Florida Climate Institute Kickoff - Nov. 16, 2010 - Tallahassee, FL
POSTER ABSTRACTS (DRAFT: 11/4/2010)

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
Alldridge, Jonathan; Martinez, Chris	*Using Climate Forecasts to Predict Residential Irrigation Demand*	Water managers in the southeastern United States today face swelling urban populations combined with drought effects from both climate variability and potential climate change. These scenarios lead to an increased demand on municipal water resources to irrigate parched residential lawns. In the past, outdoor water use restrictions have been implemented in times of drought to mitigate the burden placed on these water sources. Past restrictions, however, have been criticized as having too little effect. As such, water managers will need new tools to predict increases in irrigation demand due to changing climatic factors. This project aims to create such a tool. Historical water meter data from two Florida and two North Carolina cities will be collected and analyzed to estimate individual household irrigation usage. With this information, the use of Climate Prediction Center (CPC) and El Niño-Southern Oscillation Phase (ENSO) climate forecasts for predicting irrigation demand will be studied. Their effectiveness as a predictive tool will be established by comparing historical irrigation usage, historical climatic conditions, and forecast data. Armed with this information, water managers and other decision makers could determine the best strategy to preemptively reduce water usage and avoid larger deficits during droughts. Additionally, the climate forecast analysis will make simulations of climate variations available to assess future demands on water systems, such as those due to global warming.	jonall@ufl.edu
Bartels, Wendy-Lin; Furman, Carrie; Fraisse, Clyde; Zierden, David; Ortiz, Brenda; Royce, Frederick; Beasley, John; Wright, David; Birdsong, William; Kemerait, Robert; and Jones, James	*Learning from the past to prepare for the future: Row crop farmers, extension professionals, and scientists discuss the challenges of adapting to climate variability and change.*	This research explores how participatory processes enhance the capacity of local stakeholders to adequately address climate variability and change. A tri-state climate working group for row-crop agriculture met in April and August 2010 to discuss peanut, cotton and corn production in the southeastern USA. Workshops were designed to facilitate knowledge exchange, dialog and learning among scientists, extension professionals and growers. Participatory tools such as fishbowls, timelines, and farmer-led storytelling maximized listening and interaction among stakeholders. Growers recalled how they have coped with extreme climatic events in the past and discussed hypothetical future climate situations. Findings from the first two workshops reveal a multitude of factors at diverse scales that shape decision making. For example, despite access to climate information, infrastructural and industrial constraints might limit the extent to which farmers can change their management practices. In addition, market conditions and policies within the farm bill can influence the possibility of modifying agricultural systems. This study illustrates the role that participatory processes can play in engaging key stakeholder groups to prepare for a changing and variable climate. Further research will explore the ways in which issues are framed and prioritized over time by these diverse stakeholders, the kinds of viewpoints that dominate discussions, and how the design of workshops affects outcomes.	wendylin@ufl.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
Borisova, Tatiana; Adams, Damian	*What Does the General Public Think About the Effects of Climate Change on Precipitation in the Southern States?*	Two objectives of this study were 1) to examine the opinion of the general public in the southern states about the effect of climate change on the rainfall in their area; 2) to analyze if public believes that climate change will influence water availability in their area. The analysis is based on the results of a public survey conducted in 2008-2009 in Alabama, Arkansas, Florida, Louisiana, Mississippi, Oklahoma, Tennessee, and Texas (n=2,352). The survey instrument included questions about: a) change in the amount of rainfall in respondents' areas as a result of climate change; b) change in the likelihood of prolonged drought in respondents' areas; and c) water availability in respondents' areas in ten years. The survey instrument also included questions about respondents' socio-demographics and residence, attitudes toward environmental issues and believes about current water quantity problems, and the sources of news. The survey was administered by mail to a random sample of respondents in the summers of 2008 and 2009. Survey response rates ranged from 38.0% (Texas) to 60.5% (Arkansas). Survey responses differed significantly among the states (chi-squire test, 99% confidence level). Overall, a large percent of respondents (from 30% in Texas to 47%, in Arkansas) *did not know* what effect climate change will have on rainfalls in their areas. The percentage of respondents who believed that the amount of rainfall will *increase* was the highest in Louisiana and Mississippi (15%). Respondents from these two states were also most likely to respond that the amount of rainfall *would not be affected* by climate change (34% and 30% respectively). Finally, the number of respondents who thought that the amount of rainfall will *decrease* as a result of climate change was the highest in Tennessee (40%), and Florida (33%). We used an ordered logit model to examine the factors that influenced the likelihood of a respondent selecting specific answer choices. The state of residence, education level, news sources, and residence inside or outside city limits were significantly correlated with the answers about the expected effects of climate change on the rainfall. Respondents who resided inside city limits, who had a high school / less than high school education, and who reported cable television as a news source, were more likely to answer that rainfall will *increase* as a result of climate change. For the question about changes in the likelihood of respondents' areas suffering from a prolonged drought, compared with Florida, respondents from Arkansas, Louisiana, Mississippi, and Oklahoma were more likely to believe that likelihood of prolonged drought is *decreasing* (based on estimated ordered logit model). Respondents living inside city limits, younger respondents, and respondents with lower educational levels were also more likely to indicate that the likelihood of a prolonged drought is *decreasing*. In contrast, respondents from Tennessee, respondents with pro-environmental attitudes, and respondents who rely on national television as a news source were more likely to believe that the likelihood of prolonged drought is *increasing*. As expected, respondents who believed that climate change will reduce the amount of rainfall in their area, and respondents who though that their areas are already facing water quantity problems, were more likely to believe that the likelihood of prolonged drought is *increasing*. Finally, for the question about water availability in ten years, compared with Florida, respondents from all the other states were more likely to answer that the likelihood of having adequate water supplies is *high* (based on results of an ordered logit model). Respondents living inside city limits were also more likely to believe that the likelihood of having enough water in 10 years is *high* (compared with respondents living	tborisova@ufl.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
		outside city limits). In contrast, respondents who moved to their states within the last 5 years, and female respondents were more likely to answer that this likelihood is *low*. As expected, respondents who believed that there are currently water quantity problems in their areas, and that climate change will decrease the rainfall, were more likely to respond that the likelihood of having enough water in ten years is *low*. These results allow us to make three main conclusions. First, a large percentage of respondents do not know how climate change will influence the amount of rainfall in their areas. These results may reflect the fact that scientists cannot predict with certainty the effect of climate change on the climate in Southeastern US. Secondly, sources from which respondents get their news are important for predicting respondents' opinion about climate change. It may be that some information media do not pay enough attention to the topic of climate change. Finally, people who believed that climate change will result in rainfall reduction were more likely to think that the likelihood of their area suffering from prolonged droughts is *increasing*, and the likelihood of their area having enough water to satisfy all its needs in 10 years is *low*. Hence, these respondents connect climate change with potential negative impacts on water availability, suggesting that climate change impacts may be an important additional educational focus when seeking public support for water demand management programs.	
