

**Florida Water Resources Monitoring Council (FWRMC)**  
**Public Meeting of Monitoring Catalog Workgroup – January 11, 2012**

**Attendees:**

| <b>Agency</b>                | <b>Name</b>         |
|------------------------------|---------------------|
| DEP                          | Kate Muldoon        |
| DEP                          | Gail Sloane         |
| DEP                          | Stephanie Sunderman |
| DOH                          | Bob Vincent         |
| SJRWMD                       | Aiša Cerić          |
| SJRWMD                       | Tom Mirti           |
| SWFWMD                       | Carol Kraft         |
| SFWMD                        | Linda Crean         |
| SFWMD                        | Julianne LaRock     |
| SFWMD                        | Brian Turcotte      |
| Miami-Dade Co.               | Susan Markley       |
| Escambia Co.                 | Taylor Kirschenfeld |
| U.S. Army Corps of Engineers | Susan Kemp          |
| GOMA / DEP                   | Steve Wolfe         |

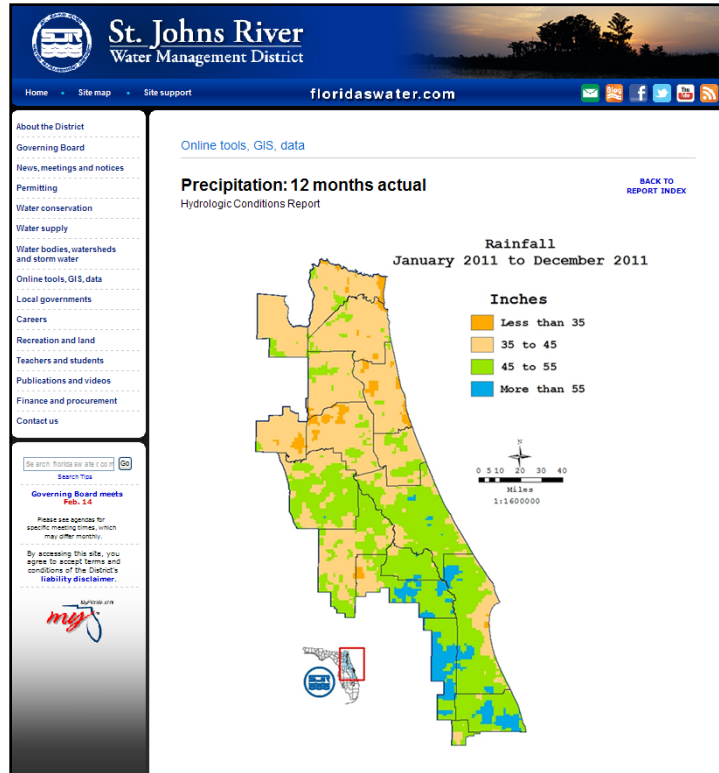
**Introduction**

Kate Muldoon (KM), DEP, welcomed everyone to the Monitoring Catalog Workgroup meeting and gave a brief overview of the meeting agenda. The first item on the agenda will be to review several more existing online catalogs. The goal will be to identify key features available in these existing applications, and to determine if the FWRMC Catalog effort may want to collaborate or piggyback onto one or more of these existing efforts.

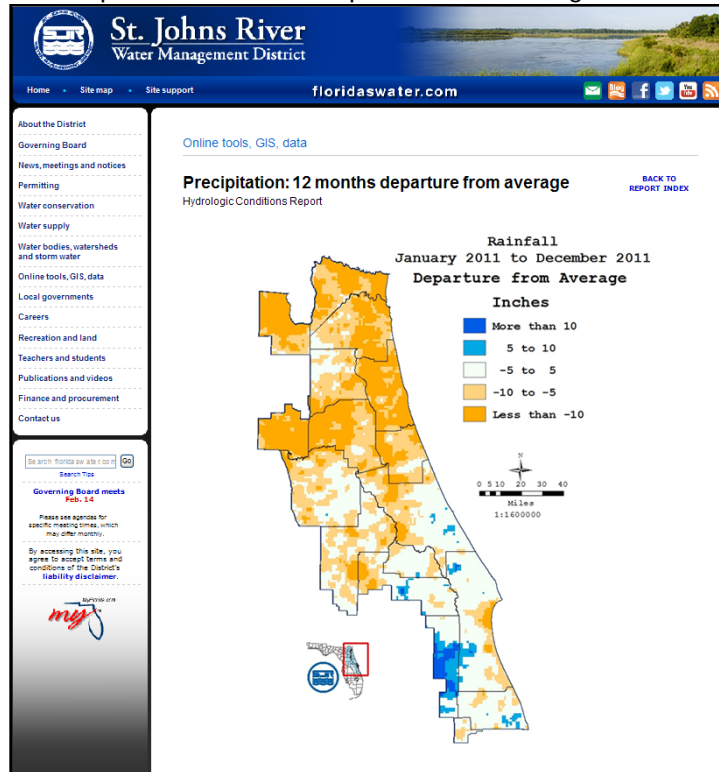
**St. Johns River Water Management District (SJRWMD)**

Aiša Cerić (AC), SJRWMD, presented information on the SJRWMD online data retrieval tools.

