JENNIFER L. WEAVER **Research Planning, Inc.**

Coastal Ecologist

Ms. Weaver is an ecologist with 13 years of experience specializing in coastal ecology, fisheries, natural resource mapping, and data analysis and synthesis. She has experience throughout the United States, including the Caribbean, and internationally in the Middle East. Ms. Weaver's specialty areas include spatial analysis and natural resource mapping; ecological data analysis; damage assessment and restoration; restoration monitoring; NEPA evaluation; and permitting and regulatory compliance.

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

1. Oil and hazardous material spill planning
2. Incident response
3. Natural resource damage assessment and restoration
4. Ecological data analysis
5. Spatial analysis and natural resource mapping

EDUCATION

M.E.M., Coastal Environmental Management, Duke University, Durham, NC (2009)
Master's project: Impacts of sea level rise on river herring spawning habitat in eastern North Carolina

B.S., Ecology and Evolutionary Biology, Tulane University, New Orleans, LA (2005) B.A., Classical Studies, Tulane University, New Orleans, LA (2005)
Honors thesis: The effects of post-fire nutrient enrichment on the reproductive biology of Three-spined stickleback

CERTIFICATIONS

Certified Ecologist (ESA)
Certificate in Geospatial Analysis (Duke, 2009)
24-hour HAZWOPER

SKILLS

Software – ArcGIS 9.x,10.x and Pro, R, Python, OpenBUGS, MARXAN, PC-ORD

Field – PADI SCUBA certified (Advanced Open Water, Nitrox), SCAT, offshore cruise experience, coastal boat operation, coastal sampling using fish traps, seines, trawls, gill nets, rod and reel, and longlines

Languages – Intermediate Spanish, basic Portuguese

PROFESSIONAL EXPERIENCE

2011 to present: Coastal Ecologist/GIS analyst, Research Planning, Inc., Columbia, SC

2009 to 2011: Marine Fisheries Fellow, North Carolina State University, Morehead City, NC

2008 to 2009: Fisheries Conservation Intern and GIS consultant, Environmental Defense Fund, Raleigh, NC

OIL AND HAZARDOUS MATERIALS SPILLS PLANNING

BOEM Oil Spill Literature Synthesis. 2019-2021. Ms. Weaver synthesized literature in support of an authored chapters summarizing impacts of oil spills to fish and invertebrate populations based for two separate reports summarizing (1) impacts of spills between 500-20,000 barrels of oil and (2) spills greater than 20,000 barrels of oil.

Pipeline and Hazardous Materials Safety Administration (PHMSA) Unusually Sensitive Area (USA) identification. 2017. Ms. Weaver was a spatial analyst responsible for compiling and processing information on drinking water sources and species occurrences to identify unusually sensitive areas for drinking water resources and species of concern.

Remediation of Underwater Legacy Environmental Threats (RULET). 2011-2012. Ms. Weaver contributed to the development of screening level risk assessment packages for the Remediation of Underwater Legacy Environmental Threats (RULET) program in 2011-2012 by writing Ecological Resources at Risk summaries. She was responsible for researching and summarizing information on the abundance and distribution of sensitive wildlife at risk of being impacted by potential oil releases from sunken vessels. The geographic scope of the project included the U.S. coastal zone, including the Great Lakes and outlying territories, and areas of Canada and the Dominican Republic.

INCIDENT RESPONSE

National Oceanic and Atmospheric Association (NOAA) Oil and Hazardous Materials Spill Response Team. 2011-present. Ms. Weaver is part of NOAA's Scientific Support Team, which provides technical expertise on cleanup methods and natural resource protection during oil and chemical spills. She has provided on-scene support on several spills, including the Refugio (2015) and *Deepwater Horizon* (2011) oil spills. Immediately following the Refugio spill, Ms. Weaver provided on-scene to NOAA for SCAT operations for two weeks. In this role, she participated in daily SCAT surveys, and contributed to the development of shoreline cleanup plans and treatment recommendations.Additionally, she has written numerous resources at risk analyses for oil and chemical spill events and drills occurring across the U.S.A and provided remote and on-scene support for training exercises. Location: Nationwide, USA.

