



United Nations
Educational, Scientific and
Cultural Organization

Organisation
des Nations Unies
pour l'éducation
la science et la culture

Organización
de las Naciones Unidas
para la Educación
la Ciencia y la Cultura

Организация
Объединенных Наций по
вопросам образования
науки и культуры

• Intergovernmental
Oceanographic
Commission

• Commission
océanographique
intergouvernementale

• Comisión
Oceanográfica
Intergubernamental

• Межправительственная
океанографическая
комиссия

19 June 2015, Paris

GLOBAL OCEAN SCIENCE REPORT: PROGRESS, CHALLENGES & PROSPECTS

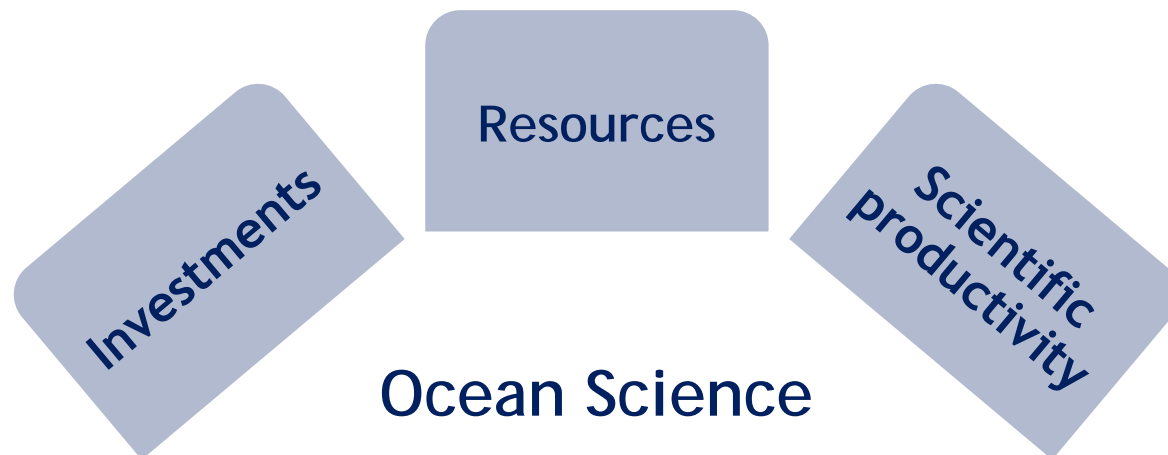
*IOC/INF-1231
EC-XLVII, Dec. 6.2*

*Presented by
Dr. Luis Valdés*

*Head of Ocean Sciences of the
Intergovernmental Oceanographic
Commission of UNESCO*



IOC



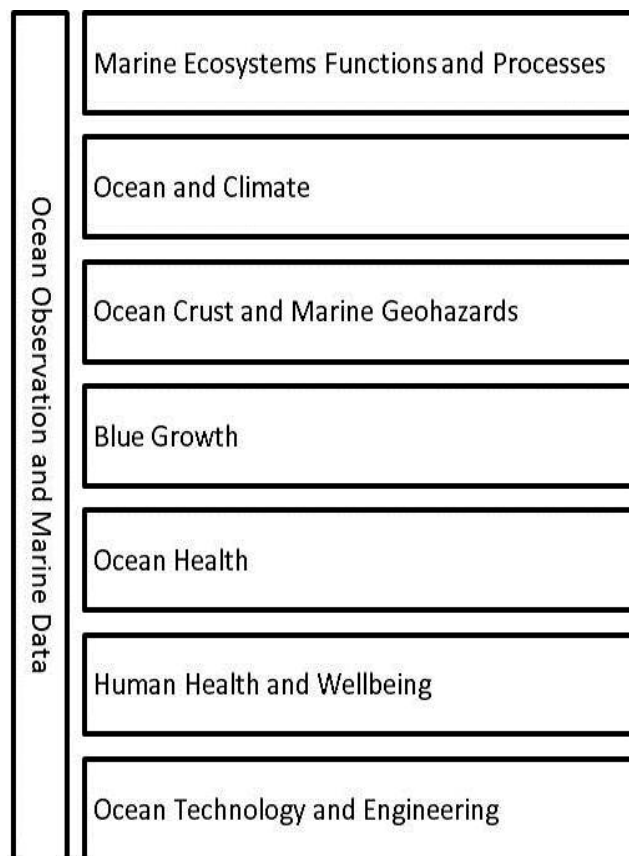
Definition: Research disciplines related to the study of the ocean: physical, biological, chemical, geological, hydrographic, health, and social sciences, as well as engineering, the humanities, and multidisciplinary research on the relationship between humans and the ocean. Ocean Science seeks to understand complex, multi-scale social-ecological systems, which requires multidisciplinary and collaborative research. (Ocean Science in Canada: Meeting the challenge, seizing the opportunity, 2013)



NECESSARY TO DEFINE DIFFERENT MEASURES OF OCEAN SCIENCE, RELEVANT IN THE FRAME OF SUSTAINABLE DEVELOPMENT. THESE WILL WOULD BE GROUPED INTO SEVEN MAJOR CATEGORIES AND ONE OVERARCHING THEME:



GOAL 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development




Outline of the Global Ocean Science Report (EC-XLVII/6.2)

1. **Introduction**
2. **Research investment**
 - 2.1. Observations
 - 2.2. Fisheries
 - 2.3. Other ocean sciences
3. **Research capacity and infrastructure**
 - 3.1. Human resources, gender distribution
 - 3.2. Facilities/laboratories/field stations
 - 3.3. Equipment
 - 3.4. Key time series sampling sites
4. **Research productivity and science impact**
 - 4.1. Peer-reviewed publications
 - 4.2. International collaboration
5. **Oceanographic data and information exchange**
6. **International supporting organizations on ocean science**
 - 6.1. Scientific organizations
 - 6.2. Fisheries management organizations
 - 6.3. The role of International Project Offices
7. **Contribution of marine science to the development of ocean and coastal policies and sustainable development**
8. **Conclusions**
 - 8.1. Gaps in knowledge, research, capacity and technical infrastructure
 - 8.2. Findings and opportunities
 - 8.3. Capacity building and transfer of technology
 - 8.4. Opportunities for international collaboration

