

Florida Water Resources Monitoring Council (FWRMC)
Public Meeting (Webinar) of Salinity Network Workgroup – May 2, 2012

Attendees:

Agency	Name
DEP	Rick Copeland
DEP	Stephanie Sunderman
DEP	Jay Silvanima
DEP	Tom Seal
NWFWMD	Tony Countryman
SRWMD	Megan Wetherington
SJRWMD	Don Boniol
SWFWMD	Dave DeWitt
SWFWMD	Ken Romie
SFWMD	Cindy Bevier
SFWMD	Lucia Baldwin
USGS	Sandy Kinnaman
Alachua Co.	Jim Myles
FL LAKEWATCH	Mark Hoyer
LaPlaya Beach & Golf Resort	Julie Germer

Welcome / Introductions / Review

Rick Copeland (RC) welcomed everyone to the fourth meeting of the Salinity Network Workgroup (SNW) and reviewed the agenda for the meeting.

RC reviewed action items from the previous meeting (2/9/2012):

- Answer questionnaire (will review responses during this meeting)
- Develop a groundwater (GW) level index (will discuss details during this meeting)
- Develop a GW Quality Index (Scott Prinos, USGS, and Fran Henderson, Broward Co, will present information on this topic during the next Salinity Network Meeting (August))
- Use volunteer data as applicable (will discuss during this meeting)
- Management of pertinent GW data as needed (will discuss during this meeting)
- Complete GW Monitoring Catalog (awaiting further guidance from FWRMC)

Discussion of Questionnaire Items and Responses:

Decision Making Process

- RC presented the proposed three tiered decision making process:
 - o Informal Decision Making (tier 1) - approval of issues is indicated by absence of objections or requests for further discussion
 - o Formal Decision Making (tiers 2 and 3)
 - Quorum (50% + 1) of voting members must be present to make a decision
 - Voting members will consist of one person from each participating organization in the Salinity Network Workgroup (currently 16 participating organizations). Voting members may designate an alternate representative to attend the meeting in their place, if they are unable to attend.
 - Consensus Building (formal, tier 2)
 - Consensus is shown as follows with a ranking of 5 through 1:
 - 5 means wholehearted support
 - 4 means support

- 3 means neutral but will support fully to outside world
 - 2 means you still have questions you need to ask
 - 1 blocks any decision
- Consensus is defined as everyone displaying a ranking of no less than 3.
- In the event anyone gives a ranking of 1 or 2, discussion will continue to answer questions or concerns of those blocking. If there are no 1's or 2's, then consensus is reached on that issue and you will move on to the next issue to be discussed.
- Every attempt must be made to reach consensus. Voting is only used if consensus cannot be reached in reasonable time.
- Voting (formal, tier 3)
 - If a supermajority (67%) of voting members present vote in favor of an item, the item passes.
- RC asked representatives in attendance to confirm that their organization would like to be included in the voting membership, and to indicate who the primary voting member would be.
 - Affirmative responses from the following organizations (representative noted in parentheses): SFWMD (Cindy Bevier), SJRWMD (Don Boniol), SRWMD (Megan Wetherington), Alachua Co. (Jim Myles), LAKEWATCH (Mark Hoyer), FDEP WMS (Jay Silvanima)
 - No response / decision (RC will contact after the meeting concludes): NFWFMD, SWFWMD, DACS, FDEP GWP, FDEP FGS, USGS, US ACE, Miami-Dade PERA, Miami-Dade Water & Sewer, Escambia Co.
 - Jay Silvanima (JS) suggested that agencies that currently have participants from multiple sub-groups (e.g. DEP and Miami-Dade Co.) coordinate internally and have only one voting representative on the Salinity Network Workgroup. RC agreed, and suggested that those organizations each nominate a single voting representative before the next meeting.
- Mark Hoyer (MH) asked if new organizations can join the Salinity Network and be included as voting members. RC indicated that new organizations are welcome to join, and can nominate a voting member at any time. However, after the meeting Dave DeWitt (DD) and RC both believe this statement should be modified to: "... and they can be a voting member if they demonstrate a commitment to participate in SNW activities."

Should SNW address remedies for salt water (SW) encroachment issues?

