

Florida Water Resource Monitoring Council

Statewide Council Meeting Agenda

Continuous Monitoring in Florida:

A forum for sharing challenges, use of emerging technology, and successes related to continuous monitoring initiatives.

Meeting Date & Time: Wednesday, January 21st 2015: 9:00 AM – 5:00 PM (eastern)
Location: Florida Department of Environmental Protection
Douglas Building, 3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000
Teleconference: 1-888-670-3525; participant passcode: 7593387652#
Webinar Registration: Morning Session: <https://attendee.gotowebinar.com/register/3564954610518034690>
Afternoon Session: <https://attendee.gotowebinar.com/register/3151666881334793986>

*****This meeting will be voice recorded**

Morning Session: *Presentations will provide overviews of continuous monitoring programs challenges, and successes.*

9:00 AM	Welcome and Introductions- Gail Sloane (Chair, DEP)
9:10 AM	Department of Environmental Protection- Julie Espy
9:30 AM	Department of Environmental Protection (Groundwater Protection Section) - Rick Hicks
9:50 AM	Department of Environmental Protection (Aquatic Preserves) - Ann Lazar
10:10 AM	Southwest Florida Water Management District- Catherine Wolden
10:30 AM	Suwanee River Water Management District- Erich Marzolf
10:50 AM	BREAK
11:00 AM	St. Johns Water Management District- Brian Sparks
11:20 AM	Florida Fish and Wildlife Commission- Paul Carlson
11:40 PM	Ocean Research and Conservation Association – Dr. Edie Widder
12:00 PM	LUNCH

Afternoon Session:

Facilitated Discussion on Next Steps for Continuous Monitoring Effort Coordination

1:30 -5:00 PM Discussion Session on Continuous Monitoring Coordination: “Next steps” for Council.

Note: Agencies who presented their continuous monitoring program overview in the morning session, and other invited representatives will participate in a facilitated discussion with Council members to discuss the challenges and next steps for coordinating these efforts.

Previously Identified Challenges:

Installations/Deployment preparation
Equipment
Data Processing
QA/QC Reporting
Data: Interpretation, sharing
Regulatory Applicability
Others?

Florida Water Resource Monitoring Council

Statewide Council Meeting Agenda

Meeting Date & Time: Thursday, January 22nd, 2015: 9:00 AM – 12:00 PM (eastern)
Location: Florida Department of Environmental Protection
Douglas Building, 3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Teleconference: 1-888-670-3525; participant passcode: 7593387652#

Webinar Registration: <https://attendee.gotowebinar.com/register/6160913658324977154>

*****This meeting will be voice recorded**

Meeting Agenda: Morning Session

Council Product Updates:

9:00 AM Welcome and Introductions- Gail Sloane (Chair, DEP) - Tom Frick (DEP)
9:15 AM Salinity Network Work Group Update (DEP) -Rick Copeland
9:45 AM Watershed Information Network (WIN)–Denise Miller (DEP)
10:00 AM Monitoring Catalog Update and Moving Forward- Kate Muldoon (DEP)
10:10 AM Adverse Events Response Plan- Roberta Starks (SWFWMD), Amber Whittle (FWC)
10:35 AM BREAK

Follow-up from Planning Meeting:

10:50 AM Recap of Planning Meeting- Lisa Van Houdt – (DEP)

- Vision Statement
- Meeting Structure
- Topic List

11:20 AM Other Updates

- Formation of “Statewide Trends Workgroup”
- Continuous Monitoring Moving Forward

12:00 PM Adjourn

**bold italicized text is used to indicate items requiring attention before next meeting*

Florida Water Resources Monitoring Council (FWRMC)
Public Meeting of Statewide Council –January 21 & 22 2015
Day one- January 21 2015: Continuous Monitoring

Attendees (X indicates present, * indicates guest attending as a representative for a Council member):

