RESEARCH DATA ALLIANCE

Adoption of Data Citation Outcomes by BCO-DMO

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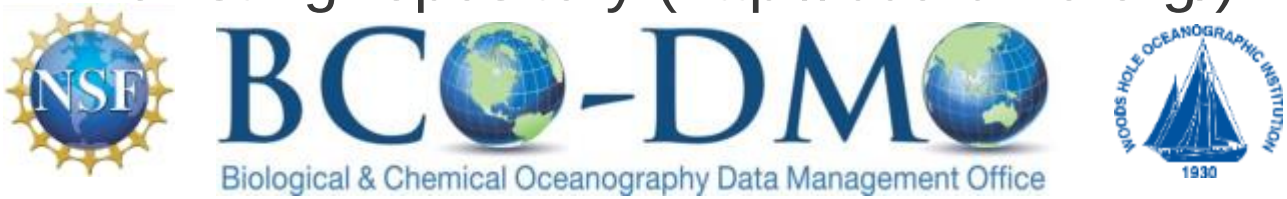
Woods Hole Oceanographic Institution and Blue Dot Labs

research data sharing without barriers
rd-alliance.org

A story of success enabled by RDA

- An existing repository (http://bco-dmo.org/)



- Research data curation for a decade
- Faced with new challenges, but no new funding
- e.g. data publication practices to support citation
- Used the outcomes from the RDA Data Citation Working Group to improve data publication and citation services

https://www.rd-alliance.org/groups/data-citation-wg.html

BCO-DMO Curated Data

- BCO-DMO is a thematic, domain-specific repository funded by NSF Ocean Sciences and Polar Programs
- BCO-DMO curated data are
  - Served: http://bco-dmo.org (URLs, URIs)
  - Published: at an Institutional Repository (CrossRef DOI) http://dx.doi.org/10.1575/1912/4847
  - Archived: at NCEI, a US National Data Center http://data.nodc.noaa.gov/cgi-bin/iso?id=gov.noaa.nodc:0078575

▾ **Archival Copy** for Linked Data URI: http://lod.bco-dmo.org/id/dataset/3046

Version Date	Archive	Persistent Identifier	Date Assigned
2007-05-24	National Oceanographic Data Center (NODC)	0078575	2011-10-26
2007-05-24	Marine Biological Laboratory/Woods Hole Oceanographic Institution Library (MBLWHOI DLA)	10.1575/1912/4847	2011-10-12

RDA Data Citation (DC) *of evolving data*

- **DC goals:** to create identification mechanisms that:
  - allow us to identify and cite arbitrary views of data, from a single record to an entire data set in a precise, machine-actionable manner
  - allow us to cite and retrieve that data as it existed at a certain point in time, whether the database is static or highly dynamic

- **DC outcomes:** 14 recommendations and associated documentation
  - ensuring that data are stored in a versioned and timestamped manner
  - identifying data sets by storing and assigning persistent identifiers (PIDs) to timestamped queries that can be re-executed against the timestamped data store

https://www.rd-alliance.org/groups/data-citation-wg.html

RDA Data Citation WG Recommendations

- Preparing the Data and the Query Store
  - R1 - Data Versioning
  - R2 - Timestamping
  - R3 - Query Store Facilities
- Persistently Identifying Specific Data Sets
  - R4 - Query Uniqueness
  - R5 - Stable Sorting
  - R6 - Result Set Verification
  - R7 - Query Timestamping
  - R8 - Query PID
  - R9 - Store the Query
  - R10 - Automated Citation Texts
- Resolving PIDs and Retrieving the Data
  - R11 - Landing Page
  - R12 - Machine Actionability
- Upon modifications to the Data Infrastructure
  - R13 - Technology Migration
  - R14 - Migration Verification

»» Data Versioning: For retrieving earlier states of datasets the data need to be versioned. Markers shall indicate inserts, updates and deletes of data in the database.

»» Data Timestamping: Ensure that operations on data are timestamped, i.e. any additions, deletions are marked with a timestamp.

»» Data Identification: The data used shall be identified via a PID pointing to a time-stamped query, resolving to a landing page.

Oct 2015 version w/ 14 recommendations

DC WG chairs: Andreas Rauber, Ari Asmi, Dieter van Uytvanck

BCO-DMO Dataset Landing Page

BCO-DMO
Biological & Chemical Oceanography Data Management Office

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DATABASE

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GEOSPATIAL ACCESS

Dataset: larval krill pigments

Get Data | Map It

Project: U.S. GLOBEC Southern Ocean (SOGLOBEC)

Principal Investigator: Dr Robin Ross (University of California-Santa Barbara, UCSB)
Dr Langdon Quetin (University of California-Santa Barbara, UCSB)

Contact: Dr Robin Ross (University of California-Santa Barbara, UCSB)

BCO-DMO Data Manager: Nancy Copley (Woods Hole Oceanographic Institution, WHOI BCO-DMO)