Circular Letters:

IOC-CL 2553

IOC-CL 2560



INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
COMMISSION Océanographique InterGouvernementale
COMISSÃO OCEANOGRÁFICA INTERGOVERNAMENTAL
МЕЖДУПРАВИТЕЛЬСТВЕННАЯ ОКЕАНОГРАФИЧЕСКАЯ КОМИССИЯ
اللجنة الدولية الحكومية لعلوم المحيطات
政府間海洋学委員会

UNESCO

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IOC Circular Letter No. 2553 **IOC/WWW/LV**
 (Available in English, French, Russian and Spanish) **4 December 2014**

To : IOC National Official Coordinating Bodies for liaison with IOC Member States

cc. : Permanent Delegates / Observer Missions to UNESCO of IOC Member States
 National Commissions for UNESCO of IOC Member States Chair
 Vice-Chairs of IOC and Major Subsidiary Bodies

Subject : Invitation to financially support the production of the IOC Global Ocean Science Report (GOSR)


In pursuance to Decision EC-XLVII/Dec 6.2 by which the IOC Executive Council at its 47th session (Paris, 1-4 July 2014) accepted the new Global Ocean Science Report proposal (IOC/EC-XLVII/2 Annex B) improved first by the recommendations of the Open-ended Intersectoral Working Group and second by discussions that took place during the session, I invite IOC Member States to assess precisely their possibilities to financially support this important project and commit extrabudgetary funds by letter to the secretariat as early as possible before 15 January 2015. The timeline and detail of the financial plan for the GOSR for 2014-2016, totalling approximately US\$ 730 000, is available in the proposal document.

Dr Luis Valdés, Head of Ocean Sciences Section, acts as the focal point of the project and leads the technical support by the secretariat. Donors of extra-budgetary contributions are now vital to the production and the publication of the Global Ocean Science Report and the presentation of the final draft to the Executive Council at its 49th session in 2016. In the meantime developments and supports will be reported to and acknowledged at the IOC Assembly in 2015.

Vice-Chairman Atanas Palazov, as past Chair of the Open-ended Intersectoral Working Group to further review and improve the Global Ocean Science Report (GOSR) proposal, and myself would very much appreciate receiving letters of support and detail of your financial contributions by electronic copy to palazov@io-ban.ba, watson-wright@unesco.org and l.valdes@unesco.org.

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<p>Chairperson</p> <p>Dr Daqingyang BRYEN Principal Research Scientist Chinese Center of Ocean Science and Technology (CCOOST) 4011 Xiangyin Road Wenzhou, Zhejiang 325100 CHINA</p> <p>Executive Secretary Dr Irving WATSON-WRIGHT Intergovernmental Oceanographic Commission – UNESCO 7 Place de Fontenay 75302 Paris Cedex 07 SP FRANCE</p>	<p>Vice-Chairpersons</p> <p>Prof. Ruzica HADZISAVIC Director, Geographical Institute University of Zagreb Jagoski trg 10000 ZAGREB CROATIA</p> <p>Dr. Ivan PALAZOV Director, Institute of Oceanography – Varna Regional University of Varna P.O. Box 102 Varna 9100 BULGARIA</p>	<p>Cap. Frederic ANTONIO SARASUA Director, Oceanographic Institute and Navigation Rue de la République, 617 63000 NANTES FRANCE</p> <p>Dr. Atsushi MITSUDA University of Tsukuba Member of National Committee for IOC Commission – UNESCO 1-1-1 Tsukuba JAPAN</p>
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МЕЖДУПРАВИТЕЛЬСТВЕННАЯ ОКЕАНОГРАФИЧЕСКАЯ КОМИССИЯ
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IOC Circular Letter No. 2560 **IOC/WWW/LVpbo**
 (Available in English, French, Russian and Spanish) **16 January 2015**

To : National Official Coordinating Bodies for liaison with IOC

Cc : Permanent Delegates/Observer Missions to UNESCO of IOC Member States
 National Commissions for UNESCO of IOC Member States
 Chair and Vice-Chairs of IOC and Major Subsidiary Bodies

Subject: Invitation to provide national information important for the production of the IOC Global Ocean Science Report (GOSR)

In pursuance to Decision EC-XLVIII/2 by which the IOC Executive Council at its 47th session (Paris, 1-4 July 2014) accepted the new Global Ocean Science Report proposal (IOC/EC-XLVIII/2 Annex B) improved first by the recommendations of the Open-ended Intersectoral Working Group and second by discussions that took place during the session, I invite IOC Member States to provide information about Ocean Science in their countries by filling in the attached survey questionnaire.

The questionnaire seeks to gain your views, information about your institute/country/organization to complete the information needed to obtain a complete picture of ocean science globally. Many international fora (WSSD, Rio+20, UN-ICPOLoS, UN World Ocean Assessment) have identified the need to strengthen marine science capacities of nations in order to advance sustainable ocean management at all levels. At present, there are no global mechanism for assessing and reporting the level of capacity, investments, and needs of nations in ocean science, observation and services.

This questionnaire is designed to obtain objective and detailed responses and it is built with a balanced ratio of direct answers, which do not need further explanation, and free text forms allowing for more expanded and qualitative analysis. We would ask you to try as much as possible to elaborate the free text forms in English to avoid the cost of translating documents.

The responses should represent either the collective views of relevant established bodies dealing with ocean affairs within the Member State and/or the views of the national relevant agency or Ministry, official statements of relevant institutes and organizations.

...

