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Fall 2016 Newsletter

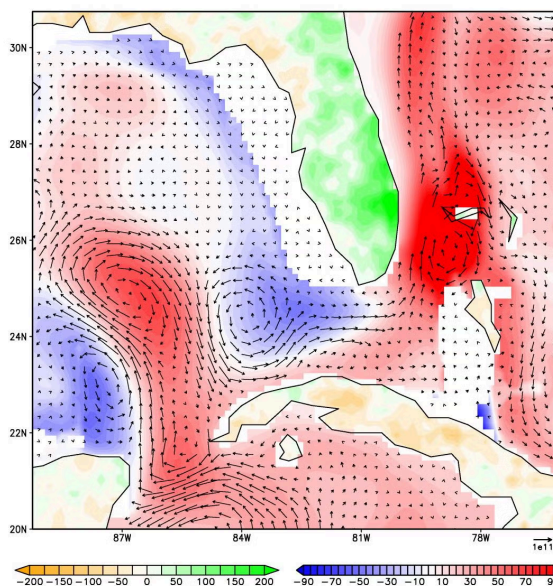


Future changes in ocean currents around Florida impact rainfall over land

By Vasu Misra, Florida State University. Source: USCLIVAR.org

Robust surface ocean currents around Peninsular Florida, namely the Loop and the Florida Currents, are shown to affect the terrestrial wet season of Peninsular Florida. New research by [Vasu Misra](#) and [Akhilesh Mishra](#) in the *Journal of Geophysical Research: Atmospheres* shows that differences in the ocean bathymetry (or topography) of two novel numerical climate model integrations can influence the ocean currents and their impact on regional climate. These changes to bathymetry dislocate and modulate the strength of these currents and thereby affect the overlying sea surface temperature (SST) and upper ocean heat content.

This study shows that a weaker surface ocean current system produces colder coastal SSTs along the Atlantic coast of Florida, thereby reducing the length and the total seasonal accumulation of rainfall in the wet season of Peninsular Florida relative to the simulation in which these currents are stronger. Further analysis reveals that overlying surface evaporation and atmospheric convection are modulated as a result of these forced changes to the temperature of the upper coastal Atlantic Ocean. This consequently changes the moisture flux convergence over land leading to changes in the length and the distribution of daily rain rates over the duration of the wet season. The results of this study have implications on interpreting future changes to the hydroclimate of Peninsular Florida, such as the influence of climate change and low frequency changes to the Atlantic meridional overturning circulation that comprises of the Loop and the Florida Currents as part of its upper branch.



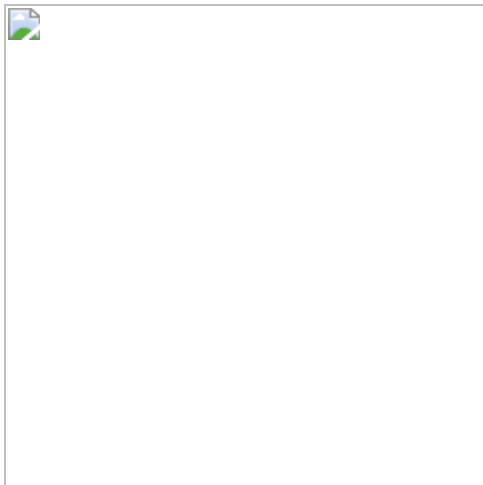
The difference in the climatological mean June-July-August ocean heat content as measured by the depth of the 20°C isotherm (in meters) overlaid with corresponding differences in ocean heat transport vectors (W/m) between two numerical climate models with slightly different bathymetries. The differences over the terrestrial region are the corresponding differences in the total seasonal rainfall (mm) of the wet season from the two model simulations.

Read the article: [The oceanic influence on the rainy season of Peninsular Florida](#) (*Journal of Geophysical Research: Atmospheres*).

News and Activities

FSU leading next phase of the Florida Building Resilience Against Climate Effects (BRACE) program

A team led by FSU assistant professor of geography Chris Uejio and state climatologist [David Zierden](#) has received a \$1.07 million grant from the Centers for Disease Control and Prevention to help county health departments across Florida adapt to problems created by changing environmental factors such as climate change. The team will work with individual Florida counties to assess potential environmental problems that would affect public health. They will also help health officials develop action plans to combat these issues. Other members of the FL BRACE team from Florida State include [Tracy Ippolito](#) and [Danny Brouillette](#) from the Center for Ocean and Atmospheric Studies, and assistant professor of urban and regional planning Tisha Holmes.