Validated: Yes

Data version: 2010-02-03

Version Date: 02/03/2010

Data URL: http://www.bco-dmo.org/dataset/3300/data

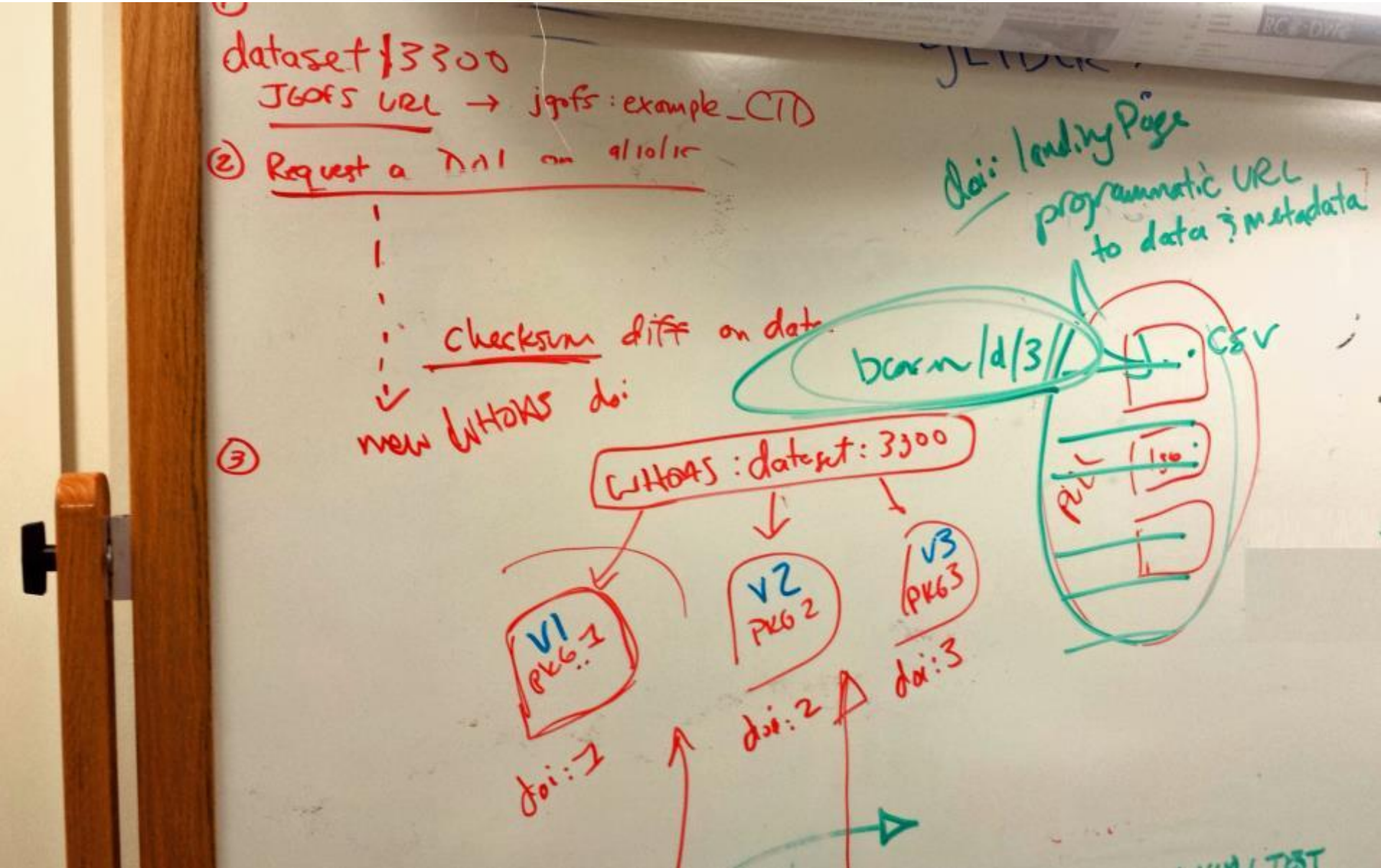
Current State: Final no updates expected

