Belmont Forum

E-INFRASTRUCTURES & DATA MANAGEMENT
Collaborative Research Action

AtlantOS, EMSO, COOP+

Fiona Grant, International Programmes, Marine Institute

Scoping Workshop

November 28-29, 2016

ANR, Paris

ANR AGENCE NATIONALE DE LA RECHERCHE

BELMONT FORUM

AtlantOS

The vision of AtlantOS is to improve and innovate Atlantic observing by using the Framework of Ocean Observing to obtain an international, more sustainable, more efficient, more integrated, and fit-for-purpose system. Hence, the AtlantOS initiative will have a long-lasting and sustainable contribution to the societal, economic and scientific benefit arising from this integrated approach. This will be achieved by improving the value for money, extent, completeness, quality and ease of access to Atlantic Ocean data required by industries, product supplying agencies, scientist and citizens.

The overarching target of the AtlantOS initiative is to deliver an advanced framework for the development of an integrated Atlantic Ocean Observing System that goes beyond the state-of–the-art, and leaves a legacy of sustainability after the life of the project.

european
multidisciplinary
seafloor & water-column
observatory

emso

The European Multidisciplinary Seafloor and water-column Observatory (EMSO) is a large scale, distributed, marine Research Infrastructure (RI).

EMSO consists of ocean observation systems for long-term, high-resolution, (near) real-time monitoring of environmental processes including natural hazards, climate change, and marine ecosystems. EMSO observatory nodes have been deployed at key sites around Europe, from the Arctic to the Atlantic, through the Mediterranean, to the Black Sea.

http://oceanobservatories.org/data/

46.pdf - Adobe Acrobat Pro

File Edit View Window Help

Open Create Customize

1 / 4 100% Tools Fill & Sign Comment

Martech 2016.
Marine Technology Workshop
26,28th October. Barcelona, Spain

Architecting the Cyberinfrastructure for the National Science Foundation Ocean Observatories Initiative (OOI)

Ivan Rodero[1] and Manish Parashar[2]

[1] *Rutgers Discovery Informatics Institute (RDI²), New Brunswick, NJ, USA, irodero@rutgers.edu*
[2] *Rutgers Discovery Informatics Institute (RDI²), New Brunswick, NJ, USA, parashar@rutgers.edu*

Abstract – **The NSF Ocean Observatories Initiative (OOI) is a networked ocean research observatory with arrays of instrumented water column moorings and buoys, profilers, gliders and autonomous underwater vehicles (AUV) within different open ocean and coastal regions. OOI infrastructure also includes a cabled array of instrumented seafloor platforms and water column moorings on the Juan de Fuca tectonic plate. This networked system of instruments, moored and mobile platforms, and arrays will provide ocean scientists, educators and the public the means to collect sustained, time-series data sets that will enable examination of complex, interlinked physical, chemical, biological, and geological processes operating throughout the coastal regions and open ocean.**

The seven arrays built and deployed during construction support the core set of OOI multidisciplinary scientific instruments that are integrated into a networked software system that will process, distribute, and store all acquired data. The OOI has been built with an expectation of operation for 25 years.

– the focus on expeditionary science is shifting to a permanent presence in the ocean. As technological advances continue over the lifetime of the OOI, developments in sensors, computational speed, communication bandwidth, Internet resources, miniaturization, genomic analyses, high-definition imaging, robotics, and data assimilation, modeling, and visualization techniques will continue to open new possibilities for remote scientific inquiry and discovery.

The OOI is funded by the National Science Foundation and is managed and coordinated by the OOI Program Office at the Consortium for Ocean Leadership (COL), in Washington, D.C. COL is leader, owner, and operator of the OOI and its infrastructure. Implementing Organizations (IOs), subcontractors to COL, are responsible for construction and development of the different components of the program. Woods Hole Oceanographic Institution is responsible for the Coastal

