Data Management Plan

Video Data

Upon retrieval of video cameras, they will immediately be downloaded to the primary project computer in Shark Bay. Files will be renamed to descriptive codes and then will be duplicated onto two external hard drives that are stored separately in the field (one at the field camp, one in the offices of the Department of Environment and Conservation). At the end of the field season, one hard drive will be returned to FIU where it will be cloned. Duplicate hard drives at FIU will be housed in separate buildings.

Traditional Data Streams

Field data will be collected onto dive slates or datasheets in the field and entered into Excel spreadsheets once on shore. Data will be backed up immediately and kept on the primary computer and an external hard drive housed separately at the field site. Data also will be copied onto computers of graduate students as soon as possible after they are entered. At the completion of field seasons, data will be transferred to the PI's computer, and an external hard drive at FIU housed separately from the PIs computer.

Importantly, field and laboratory data will be submitted to be housed in perpetuity at the Florida Coastal Everglades Long Term Ecological Research (FCE LTER) Project data servers, which can be accessed through http://fcelter.fiu.edu/. Using the FCE LTER, for which MRH is a coPI, ensures that data are secure, backed up, and will be publicly available. Data sets will be locked to the public initially (e.g. for five years) to allow publication of results (see below). After this time or when publications have been accepted, data will become open access to the public through the FCE LTER data portal. Data standards and metadata will conform to the FCE LTER guidelines. See below for details of LTER data management.

We expect to publish multiple papers based on the work outlined in this proposal and we will contribute datasets to other researchers that will enhance this productivity. For example, during past projects we provided bathymetry and aerial photography data that were central to other researcher's publications. Target journals will include broad-interest journals, broad ecological journals, and marine biological journals. Authorship on manuscripts will be based on effort in fieldwork, analysis, and write-up and it is expected that graduate students will be lead author on most publications.

All photographs and other materials collected during research will be stored on primary computers and external hard drives at Florida International University.

FCE LTER Data Management

The mission of the FCE LTER Information Management System (IMS) will be to facilitate the project's scientific work on water quality monitoring in terrestrial settings. To assure total support of the proposed project, the FCE Information Management (IM) team will establish a set of primary goals: 1) design and implement IMS protocols to handle research contributions from project collaborators, 2) collect and archive water quality data, 3) provide comprehensive metadata for data interpretation and analysis, 4) design and implement web-based tools that facilitate project data management, data discovery and data access.

Information Management System (IMS) Scope
All of the proposed project's raw and derived data and metadata files will be stored in the FCE LTER hierarchical flat file directory system. Proposed project information and minimal research data metadata will be stored in an Oracle10g database. This hybrid system (flat file and database) will give project researchers, community scientists and the general public an option to download complete original data files submitted by project scientists. The project administration agrees to comply with the FCE Information Management Policy (http://fcelter.fiu.edu/research/information_management/documents/), best practices and evolving protocols to ensure the data are available and accessible through the FCE LTER Data Resources portal (http://fcelter.fiu.edu/data/).

Information Management System (IMS) Design
The FCE IMS group manages three physical Windows servers and two physical Linux servers with a total storage capacity of 2.9 Terabytes and an additional 400 Gigabytes of storage between two desktop workstations.

Information Management System (IMS) Server/Workstation Security and Data Protection
All FCE physical servers and workstations undergo continual updates and patches to their operating systems and have dynamic firewalls. Database and flat file integrity are maintained through access passwords and user privileges and roles. The physical servers housing the FCE Oracle 10g database and the FCE Website structure documents and website related files are equipped with RAID5 technology (Redundant Array of Independent Disks). The FCE IMS implements 2 levels of data protection 1) nightly incremental backups to external drives and 2) weekly full backups to two sets external hard drives with one set being stored offsite. The FCE IMS will be adding another level of disaster recovery protection to their current plan once the information migration to the virtual servers is complete. The Oracle 10g, FCE Web and FCE FTP virtual servers housed locally at FIU will be backed up to identical virtual servers residing at the Northwest Florida Regional Data Center (NWRDC) located on the campus of Florida State University in Tallahassee, Florida. This new 'off-site' disaster recovery plan will allow the FCE website to be continually available throughout disaster events such as hardware failures and hurricanes.

Information Management System (IMS) Support for Science
The FCE LTER web site will provide outstanding support for the proposed project's science as the project's home page design will provide a simple, user-friendly gateway a wide variety of information ranging from the proposed project overview to links to additional research related websites. The proposed project 'Data' web page will provide users access to a Data Table of Contents (searchable by data contributor, workgroup, sample location, data type or keyword), and links to other sources of related data resources. An individual 'Data Summary Table' will be generated for each data file to facilitate data discovery and access; this table is the portal for data and metadata downloads