

## Rafael Muñoz-Carpena

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### Education

1993, Ph.D., Biological and Agricultural Engineer (Water Resources), North Carolina State University  
1989, B.A./MSc, Agricultural Engineering, Universidad Politécnica de Madrid (Spain)

### Professional Record

2019 – 2020 (Sabbatical) Resident Distinguished Professor, Public U. of Navarre, Spain  
2018 Interim Chair, Agricultural & Biological Engineering, University of Florida  
2011 Professor, Agricultural & Biological Engineering, University of Florida  
2010-2011 Professor in Residence, CEMAGREF (now Irstea), Lyon, France  
2006-2011 Associate Professor, Agricultural & Biological Engineering, University of Florida  
2001-2006 Assistant Professor, Agricultural & Biological Engineering, University of Florida  
2000-2001 Tenured Researcher, Canary Islands Agricultural Research Institute, Spain  
1993-2000 Engineering Researcher, Canary Islands Agricultural Research Institute, Spain  
1994-2001 Adjunct Professor, University of La Laguna, Spain  
1989-1993 Research Assistant, Biological and Agricultural Engineering, North Carolina State University

### Research Interests

Hydrology, Water quality, Environmental modeling, Vegetation riparian buffers, Surface water pollution mitigation, Global sensitivity and uncertainty analysis, Biocomplexity engineering

### Awards & Honors

2022 John Deere National Gold Medal, ASABE (American Society of Agricultural and Biological Engineers)  
2021 North Carolina State University CALS Outstanding Alumnus Award  
2020 AAAS Fellow (American Association for the Advancement of Science)  
2018 UF/IFAS Award of Excellence for Graduate Research: Best Doctoral Dissertation Advisor, Dr. Natalie Nelson  
2018 ASABE Standards Development Award, EP621 Jun2017 Guidelines for Calibrating, Validating and *Evaluating Hydrological and Water Quality Models*  
2017-2020 University Term Professor  
2017 UF/IFAS Award of Excellence for Graduate Research: Best Doctoral Dissertation Advisor to Dr. Natalie Nelson, *Quantifying the spatiotemporal importance of fresh-brackish water quality drivers using data analytics and models*.  
2017 UF/IFAS High Impact Research Publication Award. Science Adv. (AAAS), doi: 10.1126/sciadv.1601272  
2017 Web-of-Science (Clarivate) “Highly Cited Paper”, top 1% of Agricultural Science, for papers DOI: 10.1016/j.agsy.2016.05.014 and DOI: 10.1016/j.agsy.2016.09.021  
2016 UF Postdoc Mentoring Award, UF Office of Postdoctoral Affairs.  
2016 FL-ASABE Distinguished Achievement Award  
2015 Corresponding Member of the Royal Academy of Engineers of Spain, <http://www.raing.es/en>  
2015 Fellow of ASABE (American Society of Agricultural and Biological Engineers)  
2015 ASABE ADS/Hancor Soil Water Engineering National Award.  
2017 Web-of-Science (Clarivate) “Highly Cited Paper”, top 1% of Engineering, for paper DOI: 10.1016/j.jhydrol.2012.12.004  
2013 Fellow of UF Water Institute Faculty  
2013 National Postdoctoral Association (NPA) Mentoring Award  
2013 International Educator of the Year Award, UF/IFAS  
2013 Best Paper Award, Environmental Water Resources Institute (EWRI), ASCE..  
2011 University of Florida Research Foundation Professor

- 2009 Junior Faculty Award of Merit, Gamma Sigma Delta.
- 2009 Special Recognition Award, FL Section of the ASABE.
- 2008 UF/IFAS International Achievement Award
- 2008 UF International Center International Educator Award,
- 2008 UF/IFAS LEAD certificate
- 2008 UF/CALS Teacher's College certificate
- 2003 USDA-Foreign Agricultural Service Certificate of Appreciation
- 1999 Paper of ASAE Award, Hydrology Mini-Symposium
- 1989-1993 Doctoral Fellow, Fulbright bilateral commission INIA-USDA

### Teaching & Course Instruction

#### Undergraduate Courses

ABE 3212C *Land & Water Resources Engineering* (Spring), 4 ct.

#### Graduate Courses

- ABE 6254 *Simulation of Agricultural Watershed Systems* (Fall alt., years), 3 ct.
- ABE 6265 *Vadose Zone Water & Solute Transport Modeling* (Summer, alt. years), 3 ct.
- ABE 5643C *Biological Systems Modeling* (Fall), 3 ct. (co-taught with 2 other). Modules: a) Model Evaluation and testing- FITEVAL; b) Global sensitivity and Uncertainty Analysis-GSA
- ABE 6933 *Advanced Biosystems Modeling* (Spring), 3 ct. (co-taught with 2 other). Modules: a) High Performance Computing-HPC; b) HPC for Global Sensitivity and Uncertainty Analysis-GSA

#### External invited courses

- Oct. 2021 – “Evaluation of environmental models: FITEVAL and GSUA”, Program of Doctoral Excellence eAi3, U. of Cordoba (Spain) (also taught in 2019, 2017)
- Mar. 2018 – “*PWC-VFSMOD User Training*” (5 hrs). US EPA, Washington DC, March 28.
- Oct. 2017 – “*Global Sensitivity and Uncertainty Analysis of Environmental Models*”. Invited Seminar and Workshop (5 hrs) at Université Catholique Louvain (Belgium)
- Oct. 2015 – “*Objective evaluation of model fitness and importance factor assessment.*” (12 hrs.). International Master's Program CeiA3 - Univ. Cordoba, Spain
- Dec. 2011 – “*Modelling groundwater pollution of pesticides with PEARL and vegetative strip modelling with VFSMOD*” (3 hrs.). ADVANCED RESEARCH WORKSHOP: Modelling agrochemical pollution of water systems. 29 March 2011. ENVITAM.org. Université Catholique de Louvain, Belgium.
- Jun. 2010 – “*Korea AG-BMP Forum, KAB-2 International Conference, AG-BMP Development for Reservoir Water Quality Improvement*”, 15-16 June 2011, Hoam Faculty House, Seoul, Korea. Intl. (Organizing Committee Member).

### Invited Seminars & Presentations

- Oct. 2021 Invited talk, “*Identifying important drivers in pesticide mitigation exposure assessments*”. EPA Purdue Workshop on Wetland Endangered Species Assessment of Herbicides. Oct. 22-23. Purdue Univ. Lafayette, IN, USA
- May 2021 Invited talk, “*Fate of pesticide residues in vegetative filter strips in long-term exposure assessments: VFSMOD development and analysis*”. SETAC Europe. May 3-6, 2021. Seville, Spain
- June 2020 Invited talk, “*Vegetative Filter Strip Modelling*”. 22nd International Akademie Fresenius AGRO Conference, June 16-17, Mainz, Germany
- Aug. 2020 Invited talk, “*Advances in vegetative filter strips modeling to mitigate pesticides*”. CERSA North American Vegetative Filter Strips Workshop, August 31, Raleigh.

