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INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of UNESCO)

First Session of the IODE Steering Group for the OceanExpert Project (SG-OE-I), Oostende, Belgium.

History of the OceanExpert Project and considerations on its future

By: Peter Pissierssens
Arno Lambert
Sofie de Baenst

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Annexes

1. HISTORICAL BACKGROUND OF OCEANEXPERT

1.1 1997: GLODIR

The history of OceanExpert goes back to the late 1990s when the IODE Group of Experts on Marine Information Management (GE-MIM), during its fifth session (Athens, Greece, 1996) (report) "*endorsed merging national and regional directories to create a global directory to be made available through the IOC WWW Server. In addition, a data entry form needs to be developed to enable other individuals to submit their personal data for inclusion in the directory. Traditional ways of canvassing input must also be considered. To serve Member States without access to the Internet, the Group recommended that the Directory be included in the IOC CD-ROM and in other media*.".

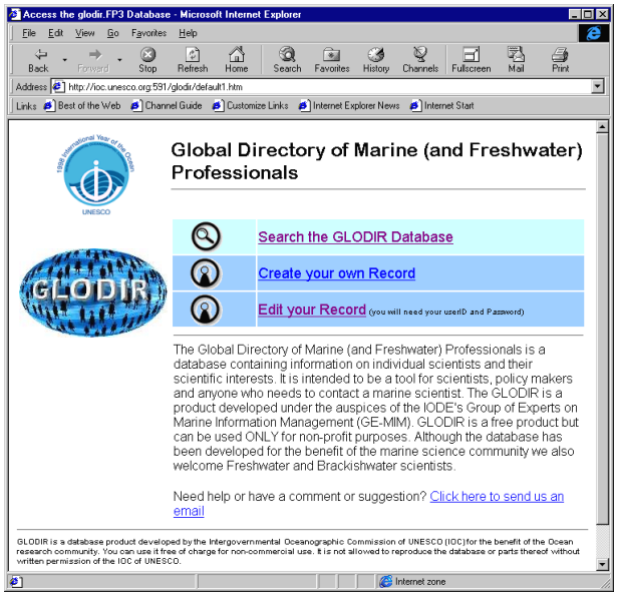


Figure 1: GLODIR homepage (1997)

The directory development started immediately after GE-MIM-V and was launched in 1997 as the "Global Directory of Marine (and Freshwater) Professionals (GLODIR). By the time the GE-MIM met for its sixth Session in Silver Spring, USA in 1999 (report) the online directory included 6000 records. The GLODIR application was developed as a Filemaker Pro database application (developed by P. Pissierssens) and hosted from the IOC/IODE Secretariat at UNESCO Headquarters in Paris, France.

On the homepage GLODIR was described as "*a database containing information on individual scientists and their scientific interests. It is intended to be a tool for scientists, policy makers and anyone who needs to contact a marine scientist. The GLODIR is a product developed under the auspices of the IODE's Group of Experts on Marine Information Management (GE-MIM). GLODIR is a free product but can be used only for nonprofit purposes. Although the database has been developed for the benefit of the marine science community, we also welcome freshwater and brackish water scientists*". In this regard we note that while the remit of IOC focuses on the marine environment, freshwater and brackish water was welcomed as well in view of the cooperation of IODE in ASFA *Aquatic Sciences and Fisheries Abstracts".

GLODIR contained the following information on individuals:

- Surname (+Firstname)
- Job Title
- Job Type (Training/Education, Research, Data Management, Information Management & Library, Natural Resource Management, Operational Support, Institutional Management, Decision Making & Policy, Extension Services (Public Awareness))
- Organization. Organization's Acronym, Department
- Organization Type (Academic, Government, NGO, Private non-profit, Private, International/ Intergovernmental)
- Address, City, State, Country
- Phone, fax, email, URL
- Description of activities (keywords)
- Environment (marine, freshwater, brackishwater)
- Geographic Descriptors relevant to activities

ASFA Subject Descriptors (you can choose from a list of over 300 codes). The ASFA codes enable you to group professionals into subject areas.

Searching could be carried out on the following fields:

- Surname (+Firstname)
- Job Title
- Job Type
- Organization, Organization's Acronym
- Organization
- City, State, Country
- Description of activities (keywords)
- ASFA Subject Descriptors (from a picklist)
- Environment
- Geographic Descriptors

1.2 2002: FROM GLODIR TO OCEAN EXPERT

GLODIR continued as a Filemaker Pro application until late 2002 when it was renamed to Ocean Expert and was accessible through the URL http://www.oceanexpet.net. The number of records in GLODIR had by then reached 13,000. In early 2002 it was decided to re-engineer GLODIR. This decision had been taken as the technical solution on which GLODIR was based until then (Filemaker database served over the Internet with Lasso as middleware) had reached its limits with response times of up to 2 seconds. In addition, the mailing function of GLODIR (sending out e-mail to all or part of GLODIR addresses) caused crashes or serious slowdown of the server when the number of addressees exceeded 1,000. It was therefore decided to migrate GLODIR to a more robust and flexible solution. A contractor was hired to re-engineer GLODIR during the summer of 2002. We specified the following new features: (i) easy registration with 'forgot my password' function that e-mails the forgotten password; (ii) enable registered experts to send e-mails to others in the same country and/or with the same research interest ("community subscribe" function to receive such mails and "community mail" function to send such mails); (iii) citation alert: to receive an e-mail alert when an expert with your research interest submits a citation. In addition, to respond to the request to also provide a 'directory of research institutions', the system now uses a 'controlled' institution list whereby new experts can choose from a list of institutions previously entered. The technology solution chosen was based on the open source mySQL database management system and PHP programming language. Last but not least, we decided to rename GLODIR to a more intuitive 'OceanExpert' and we registered the domain name www.oceanexpert.net. The new OceanExpert was brought into beta testing on 1 November 2002 and was launched in its operational version end of November 2002,

The GEMIM continued to discuss OceanExpert during its Sessions in 2004, 2007, 2008, 2010 and 2013. During each of its Sessions the GE-MIM discussed progress of OceanExpert and made recommendations for its improvement. The Session reports (and working documents) for all GEMIM Sessions are available from http://www.iode.org/gemim. We add that the GEMIM was disbanded in 2019 in line with other Groups of Experts.

The 23rd Session of the IODE Committee (2015) established OceanExpert as a Project through Recommendation IODE-XIII.2 (Figure 3). This decision was made by the IODE Committee to streamline all IODE "activities" into projects that would each be managed by an "IODE Steering Group" which was considered more efficient and effective and provide a better assurance of their long-term sustainability as projects could be allocated funds by the IODE Committee, whereas Groups of Experts were allocated funds only for their meetings and not for their activities.

Recommendation IODE-XXIII.2

ESTABLISHMENT OF THE OCEANEXPERT PROJECT

The IOC Committee on International Oceanographic Data and Information Exchange,

Recalling that OceanExpert is an activity of the IODE Group of Experts on Marine Information Management (GE-MIM) since 1997 and was initially named GLODIR, the global directory of marine and freshwater professionals,

Welcoming the great progress made by OceanExpert and recognizing that the OceanExpert directory is now the underlying technology used by all IOC web sites to manage information on experts participating in IOC events,

Encourages ocean professionals to enter professional contact information into the OceanExpert database and to update these annually, ,

Recommends the establishment of OceanExpert as an IODE project, with the terms of reference as attached in annex A to this Recommendation,

Recommends the establishment of a IODE Steering group for the IODE OceanExpert Project with Terms of Reference as attached in annex B to this Recommendation.

Annex A to Recommendation IODE-XXIII.2

Terms of Reference of the IODE OceanExpert Project

Objectives

The objective of the IODE OceanExpert project is to provide and maintain a global directory of marine (and freshwater) professionals and their institutions, including names, addresses, institutional affiliation, specialization and bibliographic information on publications of the experts.

Annex B to Recommendation IODE-XXIII.2

Terms of Reference of the IODE Steering Group for the IODE OceanExpert Project

Objectives

The IODE Steering Group for IODE OceanExpert (SG-OE) shall oversee the further development and maintenance of the database and report to the IODE Committee on its achievements and progress.

Membership

Figure 3: Recommendation IODE-XXIII.2

Although the IODE Steering Group was established in 2015 no Sessions were held so far.

1.3 2002: BEEBOX, AN EARLY CONTENT MANAGEMENT SYSTEM

Figure 4: BeeBox logo (2002)

We note that another tool was developed in 2001 by IODE: a community content management system called BeeBox (working document IOC/IODE-XVII/36 published in 2002). This system introduced the "knowledge object" concept: BeeBox uses the 'Knowledge Object' concept: there are 5 different types of knowledge that can be used in BeeBox: (i) **html pages** with embedded imagery and hyperlinks (like an ordinary web page); (ii) **documents** (basically any file type) that can be uploaded to the server by the author and downloaded by users – mostly MS-Word and PDF files. This will constitute a searchable e- library; (iii) **links** to external web sites or web pages. This will constitute a searchable URL directory; (iv) **events**: a list of upcoming events that is displayed on the homepage and links to internal or external web sites or web pages; and (v) **forum** : these are discussion for a enabling web-based discussion threads on the relevant subject category. Every category of content (like a folder) will be displayed with its associated knowledge types. The IODE homepage using BeeBox is shown in Figure 5.

