

# Marilyn C. Montgomery, PhD, GISP

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## RESEARCH SPECIALIZATION

My research focuses on environmental justice, social vulnerability, and community resilience in the context of natural hazards. I utilize concepts and methodologies in geographic information science (GIS) to assess social equity in the distribution of flood hazards.

## EDUCATION

- 8/2014 Ph.D. Geography and Environmental Science and Policy. University of South Florida, Tampa, FL  
Adviser: Dr. Jayajit Chakraborty  
Dissertation: *Assessing the Environmental Justice Implications of Flood Hazards in Miami, Florida*
- 5/2007 M.S. Environmental Science. University of West Florida, Pensacola, FL  
Adviser: Dr. Klaus Meyer-Arendt  
Thesis: *Beach Nourishment at Pensacola Beach, Florida: Assessment of Public Perception.*
- 8/2000 B.S. Environmental Science/Natural Science. University of West Florida, Pensacola, FL

## SOFTWARE PROFICIENCY

- ArcGIS for Desktop and extensions
- Python scripting for ArcGIS
- eCognition Developer (formerly Definiens Developer)
- Erdas Imagine
- Intergraph GeoMedia
- Autodesk Map 3D
- Global Mapper
- R
- GeoDa
- Geographically Weighted Regression (GWR)
- IBM SPSS Statistics
- Trimble GPS Pathfinder Office
- Solo Field and Solo Office
- Microsoft Office suite
- Adobe Design Premium Creative Suite

## WORK EXPERIENCE

- 9/2014 – present **Postdoctoral Research Fellow**, The Wharton Risk Management and Decision Processes Center
- Apply GIS and spatial statistical techniques for research of environmental justice, social vulnerability, and community resilience in exposure to flood risks in the U.S. and developing nations
  - Research on affordability concerns of the National Flood Insurance Program (NFIP)
  - Geospatial analyses, research, data visualization, and writing for multiyear collaborative national and international research projects on community resiliency to flood risk and flood insurance
- 8/2012 – 8/2014 **Research Assistant**, University of South Florida
- Utilize GIS and statistical techniques to support collaborative research project: Advancing Environmental Equity Research: Vulnerability to Air Pollution and Flood Risks in Houston and Miami, **National Science Foundation**. Grant number CMMI 1129984/1130191
  - Co-author peer-reviewed journal articles and create associated cartographic products; present at academic conferences
- 1/2010 – 1/2012 **Data Modeler III/ Coastal Geomorphologist**, Jacobs Technology Inc., contracted to U.S. Geological Survey (USGS), St. Petersburg, FL

- Applied principles and techniques of coastal geomorphology and hydrodynamics in GIS and remote sensing applications to derive estuarine shorelines, tidal flats, submerged areas, and other geomorphic features in coastal marsh and barrier island environments
- Processed and analyzed raster data (including satellite images, aerial orthophotography, and lidar) to extract geomorphic features for scientific investigations of nearshore sediment transport and geomorphology in barrier island and estuarine environments
- Reviewed and revised scientific literature and geospatial data for technical accuracy, organization of material, and clarity of expression as part of USGS peer-review process

12/2011 – 5/2012, and 8/2008 – 1/2010 **Teaching Assistant**, University of South Florida

- Instructor of record:
  - Introduction to Physical Geography (GEO2200)
  - Environmental Science (EVR2002)
  - Environmental Science Lab (EVR2001L)
- Graded papers, developed assignments, assisted students in lab and via email, occasional lecture:
  - GIS for Non-majors (GIS5049)
  - Meteorology (MET4010)

1/2007 – 10/2008 **GIS Specialist**, Science Applications International Corporation (SAIC), Shalimar, FL

- Created a GIS application with features originating from computer-aided design (CAD); trained military personnel to use it (Eglin Air Force Base)
- Extracted military infrastructure features from aerial photography and global positioning systems (GPS) (Eglin Air Force Base)
- Customized applications for GPS data collection
- Wrote and maintained metadata compliant with FGDC and Department of Defense (DoD) standards
- Provided GIS support for environmental impact statements and environmental assessments

