

NOAA Project Update

Overall Project Goal: Improved regional relevance and usability of climate and sea level rise data and tools for the specific needs of water managers in Florida.

Proposed Project Activities

- Develop a collaborative Working Group comprised of public water suppliers, water resource managers, climate scientists, and hydrologic scientists
- Evaluate the practical applicability of current climate data/models predictions at utility relevant space-time scales
- Evaluate the usefulness of these data/models for minimizing current and future public water supply risks associated with climate variability/climate change and/or sea level rise.

Short-term Project Outcomes

- A set of vetted retrospective and future climate scenarios at industry relevant space/time/event scales
- At least two applications of this climate information in utilities planning processes, models and/or decisions support systems
- A web-based knowledge management system

Executive Committee Meeting

November 22, 2011

- **Attendees:** Graham, Ingram, Irani, Misra, Staal, Adams, Asefa, Cullum, Gallinaro, Obeysekera, Yoder
- **Established Goal:** Build common set of climate and sea level rise scenarios of WMD/Utility Use
- **Actions:** Formed 4 technical groups to develop plan of action to be discussed with CWIG group
 - SEASONAL SCALE PREDICTIONS– Precipitation/temperature – (Misra (lead), Asefa, Cullum, Obeyseekra, Martinez)
 - LONG TERM SCENARIOS– Precipitation/Temperature (Graham (lead), Hwang Adams Obeysekera, Misra, Bastola)
 - SEA LEVEL RISE (Ingram (lead) Yoder, Obeysekera , Gallinaro)
 - KNOWLEDGE MANAGEMENT – Irani (lead)

Update from Long-Term Climate Scenario Group

LONG TERM SCENARIO GROUP

Discussions at ExComm meeting

- Need to develop common climate scenarios for use in Florida.
- Come up with recommendations for best historic gridded data sets to use for Florida
- Settle on emission scenarios, or RCP scenarios, that are most appropriate for analysis.
- Come up with recommendations regarding dynamic downscaling versus the various statistical downscaling approaches
- Decide on what types of events to use for evaluation
- Develop quantitative estimates of uncertainty associated with climate and hydrologic predictions

LONG TERM SCENARIO GROUP:

Actions to date

- Have had 3 webinars to bring subgroup up-to-speed on recent research activities
 - Hwang: comparison of 3 statistical downscaling techniques and evaluation of hydrologic implications in Tampa Bay region (retrospective)
 - Bastola: comparison of global scale-bias corrected, dynamically downscaled-bias corrected, and statistical weather generation and evaluation of hydrologic implications in 23 SE watersheds (retrospective)
 - Misra: Preliminary results for dynamically downscaling of future GCM scenarios over Florida

Proposed Future Work (for general discussion)

- Compile downscaled reanalysis, retrospective and future climate predictions for Florida
- Compare ability of each product to reproduce Maurer and/or PRISM gridded observations over Florida
- Focus on hydrologic applications in
 - Peace River (HyMod, Tank, NAM)
 - Upper St Johns River (HyMod, Tank, NAM)
 - Tampa Bay (IHM)
 - S. Florida Application?

Other Items for detailed discussion:

- Which downscaling techniques to use
 - RSM dynamic downscaling w/ and w/o BC?
 - BCSA, BCSD, SDBC?
 - NAARCAP w/ and w/ BCSA?
- Which climate statistics/characteristics to evaluate ?
- Which gridded data set to use?
- Which future climate scenarios to evaluate?
- How to bias correct future scenarios

Update from Seasonal Scale Predictions Group

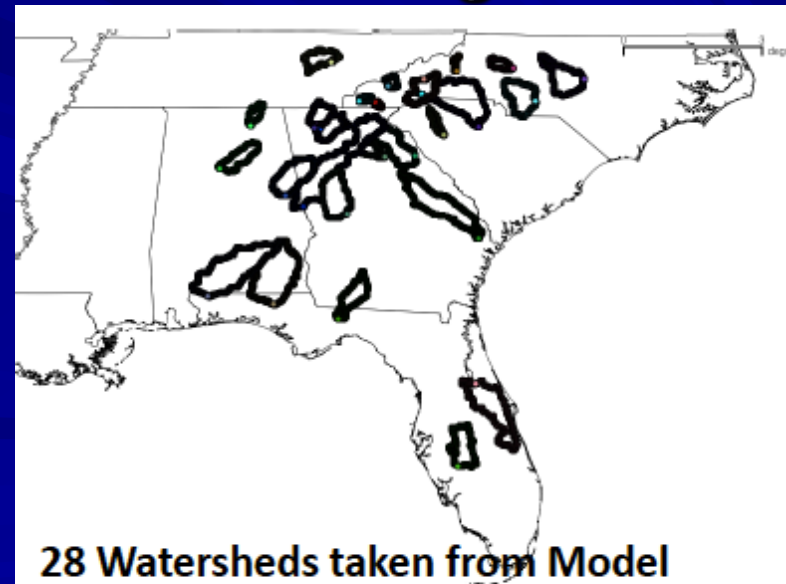
Participants: Tirusew, Mike, Obey, Chris, Satish, Syewoon

- This sub-working group was established to explore utilizing seasonal climate forecasts for water utility operations
- Had two teleconferences (1/6/2012 and 2/7/2012)

Objective

- Robustly diagnose seasonal predictability and skill for all 4 seasons of streamflow in five-six (IHM? SFWMD?) watersheds in Florida and 23 other watersheds spread around Southeast US and other derived variables like (length of wet season, length of cold season etc..)

