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bco-dmo.org



## INTRODUCTION

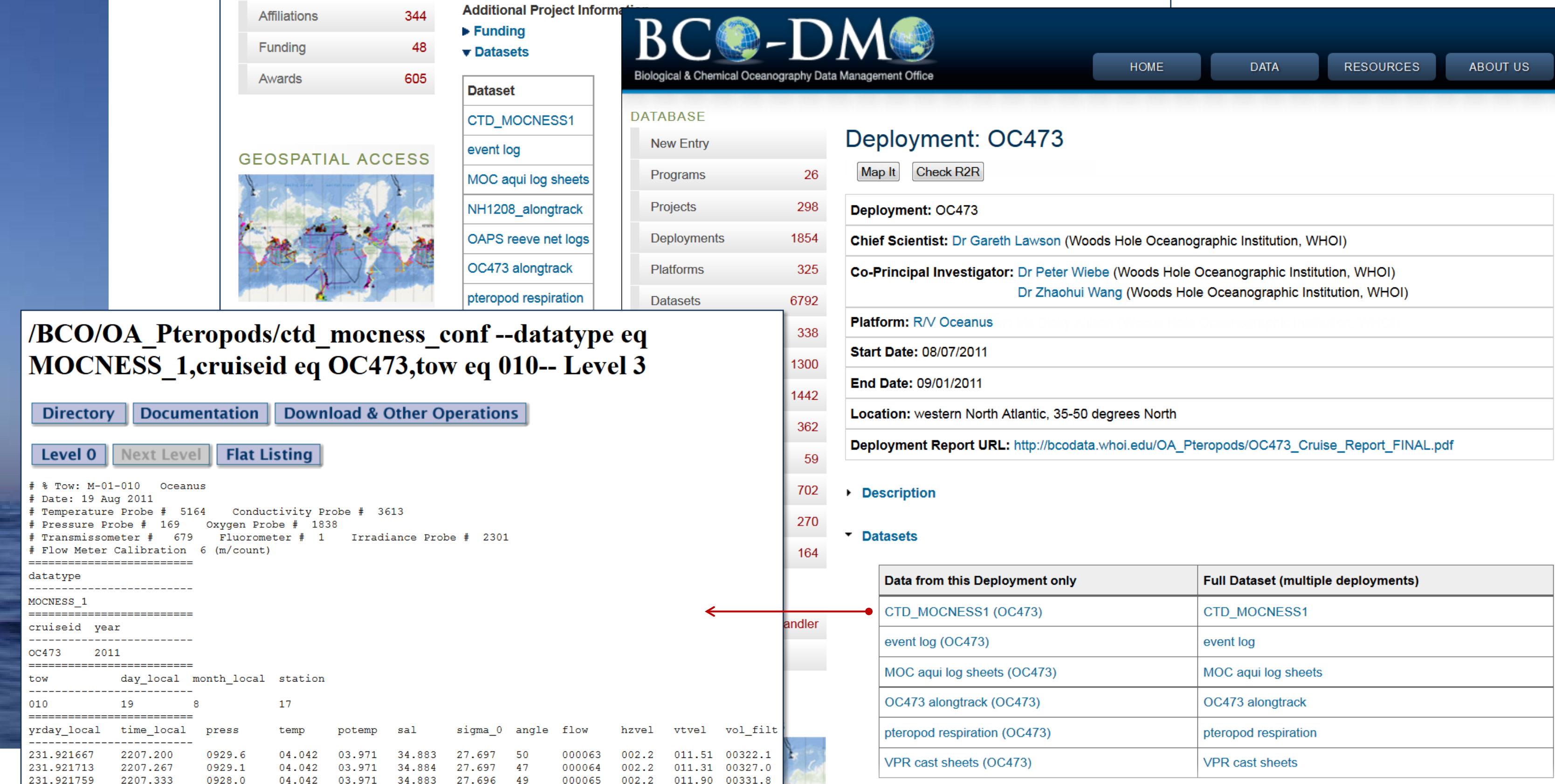
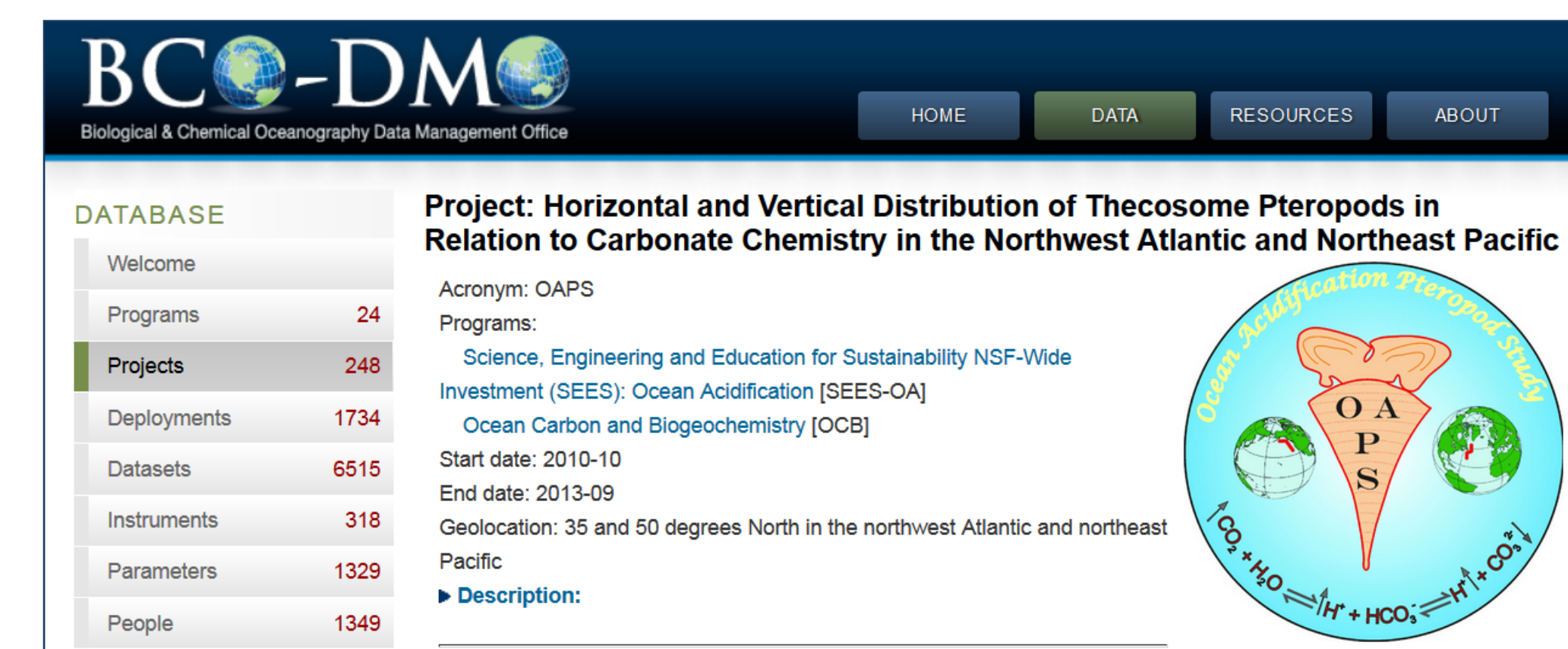
Oceanographic research is an interdisciplinary field of study that generates and requires access to a wide variety of measurements. In late 2006 the Biological and Chemical Oceanography Sections of the National Science Foundation (NSF) Geosciences Directorate Division of Ocean Sciences (OCE) funded the Biological and Chemical Oceanography Data Management Office (BCO-DMO). In late 2010 additional funding was contributed to support management of research data from the NSF Office of Polar Programs (PLR) Antarctic Organisms & Ecosystems Program (ANT). The BCO-DMO is recognized in the 2011 Division of Ocean Sciences Sample and Data Policy as one of several program-specific data offices that support NSF OCE funded researchers and was accepted in 2013 as an Associate Data Unit of the UNESCO/IOC International Oceanographic Data and Information Exchange.