Agency	Primary Members	In Person	Webinar
Department of Agriculture & Consumer Services (DACs)	Kal Knickerbocker		
Department of Health (DOH)	Charlie Donahue	X	
Fish & Wildlife Conservation Commission (FWC)	Amber Whittle		X
Department of Environmental Protection (DEP)	Kate Muldoon	X	
Northwest FL Water Management District (NFWMD)	Kris Barrios	X	
Suwannee River Water Management District (SRWMD)	Erich Marzolf	X	
St Johns River Water Management District (SJRWMD)	Aiša Cerić	X	
Southwest FL Water Management District (SWFWMD)	Roberta Starks		X
South FL Water Management District (SFWMD)	Linda Crean		X
US Environmental Protection Agency (USEPA)	David Melgaard		X
National Oceanic & Atmospheric Administration (NOAA)	Chris Sinigalliano		
US Geological Survey (USGS)	Scott McBride		
FLERA – Northwest; Escambia County (Co.)	Keith Wilkins		
FLERA - Suwannee River; Alachua Co.	Gus Olmos		
FLERA - St Johns River; City of Jacksonville	Tom Carey	X	
FLERA – Southwest; Manatee Co.	Rob Brown	X	
FLERA – South; Miami–Dade Co.	Lisa Spadafina		X
Volunteer Monitoring Programs; FL LAKEWATCH	Mark Hoyer	X	
FL Lakes Management Society (FLMS)	Sean McGlynn		X
Coastal Ocean Observing System (COOS Consortium)	Patrick Welsh		
Agency	Alternate Members	In Person	Webinar
DOH	Bob Vincent		
FWC	Paul Carlson		X
DEP	Rick Copeland	X	
NFWMD	Edward Chelette*	X	
SRWMD	Tom Mirti	X	
SWFWMD	Granville Kinsman		X
SFWMD	Julianne LaRock		X
USGS	David Sumner		
FLERA – Northwest; Escambia County (Co.)	Chips Kirshenfeld		
FLERA - Suwannee River; Alachua Co.	Chris Bird		
FLERA - St Johns River; Volusia Co.	Michelle Leigh		X
FLERA – Southwest; Pinellas Co.	Kelli Levy		
FLERA – South; Palm Beach Co.	Rob Robbins		
Agency	Council Chair	In Person	Webinar
DEP	Gail Sloane		X
Agency	Council Liaison	In Person	Webinar
DEP	Lisa Van Houdt	X	

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Agency	Guests	In Person	Webinar
DEP	Kyle Ferris		X
DEP	Rick Owen		X
DEP	Cindy Fischler		X
DEP	Ann Lazar	X	
DEP-ANERR	Lauren Levi	X	
ORCA	Warren Falls	X	
ORCA	George L. Jones	X	
ORCA	Dr. Edie Widder	X	
FWC	Jessica Griffith		X
City of Jacksonville	Betsy Deuerling		X
SJRWMD	Charles Jacoby		X
SJRWMD	Ashley Parks	X	
SJRWMD	Sue Connors		X
SJRWMD	Margie Lasi		X
SJRWMD	Brian Sparks	X	
SJRWMD	Elizabeth Mace		X
SJRWMD	Robert Burks		
SJRWMD	David Hornsby	X	
NFWWMD	Trevor Fagan		X
SWFWMD	Dave DeWitt		X
SWFWMD	Catherine Wolden		X
SFWMD	Brad Robbins		X
SFWMD	Robert Shufford		X
Florida Parks Service	Dana Bryan	X	
University of South FL (USF)	Jan Allyn		X
EPA- R.4	Simona Platukyte		X

Introduction

Gail Sloane (GS) welcomed everyone to the meeting and summarized the accomplishments from the 2011-2014 FWRMC efforts. GS indicated that today's meeting would include presentations on continuous monitoring efforts, and a facilitated discussion regarding challenges and successes.

Julie Espy, Water Quality Assessment Program, DEP:

Julie Espy, the program administrator for the Water Quality Assessment Program (WQAP) presented on the continuous monitoring efforts of the Florida Department of Environmental Protection's (FDEP) Division of Environmental Assessment and Restoration (DEAR).

Presentation Overview:

FDEP defines Continuous Monitoring as "data collected over a series of time using a recording device". Because a significant amount of data can be collected over a series of days or weeks, much more can be understood about dynamic waterbodies. DEAR currently uses continuous monitoring to obtaining diel measurements for Dissolved Oxygen (D.O.) studies, especially in tidal and intermediate zones, as well as to obtain field parameters and nutrient measurements.

Rick Hicks, Groundwater Protection Section (GWP), DEP:

Rick Hicks, an administrator, the presented on the continuous monitoring efforts of the Florida Department of Environmental Protection's (FDEP) Groundwater Protection Section (GWPS).

Presentation Overview:

Rick described the GWP section projects, which have continuously monitoring sondes with telemetry systems uploading to websites. The GWP Section has contracts with the Water Management Districts, Cardno-Entrix, and Loche Consulting. Has automated sondes in Ginnie Springs for monitoring rain events and agricultural activity in real time that allow DEP to understand potential causation by comparing analytes monitored. In addition, these sondes also use telemetry to monitor the sonde connections and maintenance needs.

The contract with Cardno-Entrix is to monitor groundwater seepage into surface water systems, especially useful for tracking septic system effluent. GWP Section models results using ArcInlet, for which Rick presented a slide of residential septic tank GW flow into SW systems. (The model currently has no calibration). Model predictions can lead to additional monitoring wells and stations. Also employs the Krupa-Seep to monitor GW flow into SWs, although GWP Section plans to develop its own seepage meter. The GWP Section obtains flow direction in wells for models by measuring the heat pulse.