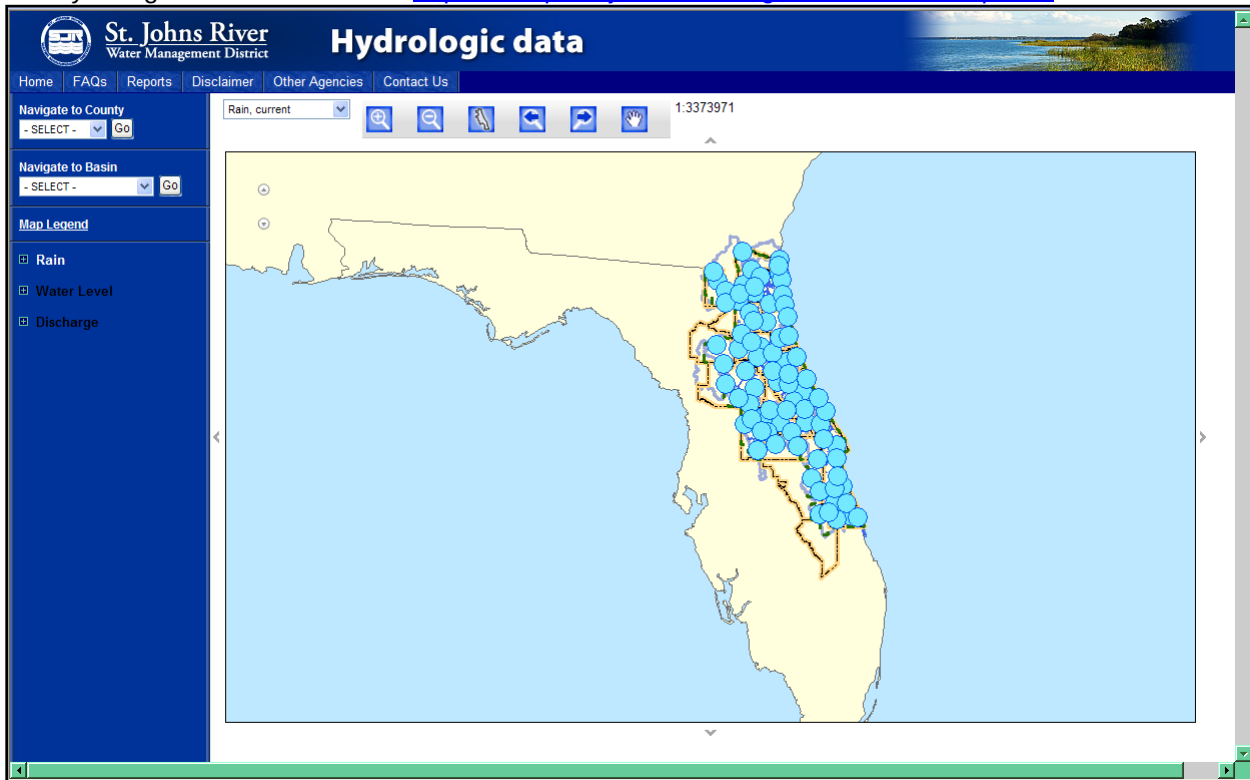
- Central access point for all online data retrieval tools is <http://floridaswater.com/toolsGISdata/>.
- Hydrologic Condition Reports are available at <http://floridaswater.com/hydroconditionsreport/>.
  - o Example 1 - Precipitation: 12 month actual