Bozec, Alexandra	*Development of a Local Ocean Prediction Model of the Fort Lauderdale Region for Energy Extraction Purposes*	The main objective of the research is to develop a real time high-resolution ocean model covering the region around Ft. Lauderdale with the aim of providing accurate real-time prediction of distribution of currents, temperature and salinity. The scientific goals include the investigation of the local energetic of the Florida Current and the potential impacts from placement of turbines within the current. As a first step, the results of already performed assimilated global 1/12º simulations of Hybrid Coordinate Ocean Model (HYCOM) are analyzed for the region of the Florida Straits to assess the suitability of the model. The transport and currents distribution at 27ºN between Ft. Lauderdale and the Bahamas are validated against observations for years 2008-2009. Despite a bias of -3Sv, the transport variability is well-reproduced in the model. To have a first idea of the potential of the Florida current to be a profitable energy source, the power density and total power availability is calculated through the 27ºN section. The results show maximum power densities about 50km offshore of Florida that vary between ~3.8kW/m2 (at 5m in December) and ~1.0kW/m2 (at 60m in November). In parallel, the impact of turbines on a flow is also investigated using HYCOM in a periodic channel configuration forced by a baroclinic flow at the each boundary. An enhanced drag coefficient is applied at defined locations to account for the moored turbine. The impact of the intensity and the location of this drag on the circulation of the channel is assessed for this idealized case. Preliminary results of the impact of such drag on the Florida Current-Gulf Stream System is also presented in the case of a realistic Atlantic 1/12º simulation. The next step will be to apply this drag to a real-time high-resolution (1/24º) ocean model of the Ft. Lauderdale region to predict power availability.	abozec@coaps.fsu.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
Bunting, Erin; Southworth, Jane	*Human Alterations to the Landscape of Florida from 1974 to 2004*	Human alterations to the landscape are affecting terrestrial ecosystems and the atmosphere at unprecedented rates and spatial scales (Turner et al. 1994). Changes to the landscape effect the flow of energy and water between the biosphere, and atmosphere (Vitousek et al 1997; Braimoh et al. 2005) and result in biodiversity change, landscape fragmentation, and altered climate regimes (Blaikie and Brookfield 1987; IPCC 2007; Kasperson et al. 1995). The focus of this study is on landscape alterations in Florida and the resulting changes to climate patterns. Particularly, urban and agricultural changes to the landscape are analyzed as human activity is affecting climate through multiple feedback mechanisms.	bunterin@ufl.edu
Bunting, Erin; Gibbes, Cerian; Southworth, Jane	*Climate Variability Across the Kwando, Okavango, and Zambezi Catchments*	Two of the main drivers of vegetation change are climatic events and anthropogenic influences on the landscape. This study will determine the effects of precipitation regimes on the landscape in southern Africa. The study site for this project spans several countries including Botswana, Namibia, Angola, and Zambia. To mitigate the effects of humans on the landscape this research was conducted within protected areas. Therefore the results of this project exclusively indicate the effects of climate regimes (precipitation or temperature) on the landscape; direct human influences have been controlled for as much as possible. Time series analysis was conducted using monthly TRMM precipitation data (¼ degree x ¼ degree), and MODIS NDVI images from 2000 to 2009 at a monthly time step. Methodologically, a time series analysis was conducted to explore the spatial and temporal relationship between precipitation and changes to NDVI. Analysis looked at the seasonal relationship between precipitation and vegetation cover, and the effects of major oscillations such as ENSO on the landscape. Lastly, regression was used to model the influence of certain variables (elevation, animal density, precipitation, temperature, and elevation) on the landscape. It is hypothesized that precipitation is a driving force in changing the landscape. Future research will differentiate changes to the landscape caused by human influences and those caused by climate regimes.	gibbesc@gmail.com
Cañas, Carlos; Waylen, Peter R.	*Modeling Hydro-Climatology of Madre de Dios Basin and Production of Migratory Catfish Larvae in Southeastern Peru*	A simple stochastic model is presented to describe the influence of the natural flow regime of Madre de Dios River (southeastern Peru) on the presence and downstream transportation of catfish larvae (Siluriformes: Pimelodidae), important migratory species in commercial fisheries in the Peruvian Amazon region. One year of daily river stage records were related to weekly larval catches to determine the association between floods and spawning events, and on the basis of hydro-climatologic characteristics of Andean-Amazon regions, available long-term historical rainfall records were employed to determine the inter-annual variability of floods within the Madre de Dios Basin. Major larval drift occurred during the high water season, and specifically they appeared to be associated with stages of over the 5 m, a level which served as a physical indicator of the river, triggering spawning responses of these species, termed a “Biologic Hydrological Significant Event” (BSE). Timing of these BSEs, estimated from the historical rainfall records, described a uniform distribution during the wet season, and their inter-arrival times were exponentially distributed. These observations provided the basis of the stochastic model describing the likelihood of larvae releases from this headwater region to the lowland Amazon.	cmcanas@ufl.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
Chapin, Tim; Deyle, Robert; Koeppel, Peter; Rokyta, Anne	*Integrating Hazard Mitigation and Sea Level Rise Adaptation into Long-Range Transportation Planning*	For Charlotte County, Florida, the project team developed a set of three scenarios in collaboration with county and city planning staff and other relevant stakeholders to serve as the basis for scenario-based planning analyses of alternative future land use and transportation system configurations under a range of sea level rise scenarios. The scenarios modeled were a (1) Policy Plan Scenario, that reflected the buildout of the county using the current plans, (2) a Smart Growth Scenarion in which development was channeled into existing and developing urban centers, and (3) a Resilient Growth Scenario that balanced both smart growth and safe growth goals, reflecting the substantial at-risk areas of the county. These scenarios were then analyzed along three key dimensions: (1) property vulnerability using a model developed by FSU, (2) traffic evacuation clearance using a modified version of the Regional Planning Council's hurricane evacuation model, and (3) transportation system performance using the region's transportation model. The results from this work have been used in the update of several county plans, including the long-range transportation plan and the local comprehensive plans.	tchapin@fsu.edu
Collier, Cristina; Smith, Shawn; Powell, Mark; Cocke, Steve; Bourassa, Mark	*Offshore Wind Potential around Florida*	Proposals for offshore wind farms along the United States coastline are growing in number; however, Florida lags behind other states efforts to define their offshore wind resource. Two considerations used to determine a region's potential for wind power include existence of wind speeds large enough to produce power using existing or future turbine technology and waters that are shallow enough for turbine construction. Large areas of Florida's offshore waters have depths that are shallow (< 20 m), including the large West Florida shelf and regions off Florida's northwest Gulf and northeast Atlantic coastline. Many of these regions experience strong large-scale diurnal flow regimes, including sea/land breeze circulations. Until recently, lack of surface observations has been a limiting factor in producing an accurate measure of whether or not an offshore wind resource exists. We will present a preliminary assessment of Florida's offshore wind resource using in-situ data from National Data Buoy Center (NDBC) moorings and instrumented Air Force towers in the northeast Gulf of Mexico. Comparisons are made to operational numerical models and reveal the need for new model approaches to develop high-spatial and temporal resolution wind resource maps. Observations from Air Force towers N7, instrumented by the Northern Gulf of Mexico Cooperative Institute (NGI), and N4 (instrumented by NDBC) provide some of the best estimates of the regional wind resource because they have instrumentation at 30 m (closer to the typical 85 m turbine hub height). Other in-situ data are obtained from moorings at 3-5 m above the ocean surface. All winds must be adjusted to hub height. The authors examine the sensitivity of the height adjustment using three algorithms: power law, log law, and a fully sea-state and stability dependent surface flux model developed by Bourassa-Vincent-Wood. Wind speed, air temperature, dew point, and water temperature are used to calculate the average raw hourly power density at anemometer height (30 m for towers) and at 85 m. For a GE 3.6 MW offshore turbine to reach minimum production it must encounter wind speeds above 3.5 m/s and maximum production is reached at 14.5 m/s. The average wind speed for the N4 and N7 towers at 30 m ranged from 5-7 m/s and increased by about 1-2 m/s	cec06c@fsu.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
		after adjusting to 85 m. The log adjustment of the wind speed reveals about a 0.5 m/s more of an increase than the BVW model. A comparison to the North American Regional Reanalysis model indicates that the model-derived winds underestimate the available wind power in a region. The extremes found in the observed data are simply not seen in the model data.	
