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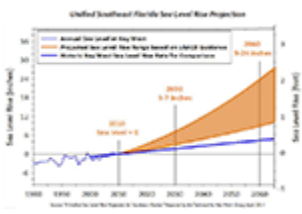
Fall 2015 Newsletter

COAPS Joins the Federation of Earth Science Information Partners

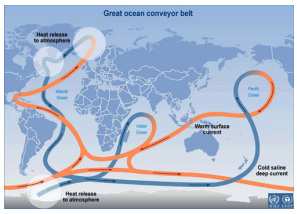
COAPS, which has a long history in marine data stewardship and provides user access to numerous data sets and products, is now a member of the Federation of Earth Science Information Partners (ESIP). ESIP brings together science, data, and information technology practitioners. Membership in ESIP allows COAPS scientists and technical personnel to engage an expert community with a focus on informatics and cyber infrastructure in the Earth Sciences. According to Shawn Smith, "It will also provide opportunities to collaborate with communities specializing in analytics, 'Big Data,' cloud computing, sematic web technology, controlled vocabularies and sematics, all of which will enable COAPS to enhance our data services to meet the evolving technical and communication environments employed by our data users." Learn more about ESIP.

Collaborative Research Leads to a More Accurate Parameter for Predicting Rainfall

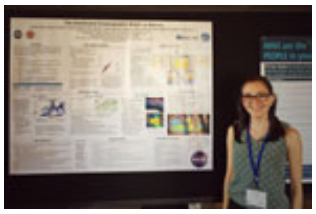
A collaborative project involving COAPS, the Indian Ministry of Earth Sciences and the Indian Department of Space, National Remote Sensing Centre has led to a new and more accurate parameter for forecasting the rainfall during a monsoon. Currently, the only oceanographic parameter applied in most of the monsoon forecasting models is Sea Surface Temperature (SST), which often does not represent the heat energy available to the atmosphere. The research team, including Drs. M.M. Ali and Mark Bourassa, studied the impacts of Ocean Mean Temperature (OMT), representing the heat energy of the upper ocean, and SST on the all India summer monsoon rainfall through a statistical relation during 1993-2013 and found that OMT has a better link than SST. Read more.



Florida Water Managers Add Climate Change to



Process-Oriented Evaluation of Climate



Oceanographic Data Match-up Service

Long List of Challenges

The most recent issue of the *Climate Change Business Journal* features commentary by Dr. Vasu Misra about the issue of sea level rise. "Sea level rise is the biggest problem for Florida water managers. They are very, very concerned about the current levels of intrusion of seawater into their groundwater wells and how that may increase in the future." Misra shared. The article covers topics such as natural variability vs. climate change, planning for growth, and discusses some of the collaborative research efforts between utilities and universities such as Florida State and the University of Florida.

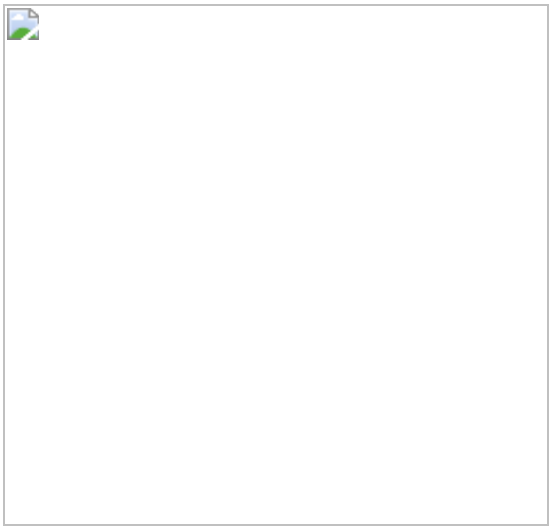
and Earth System Models and Derived Projections

A project recently funded by the NOAA Climate Program Office will allow COAPS, in collaboration with scientists at the Atlantic Oceanographic and Meteorological Laboratory (AOML/NOAA), to evaluate the oceanic thermohaline structure and the dynamical properties of the meridional overturning circulation in the Atlantic Ocean. "Our intent is to develop and demonstrate better diagnostics or metrics for evaluating and understanding the meridional circulation in the latest Coupled Model Intercomparison Project (CMIP5)," according to the Dr. Xiaobiao Xu.

Presented at ESIP

COAPS was represented at the ESIP Summer Meeting in July by **Ms. Jocelyn Elya** who presented a poster on the Distributed Oceanographic Match-up Service (DOMS), a two-year collaborative effort between COAPS, the Jet Propulsion Laboratory, and the National Center for Atmospheric Research. DOMS will support web-based queries to collocate in situ and satellite observations in support of satellite calibration/validation studies, evaluation of in situ data quality, planning for future field experiments, and a range of user-specific research projects.

