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Education

- 1979-1983 Stanford University, Stanford, California.
 Ph.D. Civil Engineering, Water Resources Engineering
 Minor in Mechanical Engineering
- 1977-1978 Stanford University, Stanford, California.
 M.S. Civil Engineering, Water Resources Engineering
- 1973-1976 University of the Witwatersrand, Johannesburg, South Africa.
 B.Sc. Civil Engineering

Professional Experience

At Stanford University

- 2006 – present The William Alden Campbell and Martha Campbell Professor of Engineering
- 2005 - 2014 The Michael Forman University Fellow in Undergraduate Education
- 2004 – 2016 Perry L. McCarty Director, Woods Institute for the Environment
- 1999- 2002 Senior Associate Dean of Engineering, School of Engineering
- 1996- present Professor, Department of Civil and Environmental Engineering
- 1995-1999 Chair, Department of Civil and Environmental Engineering
- 1994-1995 Associate Chair, Department of Civil Engineering
- 1991-1996 Associate Professor, Department of Civil Engineering
- 1991-1996 Director, Environmental Fluid Mechanics Laboratory,
 Department of Civil Engineering
- 1985-1991 Associate Director, Environmental Fluid Mechanics Laboratory,
 Department of Civil Engineering
- 1984-1991 Assistant Professor, Department of Civil Engineering
- 1983-1984 Acting Assistant Professor, Department of Civil Engineering
- 1979-1983 Research Assistant, Hydromechanics Laboratory,
 Department of Civil Engineering
*Conducted research on the characteristics of the flow in a lid-driven
cavity with and without variable-density effects. Also conducted a*

comparative study of the laser-Doppler anemometer.

- 1979-1980 Laboratory Instructor, Department of Civil Engineering
Lectured and supervised laboratory section of an undergraduate course in fluid mechanics (Eng 21). Served on committee to re-organize and revise laboratory course material.
- 1978-1979 Teaching Assistant, Department of Civil Engineering
Assisted in graduate and undergraduate courses in hydrology, hydraulics, and sedimentation engineering.

Non-Stanford

- 7/78-10/78
1977 Engineer, Watermeyer, Legge, Piesold and Uhlmann,
Johannesburg, South Africa
*Implemented finite-element analysis of cooling tower structures.
Performed hydraulic design and layout of water reticulation systems for
chemical and power plants.*
- 11/75-2/76 Student Engineer, Watermeyer, Legge, Piesold and Uhlmann,
Johannesburg, South Africa.
Finite-element analysis of cooling tower structures.

Awards and Honors/Professional Affiliations

Honors and Awards

- Robert T. Knapp Award given by the Fluids Engineering Division of the American Society of Mechanical Engineers, 1985
- American Society of Civil Engineers Award for Outstanding Service, 1986-87
- Stanford University School of Engineering Tau Beta Pi Award for Excellence in Undergraduate Teaching, 1989
- Leavell Family Faculty Scholar, Stanford University School of Engineering, 1989-92
- Gledden Visiting Senior Fellow, University of Western Australia, 1991
- ASSU Outstanding Teaching Award, 1991-92
- Lillian and Thomas B. Rhodes Award for Excellence in Undergraduate Teaching, 1993
- University Fellow, Stanford University, 1994-1996
- Bing Teaching Fellowship, Stanford University, 1995-1998
- Eugene L. Grant Award for Excellence in Undergraduate Teaching, 1995
- Associated Students of Stanford University, Teacher of the Year – Honorable Mention, 2007
- Eugene L. Grant Award for Excellence in Undergraduate Teaching, 2011
- Fellow of the American Physical Society, 2015
- Richard W. Lyman Award, Stanford University, 2015
- Sustainable Stanford Awardee, Stanford University, 2017

Society Memberships

American Society of Civil Engineers

American Society of Mechanical Engineers

American Geophysical Union

American Physical Society

External Service & Scholarly Activities

1994-present Member, ASCE Technical Committee on Hydraulic Measurements and Experimentation

1992-present Member, ASCE Technical Committee on Turbulence

1990-1994 Member, ASCE Technical Subcommittee for developing an Album of Transport Processes

1992-1995 Member, ASCE Technical Committee for developing a Research Advocacy for Hydraulics and Hydrology

1989-1992 Member, Technical Advisory Committee to the San Francisco Estuary Project

