



Salinity Network Workgroup Meeting

1:00 – 3:00 PM

May 2, 2012

[Rick Copeland (FDEP)]

**Welcome
and
Introduction**

Abridged Outline

- I. Introduction (Rick Copeland)(RC)
- II. SalNet Workgroup (SNW) Decision Process (RC)
- III. February 2012 Questionnaire Responses(RC)
 - Responses not in Questionnaire
 - Responses in Questionnaire
- IV. Evaluation of Using Vol. Monitoring Data (RC)
- V. Pilot Study? (RC)
- VI. Data Management (Jay Silvanima (FDEP) and RC)
- VII. SalNet Framework Document Status (RC)
- VIII. Action Items and Adjournment (RC)

Review of 2/09/2012 Meeting (Action Items)

- Answer Questionnaire (High)
- Develop a GW Level Index (High)
- Develop a GW Quality Index (High, but currently on hold until next SalNet Meeting)
- Use Volunteer data if applicable (Currently Moderate)
- Management of Pertinent GW Data as Needed (High)
- Complete GW Monitoring Catalog (Moderate)
(Need Guidelines from the FWRMC; pending)

Decision Making Process

- First – Approval issues can be worked out with no objections to the Chair
- Second – Consensus building (formal)
- Third – Voting (formal)
- Formal requirements:
 - Quorum – 50% + 1 of voting members
 - Voting members – one person from each participating organization
 - Does your organization want to be a voting member? If so, who?

Participating Organizations

- SFWMD
- SWFWMD
- SJRWMD
- SRWMD
- NWFWMD
- USGS
- FL DACS
- Ala Co
- LAKEWATCH
- FDEP –WMS
- FDEP – GWP
- FDEP – FGS
- US Army Corp
- Miami-Dade PERA
- M-D H2O & Sewer
- Escambia Co

Voting Members of SNW

- SFWMD – C. Bevier
- SWFWMD – G. Kinsman
- SJRWMD – D. Boniol
- SRWMD – M. Wetherington
- NFWMD – T. Countryman
- USGS – S. Prinos
- DACS – K. Knickerbocher
- Ala Co. – J. Myles

Voting Members of SNW

- LAKEWATCH – M. Hoyer
- FDEP (GWP) – G. Maddox
- FDEP (WMS) – J. Silvanima
- FDEP (FGS) – P. Hansard
- US Army Corp – S. Kemp
- M-D (PERA) – S. Markley
- M-D (H2O & Sewer) – V. Walsh
- Escambia Co – R. Turpin



Formal Decision Making Process (from FWPMC)

- Decisions – Only at meeting at which quorum is present
- Every attempt made to reach consensus
- If no consensus achieved, then vote
 - By voting members, or their designated representative

Proposed Decision Making Process (Consensus)

- Voting Member Consensus Ranking
 - 5 – wholehearted support
 - 4 – support
 - 3 – neutral but will support fully to outside world
 - 2 – still have questions that need to be addressed
 - 1 – **blocks** any decision

Decision Process

- Consensus – Everyone displaying ranking of ≥ 3
- If anyone gives a ranking of 1 or 2, discussions will continue to address those issues of concern
- If no 1's or 2's, consensus is reached
- **Voting** only if consensus cannot be reached in reasonable time
- If vote, then 67% of voting reps present required to pass item

Questionnaire Results

N = 3

- First – Not In Questionnaire
- Second - In Questionnaire

Not In Questionnaire

SNW Address remedies for salt water encroachment issues?

- (RC) We should report on the status and trends re. saltwater encroachment
- (RC) However, suggested remedies are beyond the scope of the SalNet Workgroup.

Encroachment Versus Intrusion?

- SW encroachment (Neuendorf et al., 2005) : Displacement of fresh GW by the advance of SW due > density. (Does not differentiate between natural and human-induced activities.)
- SW intrusion (Freeze and Cherry, 1979): Migration of SW into FW aquifers under the influence of GW development (Implies human-induced activities.)
- If human activity not thoroughly understood, should SNW encourage the use of encroachment?



Conduct trend analyses for
wells with POR > 5 yr?

(RC) We will need to begin discussion
in the near future; e.g. next SNW
meeting?

Long Term Period of Record

- Should the SNW encourage the use of wells with a long-term period of record (POR)?
- (RC) Encourage long-term PORs, but not restrict use to wells with long-term PORs
- Some agencies want to reduce wells with a long-term POR in favor of more wells with a greater frequency of monitoring
- Discussion of State/Regional approach for POR (to be discussed later)

Issues in Questionnaire

- Data Management – There were no responses, but will be discussed later
- Who should Chair the SNW? - FDEP
 - (RC) Only as long as SNW agree
 - Co-Chair; **Dave DeWitt** (SWFWMD) has agreed to be the first (for a two-year term)
 - Thanks Dave!

Evaluation of use of volunteer monitoring data

- Public buy-in
- Public recognition of GWL and salinity issues
- Increase data coverage
- Volunteers must be trained
- Volunteer data must be validated with proper QA and be comparable to other organizations' data
- LAKEWATCH?

Volunteer monitoring - LAKEWATCH

- Kickoff Pilot study in summer of 2012
- Many interested parties (well owners)
 - LW volunteers with wells located near lakes
 - Well owners whose wells are going dry
 - Ag well owners

Volunteer monitoring - LAKEWATCH

- “New” Govt. entities
 - IFAS (professors working on BMPs)
 - County Extension Agents
- Counties – Pick up “Dropped” wells

Volunteer monitoring - LAKEWATCH

- Many issues still to be worked out
 - Training
 - QA issues
 - Data management
 - Development of educational opportunities
 - Procurement of water level meters/tapes

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

- Yes – An index is useful for conveying information to the public regarding GW levels.
- There are related issues.