Expand/Collapse All

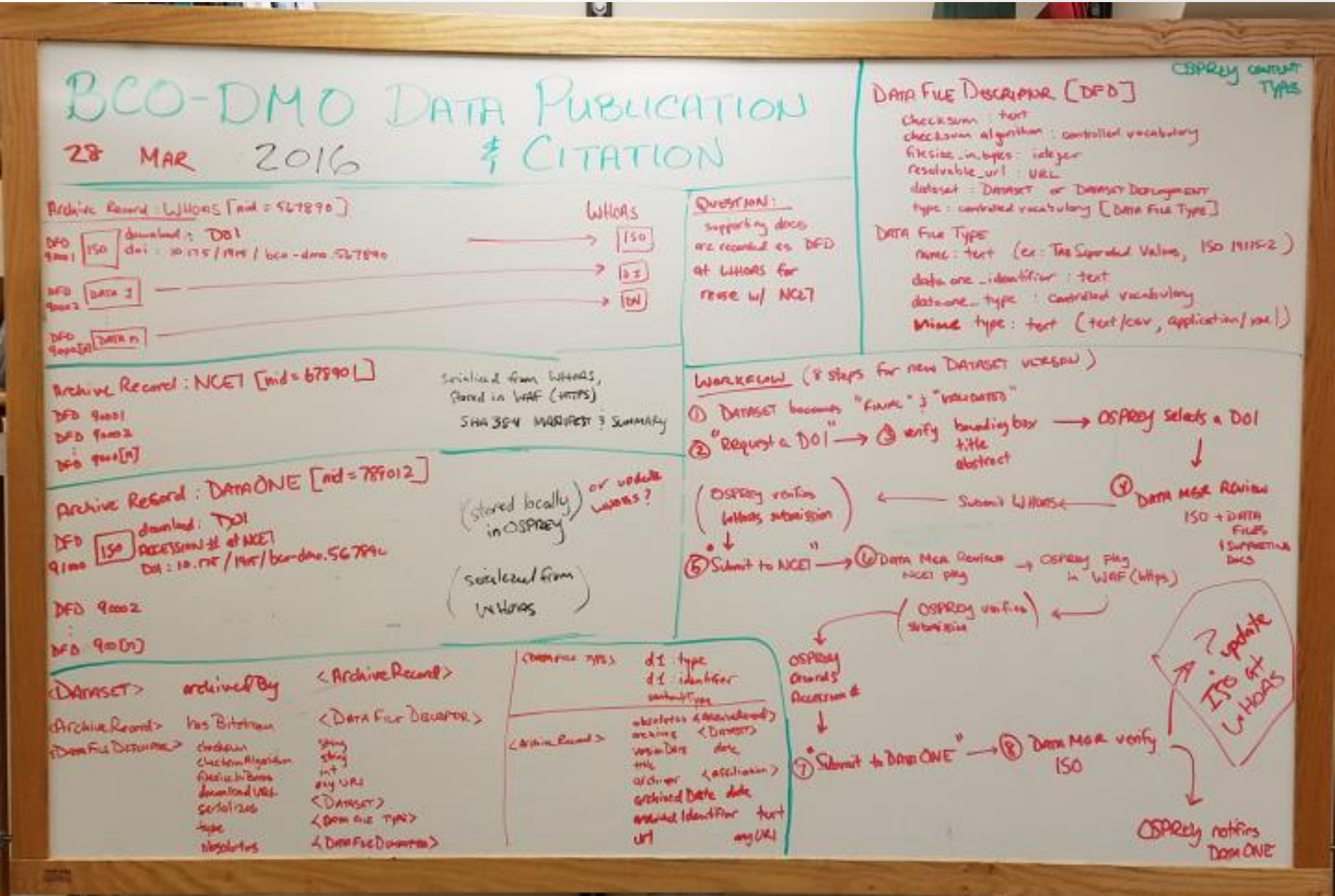
▼ Archival Copy

Archive Location	Accession ID	Archive Copy URL
National Oceanographic Data Center (NODC)	0112635	http://accession.nodc.noaa.gov/0112635

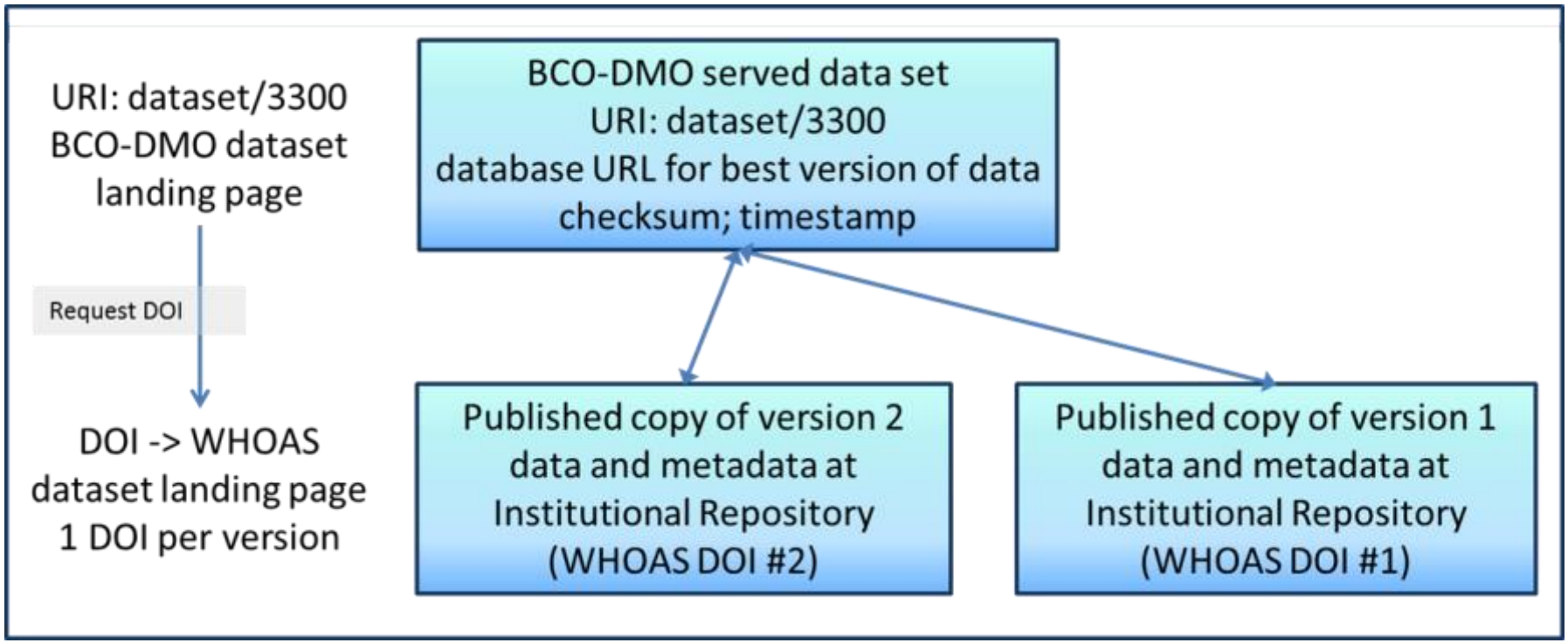
Initial Architecture Design Considerations (Jan 2016)



