

The South Florida Information Access (SOFIA) System and Everglades Depth Estimation Network (EDEN)

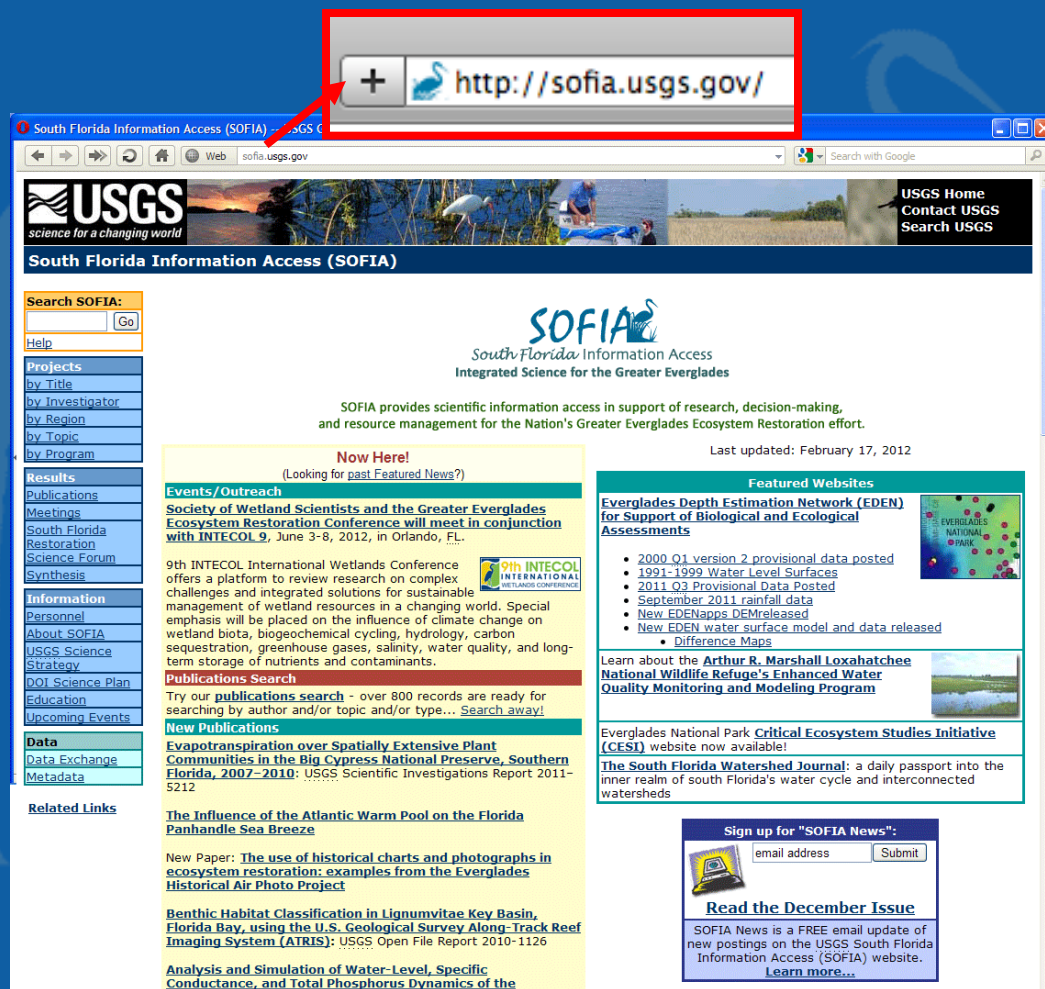
Heather Henkel

U.S. Geological Survey - Coastal and Marine Science Center
St. Petersburg, Florida

Florida Water Resources Monitoring Council (FWRMC) Annual Meeting

Today's Talk

- Introduction to South Florida Information Access (SOFIA)
- Introduction to Everglades Depth Estimation Network (EDEN)
- Talk not covering other USGS activities or programs



The screenshot shows the SOFIA website interface. A red box highlights the browser's address bar, which contains the URL <http://sofia.usgs.gov/>. The website header features the USGS logo and the text "South Florida Information Access (SOFIA)". Below the header, there is a search bar labeled "Search SOFIA:" and a navigation menu with links to "Projects", "Results", "Information", "Data", and "Related Links". The main content area includes sections for "Now Here!", "Events/Outreach", "Publications Search", "New Publications", and "Featured Websites". The "Featured Websites" section lists various resources, including the "Everglades Depth Estimation Network (EDEN)" and the "Everglades National Park Critical Ecosystem Studies Initiative (CESI)".

Problem:

- Data is scattered or unavailable
 - At many sites or “science-in-a-box”
 - Especially when dealing with complex, interdisciplinary, and multi-agency projects
- Web sites come and go
 - What happens to data?
 - Who is responsible for the data?
- Some projects do not have sufficient time or resources to manage own data
 - Difficult to do science and manage data at same time

Solution:

- Provide access to data and information in one place
- Dedicated resources
 - Ensure staff is tasked specifically with managing data
- Provide support for others

Development of SOFIA (1)

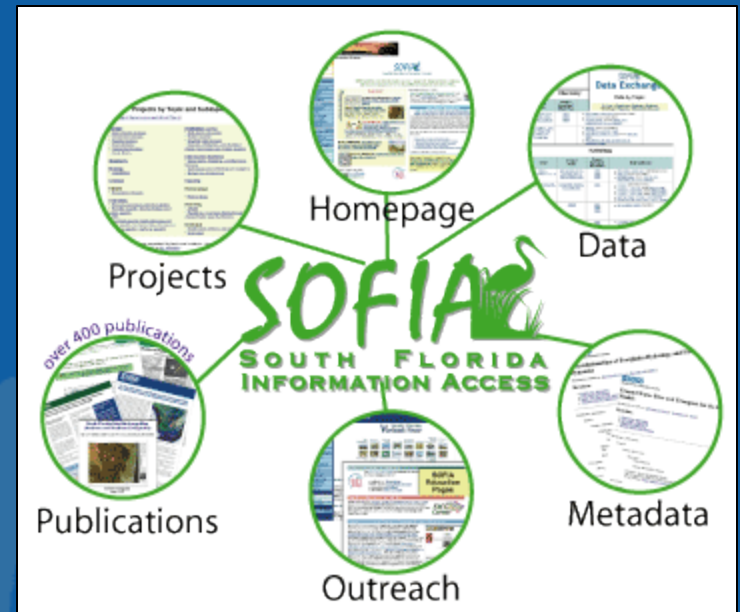
- Established to facilitate the exchange of information in the Greater Everglades
- An interdisciplinary service that provides coherent information access in support of:
 - Research
 - Decision-making
 - Resource management

Development of SOFIA (2)

- Focuses on the projects and products from USGS Greater Everglades PES as well as related projects and products from other information providers
 - Federal, state, local agencies
 - Universities
 - Non-governmental organizations (NGOs)

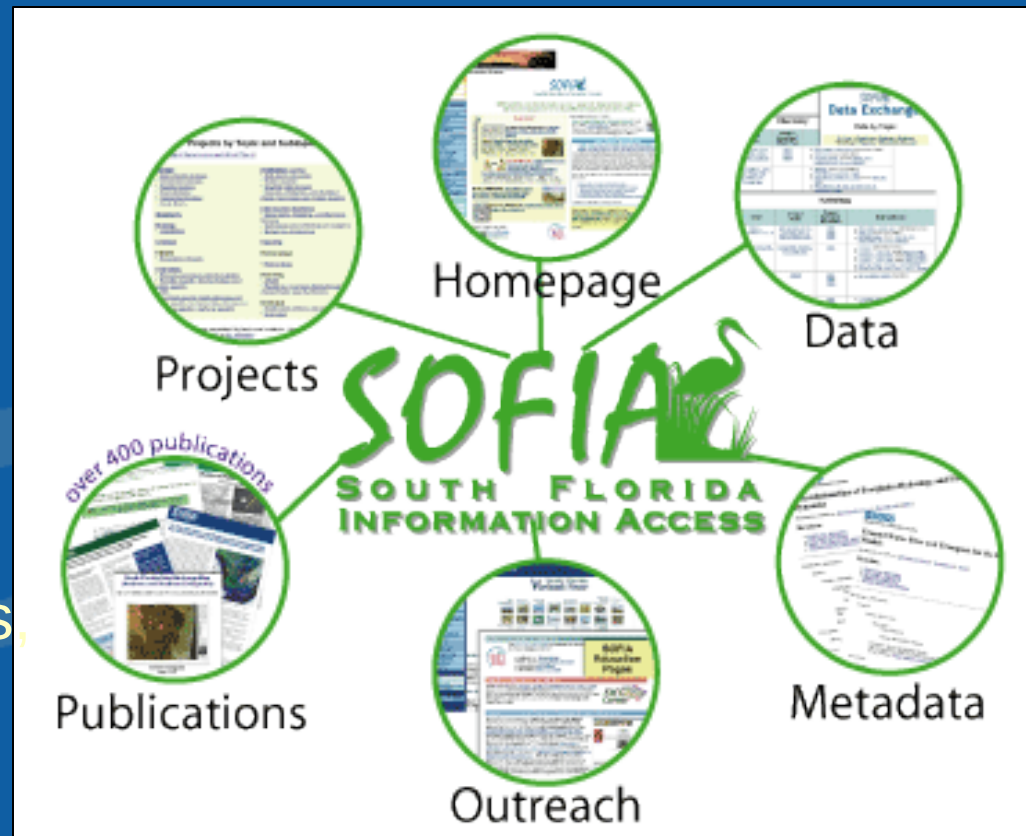
Purpose

- One place for data access
 - Scientists, data managers, decision-makers, general public
- Access to up-to-date information as well as historical information
- Interdisciplinary team of scientists, information managers, and informatics specialists working in close collaboration with partner and client agencies outside the USGS