- May 2020 Invited talk, “*VFS Effectiveness to Mitigate Pesticides: Mechanistic Analysis with VFSMOD*”, EGU Annual Conference, May 3-6. Vienna, 2020.
- Apr. 2019 Invited talk, “*Effectiveness of Vegetative Filter Strips for Pesticides Mitigation: Mechanistic Analysis with VFSMOD*”, Mitigation of Pesticides in Surface Water in California Agriculture Symposium. Organized by California Dept. of Pesticide Regulation. Sacramento, California.
- Mar. 2019 Invited talk, “*Incorporating the Benefits of Vegetative Filter Strips into Risk Assessment and Risk Management of Pesticides*”, AGRO Lunch & Webinar series/Eurofins. March 13, 2019.
- Dec. 2018 Invited talk, “*Incorporating the Benefits of Vegetative Filter Strips into Risk Assessment and Risk Management of Pesticides*”, 2018 Workshop on Innovation and Regulation in Agriculture. N.C. State University Center of Excellence on Regulatory Science in Agriculture (CERSA), Raleigh, NC
- Nov. 2018 Invited talk, “*Identifying important drivers in exposure and effects mitigation assessments: A general global sensitivity and uncertainty analysis framework*”, 2018 Society of Environmental Toxicology and Chemistry (SETAC) North America 39th Meeting. Sacramento, CA.
- Jul. 2018 Invited talk, “*What drives the ecological quality of freshwater ecosystems at the continental scale in Europe?*”. Public university of Pamplona, Spain.
- Oct. 2012 Invited (keynote speaker), SWAN-VFSMOD European Pesticide Assessment Tool. Training Workshop. October 2, 2013, Paris, France.
- Nov. 2012 Invited speaker, Taishan Symposium of Agriculture and Environment, Shandong Agricultural University, November 2012, Shandong, China
- Nov. 2014 Predictive ability of hydrological models: objective assessment of goodness-of-fit with statistical significance. Universidad Católica de Murcia, Spain. Nov. 4, 2014.
- May 2014 Complexity and unintended consequences in the Tempisque Basin PRAT project, Costa Rica. University of Costa Rica, San Jose May 2, 2014.
- Nov. 2013 Dynamic factor analysis as a tool to unravel the behavior of complex environmental systems. Agricultural Engineering School and Mathematics Department, University of Navarra, November 2013.
- Sept. 2013 Total Maximum Daily Load and the Best Management Practices program in Florida: the case for Vegetative Filter Strip Design. Sustainable Management of Soil and Water Resources Workshop - Dubai, United Arab Emirates - September 15-19, 2013. Sponsored by USDA-ARS International Programs.
- July 2013 Dynamic Factor Analysis of Environmental Systems I: Introduction and Initial lessons learned. Session coorganizer and Invited Speaker. XXIX-th European Meeting of Statisticians, July 20-25, 2013, Budapest, Hungary.
- May 2013 FITEVAL: A tool to assess the predictive ability of hydrological models through objective assessment of goodness-of-fit with statistical significance. Invited Seminar. Université Catholique de Louvain, Louvain-la-Neuve, Belgium. May, 2013.
- April 2013 Hydrological sensors data acquisition and management for the hydrological monitoring network at the Palo Verde National Park. April 2013, Workshop presented at the Organization for Tropical Studies Biological Stations in Palo Verde National Park, Guanacaste, Costa Rica.
- Feb. 2011 VFSMOD use for pesticides (Keynote Speech). Workshop: "From AIM to TOPPS-Prowadis". European Crop Protection Association, Brussels, - 24 February 2011.
- June 2011 Importance of mechanistic, science driven design of best management practices for watershed quality protection (Keynote Speech). In: Yoon and Choi (eds.), Korea KAB-2 International Conference on AG-BMP Development for Reservoir Water Quality Improvement, June 15-16, Seoul, Korea.
- June 2011 Recent advancement in evaluation of Environmental Models with Global Sensitivity and Uncertainty Analysis. National Taiwan University, June, 18, Taipei, Taiwan.
- Jun. 2010 Invited talk, “Predicting Runoff Pesticide Reduction with Vegetative Filter Strips: Factor importance, Uncertainty, and Regulatory Opportunities”. Keynote speech at the World UIPAC-RACI conference. 12th International Congress on Pesticide Science UIPAC 2010, July 4-10, 2010, Melbourne, Australia.
- Oct. 2010 Invited talk, “*Model Relevance: Frameworks for Exploring the Complexity-Sensitivity-Uncertainty Trilemma.*” (NATO Climate Change Conference, Island, 2010).

- Nov. 2009 Invited talk, “*Formal Exploration of the Complexity and Relevance of Biogeochemical Models through Global Sensitivity and Uncertainty Analysis: Opportunities and Challenges*” (Keynote speech at the Unsaturated Zone Studies Conference, Barcelona-Spain, 2009).

### Professional Service & Membership

#### 1. *Journal and Book Editor:*

- 2017- Editor-in-Chief, Elsevier’s *Journal of Hydrology: Regional Studies*,  
<http://www.elsevier.com/locate/issn/22145818>  
2004-2010 Associate Editor, Transactions of ASABE and Applied Engineering in Agriculture  
2001- Associate editor for 3 special issues of peer-reviewed journals (Vadose Zone Journal, Trans. of ASABE, Physics and Chemistry of the Earth, Part B)  
2005 Co-editor of CRC/Lewis book with 53 international contributors

#### 2. *Research Advisory Board Membership:*

- 2021- Organization for Tropical Studies, Board of Directors (OTS)  
2018- UF HW College of Engineering Research Advisory Council (RAC)  
2015- Institute for Earth System Research (IISTA), Spain  
2008- UF Research Computing Advisory Committee (campus wide)  
2002- Spanish Unsaturated Studies group ZNS, Spain, <http://zonanosaturada.com>  
2014-2015 Global Food Systems Institute (GFSI), Advisory board member  
2009-2012 UF Water Institute (campus wide)  
2012-2014 UF/IFAS Dean of Research Advisory Board  
2012-2014 UF/IFAS International Programs  
2006-2011 UF Hydrologic Sciences Academic Cluster, <http://hydrology.ufl.edu>. Elected Chair, 2008–10, member of the Faculty Advisory Committee, 2006–2011; Advisory Board

#### 3. *NSF Funded Student development:*

- 2012-2017 NSF GRF doctoral advisor, Dr. N. Nelson  
2012 NSF-REU Program, Summer 2012, faculty mentor for Wen Yang  
2009-2012 NSF-Innovation through Institutional Integration (I3), UF Advisory Board  
2007-2011 NSF IGERT doctoral advisor, A.C. Linhoss

#### 4. *Federal Projects Panelist:* NSF, USDA/ARS, USDA/NRI; USDA/ARS.

#### 5. *Scientific and Professional Societies:*

- 2015- American Society of Agricultural and Biological Engineers (ASABE), Fellow ASABE, 2015-, Member Engineer, 1993-, Chair Natural Resources and Environmental Systems Division NRES-02, NRES-21 Hydrology Chair, 2008-2009, Member, SW-5, Publications Review Committee, 2004-;  
1993- American Geophysical Union (AGU), Member.  
2007- American Association for the Advancement of Science (AAAS), Member.