<p>Chairperson</p> <p>Dr Daqingyang BRYEN Principal Research Scientist Chinese Center of Ocean Science and Technology (CCOOST) 4011 Xiangyin Road Wenzhou, Zhejiang 325100 CHINA</p> <p>Executive Secretary Dr Irving WATSON-WRIGHT Intergovernmental Oceanographic Commission – UNESCO 7 Place de Fontenay 75302 Paris Cedex 07 SP FRANCE</p>	<p>Vice-Chairpersons</p> <p>Prof. Ruzica HADZISAVIC Director, Geographical Institute University of Zagreb Jagoski trg 10000 ZAGREB CROATIA</p> <p>Dr. Atsushi MITSUDA University of Tsukuba Member of National Committee for IOC Commission – UNESCO 1-1-1 Tsukuba JAPAN</p>	<p>Cap. Frederic ANTONIO SARASUA Director, Oceanographic Institute and Navigation Rue de la République, 617 63000 NANTES FRANCE</p> <p>Dr. Atanas PALAZOV Director, Institute of Oceanography – Varna Regional University of Varna P.O. Box 102 Varna 9100 BULGARIA</p>
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Questionnaire:

Name: _____

Organization: _____

Country: _____

Main contact address: _____

Phone contact address: _____

Other contact address: _____

Has it been used previously?

1. Do you have regional agencies/organizations specialized in Ocean Science work?

2. If yes, which organization is "responsible" for OOI?

3. Do you have National Science & Technology strategy? (File attach link to the document)

4. Do you have a National Ocean Science Strategy? (File attach link to the document)

1. Has your organization been considered?

Year	2010	2011	2012	2013	2014
Yes					
No					

Type of panel considered:

Observer panel

Panel with voting rights

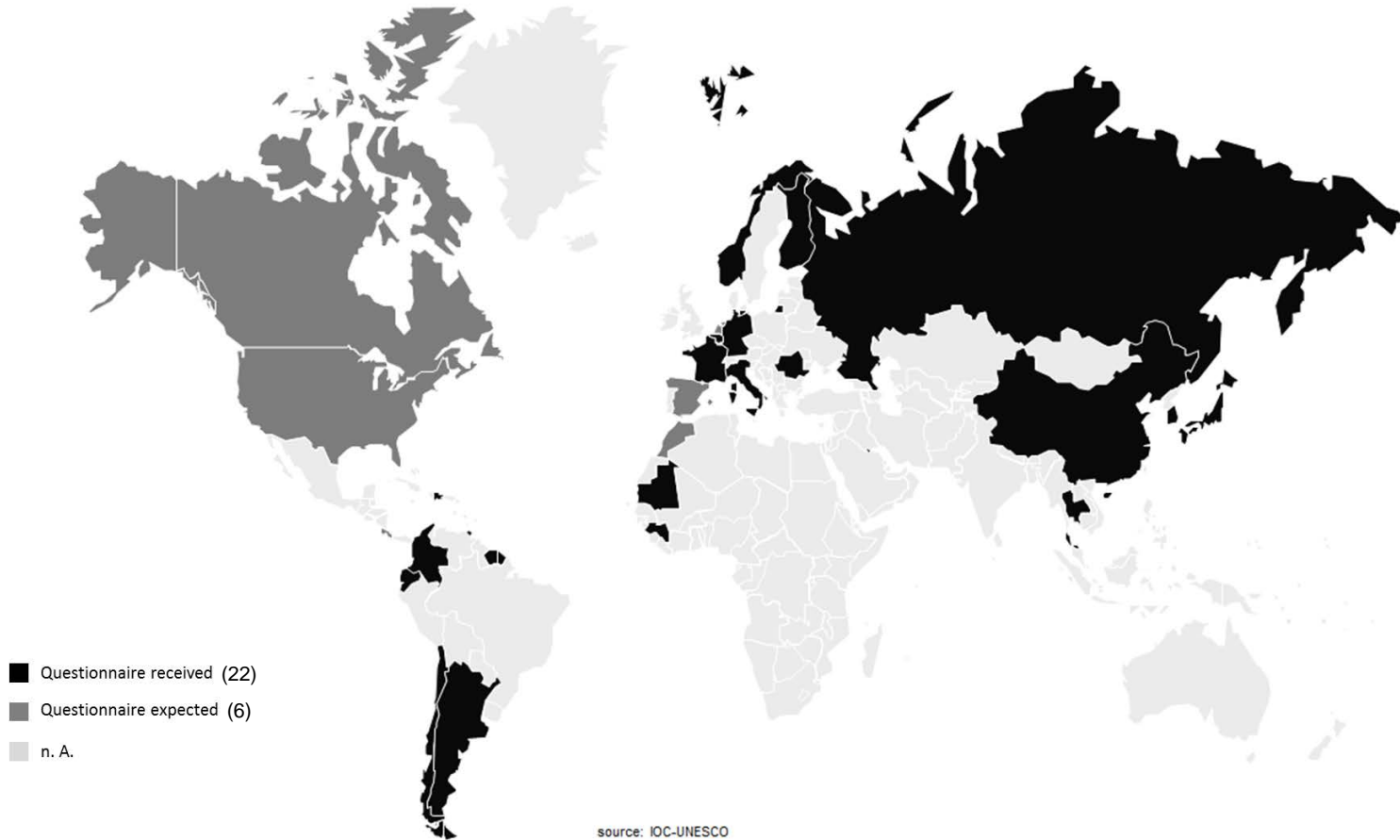
Notes: _____

2. Has your organization been invited to participate in international fora?

Year	2010	2011	2012	2013	2014
Yes					
No					

Choropleth Map of the World

responses questionnaire

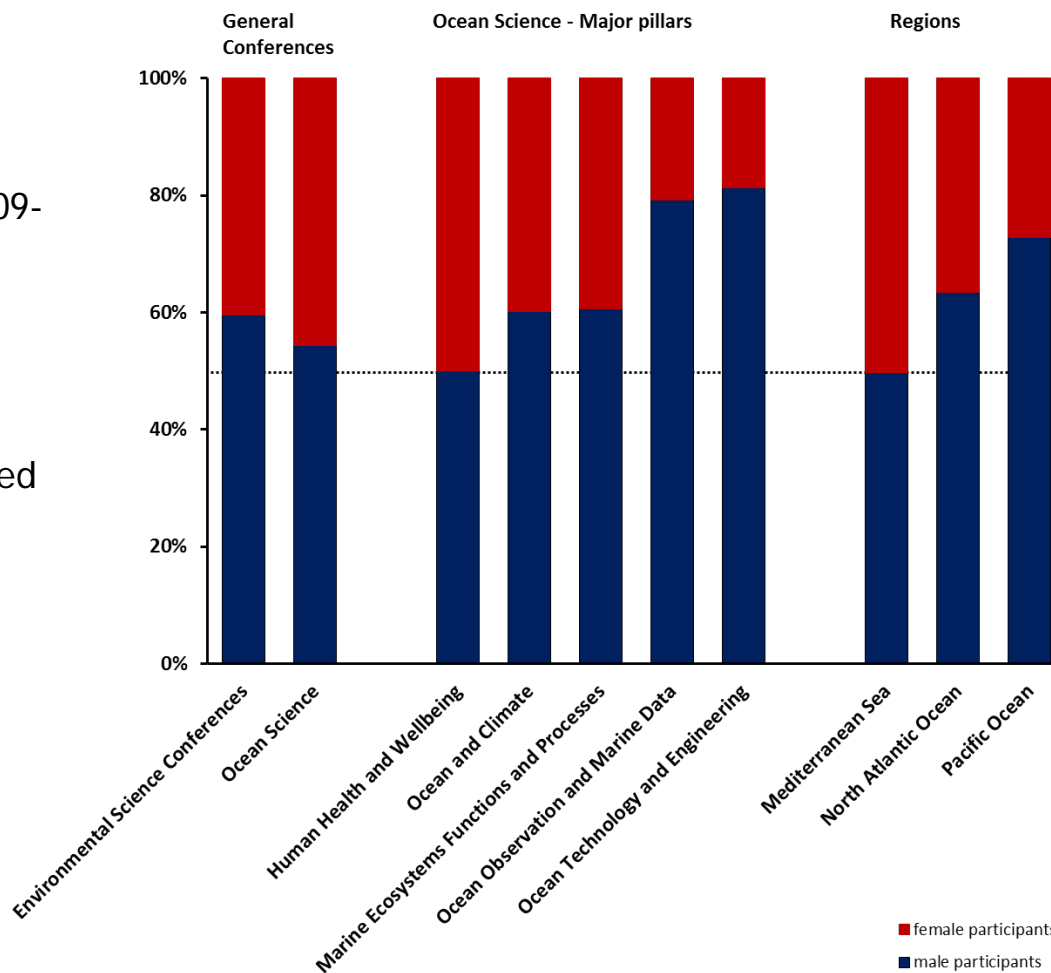


CHAPTER 3: Human Resources, gender distribution

Resource information:

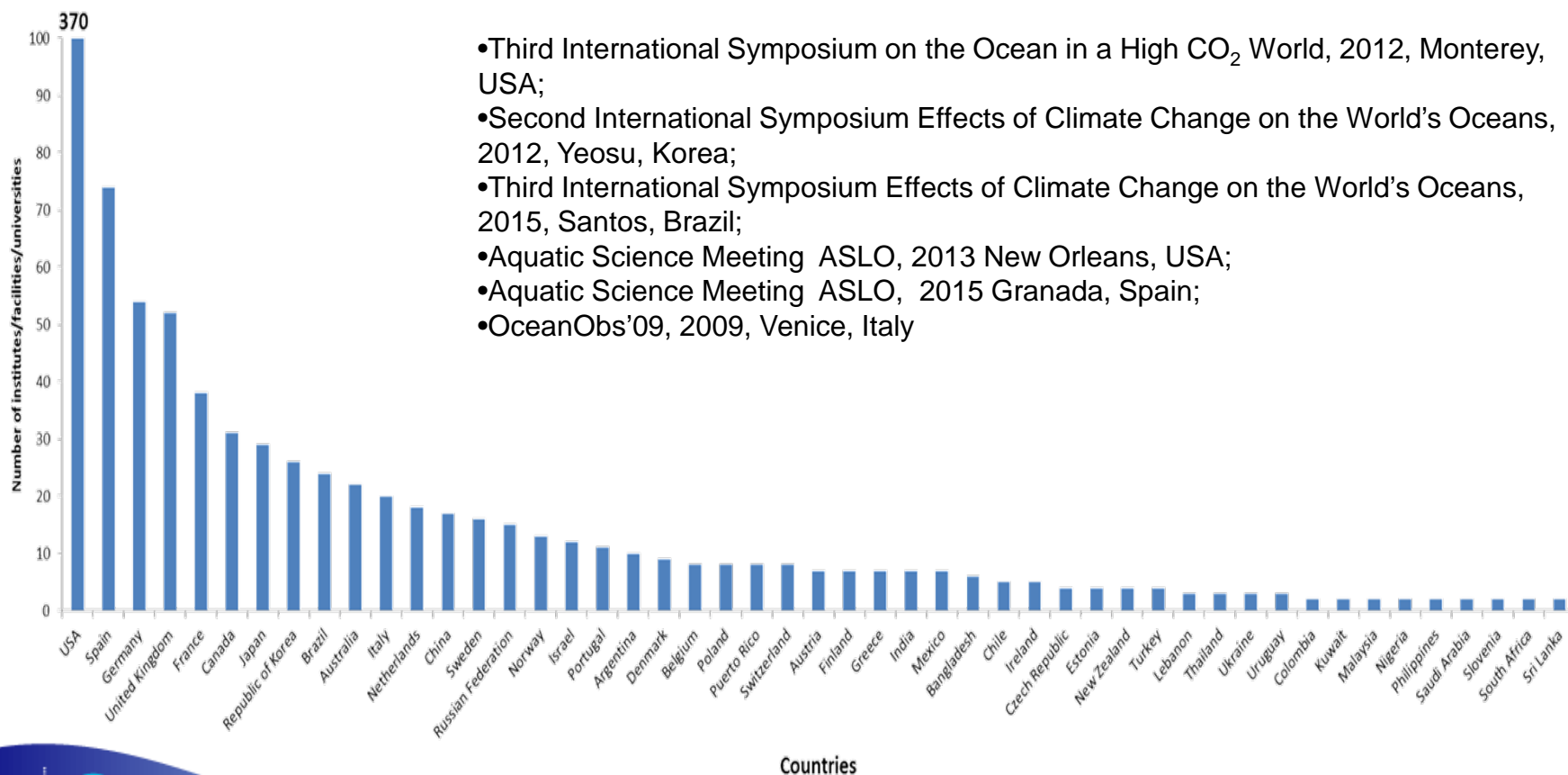
- Conferences between 2009-2015
- 28 conferences
- Conferences hosted in 15 different countries
- >17.000 participants
- >104 countries represented