Cui, Xia; Gibbes, Cerian; Southworth, Jane	*Measuring Semi-arid Savanna Cyclical Patterns and Dynamics*	With global climate change predictions indicating that many savanna regions will experience increased frequency and intensity of extreme events (ex. droughts and floods), there is a high likelihood of drastic land cover change which could influence regional biodiversity and resource availability. Despite extensive concern that land cover changes currently occurring in many savannas are leading to degraded landscapes, our understanding of the magnitude of degradation in semi arid savannas is limited. We examine patterns of land cover change and precipitation in southern African savannas in an attempt to identify changes within the landscape which may represent shifts across ecological thresholds versus those which constitute part of a natural phase within a larger cyclical pattern.	xiacui2006@163.com
Donoghue, Joseph F.; Elsner, James B.; Hu, Bill X.; Kish, Stephen A.; Niedoroda, Alan W.; Wang, Yang; Ye, Ming; Coor, Jennifer; Dai, Heng; Das, Oindrilla; Lewers, Shawn; Malmstedt, Jill; Zhang, Xiaoying	*Modeling the Risks of Near-Term Climate Change on the Northwest Florida Coast*	A modeling and field project is investigating the potential effects of near-term (~100 years) sea-level and climate change on the northwest Florida coast. We are modeling potential changes to natural coastal systems and infrastructure in response to several scenarios of sea level rise, with and without changes in storm climate. We are using recent remote-sensing data, along with digitized historic charts, to characterize barrier island morphology and to establish the long-term rates of change in shorelines and dunes. This process has resulted in a conceptual model for the evolution of the Santa Rosa Island barrier and a purpose-built numerical model. A regional storm history has been developed for use in the modeling effort, both for historic time and pre-history. The historic database encompasses 150 years. The pre-historic record, from coastal lake sediment cores, extends the record back several millennia, enabling a more robust estimate of the major storm return period. A storm model incorporates the storm history to create a climatological corridor bounding an ensemble of realistic storm tracks for the Eglin region. The model predicts a 100-year wind gust on Santa Rosa Island of 58 (+/- 5) m/s, which is greater than that predicted using a traditional Monte Carlo approach. Our purpose-built numerical model represents adjustments of complex coastal systems to accelerated rates of sea-level rise. The model represents processes on time scales of years to decades, predicting the evolution of the beach and barrier island, nearshore and inner continental shelf, inlets, bays and wetland/marsh components. The model uses the morphological, sea-level, and storm climatology data developed by other study components to predict changes over the next century. Hundreds of different sequences of hurricane forcing and system response, each representing the next 100 years at a given rate of sea-level change, are output and the range and variability of the morphology changes are determined. Uncertainty analyses are being employed to identify the data and process elements needed to improve confidence in the predictions. The results of the barrier island morphological change predictions have provided the basis for analyzing changes in the near-surface water table and the impact of these changes on likely vegetation zones and	jfdonoghue@fsu.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
		habitats. The results of this study will be used to evaluate how to make reliable predictions of the effects of future climate change on natural coastal systems and coastal infrastructure, and to enable cost-effective mitigation and adaptation strategies.	
Dukhovskoy, Dmitry; Morey, Steven	*Modeling Considerations for Estimating Coastal Inundation Risk in the Gulf of Mexico and Consequences of Sea Level Rise*	The vulnerability to Sea Level Rise for the Gulf of Mexico coast varies significantly because of spatial differences in: the coastline geometry, tides, beach slope, and frequency of hurricane impacts. For example, Hurricane Dennis (2005) caused extreme flooding along the coastal zone of the northeastern Gulf of Mexico, even though local winds were relatively weak. A modeling study presented here shows that this region is particularly susceptible to intense flooding during storms due to its coastline geometry in relation to storm tracks, even though this region is less frequently directly impacted by hurricanes compared to other places in the Gulf. Improvements in storm surge modeling methodologies are being applied to assess the geographic differences in flooding risks from storm surges and waves compared to risk of loss due to high winds. One of the likely impacts of Sea Level Rise on the region is higher vulnerability to coastal inundation and flooding. Predicting the change in inundation risk due to sea level rise along the Gulf of Mexico coast over extended temporal scales is important for assessing potential future economic, social, and environmental transformations of the region.	ddmitry@coaps.fsu.edu
Dzotsi, Kofikuma	*Sensitivity of Maize, Peanut, and Cotton's Simulated Growth to SALUS Crop Model Parameters in Cool and Warm Climates*	Assessments of climate change impacts on agricultural production and the impacts of agricultural practices on local to regional climate are needed for a better understanding of the bi-directional feedbacks between the atmosphere and croplands. These assessments can be obtained using a climate model coupled to a crop model that has the appropriate level of simplicity to estimate crop productivity over large areas based on agronomic principles, without requiring detailed parameterizations of new crops or grasses. Such simple and generic approach to crop modeling is being implemented in the Decision Support System for Agrotechnology Transfer (DSSAT). The model, which is the simple version of SALUS (System Approach to Land Use Sustainability), can in principle, be readily parameterized from literature or available agronomic data for most important annual field crops. The simple SALUS model have considerable potential for regional and other large-scale climate studies that require the estimation of economic yield, leaf area index and biomass for several crops under different rainfall and temperature regimes, taking into account agronomic aspects of growth while maintaining simplicity of processes described. However, it is unknown what the important parameters of the model that require accurate estimation are, how the model outputs and parameters are generally related, and whether this relationship is dependent on production level, location, or year under consideration. A sensitivity analysis is needed to understand these relationships. In this study, a global sensitivity analysis is presented for three important crops for the southeast USA, maize, peanut and cotton and results are discussed for four locations per crop, representing cooler (Michigan, Iowa, Virginia, and North Carolina) and warmer (Florida and Georgia) climates.	kofikuma@ufl.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
Fraisse, Clyde	*AgroClimate.org: Climate Information and Decision Aid Tools to Help Farmers Reduce Risks and Increase Profitability*	*AgroClimate* is a web-based climate forecast and decision support system (http://www.agroclimate.org) that was developed to provide extension agents, producers, and natural resource managers with tools to aid their decision-making processes in reducing risks associated with climate variability. It was designed and implemented by the Southeast Climate Consortium (SECC) in partnership with Cooperative State Extension Services, being updated and maintained periodically to ensure the relevance of the information and decision support tools contained in the system. Recent developments and establishment of an Open-source AgroClimate project will be discussed.	cfraisse@ufl.edu
Fraisse, Clyde	*Strawberry Advisory System: Climate-based Tools for a Sustainable Strawberry Industry in Florida*	Strawberries are one of the most valuable crops in Florida. The state produces around 16 million flats of strawberries every year, which represents 15% of nation's berries and virtually all the berries grown during the winter. The high value of the crop often compels growers to protect their profits by making numerous applications of fungicides, insecticides, and acaricides on a strict calendar schedule. The University of Florida in cooperation with the Florida Strawberry Growers Association is developing climate-based tools on *AgroClimate.org* to help growers reduce the application of fungicides and analyze the carbon footprint of strawberry production systems.	cfraisse@ufl.edu
Frumkin, Adam	*Predictability and Fidelity of Dry Season Downscaled Reforecasts Over the Tropical South American Region*	This study uses NCEP CFS global hindcasts downscaled with the NCEP-Scripps Regional Spectral Model over the South American continent during the South American Monsoon (SAM) dry season (June-August). The objective of this study is to investigate the fidelity of the reforecasts and the possibility of using regional climate models (RCMs) for seasonal prediction of this region. Previously, little attention had been paid to the SAM dry season, but emerging research suggests that dynamical and biological processes that occur during this time may be responsible for the transition to the SAM wet season. Additionally, there appears to be a correlation between June-August precipitation over the Amazon River Basin and SSTs in the region of the Atlantic Warm Pool (AWP) during the following June-August. Downscaling with a RCM has been shown to reduce model error in precipitation forecasts but the results can still retain the bias of the GCM. This study also investigates the impact of using anomaly nesting bias correction when downscaling with the RSM. Previous studies of the North American Monsoon have shown that anomaly nesting improves upon dynamical fields such as low level jets, which can subsequently reduce moisture flux errors. In this study, we are concerned with verifying forecasts of temperature, precipitation. Evaluations of model skill using difference plots, ROC curves, and signal-to-noise ratio tests are conducted using TRMM-3B43 merged analysis, CFSR precipitation and temperature, and CMAP. This study has shown a slight improvement in model skill for precipitation forecasts when the downscaling process is performed. Model skill is higher for temperature forecasts and also improves slightly after downscaling. Finally, this study uses correlations between downwelling shortwave flux, temperature, precipitation and evaporation to	ajf09f@fsu.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
		determine whether evaporation and precipitation are moisture limited or energy limited.	