Components Overview (1):

- Website - provides access to all available information
 - Proposals, publications data, metadata, current events, personnel
- Searchable publications database
- Data warehouse
- Metadata node (FGDC-compliant)



Components Overview (2):

- Clearinghouse : South Florida Restoration Science Forum
- SOFIA News
- Loxahatchee NWR Enhanced WQ Monitoring and Modeling website
- Tides and Inflows in the Mangroves of the Everglades (TIME) website
- EDEN

A.R.M Loxahatchee National Wildlife Refuge
Enhanced Water Quality Monitoring and Modeling



The Everglades, including the [Arthur R. Marshall Loxahatchee National Wildlife Refuge](#) (Refuge), developed as a rainfall-driven system with surface waters low in nutrients and inorganic ions such as chloride, sodium, and calcium, and, therefore, low in conductivity. Areas of pristine marsh throughout the Everglades have been impacted to various degrees by intrusion of water with high nutrients and other constituents. Information from the Refuge and other wetlands indicates that changes in phosphorus and major ions cause undesirable ecological changes in flora and fauna. A large amount of research conducted by state, federal, and private entities has demonstrated the impacts of small increases in concentration of total phosphorus. Changes in Everglades flora and fauna begin to occur at total phosphorus concentrations slightly higher than 10 ppb. In addition to elevated phosphorus concentrations, canal water has high conductivity compared to the naturally low conductivity marsh interior. Conductivity is a simple field measurement that provides a surrogate for concentration of major ions. Therefore, there are concerns that increases in canal water intrusion into the Refuge interior may cause negative ecological consequences because canal water is higher in nutrients.

Home
[Introduction](#)
[Water Quality Monitoring Network](#)
[Water Quality Modeling](#)
[Canal Sediment and Water Quality Characterization](#)
[Reports](#)
[Contact Us](#)

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USGS Home
Contact USGS
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Tides and Inflows in the Mangroves of the Everglades (TIME)

Home
[About TIME](#)
[Data](#)
[Manuals/Software](#)
[Publications](#)
[Model Animations](#)
[Photo Gallery](#)
[Scientific Links](#)

Welcome to the website for the Tides and Inflows in the Mangroves of the Everglades (TIME) Project.

The TIME Project is focused on developing a numerical model to investigate the interacting effects of freshwater inflows and tidal forces in and along the mangrove ecotone of south Florida.

Archived TIME data supporting the model development are available through the [TIME Data pages](#). TIME Project publications may be accessed through the [Project Publications page](#). An extensive [photo gallery](#) also is available on this site.

Please note that this website is no longer maintained and new information has not been added since 2006. Questions about this website should be transmitted to [Judson Harvey](#).



GEOLOGY **HYDROLOGY** **BIOLOGY** **GEOGRAPHY**

Accessibility FOIA Privacy Policies and Notices

U.S. Department of the Interior | U.S. Geological Survey
This page is: <http://sofia.usgs.gov/time/index.php>
Comments and suggestions? Contact: [Heather Henkel](#) or (727) 803-8747 ext. 3028
Last updated: March 25, 2010 11:52 AM(TJE)

USA.gov **U.S. DEPARTMENT OF THE INTERIOR** **U.S. GEOLOGICAL SURVEY** **TAKE PRIDE IN AMERICA**

sofia.usgs.gov

- Established in 1996
- Updated frequently
- New additions highlighted on front page and announced in **SOFIA News**
- Search indexes over 10,000 pages



The screenshot shows the SOFIA (South Florida Information Access) website. At the top is the USGS logo with the tagline "science for a changing world". Below this is a banner image of a wetland. The main header reads "South Florida Information Access (SOFIA)". On the left is a navigation menu with links: Project, by Title, by Invest, by Region, by Topic, by Product, Results, Publications, Meetings, South Florida Restoration Science Forum, Synthesis, Information, Personnel, About SOFIA, USGS Science Strategy, DOI Science Plan, Education, Upcoming Events, Data, and Data Exchange. The central area features a "Search SOFIA:" box with a "Go" button, which is highlighted by a red rectangle and a red arrow. Below the search box is a "Help" link. To the right of the search box is the SOFIA logo and the text "South Florida Information Access Integrated Science". Further right is a "USGS Home Contact USGS Search USGS" link. Below the search box, there is a "Now Here!" section with a link to "g for past Featured News?". The bottom right section is titled "Featured Websites" and lists several resources: Everglades Depth Estimation Network (EDEN) for Support of Biological and Ecological Assessments, March Rainfall Data, 2009 Q4 provisional data released, Real-time "quick view" images available, New DEM released, New EDENapps DEM released, November and December 2009 rainfall data posted, and New Publication: Everglades Depth Estimation Network (EDEN) Applications: Tools to View, Extract, Plot, and Manipulate EDEN Data. At the very bottom right, there is a link to "Learn about the Arthur R. Marshall Loxahatchee National Wildlife Refuge's Enhanced Water Quality Monitoring and Modeling Program" with a small image of a wetland.

Projects

- Over 180 projects
- Ongoing and completed (start /end date listed)
- Listed by title, investigator, region, or topic
- Each project page links to all associated information
- Database-driven

Projects by Topic and Subtopic

[Project proposals, Project Summaries, Scopes of Work and Work Plans]

Please note: projects are now organized by topic and subtopic. Use the links below to explore South Florida Ecosystem projects.

Biology - Aquatic biology - Avian biology - Coral Reefs - Invertebrate biology - Terrestrial biology - Vertebrate biology	Hydrology (cont'd) - Surficial Aquifer Geohydrology and Water Quality (includes Grey limestone, Biscayne aquifer, surficial aquifer) - Water Quality
Chemistry	Information Systems - Databases and Information Systems - Geography, Mapping, and Remote Sensing - Networks, Monitoring
Ecology - Vegetation	Mapping
Geology	Meteorology
History - Ecosystem History	Modeling - Across Trophic Level System Simulation (ATLSS) - Surface water, ground water, water quality, biology
Hydrology - ASR - Coastal, Wetlands, and Surface Water Hydrology and Water Quality - Floridan Aquifer Geohydrology and Water Quality - GW/SW interactions - Mercury Cycling in the Everglades - Salt water intrusion	Overview - Restoration effects and monitoring

Publications

- Both official USGS and outside publications
- 900 entries in database, most available on SOFIA
- Searchable by topic, type, author, or full text search

Biology - Amphibians & Reptiles - Aquatic Biology - Avian Biology - Coral Reefs - Endangered Species - Invertebrate Biology - Mammals - Monitoring Networks (Biology) - Nonindigenous Species - Terrestrial Biology - Vertebrate	Hydrology - Aquifer Storage & Recovery - Coastal, Wetlands & Surface Water (Includes Water Quality) - Floridan Aquifer (Includes Hydrogeology & Water Quality) - Groundwater/Surfacewater Interactions - Mercury Cycling in the Everglades - Monitoring Networks (Hydrology) - Nutrients (Nitrogen & Phosphorus) - Organics
Chemistry Ecology - Vegetation Geology History - Ecosystem - Historical	Circular Data Series Fact Sheet All Florida Geological Survey - Bulletin - Information Circular - Leaflet - Map Series - Report of Investigations - Special Publication General Information Product Lecture Map Open-File Report
Poster Report (includes Water-Data Report) Scientific Investigations Map Scientific Investigations Report Techniques & Methods (includes TWRI) Thesis Water Resources Investigations Report	

KEYWORD SEARCH (Perform a full text search of web pages and PDFs.)		HINTS:
Search entire collection:	Search	This searches all of our publication pages. Use * to do a wildcard search.
AUTHOR, TYPE, AND TOPIC SEARCH (Search by Author, Type, or Topic - or perform a combined search.)		HINTS:
Author [optional] First Name: Last Name: Search Now		Searches author names; author search automatically does a wildcard (*) search. You can search for organizations by entering relevant keywords in the Last Name field.
OR refine your search below by TYPE and/or TOPIC		

