# Sean C. Crosby

*Coastal Oceanographer*, U. S. Geological Survey
*Research Associate*, Western Washington University

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CONTACT

Sean C. Crosby
Western Washington University — Mobile: +1 707-490-5500
Environmental Studies Bldg, MS 9080 — sites.google.com/view/seancrosby
516 High Street — sean.crosby@wwu.edu
Bellingham, WA 98225 USA — scrosby@contractor.usgs.gov


EDUCATION

*University of California, San Diego:*
*Scripps Institution of Oceanography*, La Jolla CA
**PhD Oceanography** 2011 - 2017
**MS Oceanography** 2011 - 2013
*Research Advisor: Dr. Robert T. Guza*

*University of California, Santa Cruz,* Santa Cruz CA
**BS Applied Physics** 2005 - 2009
**BA Economics** 2005 - 2009
*Cum Laude with highest honors in both majors*
*Thesis Advisor: Dr. Bruce A. Schumm*

REFEREED JOURNAL PUBLICATIONS

Grossman, S. K., E. E. Grossman, J. S. Barber, S. K. Gamblewood, **S. C. Crosby**. Distribution and Transport of Olympia Oyster Ostrea lurida Larvae in Northern Puget Sound, Washington. *BioOne*, 2020.

Mooneyham, J. Z., **S. C. Crosby**, N. Kumar, B. Hutchinson. SWRL Net: a spectral, residual deep learning model for improving short-term wave forecasts. *Journal of Weather and Forecasting*, 2020.

**Crosby, S. C.**, N. Kumar, W. C. O'Reilly, R. T. Guza. Regional swell transformation by backward ray tracing and SWAN. *Journal of Atmospheric and Oceanic Technology*, 2019.

**Crosby, S. C.**, W. C. O'Reilly, B. D. Cornuelle, R. T. Guza. Assimilating global wave model predictions and deep water wave observations in nearshore swell predictions. *Journal of Atmospheric and Oceanic Technology*, 2017.

Kumar, N., D. L. Cahl, **S. C. Crosby**, G. Voulgaris. Bulk vs. Spectral Wave Parameters: Implications on Stokes Drift Estimates, Regional Wave Modeling, and HF Radars Applications. *Journal of Physical Oceanography*, 2017.

**Crosby, S. C.**, W. C. O'Reilly, and R. T. Guza, Modeling long period swell in southern California: practical boundary conditions from buoy observations and global wave model predictions, *Journal of Atmospheric and Oceanic Technology*, 2016.

Ludka, B. C., T. Gallien, **S. C. Crosby**, and R. T. Guza. Mid-El Niño erosion at nourished and unnourished southern California Beaches, *Geophysical Research Letters*, 2016.

Collier K., T. Cunnington, **S. C. Crosby**, V. Fadeyev, F. Martinez-McKinney, K. Mistry, B. A. Schumm, E. Spencer, A. Taylor, M. Wilder. Microstrip electrode readout noise for load-dominated long shaping-time systems, *Nucl. Instr. Meth. Phys. Res.*, Vol. 729, 2013.

CONFERENCE PROCEEDINGS

**Crosby, S. C.**, W. C. O'Reilly, and R. T. Guza. Regional Nearshore Wave Prediction: A Coastal Sediments Perspective. *Proceeding for Coastal Sediments*, San Diego, CA May 2015.

PAPERS IN PREPARATION

Grossman E. E., **S. C. Crosby**, A. W. Stevens, D. J. Nowacki, N. vanArendonk, and C. A. Curran (USGS Open-file report) Restoring Sediment Supply to Sustain Delta Marsh, Nisqually Delta, Washington. *Manuscript Available*

**Crosby, S. C.**, C. Neederhoff, N. VanArendonk, E. E. Grossman (in prep for Ocean Modelling). Rapid wave predictions in a semi-enclosed estuary

VanArendonk N., **Crosby S. C.**, Grossman E. E. (in prep for Journal of Marine Science and Engineering, material from MS thesis) A 60-year storm hindcast and wave climatology in Puget Sound and Salish Sea.

PUBLISHED DATASETS

**Crosby, S.C.**, and E. E. Grossman, Wave observations from nearshore bottom-mounted pressure sensors in Skagit and Bellingham Bays, Washington, USA from Dec 2017 to Feb 2018. *U.S. Geological Survey data release.* 2019

INVITED SEMINARS

**Crosby, S. C.**, E. E. Grossman. Modeling incident wave energy transformation at the coast to inform current and future hazards. *Western Washington University - Geology Dept.*, Bellingham, WA, Apr 2017.

**Crosby, S. C.**, B. D. Cornuelle W. C. O'Reilly, R. T. Guza. Combining global wave model predictions and regional buoy observations: a Southern California case study. *US Army Corps of Engineers - Coastal and Hydraulics Laboratory*, Vicksburg, MI, Nov 2016.

