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Luke Vincent Colosi

Research Interests

Air-sea Interactions, Submesoscale Dynamics, Surface Gravity Waves, Remote Sensing.

Education

2021–Present | **Ph.D. Student in Applied Ocean Sciences**, Scripps Institution of Oceanography.

2016–2020 | **BSc. in Oceanic and Atmospheric Sciences**, University of California, San Diego.

2016–2020 | **Minor in Mathematics**, University of California, San Diego.

Fellowships and Awards

2018 | **Summer URS Hiestand Scholarship for cross-disciplinary Engineering and SIO projects** – SIO, University of California, San Diego

2017–2019 | **Provost Honors at University of California, San Diego** – Awarded during Fall 2017, 2018, and 2019, Winter 2019 and 2020, and Spring 2017, 2018, and 2020 quarters.

Research Experience

2021-Present | **Graduate Student - Air-Sea Interaction Laboratory at Scripps Institution of Oceanography (SIO)**
My research aims to better understand the underlying physics of the coupled air-sea system at the submesoscale and how interactions between surface waves, winds, and currents at these scales impact the larger climate system using theoretical and field studies. Advisors: Luc Lenain, Nicholas Pizzo, Laurent Grare.

2020 | **Staff Research Associate 1 - Air-Sea Interaction Laboratory at SIO**
My research aims to leverage measurements from Instrumented Liquid Robotic Wave Gliders to better constrain interactions between surface waves, winds, and currents. The focus is to develop methods to obtain higher accuracy measurements of directional surface waves down to short scales aboard these autonomous vehicles. Advisors: Luc Lenain, Nicholas Pizzo, Laurent Grare.

2017–2021 | **Undergraduate Student Researcher - SIO**
My research aims to improve our understanding of wave and wind climates using satellite remote sensing observations. The focus is to determine how local atmospheric conditions influence the intraannual variability of the surface wave field. Advisors: Sarah Gille, Bia Villas Bôas.

Fieldwork

2022 **Twin Otter N258AR** - Participated in 10 science flights for the Submesoscale Ocean Dynamics Experiment (SMODE). Operated the SIO Modular Aerial Sensing System.

2022 **R/V Shana Rae** - Participated in 3 day cruises for SMODE. Mobilized/demobilized and deployed/recovered 8 Wave Gliders.

2022 **R/V Condor** - Participated in a 2 week cruise for the Fog and Turbulence Interactions in the Marine Atmosphere (FATIMA) experiment. Mobilized/demobilized and deployed/recovered 3 Wave Gliders and the R/V Wallace (an autonomous instrumented research vessel), and participated in radiosonde launches.

2021 **R/V Beyster** - Participated in 2 day cruises for the Task Force Oceans experiment. Mobilized/demobilized and deployed/recovered 3 Wave Gliders.

2019 **R/V Sproul** - Participated in a day cruise for SIO 176 Observational Oceanography class. Constructed and deployed a rosette mounted CTD.

Service

2022–Present **SIO Graduate Student Council Member** - I serve as a co-representative for the applied ocean science circular group in graduate student council. My focus is on improving the transportation safety on campus.

2021 **SIO Polar Center's Equity, Diversity, Inclusion, and Access Group Member** - Helped draft and edit a report on efforts to improve Equity, Diversity, Inclusion, and Access in the SIO Polar Center.

2020 **Moderator** for SIO undergraduate majors' quarterly meeting on "How to get into a Summer REU". I led group discussions guiding students interested in beginning ocean and atmospheric sciences research.

2017-2019 **Student Minister** - Served and supported the student community at the UCSD Newman Center through leading community building events, coordinating off campus retreats, and participating in social justice activities such as feeding the homeless and food/clothing drives.

Teaching Experience

2020-Present **Software Carpentry Instructor** - Certified Software Carpentry instructor responsible for two day workshops teaching best practices for scientific computing to a broad range of audiences. Workshop curriculum focuses on the Unix shell, version control with Git, and programming in Python.

2019-2020 **Software Carpentry Workshop Assistant** - Assistant for the Software Carpentry Workshop at SIO, San Diego, CA for Ocean and atmospheric science majors at UCSD (Summer 2019) and the Scripps Summer Undergraduate Research Fellowship program (remote; Summer 2020).

2019 **Introduction to Academic Tutoring of Secondary School Students** - Tutor for intermediate algebra at Gompers Preparatory Academy, San Diego, CA.

2015-2018 **Junior Lifeguard Instructor, California State Parks Santa Cruz, CA** - Educated 6 to 14 year olds on lifeguarding skills and led discussions about ocean conditions and aquatic safety.

Work Experience

2018 **Coordinator for the Sandman Triathlon, California State Parks Santa Cruz, CA** – Assisted with organizing the Sandman Triathlon supporting California State Parks and headed coordination of the transition area.

2015–2018 **California State Parks Ocean Lifeguard, Santa Cruz, CA** – Patrolled 3 miles of coastline and monitored up to 300 beach patrons to ensure beach and aquatic safety. Monitored off-road recreational facility, Hollister Hills. Executed medical procedures and aquatic rescues in communication with diverse agencies including Firefighters, State Park Rangers, and ground ambulance.

Computational Skills

Operating Systems: Unix-based operating systems.

Programming Languages: Python, Bash, Shell-Script and MatLab.

Tools and Software: Jupyter notebooks, LaTeX, and version control systems (Git).

Publications

Peer-Reviewed Articles

Luke V. Colosi, Luc Lenain, Nick Pizzo, and Laurent Grare. Observations of surface gravity wave spectra from moving platforms. *J. Atmos. Ocean. Techn., in preparation*, 2023

Luke V. Colosi, Ana B. Villas Bôas, and Sarah T. Gille. The seasonal cycle of significant wave height in the ocean: Local versus remote forcing. *Journal of Geophysical Research: Oceans*, 126 (8):e2021JC017198. doi: https://doi.org/10.1029/2021JC017198

Data and Software

Luke V. Colosi. Source code for: "Observations of surface gravity wave spectra from moving platforms". `https://github.com/lcolosi/WaveSpectrum`, 2023

Luke V. Colosi. Source code for: "The seasonal cycle of significant wave height in the ocean: Local vs remote forcing". `https://github.com/lcolosi/WaveClimatology`, 2021

Selected Conference Presentations

Luke V. Colosi, Luc Lenain, Nick Pizzo, and Laurent Grare. Observations of surface gravity wave spectra from moving platforms (talk). Sub-Mesoscale Ocean Dynamics Experiment Science Team Meeting, virtual, 2022a

Luke V. Colosi, Luc Lenain, Nick Pizzo, and Laurent Grare. Observations of surface gravity wave spectra from moving platforms (talk). Ocean Sciences Meeting, virtual, 2022b

Luke V. Colosi, Ana B. Villas Bôas, and Sarah T. Gille. The seasonal cycle of significant wave height: Local vs. remote forcing (talk). International Ocean Vector Winds Science Team Meeting, virtual, 2021

Luke V. Colosi, Ana B. Villas Bôas, and Sarah T. Gille. The seasonal cycle of significant wave height: Local vs. remote forcing (poster). Ocean Sciences Meeting, San Diego, 2020

References

Dr. Sarah Gille:

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