The BCO-DMO data system accommodates many different types of ocean science data including: in situ and experimental biological, chemical, and physical measurements; modeling results and synthesis data products. The system enables reuse of oceanographic data for new research endeavors, supports synthesis and modeling activities, provides "real data" for classroom use, and provides decision-support field data for policy-relevant activities. NSF-funded ocean science researchers in the U.S. have been contributing data from recently funded projects to the BCO-DMO data system, and it has evolved into a rich repository of data from ocean, coastal and Great Lakes research programs.

BCO-DMO staff members work in partnership with NSF-funded investigators from large national programs and medium-sized collaborative research projects, as well as researchers from single investigator awards to ensure that data resulting from their respective research projects are archived at the appropriate U.S. National Data Center. Support is provided at no charge to projects funded by OCE Biology or Chemistry or PLR ANT and available to other investigators for a fee. Data management activities at BCO-DMO span the full spectrum of the data life cycle, enabling discovery and accurate re-use and ensuring long-term permanent archive of the data that are an important component of a researcher's legacy.

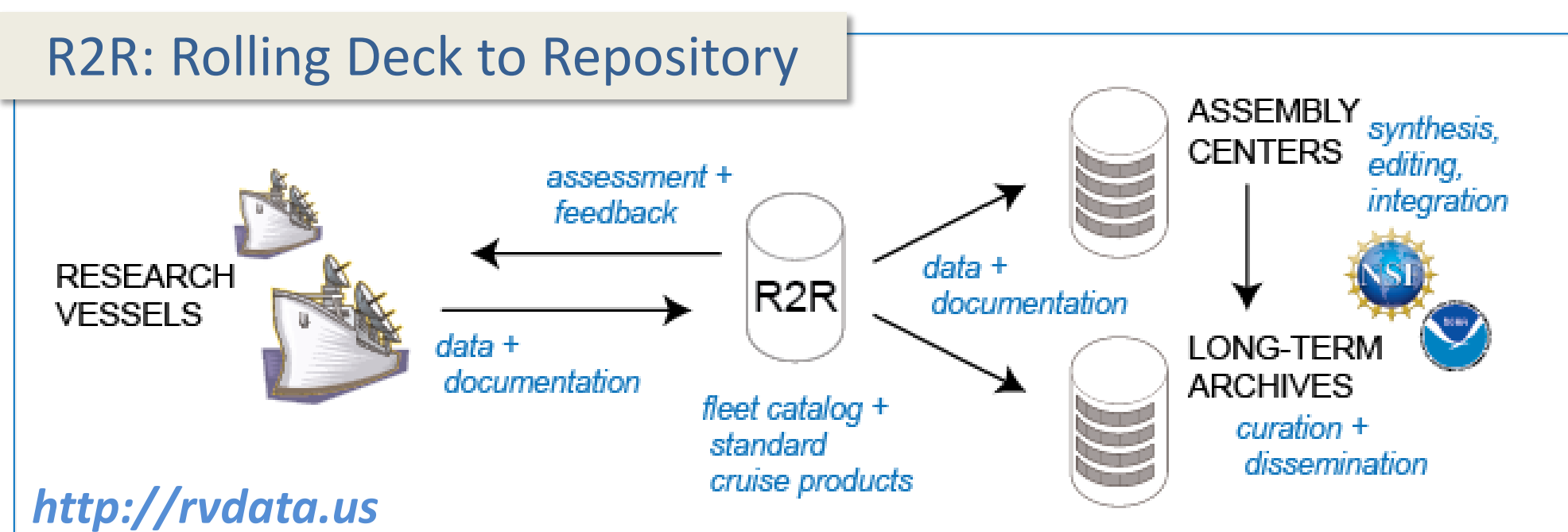
BCO-DMO staff members work on several synergistic research projects, the results of which will enhance data discoverability and access. The BCO-DMO data system has been improved recently through integration of Semantic Web technologies that help connect BCO-DMO managed data with complementary data and resources in other repositories. Collaborative projects that explore new technologies are done in close partnership with groups that support other research communities, thus helping to integrate distributed data repositories and to build a valuable knowledge network.