Modified Architecture (March 2016)

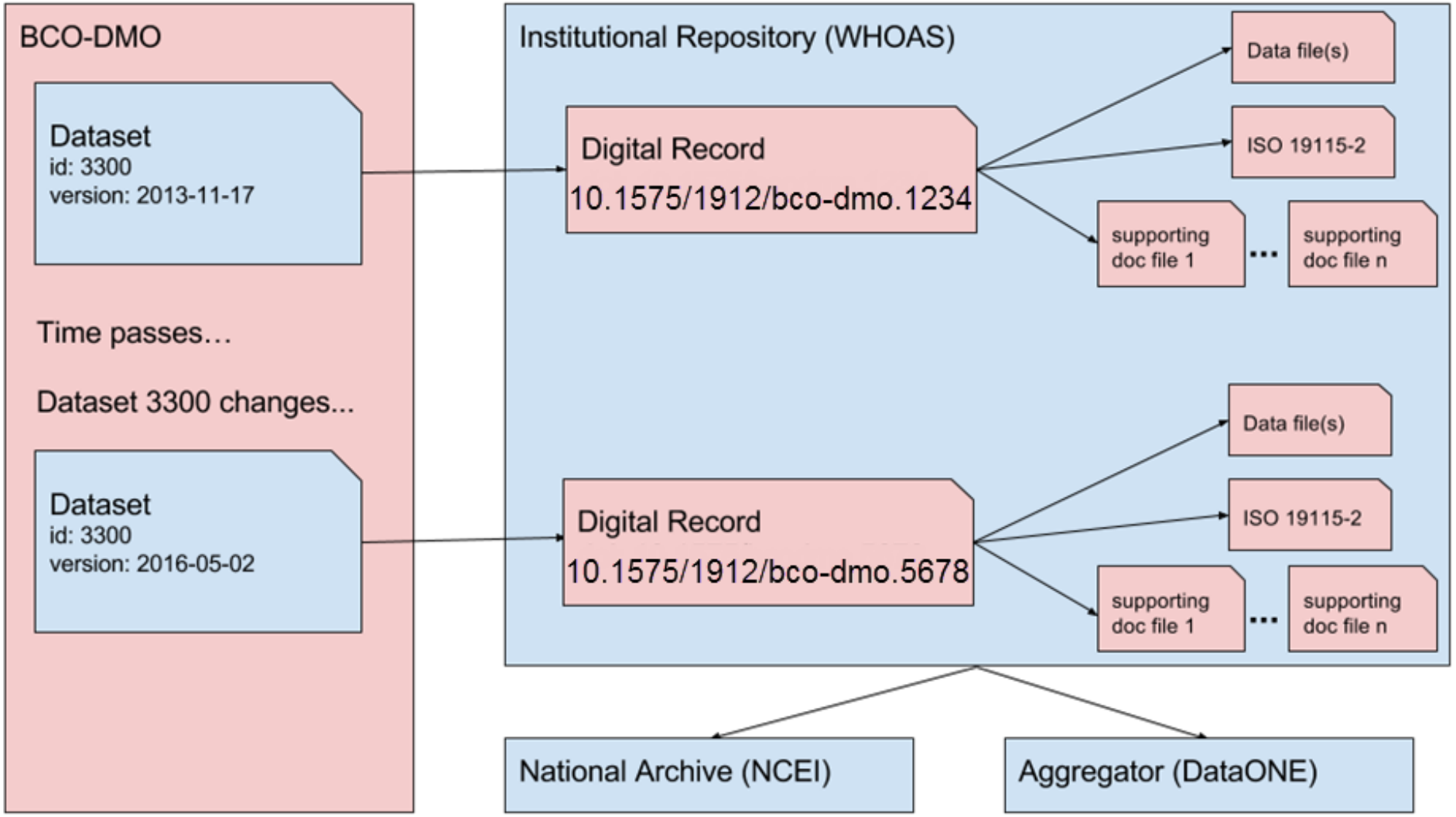


BCO-DMO Data Publication System Components

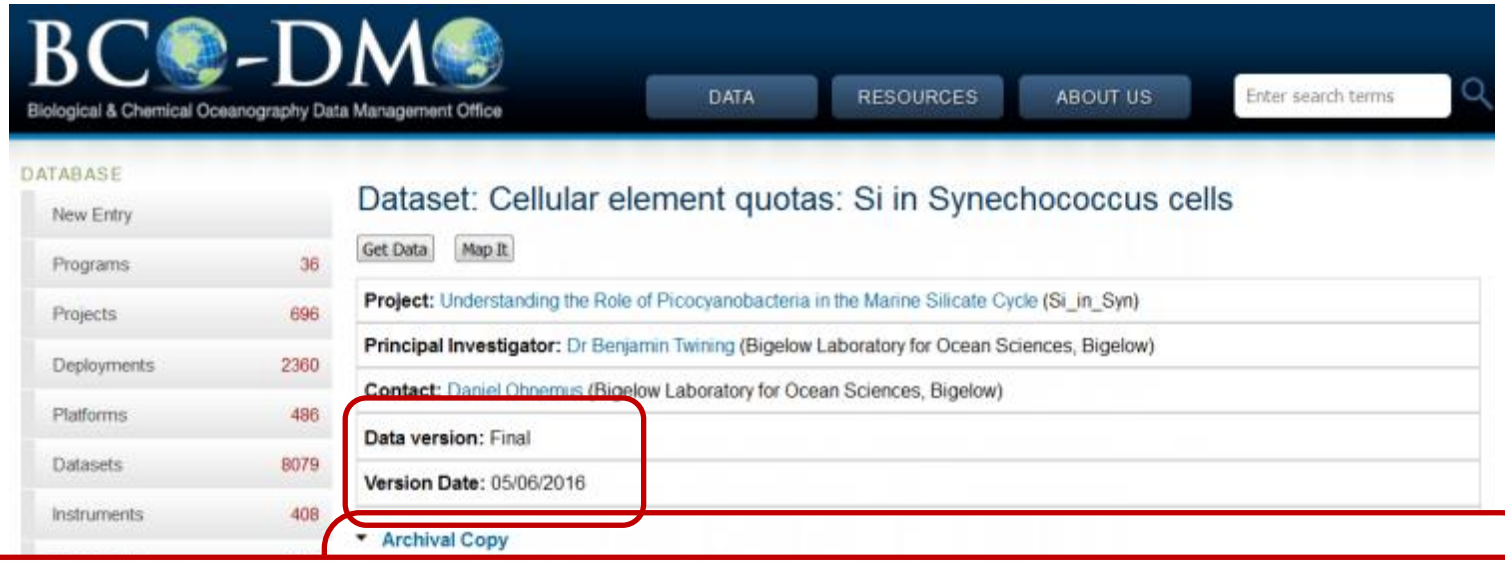


BCO-DMO publishes data to WHOAS and a DOI is assigned.
The BCO-DMO architecture now supports data versioning.

BCO-DMO Data Citation System Components



BCO-DMO Data Set Landing Page



Archival Copy

Version Date	Archive	Persistent Identifier	Date Assigned
2016-05-06	Marine Biological Laboratory/Woods Hole Oceanographic Institution Library (MBLWHOI DLA)	10.1575/1912/bco-dmo.651474	2016-07-08

GEOSPATIAL ACCESS

References:

Twining, B.S., et al. Metal contents of phytoplankton and labile particulate material in the North Atlantic Ocean. Prog. Oceanogr. (2015) http://dx.doi.org/10.1016/j.pocean.2015.07.001
