Florida Water Resources Monitoring Council (FWRMC)
Public Meeting (Webinar) of Salinity Network Workgroup – February 6, 2013

Attendees:

Agency	Name
Florida Department of Environmental Protection (DEP)	Rick Copeland
DEP	Gail Sloane
DEP	Stephanie Sunderman
DEP	Juliana Gay
DEP	Kathryn Holland
DEP	Brian Katz
DEP	Paul Kurisko
DEP	Gary Maddox
DEP	Tom Seal
DEP	Jay Silvanima
DEP - Florida Geological Survey (FGS)	Cindy Fischler
DEP - FGS	Paul Hansard
DEP - FGS	Chantel Iacoviello
Florida Department of Agriculture and Consumer Services (DACS)	John Teem
Northwest Florida Water Management District (NWFWMD)	Tony Countryman
Suwannee River Water Management District (SRWMD)	Megan Wetherington
St. Johns River Water Management District (SJRWMD)	Don Boniol
SJRWMD	Tom Mirti
Southwest Florida Water Management District (SWFWMD)	Dave DeWitt
SWFWMD	Granville Kinsman
SWFWMD	Roberta Starks
South Florida Water Management District (SFWMD)	Lucia Baldwin
SFWMD	Cindy Bevier
United States Geological Survey (USGS)	Sandy Kinnaman
USGS	Scott Prinos
Alachua County (Co.) Environmental Protection Department	Jim Myles
Broward Co. Water Management Division	Anita Allen
Broward Co.	Joe Heilman
Broward Co. Water Management Division	Fran Henderson
Broward Co. NRPMD	Michael Zygnerski
Miami-Dade Co. Department of Regulatory and Economic Resources	Steve Blair
Miami-Dade Co. Department of Regulatory and Economic Resources	Susan Markley
ISC Environmental Assurance	Erlyn Hupfer

Welcome / Introductions / Review
Rick Copeland (RC) welcomed everyone to the Salinity Network Workgroup (SNW) meeting and reviewed the agenda.

Discussion of Miscellaneous Issues:
(Presentation slides can be found in the 2013 archive section of the FWRMC website.)
Potential New SNW Members
RC has drafted a list of counties that may be interested in participating in the SNW. He has drafted a letter of invitation to send to them, and the letter is currently being reviewed internally at DEP.

Framework Document
- RC indicated the preamble, mission, goals, and objectives were ratified by SNW participants after a previous meeting. RC reviewed the ratified elements, and indicated that the group can propose modifications at any time.
- RC reviewed several potential additional objectives, to be considered at a later date.
  - Improve the quality of salinity sampling throughout the state by: (1) evaluating the best sampling methodologies for saline water given its physical properties, (2) developing standard operating procedures (SOPs) to apply these methodologies, and (3) periodically evaluating the quality of the salinity sampling by reviewing salinity methods used throughout the network.
  - Evaluate improvements in the technology used for salinity monitoring, and whenever practical, develop SOPs that will be used to implement these advances.
- RC reviewed the objectives currently being emphasized:
  - Develop a groundwater level (GWL) index because lowering GWL increases potential for saltwater encroachment, horizontally and vertically. The GWL index should be easy to understand and produce. The SNW is currently conducting a pilot study to aid in developing this GWL index.
  - Develop a groundwater quality (GWQ) index. The SNW is in the beginning stages of developing this GWQ index.

Groundwater Level (GWL) Maps
RC indicated that the statewide maps of GWL wells have been updated. County wells with GWL data available have been added to the Floridan aquifer system (FAS) and surficial aquifer system (SAS) statewide GWL maps.

Information Gathering about USGS Groundwater Watch
At the last SNW meeting RC was asked to contact USGS about potentially developing a database like that used by USGS Groundwater Watch (GWW) (http://groundwaterwatch.usgs.gov/).
- Currently GWW users can view percentile rank (PR) maps for GWL at all wells in the database, or just those wells with real-time GWL data available.
- The database was developed by George Karavitis of USGS. RC contacted his supervisor and obtained permission to speak to him about this project.
- However, since the SNW has indicated that they do not want to transfer GWL data for SNW projects, RC did not proceed with contacting the developer.

Meeting attendees asked for clarification regarding where the data would have been transferred to. RC indicated that the idea was not to transfer data to USGS. The proposal was to build a separate database and website, similar to GWW, and transfer data to this new database.

