Raphaël Savelli

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«Develop numerical methods for a better assessment of the role of the land-sea interface in the global ocean carbon cycle.»

Experiences

2022-present **Sensitivity of air-sea CO_2 exchanges of the global ocean to riverine and coastal wetlands biogeochemical exports with the ECCO-Darwin data-assimilative global ocean biogeochemistry model,** Project supervised by Dimitris Menemenlis and Marc Simard, Jet Propulsion Laboratory.

Identification/quantification of riverine and coastal wetlands biogeochemical exports and analysis of their contribution to air-sea CO2 exchanges of the global ocean with the ECCO-Darwin model.

2020-2022 **Impact of contemporary and future climate variability (1950-2100) on the primary production of microphytobenthos of intertidal mudflats,** Project supervised by Vincent Le Fouest, La Rochelle Université.

Time series analysis and modeling under two climate change scenarios from 1950 to 2100 (RCP 4.5 and RCP 8.5).

Impact of a dredging on the planktonic food web structure in a freshwater marsh from *in situ* observations, Project supervised by Christine Dupuy, La Rochelle Université.

Qualification of the divergence in the planktonic food web typology between two sampling stations in a French coastal freshwater marsh after a dredging.

2020 **Microphytobenthos productivity of intertidal habitats in relation with sediment, biogeochemical and benthic engineers faunal species dynamics,** Post doctoral fellowship supervised by Francis Orvain, BOREA, Université de Caen.

Modeling of microphytobenthos productivity in a fully vertically-discretized morphodynamical and biogeochemical sediment model.

2016 – 2019 **Microphytobenthos dynamics on temperate intertidal mudflats,** PhD thesis supervised by Vincent Le Fouest and Christine Dupuy, LIENSs, La Rochelle Université.

Combination of a physical-biological coupled model of microphytobenthos dynamics with remote sensing products (MODIS, MERIS, PLEIADES et SPOT). Model validation by satellite images and development of an algorithm of microphytobenthos primary production based on satellite images forced by simulated fields.

2015 **Impact of global warming in an Arctic high productivity area : physical-biological modeling according to climate scenarios in the Barents Sea,** Master thesis supervised by Paul Wassmann, The Arctic University of Norway.

Comparison of simulations by a physical-biological coupled model forced with contemporary and climate change scenarios. Sensitivity analysis of primary production and impact of the atlantification.

2014 **Impact of global warming on the primary production in the Arctic Ocean,** Internship supervised by Vincent Le Fouest, LIENSs, La Rochelle Université.

Analysis of simulated outputs from a physical-biological coupled model over the period 1990-2010 at the pan-Arctic, Barents Sea and Chukchi Sea scales.

Education

2016 – 2019 **La Rochelle Université**, *La Rochelle (17)*.
PhD in Environmental Sciences with Biology of the Environment, Populations and Ecology specialisation.

2014 – 2015 **Sorbonne Université (Paris VI)**, *Villefranche sur Mer (06)*.
2^{nd} year of MSc in Oceanography and marine sciences at the Observatoire Océanologique de Villefranche sur Mer.

2012 – 2014 **La Rochelle Université**, *La Rochelle (17)*.
1^{st} year of MSc in Environmental Sciences with coastal Ecology specialisation.
2^{nd} & 3^{rd} years of BSc in Exact and Natural Sciences with marine Biology specialisation.

2009 – 2012 **Excelia La Rochelle & IAE La Rochelle**, *La Rochelle (17)*.
1^{st} year of MSc in Management with environment management specialisation.
Bachelor in management and business.

Skills

Remote sensing Spectral index, Bio-optical algorithm, Coupling with simulated fields.
Data analysis Statistics, Multivariate analysis, Interpolation, Model geospatial outputs processing.
Modeling Model development, Numerical schemes, Physical-biological coupling.
Teaching Educational programme in Oceanography.
English Fluent.

Tools

Programming R, Matlab, Ferret, Fortran, Python (basics)
Edition LaTeX
GIS QGIS, ArcGIS, SNAP
Office Microsoft Office & Opensource
OS Windows, Linux et Mac OS.

Interests

Sport Trail running, Hiking, Surf, Basketball
Culture Adventure stories, Movies

Articles (in peer-reviewed journals)

to be submitted Savelli, R., Philippine, O., Agogué, H., Dupuy, C., Planktonic food web resilience to dredging in human-managed freshwater marshes, *Water Research*.

in preparation Gaucherel C., Fayolle S., Philippine, O., Pommereau F., Savelli, R., Dupuy C., Diagnostic of a planktonic trophic network dynamics with a possibilistic analysis, *Ecology letters*.

to be submitted Savelli, R., Becker, M., Dupuy, C., Etchevers, P., Regimbeau, F., Perrois, G., Bernus, S., Vincendon, B., Soubeyroux, J-M., Le Fouest, V., Fate of microphytobenthos primary production in light of IPCC climate scenarios, *Nature Climate Change*.

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

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

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

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

2018 Savelli, R., Dupuy, C., Barillé, L., Lerouxel, A., Guizien, K., Philippe, A., Bocher, P., Polsenaere, P., Le Fouest, V., On biotic and abiotic drivers of the microphytobenthos seasonal cycle in a temperate intertidal mudflat: a modeling study, *Biogeosciences*, 15.23: 7243-7271, https://doi.org/10.5194/bg-15-7243-2018.

