

MICHELLE M. IRIZARRY - ORTIZ

FLORIDA PE # 65052

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OBJECTIVE

A challenging technical lead position that would give me the opportunity to grow professionally by applying research and engineering skills toward the conservation and development of sustainable environments.

EXPERIENCE

- 2018 Research Affiliate, Sea Level Solutions Center at Florida International University Miami, FL
- Working on various projects and research proposals with the Sea Level Solutions Center at Florida International University. A key project involves performing groundwater modeling and analyzing predicted changes in extreme precipitation for Miami-Dade County as a result of climate change and sea level rise in order to determine whether revisions to the Florida Building Code for the county may be necessary.
- 2017-2018 Owner-Continuity H2O, LLC Engineering Consulting Firm Orlando, FL
- Florida Board of Professional Engineers Certificate of Authorization # 32069
 - Contracted by the SFWMD to extend the period of record of their in-house regional-scale models. The work consists of running sub-regional and basin-scale models and tidal prediction software to develop boundary condition data for the main models, QA/QC of historical data, editing model input files to reflect baseline assumptions, post-processing, and interpretation of modeling results.
- 2016 Engineering Consulting Orlando, FL
- Expertise in development of precipitation depth-duration-frequency curves under climate change through contract with the SFWMD.
 - Expertise in development of Lake Okeechobee boundary inflows under climate change using the MCRAM model through contract with the SFWMD.
- 2001-2011 South Florida Water Management District West Palm Beach, FL (SFWMD)
- Lead Engineer, 2008-2011; Senior Engineer/Hydrologic Modeler, 2005-2008; Staff Hydrologic Modeler, 2003 - 2005; Engineer, 2001-2003*
- Expertise in applying the South Florida Water Management Model (SFWMM) in support of various regional planning projects. Extensive experience in developing model input files, applying pre and post-processing utilities, interpreting performance measure output and communicating modeling results to stakeholders. Some experience with analysis and interpretation of the SFWMM code.
 - Expertise in development of pre and post-processing utilities and performance measures for the SFWMM using C-shell scripting, C, FORTRAN and xmgr/grace. This work included automating and documenting habitat suitability indices as part of the SFWMM post-processing.
 - Lead the conceptual design of SFWMM web-based performance measure viewer (PMViewer).
 - Lead the development and implementation of Management Simulation Engine (MSE) capabilities in the Regional Simulation Model (RSM). This work involved extensive code development for RSM.
 - Expertise in applying RSM at various scales in support of planning projects including Biscayne Bay Coastal Wetlands, C-111 Spreader Canal, Northern Everglades Technical Plan, and River Watershed Protection Plan. Experience includes using pre and post-processing utilities and PEST for auto-calibration.
 - As a member of the District's Emergency Modeling Team provided modeling support to guide operations during and after emergency activations.
 - Technical expert reviewer of internal and external engineering and modeling products.
 - Lead efforts to develop reference evapotranspiration datasets for long-term hydrologic modeling.

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- Member of team tasked with assessing the vulnerability of the South Florida water management system to climate change. Work products include assessment of GCM/RCM skill in simulating the climate of Florida, and analysis of historical trends in Florida climate data. Papers, presentations and other technical publications developed based on this work.

2006-2008 Testmasters Fort Lauderdale, FL
Civil Engineering PE Instructor

- Taught review course on Hydrology, Groundwater and Wells to a group of 60+ Civil PE candidates.

1999 University of Puerto Rico, Mayaguez Campus Mayagüez, PR
Service contract

- Redesigned the Civil Engineering Department website.
- Developed a program and GUI for basin-scale hydrologic routing using MATLAB.

EDUCATION

2001 Massachusetts Institute of Technology Cambridge, MA
Master of Science in Civil and Environmental Engineering – Hydrology GPA 5.0/5.0

- MIT Provost's Women/Minority Graduate Fellowship, 1999-2000.
- Research Topic: "A Study on the Climate of West Africa during the Middle Holocene Using a Zonally Symmetric Biosphere-Atmosphere Model."