#### 6. *University Committees*

IFAS Tenure and Promotion Board, 2014-2016; IFAS 2013 Food Safety Cluster, defined faculty positions, participated in Chairs planning meetings; IFAS Research Advisory Group, IFRAG, member, 2012-2015; IFAS Faculty Enhancement Awards (Sabbatical), member, 2011-2014; - Search and screen committees: Pre-Eminent Professor Risk Analysis, ESSIE-COE member, 2014-2015; Pre-eminent Professor, Dynamic optimization of networks, ISE-COE, Chair, 2014

#### 7. *Departmental Committees*

*ABE Graduate Certificate program, Chair, 2012- present; ABE Graduate committee, member, 2005–present; ABE Computer committee, Chair. 2006–present; Faculty Mentoring Committees: Dr. Nikolay Blyznyuk, member, 2014–; Dr. Eric McLamore, member, 2011-2016; Dr. Jeff Ullman, member, 2011–2015; Dr. Kati W. Migliaccio, Chair, 2005–2010; Dr. Bin Gao, Chair, 2007– 2012; - Search and screen committees: Data analytics Assistant/Associate Professor, ABE, Chair, 2016; Biocomplexity Engineering Assistant/Associate Professor, ABE, Chair, 2014; IT*

expert, ABE, 2014

### Mentions in the media

- *Innovative Application of AI Gives New Life to Long-term Monitoring Data*. April 30, 2018 | Environmental Monitor (United States). [View article](#)
- *How to prevent harmful algal blooms*. March 6, 2018 | Morning Ag Clips (United States). [View article](#)
- *UF Study: To Help Prevent Harmful Algal Blooms, Limit Nitrogen and Phosphorus*. March 6, 2018 | Newswise (United States). [View article](#)
- *Engineering the Design of Buffers and Vegetative Filter Strips*. March 1, 2018 | RESource (ASABE). [View article](#)
- *New UF/IFAS Method Detects Low-Dose Impacts of Man-Made Chemicals in Water*. September 7, 2016 | Newswise (United States). [View article](#)
- *U of Florida Researcher Receives ASABE's ADS Soil and Water Engineering Award*. September 24, 2015 | Agri Marketing (United States). [View article](#)
- *University of Florida Professor Receives ADS Achievement Award*. September 22, 2015 | Water & Wastes Digest (United States). [View article](#)
- *Two UF/IFAS Agricultural Engineering Faculty Earn High Global Honors*. May 13, 2015 | Newswise (United States). [View article](#)
- *USA: Computer Model to Help Managers with Renourishment Decisions*. February 27, 2014 | Dredging Today (Netherlands). [View article](#)
- *Computer Model Can Help Coastal Managers with Nourishment Decisions*. February 26, 2014 | Science Daily (United States). [View article](#)
- *UF Top 10, faculty profile, 2014*
- *UF Alumni Calendar, 2014*

### Funded Research

(Total federal funding while at UF as PI/Co-I/SP: ~\$11.2 million)

#### **Current:**

2018-2023	Department of Defense MURI	"Towards a Multi-Scale Theory on Coupled Human Mobility and Environmental Change", Co-PI, \$5,135,404
2017-2019	USDA-NIFA-AFRI	"Influence of preferential flow on coupled colloid, nitrogen and phosphorus transport through riparian buffers", Co-PI, \$499,208
2015-2020	USAID Innovation Labs	"USAID Feed the Future Innovation Laboratory: Sustainable Livestock Systems", SP, \$681,699

#### **Pending:**

2020-2024	NSF-CNH2	"CNH2-L-Mitigating social and environmental vulnerabilities through exchange of social, financial, and human capital", PI, \$1,599,991
2019-2023	NSF-INFEWS	"INFEWS/TI Engineering governance for resiliency in cascading FEW systems", PI, \$2,203,375
2019-2020	UF Informatics Institute	"A nonlinear dynamics approach to data-enabled science: Reconstructing soil-moisture dynamics from big data collected by wireless sensor networks", Co-PI, \$27,880

### Research Journal Publication

(Google Scholar h-index: 47, Citations: 9000+ (current: <http://goo.gl/8OMS7s>))

\* Graduate student; \*\* Postdoctoral Associate/Visiting Scholar supervised by Dr. Muñoz-Carpena

### 2022

160. Oh\*, W.S., A. Carmona-Cabrero, **R. Muñoz-Carpena**, R. Muneeppeerakul. 2022. On the interplay among multiple factors: effects of factor configuration in a proof-of-concept migration agent-based model. *Journal of Artificial Societies and Social Simulation* 25(2):7. doi:10.18564/jasss.4793.

## **2021**

159. **Muñoz-Carpena, R.**, C. Lauvernet, N. Carluer and G.A. Fox. 2021. Comment on “Modeling slope rainfall-infiltration-runoff process with shallow water table during complex rainfall patterns” by Wu et al. 2021. *J. Hydrology X* 13:100133. doi:10.1016/j.hydroa.2021.100113.
158. Barchiesi\*, S., A. Alonso, M. Pazmiño-Hernandez, J.M. Serrano-Sandí, **R. Muñoz-Carpena**, C. Angelini. 2021. Wetland hydropattern and vegetation greenness predict avian populations in Palo Verde, Costa Rica. *Ecological Applications*. doi:10.1002/eap.2493.
157. Köppl, C.J., R. Malureanu, C. Dam-Hansen, S. Wang, H. Jin, S. Barchiesi, J.M. Serrano Sandí, **R. Muñoz-Carpena**, M. Johnson, A.M. Durán-Quesada, P. Bauer-Gottwein, U.S. McKnight, M. Garcia. 2021. Hyperspectral reflectance measurements from UAS under intermittent clouds: correcting irradiance measurements for sensor tilt. *Remote Sensing Env.* doi:10.1016/j.rse.2021.112719
156. Orozco-Lopez<sup>(g)</sup>, E. and **R. Muñoz-Carpena**, R. 2021. Comparative non-Darcian modelling of subsurface preferential flow experimental observations in a riparian buffer. *Trans. ASABE* 64(5). doi:10.13031/trans.14559.
155. Vazquez<sup>(g)</sup>, K.M, **R. Muñoz-Carpena**, M.D. Danyluk, A.H. Havelaar. 2021. Parsimonious mechanistic modeling of bacterial runoff to inform food safety management of agricultural water quality. *Appl. Environ. Microbiol.* 87(15):e00596-21. doi:10.1128/AEM.00596-21.
154. Luquin<sup>(g)</sup>, E., M.A. Campo-Bescós, **R. Muñoz-Carpena**, R.L. Bingner, R.M. Cruse, H.G. Momm, R.R. Wells, J.Casalí. 2021. Evaluation of model prediction capacity of ephemeral gully temporal evolution in conservation tillage systems. *Earth Surf. Process. Landf.* 46(10):1909-1925. doi:10.1002/esp.5134
153. Guertault, L. G.A.Fox, D. Heeren, T. Hallihan and **R Muñoz-Carpena**. 2021. Quantifying the importance of preferential flow in a riparian buffer. *Trans. ASABE* 64(3):937-947. doi:10.13031/trans.14286.
152. Orozco-López<sup>(g)</sup>, **R. Muñoz-Carpena**, B. Gao and G.A. Fox. 2021. High resolution pore-scale water content measurement in a translucent soil profile from light transmission. *Trans. ASABE* 64(3):949-962.doi:10.13031/trans.14292.
151. Medina M<sup>(g)</sup>, R. Huffaker, **R. Muñoz-Carpena** and G. Kiker. 2021. An empirical nonlinear dynamics approach to analyzing emergent behavior of agent-based models. *AIP Advances* 11:035133. doi:10.1063/5.0023116

