

## **Thomas P. Connolly, Ph.D.**

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### **Research interests**

Dynamics and ecological impacts of physical processes in the coastal ocean. Inner shelf response to wind and surface waves, upwelling dynamics, coastal biogeochemistry, biophysical interactions in kelp forests, formation and transport of harmful algal blooms, and hypoxia.

### **Education**

University of Washington	Oceanography	Ph.D., 2012
University of Washington	Oceanography	M.S., 2008
Stanford University	Environmental Engineering	B.S., 2002

### **Employment history**

Assistant Professor, Moss Landing Marine Labs, San José State University	2015-present
Postdoctoral Investigator, Woods Hole Oceanographic Institution	2014–2015
USGS Postdoctoral Scholar, Woods Hole Oceanographic Institution	2012–2014
Graduate Assistant, University of Washington	2005–2012

### **Manuscripts submitted for publication**

**Connolly, T. P.** and A. R. Kirincich, High-resolution observations of subsurface fronts and alongshore bottom temperature variability over the inner shelf, submitted to *Journal of Geophysical Research*.

Manzer, C. R.\*, **Connolly, T. P.**, McPhee-Shaw, E., Smith, G. J., Physical factors influencing phytoplankton abundance in southern Monterey Bay, submitted to *Continental Shelf Research*.

\* - graduate student author

### **Peer-reviewed publications**

*Reprints at SJSU ScholarWorks:* <http://works.bepress.com/thomas-connolly>

Hickey, B., S. Geier, N. Kachel, S. Ramp, P. M. Kosro and **T. P. Connolly**, 2016. Alongcoast structure and interannual variability of seasonal midshelf water properties and velocity in the Northern California Current System. *J. Geophys. Res.*, 121, 7408 - 7430, doi:10.1002/2015JC011424

Siedlecki, S. A., N. S. Banas, K. A. Davis, S. N. Giddings, B. M. Hickey, P. MacCready, **T. P. Connolly**, and S. L. Geier, 2015. Seasonal and interannual oxygen variability on the Washington and Oregon continental shelves. *J. Geophys. Res.*, 120, 608-633, doi:10.1002/2014JC010254

**Connolly, T. P.** and S. J. Lentz, 2014. Interannual variability of wintertime temperature on the inner continental shelf of the Middle Atlantic Bight. *J. Geophys. Res.*, 119, 6269-6285, doi: 10.1002/2014JC010153

**Connolly, T. P.**, B. M. Hickey, I. Shulman, and R. E. Thomson. 2014. Coastal trapped waves, alongshore pressure gradients, and the California Undercurrent. *J. Phys. Oceanogr.*, 44, 319–342, doi:10.1175/JPO-D-13-095.1

**Connolly, T. P.** and B. M. Hickey. 2014. Regional impact of submarine canyons during seasonal upwelling. *J. Geophys. Res.*, 119, 953–975, doi:10.1002/2013JC009452

Giddings, S. N., P. MacCready, B. M. Hickey, N. S. Banas, K. A. Davis, S. A. Siedlecki, V. L. Trainer, R. Kudela, N. Pelland, and **T. P. Connolly**, 2014. Hindcasts of potential harmful algal bloom transport on the Pacific Northwest coast. *J. Geophys. Res.*, 119, 2439–2461, doi:10.1002/2013JC009622

Hickey, B. M., V. L. Trainer, P. M. Kosro, N. G. Adams, **T. P. Connolly**, N. B. Kachel, and S. L. Geier. 2013. A springtime source of toxic *Pseudo-nitzschia* cells on razor clam beaches in the Pacific Northwest. *Harmful Algae*, 25, 1–14, doi:10.1016/j.hal.2013.01.006

**Connolly, T. P.**, B. M. Hickey, S. L. Geier, and W. P. Cochlan, 2010. Processes influencing seasonal hypoxia in the northern California Current System, *J. Geophys. Res.*, 115, C03021, doi:10.1029/2009JC005283

### **Other publications**

**Connolly, T. P.**, 2013. Increasing occurrence of coastal hypoxia and anoxia. In: Miller, I.M., Shishido, C., Antrim, L, and Bowlby, E.C. Climate Change and the Olympic Coast National Marine Sanctuary: Interpreting Potential Futures. Marine Sanctuaries Conservation Series ONMS-13-01. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD, 50–60. [sanctuaries.noaa.gov/science/conservation/cc\\_ocnms.html](http://sanctuaries.noaa.gov/science/conservation/cc_ocnms.html)

### **Research Funding**

High-resolution sensing of nitrate in Monterey Bay and surrounding waters, T. Connolly, K. Coale, G. J. Smith, J. Harvey, National Science Foundation – Improvements in Facilities, Communications, and Equipment at Biological Field Stations and Marine Laboratories (FSML), July 2017-June 2019, \$140,299.