- RC suggested that the group should report on status and trends regarding SW encroachment, and indicated that addressing suggested remedies is beyond the scope of the SNW.

When should the SNW use the term "encroachment" versus "intrusion"?

- SW encroachment indicates displacement of fresh GW by the advance of SW due to greater density (Neuendorf et al., 2005).
- SW intrusion indicates migration of SW into fresh water (FW) aquifers under the influence of GW development (Freeze and Cherry, 1979)
- RC suggested that SNW encourage the use of "encroachment" if human activity is not thoroughly understood.
- Lucia Baldwin (LB) indicated that many areas are affected by both processes related to human activities and processes unrelated to human activities.
- DD suggested using the term "intrusion" in areas where there have been other studies (which can be referenced by the SNW) documenting causation by human activities.
- Tom Seal (TS) suggested using the same terminology as the USGS in Broward Co. and south FL.

Should SNW conduct trend analyses for wells with period of record (POR) greater than 5 years?

- RC suggested deferring discussion of this issue until a later meeting, once other related issues have been discussed.

Should SNW encourage the use of wells with a long-term POR?

- RC suggested encouraging use of wells with long-term PORs, but not restricting wells to be included in the network to only those with long-term PORs. However, some analyses (e.g. trend) will be restricted to wells with long-term PORs.
- Jay Silvanima (JS) added that it is critical to keep track of the POR when conducting analyses.
- Tony Countryman (TC) suggested establishing a minimum POR. RC suggested that wells with short-term PORs that are currently being monitored should still be included in the network, as they will eventually have long enough PORs to perform additional analyses.
- LB added that analyses such as the seasonal Kendall require at least 5 years of data. Therefore wells with long-term PORs are very important and should be included and maintained.
- RC noted that some agencies want to reduce wells with long-term PORs, in favor of wells with a greater frequency of monitoring. DD added that most agencies are aware of the value of wells with long-term PORs, but noted that these wells occasionally need to be abandoned or replaced due to construction of roads, etc. Some efforts have been made to replace these wells with new adjacent wells with overlapping PORs, but it is not possible to combine the PORs from two separate wells. RC asked DD to send him an example of the data from a set of adjacent wells with overlapping monitoring PORs.

Who should chair the SNW?

- Respondents suggested that the chairmanship remain with FDEP, and RC indicated that he would continue to Chair the SNW, but is welcome to having others lead in the future.
- DD has agreed to be the first Co-Chair (for a two-year term), and will act as the alternate leader for RC and work close with RC to draft the framework document and pilot study design.

Evaluation of use of volunteer monitoring data

- RC indicated that using volunteer monitoring data for the Salinity Network would facilitate public buy-in, increase public recognition of GW levels and salinity issues, and increase data coverage. However, it is important to ensure that volunteers are trained, and that volunteer data is validated with proper QA and is comparable to other organizations' data. Resources will also be needed for sampling equipment for volunteers (water level meters and tapes).
- LAKEWATCH will commence a pilot study for volunteer monitoring of ground water levels during the summer of 2012. The ending date is unknown at this time. Interested stakeholders include well owners near lakes, well owners who have noticed wells going dry, agricultural well owners, IFAS (University of Florida Institute of Food and Agricultural Sciences), county extension agents, and counties that have recently dropped wells from monitoring programs.
- Volunteer monitoring can increase opportunities for public education. RC suggested that SNW participants could submit articles on GW issues to the LAKEWATCH newsletter.
- MH emphasized the educational value of volunteer monitoring programs, reviewed a proposed solution for storing and checking out water level monitoring equipment at the LAKEWATCH regional offices, and added that the goal will be to have volunteer efforts use the same methods and terminology as professional monitoring efforts.
- DD suggested that the SNW list of issues to be addressed related to volunteer GW level monitoring. His two major concerns were: (1) volunteers should be able to properly characterize wells and (2) volunteer data should be used to assist the SNW in gap analysis. That is, an emphasis should be placed on obtaining data in areas of Florida where SNW data are sparse. Regarding (1), RC suggested that WMDs could help volunteers to gather well characterization information. Representatives from all WMDs agreed to assist. Regarding (2), as volunteer data becomes available, gap analysis will be conducted.