1999 University of Puerto Rico, Mayagüez Campus Mayagüez, PR
Bachelor of Science in Civil Engineering Magna Cum Laude GPA 3.98/4.00

- Recipient of the Associated General Contractors of America Partnering Undergraduate Scholarship, 1998.
- Etienne Totti Award for highest GPA of Civil Engineering Department, 1999.

1997, 1998 Massachusetts Institute of Technology Cambridge, MA
MIT Summer Research Program

VOLUNTEERING

- Reviewer for USACE's Journal of Hydrologic Engineering (2006-2010); Volunteering for various environmental organizations such as Moms Clean Air Force, Climate Reality, Citizens Climate Lobby, and Green for All.

SKILLS

- General: Fully bilingual (English/Spanish); Excellent written and oral communication skills.
- Programming: Proficient in Windows and Unix/Linux environments, FORTRAN, C/C++, C-shell scripting, MATLAB/Octave, R, EXCEL VBA macros and EXCEL Solver, HEC-DSS, NetCDF, XML, version control with SVN/CVS, and code debugging.
- Modeling/Autocalibration: Extensive experience with the South Florida Water Management Model, the Regional Simulation Model and PEST for auto-calibration; Some experience with DHI Suite (MIKE-11, MIKE-21, MIKE-FLOOD, MIKE-SHE), AFSIRS, MODFLOW, HEC-RAS, HEC-HMS.
- Statistics: Bayesian Statistics, Trend Analysis, Changepoint Analysis, Non-parametrics, Extreme Value Analysis and Depth-Duration-Frequency Curve Generation
- Other: Congressional lobbying; Op-ed writing; Expertise with SFWMD's DBHydro database; Proficient at data and model QA/QC; Proficient in Microsoft Office; Extensive experience with ArcView/ArcGIS/QGIS; Experience with Utide (Unified tidal analysis and prediction).

AWARDS

- SFWMD May 2007 Employee of the Month for Calibration of RSM Model for Biscayne Bay Coastal Wetlands
- Member of the December 2008 SFWMD Team of the Month for Modeling in Support of Northern Everglades Technical Plan

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- Member of the 2008 SFWMD Team of the Year for Modeling in Support of Northern Everglades Technical Plan
- Member of the August 2011 SFWMD Team of the Month for Modeling in Support of C-4 Flood Control Operations Modeling Project

PEER-REVIEWED JOURNAL PUBLICATIONS

- Irizarry-Ortiz M. M., Wang G., Eltahir E. A. B. "Role of the Biosphere in the mid-Holocene Climate of West Africa." *J. Geophys. Res. – Atmos.*, 108(D2), 4042, 2003.
- Irizarry-Ortiz M., Obeysekera J., Park J., Trimble P., Barnes J., Park-Said W., Gadzinski E. "Historical Trends in Florida Temperature and Precipitation." *Hydrol. Process* 27, 2225-2246, 2013.
- Obeysekera J., Irizarry M., Park J., Barnes J., Dessalegne, T. "Climate Change and its Implications for Water Resources Management in South Florida." Accepted by *Stoch. Environ. Res. Risk Assess.*, 2010.
- Obeysekera J., Park J., Irizarry-Ortiz M., Barnes J., Trimble P. "Probabilistic Projection of Mean Sea Level and Coastal Extremes." Submitted to *Journal of Waterway, Port, Coastal, and Ocean Engineering*, 2011.
- Park J., Obeysekera J., Irizarry-Ortiz M., Barnes J., Park-Said W., Technical Note: "Climate Links and Variability of Extreme Sea Level Events at Key West, Pensacola, and Mayport, Florida." *J. Waterway, Port, Coastal, and Ocean Engrg.*, URL [http://dx.doi.org/10.1061/\(ASCE\)WW.1943-5460.0000052](http://dx.doi.org/10.1061/(ASCE)WW.1943-5460.0000052), accessed May 12 2010, in-press.
- Park J., Obeysekera J., Irizarry M., Barnes J., Trimble P., Park-Said W., "Storm Surge Projections and Implications for Water Management in South Florida." *Climatic Change* 107:109-128, 2011.
- Yeh P. J. F., Irizarry M., Eltahir E A B. "Hydroclimatology of Illinois: A Comparison of Monthly Evaporation Estimates Based on Atmospheric Water Balance and Soil Water Balance." *J. Geophys. Res.- Atmos.* 103(D16) 19823-19837, 1998.