Relative proportion (%) of male and female experts attending international scientific conferences/ symposia



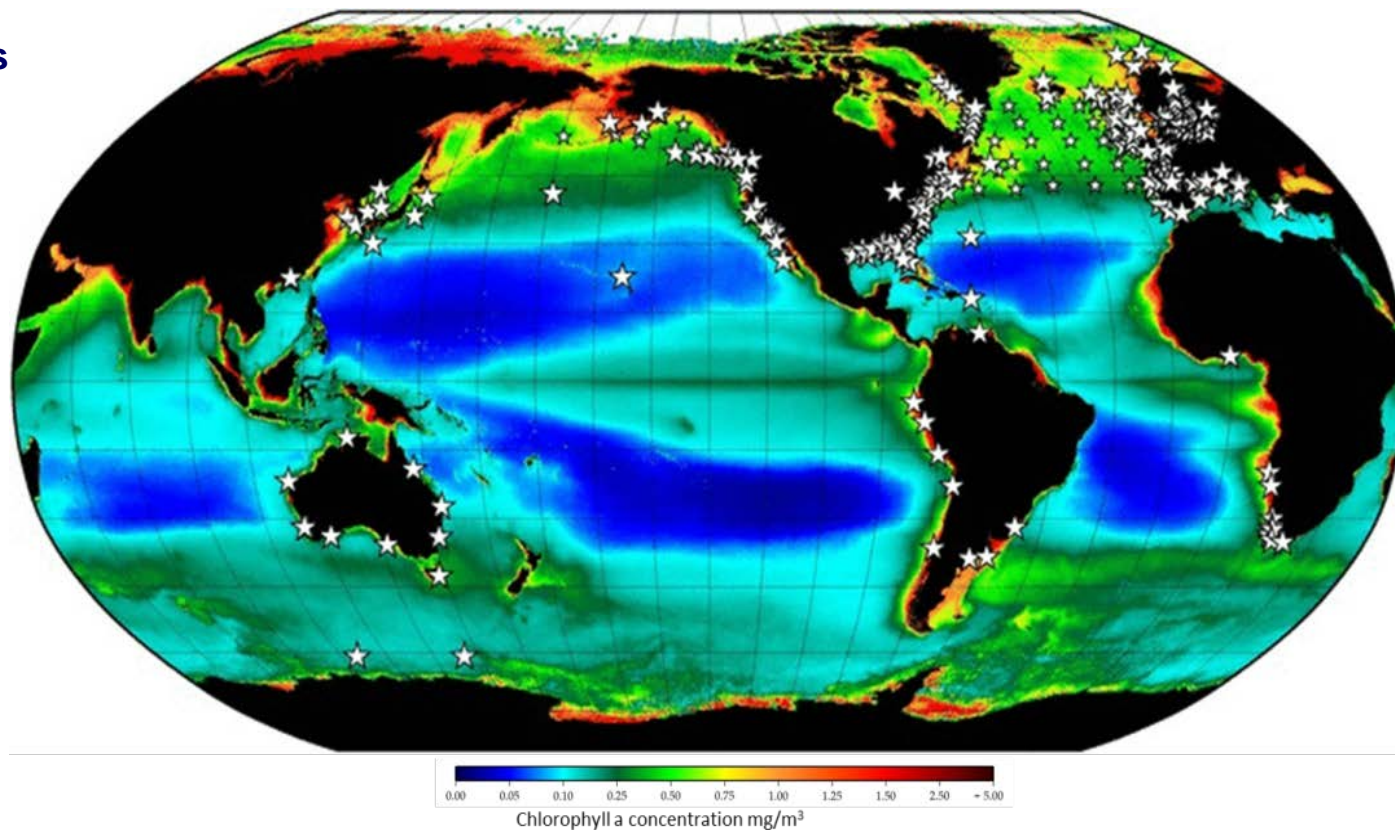
CHAPTER 3: Facilities/laboratories/ field stations

Number of institutes/facilities and universities by country represented at the following list of international conferences (more than two):



- Third International Symposium on the Ocean in a High CO₂ World, 2012, Monterey, USA;
- Second International Symposium Effects of Climate Change on the World's Oceans, 2012, Yeosu, Korea;
- Third International Symposium Effects of Climate Change on the World's Oceans, 2015, Santos, Brazil;
- Aquatic Science Meeting ASLO, 2013 New Orleans, USA;
- Aquatic Science Meeting ASLO, 2015 Granada, Spain;
- OceanObs'09, 2009, Venice, Italy

CHAPTER 3:
Key time series
sampling sites



Compilation of more than 300 ship-based marine ecological time series sites (plus about 100 estuarine sites) (©IGMETS).

