Joseph J. Fogarty

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Summary

Fifth-year graduate student enrolled in the department of Civil and Environmental Engineering (CEE) at Princeton University, conducting research in the Environmental Fluid Mechanics (EFM) group. Although my undergraduate studies were in meteorology, my interests have pivoted from traditional operational forecasting to data-driven fluid dynamics and climate change. As a graduate student, my thesis employs numerical, statistical, and observational tools to simulate the changing Arctic sea ice surface and overlying atmosphere in the face of anthropogenic warming.

Education

Princeton University — Princeton, NJ
Ph.D. in Civil and Environmental Engineering — 2018–Current

- Advisor: Elie Bou-Zeid
- M.A. in Civil and Env. Eng. Earned Apr 2021

Rutgers University — New Brunswick, NJ
B.S. in Meteorology, *summa cum laude* — 2014–2018

- Advisor: Mark Miller
- Minors in Mathematics and Environmental Sciences

Research Experience

Ice-Water-Air Exchanges in the Marginal Ice Zone: Numerical Simulations of Satellite-Sensed Surface States — Denver, CO
Oral Presentation at the Annual AMS Conference — 2023

Turbulence-Resolving Simulations of Atmosphere-Surface Coupling in the Marginal Ice Zone: The Interacting Effects of Temperature Heterogeneity — Phoenix, AZ
Oral Presentation at the Annual APS-DFD Conference — 2021

Nonlinearity of Air-Ice-Water Exchanges: Simulations of Remotely-Sensed Surface States — San Francisco, CA
Poster Presentation at the Annual AGU Conference — 2019

Modeling of Air-Sea-Ice Coupling of the Arctic Atmospheric Boundary Layer — Princeton, NJ
Poster Presentation for CEE 509: Directed Research — 2019

Drizzle Evaporation in the Stratocumulus-Topped Marine Boundary Layer and its Relationship with Sub-Cloud Turbulence — New Brunswick, NJ
Oral Presentation for George H. Cook Honors Project — 2018

Seasonal Trends in Extreme Minimum Temperatures at Six New Jersey Locations — Piscataway, NJ
Poster Presentation at Rutgers Climate Symposium — 2017

Teaching

- **Assistant in Instruction** at Princeton University — Spring 2022, Spring 2023
  Hydrology: Water and Climate (CEE 306)
- **Assistant in Instruction** at Princeton University — Fall 2021, Fall 2019
  Environmental Fluid Mechanics (CEE 305)
- **Assistant in Instruction** at Princeton University — Fall 2020, Fall 2022
  The Climatological, Hydrological, & Environmental Footprints of Cities (CEE 474)
- **Rutgers Learning Center Tutor** at Rutgers University — 2016-2017
  Pre-Calculus, Calculus, Linear Algebra

Scholarships and Awards

- Gordon S. Wu Scholarship — 2018–Current
- Rutgers Dean's List — 2014–2018
- Meteorology Student of the Year — 2018

Projects

More details of projects on github.com/josephfogarty

- **Ice SUrface energy Budget Solver** *(Python, 2019)*
  IceSUBS was a program written to solve a surface energy budget of a sea ice surface with eventual implementation in a large-eddy simulation model
- **Forecast Verification** *(Python/Jupyter, 2017)*
  A Jupyter notebook created with the intention to explore techniques and libraries in Python relevant to data science, using forecast verification techniques as the motivation

Skills

- **Languages:** Python, MATLAB
- **GIS:** ARcGIS Pro, QGIS
- **Version Control:** Git
- LaTeX, Microsoft Office

Professional Experience

Office of the New Jersey State Climatologist — Piscataway, NJ
Undergraduate Intern — 2017–2018

- Regular quality control for CoCoRaHS
- Synthesized national snow data for the 2016 Annual Snow Report
- Conducted independent research projects under the advice of the State Climatologist

Rutgers Environmental Sciences — New Brunswick, NJ
Weather Observer — 2016–2018

- Conduct and record daily weather observations few days per week
- Organize other volunteers in the program by creating weekly schedules

Spot-On Weather — Marlboro, NJ
Undergraduate Intern — 2016

- Handled operational forecasts for TV and film crews
- Created forensic meteorology reports by using archival data for civil lawsuits