BeeBox was used until end of January 2007 when the IODE web site migrated to then open sources CMS Joomla.

Figure 5: IODE homepage using BeeBox CMS (2002)

1.4 2007: PAPERCLIP

In an effort to streamline the management of expert information, documentation and event information within IODE and later, across IOC, the decision was made by the Secretariat to develop the Paperclip (PPC) tool. This was gradually implemented on a substantial number of IOC web sites as from 2007 (transiting from BeeBox).

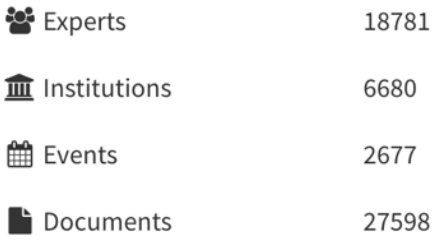
PaperClip allowed integrating the management of expert information (through OceanExpert), management of events (whereby the list of participants could be built using OceanExpert records,

automatically using contact information, as well as the creation of “groups” (e.g. for steering groups, IODE officers, etc.). It also allowed the management of documents such as working documents for and reports on events (and showing these in an event record that also included the list of participants). These event pages then included a tab on participants, a tab on documents and a tab for the agenda of the meeting (to which documents could be attached). Each content item could be created and edited through an easy to use online user interface. Experts registered in OceanExpert could be given administrator rights that enabled them to create expert records, documents and events. PaperClip has been in use since 2007. It was initially used only by IODE but gradually also other IOC programmes used PaperClip in their Joomla based web sites.

Paperclip was gradually discontinued from 2017 until 2021 and replaced by a new version of OceanExpert including an API that can be used to extract information from Paperclip and display it in a web page. This decision was made because the code of the Paperclip tool as well as OceanExpert itself had become somewhat difficult to understand and quality control because of the variety of software engineers that had contributed to it (Benjamin Sims and David Oberts (Coldrose), Adi Naik Kakodkar, Mithun Gawas, Marc Van Crombrugge and Arno Lambert). In addition, the technology framework used for the development of PaperClip became outdated. For this reason it was decided to re-engineer OceanExpert and phase out PaperClip.

1.5 OCEANEXPERT TODAY

OceanExpert is accessible through the URL https://www.oceanexpert.net or https://www.oceanexpert.org. On 12 August 2021 the system contained:



It is noted that the number of institutions is quite high as compared to the number of experts. This is because OE currently does not enable parent-child relationships. Example: a University with 5 faculties related to oceans and 10 departments for each of these faculties will result in between 10 and 15 records in OE and not showing the lineage of these entities.

OceanExpert contains detailed information on **individual experts**. This includes:

- Surname (+Firstname); Job Title, Job Type ;
- Organization; Organization's Acronym, Department, Organization Type
- Address, City, State, Country, Phone, fax, email, URL
- Description of your activities (keywords); Environment (marine, freshwater, brackishwater)
- Geographic Descriptors relevant to activities
- Subject Descriptors (grouping of professionals into subject areas)
- Citations of your most important and/or most recent papers

OceanExpert contains also detailed information on **institutions**, including address, subjects covered etc.

OceanExpert also contains detailed information on **IODE events**. This includes:

- Type of event: conference, training, internship, meeting, workshop.
- Event title
- Venue
- Start and end date
- Description
- Organizers, Staff and Participants of the event

Specifically for the LME:learn project, a “project directory” function was also built in to OceanExpert.

In addition, OceanExpert is now being used as a “early implementer/provider” data/information source for the IOC Ocean InfoHub/Ocean Data and Information System project.

2. USAGE STATISTICS OF OCEANEXPERT

Statistics are available since 2016 (Google analytics) regarding visits. Statistics on new records were sourced from the OceanExpert database.

2.1 VISITS (SESSIONS), REFERRALS AND GEOGRAPHIC ORIGIN

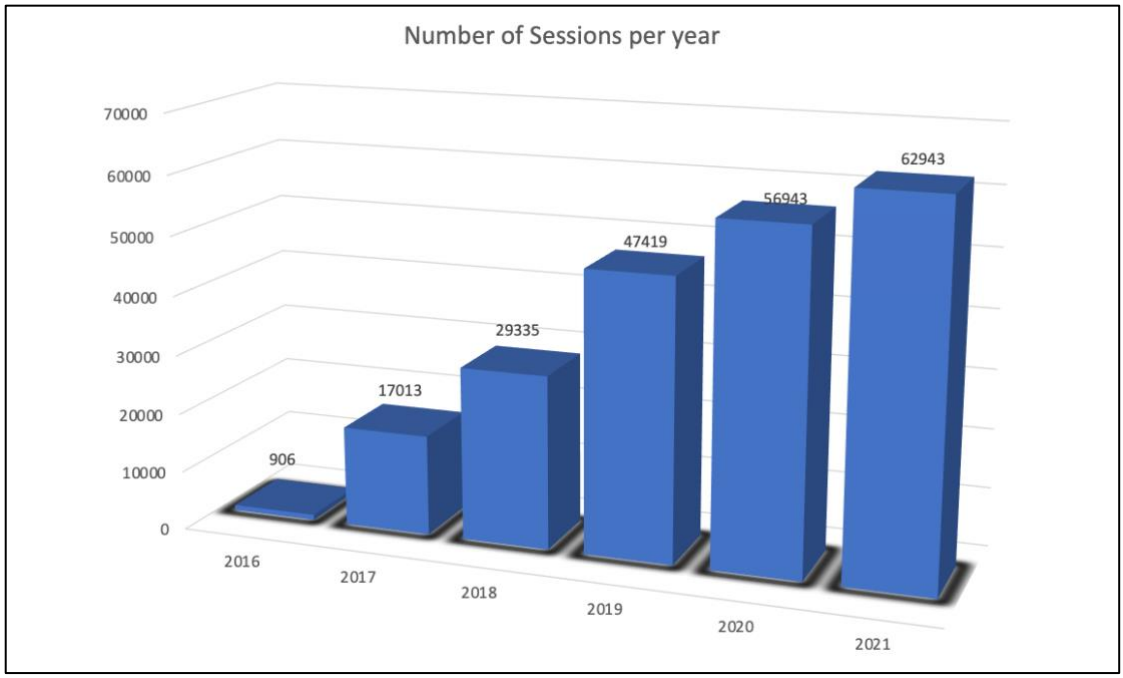


Figure 6: number of OceanExpert users sessions per year (2016-August 2021)

The number of sessions is steadily increasing demonstrating an increased use of OceanExpert.

Detailed statistics are included in Annex I. They include detailed information for each year as well as information on referrals (how did users come to OceanExpert) as well as information on their geographic location. This reveals that most users originated from United States, India and France (2018-2021). Referrals varied more widely: in 2016 most users came directly to the OceanExpert site, in 2017 and 2018 they came mostly from the IOC web site, in 2019 from the OceanTeacher

site, in 2020 from the ocean decade web site and in 2021 from the IOC web site (closely followed by the ocean decade site).

2.2 NEW RECORDS ADDED TO THE DATABASE

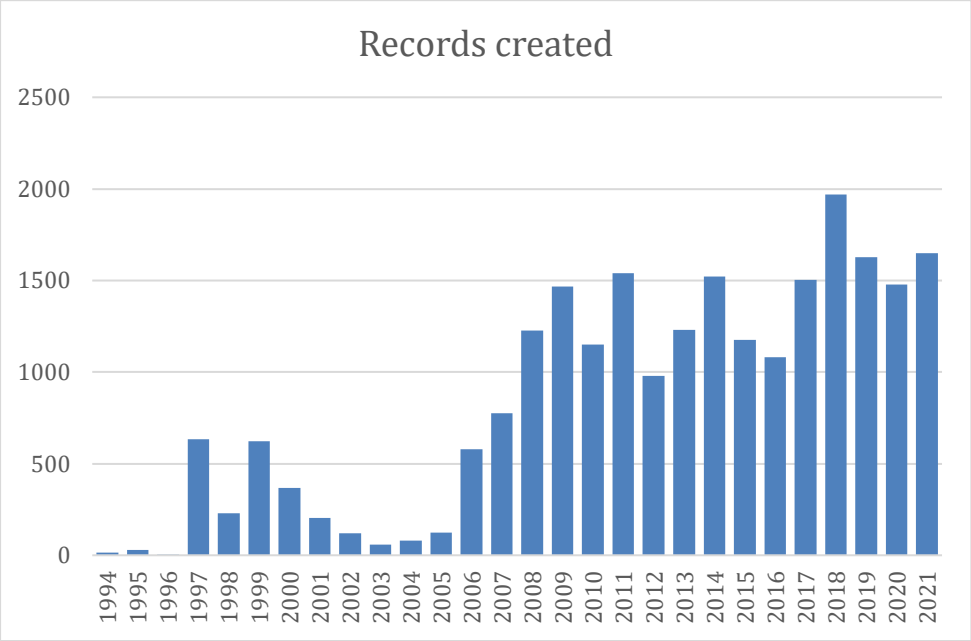


Figure 7: Records created in OceanExpert (between 1/1/1994 and 13/8/2021) by year