Gaughan, Andrea; Waylen, Peter R.	*Spatial and Temporal Precipitation Variability in the Okavango-Kwando-Zambezi Catchment, Southern Africa*	In southern Africa, multi-decadal trends over the latter half of the 20th century indicate declining mean annual precipitation, increasing variability, and an increased number of warm phase ENSO events for the region. One suggestion for the change in the precipitation pattern is attributed to a shift in the global coupled ocean-atmosphere system during the late 1970s. These potential changes in climate patterns will influence ecosystem processes and, in turn, effect vegetation plant and animal abundances and distributions. This has important implications for the future Kavango-Zambezi Transboundary Conservation Area (KAZA), a region in southern Africa that provides a vital wildlife corridor along which local precipitation and exotic streamflow constitute an important water source in an otherwise water-limited ecosystem. We investigate the variability in inter-annual regional precipitation dynamics pre/post the late 1970s climate shift within three catchments (Okavango, Kwando, and Zambezi – the OKZ catchment) in southern Africa through the descriptive spatio-temporal analysis of rainfall patterns from 1950-2005. Annual precipitation totals to each individual basin are calculated and number of wet (upper tercile) or dry (lower tercile) years experienced in two periods, 1950-75 and 1975-2008 are compared to those expected at random. Rainfall correspondence to, and the frequency of, El Niño Southern Oscillation (ENSO) events within these periods are also investigated. The coincidence of extremes in local rainfalls to the Caprivi region of Namibia and regional inputs are examined to determine if and how association in precipitation patterns may vary for different parts of the OKZ catchment. Results indicate decreasing precipitation patterns and increased dry years and warm phases of ENSO across all three sub-catchments in the last quarter of the twentieth century. Knowledge of the historical spatio-temporal shifts in precipitation plays a direct role in decisions made on the ground regarding agriculture, wildlife, and resource management. An explanation of inter-annual precipitation patterns provides important information for local collaboration between national parks and communities about decisions concerning water access and usage between wildlife and humans.	aeb416@ufl.edu
Godwin, David R.; Kobziar, Leda N.	*Prescribed Fire Management and Soil Carbon Respiration in an Old-field Forest*	The understanding of soil carbon dynamics in forested systems has increased in importance as global climate change discussions recognize the important roles forest soils play in the carbon cycles. The majority of carbon sequestered in most forested systems lies within the soils, with soil carbon efflux comprising a significant portion of total ecosystem carbon budgets. As the Southern United States has over 200 million acres of forested land (USFS/FIA 2006) there exists potential for future forest landowner compensation for carbon sequestration services (“Cap and Trade” programs). Given this, it is important to understand the effects of various land management regimes on soil carbon pools and fluxes. One method for assessing how management affects soil carbon is via the measurement of soil carbon respiration rates (SRR). A variety of forest management activities, including prescribed fire, have been shown to influence soil carbon efflux in western United States forested systems yet these relationships are not known in southern forests. This study measures SRR using a Li-Cor 8100 infrared portable gas	drg2814@ufl.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
		analyzer (IRGA)(Li-Cor, Lincoln, NE) at sample sites representing upland “old field” pine forests, with randomized replication for a period of one year. The intention of this study is to determine if fire frequency influences soil carbon respiration rate sensitivity to abiotic and biotic drivers and if fire treatment effects on SRR exist, and whether they are lasting or ephemeral. The results of this work will help the land managers assess the soil carbon sequestration capacities and fluxes associated with various fire use practices.	
Griffin, Melissa	*Community Collaborative Rain, Hail, and Snow Network (CoCoRaHS)*	The Community Collaborative Rain, Hail and Snow Network (CoCoRaHS) is a grassroots, non-profit, community-based, high density precipitation network made up of volunteers from all backgrounds and ages who take daily measurements of 'just precipitation' right in their own backyards. Given the variable pattern of rainfall over Florida, it's important to understand just how much rain fell in an area. How many times have you heard the rainfall report from an official gauge and thought to yourself: That's not what I got? This is your chance to help. By providing your daily precipitation data, you truly help many in Florida in one way or another - whether it's agricultural specialists, National Weather Service meteorologists, forestry officials, water management employees or emergency management personnel.	griffin@coaps.fsu.edu
Griffin, Melissa; Zierden, David; Leftwich, Preston; O’Brien, James	*Florida Climate Center*	The Florida Climate Center is part of three-tiered system that serves to provide climate data, information, and services for the United States. Affiliated with the National Climatic Data Center (NCDC) in Asheville, NC and the Southeast Regional Climate Center (SERCC) in Columbia, SC, the Florida Climate Center should be the first stop for climate data and information for citizens, organizations, educational institutions and private businesses in the state of Florida. We seek to serve the state of Florida by providing: * Climate Data: Historical weather observations for weather stations throughout the state of Florida. We are able to provide data for most stations from 1948-present. * Climate Information: Long-term historical averages for various stations, climate divisions, and the entire state. * Extreme Events: Information and analyses on extreme events such as storms, freezes, droughts, floods and hurricanes. * Special Analysis: With his vast knowledge of El Niño, La Niña and climate variability, the State Climatologist and staff can offer expert insight into Florida's climate trends. * Outreach: Inform and educate the people of Florida about current and emerging climate issues.	griffin@coaps.fsu.edu
Heimlich, Barry N.	*Effects of Sea Level Rise on Southeast Florida’s Water Resources*	The poster summarizes information from the section on sea level rise and its impacts on Southeast Florida’s water resources from a recent study conducted at Florida Atlantic University’s Center for Environmental Studies under the sponsorship of the National Commission on Energy Policy. Charts and graphs illustrate how sea level rise and other climate change impacts are likely to affect Southeast Florida’s ground waters, surface waters, and water supply in the next several decades. The findings show that sea level rise of as little at 3 to 9 inches could exacerbate saltwater intrusion, reduce groundwater flow, increase water tables, and	barryces@bellsouth.net

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
		significantly increase the risk of flooding during heavy rain events and storms.	
Heimlich, Barry N.	*A Probabilistic Method for Estimating Sea Level Rise Exceedances*	A method for estimating the probability of exceeding given stages of sea level rise at given times during the 21st Century is presented based on published semi-empirical correlations of historic sea level rise and global climate change model forecasts for a range of plausible IPCC scenarios. Tide gauge measurements in Florida have also been shown to be statistically indistinguishable from global average sea level rise. Projected probabilities that sea level could rise by 3, 4, and 5 feet by 2100 are projected to be approximately 89%, 42%, and 6% respectively. Sea level rise of 3 feet or more could have dire consequences to Florida's coasts, the Everglades, the Keys, and low-lying urban South Florida.	barryces@bellsouth.net
Hodgkins, Suzanne; Chanton, Jeffrey	*Determination of Methane Production Mechanisms in Contrasting Peatland Types in Arctic Sweden: Research Plan and Preliminary Data*	It is estimated that subarctic and boreal peatlands contain 455 GT of organic carbon (compared with 550 GT in the atmosphere as CO_2), of which 227 GT is contained in permafrost. As this permafrost thaws due to global warming, it becomes part of the active peat layer, which is available to biodegradation into CH_4 and CO_2. In addition, sinking of the land due to permafrost thawing leads to an increase in the proportion of fens (low-lying, completely thawed, water-saturated habitats) relative to palsas (dry, elevated, and underlain by permafrost) and bogs (intermediate between palsas and fens), and since CH_4 production is greatest in fens, the thawing of permafrost increases the total amount of CH_4 released from the peatland. Thus, permafrost thawing creates a positive feedback to climate change through two mechanisms: increase in organic matter available to biodegradation, and increase in the cover of high CH_4-producing fen habitats. In peatlands, two processes (acetoclastic and hydrogenotrophic methanogenesis) dominate CH_4 production; of these, acetoclastic methanogenesis (dominant in fens) uses more labile organic matter, while hydrogenotrophic methanogenesis (dominant in bogs) uses less labile organic matter and results in much greater ^{13}C fractionation. By measuring the production and $\delta^{13}C$ of CH_4 and CO_2, as well as other parameters such as DOC, acetate, and δD of CH_4 and H_2O, CH_4 production mechanisms within different habitat types can be discerned. In this study, peat, porewater, and pore gas from Stordalen Mire in northern Sweden will be analyzed to determine CH_4 production quantities and mechanisms in both bogs and fens. Preliminary porewater data, which show more negative $\delta^{13}C$ values for CH_4 in bogs relative to fens, confirm the hypothesis that acetoclastic methanogenesis dominates in fens, whereas hydrogenotrophic methanogenesis dominates in bogs.	sbh10c@fsu.edu
Hwang, Syewoon	*Development of Spatiotemporal Bias-Correction Techniques for Downscaling GCM Predictions for Hydrologic Applications*	Accurately representing the spatial variability of precipitation is an important factor for predicting watershed response to climatic forcing, particularly in small, low-relief watersheds affected by convective storm systems. Although Global Circulation Models (GCMs) generally preserve spatial relationships between large-scale and local-scale mean precipitation trends, most GCM downscaling techniques focus on preserving only observed temporal variability on point by point basis, not spatial patterns of events. Downscaled GCM results (e.g., CMIP3 ensembles) have been widely used to predict hydrologic implications of climate variability and climate change in large snow-dominated river basins in the western United States (Diffenbaugh et al., 2008; Adam	aceace111@ufl.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
		et al., 2009). However fewer applications to smaller rain-driven river basins in the southeastern US (where preserving spatial variability of rainfall patterns may be more important) have been reported. In this study two methods were developed to bias-correct GCMs to preserve both the long-term temporal mean and variance of the precipitation data, and the spatial structure of daily precipitation fields. Forty-year retrospective simulations (1960-1999) from 16 GCMs were collected (IPCC, 2007; WCRP CMIP3 multi-model database: https://esg.llnl.gov:8443/), and the daily precipitation data at coarse resolution (i.e., 280km) were interpolated to 12km spatial resolution and bias-corrected using gridded observations over the state of Florida (Maurer et al., 2002; Wood et al, 2002; Wood et al, 2004). In the first method a new statistical spatial correction technique, which preserves the spatial mean and variance of observed daily climatology over the study region, was applied to the temporally bias-corrected downscaled results. In the second method spatial random fields which preserved the observed spatial correlation structure of the historic gridded observations and the spatial mean corresponding to the coarse scale GCM daily rainfall were generated. The spatiotemporal variability of the two methods were evaluated against gridded observations, and compared to the original temporally bias-corrected and downscaled CMIP3 data for the central Florida. In the next phase of this research the hydrologic response of two southwest Florida watersheds to the gridded observation data, the original bias corrected CMIP3 data, and the two new spatiotemporally corrected CMIP3 predictions will be compared using an integrated surface-subsurface hydrologic model developed by Tampa Bay Water.	