NOAA Award will Further Refinements to SFMR Wind Measurements in Hurricanes



Surface wind speed observations from stepped-frequency microwave radiometers (SFMR) are a primary tool for aircraft reconnaissance-based estimates of hurricane intensity and size, both of which are critical for forecasting coastal wind and water impacts from land-falling storms. Currently, observations are limited to when data are acquired directly below the aircraft, where the impacts of surface wind and wave directions are minimal. To enhance instrument capabilities for more general use when aircraft are not flying straight-and-level, the surface directional impacts must be understood and quantified in high wind conditions, which is currently an active research topic. **Ms. Heather Holbach**'s research project for her Ph.D. dissertation has been to develop physical and empirical relationships between high-incidence angle microwave brightness temperatures, surface wind speed and direction, and surface directional wave spectra in the hurricane inner core at high wind speeds. Results will have applications beyond the SFMR to the next-generation Hurricane Imaging Radiometer, currently in testing to extend SFMR wind speed observation capability to a wide swath covering a much larger portion of the hurricane. A proposal submitted to NOAA by Dr. Mark Bourassa was recently awarded that will support Ms. Holbach as a post-doc after her graduation in the spring so she can pursue this research further.

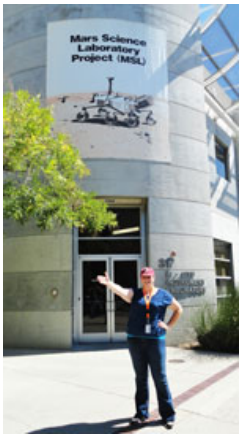
Student Achievements

Danielle Groenen, PhD in Student Meteorology, received a three-year NASA Earth and Space Science fellowship to pursue her PhD. The purpose of NASA Earth and Space Science Fellowships (NESSF) is to ensure continued training of a highly qualified workforce in disciplines needed to achieve NASA's scientific goals. Ms. Groenen's application, entitled "Mid-Summer Droughts Amidst Landfalling Tropical Cyclones and Atmospheric Rivers" was among a select group. As communicated in her award letter "Many of the previous recipients of the NASA Earth System Science (ESS) Fellowship Program since 1990 have emerged as leaders in our community. Thus, being selected for an NESSF award is a real mark of distinction."

John Steffen, MS student in Meteorology, recently completed a 10-week summer Naval Research Enterprise Internship Program (NREIP) at NRL-Monterey. He worked on several different topics/projects related to air-sea interactions within Tropical Cyclones (TC). Mr. Steffen's main project focused on the effect upper-ocean stratification has on turbulent mixing and SST cooling during a TC passage. He also assisted Dr. Sue Chen in the Mesoscale Modeling section in implementing and monitoring the coupled COAMPS-TC model for operations in 2015/2016. In addition, Hurricane Blanca (EP02) provided a unique test case for studying coupled air-sea-wave interactions within a modeling framework.

Wx Challenge

Kudos to **Heather Holbach** (PhD. Student, Meteorology) and **Mike Kozar** (former PhD student/recent graduate, Meteorology) who participated in the national Wx Challenge forecasting competition. The North American



Rachel Weihs, PhD Student in Meteorology, is currently completing a Summer Internship at the Jet Propulsion Laboratory in Pasadena, CA where she has been analyzing the coupling using the Weather Research and Forecast Model (WRF) and comparing directly with sea surface temperatures that are provided through the Physical Oceanography Distributed Active Center (PO.DAAC). Such data sets include those derived from the Geostationary Operational Environmental Satellite (GOES) as well as the NASA Multi-Scale Ultra High Resolution Sea Surface Temperature Data Set (MUR). The research topic addresses the issue of how the ocean and the atmosphere interact at the daily or diurnal time scales. The area Ms. Weihs is focusing on is how changes in the spatial gradients formed by heated sea surface temperature over the course of the day drives changes in the atmosphere. This research has the potential to improve weather forecasts by incorporating improved satellite remote sensing products and to lead to better understanding of how the diurnal cycle influences long term changes in climate.

Congratulations graduates!

Kyle Ahern completed his MS in Meteorology and will continue his research with Dr. Bourassa at FSU.

Matt Clark completed his MS in Meteorology.

Aaron Kemmer completed his BS in Computer Science and will be starting an MS in Computer Science at FSU this fall.

Chris Selman completed his PhD in Meteorology. He is joining Center for Ocean-Land-Atmosphere Studies in George Mason University, Fairfax, VA as a post-doc working on ENSO predictability.

collegiate weather forecasting competition took place from September 2014 to May 2015. Ms. Holbach received the Category 2 Runner-Up award for the two-week forecast for Caribou, ME. She finished 14th overall (out of 1367 forecasters) for the year and made it to the Elite 8 in the tournament. Mr. Kozar received the Overall Winner award for the two-week forecast for Springfield, IL. He finished 22nd overall for the year and made it into the tournament as well. Learn more about the WxChallenge.

