

ZACHARY J. NIXON

Geospatial Analyst

Mr. Nixon specializes in bringing statistical and analytical rigor to natural resource mapping and damage assessment via the use of Geographic Information Systems (GIS), geostatistics, spatial ecology, and applied quantitative analysis. As part of RPI's team since 1996, Mr. Nixon has extensive experience in the development of unique and advanced analytic and statistical techniques and tools for damage assessments, site selection and screening, and geomorphic and ecological mapping. He developed advanced 3-D interpolation processes and databases for use in the Arabian Gulf UNCC Gulf War Shoreline Remediation, and examined the risks to infrastructure in Louisiana and Puget Sound for the National Oceanic and Atmospheric Administration. He has participated in damage assessments for spills in the Gulf Coast, Alaska, and Delaware Bay. Most recently, Mr. Nixon led the technical team in developing the United Arab Emirates Coastal Environmental Atlas database, developed analysis tools for projects in the Great Lakes, and led the development and deployment of onsite field shoreline cleanup assessment (SCAT) database for the Mississippi Canyon 252/Deepwater Horizon Spill response.

EDUCATION

Master of Environmental Management, Duke University, Durham N.C. (2006)

B.S., Marine Science, University of South Carolina, Columbia, S.C. (1997).

PROFESSIONAL EXPERIENCE

Environmental Assessments:

2010: Spill Response Support, Mississippi Canyon 252/Deepwater Horizon Spill, Gulf of Mexico. Led development and deployment of onsite field shoreline cleanup assessment (SCAT), database, and supervised data management support to NOAA and other federal trustees.

2010: Project Analyst, Contingency Plan Annex Spill Risk Assessments, National Park Service, Great Lakes. Designed quantitative spatial risk analysis to assess and communicate threats to NPS properties from a variety of spill sources.

2009: Project Analyst, Arabian Gulf UNCC Gulf War Shoreline Remediation. Developed customized non-Euclidean geostatistical interpolation techniques for and 3-D modeling volume estimation of oil-contaminated sediments and coastal geomorphology data.

2009: Project Analyst, Garden Island Bay Contamination Assessment. Performed geostatistical analysis, volume estimation, and 3-D modeling of oil-contaminated sediments and coastal geomorphology data.

2007: Geospatial Technical Lead, Exxon Valdez Oil Spill Lingering Oil Survey. Responsible for development of advanced statistical modeling approach, robust survey design, and implementation of custom tools to integrate GIS and statistical software packages.

2006: Project Manager, Gulf of Mexico Marine Debris Project. Designed database structure and cartographic products and conducted stakeholder workshops to provide public dissemination of NOAA Marine Debris Program field data and track cleanup efforts.

2005: Project Analyst, Remediation of Lingering Oil in Prince William Sound Study. Performed geostatistical analysis, and 3-D modeling of oil-contaminated sediments and coastal geomorphology data.

2005: Project Analyst, Hurricane Rita HAZMAT Debris Analysis. Participated in study design, performed photo interpretation, fieldwork, and spatial analysis of Hurricane Rita debris issues for the Sabine National Wildlife Refuge.

2005: Project Analyst, M/T Athos Spill Natural Resource Damage Assessment. Conducted spatially explicit, quantitative population, oiling, and injury calculations for birds and wildlife resources affected by the M/T Athos spill.

2004: Spill Damage Assessment Support, Hurricane Ivan Spills, Louisiana. Provided onsite field shoreline cleanup assessment (SCAT) and data management support to NOAA and other federal trustees.

2004: Spill Response Support, Midvalley Pipeline Spill, Kentucky. Provided onsite field shoreline cleanup assessment (SCAT) and data management support to NOAA and other federal trustees.

2004: Project Coordinator, TNC Santee River Delta Vegetation Change Analysis. Designed study, conducted fieldwork, and performed multivariate statistical and neural network analysis for examination of wetland community change due to hydrologic and salinity regime alterations.

2002-2003: Geomorphologist/Project Analyst, Arabian Gulf UNCC Gulf War Shoreline Survey. Participated in design of sampling methodology, database structure, and data collection applications, and coordinated personnel for collection, geostatistical analysis, and 3-D modeling of oil-contaminated sediments and coastal geomorphology data.

2002: Project Analyst, NOAA Abandoned Vessels Survey. Provided spatial analysis and assisted in fieldwork in support of salvage survey of abandoned vessels in Puerto Rico, US Virgin Islands, and Pacific Territories.

