation. The Video Annotation and Reference System (VARS) (http://www.mbari.org/vars/) was the result of a multiyear MBARI project to develop a software system for the efficient creation, storage, and retrieval of video annotations (Connor 2006). The foundation of the system is a knowledge database of over 4,000 biological, geological, and technical terms. This hierarchical index allows for the consistent classification, description, and complex querying of objects observed on video. The effort has proven fundamental to understanding how marine organisms and the results of ocean processes, such as the oxygen minimum zone, have changed over time, and how they may further evolve in the future.

As of November 2015, the VARS database held nearly five million annotations describing ROV dives. Taking advantage of MBARI video annotators' expertise and software engineering, the team recently completed development of a new tool called the Deep-Sea Guide (DSG), which aids in quality control, analysis, and interpretation of these valuable records. The DSG software application was written in Scala, a hybrid functional/object-oriented programming language, and hosted it on an application server (Schlining & Jacobsen Stout 2006).

This interactive, web-based system allows for the correlation and visualization of vast amounts of information. The system can be explored using either the Latin or common name of organisms to search or browse the VARS database used for video annotations. Taxonomic relationships are hyperlinked, so that clicking on a term in the ordered list (e.g., kingdom, phylum, family, genus) will open the relevant page with images and additional links to details on distributions, descriptive characteristics, and references for species and genera. Selections from over 350,000 annotated images are linked to the taxonomic terms providing rapid access to an extensive image collection of deep-sea organisms. Recognizing that no one source of information is complete, the pages automatically link terms in the DSG to the Encyclopedia of Life, the Tree of Life, the World Register of Marine Species (WoRMS) and the National Center for Biotechnology Information (NCBI) and provides a formatted citation.

Probing deeper into the DSG, a user can access standardized data products (e.g., raw or normalized depth distributions histograms of organisms or geologic features) for review and analysis. These tools can deliver quantitative and qualitative information for biodiversity assessment studies, and provide context for hypothesis generation and modeling of future studies. In these ways, the guide helps refine sampling and analysis methods, improve the

effective exchange of information, and engage the research and education communities at large. MBARI researchers continually enrich the database content by adding images, concept names, and descriptions as their knowledge grows. Updated entries and corrections to the DSG are published monthly.

MBARI typically embargoes annotations and related data for two years for internal quality control and analysis. Most of the observational data older than two years are available through the DSG (http://dsg.mbari.org) and the VARS public query system (http://www.mbari.org/vars/), but the data provided by a particular day's query are not necessarily representative of Monterey Bay or the entire VARS database. Although the data have proven to have great scientific value, the observations summarized in the DSG data products were not always collected using systematic research procedures, and biases have been introduced as a result of changing technical capabilities, mission objectives, and environmental conditions. In a continuing effort to refine sampling and analytic methods and to improve the effective exchange of information, deep-sea researchers are encouraged to contact MBARI to suggest improvements and explore potential collaborations.

References

Connor, J. (2005). Archiving, annotating and accessing video as data. In: Markham, J.W., Duda, A. L., editors. *Voyages of discovery: Parting the seas of information Technology*: Proceedings of the 30th Annual Conference of the International Association of Aquatic and Marine Science Libraries and Information Centers. Fort Pierce (FL): IAMSLIC: 173-178.

Connor, J. L. (2006). The evolution of MBARI: leveraging technology, science and information. *In*: Anderson, K. L., Thiery, C., editors. *Information for responsible fisheries: Libraries as mediators*. Proceedings of the 31st Annual Conference of the International Association of Aquatic and Marine Science Libraries and Information Centers. Fort Pierce (FL): IAMSLIC: 119-135.

Schlining, B. & Jacobsen Stout, N. (2006). MBARI's Video Annotation and Reference System. In: *Proceedings of the Marine Technology Society / Institute of Electrical and Electronics Engineers Oceans Conference*, Boston, Massachusetts.

Taonius

Author: Steenstrup, 1861
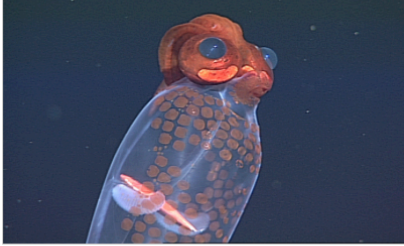
MBARI 2001: T263-04

📎 Click here for a larger image.

1 2 Next

Taxonomy:

Eukaryota (superkingdom)
└**Animalia** (kingdom)
 └**Mollusca** (phylum)
  └**Cephalopoda** (class)
   └**Coleoidea** (subclass)
    └**Decapodiformes** (superorder)
     └**Teuthoidea** (order)
      └**Oegopsida** (suborder)
       └**Cranchiidae** (family)
        └**Taoniinae** (subfamily)
         └*Taonius* (genus)
          └*Taonius borealis* (species)
          └*Taonius pavo* (species)
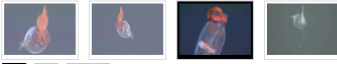
Description

Size: Up to 660 mm mantle length.

General: Long, slender terminal fins and hook-like teeth on largest club suckers.

Geographic Information

Ocean range (global): Cosmopolitan.

Additional Information

References

Encyclopedia of Life

Tree of Life

World Register of Marine Species

National Center for Biotechnology Information

Media

📎 **Phylogenetic Image Gallery**

📎 **Data Products**

📎 **Annotated Images**

Session 7: Linked Repositories – Theme of the Day

Moderator: Barbara Butler

Using Linked Open Data and Semantic Integration to Search Across Repositories

Lisa Raymond, Audrey Mickle, and GeoLink Project Group

Woods Hole Oceanographic Institution
MS#8, Woods Hole, MA 02543

Abstract:
The MBLWHOI Library is a partner in the GeoLink project, an NSF EarthCube Building Block, applying semantic technologies to enable knowledge discovery, sharing and integration. GeoLink is testing ontology design patterns that link together the MBLWHOI Library Institutional Repository (IR) Woods Hole Open Access Server (WHOAS); data repositories, including Rolling Deck to Repository (R2R), Biological and Chemical Oceanography Data Management Office (BCO-DMO), Integrated Earth Data Applications (IEDA), Long-Term Ecological Research Network (LTER), DataONE and the International Ocean Discovery Program (IODP); the National Science Foundation (NSF) funded awards; and American Geophysical Union (AGU) conference presentations.

Keywords: Linked Open Data, Semantic Web, repositories.

The Library is collaborating with scientific users, data managers, DSpace engineers, experts in ontology design patterns, and user interface developers to make WHOAS, a DSpace repository, available as linked open data. The goal is to enable searching across participating repositories without needing to change the way information providers are managing their content. The tools developed for DSpace will be made freely available to the community of users. There are 257 registered DSpace repositories in the United States and over 1700 worldwide.

Outcomes include: Integration of DSpace with OpenRDF Sesame triple store to provide SPARQL endpoint for the storage and query of RDF representation of DSpace resources, mapping of DSpace resources to Geolink ontology, and DSpace "data" add on to provide resolvable linked open data representation of DSpace resources.

Linked Open Data (LOD) (Berners-Lee 2006) is an approach to publishing and linking content online using methods and protocols known as the Semantic Web (Hitzler et al. 2010). The methodology has four basic characteristics: (1) Use of unique identifiers (URIs) to name (identify) things; (2) use of HTTP URIs so that things can be looked up ("dereferenced") on the

Web; (3) provide useful information about what a name identifies when it is looked up using open standards such as the Resource Description Framework (RDF) language (Berners-Lee 2006, Schreiber and Raimond 2014) when identifiers are dereferenced; and (4) refer to other things using their HTTP URI when publishing on the Web to support further discovery. LOD alone can succeed in opening up access to information, but it does not make data readily reusable for scientific purposes (Janowicz and Hitzler 2012). LOD capabilities for scientific use and data discovery are greatly improved when further supported by standard vocabularies such as W3C DCAT (Mali and Erikson, 2014) and PROV (Lebo et al, 2013) that describe datasets and provenance, along with the OGC GeoSPARQL language to perform queries against RDF data (Battle et al 2012). Concepts such as publications, researchers, expeditions, etc. should be modeled in a modular and consistent way using ontology design patterns (Janowicz and Hitzler 2012) to maximize reusability. Modularity allows for use and re-use of scenarios by different repositories. The MBLWHOI Library is a partner in the GeoLink project, an NSF EarthCube Building Block, applying these semantic technologies to enable knowledge discovery, sharing and integration.

The current project is an extension of a narrower effort called OceanLink that had five data sources: MBLWHOI Library Institutional Repository (IR) Woods Hole Open Access Server (WHOAS); Rolling Deck to Repository (R2R); Biological and Chemical Oceanography Data Management Office (BCO-DMO); the National Science Foundation (NSF) funded awards; and American Geophysical Union (AGU) conference presentations. All of these contain different kinds of data, are built on different platforms, and are organized in different way, but we created the ontology design patterns that enabled the connections. The Library collaborated with the open-source community of developers, including @mire, Inc., a Registered Duraspace service provider, to make our DSpace repository LOD enabled. The result of this first phase of work was an add-on for DSpace that is available on GitHub https://github.com/dspace-oceanlink/DSpace/tree/oceanlink-4_x/dspace-lod.

GeoLink attempts to go further, addressing disparate vocabularies and heterogeneity issues regarding representation of information across the geosciences. We are using a conceptual modeling approach without needing to change the way information providers are managing their content. GeoLink is testing ontology design patterns that link together the MBLWHOI Library Institutional Repository (IR) Woods Hole Open Access Server (WHOAS); data repositories, including Rolling Deck to Repository (R2R), Biological and Chemical Oceanography Data Management Office (BCO-DMO), Integrated Earth Data Applications (IEDA), Long-Term Ecological Research Network (LTER), DataONE and the International Ocean Discovery Program (IODP); the National Science Foundation (NSF) funded awards; and American Geophysical Union (AGU) conference presentations.

The MBLWHOI Library is continuing to work with @mire on DSpace enhancements. Editable administrative authority control, which provides a local authority storage solution for DSpace, has been deployed to WHOAS. Functionality includes the ability for administrative users to define and assign authority control to DSpace metadata fields for use during submission and

deposit. This solution includes support for SPARQL endpoints as authoritative sources. It also provides a mechanism to define and configure queries against known endpoints, allowing retrieval of specific resources associated with the metadata fields in DSpace records. Additional edits were done to update this work to the latest major DSpace version release, DSpace 5, and to map DSpace 5 RDF output to the latest GeoLink ontology release.

GeoLink has established resource discovery across geoscience repositories using LOD and semantic integration while respecting and preserving the heterogeneous landscape of data providers. The Library has a long history of partnering with groups interested in increasing access to research and data across the geosciences. Through the GeoLink project we have been able to make significant progress in that mission, linking our openly available theses, articles, and data with primary and axillary data and metadata across organizations and disciplines without changing the structure of our records or databases.

References

Battle, R. and Kolas, D. (2012). Enabling the Geospatial Semantic Web with Parliament and GeoSPARQL. *Semantic Web* 3(4), 355-370.

Berners-Lee, T. (2006). Linked Data. http://www.w3.org/DesignIssues/LinkedData.html, June 27, 2006, edited June 18, 2009.

Hitzler, P., Krötzsch, M., Rudolph, S. (2010). *Foundations of Semantic Web Technologies.* Boca Raton: CRC/ Chapman and Hall. 456 p.

Janowicz, K., Hitzler, P. (2012). The Digital Earth as knowledge engine. *Semantic Web* 3(3): 213-221.

Lebo, T., Sahoo, S., McGuinness, D. (2013). PROV-O: The PROV Ontology. W3C Recommendation 30 April 2013. http://www.w3.org/TR/prov-o/.