o Example 2 - Precipitation: 12 month departure from average

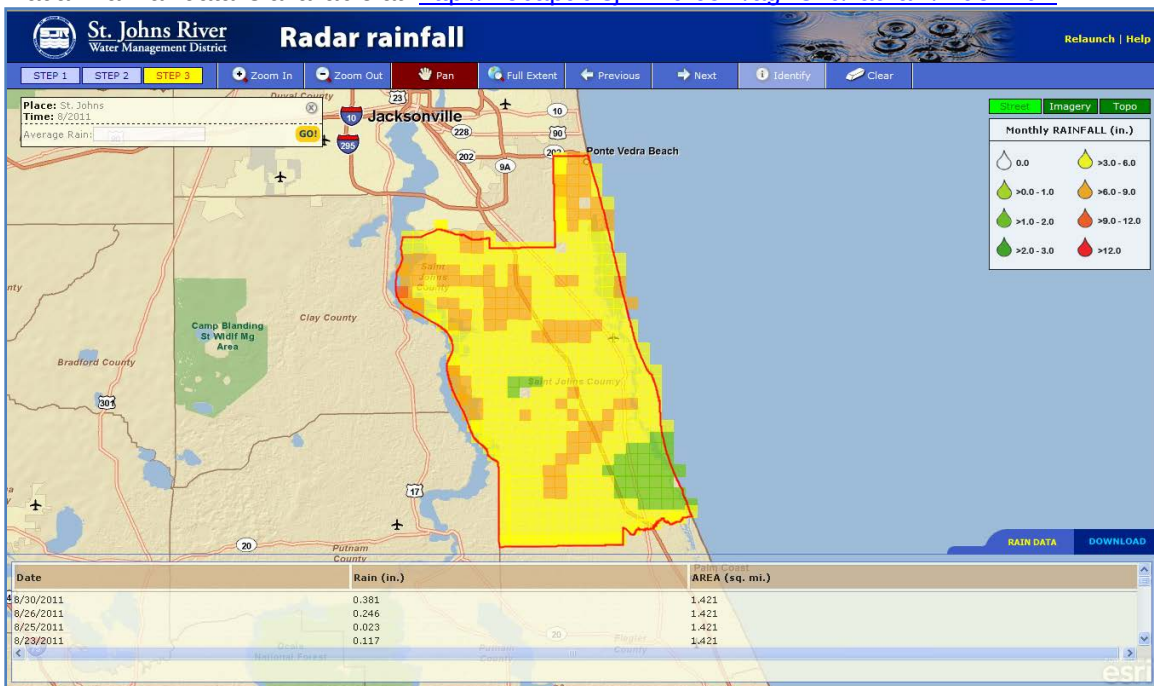


- Hydrologic data is available at <http://webapub.sjrwmd.com/agws93/hdsnew/map.html>



- Tools are available on left side of map for easy navigation to a specific county or basin.
  - Parameters available include rainfall, water level, and discharge.
  - With a current parameter selected from the top menu, clicking on a station allows you to see the station name, ID number, and view a plot of the last month's data.
  - Changing the parameter to an archived parameter and clicking on a station will allow you to download its data.

- Radar Rainfall data is available at: <http://webapub.sjrwmd.com/agws10/radrain/index.htm>



- o Tools are available at top of map for easy navigation to a specific county, basin, address, district, point, or polygon.
- o Rainfall data is available as averages for daily, monthly, or user specified range time periods.
- o Can view results as a colored mosaic grid of 2 km by 2 km pixels on the map or in a table at the bottom of the screen.
- o Results can be downloaded by clicking the download link at the bottom right.
- The Environmental Data Retrieval Tool is available at [http://webapub.sjrwmd.com/agws93/edqt\\_pub/](http://webapub.sjrwmd.com/agws93/edqt_pub/)



- o Tools are available at top of map for easy navigation to a specific county, basin, address, district, point, or polygon.
- o Can filter search results by resource type, station status (active vs. inactive), category, media, analyte name, sample fraction, and weight basis.
- o Can view data records online and download data as a CSV file. Data records include data qualifiers and MDLs, but comments are not currently included.
- Watershed Facts information is available at <http://www.sjrwmd.com/watershedfacts/>.
  - o Includes interactive site (map no longer available) of long term surface water monitoring stations where users can search by county or by water body
  - o Example – Nassau River station

The screenshot shows the St. Johns River Water Management District website. The header includes the district's logo and name, along with navigation links like Home, Site map, and Site support. The main content area is titled '19020002 (Nassau River)' and provides detailed information about the basin, including its location, point sources, and a map. The left sidebar contains a search bar and a list of links to various resources. The right sidebar offers additional links related to watershed facts and monitoring stations.

- o Includes basic information on the basin, spatial data summaries on population density, land use, geology, physiographic divisions, rainfall, public lands, soils drainage, elevation, recharge, a map of the basin's Arc Hydro model, and a water quality summary for the selected station.
- o Includes direct link to SJRWMD database where the water quality data can be downloaded.