Ann Lazar, Florida Coastal Office (FCO), DEP:

Ann Lazar presented on the continuous monitoring efforts of the Florida Department of Environmental Protection's (FDEP) Florida Coastal Office.

Presentation Overview:

Ann reiterated that the FCO includes the National Estuary Research Reserves, Aquatic Preserves, Gulf of Mexico Alliance, and the liaison for the RESTORE Act funding. She addressed the fact that NOAA has been conducting continuous monitoring studies in the National Estuarine Research Reserves for about two decades, and already has a nationwide network that uses specific makes and models of sondes, has developed SOPs, training, a centralized database (CDMO), and other features that serve as a template for continuous monitoring efforts. The database also has a webpage to share data with the public. Lauren Levi indicated that the NERRS use YSI EXOs, which cost about \$14,000 each; there are two/site that are swapped out every two weeks for

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maintenance. These are less prone to fouling, have interchangeable probes, and are accurate and precise. The Charlotte Harbor APs and St. Martin's Marsh AP also use continuous monitoring devices.

Catherine Wolden, Southwest Florida Water Management District (SWFWMD):

Catherine Wolden presented on the continuous monitoring efforts of the Southwest Florida Water Management District.

Presentation Overview:

Most of SWFWMD's continuous monitoring is used to determine flow and for meteorological purposes. Most of these will be going to near-time to obtain information on minimum flows and levels (MFL). It does not monitor nutrients with these automated devices, but plans to use Cycle-P, and SUNA devices to collect nutrient data in the future. SWFWMD has ~1269 continuous monitoring events (Sondes deployed for various on-going monitoring projects). The WMD uses YSI EXOs, 6600, 6000 series to collect, and it shares data with others working on MFLs and springs. Its focus in 2015 is developing MFL for the Central Florida Water Initiative; the focus in 2016 is nutrients in springs.

Erich Marzolf, Suwannee River Water Management District (SRWMD):

Erich Marzolf presented on the continuous monitoring efforts of the Suwannee River Water Management District.

Presentation Overview:

SRWMD is working closely with the Florida Geological Survey (FGS), U.S. Geological Survey (USGS), DEP's GWP section and State Parks to understand springs spatially and temporally. To this end, the WMD deploys continuous monitoring devices in many springs and waterways, and has created innovations to protect them, as well as allow easy retrieval. Sometimes, three different types of continuously-monitoring sondes are deployed together. The accuracy and precision of the deployed sondes are checked using 1) monthly manual sampling for analytes of interest and 2) telemetry to allow near real-time data checking for outliers, or junk data. Erich emphasized that continuous monitoring devices are useful in understanding systems, but should not be used in regulatory manners (no EPA-approved methods).

Brian Sparks, St. Johns Water Management District (SJRWMD):

Brian Sparks presented on the continuous monitoring efforts of the St. Johns River Water Management District.

Presentation Overview:

The WMD uses YSI EXOs, Cycle (PO4), and SUNA V2 (nitrates) continuous monitoring devices at 20 sites, but only a subset of the data are on its public site. Its website includes a Continuous Water Quality Data Tool that can pull any parameter, any status, as well as the max, min, and mean for its measurements. It stores the hourly data in the WMD's HYDSTRA database. All its sites are on telemetry to monitor the sondes for accuracy, precision, and outliers.

Paul Carlson, Florida Fish and Wildlife Commission, Fish and Wildlife Research Institute (FWCC/FWRI):

Paul Carlson presented on the continuous monitoring efforts of the **Fish and Wildlife Research Institute (FWCC/FWRI)**

Presentation Overview:

FWRI is focusing on continuous monitoring using remote sensing, thereby precluding the issues with vandalism and biofouling. This effort, known as the Virtual Buoy System (VBS) is funded by NASA, and is useful for obtaining optical water data, such as river discharge, optical quality, nutrient loads and seagrass losses. It

monitors 200 sites annually in the Big Bend area of Florida. MODIS allows visualization of the Suwannee River plume into the Gulf. Different wavelengths can be used to determine whether sediments/detritus (CDOM) or algae (Chl-a) are causing the plume.

Dr. Edie Widder, Ocean Research and Conservation Association (ORCA):

Dr. Edie Widder presented on the continuous monitoring efforts of the Ocean Research and Conservation Association.