Ingram, Keith T.	*SECC: Science and Partnerships for Adaptation and Resilience to Climate Change and Climate Variability*	Growing from the Florida Consortium, which was founded in 1996, the Southeast Climate Consortium (SECC) mission is to use advances in climate sciences, including improved capabilities to forecast seasonal climate and long-term climate change, to provide scientifically sound information and decision support tools for agricultural ecosystems, forests and other terrestrial ecosystems, and coastal ecosystems of the SE USA. As a multidisciplinary, multi-institutional team, the SECC conducts research and outreach to a broad community of users and forms partnerships with extension and education organizations to ensure that SECC products are relevant, reliable, and delivered to the public by these organizations through their networks and mechanisms. Until about 4 years ago, SECC research and extension focused primarily on the effects of seasonal climate variability in the agriculture sector, which is highly vulnerable to climate risks. With increasing awareness of climate change and its potential impacts, demand has grown for information on climate change and for information targeted to other ecosystems. The SECC is adopting a new organization to address the climate information needs of coastal and terrestrial ecosystems in addition to the agricultural ecosystems. Using RISA and leveraged funding, we will work in partnership with appropriate boundary organizations to assess end user needs and to develop and improve climate information for each of these ecosystems that can be used to manage risks and to pursue new economic opportunities. Research for the coastal and terrestrial ecosystems will build on the success of the SECC in providing an effective decision support system for agriculture, *AgroClimate.org.* Research and extension activities will	ktingram@ufl.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
		emphasize collaboration among investigators from natural resources sciences, including climate, water resources, land, and energy, and investigators from applications sciences, including extension and outreach, human dimensions, integrated participatory systems analysis. Our four scientific objectives are: 1) Working with boundary organizations, planners, regional data clearinghouses, and other stakeholders, assess the needs of decision makers for climate information, their access to and applications of climate information, and time-scales for needed information; 2) Based on stakeholder assessments, develop partnerships with appropriate boundary organizations to meet the climate information needs of stakeholders, particularly in coastal and other terrestrial ecosystems; 3) Provide reliable, timely, probabilistic, and local climate information according to stakeholder needs for adaptation and resilience to climate change and climate variability. Providing this information will require production of downscaled forecasts at the local level and at 1- to 30-year time scales, as well as maintaining and providing historical data and analyses for the region; 4) Through integrated, multi-disciplinary activities, develop decision support tools and information delivery systems that give decision makers access to climate information that will help decision makers manage risks associated with climate change at various time scales.	
Keellings, David; Waylen, Peter	*The Stochastic Properties of High Daily Maximum Temperatures*	The statistical properties of the excursions of maximum daily temperatures above various critical thresholds of interest are analyzed with a view to developing models of heat wave events using more than 100 years of record from meteorological stations in Lake City, DeFuniak Springs, Avon Park, and Fort Myers, Florida. These stochastic variables include; event density (number of such events per unit time), duration, timing, and peak values over the threshold. The theoretical basis for the modeling is found in Crossing Theory, which states that as the threshold of interest becomes particularly large with respect to the mean of a Gaussian process, the number of crossings (up or down) becomes Poisson distributed. The changing seasonal intensity of such events can be incorporated by utilizing a non-homogeneous Poisson model, with time-varying rates. Environmental health studies indicate that both the magnitude and duration of the excursion above the critical threshold are important. As both the number of up-crossings and down-crossings follow a Poisson distribution, it is reasonable to approximate the length of time between the two (the duration of an event) by an exponential, or exponential-like distribution. Similarly, the peak magnitudes of event over the threshold (POT) represent the extreme tail of the distribution of daily maximum temperatures and might be assumed to follow the same sort of distribution. The current study only considers a single, arbitrarily defined, critical temperature threshold of 98°F (36.7°C). The threshold that constitutes a medically critical value may well vary spatially, and be dependent upon the ultimate application of the results. It is therefore necessary to be able to extrapolate findings derived at one level of interest to others, particularly in seeking to determine the risks of extremely rare events like those of Chicago (1995), France (2003), London and California (2006) and Melbourne (2009), which had seldom, if ever, been observed in historic series. The methodology has the flexibility to extrapolate to such levels while also	keellings.rees@yahoo.com

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
		having the advantage of being able to be applied to spatially differentiated data to determine risks associated with high temperature events during any time period or at any location of interest.	
