Yu Gao

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Education

Ph.D. in Meteorology and Physical Oceanography Aug 2016 – Jan 2022
University of Miami Miami, FL

Bachelor's Degree in Marine Science Aug 2012 – June 2016
Ocean University of China Qingdao, China

Work Experience

Research Associate II-III, The Woods Hole Oceanographic Institution (WHOI)
March 2024 – Present

• Develop reproducible algorithms for meteorological and oceanographic data processing across 6 projects.
• Quality control and process buoy, wave glider and mooring observations into high-quality data products.
• Produce datasets that adhere to FAIR principles (Findable, Accessible, Interoperable, Reusable) and maintaining clear, consistent file structures for long-term usability.
• Write data reports and descriptors using an automatic data reporting system in Latex.
• Develop an AI-powered flood monitoring system integrating real-time news sources and NOAA alerts with OpenAI API platform.
• Build Python tools for submersible humidity sensor development.
• Manage version control and collaboration using GitHub repositories across research and coding projects.

Postdoctoral Scholar, UC San Diego February 2022 – January 2024

• Developed Python-based data assimilation methods to improve SWOT sea-surface height accuracy.
• Advanced techniques to jointly optimize model fields and correlated error structures in ocean state estimates.

Research Assistant, Univ. of Miami August 2016 – January 2022

• Modeled mesoscale air–sea interactions with a regional coupled ocean–atmosphere model to advance understanding of coupled climate dynamics.
• Quantified mesoscale mixed-layer heat budgets and air–sea heat exchange in the Southern Ocean using coupled climate model output.
• Analyzed mixed-layer depth variability in both regional and climate simulations, highlighting the influence of ocean eddies and atmospheric forcing.

Peer-reviewed Publications

Deep Ocean Temperature from the Stratus Ocean Reference Station in the Southeast Pacific cold tongue region (85°W, 20°S), 2012–2025., Yu Gao, Albert Plueddemann, Robert Weller, Sebastien Bigorre (Under review). *Nature Scientific Data.*

SWOT Data Assimilation with Correlated Error Reduction: Fitting Model and Error Together, Sarah T. Gille, Yu Gao, Bruce D. Cornuelle, Matthew R. Mazloff, *Journal of Atmospheric and Oceanic Technology 42.3 (2025): 253-268.* DOI:10.1175/JTECH-D-24-0062.1

Origins of Mesoscale Mixed-layer Depth Variability in the Southern Ocean, Yu Gao, Igor Kamenkovich, Natalie Perlin, *Ocean Science, 19, 615-627, 2023.* DOI: 10.5194/os-19-615-2023

Oceanic Advection Controls Mesoscale Mixed Layer Heat Budget and Air–Sea Heat Exchange in the Southern Ocean, Yu Gao, Igor Kamenkovich, Natalie Perlin Benjamin Kirtman, *Journal of Physical Oceanography, 52(4), 537-555, 2022a.* DOI: 10.1175/JPO-D-21-0063.1

A study of mesoscale air–sea interaction in the Southern Ocean with a regional coupled model Natalie Perlin, Igor Kamenkovich, Yu Gao, Benjamin Kirtman, *Ocean Modelling 153, 101660, 2020.* DOI: 10.1016/j.ocemod.2020.101660

Data Publications

Deep-Ocean Temperature data from a mooring in the Southeast Pacific (85°W, 20°S), 2012 - 2025, Yu Gao, Albert Plueddemann, Robert Weller, Sebastien Bigorre *MBLWHOI Library Dataverse, 2025.* DOI: 10.26027/DATAKX5CQK

S-MODE Waveglider Observations Level-4 Air-sea flux Dataset. WHOI. Ver. 1. PO.DAAC, CA, USA. Yu Gao, 2025, https://doi.org/10.5067/SMODE-WAVEGL4