Florida Climate Center publishes summaries of Hurricane Hermine and Tropical Storm Julia

Before the current Atlantic hurricane season, the last time a hurricane had made landfall on Florida was in 2005, when Wilma made landfall in Collier County. This unprecedented hurricane-landfall drought was broken early on September 2, when Hermine made landfall near the border of Jefferson and Wakulla counties. Even though the hurricane was only rated at Category One strength at landfall, Hermine brought a historically high storm surge along the Apalachee Bay coastline, heavy rainfall from the Tampa Bay region northward to

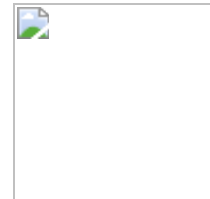


International Workshop on Coupled Data Assimilation seeks to improve weather and climate predictions and reanalyses

An International Workshop on Coupled Data Assimilation held October 19-21, 2016 was designed to facilitate the more rapid advance of development of coupled data assimilation methodologies to improve weather and climate predictions and reanalyses. [Eric Chassignet](#), Director of COAPS, attended the three day meeting, which covered methods for coupling of data assimilation methodologies between the atmosphere, ocean, land-surface, sea-ice, aerosols, atmospheric chemistry, and more, including weak coupling (coupling of the forecasts providing the background forecasts) and strong coupling (coupling of the state estimation as well). The workshop also considered which observations are particularly important to advance coupled assimilation. The workshop was sponsored by Météo-France, the World Meteorological Organization, the European Union ERA-CLIM2 FP7 project, the NOAA/Climate Program Office's Modeling, Analysis, Predictions and Projections (MAPP) Program, and US CLIVAR.

COAPS Alum is a 2016 Reubin O'D Askew Young Alumni Award Recipient

COAPS alumnus Michelle M. (Hite) Gierach has been selected by FSU to receive a 2016 Reubin O'D Askew Young Alumni Award. The Askew is the highest honor bestowed upon FSU's young alumni, and she will be honored along with five other recipients at the Young Alumni Awards event on November 12, 2016. Dr. Gierach, a 2006 graduate of the FSU meteorology department, is now a research scientist at the Jet Propulsion Laboratory, California Institute of Technology in Pasadena, CA where she leads the science activities at NASA's



the Big Bend region, and a widespread long-term power outage to Tallahassee and the surrounding area. Continuing an active period, a tropical wave was christened as Tropical Storm Julia over northeastern Florida on September 13, becoming the first named tropical cyclone in Florida's observational record to strengthen and entirely remain over land. The [Florida Climate Center](#) staff are undertaking a program of documenting weather and climate events of interest and impact in Florida and has published special reports about [Hermine](#), Julia and [Matthew](#). FCC staff will publish [future reports on its website](#). Anyone interested can follow the Center's [Facebook](#) and [Twitter](#) pages for news and updates.

Physical Oceanography Distributed Active Archive Center. Dr. Gierach is recognized nationally and internationally for her original and published research on the application of satellite observations, in situ data, and model simulations to study biophysical interactions, ecosystem dynamics, air-sea interactions, ocean dynamics, atmospheric processes, and the oceans relation to climate variability.

Student Achievements

[Heather Holbach](#) (Ph.D. student, Meteorology) successfully defended her dissertation in August and has begun her Northern Gulf Institute postdoctoral experience at the NOAA Atlantic Oceanographic and Meteorological Laboratory (AOML) Hurricane Research Division (HRD) in Miami, FL. She will be working with Frank Marks and Brad Klotz to investigate incidence angle and sea state impacts on Stepped-Frequency Microwave Radiometer (SFMR) surface wind speed measurements.



Education & Outreach

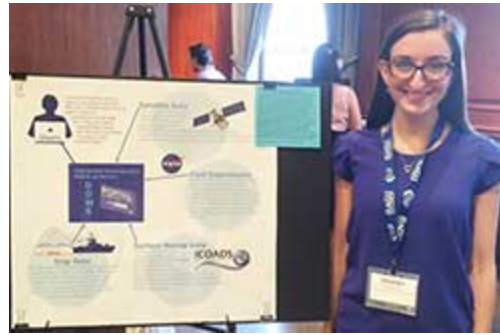


5th Annual Tallahassee Science Festival held at Lake Ella attracts largest crowds ever

At this year's [Annual Tallahassee Science Festival](#) COAPS was among the 117 exhibitors there to provide opportunities for the members of the general public to positively engage with and build a community around science, engineering, and technology. Nearly 6,000 people came out to enjoy this amazing, fun STEM experience. [Danny Brouillette](#) in the Office of the State Climatologist, along with COAPS graduate students Danielle Groenen, Erick Olvera-Prado, and John Steffen, manned a station that featured hands-on weather and climate demonstrations.