PR (GW Index) Issues/Caveats

- The PRs represent the status; they are not trends. Readers need to be aware.
- Because of regional variations in hydrogeology, the value of any one station on a statewide map may be questionable.

GW Index Issues

- Some entities use their own methods. If a statewide PR map is generated, it may be slightly different from the analogous PR map produced by a WMD
- For a statewide map, verbiage must make this clear to its readers.

GW Index Issues

- Need to explicitly explain to the reader that the PRs displayed in the statewide map may be different from the PRs from individual wells.

GW Index Issues

- Regional and statewide maps will need to be hydrostratigraphically consistent among WMDs or other boundaries.
- All caveats must be adequately described.

Do you believe PR maps are easily understood by the public?

- Yes
- However, a standardized number of classes and color codes is essential.
- For statewide maps, we should use the USGS standards.
- For WMD maps, changes in the standards would do more harm than good.
- Use 5 or less colors or codes.

Will Policy makers use the PR (GW Index)?

- Yes
- How will the GW level index (the PRI) be related back to salinity?
- (RC) It is important that the SNW begin a salinity index quickly. It is to be addressed at the next SNW meet.

Can the GW Index, based on PRs, be used at various scales?

- Yes, but with concerns
 - 1. Wells for regional maps need same POR
 - 2. Well clusters may confuse the reader
 - 3. Limitations to the PR Index must be understood and overcome
 - 4. Even for a common POR, frequencies of WLs can introduce a bias and affect calculated percentile ranks

Scales continued

- 5. Shorter PORs can be more influenced by climatic conditions than anthropogenic changes.
- 6. A common PRI method needs to be applied for statewide maps . Results may not represent true PRs, but they would be at least correlative between wells.

Scales continued(RC comments)

- PRs are usable for individual wells
- For statewide maps, wells need a consistent POR.
- Number of observations at each well needs to be stated (in appendix)?
- A min. # of obs for each well is required
- All comments above need to be worked out
- Caveats must be discussed in text

If the Index is used at diff scales, what are the obstacles?

- Freq of measurements varies greatly
 - This affects: 1. the volume of source data for which the statics are derived, and 2. the freq at which the index can be updated
- The lowest common denominator is monthly WL measurements. That may not be a useful update freq. (RC) the lowest common denominator may be quarterly

If sufficient wells exist ...

- (RC) Should a PR map be constructed over an aquifer system, an aquifer, portions of aquifers, etc.
- Respondents – hydrostratigraphic units vary greatly.
- Mapped units must be adequately correlated region to region
- Aquifers are the fundamental unit and should be the units mapped

Recall (RC)

- **The SalNet is a network of existing networks**
- **There currently are no additional funds to help improve SalNet endeavors**
 - We can develop proposals for funding as needed
- **SalNet accomplishments are entirely dependent on current resources, & our ability to cooperate/communicate**



Should SNW Conduct Pilot Study?

- “...drought began in October 2010.... the drought is far from over — and the conditions that caused it aren’t going away anytime soon. Billions have been lost and it ain’t over yet.” From NPR affiliate in TX.
- Drought is a factor that initiated SNW
- FL in or near drought conditions since 1998
- SNW can assist policy makers by supplying unbiased data, information, and maps.

U.S. Drought Monitor

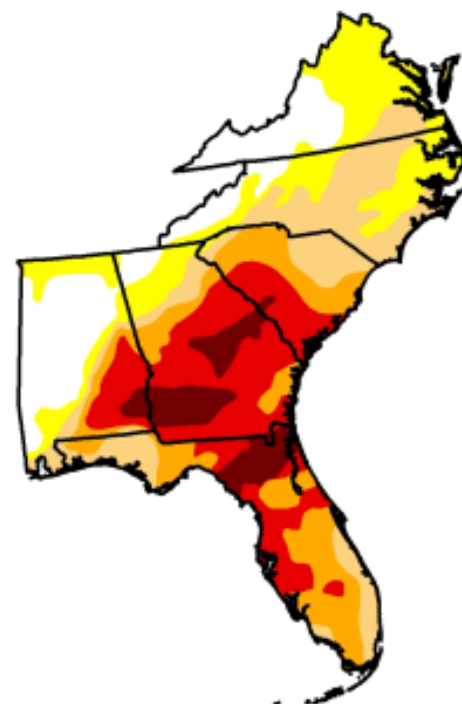
Southeast

April 17, 2012
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	17.04	82.96	63.56	43.54	27.65	7.14
Last Week (04/10/2012 map)	17.84	82.16	63.41	39.97	25.35	5.29
3 Months Ago (01/17/2012 map)	28.63	71.37	52.85	33.73	23.65	1.50
Start of Calendar Year (12/27/2011 map)	40.38	59.62	43.05	28.62	18.71	0.00
Start of Water Year (09/27/2011 map)	42.24	57.76	41.82	31.77	23.48	0.00
One Year Ago (04/12/2011 map)	30.65	69.35	48.75	15.15	4.60	0.00

Intensity:



The Drought Monitor focuses on broad-scale conditions.
Local conditions may vary. See accompanying text summary
for forecast statements.