SNW Glossary
Dave DeWitt (DD) reviewed the draft glossary for the SNW.
(The draft glossary can be found in the 2013 archive section of the FWRMC website.)
- DD indicated that the SNW will adopt a glossary of terms and acronyms for inclusion in the framework document. Subsequent SNW products will use the terms, as defined in the glossary.
- DD reviewed select terms from the list:

- Salinity: The measure of dissolved salts (i.e. sodium, chloride) in water or soil. Measured by weight in parts per thousand or parts per million (milligrams per liter) as total dissolved solids. Measured also by electrical conductivity. The salinity of ocean water is in the range 33-38 parts per thousand (ppt), with an average of 35 ppt (Poucher and Copeland, 2006).
- Water salinity based on dissolved salts in parts per thousand (ppt):

Fresh water	Brackish water	Saline water	Brine
< 0.5	0.5 - 30	30 - 50	> 50

- Specific conductance (SC): The measure of a water's ability to conduct an electrical current, and is the reciprocal of the electrical resistance of a solution measured between two electrodes, typically expressed in microseimens (micromhos) per centimeter (uS/cm) at 25° C. It is related to the amount of dissolved salts (ions) in the water (Field, 2002).

- ***DD asked SNW members to review the draft glossary and email any suggested edits or additions to him.***

Scott Prinos (SP) indicated that the term "brackish water" is typically used in reference to seawater, and has an upper limit of about 30 ppt. However, in shallow groundwater (GW) aquifers, the water is very salty, but salinity measurements only reach approximately 18 ppt. If the term "saltwater" only applies to waters with salinity > 30 ppt, then what is the proper term for the salty waters in the aquifers? Similarly, the EPA drinking water standard starts at 250 ppm (parts per million) chloride. What is the proper term for waters with salinity greater than the EPA threshold? Maps of these waters have typically been called "saltwater intrusion maps" or "delineation of saltwater in the aquifers", though the salinity of these waters is usually below the thresholds listed in the draft glossary. DD indicated that it will be important to be specific about what parameter is being discussed. The term "saltwater intrusion" is typically used to describe a process, and is defined by salinity regimes or total dissolved solids (TDS) measurements. Water in an aquifer that is less than 30 ppt TDS would be considered brackish GW. This is an important distinction because there are several current uses for brackish GW. RC suggested developing another term to distinguish waters that are above the EPA threshold of 250 ppm chloride. SP indicated that the definitions suggested seem very reasonable, but they are not consistent with much of the existing literature that uses the term "saltwater" to describe these brackish GWs. Susan Markley (SM) agreed with SP, and indicated that most regulatory standards reference the 250 ppm chloride threshold. Additionally, most reports that track saltwater in the aquifer use a 1000 ppm chloride boundary. The SNW will need to carefully consider how the information presented will be used. DD indicated that chloride measurements have been used for many of these thresholds and resource assessments. However, the SNW GWQ products may focus on specific conductance measurements, which are more easily converted to TDS. ***RC, DD, and SP agreed to research this issue and bring additional suggestions for refining the glossary to the next SNW meeting.***

Considering Alternate SOPs for Saltwater Intrusion Monitoring

SP presented information on alternate SOPs for saltwater intrusion monitoring.

- SOPs are important because the responsibility for salinity sampling is being delegated to many of different organizations, and some organizations are not trained in environmental monitoring. Uniform quality of sampling is crucial to the evaluation of geospatial or temporal trends, and improper monitoring could fail to detect saltwater intrusion, and undetected saltwater intrusion could contaminate well fields. SOPs help by providing lengthy descriptions of the methods, establishing uniform procedures, set standards, and if followed, improve the quality of the data collected.
- Existing GW Sampling SOPs are delineated by the Florida DEP SOPs, DEP-SOP-001/01 FS 2200 – GW Sampling.
  - FS 2213 – Purging of wells without plumbing. Most monitoring wells fall into this category.
  - FS 2213.1.1 – Pump or tubing placement procedure will be determined by the purging option selected.
  - FS 2213.1.1.1 – Minimizing Purge Volume
    - Applicable to small diameter wells with short (≤ 10 ft) screened interval or borehole interval. Only 17% of the saltwater intrusion monitoring wells in Lee and Collier Co. met the criteria described below.
    - Do not lower the pump or intake hose to bottom of well

