RPI

BRIE BERNIK, Ph.D. **Research Planning, Inc.**

Senior Environmental Scientist / Senior Ecologist

Dr. Bernik is an RPI senior ecologist with over 15 years of experience in coastal and marine sciences, including environmental compliance, planning, monitoring, and assessment at project- and regional scales, quantitative modeling, data management, and policy. In addition to publishing high-impact research on coastal habitats and species, she has provided technical oversight on a wide array of federally funded coastal projects across the Gulf of Mexico, ranging from infrastructure development to water resource management and large-scale habitat creation. As part of her work, she has conducted >100 scientific reviews of proposed restoration projects, led multi-agency advisory groups, and contributed to numerous policy documents and public reports. Her most recent federal consultation experience includes ESA, MMPA, EFH, CBRA, CZMA, NHPA, and SHPO consultations for projects across the Atlantic and Gulf coasts under NOAA's Marine Debris Program and Coast Guard's Programmatic EIS/OEIS for the proposed Atlantic Fairways.

EDUCATION

Ph.D., Ecology & Evolutionary Biology, Tulane University, New Orleans, LA (2015)
  Dissertation Title: Ecosystem consequences of genetic variation in the salt marsh engineer *Spartina alterniflora*

M.S., Ecology & Evolutionary Biology, Tulane University, New Orleans, LA (2010)

B.S., Environmental Biology, Tulane University, New Orleans, LA (2008)
  Cum Laude from Newcomb-Tulane College, Minor: Philosophy

PROFESSIONAL EXPERIENCE

2024 to Present: Senior Env. Scientist / Senior Ecologist, Research Planning, Inc., Tallahassee, FL

2017 to 2024: Ecologist, Science Advisor, & Program Specialist, RESTORE Council, New Orleans, LA

2017: Science Policy Analyst, National Academies (NASEM), Gulf Research Program, Washington, D.C.

2015 to 2017: Postdoctoral Researcher, ByWater Institute, Tulane University, New Orleans, LA

2014 to 2015: Instructor / Teaching Assistant, Tulane University, New Orleans, LA

2011 to 2014: Research Fellow, Tulane University, New Orleans, LA

2011 to 2011: Scientific Consultant, Blue Planet Water Solutions, Santa Barbara, CA

2008 to 2011: Laboratory Manager and Research Technician, Tulane University, New Orleans, LA

Dr. Bernik's experience of selected projects is outlined in five main areas:

1) Natural Resource Restoration and Management
2) Monitoring and Assessment
3) Science Policy
4) Oil Spill Science
5) Applied Research in Ecology & Evolutionary Biology

NATURAL RESOURCE RESTORATION AND MANAGEMENT

<u>Louisiana TIG Restoration Plan and Environmental Assessment (RP/EA) for the Chandeleur Islands Restoration Project</u>: 2024 – Ongoing. Senior Scientist. The Joint RP/EA #1 for Chandeleur Island restoration is being prepared by the LA and Open Ocean TIGs to address wide-ranging injuries to natural

resources following the Deepwater Horizon oil spill. For compliance under the Oil Pollution Act of 1990 (OPA) and National Environmental Policy Act (NEPA), the RP/EA will present and analyze alternatives for the restoration of specific resource types, including beaches and dunes, coastal wetlands, seagrasses, birds, sea turtles, and federally managed areas. Dr. Bernik fills a lead technical role by supporting the OPA analysis of proposed restoration alternatives as well as the development of a Monitoring and Adaptive Management Plan to track restoration success.

NOAA Marine Debris Program Infrastructure Grant Environmental Compliance Support: 2024 – Ongoing. Senior Scientist. Dr. Bernik provides environmental compliance support for grants that are being funded for marine debris assessment, removal, disposal, interception, and restoration efforts. The support includes identifying and assessing the potential environmental impacts associated with NOAA-funded marine debris activities, which have included multiple locations across the U.S., Territories, and Freely Associated States. RPI conducts the analysis, documentation, and interagency coordination and/or consultation for Endangered Species Act (ESA) Section 7 with USFWS and NMFS; Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) with NMFS; National Historic Preservation Act Section 106 consultation with States and Tribes; coastal zone management consistency reviews with States under the Coastal Zone Management Act (CZMA); Coastal Barrier Resource Act (CBRA) reviews with USFWS; permitting with NOAA National Marine Sanctuaries; and various other environmental review and coordination activities as needed.