Keener, Victoria	*Incorporation of Climate Information into Water Utilities Decision Making: Global and Local Perspectives*	Global and regional climate change and sea level rise will have significant effects on the water supply. Florida will experience its own set of unique challenges related to water supply and climate, and collaboratively identifying and addressing these issues via a Florida Public Utilities Working Group could facilitate future transitions, making change easier, more efficient, and increasingly sustainable. Particularly within the last five years, there has been an increasing amount of both qualitative and quantitative research dealing with the importance of applicable climate data in water resource planning and new methods on how to best integrate applicable data. Despite the abundance of literature, there have been very few water utilities that have successfully incorporated climate information into their quantitative and planning models. This is partially due to institutional and political limitations, climate data time-scale mismatches, and some lack of communication between academic researchers and utility managers. Utilities that have achieved the most success thus far are ones that have enthusiastically embraced change within their operational time-frames and to their supply models, have the financial and moral backing of higher-ups in local government, and are open to working across agencies and in a cooperative environment. This research will show more and less successful cases of climate information integration into water utilities from around the world.	vicko@ufl.edu
Keener, Victoria	*Quantifying Global Climate Variability in Local Hydrology: Integration of ENSO Signal Power through Hydrological Processes*	Our world is becoming increasingly non-stationary, as climate variability and change affect how well we can predict the future based on the past. For this reason, researchers are pursuing alternate methods of forecasting environmental variables based on climate non-stationarities. At the local-to-regional scale, these methods add to our ability to predict and quantify global climate trends in individual watersheds while potentially reducing the bias and uncertainty associated with more standard GCM downscaling techniques. The main manifestation of climate variability in Florida is the El Niño/Southern Oscillation (ENSO), a global coupled ocean-atmosphere phenomenon whose effects are especially strong during the winter months. Despite precipitation being a main driver of climatic variability, watersheds around the world show that the correlation between ENSO and precipitation is often not as strong as that with stream flow. This is usually attributed to the spatial and temporal integration of precipitation in a flow signal, resulting in lower peak frequencies. In the Little River Watershed (LRW), spectral analysis of observed data shows increased power in the relationship between the NINO 3.4 index of sea surface temperatures and stream flow relative to precipitation. Here, we show how to both identify and elucidate non-stationary hydro-climatic mechanisms hidden in multivariate and large amounts of time series data, and how that can be used to make short-term forecasts.	vicko@ufl.edu
LaRow, Timothy	*Dynamical Forecasts of Tropical Cyclone*	The Florida State University/Center for Ocean-Atmospheric Prediction Studies (FSU/COAPS) global atmospheric model [Cocke and LaRow, 2000] is used to study the predictive skill of seasonal tropical cyclone activity in the North Atlantic. The atmospheric model was run for 29	tlarow@fsu.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
	Activity in the North Atlantic	hurricane seasons (June–November) from 1982-2010 using the sea surface temperatures produced by the National Centers for Environmental Prediction's Climate Forecast System model [Saha et al., 2006] as lower boundary conditions. Time-lagged initial conditions for the atmospheric model were obtained from the European Centre for Medium-Range Weather Forecasts (ECMWF) reanalysis and were centered on 1 June. In terms of skill, the correlation of the interannual variability of the number of named storms, hurricanes and accumulated cyclone energy with the observed show that the numerical model has skill superior to well known statistical models. All correlations were found to be statistically significant with p-values<0.001. In addition, the model's ensemble mean has a root mean square error of only1.9 hurricanes/yr. Although no seasonal forecast can accurately predict storm tracks (and landfall locations), the model does show an increase in the number of storms making landfall in the southeast United States after 1995 compared to 1982-1994, as observed.	
Malmstadt, Jill; Elsner, James	*Risk of Strong Hurricane Winds in Florida Cities*	A statistical procedure for estimating the risk of strong winds from hurricanes is demonstrated and applied to several major cities in Florida. The procedure, called the Hurricane Risk Calculator, provides an estimate of wind risk over different length periods and can be applied to any location experiencing this hazard. Results show that the city of Miami can expect to see hurricane winds blowing at 112 mph or stronger, on average, once every 12 years. In comparison, the city of Pensacola can expect to see hurricane winds of 112 mph or stronger once every 24 years.	jmalmstadt@fsu.edu
Matyas, Corene	*Investigating Rainfall Regions through a GIS-based Analysis of Radar Reflectivity Data*	A central focus of my research is the use of GIS to delineate regions of high and low reflectivity values that are associated with clouds producing heavy and light rainfall. Once the reflectivity regions are spatially defined, properties are calculated such as their size, shape, orientation, and centroid location. Primarily, I have employed these techniques to analyze the rain fields of tropical cyclones as they make landfall. I have developed regression models to predict rain- field extent at landfall time, and have quantified changes in rain field shapes post-landfall. I have also explored how shape properties can distinguish between regions of convective and stratiform rainfall. While examining convective rainfall regions for a large sample of tropical cyclones, I have related their positions and sizes to vectors of vertical wind shear and storm motion. I have also analyzed regions of convective rainfall over the Midwestern U.S. Corn Belt. I have developed a convective severity index to identify climate divisions receiving the heaviest rainfall under differing synoptic circulation patterns. This work is part of a collaborative project to understand how gradients in soil moisture and differences in vegetation type may contribute to cloud development and rainfall enhancement in the Corn Belt region.	matyas@ufl.edu
Moeller, Lauren; Misra, Vasu	*Sea Breeze Variations in Florida*	This study investigates the variations of the sea breeze in Florida in the boreal summer season along two lines of latitude. One is near 26^0N cutting across southern Florida peninsula, and the other is just above 30^0N, running parallel to the northern Gulf of Mexico coast. Using very high resolution (10km) dynamically downscaled analyses from the NCEP-DOE (R2) reanalysis over	lmoeller@coaps.fsu.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
		the southeast US, a climatology of the sea breeze cross-sections for these regions was calculated eight times daily between the years 1979 to 2001. This high resolution downscaled product is validated with other independent observations to show high fidelity. Initial results show that there is no diurnal difference in the sea breeze between the panhandle and the peninsula, and that the sea breeze peaks around 4 p.m local time. It is however seen that the sea breeze is climatologically weaker along the west coast compared to that along the east coast in Florida peninsula. Other composites will be made based upon the size of the Atlantic Warm Pool (AWP) and the phase of the El-Nino Southern Oscillation (ENSO). Both of these variations affect the strength of the background winds over the region of interest, which in turn can affect the sea breeze circulations. Finally, an examination will be made on the sensitivity of the sea breeze to land cover changes from comparing two downscaled integrations at 10km grid resolution for 22 year period, with both forced byR2 reanalysis. One integration is conducted with a 33km resolution land cover dataset and the other with 111km resolution.	
Morey, Steven; Dukhovskoy, Dmitry	*Influence of Variations in River Flow on the Apalachicola Bay Estuary and Offshore Marine Environment*	Apalachicola Bay in the northeastern Gulf of Mexico is the discharge point for freshwater accumulated in the Apalachicola – Chattahoochee – Flint (ACF) basin. Significant interannual variability in the river flow is due to precipitation variability over the watershed, encompassing parts of western Georgia, eastern Alabama, and northern Florida. El Nino / Southern Oscillation contributes greatly to this variability. At interannual time scales, fluctuations in the discharge manifest a strong salinity signature in the bay, with an influence on the salinity and optical properties over 200km offshore. Within the bay, the response of higher frequency salinity fluctuations is modulated by the river discharge and winds.	morey@coaps.fsu.edu
Pantina, Peter	*Tracing the Moisture Sources in the Active and Break Periods of the Indian Monsoon*	The Indian monsoon plays an important role in agriculture and daily life. Researching this phenomenon thus has direct benefits on society. This study uses a quasi-isentropic back-trajectory program to estimate the source of moisture over central India for intra-seasonal active and break spells during normal, wet, and dry Indian monsoon years. The objective of this study is to ascertain if there is an interannual variation in the source of the moisture during the intra-seasonal events. There is growing observational evidence to suggest that there is an absence of interannual signal in the intra-seasonal spectrum of the Indian Monsoon rainfall. The quasi-isentropic back trajectory program uses winds, surface pressure, temperature, latent heat flux, and relative humidity from atmospheric reanalysis to construct the back trajectory for intra-seasonal precipitation events obtained from the Indian Meteorological Department rain gauge based observations. Since the atmospheric reanalysis is a model based product, we conduct this analysis from different reanalyses including NCEP-R2 and NCEP-CFSR. This study has found that on interannual timescales, there are noticeable differences in the moisture sources of the seasonal mean monsoon. For example, there is a statistically significant increase in the local and remote recycling ratio of rainfall between a wet and a dry seasonal monsoon for both datasets. There is also a statistically significant difference in the magnitude of local evaporate source when comparing active or break spells of wet years to those of dry years. This study will be later	ppantina@fsu.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
		extended to include MERRA and to explain the differences between the datasets.	