Maali, F., Erikson, J. (2014). Data Catalog Vocabulary (DCAT)W3C Recommendation 16 January 2014 http://www.w3.org/TR/vocab-dcat/.

Schreiber, G., Raimond, Y. (2014). RDF 1.1 Primer 25 February 2014. W3C Working Group Note. http://www.w3.org/TR/rdf11-concepts/.

Session 7: Linked Repositories – Theme of the Day

Moderator: Barbara Butler

**AEDA, a Unique Data and Information Management System
for the Environmental Sciences**

Dr. Michael R. Haft
(ORCID ID orcid.org/0000-0002-9584-7882)
Freshwater Biological Association,
The Ferry Landing, Far Sawrey
Ambleside, Cumbria, LA220LP, United Kingdom.

Abstract
The Agricultural and Environmental Data Archive (AEDA) combines the advances in Open Linked Data with Research Data Management approaches to manage a variety of digital objects from documents, images and video to GIS layers and scientific datasets. The subject focus of the Freshwater Biological Association (FBA) initiative is inland waters, their catchments and the agricultural and other environmental influences on their biology, chemistry and ecology. AEDA consists of a data model that meets the needs of long-term digital curation whilst complying with the requirements of the EU INSPIRE Directive on data sharing and compatibility. AEDA also uses a specific controlled vocabulary in order to ensure that all data and other digital information stored within it uses a common language and can therefore be published as Open Linked Data and made available via AEDA's Linked Data API (currently in development). AEDA represents a combined data and information archival and publication platform.

Keywords: Digital curation, data publication, open data, linked data, freshwater biology, environmental science.

Introduction
The Freshwater Biological Association (FBA) was founded in 1929 as a government funded research station. Now a registered UK charity, the FBA has in the course of its existence amassed a large volume of research material on the subject of freshwater science in general, though with an obvious focus on the biological. The FBA library contains approximately 350,000 catalogued items, many of which are exceedingly rare or unique. The FBA is also home to approximately 1200 archive boxes of physical research materials ranging from datasets, to correspondence, to scientific samples. Of particular note is the FBA's Fritsch Collection of algal illustrations. Collected over more than 100 years, the Fritsch Collection contains referenced illustrations of millions of freshwater algae, a unique resource for biological identification.

Figure 1. The FBA Library

.   *Figure 2. From the FBA Archive, Water Samples from 1920s Expedition to Lake Titicaca.*

In 1999 the FBA embarked on a digital project called FreshwaterLife; this was an attempt to lay the foundations of a digital future for the FBA's data and information services. The digital world was fast approaching in the form of websites, online journal publications and data sharing and management. The FreshwaterLife project laid the foundations for future work carried out by the FBA in the digital arena; this led to subsequent funding by the UK's Joint Information Systems Committee (JISC) for the Freshwater Information Sharing Network project (FISHNet) with our partners at King's College London (KCL) and the Freshwater Linked Data project (FISH.Link) with our partners at KCL and the University of Manchester (UM). The results of these projects in turn led to funding from the UK Department for the Environment Food and Rural Affairs (Defra) funding the Demonstration Test Catchment Archive project in order to take the existing knowledge and software developed and build a fully functional digital data curation and data publication system to support the need to preserve and make government funded research data publically available for the foreseeable future. This project was completed in early 2015 and the finished system was called the Agricultural and Environmental Data Archive (AEDA), http://www.environmentdata.org.

AEDA

The Agricultural and Environmental Data Archive uses a unique data model for archiving and publishing digital datasets. This data model is derived from the ISO 19100 series of standards, in particular the Observations and Measurements Standard (ISO 19156:2011); our archive data model can thus be described as a unique profile of this ISO standard.

The data model consists of three primary classes: Activity, Dataset, and Data Component. An activity represents project related contextual information such as responsible party, project start date, end date, contact details and so on. The Dataset class represents a collection of metadata fields to describe a collection of Data Components and other resources. This collection is deliberately left to the discretion of the individual user so as to avoid having to strictly define the nature of a dataset and force users to comply with a definition they may not find suitable for their own data. The Data Components can be thought of as the "payload" of the Dataset. The primary components can be a Measurement, Analysis, Synthesis, Simulation, or Literature Review, all of which consist of numerical data in comma separated value (CSV) format. In addition to the primary data components the model also allows for supplementary files such as PDFs, Word documents, images, Excel spreadsheets etc.

The Controlled Vocabularies
AEDA also consists of a series of three controlled vocabularies used to properly describe the content it contains. They are: the subject thesaurus (www.environmentdata.org/vocabulary), the geographic authorities list (www.environmentdata.org/geographicterms), and the taxonomic authorities list (http://www.environmentdata.org/plist/taxon). These three controlled vocabularies are maintained by the FBA. The vocabularies are used to keyword metadata entries for items in the archive but their most important use is as the column headings in the numerical data files submitted in AEDA Data Component CSV files.

AEDA CSV File Format
The CSV files associated with the primary data components are required to be in a particular format for use in the archive, if the files do not conform to the correct format they are rejected during the file upload process. The format requires that the first three rows of the CSV file be as follows:
- Row 1: Labels, free form and at the discretion of the user.
- Row 2: Observed Properties, must be drawn from the controlled vocabulary and should reflect the most specific parameter being measured by the data, e.g. water temperature should be used in preference to temperature if that is what is being measured.
- Row 3: Units, the unit in which the parameter in row 2 was measured; if no unit is appropriate (as in pH for example) then N/A should be entered. Preferred units for given terms are recorded in the entry for that term in the vocabulary.

Adherence to the above format allows for the issues of ambiguous data recording to be solved; i.e., does t mean time or temperature? It also allows the data to be described in a consistent manner across all Datasets and Data Components, meaning that data can effectively be published as Linked Open Data (LOD).

The Publication Process
When users wish to submit their data for publication they do so from the page associated with the Activity class for their data; publication takes place from this point so as to allow it to cascade down the tree from Activity to Dataset to Data Components. The initial stage in the

publication process is for the user to submit data for a "pre-publication check." This automated check tests their data against the data model and ensures that all the relevant fields have been completed in order to meet the minimum metadata requirements for the data. If the data pass the pre-publication check, they may be passed to the Repository Manager for scrutiny.

The Repository Manager's job in the data publication process is to ensure that the quality of the metadata and other aspects of the data are of a sufficient standard for publication; if they are not, the data are sent back to the user with recommendations for improvement. Examples of the sort of things the Repository Manager will be looking for are: non-meaningful titles, e.g. RT1, RT2 instead of River Temperature Measurement 1 etc.; insufficiently descriptive abstracts or data quality statements; errors in dates and data formats; or incorrect uses of the controlled vocabulary to describe the data being measured, e.g. using the term Mass to describe Sediment mass. Some of these practices will pass the automated check but are nonetheless not appropriate usage for the data.

If the data are passed as being appropriate by the repository manager and can be published, all digital objects in the scope of the activity involved are cloned and copied to the public area of the repository, where they can then be viewed by the general public and their content downloaded. A Digital Object Identifier (DOI) can then be minted from Datacite (www.datacite.org/) for each dataset.

Any subsequent changes to the data in the system can then be re-published using the same procedure and a new clone of the digital objects is made and assigned a different DOI. These different versions share the same landing and display page but it is possible to navigate between versions on this page.

Because the data have been ordered in this way, it is possible to query them semantically using a query to the archive's triple store. This opens up the possibility of recombining data in novel ways for use in a variety of applications.

Future Work
AEDA will continue to be supported and developed by the FBA for the foreseeable future. We are already working with several scientific research projects to store their data and make it accessible, and we also have an ongoing commitment to make items from the FBA's own physical collections available digitally via the archive.

In addition to the above the FBA has just begun a formal collaboration with the Smithsonian Institute to contribute code and development expertise to their Sidora digital archive project.

Session 7: Linked Repositories – Theme of the Day

Moderator: Barbara Butler

Towards an Aquatic Biodiversity Sciences E-library in the Philippines

Lyra Pagulyan
FishBase Information and Research Group Inc.
Compound, Los Baños, Philippines

Abstract
Most libraries now utilize modern technology; almost all use databases to manage library holdings. With the existing Reference Management System (RMS) of the FishBase Information and Research Group (FIN) library, we aim to build an e-library as web infrastructure, providing access to soft copies of aquatic biodiversity sciences publications (primary, secondary and grey literature) used in building global biodiversity information. Acquiring and inputting of references into the e-library will be a continuous process to cover all the studies. We also aim to design and implement the e-library with GIS query interface, which will facilitate visual retrieval of publications based on geographic locality. In addition, mapping studies by geographical area may be of use in identifying well-studied areas in the country, and most importantly, areas where aquatic biodiversity has not yet been surveyed. This combination is a potentially powerful tool in assessing what is known of the aquatic biodiversity in the country and in directing research towards areas where such knowledge is still lacking. The collaborative partnership that this project will establish and maintain through the e-library will hopefully expand partnership with libraries of other organizations. The accessibility of this e-library will help to increase awareness of aquatic biodiversity, especially on the forgotten freshwater biodiversity not only within the Philippine user community but also in the international community with interest in Philippine aquatic biodiversity research and management.

Keywords: Aquatic biodiversity, reference management systems, FishBase, Philippines.

Session 7: Linked Repositories – Theme of the Day

Moderator: Barbara Butler

Corporate Librarianship in the ODINECET Group (EURASLIC)

Kateryna Kulakova[1]
[1]Head of the Publishing and Translating Group
Southern Scientific Research Institute of Fisheries and Oceanography (YugNIRO)
2, Sverdlov Str., Kerch Crimea Russia 298300
Tel. +73656121012
Fax: +73656161627
Email: kulakova.kateryna@gmail.com

Olga Akimova[2]
[2]Head of Library
Institute of Biology of the Southern Seas
2, Nakhimov Ave., Sevastopol Crimea Russia 299011
Tel. +7 8692 544110
Fax: +7 8692 557813
Email: o.akimova@ibss.org.ua

Irina Krasenkova[3]
[3]Head of Library
All-Russian Research Institute of Fisheries and Oceanography (VNIRO)
17, Verkhnyaya Krasnoselskaya Str., Moscow 107140
Email: library@vniro.ru

Abstract
This paper focused on the advantages of joint librarian projects and international collaboration among the aquatic libraries, which are highly specialized. One of the outstanding features of the information environment during the last decades is the constant growth of e-libraries, or even separate digital collections. Nowadays any library is willing to expand the sphere of its informational activities either within the country or abroad; librarians attract users by promoting their services and providing (open) access to their collections via digitization. In so doing, libraries are more productive, useful and user-friendly. Libraries are becoming more integrated into the world of e-science via various international programs. Examples of certain successful international librarian partnerships are given. There have already been two institutional repositories (IBSS, Sevastopol, Crimea, and RuFIR, Russian Fishery Industry Repository, Moscow, Russia) and one corporate repository CEEMaR, launched as part of the ODINECET Program. The

paper emphasizes the pluses and minuses of the CEEMaR e-Repository, the IODE product of joint efforts of 18 libraries from five countries of the Central and Eastern Europe Region, against institutional repositories. Besides Open Access resources, worldwide corporate cooperation has brought document cataloguing to a completely different level. Electronic versions of bibliographic information has stimulated the creation of new forms of collaboration in bibliographic data exchange, leading to making the cataloguing process cheaper, raising the issue of quality control while compiling a bibliographic record, and uniting the libraries in their mutual efforts to create regulating documents of the international standards. The Union Catalogue of the ODINECET Group is a common corporate resource, gathering information on the aquatic periodicals' holdings from the Central and Eastern Europe libraries. The works (either factual or technical) have also revealed some problems that are yet to be solved, with a unique cataloguing standard among them. The challenging task for catalogue compilers will be to unite certain bibliographic metadata modes, classification descriptors and keywords. Current activities and future perspectives of the ODINECET Union Catalogue are reported on.

