DBO DATA POLICY AND RELEASE GUIDELINES-FINAL (February 20, 2015)

1. INTRODUCTION

The Distributed Biological Observatory (DBO) was established as an Arctic change detection array along a latitudinal gradient currently extending from the northern Bering Sea to the boundary between the Beaufort and Chukchi seas, near Point Barrow, Alaska. The current DBO regions may be modified or expanded as DBO objectives and requirements change. An international team of scientists and facilities are contributing to this unprecedented set of observations to be made for a decade or more. DBO sampling is focused on transects that cross areas of high productivity, biodiversity and rates of biological change. The Marine Working Group of the International Arctic Science Committee (IASC) has endorsed the DBO concept.

2. DEFINITION OF THE DBO DATA ARCHIVE

The "DBO distributed data archive" is defined as a set of distributed international data centers (e.g. Japan Agency for Marine-Earth Science and Technology (JAMSTEC), Korea Polar Research Institute (KOPRI), NCAR Earth Observing Laboratory (EOL)) with a commitment to long-term data stewardship practices (e.g. discovery and access), bringing together data from DBO sampling efforts and demonstrating the value added results from this sampling and coordinated shared-data approach to the investigation of biological responses in a rapidly changing Arctic marine ecosystem. The DBO EOL data archive (http://dbo.eol.ucar.edu) is the designated site for submission of metadata that meet the standard DBO metadata profile (hereafter referred to as the metadata profile) as shown in template form in Appendix A. This template may be linked from other sites that are supporting the DBO effort (e.g., the Alaska Ocean Observing System (AOOS) DBO workspace). The DBO can serve as a framework for international research coordination, specifically as being part of the Arctic Council Circumpolar Biodiversity Monitoring Program (CBMP) and is a recognized task of the pan-Arctic Sustaining Arctic Observing Networks (SAON) program, facilitated by the Arctic Council.

There is interest in making DBO data (defined and listed in Appendix B) available to researchers in a timely manner for analysis, and for the larger community once data are finalized. The principal steps in the flow of data from the researcher's lab to the DBO data archive have been organized into a process that encompasses: (1) the required completion of a standard DBO metadata profile to the DBO EOL archive, (2) the encouraged sharing of data among DBO members in a common, password-protected work space in the short-term (AOOS DBO workspace), and (3) the final submission of data to a national data archive. The DBO data flow requirement for a standard DBO metadata profile submission will be met by use of an interactive form on the DBO EOL website (supported by US National Science Foundation) that has been developed to ensure consistency of information cataloging data collections annually within the DBO data network.

The data centers that make up the "DBO distributed archive" will coordinate their data management activities including developing consistent metadata generation, curation, and

interoperability. When data submitted directly to the DBO AOOS Workspace or National archive are deemed ready for long term storage and distribution, a final version of these data and metadata will then be updated or linked to the DBO EOL archive.

3. DBO DATA POLICY AND RELEASE GUIDELINES

3.1 Data Policy in Compliance with IASC and other Collaborative Arctic Activities

It is appropriate that any policy for release and dissemination of DBO data should be consistent and in compliance with International standards and agreements such as the IASC Statement of Principles and Practices for Arctic Data Management, data sharing commitments made during the International Polar Year (IPY), and the World Meteorological Organization (WMO) policy, practice and guidelines for the exchange of meteorological, hydrological, and related data and products, as embodied in Resolution 40 of the Twelfth WMO Congress 1995 (CG-XII), and Resolution 25 of the Thirteenth WMO Congress 1999 (CG-XIII); that is, free, timely, and unrestricted exchange of essential data and products to the maximum extent possible. The DBO data policy approach is fully compatible with the CLIVAR Data Policy. The DBO will follow the WMO Core Profile of the ISO 19115: Geographic Information - Metadata standard. This DBO policy is not meant to conflict or supersede any national or international agency policy related to public access to these data, such as the U.S. Public Access to Research Results (PARR).

