Jonathan Benoit

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Research Experience

Senior Thesis

2021-2022 | Advised by Dr. Baylor Fox-Kemper

- Forced a coastal ocean model of Narragansett Bay (OSOM) with climate forcing under RCP 8.5 for past, present, and future (2100) scenarios using the Regional Ocean Modeling System (ROMS) and the Cheyenne supercomputer
- Predicted increases in temperature, sea level, salinity, and stratification within Narragansett Bay
- Visualized the effect of thermal effluent and climate change in 3D space and time
- Presented the work orally and in writing

Ernest F. Hollings Scholarship | NOAA

2020-2022 | National Weather Service | Key West, FL

- Used statistics and machine learning to discover novel synoptic-scale meteorological phenomena from ERA5 that correspond to waterspout favorability in the Florida Keys
- Presented results in a poster at the AGU and AMS

Summer Undergraduate Research Fellowship

Summer 2019 | Brown University

- Validated the Ocean State Ocean Model (OSOM) against buoy data for temperature and salinity
- Developed a machine learning algorithm to automatically detect erroneous buoy data

Summer 2020 – Spring 2021 | Brown University

- Derived high resolution maps of temperature in Narragansett Bay from the Landsat satellite series in Google Earth Engine
- Calculated the rate of surface temperature warming in Narragansett Bay and conducted a post-impact analysis of the effect of thermal effluent in the region
- First author on a peer-reviewed publication to Frontiers in Marine Science. The publication was accepted with no major revisions
- Presented this work as a guest lecture in a Remote Sensing class in Spring 2022

Scientific Visualization Experience

RI C-AIM Visualization Intensive

Spring 2020

- Collaborated with the Rhode Island School of Design to create a sonification project that converted Narragansett Bay buoy data into sound

Education

Brown University | Sc.B. Geophysics

Class of 2022 | Magna Cum Laude | Honors

Juneau Icefield Research Program

Summer 2022 | Juneau, AK

- Participated in an 8-week glaciology field course
- Developing skills in mountaineering, working in extreme and isolated environments, glacier physics, field work, and outdoor leadership

Leadership Experience

DEEPS Spring Break Field Trip Leader

2020 - 2022

- *Organized (2020, 2022) and led (2022) an 8 day, 30-person trip to Utah for Brown's Earth Science department*
- Created an educational itinerary spanning environmental disciplines
- Coordinated group planning surrounding food, gear, fundraising, field guide writing, flights, camping, group bonding, and other trip logistics

Teaching Assistant | Earth Processes

Spring 2021

- Provided technical support for a hybrid Earth processes course
- Graded homework, led labs and office hours

Skills

- Matlab, Python (4+ Years)
- Remote Sensing (Earth Engine)
- Modeling (ROMS, HYSPLIT)
- Model Validation/Assimilation
- Meteorological Machine Learning
- Environmental Impact Studies
- Experience with netCDF data
- Basic terminal commands
- Supercomputing
- GIS
- Statistics/Data Analysis
- Scientific Writing/Speaking

Interests

- Atmosphere/Ocean Physics
- Earth System Modeling
- Data Visualization
- Environmental Regulation/Justice
- Computer Science
- Climate Change
- Applying Weather Models
- Science Communication
- Field Work

Publications

- Benoit, J. & Fox-Kemper, B. (2021). Contextualizing thermal effluent impacts in Narragansett Bay using Landsat-derived surface temperature. *Frontiers in Marine Science*, *8*. https://doi.org/10.3389/fmars.2021.705204
- "Modeling Estuary-Scale Climate Change: Narragansett Bay Under RCP 8.5" (senior thesis)
- Poster presentations at RI-CAIM SURF Conference 2019, American Geophysical Union 2021, American Meteorological Society 2022