https://www.researchgate.net/publication/282626294_Metal_contents_of_phytoplankton_and_labile_particulate_material_in_the_North_Atlantic_Ocean

More Information about this dataset

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Titles

Element quotas of individual Synechococcus cells collected during Bermuda Atlantic Time-series Study (BATS) cruises aboard the R/V Atlantic Explorer between dates 2012-07-11 and 2013-10-13

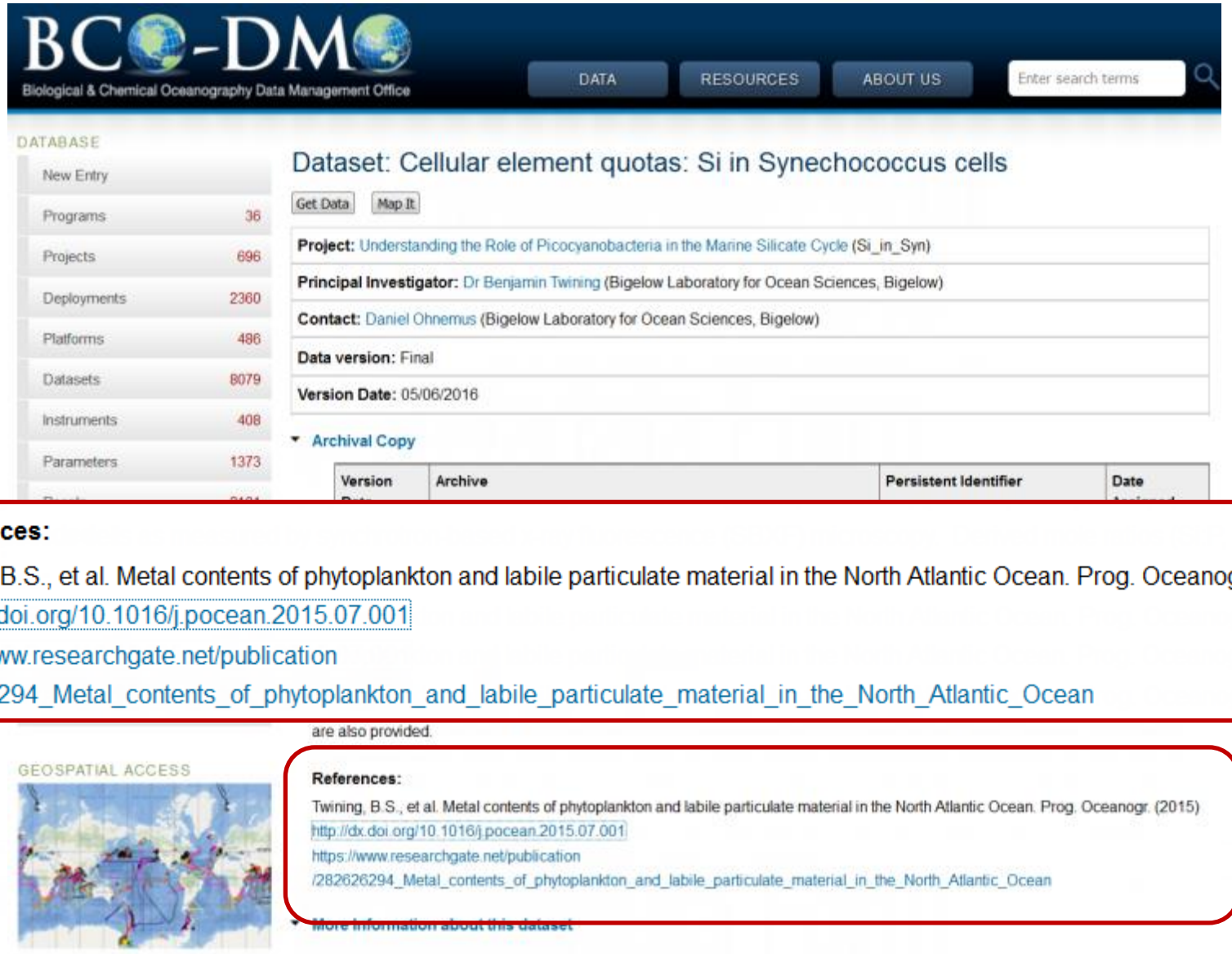
dc.description.sponsorship	NSF Ocean Sciences (NSF OCE) OCE-1131139, NSF Ocean Sciences (NSF OCE) OCE-1335012, NSF Ocean Sciences (NSF OCE) OCE-1131046
dc.publisher	Biological and Chemical Oceanography Data Management Office (BCO-DMO). Contact: bco-dmo-data@whoi.edu
dc.relation	http://lod.bco-dmo.org/id/dataset/644840