6/2005 – 1/2007 **GIS Analyst III**, Santa Rosa County Board of County Commissioners, Milton, FL

- Mapped various county features and maintained county-wide enterprise geodatabases:
  - fire hydrants, manhole covers, streets, street signs, structures with their addresses
- Created interactive and static cartographic products for County Departments:
  - Board of County Commissioners, Emergency Management, Building Permits, and Property Appraiser
- Managed student interns

10/2000 - 6/2005 **Environmental Specialist I**, Escambia County Environmental Health Services, Florida Department of Health (FDOH), Pensacola, FL

- Part of team that won Davis Productivity Award for streamlining routine surface water sampling program, saving time and money
- Created interactive web map application to disseminate West Nile Virus monitoring data to the public
- Trained others on ArcPad and ArcGIS
- Employed geospatial technology and produced cartographic products required for FDOH Environmental Health programs; including Healthy Beaches, drinking water wells, and State Underground Environmental Response (SUPER) Act

## **PUBLISHED PEER-REVIEWED JOURNAL ARTICLES**

2017. Czajkowski, J., Villarini, G., Montgomery, M., Michel-Kerjan, E., and Goska, R. "Assessing Current and Future Freshwater Flood Risk from North Atlantic Tropical Cyclones via Insurance Claims" *Scientific Reports* (DOI: 10.1038/srep41609).
2016. Grineski, S.E., Collins, T.W., Chakraborty, J., and Montgomery, M.C. "Hazard Characteristics and Patterns of Environmental Injustice: Household-level Determinants of Environmental Risk in Miami, Florida" *Risk Analysis* (DOI: 10.1111/risa.12706).
2015. Montgomery, M.C., and Chakraborty, J.C. "Assessing the environmental justice consequences of flood risk: a case study in Miami, Florida" *Environmental Research Letters* (DOI:10.1088/1748-9326/10/9/095010).
2015. Collins, T.W., Grineski, S.E., Chakraborty, J., Montgomery, M.C., and Hernandez, M. "Downscaling Environmental Justice Analysis: Determinants of Household-level Air Toxics Cancer Risk Disparities in Greater Houston" *Annals of the Association of American Geographers* (DOI: 10.1080/00045608.2015.1050754).
2015. Montgomery, M.C., Chakraborty, J., Grineski, S.E., and Collins, T.W. "An environmental justice assessment of public beach access in Miami, Florida" *Applied Geography* (DOI: 10.1016/j.apgeog.2015.04.016).
2014. Chakraborty, J., Collins, T.W., Grineski, S.E., and Montgomery, M.C., and Hernandez, M. "Comparing Disproportionate Exposure to Acute and Chronic Pollution Risks: A Case Study in Houston, Texas" *Risk Analysis* (DOI: 10.1111/risa.12224).
2014. Grineski, S.E., Collins, T.W., Chakraborty, J., and Montgomery, M.C. "Hazardous Air Pollutants & Flooding: A comparative interurban study of environmental injustice" *GeoJournal* (DOI: 10.1007/s10708-014-9542).
2014. Chakraborty, J., Collins, T.W., Montgomery, M.C., and Grineski, S.E. "Social and Spatial Inequities in Exposure to Flood Risk: Case Study in Miami, Florida" *Natural Hazards Review* (DOI: 10.1061/(ASCE)NH.1527-6996.0000140).
2013. Montgomery, M.C. and Chakraborty J., "Social Vulnerability to Coastal and Inland Flood Hazards: A Comparison of GIS-based Spatial Interpolation Methods" *International Journal of Applied Geospatial Research* 4(3): 58-79.

