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Towards Linked Data for Oceanographic Science: The R2R Eventlogger Project, Controlled Vocabularies, and Ontologies at The MBLWHOI Library

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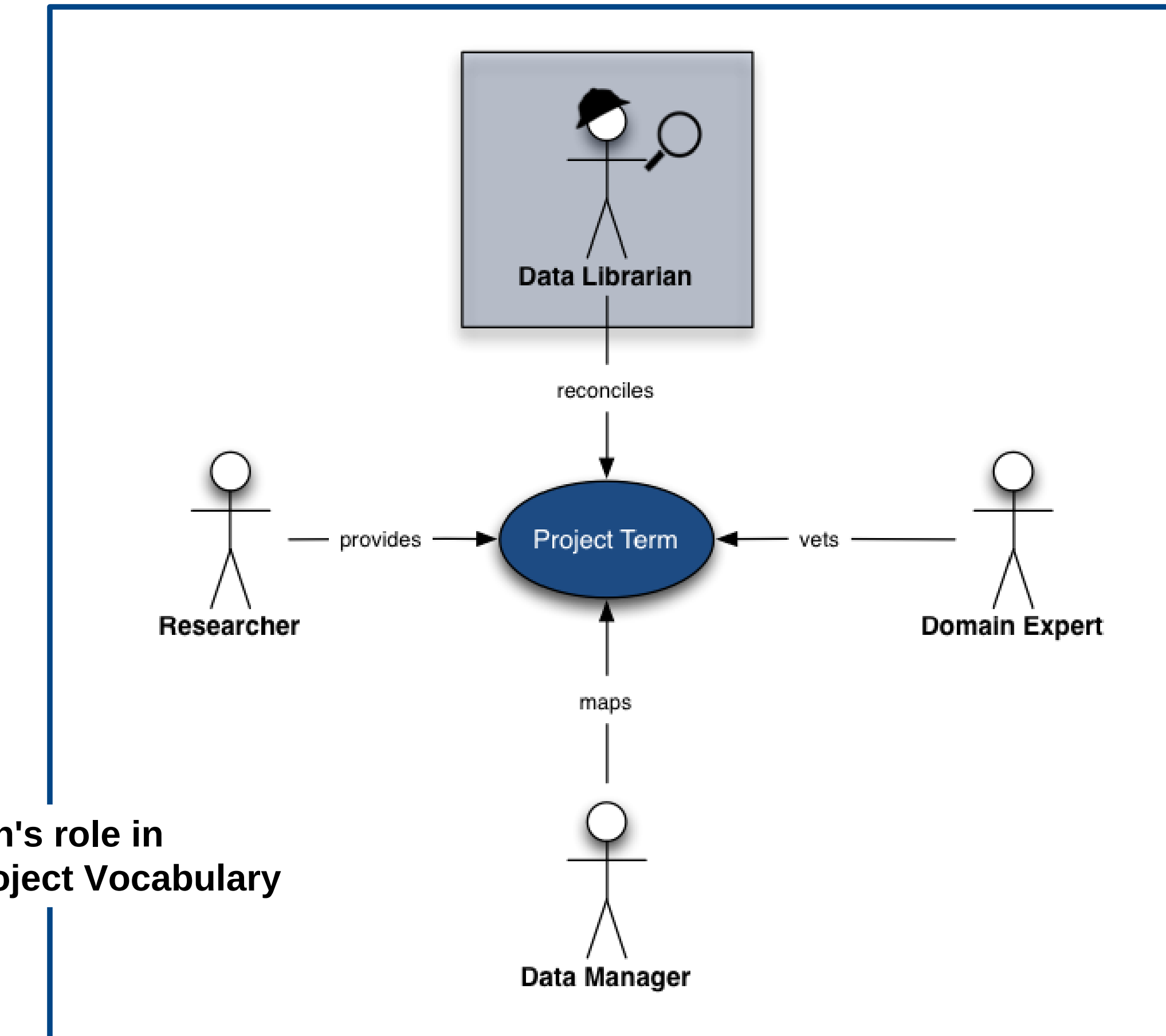
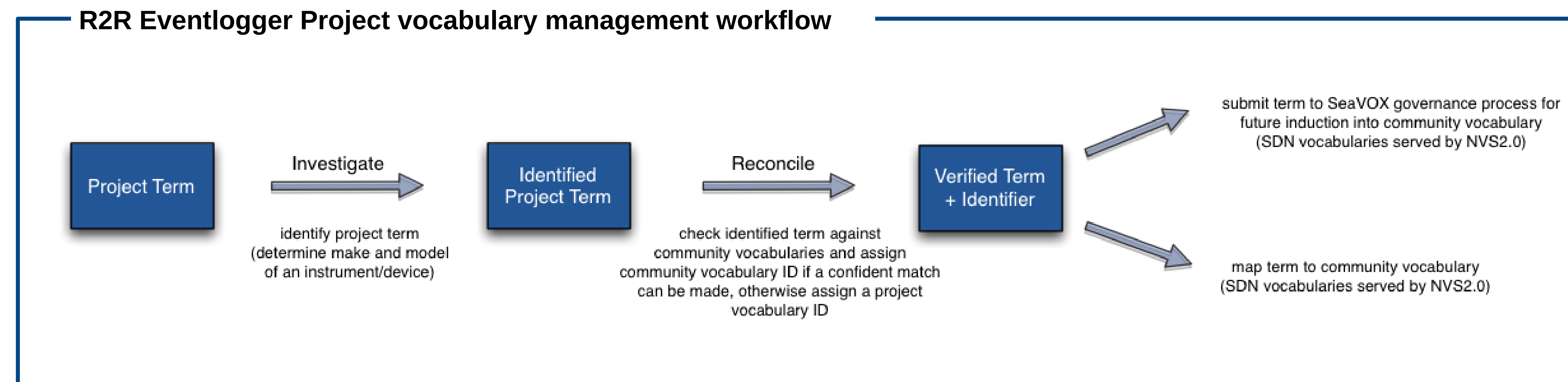
Towards Linked Data for Oceanographic Science: The R2R Eventlogger Project, Controlled Vocabularies, and Ontologies at The MBLWHOI Library