BCO-DMO has worked in partnership with NSF funded investigators to build a community resource of ocean research data from cruises, laboratory experiments, synthesis and modelling efforts.

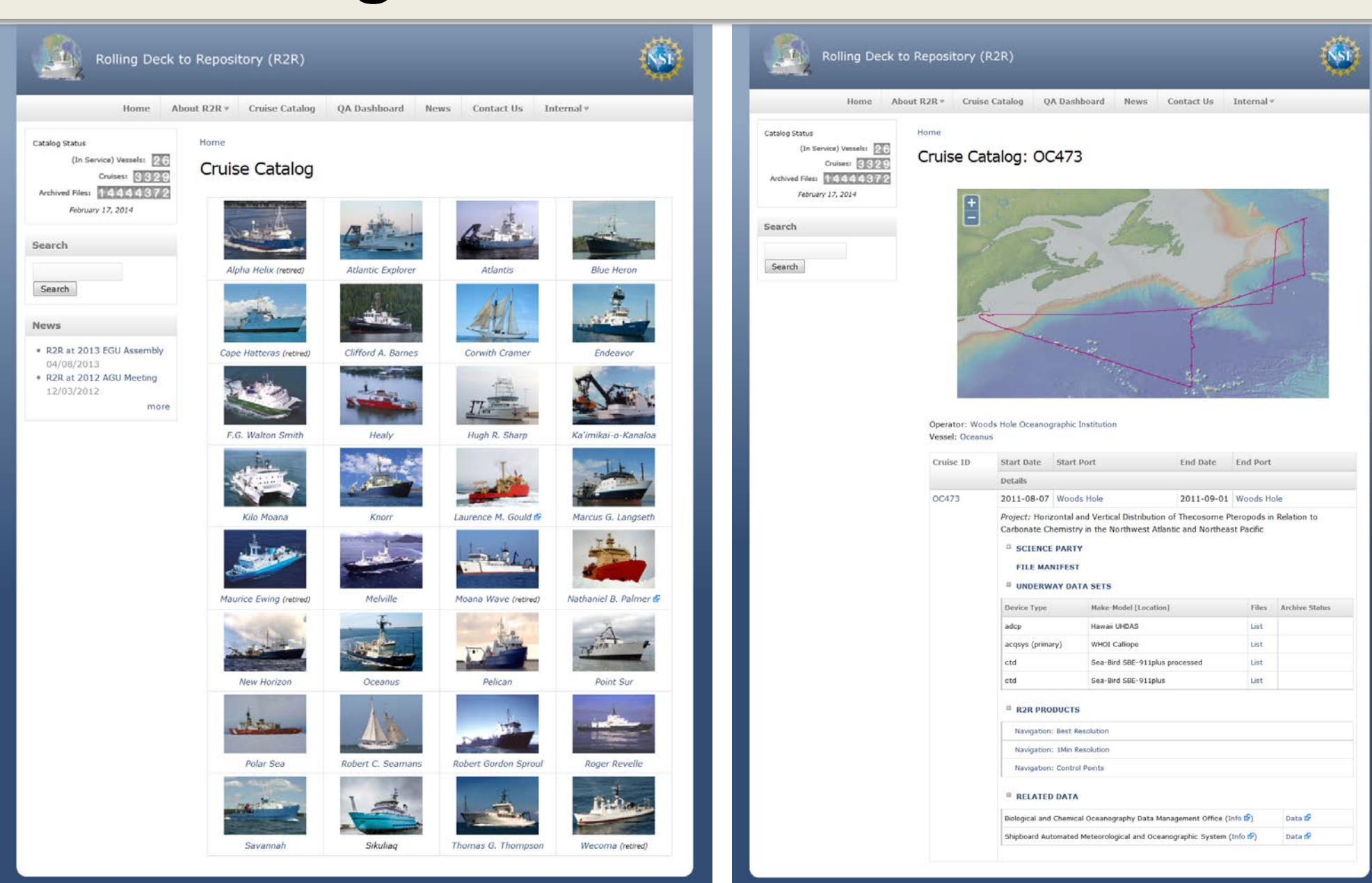


documentation recorded for projects and cruises provides context for complex data

A variety of Semantic Web technologies recently integrated into the existing BCO-DMO architecture contribute to improved data discovery and access.



