

Florida Water Resources Monitoring Council (FWRMC)
Public Meeting of Monitoring Catalog Workgroup – October 3, 2012

Attendees:

Agency	Name
Florida Department of Environmental Protection (DEP)	Kate Muldoon
DEP	Stephanie Sunderman
Florida Department of Health (DOH)	Charlie Donahue
St. Johns River Water Management District (SJRWMD)	Aiša Cerić
Southwest Florida Water Management District (SWFWMD)	Carol Kraft
SWFWMD	Dave DeWitt
South Florida Water Management District (SFWMDC)	Linda Crean
Miami-Dade County Department of Regulatory and Economic Resources	Susan Markley
United States Army Corps of Engineers (US ACE)	Susan Kemp
Alabama Office of Water Resources	Tom Littlepage

Introduction

Kate Muldoon (KM) welcomed everyone to the Monitoring Catalog Workgroup meeting and reviewed the agenda. Items to be discussed include developing a recommendation for how to proceed with the FWRMC Monitoring Catalog effort, developing a timeline for the project, and drafting a list of metadata elements to be included in the catalog.

Review of Progress to Date

KM reviewed the workgroup's progress to date

- Evaluated eighteen online catalogs / atlases based on three main criteria: easy to navigate user interface, search features (text-based and spatial) and the ability to search metadata, and the ability for data providers to upload and edit their own monitoring station information
- Determined that it would be preferable to collaborate with an existing / ongoing effort, to make use of available resources most effectively by utilizing existing knowledge and expertise.
- Identified three existing online catalogs / atlases as potential collaborators for the Monitoring Catalog effort: Gulf of Mexico Alliance (GOMA) Catalog of Monitoring Programs (developed by University of Miami), Water Atlas (developed by University of South Florida), and Map Direct (developed by DEP).
- Sent brief statement of needs describing FWRMC catalog project to the three potential collaborators and requested that they submit pre-proposals if they were interested in working on this new collaborative effort.
- GOMA Catalog of Monitoring Programs and Water Atlas responded with pre-proposals containing generalized estimates of cost, project timelines, server location, and database administration / QA staff.
- FWRMC Catalog Workgroup reviewed pre-proposals during June and August meetings, and requested extra time to make a recommendation regarding which project to collaborate with. The GOMA Catalog of Monitoring Programs was scheduled to be publicly released in early September, and the workgroup wanted to gain more information about it by using the application.

Discussion / Comparison of Water Atlas and GOMA Catalog of Monitoring Programs to Inform Recommendation Development

Stephanie Sunderman (SS) (who is a Beta tester for the GOMA Catalog of Monitoring Programs) prepared a comparison of the current versions of the Water Atlas and the GOMA Catalog of Monitoring Programs, and distributed it before the workgroup meeting. This comparison summarized the following elements of the current applications: software, data entry, quality assurance, metadata elements, information / datasets available, information display, and search features.

The workgroup did not have an opportunity to interact with the GOMA Catalog of Monitoring Programs because it has not yet been publicly released. The public release has been delayed because the developers are still working on fixing issues with the data entry part of the application.

KM summarized a few key points from the pre-proposals and the comparison document mentioned above.

- Estimated cost and time for completion are similar for both projects.
- Water Atlas staff appear to have more experience with web-enabled databases and GIS.
- Water Atlas has additional support and infrastructure as a major ongoing project at the Florida Center for Community Design and Research located within USF, while the GOMA Catalog of Monitoring Programs is a relatively new project at the University of Miami Center for Computational Science, with plans to relocate the application / database once it has been completed.

KM asked if the group would like to proceed with formulating the recommendation to the Statewide Council, since they have been gathering information for about a year and may want to avoid further delay waiting for the opportunity to interact with the GOMA Catalog of Monitoring Programs.