Country	Papers		SI	ARC	ARIF	GI
	Score	Trend*				
United States	146,658		1.02	1.28	1.17	0.99
China	66,598		0.80	0.77	0.78	1.09
United Kingdom	44,422		1.17	1.43	1.21	0.98
Japan	36,812		1.02	0.88	0.91	1.04
Germany	32,616		0.91	1.42	1.16	1.03
France	31,408		1.18	1.36	1.15	1.05
Canada	29,162		1.36	1.33	1.17	0.91
Australia	26,696		1.81	1.36	1.16	0.98
Spain	21,798		1.31	1.24	1.13	1.01
Italy	20,703		1.02	1.12	1.08	0.99
India	16,033		0.97	0.71	0.80	0.93
Norway	13,874		3.96	1.28	1.10	0.95
Brazil	13,869		1.24	0.73	0.87	1.06
Russia	13,827		1.24	0.52	0.55	1.03
Rep. of Korea	11,983		0.84	0.83	0.90	1.15
Netherlands	11,843		1.03	1.53	1.20	0.96
Sweden	8,266		1.08	1.49	1.22	1.02
Turkey	7,540		1.00	0.85	0.87	1.06
Denmark	7,428		1.71	1.53	1.21	0.94
Mexico	7,069		1.82	0.71	0.88	0.94
Portugal	7,043		2.13	1.20	1.10	1.02
New Zealand	6,606		2.40	1.37	1.14	0.92
Belgium	6,128		0.95	1.49	1.17	1.03
Poland	6,108		0.78	0.75	0.79	1.09
Switzerland	6,023		0.72	1.90	1.31	1.16
World	520,734		1.00	1.00	1.00	0.99

CHAPTER 4: Research productivity and science impact

Ocean sciences
(all branches)
2003-2011

More than 520,000 publications in Ocean Science research are indexed in the Scopus database from 2003 to 2011

Source: Computed by Science-Metrix using the Scopus database (Elsevier).

Country	Papers		SI	ARC	ARIF	GI
	Score	Trend*				
United States	28,712		1.40	1.22	1.10	1.05
United Kingdom	8,589		1.57	1.52	1.19	1.11
China	7,810		0.66	0.72	0.77	0.96
Germany	6,621		1.29	1.39	1.14	1.06
France	5,947		1.56	1.40	1.12	1.07
Japan	4,759		0.92	0.93	0.93	1.08
Canada	4,544		1.48	1.28	1.11	0.96
Australia	4,440		2.10	1.36	1.12	1.23
Italy	3,056		1.05	1.20	1.04	1.06
Spain	2,722		1.14	1.21	1.14	1.25
Netherlands	2,297		1.39	1.57	1.16	0.99
India	2,150		0.91	0.54	0.80	0.85
Norway	1,905		3.80	1.44	1.16	1.09
Russia	1,871		1.17	0.63	0.62	1.05
Rep. of Korea	1,401		0.69	0.71	0.91	1.18
Sweden	1,334		1.22	1.43	1.15	1.18
Switzerland	1,304		1.09	1.91	1.26	1.21
Brazil	1,227		0.77	0.76	0.89	0.92
Denmark	1,164		1.88	1.55	1.17	0.99
New Zealand	970		2.46	1.37	1.11	0.91
Belgium	839		0.91	1.60	1.18	1.09
Mexico	825		1.48	0.67	0.85	0.83
Portugal	825		1.74	1.13	1.05	1.20
Poland	748		0.66	0.69	0.78	1.05
Turkey	395		0.36	0.90	0.99	1.08
World	74,541		1.00	1.00	1.00	0.97

CHAPTER 4: Research productivity and science impact

Ocean sciences: Climate change 2003-2011

About 75,000 publications are indexed in the Scopus database from 2003 to 2011

Source: Computed by Science-Metrix using the Scopus database (Elsevier).

Leading countries in microplastics marine pollution (1996–2012)

Country	Papers	Trend	ARC	ARIF	SI
United States	191		1,13	1,12	1,15
United Kingdom	77		1,33	1,19	1,75
Japan	47		1,04	0,89	1,07
China	40		0,59	0,74	0,51
Australia	36		1,04	1,19	2,25
Brazil	35		1,32	0,89	3,15
Canada	29		1,16	1,16	1,24
Germany	24		1,85	1,14	0,58
France	22		1,47	1,06	0,73
Rep. of Korea	17		0,31	0,70	1,22
South Africa	14		1,47	1,05	4,79
Italy	14		0,94	0,94	0,62
Spain	13		0,86	0,73	0,73
India	12		0,65	0,54	0,70
Netherlands	12		1,28	1,17	0,94
Greece	11		1,09	1,10	2,62
New Zealand	9		1,80	1,22	2,98
Switzerland	8		0,71	1,18	0,87
Chile	8		2,22	1,24	4,88
Sweden	8		2,02	1,50	0,90
Norway	6		3,09	1,15	1,58
Belgium	6		2,42	1,38	0,85
Turkey	6		0,33	0,63	0,83
World	578		1,00	1,00	1,00

Note: Scores in light gray are highly prone to fluctuations; please use/interpret with caution

Source: Compiled by Science-Metrix using Scopus database (Elsevier)