#### Questions / Comments

KM asked how long it took to create the Watershed Facts site. AC indicated that it took approximately 3 years, with much time spent in the design phase. Much of the work was accomplished through the SJRWMD communications office and through contracted work.

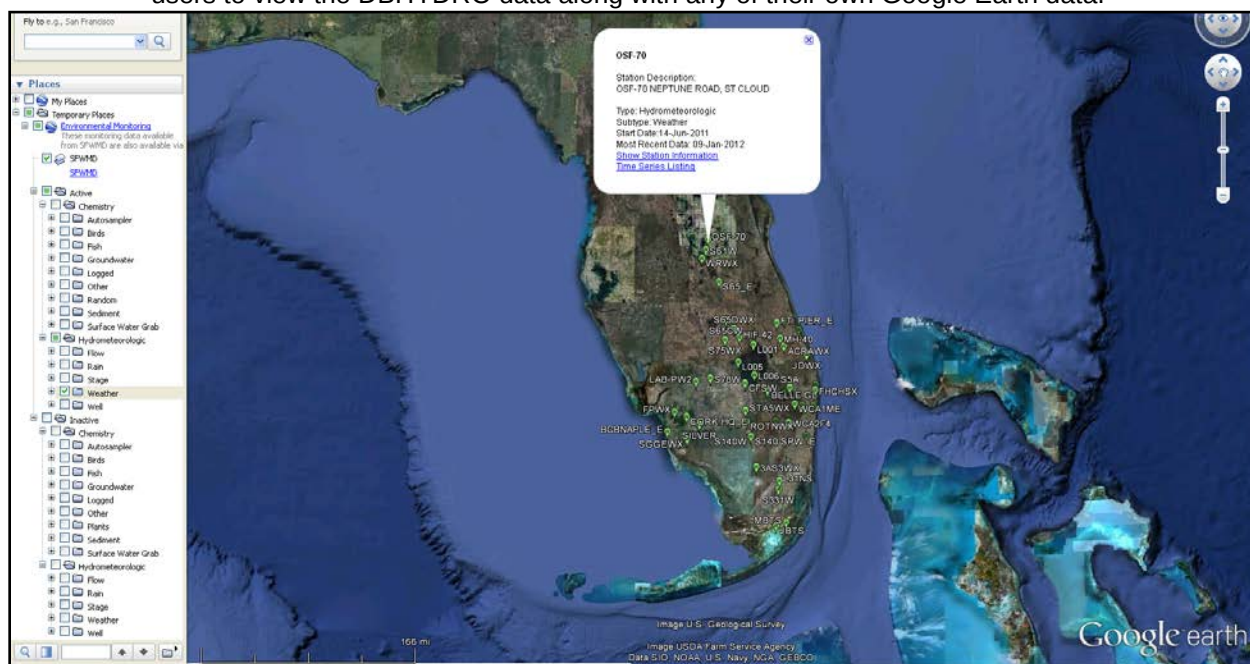
AC added that the most important thing needed to develop a site like Watershed Facts is an existing database with the types of information that the site will access. Without that existing structure, it would be much more complicated to map out the site design and the key points may be missed.

#### South Florida Water Management District (SFWMD)

Brian Turcotte (BT), SFWMD, presented information on SFWMD's DBHYDRO layers available for viewing in Google Earth

- DBHYDRO is SFWMD's publically accessible online environmental database which stores hydrologic, meteorological, hydrogeologic, and water quality data.
- The main DBHYDRO website, where users can search the database, can be accessed at <http://www.sfwmd.gov/portal/page/portal/xweb%20environmental%20monitoring/dbhydro%20application>.

- A tool has been developed that allows the DBHYDRO station locations to be viewed in Google Earth. The tool can be accessed at this link, which is also found in the DBHYDRO user guide:  
[http://my.sfwmd.gov/KMLEXT/CUSTOMKMLS/DBHydro/DBHydroKML/DBHYDRO\\_KML.kmz](http://my.sfwmd.gov/KMLEXT/CUSTOMKMLS/DBHydro/DBHydroKML/DBHYDRO_KML.kmz).
  - o The tool used FME (Feature Manipulation Engine) to create a KML file containing the locations of the data records in DBHYDRO. Every day a script automatically creates this KML file based on the contents of DBHYDRO, combines it with other files that define the symbology used when the layers are displayed in Google Earth, and places it on a publically accessible internet site.
  - o Making the data available through a commonly used interface such as Google Earth allows users to view the DBHYDRO data along with any of their own Google Earth data.