R2R catalog of U.S. academic fleet cruises



BCO-DMO and R2R use Linked Data to exchange resources curated at each of the repositories.

5 Star Linked Data

★ Make your stuff available on the Web (whatever format)

★★ Make it available as structured data (e.g. Excel instead of an image scan)

★★★ Non-proprietary format (e.g. CSV instead of Excel)

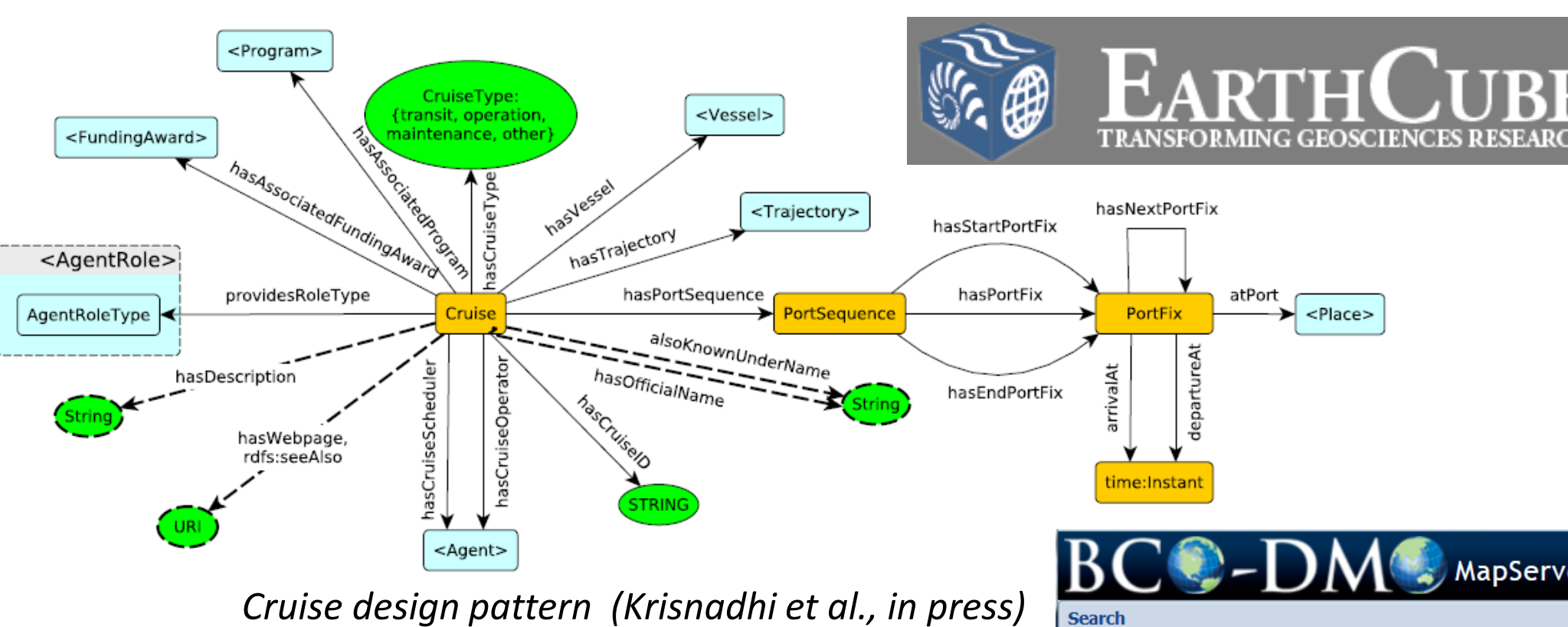
★★★★ Use URLs to identify things, so people can point at your stuff