OTHER PUBLICATIONS

- Abteu W., Obeysekera J., Irizarry-Ortiz M., Lyons D., and Reardon A. "Evapotranspiration Estimation for South Florida.", EWRI Symposium on integrated surface and groundwater modeling, ASCE, June 22, 2003.
- Barnes J.A., Irizarry-Ortiz M. M., Park Said W., Obeysekera J. "Potential Impacts of Climate Change on Everglades Ecosystem", AGU 2008 Joint Assembly Meeting, Ft. Lauderdale, Florida, May 27-30, 2008.
- Dessalegne T., Irizarry M., Obeysekera J. "Future Rainfall Depth-Duration-Frequency Curve Estimates Under Various Climate Change Scenarios", Greater Everglades Ecosystem Restoration Conference, Coral Springs, Florida, Apr. 17-20, 2017.
- Irizarry M. M., Wang G., Eltahir E., "A Study on the Climate of West Africa During the Middle Holocene Using a Zonally Symmetric Biosphere-Atmosphere Model (ZonalBAM)", *Eos Trans. AGU*, 81(48), Fall Meet. Suppl., 2000.
- Irizarry-Ortiz M., Tarboton, K. C., Obeysekera J., Lyons, D. "Long-Term Reference Evapotranspiration and Solar Radiation Estimation Methods for Hydrologic Modeling in South Florida.", Joint Conference on the Science and Restoration of the Greater Everglades and Florida Bay Ecosystem - "from Kissimmee to the Keys", Palm Harbor, Florida, April 13-18, 2003.
- Irizarry-Ortiz M., Novoa R., Park J., Santee R., and Zheng F. "Development of Water Supply and Flood Control Assessors for the Lower East Coast Service Area in South Florida", 2006 AWRA Summer Specialty Conference – Adaptive Management of Water Resources, Missoula, Montana, June 26-28, 2006.

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- Irizarry-Ortiz M., Novoa R., Park J., Santee R., and Zheng F. "Application of Water Supply and Flood Control Assessors in the Regional Simulation Model to a Miami-Dade County Testbed", 2006 AWRA Summer Specialty Conference – Adaptive Management of Water Resources, Missoula, Montana, June 26-28, 2006.
- Irizarry, M., Obeysekera J., Park, J., VanZee R. "MSE Network: An integrated database and stream flow network representation in the Regional Simulation Model (RSM)", Third Federal Interagency Hydrologic Modeling Conference, Reno, Nevada, April 2-6, 2006.
- Irizarry-Ortiz M. M., Obeysekera J. T., Ali A. E., Trimble P., Newton T., Brown M. C., Tarboton K. T., Park-Said W., Trimble B. "Estimation of Long-Term Reference Evapotranspiration from Regional Climate Model Datasets", EWRI 2007 World Environmental & Water Resources Congress, ASCE, Tampa, Florida, May 15-19, 2007.
- Irizarry-Ortiz M. M., Barnes J. A., Dessalegne-Agaze T., Trimble P., Obeysekera J. T. "TI: Climate Change Vulnerability Assessment for Water Resources Planning in South Florida", AGU 2008 Joint Assembly Meeting, Ft. Lauderdale, Florida, May 27-30, 2008.
- Irizarry-Ortiz M. M., Obeysekera J., Gadzinski E. "Historical Trends in Florida Temperature and Precipitation", 2nd University of Florida Water Institute Symposium Gainesville, FL, February 24-26, 2010.
- Irizarry M., Dessalegne T., Obeysekera J. "Assessment of Future Depth-Duration-Frequency Curve Development under Climate Change for the State of Florida", EWRI 2017 World Environmental & Water Resources Congress, ASCE, Sacramento, California, May 21-25, 2017.
- Irizarry M., Obeysekera J., Dessalegne, T. "Determination of Future Intensity-Duration-Frequency Curves for Level of Service Planning Projects", Technical Report, SFWMD, West Palm Beach, FL, 2016.
- Loucks D. P., Obeysekera J., Tarboton K. T., Davis S. M., and Irizarry-Ortiz M. "Linking Hydrology to Ecology for Water Management in the Everglades", 7th International Wetlands Conference, INTECOL, Utrecht, NL, June 26-30, 2004.
- Lyons D., Irizarry-Ortiz M., Correa H., Bologna, L. "Data Issues in Computing Long-Term Reference Evapotranspiration for Hydrologic Modeling", Joint Conference on the Science and Restoration of the Greater Everglades and Florida Bay Ecosystem - "from Kissimmee to the Keys", Palm Harbor, Florida, April 13-18, 2003.
- Obeysekera J., Irizarry M., Park J., Barnes J., Dessalegne, T. "Climate Change Assessment for Water Management of Water Resources in South Florida, USA." World City-Water Forum 2009, Incheon, Korea, August 18-21, 2009.
- Obeysekera J., Irizarry M., Park J., Barnes J., Said W., Trimble P., Dessalegne T. "Water Resources Management in a Changing Climate", 2nd University of Florida Water Institute Symposium Gainesville, FL, February 24-26, 2010.
- Obeysekera J., Irizarry-Ortiz, M. M., Abteu W., Park J., Barnes J. A., Trimble P. "Assessment of Precipitation Projections and Derived Estimates of Evapotranspiration from NARCCAP models for Water Resources Applications in Florida.", AGU Fall 2010 Meeting.
- Obeysekera J., Park J., Irizarry-Ortiz M. M., Barnes J. A., Trimble P., Said, W. "Challenges in Projecting Sea Level Rise impacts on the Coastal Environment of South Florida.", AGU Fall 2010 Meeting