Keywords: Aquatic libraries, collaboration, e-repositories, CEEMaR, Russia, Ukraine.

The social role of a library has evolved for the last two decades. Such traditional functions of the library as enlightenment, physical preservation and dissemination of cultural and scientific heritage are regarded as insufficient nowadays. Today the library is only considered competent when it promotes itself as an information center, providing access to various databases, datasets, websites and other digital resources that enable the researcher to seek further. Libraries inform readers that "if we cannot satisfy the needs of those seeing information, we will show them where and, most importantly, how, to find it." Modern libraries have become serious community units, collaborating with different academic universities, scientific institutions, government, media and international organizations. Nowadays a library is willing to expand the sphere of its informational activities either within the country or abroad; librarians attract users by promoting their services and providing (open) access to their collections via digitization. In so doing, libraries are more productive, useful and user-friendly.

Creation of e-repositories is currently gaining popularity as one of the solutions for libraries to enter the World Wide Web space and, due to the principles of linked data, make their library resources visible and accessible far beyond the library walls. Evidence is mounting that any material that is not available in digital format does not get used. But how are libraries encouraged to keep up with these tendencies? They need to define their projects efficiently so that they are not very time- and fund consuming, and make their first steps in the semantic web. Digital collections are usually the biggest part of any e-repository content. So far libraries have accumulated gigabytes of scanned materials, which, either for the purposes of preservation for future generations or for popularization among a wider community, can be professionally stored in e-repositories. That is why libraries, archives, museums, research centers and publishers unite

in their efforts to implement large-scale and small-scale projects, raising money either within the establishment or from outside sources. One of the most successful examples of such an international partnership of libraries is the CEEMaR (Central and Eastern European Marine e-Repository, http://ceemar.org/), which initially united 18 aquatic libraries from the research and academic institutions of Bulgaria, Croatia, Poland, Latvia, Russia, and Ukraine.

The percentage of documents uploaded into the CEEMaR is different for each participating country, depending on how eagerly and intensively the library works on filling the repository content with its collections. Although some of the organizations have submitted only one document, that may be because the library has its own institutional repository and has not yet decided on the amount of digital collections to be stored in the corporate one (like the Russian institute VNIRO with their new and productive DSpace-based e-repository RuFIR: http://dspace.vniro.ru/) or because the library lacks human resources (like our Bulgarian partners from IO BAS). The latter problem becomes more pressing nowadays as the number of requirements for depositing reliable texts is growing: OCR scanning (an obligatory rule for many project funders and repositories' policies), error-free text, quality control and preservation in secure formats (for instance, PDF/a) take time and considerably slow the process of Open Access. However, taking into consideration long-term conditions of storage and repeated usage of a digital document, the job is worth doing well.

Southern Scientific Research Institute of Fisheries and Oceanography (YugNIRO, Kerch, Crimea) became a member of this joint project in 2008. So far the total rate of our input makes up 42.8% of all the submitted documents in the CEEMaR. The main reason for such an intensive activity is that, due to very limited budgets, our institute cannot afford to develop its own e-repository because it would mean hiring additional IT staff, customizing the basic free software and providing constant maintenance to what has been created. That is why the idea of participation in the corporate digital resource, supported and physically located beyond our server, appealed to both the library staff and administration. Before joining the CEEMaR, we already felt that as library users' behaviors had changed, so had library expenses. In her article "Impacts of mass digitization projects on libraries and information policy," Trudi Bellardo Hahn (2006) precisely described common behaviors of library users nowadays, which appeared to apply to our scholars, too: "Researchers all over the world are relying on the ease and speed of digital access and are unearthing many new and rare treasures they never would have known about or found in print collections. Even for material that is readily available, people are annoyed if they have to go find a book, photocopy it, retype the relevant passage or quote."

Our priority during 2008-2014 was to provide Open Access to all recent born-digital products and OCR-scanned materials; the library was eager to make sure all the newly written scientific works, standards, books and manuals are shared worldwide. Thus we chose to add the repository content from the more recent period to earlier materials. In 2014 such policy proved to be fruitful, resulting in submission of all the documents printed within YugNIRO during the years of Ukraine's independence (since 1993). This year we have made a controversial decision: to start a digitizing campaign of the first YugNIRO expedition reports and proceedings – the

collection of so called rare books, which survived during the YugNIRO evacuation in the Second World War. This decision was made for a number of reasons: the poor conditions of physical carriers' storage, researchers' constant requests for these materials and the fact that some of these reports were concentrated only in the libraries of the post-Soviet countries.

Very old materials are still widely used nowadays, but mainly in digital format due to the expense of transporting print copies. In fact, the idea that it is necessary to give second life to yellowish and deteriorated volumes with dog's ears is far from being new. Librarians must cooperate in digitization; it makes no sense not to digitize because of the fear that after becoming digital the book will lose its value as a printed material. Instead, librarians should focus on increasing access to rich unique treasure troves. According to the Disaster Plan for our library, all the digitized physical carriers, in particular old and valuable ones, should be kept in safe boxes and access to them must be either restricted or prohibited. We consider digitization as the best form of insurance we have; it is not a replacement for the physical objects, but increasingly a good (though not always perfect) surrogate that at least preserves the content. Thus, this year we have uploaded eight expedition reports and YugNIRO Proceedings, dating back to the period of 1926-1930.

Rare books collections have already been digitized and included in the CEEMaR by two of our repository partners – the libraries of the Polish National Marine Fisheries Research Institute in Gdynia and of the Odessa Branch of the Institute of Biology of the Southern Seas (OB IBSS) in Odessa (Ukraine).

IBSS Repository (Institute of Biology of the Southern Seas, Sevastopol, Crimea) was established in April 2007, and in over two years it has gained popularity among the scientists in our institute and worldwide. According to the statistics, the repository includes 1,400 full-text documents. At the Ranking Web of World Repositories (repositories.webometrics.info), there were 800 registered repositories as of January 30, 2010. The rating was based on 400 most active repositories. IBSS Repository (the only one in Ukraine) entered the rating as # 305 on the total list.

For over 140 years of its existence in the Sevastopol Biological Station (the SBS was founded in 1871), IBSS has accumulated a large number of publications. Since then, this institution has many times changed the forms and versions of its scientific publications. When the project was first launched, it was decided to start filling the repository with periodicals published by the institute at that time. By the end of 2014, all periodicals, books, collections, conference proceedings, preprints and theses from recent years had been uploaded to the repository.

In 2015, the publishing activities of the institute were terminated. Inputting the abovementioned documents has been conducted simultaneously with taking the first steps to upload books and scientific collections published since the 1970s. The main obstacle to preparing books and collections of earlier periods is that many of them lack either Russian or English annotation. Thus, it is necessary to further pursue this work. Books and collections are scanned (unfortunately, without OCRecognition), supplemented by the corresponding

annotations and inputted into the repository. This work has been slowing down the filling of the repository during the last few years. In 2015, it was decided to submit theses abstracts of the Institute's scientists.

IBSS is also a Collaborating Center, inputting the institute's materials into the ASFA system. All the submissions are provided with the corresponding links to the articles from the repository. In order to provide effective monitoring of the repository activities, the system of the inputted journals analysis and statistics was almost simultaneously introduced. To ensure more precise and detailed statistics (for instance, which pages were visited and how often, which articles were downloaded and how often), the last version of the repository software was supplemented by a separate statistical module. Use of GoogleAnalytics was also added. In August 2015 there were 3,907 full-text documents in the repository. The schedule of general users' visits, which increased in 2011, remained stable up to 2015. During the winter months, there is an increased number of visits to the repository, and visits decrease during the summer.

In 2015, in the rating of the world repositories' web pages (Ranking Web of World Repositories) the IBSS was # 765 out of 2,275 registered repositories, and the CEEMaR repository was # 955. Analysis of the statistics shows that since 2010 the IBSS Repository has been consistently in the top third of the list.

In the same ranking in 2010, there was one repository from Russia and one from Ukraine (IBSS Repository). In January 2015, of 2,275 repositories on the list, 46 were registered in Ukraine, many with high ratings. The number of Russian repositories has increased, too; there are 21 of them in total. One of the first and leading Russian repositories is the Ural Federal University Institutional Repository, which occupies the 402nd position on the list.

The results achieved by the IBSS in creating and extending the IBSS and CEEMaR repositories were made possible through the capacity building program and facilities at the IODE Project Office for IODE, where many trainings in the field of marine information management are provided that help librarians establish e-repositories in their own institutions.

The most important task of the VNIRO library (All-Russian Scientific Research Institute of Fisheries and Oceanography, Moscow, Russia) is to provide readers with documents they need. A full-text documents collection and electronic content repository is now one of the main tasks of the VNIRO library and it is an integral part of the VNIRO holdings. Its development improves readers' services. Also, availability of electronic copies of particularly important publications from the VNIRO and other fishery institutes helps remove the physical items from active handling and prevents physical wear. Creation of the electronic library raises the quality and efficiency of users' services.

In 2008 the scientific and technical VNIRO library started developing the Russian Branch e-Repository "RuFIR" (http://dspace.vniro.ru).The scientific electronic library (repository) of VNIRO regularly updates digitized materials of scientific content. In it is a collection of scientific

works of Russian scientists: monographs, scientific works of the leading Russian institutes, conference materials, authors' abstracts of theses (which we consider equivalent to articles in journals) and the main branch journals available at the VNIRO library holdings. Authors' abstracts of theses and scientific works of VNIRO are included for all the time periods. The rare books collection of the library holdings is represented as well.

The repository is Open Access, so everyone can easily find a scientific article on almost any topic covering fisheries and marine subjects. Currently RuFIR repository has a database of full-text documents (about 6,000 full texts), including articles by our scientists from the internationally ranked journals with a high impact factor, collections of conferences and seminars, and serial publications of the Institute, based on VNIRO scientific researches.

The main objectives of the VNIRO library repository are the following:
- Providing centralized and long-term storage of published texts and information in electronic format.
- Ensuring Open Access to sources of scientific information and the heritage of the research Institute.
- Providing opportunities for remote use.
- Promoting scientific research in the field of fisheries.
- Promoting growth of the VNIRO popularity by means of presenting its scientific achievements in the global network.
- Increasing citations of scientific publications by the VNIRO employees by providing free access to texts through the Internet.
- Creating a reliable and accessible system of accounting and control of the publication activity of the VNIRO research staff.

Use and development of the VNIRO institutional repository is beneficial for:
- Every scientist-officer
  ➢ Dissemination, presentation, and advance of the research.
  ➢ Increase of the impact and citation studies.
  ➢ Permanent and long-term storage.
  ➢ Preservation of copyright.
  ➢ Full-text search.
- Structural subdivisions
  ➢ Distribution.
  ➢ Growth of the citation level.
  ➢ Duration and constancy.
  ➢ Maintenance.
- Scientific organization (VNIRO)
  ➢ Research dissemination.
  ➢ Support of research activities;
  ➢ Improvement of the scientific communication quality.
  ➢ Rating increase.
  ➢ Open Access to research materials.

Scientific publications of the VNIRO researchers in an open archive provide an opportunity to draw conclusions about the effectiveness of scientific research, and to analyze publications and their citations. It is complicated to implement such an accurate analysis, because during the process of writing publication of materials is affected by many factors. Science Citation Index is one tool to measure the significance of scientists' materials, determined by the number of citations to his/her publications. A scientist has a h-index if "h" of his many articles are cited at least "h" times each, while the remaining articles are not cited more than "h" times each.

