

# Galen Egan

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## EDUCATION

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<b>Ph.D.</b> , Civil & Environmental Engineering Environmental Fluid Mechanics & Hydrology Stanford University, Stanford, CA	June 2020
<b>M.S.</b> , Civil & Environmental Engineering Environmental Fluid Mechanics & Hydrology Stanford University, Stanford, CA	June 2016
<b>B.S.</b> , Civil & Environmental Engineering   <i>magna cum laude</i> Environmental & Water Resources Engineering UCLA, Los Angeles, CA	June 2015

## EXPERIENCE

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<b>Postdoctoral researcher</b> , Stanford University Bob & Norma Street Environmental Fluid Mechanics Lab Advisor: Prof. Oliver Fringer Improving parameterization schemes for numerical sediment transport models based on results from field data collected in San Francisco Bay.	2020–present
<b>On-call scientist</b> , Integral Consulting Inc. Supervisor: Grace Chang Providing data analysis and field work support for Integral's Marine Science & Engineering practice. Current work includes a baseline condition assessment for a potential sediment remediation site.	2019–present
<b>Visiting student</b> , United States Geological Survey, Woods Hole, MA Contact: Neil Ganju Sat in with the Coastal and Marine Geology group while finishing dissertation research.	2019–2020
<b>Graduate researcher</b> , Stanford University Bob & Norma Street Environmental Fluid Mechanics Lab Advisor: Prof. Stephen Monismith, Co-advisor: Prof. Oliver Fringer Thesis: <i>Waves, turbulence, mud, and worms: sediment transport and boundary layer dynamics in an estuary</i> Led three field deployments in San Francisco Bay with novel instrumentation designed to investigate boundary layer turbulence and sediment transport. Additional projects include hydrodynamic modeling of stratified turbulence in a tidal river, and running laboratory experiments to quantify the mixing of brine discharge from desalination plants.	2016–2020
<b>Undergraduate researcher</b> , UCLA Laboratory for the Chemistry of Construction Materials Advisor: Prof. Gaurav Sant Investigated the mechanical and transport properties of low-CO <sub>2</sub> footprint concretes for civil infrastructure applications. Designed and conducted multi-year experiments studying the effects of aggregate inclusion on moisture transport and drying shrinkage in cement composites.	2013–2015

## PUBLICATIONS

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- Egan, G.**, Chang, G., Manning, A., Monismith, S., & Fringer, O. (2020 *in prep*). On the variability of flocculated particle characteristics in a shallow estuary
- Cowherd, M., **Egan, G.**, Monismith, S., & Fringer, O. (2020 *in prep*). Phase-resolved wave boundary layer dynamics in a shallow estuary.
- Egan, G.**, Chang, G., McWilliams, S., Revelas, G., Fringer, O., & Monismith, S. (2020 *in revision*). Cohesive sediment erosion in a combined wave-current boundary layer.
- Roberts, D.C., **Egan, G.**, Forrest, A.L., Largier, J.L., Bombardelli, F.A., Laval, B.E., Monismith, S.G., Schladow, S.G. (2020 *accepted*). The setup and relaxation of spring upwelling in a deep, rotationally influenced lake.
- Egan, G.**, Manning, A., Chang, G., Fringer, O., & Monismith, S. (2020). Sediment-induced stratification in an estuarine bottom boundary layer. *Journal of Geophysical Research: Oceans* 125, e2019JC016022.
- Egan, G.**, Chang, G., Revelas, G., Monismith, S., & Fringer, O. (2020). Bottom drag varies seasonally with biological roughness. *Geophysical Research Letters* 47(15), e2020GL088425.
- Egan, G.**, Cowherd, M., Fringer, O., & Monismith, S. (2019). Observations of near-bed shear stress in a shallow, wave- and current-driven flow. *Journal of Geophysical Research: Oceans* 124(8), 6323-6344.
- Monismith, S.G., Hirsh, H., Batista, N., Francis, H., **Egan, G.**, & Dunbar, R.B. (2019). Flow and drag in a seagrass bed. *Journal of Geophysical Research: Oceans* 124(3), 2153-2163.
- Hogg, C. A., **Egan, G.**, Ouellette, N. T., & Koseff, J. R. (2018). Shoaling internal waves may reduce gravity current transport. *Environmental Fluid Mechanics* 18(2), 383-394.
- Egan, G.**, Kumar, A., Neithalath, N., & Sant, G. (2017). Re-examining the influence of the inclusion characteristics on the drying shrinkage of cementitious composites. *Construction and Building Materials* 146, 713-722.