- Susan Kemp (SK) recommended that, as the catalog effort moves forward, the workgroup members should reach out to the appropriate members of their respective information technology (IT) sections and involve them in the catalog development process, as appropriate. Working closely with members of the IT departments may aid the workgroup in evaluating the business logic of the pre-proposals, if members are not ready to make a decision.
- Charlie Donahue (CD) asked for clarification regarding where the data will be housed. KM clarified that that the Monitoring Catalog will only be designed to store the metadata (information about monitoring programs and their associated stations), not the actual monitoring data. This collection of metadata will likely reside at the developer's institution.
- Susan Markley (SM) abstained from making a recommendation.
- Linda Crean (LC) indicated that Brian Turcotte (BT) from SFWMD was assisting with evaluating the two pre-proposals. BT was comfortable moving forward with either of the collaborators, but favored working with the GOMA Catalog of Monitoring Programs. However, BT realized that there may still be some problems with the application not being ready for public release as anticipated.
- Aiša Cerić (AC) was satisfied with the information provided in SS's comparison of the two current projects, and maintained her recommendation to collaborate with the Water Atlas. The current Water Atlas product is very good, and the developers have the necessary experience to be able to provide a good product for this new collaborative project.
- Charlie Donahue (CD) did not indicate a preference, but suggested that DEP play a larger role in choosing which project to collaborate with because DEP will be responsible for contracting with the selected University. KM clarified that DEP will be responsible for managing the contract, but decisions regarding the project direction, collaborators, and final product should be made by the Council.
- Carol Kraft (CK) suggested that the workgroup present both pre-proposals to the full Council for further discussion. There are pros and cons to collaborating with either existing project, and there may be some value to waiting until the GOMA Catalog of Monitoring Programs is released so that workgroup members can fully evaluate it. CK and Dave DeWitt (DD) highlighted the Water Atlas's ability to display data from STORET. This would likely reduce the effort required by data providers, as they would not need to upload all of their monitoring station information again if it is already in STORET. KM indicated that the GOMA Catalog of Monitoring Programs would not be released in time to present to the Council at the October 9th meeting.

KM summarized that some workgroup members favored the Water Atlas, while others did not strongly favor one project over the other. KM asked the group if they would be willing to support a recommendation to collaborate with the Water Atlas, now that there has been further discussion and comparison of both projects. SS clarified that the workgroup's recommendation isn't a final decision of which project to collaborate with. The recommendation will be presented to the statewide Council at their meeting next Tuesday (10/9/2012), where there will be further opportunities for discussion, and the statewide Council will have the opportunity to accept the recommendation or request further information gathering.

- CK, CD, AC, and LC agreed that the workgroup should move forward with a recommendation to collaborate with the Water Atlas.

KM summarized a few issues that will need to be addressed as the scope of work for the Monitoring Catalog is being developed.

- Need to decide if the Monitoring Catalog should be part of the existing Water Atlas website. Jim Griffin (JG) has indicated that either option would be feasible.
- Need to assess the amount of time needed to associate monitoring sites with water bodies, and assess the necessity of incorporating this feature into the Catalog if it appears as though it may prolong the development of the Catalog.
- Need to decide on the properties of the fields included in the database. Fields may be domain limited (to enable the use of drop-down lists) or free text.
- Need to determine the level of detail desired and select the metadata elements to include in the Catalog.
- Need to develop a list of priorities and a timeline for how to proceed with the Catalog effort.

Discussion of Metadata Elements to be Included in FWRMC Catalog Effort

KM reviewed the list of metadata elements included in both the Water Atlas and the GOMA Catalog of Monitoring Programs and suggested using the list as a template for discussion of which metadata elements should be included in the FWRMC Catalog.

(A complete list of these metadata elements is included in the document comparing the current Water Atlas and GOMA Catalog of Monitoring Programs applications, available as part of the October 3rd Monitoring Catalog Workgroup meeting materials in the 2012 archive section of the FWRMC website.)

KM also suggested dividing the metadata lists into elements that answer five basic questions (Who is monitoring? What are they monitoring? Where are they monitoring? When are they monitoring? How are they monitoring? Why are they monitoring?), and then identifying the level of detail and associated metadata elements desired to answer each question.