- o Table of contents on the left shows all available layers. Data has been divided into active and inactive sites, and further separated into the types of chemistry and hydrometeorologic data begin collected.
  - o Station place marks have a letter code corresponding to the type of data collected. Clicking on a station's place mark allows the user to view the station name, data type, and period of record.
  - o Additional station information and time series data can be viewed by clicking the link in the balloon that directs the user to the DBHYDRO database. Once the user is directed to the DBHYDRO database, search options are available for refining the data retrieved by analyte, date range, and export format (PDF, graph, spreadsheet).
- Keys to successfully creating an online catalog of monitoring stations
  - o Define common information (the what) to be displayed in catalog or place marks (location name, latitude, longitude, description, parameters available, period of record, etc.)
  - o Define common interface (the how), including platform, place mark styles, and balloon content
  - o Work out the logistics of information assembly. For example, it is fairly easy to create KML files for subsets of a database's information. Then the Google Earth framework allows the information to be used easily without requiring a large investment in technology from either the data provider or the user to make it run.

#### Questions / Comments

KM asked if there is a way to select multiple stations at a time (for example, by using a polygon). BT responded that selecting stations in Google Earth is limited to clicking on individual features (place marks or polygons). If the user has additional layers displayed that contain a specific area of interest, it is

possible to zoom directly to that area by selecting it in the table of contents, but it is not possible to perform a spatial query for all stations within that area.

Susan Markley (SM) asked if all DBHYDRO KMLS were available for the public to access. BT responded that all of the station place marks are publically accessible through the DBHYDRO website ([http://my.sfwmd.gov/KMLEXT/CUSTOMKMLS/DBHydro/DBHydroKML/DBHYDRO\\_KML.kmz](http://my.sfwmd.gov/KMLEXT/CUSTOMKMLS/DBHydro/DBHydroKML/DBHYDRO_KML.kmz)). However, the layers representing the waterbodies, WMDs, etc. are only available to SFWMD staff.

BT added that the place marks currently only represent monitoring stations. Research stations have not been added. A layer containing permit locations in Miami Dade has been discussed, but the spatial database and script to create the KMLs have not yet been created.

### **Comprehensive Everglades Restoration Plan (CERP)**

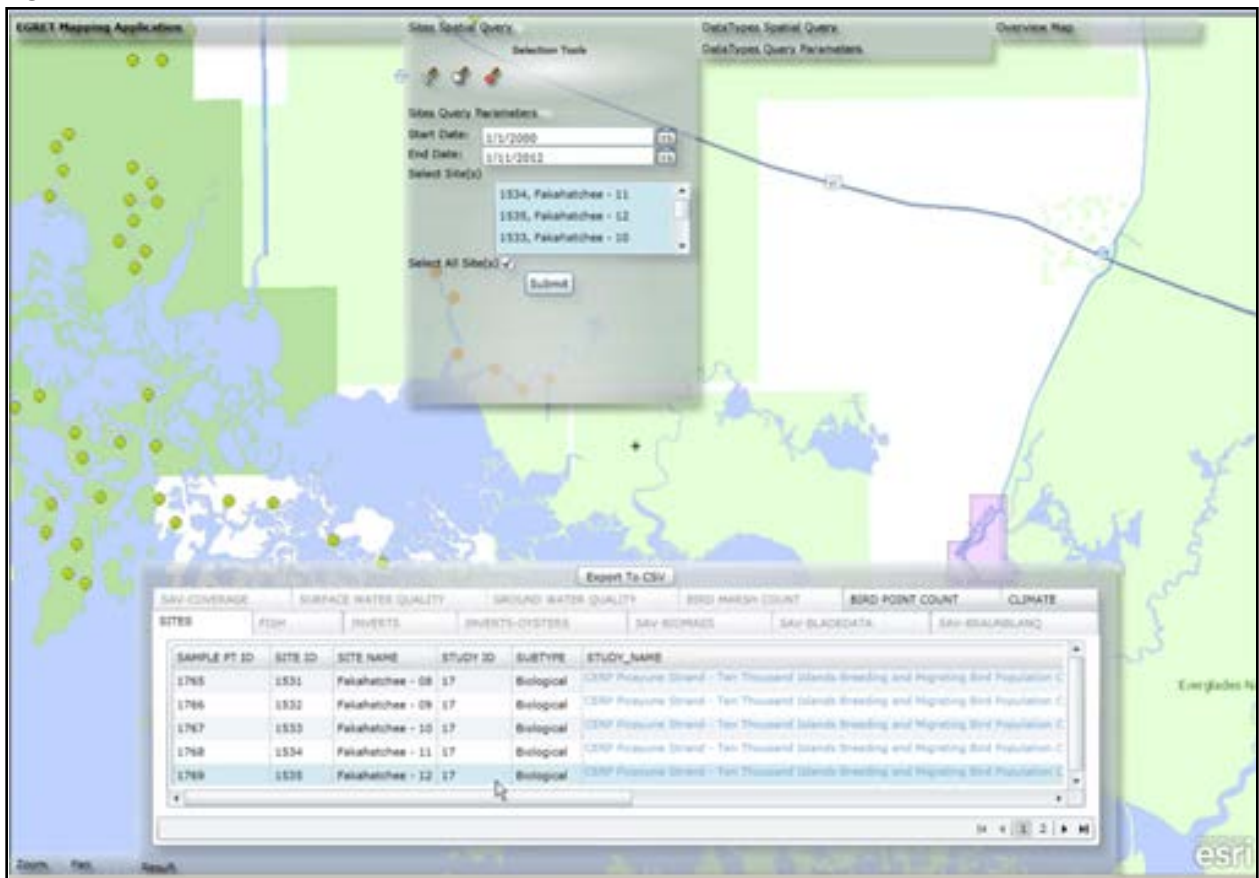
Susan Kemp (SK), US Army Corps of Engineers, presented information on the CERP Integrated Database (CID) and the EverGlades Restoration data Extraction Tool (EGRET)