Presentation Overview:

Orca deploys several types of continuous monitoring devices in the Indian River Lagoon (IRL). Besides EXOs and YSIs, it deploys devices, known as Kilroys, that are custom-designed to be wireless, inexpensive, easily mounted and maintained, and to collect field measurements. ORCA is especially interested in measuring biotoxicity caused by runoff and GW discharge into the IRL. Systems cannot function in the clean water/dirty water pulses that characterize inflow into the IRL. Currently, ORCA is installing a new system into creeks and canals that contribute to the IRL.

Discussion:

To prepare for the discussion, Lisa Van Houdt (LVH) and Kate Muldoon (KM) grouped and summarized continuous monitoring challenges and potential solutions in a PowerPoint for Julie Espy (JE), the facilitator. The four priority challenges are:

- Equipment Maintenance and Associated Costs
- QA/QC and SOPs
- Data Sharing, Availability, and Comparability
- Design and Implementation

Equipment Maintenance and Associated Costs

This may vary based on seasonality and waterbody types, with continuous monitoring sondes in marine or estuarine waters requiring higher maintenance (every 1-2 weeks) than those in freshwater bodies (every 2-4 weeks), where there are fewer fouling organisms. NOAA typically changes out its sondes every 2-3 weeks, based on fouling and need for battery changes.

It was noted that turbidity and optical sensors are the most difficult to maintain. In terms of staff time, a YSI EXO unit generally requires ~ 1 full time employee (FTE). Any unit in a marine environment will require nearly .5 FTE

Maintenance solutions include:

- Use solar panels as power sources for telemetry and to preclude maintenance for battery changes, since solar-powered batteries need replacement only once every three years;
- Install a pump to pump water through and over sensors (however, pumps require a lot of power);
- Use UV light to disinfect & clean sensors, although this requires a lot of battery power also;
- To reduce power usage, turn on telemetry modems for 10 minutes only once or twice/day;
- 50W solar panels can be used to power pumps.

To protect expensive sondes from vandalism, participants had developed a number of strategies, such as:

- Place sonde and signage in public locations, such as state parks;
- waterside owners willing to oversee a nearby sonde;

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- Sondes locked in a flow-through container and submerged;
- Use crowd-sourced technology to report on sonde condition;
- Decorate sonde containers with an American flag, a Confederate flag, or a large number “3”, which was Dale Earnhardt’s NASCAR number.

QA/QC and SOPs

SOPS and QA/QC differ from instrument to instrument as well as among manufacturers, so this issue complicates things. The SUNA 2 is not approved by the EPA, and the YSI EXO2 is approved by EPA only for field methods. The Cycle doesn’t need any on-site calibration but requires that it be sent back annually to manufacturer for maintenance and calibration. The Kilroy runs a calibration standard before each sample. The WMDs validate their CM data via grab samples. Current Council consensus is that the YSI nitrate probe needs many improvements before Council members would recommend it.

NOAA SOPS already exist for continuous monitoring devices, so these can be used as a template, or starting place:

- Installation
- Maintenance
- Three level data review
- All SOPS are updated annually
- an annual tech training
- data management and handling
- Calibration

The Council/Florida monitoring entities must determine the amount of acceptable variability in monitoring results. We should also make decisions about whether alternative methods would be appropriate. Participants in the discussion recommended that we provide information on the Nutrient Sensor Method, and on products developed by the NWQMC’s Continuous Monitoring workgroup.

Data Sharing, Availability, and Comparability

The Council will be able to share CM data via the Watershed Information Network (~2017) or other specific websites.

ORCA has its own database, with the size of ORCA’s data files currently at 1 Terabyte.

SJRWMD is using Hydstra to both evaluate and manage CM data.

DEP is currently looking at Aquatics Informatics to store CM data, and may collaborate with NFWMD on a license for data management and storage.

Design and Implementation

The Council agrees that it will develop a document to inform monitoring entities who are considering continuous monitoring of its pros and cons and considerations.

The SJRWMD identified common failures in deploying a continuous monitoring device:

- Modem failure;
- One instrument stops communicating;
- One of the probes fails.

A suggested solution for fouling is to wrap the sonde in saran wrap, and secure with duct tape. This layer can simply be cut off to inspect the sonde. The sondes are also deployed in pre-drilled PVC pipes to

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preclude corrosion and bent brushes. SJRWMD also uses sondes on vertical, moveable platforms to address water level changes and prevent vandalism.

To successfully deploy these devices, staff to address telemetry and water sampling are both needed. For example, the operations and management group and the data collectors must work together to achieve a successful outcome. In fact, technical errors can be reduced by using a team “check’ approach when installing devices. In terms of the data collectors, SWRWMD indicated that joint water quality and hydrological teams can best address issues that arise from CM devices, as well as work together to understand the system being monitored. In some cases, the data dictionary may need to be modified if the device is moved to another location.