## **2020**

150. Morgan\* V., L. Casso-Hartmann, I. Velez-Torres, D.C. Vanegas, **R. Muñoz-Carpena**, E.S. McLamore and G. Kiker. 2020. Modeling exposure risk and prevention of mercury in drinking water for artisanal-small scale gold mining communities. *Human and Ecological Risk Assessment* (accepted).
149. Fox, G.A., **R. Muñoz-Carpena**, B. Brooks, T. Hall. 2020. Advancing surface water pesticide exposure assessments for ecosystem protection. *Trans. ASABE* (in press)
148. Medina\*, M., R. Huffaker, J.W. Jawitz, and **R. Muñoz-Carpena**. 2020. Seasonal dynamics of terrestrially sourced nitrogen influenced *Karenia brevis* blooms off Florida's southern Gulf Coast. *Harmful Algae* 98:101900. doi:10.1016/j.hal.2020.101900
147. **Muñoz-Carpena, R.**, O. Batelaan, P. Willems, D.A. Hughes. 2020. Editorial – Why it is a blessing to be rejected: improving science with quality publications. *J. of Hydrology: Regional Studies* 31:100717. doi:10.1016/j.ejrh.2020.100717
146. Mompremier, R.\*, Y. Her, G. Hoogenboom, K. Migliaccio, **R. Muñoz-Carpena**, Z. Brym, R. W. Colbert, and W. Jeune. 2020. Modeling the response of dry bean yield to irrigation water availability controlled by watershed hydrology. *Agric. Water Manage.* 243:106429. doi:10.1016/j.agwat.2020.106429
145. Nelson, N.G.\*, **R. Muñoz-Carpena**, and E. Philips. 2020. Parameter uncertainty drives important incongruities between simulated chlorophyll-a and phytoplankton functional group dynamics in a mechanistic management model. *Env. Modeling & Soft.* 129:104708. doi:10.1016/j.envsoft.2020.104708.
144. Alonso, A.\*, **R. Muñoz-Carpena**, and D. Kaplan. 2020. Coupling high-resolution water level sensors and MODIS for mapping wetland historical hydroperiod at high temporal frequency. *Remote Sensing of*

*Environment* 247:111807. doi:10.1016/j.rse.2020.111807.

143. Moreno-Cadena, L.P.\*, G. Hoogenboom, M.J. Fisher, J. Ramirez-Villegas, S.D. Prager, L.A. Becerra Lopez-Lavalle, P. Pypers, M.S. Mejia de Tafur, D. Wallach, **R. Muñoz-Carpena**, S. Asseng. 2020. Importance of genetic parameters and uncertainty of MANIHOT, a new mechanistic model of cassava. *Europ. J. Agronomy* 115:126031. doi:10.1016/j.eja.2020.126031
142. Delforge, D.\*, **R. Muñoz-Carpena**, M. Van Camp, M. Vanclooster. 2020. A parsimonious empirical approach to streamflow recession analysis and forecast. *Wat. Resour. Res.*56(2):e2019WR025771. doi: 10.1029/2019WR025771

## **2019**

141. Medina, M.\*, R. Huffaker, J.W. Jawitz, **R. Muñoz-Carpena**. 2019. Nonlinear dynamics in treatment wetlands: Identifying systematic drivers of non-equilibrium outlet concentrations in Everglades STAs. *Wat. Resour. Res.* 55(12):11101-11120. doi: 10.1029/2018WR024427
140. **Muñoz-Carpena, R.**, A. Ritter, G. Fox. 2019. Comparison of empirical and mechanistic equations for vegetative filter strip pesticide mitigation in long-term environmental exposure assessments. *Water Research* 165:1149833. doi:10.1016/j.watres.2019.114983
139. Klarenberg, G.\*, **R. Muñoz-Carpena**, S. Perz, C. Baraloto, M. Marsik, J. Southworth, L. Zhu. 2019. A spatiotemporal natural-human database to evaluate road development impacts in an Amazon trinational frontier. *Nature Sci. Data* 6:93. doi:10.1038/s41597-019-0093-7
138. Khare, Y.P.\*, C. Martinez, **R. Muñoz-Carpena**, A. Bottcher and A. James. 2019. Effective global sensitivity analysis for high-dimensional hydrologic and water quality models. *ASCE Journal of Hydrologic Engineering*. 24(1). doi:10.1061/(ASCE)HE.1943-5584.0001726
137. Kuo, Y.-M., W.-W. Liu, E. Zhao, R. Li, L. Yao, **R. Muñoz-Carpena**. 2019. Water quality variability in the middle and down streams of Han River under the influence of the Middle Route of South-North Water Diversion Project, China. *J. of Hydrology* 569:218-229. doi: 10.1016/j.jhydrol.2018.12.001.

## **2018**

136. Trost, J.J., K.S. Perkins, W. Henson, B.B. Mirus, J.R. Nimmo, and **R. Muñoz-Carpena**. 2018. UZIG research: Measurement and characterization of unsaturated zone processes under wide-ranging climates and changing conditions. *Vadose Zone J.* 17:180198. doi:10.2136/vzj2018.11.0198.
135. Southworth J, E. Bunting, L. Zhu, S.J. Ryan, H.V. Herrero, P. Waylen, **R. Muñoz-Carpena**, M.A. Campo-Bescós, D. Kaplan. 2018 Using a coupled dynamic factor – random forest analysis (DFRFA) to reveal drivers of spatiotemporal heterogeneity in the semi-arid regions of southern Africa. *PLoS ONE* 13(12): e0208400. doi:10.1371/journal.pone.0208400.
134. Gowdiah, L.\* and **R. Muñoz-Carpena**. 2018. 3DMGAR: A transient quasi-3D point source Green-Ampt infiltration and redistribution model. *Vadose Zone J.* doi: 10.2136/vzj2018.02.0032.
133. Hahus, I.\*, K.W. Migliaccio, K. Douglas-Mankin, G. Klarenberg, **R. Muñoz-Carpena**. 2018. Using cluster analysis to compartmentalize a large managed wetland based on physical, biological, and climatic geospatial attributes. *Environmental Management* 62(6):571–583. doi:10.1007/s00267-018-1050-5
132. Simmons, C.S., L. Famolare, M. Macedo, R.T. Walker, M. Coe, B Scheffers, E. Arima, **R. Muñoz-Carpena**, D. Valle, C. Fraisee, P. Moorecroft, M. Diniz, M. Diniz, C. Szlafsztein, R. Pereira, C. Ruiz, G. Rocha, D. Juhn, L.O. Do Canto Lopes, M. Waylen, A. Antunes. 2018. Science in support of Amazonian conservation in the 21st century: The case of Brazil. *Biotropica*. doi:10.1111/btp.12610
131. Klarenberg, G.\*, **R. Muñoz-Carpena**, M.A. Campo-Bescós, S.G. Perz. Highway paving in the southwestern Amazon alters long-term trends and drivers of regional vegetation dynamics. *Heliyon* 4 (2018) e00721. doi:10.1016/j.heliyon.2018.e00721
130. Orozco-López, E.\*, **R. Muñoz-Carpena**, B. Gao, G.A. Fox. 2018. Riparian vadose zone preferential flow: review of concepts, limitations and perspectives. *Vadose Zone J.* 17:180031. doi:10.2136/vzj2018.02.0031
129. Nelson, N.\*, **R. Muñoz-Carpena**, E. Philips, D. Kaplan, P. Sucsy and J. Hendrickson. 2018. Revealing biotic and abiotic controls of harmful algal blooms in a shallow subtropical lake through statistical machine learning. *Environ. Sci. Technol.* 52(6):3527-3535. doi:10.1021/acs.est.7b05884