FEMA Emergency Support Function (ESF)-10, NOAA. 2017-2018. Ms. Weaver was part of the NOAA scientific support team during the ESF-10 response for Hurricanes Irma and Maria. She served as a technical specialist for the response in Florida and the Environmental Unit Leader in the U.S. Virgin Islands. Her role in both places focused on ensuring the protection of natural resources during operations related to pollution response and removal. Specific tasks included coordinating agency consultations and permitting, developing BMPs for use in the field, identifying sensitive sites for enhanced monitoring during removal, and overseeing monitoring efforts. Permitting and consultations included USACE Section 404/10; ESA Section 7 emergency consultation with USFWS, NMFS Protected Species Division, and NMFS Essential Fish Habitat; National Historic Preservation Act Section 106 consultation with USVI and FL SHPO and tribal consultations.

NATURAL RESOURCE DAMAGE ASSESSMENT AND RESTORATION

Coastal Long-Term Monitoring Program of sites remediated from the Gulf War Spill in Saudi Arabia. 2018-present. Ms. Weaver is the primary data manager and analyst for the project, which collects biannual monitoring data from 339 plots measuring vegetation, fish and invertebrate fauna, soils, and physical data to assess progress towards restoration of coastal areas. Ms. Weaver is responsible for management and analysis of ecological monitoring data and is one of the primary authors of the annual reports. Additionally, Ms. Weaver developed and leads the fish sampling efforts and contributes to

planning and execution of semi-annual field efforts, serving as a field team leader.

Deepwater Horizon Restoration Planning Support to NOAA Restoration Center (subcontracted through Industrial Economics). 2021. Ms. Weaver was the primary author of a report detailing restoration priorities and objectives for fish and water column invertebrates in the Gulf of Mexico. She was responsible for collating and summarizing stakeholder and agency input and ecological and fisheries data to designate develop focal species for restoration and corresponding objectives for restoration projects.

Deepwater Horizon Natural Resource Damage Assessment and Restoration. 2014-2016. Ms. Weaver provided technical support for the *Deepwater Horizon* injury assessment and restoration planning teams. Her tasks include communicating with stakeholders and resource experts, gathering and analyzing data to support project scaling, and creating methods documents and restoration plans to support the development of restoration alternatives to be part of the Damage Assessment, Remediation and Restoration Program (DARRP). In addition, she performed spatial analyses to inform the injury assessment for nearshore resources.

RESTORE Act Best Available Science Reviews and other Technical Support. 2015-present. Ms. Weaver is the deputy program manager for best available science, environmental compliance, and construction reviews initiated by the Office of Gulf Coast Restoration, U.S. Department of Treasury for all Direct Component projects relating to restoration and protection of natural resources. Ms. Weaver has managed and contributed to independent third-party technical reviews on a wide variety of Gulf restoration projects under this contract, ranging from large-scale coastal marsh restoration to resource enhancement projects. In this role, Ms. Weaver identifies reviewers, coordinates the review process, and ensures that the reviews are scientifically and technically sound and meet the standards set forth by the RESTORE act. She also serves as a reviewer and technical advisor as needed. Proposals reviewed have included a variety of coastal habitat restoration projects across the Gulf of Mexico.

Selendang Ayu Natural Resource Damage Assessment. 2020. Ms. Weaver conducted an analysis of fishery independent survey data of tanner crab abundance to evaluate impacts from the *Selendang Ayu* oil spill.