<http://droughtmonitor.unl.edu>



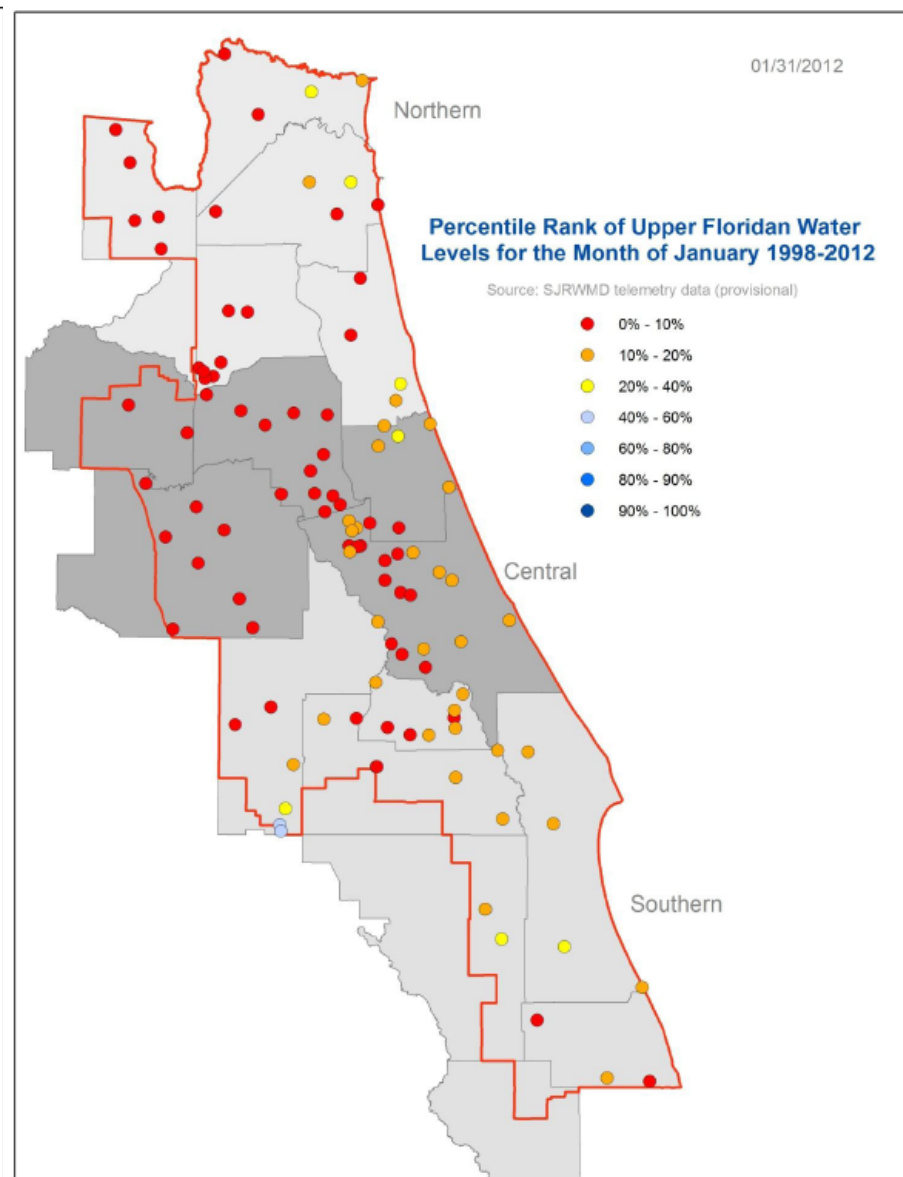
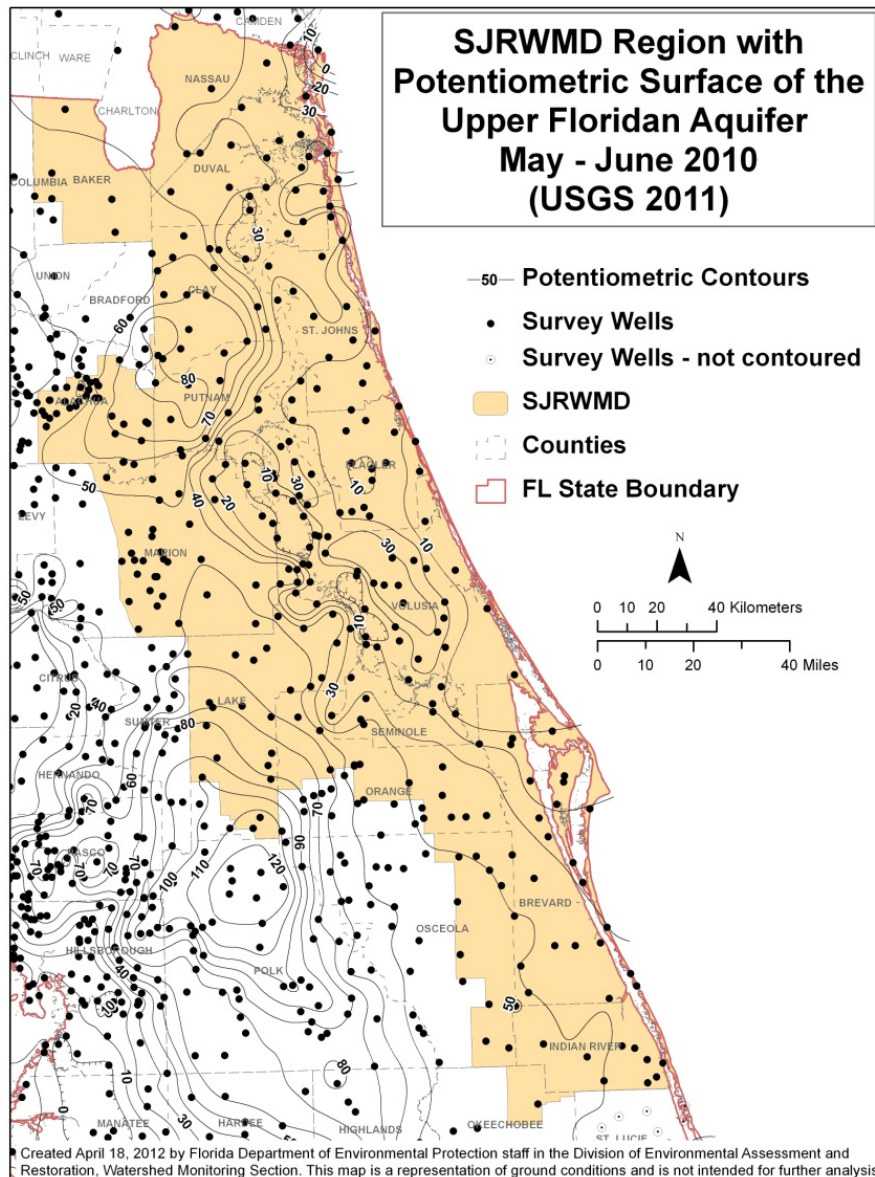
Released Thursday, April 19, 2012
Anthony Artusa, Climate Prediction Center/NCEP/NWS/NOAA