Slides from this presentation, and an information sheet on CID EGRGET are available in the 2012 meeting archive section of the FWRMC website

(<http://www.dep.state.fl.us/water/monitoring/council/index.htm>)

- SK is a member of RECOVER, an interdisciplinary group of 12 federal and state agencies that work together to keep the system-wide goal for CERP focused on restoration.
- Problem to be solved:
  - o Significant number of environmental monitoring data records generated by CERP at the project (individual component) and program (system-wide) level
  - o Data encompassed many disciplines including biology, ecology, hydrology, and water quality
  - o Data was collected for many purposes including regulatory, baseline, cultural resources, system-wide understanding, and hydrodynamic modeling.
  - o Data was housed in many locations and by many agencies.
  - o Data was saved in many formats including excel spreadsheets, access/oracle databases, pdf tables, and paper copies.
- Impact
  - o Large amount of time and work required to locate and collate needed data to answer specific questions about restoration efforts and monitoring.
  - o Missed opportunities for collaboration because projects don't know what information other projects are collecting.
  - o Loss of efficiency in application of adaptive management due to inefficiency of assessing projects and programs
- Solution
  - o Create a tool to house all CERP monitoring data and provide a user-friendly access interface to that data.
  - o Data solutions would house all MAP monitoring data, CERP planning data, and CERP Project data.
  - o CERP Integrated Database (CID) and EverGlades Restoration data Extraction Tool (EGRET) were final products.
- CERPZone
  - o Online collaborative environment used by 25 agencies and over 1100 users
  - o Password protected (no public access)
  - o Storage system for documents (photos, contracts, presentations, etc.)
  - o MORPHO manages metadata for monitoring data and allows users to associate data files with projects
  - o Once all data is received, contract manager approves data in the dashboard and MORPHO loads data into CID where it can be archived and accessed by the various data processing applications
  - o CID used for storing monitoring data with connections to GIS data file storage and SDE databases.
- Benefits of the CERP Monitoring Data Storage Process

- o Standardization of package data (metadata, data files, and site information)
- o File and package level security is available on all data loaded
- o Tracking and indexing of complete data inventory
- o Ability to search across multiple types of studies, by type of data
- o Relational data storage allows data to be used by other processing applications
- o Low maintenance design using freeware and software that users already possessed licenses for
- Other efforts
  - o Monitoring Locator was developed to show where projects were monitoring and what type of data they were collecting. However, this program was recently taken offline because many of its functions can be accomplished using EGRET.
- Timeline for development of CID EGRET
  - o Started in 2010
  - o Limited production in April 2011
  - o Full production since July 2011
  - o Currently in the process of loading data from the previous 10 years of CERP projects
- EGRET



- Tools available at the top center menu for spatial query include drawing a polygon or box, or clicking on individual points. Search results can be refined by date range or by choosing specific sites.
- Tools also available to query by data type, with the ability to refine search results by date range or by choosing specific sites.
- Search results table has information organized by tabs (grayed out tabs indicate that selected stations do not have that type of information associated with them). Site tab give s basic information (site name, ID, study name, coordinates). Clicking on the study name will open a separate window with additional metadata about the study. Other tabs allow users to view the data records for a specific data type (bird point count, climate, ground water quality, etc).