U.S. Coast Guard (USCG) Programmatic Environmental Impact Statement (PEIS) for Shipping Safety Fairways along the U.S. Atlantic Coast: 2024 – Ongoing. Senior Scientist. Dr. Bernik assists in preparing the PEIS that addresses the USCG's proposed establishment of shipping safety fairways and other routing measures along the Atlantic Coast of the U.S. The fairways are designed to keep traditional navigation routes free from fixed structures that could impact navigation safety and impede other shared offshore activities, but their use is not required. Dr. Bernik is helping to review information and analyses on biological resources (e.g., vegetation including seagrasses, birds and bats, invasive species, and designated protection areas), and is responsible for preparing supporting documentation for Endangered Species Act compliance and consultation with U.S. FWS.

RESTORE Act Subject Matter Expert Reviews and Technical Oversight: 2018 – 2024. Lead / Senior Scientist. Dr. Bernik was responsible for overseeing reviews of all data collection plans and data management plans for the RESTORE Council. Dr. Bernik was also the Council's Program Lead for two Council-member agencies and a wide range of member-sponsored projects. In this role she was responsible for reviewing programmatic consistency, environmental benefits and risks, and use of Best Available Science (BAS), and providing technical oversight throughout the lifecycle an award, including conducting monthly meetings with sponsors, annual performance report reviews, site visits, and ensuring that all compliance requirements were fully met prior to award closeout. At the close of her tenure, over one billion dollars of Council funding had been awarded through more than 100 awards across the Gulf.

MONITORING AND ASSESSMENT

FWC El Dorado Seagrass Restoration Monitoring: 2024 – Ongoing. Environmental Scientist. Dr. Bernik provided GIS and field support during monitoring of the 2023 seagrass restoration following the grounding of the 147' M/V El Dorado in St. Andrew Bay's North Bay during Hurricane Michael in 2018. The vessel removal and recovery efforts resulted in a 0.20-acre depression where seagrass was transplanted from nearby donor sites in 2023. Dr. Bernik assisted in monitoring restored, donor, and reference sites of the seagrass restoration and produced maps used by RPI in the annual report.

Data Collection and Management Guidelines for Gulf Restoration Projects: 2018 – 2021. Lead / Senior Scientist. Dr. Bernik led the development of comprehensive guidance for developing data collection and data management plans for restoration projects funded by the Gulf Coast Ecosystem Restoration (RESTORE) Council. By coordinating with partner funding agencies and science collaboratives, Dr.

Bernik worked to ensure that the guidelines would promote the use of consistent monitoring standards and protocols to generate robust, compatible/comparable data across projects and funding streams. This guidance was aimed at enabling restoration impacts to be assessed programmatically for the Gulf region, including variation by restoration strategy, habitat, and resource type. The guidelines included metric and parameter recommendations for different project types and restoration objectives, corresponding methodologies, and best practices for data management. These guidelines were unanimously approved by the Council and are used for all Council-funded projects across the Gulf.

Council Monitoring and Assessment: 2018 – 2023. Senior Scientist / Project Scientist. From 2018 – 2021, Dr. Bernik acted as a RESTORE staff co-lead supporting the Council Monitoring and Assessment Program (CMAP), jointly sponsored by NOAA and USGS. As a member of the Monitoring Community of Practice (MCoP) and the Program Advisory Team (PAT), she supported the development of a Gulfwide monitoring inventory, an online repository of habitat and water quality assessments, and gap analysis work. Responsibilities included compiling and analyzing metadata, QA/QC, reviewing and editing work products, and participating in workshops. From 2021 – 2023, Dr. Bernik was the facilitator for the Council Monitoring and Assessment Workgroup (CMAWG), a collaborative workgroup made up of scientific experts representing the RESTORE Council Member agencies (5 Gulf states and 11 Federal agencies). The CMAWG helps address monitoring and adaptive management (MAM) responsibilities and provides recommendations on monitoring parameter guidelines, plan formats, reporting requirements, and the use of Best Available Science. Dr. Bernik's responsibilities included organizing and facilitating meetings, drafting supporting materials (agendas, notes, presentations), managing membership and participation, addressing funding considerations, leading work tasks (analyses, data management, QA/QC), and finalizing documents for Council approval. She also stood up and facilitated subgroups as needed to address specific technical tasks.