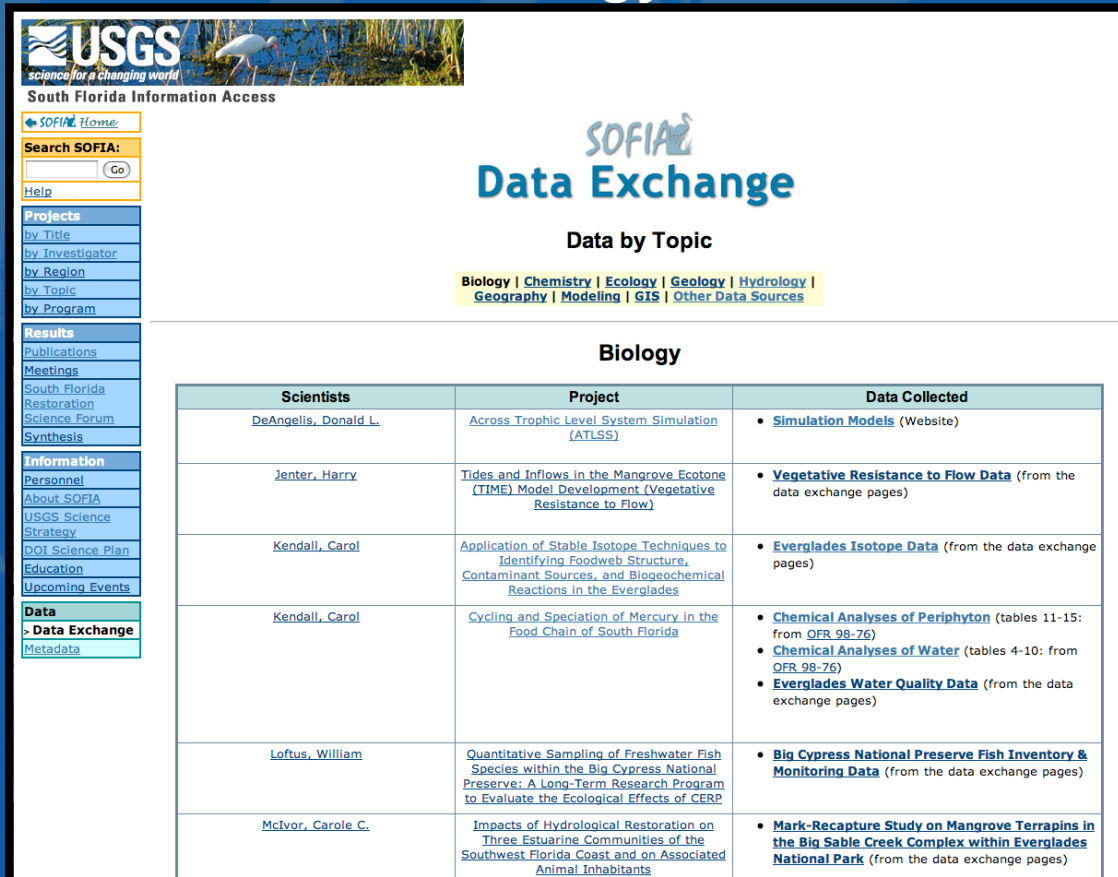
February 22, 2012

General Information

- SOFIA Contacts
- Personnel
 - Contact information
 - Related projects
- Information about SOFIA and PES
- DOI Science Plan (Greater Everglades)
- Education and Outreach programs
- Upcoming events

Data Exchange

- Organized by general topic
 - Biology, Chemistry, Ecology, Geology, Geography, Modeling, Hydrology, GIS Data
- Access to data sets, format, methodology, location maps, site listings, photos, frequency, period of record
 - Field data
 - Interpretive results



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[SOFIA Home](#)

Search SOFIA:

[Go](#)

[Help](#)

Projects

[by Title](#)

[by Investigator](#)

[by Region](#)

[by Topic](#)

[by Program](#)

Results

[Publications](#)

[Meetings](#)

[South Florida Restoration Science Forum](#)

[Synthesis](#)

Information

[Personnel](#)

[About SOFIA](#)

[USGS Science Strategy](#)

[DOI Science Plan](#)

[Education](#)

[Upcoming Events](#)

Data

[Data Exchange](#)

[Metadata](#)

SOFIA Data Exchange

Data by Topic

[Biology](#) | [Chemistry](#) | [Ecology](#) | [Geology](#) | [Hydrology](#) | [Geography](#) | [Modeling](#) | [GIS](#) | [Other Data Sources](#)

Biology

Scientists	Project	Data Collected
DeAngelis, Donald L.	Across Trophic Level System Simulation (ATLSS)	Simulation Models (Website)
Jenter, Harry	Tides and Inflows in the Mangrove Ecotone (TIME) Model Development (Vegetative Resistance to Flow)	Vegetative Resistance to Flow Data (from the data exchange pages)
Kendall, Carol	Application of Stable Isotope Techniques to Identifying Foodweb Structure, Contaminant Sources, and Biogeochemical Reactions in the Everglades	Everglades Isotope Data (from the data exchange pages)
Kendall, Carol	Cycling and Speciation of Mercury in the Food Chain of South Florida	Chemical Analyses of Periphyton (tables 11-15: from QFR 98-76) Chemical Analyses of Water (tables 4-10: from QFR 98-76) Everglades Water Quality Data (from the data exchange pages)
Loftus, William	Quantitative Sampling of Freshwater Fish Species within the Big Cypress National Preserve: A Long-Term Research Program to Evaluate the Ecological Effects of CERP	Big Cypress National Preserve Fish Inventory & Monitoring Data (from the data exchange pages)
McIvor, Carole C.	Impacts of Hydrological Restoration on Three Estuarine Communities of the Southwest Florida Coast and on Associated Animal Inhabitants	Mark-Recapture Study on Mangrove Terrapins in the Big Sable Creek Complex within Everglades National Park (from the data exchange pages)

South Florida Hydrology Data Download tool

[Clear All Selections](#)

Time Frame

Enter a date range in the format "YYYYMMDD" (data at 15 minute intervals from 1995-10-01 to 2009-09-30; not all stations have full range of data--coverage for each station is detailed in the Stations table).

Start of date range: 19951001

End of date range: 20090930

Data Variables

Select the measured parameters you would like to download. Not all variables are available for all stations--see list of available variables in the Stations table.

[Select All Variables](#)

[Clear Selected Variables](#)

- ☒ Stage (St, ft)
- ☐ Temperature (Te, °C)
- ☒ Surface Temperature (STe, °C)
- ☐ Bottom Temperature (BTe, °C)
- ☐ Salinity (Sa, ppt)
- ☒ Surface Salinity (SSa, ppt)
- ☐ Bottom Salinity (BSa, ppt)
- ☐ Discharge (Di, ft³/s)
- ☐ Filtered Discharge (FDi, ft³/s)
- ☐ Specific Conductance (SCo, µS/cm)

South Florida Hydrology Data Download

This form will allow you to download hydrological data for South Florida stations in tab-delimited or CSV (comma-separated values) text format, which may then be imported into Excel, or most spreadsheet or database programs. Select any variables and sites listed below for which you would like data, and then press the "Download data" button. This will then produce a .zip file containing text files with the data you have requested along with a "readme" file describing the data collection. For questions about this data, please contact [Mark Zucker](#).

[Help Page](#)

The Google Map on this page requires enabled JavaScript to view; if you cannot fully access the information on this page, please contact [Heather Hensel](#).



Stations

Select the stations for which you would like to download data. Ranges of data collection are noted below each station, as are the observed variables (range may not receive full coverage for all variables). Selecting larger date ranges or variables not available for some or all of your selected stations will not cause a problem; your resultant dataset will merely be blank for the period/variables in question. Clicking on a station name will bring up the period of record for the individual parameters in a separate window.

[Select All Stations](#)

[Clear Selected Stations](#)