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Objectives

Research vessels coordinated by the United States University-National Oceanographic Laboratory System (US-UNOLS) collect data which are considered important oceanographic science research products. The NSF-funded Rolling Deck to Repository (R2R) project aims to improve access to these data and diminish barriers to their use. One aspect of the R2R project has been to develop a shipboard scientific event logging system, Eventlogger, which incorporates best practice guidelines, controlled vocabularies, a cruise metadata schema, and a scientific event log. Eventlogger facilitates the eventual ingestion of datasets into oceanographic data repositories for subsequent integration and synthesis by investigators. The careful use of controlled vocabularies and ontologies is an important feature of this system, as the use of internationally-informed, consensus-driven controlled vocabularies will make datasets more interoperable, discoverable and reusable as well as facilitate linking. The R2R Eventlogger project is led by Woods Hole Oceanographic Institution (WHOI), and the management of the controlled vocabularies is led by the Data Librarian in the Marine Biological Laboratory/Woods Hole Oceanographic Institution (MBLWHOI) Library.



The MBLWHOI Data Librarian's role in managing the R2R Eventlogger Project Vocabulary

Methods

The first target vocabulary is one for oceanographic instruments. Management of this vocabulary has consisted thus far of reconciling project vocabulary terms with the more widely used community vocabularies served by the NERC Vocabulary Server v2.0 (NVS2.0): terms included in the SeaDataNet Device Catalogue (L22) and the SeaDataNet Device Category vocabularies (L05). Rather than adopt existing community terms, it is more often the case that local terms are mapped by the Data Managers in the NSF-funded Biological and Chemical Oceanographic Data Management Office (BCO-DMO) to community terms, which preserves any important information and meaning investigators impart through the process of assigning these local terms, and has less impact on researchers. New terms, those that cannot be mapped to the existing community vocabularies (often custom, or modified instruments) are submitted for review to the SeaVOX governance process for addition to the community vocabularies. These vocabularies and their mappings are an important part of the aforementioned Eventlogger system. Before a research cruise, investigators configure the instruments they intend to use for their science activities. The instruments available for selection are provided by the MBLWHOI Data Librarian, who curates UNOLS ship-specific lists of standard shipboard instruments using terms for instruments from the R2R Eventlogger Project Vocabulary. Non-standard shipboard instruments a researcher or investigator wishes to use can also be added, and these instrument terms will eventually be inducted into the R2R Eventlogger Project Vocabulary.

Results

The vocabulary for oceanographic instruments is currently being vetted locally by a domain expert, and the Eventlogger application is currently being tested across the UNOLS fleet. A large submission of suggested instrument terms to the SeaDataNet community listserv will follow. New tools for facilitating the management, mapping, and use of these controlled vocabularies are being developed, and new projects with eager partners are envisioned. Ideas for future controlled vocabularies for the ocean science community include: Cruise IDs, Persons, and Ships.

Conclusions

The promotion and use of controlled vocabularies and ontologies will pave the way for linked data in oceanographic science. By mapping local terms to authoritative and community-accepted terms, links are created whereby related datasets can be better discovered, and utilized. Librarians have an established history of working with controlled vocabularies and metadata. Libraries (have and will continue to) serve as centers for information discovery as well as a natural home for the management of standards.