On more technical note, Council members indicated that specific conductance probes may not work if the temperature exceeds a certain range. In addition, switching manufacturers can result in new logistics, causing disruptions. The telemetry equipment and sampling devices may not be compatible, resulting in additional costs. However, telemetry is very useful, not only for obtaining data in real-time, but also as a means to ensure data quality (e.g. weird or no measurements may result if a probe fails or the device gets fouled or vandalized).

Questions / Comments / Open Member Dialog

GS concluded the meeting and indicated that the meeting will continue tomorrow and will include product updates from the all FWRMC workgroups, including the Catalog Workgroup (Water-CAT), Salinity Network Workgroup (Groundwater level and quality indices), and the Coastal Monitoring Workgroup (adverse event response plan). The meeting will also include Council business items such as follow-up from the Planning Meeting held in October, and next steps for continuous monitoring.

Meeting Evaluations

Do you have any comments or suggestions on how to improve the new “Themed Meeting” format?

- Liked it
- Everything was super
- This format has gotten off to a great start! The continuous/real-time monitoring presentations and associated discussions were great. We have hit on a very "needed attention" item!
- Good start... next time inviting federal counterparts that may have more experience on this particular themed meeting
- I thought it was a good webinar/meeting
- Enjoyed the meeting and learning what others are doing with respect to continuous monitoring.
- This discussion part should not include the call-in people

What topics / presentations were most useful?

- All of the real time monitoring presentations were good, and the Big Bend sea grass talk was very good
- Everything was useful, & provided a comprehensive overview of continuous monitoring issues.
- All Themed Meeting presentations and discussions on real-time monitoring trials and tribulations. Make sure we don't leave out levels and discharge monitoring for soon to be Workgroup discussions.
- Who's using what technology and the solutions found for some of the common challenges
- All were useful (2 votes)

What topics / presentations were least useful? Why?

- None (two votes)
- Discussion, Couldn't hear it on the webinar.

What topics would you like to see at the next FWRMC meeting?

- Lakes monitoring, stream water quality, and discharge monitoring

Meeting at Tallahassee (DEP – Bob Martinez Center)

- Good (votes 6) / Fair (votes) / Poor (vote)

Webinar

- Good (votes 2) / Fair (votes 3) / Poor (vote)

Presentation time / format

- Good (votes) / Fair (votes) / Poor (vote)

Discussion time / format

- Good (votes 7) / Fair (votes) / Poor (vote 1)

- Call-in issues limited some discussion time.

Other comments / suggestions

- Senior management from Council membership should attend.
- All seemed to go well except webinar connections were acting up with long meeting time, but staff troubleshoot well.

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Florida Water Resources Monitoring Council (FWRMC)
Public Meeting of Statewide Council –January 21 & 22 2015
Day Two- January 22 2015

Attendees (X indicates present, * indicates guest attending as a representative for a Council member):

Agency	Primary Members	In Person	Webinar
Department of Agriculture & Consumer Services (DACS)	Kal Knickerbocker		
Department of Health (DOH)	Charlie Donahue		
Fish & Wildlife Conservation Commission (FWC)	Amber Whittle		X
Department of Environmental Protection (DEP)	Kate Muldoon	X	
Northwest FL Water Management District (NFWFMD)	Kris Barrios	X	
Suwannee River Water Management District (SRWMD)	Erich Marzolf	X	
St Johns River Water Management District (SJRWMD)	Aiša Cerić	X	
Southwest FL Water Management District (SWFWMD)	Roberta Starks		X
South FL Water Management District (SFWMD)	Linda Crean		X
US Environmental Protection Agency (USEPA)	David Melgaard		X
National Oceanic & Atmospheric Administration (NOAA)	Chris Sinigalliano		
US Geological Survey (USGS)	Scott McBride		
FLERA – Northwest; Escambia County (Co.)	Keith Wilkins		
FLERA - Suwannee River; Alachua Co.	Gus Olmos		
FLERA - St Johns River; City of Jacksonville	Tom Carey	X	
FLERA – Southwest; Manatee Co.	Rob Brown	X	
FLERA – South; Miami–Dade Co.	Lisa Spadafina		X
Volunteer Monitoring Programs; FL LAKEWATCH	Mark Hoyer	X	
FL Lakes Management Society (FLMS)	Sean McGlynn		
Coastal Ocean Observing System (COOS Consortium)	Patrick Welsh		
Agency	Alternate Members	In Person	Webinar
DOH	Bob Vincent		
FWC	Paul Carlson		
DEP	Rick Copeland	X	
NFWFMD	Tony Countryman		
SRWMD	Tom Mirti	X	
SWFWMD	Granville Kinsman		
SFWMD	Julianne LaRock		X
USGS	David Sumner		
FLERA – Northwest; Escambia County (Co.)	Chips Kirshenfeld		
FLERA - Suwannee River; Alachua Co.	Chris Bird		
FLERA - St Johns River; Volusia Co.	Michelle Leigh		X
FLERA – Southwest; Pinellas Co.	Kelli Levy		
FLERA – South; Palm Beach Co.	Rob Robbins		
Agency	Council Chair	In Person	Webinar
DEP	Gail Sloane	X	
Agency	Council Liaison	In Person	Webinar
DEP	Lisa Van Houdt	X	