128. Lim, K.J.\*\*, Y.S. Park; M.-K. Kim, J. Jeong, B.A. Engel, **R. Muñoz-Carpena** and J. Kim. 2018. Design of vegetative filter strip using web-based system with groundwater table and pesticide degradation analysis modules. *Journal of Hydrologic Engineering (ASCE)* 23(2). doi:10.1061/(ASCE)HE.1943-5584.0001611
127. Fox, G., **R. Muñoz-Carpena** and R. Purvis. 2018. Controlled laboratory experiments and modeling of vegetative filter strips with shallow water tables. *J. of Hydrology* 556(1):1–9, doi:10.1016/j.jhydrol.2017.10.069
126. **Muñoz-Carpena, R.**, Lauvernet, C., and Carlier, N. 2018. Shallow water table effects on water, sediment and pesticide transport in vegetative filter strips: Part A. non-uniform infiltration and soil water redistribution, *Hydrol. Earth Syst. Sci.* 22:53-70. doi:10.5194/hess-22-53-2018
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30. Muñoz-Carpena, R., Z. Zajac and Yi-Ming Kuo. 2007. Global Sensitivity and uncertainty Analyses of the Water Quality Model VFSMOD-W. *Trans. of ASABE* 50(5):1719-1732.
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15. **Muñoz-Carpena, R.** and J.E. Parsons. 2004. A Design Procedure for Vegetative Filter Strips Using VFSSMOD-W. *Trans. of ASAE* 47(5):1933-1941.
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13. Regalado\*\*, C.M. and **R. Muñoz-Carpena**. 2004. Estimating the saturated hydraulic conductivity in a spatially variable soil with different permeameters: a stochastic Kozeny-Carman relation. *Soil & Tillage Research* 77(2):189-202.

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#### 2002

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5. **Muñoz-Carpena, R.**, J.E. Parsons, and J.W. Gilliam. 1999. Modeling hydrology and sediment transport in vegetative filter strips. *Journal of Hydrology* 214(1-4):111-129.

#### 1996

4. Cabrera, M.C., **R. Muñoz-Carpena**, R. Poncela, A.R. Socorro, G. Gonzalez, and F. Hernandez. 1996. Methodology for the study of the unsaturated zone and aquifer pesticide pollution in Gran Canaria and Tenerife (Canary Islands) [in Spanish]. *GeoGaceta*, 20(6):39-41.
3. **Muñoz-Carpena, R.**, D. Fernandez Galvan, G. González Tamargo, and P. Harris. 1996. Diseño de una estación micrometeorológica automática de bajo coste para el calculo de la evapotranspiración de referencia ["Design and evaluation of a low cost automatic weather station for the calculation of reference" - in Spanish]. *Riegos y Drenajes XXI*, 88:17-25.

#### 1993

2. Muñoz-Carpena, R., C.T. Miller, and J.E. Parsons. 1993. A Quadratic Petrov-Galerkin Solution for Kinematic

Wave Overland Flow. *Water Resources Research* 29(8):2615-2627.

1. Muñoz-Carpena, R., J.E. Parsons, and J.W. Gilliam. 1993. Numerical Approach to the Overland Flow Process in Vegetative Filter Strips. *Trans. of ASAE* 36(3):761-770.

### Books

5. **Muñoz-Carpena, R.**, and A. Ritter. 2005. *Hidrología Agroforestal* [Agricultural and Forest Hydrology - in Spanish]. pp. 360. Ed. Mundi-Prensa Libros, S.A. Madrid:Spain (ISBN: 84-8476-245-9).
4. Álvarez-Benedí, J. and **R. Muñoz-Carpena** (eds). 2005. *Soil-Water-Solute Process Characterization, An Integrated Approach*. CRC Press LLC:Boca Raton. ISBN: 1-5667-0657-2.

Reviewed at:

- Whalley, W.R. 2005. Book Reviews: Soil-Water. Solute Process Characterization. An Integrated Approach. Edited by J. Álvarez-Benedí and R. Muñoz-Carpena. *Expl Agric.* 41:505-509. Cambridge University Press.
- Vereecken, H. 2006. Book Reviews: Soil-Water-Solute-Process Characterization: An Integrated Approach. Ed. by J. Álvarez-Benedí and R. Muñoz-Carpena. *Vadose Zone J* 5:909-910. DOI: 10.2136/vzj2005.0135
- Cresser. 2007. Soil-Water-Solute Process Characterization: An Integrated Approach - Edited by J. Álvarez-Benedí & R. Muñoz-Carpena. *European Journal of Soil Science (OnlineEarly Articles)*. doi:10.1111/j.1365-2389.2007.00898\_3.x
3. Candela, L. and **R. Muñoz-Carpena** (eds.). 1999. (II) *Hydrology and the Earth's Crust-Coastal Aquifer Dynamics and Groundwater Recharge*. Physics and Chemistry of the Earth, Part B. 24(4).
  2. **Muñoz-Carpena, R.**, A. Ritter, and C. Tascón (eds). 1999. *Studies on the Soil Vadose Zone* [in Spanish]. Proc. of the IV National Meeting on Soil Vadose Zone Studies. ICIA:La Laguna. ISBN: 84-699-1258-5.
  1. **Muñoz-Carpena, R.** (ed.). 1998. *Water Quality and Quantity in Greenhouse Horticulture*. Acta Horticulturae (ISHS), 458.