- “Who?”
 - o KM suggested having the organization name, program name, and project name. LC indicated that many organizations do not store the program name in their database because the program names change often.
 - o SM indicated that for a given program, the information provided for almost all of the metadata elements (at the organization level, program level, project level, station level, and observation parameter level) may change throughout the duration of the monitoring effort. This even includes basic elements such as program name. This needs to be considered when designing the database structure to ensure that it is flexible enough to permit cataloging of complex monitoring program changes. KM asked how SM's agency currently organizes the data. SM indicated that most of the data is currently linked to the station and uploaded into FL STORET and/or DBHYDRO.
 - o SM also indicated that it is still valuable to document how the data can be found (contact information, websites, etc.), but those fields may need to be optional or included in a narrative (free text) section, to better accommodate importing information from a variety of database structures that are currently being used to store monitoring data.
 - o KM suggested that perhaps we will need to make the station name the key identifier.
 - o KM asked if the catalog should include metadata for a specific contact person, and who that person would be. LC indicated that the person could be the individual in charge of handling public records requests. SM indicated that completing this information can also be difficult for organizations that do not have a single point of contact for information requests. AC indicated that providing contact information should be required, and SM added that the field should be flexible enough to accept very general responses (e.g. contact for agency switchboard).
- “When?”
 - o KM asked if there is interest in including metadata elements describing date ranges or sampling frequency. LC indicated that documenting this information can also be complex, as monitoring may have started and stopped several times at a given location. Perhaps including a period of record or just a start date may be easiest to populate.
 - o KM asked if there is interest in designating stations as “active” vs. inactive”. LC indicated that it can be difficult to design an algorithm that properly identifies the active stations, as some monitoring programs have stations that are sampled very infrequently (e.g. every 3 years).
- “Where?”
 - o KM suggested including geographic coordinates to facilitate locating the station in a GIS. LC asked if the data would need to be in a specific format (e.g. decimal degrees), and KM indicated that they could be converted to a standard format.
- “What?”

- o KM suggested including station names / identifiers. LC indicated that the agencies will have already assigned names to the stations, and it would not be desirable to deviate from those names. CH suggested assigning unique identifiers to stations based on their geographic coordinates. AC indicated that assigning unique identifiers to stations based on their geographic coordinates will not work for groundwater, as there may be several different wells tapping different aquifers in very close proximity to each other. A possible solution could be creating a unique identifier based on a combination of the station name and the location. SM agreed and indicated that similar concerns may also apply to surface water sampling.
- o KM asked what level of detail is desired for the parameters measured. LC indicated that it may be easier to just specify the parameter names without first grouping them into categories such as nutrients, as many databases will not likely include the categories. AC indicated that the medium should be included. SM agreed and indicated that the group will need to agree on the level of separation for different types of water mediums (e.g. Is groundwater a separate medium from surface water? Is saltwater separate from freshwater?)
- o KM asked if the frequency of sampling for each parameter should be included. SM and LC indicated that this may be difficult to capture because frequent changes could result in a very large matrix of sampling frequencies for various parameters. It may be easier to just provide a link to the data, where users could calculate the sampling frequency for the parameters of interest. SK added that users will likely be interested in seeing who is sampling where, what the parameters are, and what the period of record is. Once they have that information, the next step would be for them to contact the organizations responsible for that monitoring to obtain more information, including frequency.
- o KM asked if there is interest in including any other information about the project or the program, such as the number of stations. CD indicated that an abstract and keywords for the project. LC indicated that the abstract should apply to the entire network and may need to be optional. LC also indicated that the abstract should not include specific information such as the number of stations, as that information will be changing over time.
- “Why?”
 - o KM asked if there is interest in including information such as data quality objectives (explaining why the monitoring program was designed as it was, what outcomes are expected, etc.). SK indicated that certain information from DQOs may be important to include (e.g. data was collected as part of a larger monitoring design such as the Comprehensive Everglades Monitoring Program, or data was collected as part of permit requirements). LC added that the DQO information should be optional because some stations have DQOs that change frequently.
- “How?”
 - o KM asked if there is interest in including information on the sample collection method or analysis method. LC indicated entering this information could also be complex because there are often automated samplers located in close proximity to locations where staff collect grab samples. AC indicated that this information is too detailed and does not need to be included.

SM indicated that many of the issues that the group has discussed above are reasons that a statewide effort like the Monitoring Catalog has not yet been successfully completed. KM agreed, comparing the effort to the lengthy process that the first FWRMC went through when developing the metadata standards, but also indicated that it is great that there is currently a lot of support for moving forward with the Catalog effort.

Timeline for Proceeding with FWRMC Catalog Effort

KM indicated that she will present the workgroups recommendation to proceed with the Water Atlas and the draft list of metadata elements at the statewide Council meeting on 10/9/2012.

KM asked if the group would like to discuss further suggestions for the database structure such as the properties of the fields included in the database (e.g. use of drop-down lists versus free text). SS added that the group has already partially addressed this issue by requesting that several fields be optional narratives.