- The active table can be exported as a CSV file by clicking the appropriate button.
- Potential Future Additions
  - Cannot currently conduct spatial search by predefined zones (basins, etc.), but discussions on incorporating additional features are ongoing.
  - EGRET is primarily focused on ecological and biological data, while SFWMD's DBHYDRO is primarily focused on the water quality and hydrology data. In the future, it may be possible to connect the EGRET interface with DBHYDRO to form a more comprehensive database.
  - Other agencies, such as USGS, are not using CID as their primary database. Currently CID contains a copy of information stored in the agency's own internal database. In the future, plans exist to have CID EGRET link directly to the agency's database.
- The CERP RECOVER public website ([http://evergladesplan.org/pm/recover/assess\\_team.aspx](http://evergladesplan.org/pm/recover/assess_team.aspx)) has status reports (produced at least every 5 years).

#### Questions / Comments

Steve Wolfe asked if all sampling points were fixed points, as opposed to areas where random sampling occurs. SK responded that the data that are currently loaded are fixed points, but areas with random sampling will be loaded in the future. These areas will likely be represented as the centroid of the area, with an explanation in the metadata that the point represents a random sampling area.

KM asked if the EGRET data are publically available. SK responded that there is no online interface available for searching or displaying data publically. However, the data is publically available and can be obtained by submitting a public records request to the data management section.

#### **Discussion:**

##### Potential for collaborating with existing catalog and data portal efforts

KM asked the group for input regarding creating a new catalog versus potentially collaborating or piggybacking with existing catalogs and data portal efforts.

SM indicated that a lot of the information that we are looking to put into the monitoring catalog is already available, and data providers may be reluctant to enter their information into a new, separate catalog. Although we may not be ready to choose a specific project to collaborate with yet, we should take advantage of the time and resources that other projects have devoted to similar efforts, look for guidance from their experiences, and take advantage of the cost efficiency associated with using an existing platform.

KM agreed and suggested that we need to get a better idea of what the desired features are for the FWRMC monitoring catalog effort. KM also suggested that the group revisit some of the more favorable catalogs that we've already seen.

KM also indicated that she is trying to get a representative from the Florida Water Atlas ([www.wateratlas.org](http://www.wateratlas.org)) to speak at the next FWRMC Statewide Council meeting in Tampa, on Feb 21-22, 2012.

KM provided a brief update on the GOMA Catalog of Monitoring Programs effort

- KM and Stephanie Sunderman (SS) have had a series of meetings with the developers from the University of Miami, to discuss the functional requirements for the Catalog of Monitoring Programs and ensure that the project expectations were clear to both the developers and the customers (GOMA representatives).
- Process of developing the GOMA catalog can inform the FWRMC effort, and aid in possible future collaboration with the GOMA Catalog of Monitoring Programs, the Water Atlas, or any other effort that we may decide to pursue.

SK recommended contacting Heather Henkel (HH) from USGS in Tampa. HH is working on cataloging information on USGS monitoring efforts. She could possibly give a presentation on this effort at next FWRMC Statewide Council meeting in Tampa, on Feb 21-22, 2012. It might be possible to have the

state collaborate with the USGS effort, if it is still in the development phase, to see if some of the features that the FWRMC would like to see can be built into the USGS catalog effort. KM and Gail Sloane (GS) agreed that it would be a good idea to try to get HH to present information on the USGS effort. SK volunteered to contact HH to extend the invitation and forward her contact information to GS and SS.

BT indicated that a list of functional requirements for an Integrated Data Management (IDM) system had been developed several years ago by the previous FWRMC and the FL Oceans and Coastal Council, and suggested that this list could possibly help to inform the current FWRMC catalog effort. KM indicated that the GOMA Catalog of Monitoring Programs effort is making use of the IDM documents, and they can certainly help to inform the FWRMC effort as well. The IDM System Functional Requirements document and the Comprehensive List of Draft Metadata Elements are available at <http://www.floridaoceanscouncil.org/reports/idm.htm>.

#### Strategies for presenting catalog to upper management

KM indicated that because of the current budgetary situation, it is apparent that the need for a Catalog of Monitoring Programs is greater than ever, so perhaps it will be easier to gain support from upper management for this effort. The key issues will likely focus on what resources are available, what the timeline will be, and how we will fund the effort. KM is currently working with GS to explore what options may be available.

