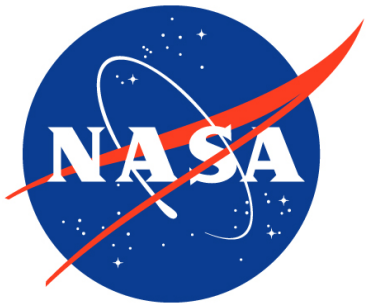
raphael.savelli@jpl.nasa.gov

What rivers and coastal wetlands bring into the global ocean ?

R. Savelli [a], D. Menemenlis [a], M. Simard [a], D. Carroll [b]

[a] Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA
[b] Moss Landing Marine Laboratories, San José State University, Moss Landing, CA, USA

SWOT Science Team Meeting, June 2022



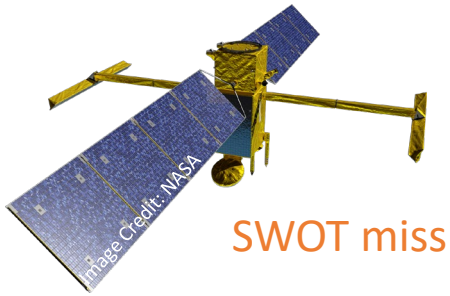
Exports from rivers and coastal wetlands

- Large amount of carbon and nutrients delivered to the ocean:
  - Rivers: ~ 1 Pg C yr^{-1} (Li et al., 2017)
  - Coastal wetlands: ~ 2 Pg C yr^{-1} (Duarte et al., 2005)
- Natural drivers (ecosystem productivity, burial, river discharge, tidal inundation, disturbance)

Questions:

1. The contribution of rivers and coastal wetlands to the carbon cycle of the global ocean?
2. Response of the marine biological activity to these exports?

Method



SWOT mission

Nutrient and carbon loads from rivers

- River discharge (JRA55-do)
- Nutrients loads (GlobalNEWS2)

Image Credit: Greenscapes North Shore Coalition

Carbon exports from coastal wetlands

- Landcover classification
- Ecosystem productivity
- Soil organic carbon
- Tidal inundation (FES, TPXO, NS_tide)

Image Credit: NOAA

Ocean biogeochemistry ECCO-Darwin model

- Data-assimilative
- MITgcm
- Darwin model
- Radiative transfer
- DIC budget

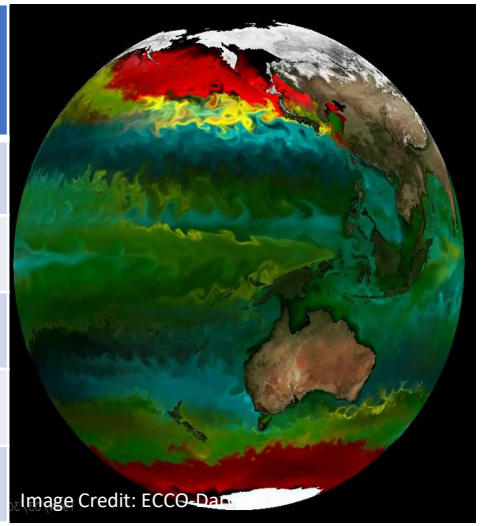


Image Credit: ECCO-Dar

- Air-sea CO_2 fluxes
- Biological production
- Phytoplankton communities

Conclusion

A project that:

- Estimates carbon and nutrients transiting through the Land-Ocean aquatic continuum
- Quantifies their role in the ocean biogeochemistry
- Covers aquatic components encompassed by the SWOT mission
- Will benefit from the SWOT mission (river discharge, tidal inundation)