CD asked how station information will be entered / uploaded (batch upload versus entering information one record at a time). KM indicated that the group will need to discuss data transfer mechanisms with the selected contractor, to gain a better understanding of all options that are available.

CD suggested revisiting the Southeast Coastal Water Quality Monitoring Metadata Project Web Portal, looking at their list of metadata elements, and trying to structure the FWRMC Catalog so that the information contained in the data from this project could be used without much transformation required. KM indicated that the Southeast Coastal Water Quality Monitoring Metadata Project Web Portal was developed by the National Park Service and is being used by the South Atlantic Alliance (SAA). SE Coastal Water Quality Monitoring Metadata Project Web Portal staff have already agreed to share all of their station and metadata information with the FWRMC Catalog, once it is complete.

- The table below lists the metadata elements included in the Southeast Coastal Water Quality Monitoring Metadata Project Web Portal

Field	Required	Explanation
Program	Yes	Monitoring program under which the site or station is operated
SiteCode	Yes	Code or short name used as the site or station identifier within the monitoring program
SiteName	Yes	Full name of the site or station
Description	no	Description of the site or station
State	no	State the site or station is located in
County	no	County the site of station is located in
Location	no	Additional location description information (if relevant), e.g. local geographic features or context
Latitude	Yes	Geographic latitude in decimal degrees
Longitude	Yes	Geographic longitude in decimal degrees
HUC8	no	8-digit hydrologic unit code (will be auto-generated if missing)
HUC12	no	12-digit hydrologic unit code (will be auto-generated if missing)
DateStart	Yes (if available)	Date the monitoring activity started
DateEnd	no	Date the monitoring activity ended (blank for ongoing)
WebsiteUrl	no	Address (URL) for a web page describing the site or station
DataUrl	no	Address (URL) for a web page or FTP site for obtaining data from the site or station
Parameters	Yes (if available)	List of parameters (variables) measured at the station, including STORET codes or units and methods when possible

- CD asked if the group is interested in adding the HUC codes corresponding to the hydrologic units that the stations are located in. CD also noted that the HUC codes do not apply to groundwater. SS indicated that the HUC codes are optional in the table above, and can easily be added by catalog / portal staff as long as the station's geographic coordinates are known.
- SM indicated that the "parameter" field in the table above does not clearly indicate how information should be entered, and what level of detail is required for each parameter (e.g. start and end dates, etc.). SS looked at how the parameter information was being displayed for an example station in the catalog. It appears as though details such as start and end dates are not captured, instead each station's metadata just includes a list of all parameters that have ever been monitored.
- KM and CD suggested using the list of metadata elements from the Southeast Coastal Water Quality Monitoring Metadata Project Web Portal (<http://www.gcrc.uga.edu/wqmeta/>) as a starting point for the list of metadata elements included in the FWRMC Catalog. CD asked the group if there are any metadata elements not included in the table above that should be included in the FWRMC Catalog.
 - CD suggested adding required fields for the agency name, some type of contact information, and a website link.
 - SK suggested adding an optional field for the station name / unique identifier in the data provider's internal database. KM indicated that this may correspond to the "SiteCode" in the list above. SK suggested seeking further clarification because there may be differences between the names and codes in these external databases and the agency's internal database.

- o SM expressed concern that limiting the geographic location to points may present difficulties when representing monitoring projects designed as a probabilistic network. KM suggested adding a field to indicate if the station (point) is part of a probabilistic or deterministic network. SM indicated that it may be more appropriate to represent the probabilistic network as a polygon or region from which the random sampling locations are selected. SK suggested that a possible solution could be to use the centroid of the polygon to represent the area from which the random samples are selected. SM added that using the polygon centroids will then require further explanation in one of the other fields about the full area sampled by the probabilistic network. KM asked why it was important to represent the probabilistic network's sites using an area instead of a point. SM indicated that it is important to represent the area sampled to better convey details such as the sampling (e.g. an area could include 100 samples collected over several years, but each sampling point will only be sampled once). ***KM suggested that the group continue discussion of how to represent sampling locations for probabilistic monitoring networks at the next workgroup meeting.***

Since the workgroup is interested in using the metadata elements from the Southeast Coastal Water Quality Monitoring Metadata Project Web Portal, ***KM indicated that she will contact their staff before the statewide Council meeting next week, to determine if they have any plans for further development or other potentially helpful information regarding their list of metadata elements.***