Pilot Study

- Generate a draft statewide PR map for an aquifer for a synoptic event. For example:
- Upper FL aquifer (UFA)? The Water Table?
- Draft PR map could be placed beside the last Statewide potentiometric (pot) Map (2010) for the UFA (USGS)
 - To the public,
 - A pot map - looks like topographic map
 - A PR map - tells them current condition (status) relative to the POR



Potentiometric Surface of the Upper Floridan Aquifer in Florida and Parts of Georgia, South Carolina, and Alabama, May – June 2010



Pilot Study

- 2010 statewide UFA PR map
- Purpose - Work out issues
- For now, only deal with statewide POR map
- In **future** SNW possibly periodically produces side-by-side pot map and PR map

Pilot Study

- If SNW agrees on proposal, we need:
 - A consistent POR that all included wells (e.g. 1998-2011, or 1992-2011)
 - Min # of WL measurements needed for POR
 - Subset of wells to use (same POR)

Number of Wells - UFA POR: 1998-2011

- NFWWMD (156)
- SRWM D (189)
- SJRWMD (159)
- SWFWMD (303)
- SFWMD (0)
- USGS (?)
- DACS - (?)
- Ala Co - (45)
- LAKEWATCH (0)
- FDEP -WMS (47?)
- FDEP - GWP (0)
- FDEP - FGS (0)
- US Army Corp (?)
- Miami-Dade (0)
- M-D Sew/H2O (0)
- Escambia Co (0)

Total $\approx$ 852

Number of Wells - UFA POR: 1992-2011

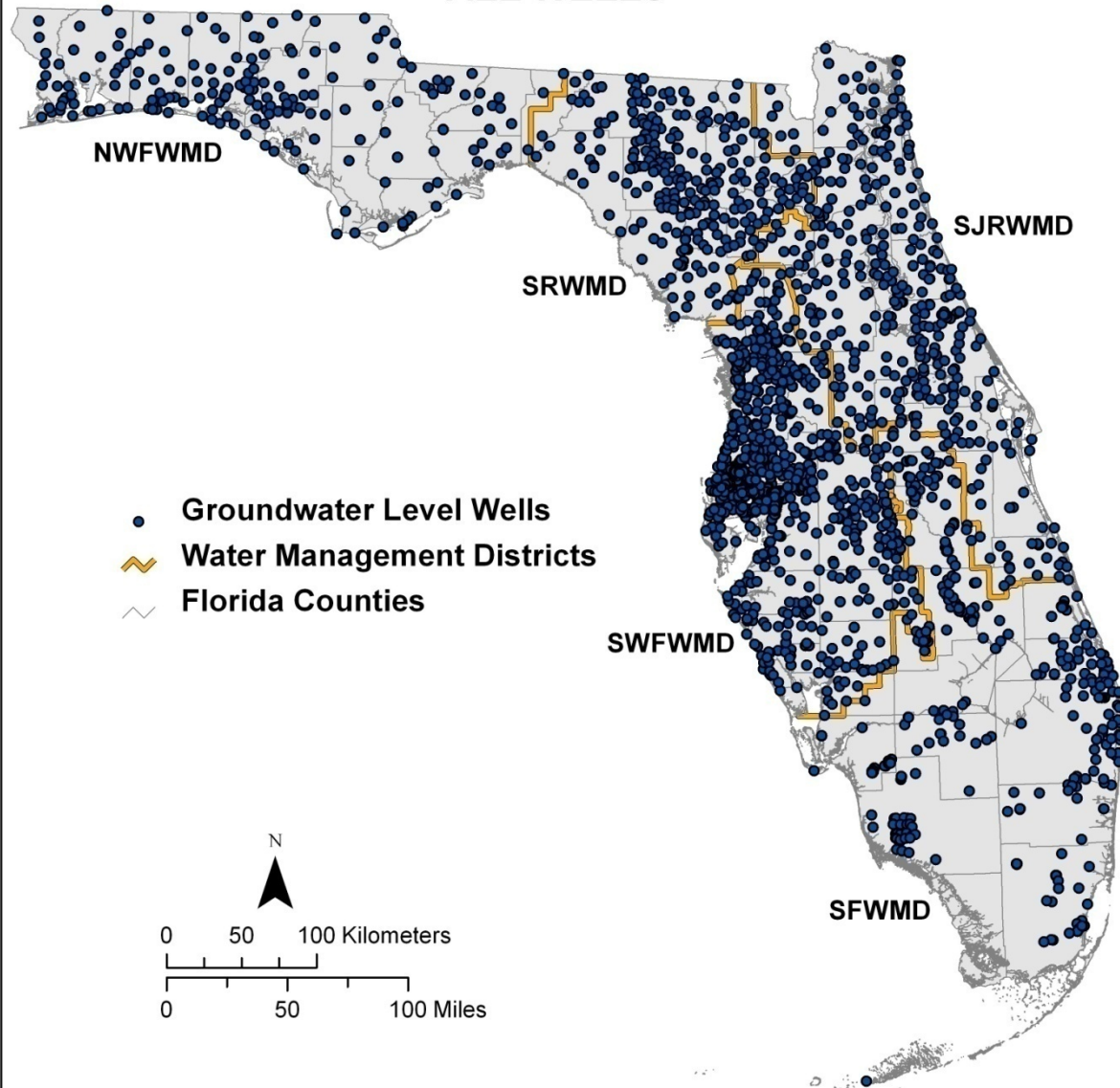
- NFWWMD (146)
- SRWM D (181)
- SJRWMD (120)
- SWFWMD (227)
- SFWMD (0)
- USGS (?)
- DACS - (?)
- Ala Co - (0)
- LAKEWATCH (0)
- FDEP -WMS (47?)
- FDEP - GWP (0)
- FDEP - FGS (0)
- US Army Corp (?)
- Miami-Dade (0)
- M-D Sew/H2O (0)
- Escambia Co (0)