Aaron Swearingen completed his BS in Meteorology and will be attending FSU to obtain his MS in Meteorology. He will be conducting fog climatology research with Prof. Ray at FSU.

Lauren Zuromski completed her BS in Meteorology and will be attending the University of Utah in Salt Lake City for her MS in Meteorology with honors in the major.

COAPS in the Community

Girls Investingating Science Day

COAPS Co-sponsors a "Girls Investigating Science" (GIS) Day

On Saturday, May 9th, FSU Coastal and Marine Lab hosted 20 girls selected to participate in the COAPS Girls Investigating Science (GIS) Day. The girls had the chance to hear from and work alongside scientists. They collected samples and analyzed scientific data from the coastal ecosystem and its inhabitants to see how they are affected by weather and water conditions. See photos from the event.

Elementary School "Late Night Library"

Assistant State Climatologist Melissa Griffin took part in a Late Night Library event at a local area elementary school. The after school event held in May focused on science in action, and Ms. Griffin was on hand talking about Hurricane Preparedness, demonstrating the power of wind, and explaining how clouds form.

"An Ocean of Reading" Summer Reading Academy

Dr. Kat Maksimova presented a physical oceanography lab as part of the Summer Reading Academy hosted by Grace Mission in Tallahassee, FL. The Academy is an annual event for children ages 6-12,that includes fun and educational outings. This year's events took place July 20-31, with "An Ocean of Reading" as the theme. Grace Mission helps reach out to the underemployed, the homeless, poor, and others in the community.

In Honor of Dr. James J. O'Brien...

Students, colleagues and friends gathered earlier this month for an evening of memories and merriment in honor of Dr. James J. O'Brien's 80th birthday. Attendees traveled near and far, and included many of Dr. O'Brien's former students. One of the many highlights of the event was the presentation of a plaque to Dr. O'Brien by Dr. Ruth Preller of the Naval Research Academy. The plaque commemorated many of Dr. O'Brien's

collaborations over the past four decades and who expressed their appreciation for his expertise and mentorship.

(Back Row, L-R) Steve Morey, John Kindle, Gernana Peggion, Ole Martin Smedstad, Tony Busalacchi.
(Front) Ruth Preller and Jim O'Brien

Recent Publications

*COAPS authors are in **bold**.*

Ali, M.M., P.V. Nagamani, N. Sharma, R.T. Venu Gopal, M. Rajeevan, G.J.Goni and **M.A. Bourassa**, 2015: Relationships Between Ocean Mean Temperatures and Indian Summer Monsoon Rainfall. Atmospheric Science Letters. 16, 408-413. doi: 10.1002/asl2.576

Bastola, S., and **V. Misra**, 2015. Seasonal hydrological and nutrient loading forecasts for watersheds over the Southeastern United States, Environmental Modelling and Software, in press.

Brassington, G.B., M.J. Martin, H.L. Tolman, S. Akella, M. Balmaseda, C.R.S. Chambers, **E.P. Chassignet**, J.A. Cummings, Y. Drillet, P.A.E.M. Janssen, P. Laloyaux, D. Lea, A. Mehra, I. Mirouze, H. Ritchie, G. Samson, P.A. Sandery, G.C. Smith, M. Suarez, and R. Todling, 2015. Progress and challenges in short- to medium-range coupled prediction. J. Oper. Oceanogr., in press.

Brzezinski, M. A., J.W. Krause, R.M. Bundy, K.A. Barbeau, P. Franks, R. Goericke, M.R. Landry, **M.R. Stukel.** (2015). Enhanced silica ballasting from iron stress sustains carbon export in a frontal zone within the California Current. Journal of Geophysical Research: Oceans. 120(7): 4654-4669 doi: 10.1002/2015JC010829

Cammarano, D., **D. Zierden**, **L. Stefanova**, S. Asseng, **J.J. O'Brien**, J. W. Jones, 2015. Using historical climate observations to understand future climate change crop yield impacts in the Southeastern US, Climatic Change, accepted.