coop+
Promoting
collaboration among RIs

COOPEUS

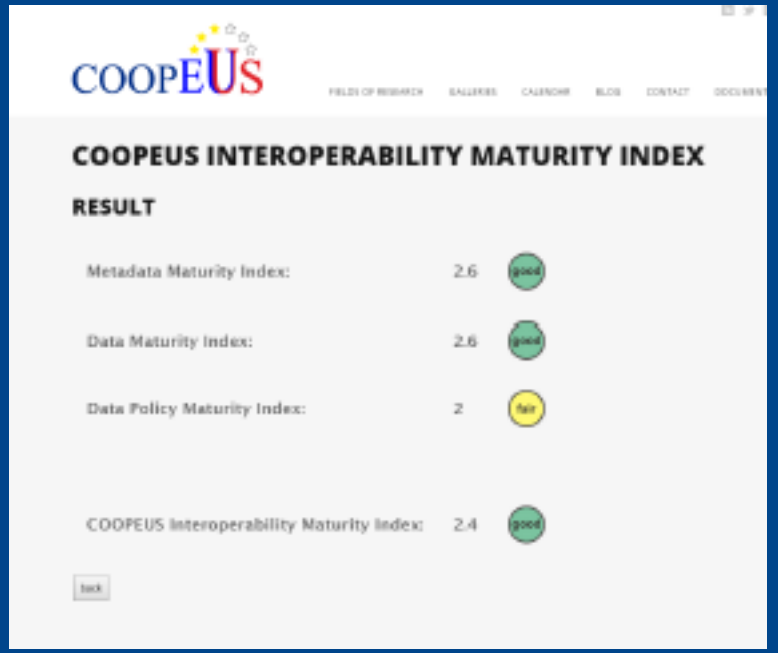
COOP+ (Cooperation of Research Infrastructures to address global challenges in the environmental field) is an Horizon 2020 project whose goal is to strengthen the links and coordination of the European RIs related to Marine Science (EMSO), Arctic and Atmospheric Research (EISCAT), Carbon Observation (ICOS) and Biodiversity (LifeWatch) with international counterparts (NEON, TERN, AMISR/SRI, CGSM, OOI, INPA/LBA, IMOS, OCN, AMERIFLUX, etc.) and to leverage international scientific cooperation and data exchange with non-EU countries.

COOPEUS Interoperability Maturity Index (Space Weather, Carbon Observatories, Ocean Observatories, Solid Earth Dynamics and Biodiversity)

COOPEUS joint data policy

Common metadata standards

Common data standards



E-INFRASTRUCTURES & DATA MANAGEMENT

WP7 Data flow and data integration

- Provide leadership for Europe in implementing GEOSS
- Integrate standardised in-situ key marine observations
- Improve modelling outputs and reduce cost of data collection in support of ocean-related industrial and societal activities
- Contribute to make better informed decisions and documented processes within key sectors
- Improve the implementation of European maritime and environmental policies
- Enhance the knowledge base necessary to cope with global challenges

European “Standard” Framework to generate products out of observations

Information: Value Adding Knowledge Chain

Data Providers

Intermediate Data Providers & Users

Downstream Providers & Users

Input

Generic

User Customised Products & Services

Copernicus Satellite Systems

AtlantOS

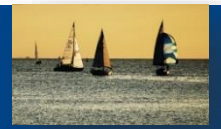
EuroGOOS
IBIROOS
Argo
MONGOOS
NOOS
BOOS
Artic GOOS
Black Sea GOOS
Ocean Sites
MS in-situ networks
SeaDataNet
EMODnet
WISE marine
GO-SHIP
ICES fishery services

Services
CMEMS MCS
SeaDataNet
EMODnet

1 = Global
2 = Artic
3 = Baltic
4 = NWS
5 = IBI
6 = Med Sea
7 = Black Sea

Downstream Services

AtlantOS



E-INFRASTRUCTURES & DATA MANAGEMENT

AtlantOS - Strategies, methods and new technologies for a sustained and integrated autonomous in-situ observing system for the Atlantic – a joint AtlantOS–AORA workshop

- Encourage full meta data delivery with all data sets and to establish and promote the use standard descriptors to allow best data harvesting
- Include to the EOVs discussion issues such as metrology, data compression, comparison of performance and establish review criteria

