Michael JV O'Mahoney

Bioinformatician | *Molecular Biologist*

(904) 504-0682

mjvomahoney@gmail.com

Professional Summary

Dedicated molecular biologist and bioinformatician with a decade-long career in federal research institutions. Coordinated an interagency genomics project for five years, facilitating genetic sequencing and analysis for research collaborators. Proficient in analyzing Sanger and high-throughput sequencing data using bioinformatic pipelines on high-performance computing clusters. Experienced in project coordination, technical reporting, database management, and certified in Data Carpentries instruction.

Education

B.S. Biology *cum laude* May 2012
Minor in Psychology
American University, Washington DC

Technical Skills

- Data Analysis [Python, R, OpenRefine, SQL]
- Programming [Python, JavaScript, Bash]
- Next-gen sequencing workflows
- Technical reporting
- Database management
- Project management [Agile]

Transferable Skills

- Communication
- Teamwork
- Adaptability
- Organization
- Leadership
- Problem solving

Experience

Software Engineer

MJVO Consultants / Washington, DC / October 2023 - Present

- Produce full-stack web applications using current frameworks (HTML5, CSS3, Node.js) for industry clients.
- Manage business development operations and develop new client relationships.
- Facilitate requirements gathering meetings, and draft project scope of work for stakeholder approval.
- Draft, finalize, and execute client project proposals.
- Provide status reports of project progress to clients.

Molecular Project Coordinator

Department of Invertebrate Zoology / Smithsonian Institution / Washington, DC / September 2017 - September 2023

- Spearheaded planning of Bureau of Ocean Energy Management (BOEM) genomic expansion project, evaluating established programs, fostering stakeholder networks, and implementing new techniques to enhance genomic coverage of marine species.
- Implemented new, and modified existing, genomic analysis workflows using modern programming languages such as R, Python, BASH, and statistical packages to streamline analyses on local machines and high-performance computing clusters (HPCs).
- Oversaw management and curation of genomic data produced by the BOEM interagency program with the NMNH's Department of Invertebrate Zoology (NMNH IZ).
- Responsible for analyzing and publishing genomic data and metadata to GenBank and BOLD.
- Programmed a genome skimming workflow to efficiently process raw genomic data from hundreds of samples using software packages, like fastp, SPAdes, Mitofinder, and QUAST, on the Smithsonian's HPC.
- Optimized a metagenomic bioinformatic workflow using QIIME2, VSEARCH, Mothur, LULU, and ggplot2 for environmental DNA application.
- Documented and instructed staff and students in ways to parallelize analyses using job arrays to more efficiently use system resources and complete tasks efficiently.
- Collaborated for the past four years with several marine laboratories to augment their marine science course curricula with a sequencing component to capture genetic biodiversity and provide graduate and undergraduate students with experience using traditional and NGS methods.
- Instructed four Data Carpentries workshops, educating 100 learners on topics including R, Python, SQL, Excel, and OpenRefine.
- Utilized Conda package and environment management system to deploy custom environments on HPC to extended analysis capabilities.
- Engaged in genomics standards and working groups, contributed to technical papers and collaborated with external partners.
- Managed GEOME field information management system, ensuring data fidelity across 37 projects and 16,000 samples.

- Designed and conducted novel experiments in Arctic environments, examining anthropogenic effects through metabarcoding environmental samples using NGS methods and bioinformatic pipelines.
- Coordinated and participated in a field expedition to Aleutian Islands, Alaska, resulting in collection of 752 specimens, 512 marine invertebrate sequences, and 18 eDNA community profiles.
- Participated in bi-weekely team meetings in order to share status reports on project tasks with supervisors and set weekly and long-term programmatic goals.
- Independently wrote yearly technical reports highlighting the research generated from internal and external collaborations in order to maintain interagency compliance with BOEM.

Research Collaborator

Division of Birds / Smithsonian Institution / Washington, DC / September 2017 - Jul 2020

- Collaborated with a team to use established processes and develop novel procedures for characterizing avian gut microbiotas.
- Contributed to three manuscripts, in Springer Nature journals, focused on avian microbiomes and related environmental impacts and public health implications.

Museum Technician

National Museum of Natural History / Smithsonian Institution / Washington, DC / December 2013 - September 2017

- Contributed to quarterly, annual, and final technical reports to maintain interagency compliance with BOEM.
- Contributed to the collections database, as a Data Manager, and ensured the fidelity of specimen data entered therein and as a result, made over 29,000 specimen, tissue, and extract records publicly accessible.
- Presented at the Quadrennial GIS @ SI conference where I showcased BOEM environmental studies program expeditions through geospatial data products created in ArcGIS Online.
- Maintained the NMNH IZ websites including providing technical and software support such as content creation, security patching, and viewership analytics.
- Served as the departmental point of contact to provide oversight and technical support during website migration from Dreamweaver to the Drupal content management system.

Post-Baccalaureate Researcher

Walter Reed Biosystematics Unit / Walter Reed Army Institute of Research / Suitland, MD / June 2012 - December 2013

- Supported entomological disease vector surveillance through augmentation of a web-based geospatial data product, VectorMap.

Peer Reviewed Publications

2024 Williams, J., Pettorelli, N., Hartmann, A. C., Quinn, R. A., Plaisance, L., **O'Mahoney, M.**, Meyer, C. P., Fabricius, K. E., Knowlton, N., Ransome, E. (2024). Decline of a distinct coral reef holobiont community under ocean acidification. *Microbiome*, 12, 75. DOI:10.1186/s40168-023-01683-y.

2023 Molodtsove, T.N., Opresko, D.M., **O'Mahoney, M.J.V.**, Simakova, U.V., Kolyuchkina, G. A., Bledsoe, Y. M., Nasiadka, T. W., Ross, R. F., & Brugler, M. R. (2023). One of the deepest genera of antipatharia: Taxonomic position revealed and revised. *Diversity, 15*(3), 436. DOI: 10.3390/d150

2020 Graves, G.R., Matterson, K.O., Milensky, C.M., Schmidt, B.K., **O'Mahoney, M.J.V.**, Drovetski, S.V. (2020). Does solar irradiation drive community assembly of vulture plumage microbiotas? Animal Microbiome 2, 24. DOI: 10.1186/s42523-020-00043-7.

2019 Drovetski, S.V., **O'Mahoney, M.J.V.**, Matterson, K.O., Schmidt, B.K., Graves, G.R.(2019). Distinct microbiotas of anatomical gut regions display idiosyncratic seasonal variation in an avian folivore. Animal Microbiome 1(1): 2. DOI: 10.1186/s42523-019-0002-6.

2018 Drovetski, S.V., **O'Mahoney, M.J.V.**, Ransome, E.J., Matterson, K.O., Lim, H.C., Chesser, R.T., Graves, G.R. (2018). Spatial organization of the gastrointestinal microbiota in urban Canada geese. Scientific Reports 8: 3713. DOI: 10.1038/s41598-018-21892-y.

References

W. Geoff Keel
Museum Specialist
Smithsonian Institution
keelw@si.edu

Kenneth 'Tripp' MacDonald
Molecular Technician
Smithsonian Institution
macdonaldk@si.edu

Nicole Webster
Manager of School and Youth Programs
Smithsonian Institution
webstern@si.edu