Remote forcing of seasonal currents in the California Current System, T. Connolly, Council on Ocean Affairs, Science and Technology (COAST) Grant Development Program, July 2017-December 2018, \$19,752.

CeNCOOS Partnership: Ocean Information for Decision Makers, T. Connolly, K. Coale and G. J. Smith, National Oceanic and Atmospheric Administration – U.S. Integrated Ocean Observing System, sub-contract with Monterey Bay Aquarium Research Institute, June 2016–May 2021, \$169,720 (through Year 3 of 5).

Along-shelf transport and cross-shelf exchange driven by surface waves on the inner continental shelf, T. P. Connolly and S. J. Lentz, National Science Foundation – Physical Oceanography, September 2014–January 2019, \$247,440.

Field observations of wave-induced bottom streaming over the inner continental shelf, T. P. Connolly, J. H. Trowbridge and S. J. Lentz, WHOI Coastal Ocean Institute, Four-month extension of postdoctoral scholarship. May–September 2014.

### **Pending Research Funding**

Collaborative Research: RUI: Disentangling the role of consumers in nutrient cycling in California kelp forests, S. L. Hamilton, K. H. Coale, T. P. Connolly, C. A. Durkin, M. H. Graham, A. Kahn, and Y. Takeshita, National Science Foundation – Biological Oceanography, \$1,085,945.

Effects of hypoxia on nursery function for fishes in coastal estuaries: investigating mechanisms and developing indicators. S. L. Hamilton, T. P. Connolly, and C. Logan. Council on Ocean Affairs, Science and Technology (COAST) Grant Development Program. \$19,820.

### **Fellowships and Awards**

- USGS Postdoctoral Scholarship, Woods Hole Oceanographic Institution, 2012-14
- Sarchin Graduate Fellowship in Oceanography, University of Washington, 2007
- American Meteorological Society/Office of Naval Research Graduate Fellowship, 2005–2006
- Summer Student Fellow, Woods Hole Oceanographic Institution, 2002
- Tau Beta Pi National Engineering Honor Society, 2001

### **Teaching and Advising Experience**

Masters thesis advisor, Physical Oceanography Lab, Moss Landing Marine Labs, 2015-present, Work directly with graduate students to develop research questions and plans. Review thesis and proposal documents. Organize laboratory meetings.

Mentor, Monterey Bay Regional Ocean Science Research Experience for Undergraduate (REU) program, Summer 2016, Provide guidance and assistance with experimental design and field work. Coordinate with co-mentor. Provide critical feedback on project proposal, research report, final presentation, and conference presentations after end of program.

Lead Instructor, Physical Oceanography, Moss Landing Marine Labs, Fall 2015-8 (4 units). Develop syllabus, prepare lectures, create assignments and design laboratory activities. Develop and grade assignments. Work with teaching assistant to implement lab activities. Meet with students in office hours and during class to answer questions about class assignments and related student research topics.

Lead Instructor, Data Analysis Methods in Marine Science, Moss Landing Marine Labs, Spring 2016-8 (4 units). Develop syllabus, prepare lectures, create assignments and design lab activities. Lead tutorials on fundamental computer programming skills using Python. Organize submission of assignments through version control system (Git) and grade assignments. Meet with students to answer questions about class assignments and related student research topics.

Lead Instructor, Modeling Marine Systems, Moss Landing Marine Labs, Fall 2016 and 2018 (2-3 units). Develop syllabus, prepare lectures, create assignments and design laboratory activities. Develop and grade assignments. Lead discussions and tutorials on various types of models from different disciplines in marine science.

Lead Instructor, Oceanography of the California Coast and Estuaries, Moss Landing Marine Labs, Spring 2018 (4 units). Lead discussions on peer-reviewed journal articles. Develop and grade assignments. Coordinate regular field sampling from small boats in Elkhorn Slough. Organize laboratory activities based on collection and interpretation of field observations.

Lead Instructor, Bio-physical Interactions, Moss Landing Marine Labs, Spring 2016 (2 units). Develop syllabus. Lead discussions and tutorials on interactions between organisms and their fluid environment. Design and lead hands-on laboratory demonstrations.

Research advisor, independent undergraduate project, University of Washington, Summer 2009–Spring 2010. Oversaw independent research project, originally funded by an REU grant from the Center for Oceans and Human Health. Guided calculation and mapping of geostrophic velocity and water properties. Demonstrated shipboard processing of CTD and ADCP data in the field. Provided feedback on written report and public oral presentation.