        - Pump intake hose is positioned in the screened or open borehole interval if:
            - The well screen or borehole interval is ≤ 10 ft.
            - The same pump is used for both purging and sampling.
            - The well screen or borehole is fully submerged.
            - Position and length of screened interval is known.
            - The well is not a large diameter well.
    - FS 2213.1.1.2 and FS 2213.1.3.1 – Conventional Purging
        - Applicable to wells with open intervals >10 ft and wells with unknown open intervals.
        - Position the pump or intake tubing in the top one foot of the water column or no deeper than necessary for the type of pump used.
        - Water is being sampled from the top of the water column, which may not pull much water from the saltwater interface near the bottom of the well.
    - FS 2214 – Large volume, high-recharge wells
        - Applicable to deep large diameter wells with a section of open borehole.
        - Place pump at the top of the open borehole.
        - Water is being sampled from just below the casing, which may not pull much water from the saltwater interface near the bottom of the well.
- Kohout and Hoy, USGS (1963) conducted a study at wells with long open borehole intervals and compared chloride concentration in pumped samples to chloride concentrations in multiple depth-specific bottle samples. Results indicated that pumped samples were not characteristic of maximum salinity within the open borehole interval.
- Conductivity profiles collected from monitoring well L-5723 from 1998-2000 demonstrate that there is a clear saltwater interface within the open borehole interval. Chloride concentration in samples collected from this well were typically < 1000 uS/cm when the DEP SOPs were followed. Chloride concentrations in samples collected from the same well using a Kemmerrer to sample at depth in the open borehole were almost an order of magnitude greater.
- A study conducted in Israel using five conductivity meters showed that the interface was oscillating up and down in conjunction with water levels in long screened wells near the coast. The open borehole receives and amplified effect of the changes that are occurring in the aquifer.
- USGS study in Hawaii showed potential effects of flow on salinity in long open interval wells. If the well has up flow in the lower section of the borehole and down flow in the upper section of the borehole, the saltwater interface will correspond to the depth at which the water exits the borehole. Similarly, there could be multiple interfaces corresponding to multiple points of outflow within the open borehole.
- Upward and downward flow has been measured in sections of boreholes drilled in Biscayne aquifer (BA) wells. Some wells in BA have been designed to include a long screened interval, used for conductivity profile measurements, and several sampling tubes at different depths. Flow within these wells, or changing interface levels in response to rapid pumping may affect sample results.
- Possible alternatives include:
    - Pumping with intake near the bottom of the wells.
    - Using nonisokinetic thief samplers (double-valved bailer or Kemmerrer) to collect samples from near the bottom of wells.
    - Micropurging well with pump intake near bottom of well.
    - Collecting samples using two pumps. One pump used for purging, which creates an upward flow within the borehole, and another pump, installed near the bottom of the well, to collect the sample. The purging pump could remain on during sample collection, to draw water into the well.
    - Install wells specifically designed for monitoring salinity with short open intervals.
- Most SOPs are designed for looking at minute concentrations of contaminants within wells. The changes in chloride that are being examined in saltwater intrusion studies are fairly large, so it may not be necessary to use some of the higher resolution procedures for this purpose. For example: DEP SOP FS 2200.2.1.2 and FS 2200.2.1.2.1
    - The DEP SOPs state that a variable speed centrifugal pump can be used to purge GW from 2-inch and larger internal diameter wells. Do not use the type of pump to collect GW samples. When purging is complete, do not allow the water that remains in the tubing to fall back into the

well. Install a check valve at the end of the purging tubing, and withdraw the tubing slowly form the well while the pump is still running.
- USGS has been using variable speed centrifugal pumps to collect chloride samples for many years, and they have not experienced difficulty detecting changes in chloride concentrations. The higher resolution methods described in the DEP SOPs may not be needed in these scenarios.
- Need to consider what the best modifications to the SOPs may be to ensure that saltwater intrusion can be accurately detected.

RC asked if there is a preferred method among the alternative solutions presented. SP indicated that the biggest problem is likely ambient flow within the open borehole interval, as there is no way to overcome this. However, there are many possible improvements that could be made to the current SOPs, which have been designed to pull mostly freshwater into the well while sampling. Of the alternative methods suggested, many people prefer using peristaltic pumps which purge at a very low rate. For long open borehole interval wells, micropurging and putting tubing near the bottom of the well also seems promising, although the equipment cost increases with this method because of the greater length of tubing used. Wells with long screened intervals present additional challenges because the screen filter can clog at any depth which would result in the sampler unknowingly collecting water flowing in from a different depth.