## CONFERENCES

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- Egan, G.**, Cowherd, M., Spada, F., Scheu, K., Manning, A., Jones, C., Chang, G., Fringer, O., & Monismith, S. "Cohesive sediment erosion in a shallow, wave- and current-driven flow." (poster) 2020 Ocean Sciences Meeting, San Diego, CA
- Cowherd, M., **Egan, G.**, Monismith, S., & Fringer, O. "Wave phase-decomposed near-bed currents and turbulence on the shoals of South San Francisco Bay." (poster) 2020 Ocean Sciences Meeting, San Diego, CA
- Chang, G., **Egan, G.**, Spada, F., Jones, C., Manning, A., Monismith, S., & Fringer, O. "Variability of particle characteristics in a wave- and current-driven estuarine environment." (poster) 2020 Ocean Sciences Meeting, San Diego, CA
- Egan, G.**, Cowherd, M., Spada, F., Scheu, K., Manning, A., Jones, C., Monismith, S., Chang, G., Fringer, O. "More than mud: bottom boundary layer observations in an estuary." (poster) Gordon Research Conference: Coastal Ocean Dynamics, June 2019, Manchester, NH.
- Egan, G.**, Cowherd, M., Spada, F., Scheu, K., Manning, A., Jones, C., Monismith, S., Chang, G., & Fringer, O. "*In situ* observations of near-bed turbulence and cohesive sediment transport." (presentation) AGU Fall Meeting 2018, Washington, D.C.
- Chang, G., Spada, F., Scheu, K., Jones, C., **Egan, G.**, Cowherd, M., Monismith, S., Fringer, O., & Manning, A. "Optics and acoustics for near-bed particle characterization and quantification of turbulence." (poster) Ocean Optics XXIV, October 2018, Dubrovnik, Croatia.
- Egan, G.**, Monismith, S.G., & Hench, J.L. "1D water column modeling of stratification and turbulence in a tidal river." (poster) 2018 Ocean Sciences Meeting, February 2018, Portland, OR

## INVITED TALKS

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- “The bottom boundary layer in San Francisco Bay: waves, turbulence, mud, and worms.” Coastal Ocean Fluid Dynamics Laboratory Talk, September 2019, Woods Hole, MA
- “What we learned from three muddy field deployments in San Francisco Bay.” Integral Consulting Marine Science and Engineering Webinar, May 2019, Santa Cruz, CA
- “Cohesive sediment and the friction velocity.” Stanford Environmental Fluid Mechanics Laboratory Seminar, April 2019, Stanford, CA
- “Stratification and turbulence in a tidal river: observations and 1D modeling.” Stanford Environmental Fluid Mechanics Laboratory Seminar, September 2017, Stanford, CA

## TEACHING

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**CEE 262H: Observational Methods in Coastal Oceanography, Stanford University** Spring 2020  
Co-instructor: prepared and gave lectures related to turbulence and sediment measurements and data analysis in coastal environments.

**CEE 262B: Transport and Mixing in Surface Water Flows, Stanford University** Winter 2017, 2018  
Teaching assistant: prepared and taught lessons for weekly supplementary class session, held office hours, and graded assignments.

**OSPGEN 53: Corals of Palau, Stanford/Bing Overseas Program** Summer 2017  
Teaching assistant: Prior to the course, coordinated shipping and programming all of scientific instruments used for three week summer course in Palau. During the course, helped mentor student research projects, coordinated field excursions, and directed student life abroad.

**CEE 101B: Mechanics of Fluids, Stanford University** Fall 2016  
Teaching assistant: held weekly office hours and review sessions, set up and assisted with the laboratory portion of the course.

**CEE 201S: Computations in CEE, Stanford University** Summer 2016  
Teaching assistant: held weekly office hours, graded assignments, and led supplemental discussion section for a MATLAB-based programming class. Taught to a wide audience, from high school seniors to Stanford Continuing Studies students.

## AWARDS & CERTIFICATIONS

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Centennial Teaching Assistant Award Recipient	2018
Outstanding Student Presentation Award, AGU Fall Meeting	2018
Charles H. Leavell Graduate Student Fellowship	2017–2018
John K. Vennard Fellowship	2015–2016
California EIT #157339	2016

## MENTORING, SERVICE, & OUTREACH

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**Undergraduate research mentor** 2018–present

Mentoring an undergraduate (now MS) researcher. Trained in field work and data analysis, and held weekly meetings for honors thesis project.

For reference, contact Marianne Cowherd at mcowherd@stanford.edu

**Undergraduate research mentor** 2018–2019

Assisted an undergraduate researcher with her honors thesis, which won the Firestone Medal for Excellence in Undergraduate Research.

For reference, contact Sienna White at siennarwhite@gmail.com

**Stanford CEE Graduate Life Committee** Environmental Engineering Representative 2017–2019

Planned and led quarterly town hall meetings to gain insight into problems experienced by graduate students in CEE, including issues related to diversity and inclusion, advisor relationships, and admissions procedures.

**Stanford EnvEng Student Committee** Representative 2017–2019

Organized activities and mentorship programs for students in the EnvEng sub-department.

**National Ocean Sciences Bowl** Volunteer - Stanford, CA 2017

Assisted with judging and logistics for Ocean Sciences quiz bowl for local high school students.

## RELEVANT SKILLS AND SOFTWARE

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**Advanced:** Python (including Keras, PyTorch, sklearn, NumPy, SciPy, pandas, cvxpy), MATLAB,  $\text{\LaTeX}$

**Proficient:** C++, git, SQL, ArcGIS, AutoCAD Civil3D