KM asked the group if they have had experience with trying to present the need for a catalog effort to upper management during a similar budgetary situation.

SK responded that even though it was apparent to the project team that these data management tools were necessary, upper management didn't immediately understand that need. Data management isn't well understood by upper management due to its very technical nature. This lack of understanding has made gaining support and/or funding for data management tools difficult in the past. KM asked if SK had any specific advice or lessons learned to share. SK responded that her group tried to use one of the earlier CERP projects as an example. Funding for data management was cut for this project, and they are now struggling to organize ten years worth of data that has been collected.

#### Developing priorities and a timeline for the FWRMC catalog effort

Bob Vincent (BV) asked if the CERP CID EGRET system was built internally or bid out for contracting. SK responded that the internal IT group staff worked with contractors at SFWMD and US Army Corps of Engineers. BV asked if some of the efficiencies realized through the CERP contracting process could help to inform the FWRMC effort. SK volunteered to send the CERP IT task initiation form used for IT assessment and solution development to KM and SS, for distribution to the FWRMC Monitoring Catalog Workgroup.

BT commented that knowing what the group wants the catalog to be able to deliver is key. It is important to find a balance in terms of helpfulness and cost for the features that will be required, and there is typically an increase in cost associated with making more information automatically available to the user. KM asked BT if there is usually a great increase in cost associated with increasing the complexity of the database and subsequently the computer processing required for running a query. BT responded that the cost generally increases when a system has a greater amount of information detail integrated and involved in the mapping and transformation of data. In order to minimize cost to the catalog production team and to the data providers, the data displayed will need to already be organized in a format that will allow it to be mapped. The work (and cost) involved increases as the interface becomes more granular. For example, mapping "water quality" or "nutrients" is much simpler and requires fewer resources than mapping specific species of phosphorus and their analysis methods. The later situation also has greater costs associated with quality assurance (ensuring that data providers are entering their information into the system properly).

Linda Crean (LC) commented that it may be useful to approach the task of deciding what features to include in the monitoring catalog by asking "what must we have versus what do we want to have," and

then first trying to implement only those items that we must have. The group will also need to assess how much, if any, funding will be available for this effort.

KM agreed that we will need to define the expectations for the FWRMC effort early on, and then try to obtain the necessary amount of funding.

SK added that CERP went with the EGRET product, instead of an analysis based tool, because the number of possible questions/analyses is very large, and the associated cost with creating scripts for additional analyses was too great. The data retrieval tool was a cost effective solution because it provides an easy way for the users to access the data, so they can then perform their own analysis or create their own scripts as needed.

KM responded that the scope of the catalog is more of a basic database of the who/what/where/when associated with monitoring sites, with the ability to search both spatially, and by attributes (by organization or analyte, etc.).

SK added that the downside of the CERP Monitoring Locator (now offline) was that the database was static, and that a large effort was required from data providers every few years to update the information. KM responded that we had been considering asking data providers to update their own information on an as needed basis (or at minimum, annually). SK expressed concern that data providers would not continue to update their information unless they were contractually obligated to do so. KM added that we may need to devise strategies to create a greater incentive to keeping information updated. Currently the primary incentive is just the ability to develop new collaborations and leverage monitoring resources across programs through information found in the Monitoring Catalog.

GS commented that it is important to acknowledge all of the existing efforts, and suggested that a first step could be to provide links to existing catalogs on the FWRMC website. We also want to avoid asking the same people to provide the same information multiple times, and we don't want to lose or redo previous efforts. We also don't have the resources to make the FWRMC effort a full database, so instead of asking data providers to input all of their data, the FWRMC effort could just provide links to their data. KM agreed that providing links to existing catalogs on the FWRMC website would be a good starting point. We will need to get permission from the owners of these websites to link to their applications or harvest the information that they have already made available. SK commented that since EGRET is not publicly accessible, we could possibly direct people to the appropriate contact in the data management section, and encourage them to submit a formal data request.

#### Next steps

KM indicated that, at the FWRMC Statewide Council meeting in Tampa, on Feb 21-22, 2012, we will have additional presentation(s) on existing catalog and data atlas efforts and KM will provide a summary of the FWRMC Monitoring Catalog Workgroup's progress. Before the meeting, we should summarize the best features in each of the applications that the Workgroup has reviewed, and compare those features to a list of the desired functional requirements for the FWRMC catalog effort. LC volunteered BT to assist KM with the summary and comparison exercise.