### Book Chapters

\* Graduate student; \*\* Postdoctoral Associate/Visiting Scholar supervised by Dr. Muñoz-Carpena

12. Convertino, M.\*\*, **R. Muñoz-Carpena**, and C. Murcia. 2015. "Reading the minds" for quantitative sustainability: Assessing stakeholder mental models via probabilistic text analysis. In: J. Zhang, L. F. Luna-Reyes, T. A. Pardo and D. S. Sayog (editors). *Information, models, and sustainability - Policy informatics in the age of big data and open government*. Springer. doi:10.1007/978-3-319-25439-5
11. Wang, Q., **R. Muñoz-Carpena**, A. Foster, and K.W. Migliaccio. 2010. "Groundwater sampling". In: Y. Li and K. Migliaccio (eds.). *Water Quality Concepts, Sampling, and Analyses*. CRC Press. ISBN: 978-1420092660.
10. Convertino\*\* M, Nardi F, Kiker GA, **Muñoz-Carpena R**, Linkov I, 2013. "Epitomes of bottom-up hydrogeo-climatological analysis to face sea-level rise in complex coastal ecosystems". In: *Water Encyclopedia: Climate Vulnerability* (Ed. R.A. Pielke, Sr.). Elsevier: The Netherlands. pp. 267–282. ISBN: 9780123847034.doi:10.1016/B978-0-12-384703-4.00502-5.
9. Muller, S.\* , **R. Muñoz-Carpena**, G. Kiker. 2011. "Model Relevance: Frameworks for Exploring the Complexity-Sensitivity-Uncertainty Trilemma". In: I. Linkov and T.S.S. Bridges (eds.). *Climate: Global Change and Local Adaptation*. NATO Science for Peace and Security Series C: Environmental Security. pp. 35-65. Springer:Boston doi:10.1007/978-94-007-1770-1\_4.
8. Kiker, G.A., **R. Muñoz-Carpena**, N. Ranger, M. Kiker, I. Linkov. 2011. "Adaptation in Coastal Systems: Vulnerability and Uncertainty within Complex Socioecological Systems." In: I. Linkov and T.S. Bridges (eds.), *Climate: Global Change and Local Adaptation*. pp. 373-399. Springer:Boston
7. Convertino\*\*, M., G.A. Kiker, M.L. Chu-Agor, **R. Muñoz-Carpena**, C.J. Martinez, M. Aiello-Lammens, H.R. Akçakaya, R.A. Fischer, I. Linkov. 2011. "Integrated Modeling To Mitigate Climate Change Risk Due To Sea Level Rise: Imperiled Shorebirds on Florida Coastal Military Installations". In: I. Linkov and T.S. Bridges (eds.), *Climate: Global Change and Local Adaptation*. pp. 431-465. Springer:Boston



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5. Dukes, M.D. and **R. Muñoz-Carpena**. 2005. "Soil Water Sensor-Based Automatic Irrigation of Vegetable Crops" Field methods for monitoring soil water status. In: J. Álvarez-Benedí and R. Muñoz-Carpena (eds). Soil-Water-Solute Process Characterization. Chapter 5, pp. 167-195. CRC Press LLC:Boca Raton.
3. **Muñoz-Carpena, R.** and J. Álvarez-Benedí. 2005. "Preface". In: J. Álvarez-Benedí and R. Muñoz-Carpena (eds). Soil-Water-Solute Process Characterization. pp. v-xii. CRC Press LLC:Boca Raton.
2. Álvarez-Benedí, J., **R. Muñoz-Carpena** and M. Vanclooster. 2005. "Modeling as a characterization tool". In: J. Álvarez-Benedí and R. Muñoz-Carpena (eds). Soil-Water-Solute Process Characterization. Chapter 3. pp, 87-35. CRC Press LLC:Boca Raton.
1. Vanclooster M., J. Boesten, A. Tiktak, N. Jarvis, J.G. Kroes, **R. Muñoz-Carpena** , B.E. Clothier and S.R. Green. 2004. "On the use of unsaturated flow and transport models in nutrient and pesticide management". In: R.A. Feddes; G.H. de Rooij and J.C. van Dam (eds.) Unsaturated-Zone Modeling: Progress, Challenges and Applications. Chapter 11, pp. 331-361. Wageningen University and Research Centre, Wageningen, The Netherlands.

### Creative works

- a) Software. See details at <https://abe.ufl.edu/faculty/carpena/software/>
  1. *FITEVAL*  
- Program for objective assessment of model goodness-of-fit with statistical significance.
  2. *PDunne*  
- Soil-saturated hydraulic conductivity calculation with the Philip-Dunne permeameter.
  3. *VFSMOD-W*  
- Vegetative Filter Strip Modeling System.
  4. *HPC - Global Sensitivity Analysis (GSUA)*  
- HPC scripts for GSUA in the UF HPC Hipergator (SLURM linux compatible).
  5. *VGPest3*  
- Program to fit van Genuchten's curve to experimental soil moisture retention data.
  6. *WinGAmpt*  
- A Windows based teaching tool for Green-Ampt Infiltration for Unsteady Rainfall Model.
  7. *SWINGO*  
- A Fortran comand line program to calculate infiltration for soils bounded by a shallow water table.
  8. *Morris SU sampling*  
- A Matlab code for improved input factor sampling for Morris (elementary effect) global sensitivity analysis.
  9. *MGAR 1D/3D*  
- A fortran program to calculate soil infiltration and redistribution from a series of storms using the MGAR method for 1D (vertical flow) and 3D (point source) conditions.
  10. *Programas de Cálculo para Riego Localizado*  
- Drip Irrigation Design Suite (in Spanish)
- b) Patents
  1. Low Cost Automatic Weather Station. R. Muñoz-Carpena. Patent no. P9502391 (Spain, Portugal and Latin America). 1995
  2. Quantified Soil Moisture-Based Irrigation Control System. M.D. Dukes, R. Muñoz-Carpena, L.W. Miller. UF#11415. US Patent Applied in 2004.
- c) Videos (UF/ABE Biocomplexity Engineering YouTube Channel)  
<https://www.youtube.com/playlist?list=PLU-Q9kmYD4CJ5EDDVIIIE3iK5MyaOk9yEl>

1. *Detecting Pharmaceuticals in the Waterways* ([IFAS Video](#))
2. *Clearing Up The Scum*
3. *Socioecological effects of road construction in the Amazon*
4. *Unintended Consequences of Engineered Water Systems*
5. *Living with Thirst Part One*
6. *Living with Thirst Part Two*

### Training of New Researchers

#### a) Doctoral students

This is a list of Ph.D. dissertations from students advised directly by Dr. Muñoz-Carpena (Chair or Co-Chair).