2001: GIS Coordinator, Poplar Pt./Anacostia River Groundwater Contamination Assessment. Provided spatial and geostatistical analysis and 3-D visualization of stratigraphic and environmental data.

2001: Project Analyst, API In-Situ Burning Site Assessment. Participated in field collection and spatial analysis of environmental data and photography.

2001: GIS Coordinator, T/V Gilbert Taylor Grounding Natural Resource Damage Assessment. Provided spatial and geostatistical analysis, 3-D visualization, and modeling of bathymetric data and quantification of associated seagrass injury.

2000-2001: Project Analyst, Todd Shipyard, Seattle WA Environmental Remediation litigation support. Provided spatial and geostatistical analysis, 3-D visualization, and modeling of sediment contamination and bathymetric data.

1999: Project Analyst, Parris Island, SC Thermal Plume Study. Field collection and spatial analysis of water quality and bathymetry data and design of cartographic products.

1998-1999: Project Analyst, DOT Unusually Sensitive Areas Project. Analysis and identification of drinking water resources sensitive to petroleum pipeline spills.

1997: Project Analyst, New Jersey Tidal Inlet Protection Strategies Designed digital data structure and cartographic products.

Assessment Tools:

2009: Project Analyst, NOAA Habitat Equivalency Analysis (HEA) GIS Toolset. Designed screening tool methodology to integrate advanced interpolation methods and automate HEA analysis for complex natural resource damage assessments.

2009: Project Analyst, NOAA Proactive Response and Prevention (PReP) Initiative. Assisted in data collection and development and designed screening tools to assess risk to hazardous waste sites and NOAA trust resources from global warming and sea level rise.

2002-2003: Project Analyst, NOAA Oil and Gas Infrastructure and Coastal Land Loss Risk Assessment for Louisiana. Designed spatial risk analysis and software tools to assess risks to coastal oil and gas infrastructure in Louisiana from coastal land loss.

Natural Resource Mapping:

2009: Technical Director, Abu Dhabi Coastal Environmental Atlas. Designed technical approach for data collection and integration, including advanced remote sensing methods, of biological and geomorphic data for integrated coastal atlas and environmental stressor screening tools.

2007: Project Analyst/Geomorphologist, Northern California ESI Project. Conducted high resolution shoreline geomorphological mapping using georeferenced oblique aerial imagery.

2006: Project Analyst/Geomorphologist, Alabama ESI Project. Conducted high resolution shoreline geomorphological mapping using georeferenced oblique aerial imagery.

2006: Project Analyst/Geomorphologist, Maryland ESI Project. Designed and implemented new approach for high resolution shoreline geomorphological mapping using georeferenced oblique aerial imagery.

2005: Project Analyst/Geomorphologist, Puget Sound ESI Project. Designed and conducted field accuracy assessment of photo-interpreted shoreline classification for Puget Sound.

2005: Project Analyst/Geomorphologist, Hudson River Valley ESI Project. Mapped shoreline geomorphology via low-altitude aerial overflight for Hudson River Valley.

2005: Project Analyst/Geomorphologist, Central California ESI Project. Photo-interpreted shoreline geomorphology, and conducted low-altitude aerial overflight fieldwork for central coast of California and Monterey Bay National Marine Sanctuary.

2002: Project Analyst/Geomorphologist, Florida ESI Maintenance Project. Photo-interpreted shoreline geomorphology for portions of coast of Florida.

2001: GIS Coordinator, Honduras Coastal Resource mapping. Compiled and synthesized geomorphic, biological, and socioeconomic data for coastal resource atlas.

2001: GIS Coordinator, Guatemala Coastal Resource mapping. Compiled and synthesized geomorphic, biological, and socioeconomic data for coastal resource atlas. Conducted in-country reviews with local resource experts.

2001: Project Analyst, Hawaii ESI Mapping. Compiled and synthesized geomorphic, biological, and socioeconomic data for coastal resource atlas. Assisted in the development of a quantitative spatial accuracy assessment for coastal geomorphic mapping.

1999-2001: GIS Coordinator/Geomorphologist, LSU Louisiana Gulf-wide Information System. Collected, compiled and synthesized geomorphic, biological, and socioeconomic data for coastal resource atlas. Assisted with fieldwork for shoreline geomorphic classification.