Total $\approx$ 674

Pilot Study

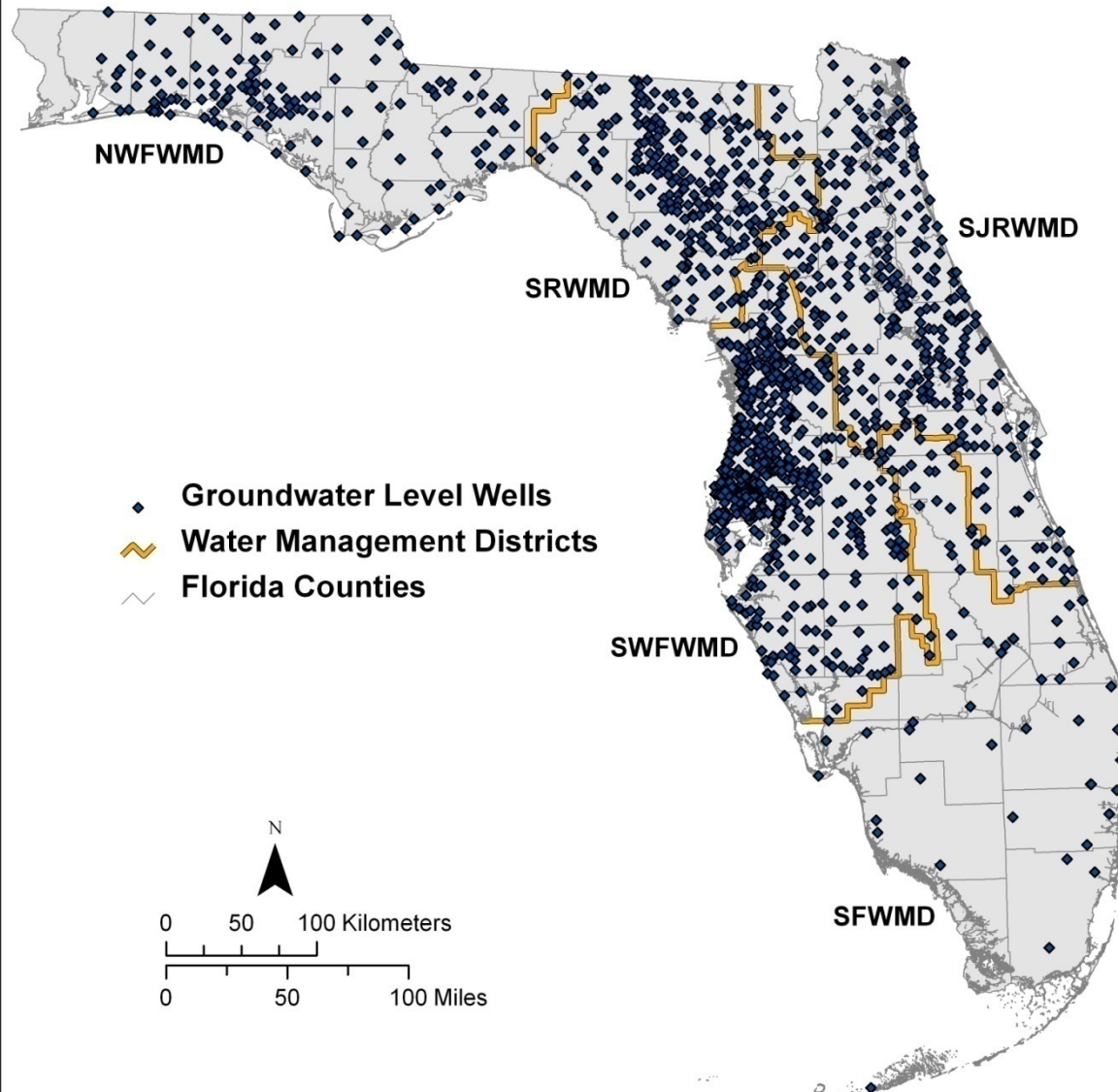
- Once draft map is completed
 - SNW review and comment on pros/cons
 - For WMDs currently using PR maps
 - Compare Draft Stateside map to district maps for the same time period
 - Work out “kinks”