Teaching Assistant, Advanced Field Oceanography, University of Washington, Spring 2009. Senior undergraduates. Evaluated and critiqued senior thesis manuscripts and presentations. Led tutorials on data analysis. Guided interpretation of results in individual student meetings.

Teaching Assistant, Design of Oceanographic Field Experiments, University of Washington, Winter 2009. Senior undergraduates. Evaluated and critiqued senior thesis research proposals. Lectured on proposal writing and instrumentation. Assisted with cruise planning. Assisted with collection of field measurements. Designed class website and organized cruise blog.

Instrumentation advisor, Advanced Field Oceanography, University of Washington, Winter 2008. Assisted senior undergraduate in preparing equipment for drifter experiment. Prepared instructions for deployment, tracking and recovery. Responsible for equipment loaned to student.

Teaching Assistant, Geophysical fluid dynamics, University of Washington, Winter 2007. Graduate level. Led tutorial sessions. Graded and prepared answer keys for homework and exams. Lectured on shallow water equations and geostrophic balance.

Lectures, Woods Hole Oceanographic Institution

- Hypoxia in the coastal ocean, 2013 Summer Student Fellow Lecture Series
- Oceanographic questions in the Mid-Atlantic Bight, 2013 MIT/WHOI Joint Program Orientation Cruise

Lectures, University of Washington

- Coastal circulation near Washington and British Columbia, Advanced Field Oceanography (senior undergraduates), Spring 2010
- Shelf hypoxia off the Washington/Oregon coast, Climate Change Impacts on Marine Ecosystems (junior and senior undergraduates), Spring 2010, 2011, 2012
- Lagrangian measurements, Coastal Oceanography (graduate level), Spring 2007, 2009
- Hypoxia off the Washington coast: Physical and biological process, Coastal Oceanography (graduate level), Spring 2009

Science instructor, Camp Sea Lab, Summer 2004–Spring 2005. Taught activities from the Marine Activities, Resources and Education (MARE) curriculum. Demonstrated scientific concepts such as “adaptation” and “buoyancy” to grade school students.

### **Field Experience**

Summer 2016-2018, Stillwater Cove and Elkhorn Slough (MLML small boats), Provide guidance to students on measurement of waves, currents and vertical profiles of water properties.

Fall 2015-2018, Physical Oceanography class cruises (R/V John H. Martin, day trips), Development of cruise plans with input from students and captain. Coordination of task rotation among students. Processing of shipboard ADCP data.

November-December 2014, Martha’s Vineyard Coastal Observatory (R/V Tioga, day trips), Recovery of fiber-optic distributed temperature sensing system, tripods and surface moorings.

June-July 2014, Martha’s Vineyard Coastal Observatory (small boat, R/Vs Tioga and Discovery, day trips), Deployment and installation of fiber-optic distributed temperature sensing system.

July 2013, MIT/WHOI Joint Program Orientation, New England shelf break (SSV Corwith Cramer, 8 days), Assisted with cruise planning. Participated in science operations and sailing.

November 2009, Oceans and Human Health, Puget Sound, WA (R/V Thompson, 3 days). Assisted with cruise planning and trained students.

March 2009, student cruise, Kermadec Volcanic Arc, NZ (R/V Thompson, 10 days). Assisted with cruise planning and trained students.

January 2009, mooring cruise, WA shelf (R/V Centennial, 3 days). Mooring recovery and dissolved oxygen calibration.

July 2007, NOAA BIOTOX, WA and BC shelf (R/V MacArthur, 10 days). Assisted with cruise planning. Collected dissolved oxygen samples. Operated CTD. Tracked, deployed and recovered surface drifters.

September 2006, ECOHAB-PNW, WA and BC shelf (R/V Thompson, 21 days). Collected dissolved oxygen samples. Tracked, deployed and recovered surface drifters. Operated CTD.

August 2006, San Juan Islands, WA (R/V Centennial and small boats). Designed, assembled, deployed and recovered moorings with other students. Organized daily small boat CTD surveys.

September 2005, ECOHAB-PNW, WA and BC shelf (R/V Melville, 21 days). Tracked, deployed and recovered surface drifters. Operated CTD.