ECOLOGICAL DATA ANALYSIS

Minimum Flows and Levels Analysis for Northwest Florida and Suwannee River Water Management Districts. 2015-present. Lead analyst. Ms. Weaver is the data analyst for Minimum Flow and Levels (MFL) studies of the Wakulla and St. Marks Rivers (2015-2017), Waccasassa River (2020-2021) and upper Santa Fe River (2021). The minimum flow and level (MFL) studies facilitate management decisions on water withdrawals from river systems by analyzing the effect of flow conditions on wetlands, floodplain habitats, and protected species. Ms. Weaver analyzed field data on physical characteristics, vegetation, elevation, and instream habitat to characterize ecological communities and habitats occurring in the floodplain. Techniques used included discriminant functions analysis, community analysis, and wetted perimeter calculations, among others.

Meta-Analyses of Salt Marsh Impacts and Recovery Following the *Deepwater Horizon* Oil Spill. 2018-2021.Ms. Weaver was the primary data analyst on several primary analyses and meta-analyses of oil spill impacts and treatment methods to marsh vegetation and invertebrates as part of a GOMRI-funded effort. Her role included data compilation, implementation of statistical analyses, and generation of figures, tables, and statical output for reports and publications. Statistical techniques used include the application of mixed models to annual monitoring to estimate recovery rates at long-term monitoring plots. All analyses and relevant figures were conducted using R via custom scripts generated for the project.

Impacts of Lingering Oil from the *Exxon Valdez* oil spill in Prince William Sound. 2016. Ms. Weaver provided technical support for an assessment of the impacts of lingering oil on wildlife in Prince William Sound for the National Marine Fisheries Service. She was responsible for reviewing literature, manipulating spatial datasets, and conducting analyses using maxent models to assess the relative habitat use of harlequin ducks and sea otters in relationship to oil persisting from the Exxon Valdez oil spill.

Analysis of Infauna Recovery following Shoreline Treatment Methods in Prince William Sound, Alaska, NOAA. 2013-present. Ms. Weaver was responsible for designing and analyzing data collected to evaluate the effects of experimental oil remediation treatments on infauna communities at treatment and references plots over 12 years. Techniques including mixed effects models, MANOVA, and nonmetric multidimensional scaling were applied to annual sampling data to estimate recovery timeline of infauna communities following shoreline treatment methods.

SPATIAL ANALYSIS AND NATURAL RESOURCE MAPPING

ESI Biologist. 2011-present. Ms. Weaver contributed to the biology data collection and processing for Environmental Sensitivity Index Atlases. ESIs are used to identify natural resources sensitive to oil spills and other pollution events during contingency planning exercises and incident responses. Her role as a biologist on ESI projects requires extensive correspondence with biological and socio-economic resource experts from state and federal governments, university, and private agencies throughout the U.S. As a result, she is intimately familiar with spatial datasets commonly available for coastal zone resources. She has extensive experience in natural resource and socioeconomic data collection, interpretation, and compilation using both quantitative data sources and participatory mapping techniques.

She has worked on the following ESI projects for clients such as NOAA, TGLO, FWRI, and BSEE.

South Florida	2013
Texas, Upper Coast	2013
Louisiana	2013
Delaware Bay	2014
Outer coast of Washington and Oregon	2014
Georgia	2015
South Carolina	2015
Maryland/Virginia	2016
Southwest Florida	2016
East Florida	2020
Gulf of Mexico	2022

Strategic Habitat Area Identification and Designation. 2009-2011. Ms. Weaver was the primary GIS analyst for the North Carolina Division of Marine Fisheries' Region 2 Strategic Habitat Areas Assessment. In this role, she assembled a regional GIS database of fish habitats and anthropogenic impacts, performed spatial analyses to recommend candidate sites for strategic habitat area designation, and used geospatial and statistical modeling techniques to summarize geographic trends in fish abundance and their relationship to anthropogenic impacts. She was responsible for the oral and written presentation of results to stakeholders and managers.

