

Stephen K. Formel

BIOLOGIST • BIODIVERSITY INFORMATICIAN

New Orleans, LA, USA

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Education

Ph.D. in Ecology and Evolutionary Biology under Dr. Sunshine Van Bael

New Orleans, LA, USA

Tulane University

2021

BA in Biological Sciences, Magna Cum Laude

New York, NY, USA

Hunter College

2015

BFA in Film and Animation

Rochester, NY, USA

Rochester Institute of Technology

2004

Publications

- Benson, B. A., & Formel, S. (2025). Planting seeds for thriving data management. *Eos*, 106. <https://doi.org/10.1029/2025EO250109>
- Bayer, L. V., Milano, S., Formel, S. K., Kaur, H., Ravichandran, R., Cambeiro, J. A., Slinko, L., Catrina, I. E., & Bratu, D. P. (2023). Cup is essential for oskar mRNA translational repression during early drosophila oogenesis. *RNA Biology*, 20(1), 573–587. <https://doi.org/10.1080/15476286.2023.2242650>
- Formel, S. K., Martin, A. M., Pardue, J. H., Elango, V., Johnson, K., Gunsch, C. K., Lefèvre, E., Varner, P. M., Kim, Y. J., Bernik, B. M., & Bael, S. A. V. (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. <https://doi.org/10.3389/fsoil.2022.949439>
- Formel, S. K., Mighell, K. L., Kandalepas, D., Jarrell, E., Bernik, B. M., Elango, V., Pardue, J. H., Blum, M. J., & Bael, S. A. V. (2021). Spatial and temporal comparisons of salt marsh soil fungal communities following the deepwater horizon spill. *Wetlands Ecology and Management*, 30(2), 239–256. <https://doi.org/10.1007/s11273-021-09848-y>
- Addis, S. D., Formel, S. K., Kim, Y. J., Varner, P. B., Raudabaugh, D. B., Lefevre, E., Bernik, B. M., Elango, V., Bael, S. A. V., Pardue, J. H., & Gunsch, C. K. (2022). Alterations of endophytic microbial community function in spartina alterniflora as a result of crude oil exposure. *Biodegradation*, 33(1), 87–98. <https://doi.org/10.1007/s10532-021-09968-5>
- Tellez, P. H., Woods, C. L., Formel, S., & Bael, S. A. V. (2020). Relationships between foliar fungal endophyte communities and ecophysiological traits of CAM and C3 epiphytic bromeliads in a neotropical rainforest. *Diversity*, 12(10), 378. <https://doi.org/10.3390/d12100378>
- Lumibao, C. Y., Kimbrough, E., Formel, S., Day, R. H., From, A. S., Conner, W. H., Krauss, K. W., & Van Bael, S. A. (2020). Salinity, water level, and forest structure contribute to baldcypress (taxodium distichum) rhizosphere and endosphere community structure. *Wetlands*, 40(6), 2179–2188. <https://doi.org/10.1007/s13157-020-01338-w>
- Lumibao, C. Y., Bernik, B. M., Formel, S. K., Kandalepas, D., Mighell, K. L., Pardue, J., Van Bael, S. A., & Blum, M. J. (2020). Rhizosphere microbial communities reflect genotypic and trait variation in a salt marsh ecosystem engineer. *American Journal of Botany*, 107(6), 941–949. <https://doi.org/10.1002/ajb2.1497>
- Janowsky, J., Kimbrough, E., Kandalepas, D., Shaffer, G., Formel, S. K., & Bael, S. A. V. (2019). Bacterial and fungal endophyte communities differ in trees of natural versus wastewater-treatment wetlands. *Wetlands Ecology and Management*, 27(5-6), 711–723. <https://doi.org/10.1007/s11273-019-09688-x>
- Lumibao, C. Y., Formel, S., Elango, V., Pardue, J. H., Blum, M., & Bael, S. A. V. (2018). Persisting responses of salt marsh fungal communities to the deepwater horizon oil spill. *Science of The Total Environment*, 642, 904–913. <https://doi.org/10.1016/j.scitotenv.2018.06.077>

- Bayer, L. V., Batish, M., Formel, S. K., & Bratu, D. P. (2015). Single-molecule RNA in situ hybridization (smFISH) and immunofluorescence (IF) in the drosophila egg chamber. In *Methods in molecular biology* (pp. 125–136). Springer New York. https://doi.org/10.1007/978-1-4939-2851-4_9

Coding and Data Science

Programming Languages

- Fluent in R
- Proficient with Quarto, RShiny, Python, LaTeX, Markdown, Google Apps Script, Git
- Familiar with PSQl, SQLite, Perl, Java, MatLab, JSON-LD

(meta)Data Standards and Semantic Resources

- Fluent with Dublin Core, Darwin Core
- Proficient with ISO 19115, EML, MixS, CSDGM
- Proficient with GCMD, NERC VS, ENVO, CMECS,
- Proficient with WoRMS, ITIS, Catalogue of Life, Checklistbank
- Comfortable with schema.org

Software

HPCs and Cloud

Have conducted parallel-implementations of national-scale spatial analyses on USGS HPC environments. Familiar with cloud environments (e.g. AWS).

AI/ML

completed USGS ARC "Intro to Deep Learning and Image Classification" Training

Certified Carpentries Instructor

Have co-instructed multiple Carpentries workshops on R, the Unix shell, and ecological and spatial analyses

2023

GIS

Basic Skills with ArcGIS Pro, ArcGIS Online, qGIS

Project Management

Expert with with MS Teams, Google Suite, Slack, Discourse and related apps.