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Agency	Guests	In Person	Webinar
DEP	Kyle Ferris		X
DEP	Tom Frick	X	
DEP	Cindy Fischler		X
DEP	Denise Miller	X	
FWC	Jessica Griffith		X
University of South FL (USF)	Jan Allyn		X
EPA- R.4	Simona Platukyte		X

Introductions: Gail Sloane (Chair, DEP) and Tom Frick (DEP)

Gail Sloane (GS) welcomed everyone to the meeting and indicated that this morning's meeting would include presentations on current Workgroup products, the Watershed Information Network (Replacement for STORET), and Council business from the Planning Meeting held in October. Tom Frick commended the excellent work of the Council, and indicated the need for the Council as a forum to communicate monitoring efforts among agencies. He discussed the issue of continuous monitoring (CM), requesting members' input on the challenges and solutions.

Council members responded with the following:

- Watershed data are most important to the public for obtaining critical information concerning flood protection and water levels, both for recreation and water supply.
- Upper management, legislators, and policymakers need to realize what it takes to gather good data, including the components of hydrology, water quality, and biology.
- To gather good data from CM devices, monitoring entities requires funding for operations and maintenance as well as the capital outlay for the monitoring devices.
- Managing the data from CM devices is a considerable challenge to be addressed.
- The public needs education and outreach concerning watershed and springs systems.

Tom is interested in cost efficiency and noted that CM devices are a hot topic among Florida legislators, especially since session starts in March.

Workgroup Updates:

Salinity Network Work Group Update (FDEP) - Rick Copeland

The Salinity Network Work Group "SalNet" is a network of existing monitoring networks covering the entire state. It emphasizes groundwater but works closely with surface water monitoring programs. It is unfunded. The SNW coordinates the efforts of its members. The intended audience of the Workgroup products are the general public, water managers and policy makers, and the scientific community. Currently the SNW is developing: (1) a groundwater level index and (2) a groundwater quality index. The purpose of the indices is to assist the public in understanding the conditions of Florida's water resources with regard to saltwater encroachment.

The Groundwater Level Index: The reason for addressing levels is that when groundwater levels decline, the potential for saltwater encroachment increases, especially in the Upper Floridan aquifer (UFA). The UFA, which underlies most of Florida, is the principal source of groundwater supplies in the state. It is susceptible to saline water encroachment through coastal saltwater intrusion and the upwelling of deeper mineralized water. The Groundwater Level Index is based on percentile rankings of the groundwater levels for the period of record, which often go back in time for several decades. GWLs in each well are converted to percentile ranks. The highest water level for a well is 1.00 (100%) and the lowest is 0.01 (1%). The use of the index will commence in May of this year and will be produced every May (low levels) and September (high levels). It currently is restricted to the Upper Floridan aquifer, but can be expanded to other aquifers of the state.

The Groundwater Salinity Index: This index is just now in its beginning stage of development. It is expected to take about two years to fully implement the use of the index. The index is based on specific conductance (SC). SC data is obtained instantly with inexpensive portable meters in the field. It can be mathematically converted to total dissolved solids (TDS), as well as other saline indicators such as chloride, sodium, and sulfate. The plan is to periodically produce maps of TDS and Chloride, and possibly other maps of groundwater quality for all aquifer in Florida.

Coastal Salinity Monitoring Network:

The Governor's office has encouraged FDEP to develop a Coastal Salinity Monitoring Network (CSMN), which will eventually include surface water. As with the GW Quality index, the development of a CSMN is

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in the initial stages of development and should take about two years to develop.

Watershed Information Network (WIN)–Denise Miller (DEP)

The Watershed Information Network (WIN) project is the replacement for FL STORET.

- Phase 1a (for data input, storage and maintenance) and Analysis and Design (C&I) was concluded in February, 2014.
- Phase 1a Construction and Implementation (C&I) was initiated in June, 2014
- Phase 1b (reporting) Analysis and Design (A&D) was concluded in November 2014
- Currently drafting a contract addition for Phase 1b C&I
- Pending approval, Phase 1b C&I will begin in April 2015, to run concurrently with Phase 1a C&I.