1997-1998: Project Technician, El Salvador Coastal Resource mapping. Compiled and synthesized geomorphic, biological, and socioeconomic data for coastal resource atlas.

1996-1997: Project Technician, St. Johns River ESI mapping. Compiled and synthesized geomorphic, biological, and socioeconomic data for ESI atlas.

1996: Project Technician, Georgia ESI mapping. Compiled and synthesized geomorphic, biological, and socioeconomic data for ESI atlas.

Publications

Barnea, N., J. Michel, B. Bray, Z. Nixon, G. Imahori and C. Moegling. 2009. Marine Debris Response Planning in the North-Central Gulf of Mexico. June 2009. NOAA Technical Memorandum NOS-OR&R-31.

Michel, J, Z. Nixon, J. Dahlin, D. Betenbaugh, M. White, D. Burton, and S Turley. 2009. Recovery of Interior Brackish Marshes Seven Years After the Chalk Point Oil Spill. Marine Pollution Bulletin. Manuscript submitted for publication.

- Nixon, Z., 2008. Predictive Modeling of Storm-Generated Marine Debris. Poster session presented at: 2008 Mississippi – Alabama Bays and Bayous Symposium, Biloxi, MS.
- Nixon, Z., 2008. Modeling Storm-Generated Marine Debris. Poster session presented at: 2008 NOAA Marine Debris Information Forum, Bethesda, MD..
- Nixon, Z., Michel, J., Hoff, J. Forsell, D., Krest, S., Hossler, R., Clark, K., Nichols, T. and J. Dunn. 2008. Estimating Bird Injury From the M/T Athos Spill. Proc. In: 2008 International Oil Spill Conference, American Petroleum Institute.
- Michel, J., Nixon, Z., and Cotsapas, L. 2005. Evaluation of Oil Remediation Technologies for Lingering Oil from the Exxon Valdez Oil Spill in Prince William Sound, Alaska. Exxon Valdez Oil Spill Restoration Project Report #050778
- Lord-Boring C., Zelo, I. J., and Z. Nixon. 2004. Abandoned vessels: impacts to coral reefs, seagrass, and mangroves in the U.S. Caribbean and Pacific territories with implications for removal. Marine Technology. Marine Technology Society Journal. 38:(3)
- Henry, C., R. Pavia, S., Zengel, Z. Nixon, C. Locke, and K. Debusschere. 2003. Developing Contingency Planning Tools to Address Wetland Loss, Ageing Infrastructure, and Oil Spill Risk in Louisiana. In: Proc. 2003 International Oil Spill Conference, American Petroleum Institute.
- Plank, C., and Z. Nixon. 2003. Hawaii Environmental Sensitivity Index (ESI) Maps and The Spatial Accuracy of ESI Mapping Methodology. In: Proc. 2003 International Oil Spill Conference, American Petroleum Institute.
- Michel, J., Z. Nixon, and H. Hinkeldey. 2003. Use of *in situ* burning as an oil spill response tool: Follow-up of four case studies. In: Proc. 2003 International Oil Spill Conference, American Petroleum Institute.
- Michel, J., S. Zengel, C. Lord, and Z. Nixon. 2002. Surveys of Abandoned Vessels: U.S. Caribbean Region. NOAA Office of Response and Restoration, Silver Spring, Maryland, 52 pp. + appendices.
- Zengel, S., Z. Nixon, C. Plank, J. Hanifen, D. Sa, and D. Braud, 2002. Environmental Sensitivity Mapping and GIS: the Louisiana G-WIS Database. In: Fourth Biennial Freshwater Spills Symposium. EPA, Cleveland OH.
- Michel, J., Z. Nixon, and H. Hinkledey. 2002. Recovery of Four Oiled Wetlands Subjected to *In Situ* Burning. API Publ. No., American Petroleum Institute, Washington, D.C., 71 pp.
- Zengel, S., Z. Nixon, and J. Hanifen. 2001. Louisiana Gulf-Wide Information System: coastal habitats, wildlife, and fisheries components. Invited Presentation, 17th Annual Louisiana Remote Sensing and GIS Conference, Baton Rouge, Louisiana.
- Zengel, S. and Z. Nixon. 2001. Louisiana Gulf-Wide Information System: Environmental Sensitivity Index Components. CleanGulf '01, Proceedings, abstract.