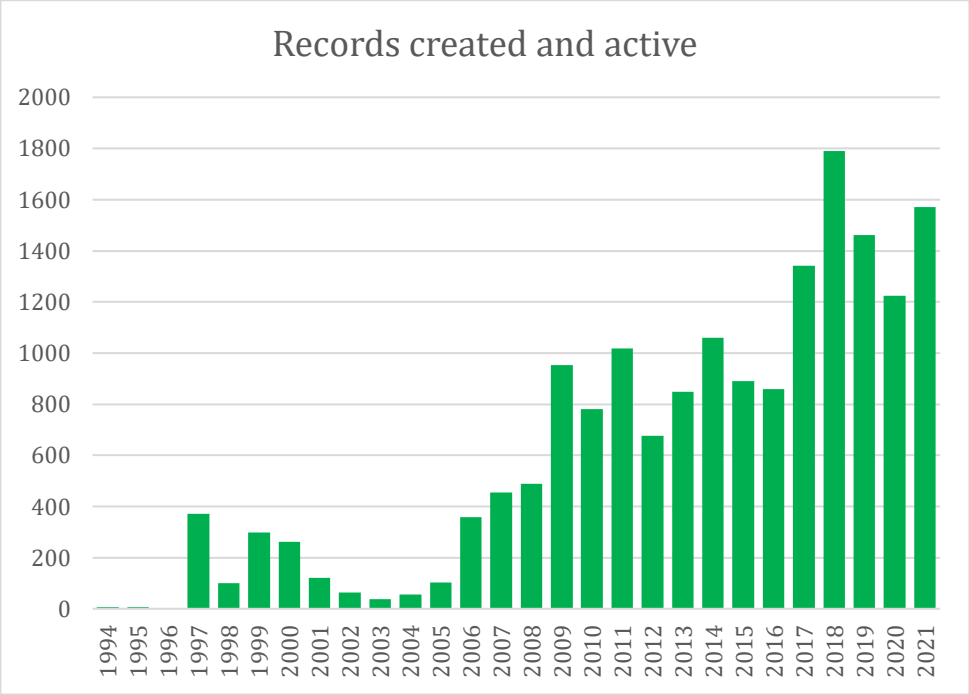


Figure 8: Records created and still active (between 1/1/1994 and 13/8/2021)

We see a rapid increase in the number of new records since 2006/2007 when Paperclip was implemented and other IOC programmes started using Paperclip for the management of events.

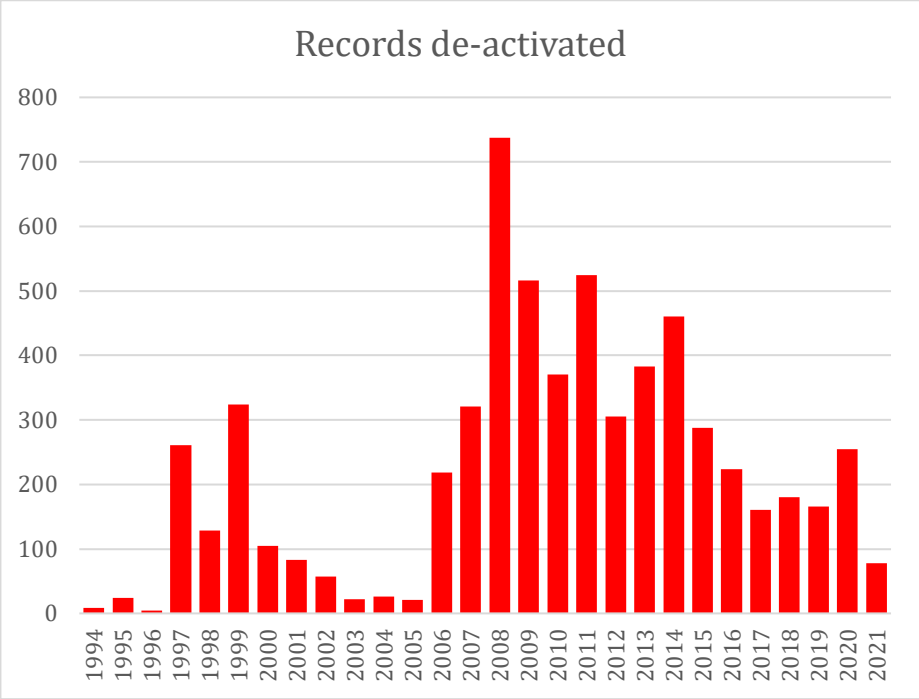


Figure 9: Records de-activated (between 1/1/194 and 13/8/2021) by year

The steep increase in de-activations in 2008 is because as from that year the Secretariat sent out annual emails inviting experts to update their record. De-activations have declined steadily since 2015 when the IODE Secretariat undertook regular quality control and contacted individual experts who had not replied to the update request.

3. COMPETITORS OF OCEANEXPERT

When GLODIR was created in 1997 there were no competitors for online directories. The only global directories for ocean professionals were FAO printed directories. Some large organizations also produced some institutional directories. Of course in 1997 the world wide web was still very new. The first appearance of a UNESCO web site and IOC web site goes back to 1997 (see Figure 7). As explained above GLODIR soon followed the same year.

Figure 10: IOC web site in 1997 (from web.archive.org)

The list of products and services by IOC at that time (developed by IODE) can be found on https://web.archive.org/web/19970718205853/http://www.unesco.org/ioc/infserv/glodir.htm . 1997 was also the start of collaboration between IODE and the HAB programme as IODE co-developed and hosted the HABDIR database.

If we Google for “directories of marine experts” (or directories of ocean experts) then we see OceanExpert appear 5 times in the first results page which is excellent.

However I would argue that the most important competitors of OceanExpert today are LinkedIn and ORCID.

3.1 LINKEDIN

http://www.linkedin.com

LinkedIn: started in 2003. Was acquired by Microsoft in 2016. The web site states “today, LinkedIn leads a diversified business with revenues from membership subscriptions, advertising sales and recruitment solutions”. In addition to the free service there is now also a “Premium” registration for which you pay. While entering your information in LinkedIn remains free, LinkedIn now focuses on commercial services and a question is how LinkedIn will use information.
LinkedIn currently (12/8/2021) contains over 774 million records. A search for “ocean” in People gave 1,030,000 results.

The vision of LinkedIn is “Create economic opportunity for every member of the global workforce.” The mission of LinkedIn is “connect the world’s professionals to make them more productive and successful”.

LinkedIn is a social network that focuses on professional networking and career development.

You can use LinkedIn to display your resume, search for jobs, and enhance your professional reputation by posting updates and interacting with other people. It enables you to create your professional “brand” by showing where you have worked, what experience you have (and have this endorsed by others) expecting that potential employers will consult LinkedIn when you apply for a position.

By “connecting” to someone you create your own list of contacts. It enables you to create your own network.

LinkedIn is free, but a subscription version called LinkedIn Premium offers additional features like online classes and seminars, as well as insights into who's searching for and viewing your profile.

LinkedIn collects the following information:
Name, function, geographic location, experience (professional career), education, interests

The risks of using LinkedIn are similar to using any online service where you post personal information: you need to make sure you have a safe password, you can become the target of phishing attacks and of course LinkedIn itself can be hacked whereby user accounts and passwords are stolen. This happened in 2012.Fake job postings are also a regular problem for LinkedIn.

Visually LinkedIn looks like a Facebook page with a “feed” showing information posted by experts to which you are “connected”. But increasingly the feed page is filled with business propositions, job offers and other advertizing.

LinkedIn allows its users to decide which elements of their personal profiler are make public

So in summary the main use of LinkedIn is **networking and job seeking.**

Commercial competitors of LinkedIn are:

Xing (Germany)
Indeed (USA)
AngelList (USA)
The Opportunity Network (UK)
ZipRecruiter (USA)
Career Builder (USA)
viadeo (France)
Jobcase (USA)
Hired (USA)
Sumry (USA)

All these are job seeking focused.

3.2 ORCID

https://orcid.org

ORCID is intended to provide unique (and persistent) identifiers to individual experts so these can be easily included in journal particles and other publications. The ORCID mission states “*In order to realize our vision, ORCID strives to enable transparent and trustworthy connections between researchers, their contributions, and their affiliations by providing a unique, persistent identifier for individuals to use as they engage in research, scholarship, and innovation activities*.”

ORCID is a not-for-profit organization sustained by fees from member organizations. The ORCID founding principles are:

1. ORCID will work to support the creation of a permanent, clear, and unambiguous record of research and scholarly communication by enabling reliable attribution of authors and contributors.
2. ORCID will transcend discipline, geographic, national, and institutional boundaries.
3. Participation in ORCID is open to any organization that has an interest in research and scholarly communications.
4. Access to ORCID services will be based on transparent and non-discriminatory terms posted on the ORCID website.
5. Researchers will be able to create, edit, and maintain an ORCID identifier and record free of charge.
6. Researchers will control the defined privacy settings of their own ORCID record data.
7. All data contributed to ORCID by researchers or claimed by them will be available in standard formats for free download (subject to the researchers’ own privacy settings) that are updated once a year and released under a CC0 waiver.
8. All software developed by ORCID will be publicly released under an Open Source Software license approved by the Open Source Initiative. For the software it adopts, ORCID will prefer Open Source.