31.6691

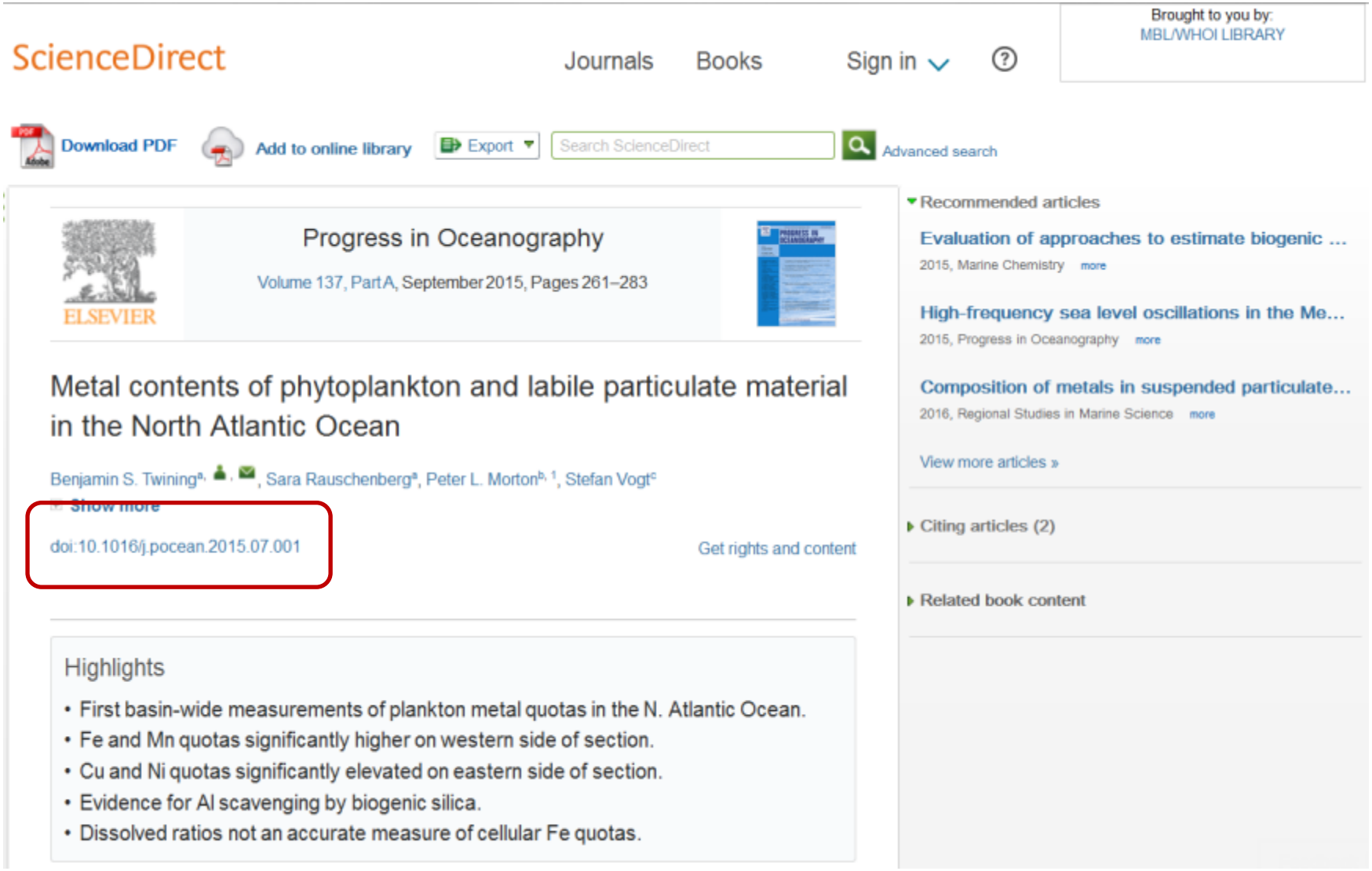
DOI
10.1575/1912/bco-dmo.651474

Keyword
SXRF; Synchrotron radiation X-Ray Fluorescence; Synechococcus; sil

BCO-DMO Data Set Landing Page



Linked to Publication via DOI



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ELSEVIER

Progress in Oceanography

Volume 137, Part A, September 2015, Pages 261–283

Metal contents of phytoplankton and labile particulate material in the North Atlantic Ocean

