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Associate Professor
University of Florida







Funded by NOAA Climate Program Office



- Partnership of:
 - Water utilities
 - State agencies
 - Researchers
 - Local governments
- Formed in 2010









Goal:

To increase the regional relevance and usability of climate and sea level rise models for the specific needs of water suppliers and resources managers in Florida.

A Collaborative Working Group

Actionable climate science Data/models/tools

Domain

Learning
together

Practice

Public water suppliers, resource managers, climate, social and hydrologic scientists, local planners

Workshops, projects, research, website, reports, emails, personal communication, outreach

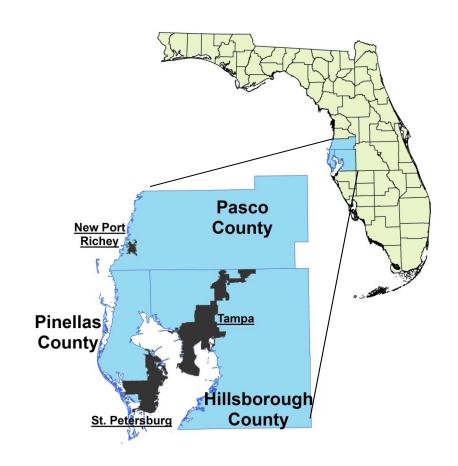
Based on: Wenger, Etienne, Communities of Practice presentation at UF, May 2009



Tampa Bay Water



- Regional wholesale water supply authority
- Non-profit, special district created by inter-local agreement
- 6 member governments
- Serving 2+ million people





Tampa Bay Water



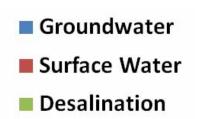
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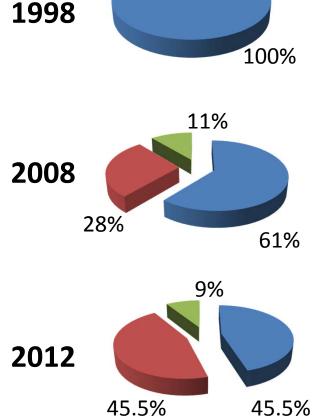
Water by Source

• Current sources:

- Groundwater (13 Wellfields)
- Hillsborough and Alafia Rivers
- C.W. Bill Young Reservoir
- Desalination Plant







TAMPA Links Between Information and Decisions

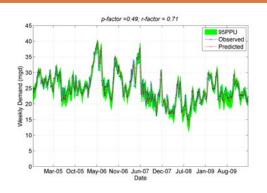
Decision	Time-Scale	Required Information
Operational Allocations	1 Week to 1 Month	Demand forecasts
Update water-year Allocations	1 Month to 12 Months	Streamflow forecasts
Infrastructure	Decades	Precipitation, Temperature, Streamflow, and Demand Projections

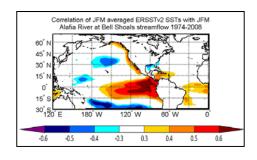


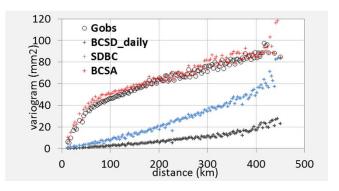
Products at Multiple Scales



- Weekly Demand Forecasts
 - Global Ensemble Forecast System (GEFS)
 - Reduced uncertainty
- Seasonal Streamflow Forecasts
 - El Niño/Southern Oscillation
 - Probability of Exceedance
- Downscaling Future Climate
 - Multiple GCMs
 - Hydrologic Applications





