

CAREER SUMMARY

Data scientist (PhD Candidate) with a background in environmental resources management. Extensive knowledge of hydrological analysis techniques and water management issues. Expertise in a wide array of statistical tools and analyses, most notably cluster analysis, (non-linear) time series analysis, dynamic factor analysis and occupancy models. Experience with modeling/simulating biological and environmental systems. Proficient in R, knowledgeable of Python, Fortran and Matlab. Main interest in time series analysis, causality mechanisms, ecosystem services and research on alternative stable states in (socio-ecological) systems.

EDUCATION

Jan 2012 – Dec 2017 (expected, ABD) PhD Agricultural and Biological Engineering (with a certificate in Biological Systems Modeling) at the University of Florida.

Research is part of NSF funded project "Global Sensitivity & Uncertainty Analysis for Evaluation of Ecological Resilience: Theoretical Debates over Infrastructure Impacts on Livelihoods & Forest Change". Dissertation: "Changes in vegetation in a socio-ecological system in the SW Amazon subject to highway paving". Statistical analysis of biophysical and socio-economic time series, and analysis of a dynamic vegetation model (ED2). Advisor: Dr. R. Muñoz-Carpena.

Sep 1998 – Nov 2004 BSc/MSc Irrigation and Water Management (major) / Law and Governance (minor) at Wageningen University (The Netherlands)

- Thesis 2 (11/2003 – 11/2004), "Fishing in troubled waters. Two case studies of water quality management in sub-catchments of the Olifants Basin in South Africa". Qualitative study on policy effectiveness concerning water quality issues of coal and phosphate mining, hosted by the International Water Management Institute (CGIAR), South Africa. Advisors: Ir. P. Wester and Dr. D. Roth.
- Thesis 1 (01/2003 – 09/2003), "Scratching the surface. Infiltration and drainage properties of the Savutalele catchment, Fiji Islands". Field and laboratory measurements of infiltration and saturated hydraulic properties of different soils under different vegetation types, and hydrological and erosion modeling with the model SWAP. Funded by the CROPPRO project (EU 7th Framework), aimed at providing assistance to Pacific Island countries (Fiji, Samoa and Tonga) with the development of integrated farming approaches for sustainable crop production in environmentally constrained systems. Advisor: Dr. J.C. Van Dam.

RESEARCH

- Current research at Fisheries and Aquatic Sciences (University of Florida) includes
- Analysis of a long-term Florida horseshoe crab monitoring dataset by developing an occupancy model, with Dr. J. Brockmann and Dr. M. Allen.
 - Development of a dynamic population model to evaluate trends and structural breakpoints of recruitment and mortality anomalies of bonefish population in the Florida Bay area, and

relationships of these anomalies with variables associated with climate, hydrology, water quality and habitat changes, with Dr. R. Ahrens, Dr. M. Allen and Dr. J. Rehage (FIU).

- Assistance to UF Environmental Engineering Department on dynamic factor analysis of Amazon fisheries data, with Dr. V.J. Isaac.

PhD research includes

- Time series cluster analysis of vegetation index (VI) time series, dynamic factor analysis and evaluation of Shapley Values, with Dr. R. Muñoz-Carpena.
- Non-linear time series analysis, including phase space models, noise reduction, decomposition and reconstruction of signals, (multivariate) singular spectrum analysis, cross-convergent mapping and Granger causality / prediction, with Dr. R. Muñoz-Carpena and Dr. R. Huffaker.
- Global sensitivity and uncertainty analysis of a vegetation dynamics model (an existing individual-based, terrestrial biosphere model, Ecosystem Demography 2).

Previous research (at the Suwannee River Water Management District) includes

- Evaluation and determination of minimum flows and levels (MFLs), based on historic and hindcasted flow data, and habitat suitability assessments.
- Spatial correlation analysis of groundwater and spring flow time series to investigate possible nitrate pathways and sources.
- Development of statistical models to hindcast spring flows based on groundwater and river levels, and to estimate river base flow based on conductivity and river flow (mass balance).

PUBLICATIONS

Colvin, J., F. Ballim, S. Chimbuya, M. Everard, J. Goss, G. Klarenberg, S. Ndlovu, D. Ncala and D. Weston (2008). Building capacity for co-operative governance as a basis for integrated water resource managing in the Inkomati and Mvoti catchments, South Africa. *Water SA*, 2008 ; 34(6): 681-689.

MANUSCRIPTS IN PREPARATION OR UNDER REVIEW

Klarenberg, G., R. Muñoz-Carpena and S. Perz (in preparation). Changing lanes: SW Amazon road paving alters complexity and drivers of vegetation dynamics.

Klarenberg, G., M. Allen, R. Ahrens, R. Santos and S. Shaw. Application of a dynamic population model to investigate changes in bonefish populations in Florida Bay between 1980 and 2014.

AWARDS AND COMPETITIONS

March 2017 First place – Best Poster presentation at the annual poster symposium of UF's Agricultural and Biological Engineering Department:
"Changing lanes: SW Amazon road paving alters vegetation dynamics and its drivers"

- June 2015 First place – Best Paper presentation at the American Society of Agricultural and Biological Engineering (ASABE) Florida section meeting: “Non-linear time series analysis on Amazon vegetation data”
- August 2014 Attribute of a Gator Engineer Award 2014-2015: Leadership
- June 2014 Second place – Best Paper presentation at the American Society of Agricultural and Biological Engineering (ASABE) Florida section meeting: “A Spatial and Temporal Analysis of possible Impacts of Inter-Oceanic Highway Road Paving on Vegetation Dynamics in the SW Amazon: Dynamic Factor Analysis”
- March 2014 Third place – 3 Minute Thesis Competition at the Department of Agricultural and Biological Engineering (University of Florida): “Seeing the forest for the trees. Resilience of a socio-ecological system in the Amazon”.