Qiu, Youliang	*Global Cake: A Comprehensive Data Portal for Climate Change*	Climate data are available in many different resources with different spatial and temporal scales in heterogeneous format. Global Cake has been designed and established to harvest climate data from various resources and organize data in a centralized location. A set of spatial domain analysis tools have been setup for analysis via roll-up, drill-down, and other operators on aggregation hierarchy. Users can retrieve climate data through a web-based GIS interface. Analysis results can be visualized on the online GIS map.	youliang@gmail.com
Risko, Susan; Martinez, Chris	*Optimization of Climate Indicators to Provide Probability of Exceedance Streamflow Forecasts*	Climate represents a direct link to the availability of water supplies and by understanding the patterns associated with climatic influences, water resource managers can be better equipped for making more accurate water supply projections. This study has been conducted in support of Tampa Bay Water to efficiently perform groundwater/surface water source rotation and reservoir management by enhancing system reliability through improved surface water supply forecasts. Previous research has shown that climate indices are known to have significant correlations with streamflows, for example, the Niño 3 and Niño 3.4indices are associated with streamflows in the southeastern United States. Using these climate indices and historical streamflows as data inputs, an analysis of the Non-Parametric Seasonal Forecast Model (NSFM) was performed that reiterated previous seasonal correlations between climate and streamflow. Additionally, this model provides outputs in the form of probability of exceedance plots to assist water resource managers for short-term streamflow forecasts. However, the climatic indices used provide input data that tends to be relatively spatially static. Therefore, through the use of singular value decomposition (SVD) methods it is speculated that an optimal spatial distribution of a global climatic variable time series could be identified. Investigation of multiple climatic variables using SVD, which could then be combined through the use of weighting methods, may render favorable options for various seasons and lead times. Results from this study will provide Tampa Bay Water with the necessary tools for short-term source allocation decisions and a template that will assist water resource managers of any geographic region with improved streamflow forecasts.	susanrisko@ufl.edu
Rooney, Robert; Martinez, Chris	*Assessment of Precipitation Reforecast Analogs in the Tampa Bay*	Reforecasts are retrospective weather forecasts generated with a fixed numerical model. Large reforecast datasets allow for the correction of systematic model error, thus improving upon the raw forecast. In this study, 1-14 day lead-time precipitation forecasts were evaluated in the Tampa Bay region using a two-step analog technique and the 30-year reforecast dataset developed by the Climate Diagnostic Center (CDC) of the National Oceanic and Atmospheric Administration (NOAA) using the Global Forecasting System (GFS) Model. The two-step analog technique consisted of finding historical forecast analogs within a +/-45 day search window followed by retrieving an ensemble of observed precipitation on the analog dates. Different lead days, number of analogs, precipitation thresholds and predictors were evaluated with respect to different months in the year. Results of this study will determine the potential use of a reforecast analog technique for surface water supply decision making and management by Tampa Bay	rrooney@ufl.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
		Water, the largest public water supplier in the region.	
Ruppert, Thomas; Havens, Karl; Spranger, Mike	*Florida Sea Grant's Role in Climate Variability and Change*	As climate variability and change affects Florida, impacts at Florida's diverse, valuable, and dynamic land/water interface will include sea-level rise, ocean acidification, and increased storm intensity. These impacts will create or exacerbate numerous issues in coastal management. The Florida Sea Grant College Program focuses its climate-related efforts on addressing the coastal and ocean-specific impacts related to climate variability and change through work with coastal counties and municipalities and connecting local governments with resources that assist them in their planning activities related to the coastal zone. Key among these efforts are addressing technical and planning needs for hazard mitigation planning and statutorily-required post-disaster recovery planning as lead-ins to discussions of sea-level rise. Addressing these needs at the local level emphasizes Florida Sea Grant's role in connecting university researchers and resources with the local governments that can utilize their services and expertise while at the same time allowing researchers to better understand practical issues from the grass-roots level. In addition Florida Sea Grant organized and hosted a Gulf of Mexico "Community of Practice" workshop on the topic of sea level rise and adaptive planning to link researchers and educators working on resiliency in the Gulf.	truppert@ufl.edu
Sheftall, William; Fraisse, Clyde; Martinez, Chris; Campbell, Mary	*Climate Education Needs in Florida from the Perspective of Extension Professionals*	Survey data were collected from UF/IFAS Extension colleagues who participated in training conducted during the 2009 and 2010 annual meetings of the Extension Professionals Association of Florida (EPAF). Questions were designed by the UF/IFAS Extension Focus Team on Climate Variability & Change – responsible for providing educational resources that help our colleagues educate their clientele – to provide understanding of our colleagues' perception of the relevance of climate-related issues to stakeholders across different sectors of society in the State of Florida. Faculty participants in the two Climate Variability & Change training sessions (n=110) were asked to answer questions such as, "What are the most frequent climate-related questions asked by your clientele?" and to rank the relevance of climate-related issues to the long-term economic success and sustainability of their clients' enterprises. This poster will present the survey results and discuss how they will be used to guide the design of climate-related Extension educational programs at the University of Florida.	Sheftall@ufl.edu
Shin, Dong-Wook	*Potential Values in Downscaling Systems for Agricultural Models*	Potential values in seasonal downscaling systems are explicitly evaluated by comparing with global models. One of our primary metrics for evaluating the downscaling methodologies is comparing the variation of crop yields simulated using the downscaled data, assuming non-irrigated conditions, to yields simulated by using observations. Rainfed crops in the southeast United States are very sensitive to water stress. In fact, these crops are often more sensitive to periods of wet/dry spells than the total seasonal precipitation. Thus using crop models as a performance metric provides an alternative to simply evaluating the prediction/simulation of seasonal mean, and has more practical relevance. Furthermore, while the discovery of climate signals contributing to total summertime precipitation variability remains elusive, out results	shin@coaps.fsu.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
		suggest that intra-seasonal variability may be better simulated by dynamical models than simply the anomalies of the seasonal mean. We will explore this possibility more fully in the current research.	
Smith, Thomas J.; Allen, M.; Chassignet, E.; Davis, H.;DeAngelis, D.; Foster, A.; Green, T.; Kitchens, W.; Misra, V.; Percival, F.; Plant, N.; Slone, D.; Stefanova, L.; Stith, B.; Swain, E.; Sumner, D.; Tihansky, A.; Tiling-Range, G.; Walls, A.; Zweig, C.	*La Florida - A Land of Flowers on a Latitude of Deserts: Aiding Conservation and Management of Florida's Biodiversity by using Predictions from Downscaled AOGCM Climate Scenarios in Combination with Ecological Modeling*	La Florida (Land of Flowers) straddles latitudes forming the northern hemisphere's desert belt. Orlando is one degree latitude south of Cairo, Egypt. Florida is unique because it is a peninsula surrounded by warm water. How will Florida's biodiversity respond to a changing climate? Which species and habitats will increase? or decrease? What role does land use–land cover (LULC) change play? Before these questions can be answered, accurate regional climate change scenarios must be developed. We are down-scaling predictions from three coupled Atmospheric-Ocean General Circulation Models and making regional predictions for Florida and the adjacent southeastern US. Climate predictions are being used as inputs to a suite of species / habitat / ecosystem models that are currently being used in two areas where we have existing ecological models: the Greater Everglades and Suwannee River-Big Bend. Selected species include: manatee, alligator, crocodile, wading birds and a number of tropical tree species. Three scenarios of LULC: past (≈1900), present, future (2041-2070) are employed. Additional climate model runs will address the contribution of green house gasses to climate variability and change. Model perturbation experiments will be performed to address sources of variability and their contribution to the output regional climate change scenarios. We have scenarios that specifically address potential change in temperature and rainfall fields over the study region. We are providing these scenarios and modeling results to resource management groups via workshops in which the scenarios will be used to predict responses of additional selected species, habitats and ecosystems.	tom_j_smith@usgs.gov
Staal, Lisette; Galindo, Sebastian; Keener, Victoria	*Development of Public Water Supply Utility Relevant Climate Information for Improved Operations and Planning: Implementing a Collaborative Working Group Process in Florida*	In Florida, the pressures of a growing population, increasing environmental regulation, and water supplies that are nearing their sustainable yields have made it clear that understanding the impacts of climate variability and change as well as sea level rise on water supply will become an increasingly pressing challenge. Public water utilities will need to adapt to changing conditions in order to meet public water demand. In the face of these challenges, these utilities will need reliable information on probable impacts for Florida at local to regional spatial and temporal scales. Currently, best available climate science and technology is not being used by public water utilities in their planning or decision making. The uncertainty of the information and the lack of credibility, complexity, and inappropriate scales of existing data and models, in conjunction with unique political regulations faced by each utility, present barriers to the application of existing climate information. In addition, relatively little guidance and few tools exist for either water or wastewater utilities to help them prepare for and adapt to the effects of climate change. In response to this challenge, the University of Florida, Florida State University and the Southeast Climate Consortium, along with representatives from six major public water supply utilities and three Water Management Districts in Florida, are initiating a collaborative working group focused on learning together how climate variability/change and sea level rise may impact	lstaal@ufl.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
		planning and operations of Florida's public water supply utilities. The collaborative working group will operate as a social learning and knowledge management platform to promote the sharing of knowledge, data, models and decision-making tools among public water suppliers, water resource managers, climate scientists and hydrologic scientists. The process is intended to increase the relevance and use of climate variability, climate change and sea level rise data and models by public water supply utilities. Through an iterative process stakeholders will jointly assess, adapt and develop locally and institutionally relevant tools to better prepare for and adapt to the effects of climate change. While the immediate focus of the working group will be on Florida public water supply utilities, the working group process and products will be transferable and useful nationwide. This poster illustrates the dynamic and interactive process of implementation and preliminary outcomes of the working group.	