When members of the research staff of VNIRO wish to place electronic versions of their materials in the repository, they contact the repository administrator, who is an employee of the VNIRO library. Joint efforts of authors are quickly filled and deposited in the VNIRO repository.

Some ways to further improve and replenish the database are:
- To separate the repository content in order to differentiate articles published in print and those born digital.
- To submit thematic bibliographies into the collection of "Bibliography of VNIRO scientists."
- To submit the collection of virtual exhibitions with illustrative educational and informational materials of both scientific and popular-scientific nature. The purpose of such exhibitions is popularizing science;
- To create an ex libris (bookplates) database of the VNIRO library holdings;
- To create other project of library collections for science and technology, focused on popularization of science and scientific achievements.

Any e-repository has a great disadvantage, however. Digital repositories create digital "containers" for scholars to "dump" their data. However, libraries are creating "dumping grounds" of data in digital repositories, and researchers may have to search many dumps to find what they need. Without standards for interoperability, the search may be expensive and time-consuming, or even impossible.

There are some scientists who, for various reasons, seem unaware of materials and information that they cannot find easily on the web. Scholars are limiting their searches to only what they can retrieve through simple, "good enough" searches. They are not only missing key information, they are not learning advanced searching skills. In the 21st century, "good enough" is not enough. Only 20 % of users go to library catalogs when seeking a book. That means that 80 % are going to the web and are satisfied with the results obtained by the search engines. These potential library customers get lost in the global network. The proportion 20/80 has been changing, but not in favor of libraries. By making the library metadata available for the search engines, libraries add their resources to the world content, and both parties benefit.

The process of library e-catalog development is accompanied by a number of difficulties that affect many libraries in Russia and Ukraine. One example is the creation of duplicates not only

within a library but also on the international level. Why should hundreds of catalogers each use valuable time to compose nearly identical cataloging records for the same item when one cataloger could do it and share the record? Why should hundreds of typists retype that same record on cards when a computer could be programmed to print them?

The other great concern of machine-readable cataloging is a very low level of unification methods applied to analytical processing of documents. Libraries share the benefits of machine-readable cataloging whether they have an online system or not. International cooperation of libraries is essential while developing bibliographic databases; machine-readable cataloging facilitates libraries' integration into the world web. Any cataloging process includes such activities as preparation of bibliographic records, harmonization of the bibliographic description rules on the international level, and linguistic support of translated records.

The quality of library information products depends directly on the standards according to which the records are compiled, and which machine-readable format is applied. However, there is one more factor that greatly influences the record quality and, most importantly, that can only be done by a librarian; processing of the content document. Everyday routine tasks of librarians – indexing, editing, inputting of documents into the e-catalogs – make them very selective in choosing and submitting titles, subtitles, keywords, and descriptors. With the further development of information processes, the rules of indexing get more precise and refined. This approach is particularly applied to the scientific and technical libraries, where the assistance of a subject librarian is needed.

Together with the partners of the ODINECET Group, YugNIRO became a member of the Union List of Serials project, implemented by 20 libraries in total. So far, the following tasks have been accomplished:
  1. All the libraries have added holdings of all the 128 serial periodicals included to this bibliographic database.
  2. Lists of more periodicals to be included into the system have been prepared by a number of libraries; the lists are accompanied by the required metadata (ISSN, translated subtitle, publisher, place and date of publication).
  3. Guidelines for submitting the data into the Union Catalog have been provided in several languages.

Due to problems regarding both the human resources needed and the technical difficulties, the work on e-catalog development has been stagnating. Hopefully the activities on the Union List of Serials will be refreshed, and the new data on accessible holdings and archives will be open to any user.

During 2014, the logical order and format regulations of the documents inputted in Russian were analyzed according to the Russian All-Union State Standard 7.1-2003 "A System of Standards on Information, Librarianship and Publishing. Bibliographic Record. Bibliographic

Description. General Rules and Regulations for Compiling" (ГОСТ 7.1-2003 "Система стандартов по информации, библиотечному и издательскому делу. Библиографическая запись. Библиографическое описание. Общие требования и правила составления"). Agreeing on a transliteration system and creating a unique bibliographic record for the serials in different languages is still to be considered and implemented. While analyzing the order of fields to be inputted, all the work was focused on sharing: librarians shared samples of records, sets of keywords, serials metadata and so on. Various indexing methods were discussed and compared before the decision on any item was made and the "golden mean" was found. We strongly believe that those topics should be given more time for consideration; project coordinators should control such activities, and we suggest that separate libraries represent their own methodologies within the library community worldwide. Participation of IT staff during these activities to reach consensus is highly recommended. In any corporate work, agreements should be made as a team. As Betty Ferrie points out in her report "Understanding MARC Bibliographic: Machine-readable cataloguing" (1988), "You could devise your own method of organizing the bibliographic information, but you would be isolating your library, limiting its options, and creating much more work for yourself."

References

Baranova, O.V., Buntova, O.G., Kaplunov, D.A., Lissikh, I.G., Lovtskiy, K.E., Mansurova, E.N. (2002). Standards of the library information systems: Traditions and perspectives (in Russian). *Libraries and associations in the changing world: New technologies and new forms of collaboration.* Ninth International Conference "Crimea 2001" 1:152-154. http://www.gpntb.ru/win/inter-events/crimea2002/trud/sec78/Doc6.HTML

Betty, F. (1988). Understanding MARC Bibliographic: Machine-readable cataloguing. 8th edition reviewed and edited. Network Development and MARC Standards Office, Library of Congress. http://www.loc.gov/marc/umb/.

Hahn, T.B. (2006). Impacts of mass digitization projects on libraries and information policy. *ASIS&T Bulletin*, October/November. https://www.asis.org/Bulletin/Oct-06/hahn.html.

Pershina, M.A. (2010). Social partnership as a way of library development: Library as a developing environment of a new generation. Materials of the 5th Inter-regional Library Junior lections (in Russian). http://cbssykt.ru/kollegam/nashi_publikatsii_opyt_raboty_bibliotek_muk_tsbs/sotsialnoe_partnerstvo_kak_put_razvitiya_bibliotek/.

Shcherbinina, G.S. (2002). Coordinate indexing in the light of integral processes (in Russian). *Scientific and Technical Libraries* 10:72-76. http://www.gpntb.ru/win/ntb/ntb2002/10/f10_08.htm.

Session 8: Linked Repositories – Theme of the Day

Moderator: Kristen LaBonte

Twenty-five Years of Connecting With Fishing Communities for a Sustainable Future

Venugopalan Nottankandath
International Collective in Support of Fishworkers
Tamil Nadu, India

Abstract
The International Collective in Support of Fishworkers (ICSF) has substantially contributed to the empowerment of fishing communities. The presentation examined the information management activity of ICSF in its work to support the human rights of fishing communities and fishworkers worldwide. It described the way that ICSF's various activities have raised awareness of the social components of fisheries and the marine environment among fishworker organizations, policy makers, multilateral agencies, research institutions, NGOs and others. Through intense interactive workshops, field visits, publications, films, and cd-roms, information management has moved to new platforms of immediate accessibility to all. Through the worldwide web, ICSF created new ways of thinking about storage and distribution of information and access. Through the introduction of new e-reading services, it created new forms of negotiating and navigating. Through Interactive training programs and films, it promoted innovation in information/knowledge management as a creative process to respond coherently and effectively to the requirements of fishing communities.

Drawing on examples from the work of ICSF in different continents for over 25 years and experiences from different aquatic environments, the presentation looked at how ICSF has worked to create informed public opinion and improved its visibility to empower fishing communities to improve their situations, despite their unequal access to technology, low bandwidth, and the unequal levels of skills. The challenge is to make it easier for fishing communities and fishworker organizations to find tools that they can use and adapt to their own specific areas of work. Library networks like IAMSLIC can help by sharing costly information resources and multiplying channels of information and exchange to create better and more sustainable access to information for those to whom this is not easily available.

Keywords: International Collective in Support of Fishworkers (ICSF), fishing communities, fisheries.

Session 8: Linked Repositories – Theme of the Day

Moderator: Kristen LaBonte

Metadata Creation Practices among Aquatic Science Digital Repositories in Asia and the Pacific

Samuela Nakalevu and Verenaisi Moceyawa-Bavadra
Secretariat of the Pacific Community (SPC)
Suva, Fiji
Daryl L. Superio
Southeast Asian Fisheries Development Center (SEAFDEC/AQD)
TIgbauan, Iloilo, Philippines

Abstract:
Metadata enables discovery, access and sharing of digital collections in institutional repositories (IRs). However, the discoverability, accessibility and shareability of digital collections depend greatly on the quality of metadata and international standards followed and assigned by metadata professionals. The ability to maintain quality and consistent metadata has been a great challenge among IRs nowadays. This could be due to lack of professional training among information management professionals and the unclear or the lack of metadata creation policies among IRs in the Asia-Pacific region.

Using a one-shot survey design, our study will determine the current metadata creation practices among aquatic science IRs in the region. Specifically, it will identify metadata schemas, content standards and subject controlled vocabularies used among IRs. It will also document the software used in the development of IRs, digitization practices, metadata creation policies, international cataloguing standards (e.g. AACR2, RDA) and the competence level of metadata professionals. The results of the proposed study would enable IRs to review their current metadata practices and policies. It would also help in enhancing the capabilities of metadata professionals in the region. The study could reveal best practices and lessons learnt among IRs which in turn could also serve to guide institutions that are planning to develop their own IRs.

Keywords: Institutional repositories, metadata, aquatic sciences.

Session 8: Linked Repositories – Theme of the Day

Moderator: Kristen LaBonte

The Role Played by NaFIRRI Library and Data Centre in Managing Scientific Fisheries Data From Ugandan Waters

Alice Endra

Abstract:
National Fisheries Resources Research Institute (NaFIRRI) is one of the Public Agricultural Research Institutes under Uganda's National Agricultural Research Organisation (NARO). National Fisheries Resources Research Institute Information and Data centre has been in existence for over 50 years. It is charged with not only managing library holdings but is also with managing the Institute's scientific data generated from research. The library serves as a data center, meaning that the staff also work as data librarians. It acts as a storehouse for the Institute's data, most of which is maintained in their raw form. The data date back in the 1920's when the first surveys were carried out on Lakes Victoria and Albert in Uganda. The datasets have been organized in files. The paper explains the different ways used by NaFIRRI Library to organize and manage scientific data. It will examine challenges with managing raw scientific data that the library has faced.

Keywords: Libraries, fisheries data, data management, data curation, data center, Uganda.

Introduction
National Fisheries Resources Research Institute (NaFIRRI) is one of the Public Agricultural Research Institutes under National Agricultural Research Organisation (NARO). Its mandate is to conduct basic and applied research of national and strategic importance in aquaculture, capture fisheries, water environment, socio-economic and marketing, Information communication management and emerging issues in the fisheries sector.

National Fisheries Resources Research Institute Library and Data Centre has been in existence for over 50 years. NaFIRRI Library and Data Centre is charged with not only managing library holdings but also with managing the Institute's scientific data generated from research. The library serves as a data center, meaning that the staff members also work as data librarians. It acts as a storehouse for the Institute's data, most of which are maintained in their raw form.

The data date back to the 1920's when the first surveys were carried out on Lakes Victoria and Albert in Uganda. The data sets have been organized in files.

NaFIRRI Library and Data Centre was established in 1948 to provide information to scientists in the East African region. The library after renovation in 2005 became a Library and Information Centre, meaning that it had now acquired the additional responsibility of being a data center. To date the data centre possesses historical fisheries data from the 1950's in raw form. Therefore the library:

1). Acts as an archive for the institute's data.
2). Organizes data and information for easy access and protects them from damage and loss.
3). Data and information are available on request to scientists and the various stakeholders.