References

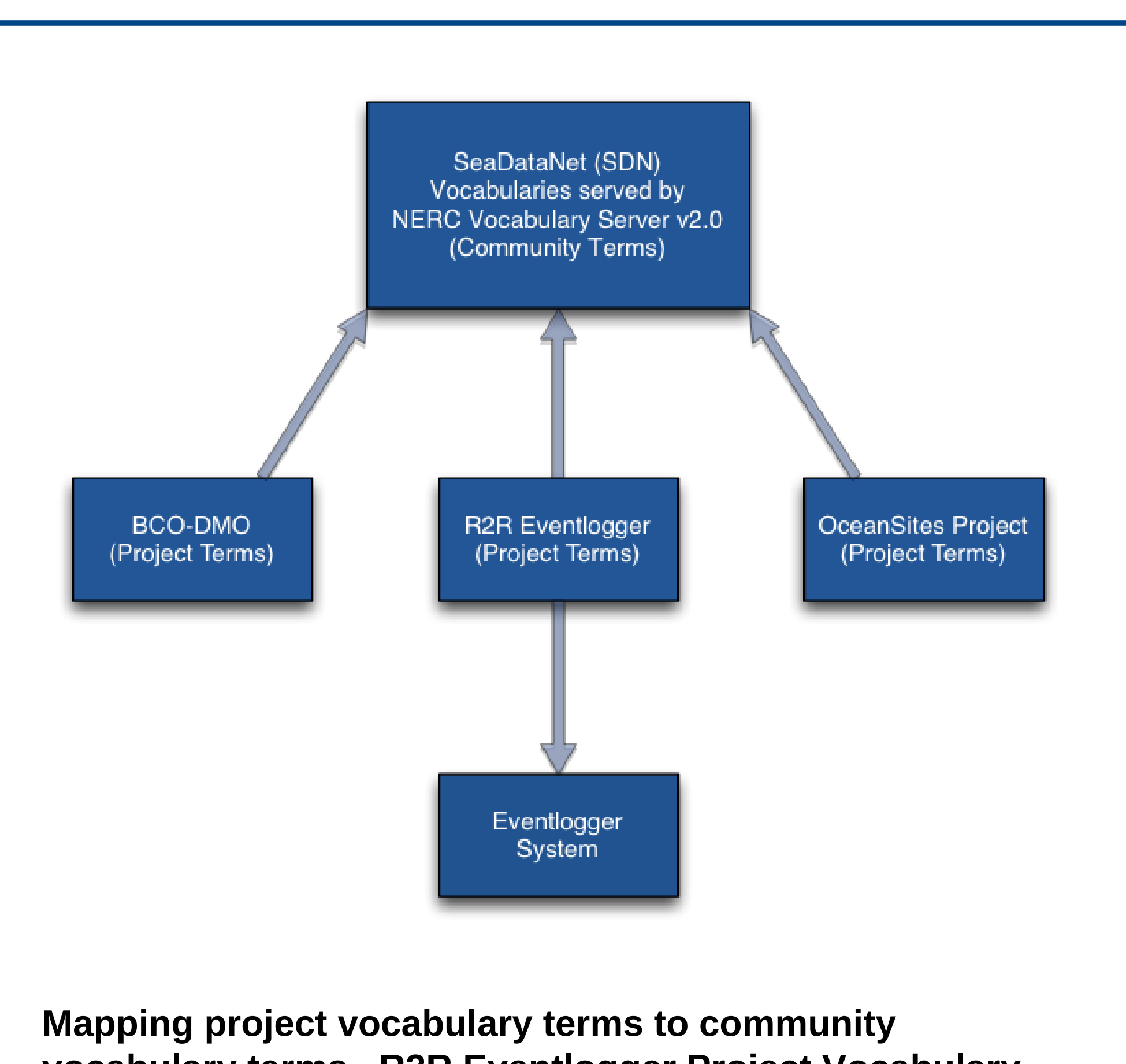
Maffei, Andrew R., Cynthia L. Chandler, Janet Fredericks, Nan Galbraith, Laura Stolp. Rolling Deck to Repository (R2R): A Controlled Vocabulary and Ontology Development Effort for Oceanographic Research Cruise Event Logging. EGU2011-12341. Poster presented at the 2011 EGU Meeting.