☐ Alligator Creek 2007-04-24 to 2009-09-30 St,Di	☐ Barron River 2001-09-11 to 2009-09-30 St,Te,Sa	☒ Bottle Creek 2003-09-30 to 2009-09-30 St,Te,Sa,Di,SCo	☐ Broad River 2001-02-22 to 2009-09-30 St,Te,Sa,SSa,BSa,Di	☐ C-111 Wetland 2003-10-03 to 2009-09-30 St,Te,Sa,SCo
☐ Card Sound Canal 2003-09-30 to 2009-09-30 St,Ste,BTe,SSa,BSa,Di,FDi	☐ Chatham River 2001-02-28 to 2009-09-30 St,Ste,BTe,SSa,BSa,Di	☐ EDEN 3 2003-09-30 to 2009-09-30 St,Te	☐ East Creek Near Homestead 2001-08-09 to 2009-09-30 St,Di	☐ East Highway Creek 2001-08-09 to 2009-09-30 St,Di
☐ G-3763 2002-03-15 to 2009-09-30 St,Te,Sa,SCo	☐ G-3764 2002-03-15 to 2009-09-30 St,Te,Sa,SCo	☐ Joe 1999-07-29 to 2009-09-30 St,Te,Sa,Di	☐ Joe Bay 1E 1999-07-29 to 2009-09-30 St,Te,Sa,Di	☐ Joe Bay 1W 1999-05-26 to 2009-09-30 St,Te,Sa,Di
☐ Jewish Creek 1997-09-30 to 2009-09-30 St,Ste,BTe,SSa,BSa,Di,FDi	☐ Jon 1999-07-29 to 2009-09-30 St,Te,Sa,SCo	☒ Lostmans River 2001-03-26 to 2009-09-30 St,Ste,BTe,SSa,BSa,Di	☐ McCormick Creek 1995-10-16 to 2009-09-30 St,Ste,BTe,SSa,BSa,Di	☐ MO-211 2005-11-09 to 2009-09-30 St,Te,Sa,SCo
☐ Lopez River 2001-04-18 to 2009-09-30 St,Te,Sa,Di	☐ Manatee Bay Creek 2002-10-28 to 2009-09-30 St,Ste,BTe,SSa,BSa,Di,FDi	☐ Oregon Creek 2001-07-19 to 2009-09-30 St,Di	☐ Severn Creek 2003-10-08 to 2009-09-30 St,Te,Sa,Di,FDi	☐ Shink River 2001-03-13 to 2009-09-30 St,Te,Sa,Di,FDi
☐ Onion Key 2005-12-06 to 2009-09-30 St,Te,Sa,Di	☐ Taylor River Mouth 1995-10-02 to 2009-09-30 St,Ste,BTe,SSa,BSa,Di	☐ Taylor Slough Wetland 2003-10-04 to 2009-09-30 St,Te,Sa,SCo	☐ Trout Creek 1996-01-21 to 2009-09-30 St,Ste,BTe,SSa,BSa,Di	☐ Turner River 2001-09-19 to 2009-09-30 St,Te,Sa
☐ Upstream Lostmans River 2003-09-05 to 2009-09-30 St,Ste,BTe,SSa,BSa,Di,FDi	☐ Upstream Lostmans River 2003-09-05 to 2009-09-30 St,Ste,BTe,SSa,BSa,Di,FDi	☐ Upstream North River 2003-09-05 to 2009-09-30 St,Ste,BTe,SSa,BSa,Di,FDi	☐ Upstream Taylor River 1996-07-30 to 2009-09-30 St,Ste,BTe,SSa,BSa,Di	☒ West Highway Creek 2003-10-03 to 2009-09-30 St,Ste,BTe,SSa,BSa,Di

Output Format

Select an output format for the downloaded data.

- ☐ CSV
- ☒ Tab-delimited

Output Organization

Select an organization option for the downloaded data. "By station" denotes individual text files for each selected station, with columns for all selected variables in each station file. "By variable" denotes individual text files for each selected variable, with columns for all selected stations in each variable file.

- ☒ By station
- ☐ By variable

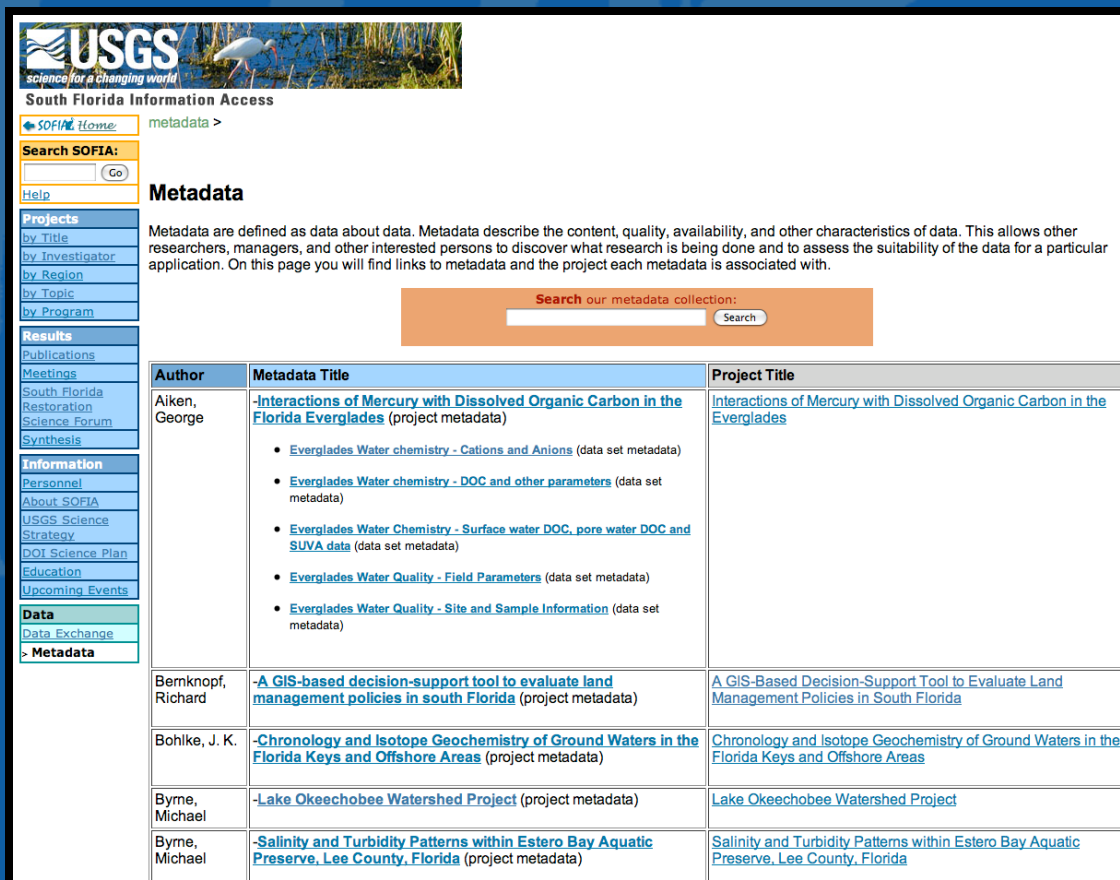
[Download data](#)

Please be patient while your data is downloading, especially if multiple stations or variables have been selected.

[Help Page](#)

Metadata (1)

- Over 230 records
- FGDC-compliant
 - Used from beginning
- Staff in charge of creating metadata for all SOFIA projects
 - Early survey showed project chiefs felt metadata was important to their work, but did not have time to create it
 - Support component added



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[SOFIA Home](#) metadata >

Search SOFIA:

[Help](#)

Projects

[by Title](#)

[by Investigator](#)

[by Region](#)

[by Topic](#)

[by Program](#)

Results

[Publications](#)

[Meetings](#)

[South Florida Restoration Science Forum](#)

[Synthesis](#)

Information

[Personnel](#)

[About SOFIA](#)

[USGS Science Strategy](#)

[DOI Science Plan](#)

[Education](#)

[Upcoming Events](#)

Data

[Data Exchange](#)

[> Metadata](#)

Metadata

Metadata are defined as data about data. Metadata describe the content, quality, availability, and other characteristics of data. This allows other researchers, managers, and other interested persons to discover what research is being done and to assess the suitability of the data for a particular application. On this page you will find links to metadata and the project each metadata is associated with.

Search our metadata collection:

Author	Metadata Title	Project Title
Aiken, George	Interactions of Mercury with Dissolved Organic Carbon in the Florida Everglades (project metadata) Everglades Water chemistry - Cations and Anions (data set metadata) Everglades Water chemistry - DOC and other parameters (data set metadata) Everglades Water Chemistry - Surface water DOC, pore water DOC and SUVA data (data set metadata) Everglades Water Quality - Field Parameters (data set metadata) Everglades Water Quality - Site and Sample Information (data set metadata)	Interactions of Mercury with Dissolved Organic Carbon in the Everglades
Bernknopf, Richard	A GIS-based decision-support tool to evaluate land management policies in south Florida (project metadata)	A GIS-Based Decision-Support Tool to Evaluate Land Management Policies in South Florida
Bohlke, J. K.	Chronology and Isotope Geochemistry of Ground Waters in the Florida Keys and Offshore Areas (project metadata)	Chronology and Isotope Geochemistry of Ground Waters in the Florida Keys and Offshore Areas
Byrne, Michael	Lake Okeechobee Watershed Project (project metadata)	Lake Okeechobee Watershed Project
Byrne, Michael	Salinity and Turbidity Patterns within Estero Bay Aquatic Preserve, Lee County, Florida (project metadata)	Salinity and Turbidity Patterns within Estero Bay Aquatic Preserve, Lee County, Florida

Metadata (2)

- Access to metadata through SOFIA site and various metadata portals
 - Provides more accessibility to metadata, data, site
- Metadata for projects and data sets