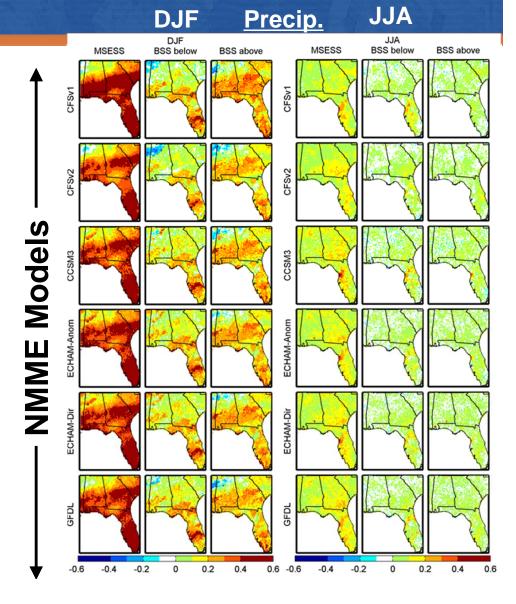


Seasonal Forecasts using the National Multi-Model Ensemble (NMME)



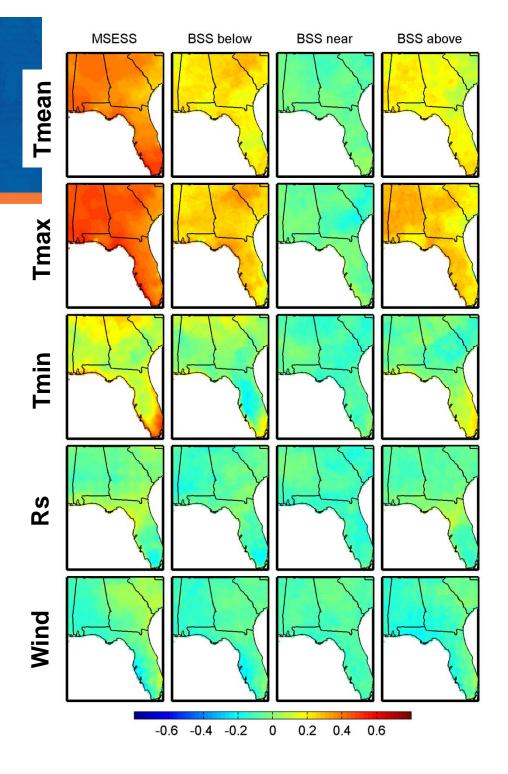
 6 GCMs downscaled to 12 km

Multiple downscaling methods



Seasonal Reference Evapotranspiration

- Climate Forecast System v2 (CFSv2)
- Downscaled to 12 km
- Penman Monteith
- Skill highest in winter
 & during ENSO events





Peace River Manasota Regional Water Supply Authority

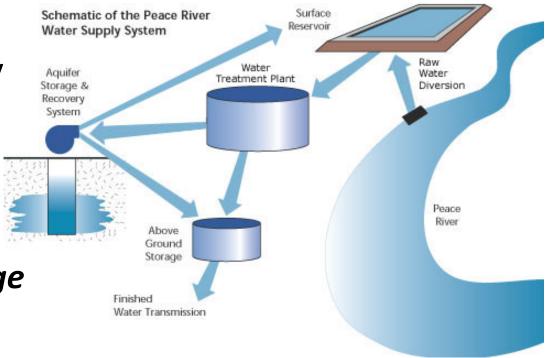


 Regional wholesale water supply authority

 Peace River is the only source

Reservoir

 Largest Aquifer Storage and Recovery (ASR)
 East of the Mississippi





When to start ASR recovery?

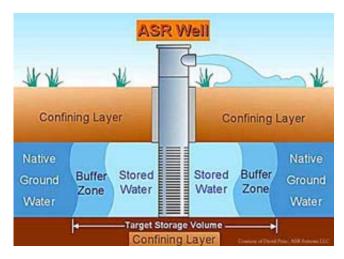


Too Soon:

- Costs rise (ASR Water treated twice!)
- Higher TDS (blended water quality issue)

Too Late:

- Less reservoir water to dilute TDS of ASR water
- Water restrictions
- Salt water upconing





