

Seth Zippel (he/him), PhD

Assistant Professor

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EDUCATION

- 2017 **PhD** *Applied Physics Lab, University of Washington, WA*
Civil and Environmental Engineering: Hydrology and Hydrodynamics
- 2014 **MS Civil and Environmental Engineering** *Applied Physics Lab, University of Washington, WA*
- 2009 **BA Physics** *Whitman College, WA*

EMPLOYMENT

- 2023-present **Assistant Professor** *Oregon State University, OR*
- 2019-present **Assistant Scientist** *Woods Hole Oceanographic Institution, MA*
- 2017-2019 **Postdoctoral Scholar** *Woods Hole Oceanographic Institution, MA*

PUBLICATIONS

- Scully, M., **Zippel**, S. (Submitted) Vertical Energy Fluxes Driven by the Interaction Between Wave Groups and Langmuir Turbulence *J. Phys. Oceanogr.*
- Zippel**, S., Edson, J. E., Scully, M., Keefe, O. R., (In Revisions) Direct Observation of Wave-coherent Pressure Work in the Atmospheric Boundary Layer *J. Phys. Oceanogr.*
- Wang, X., Kukulka, T., Farrar, J. T., Plueddemann, A. J., & **Zippel**, S. F. (2023). Langmuir turbulence controls on observed diurnal warm layer depths. *Geophys. Res. Lett.*, 50, e2023GL103231.
- Miller, U. K., Zappa, C. J., **Zippel**, S., Farrar, J. T., & Weller, R. A. (2022). Scaling of moored surface ocean turbulence measurements in the Southeast Pacific Ocean. *J. Geophys. Res. Oceans.*, e2022JC018901.
- Zippel**, S., Farrar, J. T., Zappa, C. J., Plueddemann, A. J. (2022). Parsing the kinetic energy budget of the ocean surface mixed layer. *Geophys. Res. Lett.*, 49, e2021GL095920.
- Zippel**, S., Farrar, J. T., Zappa, C. J., Miller, U., St. Laurent, L., Ijichi, T., Weller, R. A., McRaven, L. T., Nylund, S., Le Bel, D. (2021). Moored Turbulence Measurements using Pulse-Coherent Doppler Sonar. *J Atmos Ocean Technol.* 38(9), 1621-1639.
- Zippel**, S., Maksym, T., Scully, M., Sutherland, P., Dumont, D., (2020) Measurements of Enhanced Near-Surface Turbulence Under Windrows. *J. Phys. Oceanogr.*, 50, 197-215.
- Zippel**, S., Thomson, J., Farquharson G. (2018). Turbulence from breaking surface waves at a river mouth. *J. Phys. Oceanogr.*, 48, 435-453.
- Zippel**, S., and Thomson, J. (2017). Surface wave breaking over sheared currents: observations from the Mouth of the Columbia River. *J. Geophys. Res. Oceans.*, 122, 3311-3328.
- Thomson, J., Schwendeman, M. S., **Zippel**, S. F., Moghimi, S., Gemmrich, J., & Rogers, W. E. (2016). Wave breaking turbulence in the ocean surface layer. *J. Phys. Oceanogr.*, 46, 1857-1870.
- Zippel** S., Thomson J. (2016). Air-sea interactions in the marginal ice zone. *Elem. Sci. Anth.*, 4: 000095.
- Moghimi, S., Thomson, J., Özkan-Haller, T., Umlauf, L., & **Zippel**, S. (2016). On the modeling of wave-enhanced turbulence nearshore. *Ocean Modell.*, 103, 118-132.
- Zippel**, S., and J. Thomson (2015), Wave breaking and turbulence at a tidal inlet, *J. Geophys. Res. Oceans.*, 120, 1016-1031.
- Thomson, J., Horner-Devine, A. R., **Zippel**, S., Rusch, C., & Geyer, W. (2014). Wave breaking turbulence at the offshore front of the Columbia River Plume. *Geophys. Res. Lett.*, 41, 8987-8993.