9. ORCID identifiers and record data (subject to privacy settings) will be made available via a combination of no-charge and for-a-fee APIs and services. Any fees will be set to ensure the sustainability of ORCID as a not-for-profit, charitable organization focused on the long-term persistence of the ORCID system.
10. ORCID will be governed by representatives from a broad cross-section of stakeholders, the majority of whom are not-for-profit, and will strive for maximal transparency by publicly posting summaries of all Board meetings and annual financial reports.

Anyone who participates in research, scholarship, or innovation can register an ORCID iD for themselves free of charge, and can use the same iD throughout their whole career—even if their name or email changes or they move to a different organization, discipline, or country.

ORCID is now widely used in the scientific community including the marine science community. In 2020 ORCID reported 10,000,000 registrations.

A search by keywords “ocean, marine” resulted in 94,882 results. However the search capabilities are somewhat limited and confusing and not precise. example: searching for “intergovernmental oceanographic commission” gives 21 results but of these come from various fields and are therefore somewhat incorrect. As such ORCID is not usable as a directory as such.

3.3 RESEARCHGATE

https://www.researchgate.net

ResearchGate defines itself as “*the professional network for scientists and researchers. Over 20 million members from all over the world use it to share, discover, and discuss research. We're guided by our mission to connect the world of science and make research open to all*.”

It provides the following functionality:

Share your publications, access millions more, and publish your data.
Connect and collaborate with colleagues, peers, co-authors, and specialists.
Get stats and find out who's been reading and citing your work.
Ask questions, get answers, and solve research problems.
Find the right job using our research-focused job board.
Share updates about your current project, and keep up with the latest research.

What is quite useful in ResearchGate is that it provides citation information for your publications.

However this should not be considered as a directory of experts and/or institutions.

3.4 OCEAN RELATED DIRECTORIES OF EXPERTS OR INSTITUTIONS

The number of online directories of ocean experts which we could find using Google is actually quite limited. A source of links to web sites that contain directories of experts or institutions is the IODE ODISCat on https://catalogue.odis.org (category: https://catalogue.odis.org/search/type=9, then enter directory in the search box).

Most sources are institutional or community based.

Ocean Directory (World Ocean Observatory): The World Ocean Directory is a dynamic list of ocean-related organizations located throughout the world. It presently contains more than 18,000 entries, a fraction of the many institutions that are involved in all aspects of ocean studies, education, technology, and communication. We invite you to add your organization to the list and to join the growing world ocean community.

Expertscape – Expertise in Oceans and Seas: allows browsing to the expert level trough region, city, institution and expert. This information is based on articles published since 2011

Consortium for Ocean Science Exploration and Engagement - Directory of experts - Directory of experts at the Centers for Ocean Sciences Education Excellence (COSEE). Since its establishment in 2002 as a set of 7 Regional Centers, COSEE has evolved into a coordinated Network comprised of 12 thematic and regional Centers located around the United States including over 270 institutional partners with close to two thousand Network members. The mission of the COSEE Network is to spark and nurture collaborations among research scientists and educators to advance ocean discovery and make known the vital role of the ocean in our lives. The mission reflects the three-fold partnership, which composes each COSEE Center-partnerships between formal and informal education institutes and research institutes.

Directory - Institute for Marine and Coastal Research of Colombia - Corresponds to the internal institutional directory organized alphabetically, indicating the name of the officer you will find their contact details such as telephone extension, mail. The directory will also indicate the position.

Employee directory - Institute of Oceanography and Fisheries, Croatia - The Institute of Oceanography and Fisheries was founded in 1930 as the first national scientific institution dedicated to marine research. The scientific activity of the Institute has been multidisciplinary from the beginning, encompassing biological, chemical and physical oceanography as well as sedimentology, fishery and mariculture. Today, the basic orientation of the Institute's work is fundamental scientific research in the framework of various projects funded by the Croatian Science Foundation (HRZZ). A significant part of this research aims at detecting complex interactions that shape the Adriatic marine environment, since understanding the ecosystem's functioning represents a necessary prerequisite to creating measures for the protection of ecosystem and its biological resources, with a view to sustainable exploitation. In addition, numerous projects funded by the European Commission or different commercial entities, enable us to carry out monitoring of populations and stocks of marine organisms, biotope mapping, initial assessments of the marine environment and various studies on environmental state and impacts. The physical, chemical and biological long-term data series collected by the Institute represent a valuable basis for the implementation of European directives, aiming at aquatic environment management and protection (MSFD, WFD).

Some of the web sites are database driven while others are static html pages.

4. STRENGTHS AND WEAKNESSES OF OCEANEXPERT TODAY

If we look at the original objectives of OceanExpert as defined in Recommendation IODE-XXIII.2 (*The objective of the IODE OceanExpert project is to provide and maintain a global directory of marine (and freshwater) professionals and their institutions, including names, addresses, institutional affiliation, specialization and bibliographic information on publications of the experts*.)

then it is clear that we have gone far beyond those initial terms of reference: rather than being "just" a directory of professionals and institutions.

Below we list several strengths and weaknesses. For weaknesses we include recommendations to resolve the weaknesses.

4.1 STRENGTHS

1. OceanExpert has become an **integrated information management tool** that is plugged into a number of IOC web sites;

2. Experts associated with IOC activities have become **familiar** with OceanExpert;

3. **IOC staff have become familiar** with OceanExpert: for every event organized by the participating IOC programmes (IODE, GOOS, HAB, tsunami,…) OceanExpert is used to prepare and display the list of participants. This has resulted in substantial increases in records within the OE database;

4. OceanExpert remains an **easy to use and "free and open"** source of contact information on experts and their institutions which enables experts to easily contact each other.

5. OceanExpert is **maintained by a UN agency** and does not depend on revenue sourced from commercial activities. As such it can profile itself as a neutral, unbiased, advertisement free and totally free service. In addition, OceanExpert does not have geographic limitations due to political issues (in as far as UN decisions are respected).

6. Through OIH/ODIS OceanExpert has the **opportunity to become a more key "connector"** between individuals and their scientific output (data, publications, reports, projects). It could also become a "partner" to certain commercial or not-for-profit services (through federating services)
    a. RECOMMENDATION: investigate ways to link OE with online data and information services within the framework of OIH/ODIS. This could include ASFA, LinkedIn, ORCID, ResearchGate and others.
    b.
7. ...

4.2 WEAKNESSES

1. A major weakness of OE today is that **experts do not update their records** on a regular basis. During the past years the IODE Secretariat therefore sent out an email to all experts in OE once a year inviting them to update their information. This usually resulted in 20-30% of the records being de-activated as the email address was no longer existing. These losses were then often compensated by new entries the year thereafter which is the reason the number of records has remained fairly constant since 2020 (when it reached 13,000). Based upon the number of records in other systems (see above) we would expect the real number of ocean experts to number about 100,000.
    a. RECOMMENDATION: seek ways to keep experts in OceanExpert aware of OE so they update their record before any career change and email change;

2. The **management of institutions** in OE is not easy to use: due to the lack of a parent-child/hierarchy relation the number of institutions has become unmanageable and users often create duplicates which then need to be removed manually by the OE manager.
    a. RECOMMENDATION: implement a parent-child/hierarchy approach to institutions and an easier way for experts to find their institution in a list;

3. While the inbuilt **document management** module is widely appreciated and used, its field structure does not comply with standards and the OE document repository is now competing with AquaDocs, ASFA and UNESDOC.
    a. RECOMMENDATION: use AquaDocs as the document module in OE

4. The **detailed information on expert activities** is often incomplete and experts participating in IOC events often complain that entering that information takes too much time.
    a. RECOMMENDATION: reconsider whether all activity description fields are needed and adjust based on real requirements/benefits.

5. One could argue that **OceanExpert has become more a Secretariat management tool rather than a tool that directly serves experts**. It is currently unclear what functionality directly benefits experts in OE especially taking into account other widely used social media such as Facebook, LinkedIn etc that focus on networking and community building. It is neither likely or desirable for OceanExpert to effectively compete with these widely adopted services.
    a. RECOMMENDATION: redefine and highlight benefits from registration in OE. Do no try to compete with community building/networking services. Instead enable inclusion of other social media IDs to be included (which is already done).

6. While OceanExpert shows **personal email addresses** and physical addresses (institutional) to other members it is unclear whether this complies with the new GDPR regulations adopted by the European Union. Currently OE does not have a “switch” whereby experts can agree or disagree to make their email address visible. However if we consider IOC activities then lists of participants, including their email addresses, are always added to reports as an annex as well.
    a. RECOMMENDATION: consider legal issues of exposing personal information (email, address) in view of GDPR (this needs to be done at the level of the IOC Secretariat and UNESCO).

7. OceanExpert **insufficiently promotes itself**. Therefore OceanExpert is largely unknown outside the community associated with IOC.
    a. RECOMMENDATION: once redeveloped OE needs to undertake a major PR campaign.

8. The target users for OceanExpert and the services they can obtain are not well defined. Right now we can only “market” OE as a “white pages” product.
    a. RECOMMENDATION; We need to consider weaknesses at the national level: often the government middle management and policy making level is unaware of the expertise available nationally. OE can be promoted as an information source for government management and policy makers by providing reliable access on national (and/or regional) expertise in coastal and marine research and management. However, this information must be fact based: we cannot just rely on skills/proficiencies and even educational degrees as reported by the expert him/herself. This is even a weakness in LinkedIn as you can enter whatever you want. Linking with peer-reviewed publications as well as with official events (like those organized by IOC) can provide a more reliable reflection of skills,

proficiencies and experience. This could be achieved by linking OE records to IOC events (which is already available) as well as AquaDocs and ASFA (we need to check if we can a least also link to titles and abstracts of commercial journal articles). This could also be linked to LinkedIn to obtain employment histories (this will need to be negotiated).

