

# **South Florida Water, Sustainability and Climate (SFWSC) Project Data Management Policy December 2013**

(Modified April 2014)

## **Objectives**

The South Florida Water, Sustainability, and Climate (SFWSC) Project data sets address the project's specific objectives which include the development of hydro-economic models and the collection of data to investigate 1) the economic value of ecosystem services and ecological functioning and 2) the potential hydrologic, ecological and economic impacts of management schemes that are designed to increase the resilience of the system to climate variability, climate change and sea level rise. These data will help with understanding the roles of cognitive and perceptual biases in risk assessment and decision-making in scenario evaluations and with the development of recommendations for adaptive water management plans that optimize economic productivity and the value of ecosystems services.

All researchers participating in the SFWSC project recognize their responsibility to contribute all NSF SFWSC-funded data to the SFWSC database and to publish data via the SFWSC website in a timely manner. The Florida Coastal Everglades LTER program (<http://fcelter.fiu.edu/>) will be managing the SFWSC data throughout the course of the project and beyond. The SFWSC administrators and the FCE LTER Data Management Group has established a set of protocols and services for data collection, quality assurance, organization, data archiving, data access, and data distribution to facilitate SFWSC scientific work and provide research data to those participating in sustainability and climate work.

## **Data Collection**

To ensure that SFWSC data are properly archived and protected, researchers are strongly encouraged to routinely submit data from ongoing research to the SFWSC/FCE LTER Information Manager. To this end, SFWSC researchers must submit all data (digital format) collected during a calendar year to the FCE LTER Information Manager by no later than September 1 of the following year. The Information Manager will schedule quarterly data collection dates (February 1, May 1, August 1, & November 1) throughout the year whereby electronic collection reminders with the appropriate data submittal information, will be sent out to all participating researchers. The purpose of these reminders is to encourage researchers to continually submit their data for archiving and protection, rather than waiting until September 1 of each year to submit the previous year's data. All SFWSC data must be submitted with a standard SFWSC digital EML 2.1 metadata form describing the format and content of the data together with a list of persons

that have permission to make data available to others during its protected period (see Data Distribution Section).

## **Quality Assurance**

A goal of the SFWSC/FCE LTER Data Management Group is to create and maintain an archive of SFWSC data files that are error-free and fully documented. Good communication and interaction between the SFWSC/FCE LTER Information Manager and scientists are both critical to preventing data loss and to maintaining data integrity. Any SFWSC researcher who submits data to the FCE LTER database will be responsible for the quality assurance of that data, including the metadata content. Once those data have been submitted to the FCE Information Manager, the LTER program and Information Manager will be responsible for supervision and stewardship of SFWSC datasets.

## **Data Organization**

### *SFWSC Metadata Protocol*

The SFWSC project adheres to the LTER network-wide Ecological Metadata Language (EML 2.1.0) standard developed at the National Center for Ecological Analysis and Synthesis (NCEAS). This new standard includes distribution of both geospatial and non-geospatial metadata in parsable XML formats based on EML. EML exists as a set of XML Schema documents that allow for the structural expression of metadata necessary to document a typical data set in the ecological sciences. A full description of EML 2.1.0 can be found at the following URL: <http://knb.ecoinformatics.org/software/eml/>.

Currently, the SFWSC/FCE LTER Information Management Group uses a Metadata template that follows the EML content standard and is based on the LTER EML Best Practices Version 2 (August, 2011). A downloadable version of the SFWSC Metadata template, available in Microsoft Excel (.xlsx), can be found on the SFWSC public website ([http://eimc.fiu.edu/projects/SFWSC/SFWSC\\_MetadataTemplate\\_EML2.1.xlsx](http://eimc.fiu.edu/projects/SFWSC/SFWSC_MetadataTemplate_EML2.1.xlsx)).