Metadata		
Metadata are defined as data about data. Metadata describe the content, quality, availability, and other characteristics of data. This allows other researchers, managers, and other interested persons to discover what research is being done and to assess the suitability of the data for a particular application. On this page you will find links to metadata and the project each metadata is associated with.		
Search our metadata collection: Search		
Author	Metadata Title	Project Title
Aiken, George	Interactions of Mercury with Dissolved Organic Carbon in the Florida Everglades (project metadata) - Everglades Water Chemistry - Cations and Anions (data set metadata) - Everglades Water Chemistry - DOC and Other Parameters (data set metadata) - Everglades Water Chemistry - Field Parameters (data set metadata) - Everglades Water Chemistry - Site and Sample Information (data set metadata)	Interactions of Mercury with Dissolved Organic Carbon in the Florida Everglades
Bales, Jerad	Review of selected features of the Natural Systems Model and suggestions for applications in South Florida (project metadata)	Review and Evaluation of a Model for Simulating the Natural Hydrology of South Florida
Bohne, J.K.	Chronology and Isotope Geochemistry of Ground Waters in the Florida Keys and Offshore Areas (project metadata)	Chronology and Isotope Geochemistry of Ground Waters in the Florida Keys and Offshore Areas
Byrne, Michael	Salinity and Turbidity Patterns within Estero Bay	

ACME Data Download

Clear All Selections

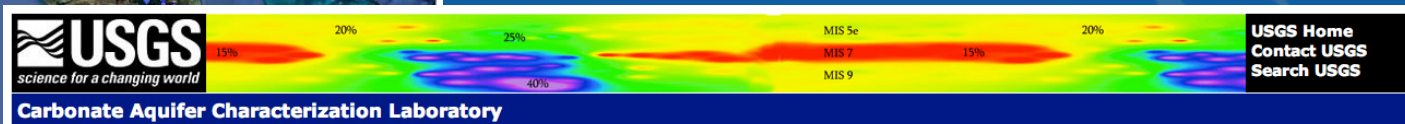
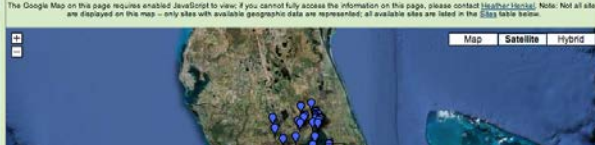
Time Frame
To restrict the results to data sets with Sample Dates within a desired time period, enter a date range in the format "YYYYMMDD" from 1995-03-27 to 2008-09-03 (default behavior will return results within this maximum time period).
Start of date range: 19950327
End of date range: 20080903

Parameters
Select the measured parameters you would like to include in your search results. To select multiple parameters, hold down the control key (Windows) or command key (Mac) while selecting.
Select All Parameters
Clear Selected Parameters

Al (µg/L)
Alk (µequiv/L)
ANC (µequiv/L)
As (µg/L)
AVS (µmoles/g dry weight)
B (µg/L)
Ba (µg/L)
Br (µM)
Ca (mg/L)
Cd (mg/L)
Cl (µM)
Co (µg/L)
CRS (µmoles/g dry weight)
Cu (µg/L)
d14S Sulfate (δ34S)
dD (‰)
DO (mg/L)
dO18 (‰)
DOC (mg C/L)
DOC-2 (mg C/L)
Dry Bulk Density (g dry weight/cm3)
F (µM)
Fe (µM)
FMHg (ng/L)
FMHg xs201 (ng/L)
FTHg (ng/L)
FTHg (ng/L)
FTHg (ng/L)
H4SiO4 (mg/L-SiO2)
HgR (ng/L)
K (mg/L)
Length (per day)
Li (µg/L)
LOI (percent)
Methg-solid xs198 (ng/g dry weight)
Methg-solid xs199 (ng/g dry weight)
Methg-solid xs200 (ng/g dry weight)
Methg-solid xs201 (ng/g dry weight)
Methg-solid xs202 (ng/g dry weight)
Hg (mg/L)
Mn (µg/L)
Na (mg/L)
NH4 (µM)
Ni (µg/L)
NO3 (µM)
Pb (µg/L)
Peat Depth (cm)

Experi
Select experiments you
Select All Ex
Clear Selected

☐ Dry-Rewet Exp. I (Feb - May 2)
☐ Dry-Rewet Exp. II (Dec 02-2a)
☐ Dry-Rewet Exp. III (Feb - Jun)
☐ Field MESOS 2000 (June - Aug 2)
☐ Field Data
☐ Hg MESOS 2000 (May 01- Apr)
☐ Marine Survey
☐ McCormick PO4 MESOS
☐ S_TOX 2003 (Started Nov 2003)
☐ SDM MESOS 2001 (Nov 2001)
☐ SDM MESOS 2002 (June 2002)
☐ SW_Survey



Carbonate Aquifer Characterization Laboratory

CACL Home
About Us
Projects
Capabilities
Collaboration
Contact Us

The Carbonate Aquifer Characterization Laboratory (CACL) was initiated to promote collaborative research on carbonate aquifer characterization between the U.S. Geological Survey (USGS) Florida Water Science Center (Davie office) and other governmental scientific agencies and academia. And, also to provide applied research for local, state, and federal agencies, and private industry, when research needs are within the scope of the USGS mission.

As the primary Federal science agency for water-resources information, the USGS is responsible for monitoring the quantity and quality of water in the Nation's rivers and aquifers and assessing the sources and fate of contaminants in aquatic systems. Towards this goal, a top priority for the USGS is to provide information to better define and manage the quality of the Nation's water resources. The CACL directly addresses this priority issue for the USGS by improving strategies to identify and protect drinking-water sources. The approach of the CACL is focused on the integration of the various disciplines that include core examination, sequence stratigraphy, borehole geophysics, digital optical borehole imaging, seismic, ground-penetrating radar, computational methods (eg., Lattice Boltzmann methods), and 3D geomodeling.

Accessibility FOIA Privacy Policies and Notices

U.S. Department of the Interior | U.S. Geological Survey
This page is: http://sofia.usgs.gov/cac/_draft/index.php
Comments and suggestions? Contact: [Heather Henkel - Webmaster](#)
Last updated: February 10, 2012 10:26 AM (KP)

Select the sites for which you would like to download data. Clicking

☐ Barren	☐ BCNP-WWRD	☐ BCNP-WW
☐ C111	☐ C41	☐ C41A-Ruel
☐ DF-Hwy835	☐ DF-Hwy846	☐ ENRFP
☐ ENPT87	☐ ENPT89	☐ ENR Cell 1
☐ ENR011	☐ ENR012	☐ ENR102
☐ ENR202	☐ ENR303	☐ ENR307
☐ ENR407	☐ ENRQ250	☐ ENRQ253E
☐ ENRFP12 open	☐ ENRFP12 Veg	☐ ENRPS
☐ FB1	☐ FB2	☐ FC-1
☐ FC-4	☐ HC-1	☐ HC-1A
☐ HC-3A	☐ HC-5	☐ HC-8
☐ Indian River 3	☐ Indian River 4	☐ Indian River 5
☐ Kiss-1	☐ Kiss-2	☐ Kiss-3
☐ L67-S151	☐ L67-S333	☐ L67-Holiday
☐ L67-S333	☐ L67-Tamiami	☐ Lostmans River
☐ MC-3	☐ MC-4	☐ MC-5
☐ Miami-S151	☐ Miami-S151	☐ MM.TS.N.#1
☐ MM.TS.S.#1	☐ MM.TS.S.#2	☐ MM.TS.S.#3
☐ MM.WCA.1.#3	☐ MM.WCA.1.#1	☐ MM.WCA.2.#2
		☐ MM.WCA.2.#3
		☐ ENR103
		☐ ENR401
		☐ ENRQ259
		☐ ENRPS
		☐ FC-2
		☐ HC-2
		☐ Indian River 1
		☐ IP-Hwy283
		☐ L28-175
		☐ L67-Miami
		☐ MC-1
		☐ MC-6
		☐ MM.TS.N.#2
		☐ MM.WCA.1.#1
		☐ MM.WCA.2.#3
		☐ ENR301
		☐ ENR402
		☐ ENRP-12
		☐ Faka-Union
		☐ FC-3
		☐ HC-3
		☐ Indian River 2
		☐ IP-Hwy721
		☐ L2W-Hwy835
		☐ L67-S151
		☐ MC-2
		☐ Miami-S151
		☐ MM.TS.N.#3
		☐ MM.WCA.1.#2
		☐ MM.WCA.3N.#1



Today's Talk

- Introduction to South Florida Information Access (SOFIA)
- Introduction to Everglades Depth Estimation Network (EDEN)

Everglades Depth Estimation Network (EDEN)

<http://sofia.usgs.gov/eden/>

- Overview
- Data
- Tools
- Status



Introduction (1)

- Many ecological models require hydrologic data
 - Water depth
 - Sheet flow
 - Hydroperiod and hydropatterns
- What tools are available to measure these attributes?