Should SNW use percentile ranks (PRs) as an index for GW levels?

- Respondents indicated support for this index, as a useful tool for conveying information to the public regarding GW levels.
- Items of concern that readers must be aware of:
 - PRs represent the status, they are not trends.

- o Values of any one station on a statewide map may be questionable because of regional variations in hydrogeology.
 - o If a statewide PR map is generated, it may be slightly different from the analogous PR map produced by a WMD because of slight differences in the methods used.
 - o PRs displayed in the statewide map may be different from the PRs from individual wells.
- Regional and statewide maps will need to be hydrostratigraphically consistent among WMDs or other boundaries.

Will PR maps be easily understood by the public?

- Respondents indicated that they believed the maps would be easily understood, but recommended using a standardized number of classes (5 or less) and color codes (could use USGS standards). DD suggested that the color system could also be used as a warning system for water conservation (similar to fire danger warning maps).
- Some concern about potential confusion caused by changing standard classes and colors for WMDs that already produce PR maps.

Will policy makers use the PR index (GW level index)?

- Respondents indicated that they believed the index would be used.
- SNW should begin to discuss a complimentary salinity index at the next meeting.

Can the PR index be used at various scales?

- Respondents indicated that they believed the index could be used at various scales.
- Limitations to using the PR index must be understood and overcome:
 - o Well clusters may confuse the reader.
 - o Wells for statewide and regional maps will need to have the same POR.
 - o A common PRI method needs to be applied for statewide maps.
 - o Frequencies of water level measurements can introduce a bias and affect calculated PRs, even for a common POR. Therefore, a minimum number of observations for each well should be required, and the number of observations at each well needs to be stated (possibly in an appendix).
 - o Shorter PORs can be more influenced by climatic conditions than anthropogenic changes. However, these influences may not provide major complications if focus of SNW reports is only to present observations of the status of water levels, regardless of causation.
- Obstacles:
 - o Frequency of measurements varies greatly. This affects the volume of source data for which statistics are derived, and the frequency at which the index can be calculated.
 - o The lowest common denominator for frequency of GW level measurements may be monthly or quarterly. SNW will need to evaluate the usefulness of this frequency to determine appropriate GW level index update frequency.
 - o Varying frequencies may not affect PR results greatly because classes (on map) are very coarse.

If sufficient wells exist, should a PR map be constructed over an aquifer system, an aquifer, portions of an aquifer, etc.?

- Respondents indicated that aquifers are the fundamental unit and should be the units of measurement.
- Issues of concern:
 - o Hydrostratigraphic units vary greatly, as well as differences in nomenclature.
 - o Mapped units must be adequately correlated between regions.
 - o Need to make sure that data from wells in Upper Floridan aquifer and Lower Floridan aquifer are analyzed separately.

Resources

- Salinity Network is a network of existing networks
- There are currently not additional funds to help improve SNW endeavors, but SNW can develop proposals for funding, as needed.
- SNW accomplishments are entirely dependent on current resources and members' ability to cooperate and communicate.

Should SNW conduct a pilot study?