CHAPTER 4: Research productivity and science impact

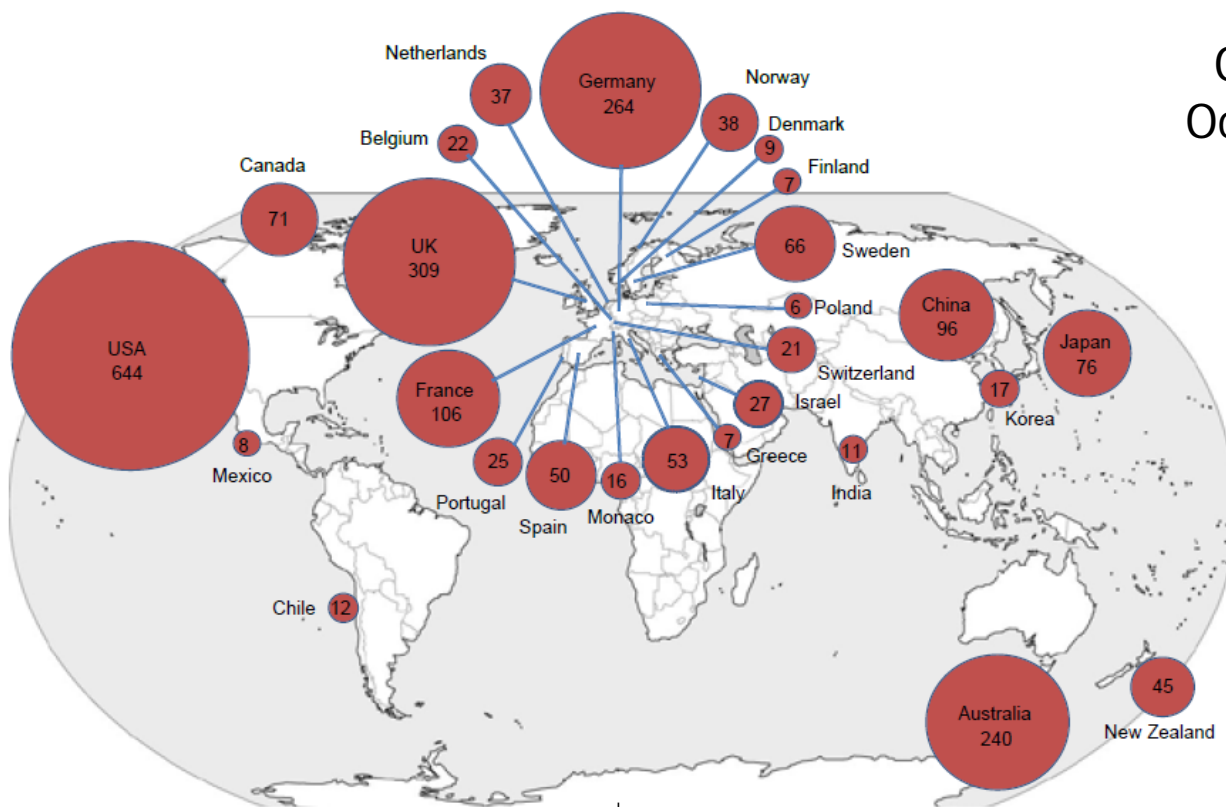
Ocean sciences: Microplastics 1996-2012

Emerging issue, only 575 publications are indexed in the Scopus database from 1996-2012, 70% of them since 2007

CHAPTER 4: Research productivity and science impact

National involvement in ocean acidification research, based on first authors' addresses for peer-reviewed papers published in 2005–2014 for countries with 5 or more ocean acidification publications.

(P. Williamson. Data from the International Atomic Energy Agency (IAEA) Ocean Acidification International Coordination Centre)