1. Enrique Orozco. 2020 (Exp.). Effect of preferential flow in vegetative filter strips efficiency for runoff pollution control.
2. Lory Willard. 2022 (exp.). Quantitative methods for analysis of water quality impacts in the developing region of Nanyuki, Kenya.
3. Alvaro Carmona-Cabrero 2023 (exp.). Quantification of global sensitivity and uncertainty in human migration.
4. Marco Pazmino, 2020 (exp.). Simulation of cascading impacts from an interbasin water transfer for hydroelectrical and agricultural use on the Palo Verde coastal wetland, Costa Rica
5. Geraldine Klarenberg. 2017. Hidden disturbance in regional vegetation dynamics from road paving in a coupled natural and human system: A case study from the Southwest Amazo . Ph.D. dissertation. [Gainesville, Fla.]: University of Florida. (Chair: R. Muñoz–Carpena & G. Kiker)
6. Natalie G. Nelson. 2017. Quantifying the spatiotemporal importance of fresh-brackish water quality drivers using data analytics and models. Ph.D. dissertation. [Gainesville, Fla.]: University of Florida. (Chair: R. Muñoz–Carpena)
7. Alice Alonso. 2016. Novel quantification of long-term hydrological and landscape spatiotemporal dynamics of coupled natural human systems: the case study of the Tempisque-Palo Verde National Park coastal wetland, Costa Rica. Ph.D. dissertation. [Gainesville, Fla.]: University of Florida. (Chair: R. Muñoz–Carpena)
8. Yogesh P. Khare. 2014. [Hydrologic and Water Quality Model Reliability With Global Sensitivity Analysis: Improvements and Applications](#). [Gainesville, Fla.]: University of Florida. (Chairs: Dr. Christopher J. Martinez and R. Muñoz–Carpena)
9. Isaya Kisekka. 2013. [Modeling influences of canal stage raises on groundwater and soil water in the C-111 basin of south Florida](#). Ph.D. dissertation. [Gainesville, Fla.]: University of Florida. (Chairs: Dr. K.W. Migliaccio and R. Muñoz–Carpena)
10. Nathan Barasa Wangusi. 2013. [Investigating the relationship of scale and resilience in integrated water resource management in the Crocodile River, South Africa](#). Ph.D. dissertation. [Gainesville, Fla.]: University of Florida. (Chairs: Dr. G.A. Kiker and R. Muñoz–Carpena)
11. Lei Wu. 2013. [Filtration and transport of colloids and nanoparticles in dense emergent vegetation: theory, experiments and modeling](#). Ph.D. dissertation. [Gainesville, Fla.]: University of Florida. (Chairs: R. Muñoz-Carpena and B. Gao).
12. Congrong Yu. 2011. [Colloids transport in surface runoff through dense vegetation](#). Ph.D. dissertation. [Gainesville, Fla.]: University of Florida. (Chairs: R. Muñoz-Carpena and B. Gao).
13. Anna M. Cathey Linhoss. 2011. [Hydrology and fish population dynamics in the Okavango basin: managing for uncertainty in a data poor environment](#). Ph.D. dissertation. [Gainesville, Fla.]: University of Florida. (Chairs: R. Muñoz-Carpena and G.A. Kiker).
14. Chung T. Nguyen. 2011. [Effects of a prescribed fire on soil nutrient pools in the pine rockland forest ecosystem](#). Ph.D. dissertation. [Gainesville, Fla.]: University of Florida. (Chairs: Y.Li and R. Muñoz-Carpena).
15. Gareth A. Lawerwall. 2011. [Modeling \*Typha Domingensis\* in an Everglades Wetland](#). Ph.D. dissertation. [Gainesville, Fla.]: University of Florida. (Chairs: Greg A. Kiker and R. Muñoz-Carpena).
16. Zuzanna B. Zajac. 2010. [Global sensitivity and uncertainty analysis of hydrologic spatially distributed watershed models](#)[3.8 MB].Ph.D. dissertation. [Gainesville, Fla.]: University of Florida. (Chairs: R. Muñoz-Carpena and Wendy D. Graham).

17. Oscar Pérez-Ovilla. 2010. [A flexible numerical component to simulate biogeochemical transport processes through vegetative filter strips](#)[3.3 MB].Ph.D. dissertation. [Gainesville, Fla.]: University of Florida. (Chair: R. Muñoz-Carpena).
18. Stuart J. Muller. 2010. [Adaptive spatially-distributed water-quality modeling: an application to mechanistically simulate phosphorus conditions in the variable-density surface-waters of coastal Everglades wetlands](#)[10.8 MB].Ph.D. dissertation. [Gainesville, Fla.]: University of Florida. (Chair: R. Muñoz-Carpena).
19. David D. Kaplan. 2010. [Linking river, floodplain, and vadose zone hydrology in a coastal wetland impacted by saltwater intrusion : the Loxahatchee river \(Florida, USA\)](#)[3.3 MB].Ph.D. dissertation. [Gainesville, Fla.]: University of Florida. <http://purl.fcla.edu/fcla/etd/UFE0021213>. (Chair: R. Muñoz-Carpena).
20. Leslie C. Gowdish. 2007. [An improved Green-Ampt soil infiltration and redistribution method and its application to 1-dimensional and quasi 3-dimensional \(point source\) flow domains](#)[3.3 MB].Ph.D. dissertation. [Gainesville, Fla.]: University of Florida. <http://purl.fcla.edu/fcla/etd/UFE0021213>. (Chair: R. Muñoz-Carpena).
21. Yi-Ming Kuo. 2007. [Vegetative filter strips to control surface runoff phosphorus transport from mining sand tailings in the Upper Peace River basin of central Florida](#)[3.3 MB].Ph.D. dissertation. [Gainesville, Fla.]: University of Florida. <http://purl.fcla.edu/fcla/etd/UFE0021212>. (Chair: R. Muñoz-Carpena).
22. Axel Ritter. 2002. [Application of inverse optimization techniques to modeling flow and solute transport in volcanic soils as a tool to evaluate current management practices](#)[3.1 MB].Ph.D. dissertation. [Cordoba, Spain]: University of Córdoba. (Chair: R. Muñoz-Carpena).

b) Masters students

This is a list of Masters thesis from students advised directly by Dr. Muñoz-Carpena (Chair or Co-Chair).

1. Kathleleen Vazquez. 2017. Statistical and mechanistic analysis of bacterial water quality to evaluate and inform food safety agricultural water regulations. M.Sc. Thesis. [Gainesville, Fla.]: University of Florida (Advisors: R. Muñoz-Carpena & Arie Havelaar).
2. Luis Pablo Barquín-Valle, 2009. [Modeling shallow groundwater table contribution to soil water retention in the unsaturated zone of a calcareous soil of south Florida](#)[3.3 MB]. M.Sc. thesis. [Gainesville, Fla.]: University of Florida. <http://purl.fcla.edu/fcla/etd/UFE0025060>. (Advisors: K.W. Migliaccio and R. Muñoz-Carpena).
3. Manon Bachelin, 2009. [Water Balance, Seasonal Hydroperiod Variation and Time of Residence of a Small Natural Freshwater Wetlands in the Humid Tropics in Costa Rica](#)[7.16MB]. M.Sc. thesis. Civil and Environmental Engineering, Swiss Federal Institutes of Technology (EPFL), Laussane, Switzerland. (Advisors: R. Muñoz-Carpena and A. Rinaldo).
4. Jason T. Icerman, 2007. [Approaches for two-dimensional monitoring and numerical modeling of drip systems](#)[4.8 MB]. M.Sc. thesis. [Gainesville, Fla.]: University of Florida. <http://purl.fcla.edu/fcla/etd/UFE0021417>. (Advisors: M.D. Dukes and R. Muñoz-Carpena).
5. Amanda E.Mortl, 2006. [Monitoring soil moisture and soil water salinity in the Loxahatchee floodplain](#)[4.8 MB]. M.Sc. thesis. [Gainesville, Fla.]: University of Florida. <http://purl.fcla.edu/fcla/etd/UFE0015734>. (Advisor: R. Muñoz-Carpena).
6. Jonathan H. Schroder. 2006. [Soil moisture-based drip irrigation for efficient use of water and nutrients and sustainability of vegetables cropped on coarse soils](#)[4.8 MB]. M.Sc. thesis. [Gainesville, Fla.]: University of Florida. <http://purl.fcla.edu/fcla/etd/UFE0014283>. (Advisor: R. Muñoz-Carpena).
7. Martin Morawietz. 2003. The Biscayne aquifer: a local groundwater study in the agricultural areas adjacent to the Everglades National Park, south Florida. M.Sc.thesis (Diplomarbeit) Institute of Hydrology, Freiburg: Universität Freiburg, Germany. (Advisor: R. Muñoz-Carpena).