Benjamin S. Twining[a], Sara Rauschenberg[a], Peter L. Morton[b, 1], Stefan Vogt[c]

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doi:10.1016/j.pocean.2015.07.001

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Highlights

- First basin-wide measurements of plankton metal quotas in the N. Atlantic Ocean.
- Fe and Mn quotas significantly higher on western side of section.
- Cu and Ni quotas significantly elevated on eastern side of section.
- Evidence for Al scavenging by biogenic silica.
- Dissolved ratios not an accurate measure of cellular Fe quotas.

Recommended articles

Evaluation of approaches to estimate biogenic ...
2015, Marine Chemistry more

High-frequency sea level oscillations in the Me...
2015, Progress in Oceanography more

Composition of metals in suspended particulate...
2016, Regional Studies in Marine Science more

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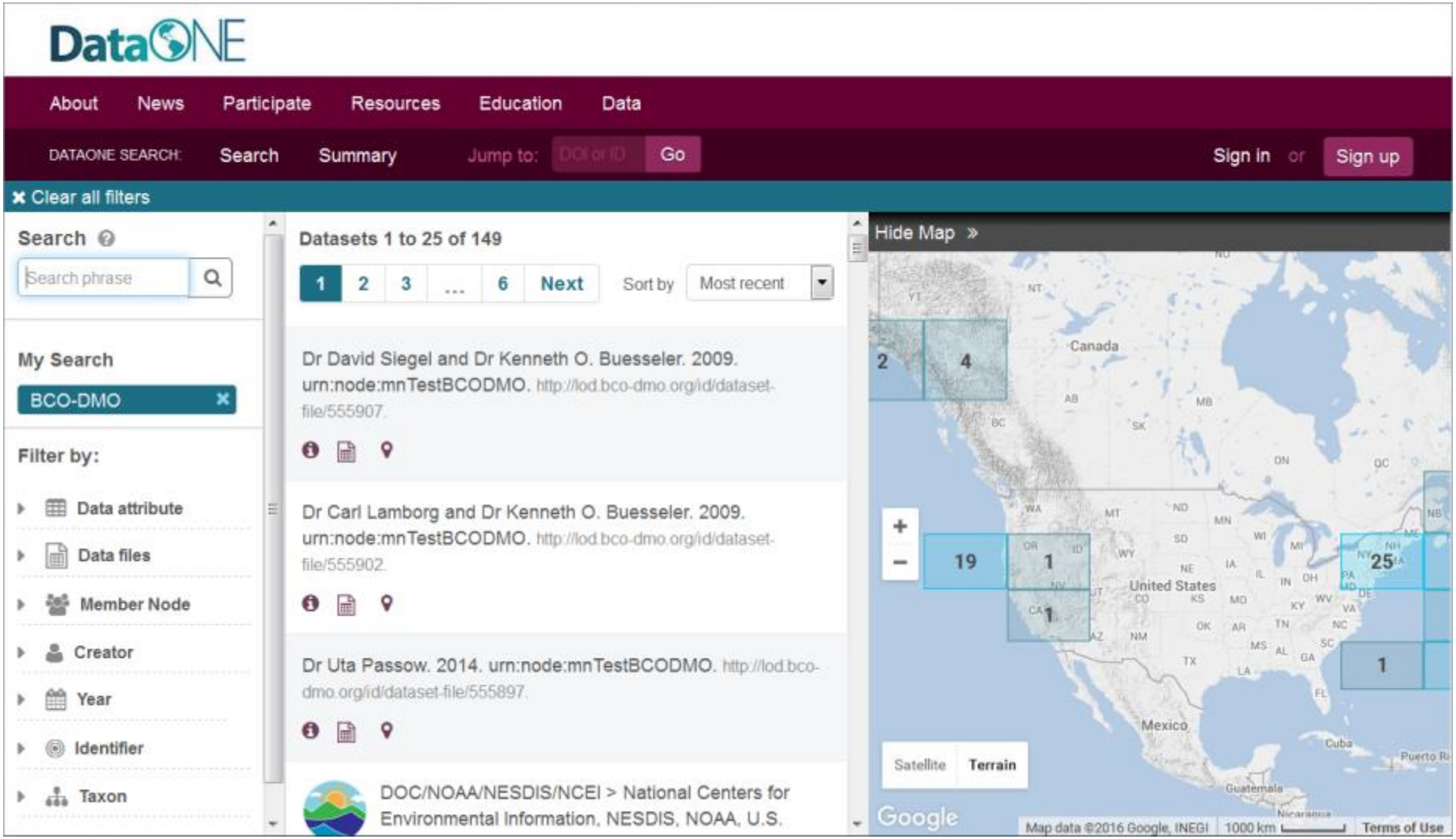
Citing articles (2)