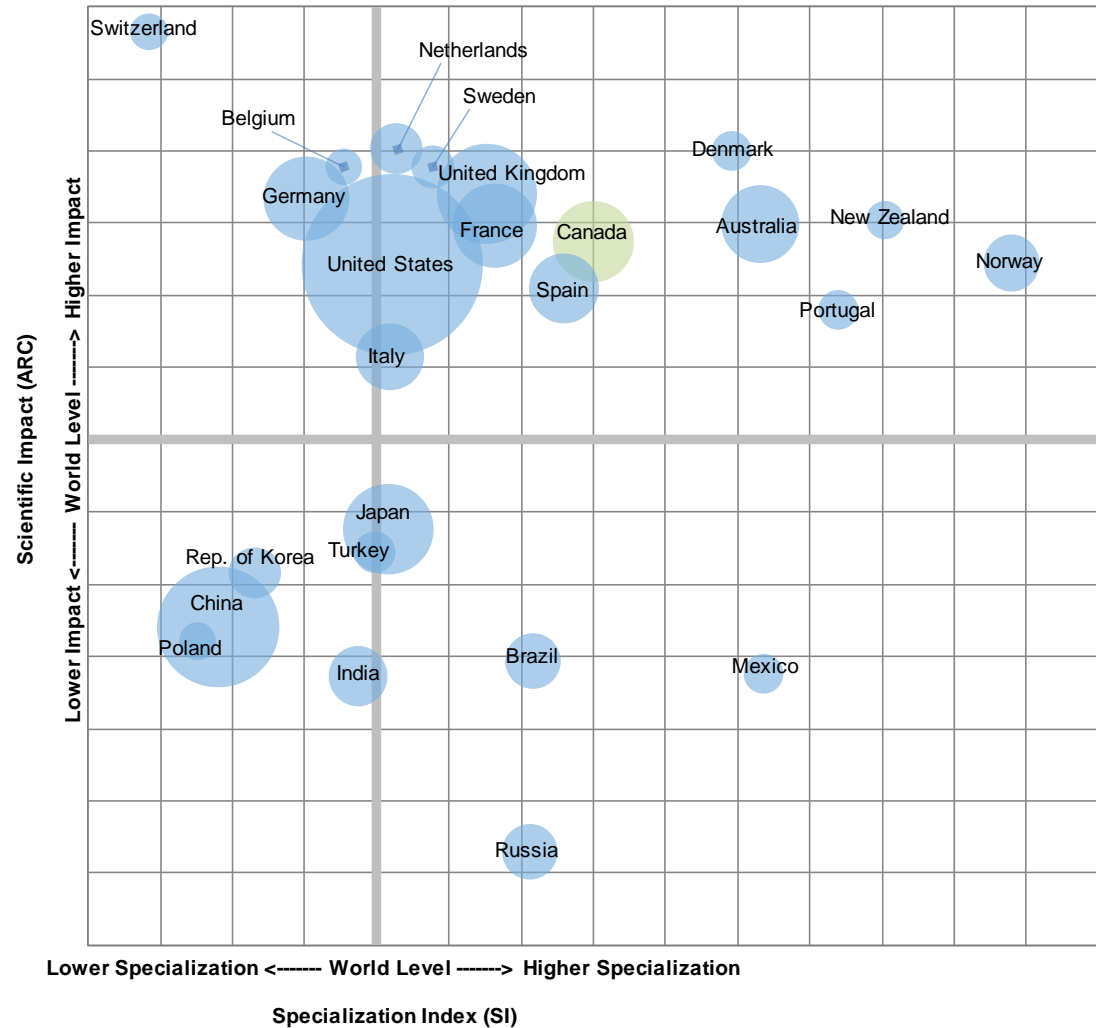


Ocean sciences:
Ocean acidification
2005-2014

CHAPTER 4: Research productivity and science impact

Positional analysis
of countries in
Ocean Science

This positional
analysis can also be
done for the
identified branches



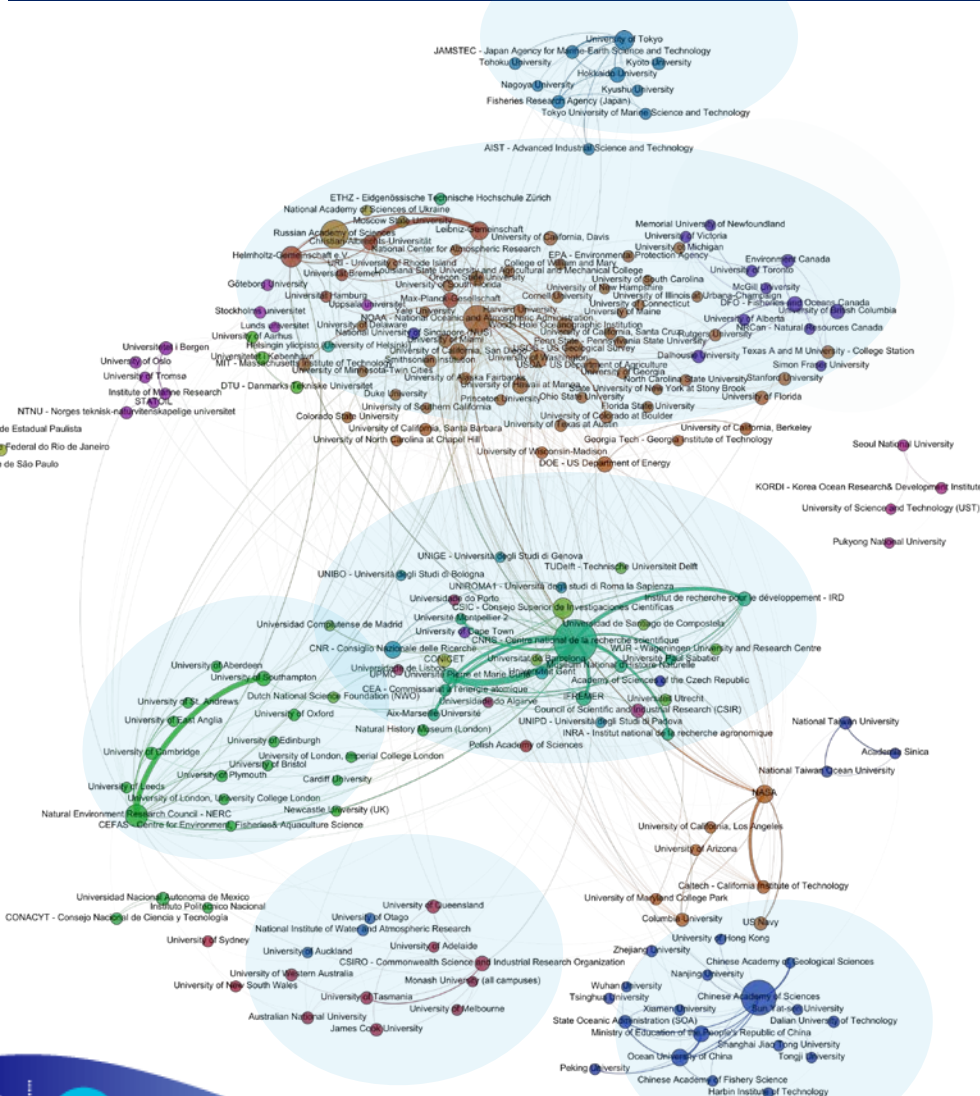
CHAPTER 4: Research productivity and science impact

Most organizations are clustered based on **geographical proximity**: American cluster, European cluster, Chinese cluster, Oceania cluster, UK cluster, Canadian cluster, etc.

The European cluster is central to the network, linking the American cluster to the Chinese and Oceania clusters

Most clusters are centered around a main hub which represents a national organization (CNRS for Europe, Chinese Academy of Science for China, NOAA for the US, etc.)

Source: Computed by Science-Metrix using the Scopus database (Elsevier).



Dates	Actions
June–July 2015	Twenty-eighth session of the IOC Assembly Call to Member States to provide funds for the GOSR
August 2015–January 2016	Analysis of received questionnaires and free of charge resources
September 2015	In case of new financial resources bibliometric analysis carried out.
December 2015	Identifying authors of the individual chapters; forming the editorial board
February–May 2016	Workshops – Lead authors convene drafting the first text elements
June 2016	Discussions by email and teleconferences with the editorial board and experts from Member States Review of the first text elements First draft presented at the 49 th Session of the IOC Executive Council
July–September 2016	Writing and improving of text elements Finalize the discussions by email and teleconferences Review of conclusions and recommendations Complete the structure of the report
September–November 2016	Finalizing the report and an executive summary
	Presentation at a relevant meeting, December 2016



GLOBAL OCEAN SCIENCE REPORT

Thank you very much for your attention!

Thanks to ScienceMetrics for providing some preliminary figures and the Member States for their support.