Fran Henderson (FH) indicated that Broward Co. had modified their SOP to comply with the DEP SOPs. Prior to modification, they were collecting samples using a centrifugal pump, just as USGS was. Broward Co. has seen no difference between the pre- and post-modification data. The most important consideration may be ensuring that wells with similar characteristics are grouped together during data analysis.

DD indicated that there are other parts of the DEP SOPs that were not discussed, such as ensuring stability of field parameters, which is required prior to collecting a sample. SP indicated that field parameters may still be stable if the majority of the water is being pulled from the freshwater portion of the aquifer. DD agreed and indicated this scenario may result in inconsistent salinity measurements between sampling events. SP indicated that the situation may also be different for deep wells that are salty throughout, as opposed to shallower wells with a distinct saltwater interface. Conductivity profiles may be useful for understanding each well's characteristics. Maximum salinity values measured during the profile monitoring can be compared to the salinity values from samples collected, to see if samples are representative of the entire well.

Tom Seal (TS) asked if conductivity profiles could be collected before purging. FH indicated that he has been conducting conductivity profiles before purging the well, and then leaving the probe in the screened interval to monitor salinity as the well is being pumped. He has also recently deployed an in-situ probe to continuously monitor salinity in a test well.

Monitoring Saltwater Encroachment from a County Perspective

FH presented information on saltwater encroachment monitoring in Broward Co.

- Key SNW objectives related to monitoring saltwater encroachment include:
  - Develop and use indices and other tool to evaluate the status and trends of saltwater encroachment.
  - Use commonly defined indices and other tools to assist in evaluating the threat of encroachment to water supplies, and determining the cause of saltwater encroachment.
  - Encourage the use of the US EPA's Data Quality Objective (DQO) process, and use this process in Salinity Network monitoring projects.
    - The DQO process is used to develop performance and acceptance criteria (or DQOs) that clarify study objectives, define the appropriate type of data, and specify tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions.
    - EPA QA/G-4 (Guidance on Systematic Planning Using the DQO Process) provided a standard working tool for project managers and planners to develop DQOs for determining the type, quantity, and quality of data needed to reach defensible decisions or make credible estimates.

- Need to consider the intended use of the monitoring data.
  - Decision making uses (e.g. compliance monitoring or well field operational planning)
    - Permit compliance salinity monitoring typically has a local focus, monitoring objectives that are rarely stated or at best implied as to ensure compliance with permit conditions, and variable monitoring design and sampling protocols.
    - Statewide consistency for compliance monitoring CUPcon – Tier 2 issue
      - Issue: monitoring requirements are inconsistent and may be excessive or have data that is not being used.
      - Goal: improve consistency in consumptive use permitting (CUP) compliance monitoring and submittal requirements, and require only the minimum amount of information needed to ensure permitting criteria and conditions are being met.
  - Estimation uses (e.g. local and regional studies to further the knowledge base)
    - Local studies can be permit compliancy driven, and are intended to provide a better understanding of the nature and extent of saltwater intrusion in a given area.
    - Regional studies including GW modeling are needed to provide the framework of our understanding of the problem, and can lead to implementation of long-term regional monitoring programs.
- Need to consider the source and modes, mechanisms or pathways for saltwater encroachment.
  - Lateral encroachment from the ocean (landward movement of freshwater-saltwater interface)
  - Up-coning of saline GW (leakage of saltwater from deeper saline water-bearing zones)
  - Downward intrusion from coastal surface waters
- In Broward Co., the BA pinches downward near the coast, and the 2nd reef outcropping offshore typically corresponds to the bottom of the BA. The confining unit below the BA contains brackish water that was trapped from times of higher sea level.
- Broward CO. has many coastal well fields, and saltwater intrusion has already occurred in several of them. One well field is within the zone of saltwater intrusion, but the supply well's intake is 20 feet above the saltwater interface and is currently maintaining chloride concentrations of 175 ppm.
- The saltwater interface gradient at the base of the aquifer includes waters with chloride concentrations up to approximately 19000 ppm. The gradient flattens out in shallower parts of the BA and is very steep in deeper parts of the BA.
- In the early 1990's, Broward Co. received funding to construct a new network for saltwater encroachment monitoring studies. These studies included a Time Domain Electromagnetic Conductance (TDEM or TEM) survey, which allowed scientists to produce a regional spatial model of the depth of the 250 ppm chloride level. The new saltwater encroachment monitoring network included several existing wells and many new wells installed on the landward and seaward sides of the modeled saltwater encroachment line.
  - Case study: high area of coastal ridge in Palm Beach Co. This area is used as a recharge operation that is being maintained to recharge the coastal area. Higher water levels drop off quickly as the modeled flow nears the coast.
  - Case study: G2893. This was one of the regional wells constructed for the saltwater encroachment monitoring network. The well is 177 ft deep, and taps the base of the BA. The well's screen interval is from 167-177 ft. Surrounding wells tap shallower aquifer units in the lower SAS. Most wells have chloride concentrations in the 10 – 20 ppm range, but G2893 has shown a steady increase from 20 – 430 ppm chloride. Another well that taps the base of the surficial aquifer is tracking G2893 and gradually increasing in chloride concentration, demonstrating that saltwater intrusion is occurring both laterally and vertically.
  - Case study: 2255, an older well seaward of the saltwater interface line. Data from this well showed a steady increase in chloride concentration to over 10000 ppm, followed by a gradual leveling off of chloride concentration around 14500 ppm.
  - USGS is conducting induction logging on the saltwater encroachment monitoring wells.
  - Seasonal variation in water levels is generally consistent in these rainfall driven systems, with inland wells higher than coastal wells. However, during past times of drought heavy demand on inland wells caused their water levels to drop below those of coastal wells.
- It is important to note that saltwater intrusion is a dynamic process. Changes in the saltwater intrusion gradient occur over time and monitoring programs are constantly making changes to their systems