Stefanova, Lydia; Misra, Vasu; Chan, Steven; Griffin, Melissa; O'Brien, James J.; Smith, Thomas J.	*COAPS Land-Atmospheric Regional Reanalysis for the Southeast United States (CLARReS): Seasonal, Sub-Seasonal and Diurnal Variability of Precipitation*	We present an analysis of the seasonal, sub-seasonal and diurnal variability of rainfall from the COAPS Land-Atmosphere Regional Reanalysis for the Southeast at 10 km resolution (CLARReS10). The NCEP-NCAR/DOE Reanalysis 2 and the ECMWF-ERA40 Global Atmospheric Reanalysis have been dynamically downscaled with the NCEP/ECPC Regional Spectral Model (RSM). The downscaling has been performed over the Southeast United States at a horizontal resolution of 10 km for the period 1979-2001. The resulting regional reanalyses are compared to gridded observations and station data. The analysis focuses on the representation of the seasonal cycle and the summertime sub-seasonal and diurnal variability of precipitation since the summer season over the Southeast incorporates a variety of regional-scale phenomena, such as sea-breeze, thunderstorms and squall lines, tropical storms and hurricanes, which are barely resolved in the existing atmospheric reanalyses but are contributing significantly to the hydrological budget over the region. We find that the downscaled reanalyses show very good agreement with observations in terms of both the relative seasonal distribution and the diurnal structure of precipitation. The spatial distribution of precipitation is simulated well over Florida, but has a wet bias over Georgia, Alabama and South Carolina. There are important differences between the two simulations (CLARReS10/ERA40 tends to be wetter than CLARReS10/R2, and to have the diurnal precipitation maximum earlier in the day). The reasons for this are currently under investigation.	lstefanova@coaps.fsu.edu
Stroman, Ashley	*The Rendition of the Atlantic Warm Pool in Reanalysis*	The IAS (Intra-America Seas) region, which includes the Caribbean Sea, the Gulf of Mexico, the Pacific Ocean west of Central America and northern South America, and the adjacent lands, is one of the most poorly observed locations in the world. It is important to predict the weather and climate in this region as it has an impact on coastal areas, tropical cyclones, geological and ecological systems, and the climate of North and South America. The IAS region hosts the Atlantic Warm Pool (AWP), an area of water greater than 28.5oC. There is an interannual variation of the size of the AWP as it reaches its peak in August through October and disappears in boreal winter. Observations are scarce over the AWP; thus, observations surrounding the AWP are used to describe it, albeit inaccurately. Therefore, reasons for explaining the changing	acs08g@fsu.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
		size of the AWP are minimal. This study focuses on explaining the subsurface evolution of the AWP and discussing the impact of ocean dynamics and thermodynamics that can change it. The area of the AWP for August through October from 1980-2008 was calculated with GODAS (Global Ocean Data Assimilation) data. Using NCEP/NCAR Reanalysis and CFSR (Climate Forecast System Reanalysis) data, correlations were found comparing the AWP to variables such as sea surface temperature (SST), and sea level pressure (SLP) at 0, 3, and 6 months lag. It has been found that for both NCEP/NCAR and CFSR data at 0 and 3 months lag there is a positive correlation of the AWP with SST in the IAS regions. Also, there exists a negative correlation with SLP in the IAS region and a positive correlation in the East Pacific Ocean. Future work will include looking at CORE and SODA data and calculating correlations as done previously, as well as looking at correlations of the area of the AWP with velocity potential and divergence at 0,3, and 6 months lag regressions.	
Timilsena, Janak	*Water Management Scenario Analysis of Tampa Bay Water System*	This research focuses on water resource allocation strategy of Tampa Bay Water, the largest wholesale water supplier in the region. The Water Evaluation and Planning (WEAP) modeling software and MS Excel Spreadsheet Model using the inbuilt Solver were developed and utilized to assess and simulate different water supply allocation policies (Surface Water, Ground Water, and Desalinated Water) and demand scenarios. This research included two phases of investigation: (i) Development of a baseline scenario based on historical water supply and demand data for the 2009 water year (ii) Development of several plausible future scenarios based on future demand, future supply requirements, planned infrastructure alterations and conservation improvement. Historical water supply allocation data (Surface Water, Ground Water, and Desalinated Water) was obtained from Tampa Bay Water. Current and future scenarios were developed in close coordination with Tampa Bay Water management as well as their current system operating policies. Forecasted climate information (e.g. El Niño and La Niña) and its effect in water allocation decision making was incorporated while developing the future scenarios. Sensitivity analysis was carried out by forcing different management strategies on source allocation and demand. This study provides better understanding of water resources planning, and evaluates different options for meeting future water demand in the Tampa Bay region.	jtimilsena@ufl.edu
Williams, Marcus; Bourassa, Mark; Zierden, David; Griffin, Melissa	*Characterizing Multi-Decadal Variability in the Southeast United States*	Prior studies of the long-term temperature record in the Southeastern United States (SE US) mostly discuss the long-term cooling trend, and the inter-annual variability produced by the region's strong ties to El Niño Southern Oscillation (ENSO). An examination of long-term temperature records in the SE US show clear multi-decadal variations in temperature, with relative warm periods in the 1920's through the 1950's and a cool period in the 1960's through the 1990's. This substantial shift in multi- decadal variability is not well understood and has not been fully investigated. It appears to account for the long-term downward trend in temperatures. An accurate characterization of this variability could lead to improved interannual and long-term forecasts, which would be useful for agricultural planning, drought mitigation, water management,	mwilliams@coaps.fsu.edu

AUTHOR(S)	TITLE	ABSTRACT	CONTACT
		and preparation for extreme temperature events. Statistical methods are employed to determine the spatial coherence of the observed variability on annual and seasonal time scales. The goal of this study is to characterize the nature of this variability through the analysis of National Weather Service Cooperative Observer Program (COOP) station data in Florida, Georgia, Alabama, North Carolina, and South Carolina. One finding is a shift in the temperature Probability Distribution Function (PDF) between warm regimes and cool regimes.	
Woli, Prem; Jones, James W.; Ingram, Keith T., Fraisse, Clyde W.	*Agricultural Reference Index for Drought (ARID)*	This study was conducted to evaluate the performance of Agricultural Reference Index for Drought (ARID) to estimate soil water content and crop yield loss from drought; determine the sensitivity of ARID to its parameters; compare ARID with other drought indices; and explore various methods for forecasting ARID. Daily values of field-measured and ARID-estimated soil water contents over one year at each of two locations in Florida and the observed and ARID-estimated yields of four crops for several years and locations in Georgia were compared. Sensitivity was assessed using seasonal values of ARID computed for five locations in the southeast USA with historical weather data of 30 years and Fourier Amplitude Sensitivity Test as the method. For comparing drought indices, values of nine different drought indices were computed for maize using historical weather data of five locations in the region. The performance of each drought index was assessed in terms of how closely it mimicked a crop model-based water deficit variable using RMSE. The predictability in ARID was explored using six climate indices and four forecasting models. Using past values of the first principal component of the climate indices and historical weather data spanning 56 years of five locations in the southeast USA, values of ARID were predicted one month ahead. The performances of each forecasting model relative to that of ENSO were evaluated using modeling efficiency (ME). ARID estimated soil water contents with RMSE values ranging from 0.010 to 0.019. It predicted yield loss from drought for cotton, maize, peanut, and soybean with ME values of 0.05, 0.65, 0.45, and 0.35, respectively. Parameters water holding capacity and root zone depth explained about 90% of the total variability in ARID. Forecasts of ARID were better using ANN or SARIMA models than those with the ENSO approach especially for the southern part of the region.	premwoli@ufl.edu