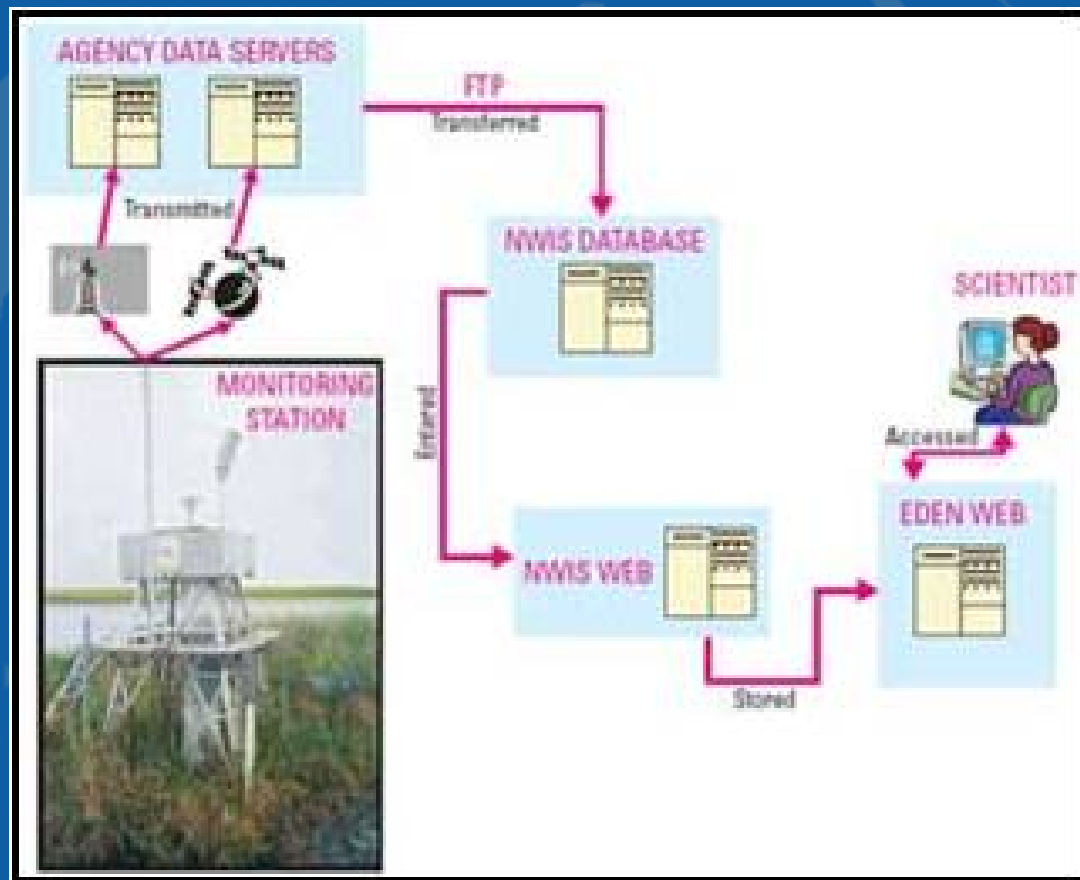
Introduction (2)

- Are they sufficient to measure change?
 - Often on small-scale in Florida
- Do biologists and ecologists have consistent hydrology for cross comparisons of landscape and trophic level assessment results?
- Is the scale of the data sufficient for biologists on the ground at individual sampling points?

Why EDEN?

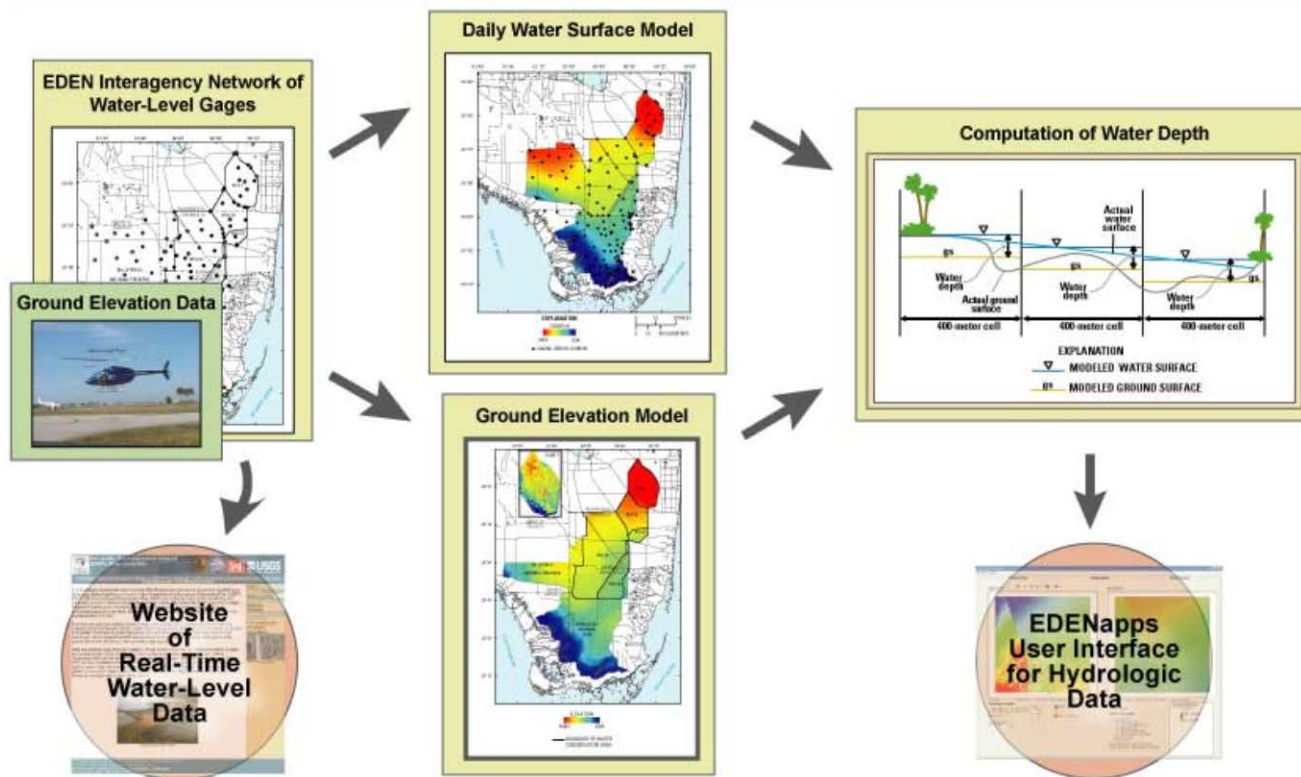
Purpose of EDEN hydrologic data is provide consistent, documented hydrologic data at a scale used by biologists and ecologists.

Instead of the biologists and ecologists doing the hydrology, EDEN provides the hydrologic data and lets the scientists do what they do best.



EDEN Overview

Everglades Depth Estimation Network (EDEN) Project Overview



Modeled

EDEN Data Types

- Water level
- Land surface elevation
- Vegetation data
- Rainfall
- Evapotranspiration
- Derived data
 - Depth
 - Days Since Dry
 - Slope

Data Sources

- Everglades National Park
- Big Cypress National Preserve
- South Florida Water Management District
- US Geological Survey
- US Fish and Wildlife Service
- University of Florida
- Florida Atlantic University
- Florida International University

EDEN Tools Introduction

1. EDENweb
2. EDENapps

EDEN Website

EDENweb - website for water level data

- Multi-agency and integrated
- Pages for all gages
 - Station description
 - Near real-time data access
 - Historic hourly data (if available, through Sept. 2005)
 - Rainfall and evapotranspiration data
 - Hindcasted data
 - Measured ground elevation (if available)
 - Observed vegetation (if available)
 - Station location map (Google Earth) and photos

Everglades Depth Estimation Network (EDEN) for Support of Biological and Ecological Assessments

Station name: **2A300**
Location Area: **Water Conservation Area 2A**

[Print page](#)

[[Station Information](#) | [Data Links](#) | [Datum Information](#) | [Ground Elevation/Vegetation](#) | [Other Information](#)]

Station Information	
Station Name:	2A300
Operating Agency:	SFWMD
USGS NWIS Agency Code:	FL005
USGS NWIS ID:	261446080243000
Latitude (DMS) NAD83:	26°14'47"
Longitude (DMS) NAD83:	-80°24'29"
UTM Easting Zone 17N (meters NAD83):	559111.7
UTM Northing Zone 17N (meters NAD83):	2903114.4
Location Area:	Water Conservation Area 2A
Real-time data (daily):	Yes

Data Links	
(Please note: the links below marked by this icon  will take you off of the EDEN website.)	
[Information about these links]	
Water Level Data:	Recent Hourly  Recent Daily 
Salinity Data:	(no salinity data available)
Historic Hourly Data (Through September 2005)	(.txt file)
Evapotranspiration Data	
Rainfall Data	
Station Location Map	
Other Database Links (Data on SFWMD DBHYDRO is in NGVD29)	