## **Data Archive and Protection**

The SFWSC/FCE LTER Data Management Group is dedicated to developing and maintaining a high-quality program for long-term data archival storage. All SFWSC data submitted to the FCE LTER Information Manager will be stored in the SFWSC data archives residing on FCE LTER servers. SFWSC project information, minimal research data metadata will be stored in the FCE LTER Oracle Database under the SFWSC\_WEB schema.

The entire network of FCE servers and workstations undergo continual updates and patches to their operating systems. There is a secure socket layer (SSL) on all servers and all FCE computers have dynamic firewalls. The FCE Information Management System implements 3 levels of data protection:

- 1) Level 0 – Nightly incremental backups of the Oracle Database server, the FCE Web server and IMS personnel workstations
- 2) Level 1 – Two sets of weekly full backups of all FCE LTER physical and virtual servers and workstations are made to external hard drives. One set of hard drive backups is stored in an off-site location in a fully padded, waterproof, rolling case and the second set is stored in the FCE LTER Office firebox safe. There are a total of six external hard drives used in the weekly backup rotation, giving the FCE data management group 3 weeks of system backups at any given time.
- 3) Nightly Syncs and/or manual syncs when necessary made between the 3 production virtual servers housed at FIU and identical virtual servers residing at the Northwest Regional Data Center (NWRDC) located roughly 400 miles north of Miami on the campus of Florida State University in Tallahassee, Florida. This ‘off-site’ disaster recovery plan will allow the FCE website to be continually available throughout disaster events such as hardware failures and hurricanes.

In addition to all SFWSC project digital data, any pertinent hardcopy data, such as completed field notebooks, may also be stored in the FCE LTER office fireproof cabinet. Researchers are encouraged to take advantage of the LTER office for these kinds of non-digital backup protection.

## **Data Distribution**

### ***Part A- Data***

Data and information derived from publicly-funded research under the South Florida Water, Sustainability, and Climate project is supported by the National Science Foundation’s Water, Sustainability and Climate (WSC) program (EAR-1204762) with joint support from the United States Department of Agriculture’s National Institute of Food and Agriculture (NIFA Award Number 2012-67003-19862). These data are made available online with as few restrictions as possible on a nondiscriminatory basis. SFWSC researchers make every effort to release data in a timely fashion.

The SFWSC/FCE Information Management protocol is that researchers must provide “unlock” updates for all datasets (meaning updates about when data can be unlocked and made available to the public). All researchers will provide updates on the lock status of all their remaining locked data sets each September 1. The SFWSC researcher associated with a given dataset controls access to their data while it is locked. No locked datasets will be released to anyone (including SFWSC-affiliated

researchers) without the expressed permission of the researcher, transmitted in writing to the SFWSC/FCE Information Manager (email is acceptable), whose data have been requested.

The SFWSC/FCE LTER Data Management Group will make SFWSC data and metadata available for online access via the web according to the data availability status as defined by their data type described below:

**Type I** – data are to be released to the general public according to the terms of the general data use agreement (*see Data Use Agreement Section below*) no later than the publication of the main findings from the dataset.

**Type II** - data are to be released to restricted audiences according to terms specified by the owners of the data. Type II data are considered to be exceptional and should be rare in occurrence. The justification for exceptions must be well documented and approved by the lead PI and Site Data Manager. Some examples of Type II data restrictions may include: locations of rare or endangered species, data that are covered under prior licensing or copyright (e.g., SPOT satellite data), or covered by the Human Subjects Act, Student Dissertation data and those data related to the SFWSC project but not funded by the National Science Foundation (NSF) WSC program (EAR-1204762) and the NIFA Award Number 2012-67003-19862. Researchers that make use of Type II Data may be subject to additional restrictions to protect any applicable commercial or confidentiality interests.

### **Conditions Justifying Type 2 Statutes**

#### **1. Legal Issues**

- a. The data includes the location of sensitive resources that might be endangered by revealing the location. This would include locations of artifacts, threatened or endangered species.
- b. Data will not be released that may compromise one's personal privacy. This might include types of survey and census data involving human subjects.
- c. Data that are covered by copyright laws (e.g. TM and/or SPOT satellite data).