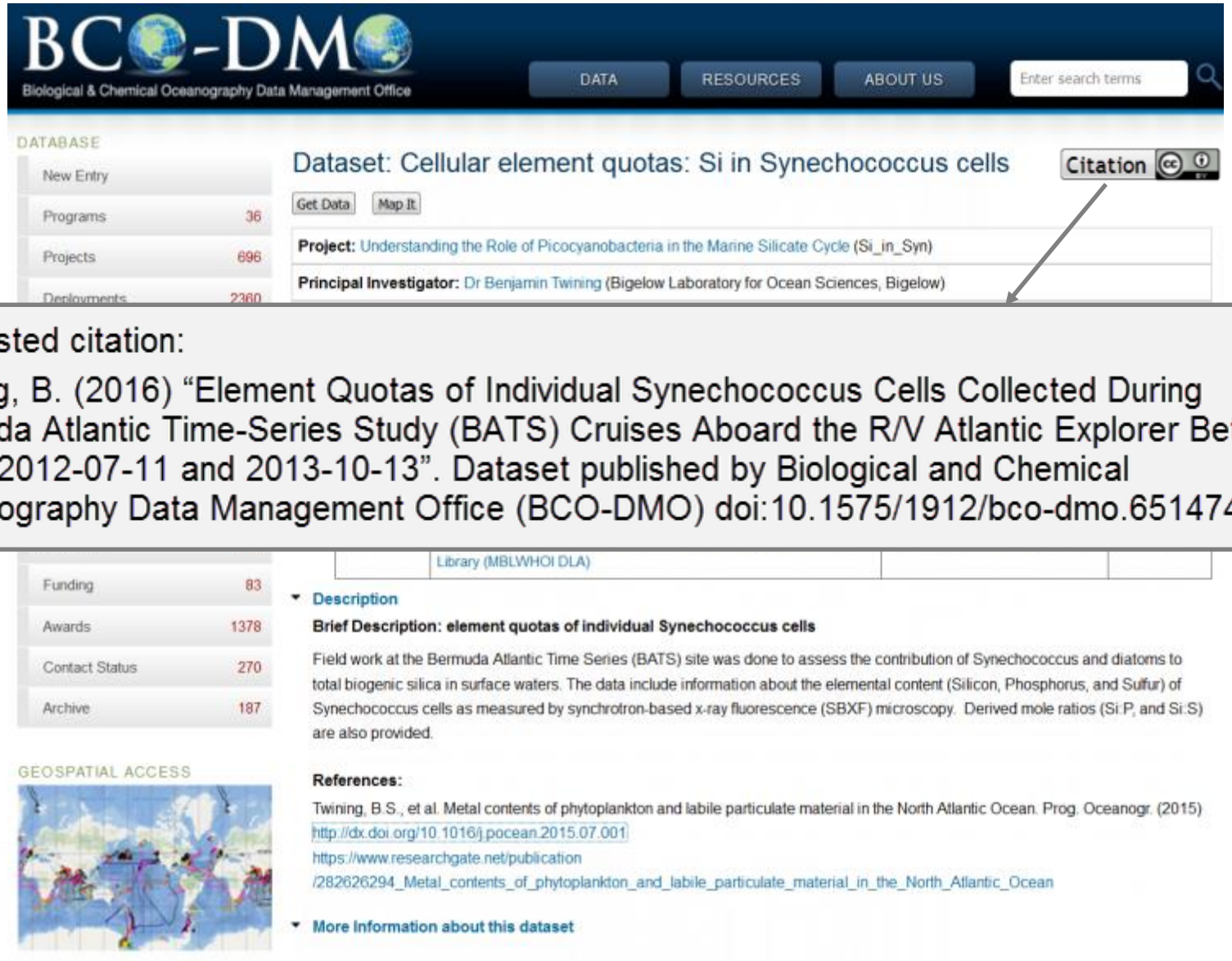
Related book content

New Capabilities … BCO-DMO becoming a DataONE Member Node

https://search.dataone.org/



BCO-DMO Data Set Citation (by 19 Sep 2016)



Thank you …

- To the Data Citation Working Group for their efforts https://www.rd-alliance.org/groups/data-citation-wg.html
- RDA US for funding this adoption project

- TIMELINE:
  - Redesign/protoype completed by 1 June
  - New citation recommendation by 19 Sep 2016
  - Report out at RDA P8 (Denver, CO) September 2016
  - Production version by 1 December 2016

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EXTRA SLIDES

- Removed these to reduce talk to 15 minutes

Adoption of Data Citation Outputs

- **Evaluation**
  - Evaluate recommendations (done December 2015)
  - Try implementation in existing BCO-DMO architecture (work began 4 April 2016)

- **Trial**
  - BCO-DMO: R1-11 fit well with current architecture; R12 doable; test as part of DataONE node membership; R13-14 are consistent with Linked Data approach to data publication and sharing

NOTE: adoption grant received from RDA US (April 2016)

New capability (implemented)

procedure: when a BCO-DMO data set is updated …

- A copy of the previous version is preserved
- Request a DOI for the new version of data
- Publish data, and create new landing page for new version of data, with new DOI assigned
- BCO-DMO database has links to all versions of the data (archived and published)
- Both archive and published dataset landing pages have links back to best version of full dataset at BCO-DMO
- BCO-DMO data set landing page displays links to all archived and published versions

REFERENCES

- Extended description of recommendations

Identification of Reproducible Subsets for Data Citation, Sharing and Re-Use

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- Altman and Crosas. 2013. “Evolution of Data Citation …”
- CODATA-ICSTI 2013. “Out of cite, out of mind”
- FORCE11 https://www.force11.org/about/mission-and-guiding-principles
- R. E. Duerr, et al. “On the utility of identification schemes for digital earth science data”, ESI, 2011.