- Background: Drought is a factor that initiated SNW. FL has been in or near drought conditions since 1998. SNW can assist policy makers by supplying unbiased data, information, and maps related to GW levels.
- Proposed pilot study
 - o Goal: generate a draft statewide PR map for an aquifer for a synoptic event (e.g. UFA). Draft PR map could be placed beside the USGS 2010 statewide potentiometric (pot) map for the UFA.
 - o Focus: 2010 statewide UFA PR map
 - o Purpose: to work out methodologies and address issues for creating statewide PR map
 - o In Future: SNW could possibly periodically produce side-by-side pot maps and PR maps.
- Needs for subset of wells to use in pilot study analyses:
 - o Consistent POR for all wells included in analysis (e.g. 1998-2011 or 1992-2011)
 - o Minimum number of water level measurements needed within the chosen POR
- DD and Sandy Kinnaman (SK) added clarification that the 2010 USGS pot map was created using synoptic measurements, which will be different than the data used to make the PR map.
- RC will contact data providers to verify the POR and frequency for candidate wells (current estimate is 852 wells with 5 year POR and 674 wells with 10 year POR). DD suggested asking which wells also have water quality data available, to help with well selection for upcoming analyses.
- Proposed work plan: generate draft PR map, send to SNW for review and comments, compare draft statewide PR map to district maps (when available from WMDs currently using PR maps), and revise methods as needed.
- MH suggested making multiple maps of varying PORs, with additional maps being created to include wells with shorter PORs.
- DD suggested including inset graphs of individual sites showing long-term trends on PR map.
- DD suggested asking USGS to continue producing the statewide pot maps. SK indicated that producing the pot maps will require resources which are not currently available (2010 map funded by USGS for Water Availability Study, previous semi-annual maps funded by WMDs), and much of the monitoring that had been conducted by USGS is now being conducted by the WMDs. SK added that comparing regional changes is easier than comparing individual wells, as maintaining a consistent network of wells has been one of the largest challenges.
- RC indicated that FDEP may be able to produce statewide pot maps if the SNW is unable to find resources to support the USGS pot map creation.
- JS and TC asked for clarification on how the pilot study will aid in meeting the SNW goals and objectives. RC and DD indicated that the SNW goals include developing a GW level index. Since the SNW is currently leaning toward using the PR index, a pilot study would be helpful to evaluate its feasibility and usefulness. The UFA was suggested for the pilot study because it is the aquifer with the largest number of wells that have been monitored consistently.
- MH asked what steps will need to be taken to assess the spatial coverage of data available and locate missing data. RC indicated that he will follow-up with the WMD representatives to identify counties in their regions that may have additional data available. DD and RC suggested that the FWRMC Regional Councils could also assist with getting other counties and data providers involved with the SNW.

Data Management

- RC indicated that there were no responses to this section of the questionnaire.
- JS suggested that the SNW needs to decide how data will be managed. Will SNW create and maintain a database of contributing agencies' stations / wells and water level data or have each agency manage their own data and submit the information for SNW projects as reduced data in the form of percentile rank per well?
- A central database will require a large amount of effort / resources to create and maintain. The SNW would need to find a repository to store the data and someone responsible for data maintenance and data quality assurance, develop methods, formats, and translation tables for submitting data, and agree upon a set of metadata standards and data element definitions.
- JS presented options for centralized data storage, including using an existing national database (USGS NWIS or EPA STORET), using a state agency's existing database, or contracting with a private organization via a grant.
- Several participants indicated that it would not be preferable to create a new database for SNW efforts because data is already managed in participating agencies' central repositories. DD suggested that the SNW maintain a sites database to use for validation of the sites represented on the PR map.
- RC and JS suggested developing an algorithm that could be used by each participating agency to generate the PRs for the selected wells from their own databases. This would require fewer resources because there would be no need to develop centralized minimum data elements, quality assurance, and data maintenance plans.
- JS added that it may be easier for individual agencies to perform necessary calculations to generate PRs for GW levels than it will be for them to perform the calculations needed for the water chemistry index. RC suggested focusing on only the GW level index for the pilot study.
- TC asked about the required resources (time, etc) for using the supplied algorithm to generate the PRs. DD indicated that the process needs to be relatively simple and not very time consuming.
- Representatives from all agencies present indicated that they would prefer not to create a new central database, and would be willing to use the supplied algorithm to generate PRs.
- RC suggested that the next step should be to develop the statewide algorithm (recognizing that it may be slightly different that the algorithm currently being used by any given agency). Ken Romie suggested clarifying the objective for the pilot study and the POR for the algorithm input information. Megan Wetherington suggested making multiple maps / sets of PRs for several different PORs. DD suggested developing the quality assurance plan for the reduced data, and JS indicated that the required attributes for the reduced data will also need to be finalized. LB suggested adding a unique identifier for each well in the reduced data set.

Framework Document

- Draft preamble, mission, goals, and objectives have been completed and reviewed by the SNW.
- RC will refine the goals and objectives and begin drafting the following sections, based on discussion from the 5/2/2012 meeting: Design, Analytes, QA, Data Management, Data Analysis, Reporting, Program Evaluation, General Support, Infrastructure Planning, and Glossary.