Ground Elevation and Vegetation Information for 2A300	
[How was this collected?]	
Major Vegetation Community	
Vegetation Community:	Wet prairie
Average Ground Elevation (ft) NAVD88:	8.70
Maximum Ground Elevation (ft) NAVD88:	8.93
Minimum Ground Elevation (ft) NAVD88:	8.52
Number of Measurements:	6
Collecting Agency and Date:	USGS, August 2005
Secondary Vegetation Community	
Vegetation Community:	Ridge or sawgrass and emergent marsh
Average Ground Elevation (ft) NAVD88:	9.56
Maximum Ground Elevation (ft) NAVD88:	9.70
Minimum Ground Elevation (ft) NAVD88:	9.48
Number of Measurements:	3
Collecting Agency and Date:	USGS, August 2005

Other Information	
Type of Station (Physical Location):	Marsh
Type of Station (Freshwater/Tidal):	Freshwater

Google Map

Map Satellite Hybrid

Stormwater Treatment Area

Browns Farm Wildlife Mgt Area

Hampsons at Boca Raton

Sandhillfoot

Boca Raton

EDEN Website (2)

- Information on water surface and digital elevation models (DEM)
 - Download EDEN surfaces and DEM data
- Search and download station information through interactive forms
- Access to EDENapps Tools, Publications, Newsletter, contact information

Everglades Depth Estimation Network (EDEN) for Support of Biological and Ecological Assessments

Ground Elevation Model

New DEM Posted - January 2010

For More Information:

"Initial Everglades Depth Estimation Network (EDEN) Digital Elevation Model Research and Development" (USGS Open File Report 2007-1034) and "Conceptual design of the Everglades Depth Estimation Network (EDEN) grid" (USGS Open File Report 2007-1200).

Ground elevation data for the greater Everglades and the digital ground elevation models (DEM) derived from them form the foundation for all EDEN water depth and associated ecological/hydrologic modeling.

This DEM was produced using the version HAED_v01 of the HAED, all available aerial height finder (AHF) data points posted to the SOFIA website as of October 2007. To create a realistic region-wide elevation model for EDEN purposes, the elevation data were segregated by Water Conservation Areas and National Park boundaries so that local trends could be isolated, sub-region specific interpolation models could be developed, and realistic breaks in elevation along sub-region boundaries could be imbedded in a final, region-wide DEM.

The ground elevation, and therefore water depth, in the Everglades can vary by centimeters or tens of centimeters within a few meters of a given location as a result of microtopographic features. In addition, ground surface elevations in the peat soils of the Everglades can drop during droughts due to compaction as the peat dries and can rise again in the wet season with re-hydration. The elevation value for each EDEN 400m by 400m grid cell is a modeled value influenced by variation in the AHF data surrounding the grid cell. Users are cautioned to use the EDEN data appropriately for site-specific assessments.

January 2010 EDEN Digital Elevation Model (DEM)

WCA1 subarea

What has changed?

The updated ground elevation model for the EDEN study area is based on the most current data available. The model is based on the most current data available. The model is based on the most current data available.

USGS science for a changing world

EDEN Website (3)

EDEN Website

Everglades Depth Estimation Network (EDEN) for Support of Biological and Ecological Assessments

WCA1 | WCA2 | WCA3 | Big Cypress National Preserve | Everglades National Park | Pennsuco Wetlands and Urban Coastal | Coast of Florida Bay | Coast of Gulf of Mexico

WCA3

Station name: 3ANE
Location Area: Water Conservation Area 3A

Map Satellite Hybrid

Print page

[Station Information | Data Links | Datum Information | Ground Elevation/Vegetation | Other Information]

Station Information	
Station Name:	3ANE
Operating Agency:	SFWMD
FWS Agency Code:	FL005
ID:	261643080361800
Location (DMS) NAD83:	26°16'44"
Longitude (DMS) NAD83:	-80°36'17"
UTM Easting Zone 17N (meters NAD83):	539459.1
UTM Northing Zone 17N (meters NAD83):	2906638.9
Location Area:	Water Conservation Area 3A
Real-time data (daily):	Yes

Data
Water Levels (Gage)
- Explanation of Terms
- Hindcasted
- Download Station Info
Ground Elevation (DEM)
Water Surfaces
EDEN Grid
Meteorologic
EDENapps
Introduction
DataViewer

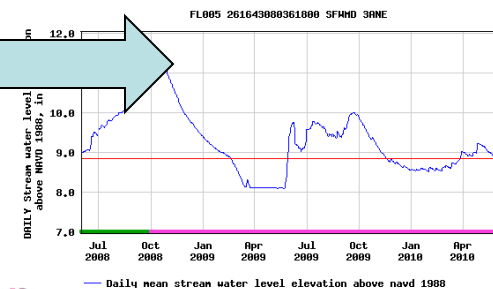
This station managed by the South Florida Water Management District.

Available Parameters	Period of Record	Output format	Begin date	End date
☐ All 1 Available Parameters for this site ☒ 63160 Stream level, NAVD (Mean)	2000-10-10 2010-05-25	☐ Graph ☐ Graph w/ stats ☐ Table ☐ Tab-separated	2009-06-01	2010-06-01

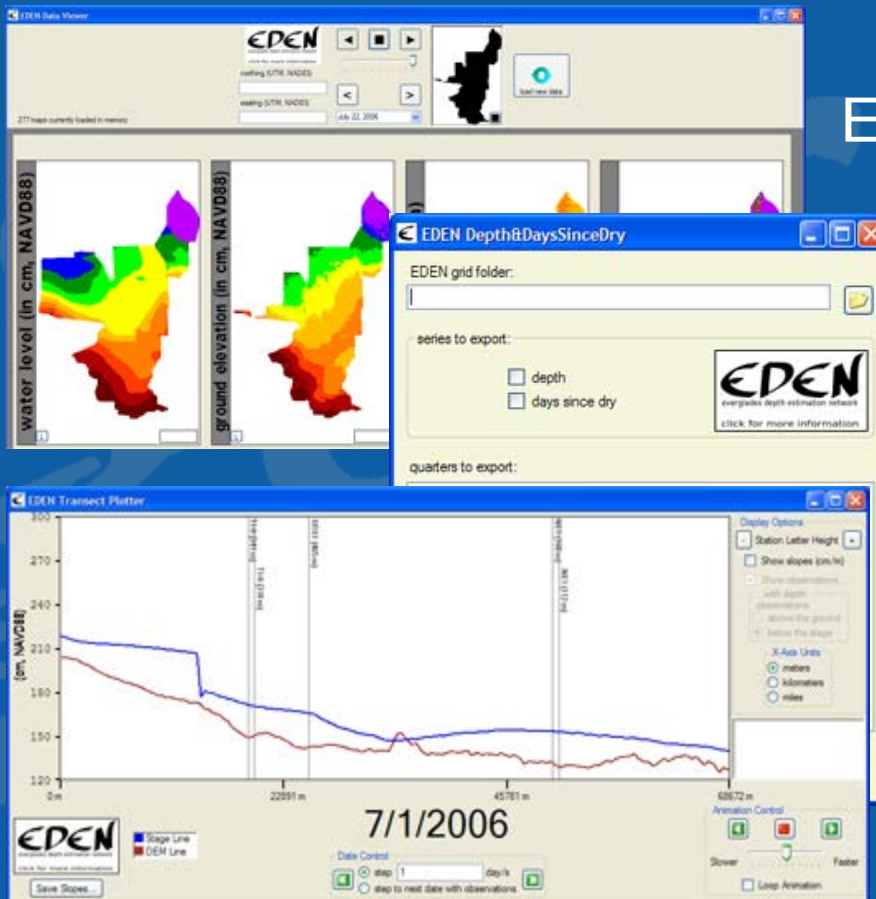
GO

Summary of all available data for this site

Stream water level elevation above NAVD 1988, in feet



EDENapps Tools (1)



EDENapps - desktop tools to interface with EDEN hydrologic data

- Data Viewer
- xyLocator
- Transect Plotter
- Depth & Days Since Dry
- GridtoNetCDF & NetCDFtoGrid (conversion tools)