GROUNDWATER LEVEL ALL WELLS



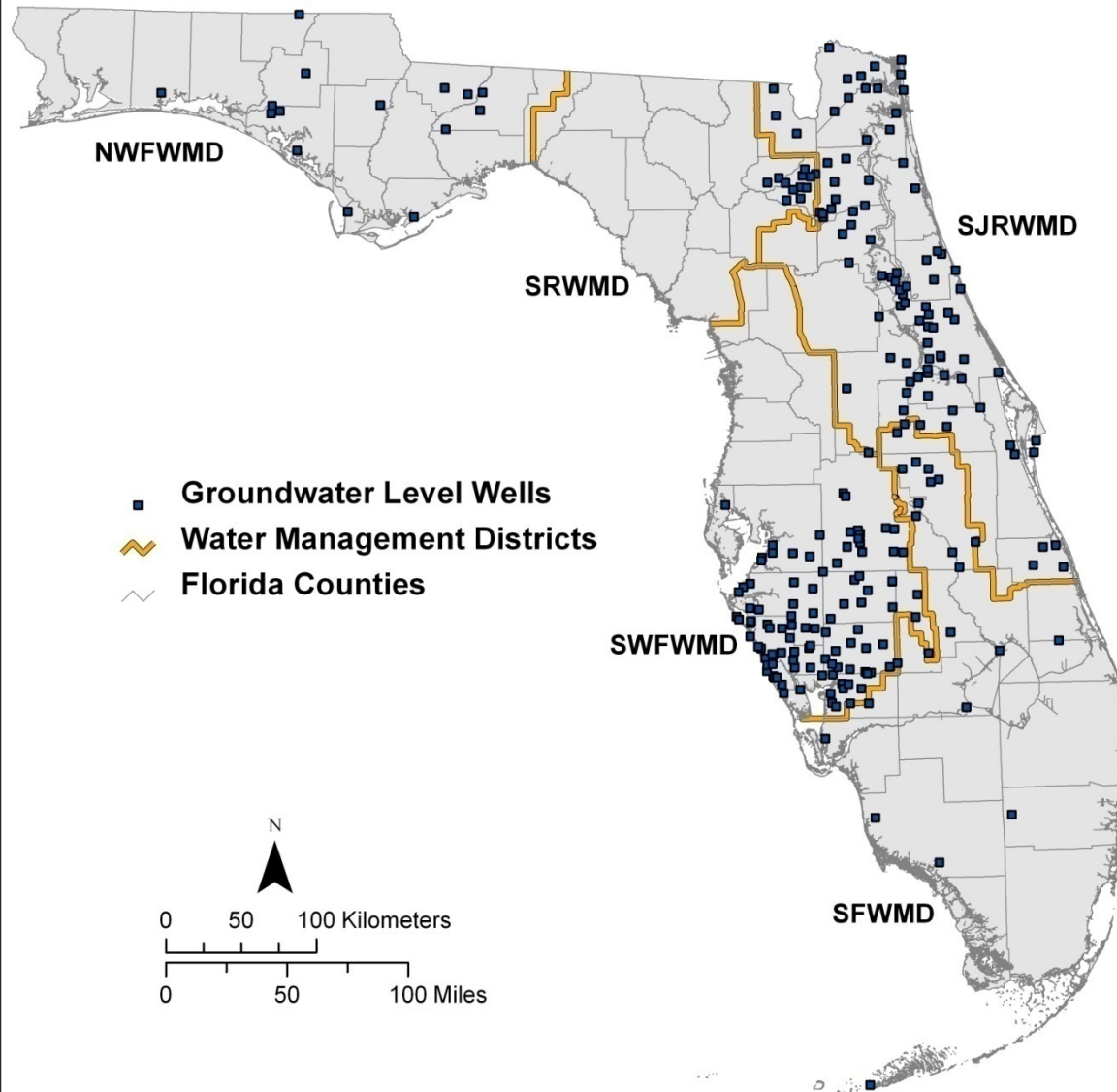
Created January 9, 2012 by Florida Department of Environmental Protection staff in the Division of Environmental Assessment and Restoration, Watershed Monitoring Section. This map is a representation of ground conditions and is not intended for further analysis.