3.2 Broad Community Access to Data

It is in the best interests of both the data providers and the potential users to maintain the latest version of the data and metadata in the DBO archive. The reason is that this will allow the DBO archive to potentially alert users of revised or updated data. The unrestricted copying of the original data from source other than the DBO archive to multiple users may lead to propagation of errors in the data analysis, confusion on inconsistent versioning, incomplete metrics, and loss of identity of its DBO origin. The sharing of data through the AOOS DBO Workspace allows for the distribution of preliminary data among DBO Science Team and collaborators before it is submitted to National archives and made fully accessible to the community.

3.3 Acknowledgement and Citation

Whenever DBO data distributed by the archive are being used for publication of scientific results, the data's origin should be acknowledged and referenced. The user is responsible to reference the PI responsible for creating the dataset and the dataset's source at the DBO. If multiple sources have been used, acknowledgement should be provided for each dataset used.

International agencies, professional societies, and research organizations are moving towards the formal citation of data and sources that led to a given research result. Consequently, there has been an increased use of DOIs (Digital Object Identifiers) as a simple, standard way to reference datasets. DOIs allow for linkages between datasets and respective publications, thus providing the ability to track the use of these datasets in the literature and provide metrics of their use or influence. DOIs are considered "perpetual" and provide proper attribution, even if a dataset has been moved to another archive over time. EOL is willing to assist all DBO data

providers with developing DOIs should the distributed archives be unable to provide the service. Standards have been established for the creation of data DOIs and have been supported by international coordination groups such as the Research Data Alliance (RDA).

3.4 Co-Authorship for DBO Principal Investigators (PIs)

DBO ship platforms and site measurements are equipped with sophisticated, state-of-the-art instrumentation and comply with strict requirements of maintenance, exposure of instruments, calibration, quality assurance procedures and the like, in order to achieve the highest attainable standards of measurement, accuracy, representativeness, stability and repeatability. To ensure that this goal is reached, PIs who are leading experts for their instruments are taking responsibility for individual instruments operated on the respective DBO ship platforms and sites.

Data users of DBO data are encouraged to establish direct contact with PIs as *data providers* for the purpose of complete interpretation and analysis of data for publication purposes. Co-authorship of the DBO PIs on publications making extensive use of DBO data is highly recommended if their work has contributed to the study in question, or has been involved in directly contributing to the publication in other ways. It is highly recommended that any *data user* should contact the responsible PI and to discuss whether the PI's data collection and Quality Assurance (QA) or Quality Control (QC) work warrants co-authorship or an acknowledgement.

3.5 DBO Publication List

The DBO EOL archive will develop a DBO publication list from citations submitted whenever DBO data are used for publication of scientific results. Whenever possible, the DBO archive will utilize DOIs to link to the publication's source. If you use the DBO data in a publication, please provide the DBO EOL archive with a citation via its data portal any time during the life of the project. The DBO EOL archive will maintain this list and make it public via the archive website in order to provide a continuous record of applications and analyses of DBO data and of DBO's scientific achievements.

4. REFERENCES

Arctic Council Circumpolar Biodiversity Monitoring Program (CBMP) http://www.arctic-council.org/index.php/en/

Distributed Biological Observatory (DBO) http://www.arctic.noaa.gov/

International Arctic Science Committee (IASC) http://www.iasc.info/

Research Data Alliance (RDA) https://rd-alliance.org/

Sustaining Arctic Observing Networks (SAON) Program http://www.arcticobserving.org/

U.S. Public Access to Research Results (PARR) http://www.whitehouse.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf

World Meteorological Organization (WMO) Climate and Ocean: Variability Predictability and Change (CLIVAR Project) Data Policy http://www.clivar.org/resources/data/data-policy