and adding new wells. Often these changes affect how supply wells are operated, to make sure they are useful over the longest time possible.

RC invited SM to give a presentation at the next SNW meeting and asked if Miami-Dade Co. was conducting monitoring similar to that described for Broward Co. SM indicated that she briefly described a few of their monitoring programs during the presentation that she gave on 10/9/12 at the Statewide FWRMC meeting. USGS has done a lot of work in partnership with Miami-Dade Co., so ***SM and SP will discuss what might be best to share with the group***. Additionally, SM could provide information on how the County relates the information collected to its management goals. Management issues include CUP, drainage, and Everglades management. SP indicated that both Broward and Miami-Dade Counties have been working with USGS for decades to investigate saltwater intrusion issues. ***RC also invited FH to share a few more examples of saltwater intrusion monitoring from Broward County, including sampling protocols.***

Percentile Ranking Pilot Study

RC reviewed the status of the percentile ranking pilot study.
(Presentation slides can be found in the 2013 archive section of the FWRMC website, as part of the "Discussion Points" presentation.)

- Goal is to produce a PR index map for spring 2010 for the upper Floridan aquifer (UFA)
- Purpose is to determine if the SNW can overcome obstacles associated with producing statewide products
- If pilot study is successful, SNW can periodically produce PR maps for aquifers or other mappable units, and possibly produce side-by-side potentiometric maps with PR maps.
- A discussion regarding specific methods to be used in the pilot study was held on 12/12/12 for pilot study participants.
- Issues:
  - PR index
    - Pilot study will use a PR method from Excel: PR(x) = [# obs < x / (n-1)] * 100
    - Will need to compare Excel results to results obtained using Hydstra, which several WMDs currently use.
    - Will first conduct a quality assurance exercise. DEP will provide example data to all pilot study participants. Participants will each calculate PRs for example data, and results will be compared to ensure consistency between the data providers.
  - Color scheme and number of classifications
    - Most entities prefer USGS schemes with five categories plus a different symbol used to indicate maximum and minimum.
    - RC suggested red / orange / green / light blue / dark blue
    - SWFWMD currently uses red / orange / yellow / green / blue.
    - Several data providers indicated that they would prefer the red / orange / green / light blue / dark blue color scheme, while several others did not express a preference.
  - Stitching together data from adjacent wells to create a longer period of record (POR)
    - Most favor letting data providers decide when this is appropriate
    - Tom Mirti (TM) indicated that using the stitching together technique provides a better aerial coverage of wells.
  - POR
    - Most favor using a POR of 1980-2010, but would accept up to 1985-2010
    - 313 wells are available for 1980-2010, 449 wells are available for 1985-2010, and 605 wells are available for 1991-2010
    - Several data providers (Alachua Co, DEP, and SFWMD) do not have data available prior to 1991.
    - RC suggested conducting two pilot studies, one for each POR.
    - TM suggested evaluating the aerial coverage represented by the wells included in each POR, and choosing the longer POR if coverage is adequate.
    - SP asked what the frequency of the data collection is, and indicated that the group should select a POR and frequency where they will have at least 100 observations available at each