9. OceanExpert does not keep individuals' professional historical record. Once an individual changes job, all previous information is lost
    a. RECOMMENDATION: consider including professional history as part of an individuals record
10. …

5. RECOMMENDATIONS FOR THE FUTURE OCEANEXPERT

5.1 OCEANEXPERT AS DIRECTORY OF OCEAN EXPERTS CONTRIBUTING TO IOC

When we consider the future of OceanExpert we first need to look at what OceanExpert intended to be, whether it achieved those goals and whether those goals are still relevant today and for what users.

In the previous chapters we have reviewed the original objectives of OceanExpert and for which target audiences OceanExpert was developed. We have explained that OceanExpert's initial objectives have evolved and that OE is now mainly a tool for the IOC Secretariat as part of its web-based information system and focusing mainly on managing information and documentation related to IOC events (major meetings, workshops, training courses).
The usage statistics since 2016 have shown a substantial growth which demonstrates that the current OE serves a purpose.

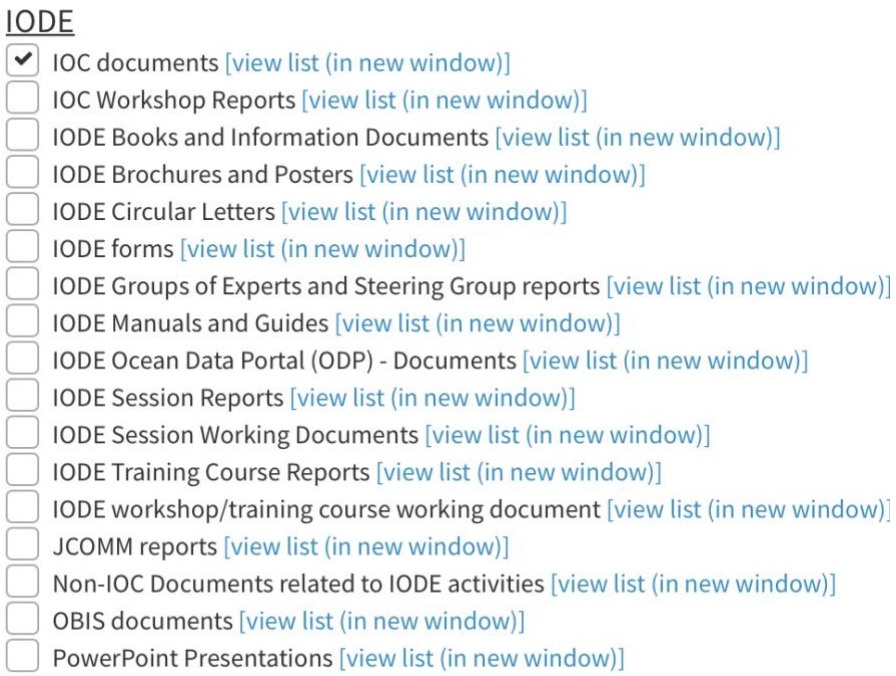
What we have also shown is that there are now many competitors in the sharing of expert information (information on experts, their career information and their scientific output). Successfully trying to compete with these is highly unlikely and, in our opinion, not the right path to take.

We believe that instead OE should focus on promoting what it actually has become today: a directory of ocean experts who are involved in IOC activities. These experts, in addition to building their career through their personal research and publications are making important and crucial contributions to ocean research, observation, data/information management and disaster risk reduction by collaborating with other experts around the global (and not just within their own country) through IOC. This contribution to a global objective and its importance needs to be more emphasized and appreciated and this can be done through OceanExpert: being identified in OceanExpert as a "global expert" needs to be considered as valuable in a scientist's career.

5.2 OPTIMIZATION OF THE OCEANEXPERT DOCUMENT REPOSITORY

The current field structure of the document repository module of OceanExpert contains the following fields:

1. **Document Type** (picklist: options Report, Presentation, Information Document, Letter, Book, MOU, Other, Website, Reference Document, Working Document)
2. Document Title (free text)
3. **Author(s)** (free text)
4. **Summary** (free text)
5. **Notes** (free text)
6. **Keywords** (free text)
7. **Document code** (free text; example" I-GOOS-VII/7)
8. **Status** (picklist: options Draft, Pending, Published)
9. **Lists to include document in** (picklist: options GOOS, IOC, IOC Capacity Development, IODE, JCOMM, Tsunami. For each there is then a secondary picklist (see example below for IODE)



AquaDocs uses Dublin core metadata. In Table 1 we show an example of a metadata record in AquaDocs.

Table 1: field structure AquaDocs record sample

dc.date.accessioned	2017-04-07T13:55:11Z
dc.date.available	2017-04-07T13:55:11Z
dc.date.issued	2017
dc.identifier.other	IOC/IODE-XXIV/3

dc.identifier.uri	http://hdl.handle.net/1834/9645	
dc.description.abstract	The IOC Committee on International Oceanographic Data and Information Exchange held its Twenty-fourth Session (IODE-XXIV) at the Renaissance Hotel Kuala Lumpur, Kuala Lumpur, Malaysia between 28 and 31 March 2018. The Session was preceded by a 1-day scientific workshop on 27 March 2017. The IODE Session was attended by 67 participants from 31 IOC Member States and 5 Organizations. The Session adopted 4 decisions (+ 2 draft decisions for the IOC Assembly) and 6 recommendations. The decisions concerned (i) the establishment of a new IODE management structure (replacing the IODE officers; (ii) project and activity performance evaluation procedures; (iii) the establishment of an inter-sessional working group to finalize a concept paper on the IOC data and information system (ODIS); and (iv) revision of the terms of reference for the IODE QMF to accommodate the ADUs. In addition, draft decisions were prepared for the IOC-XXIX regarding the IOC strategic plan for data and information management (2017-2201) and for the IOC communication and outreach strategy for data and information management. The 6 recommendations concern (i) revised terms of reference of the Joint IODE/IAMSLIC GE-MIM in a transitional capacity; (ii) the renewal of the MoU for the IOC Project Office for IODE, Oostende, Belgium; (iii) the establishment of a new pilot project OBIS-EVENT-DATA; (iv) the ODINWESTPAC project; (v) the IODE Associate Information Units (AIUs); and (vi) the IODE work plan and budget for 2017-2019. The Committee re-elected Ms Cynthia Chandler (USA) and Mr Yutaka Michida (Japan) as IODE Co-Chairs.	en_US
dc.language.iso	en	en_US
dc.publisher	UNESCO/IOC Project Office for IODE	en_US
dc.relation.ispartofseries	Intergovernmental Oceanographic Commission Reports of Meetings of Experts and Equivalent Bodies;	
dc.relation.uri	http://www.iode.org/index.php?option=com_oe&task=viewDocumentRecord&docID=19058	en_US
dc.subject.other	IODE	en_US
dc.subject.other	Data management	en_US

dc.subject.other	Information management	en_US
dc.title	IOC Committee on International Oceanographic Data and Information Exchange Twenty-fourth Session Kuala Lumpur, Malaysia, 28-31 March 2017.	en_US
dc.type	Report	en_US
dc.contributor.corpauthor	IOC Project Office for IODE	en_US
dc.description.status	Published	en_US
dc.format.pages	61pp & Annexes	en_US
dc.publisher.place	Paris, France	en_US
dc.type.refereed	Refereed	en_US
refterms.dateFOA	2021-01-30T18:49:04Z	

In Table 2 we show the mapping of the metadata structures:

Table 2: mapping OE document metadata structure vs AquaDocs

Field in OceanExpert	Field in AquaDocs	Comments	mappable
Document Type	**dc.type**		Yes
Document Title	**dc.title**		Yes
Author(s)	**dc.contributor.corpauthor** **dc.contributor.author**	If corporate author If individual author	Yes
Summary	**dc.description.abstract**		Yes
Notes			No
Keywords	**dc.subject.other**		Yes

Document code	**dc.identifier.other**		Yes
Status (and date)	**dc.description.status**		Yes
Lists to include document in	Collections (this item appears in the following collection(s))		Yes
Date created	**dc.date.available / dc.date.issued**		Yes
Date updated			?
Created by			?
Updated by			?
[Metadata record URL]	**dc.relation.uri**	Link to metadata record	Yes
	dc.identifier.uri		No
Download E			?
Download F			?
Download S			?
Download R			?
[language of file	**dc.language.iso**	Language of document (unclear how to deal with multiple languages availability)	Yes
	dc.publisher		No
	dc.relation.ispartofseries		No
	dc.format.pages		No
	dc.publisher.place		No
	refterms.dateFOA		?
[download link]	Files in this item (name, size, format, description)		Yes
[file type]	**dc.format / dc.format.mimetype**		Yes
	dc.bibliographicCitation.conferencedate		No
	dc.bibliographicCitation.conferencename		No
	dc.bibliographicCitation.conferenceplace		No

Note: in addition to the AquaDocs metadata elements listed above there are still some additional ones which we are not listing here.

