

Status Report

Period Covered: October 1, 2007 through September 30, 2008

Project: South Florida Surface Water Monitoring Network for Support of MAP Projects

Agency: U.S. Geological Survey (USGS)

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Agreement: USGS IA#12 under MOA between USGS and USACE

I. MAJOR ACCOMPLISHMENTS

- The EDENweb (sofia.usgs.gov/eden) serves EDEN daily water level surfaces for 1/1/00 to current. Based on status of gage data, the surfaces are real-time, provisional, or final.
- The EDENapps tools are posted to the EDENweb:
 - Data Viewer
 - xyLocator
 - Transect Plotter
 - Depth&DaysSinceDry
 - GRIDtoNetCDF
 - NetCDFtoGRID
- Twenty-five water level gages were operated as part of the EDEN network of water level gages.
- EDENapps tools posted to CERPZone; required some recoding, testing and documentation.
- Conducted a statistical analysis of ground elevation data in WCA1 to better understand the highly variable ground elevation in that subarea.
- Conducted a statistical analysis to define variability of ground throughout the EDEN domain and how it related to computation of water depth.
- Funded USGS National Wetlands Research Center, Lafayette, LA for support for EDENapps maintenance and enhancements.
- Developed training workshop and materials for use of EDENapps tools and EDEN datasets for PIs and staff, conducted training at GEER for about 50 users.
- EDEN Newsletter currently has 90 subscribers and is used to notify users of updates or additions to the EDEN website.
- Made modifications and enhancements to the EDEN database and programs that store and manipulate the EDEN data and create the EDEN daily surfaces of water level.
- Created a demo Everglades tree island database and web-based map application with rollover stations information, including new information formatting, with new, multi-size, and linked images, animations, and graphs – used at EDEN booth at GEER.

TASKS FUNDED BY USGS PES IN SUPPORT OF EDEN

- Rainfall data (NEXRAD) for period 2002-2007 by gage location posted to EDENweb.
- Simple regression gap filling spreadsheet for USGS marsh gages developed to test ability to fill data gaps on a real-time basis. Goal is to incorporate estimated data into current surfacing datasets.

II. SIGNIFICANT MEETINGS/WORKSHOPS/CONFERENCES

- Tree Island Workshop, Dec. 1 -3; produced an EDEN handout describing the EDEN datasets and tools on EDENweb.
- Association of American Geographers, Annual meeting 2008, Boston, MA; presentation by Zhongwei Liu on validation of surface water model.
- GEER 2008; staffed EDEN booth, distributed EDEN reports, conducted EDENapps training, displayed applications of EDEN data use by multiple PIs, displayed Tree Island PPT showing application of EDEN data.
- GEER 2008; Approximately 15 PIs referenced use of EDEN data in their GEER presentations or posters.
- GEER 2008; 5 GEER sessions talks were presented by EDEN staff or staff funded by EDEN.

III. ADMINISTRATIVE (Contractual and Budgetary)

- The EDEN project continued to fund University of Florida (UF) for project support through a CESU agreement in FY08 and plans to fund in FY09. The UF lead is Aaron Higer.
- The EDEN project funded Florida Atlantic University (FAU, Dr. Dale Gawlik's staff) for project support through a CESU agreement in FY08 and plans to fund in FY09. The FAU lead is Dale Gawlik.

IV. SUPPORT FROM OTHER PROGRAMS AND FUNDING SOURCES

- Greater Everglades PES funds continue to support the EDEN project by funding efforts by Paul Conrads (USGS-SC), John Jones (USGS-Reston), Heather Henkel (USGS-FISC), Mike Holmes (USGS-FISC), and Aaron Higer (UF). Additionally, PES provides some funds for Pamela Telis (USGS-FISC) in her role as project coordinator and liaison with the USACE.
- SFWMD has provided funding to survey 5 gages in the EDEN network in ENP to NAVD88. Four of the gages are operated by USGS and one is operated by ENP. Additionally, Jana Newman investigated the status of surveys of gages in northern WCA3A that are operated by SFWMD and will ensure that surveys are used to update the water level data in coming months.