ESIP highlights research as art

The Federation of Earth Science Information Partners (ESIP) is an open, networked community that brings together science, data and information technology practitioners. The 2016 ESIP Summer Meeting featured a "Research as Art" event. The goal of "Research as Art" was to show how the ESIP community uses data, and the diversity of the work done by Federation members. The event allowed the ESIP community and members of the general public to learn about ESIP work in an engaging and easily accessible way. The COAPS Data Management Team accepted ESIP's invitation to submit a piece of visual media depicting their work. [See theirs and the other submissions.](#)



Jocelyn Elya attended the ESIP event, presenting the Distributed Oceanographic Match-Up Service (DOMS) "art" -- a visual representation of the DOMS project.

Recent Publications

COAPS authors are in **bold**.

Daneshgar Asl, S., **D.S. Dukhovskoy**, **M.A. Bourassa**, and I.R. MacDonald, 2016: Hindcast modeling of oil slick persistence from natural seeps, *Remote Sensing of Environment*, Accepted.

Dukhovskoy, D.S., et al. (2016), [Greenland freshwater pathways in the sub-Arctic Seas from model experiments with passive tracers](#), *J. Geophys. Res. Oceans*, 121, 877-907, doi:10.1002/2015JC011290.

Griffies, S. M., G. Danabasoglu, P.J. Durack, A.J. Adcroft, V. Balaji, C.W. Böning, . . . **E.P. Chassignet**, ... S.G. Yeager, 2016: [OMIP contribution to CMIP6: Experimental and diagnostic protocol for the physical component of the ocean model intercomparison project](#). *Geoscientific Model Development*, 9(9), 3231-3296. doi:http://dx.doi.org/10.5194/gmd-9-3231-2016

Hiester, H.R., **S.M. Morey**, **D.D. Dukhovskoy**, **E.P. Chassignet**, E.C., V. Kourafalou, and C. Hu, 2016: A topological approach for quantitative comparisons of ocean model fields to satellite ocean color data. *Methods in Oceanography*, In Press.

Kozar, M., **V. Misra**, and M. Powell, 2016: Hindcasts of Integrated Kinetic Energy in Atlantic Tropical Cyclones: A Neural Network Prediction Scheme. *Monthly Weather Review*, doi:10.1175/MWR-D-16-0030.1, In Press.

Mahalakshmi, D.V., A. Paul, D. Dutta, **M.M. Ali**, R.S. Reddy, C. Jha, J.R. Sharma, V.K. Dadhwal, 2016: [Estimation of net surface radiation from eddy flux tower measurements using artificial neural network for cloudy skies](#), *Sustainable Environment Research*, Volume 26, Issue 1, January 2016, Pages 44-50, ISSN 2468-2039, http://dx.doi.org/10.1016/j.serj.2015.09.002.

Misra, V., **A. Mishra**, and H. Li, 2016: [The Sensitivity of the Regional Coupled Ocean-Atmosphere Simulations over the Intra-Americas Seas to the prescribed bathymetry](#). *Dynamics of Atmospheres and Oceans*. DOI: 10.1016/j.dynatmoce.2016.08.007, In Press - Accepted

Özgökmen, T.M., **E.P. Chassignet**, C.N. Dawson, D. Dukhovskoy, G. Jacobs, J. Ledwell, **O. Garcia-Pineda**, I.R. MacDonald, **S.L. Morey**, M.J. Olascoaga, A.C. Poje, M. Reed, and J. Skancke, 2016: [Over what area did the oil and gas spread during the 2010 Deepwater Horizon oil spill?](#) *Oceanography* 29(3):96-107, http://dx.doi.org/10.5670/oceanog.2016.74.

Xu, X., P. Rhines, **E.P. Chassignet**, 2016: [Temperature-salinity structure of the North Atlantic circulation and associated heat and freshwater transports](#). *Journal of Climate*, 29(21), 7723-7742. DOI: 10.1175/JCLI-D-15-0798.1

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