## **PUBLISHED TECHNICAL REPORTS**

2010. Morton, R.A. and Montgomery, M.C. Geomorphology and depositional subenvironments of Gulf Islands National Seashore, Perdido Key and Santa Rosa Island, Florida: U.S. Geological Survey Open-File Report 2010-1330. (published online at <http://pubs.usgs.gov/of/2010/1330/>)

## **PAPERS AND POSTERS PRESENTED AT ACADEMIC CONFERENCES**

2016. Montgomery, M.C. "Affordability of the NFIP Newly Mapped Procedure: Case Study in Jefferson and Orleans Parishes, Louisiana" *American Insurance and Risk Association (ARIA) 2016 Annual Meeting* (Boston, MA); August.
2016. Montgomery, M.C. "Social Equity Implications of the Newly Mapped Procedure of the National Flood Insurance Program" *2016 Annual Meeting of the Association of American Geographers (AAG)* (San Francisco, CA); March.
2015. Montgomery, M.C., Chakraborty, J., Collins, T.W., and Grineski, S.E. "Effects of Dasymetric Modeling on Environmental Justice Analyses of Flood Hazards Exposure" *2015 Annual Meeting of the Association of American Geographers (AAG)* (Chicago, IL); April.
2014. Montgomery, M.C., Chakraborty, J., Collins, T.W., and Grineski, S.E. "Environmental Justice Analysis of Coastal Hazards and Amenities in Miami, Florida" *2014 Annual Meeting of the Association of American Geographers (AAG)* (Tampa, FL); April.
2013. Montgomery, M. "Using Dasymetric Modeling to Assess the Environmental Justice Implications of Flood Hazards in Miami, Florida" *2013 Annual Meeting of the AAG* (Los Angeles, CA); April.

2012. Chakraborty J., Collins T., Grineski S., and Montgomery M., "Spatial and Social Inequities in Exposure to Flood Hazards: A Case Study in Miami, Florida" *32nd International Geographical Congress 2012* (Cologne, Germany); August.
2012. Montgomery, M., and Chakraborty, J. "Racial/Ethnic and Socioeconomic Disparities in Exposure to Flood Hazards in Miami, Florida" *Race, Ethnicity and Place Conference VI* (San Juan, Puerto Rico); October.
2011. Montgomery, M.C. "Vulnerability to Coastal and Inland Flood Hazards: A Comparison of GIS-Based Spatial Interpolation Techniques" *2011 Annual Meeting of the AAG* (Seattle, WA); April.
2010. Montgomery, M.C. "Spatial Analysis of Vulnerability to Coastal and Inland Flood Hazards: Tampa Bay, FL" *2010 Annual Meeting of the AAG* (Washington, DC); April.
2009. Montgomery, M.C. "Perception of Beach Nourishment at Pensacola Beach, Florida". *Florida Society of Geographers 2009 Annual Meeting* (Saint Augustine, FL); January.
2004. Montgomery, M.C. "GIS in West Nile Virus Surveillance: Escambia County, Florida". *Florida Society of Geographers 2003 Annual Meeting* (Pensacola Beach, FL); February.
2002. Montgomery, M.C. "GIS at Escambia County Environmental Health Services". *2002 Seven Hills Regional User Group for GIS (SHRUG GIS) Annual Workshop* (Tallahassee, FL); November.

#### **AWARDS**

2014. IGI Global Sixth Annual Excellence in Research Journal Awards, celebrating best articles from the 2013 volume year (for "Social Vulnerability to Coastal and Inland Flood Hazards: A Comparison of GIS-based Spatial Interpolation Methods", *International Journal of Applied Geospatial Research*).
2014. International Journal of Applied Geospatial Research (IJAGR) Best Paper Award for 2013 (for "Social Vulnerability to Coastal and Inland Flood Hazards: A Comparison of GIS-based Spatial Interpolation Methods").
2013. Jeanne X. Kasperson Award for best student paper in hazards and disaster geography. Given by the Hazards, Disasters, and Risk specialty group of the AAG; *2013 Annual Meeting of the AAG* (Los Angeles, CA); April.
2010. Norb Psuty Student Paper Merit Award. Given by the Coastal and Marine specialty group of the AAG; *2010 Annual Meeting of the AAG* (Washington, DC); April.
2002. Best Educational Media Poster award. Given by the Seven Hills Regional User Group for GIS (SHRUG GIS); *2002 SHRUG GIS Annual Workshop* (Tallahassee, FL); November.