★★★★★ Link your data to other people's data to provide context

(Bizer, Heath, Berners-Lee, 2009; 10.4018/jswis.2009081901)

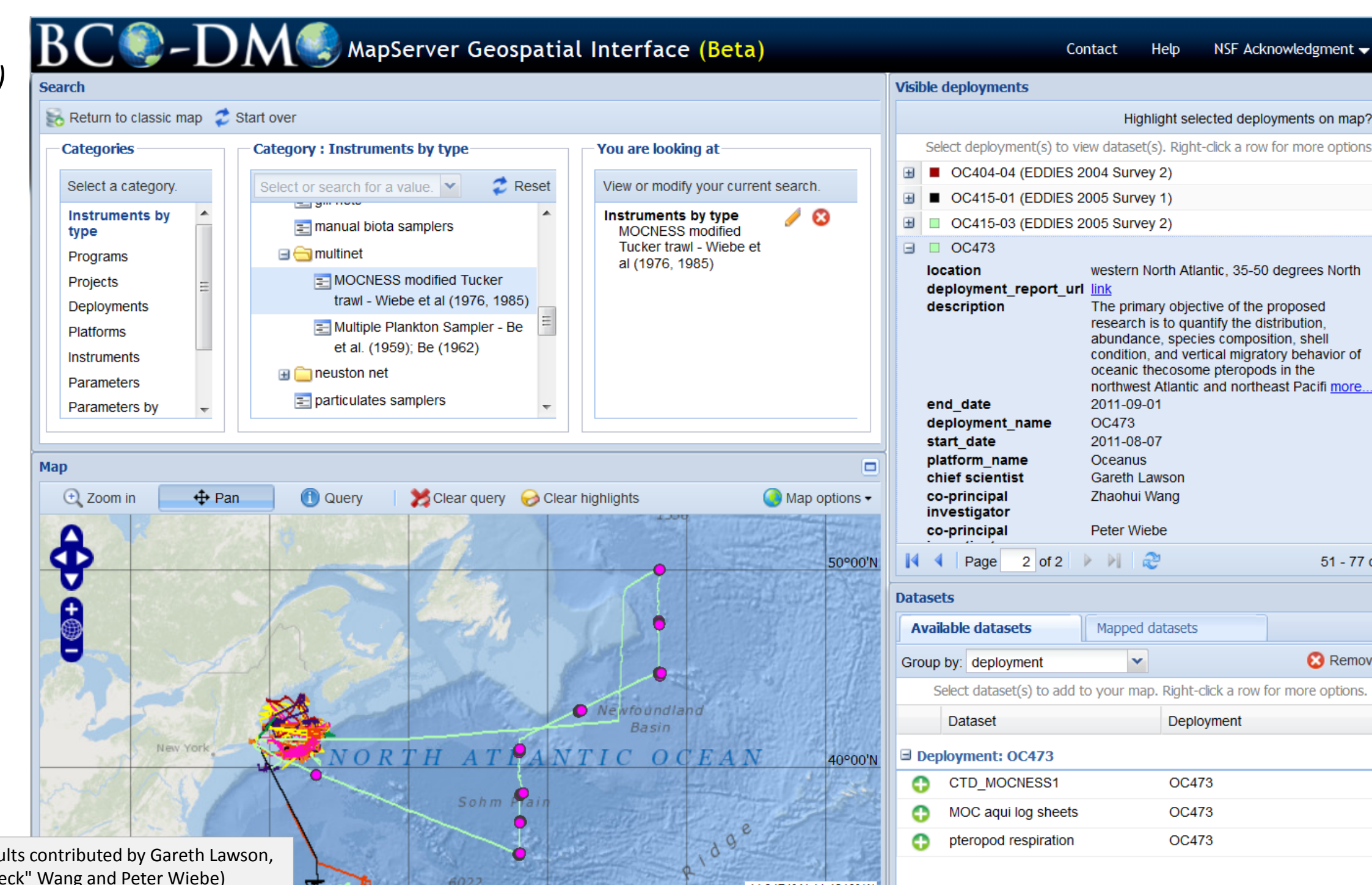
cruise metadata, quality controlled navigation data, links to original, raw underway data

links to post-cruise processed data, project documentation and additional results