Reports

2019 Savelli, R., Dupuy, C., Polsenaere, P., Le Fouest, V., Study of microphytobenthos dynamics in temperate intertidal mudflats by using physical-biological coupled modelling and remote sensing data analysis, *PhD thesis*, english, 215pp.

2015 Savelli, R., Ellingsen, I., Slagstad, D., Wassmann, P., Impact of global warming in an Arctic high productivity area: physical-biological modeling in the Barents Sea, *Master thesis*, english, 37pp.

2014 Savelli, R., Le Fouest, V., Impact of global warming on the primary production in the Arctic Ocean, *Internship report*, french, 18pp.

2013 Savelli, R., Vincent, C., Seals depredation in France, *Internship report*, french, 29pp.

Peer-reviewed meetings

2021 Savelli, R., Becker, M., Etchevers, P., Regimbeau, F., Perrois, G., Bernus, S., Vincendon, B., Soubeyroux, J-M., Dupuy, C., Bertin, X., Le Fouest, V., Primary production of intertidal mudflats under two climate change scenarios, EVOLECO, November, 3.
La Rochelle, France

2019 Savelli, R., Dupuy, C., Le Fouest, V., Combining physical-biological modeling and remote sensing for mapping the microphytobenthos of intertidal mudflats, Oceanext, 3-5 July.
Nantes, France

2019 Savelli, R., Bertin, X., Orvain, F., Gernez, P., Dalle, A., Coulombier, T., Pineau, P., Lachaussée, N., Polsenaere, P., Dupuy, C., Le Fouest, V., modeling of chronic and massive resuspension mechanisms of microphytobenthos on a temperate intertidal mudflat, ASLO Aquatic Sciences Meeting, 23 February - 2 March.
San Juan, Puerto Rico

2018 Savelli, R., Dupuy, C., Barillé, L., Lerouxel, A., Orvain, F., Guizien, K., Bocher, P., Philippe, A., Cugier, P., Polsenaere, P., Le Moine, O., Le Fouest, V., Drivers of microphytobenthos (MPB) seasonal cycle on a temperate intertidal mudflat: A modeling approach, Microphytobenthic biofilm symposium, 9-11 January.
Southend, U.K.

2017 Savelli, R., Dupuy, C., Barillé, L., Lerouxel, A., Orvain, F., Guizien, K., Bocher, P., Philippe, A., Cugier, P., Polsenaere, P., Le Moine, O., Le Fouest, V., Drivers of microphytobenthos (MPB) seasonal cycle on a temperate intertidal mudflat, AMEMR (Advances in Marine Ecosystem modeling Research), 3-6 July.
Plymouth, U.K.

Guest lectures

2018 Savelli, R., Dupuy, C., Barillé, L., Lerouxel, A., Orvain, F., Guizien, K., Bocher, P., Philippe, A., Cugier, P., Polsenaere, P., Le Moine, O., Le Fouest, V., Spatial and temporal dynamics of benthic microalgae on intertidal mudflats of the Pertuis Charentais Sea, La Rochelle Université PhD students meeting, 24 May.
La Rochelle, France

2017 Savelli, R., Dupuy, C., Barillé, L., Lerouxel, A., Orvain, F., Guizien, K., Bocher, P., Philippe, A., Cugier, P., Polsenaere, P., Le Moine, O., Le Fouest, V., modeling of spatial and temporal dynamics of microphytobenthos on intertidal mudflats of the Pertuis Charentais Sea, Ifremer PhD students meeting, 17 October.
Nantes, France

2017 Savelli, R., Dupuy, C., Barillé, L., Lerouxel, A., Orvain, F., Guizien, K., Bocher, P., Philippe, A., Cugier, P., Polsenaere, P., Le Moine, O., Le Fouest, V., Seasonal cycle of microphytobenthos on a teperate intertidal mudflat: a modeling study, Scientific day of the Université de Nantes, 2 June.
Nantes, France

2017 Savelli, R., Guizien, K., Le Fouest, V., modeling of spatial and temporal dynamics of microphytobenthos on intertidal mudflats: mud temperature role, MARS-3D users days, Ifremer, 21-22 March.
Brest, France

2015 Savelli, R., Ellingsen, I., Slagstad, D., Wassmann, P., Impact of global warming on primary production in the Barents Sea: biological-physical modeling, AkvaSem, 5 June.
Tromsø, Norvège

Posters

2019 Savelli, R., Cugier, P., Polsenaere, P., Méléder, V., Lavaud, J., Barnett, A., Dupuy, C, Le Fouest, V., Spatial and temporal variations of microphytobenthos photoinhibition on a temperate intertidal mudflat, ASLO Aquatic Sciences Meeting, 23 February - 2 March.
San Juan, Puerto Rico

2018 Savelli, R., Dupuy, C., Barillé, L., Lerouxel, A., Guizien, K., Bocher, P., Philippe, A., Polsenaere, P., Le Fouest, V., Spatial and temporal dynamics of microphytobenthos on intertidal mudflats of the Pertuis Charentais Sea, La Rochelle Université PhD students meeting, 24 May.
La Rochelle, France

2017 Savelli, R., Dupuy, C., Polsenaere, P., Le Moine, O., Barillé, L., Méléder, V., Gernez, P., Lerouxel, A., Brenon, I., Cugier, P., Orvain, F., Guizien, K., Bocher, P., Philippe, A., Le Fouest, V., Spatial and temporal dynamics of microphytobenthos on intertidal mudflats: combination of physical-biological coupled model and remote sensing, Remote Sensing National Program day, CNES, 16 March.
Paris, France