SCIENCE POLICY

RESTORE Best Available Science Guidelines: 2019 – 2023. Senior Scientist. Dr. Bernik co-authored the Council’s Best Available Science Guidelines, an internal policy document guiding the peer review process for Council-funded projects. Responsibilities included reaching agency consensus, updating review questionnaires, and developing training materials.

RESTORE Council Monitoring and Adaptive Management (MAM) Guidelines: 2019. Senior Scientist. Dr. Bernik co-authored the Council’s Monitoring and Adaptive Management Guidelines, detailing roles, responsibilities, communication pathways, and activities necessary for the Council to fulfill its MAM responsibilities under the RESTORE Act.

Gulf Coast Ecosystem Restoration Council Planning Framework: 2018 – 2019. Senior Scientist. Dr. Bernik co-led the development of the Planning Framework. This foundational document provides a bridge between the federal agency’s restoration strategies and funding priorities. Responsibilities included drafting, reviewing, and facilitating consensus among member agencies.

Other foundational agency documents that Dr. Bernik contributed to as a co-author include the RESTORE Council’s 2022 Comprehensive Plan Update, the Submission Guidelines, and the 2020-2021 Funded Priorities Lists.

OIL SPILL SCIENCE

Deepwater Horizon-impacted soil microbial communities in Louisiana salt marshes (ByWater Institute): 2015-2017. Lead / Senior Scientist. Dr. Bernik was a Field Lead and Data Analyst for shoreline surveys of soil microbial communities at oil-impacted and unimpacted marsh sites following the Deepwater Horizon oil spill. This work involved sampling of sediments and description of surface and subsurface oiling, as well as microbial genetic data preparation and analysis. She modeled and conducted analyses of plant-microbe communities, including network analysis; designed and implemented greenhouse experiments to inform marsh remediation and restoration; organized, trained, and led student workers; provided technical expertise and advisement to the research team; and contributed to peer-reviewed publications.

Deepwater Horizon shoreline oiling remediation strategy R&D: 2011. Lead / Senior Scientist. Dr. Bernik led field research to pilot test new oil remediation technology for salt marsh shorelines. She was responsible for organizing the field demonstration, including managing the budget; handling scheduling, staffing, and other logistics; overseeing and conducting site surveys and shoreline monitoring, as well as scientific writing, report preparation, and communicating with the client and stakeholders.

APPLIED RESEARCH IN ECOLOGY & EVOLUTIONARY BIOLOGY

Social-ecological systems post-disturbance: 2015 – 2016. Project Scientist. Dr. Bernik modeled communities of coupled social-ecological systems post-disturbance; assessed differences in drivers, functional outcomes, and cascading effects on ecosystem services, co-authored a peer-reviewed publication, and wrote a proposal for a highly collaborative interdisciplinary workshop.

Spatiotemporal patterns of marsh shoreline erosion: 2014 – 2016. Lead Scientist. To examine the role of biotic interactions in mediating marsh shoreline erosion under wind wave forces, Dr. Bernik parameterized analytical and cellular automata models with field data reflecting soil heterogeneity among clonal patches of an ecosystem engineer, *Spartina alterniflora*. Her published findings highlight how the physical response of marsh shorelines to wind wave erosion is a function of landscape ecology.

GoM Marsh Shoreline Restoration Studies: 2010-2015. Lead Scientist. Dr. Bernik led research investigating the effect of salt marsh plant population composition on ecosystem processes and shoreline erosion in Barataria Bay, LA. She designed and conducted a field transplantation experiment, plant surveys, sample collection, and monitoring over several years, and was responsible for all aspects of project management, including project staffing and budget, scheduling, procuring supplies, and logistics, as well as field and laboratory work, data management, statistical analysis, interpretation, writing, and reporting. She authored and published several papers in high-impact journals based on this work

RELEVANT SKILLS AND CERTIFICATIONS

Statistical Packages and Programming Languages – MATLAB, R, SPSS, SAS, C++, JavaScript, VBA
Data Visualization – ArcGIS, Tableau, Adobe Creative Cloud
Office Software Suites – Microsoft 365, Google Workspace
Certifications – SSI Open Water Diver, Louisiana Boater Education Certification / Boating License