Reviewerships

Journal of Fluids Engineering, ASME

Journal of Hydraulic Engineering, ASCE

National Science Foundation - Fluid Mechanics

- Physical Oceanography

- Biological Oceanography

- Instrumentation Development

Journal of Fluid Mechanics

Environmental Fluid Mechanics

Department of Energy - Basic Energy Sciences

International Journal of Heat and Fluid Flow

Experiments in Fluids

Physics of Fluids

Journal of Atmospheric and Oceanic Technology

Journal of Computational Physics

International Journal for Numerical Methods in Fluids

Research Experience and Interests

Upwelling in coastal systems

Transport and mixing processes in estuarine and near-coastal systems

The nature of turbulence in stratified environments

Numerical techniques for simulating estuarine and geophysical flows

The hydrodynamics of benthic grazing by bivalve feeders

The effects of coherent structures on mixing in the upper layers of large water-bodies

The hydrodynamics of chemical sensing in marine environments

Mass and momentum transfer in coral-reef and kelp-forest systems

Teaching

Fluid Mechanics; Water Resources Engineering; Environmental Fluid Mechanics; Open Channel Flow; Numerical Methods; Transport and Mixing Processes in Surface Water Flows; Modeling Environmental Flows; Rivers Streams and Canals; Topics in Stratified Turbulence; A Transition to Sustainability; Hydrodynamics.

Papers in Refereed Journals

- DiBenedetto, M.H., Ouellette, N.T., and Koseff, J.R., "Transport of anisotropic particles under waves," *Journal of Fluid Mechanics*, 837, pp. 320-340, doi:10.1017/jfm.2017.853, 2017
- Hogg, C.A.R., Egan, G.C., Ouellette, N.T., and Koseff, J.R., "Shoaling internal waves may reduce gravity current transport," *Environmental Fluid Mechanics*, <https://doi.org/10.1007/s10652-017-9554-8>, 2017.
- Arthur, R.S., Venayagamoorthy, S.K., Koseff, J.R., and Fringer, O.B., "How we compute N matters to estimates of mixing in stratified flows," *Journal of Fluid Mechanics*, 831, R2, doi:10.1017/jf.2017.679. 2017.
- Mandel, T.L., Rosenzweig, I., Chung, H., Ouellette, N.T., and Koseff, J.R., "Characterizing free-surface expressions of flow instabilities by tracking submerged features," *Experiments in Fluids*, 58: 153. <https://doi.org/10.1007/s00348-017-2435-6>, 2017.
- Arthur, R.S., Koseff, J.R., and Fringer, O.B., "Local versus volume-integrated turbulence and mixing in breaking internal waves on slopes," *Journal of Fluid Mechanics*, 815, pp. 169-198, 2017.
- Craig, A.E., Dabiri, J.O., and Koseff, J.R., "Low order physical models of vertical axis wind turbines" *Renewal and Sustainable Energy*, doi: 10.1063/1.4976983, , Feb. 28, 2017.
- Craig, A.E., Dabiri, J.O., and Koseff, J.R., "Flow kinematics in variable-height rotating cylinder arrays," *Journal of Fluids Engineering*, 138(11), 111203, Paper FE-16-1062; doi:10.1115/1.4033676, 2016.
- Venayagamoorthy, S.K., and Koseff, J.R., " On the flux Richardson number in stably stratified turbulence," *Journal of Fluid Mechanics*, 798, doi:10.1017/jfm.2016.340, 2016.
- Lucas, L.V., Cloern, J.E., Thompson, J.K., Stacey, M.T., and Koseff, J.R., "Bivalve grazing can shape phytoplankton communities," *Frontiers in Marine Science*, <http://dx.doi.org/10.3389/fmars.2016.00014>, 2016.
- Moore, C.D., Koseff, J.R., and Hult, E.L., "Characteristics of bolus formation and propagation from breaking internal waves on shelf slopes," *Journal of Fluid Mechanics*, Vol 791, pp. 260-283, doi: 10.1017/jfm.2016.58, 2016.
- Craig, A.E., Dabiri, J.O., and Koseff, J.R., " A kinematic description of the flow characteristics in an array of finite-height rotating cylinders," *Journal of Fluids Engineering*, 138(7), 070906, Paper FE-15-1630; doi:10.1115/1.4032600, 2016.
- Mungal, M.G., and Koseff, J.R., "Introduction: 32nd Annual Gallery of Fluid Motion (San Francisco, California, USA, 2014)", *Physics of Fluids*, 27, 091101, <http://dx.doi.org/10.1063/1.4930849>, 2015.
- Chou, Y-J., Hollerman, R.C., Fringer, O.B., Stacey, M.T., Monismith, S.G., and Koseff, J.R., "Three-dimensional wave-coupled hydrodynamics modeling in South San Francisco Bay", *Computers & Geosciences*, 85, pp10–21, doi.org/10.1016/j.cageo.2015.08.010, 2015.
- Weitzman, J.S., Zeller, R.B., Thomas, F.I.M., and Koseff, J.R., "The attenuation of current- and wave-driven flow with submerged multispecific vegetative canopies," *Limnology and Oceanography*, doi: 10.1002/lno.10121, 2015.