Downes, S.M, R. Farneti, P. Uotila, S.M. Griffies, S.J. Marsland, D. Bailey, E. Behrens, M. Bentsen, D. Bi, A. Biastoch, C. Böning, A. Bozec, V.M. Canuto, **E.P. Chassignet**, G. Danabasoglu, S. Danilov, N. Diansky, H. Drange, P.G. Fogli, A. Gusev, A. Howard, M. Ilicak, T. Jung, M. Kelley, W.G. Large, A. Leboissetier, M. Long, J. Lu, S. Masina, A. Mishra, A. Navarra, A.J.G. Nurser, L. Patara, B.L. Samuels, D. Sidorenko, P. Spence, H. Tsujino, Q. Wang, and S.G. Yeager, 2015. An assessment of Southern Ocean water masses and sea ice during 1988-2007 in a suite of inter-annual CORE-II simulations. Ocean Modelling, in press.

Dukhovskoy, D.S., R.R. Leben, **E.P. Chassignet**, C. Hall, **S.L. Morey** and **R. Nedbor-Gross**, 2015. Characterization of the uncertainty in the Gulf of Mexico loop current description using a multidecadal numerical simulation and altimeter observations. Deep-Sea Res., in press.

Dukhovskoy, D.S., J. Ubnoske, E. Blanchard-Wrigglesworth, **H.R. Hiester**, A. Proshutinsky, 2015. Skill metrics for evaluation and comparison of sea ice models. J. Geophysical Res. - FAMOS special issue, in press.

Farneti, R., S.M., Downes, S.M., Griffies, S.J., Marsland, E.Behrens, M. Bentsen, D. Bi, A., Biastoch, C. Boning, **A. Bozec,** V.M. Canuto, **E. Chassignet,** G. Danabasoglu, S. Danilov, N. Diansky, H. Drange, P.G. Fogli, A. Gusev, R.W. Hallberg, A. Howard, M. Ilicak, T. Jung, M. Kelley, W.G. Large, A. Leboissetier, M. Long, **J. Lu,** S. Masina, **A. Mishra,** A. Navarra, A.J.G. Nurser, L. Patara, B.L. Samuels, D. Sidorenko, H. Tsujino, P. Uotila, Q. Wang, S.G. Yeager, 2015. An assessment of Antarctic Circumpolar Current and Southern Ocean Meridional Overturning Circulation during 1958-2007 in a suite of interannual CORE-II simulations, Ocean Modelling, doi: 10.1016/j.ocemod.2015.07.009

Jones, C.S., C. Cenedese, **E.P. Chassignet**, P.F. Linden, and B.R. Sutherland, 2015. Gravity current propagation up a valley. J. Fluid Mech., 762, 417-434, doi:10.1017/jfm.2014.627.

Krause, J.W., **M.R. Stukel,** A.G. Taylor, D.A. Taniguchi, A. De Verneil, M.R. Landry, 2015 Net biogenic silica production and the contribution of diatoms to new production and organic matter export in the Costa Rica Dome ecosystem. Journal of Plankton Research, in press.

Misra,V. and S. Bastola, 2015. Reconciling droughts and landfalling tropical cyclones in the Southeastern United States, Climate Dynamics, May 2015. doi: 10.1007/s00382-015-2645-7

Paget, A., **M.A. Bourassa**, and M.D. Anguelova, 2015. Comparing in situ and satellite-based observations of oceanic whitecaps. J. Geophys. Res. doi: 10.1002/2014JC010328

Proshutinsky, A., **D. Dukhovskoy**, M.-L. Timmermans, R. Krishfield, J. Bamber, 2015. Arctic circulation regimes. Philosophical Transactions Royal Society A, in press.

Nguyen, T.T., S.L. Morey, D.S. Dukhovskoy, and **E.P. Chassignet**, 2015. Non-local impacts of the Loop Current on cross-slope near-bottom flow in the northeastern Gulf of Mexico. Geophys. Res. Lett., 42, doi:10.1002/ 2015GL063304.

Selph, K. E., M.R. Landry, A.G. Taylor, A. Gutierrez-Rodriguez, **M.R. Stukel**, J. Wokuluk, A. Pasulka, 2015. Phytoplankton production and taxon-specific growth rates in the Costa Rica Dome. Journal of Plankton Research, in press.

Stukel, M.R., E. Asher, N. Couto, O. Schofield, S. Strebel, P. Tortell, H. W. Ducklow, 2015. The imbalance of new and export production in the Western Antarctic Peninsula, a potentially "leaky" ecosystem. Global Biogeochemical Cycles, in press.

Sura, P. and A. Hannachi, 2015. Perspectives of Non-Gaussianity in Atmospheric Synoptic and Low-Frequency Variability. J. Climate, 28, 5091-5114. doi: 10.1175/JCLI-D-14-00572.1

Xu, X., P. B. Rhines, **E.P. Chassignet**, and W.J. Schmitz Jr., 2015. Spreading of the Denmark Strait overflow water in the western subpolar North Atlantic: Insights from eddy-resolving simulations with a passive tracer, J. Phys. Oceanography, doi: 10.1175/JPO-D-14-0179.1, accepted.

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