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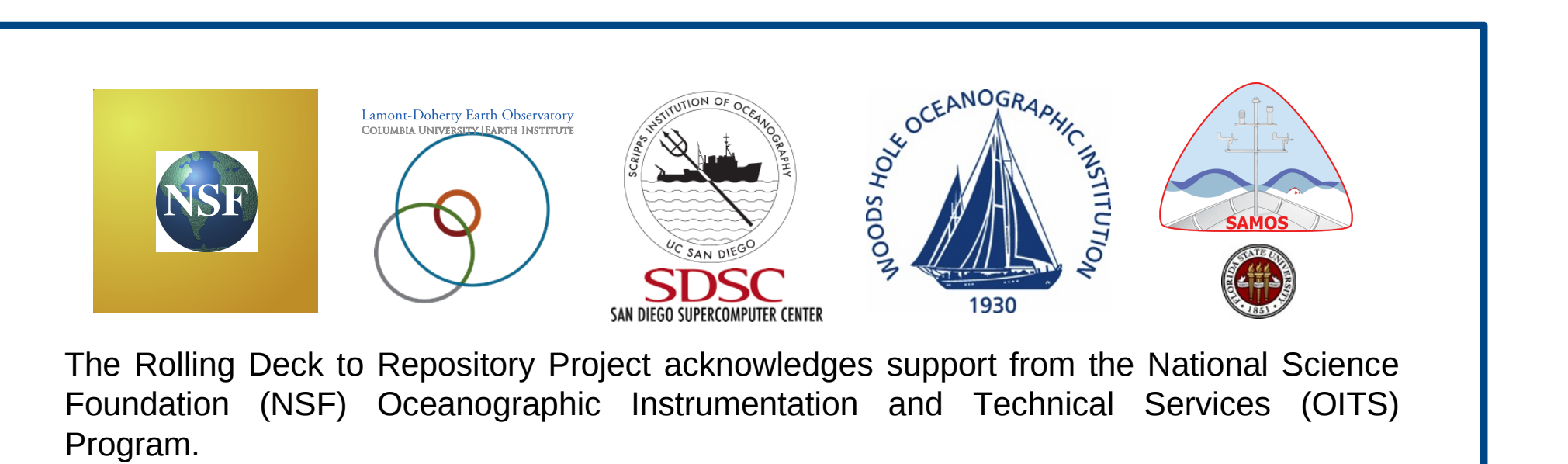
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Mapping project vocabulary terms to community vocabulary terms. R2R Eventlogger Project Vocabulary terms are mapped up to SeaDataNet Device Category terms (L05) and SeaDataNet Device Catalogue terms (L22), both are served by the NERC Vocabulary Server v2.0 (NVS2.0). Eventlogger Project terms are used in the R2R Eventlogger System.

R2RUse	DeviceID	DeviceTerm	DeviceCatID	DeviceCatTerm	DefaultInstrumentTerm
51	L221/TOOL0262	Lockheed Martin Sippican T-6 XBT probe	L05/132	bathythermographs	XBT
52	L221/TOOL0263	Lockheed Martin Sippican T-7 XBT probe	L05/132	bathythermographs	XBT
53	R2RE/9040	Lockheed Martin Sippican XBT Fast Deep probe	L05/132	bathythermographs	XBT
54	R2RE/9023	magnetometer r2r_devtype	L05/159	magnetometers	Magnetometer
55					
56	1 TOOL0474	Marine Magnetics SeaSPY Marine Magnetometer	L05/159	magnetometer	SeaSPY magnetometer
57	R2RE/1023	Marine Mammal Observer	L05/91	observers	ObserverMammals
58	R2RE/1014	Mast Camera	L05/311	cameras	mastCamera
59	R2RE/9024	metastation r2r_devtype	L05/102	meteorological packages	Metstation
60	1 L221/NETT0097	MOCNESS modified Tucker trawl - Wiebe et al (1976, 1985)	R2RE/1010	custom instrument	MOCNESS
61	R2RE/1017	MOCNESS1	R2RE/1010	custom instrument	MOCNESS1
62	R2RE/1018	MOCNESS10	R2RE/1010	custom instrument	MOCNESS10
63	R2RE/9025	MRU r2r_devtype	R2RE/9999	lookup this up in seavox	MRU
64	R2RE/9026	multi-beam r2r_devtype	L05/157	multi-beam echosounders	Multi-beam
65	R2RE/1034	NOAA SCS data acquisition system	R2RE/9010	data acquisition system	Acqsys
66	R2RE/9027	PCO2 r2r_devtype	R2RE/9999	lookup in seavox	PCO2
67	R2RE/9028	radiometer r2r_devtype	L05/122	radiometers	Radiometer
68	R2RE/9029	raingauge r2r_devtype	R2RE/9999	lookup in seavox	Raingauge
69	L221/NETT0147	Reeve Net	R2RE/9999	lookup in seavox	ReeveNet

Currently, the Data Librarian uses Google Drive to manage R2R Eventlogger Project vocabulary terms (left). A new Drupal site, Project Vocabulary Mapper (right), is in the prototype stage, and will potentially meet the long-term vocabulary management needs of Data Managers, the Data Librarian and others, as well as foster collaboration among stakeholder institutions.



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