The respondents interviewed admitted that they access data from the information center. The reason why the data are kept in their raw form is because researchers often request the data files and re-analyze the data to make comparisons between the past and present. This introduces the subject of data curation in libraries. According to Jahnke et al. (2012), data curation is a term defined as a set of activities that includes the preserving, maintaining, archiving, and depositing of data to keep it secure, intact, and accessible for reuse.

Heidorn (2011) states that there are a number of arguments that lead to the conclusion that libraries must curate digital data to protect and disseminate the intellectual capital of society. Curation of the data is within the libraries' mission, and libraries are among the only institutions with the capacity to curate many data types. The data are critical to the scientific and economic development of society. The reason for conducting all of this work is of course for access, use, and reuse of the data.

David Stewart (2015) argues that increased interest in scientific data and a need for data-centric services provide a host of opportunities for the library to re-establish itself as having a central role within research institutions, but the overlapping roles of competing organizations mean that other organizations can quickly stake claims in areas that the library profession may have considered theirs by right.

The library is well situated to be a key player in data management, curation, and preservation, given its extensive experience with selection, metadata, collections, institutional repositories, preservation, curation and access (Erway 2013).

The main objectives of the study were:
1. To evaluate the role of the library and data center in managing scientific fisheries data.
2. Identify the gaps in management of fisheries data.
3. Identify ways of improving the management, access and sharing of scientific fisheries data and information within the library.

Some of the Historical Data Available

1. Lake Victoria Bottom and mid water trawl data, catch assessment survey data and frame survey data.
2. Biometric data for *Lates niloticus* (Nile perch) studies.
3. Lake Wamala data.
4. Lake George data.
5. Lake Mburo data.
6. Lake Nabugabo data.
7. Lake Albert data.
8. Lake Kyoga data.
9. Gillnet data.
10. Catch composition data.
11. Water quality data.
12. Fisheries socioeconomic data.
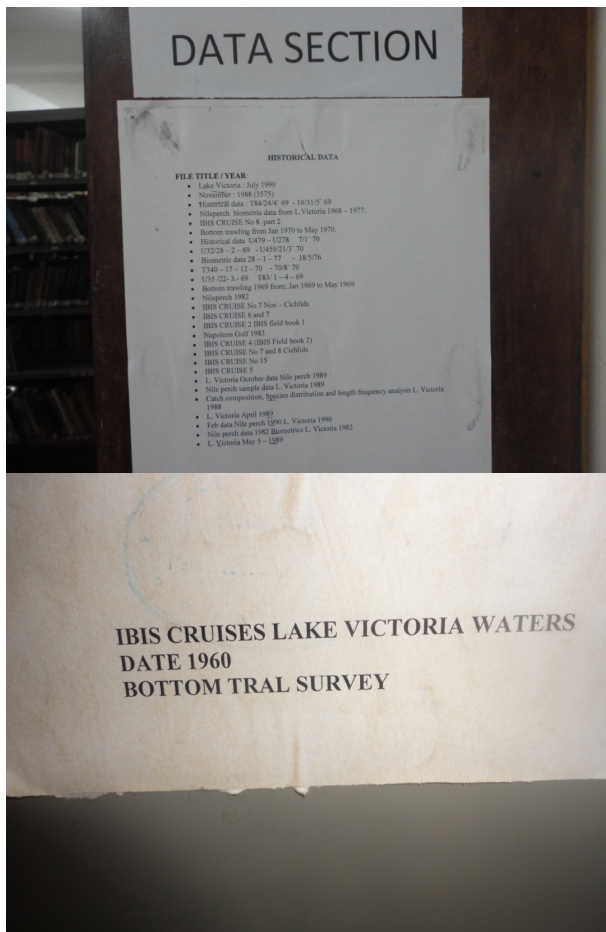
Figure 1: Part of the Historical Fisheries Data.

Role of the NaFIRRI Library in Managing Scientific Data

According to Heidorn (2011), the role of libraries is to collect, preserve, and disseminate the intellectual output of the society. This output includes books and serials as well as the digital versions of the same. The library had managed to organize historical data from 1960's to 1990's, which can be referred to by scientists.

Data have been organized:
1. According to Lakes System**s:**
   a) Lake Albert.
   b) Lake George.
   c) Lake Wamala.
   d) Lake Victoria.
   e) Lake Kyoga.
   f) Lake Bisina.

Figure 2 : Data Organized According to Lake Systems.

2. According to Bays within the different lake systems
   a) Lingira Bay.
   b) Napoleon Gulf.
   c) Buvuma Channel.
   d) Itome Bay.
   e) Ingira Bay.

3. All on Lake Victoria: Organized in files, cabins and shelves.

Figure 3: Data Displayed in Files.

Methodology Used
The author used questionnaires and interviews to get information from the various respondents.

Key Findings From the Interviews
A. How frequently do scientists visit the library?
30 respondents were interviewed on the frequency of visits to the library and data center, as seen the table below:

Number of times	Percentage
a) Once a week	22.7%
b) Twice a week	27.2%
c) Daily	22.7%
d) Once a month	22.7%
e) None	4.5%

Figure 4. *Number of Times Scientists Interviewed Admitted to Visiting the Library and Data Center.*

B. Role Played by the Library and Data Centre
The library plays a role in organizing historical data for easy access and reference by scientists. 95.4% of respondents admitted that the information and data center provides the required information and data.

When asked about the types of data they access from the information and data center, scientists said that they accessed the following:
1. Fish stock data.
2. Frame survey data
3. Limnological data (aquatic environment, water quality).
4. Data and Information on aquaculture.
5. Fisheries socio-economics data and information.

C. Contribution of Library Data to Research
When asked whether the scientific fisheries data kept in the information center had contributed positively to their research Input /output and work, the majority (94%) of the respondents said that fisheries data kept in the information center contribute positively to their research work in the following ways.
1. By helping them to shape their current and future research.
2. By providing a reference for describing trends in fisheries production.
3. By providing a source of reference materials for writing scientific reports and other publications.
4. By helping them to accomplish tasks in time and also to address stakeholders' concerns and inquiries appropriately.

All the respondents said that data being kept in the information and data center had contributed positively to their research since they have been able to access historical data and information that they have used to compare with current data.

When asked whether they are happy with the way they keep data in their possession, the following responses were given:

1. Not happy (75%): They need training on how best to keep data so that they are easily accessible when required. They felt that data from one section might not easily be accessed by others in different sections, yet fisheries data are inter-dependent. Furthermore, data are kept in files, shelves and computer. Data stored on computers is prone to virus attacks, hence vulnerable to loss if there is no backup.
2. Are happy (25%): Because they can retrieve data anytime from anywhere.
3. Methods used in managing scientific data: When asked about the level of satisfaction with the current method of storing and managing scientific data in data center, 87% of the respondents were satisfied because historical data are centrally managed and can easily be accessed by users.

Challenges the Library Has Faced
1. Historical data available within the library are not in electronic format but in paper, which is vulnerable to damage and loss.
2. The current data are under the custody of different scientists for fear of data piracy.
3. Convincing scientists to release data so that they are stored and kept for future reference within the information and data center is still a challenge.

Gaps
There is a need to tag the data available to the publications that have been generated from the data within the library. There is also a need to digitize the historical data available within the library and make it accessible electronically.

Key Findings and Recommendations
When respondents were asked what they thought should be done to improve data storage and management within the library and data center, they made the following suggestions:
1. Need to manage data in a network environment. Although some scientists welcomed the idea of data sharing, especially within the Institute, many are reluctant to enter into any arrangement in which they would relinquish control over access to data.
2. The Library should liaise with scientists and technicians for current information /data.
3. The Centre should link with related institutions at national, regional and international levels for purposes of sharing/accessing data and information.
4. Few researchers are aware of the data services that the library provides. This calls for more sensitization.
5. Maintaining the process of digitalization of the available data and Information.
6. Installation of modern IT packages (computers) to enable computerization of the historical data available within the data center. Data storage and management systems should be upgraded to modern systems by computerizing them.
7. Respondents noted that everybody is a good custodian of data. However, it is not helpful when data are kept at individual levels until shared. They recommend the data be kept at the library and data center for further management and external sharing.
8. Strengthen security in the library and data center. This will build the confidence of researchers to release the data under their custody.

9. Networking and electronic data management should be adopted by the library and data center.
10. Acquire more soft copies of data because they are easier to store than hard copies, which need a lot of space. Important research findings should be also stored in soft copy form and not only hard copy.

Conclusion

Despite the challenges, NaFIRRI Library and Data Centre has tried to ensure safe storage and access of data and information. We look forward to digitization of the data and sharing them through different networks. In the area of privacy and data access control, additional tools will be developed to manage confidential data and provide the necessary security. Many researchers expressed concerns surrounding the ethical reuse of research data.

References

Erway, R. (2013). *Starting the conversation: University-wide research data management policy*. Dublin, OH: OCLC Research. Available at: http://www.oclc.org/content/dam/research/publications/ library/2013/2013-08.pdf.

Gray,J., David T. et al. (2011) *Scientific data management in the coming decade*. Available at: http://research.microsoft.com/pubs/64537/tr-2005-10.pdf.

Heidorn, P. B. (2011). The emerging role of libraries in data curation and e-science. *Journal of Library Administration* 51: 662–672. DOI: 10.1080/01930826.2011.601269.

Jahnke, L., Asher, A., Spencer, A. A., Keralis, D. C., Henry, C. (2012). *The problem of data.* Council on Library and Information Resources, Washington, DC. Available at http://www.clir.org/pubs/reports/pub154.

Osswald, A., Strathmann, S. (2012)**.** The role of libraries in curation and preservation of research data in Germany: Findings of a survey. Session 116 - The role of libraries in data curation, access and preservation: an international perspective. Available at: http://conference.ifla.org/ifla78.

Stuart, D. (2015). Libraries could play key role in managing research data. **In** *Research Information*: December 2014/January 2015. Available at: http://www.researchinformation.info/features/feature.php?feature_id=497.

Session 9: Linked Repositories – Theme of the Day

Moderator: Jaime Goldman

**Digitization of Malawi's Aquaculture and Fisheries Grey Literature
For Sustainable Information Management**

Geoffrey F. Salanje
University Librarian
Lilongwe University of Agriculture and Natural Resources (LUANAR)
P.O. Box 219
Lilongwe
MALAWI
Email: gsalanje@bunda.luanar.mw

Abstract
Lilongwe University of Library and Natural Resources (LUANAR) Library has a special collection of publications on Malawi or by Malawians. The collection is popularly known as "Malawiana." Malawiana are rare publications in the sense that they may not be available anywhere else and are sought after by library users. They are stored in a special area on shelves or in pamphlet boxes and are used only in the library in an enclosed area as they are vulnerable to theft or damage. Amongst the publications are ones on aquaculture and fisheries science information; most are in pamphlet boxes and only accessible in the LUANAR. The library embarked on a project to scan these Malawiana publications. The goal was to scan about 300 aquaculture and fisheries grey literature documents within one year and make them available first on the intranet before they were accessible online through platforms such as Aquatic Commons (AC) and African Digital Library Support Network (DLSN). The project used DSpace open source software to create a digital library collection. The project, which received initial funding from IAMSLIC, has assisted in exposing the rare publications to wider usage apart from preserving and conserving them. The paper describes the project's benefits, challenges and way forward.

Keywords*:* Digitization, digital repository, Malawiana, aquaculture and fisheries information, Aquatic Commons.

Introduction
A great deal of the knowledge generated in fisheries and aquaculture science and management in Malawi is not discoverable or accessible to researchers and fisheries managers at the national and local levels. Some local scientists have had some of their works made available in various

publications both local and international; however, a larger percentage of the documents cannot be accessed online. Similarly, some local institutional libraries have attempted to create digital and institutional repositories for locally generated documents, but a lot of work has yet to be done to identify, organize, prioritize, obtain, select, process and make available documents and materials that are relevant to fisheries management in Malawi. Similarly, there is a need to foster increased exchange of ideas and knowledge among managers, researchers and stakeholders.