V. FY08 DELIVERABLES/REPORTS

- EDENweb (sofia.usgs.gov/eden) has been expanded throughout the year to provide data, metadata, and documentation to MAP PIs and others.
- Reports (partially funded by USGS PES funds):
 - Conrads, Paul A. and Edwin A. Roehl, Jr., 2007, *Hydrologic Record Extension of Water-Level Data in the Everglades Depth Estimation Network (EDEN) using Artificial Neural Network Models, 2000-2006*: U.S. Geological Survey Open-File Report 2007-1350, 56 p.
 - Pearlstine, L., Higer, A., Palaseanu, M., Fujisaki, I., and Mazzotti, F., 2007, *Spatially Continuous Interpolation of Water Stage and Water Depths Using the Everglades Depth Estimation Network (EDEN)*: Gainesville, FL, Institute of Food and Agriculture, University of Florida, CIR 1521, 18 p., 2 apps.
 - Palaseanu, M., Pearlstine, L., *Estimation of water surface elevations for Everglades, Florida*, Computers and Geosciences (2008), doi:10.1016/j.cageo.2007.08.004.
 - Volin, J., Liu, Z., Higer, A., Mazzotti, F., Owen, D., Allen, J., and Pearlstine, L., 2008, *Validation of a Spatially Continuous EDEN Water-Surface Model for the Everglades, Florida*, Department of Natural Resources Management and Engineering, University of Connecticut, 55 p.
- TIME data library for period 2002 – 2006 (funded by SFWMD)
- Report defining variability of ground elevation in progress. Expected final and posted to EDENweb by Dec. 31, 2008.

VI. FY09 WORKPLAN

- Maintenance of EDENweb
 - Real-time water level gage data
 - Daily water level surfaces
 - EDENapps
- Operation and maintenance of 25 water level gages in EDEN network
- Revision of data management plan
- Reanalysis of surface water model using:
 - Updated datums at several gages
 - Filled data gaps
 - Updated WCA1 DEM, if possible
 - New surfacing techniques (explore options, as funding allows)
- Publications
 - EDENapps factsheet
 - Updates previous factsheet
 - USGS-series report on hydroperiod
 - If time allows
- Pilot options for EDEN analysis for coastal zone

VII. UNFUNDED NEEDS IN FY09

- Several activities would greatly enhance the EDEN products and data to PIs however are not funded through the EDEN project:
 - Provide ET data by gage location for 1995 to current on the EDENweb. And keep the rainfall data by gage location current based on data compiled from SFWMD monthly.
 - Conduct NAVD88 surveys at up to 30 water level gages in EDEN network. The survey would need to have high-level accuracy, probably using differential GPS. Perhaps about \$3K per gage.
 - Purchase radio telemetry equipment for 15 SFWMD water level gages in the EDEN network that currently are non-real-time. These gages were added to the EDEN network because they are in critical locations but without real-time telemetry they are not used for creation of the real-time water level surfaces. Perhaps about \$4-5K per gage.
 - Make several critical code changes and enhancements to the EDENapps to improve the reliability and usefulness of the EDEN data and products for PIs. Perhaps \$30-50K.
 - Install and survey to NAVD88 a network of benchmarks (approximately 30 to 40) in the Everglades marshes: northern WCA3A, WCA1, WCA2, western WCA3B, ENP and BCNP. Cost not known at this time.
 - Install and operate shallow (approximately 5-8 feet below ground) ground water wells at approximately 20 water level gages in the EDEN network. Perhaps about \$6K per gage for installation, operation costs not known at this time.

VIII. ANTICIPATED NEEDS OR ISSUES

- The EDEN project agreement with the USACE is approved through March 2010. The project chief (Pamela Telis, USGS) will need to be notified by January-February 2009 of the status of funding and scope of work after March 2010 to allow time for discontinuing, revising, or continuing the project. For example, if funding for the 25 water level gages will discontinue, they must be decommissioned and dismantled or other funding sources must be found.

IX. FUNDING STATUS

- As of 9/26/08, all FY08 funding has been expended or obligated.
- On 9/3/08, the total funding for FY09 (\$530,263) was accepted by USGS. These funds were 'no-year' funds and the USGS will hold until 10/1/08 when they will be available to expend or obligate as needed for FY09 activities.