RPI

Christine L. Boring **Research Planning, Inc.**
Coastal Resources Specialist

Ms. Boring is an ecologist specializing in coastal ecology, wildlife/fisheries biology, natural resource mapping, data synthesis, contaminants, and water quality improvement/watershed management. Ms. Boring has worked either in the field and/or in stakeholder meetings in 21 Pacific (including Hawaii and Alaska), Gulf Coast, Atlantic, and Great Lakes States and in every U.S. Territory during her 14 years as an ecologist at RPI.

Her responsibilities at RPI include serving as lead biologist, project manager, and/or senior ecologist on several different types of projects and tasks, including 25 Environmental Sensitivity Index mapping projects and numerous natural resource data syntheses in support of Resources at Risk Analyses, Environmental Impact Statements, Environmental Assessments, and Alternative Energy studies. She has served as a member of the National Oceanic and Atmospheric Administration (NOAA) Scientific Support Team as a responder to oil/hazardous materials spills for over 13 years, as part of Natural Resource Damage Assessments, and has managed water quality improvement projects in 13 watersheds. She has co-authored several technical publications and reports while at RPI and previously at Rutgers University.

EDUCATION

M.S., Ecology and Evolution, Rutgers University, New Brunswick, NJ (1999).
Thesis Title: Mercury in Raccoons: Use as a Bioindicator of Environmental Contamination

B.S., Biology, University of Michigan, Ann Arbor, MI (1996)
Certification in Secondary Education for Biology, Chemistry, and History, University of Michigan (1996)

Honors
Rutgers Graduate Student Summer Research Fellowship, 1998

PROFESSIONAL EXPERIENCE

1999 to Present: Ecologist, Research Planning, Inc., Columbia, SC

1996 to 1999: Graduate Research Assistant at Rutgers University and University of Georgia's Savannah River Ecology Laboratory (SREL)

Ms. Boring's experience is outlined separately on the following pages in five main areas:

1) ESI/Coastal Resource Mapping
2) Oil and Hazardous Material Spill Response/Assessment
3) Ecological Risk Assessment
4) Alternative Energy / Environmental Assessments
5) Watershed Restoration

COASTAL RESOURCE MAPPING FOR OIL SPILL CONTINGENCY PLANNING AND RESPONSE

Environmental Sensitivity Index (ESI) Mapping: Ms. Boring served as lead biologist on the following ESI Projects used for coastal zone management, contingency planning, and hazardous material/natural disaster responses:

Gaza Strip	2000

Rhode Island	2001
Connecticut	2001
New York/New Jersey Metropolitan Area	2001
Hawaii including NWHI (2 volumes)	2001
Northwest Arctic, Alaska	2002
Western Alaska	2003
American Samoa	2003
Bristol Bay, Alaska	2004
Columbia River, Ore./Wash. (supervisor)	2004
North Slope/Chukchi Sea, Alaska	2005
Guam (project manager)	2005
Northern Mariana Islands (CNMI) (manager)	2005
Virginia (2 volumes)	2005
Central California and MBNMS (manager)	2006
Alabama	2007
Maryland (2 volumes)	2007
Northern California (project manager)	2008
Southern California	2010
North Carolina (3 volumes)	2011
Florida Panhandle	2012
South Florida (supervisor)	2013
Texas, Upper Coast (supervisor)	2013
Louisiana (supervisor)	2013
Delaware Bay (supervisor)	2014

Her role as lead biologist on multiple ESI projects requires extensive correspondence with biological and socio-economic resource experts from several government, university, and private agencies throughout the U.S. and abroad (including compilation efforts for the Honduras and Nicaragua ESI mapping projects). She has extensive experience in natural resources data collection and interpretation, as well as a working knowledge of Geographic Information Systems (GIS) software, particularly ArcMap and Geodatabase. Her intimate familiarity with the history of ESI mapping has resulted in her being a key player in the development of new products and tools related to the ESIs and the use of ESIs to support NOAA's core mission.