Pending approval of contract additions and modifications:

- Phase 1a (data input, storage and maintenance) is scheduled to go live by early 2017;
- Phase 1b (reporting) is scheduled to go live in two 2017 deployments;
- Early 2017 for advanced reporting, within ~two months of Phase 1a go live;
- Late 2017 for additional reporting;
- Testing of required WIN functionality based on determined Minimum Data Quality Standards (MDQS).

WIN Next Steps:

Phase 1:

- DEP to contract for & initiate C&I of Phase 1b (April, 2015);
- DEP Implementation Planning and Communications;
- Minimum Data Quality Standards (MDQS) updates including SVLs (Standard Value Lists);
- Type of data for WIN (e.g., guidance non-regulatory database);
- Data Provider Implementation Planning for Phase 1a:
- MDQS are the “blueprint”
- Updated versions of MDQS provided at the following site (latest update with message imminent):
- ftp://ftp.dep.state.fl.us/pub/outgoing/STORET/WIN_MDQS
- Data providers requested to use MDQS to prepare for WIN Phase 1a Go Live in early 2017

WIN Phase 2: Continuous Monitoring

- DEP to resume A&D for WIN continuous monitoring data;
- Planned development & execution of contract addition by 2016 to resume and complete Analysis & Design;
- WIN Phase 3: Biology
- DEP to initiate DEAR planning discussions for WIN biological monitoring data needs

Catalog Network Work Group Update (DEP) – Kate Muldoon

Phase I Water-CAT has both tabular and a spatial search functions, and currently contains information on about 75 monitoring entities and 104,800 stations in Florida. Searchable metadata for surface water, ground water, freshwater, coastal, and some biological monitoring can be exported as CSV, TXT, or KLM files. This version of the Water-CAT is more elegant and functional due to fixes based on recommendations from a period of beta testing.

To populate the Water-CAT (Phase II), USF hired a graduate student to assist, and developed a plan and tracking spreadsheet. To increase the functionality of the search feature, the team has contacted STORET and non-STORET data providers for additional metadata parameter information. To improve the

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accuracy of information returned in a search, data providers were asked to provide clarification and additional information on:

- Confirming active vs. Inactive projects & stations - Information will narrow results to only on-going monitoring projects, to provide a more accurate representation of current efforts.
- Monitoring Frequency- Information will allow users to narrow searches based on frequency.
- Project Description- Information will provide a description of the project, and keywords which can be used in a general search.
- Data Quality Objectives- data providers can include these in the Project Description.

DEP met with data managers of groundwater, springs, and biological monitoring projects to arrange metadata uploads. Secondary categories and keywords for biological parameters were recommended during Beta testing to broaden search results. DEP developed a draft list which will be reviewed at the next Catalog workgroup meeting.

Phase II has also included steps to refine the Catalog. USF is reviewing a new data download from STORET to ensure that current revisions are not overwritten; which should be completed in about one month. To assess “Active vs. Non-Active Projects and Stations” USF will run an algorithm to determine “presumed active” from “presumed inactive” projects and stations, until both can be confirmed. This will reduce data provider fatigue to populate this information for each project, and will be completed in about 6 months. USF is also in the process of aligning spatial and tabular databases, which will take about two months.

Next steps: USF will continue to work with data providers to populate the Catalog, and Redesign tabular search to absorb additional biological parameter and keyword search capability. The list of secondary biological parameters and keywords will be “finalized” during the next Catalog Workgroup meetings.

Adverse Events Response Plan- Roberta Starks (SWFWMD), Amber Whittle (FWC)

The Adverse Events Response Plan is under development to facilitate monitoring coordination among stakeholders in response to events that cross different environmental agency jurisdictions. This was identified as a need as a result from lessons learned from an extensive variety of crises, including the Deepwater Horizon oil spill and the sea grass, marine mammal and bird die-off in the Indian River Lagoon.

The first step was to develop a list of parameters for which would be pertinent in a variety of adverse events (e.g. event responsibilities, available equipment, and agency contact information). To ensure that this basic format would work for all contributing entities, Council members reviewed this initial list with their agencies/organizations and provided feedback.

Based on suggestions gathered during this review period, it was decided that the best medium for a database containing this information would be a Map Viewer with searchable features. As of January 2015, SWFWMD has created an alpha version of the map viewer. Users will be able to conduct a preliminary asset search and obtain respective agency contact information. Next steps include refining the map viewer, expanding the list of searchable parameters, and developing the “Plan” associated with this viewer in the form of accompanying text.

Next steps: SWFWMD will continue to refine the Map Viewer, and structure for capturing information and will distribute further information for another comment period.