E-INFRASTRUCTURE AND DATA MANAGEMENT ISSUES

https://www.coopeus.eu/wp-content/uploads/2015/10/D8.4-COOPEUS_roadmap-2-version-for-EC-submission.pdf

"As challenges to foster interoperability among different information and knowledge systems are **not limited to the data itself**, but also activities such as **education and training, trust and community building** (changing culture) are equally relevant for achieving the set COOPEUS strategic goals. Therefore, we have conceptualized needed actions in following themes: data and technological capital, human capital, cultural capital, organisational framework and outreach. Our ability to address each of our strategic goals relies on **integrating the respective technical, cultural and human needs and resources**."

E-INFRASTRUCTURE AND DATA MANAGEMENT ISSUES

Strategic Goal 1: Removing technical, scientific, cultural and geopolitical barriers for data use

Finding 1: Common description of data systems
Finding 2: Collaborative advancement on Standards and Metrology
Finding 3: Supporting the common data licenses following Creative Commons standards
Finding 4: Long-term preservation and certification of Research Infrastructure Data Centers

Strategic Goal 2: Coordinating the flow, integrity and preservation of information

Finding 5: Advance the use of standard methodologies for use of Persistent Identifiers
Finding 6: Creating interoperable Quality Assurance and Quality control (QA/QC) Methodologies
Finding 7: Develop, promote sound, and execute defensible Data Management plans and archival guidelines

Strategic Goal 3: Engaging and enabling both bottom-up (user) and top-down (directives) communities – Human, cultural and institutional frameworks

Finding 8: Training of Research Infrastructure users
Finding 9: Training of staff and staff exchange
Finding 10: Citizen Science
Finding 11: Communication strategy

E-INFRASTRUCTURE AND DATA MANAGEMENT ISSUES

Strategic Goal 3: Engaging and enabling both bottom-up (user) and top-down (directives) communities – Human, cultural and institutional frameworks (Continued)

Finding 12: Building common language and creating culture of open science

Finding 13: Ethical perspectives of the data

Finding 14: Common long-term COOPEUS platform

Finding 15: Expansion of collaborative work and governance structure beyond Europe-US

Strategic Goal 4: Contribute to address evolving societal and scientific needs by providing information on Earth System – Implementing Scientific Field-Specific COOPEUS Use Cases

Finding 16 Use Case: Harmonization of Tsunami Data and Warning Processes

Finding 17 Use Case: Expansion of federated services beyond Europe-US (Solid Earth)

Finding 18 Use Case: Data – Model Fusion by linking the temporal information embedded in local-to-regional phenology (Biodiversity) to advance Ecosystem Production Model Fidelity (Carbon)

EXPECTATIONS

ATLANTIC OCEAN RESEARCH ALLIANCE

THE ATLANTIC:
OUR SHARED RESOURCE
MAKING THE VISION REALITY

- Any form of synchronized, internationally-coordinated funding is enormously helpful
- Certain amount of collaboration already being undertaken in AtlantOS and EMSO on data (and also Argo & Euro-Argo)
- Substantial investments in Canada in relation to Ocean Networks Canada and the relatively recent award for the Ocean Frontier Initiative
- Atlantic Ocean Research Alliance (~€120m EC funding for Atlantic related research projects to date)
- Build on existing investments and consortia whilst expanding partnership internationally. (Series of dedicated workshops on ocean data capture and integrated information technology tools between major ocean obs RIs?)

ACKNOWLEDGEMENTS

Martin Visbeck & Anja Reitz (AtlantOS)
Paolo Favali & Richard Lampitt (EMSO & FixO3)
Sanna Sorvari, Christoph Waldmann, Robert Huber (COOPEUS)

Hank Loescher (NEON); Christopher Lenhardt (RENCI); Chuck Meertens (UNAVCO); Tim Ahern (IRIS) – COOPEUS Strategic Cooperation Board

EMSO Grant Agreement 211816 (FP7) & EMSO-Dev, EMSO-Link (H2020)
COOPEUS Grant agreement 312118 (FP7)
AtlantOS Grant Agreement 633211 (H2020)
US National Science Foundation awards to NEON