We can conclude that most fields in the current OceanExpert document module are mappable to the Dublin Core standard-based AquaDocs.

It is therefore recommended to implement the OE document module as a Dublin Core standard repository, interoperable with AquaDocs or as a DSpace repository.

5.3 OTHER SUGGESTIONS FOR THE FUTURE OCEANEXPERT

…

6. DISCUSSION AND WAY FORWARD

Annex I: Ocean Expert Statistics reports 2016-2021

Overview Sessions 1/10/2016 – 11/8/2021

Analytics OceanExpert
All Web Site Data

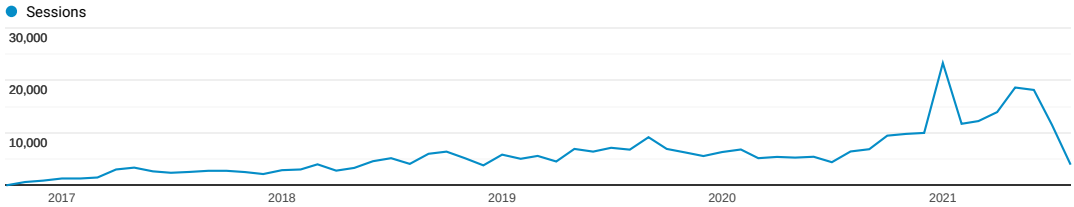
Go to report

Audience Overview

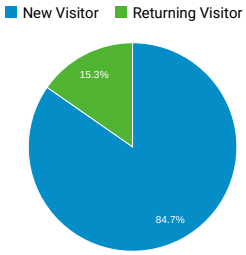
All Users
100.00% Users

1 Oct 2016 - 11 Aug 2021

Overview



Users	New Users	Sessions	
208,794	212,034	351,811	
Number of Sessions per User	Page Views	Pages/Session	
1.68	1,446,458	4.11	
Avg. Session Duration	Bounce Rate		
00:03:31	60.08%		



	Country	Users	% Users
1.	United States	27,007	12.69%
2.	India	11,943	5.61%
3.	France	9,496	4.46%
4.	United Kingdom	8,617	4.05%
5.	Indonesia	7,508	3.53%
6.	Colombia	7,366	3.46%
7.	Germany	6,149	2.89%
8.	Australia	5,757	2.71%
9.	China	5,569	2.62%
10.	Canada	4,858	2.28%

Sessions 2016

Analytics OceanExpert All Web Site Data

Go to report

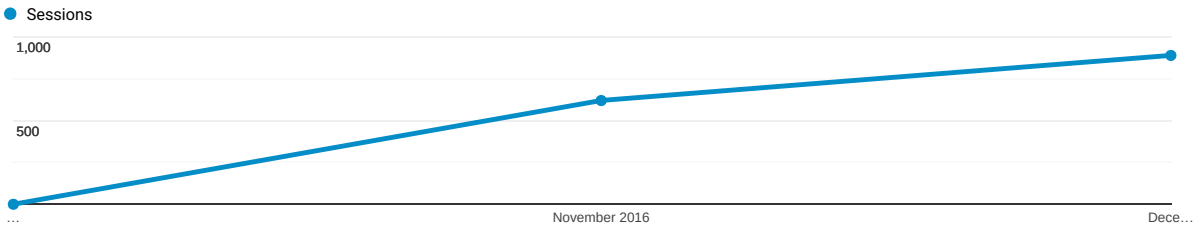
Location

All Users
100.00% Users

1 Oct 2016 - 31 Dec 2016

Explorer

Site Usage



	Country	Users ▼	Users ▼
		906 % of Total: 100.00% (906)	906 % of Total: 100.00% (906)
1.	United States	86	9.45%
2.	Belgium	83	9.12%
3.	France	49	5.38%
4.	Germany	37	4.07%
5.	India	37	4.07%
6.	Mozambique	32	3.52%
7.	United Kingdom	30	3.30%
8.	Australia	29	3.19%
9.	Canada	26	2.86%
10.	Italy	21	2.31%
11.	Portugal	21	2.31%
12.	Spain	19	2.09%
13.	Japan	18	1.98%
14.	Nigeria	16	1.76%
15.	South Africa	16	1.76%
16.	Brazil	15	1.65%
17.	China	15	1.65%
18.	Kenya	15	1.65%
19.	Indonesia	14	1.54%
20.	Malaysia	13	1.43%
21.	Bangladesh	11	1.21%
22.	Colombia	11	1.21%
23.	Iran	11	1.21%
24.	Senegal	10	1.10%
25.	Chile	9	0.99%

Sessions 2017

Analytics OceanExpert All Web Site Data

Go to report

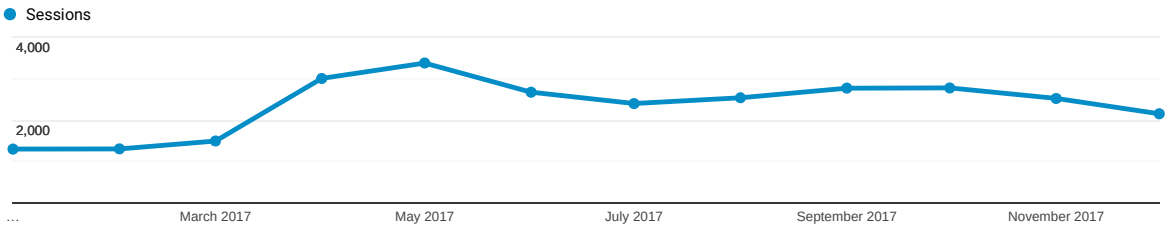
Location

All Users
100.00% Users

1 Jan 2017 - 31 Dec 2017

Explorer

Site Usage



	Country	Users	Users
		17,013 % of Total: 100.00% (17,013)	17,013 % of Total: 100.00% (17,013)
1.	United States	2,150	12.55%
2.	India	1,065	6.22%
3.	United Kingdom	854	4.98%
4.	France	763	4.45%
5.	Belgium	679	3.96%
6.	Germany	596	3.48%
7.	Australia	475	2.77%
8.	Canada	475	2.77%
9.	Indonesia	458	2.67%
10.	Italy	392	2.29%
11.	Colombia	371	2.17%
12.	China	356	2.08%
13.	Malaysia	353	2.06%
14.	Spain	351	2.05%
15.	Kenya	324	1.89%
16.	South Africa	264	1.54%
17.	Portugal	259	1.51%
18.	Mexico	243	1.42%
19.	Japan	231	1.35%
20.	Brazil	208	1.21%
21.	Switzerland	204	1.19%
22.	Chile	201	1.17%
23.	Nigeria	199	1.16%
24.	Netherlands	191	1.11%
25.	Philippines	188	1.10%

Sessions 2018

Analytics OceanExpert All Web Site Data

Go to report

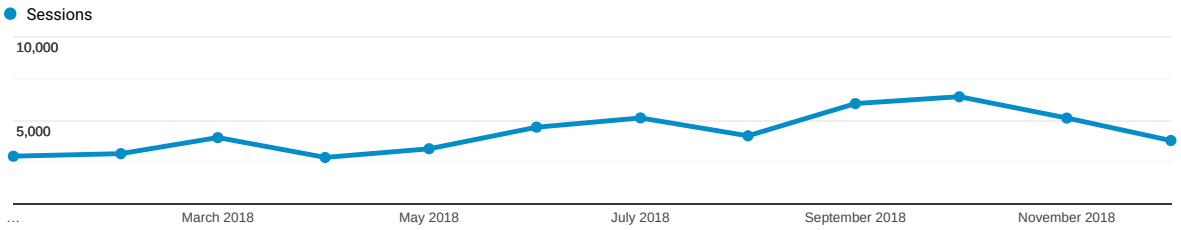
Location

All Users
100.00% Users

1 Jan 2018 - 31 Dec 2018

Explorer

Site Usage



	Country	Users ▼	Users ▼
		29,335 % of Total: 100.00% (29,335)	29,335 % of Total: 100.00% (29,335)
1.	United States	3,185	10.73%
2.	India	1,984	6.69%
3.	France	1,322	4.46%
4.	United Kingdom	1,196	4.03%
5.	Indonesia	1,076	3.63%
6.	Germany	1,018	3.43%
7.	Colombia	958	3.23%
8.	Belgium	896	3.02%
9.	Malaysia	793	2.67%
10.	Australia	781	2.63%
11.	Canada	718	2.42%
12.	Kenya	585	1.97%
13.	Italy	578	1.95%
14.	Spain	562	1.89%
15.	Brazil	506	1.71%
16.	Mexico	467	1.57%
17.	China	453	1.53%
18.	Philippines	426	1.44%
19.	Portugal	401	1.35%
20.	Japan	392	1.32%
21.	South Africa	365	1.23%
22.	Chile	360	1.21%
23.	Egypt	349	1.18%
24.	Nigeria	338	1.14%
25.	Bangladesh	332	1.12%