EXTERNAL FUNDING

- 2023-2026 **NSF, OCE (Anticipated)** Physical Control of Atmospheric Carbon Dioxide Flux in Estuaries
Lead: M. Scully (WHOI)
Role: Co-PI, lead of air/sea flux measurements and analysis
- 2023-2024 **ONR** Distributed, Real-Time Observations of the Air-Sea Interface
Lead: Sofar Ocean
Role: Subaward, responsible for air/sea flux measurements and related analysis
- 2021-2025 **NSF, OCE-2219825** Collaborative Research: The Heated Wind- and Wave-Driven Ocean Surface Boundary Layer: Synergistic Analyses of Observations and Simulations
Lead: T. Kukulka (UDEL)
Role: Co-lead, in charge of analysis of field observations
- 2021-2025 **NASA** Salinity and Stratification at the Sea Ice Edge (SASSIE)
Lead: K. Drushka (UW/APL)
Role: lead collection and analysis of shipboard air-sea heat, momentum, and moisture flux measurements
- 2021-2025 **DOE** Improving High Resolution Offshore Wind Resource Assessments and Forecasts using Observations in the MA/RI Lease Areas
Lead: A. Kirincich (WHOI)
Role: upper ocean current measurements, wave measurements, assisting with large-barge flux tower deployments and ASIT measurements
- 2020-2023 **NSF, OCE-2023020** Air/Sea Energy Fluxes Mediated by Waves and Pressure Work
Role: Lead Principal Investigator, leading field work, analysis, student mentorship
- 2020-2021 **NSF, OIA-2035143** NSF Convergence Accelerator: Future of Oceans: Innovation, Exploration, and Utilization
Role: Co-Principal Investigator, co-lead planning, organization, and enacting of Smart Oceans 2020 workshops

TEACHING

- 2022 **Co-Instructor** AOSE, MIT-WHOI Joint Program
 Co-instructor for AOSE 2.688: Principles of Oceanographic Systems and Sensors. Responsible for 6 weeks of twice weekly 1.5 hr lectures and once weekly 3 hr labs focused on measurement principles of fluid velocity, surface waves, air-sea fluxes, and cameras and imagery.
- 2016 **Teaching Assistant** Civil and Env. Engineering, University of Washington
 Developed CEE572, the graduate level addition to coastal engineering CEE473. Created graduate coursework, including an introduction to the wave model SWAN.
- 2014 **Teaching Assistant** Civil and Env. Engineering, University of Washington
 CEE:473 Coastal Engineering. Gave multiple in class lectures, and ran office hours.

GRADUATE STUDENT ADVISING

- 2021-current **Oaklin Keefe**, MIT/WHOI Joint Program Student in Physical Oceanography

GRADUATE STUDENT COMMITTEES

- Expected 2025 **Emily Hayden**, CEOAS
- Expected 2023 **Rachel Kahn**, MIT/WHOI Joint Program

SERVICE

- 2020 **Smart Oceans 2020 workshops**
 Conference co-lead and organizer
- 2020 **Committee for Diversity, Equity, and Inclusion**,
 Volunteer, Messaging and Implementation Working Group

- 2021 **AOPE Department Standing Committee for Diversity**
Member
- 2021 **Search Committee for Chief Diversity, Equity & Inclusion Officer,**
Non-tenured Scientific Staff Representative
- 2021 **Cañada College STEM Center, Job Shadowing Program**
Hosted URM community college students for job shadowing program (Virtual)

PRESENTATIONS

- Apr, 2023 **Direct Observation of Wave-coherent Pressure Work in the Atmospheric Boundary**
29th WISE Meeting *Princeton, NJ*
- Mar, 2023 **Direct Observation of Wave-coherent Pressure Work in the Atmospheric Boundary Layer**
POA Seminar, Corvallis, OR
- Jan, 2023 **Direct Observation of Wave-coherent Pressure Work in the Atmospheric Boundary Layer**
COFDL Seminar, Woods Hole, MA
- Oct, 2022 **Direct Observation of Wave-coherent Pressure Work in the Atmospheric Boundary Layer**
MABPOM, University of Delaware
- Jun, 2022 **Waves!**
Science Untapped, Falmouth, MA
- Mar, 2022 **Parsing the kinetic energy budget of the ocean surface mixed layer**
OSU Department Seminar, Corvallis, OR
- Feb, 2022 **Parsing the kinetic energy budget of the ocean surface mixed layer**
Ocean Sciences Meeting, Virtual
- Feb, 2022 **Parsing the kinetic energy budget of the ocean surface mixed layer**
WaCM Webinar, San Diego, CA (Zoom)
- Jan, 2022 **Parsing the kinetic energy budget of the ocean surface mixed layer**
COFDL Seminar, Woods Hole, MA (Zoom)
- Nov, 2020 **Turbulence Estimation from Moorings using Pulse-Coherent Doppler Profilers**
COFDL Seminar, Woods Hole, MA (Zoom)
- Apr, 2020 **Turbulence Estimation from Moorings using Pulse-Coherent Doppler Profilers**
EFM Seminar Series, Seattle, WA (zoom)
- Feb, 2020 **Turbulence measurements from the SPURS-2 mooring**
Ocean Sciences Meeting, San Diego, CA
- Jan, 2020 **M-O Scaling at the SPURS Moorings: A Cautionary Tale**
Coastal Ocean Fluid Dynamics Laboratory Seminar, Woods Hole, MA
- Sep, 2019 **The Effects of Ice and Currents on Wave-breaking Turbulence at the Ocean Surface**
UConn Marine Sciences Seminar, Groton, CT
- Jun, 2019 **The Circulation, Geometry, and Turbulence of Windrows: Measurements from the St. Lawrence Estuary**
Gordon Conference, Manchester NH
- Jun, 2019 **The Circulation, Geometry, and Turbulence of Windrows: Measurements from the St. Lawrence Estuary**
Gordon Seminar, Manchester NH
- Apr, 2019 **Modifications to Wave-breaking Turbulence at the Ocean Surface by Ice, Currents, and Windrows**
WHOI AOP&E Seminar, Woods Hole, MA
- Dec, 2018 **Measurements of Enhanced Near-Surface Turbulence Under Windrows**
AGU Fall Meeting, Washington D.C.
- Oct, 2018 **The Effects of Ice and Currents on Wave-breaking Turbulence at the Ocean Surface**
WHOI PO seminar Woods Hole, MA
- Feb, 2018 **Wave-breaking Turbulence at a River Inlet**
Ocean Sciences Portland, OR
- Jan, 2018 **The Effects of Ice and Currents on Wave-breaking Turbulence at the Ocean Surface**
UNH Oce. Eng. Seminar Durham, NH
- Dec, 2017 **The Effects of Ice and Currents on Wave-breaking Turbulence at the Ocean Surface**

