Yu Gao

Updated May 21, 2024

Email: gaoyu@ucsd.edu **Website**: https://yugaophd.github.io
Phone: (858) 305-1866 **GitHub**: https://github.com/yugaophd

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, The Woods Hole Oceanographic Institution (WHOI) March 2024 – Present

Process and analyze large volumes of SWOT InSAR LR altimetry expert data products using advanced Python-based techniques to prepare the data for scientific analysis and ensure its accuracy and integrity, while conducting thorough analysis of SWOT data in conjunction with oceanographic and meteorological data from diverse sources to investigate air-sea interaction and ocean dynamics. Conduct advanced processing of High Frequency radar data and wave glider data into high-quality data products to support studies of mesoscale and submesoscale ocean dynamics. Perform rigorous quality control procedures on deep ocean temperature and salinity measurements, including data validation, error detection, and calibration, and process the data using standardized methods to generate consistent, well-documented datasets that are suitable for open source distribution and collaborative open science initiatives.

Postdoctoral Scholar, UC San Diego February 2022 – January 2024

Developed sophisticated Python-based statistical models to enhance SWOT Sea Surface Height satellite data accuracy by mitigating sampling errors and effectively bridging observational gaps. Interpreted California Current state estimate that incorporates the SWOT data. Conducted power spectra analysis of the California State Estimate and SWOT satellite data.

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

Modeled and analyzed mesoscale heat budget and air-sea interactions using regional air-sea coupled model. Interpreted data from Community Climate System Model (CCSM). Published three peer-reviewed papers.

Undergraduate Student, Ocean Univ. of China September 2015 – June 2016

Modeled water masses using FVCOM and analyzed coastal processes.
Quantified the impact of freshwater input on water mass distribution.

Peer-reviewed Publications

SWOT Data Assimilation with Correlated Error Reduction: Fitting Model and Error Together
Yu Gao, Sarah T. Gille, Bruce D. Cornuelle, Matthew R. Mazloff,
Journal of Atmospheric and Oceanic Technology (Under Review)
DOI:10.31223/X5T12Z

Oceanic Mesoscale and Atmospheric Noise Coupling Dampens Southern Ocean Mixed Layer Variability
Yu Gao, Igor Kamenkovich, Benjamin Kirtman,
Journal of Geophysical Research: Oceans (Under review)
DOI:10.22541/essoar.170067051.16403665/v1

Origins of Mesoscale Mixed-layer Depth Variability in the Southern Ocean
Yu Gao, Igor Kamenkovich, and 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 and 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, and Benjamin Kirtman
Ocean Modelling 153, 101660, 2020. DOI: 10.1016/j.ocemod.2020.101660

Data Publications

Data for Origins of Mixed Layer Depth Variability in the Southern Ocean
Yu Gao, Igor Kamenkovich, and Benjamin Kirtman,
University of Miami Libraries [data set], 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, and Benjamin Kirtman,
University of Miami Libraries [data set], 2021. DOI: 10.17604/94qh-6m66

Teaching Experience

MSC 302 Physical Oceanography Laboratory
Undergraduate level class on Physical Oceanography lab experiments. 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
Role of Mesoscale Currents in Ocean Mixed Layer Heat Budget,
Ocean Sciences Meeting 2020, San Diego, CA, USA Feb 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

The Pattullo Conference by MPOWIR, Warrenton, VA, USA Sept. 24 - 27, 2023
NASA's Earth Observations Summer School, Using Satellite Observations to Advance Climate Models
Pasadena, CA, USA Aug 16, 17 and 21 - 25, 2023
Unifying Innovations in Forecasting Capabilities Workshop
Boulder, CO, USA July 24, 2023 - July 28, 2023
San Diego Supercomputer Center, Summer Institute 2022, Supercomputing and Data Science
San Diego, CA, August 5 - 9, 2022
SWOT Science Team Meeting, Chapel Hill, NC, USA Jun 2022
RSMAS's Informatics Group: Member-led discussion on Aitificial Intelligence in Oceanograpy and Atmospheric Sciences 2021
AMS Short Course: Machine Learning in Python for Environmental Science Apr 2021

AMS Short Course: Python for Climate and Meteorology Mar 2021

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

Skills

Programming Languages: Python, Fortran, SQL, LaTeX
Softwares and computing: Git, High-performance Computing(HPC), Cloud Computing (JPL-CMDA, PO.DAAC)
Models and Methods: ROMS, FVCOM and data assimilation

Professional Services

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