OIL AND HAZARDOUS MATERIALS SPILL RESPONSE/ASSESSMENT

Emergency Response: Since 1999 Ms. Boring has been part of the Scientific Support Team to the U.S. Coast Guard provided by the National Oceanic and Atmospheric Administration (NOAA) for oil and chemical spills. She has written and edited hundreds of resources at risk analyses for oil and chemical spills, spill drills, contingency plans, natural disasters (e.g., hurricane Katrina), and natural resource damage assessments (NRDA) based on the extensive library (ESI atlases and beyond) of nearshore and offshore resource data that she has been integral in compiling.

She has provided on-scene support for the Emergency Response and Assessment and Restoration Divisions of NOAA at numerous incidents, including:

2011 Cedyco Manila Village pipeline leak, Bayou Dupont, Louisiana: Incident Command representative and SCAT Coordinator.

2010 *Deepwater Horizon*: Assisted Shoreline Cleanup Assessment Team (SCAT) Coordinator with Shoreline Treatment Recommendations (STR), Section 7 and Section 106 Consultations with

Trustees, etc. In the early weeks/months of the spill she wrote Resources at Risk for most of the shorelines and coastal resources in Texas, Louisiana, Alabama, and Florida, collected digital data and maps from various state and federal agencies to be incorporated into the Gulf Response GeoPlatform, and QA/QC'ed hundreds of SCAT field forms.

2010 Enbridge Pipeline, Kalamazoo River, Michigan: Incident Command representative.

2008 DM 932 Barge Spill, New Orleans, Louisiana: SCAT team lead.

2007 Mystery Spill, Puerto Rico: Incident Command representative and SCAT team member.

2006 Citgo, Calcasieu Lake, Louisiana: SCAT team member for the response. Team lead for the NRDA sediment and biological sampling effort.

2004 Sun Anchorage T/S *Torm Mary*, Port Neches, TX: SCAT team member.

Training: 2003-present: Ms. Boring has been a lecturer and instructor for ESI Mapping and Shoreline Cleanup Assessment Trainings for the last 10 years. From 2003-2013 Ms. Boring participated in ESI/SCAT training workshops in Wells, Maine, Norfolk, Virginia, Mobile, Alabama, Honolulu, Hawaii, Anchorage, Alaska, and Charleston, South Carolina. She led classes of 30+ students through the history and creation of the ESI Atlas and databases, as well as exercises using ESI maps for decision making.

Long-term Monitoring: In 2007 Ms. Boring lead a field team on three 10-day cruises in Prince William Sound, AK to revisit sites oiled during the Exxon Valdez Oil Spill. She also assisted in writing the technical report following the multi-year surveys.

ECOLOGICAL RISK ASSESSMENT

RULET: Ms. Boring worked on determining Ecological Resources at Risk as part of screening level risk assessment packages for the Remediation of Underwater Legacy Environmental Threats (RULET) program in 2011-2012. This entailed quickly identifying critical marine and coastal resources over vast areas of the Atlantic, Gulf, and Pacific Coasts at various scales.

Arctic Damage Assessment Planning: Ms. Boring worked in support of the NOAA Assessment and Restoration Division (ARD) on several tasks related to the U.S Arctic from 2010-2012. In particular, she assisted with planning and served as a group lead (birds and fish/invertebrates) in a 3-day Arctic Natural Resource Damage Assessment (NRDA) planning workshop (April 2010) and an Arctic Environmental Response Management Application (ERMA) workshop (April 2011). Deliverables included reports that required Ms. Boring to research habitats, flora, and fauna of the Alaskan Arctic as well as documenting digital and hardcopy data sets available for the state of Alaska. She also assisted with building a conceptual model for determining oil fate and effects on habitat and wildlife in the Arctic in support of NRDA planning.

Abandoned Vessels: Ms. Boring worked with the NOAA Abandoned Vessel Program on the following tasks from 2003-2008:

Derelict vessel field surveys and technical report: 2002-2004: Ms. Boring assisted in assessing potential threats to corals, seagrasses, and mangroves caused by derelict vessels in the Caribbean (Virgin Islands and Puerto Rico) and the Pacific (Guam, Commonwealth of the Northern Mariana's (CNMI)).

Review of state legislature on abandoned vessel issues (2006).