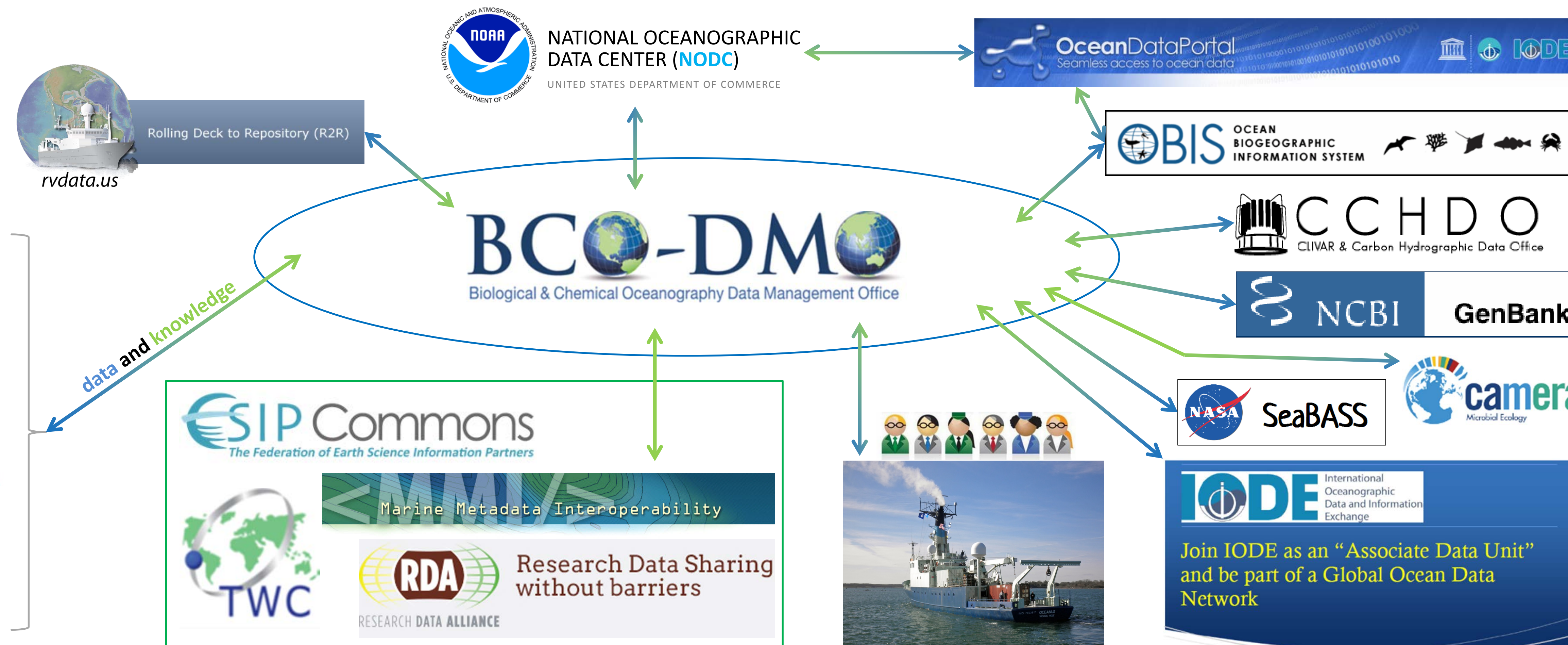
Cruise design pattern (Krisnadi et al., in press)

BCO-DMO and R2R federate controlled vocabulary term lists (e.g. instruments) using the NERC Vocabulary Server (NVS 2.0; Leadbetter, 2013).



BCO-DMO uses Semantic Web technologies to enhance search interfaces for improved data discoverability and access.

Increased data and knowledge exchange is fostered through collaborative partnerships with national and international organizations.



## ACKNOWLEDGEMENTS

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