User Guides available for each tool

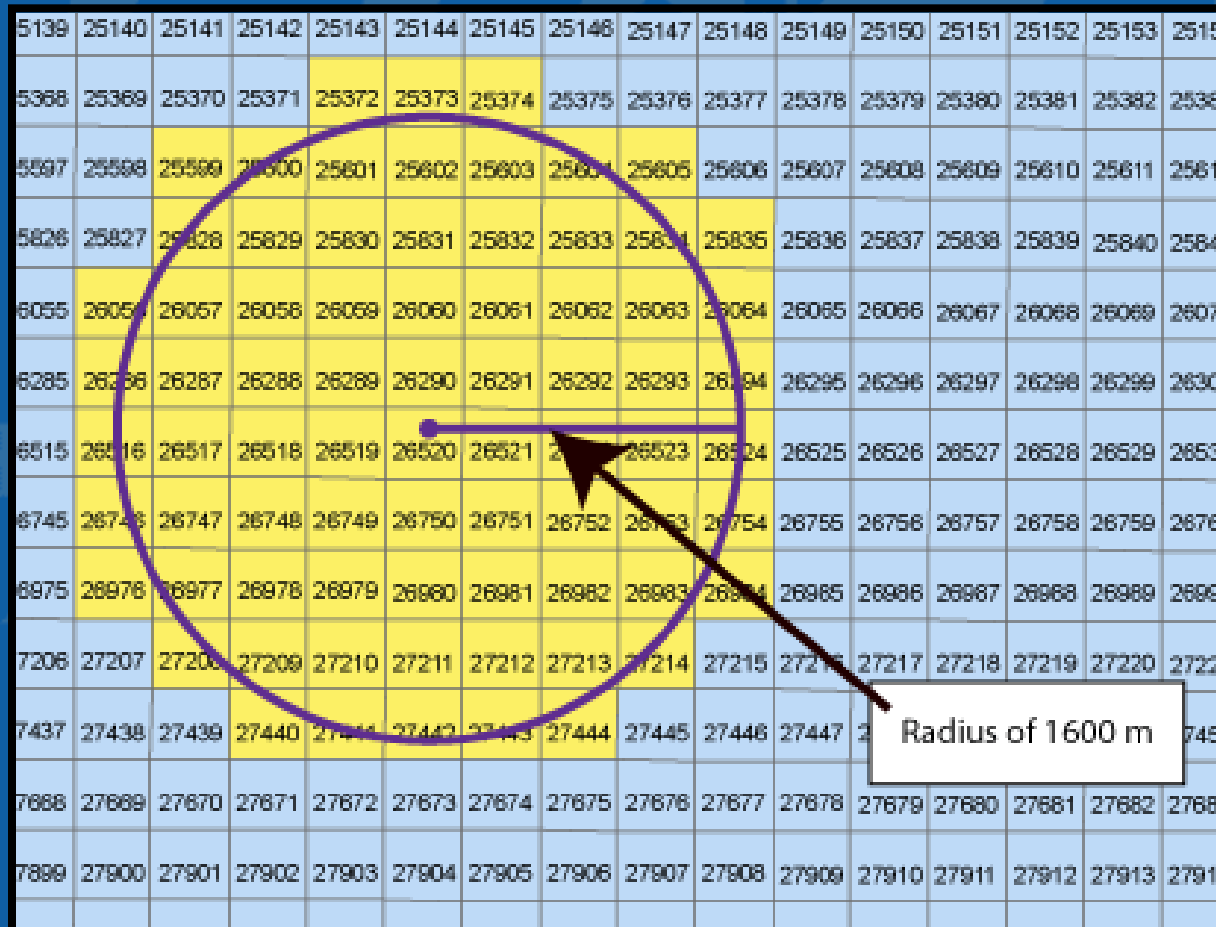
EDENapps Tools (2)

EDEN Website and EDENapps Tools give you access to:

- Water level
- Water depth
- Ground Elevation
- Days since dry down
- Slope
- Hydroperiod
- Gage metadata
- Salinity
- Hindcasted Data
- Rainfall
- Evapotranspiration
- Historical data
(selected stations,
1999-2005)
- Datum Conversion
- Vegetation

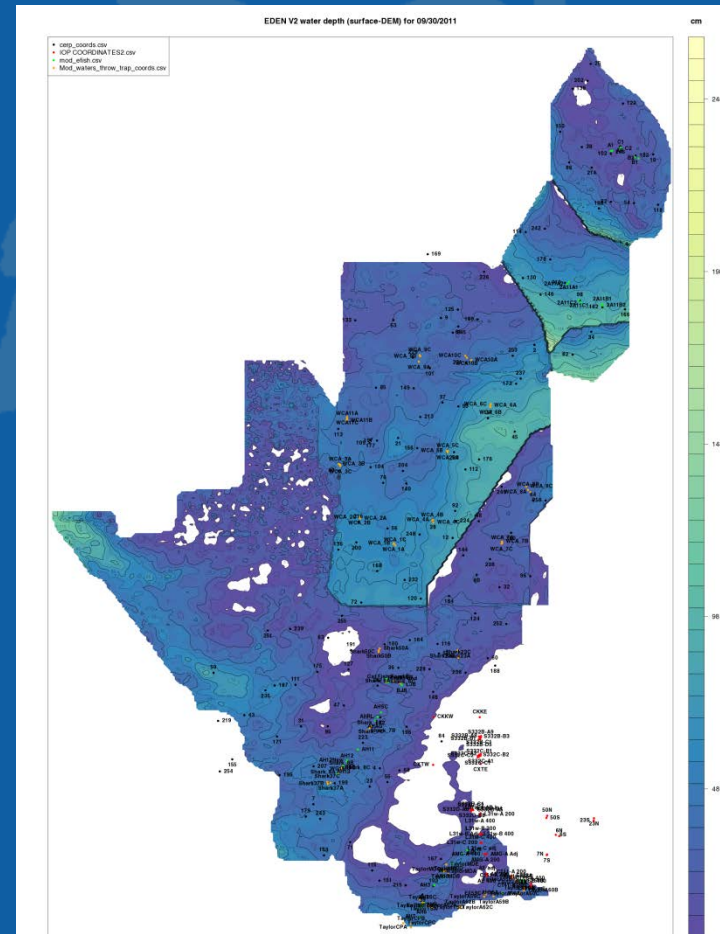
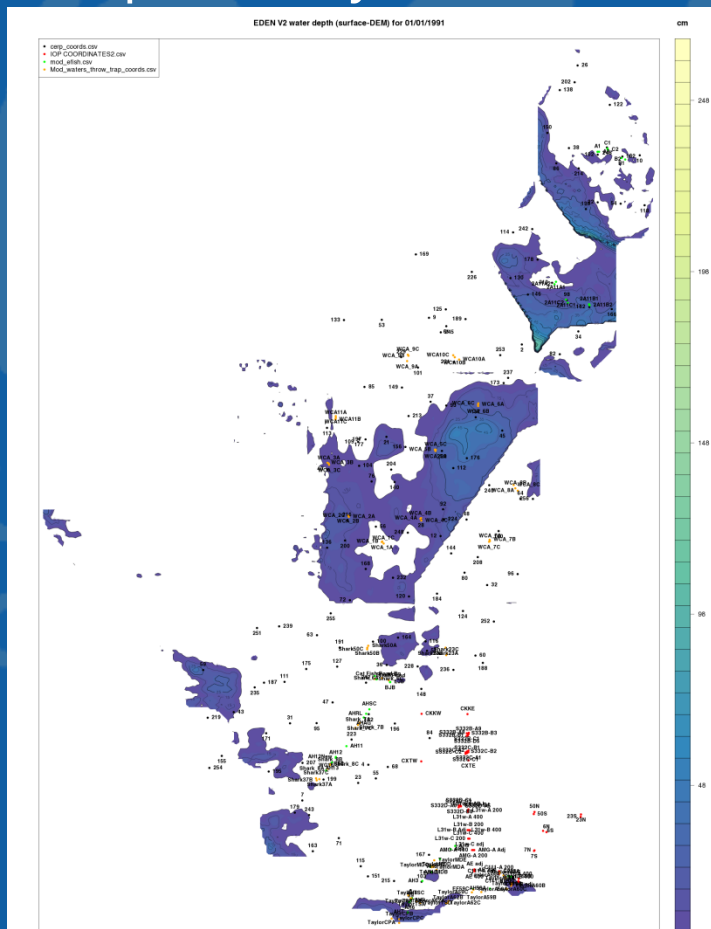
Fish Tracking Project

- Radio-tagged fish appear in one EDEN grid cell
- Assuming a maximum range of 1600m/day, which cells could the fish inhabit that day?
- Given the daily EDEN water surface and ground elevation model, what water depths could the fish be inhabiting on that day?



Everglades Ponds Project

- Connected ponds in the Everglades change size, shape, depth, and connectivity daily
- New project allows tracking which connected pond points of interest are contained within on specific days



Current Status

1. Access all data, information and tools at <http://sofia.usgs.gov/eden>
2. Real-time processing of water surfaces
3. New DEM released
4. New surface water model (v2) released
5. Data now available from 1991-present
6. Update to EDENapps Tools
7. Review of inclusion of coastal stations
8. Sign up for newsletter updates

EDEN Team

- **Pamela Telis** – Project chief, USGS
- **Heather Henkel** (hhenkel@usgs.gov) – Data storage, creation of surfaces, website, USGS
- **Paul Conrads** – QA using cluster analysis, USGS
- **Bryan McCloskey** (bmccloskey@usgs.gov) – Programming, data processing, data management, USGS
- **Matt Petkewich** – QA/QC review, USGS
- **Zhixiao Xie** – Water surface model, FAU
- **John Jones** – Ground surface model, cell grid, vegetation mapping, USGS
- **Leonard Pearlstine** – Technical lead for UF team, ENP
- **Arturo Torres** – Water depth/veg data by PIs, USGS
- **Carolyn Price** – Data, USGS
- **Aaron Higer, Zhongwei Lui** – Technical advisor/support
- **Roy Sonenshein** – Data and technical support, ENP
- Programming support - Joint Ecosystem Modeling



**Heather Henkel
USGS
St. Petersburg, Florida**

Thank you