### **Outreach and Scientific Service**

- Volunteer and organizer of Physical Oceanography lab activities, Moss Landing Marine Labs Open House, 2016-2018.
- Guest Speaker, Waves and Their Impacts, Santa Cruz Museum of Natural History, December 14, 2017.
- Member, Moro Cojo Slough Technical Advisory Council.
- Reviewer, Continental Shelf Research, Journal of Geophysical Research, Journal of Physical Oceanography, Geophysical Research Letters, Fisheries Oceanography, Progress in Oceanography, Deep Sea Research, Ocean Modelling, Journal of Marine Research, Ocean Dynamics, Aquaculture Research
- Proposal Reviewer, NSF, NOAA, Woods Hole Sea Grant, Oregon Sea Grant, California Sea Grant, CSU Council on Ocean Affairs, Science and Technology (COAST)
- Volunteer, Geophysical Fluid Dynamics Laboratory Open House, Woods Hole Oceanographic Institution, May 2013, 2014.
- Scientific Contributor, Physical summary and forecast. Pacific Northwest Harmful Algal Bloom Bulletin, 2009-2011.
- Reviewer, Sea Grant, *West Coast Regional Marine Research and Information Needs*. Sea Grant, 2009.
- Posters, Low oxygen and coastal upwelling in the Pacific Northwest, Centers for Ocean Sciences Education Excellence (COSEE), Communicating Ocean Sciences event, November 2008; University of Washington Science and Policy Summit, May 2011.
- Guest Speaker, Coastal Upwelling and Dead Zones - The Study of Hypoxia on Washington's Pacific Coast, WSU Beach Watchers Program, Anacortes, WA, May 2008
- Guest Speaker, Coastal upwelling in the Pacific Northwest, Ballard High School, Seattle, WA, February 2007

### **Selected Invited Seminar presentations**

Exchange across the inner shelf: the role of surface gravity waves and internal bores, Naval Postgraduate School, March 23, 2016

New perspectives on inner-shelf circulation from a coastal ocean observatory. Monterey Bay Aquarium Research Institute (MBARI), January 20, 2016.

Surface waves and exchange across the inner shelf, Woods Hole Oceanographic Institution, Physical Oceanography Department, June 16, 2015.

Distributed temperature sensing (DTS) with fiber optics on the Martha's Vineyard inner shelf. Woods Hole Oceanographic Institution, Coastal Ocean Fluid Dynamics Laboratory seminar, May 1, 2015.

### **Selected Conference Presentations (Including Student Presentations)**

Connolly, T. P., K. H. Coale, G. J. Smith, J. Adelaars (2017), Physical and biogeochemical variability at the head of Monterey submarine canyon, Poster presentation, Eastern Pacific Ocean Conference, South Lake Tahoe, CA.

Connolly, T. P. (2017), The California Undercurrent and along-slope gradients of dynamic height, Poster presentation, Eastern Pacific Ocean Conference, South Lake Tahoe, CA.

Daniel, P. D.\* and T. P. Connolly (2017), Examining the contribution of wave-induced transport to nearshore chlorophyll-a variability in Northern California, Poster presentation, Eastern Pacific Ocean Conference, South Lake Tahoe, CA.

Burrier, D.\*, T. P. Connolly and E. McPhee-Shaw (2017), Internal Wave Dynamics in Barkley Submarine Canyon, Poster presentation, Eastern Pacific Ocean Conference, South Lake Tahoe, CA.

Baker, M. C.\*\*, K. A. Null, T. P. Connolly (2016), Effects of tidal management on salinity and nutrient concentrations in a low-flow estuary, Oral presentation, ASLO Aquatic Sciences Meeting, Honolulu, HI.

Burrier, D. A.\*, T. Connolly (2016), Internal wave dynamics in Barkley submarine canyon, Poster presentation, American Geophysical Union Fall Meeting, San Francisco, CA.

Connolly, T. and S. Lentz (2016), Effects of wave-induced stresses on inner shelf circulation, Poster presentation, Eastern Pacific Ocean Conference, Mt. Hood, OR.

Manzer, C. R.\*, T. Connolly, E. McPhee-Shaw (2016), Physical processes governing synoptic-scale phytoplankton events in southern Monterey Bay, Poster Presentation, Eastern Pacific Ocean Conference, Mt. Hood, OR.

Baker, M. C.\*\*, K. A. Null, T. P. Connolly (2016), Effects of tidal management on salinity and nutrient concentrations in a low-flow estuary, Poster presentation, SACNAS National Diversity in STEM Conference, Long Beach, CA.

Connolly, T. and S. Lentz (2016), Stratification and the vertical structure of wave-driven cross-shelf circulation over the inner shelf, Oral presentation, Ocean Sciences Meeting, New Orleans, LA.

Connolly, T. and A. Kirincich (2015), Fine-scale alongshore variability over the inner continental shelf revealed by fiber-optic distributed temperature sensing, Poster presentation, American Geophysical Union Fall Meeting, San Francisco, CA.

\* - graduate student presenter, \*\* - undergraduate student presenter