Document Scanning
Most of the locally generated documents are in print format. Work to digitize them has started and so far about 350 documents on aquaculture and fisheries science have been scanned using an ordinary office scanner (HP Scanjet N6350). The work is ongoing, though progressing slowly.

Creating a Digital Repository: Benefits
The creation of a digital repository has had a number of benefits for LUANAR in particular and Malawi in general; some of them are as follows:

- **Exposure of local scientific materials**
  There are a lot of documents in aquaculture and fisheries science available in various institutions in Malawi. Most of them are not accessible by users because they are not known since they either hidden in pamphlet boxes or cartons, while others are yet to find their way into the library. The creation of the digital repository would expose these documents to a wider readership.

Figure 1. Some of the aquaculture and fisheries documents

- **Preservation and conservation of rare scientific materials**
  Many of Malawi's aquaculture and fisheries publications are in poor condition and also too fragile for frequent use. Maintaining and disseminating digital copies of these works in a repository would prevent the wear and tear on the original documents.
- **Enhancing the research process**
  The repository allows research to move faster and more efficiently. Scientists are now spending less time seeking articles that they could not access through other sources. Through the repository they can do so with a few clicks of the mouse. This has speeded up not only the research process itself, but also the peer review process, especially when reviewers look up the supporting articles cited in the paper, and other research-related activities such as reviewing related literature for a new project.
- **Visibility and usage of research outputs**
  The repository has maximized visibility of research outputs at LUANAR and the country as a whole and has increased their chances of usage. Articles that are in repositories are now discoverable through Intranet and Web search using appropriate keywords with one click. Data on repository usage have demonstrated increased levels of interest in research in the subject area.

Achievements

The project has so far managed to scan about 350 documents, developed an institutional repository and with assistance from FAO has contributed a few documents to Aquatic Commons. Some documents have also found their way into the Malawi National Digital Repository. The project has helped in building skills for some LUANAR staff through the process of scanning documents, creating a repository and updating. Staff members have gained sexpertise in how to scan documents, creating a repository using DSpace software and maintaining the repository.

Figure 2. A Page From the LUANAR Repository.

Challenges

- **Neither LUANAR nor the country has a policy on Open Access**
  LUANAR is yet to develop an Open Access policy upon which a digital repository could be widely accessible online. LUANAR has an institutional repository accessible on its intranet, although plans are to go online once a policy is developed. Malawi as a country has yet to develop an Open Access policy.

- **Most of the publications are in print format**
  As already stated above, most of the documents in aquaculture and fisheries science need to be scanned and cleaned. The work is tedious and slow when using inappropriate equipment. An HP Scanjet 5590 flat bed, A4 size scanner is being used for the digitization process. Digitization of certain documents requires a heavy-duty scanner to hasten the process. They also need to go through an Optical Character Recognition (OCR) process after scanning because some of the documents are old.
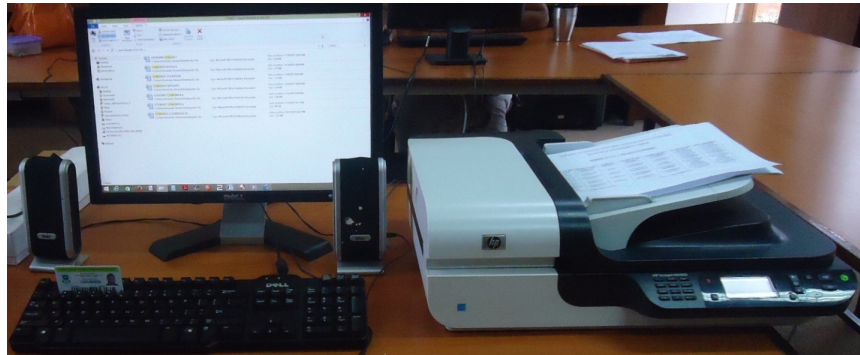

Figure 3. An HP Scanjet 5590 Flat Bed.

Fortunately, the Library has now acquired a heavy-duty scanner (M1000 Book Scanner A3 300ppi) as shown below.

Figure 4. Heavy-duty Scanner.

The documents are provided by the scientists through visits LUANAR staff make to their institutions and offices. The scientists are now able to provide documents in either printed or electronic copies. Electronic copies are a better way of collecting the publications because it avoids the work of scanning or physically visiting the scientists since they could be sent via online.

- **Institutional repository activities not coordinated**
  Some institutions have attempted to collect and scan documents for repositories in various subject areas. Notable amongst the institutions are Malawi National Library Services, Chancellor College, Mzuzu University and College of Medicine. These efforts are not coordinated, resulting in duplication.

Other Complementary Repositories' Activities in Malawi
Some institutions such as PACT through its FISH (Fisheries Integration of Society & Habitats) project and the Malawi National Library Services (MNLS) have attempted to create institutional and digital repositories including unpublished articles on Malawi's fisheries and aquaculture. The Malawi Library and Information Consortium (MALICO) is leading in the development of Open Access policies for Malawi.

- **FISH Project**
  The primary objective of the FISH project is i*ncreased resiliency to climate change and improved biodiversity conservation through sustainable fisheries co-management* and it is funded by USAID. One of the project's outputs is *utilization of science, analysis, and information for decision-making increased.* Through this the project seeks to improve access to fish science & information. It therefore endeavors to facilitate a community of practice in Malawi for fisheries co-management, including both historical and current literature and data. It also aims to glean knowledge from fishers, extension agencies and stakeholders involved in the value chain from net to table. Improving access to relevant knowledge for fisheries management includes but is not limited to scientific information in published journal articles, unpublished technical reports ("grey literature"), data and statistics from research and monitoring efforts, oral and recorded narratives of past and present fishing activity and environmental conditions, social and economic information about the communities and areas where fishing occurs or whose activities impact on fish stocks and ecosystem productivity.
  LUANAR has been part of this project. Its involvement is in the creation of a repository, sourcing relevant documents, scanning documents (where necessary), updating the repository and marketing it to researchers / scientists.
- **MALICO (Malawi Library Information Consortium) initiative**
  - o Development of Open Access Policies
  Malawi does not have any policy or legislation on Open Access to encourage or oblige the government or its institutions to grant Open Access to research information. MALICO, with funding from EIFL (Electronic Information for Libraries), is leading a process of developing an Open Access policies for funders and institutions such as universities that would enhance access to research funded by government and donor agencies and to improve the dissemination of research results. The policies particularly seek to enhance scholarly

communication, increase the visibility of the scholarly output from Malawian researchers and institutions, and promote the development of the local publishing industry.

The key goal of developing the Open Access policies in Malawi is to advance research and knowledge sharing through the removal of technical, legal and financial barriers that researchers encounter in accessing each other's research work. Institutional and digital repositories therefore operate under such policies.

So far Open Access policies have been drafted and are waiting to be approved by relevant authorities.

o   Malawi National Digital Repository

The Malawi National Library Service created the Malawi National Digital Repository (MNDR) with documents collected from local institutions. MNDR is an Open Access e-repository platform where Malawian research and other relevant work reaches many and has a direct impact on policies and practices in Malawi, Africa and worldwide. There are 1,323 documents, of which about 50 are on fisheries and aquaculture science. It is expected that the two institutions will continue working together to avoid duplication of documents in their repositories.
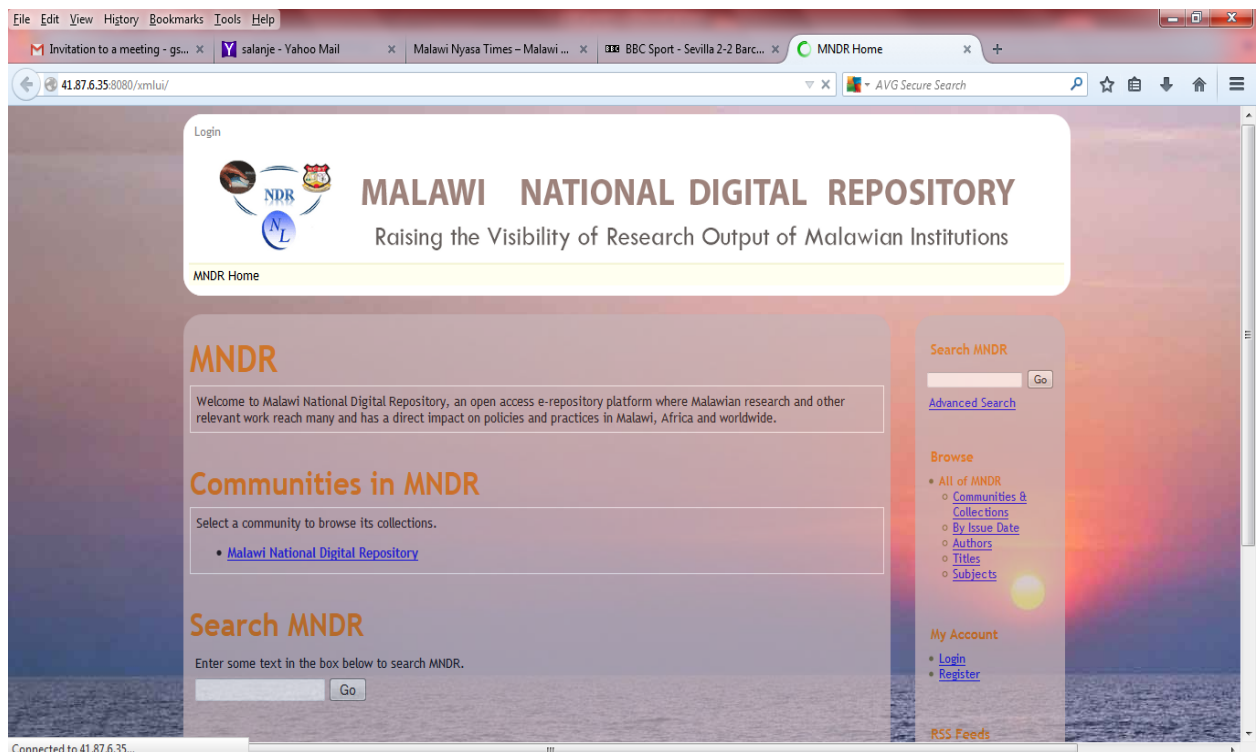

Figure 5. A Page View of the Malawi National Digital Repository.

Future Activities on the Repositories in Malawi
- **Development of enabling policies**
  As already indicated, most institutions in Malawi such as LUANAR and country as a whole have no Open Access information policy. However, the Malawi Library Information Consortium (MALICO) with funding from EIFL (Electronic Information for Libraries) has embarked on a project to develop open access policies for funders and institutions. The key goal of developing the Open Access policies for Malawi is to advance research and knowledge sharing through the removal of barriers that researchers encounter in accessing each other's research work. LUANAR as an institution of higher learning will also develop its own policy.
- **Collect all the fisheries documents (both printed and electronic) available in all institutions and in scientists' offices.**
  There has been an effort to collect all the documents that are available in all fisheries scientific institutions in Malawi; this work will have to continue. Targeted institutions are: LUANAR, Fisheries Research, Fisheries Research Unit Library in Monkey Bay, World Fish Center, Chancellor College Department of Biology, Malawi Fisheries College in Mangochi, National Aquaculture Centre in Domasi, Department of Fisheries Headquarters in Lilongwe and Mzuzu University's department of Fisheries. There will also be a coordinated effort to share electronic documents or make links to existing repositories created by local institutions. The documents collected will have to find their way into Aquatic Commons if and when permission is given by the relevant institutions or the authors. This will indeed enhance the number of documents in AC from Malawi.
- **To encourage scientists/ researchers to deposit their papers with the library**
  The first step is for scientists or researchers to be made aware of Open Access and its benefits, then encourage them to always deposit their papers with the library to be part of the repository. LUANAR Library will ensure that repository standards and completeness are upheld.
- **Continuous updating and marketing of the repository**
  The repository will continuously be updated with more documents. As more documents are created and collected, there is a good possibility of updating the repository. However, some documents on Malawi aquaculture and fisheries are available in other digital repositories and accessible online. Before depositing any document on the local repository, it must first be established that the document is not already in another repository to avoid duplication or any violation of intellectual property rights (IPR). Links to other sources could be made on the local repository.
- **Contribute documents to Aquatic Commons**
  LUANAR will continue to contribute local documents to Aquatic Commons. The issuing agency was Bunda College of Agriculture; now with a change of name, it is also necessary to change the issuing agency to LUANAR.

