Raphaël Savelli

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Data Scientist with a PhD in Marine Science and over a decade of experience integrating multi scale data, high performance modeling, and statistical analysis to investigate land–ocean carbon dynamics. Skilled in data–model coupling, geospatial analytics, and ocean modeling. Combines technical expertise with strong communication, collaboration, and project management abilities.

Skills

Data Science & Modeling:
Data Analysis, Data Modeling, Model–Data Coupling, High-Performance Computing, Machine Learning, Statistical Analysis, Time-Series Analysis, Sensitivity Analysis, Uncertainty Quantification

Environmental & Geospatial Techniques:
Geospatial Analysis, Remote Sensing, GIS, Environmental Modeling, Climate and Biogeochemical Modeling, Visualization and Mapping of Environmental Data

Programming & Tools:
Python, R, Matlab, Fortran, C, Shell Scripting, Git, Data Visualization, Workflow Automation

Additional Skills:
Project Management, Technical Writing, Science Communication, Cross-Disciplinary Collaboration,

Experience

Research Associate — San José State University / Moss Landing Marine Laboratories (2025–Present)
Develop end-to-end data-model frameworks integrating terrestrial and oceanic carbon dynamics. Build robust, reproducible workflows combining land and ocean modeling to assess the transformation of lateral fluxes of carbon and nutrients through the land-to-ocean aquatic continuum.

Postdoctoral Scientist — NASA Jet Propulsion Laboratory (2022–2025)
Led the integration of riverine biogeochemical inputs into the ECCO-Darwin global ocean model. Conducted sensitivity analyses on terabyte-scale simulations. Compared results with state-of-the-art observational data products to evaluate global ocean carbon dynamics.

Postdoctoral Scientist — La Rochelle Université, France (2020–2022)
Developed and implemented hydrodynamic–biogeochemical modeling approaches for benthic microalgal dynamics in intertidal mudflats. Created automated pipelines for integrating satellite observations, in-situ data, and model outputs, assessing long-term climate impacts and coastal ecosystem resilience.

PhD Candidate — La Rochelle Université, France (2016–2020)
Built coupled physical–biogeochemical models for estuarine environments, integrating satellite data, field observations, and hydrodynamic modeling. Advanced understanding of land–ocean carbon connections through model–data synthesis and published peer-reviewed studies.

Education

PhD — Marine Science | La Rochelle Université (October 2016–December 2019)
Master's — Oceanography | Sorbonne Université (September 2013–September 2015)
Bachelor's — Marine Biology | La Rochelle Université (September 2011–September 2012)
Bachelor of Business Administration (BBA) | Excelia (September 2009–August 2011)

Publications

Implementing Riverine Biogeochemical Inputs in ECCO-Darwin: a Critical Step Forward for a Pioneering Data-Assimilative Global-Ocean Biogeochemistry Model. Savelli, R., Carroll, D., Menemenlis, D., Lauderdale, J., Bertin, C., Dutkiewicz, S., Manizza, M., Bloom, A., Castro-Morales, C., Miller, C. E., Simard, M., Bowman, K. W., Zhang, H., (under review), *Geoscientific Model Development*, https://doi.org/10.5194/egusphere-2025-1707

Warming could shift the phenological responses of benthic microalgae in temperate intertidal zones. Savelli, R., Le Fouest, V., Becker, M., Dupuy, C., Perrois, G., Rousset, F., Menemenlis, D., Simard, M., (2024), *Communications Earth & Environment*, https://doi.org/10.1038/s43247-024-01764-2

Diagnosis of planktonic trophic network dynamics with sharp qualitative changes. Gaucherel C., Fayolle S., Philippine, O., Pommereau F., Savelli, R., Dupuy C., (2024), *Peer Community Journal*, https://doi.org/10.24072/pcjournal.417

Potential impact of photoinhibition on microphytobenthic primary production on a large intertidal mudflat. Savelli, R., Serodio, J., Cugier, P., Meleder, V., Polsenaere, P., Dupuy, C., Le Fouest, V., (2021), *Journal of Geophysical Research: biogeosciences*, https://doi.org/10.1029/2021JG006443

Mapping the intertidal microphytobenthos Gross Primary Production. Part II: Merging remote sensing and physical-biological coupled modeling. Savelli, R., Meleder, Cugier, P., Polsenaere, P., Dupuy, C., Lavaud, J., Barnett, A., Le Fouest, V., (2020), *Frontiers in Marine Sciences*, https://doi.org/10.3389/fmars.2020.00521

Mapping the intertidal microphytobenthos Gross Primary Production. Part I: coupling multispectral remote sensing and physical modeling. Meleder, V., Savelli, R., Barnett, A., Polseneare, P., Gernez, P., Cugier, P., Lerouxel, A., Le Bris, A., Dupuy, C., Le Fouest, V., Lavaud, J., (2020), *Frontiers in Marine Sciences*, https://doi.org/10.3389/fmars.2020.00520

Impact of chronic and massive resuspension mechanisms on the microphytobenthos dynamics in a temperate intertidal mudflat. Savelli, R., Bertin, X., Orvain, F., Gernez, P., Dale, A., Coulombier, T., Pineau, P., Lachaussee, N., Polsenaere, P., Dupuy, C., Le Fouest, V., (2019), *Journal of Geophysical Research: biogeosciences*, https://doi.org/10.1029/2019JG005369

On biotic and abiotic drivers of the microphytobenthos seasonal cycle in a temperate intertidal mudflat: a modeling study. Savelli, R., Dupuy, C., Barille, L., Lerouxel, A., Guizien, K., Philippe, A., Bocher, P., Polsenaere, P., Le Fouest, V., (2019), *Biogeosciences*, https://doi.org/10.5194/bg-15-7243-2018