S-MODE Waveglider Observations Level-3 Dataset. WHOI. Ver. 1. PO.DAAC, CA, USA. Yu Gao, 2025, DOI: 10.5067/SMODE-WAVEGL3

Origins of Mixed Layer Depth Variability in the Southern Ocean, Yu Gao, Igor Kamenkovich, Benjamin Kirtman, *University of Miami Libraries, 2022b.* DOI: 10.17604/0BKF-P943

Oceanic Advection Controls Mesoscale Mixed Layer Heat Budget and Air-sea Heat Exchange in the Southern Ocean, Yu Gao, Igor Kamenkovich, Natalie Perlin, Benjamin Kirtman, *University of Miami Libraries, 2021.* DOI: 10.17604/94qh-6m66

Teaching Experience

MSC 302 Physical Oceanography Laboratory: I guided and supervised laboratory experiments, and assessed student lab reports and with a focus on enhancing understanding and application of physical oceanography concepts.

Teaching Assistant, University of Miami — Spring 2019

MSC/ATM 220 Climate and Global Change: Undergraduate level class on Earth's climate system and the role of natural and anthropogenic processes in shaping climate change. I gave lecture on global climate change, assisted with course materials, and graded assignments.

Teaching Assistant, University of Miami — Fall 2019

Seminar and Talks

Mesoscale air-sea Interaction and Mixed Layer Variability in the Southern Ocean, JPL Center for Climate Sciences Seminar, Pasadena, CA — October 2023

SWOT Data Assimilation With Correlated Error Reduction,
NASA-MPOWIR Speaker Series, JPL, Pasadena, CA — November 2022

Origins of Mesoscale Mixed Layer Variability in the Southern Ocean,

Ocean Sciences Meeting 2022, Online Feb-Mar 2022

SWOT Data Assimilation With Correlated Error Reduction,
SWOT Science Team Meeting, Chapel Hill, NC, USA Jun 2022

Role of Mesoscale Currents in Ocean Mixed Layer Heat Budget, Ocean Sciences Meeting 2020, San Diego, CA, USA February 2020

Poster Presentations

SWOT Data Assimilation with Correlated Error Reduction: Fitting Model and Error Together, SWOT Science Team Meeting, Toulouse, France Sept 2023

Origins of Mesoscale Mixed Layer Variability in the Southern Ocean
US CLIVAR Workshop, Denver, CO, USA Mar 2023

SWOT Data Assimilation With Correlated Error Reduction
AGU Fall Meeting, Chicago, IL, USA, Dec 2022

Role of Mesoscale Currents in Ocean Mixed Layer Heat Budget and Air-Sea Coupling
AGU Fall Meeting, Online Dec 2020

Professional Development

NASA's Earth Observations Summer School, Using Satellite Observations to Advance Climate Models, Pasadena, CA, USA Aug 16, 17 and 21 - 25, 2023

The Pattullo Conference by MPOWIR, Warrenton, VA, USA Sept. 24 - 27, 2023

Unifying Innovations in Forecasting Capabilities Workshop
Boulder, CO, USA July 24, 2023 - July 28, 2023

San Diego Supercomputer Center, Summer Institute 2022, Super-computing and Data Science, San Diego, CA, August 5 - 9, 2022

AMS Short Courses: Machine Learning in Python for Environmental Science; Python for Climate and Meteorology Mar–Apr 2021

Annual RSMAS Writing Workshop with Dallas Murphy
Miami, FL, USA and Virtual Dec 2020 - Jan 2021

Skills

Programming Languages: Python, MATLAB, Fortran, LaTeX
Softwares and computing: Git, High-performance Computing(HPC)
Ocean Modeling: Coupled ocean-atmosphere modeling and data assimilation; Experience in Regional Ocean Modeling System (ROMS), Finite Volume Community Ocean Model (FVCOM)

Professional Services

Referee for: National Science Foundation & Ocean Science (eISSN: OS 1812-0792, OSD 1812-0822)