SEMINARS

**Crosby, S. C.**, N. VanArendonk, E. E. Grossman. Modeling waves in the Salish Sea and their impacts to nearshore flooding and transport. *Western Washington University - Geology Dept.*, Bellingham, WA, Jan 2019.

LECTURES

**Crosby, S. C.**, Tides in the Salish Sea: their physics and impacts. *Anacortes Science Cafe* Aug 2018.

**Crosby, S. C.**, Ocean Waves. *Oceanography of the Salish Sea*, Western Washington University Course in Environmental Sciences, Feb 2019.

PUBLISHED ABSTRACTS

Mooneyham, J. Z., **S. S. Crosby**, N. Kumar, B. Hutchinson. Improving short-term wave forecasts with convolution neural networks and regional buoy observations. *Poster presentation at Ocean Sciences Meeting*, San Diego, Feb 2020.

Nowacki D. J., A. W. Stevens, **S. S. Crosby**, E. E. Grossman, N. R. VanArendonk, B. Tehranirad. Assessing Coastal Water-Level Variability in the Salish Sea via a Spatially Extensive Network of Real-time Water-level Sensors and Hydrodynamic Modeling. *Poster presentation at Ocean Sciences Meeting*, San Diego, Feb 2020.

Tehranirad, B., A. W. Stevens, E. E. Grossman, D. J. Nowacki, **S. S. Crosby**, L. H. Erikson. Modeling Extreme Water Levels in Puget Sound. *Oral presentation at Ocean Sciences Meeting*, San Diego, Feb 2020.

Mooneyham, J., J. Lingg, **S. C. Crosby**, B. Hutchinson. Improving forecasts of wave height and direction using deep learning methods. *Oral presentation at Western Washington University's Graduate Symposium*, Bellingham, Washington, May 2019.

Maverick, A., E. E. Grossman, **S. C. Crosby**. Wave run-up and coarse sediment transport on mixed-sediment beaches for coastal evolution modeling. *Poster presentation at Geological Society of America*, Portland, Oregon, May 2019.

VanArendonk, N., E. E. Grossman, **S. C. Crosby**. Mapping flood hazards for future sea level rise along Ruston Way, Tacoma, WA. *Oral presentation at Geological Society of America*, Portland, Oregon, May 2019.

**Crosby, S. C.**, E. E. Grossman, N. R. VanArendonk, A. W. Stevens. Validation and sensitivity of wave predictions in Puget Sound and Strait of Juan de Fuca. *Poster presentation at Ocean Sciences Meeting*, Portland, Oregon, Feb 2018.

**Crosby, S. C.**, B. D. Cornuelle W. C. O'Reilly, R. T. Guza. Assimilating coastal wave buoy observations and global wave model predictions in regional wave models. *Oral presentation at American Geosciences Union Fall Meeting*, San Francisco, California, Dec 2016.

Rhee K., **S. C. Crosby**, J. W. Fiedler. Observations of High-frequency Internal Wave Energy Offshore of Point Loma, California. *American Geophysical Union Fall Meeting*, San Francisco, CA, Dec 2016.

Fiedler J. W., V. M. Tamsitt, **S. C. Crosby,**, B. C. Ludka. Experiential Learning: High School Student Response to Learning Oceanography at Sea. *American Geophysical Union Fall Meeting*, New Orleans, LA, Dec 2016.

**Crosby, S. C.**, B. D. Cornuelle W. C. O'Reilly, R. T. Guza. Assimilating coastal wave buoy observations and global wave model predictions in regional wave models. *Oral presentation at Eastern Pacific Ocean Conference*, Mt. Hood, Oregon, Sept 2016. *Awarded best student presentation*

**Crosby, S. C.**, W. C. O'Reilly, R. T. Guza. Modeling long period swell in southern California: Practical boundary conditions from buoy observations and global wave model predictions. *Poster presentation at Ocean Sciences Meeting*, New Orleans, LA, Feb 2016.

**Crosby, S. C.**, W. C. O'Reilly, R. T. Guza. Regional Nearshore Wave Prediction: A Sediments Perspective. *Oral presentation at Coastal Sediments*, San Diego, CA, May 2015.

**Crosby, S. C.**, W. C. O'Reilly, R. T. Guza. Improved Temporal Smoothing for Wave Buoy Observations, *Poster presentation at American Geosciences Union Fall Meeting*, San Francisco, CA, Dec 2014

**Crosby, S. C.**, W. C. O'Reilly, R. T. Guza. Improving Coastal Wave Estimates by Combining Buoy Observations with Global Wave Models. *Oral presentation at Ocean Sciences Meeting*, Honolulu, Hawaii, Feb 2014.