Sessions 2019

Analytics OceanExpert All Web Site Data

Go to report

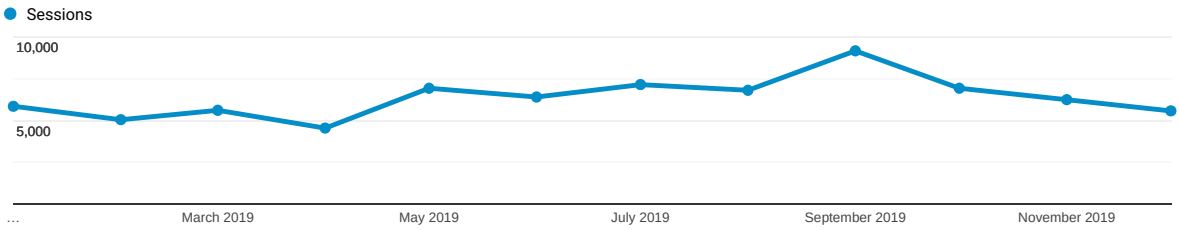
Location

All Users
100.00% Users

1 Jan 2019 - 31 Dec 2019

Explorer

Site Usage



	Country	Users ▼	Users ▼
		47,419 % of Total: 100.00% (47,419)	47,419 % of Total: 100.00% (47,419)
1.	United States	5,665	11.85%
2.	India	3,072	6.43%
3.	France	2,149	4.50%
4.	United Kingdom	1,910	4.00%
5.	Indonesia	1,844	3.86%
6.	Germany	1,572	3.29%
7.	Colombia	1,537	3.22%
8.	Japan	1,212	2.54%
9.	Malaysia	1,073	2.25%
10.	Canada	1,056	2.21%
11.	China	1,046	2.19%
12.	Australia	1,037	2.17%
13.	Italy	1,035	2.17%
14.	Belgium	961	2.01%
15.	Spain	917	1.92%
16.	Brazil	830	1.74%
17.	Portugal	762	1.59%
18.	Kenya	736	1.54%
19.	Mexico	703	1.47%
20.	Philippines	621	1.30%
21.	Chile	603	1.26%
22.	South Africa	592	1.24%
23.	Netherlands	555	1.16%
24.	Egypt	488	1.02%
25.	Turkey	472	0.99%

Sessions 2020

Analytics OceanExpert
All Web Site Data

Go to report

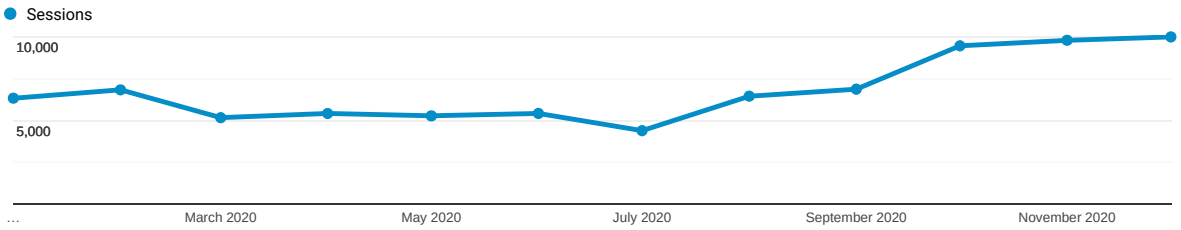
Location

All Users
100.00% Users

1 Jan 2020 - 31 Dec 2020

Explorer

Site Usage



	Country	Users ▼	Users ▼
		56,943 % of Total: 100.00% (56,943)	56,943 % of Total: 100.00% (56,943)
1.	United States	7,513	13.08%
2.	India	3,026	5.27%
3.	France	2,532	4.41%
4.	United Kingdom	2,437	4.24%
5.	Colombia	2,227	3.88%
6.	Indonesia	2,131	3.71%
7.	China	1,680	2.93%
8.	Germany	1,662	2.89%
9.	Australia	1,518	2.64%
10.	Canada	1,345	2.34%
11.	Spain	1,235	2.15%
12.	Italy	1,064	1.85%
13.	Malaysia	1,048	1.83%
14.	Brazil	984	1.71%
15.	Japan	968	1.69%
16.	Mexico	964	1.68%
17.	Philippines	956	1.66%
18.	Netherlands	825	1.44%
19.	Belgium	822	1.43%
20.	Portugal	817	1.42%
21.	Kenya	808	1.41%
22.	Bangladesh	656	1.14%
23.	Peru	639	1.11%
24.	Chile	638	1.11%
25.	Russia	607	1.06%

Sessions 2021

Analytics OceanExpert All Web Site Data

Go to report

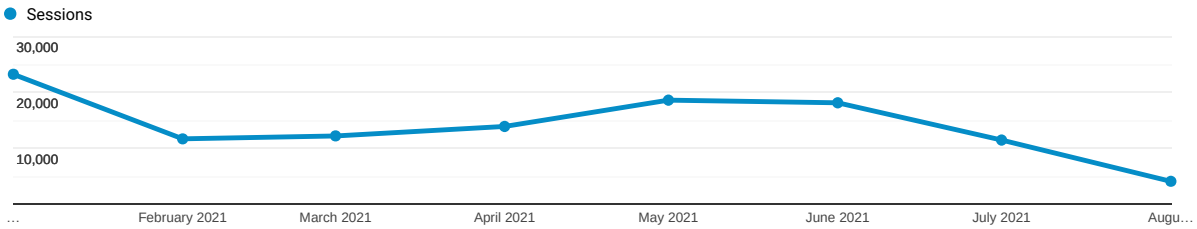
Location

All Users
100.00% Users

1 Jan 2021 - 12 Aug 2021

Explorer

Site Usage



	Country	Users	Users
		62,943 % of Total: 100.00% (62,943)	62,943 % of Total: 100.00% (62,943)
1.	United States	8,644	13.46%
2.	India	3,030	4.72%
3.	France	2,939	4.58%
4.	Colombia	2,393	3.73%
5.	United Kingdom	2,264	3.53%
6.	Indonesia	2,119	3.30%
7.	China	2,075	3.23%
8.	Brazil	2,074	3.23%
9.	Australia	2,004	3.12%
10.	Mexico	1,808	2.82%
11.	Germany	1,386	2.16%
12.	Canada	1,298	2.02%
13.	Spain	1,158	1.80%
14.	Italy	1,142	1.78%
15.	Malaysia	1,094	1.70%
16.	Philippines	1,076	1.68%
17.	Argentina	1,066	1.66%
18.	Netherlands	1,030	1.60%
19.	Portugal	933	1.45%
20.	Chile	871	1.36%
21.	Peru	845	1.32%
22.	Bangladesh	821	1.28%
23.	Japan	816	1.27%
24.	Nigeria	773	1.20%
25.	Belgium	764	1.19%

Referral 2016

Analytics OceanExpert
All Web Site Data

Go to report

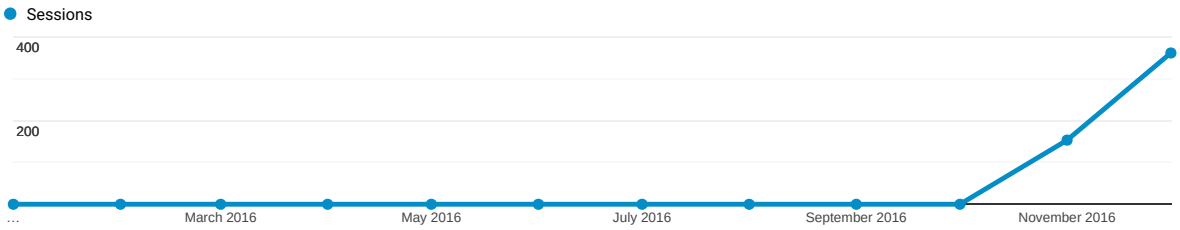
Referral Traffic

All Users
100.00% Users

1 Jan 2016 - 31 Dec 2016

Explorer

Summary



	Source	Sessions ▼	Sessions ▼
		514 % of Total: 34.11% (1,507)	514 % of Total: 34.11% (1,507)
1.	oceanexpert.net	153	29.77%
2.	ioc-unesco.org	132	25.68%
3.	iode.org	84	16.34%
4.	jcomm.info	49	9.53%
5.	goosocean.org	31	6.03%
6.	itic.ioc-unesco.org	22	4.28%
7.	ioc-goos.org	10	1.95%
8.	ioc-tsunami.org	8	1.56%
9.	hab.ioc-unesco.org	7	1.36%
10.	outlook.live.com	4	0.78%

Rows 1 - 10 of 20

Referral 2017

Analytics OceanExpert All Web Site Data

Go to report

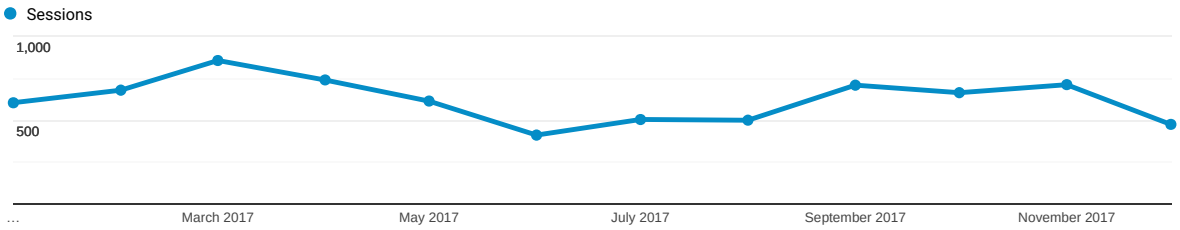
Referral Traffic

All Users
22.50% Users

1 Jan 2017 - 31 Dec 2017

Explorer

Summary



	Source	Sessions ▼	Sessions ▼
		7,468 % of Total: 26.43% (28,258)	7,468 % of Total: 26.43% (28,258)
1.	ioc-unesco.org	1,733	23.21%
2.	iode.org	1,031	13.81%
3.	oceanexpert.net	934	12.51%
4.	jcomm.info	739	9.90%
5.	goosocean.org	430	5.76%
6.	ioc-tsunami.org	348	4.66%
7.	ioc-cd.org	255	3.41%
8.	outlook.live.com	191	2.56%
9.	e.mail.ru	144	1.93%
10.	itic.ioc-unesco.org	113	1.51%