Identification of River Herring Spawning Habitats in the Chowan River. 2008-2009, Ms. Weaver worked with Environmental Defense Fund scientists to refine a GIS-based model characterizing the

condition of river herring spawning habitat in Eastern North Carolina and prioritizing sites for preservation and restoration. She collected and integrated data from different sources to create GIS layers describing habitat quality and used them to summarize the relative condition of spawning habitat for each of 26 watersheds in the Chowan River Basin. She planned and executed field verification of the habitat model. In addition, she was responsible for creating and refining all of the maps in the final report.

Improving Compensatory Mitigation Requirements. 2009. Ms. Weaver performed GIS analysis to assist Environmental Defense Fund on a project to recommend improvements to compensatory mitigation practices in North Carolina. She created a custom analytical tool using ArcGIS and Python to characterize the landscape in target watersheds and identify parcels of land as suitable mitigation sites. She was also responsible for acquiring data to be used as an input to the model, delineating watersheds based on digital elevation models using ArcGIS, communicating the results to project partners, assisting in the refinement of the model and creating maps and tables for use in the final report.

PUBLICATIONS

Zengel, S., **J. Weaver,** I.A. Mendelssohn, S.A. Graham, Q. Lin, M.W. Hester, et al. 2021. Meta-analysis of salt marsh vegetation impacts and recovery, synthesis following the *Deepwater Horizon* oil spill. Ecological Applications, 32:e02489.

Zengel, S., N. Rutherford, B.M. Bernik, **J. Weaver,** M. Zhang, Z. Nixon, and J. Michel. 2021. Planting after shoreline cleanup treatment improves salt marsh vegetation recovery following the *Deepwater Horizon* oil spill. Ecological Engineering, 169, 106288.

Weaver, J., J.A. Hale, L. Cotsapas, and H. Fravel. 2021. Ecosystem recovery at hypersaline salt marsh remediation projects impacted by the Gulf War Oil Spill. International Oil Spill Conference Proceedings 2021:1141405.

Arthur, C., S. Friedman, **J. Weaver,** D. Van Nostrand, and J. Reinhardt. 2020. Estimating the benefits of derelict crab trap removal in the Gulf of Mexico. Estuaries and Coasts, 43 (7) 1821-1835.

Reinhardt, J.F., **J. Weaver,** P.L. Latham, A. Dell'Apa, J.E. Serafy, and J.A. Browder. 2018. Catch rate and at-vessel mortality of circle hooks versus J-hooks in pelagic longline fisheries: A global meta-analysis. Fish and Fisheries, 19 (3), 413-430.

Zengel, S., **J. Weaver**, S.L. Wilder, J. Dauzat, C. Sanfilippo, M.S. Miles, et al. 2018. Vegetation recovery in an oil-impacted and burned Phragmites australis tidal freshwater marsh. Science of the Total Environment, 612: 231-237.

Zengel, S., **J. Weaver**, S.C. Pennings, B. Silliman, D.R. Deis, C.L. Montague, et al. 2017. Five years of *Deepwater Horizon* oil spill effects on marsh periwinkles, Littoraria irrorata. Marine Ecology Progress Series, 576: 135-144.

Zengel, S., **J. Weaver**, S.C. Pennings, B. Silliman, D.R. Deis, C.L. Montague, et al. 2016. Five years of *Deepwater Horizon* oil spill effects on marsh periwinkles Littoraria irrorata. Marine Ecology Progress Series, https://doi.org/10.3354/meps11827.

Zengel, S., S.C. Pennings, B. Silliman, C. Montague, **J. Weaver**, D.R. Deis, M.O. Krasnec, N. Rutherford, and Z. Nixon. 2016. *Deepwater Horizon* oil spill impacts on salt marsh fiddler crabs (Uca spp.). Estuaries and Coasts, 39(4):1-10.

Conn, D.B., **J. Weaver**, T. Graczyk, and L. Tamang. 2007. Synanthropic flies as vectors of *Cryptosporidium* and *Giardia* among livestock and wildlife in a multispecies agricultural complex. Vector-Borne and Zoonotic Diseases, 7(4):643-652.