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- Park J., Barnes J., Obeysekera J., Irizarry M., Park-Said W. "Regional Climate Teleconnections to Extreme Tidal Levels for Water Management Planning in South Florida", 2nd University of Florida Water Institute Symposium Gainesville, FL, February 24-26, 2010.
- Park J., Barnes J., Obeysekera J., Irizarry M., Park-Said W.W. "Florida Extreme Statistics for Water Management Planning", Predicting the Climate Of the Coming Decades, CLIVAR, Miami, FL, January 11-14, 2010.
- Tarboton K. C., Irizarry-Ortiz M., Davis S. M., Obeysekera J., Loucks, D. P., "Habitat Suitability Indices for Linking Hydrology to Ecology.", Joint Conference on the Science and Restoration of the Greater Everglades and Florida Bay Ecosystem - "from Kissimmee to the Keys", Palm Harbor, Florida, April 13-18, 2003.
- Tarboton K. C., Irizarry-Ortiz M. M., Davis S. M., Obeysekera J. T., Loucks, D. P., "Habitat Suitability Indices for Evaluating Alternative Water Management Strategies", Joint Conference on the Science and Restoration of the Greater Everglades and Florida Bay Ecosystem - "from Kissimmee to the Keys", Palm Harbor, Florida, April 13-18, 2003.
- Tarboton K. C., Irizarry-Ortiz M. M., Loucks D. P., Davis S. M., Obeysekera J. T. "Habitat Suitability Indices for Evaluating Water Management Alternatives." Office of Modeling Technical Report. South Florida Water Management District, West Palm Beach, Florida, December, 2004.
- Tarboton K. C., Irizarry M., Saari K. D., Rodberg K. A., "Data-Driven Web Application for Access and Review of CERP System-Wide Modeling", Joint Conference on the Science and Restoration of the Greater Everglades and Florida Bay Ecosystem - "from Kissimmee to the Keys", Palm Harbor, Florida, April 13-18, 2003.
- Tarboton K. C., Irizarry-Ortiz M., Davis S. M., Obeysekera, J., Loucks D. P., "Managing Water to Restore Natural Habitats: Some Experiences in the Everglades", Frontiers in Assessment Methods for the Environment Symposium, University of Minnesota, August 10, 2003.
- Wang G., Eltahir E. A. B., Irizarry-Ortiz M. M., "Drought Occurrence in West Africa: Role of Vegetation Dynamics." Intergovernmental Panel on Climate Change, Drought Implications Workshop. November 18-21, 2003.