Coordination of a 3-day meeting on issues related to potential damages associated with vessel groundings in the Northwest Hawaiian Islands and annexing the Hawaii Area Contingency Plan (2006).

Technical reports on coral protocols, underwater GPS technology (2008).

Technical report detailing the response, restoration, and monitoring associated with the grounding and removal of 9 longliners in Pago Pago harbor, American Samoa (2008).

ALTERNATIVE ENERGY/ ENVIRONMENTAL IMPACT STATEMENTS / ENVIRONMENTAL ASSESSMENTS

Worldwide Synthesis of Impacts from Alternative Energy Development: In 2006-2007 Ms. Boring worked with a team of RPI and outside experts on a synthesis of worldwide literature on alternative energy for the Minerals Management Service. Her focus was on impacts of offshore wind power and other cutting edge energy technologies on avifauna.

PEIS: Ms. Boring worked with several firms on a Programmatic Environmental Impact Statement for the U.S. Coast Guard rulemaking that requires the inclusion of in-situ burning and dispersant capability in vessel and facility oil spill response plans in 2004. Under this project, she evaluated the impacts of the use of in situ burning and dispersants versus mechanical response only on marine birds, marine mammals, subsistence use, and intertidal habitats.

EA for Offloading of the USS *Mississinewa*: Ms. Boring was a co-author on the Environmental Assessment for the Offloading of USS *Mississinewa*, a World War II tanker that started leaking oil into Ulithi Lagoon, Federated States of Micronesia in 2002.

WATERSHED RESTORATION

Non-Point Source Pollution Control: 2000-2013: For 13 years, Ms. Boring acted as Project Manager on 8 non-point source pollution projects in 13 South Carolina watersheds to identify and mitigate fecal coliform loading and turbidity and to implement Total Maximum Daily Loads (TMDL). These projects required an ability to generate partnerships with local community members, as well as plan and run informational meetings with local stakeholders and federal/state partners to encourage landowners to implement Best Management Practices (BMPs) on their properties in order to reduce non-point source pollution into their watersheds.

SELECTED PUBLICATIONS

Beckham, K.R., C.L. Boring, and M. White. 2012. Turning analysis into action: Targeting likely sources of watershed impairment ArcUser. Spring 2012:16-19.

Boring, C.L. and I.J. Zelo. 2008. Abandoned small vessels: state perspectives on a nationwide issue. Proc. 2008 International Oil Spill Conference, American Petroleum Institute, Wash., D.C.

Lord, C.G. and J. Michel. 2003. Conceptual models for assessing the risk of seafood tainting during oil spills. Proc. 2003 International Oil Spill Conference, American Petroleum Institute, Wash., D.C., 6 pp.

Lord-Boring, C., I.J. Zelo, Z.J. 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 Society Journal 38(3): 25-34.

Michel, J., C. Boring, J. Tarpley, G. Shigenaka, and F. Csulak. 2011. SCAT: Improving the process, training, tools, data management, and products. Proc. 2011 International Oil Spill Conference, American Petroleum Institute, Wash., D.C.

Michel, J., C. Boring, and C. Locke. 2008. Rapid assessment protocols for small vessel groundings. Proc. 2008 International Oil Spill Conference, American Petroleum Institute, Washington, D.C.

Michel, J., Dunagan, H., Boring, C., Healy, E., Evans, W., Dean, J.M., McGillis, A. and Hain, J. 2007. Worldwide Synthesis and Analysis of Existing Information Regarding Environmental Effects of Alternative Energy Uses on the Outer Continental Shelf. U.S. Department of the Interior, Minerals Management Service, Herndon, VA, MMS OCS Report 2007-038, 254 pp.

Michel, J. and C. Lord. 2002. *Mississinewa* Offloading, Ulithi Lagoon, Yap State, Federated States of Micronesia: Environmental Assessment. Naval Sea Systems Command, Washington, D.C., 47 pp + appendices.

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, MD, 52 pp. +

Plank, C., Z. Nixon, and C.G. Lord. 2003. Hawaii Environmental Sensitivity Index (ESI) maps and the spatial accuracy of ESI mapping methodology. Proc. 2003 International Oil Spill Conference, American Petroleum Institute, Wash., D.C., 6 pp.