1.07	44.8	0.32	1248	PEACE RIVER AT ARCADIA, FLA.
1.29	49.3	0.39	1349	OCHLOCKONEE RIVER NR HAVANA, FLA.
1.42	171.9	0.42	1425	CHOCTAWHATCHEE RIVER AT CARYVILLE, FLA.
1.46	201.2	0.43	1493	ESCAMBIA RIVER NEAR CENTURY, FL
1.03	97.7	0.3	1293	ST. JOHNS RIVER NR DELAND, FLA.




28 Watersheds taken from Model Parameter Experiment (MOPEX)

Methodology

- Obtain surface meteorology variables of T_{max}, T_{min}, downwelling shortwave flux, precipitation preferably on daily time scale but monthly will do from climate forecast models
- Force hydrology models (NAM, TANK, HyMOD, IHM?, SFWMD?) with the above forcing with bias correction, and with some form of downscaling to watershed scales
- Sources of seasonal forecast: Discussed 2 sources of seasonal forecasts: National Multi-Model Ensemble (NMME) and IRI seasonal forecasts

IRI seasonal forecasts: http://iri.columbia.edu/forecast/climate/skill/Skill_indvl.html

 The International Research Institute for Climate and Society	
Individual Model Skill Map Request	
Period: 1950-2000	
Region: <ul style="list-style-type: none"><input type="radio"/> Globe<input type="radio"/> Africa<input type="radio"/> Asia<input type="radio"/> Australia<input type="radio"/> Europe<input type="radio"/> Mid_East<input type="radio"/> N_America<input type="radio"/> Pacific<input type="radio"/> S_America	Season: <ul style="list-style-type: none"><input type="radio"/> JFM<input type="radio"/> FMA<input type="radio"/> MAM<input type="radio"/> AMJ<input type="radio"/> MJJ<input type="radio"/> JJA<input type="radio"/> JAS<input type="radio"/> ASO<input type="radio"/> SON<input type="radio"/> OND<input type="radio"/> NDJ<input type="radio"/> DJF
Model: <ul style="list-style-type: none"><input type="radio"/> CCM3.6<input type="radio"/> COLA-T63<input type="radio"/> ECHAM4.5<input type="radio"/> COAPS/FSU<input type="radio"/> GFDL-AM2p12b<input type="radio"/> GSFC-NSIPP1	Type: <ul style="list-style-type: none"><input type="radio"/> CORR (Anomaly Correlation)<input type="radio"/> ROC Areas (33%-ile Tercile Categories)<input type="radio"/> ROC Areas (15%-ile Extreme Categories)<input type="radio"/> RPSS (Ranked Probability Skill Score)
Variable: <ul style="list-style-type: none"><input type="radio"/> Precipitation<input type="radio"/> 2m Air Temperature	Statistical Significance: <ul style="list-style-type: none"><input type="radio"/> All Values<input type="radio"/> 90% Confidence Level (Correlation only)
<input type="button" value="Reset"/> <input type="button" value="Submit"/>	For RPSS and ROC Areas (Tercile and Extremes), only All Values are Available
EXPLANATION OF CORR and ROC SCORES	

Issues with IRI seasonal forecasts

- Goes back only up to 1998
- Resolution is typically ~200km
- Stores only monthly mean
- Does not have T_{max}, T_{min}
- Very difficult to impossible to retrieve forecasts for years prior to 2 years from now-----This rules out the use of these datasets for our application

NMME:

<http://iridl.ldeo.columbia.edu/SOURCES/.Models/.NMME/>

- COLA-RSMAS-CCSM3
 - IRI-ECHAM4P5-Anomaly coupled
 - IRI-ECHAM4P5-Directly coupled
 - NASA GMAO
 - NCEP CFSv1 (will be discontinued by end of June 2012)
 - NCEP CFSv2
 - GFDL-CM2p1
-
- They are seasonal forecasts from 7 months to a year, that are started at the beginning of every month of the year from 1982 to 2012.
 - The ensemble members range from 6 to 15 depending on the model for each seasonal forecast
 - Resolution range from around ~200km to 100km
 - Currently only precipitation, SST and T2M are available at monthly mean resolution. There is a very good possibility that daily will be made available.

Strategy

- Diagnose seasonal prediction skill and predictability for winter forecast as a function of:
 - 1) Lead time
 - 2) Model (Good to worst model; merit of MME)
 - 3) Ensemble member(how many is good)
 - 4) Size of watershed
- Repeat the above for Spring followed by Summer and then finally Fall season

Update from Sea Level Rise Group

Update from Knowledge Management Group