TEACHING

- Fall 2014 Guest lecturer for course “International Water Management” (topics: rainwater harvesting, and watershed management) at the University of Florida (Agricultural and Biological Engineering)
- Spring 2013 Teaching Assistant for course “Land and Water Resources Engineering” at the University of Florida (Agricultural and Biological Engineering)

PRESENTATIONS (selected)

- Jul 2016 American Society of Agricultural and Biological Engineers (ASABE) Annual International Meeting (AIM) in Orlando, FL: “Causality in a changing complex socio-ecological system in the SW Amazon” (oral).
- Feb 2016 University of Florida Water Institute Symposium: “Determining low-dimensional non-linear structure and causality of vegetation dynamics in the SW Amazon” (poster).
- Mar 2016 American Water Resources Association (AWRA) Florida section meeting: “Presentation and investigation of continuous monitoring data from the Manatee and Fanning springsheds” (oral).
- Jul 2015 ASABE AIM in New Orleans, LA: “Road construction and dynamics of vegetation structure. The importance of biophysical and socio-economic variables according to paving progress” (oral).
“Amazonian vegetation dynamics along a road disturbance gradient: deterministic or stochastic?” (poster).
- Jun 2015 ASABE Florida section meeting: “Non-linear time series analysis on Amazon vegetation data” (oral).
- Jul 2014 ASABE AIM in Montréal, Canada: “A spatial and temporal analysis of vegetation dynamics in a disturbed SW Amazonian forest area” (poster).

- Jun 2014 ASABE Florida section meeting: “A Spatial and Temporal Analysis of possible Impacts of Inter-Oceanic Highway Road Paving on Vegetation Dynamics in the SW Amazon: Dynamic Factor Analysis” (oral).
- Mar 2014 3-Minute Thesis competition: “Seeing the forest for the trees. Resilience of a socio-ecological system in the Amazon” (oral).
2-Minute video competition: “Impacts of road paving on vegetation in a complex socio-ecological system in the SW Amazon”.

PROFESSIONAL EXPERIENCE

Sep 2016 – Current Biological Scientist II

University of Florida, School of Forestry and Natural Resources, Fisheries and Aquatic Sciences (USA). Supervisors: Dr. R. Ahrens and Dr. M. Allen.

Aug 2015 – Aug 2016 Statistician

Suwannee River Water Management District (USA)

Research and analysis of flow and water quality data, evaluation of and assisting with consultants’ statistical analyses, contribute to database development and sampling design, development of code and scripts for data extraction, analysis, synthesis and presentation.

Mar 2010 – Dec 2011 Independent consultant/researcher

Self-employed (South Africa and USA)

Research, analysis, information syntheses and report development for various clients (government, universities, non-profits) on Integrated Water Resources Management (IWRM) and associated public participation and awareness raising; on water supply and sanitation services (community-based approach and institutional development).

May 2007 – Feb 2010 Senior Policy Specialist

Jan 2006 – Apr 2007 Project and Programme Manager

Jan 2005 – Dec 2005 Project and Management Support

The Mvula Trust, South Africa’s largest water and sanitation NGO.

Water resources management and water services policy analysis, research on sustainable livelihoods (rainwater harvesting, multiple use of water); project and program management (including tendering and fund raising).

Management of (EU- and government-funded) civil society capacity building and support programs, focused on the water services and sanitation delivery sector.

SKILLS AND PROFESSIONAL COURSES

Statistical analysis – R, Brodgar, Minitab

Computer modeling and simulation – Fortran, Python, Matlab, C, Visual Basic

GIS – ArcMap

Microsoft Office – Word, Excel, Powerpoint, Outlook, some Access

Hydrological field and laboratory measurements

PADI Open Water & Advanced Open Water Diver

Languages: Dutch (mother tongue), English (fluent), French (intermediate), German (intermediate)

Empowering Women in Technology Startups (UF, 2015)
Online certificate course on Ecological Sanitation (UNESCO-IHE, 2009)
Three-day course on Monitoring, Evaluation and Reporting (CJ Development Research Consulting, 2008)

MEMBERSHIPS

American Society of Agricultural and Biological Engineers (ASABE)
American Water Resources Association (AWRA)

SERVICE / COMMUNITY INVOLVEMENT (selected)

Oct 2015 – current	Volunteer for PhDMoms, a graduate student organization at UF that supports doctoral student-parents, with specific attention to female student-parents: run weekly writing groups, newsletter and assist with tabling
Sep 2014 – Sep 2015	Member-at-large (Graduate Student Relationships) of the Young Professionals Community (YPC) of the American Society of Agricultural and Biological Engineers (ASABE)
Jun 2014 – Sep 2015	Co-President of PhDMoms, a graduate student organization at UF that supports doctoral student-parents, with specific attention to female student-parents
Oct 2013 – Sep 2015	President of ABE-GSO, UF's Agricultural and Biological Engineering Graduate Student Organization
2013 – 2015	Science Fair judging for Alachua County middle schools
Jan 2013 – Sep 2015	Member of ABE-GPDC, the Agricultural and Biological Engineering Graduate Professional Development Committee (predecessor to ABE-GSO)
Jan 2013 – May 2014	Member of GSAC, the Graduate Student Advisory Council to the NSF-funded I-cubed Program at the University of Florida (organized the Graduate Student Research Day 2013)
Aug 2012 – May 2014	Co-founder of Tanglewood Community Gardens, and secretary of the Board from Oct 2012 to May 2014. Tanglewood Community Gardens won the UF Sustainability Award in 2013