GROUNDWATER LEVEL FLORIDAN AQUIFER SYSTEM



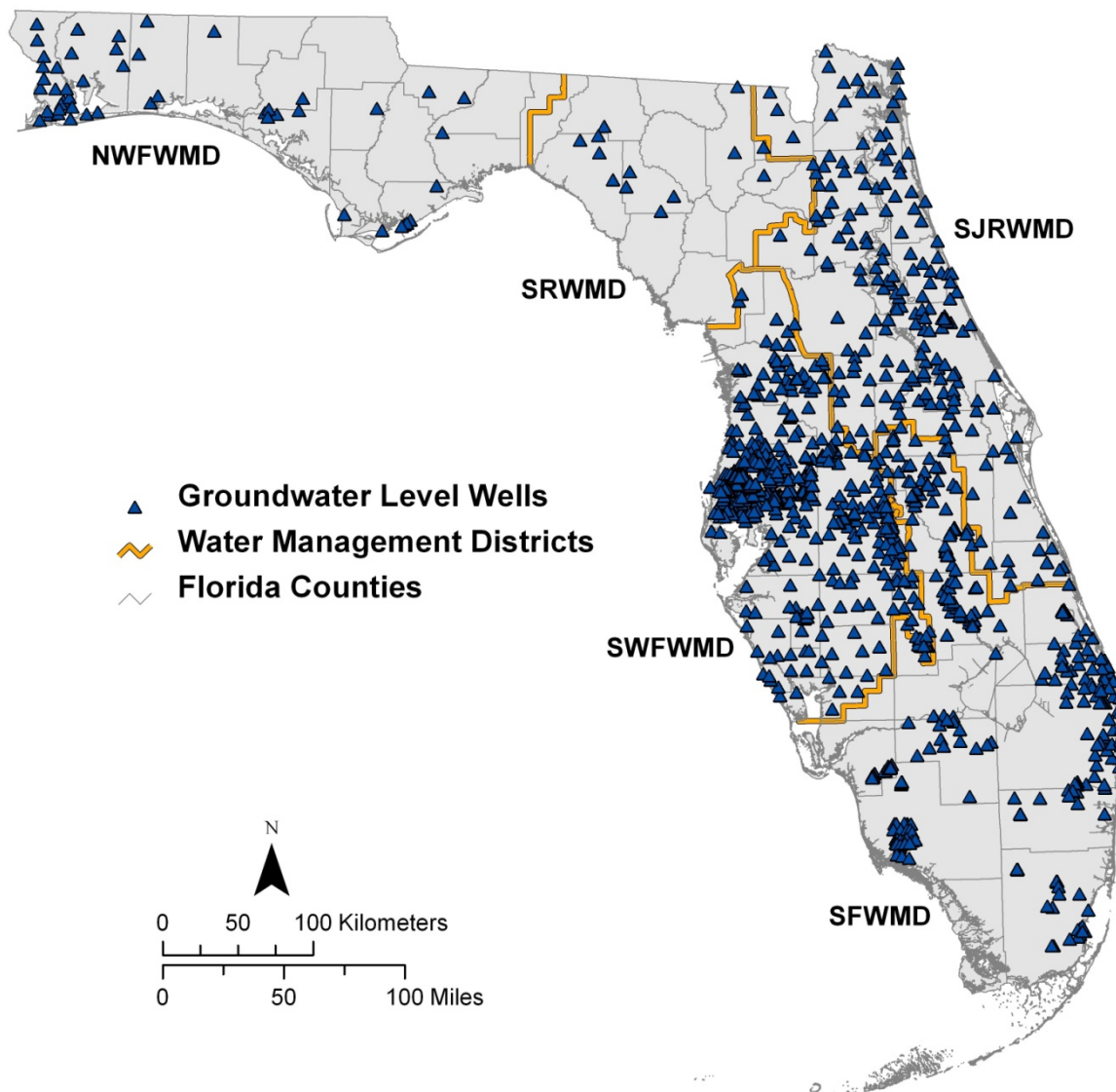
Created January 10, 2012 by Florida Department of Environmental Protection staff in the Division of Environmental Assessment and Restoration, Watershed Monitoring Section. This map is a representation of ground conditions and is not intended for further analysis.

