Data Management Plan

I. Products of Research

Data generated by this research will include time series observations of the following data:

(i) Sediment concentrations and stable isotope compositions of organic carbon and inorganic carbon, and sediment concentrations of pyrite and reactive iron oxides.

(ii) Pore water concentrations of alkalinity, [O2] sulfide, salinity, pH, ΣDIC, DOC and short chain organic acids.

(iii) Sediment and wrack trap measures consisting of dry mass, organic and inorganic C content and stable isotope composition.

(iv) Whole plant performance measures including shoot density, plant size (total mass, leaf area), growth rates, leaf optical properties, and rates of photosynthesis and respiration. Raw data (ranging from direct counts of shoots in each treatment to voltages recorded by O_2 electrodes, fluorometers and spectrophotometers) will be converted into rates of population growth (shoots $month^{-1}$), shoot growth (g d^{-1} $shoot^{-1}$, cm d^{-1} $shoot^{-1}$ and % d^{-1} $shoot^{-1}$) using standard protocols.

(v) *in situ* rates of O_2 and C metabolism from the Eulerian and EC measures, along with irradiances and water column optical properties.

Raw instrument data will be processed to absolute physical units using appropriate calibration factors and chemical standards, either purchased directly for commercial sources or made locally from high purity reagents. The source code and compiled versions of the numerical model generated by this research, as well as all required input files and a user manual, will be provided for research purposes without charge to anyone requesting it from the PIs, as is our current policy with the Bio-optical model *GrassLight.*

II. Data Storage and Preservation

All data will be deposited into an ACCESS® database maintained by the Bio Optical Research Group (BORG) headed by Dr. Zimmerman. In addition to serving as our local repository for all lab data, the BORG database system provides export routines for depositing our data and metadata into national database structures, including SeBASS (administered by NASA) and BCO-DMO (administered to support the NSF Geosciences directorate). The BORG database resides on a 15 Tb data server managed by the ODU Office of Computing and Communications Services for security and routine backup (nightly to tape and weekly to a secure offsite location). Data are available to authorized users via direct on-line access (on campus) and via VPN client protocols (off campus). Maintenance costs for this service are included as part of the indirect costs at ODU. Once checked for QA/QC, these data will be transferred to the BCO-DMO website where Dr. Zimmerman is currently depositing data from NSF project OCE 1061823. Model products, including source code written in FORTRAN and MatLab, executable files, all required input files and a user manual will be provided to BCO-DMO for permanent archival and public distribution.

III. Data Formats and Metadata

Data will be stored locally in instrument generated files (unformatted and ASCII), excel spreadsheets and ASCII files during various processing stages. All data uploaded to public databases will be stored as flat ASCII files, unless otherwise required by the database. Metadata will conform to the database protocols, including simple "REAME" files to explain variables, data structures etc. and/or EML specifications, as required. All non-numeric metadata will be provided in English.

IV. Data Dissemination & Policies for Data Sharing and Public Access

All data published in peer-reviewed articles will be deposited with the publisher, according to their policies and procedures, as well as the databases described above. All data placed into national databases will be made publicly available according to the policies of the individual database. We will create links

to all publications on our individual websites and make data from the publications available to any user, upon written request. The PIs and ODU will retain intellectual property rights to all data, except as transferred to publishers for individual articles.

V. Roles and Responsibilities

The PIs will provide primary responsibility for implementation of this data management plan (DMP) for the duration of their participation in the project. At the end of the project, all data and metadata will transferred to BCO-DMO and/or other relevant national and institutional databases for long term storage and curation, but the PIs will continue to serve all data requests as long as they are able. Old Dominion University is currently developing an institutional DMP. Once implemented, we will follow its policies/procedures with respect to long term management and curation of these data.