References

Balarin, J. (2004). Legal toolbox for participatory fisheries management: User manual and templates. Development Alternatives, Inc. (DAI). Prepared by the Community partnerships for sustainable resource management in Malawi (COMPASS) for the Malawi Ministry of Natural Resources & Environmental Affairs. Department of Fisheries and the USAID Mission to Malawi, Document 77, January.

Bell, R., Collie, J., Jamu, D., Banda, M. (2012). Changes in the biomass of chambo in the southeast arm of Lake Malawi: A stock assessment of *Oreochromis* spp. *Journal of Great Lakes Research* 38(4): 720-729.

Jantz, Ron (2001). Knowledge management in academic libraries: Special tools and processes to support information professionals. *Reference Services Review* 29(1): 33–39.

Kadzamira, G.A., Ngwira, M.E. & Salanje, G.F. (2003). Review of the fisheries information resources in Malawi. FAO 2004: Report of and papers presented at the Regional Workshop on Networking for Improved Access to Fisheries and Aquaculture Information in Africa. Grahamstown, South Africa, 3-7 November 2003. FAO Fisheries Report No. 740 61-78. (Also available at: ftp://ftp.fao.org/docrep/fao/007/y5519b/y5519b00.pdf). Accessed April 29 2012*.*

Mchombu, Kingo (2006). Harnessing knowledge management for Africa's transition to the 21st century. *Proceedings of SCECSAL XVII: Leadership as a bridge to an information and knowledge society's in Eastern, Central and Southern Africa*, p. 2-39.

Nonaka, I., and Konno, N. (1998). The concept of "Ba:" Building a foundation for knowledge creation. *California Management Review* 40(3).

Nonaka, I., and Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. Cambridge: Oxford University Press.

O'Leary, Daniel E. (1998). Knowledge-management systems: Converting and connecting. *IEEE Intelligent Systems*.

Salanje, Geoffrey F. (2007). Managing grey literature in fisheries and aquaculture information: Experiences in Malawi. Paper presented at 33rd IAMSLIC conference in Sarasota, Florida, USA, October 2007. https://darchive.mblwhoilibrary.org/bitstream/handle/1912/2950/Salanje%202007.pdf?sequence=1. Accessed on April 14 2015.

Salanje, Geoffrey F. (2013). Creating Digital Library Collections: Prospects and Challenges for Libraries in Malawi. Paper presented at 2nd International Conference on African Digital Libraries & Archives (ICADLA-2), University of the Witwatersrand, Johannesburg, South Africa. http://www.slideshare.net/JohannesPhaladi/salanje-geoffrey-presentation-2 Accessed January 14 2013.

Salanje, Geoffrey F. (2015). Knowledge management system (KMS) in fisheries and aquaculture science: A case for Malawi.

Townley, Charles T. (2001). Knowledge management and academic libraries. *College & Research Libraries* 62(1): 44-55.

Session 9: Linked Repositories – Theme of the Day

Moderator: Jaime Goldman

Incorporating Project Management Practices in to Library Culture

Jennifer Walton
MBLWHOI Library
Woods Hole, MA, USA

Abstract
Libraries are involved in many types of projects such as digitization, large scale weeding, cooperative collection development, building renovations, website development. Implementing project management procedures can help ensure that the projects are completed on time, in budget and that the goals are met; however libraries do not always have a strong background in project management. One of the primary goals of project management is to improve communication. Clearly thinking about the project from the beginning will define the scope, personnel, and time frame for the project. This can be used to gain approval for the project and communicate the project to others involved. Library projects often involve coordination   with other units or libraries from other institutions. Communicating effectively and managing expectations can ensure that the project is a success. Often people are eager to get to work on the project itself and creating a plan can seem to be a waste of time until something goes wrong. There are many project management tools available and several styles. Finding what works for your library and using it to achieve meaningful results is important to implementing lasting use. The presentation showed some of the tools evaluated and how the author is adapting them for use in our projects.

Keywords: Project management, libraries.

Session 9: Linked Repositories – Theme of the Day

Moderator: Jaime Goldman

Grow Your Knowledge Through Sustainable Collection Assessment

Michelle Leonard
University of Florida
Marston Science Library
Florida, USA

Abstract:
The foundation of any library or information center is the collections. It is important for librarians and information specialists to conduct assessments on the use, currency and scope for sustainable collections. The assessment results will formulate a strategy for sustainable collection growth and the promotion of use to researchers/scientists. It is also vital to highlight the value of continuing support by administrators through the use of evidence-based metrics. In this presentation librarians/information specialists will develop the expertise required to conduct formative and summative evaluations on their collections that will have a positive impact on existing and future collections leading to new services that can be offered to fit the needs of the patrons. Learning objectives based on topics covered are:
- Assess your patrons and their research needs.
- Evaluate your current library collection.
- Understand and use techniques and tools to assess your collection by gathering statistics:
    - IAMSLIC Z39.50
    - Altmetrics
    - OA repositories and databases
- Develop surveys to assess patron satisfaction with the library collection.
- Create reports on collections for patrons, and administrators.
- Develop collection policies for library/information center staff, patrons and administrators.
- Identify reliable Open Access sources to enhance your collections.
- Promote (brand & market) collections and local research to patrons & administrators.

Keywords: Libraries, collection assessment.

As Necessary as Water: Information Science in Marine Biomedical Research

Alyson Gamble
Jane Bancroft Cook Library
5800 Bay Shore Road
Sarasota, Florida 34243 USA

Abstract
Medical discoveries from marine research are well documented, but the impact of information science on these endeavors is not well known. With funding from the 2015 Medical Library Association Eugene Garfield Fellowship, explorations into the history of information science in marine biomedical research are being conducted. This project investigates modern roles of information science in marine biomedical research and contrasts modern and historical roles of information science in the field via a literature review and survey of IAMSLIC librarians. Since the marine sciences, as well as medical and health sciences, are interdisciplinary, researching information science's role in their histories can be informative for other disciplines. This paper covers the second update of the research by providing information about the literature review and survey responses, as presented at the IAMSLIC Annual Meeting and EURASLIC Biennial Meeting at the Food and Agriculture Organization in Rome, Italy, 7-11 September 2015. This paper also introduces the next stages of the project, including case studies of marine science laboratories and compiling an annotated bibliography for addition to the Aquatic Commons.

Keywords: Aquatic drugs, bibliographies, experimental research, historical account, information centers, laboratories, librarians, literature reviews, research institutions.

Introduction
Marine science holds answers for problems in medicine and public health. Most biological diversity exists in Earth's waters, providing legions of organisms that can be studied, some of which are especially suited for medical research. Medical branches including pharmacology, neurobiology, and oncology have benefited from marine science discoveries, as have public health initiatives (Bessey 1976; Fusenati 2000; Thomas 1988). While information's role in these explorations is understood as being as necessary as water, its function has not been well documented.

The diversity of the oceans provides scientists with seemingly infinite specimens for research. Marine biomedical research has been conducted since at least 1882, when studies on sea stars helped build the foundation of cellular and comparative immunology. Soon after, in 1908,

investigating sea urchins led to improved understanding of the respiratory enzyme (National Academy of Sciences 1999; Sargent 1987). Research on sharks and skates through the mid-twentieth and early twenty-first centuries have revealed potential anti-cancer as well as antimicrobial implications (de la Calle 2009; Helfman 2015). The sea squirt *Ecteinascidia turbinate,* first discovered in 1880 and studied throughout the twentieth century, led to the creation of the recently FDA-approved drug Trabectedin (Gower 2015). Better understanding of information science's role in these endeavors can improve marine biomedical research initiatives.

Funding for biomedical marine research in the United States has been provided by a variety of organizations, including the National Institutes of Health and the Department of Defense (National Academy of Sciences 1999). Yet despite these pursuits, there is a lack of literature about the role information science has played in medical marine research. Currently, over 280 individuals from libraries and other information centers support marine research around the world (IAMSLIC Membership Database 2015). Information about the roles of these libraries and information centers in marine medical research is sparse. Better examinations into marine science library support for biomedical research endeavors can improve understanding of the necessity for these libraries as well as provide resources for interdisciplinary endeavors.

Researching the role of information science in the pursuit of marine medical research will provide a clearer picture of the importance of information specialists in the process of conducting scientific research. Additionally, investigating the history of information science in marine medical research can provide a framework for conducting similar studies into other types of health and medical research centers, leading to a better understanding of our present pursuits with implications for future preparation. This project aims to establish information science as a link between marine science and medical research through a literature review, a survey of marine science libraries, and three case studies of information centers at marine science laboratories. These tools will be used to create two publications: an annotated bibliography of materials about the role of information science in marine biomedical research and a trio of case studies. The presentation discussed in this paper covered the results of the first two literature reviews and the survey of IAMSLIC libraries.

Methods: Literature Review
A systematic literature review was employed to examine the previous research into the role of information science in marine medical research and to provide an overview of the topic. The first iteration of searches performed as part of the literature review focused on finding mention of physical libraries or library spaces devoted to supporting marine medical research. The initial literature review uncovered the importance of marine pharmacology, leading to a second literature review on this topic. Prior to the compilation of the annotated bibliography, a third literature review will be conducted on information pursuits by marine and medical researchers.

Search terms employed in the literature reviews included: aquatic drug(s); bioinformatics; biomedical informatics; biomedical research; historical account; informatics; information centers; information seeking; information gathering; library or libraries; marine animals; marine

biomedicine; marine biotechnology; marine drugs; marine laboratory; marine science libraries; marine toxins; medical information; medical libraries; medical ontology; medical research; research institution; translational medical research.

Databases searched in the literature review included Aquatic Science and Fisheries Abstracts; IAMSLIC Z39.50; Library, Information Science, and Technology Abstracts with Full Text (LISTA); Library and Information Science Abstracts; MedLine via Ovid; National Center for Biotechnology Information; National Sea Grant Library; Oceanic Abstracts; ProQuest Dissertations and Theses; PubMed; Scientific Electronic Library Online (SciELO); Web of Science; and WorldCat.

The reference management software Mendeley and the file hosting system Google Drive were employed to keep track of articles and notes. Microsoft Excel was used to create matrices for the literature review.

Methods: Survey
An eight question survey for assessment of IAMSLIC-affiliated information professionals (e.g., librarians) was designed based on Eldredge's "Inventory of research methods for librarianship and informatics" (2004) and the American Association for Public Opinion Research's Best Practices for Research (n.d.). The survey's questions were discussed with IAMSLIC librarians via correspondence and at the SAIL regional meeting in Charleston, South Carolina, prior to the survey's distribution. This survey was designed to take five to ten minutes of each respondent's time.