GROUNDWATER LEVEL INTERMEDIATE AQUIFER SYSTEM



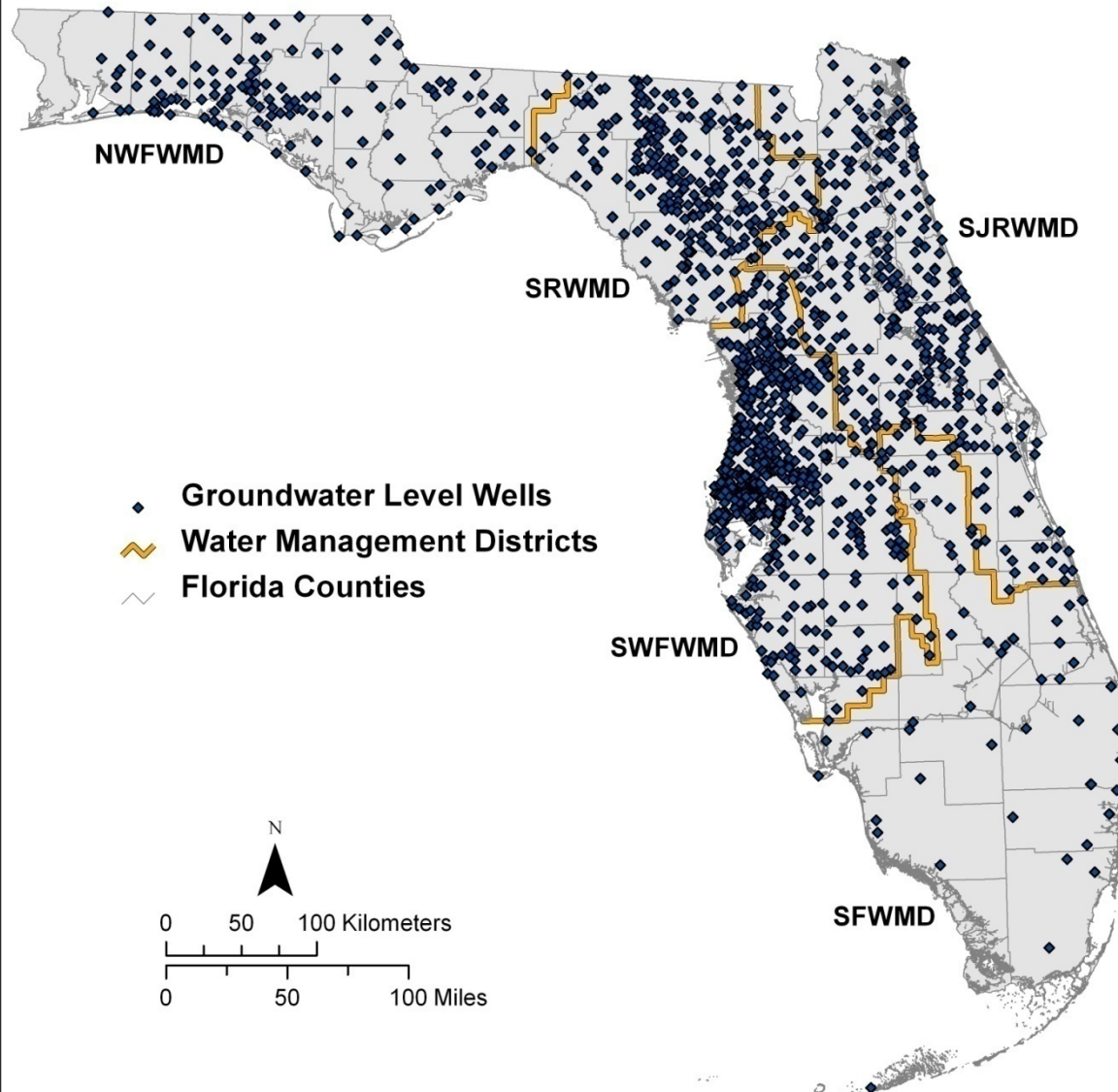
Created January 10, 2012 by Florida Department of Environmental Protection staff in the Division of Environmental Assessment and Restoration, Watershed Monitoring Section. This map is a representation of ground conditions and is not intended for further analysis.

GROUNDWATER LEVEL SURFICIAL AQUIFER SYSTEM



Created January 10, 2012 by Florida Department of Environmental Protection staff in the Division of Environmental Assessment and Restoration, Watershed Monitoring Section. This map is a representation of ground conditions and is not intended for further analysis.

GROUNDWATER LEVEL FLORIDAN AQUIFER SYSTEM



Created January 10, 2012 by Florida Department of Environmental Protection staff in the Division of Environmental Assessment and Restoration, Watershed Monitoring Section. This map is a representation of ground conditions and is not intended for further analysis.

UFA Pilot Study Using 2010 data

- Does SN Workgroup agree?
- If so, I (RC) would like to get started

Pilot Data Management

- Jay Silvanima

What do we need for the Pilot?

- We need to decide
 - are going to create and maintain a database of contributing agency's stations (wells) and water level data?
 - or have each agency submit the reduced data in the form of a percentile rank per well?

If we want a database we will need

- A repository to store the data and someone responsible for data maintenance and data quality assurance
- An agreed upon set of metadata standards and data element definitions

Metadata Standards

- Recommend using established standards, for example those used by the USGS NWIS database
 - Need an agreed upon set of data elements for which contributors' data can be translated into.
 - Need references to quality assurance plans of contributing agencies

Minimum Data Elements

- Stations
 - Unique id – ‘dumb’ number such as a sequence number.
 - Organization maintaining well information –
 - Station name –
 - Location Information including Latitude/Longitude, determination method, and datum –
 - Elevation of measuring point –
 - Hydrologic unit tapped –
 - Other recommended data elements include, casing diameter & material, screen material, screen/open hole interval, others?

Minimum Data Elements

- For samples and results:
 - Unique station id (foreign key to station/well data) –
 - Sample collection method –
 - Measurement code and/or name –
 - Measurement value, unit and qualifier –
 - Measurement analysis method –
 - Measurement collection date/time –
 - Agency collecting data –
 - Sampler names –
 - Data source – (e.g. primary data repository)

If we want a database we will need

- A survey of potential contributors' well and water level data
- Translation tables for the existing data will need to be developed by someone
 - Either at the contributing agency level
 - Or upon insert into the Salinity Network Database

If we want a database

- Perhaps we can store these data in a National Database such as USGS' NWIS or US EPA's STORET?
- Or some state agency's database?
- Or contract out via a grant to a private organization

Reporting for Pilot Study

- We will have to supply an algorithm to generate the percentile ranks
 - Regardless of whether we use a single database to generate the ranks or have each contributing agency generate them independently



Framework Document- Status

- Preamble, Mission, Goal, Objectives
 - Will be placed into Draft Document
- Based on results of today's meeting, will begin:
 - Design, Analytes, QA, Data Management, Data Analysis, Reporting, Program Evaluation, General Support and Infrastructure Planning
 - Glossary

Action Items

- For next meeting...
- Next Meeting...