AWARDS, GRANTS, AND FELLOWSHIPS

Science Policy Fellowship, National Academies Gulf Research Program (2017-2018)
Christine Mirzayan Science & Technology Policy Fellowship, National Academies (2017)
US EPA Science to Achieve Results (STAR) Fellowship (2011-2014)
Tulane University Student Grant Writing Competition (2010)
Gerald E. Gunning Memorial Award, Tulane University (2008)
Newcomb Scholar, Tulane University (2007-2008)

PUBLICATIONS

Zengel S, Nixon Z, Weaver J, Rutherford N, **Bernik BM**, Michel J (2022) Accelerated marsh erosion following the Deepwater Horizon oil spill confirmed, ameliorated by planting. Scientific Reports, 12(1), p.13802. https://doi.org/10.1038/s41598-022-18102-1

Formel SK, Martin AM, Pardue JH, Elango V, Johnson K, Gunsch CK, Lefèvre E, Varner PM, Kim YJ, **Bernik BM**, Van Bael SA (2022) Decay of oil residues in the soil is enhanced by the presence of Spartina alterniflora, with no additional effect from microbiome manipulation. Frontiers in Soil Science, 2, p.74. https://doi.org/10.3389/fsoil.2022.949439

Formel SK, Mighell KL, Kandalepas D, Jarrell E, **Bernik BM**, Elango V, Pardue JH, Blum MJ. Van Bael SA (2022) Spatial and temporal comparisons of salt marsh soil fungal communities following the deepwater horizon spill. Wetlands Ecology and Management, 30(2), pp.239-256. https://doi.org/10.1007/s11273-021-09848-y

Addis SD, Formel SK, Kim YJ, Varner PB, Raudabaugh DB, Lefevre E, **Bernik BM**, Elango V, Van Bael SA, Pardue JH. Gunsch CK (2022) Alterations of endophytic microbial community function in Spartina alterniflora as a result of crude oil exposure. Biodegradation, 33(1), pp.87-98. https://doi.org/10.1007/s10532-021-09968-5

Bernik BM, Lumibao CY, Zengel S, Pardue J, Blum MJ (2020) Intraspecific variation in landform engineering across a restored salt marsh shoreline. Evolutionary Applications, 14(3), pp.685-697. https://doi.org/10.1111/eva.13148

Zengel S, Rutherford N, **Bernik BM**, Weaver J, Zhang M, Nixon Z, Michel J (2021) Planting after shoreline cleanup treatment improves salt marsh vegetation recovery following the Deepwater Horizon oil spill. Ecological Engineering, 169, p.106288. https://doi.org/10.1016/j.ecoleng.2021.106288

Lumibao CY, **Bernik BM**, Formel SK, Kandalepas D, Mighell KL, Pardue J, Van Bael SA, Blum MJ (2020) Rhizosphere microbial communities reflect genotypic and trait variation in a salt marsh ecosystem engineer. American Journal of Botany, 107(6), pp.941-949. https://doi.org/10.1002/ajb2.1497

Bernik BM, Pardue JH, Blum MJ (2018) Soil erodibility differs according to heritable trait variation and nutrient-induced plasticity in the saltmarsh engineer, Spartina alterniflora. Marine Ecology Progress Series, 601, pp.1-14. https://doi.org/10.3354/meps12689 [Featured Article]

Summers JL, **Bernik BM**, Saunders CJ, McLachlan JS, Blum MJ (2018) A century of genetic variation inferred from a persistent soil-stored seed bank. Evolutionary Applications, 11(9), pp.1715-1731. https://doi.org/10.1111/eva.12675

Bernik BM, Eppinga MB, Kolker AJ, Blum MJ (2018) Clonal vegetation patterns mediate shoreline erosion. Geophysical Research Letters , 45(13):6476-6484. https://doi.org/10.1029/2018GL077537

Lewis JA, Zipperer WC, Ernstson H, **Bernik B**, Hazen R, Elmqvist T, Blum MJ (2017) Socioecological Disparities in New Orleans Following Hurricane Katrina. Ecosphere, 8(9):e01922. https://doi.org/10.1002/ecs2.1922

Bernik BM, Li H, Blum MJ (2016) Genetic variation of Spartina alterniflora intentionally introduced to China. Biological Invasions 18: 1485-1498. https://doi.org/10.1007/s10530-016-1096-3

Bernik BM (2015) Ecosystem consequences of genetic variation in the salt marsh engineer Spartina alterniflora, PhD thesis, Dep. of Ecol. and Evol. Biol., Tulane University, New Orleans, LA.