Aquifer Storage and Recovery



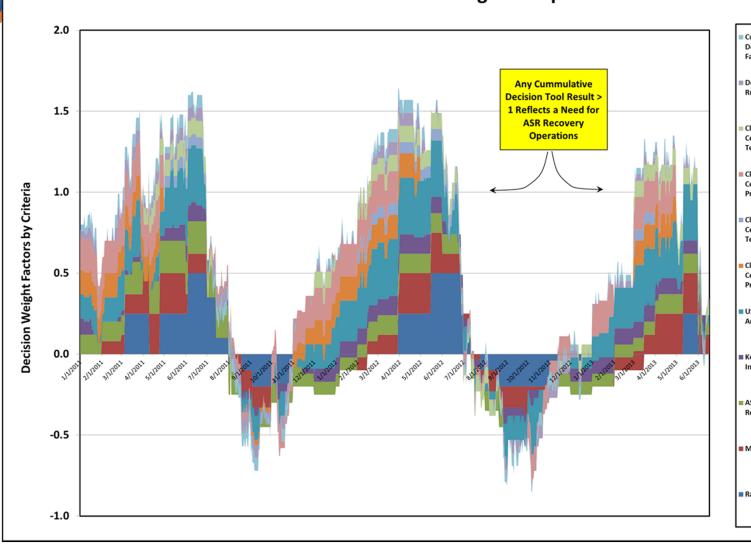
Decision Support Tool:

- Keetch Byram Drought Index (KBDI)
- CPC 1 Month Outlooks
- CPC 3 Month Outlooks
- Raw water reserves
- ASR reserves
- River flow
- Different Weights

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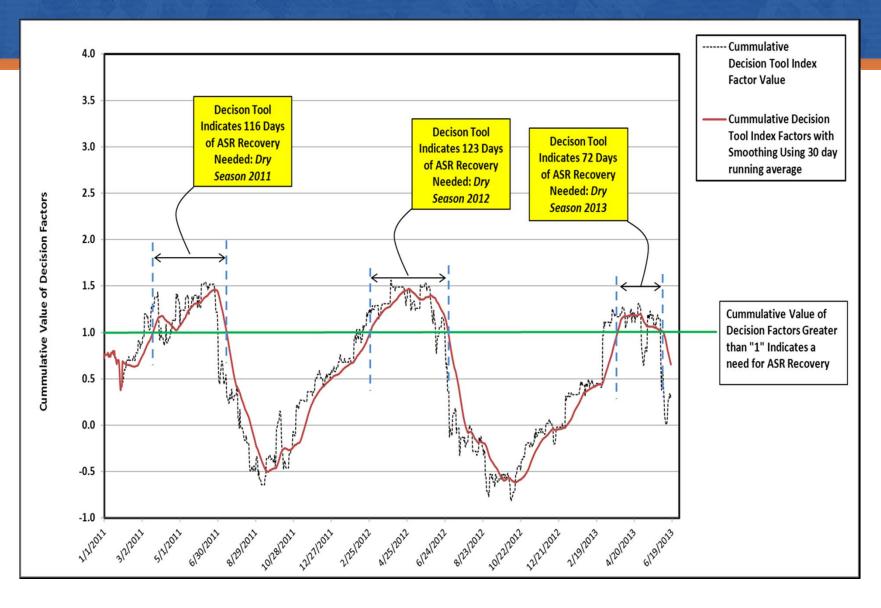
Aquifer Storage and Recovery (ASR)





- Cummulative
 Decision Tool Index
 Factor Value
- Demands based on Running Annual Average
- Climate Prediction
 Center 3 Month
 Temperature Outlook
- Climate Prediction
 Center 3 Month
 Precipitation Outlook
- Climate Prediction Center 1 Month Temperature Outlook
- Climate Prediction
 Center 1 Month
 Precipitation Outlook
- USGS River Flow at Arcadia
- Keetch Byram Drought Index for Watershed
- ASR Reserves
- Month of the Year
- Raw Water Reserves

Aquifer Storage and Recovery (ASR)





record Need Quantitative dialogue/communication stakeholder language/defi

models Decadal evaluation research regions

Short months demand Rainfall natur

water impact

- Strengths
 - Collaborative
 - Champions
 - University Extension
- Weaknesses
 - Funding
- The Future www.FloridaWCA.org
 - New Governance Structure
 - Sustained Funding