Council Business:

Recap of Planning Meeting:

Vision Statement: At the Planning Meeting it was decided that Linda Crean and Kate Muldoon would modify the vision statement and distribute it to Council members for comments. KM presented the latest version of the statement.

Modified Vision Statement:

“The vision of the Florida Water Resources Monitoring Council is to support the protection, preservation, conservation, management, and restoration of water resources throughout the State of Florida by fostering communication, cooperation, collaboration and coordination among all water resource data collection entities. We strive to build relationships that facilitate data and resource sharing to reduce redundancy and ensure efficiency and effectiveness, and to increase data comparability among all Florida monitoring entities, ensuring that data and metadata are available to all users. We remain committed to following the highest ethical standards to assure the scientific and legal defensibility of the data that are collected by Council affiliates and stakeholders. We will continue to seek the most efficient water resource monitoring technologies available to promote cost effectiveness, high data quality, and data integrity, and stay abreast of new technologies, as well as emerging water resource issues, to ensure that we meet future monitoring objectives throughout the state. “

Conclusion: Council members requested that this latest version be distributed to all for further comments.

Update: The comment period closed on 2/27 and no revisions were submitted. This version will be adopted for 2015.

Statewide Trends using LAKEWATCH Data:

Currently Mark Hoyer (MH) (LAKEWATCH, UF) is attempting to find funding for a full-time person to coordinate the collating and analysis of multiple long-term data sets that are available. The primary (but not the only objective) should be to determine natural long-term background variability (spatially and temporally) for variables that are keystone environmental factors (e.g., nutrient concentrations) or natural commodities (e.g. ground water supply) that need potential regulation. Finding monies for this position is proving to be difficult. Until these resources are captured, there are some things that could move this initiative forward.

There are over 120 lakes with greater than 20 years of data in the LAKEWATCH database. Currently, MH is in the process of compiling the following data for analyses of variance and trends over a large geographical area:

- Water chemistry (Nutrients, chlorophyll, water clarity, color, conductivity/alkalinity)
- Bathymetric maps
- Aquatic plant data (LAKEWATCH and FWC)
- Nearest rainfall station (data 1950 to present)
- Watershed area and land use in the watershed from the early 1990s and late 2000s

FDEP, Water Management Districts and County agencies may have additional lakes with similar data that we could add for statewide analyses of temporal patterns over geographical ranges. However, at the present the long-term (>20 years) data, Dr. Hoyer would like to acquire for each of the LAKEWATCH lakes listed in are, in order of importance:

- Lake level data
- Nearest groundwater level and conductivity if available
- Stream discharge at the nearest river station

**bold italicized text is used to indicate items requiring attention before next meeting*

- Additional aquatic plant data because data I have currently has multiple years of missing data
- Lists of any management activities that have occurred on the lakes (e.g., grass carp, dredging, alum treatments etc.)
- Soil pH and nutrient concentrations in the watershed

Conclusion: LVH will distribute this information to all, and anyone is interested in helping let MH know and he will set up a conference call to discuss options. Those not interested in participating but have data should send to MH and he will continue to collate the data.

Meeting Structure:

At the October 2014 Planning Meeting, the Council agreed that future meetings would be “**Themed Meetings**”. Presentations will be selected based on topics of interest indicated by members at a Planning Meeting, to be held regularly (frequency to be determined) and at Council meetings to allow for urgent emerging issues. Each topic of interest will be presented from several agencies/entities to provide a statewide vision of current efforts. The presentations will be followed by a discussion session to determine the Council’s future course of action. A future course of action may include further investigation at a future meeting, a new Workgroup, issue resolution, or a product. These presentations and subsequent discussion sessions will better utilize the Council as a forum to address the charge of Council to “Coordinate Florida’s ongoing fresh water monitoring with coastal and marine monitoring networks” and “Coordinate Florida’s state monitoring efforts with local and federal monitoring programs” as defined in the Action Plan.

Conclusion: Council members agreed that this first “Themed Meeting” was a success, and future meetings should continue with this format. Webinar participants suggested that the discussion session should not be available for webinar participation in the future, as the audio quality made it difficult to participate.

Topic List: The topic list resulting from the Planning Meeting was presented.

Conclusion: There were no suggestions to remove or add topics to this list.

Continuous Monitoring: The Council discussed challenges and successes of current Continuous Monitoring initiatives on the first day of the meeting.

Conclusion: It was suggested that a workgroup may be formed to address the CM issues identified, and serve as a forum for coordinating efforts and sharing this information further by populating a shared resource for this information (e.g. webpage, white paper) The Liaison will distribute a summation of discussions, and Doodle poll for dates of an initial “Workgroup” meeting to discuss next steps.

GS Thanked the participants for their continued support of the Council and Adjourned the meeting.