Data Management Plan

All data collected as part of this project with the exception of the pCO_2-mooring data will be submitted to and archived with the Biological and Chemical Oceanography Data Management Office (BCO-DMO).

Bermuda coral reef inshore carbonate chemistry parameters collected between 2007-2012 are currently being formatted for submission to BCO-DMO. These data will be archived under project BEACON (http://www.bco-dmo.org/project/2190). We intend to amend the inshore data collected as part of this project #7423667 to this dataset. Hydrographic and biogeochemical parameters are listed in **Table 1**.

pCO_2-mooring data from Hog and Crescent reefs are currently archived and reported online (http://www.pmel.noaa.gov/co2/story/Coral+Reef+Moorings) in near-real time by NOAA PMEL. NOAA PMEL will continue this service as part of this project (see letter of collaboration).

BATS data are currently archived at BCO-DMO (http://www.bco-dmo.org/project/2124) and are also available at: http://bats.bios.edu/index.html and for FTP services ftp://batsftp.bios.edu/BATS/ .

The hydrographic and discrete samples (salinity, dissolved oxygen, DIC, TA, nutrients, POC/PON, TOC/TOC, bacteria abundance and HPLC pigments) will be QA/QC'd following standard protocols as outlined at http://bats.bios.edu/bats_methods.pdf . Following sample analysis of the discrete variables, data are plotted against each other (e.g., T-S diagrams, elemental ratio profiles) since this has proven to be a successful way for tagging outliers. For the Hydrostation and BATS station samples the final quality check of the data will be performed using interactive plotting routines of the probability distribution function of each parameter (based on the BATS database) for each cruise. This will generate plots of the vertical profile overlaid on a colormap of the probability distribution function with curves for ± 2σ; time series plot at that depth showing the past 20 years of QC'd data; and a contour section of the past five years. Experience from this QC process over the past 25 years of BATS procedures enforces a very cautionary approach for excluding data since real variability at times appears wildly anomalous on consideration of past data envelopes.

We anticipate that much of the CTD and discrete data will be stored locally (BIOS) in a system similar to that used for BATS data. This system is based on Matlab structured arrays files (analogous to NetCDF formats) for each cruise, which contains all levels of CTD data, bottle data, meta data and calibration information. All the CTD and bottle data streams have quality masks consisting of matrices of the same dimensions as the datafiles (i.e every single data point has a quality flag). The parameter names and quality flag criteria within programming structure are consistent with those being propagated by OceanSITES. Finally, all primary and processed data (CTD, underway thermosalinograph and meterology, ADCP and discrete biogeochemcial samples) hosted at BIOS will reside on two IBM UNIX workstations supporting a RAID 1 data storage system which in turn will be backed up at BIOS using a Crashplan near real-time replication service.

In addition, the PIs will share and temporarily store data on a *dropbox* account (http://www.dropbox.com), which allows easy sharing and joint analysis of datasets. Each

PI is responsible for backing up data locally outside of the "cloud" provided by *dropbox*. Meta-data files following the guidelines of BCO-DMO will be created at the onset of data collection to ensure that the format and structure are in accordance with the guidelines for subsequent submission to BCO-DMO. Specific datasets used in project publications will be assigned doi index numbers and published online concurrent with journal publication. All data will be submitted to BCO-DMO within 12 month of completed QA/QC.

BCO-DMO will archive all the data at the appropriate national archive facility, such as CDIAC, NODC, or OBIS.

Table 1.

Expected Data Inventory for NSF CRI-OA Project # [7423667; Collaborative Research Ocean Acidification: Establishing the links between offshore biogeochemistry, coral reef metabolism and acidification]

Data Type	Quantities Measured/Calculated	Depth Range	RESOLUTION Horizontal	RESOLUTION Vertical	Data System
1. MONTHLY INSHORE					
Hydrographic Data					
CTD					
	temperature	0 - <16 m	TB, DY, MP, NC, CR, HR	<1 m	BCO-DMO
	conductivity	0 - <16 m	TB, DY, MP, NC, CR, HR	<1 m	BCO-DMO
	pressure	0 - <16 m	TB, DY, MP, NC, CR, HR	<1 m	BCO-DMO
	dissolved oxygen	0 - <16 m	TB, DY, MP, NC, CR, HR	<1 m	BCO-DMO
	pH	0 - <16 m	TB, DY, MP, NC, CR, HR	<1 m	BCO-DMO
	salinity (calculated)	0 - <16 m	TB, DY, MP, NC, CR, HR	<1 m	BCO-DMO
Biogeochemical Data					
Bottle samples					
Carbonate system chemistry (bottle samples)					
	DIC	0 - <16 m	TB, DY, MP, NC, CR, HR	sfc (bottom)	BCO-DMO
	TA	0 - <16 m	TB, DY, MP, NC, CR, HR	sfc (bottom)	BCO-DMO
	pCO2 (calc.)	0 - <16 m	TB, DY, MP, NC, CR, HR	sfc (bottom)	BCO-DMO
	CaCO3 saturation state (calc.)	0 - <16 m	TB, DY, MP, NC, CR, HR	sfc (bottom)	BCO-DMO
Macronutrients					
	nitrate + nitrite	0 - <16 m	TB, DY, MP, NC, CR, HR	sfc (bottom)	BCO-DMO
	ammonium	0 - <16 m	TB, DY, MP, NC, CR, HR	sfc (bottom)	BCO-DMO
	silicate	0 - <16 m	TB, DY, MP, NC, CR, HR	sfc (bottom)	BCO-DMO
	orthophosphate	0 - <16 m	TB, DY, MP, NC, CR, HR	sfc (bottom)	BCO-DMO
Other					
	salinity	0 - <16 m	TB, DY, MP, NC, CR, HR	sfc (bottom)	BCO-DMO
	calcium	0 - <16 m	TB, DY, MP, NC, CR, HR	sfc (bottom)	BCO-DMO
	dissolved oxygen	0 - <16 m	TB, DY, MP, NC, CR, HR	sfc (bottom)	BCO-DMO
	POC/N	0 - <16 m	TB, DY, MP, NC, CR, HR	sfc (bottom)	BCO-DMO
	TOC/N	0 - <16 m	TB, DY, MP, NC, CR, HR	sfc (bottom)	BCO-DMO
	HPLC	0 - <16 m	TB, DY, MP, NC, CR, HR	sfc (bottom)	BCO-DMO
	bacterial abundance	0 - <16 m	TB, DY, MP, NC, CR, HR	sfc (bottom)	BCO-DMO
2. MONTHLY OFFSHORE					
Underway system	Same parameters as for 1. monthly inshore	sfc	every 5 km to Hydro S, then every 15 km to BATS	sfc	BCO-DMO
CTD	Same parameters as for 1. monthly inshore PAR transmissometer fluorometer	1-100 m	Hydro S, BATS	1,10,25,50,75, 100	BCO-DMO
3. QUARTERLY NORTHWARD TRANSECT	Same parameters as for 1. monthly inshore	sfc	every 500 m, northward from Hog Reef	sfc	BCO-DMO