Zengel S, **Bernik BM**, Rutherford N, Nixon Z, Michel J (2015) Heavily oiled salt marsh following the Deepwater Horizon oil spill, ecological comparisons of shoreline cleanup treatments and recovery. PLoS ONE 10(7): e0132324. https://doi.org/10.1371/journal.pone.0132324

Blum MJ, **Bernik BM**, Azwell T, Hoek EMV (2014) Remediation and restoration of northern Gulf of Mexico coastal ecosystems following the Deepwater Horizon event. Oil Spill Remediation: Colloid Chemistry-Based Principles and Solutions, pp 59–88. https://doi.org/10.1002/9781118825662.ch3

Zengel S, Rutherford N, **Bernik B**, Nixon Z, Michel J (2014) Salt marsh remediation and the Deepwater Horizon oil spill, the role of planting in vegetation and macroinvertebrate recovery. International Oil Spill Conference Proceedings 2014(1):1985–1999. https://doi.org/10.7901/2169-3358-2014.1.1985

Durrant KL, Marra PP, Fallon SM, Colbeck GJ, Gibbs HL, Hobson KA, Norris DR, **Bernik B**, Lloyd VL, Fleischer RC (2008) Parasite assemblages distinguish populations of a migratory passerine on its

breeding grounds. Journal of Zoology 274(4): 318–326. https://doi.org/10.1111/j.1469-7998.2007.00387.x

SELECTED PRESENTATIONS

Bernik BM (2023) Building capacity for the future of the coast: funding opportunities through the National Academies of Sciences, Engineering, and Medicine's Gulf Research Program. Invited presentation, State of the Coast, New Orleans, LA.

Bernik BM (2020) The Gulf Coast Ecosystem Restoration Council. Invited presentation, Gulf of Mexico Ecosystem Service Logic Models & Socio-Economic Indicators (GEMS) Regional Meeting, Houston, TX.

Bernik BM (2020) Monitoring Ecosystem Restoration Projects: Foundations for Programmatic Synthesis. Invited presentation, Gulf of Mexico Monitoring Community of Practice Workshop and GOMA Team Mid-Year Meeting, Mobile, AL.

Bernik BM (2018) Fellowships and Awards to Jump Start Your Career in Science Policy and Beyond: Christine Mirzayan Fellowships. Invited presentation, Annual Meeting of the Ecological Society of America, New Orleans, LA.

Zengel S, **Bernik BM** (2017) Oil removal and planting (Deepwater Horizon). Sea Grant Workshop "Responding to oil spills: Coastal wetland habitats", Biloxi, MS.

Bernik BM, Blum MJ (2015) Differences in nutrient uptake and response among wild and cultivated genotypes of the salt marsh grass Spartina alterniflora. Ecological Society of America, Baltimore, MD.

Bernik BM, Zengel S, Blum MJ (2014) Land loss rates influenced by population genetics. 4th International Conference on Invasive Spartina, Rennes, France.

Bernik BM, Zengel S, Blum MJ (2013) Extended phenotype of an ecosystem engineer: Variation across cultivated and wildtype clones influences processes of erosion. Annual Meeting of the Ecological Society of America, Minneapolis, MN.

Bernik BM, Zengel S, Blum MJ (2013) Post-remediation restoration of heavily oiled Louisiana salt marshes. Gulf of Mexico Oil Spill & Ecosystem Science Conference, New Orleans, LA.

Bernik BM, Zengel S, Blum MJ (2012) Salt Marsh Restoration Following an Oil Spill: Ecosystem Consequences of Genetic Variation. 9th INTECOL International Wetlands Conference, Orleans, FL.

Bernik BM, Blum MJ, McLachlan JS, Saunders CJ (2010) Contemporary population genetic structure clarifies patterns of temporal change reconstructed from a century long coastal marsh seed bank. Society for the Study of Evolution Annual Meeting, Portland, OR.