The survey was input into a Google Form. This tool allows for distribution to a broad audience, data stamping of responses, and downloading of survey data. IAMSLIC librarians were contacted to participate in the survey via emails to the IAMSLIC listserv. Additionally, IAMSLIC librarians in the SAIL region were informed about the upcoming survey at the annual SAIL meeting in Charleston, South Carolina, in May 2015. Announcements to the listserv were posted on June 1 and 12, 2015. All responses were collected between June 1 and 22, 2015. The survey was closed on July 1.

Prior to starting the survey, respondents were required to agree to an informed consent statement containing information about the purpose, activities, risks, discomforts, confidentiality, voluntary nature, use of findings, and the investigator's contact information.

Personal questions covered the organization represented by the respondent, the job title of the respondent, the years the respondent had been with their employer. Information was also gathered about whether marine research projects were presently being conducted at the respondent's organization, whether the respondent's library presently collaborates with medical libraries or librarians, whether medical research had ever been performed at the organization, whether the respondent's library had ever collaborated with medical libraries or librarians, and research services provided by the library or information center.

Responses from the survey were exported as an Excel (.xml) file for analysis. In order to determine membership statistics, an Excel (.xml) file provided by the IAMSLIC Database Coordinator was edited by the author to reflect individual members' library affiliations and to calculate the number of unique information centers represented by IAMSLIC members. Unique information centers were determined by the name provided by each member for their organization (e.g., the names "FAO," "FAO Fisheries and Agriculture Library," "FAO Fisheries Library," and "Fisheries Library, FAO" were considered indicative of a single organization, the Food and Agriculture Organization of the United Nations). Despite these edits, this file proved to not provide the most adequate statistics for the members and organizations surveyed in June, as the survey was only distributed to the listserv, which can not be proven to have reached every organizational member. An archive of the listserv subscribers was requested to cross-reference with the membership statistics, but was not available.

Results: Literature Review
During the first iteration of searches for the literature review, conducted in early 2015, attention was paid to mentions of libraries as physical buildings or spaces devoted to support of research. PubMed returned three unique results discussing such libraries, the National Center for Biotechnology Information uncovered over 18, IAMSLIC's Z39.50 returned nine, WorldCat returned seven, Web of Science generated five, Library Information Science and Technology Abstracts (LISTA) returned five, MedLine via Ovid returned one, and both the Library and Information Science Abstracts (LISA) and Scientific Electronic Library Online (SciELO) returned none.

Further investigations into the cited literature established that many initial marine science laboratories in the United States began with small libraries. These libraries were necessary parts of the labs, as many of the stations were located far away from other collections of research materials. As Samantha K. Muka writes,

"Libraries were important spaces in marine stations; even the remotest laboratories with rustic living conditions (such as the Carnegie Laboratory in the Dry Tortugas) kept a library for research and marine laboratory journals. These publications made up much of the library resources at these locations. By reading these sources, a researcher could ascertain what organisms were available throughout the network, what scientific questions were being explored in these locations, new techniques for maintaining captive organisms, and new methods for modifying the basic technologies that were found throughout the network. While circulation outside of the marine station community proved low for these publications, each station sought to include as many publications from throughout the network as possible in order to facilitate exchange of information" (2015).

The International Association of Marine Science Libraries and Information Centers (IAMSLIC), a global network of marine science informationists, began in 1975 as the East Coast Marine Science Librarians (ECMSL). Its first meeting included librarians from the US, Canada, and Bermuda. In 1978, the organization changed its name to reflect its global focus (IAMSLIC n.d.).

By November 2015, there were 290 members of IAMSLIC, representing approximately 225 organizations (IAMSLIC Membership Database, 16 November 2015).

Survey

A total of 45 responses were collected. Forty-three individuals responded to the Google Form survey. Two additional respondents contacted the researcher via email and were provided a Word copy of the survey, complete with Informed Consent statement. Responses from these two surveys were then entered into the Google Forms Sheet responses as a new tab and exported through the Excel (.xml) file.

At the time of the survey, there were 284 members of IAMSLIC (S. Watkins, personal communication, 25 August 2015). Approximately 16 percent of IAMSLIC members were represented by the survey. The 45 responses to the survey represented 45 unique libraries or information centers.

Of the responses, 30 librarians had been with their organization over twelve years, seven had been with theirs for six to eleven years, and eight had been with their organization for zero to five years. Twenty-seven respondents reported marine research projects with medical implications were not being undertaken at their organization this year, while 13 said such projects were being performed, and five indicated they were unsure. According to respondents, 27 libraries or information centers do not currently collaborate with medical libraries or librarians, while 14 do and three are unsure if such collaboration occurs. Of the surveyed librarians, 21 indicated medical research had been performed at their organization at some point, while 19 said it had not and five were unsure. Twenty-two libraries or information centers had collaborated with medical libraries or librarians in the past, while 20 had not and three were unsure if such collaboration occurred.

Discussion

A great deal of marine science is being conducted that has potential to positively impact medicine and public health. Libraries can support interdisciplinary approaches and technical advances, but there is a necessity for better documentation of their roles and an increase in collaborative efforts. In the next months, the author will be conducting three case studies of marine laboratory libraries in the United States where biomedical studies have been performed. The author will also compile an annotated bibliography of resources related to information science's role in marine medical research, which will be submitted to the Aquatic Commons digital repository. These resources will help establish information as being as necessary as water in the pursuit of biomedical knowledge from the oceans. Future projects stemming from this initial research could benefit from additional literature reviews and a survey of only those individuals listed as being IAMSLIC members, rather than of the IAMSLIC listserv, in order to supply additional information about the topic. As the field of marine science changes and grows, so will the information needs of researchers and the information services of the IAMSLIC professionals who assist in these endeavors.

References

American Association for Public Opinion Research (n.d.) *Best Practices for Research*. Retrieved from http://www.aapor.org/AAPORKentico/Standards-Ethics/Best-Practices.aspx

Bessey, Otto (1976). Status of Marine Biomedical Research. *Environmental Health Perspectives* 13: 147-163.

De la Calle, F. (2009). Marine genetic resources, a source of new drugs: the experience of the biotechnology sector. *The International Journal of Marine and Coastal Law* 24: 209-220.

Eldredge, J.D. (2004). Inventory of research methods for librarianship and informatics. *Journal of the Medical Library Association* 92(1): 83-90.

Fusenati, N. (2000). *Drugs from the Sea.* New York: Karger.

Gower, T. (2015). Testing the waters: The field of marine pharmacology. *Proto* (Spring): 25-29.

Helfman, G. & G. H. Burgess (2015). *Sharks: The animal answer guide*. Baltimore (MD): Johns Hopkins University Press.

IAMSLIC (n.d.) About Us. Retrieved from http://www.iamslic.org/about-us

IAMSLIC (2015). IAMSLIC Membership Database.

Muka, Samantha K. (2014). *Working at Water's Edge: Life Sciences at American Marine Stations, 1880–1930*. Doctoral dissertation. Pennsylvania: University of Pennsylvania.

National Academy of Sciences (1999). *From monsoons to microbes: Understanding the ocean's role in human health.* Washington (DC): National Academies Press.

Sargent, W. (1987). *The year of the crab: Marine animals in modern medicine*. New York (NY): W.W. Norton & Company.

Thomas, L. (1988). *The Lives of a Cell: Notes of a Biology Watcher.* New York (NY): Bantam New Age Books.

Session 10: Diversity in Practice

Moderator: Teresa de Jesus Barriga Ramirez

The Information Bridge: How Marine Research Informs and Influences Major offshore

Kristen L. Metzger
CSA Ocean Sciences Inc.
Stuart, Florida, USA

Abstract:
The collections of marine and aquatic science libraries hold resources essential to the assessment of the environmental impacts of offshore engineering projects. Projects such as petroleum exploration, liquefied natural gas pipelines, dredging of ports, submarine cables, wind farms and other renewable ocean energy projects may be deemed essential and worthwhile or as an unnecessary assault on our fragile environment. We'll examine the direct, indirect and cumulative effects of such projects and the importance that access to basic research and library resources plays in compiling the baseline data necessary to the environmental impact assessment process.

Keywords: Aquatic and marine science libraries, offshore engineering projects.

Session 10: Diversity in Practice

Moderator: Teresa de Jesus Barriga Ramirez

High Impact Practices: Transformative Experiences for Library Student

David R. Baca
Texas A&M University at Galveston
Galveston, Texas, USA

Abstract:
There are many factors that influence student success. Research has shown that students who are engaged in their classes and with their faculty, have a mentor and find a connection between learning and practice are the most successful. Universities will retain these students and see a higher graduation rate from them. Students can realize this engagement through experiences such as study abroad, student research programs, living learning communities and internships. Universities promote and administer these activities and reflect these practices through their strategic goals and Quality Enhancement Plans. Libraries use student workers extensively to provide front-line services and technical support. Working in a university or library environment can provide much of the same engagement students experience through classwork. While the accomplishment of student job duties is critical, libraries can enhance these duties with high-impact practices that not only fulfill job requirements but add to student engagement and success. These practices then support the mission and strategic goals of the university. This paper outlined preliminary activities at Texas A&M University at Galveston Jack K. Williams Library to define student jobs, define current experiences, determine potential high-impact practices that directly relate to the strategic goals and QEP of the University and measurements of current student engagement and success. This first phase will measure the impact of working as a student on grades, extracurricular involvement and potential for success.

Keywords: Academic libraries, college students.

Invitation to the 42nd IAMSLIC Conference

42nd IAMSLIC Conference

October 16-20, 2016
Mérida, Yucatán, Mexico

Host Institution: CINVESTAV del IPN Unidad Mérida

Irene Beltrán Rodriguez

The 42nd IAMSLIC Conference will be hosted by CINVESTAV del IPN Unidad Mérida in Merida, Yucatán, Mexico in October 2016. Yucatán is located in southeastern Mexico, in the northern part of the Yucatán Peninsula. On the north and west it is bordered by the Gulf of Mexico, southeast with the state of Quintana Roo and southwest with the state of Campeche.

The capital city of Yucutan is Merida, the white city, founded in 1542.Today it is the most populous city in Mexico's southeast.

The official language is Spanish, though many speak Maya.

The currency is the peso; 1 peso = approximately US17.00 or €20.00 in September 2015.

The weather is tropical, with average temperatures between 77° and 95°F.

The conference venue is the Holiday Inn. There are special rates for conference attendees – between $40 and $120 US per night.

Traditional Yucatecan cookery derived from the mixing of Spanish and Maya cultures. It uses strong condiments and corn and turkey predominate.

The host institution for the conference is the Center for Research and Advanced Studies of the National Polytechnic Institute (CINVESTAV), founded in 1961 in Mexico City. Its mission is: *To contribute in science and technology and to undertake research that can help to solve problems of national interest.*

The Mérida Unit of CINVESTAV was the first one created in 1980 as part of a decentralization process of science in Mexico. The Unit comprises three departments: Marine Resources, Human Ecology and Applied Physics. The institution's library dates back to the creation of the Unit (1980). In 2011, it was named "Luis R.A. Capurro Filograsso." Its holdings reflect the work of the Unit. The collection consists of over 10,000 items in print, mainly books, theses and journals. The electronic collection comprises journal subscriptions, databases and connections with nine national institutions in a consortium. The OPAC access is http://biblioteca.cinvestav.mx.

Yucatán, land of the Mayan culture, has many fabulous places such as:
- Archaeological Sites are the legacy of one of the greatest civilizations of the world, the Mayans.
- Magical Town and the Convent Route.
- Cenotes. The impact of a meteorite 65 million years ago created a vast network of underground caves known today as cenotes or sinkholes.
- Natural Reserves.
- Beaches .

© Jose Miguel Pantaleon

If you have any questions please contact:
Irene Beltrán
irene@mda.cinvestav.mx