Coastal Ocean Fluid Dynamics Laboratory Seminar *Woods Hole, MA*
 May, 2017 **Wave breaking over vertically sheared currents**
 WISE Meeting *Victoria, Canada*
 Apr, 2017 **Field Measurements of Waves and Currents at the Mouth of the Columbia River**
 EGU Meeting *Vienna, Austria*
 Jan, 2017 **Turbulence Estimates from a Free Drifting Platform at a River Inlet**
 AMS *Seattle, WA*
 Jun, 2016 **Observations of Wave Breaking Induced by Wave-Current Interactions**
 WISE Meeting *Venice, Italy*
 Feb, 2016 **The Effects of Ice and Currents on Wave-driven Turbulence at the Ocean Surface**
 Ocean Sciences *New Orleans, LA*
 Apr, 2015 **Winds, Waves, and Turbulence in the Marginal Ice Zone**
 Gas Transfer Workshop 7 *Seattle, WA*
 Dec, 2014 **Wave Transformation and Breaking on a Sheared Current**
 AGU Fall Meeting *San Francisco, CA*
 Jun 2014 **Wave Breaking and Turbulence and New River Inlet, Depths, Currents, and Winds**
 WISE Meeting *Reading, England*
 Feb 2014 **Wave Breaking Due To Depth and Currents**
 Ocean Sciences *Honolulu, HI*
 Dec 2012 **Wave Breaking at New River Inlet**
 AGU Fall Meeting *San Francisco, CA*
 Feb 2010 **Bottom Drag Coefficients on a Tidal Flat**
 Ocean Sciences *Portland, OR*
 Dec 2009 **Friction Coefficients on the Skagit Tidal Flats**
 Coastal Ocean Fluid Dynamics Laboratory Seminar *Woods Hole, MA*

CERTIFICATIONS

2011 **NOLS Leadership Training**
 2010 **AAUS Scientific Diver**, Dry Suit Certification, Nitrox Certification
 2011 **Woods Hole Oceanographic Institution Small Boat Certification**

CRUISES, FIELD WORK, AND OTHER DATA COLLECTION CONTRIBUTIONS

Sep 2023 **SOFAR ASIT deployments** *Martha's Vineyard, MA*
 Jun 2023 **AICC SKQ Chief Scientist Training** *Seward to Nome, AK*
 Sep-Dec 2022 **BBASIT Buzzards Bay**, MA
 Sep-Oct 2022 **SASSIE Beaufort Sea**
 Apr-Jun 2022 **BBASIT Pilot Buzzards Bay**, MA
 Feb 2020 **BicWin2020 Rimouski**, Quebec
 Feb-Mar 2018 **BicWin2018 Rimouski**, Quebec
 Apr 2017 **Quinalt River** *Ocean Shores, WA*
 Oct 2016 **RollEx Duck**, NC
 Oct 2014 **Marginal Ice Zone DRI Beaufort Sea**
 Aug 2014 **USCGC Healy Beaufort Sea**
 Sept 2013 **USCGC Healy Beaufort Sea**
 April-Sept 2013 **RIVET 2 Columbia River Mouth**, WA/OR
 Jun-Aug 2012 **HoleEx 2 Duck**, NC
 Apr-Jun 2012 **RIVET 1 New River Inlet**, NC
 Oct-Nov 2011 **Duck sensor tests** *Duck, NC*
 Jul-Sept 2011 **Rivers and Inlets Study** *Katama Bay, MA*
 May 2011 **Vorticity Experiment** *Duck, NC*
 Jul-Aug 2010 **HoleEx 1 Duck**, NC
 Jun-Sept 2009 **Skagit Tidal Flats Experiment** *La Conner, WA*