Appendix A – DBO METADATA PROFILE

	Metadata Field Name	Definition
General	title	A name given to the data set.
	dataset author(s)	The person(s) receiving credit for the data set, as in a citation (usually the PI).
	description	A summary of data set content
	language	Language of the data set (e.g. English, Japanese, Korean)
Dataset Details	cruise number	Cruise ID or Number
	funding agency	The Agency providing funding (e.g. JAMSTEC, NSF, NOAA)
	Grant, project or award number	Agency assigned Grant or Award number
	temporal coverage start	Begin date of full data set
	temporal coverage end	End date of full data set
	temporal resolution	The sampling or reporting frequency of an instrument or platform
	northernmost latitude	Northern extent of data collection in decimal degrees
	southernmost latitude	Southern extent of data collection in decimal degrees
	westernmost longitude	Western extent of data collection in decimal degrees
	easternmost longitude	Eastern extent of data collection in decimal degrees
DBO Specific		Note: Each transect has its own DBO Specific metadata
	regions occupied	DBO region 1 to 5, Transect 1 to 5 (plus future DBO lines)
	DBO line occupation start	Begin date of DBO transect data collection (each DBO line will have separate form)
	DBO line occupation end	End date of DBO transect data collection (each DBO line will have separate form)
	transect	DBO line (up to 5 resubmissions of this section), with additional submission for any new DBO lines (e.g., pending Beaufort Sea lines)
	station	Unique DBO transect Station Name ID (DBO1.1, DBO1.2, etc.) to be cross-linked to what each cruise uses as a station name for their cruise (e.g SWL14, DBO1.1=SLIP5). Please Note: A unified list of all DBO stations and an associated list of station identifiers from each cruise will be required and posted on the DBO data portal. *Also Note: If the station occupied is not a specified DBO location, but close, we need the exact latitude and longitude of the station sampled*
	DBO keyword	Suite of data type collected, with pull down menu of parameters from DBO data matrix: e.g., CTD, ADCP, bottle data for chlorophyll, nutrients; abundance, biomass and composition of Ice algae, phytoplankton, zooplankton, benthic

		fauna (infauna and epifauna) and fish; seabird and marine mammal surveys; Mooring data (T, S, Currents, fluorescence, nutrients, sediment trap); Satellite data (surface T, S, winds)
Contact Info	point of contact	Person who is responsible for the content of the metadata and data.
	principal investigator	The PI responsible for leading the project
	publisher	The Institution where the data resides and responsible for distributing the data set (e.g. KOPRI, JAMSTEC, PRIC, UCAR/NCAR, CCIN)
	Weblink to dataset	Electronic link to location of dataset (e.g., at KOPRI, JAMSTEC, AOOS, EOL)
Data Details	platform	The vessel or vehicle from which instruments are deployed
	instrument	The name of the instrument used to acquire the data
	science keywords	GCMD Science Keywords
	data version	Version number of the data set available
	dataset last revision date	Date the data set was last revised
	distribution format	Distributed file format of the data set (e.g. excel, ascii, multiple)
	data set progress	Amount of progress through to data publication (i.e. in progress, or completed)
	access restriction	Password protection required
Citation		Any additional citations; Listed of known
DOI		

Appendix B – Definition of DBO Data

The suite of selected DBO data types and parameters include:

- Conductivity, Temperature, Depth (CTD), Acoustic Doppler Current Profiler (ADCP) data
- bottle data for chlorophyll and nutrients
- abundance, biomass and composition of Ice algae, phytoplankton, zooplankton, benthic fauna (both infauna and epifauna), and fish
- sediment parameters (grain size, organic carbon content, chlorophyll *a* content)
- seabird and marine mammal surveys
- Mooring data (temperature (T), salinity (S), Currents, fluorescence, nutrients, sediment trap
- Satellite data (data presented are weekly averages of most recent data on: (1) Chlorophyll Pigment Concentration; (2) Sea Surface Temperature (SST); (3) Sea Ice Concentration; (4) Cloud Fraction, and (5) Winds and Sea Level Pressure (SLP).)
- Other (a text entry): model output, other parameters being collected on DBO lines, but not a core DBO measurement listed above.