c) Post-doctoral researchers

15 postdocs supervised and mentored by Dr. Muñoz-Carpena. He has been recognized with the 2013 National Postdoctoral Association Garnett-Powers & Associates Advisor of the Year Award.

d) Graduate student Awards

Honors for graduate students under Dr. Muñoz-Carpena's direct supervision.

1. **2017 Natalie Nelson.** UF/IFAS Doctoral Dissertation Award.
2. **2015 Alice Alonso.** McNair Bostic Scholarship for research in agricultural and natural systems modeling and analysis, offered by Agricultural and Biological Engineering, University of Florida.
3. **2015 Nicolas Stipo (UCL, Belgium).** OTS Research Fellowship Recipient (~\$4000)
4. **2014 Alice Alonso.** Honorable Mention at the annual UF-ABE Departement Poster Symposium.
5. **2014 Alice Alonso.** William V. Storch Award (AWRA). (\$1500)
6. **2014 Alice Alonso.** OTS Research Fellowship Recipient. (\$2630)
7. **2014 Alice Alonso.** Tropical Conservation Development Field Research Grant Fellow. (\$1500)
8. **2014 Alice Alonso.** Grinter Fellowship Award. (\$3600)
9. **2014 Yogesh Khare.** McNair Bostic Scholarship for research in agricultural and natural systems modeling and analysis, offered by Agricultural and Biological Engineering, University of Florida.
10. **2014 N. Nelson.** Richard A. Herbert Memorial Scholarship, American Water Resources Association.
11. **2014 N. Nelson.** Student Video Competition, 1<sup>st</sup> Place, (National Team Award), American Society of Agricultural and Biological Engineers (ASABE)
12. **2014 N. Nelson.** Campus RainWorks Challenge: 1<sup>st</sup> Place in the Master Plan Category, (team award), US-EPA.
13. **2014 N. Nelson.** Robert Stewart Engineering-Humanities National Award, American Society of Agricultural and Biological Engineers (ASABE).
14. **2014 N. Nelson.** Research Poster Competition, 1st Place, Agricultural and Biological Engineering Departmental Symposium, University of Florida
15. **2014 N. Nelson.** A.S. Herlong Sr. Graduate Scholarship, 2 years, College of Agricultural and Life Sciences, University of Florida
16. **2014 N. Nelson.** Sanford N. Young Scholarship, Florida Section of the American Water Resources Association
17. **2014 N. Nelson.** Best Graduate Student Presentation, Florida Section of the American Society of Agricultural and Biological Engineers Annual Conference
18. **2014 N. Nelson.** Graduate Scholarship, University Women's Club
19. **2014 N. Nelson.** Research Video Competition, 3rd Place, Agricultural and Biological Engineering 3MT+V (3 Minute Thesis and Video), University of Florida
20. **2014 N. Nelson.** Best Graduate Student Poster Award, Sustainable Water Resources: Water Supply Planning in a Non-Stationary World. UF Water Institute Symposium. University of Florida
21. **2013 Yoguesh Khare.** Alec Courtosis International Student Award. UF International Center. **2013 Natalie Nelson,** EPA RainWorks, April 2013.
22. **2010. David Kaplan** (Ph.D. ABE). Gamma Sigma Delta Graduate Student Award of Merit (April 2010)
23. **2010. Stuart Muller** (Ph.D. ABE). Student Speaker Award, 1<sup>st</sup> Place, Florida Section, American Society of Agricultural and Biological Engineers (June 2010).
24. **2010. Anna Cathey** (Ph.D. ABE) James Davidson Graduate Travel Scholarship by the College of Agricultural and Life Sciences (February 2010).
25. **2009. Anna Cathey** (Ph.D. ABE). Travel Award by the Ecological Society of America to attend the 2009 Millennium Conference.
26. **2010. Anna Cathey** (Ph.D. ABE). NSF-IGERT Travel Award by National Conference in 2010 to present "Living with Thirst" video.
27. **2009. Oscar Pérez-Ovilla** (Ph.D, ABE). UF College of Engineering Certificate of Excellence for "2009 Outstanding International Student".
28. **2009. Stuart Muller** (Ph.D. ABE). James Davidson Graduate Travel Scholarship by the College of Agricultural and Life Sciences (August 2008).
29. **2009. David Kaplan** (Ph.D. ABE). McNair Bostick Scholarship for Research in Agricultural and Natural Resource Systems.
30. **2009. David Kaplan** (Ph.D. ABE). Student Speaker Award, 1<sup>st</sup> Place, Florida Section, American Society of Agricultural and Biological Engineers.
31. **2009. David Kaplan** (Ph.D. ABE). Travel Awards: University of Florida (UF) Office of Research, UF Institute of Food and Agricultural Sciences, UF Graduate Student Council (May 2009).
32. **2009. Zuzanna Zajac** (Ph.D. ABE). James Davidson Graduate Travel Scholarship by the College of Agricultural and Life Sciences (August 2008).
33. **2008. Zuzanna Zajac** (Ph.D. ABE). Student Speaker Award, 1<sup>st</sup> Place, Florida Section, American Society of Agricultural and Biological Engineers (June 2008).

33. **2008. Stuart Muller** (Ph.D. ABE). Florida Society of Environmental Analysts Travel Scholarship. St. Petersburg, FL.
34. **2007. Zuzanna Zajac** (Ph.D. ABE). Honorable mention among the outstanding papers for 2007 in the Transactions of ASABE for the paper: *Evaluation of water quality models through global sensitivity and uncertainty analyses techniques: application to the vegetative filter strip model VFSSMOD-W*.
35. **2007. Stuart Muller** (Ph.D. ABE). Alec Courtelis Award 2007, presented to just three international students from the entire university each year to honor their academic accomplishments and community service.
36. **2005. Stuart Muller** (Ph.D. ABE). Storch Scholarship of the American Water Resources Association (AWRA).
37. **2004. Stuart Muller (Ph.D. ABE). Certificate of Merit UF International Center. For academic excellence.**