Rows 1 - 10 of 292

Referral 2018

Analytics OceanExpert
All Web Site Data

Go to report

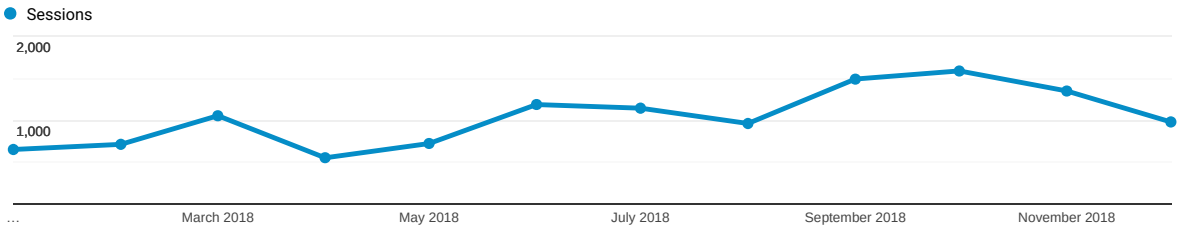
Referral Traffic

All Users
20.10% Users

1 Jan 2018 - 31 Dec 2018

Explorer

Summary



	Source	Sessions ▼	Sessions ▼
		12,383 % of Total: 24.20% (51,165)	12,383 % of Total: 24.20% (51,165)
1.	ioc-unesco.org	1,531	12.36%
2.	mail.google.com	1,354	10.93%
3.	classroom.oceanteacher.org	1,268	10.24%
4.	iode.org	924	7.46%
5.	m.facebook.com	655	5.29%
6.	facebook.com	624	5.04%
7.	goosocean.org	501	4.05%
8.	ioc-tsunami.org	489	3.95%
9.	mail.yahoo.com	407	3.29%
10.	jcomm.info	343	2.77%

Rows 1 - 10 of 410

Referral 2019

Analytics OceanExpert
All Web Site Data

Go to report

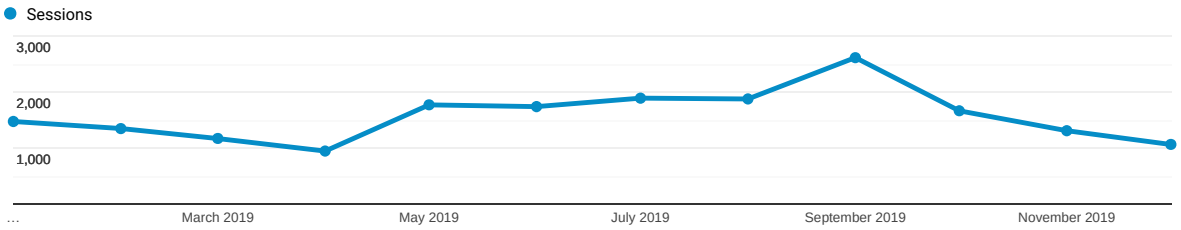
Referral Traffic

All Users
18.18% Users

1 Jan 2019 - 31 Dec 2019

Explorer

Summary



	Source	Sessions ▼	Sessions ▼
		18,905 % of Total: 24.81% (76,187)	18,905 % of Total: 24.81% (76,187)
1.	classroom.oceanteacher.org	6,291	33.28%
2.	ioc-unesco.org	1,160	6.14%
3.	mail.google.com	1,151	6.09%
4.	ioc-tsunami.org	1,029	5.44%
5.	m.facebook.com	974	5.15%
6.	iode.org	843	4.46%
7.	baidu.com	732	3.87%
8.	facebook.com	630	3.33%
9.	goosocean.org	581	3.07%
10.	l.facebook.com	416	2.20%

Rows 1 - 10 of 471

Referral 2020

Analytics OceanExpert
All Web Site Data

Go to report

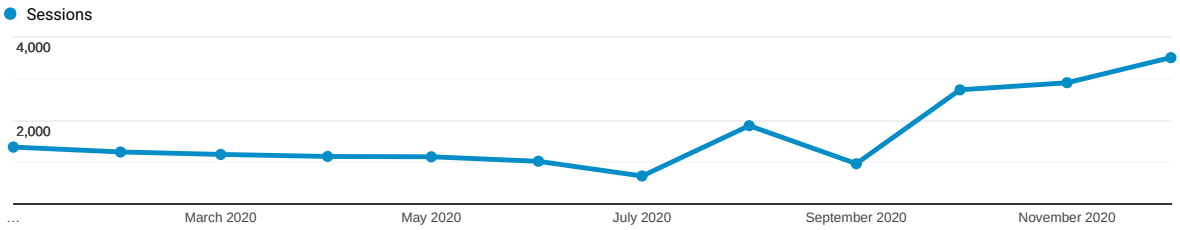
Referral Traffic

All Users
19.21% Users

1 Jan 2020 - 31 Dec 2020

Explorer

Summary



	Source	Sessions ▼	Sessions ▼
		19,747 % of Total: 24.27% (81,349)	19,747 % of Total: 24.27% (81,349)
1.	oceandecade.org	3,945	19.98%
2.	classroom.oceanteacher.org	2,499	12.66%
3.	m.facebook.com	1,449	7.34%
4.	surveymonkey.com	1,157	5.86%
5.	iode.org	1,114	5.64%
6.	ioc-unesco.org	972	4.92%
7.	ioc-tsunami.org	754	3.82%
8.	baidu.com	729	3.69%
9.	oceanliteracy.unesco.org	588	2.98%
10.	l.facebook.com	586	2.97%

Rows 1 - 10 of 444

Referral 2021

Analytics OceanExpert
All Web Site Data

Go to report

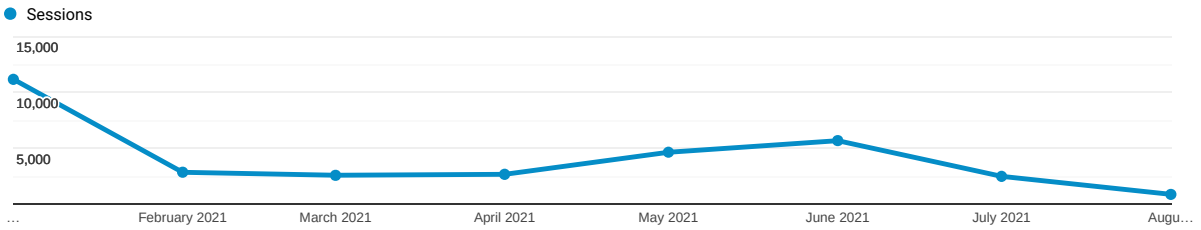
Referral Traffic

All Users
21.12% Users

1 Jan 2021 - 12 Aug 2021

Explorer

Summary



	Source	Sessions ▼	Sessions ▼
		33,050 % of Total: 29.11% (113,532)	33,050 % of Total: 29.11% (113,532)
1.	ioc.unesco.org	5,045	15.26%
2.	oceandecade.org	4,279	12.95%
3.	bottraffic.live	3,061	9.26%
4.	trafficbot.live	2,902	8.78%
5.	oceanliteracy.unesco.org	2,049	6.20%
6.	m.facebook.com	1,713	5.18%
7.	classroom.oceanteacher.org	1,397	4.23%
8.	mail.google.com	1,182	3.58%
9.	l.facebook.com	1,086	3.29%
10.	goosocean.org	993	3.00%

Rows 1 - 10 of 482

ANNEX II: OCEANEXPERT (2021) FIELD STRUCTURE

AFFILIATION AND ADDRESS

Do you work for an Organization/Institution/Company? YES NO

Country (picklist)

Organisation/Institution/Company (picklist)

Department (free text)

Address
Address Line 1 (free text)
Address Line 2 (free text)

Postal/ZIP code (free text)
City (free text)

State/Province/Region (free text)

PERSONAL DETAILS

Title
First Name
Middle Name
Last Name

Gender. (Male, Female, Not Specified) [comment: we may wish to explain why we are asking this]

Nationality (picklist) [comment: we may wish to explain why we are asking this]

Phone (free text)

Email (primary and secondary)

Persistent Digital Identifier (ORCID ,ResearcherID)

Website (personal, institutional)

Social network (LinkedIn, Facebook, Other)

PROFESSIONAL DETAILS

Highest Degree

Skills

Working Language(s)

Job Title

Job Type(s) (picklist)

Subject Area(s) (picklist)

Detailed Activities (free text)

Comments (free text)

Sea regions of study (picklist)

Citations (Google scholar, ResearchGate, Others)
Citation URL

Fields marked in ready may need to be reviewed for continued use. This information could possibly be extracted from publications.

[END OF DOCUMENT]