- Comfortable with design software, e.g Adobe Creative Cloud, Miro, Canva, Lucid, Davinci Resolve
- Proficient in GitHub, GitLab, Jira
- Proficient with reference managers, e.g. Zotero, Mendeley, Endnote

Work Experience

Biologist (GS-12)

Remote (USA)

U.S. Geological Survey; Science Analytics and Synthesis (SAS); Biogeographic Science Branch

Sep. 2022 - Present

- Node Manager of US nodes for OBIS & GBIF. Work with a variety of with government and non-government organizations and systems to receive, process, standardize, quality control, visualize and archive biological observation data for sharing with the Global Biodiversity Information Facility (GBIF) and the Ocean Biodiversity Information System (OBIS). Manage related biological observation data following the principles of open science and the data lifecycle model to ensure data processing procedures are well documented and repeatable, using code such as R or Python.
- Lead, organize, and participate in working groups in the U.S., and international, scientific community to promote the use of, learn about, contribute to, and assist others with applying biological data standards. Serving, for example, as a U.S. Delegate to GBIF, Co-Chair of Earth Science Information Partners (ESIP) Biological Data Standards Cluster, and co-leader of the Standardizing Marine Biological Data Working Group.
- Use code such as R and Python, manipulate, visualize, and build reports using Application Programming Interfaces (APIs) to synthesize and analyze data, and answer questions related to biological observation data and informing scientific questions.

Physical Scientist

NOAA National Centers for Environmental Information

Feb 2021 to August 2022

- Data Officer. Direct and appraise data, ensure data appraisal procedures are well documented, and review the work of Data Content Managers.
- Data management lead, MDBC Portfolio. Develop data workflows and standards to support the Mesophotic and Deep Benthic Communities (MDBC) portfolio; a 90-person team and \$125 million budget. Ensure data is properly stewarded and archived over the 8-year project. Data types included bathymetry, biological samples, eDNA, physical and chemical oceanography. Collection by Uncrewed Systems (UxS), ROV, CTD, and landers.
- NESDIS representative, NOAA Science and Technology 'Omics Strategy. Member of the data and bioinformatics subcommittee; help develop, standardize, and integrate 'omics data management into NOAA research and management.
- Co-Chair, NCEI Metadata Working Group. Coordinate and lead discussion of metadata needs and interests at NCEI

Stennis Space Center, MS,
USA

National Academy of Sciences GRP Policy Fellow

NOAA National Centers for Environmental Information

Sep 2020 to Jan 2021

- My duties included participation in NOAA's environmental data programs by helping to develop knowledge, skills and abilities for collection of environmental and support data by NOAA, academia, and partner agencies in the Gulf of Mexico. In particular, I worked on designing and coordinating data management for the NRDA Mesophotic and Deep Benthic Communities Portfolio.

Graduate Student

New Orleans, LA, USA

Tulane University

Aug 2015 to Aug 2021

- Led field, greenhouse and laboratory-based projects for the Van Bael Lab.
- Work focused on examining the role of microbes played in the response of salt marshes to the Deepwater Horizon oil spill, with a goal of understanding whether microbes could be employed in restoration strategies.
- Collaborated daily with senior scientists and trained teams of junior scientists.
- Projects required management of a variety of data, from handwritten data to terabytes of DNA sequences. As lab manager from 2017-2019, I helped to develop a data archiving system for the lab.

Data Science Assistant

New Orleans, LA, USA

Louisiana Workforce Commission

Dec 2018 to Dec 2019

- I supported a team of data analysts by revising three data pipelines. The pipelines generated publicly available data but were antiquated, hand-curated, and undocumented. I developed and revised the process for the end-user team of data analysts to ensure their archive and access needs were met. My work reduced the pipeline time from approximately 30 hours per month to less than one hour per month. The process created reliable metadata to document each iteration of the pipeline and no longer produced needless intermediate documents.

Research Assistant

New York, NY, USA

Hunter College - Bratu Lab

Oct 2012 to Jul 2015

- Managed library of fruit fly strains and generated crosses for experiments.
- Ran experiments to visualize nucleic acids and proteins with spinning-disc confocal microscopy.

Howard Hughes Medical Institute Fellow

Woods Hole, MA, USA

Marine Biological Laboratory - Brady Lab

Summers of 2013 and 2014

- Assisted on experiments testing the effects of neurodegenerative proteins on axonal transport.
- Primary duties were to monitor daily microscopy experiments and record rates of decay in treated squid axons.

United States and
Caribbean

Various positions in logistics and film

Forklift and truck driver, mariner, manager, electrician, grip. Details and references available upon request

2004-2012

Awards

NSF Graduate Research Fellowship

\$138,000

2016

Louisiana Sea Grant Graduate Research Scholar

Fellowship in science communication focusing on the coastal crisis in southern Louisiana

2018

Louisiana Board of Regents Fellowship

\$120,000	2015
NASEM Gulf Research Program Policy Fellowship	
\$55,000	2020
Garden Club of America Wetlands Scholarship	
\$5000	2016
Louisiana Sea Grant's Coastal Connections Competition People's Choice Award	
\$500	2019
Three-Minute Thesis People's Choice Award	
\$200	2019
Louisiana Environmental Education Commission Grant	
\$1200	2017
Tulane EEB Department Graduate Research Grant	
\$1834	2016
Else Seringhaus Award for Excellence in Research in Biological Sciences	
\$150	2015
Hunter College Undergraduate Research Fellowship	
\$1200	2015
Howard Hughes Medical Institution Summer Undergraduate Scholarship	
\$6000	2013

Skills

Languages

English (Native), Spanish (Intermediate), French (Beginner)

Non-digital Technical Skills

- Operate small motor vessels
- Crew large motor vessels
- Operate trucks, forklifts
- Proficient carpenter, electrician, plumber

References

Available upon request