#### **2. Publication Issues**

- a. The protection of a vulnerable PI is required. These data are those collected by graduate students, Post-Docs and others who have limited number of data to their name and whose professional development might be compromised by releasing the data too early.

### **3. Non-LTER Funded Data**

- a. This includes data related to the SFWSC project but not funded by the National Science Foundation (NSF) WSC program (EAR-1204762) and the NIFA Award Number 2012-67003-19862. These data are funded by other agencies and/or institutions but the data are tied to the SFWSC objectives. In these cases, the researchers are strongly encouraged to either a) submit links to their databases, allowing direct connection to their web accessible data via the SFWSC website and through the FCE Database, or b) to also submit their data to the FCE Information Manager at the time the data are released to the agency. In either case, the researcher should seek permission of the agency in question to make this link. The recommended lock period is identical to that mandated by the funding agency.

### **4. Data Quality Assurance and Control Issues**

- a. Data with quality assurance and control issues such as data with low quality or data that include measurements using new techniques that require further study before their value and limitations are understood.

#### ***Part B- Metadata***

1. Metadata documenting archived/online data sets of all types listed above will be made available when, or before, the dataset itself is released according to the terms above.
2. All metadata will be publicly available regardless of any restrictions on access to the data.
3. All metadata will follow LTER recommended standards and will minimally contain adequate information on proper citation, access, contact information, and discovery. Complete information including methods, structure, semantics, and quality control/assurance is expected for most datasets and is strongly encouraged.

#### ***Data Use Agreement***

**Type I** data sets available via the SFWSC web site (<http://sfwsc.fiu.edu>) are freely available and can be downloaded for academic, research, or professional purposes subject to the following user terms:

1. **Acceptable use:** User must notify designated SFWSC researcher when any future work based on or derived from SFWSC data is published and they must agree to send 2 reprints of any publications resulting from the use of the data and documentation to the following address:

South Florida Water, Sustainability and Climate Project  
C/O Dr. Mike Sukop  
Department of Earth & Environment  
Florida International University  
ECS 347  
11200 SW 8<sup>th</sup> Street  
Miami, FL 33199

Publications may also be E-mailed to [sukopm@fiu.edu](mailto:sukopm@fiu.edu) and [jessicabolson@gmail.com](mailto:jessicabolson@gmail.com)

2. **Redistribution:** User agrees not to redistribute original SFWSC data and Documentation.
3. **Citation:** User will acknowledge the support of the SFWSC project and appropriate NSF Grant numbers in any publications using these data with the following citation:

Data sets were provided by the South Florida Water, Sustainability and Climate Project. This material is based upon work supported by the National Science Foundation under Grant No. EAR-1204762 and the United States Department of Agriculture NIFA Award Number 2012-67003-19862. Please note that specific NSF Grant Numbers may need to include the following collaborative grants:

1204380 Charles R. Hinkle, University of Central Florida Office of Research & Commercialization  
1204445 Christopher J. Martinez, University of Florida  
1204572 David T. Ho, University of Hawaii  
1204474 David W. Watkins, Michigan Technological University  
1204666 Jose D. Fuentes, The Pennsylvania State University  
1204079 Joseph M. Smoak, University of South Florida  
1204752 Kenneth . Broad, University of Miami, Rosenstiel School of Marine & Atmospheric Sciences  
1204780 Robert J. Meyer, University of Pennsylvania

FIU WSC 1 grant was EAR-1039223

It also must be assured that, in any publication including World Wide Web pages which contains material based on or developed under your award, (other than a scientific article or paper appearing in a scientific, technical, or

professional journal) this acknowledgment is accompanied by the following disclaimer:

"Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation."

By using or copying these data and documentation, the Data User agrees to abide by the terms of this agreement.