## HONORS AND AWARDS

Ocean Observation Institute - Data Lab Fellow (Blog Post) — Spring 2020
Best student oral presentation — Mt. Hood, Oregon, Sept 2016
Department travel award for attending and presenting — 2014

## SKILLS

*Programming Languages:* MATLAB**, Python**, Fortran*, Java*, C*, SQL*
*Ocean Models:* SWAN**, XBeach**, Delft3D**, SFINCS**, ROMS*, WW3*

***expert*
**some experience*

## FIELD EXPERIENCE

*Field Crew,* U. S. Geological Survey — 2018,2019
- Planned, deployed, and processed pressure data for wave and tide levels

*Co-Chief Scientist,* R/V Robert Gordon Sproul - Student Cruise — July 16, 2016
*Scientific Party*, R/V Robert Gordon Sproul - Student Cruise — July 10, 2016
*Scientific Diver*, Scripps Institution of Oceanography — 2012 - 2017
*Field Crew*, SCBPS Beach Surveys, San Diego County, CA — 2011 - 2016
*Field Crew*, CSIDE, Imperial Beach, CA — Fall 2015

## WORK EXPERIENCE

*Coastal Oceanographer* — March 2017 - Present
Lynker Technologies & U. S. Geological Survey
- Develop wave and hydrodynamic models in Puget Sound and Salish Sea
- Investigate coastal processes

*Graduate Student Researcher* — June 2011 - March 2017
Scripps Institution of Oceanography, La Jolla, CA

*Operations Analyst* — March - Dec 2010
Encore Capital, San Diego, CA
- Developed analytical models for various projects with SQL for data management and and Excel Macros for analysis

*Lab Assistant* — June 2007 - 2009
University of California, Santa Cruz, CA
- Developed and analyzed custom electronics for particle collider detection R&D

## TEACHING EXPERIENCE

*Instructor, Oceanography of the Salish Sea* — Spring 2019, 2020
Western Washington University
- Designed and taught upper division capstone course, ESCI 491
- Students performed data analysis, collected CTD data at sea, and presented their findings
- Fostered student learning across several mediums including in-class lectures, discussions, hands-on demonstrations, guided programming labs, and field experience.
- Adapted and taught online in 2020 employing collaborate web-based programming tools for data analysis (Google Collab)

*Co-Instructor, Physics of the Ocean World* — Summers 2015, 2016
UCSD Extension, Academic Connections
- Developed and taught introduction to physical oceanography.
- Two summers, each 3-week (75-hour) courses.
- Summer 2016 included a 1-day research cruise aboard the R.V. Sproul
- Our curriculum focused on lab and field experiment driven learning.

*Instructor, Surfzone Waves and Alongshore Current Lab* — Summers 2014 - 2016

Upward Bound with Palomar College & UCSD
- Developed and taught 2-day lecture and lab course for high school seniors.

*Instructional Assistant* Spring 2011
Woodbridge High School, Irvine CA
- Tutored high-school students with learning disabilities using various methods to meet individual needs.

*Instructional Assistant* Winter-Summer 2006
UCSC Cal-Teach & UCSC COSMOS, Santa Cruz CA
- Tutored high-school students and assisted with classroom activities.

MENTORING

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| *Committee member:* Liesl Danyluk | WWU-ESCI 2021 |
| *Committee member:* Avery Maverick | WWU-GEO 2020 |
| *Mentor:* Raleigh Hansen | WWU-CS 2021 |
| *Mentor:* Chloe Dawson | WWU-CS 2021 |
| *Mentor:* Jonny Mooneyham | WWU-CS 2019 |
| *Mentor:* Nate VanArendonk | WWU-GEO 2019 |
| *Mentor:* Kaitlin Rhee | Castilleja High 2016 |

OUTREACH AND LEADERSHIP

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| *Aquarium Diver*, Birch Aquarium, La Jolla CA | 2012 - 2017 |
| *Panelist & Demonstrator*, STEM Career Night | 2015, 2016 |
| *Webmaster*, Committee for Humanity and Public Service (CHiPS) | 2012 - 2015 |
| *Instructor*, SurfScience Teen Conference | 2011, 2013, 2014 |
| *Student Representative*, Graduate Student Association, UCSD | 2011 - 2012 |

ACKNOWLEDGEMENTS

Broccato, C. Joint Motions of the Knee, Hip, and Trunk during a Single-Leg Step-Down Test and Running Peer Reviewer. *WWU MS thesis,* 2018.

Gallet, B., W. R. Young. Refraction of swell by surface currents. *Journal of Marine Research,* 2014.

SERVICE

*Peer Reviewer*, Scientific Reports, Nature *Peer Reviewer*, Geophysical Research Letters, American Geophysical Union
*Peer Reviewer*, Journal of Marine Systems, Elsevier
*Peer Reviewer*, Deep Sea Research Part I: Oceanographic Research Papers
*Peer Reviewer*, Ocean Science, EGU
*Peer Reviewer*, Ocean Dynamics, Springer
*Member*, Student Committee for Faculty Search 2016

MEMBERSHIPS

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|---|---|
| The Oceanography Society (TOS), Member, | 2014 - Present |
| American Geophysical Union (AGU), Member | 2011 - Present |
| Birch Aquarium, Member | 2011 - 2017 |

REFERENCES