well, to aid in calculating PRs. RC indicated that the frequency is highly variable and will need to be addressed.
    - TM indicated that SWFWMD, SJRWMD, and SRWMD are currently creating PR maps monthly. RC indicated that the frequency available for statewide data is less than monthly for some areas.
- Missing values
    - RC suggested treating these as missing values.
- Continuous recorders vs. discrete
    - Continuous recorder data could be compiled as the monthly mean, or sampled as the noon reading on the 25th day of the month.
    - SP indicated that older USGS readings are typically compiled as the daily maximum.
    - Granville Kinsman (GK) indicated that SWFWMD has used the daily maximum, but can use other statistics, as well.
    - Don Boniol (DB) and TM indicated that SJRWMD compiles data as monthly means for one analysis, and samples data as the noon reading on the 25th day of the month for another analysis.
    - Megan Wetherington (MW) indicated that SRWMD had been compiling data as monthly means, but has recently begun using the daily mean of the 25th day of the month. It would not be possible to extract a daily maximum or a daily noon reading from older data. Only daily means or monthly means are available for the entire POR.
    - SP indicated that in wells that are near pumping fields, there will be a difference in results using the monthly mean and monthly maximum. However, as long as the same statistic is used throughout time, there should not be a difference for comparisons among the same well, though there may be differences in comparisons between wells.
- De-trending GW data prior to computing PRs
    - RC suggested not de-trending the data. Data providers know that trends will be present, but the purpose of the study is to capture the PRs that cover the past few decades. In addition, data transfer would likely be required to de-trend the data.
    - SP indicated that USGS produces both de-trended and not de-trended reports. For well data that has not been de-trended, wells with long term decreasing trends will have current PR results always near the low end of the PR range. Well data that has been de-trended is useful for illustrating short-term changes, such as water levels during a drought.
    - RC asked if data providers had the resources available to de-trend the data before calculating the PRs for the SNW study. Several data providers indicated that they did not have those resources available.
- Minimum number of observations for the selected POR
    - Lowest frequency for historic data is often monthly or quarterly
    - Will need to compare PRs obtained using different frequencies from wells with high frequency data available (e.g. compare PRs calculated using monthly data to PRs calculated using quarterly data).
    - GK indicated that SWFWMD only uses wells that have daily data for calculating PRs.
    - DB, TM, and MW indicated that SJRWMD and SRWMD try to use monthly data for calculating PRs, but occasionally resort to using wells with quarterly data.
    - Tony Countryman (TC) indicated that NWFWMD has several wells with only quarterly data available.
    - Jim Myles (JM) indicated that Alachua Co. has several well with only biannual data available.
    - Lucia Baldwin (LB) indicated that she has done a test comparison for a SFWMD well using non-seasonally adjusted data. She calculated PRs using a daily mean and compared them to PRs calculated using monthly data (the daily mean for only one randomly selected day each month), and found that the results were similar. ***LB asked to present the results of this exercise at the next SNW meeting.***
- Seasonality
    - Some data providers have suggested ignoring it, while others have suggested comparing the data to historic quarterly seasonal data.
    - Weather / climate-related effects should be discussed further at a future meeting.
- Clarifying the purpose of the PR analysis

- The purpose of the PR analysis / maps is to report on the overall status of GW levels within the aquifer.
- If results indicate that there are areas with very low PRs, further discussion of those areas can be included in accompanying text.
- Need to ensure that SNW products avoid conflicting with assessments of hydrologic condition that are routinely reported by the WMDs. Therefore, WMDs and other data providers will thoroughly review all SNW products before they are publicly released.

o Adjusting GWL for salinity
- For now, data providers agreed to proceed using water levels unadjusted for salinity
- WMDs are looking into this issue further, and will alert the SNW if future refinements are needed.

o Vertical datum
- The vertical datum used should not matter when calculating PRs, as long as data providers are internally consistent (e.g. all GWL data for each well are recorded using the same vertical datum).
- Vertical datum issues will need to be addressed if SNW decides to make or use potentiometric maps.

Closing Issues

RC reminded participants that SNW meetings will be regularly scheduled every three months, on the first Wednesday of the month. ***The next SNW webinar meeting will be held on Wednesday, May 1st from 1:00PM – 3:00PM.*** This meeting will include additional discussions of salinity and water quality monitoring issues.