- Zeller, R.B., Zarama, F.J., Weitzman, J.S., and Koseff, J.R., "A simple and practical model for combined wave-current canopy flows", *Journal of Fluid Mechanics*, 767, pp 842-880, doi:10.1017/jfm.2015.59, 2015.
- Weitzman, J.S., Samuel, L.C., Craig, A.E., Zeller, R.B., Monismith, S.G., and Koseff, J.R., "On the use of refractive-index-matched hydrogel for fluid velocity measurements in and around geometrically complex solid obstructions," *Experiments in Fluids*, 55, DOI 10.1007/s00348-014-1862-x, 1862- 1874, 2014.
- Walter, R.K., Squibb, M.E., Woodson, C.B., Koseff, J.R., and Monismith, S.G., "Stratified turbulence in the nearshore coastal ocean: Dynamics and evolution in the presence of internal bores," *Journal of Geophysical Research, Oceans*, DOI: 10.1002/2014JC010396, December, 2014.
- Zeller, R.B., Weitzman, J.S., Abbett, M.E., Zarama, F.J., Fringer, O.B., and J.R. Koseff, "Improved parameterization of seagrass blade dynamics and wave attenuation based on numerical and laboratory experiments," *Limnology and Oceanography*, 59(1), 251-266, 2014.
- Teneva, L., Dunbar, R.B., Mucciarone, D.A., Dunckley, J.F., and J. R. Koseff, "High-resolution carbon budgets on a Palau back-reef modulated by interactions between hydrodynamics and reef metabolism," *Limnology and Oceanography*, 58(5), 1851-1870, 2013.
- Rosman, J.H., Denny, M.W., Zeller, R., Monismith, S.G., and Koseff, J.R., "Interactions between a kelp forest (*Macrocystis pyrifera*) and waves: Insights from a dynamically scaled laboratory model," *Limnology and Oceanography*, 58(3), 790-802, 2013.
- Weitzman, J.S., Aveni-Deforge, K., Koseff, J.R., and Thomas, F.I.M., Uptake of dissolved inorganic nitrogen by shallow seagrass communities exposed to wave-driven unsteady flow," *Marine Ecology Progress Series*, Vol. 475, doi: 10.3354/meps09965, 65-83, 2013.
- Dunckley, J.F., Koseff, J.R., Steinbuck, J.V., Monismith, S.G., and Genin, A., "Comparison of mixing efficiency and vertical diffusivity models from temperature microstructure," *Journal of Geophysical Research*, 117, C10, doi:10.1029/2012JC007967, 2012
- Kline, D.I., Teneva, L., Schneider, K., Miard, T., Chai, A., Marker, M., Headley, K., Opdyke, B., Nash, M., Valetich, M., Caves, J.K., Russell, B.D., Connell, S.D., Kirkwood, B.J., Brewer, P., Peltzer, E., Silverman, J., Caldeira, K., Dunbar, R.B., Koseff, J.R., Monismith, S.G., Mitchell, B.G., Dove, S., and Hoegh-Guldberg, O., "A short-term in situ CO₂ enrichment experiment on Heron Island," *Scientific Reports*, Vol. 2, Article No. 413, DOI: 10.1038/srep00413 Published: MAY 21 2012
- Steinbuck, J.V., Koseff, J.R., Genin, A., Stacey, M.T., and Monismith, S.G., "Horizontal dispersion of ocean tracers in internal wave shear," *Journal of Geophysical Research*, Vol. 116, C11031, doi:10.1029/2011JC007213, 2011.
- Venayagamoorthy, S.K., Ku, H., Fringer, O.B., Chiu, A., Naylor, R.L., and Koseff, J.R., "Numerical modeling of aquaculture dissolved waste transport in a coastal embayment," *Environmental Fluid Mechanics*, Vol. 11, 4, 2011, pp. 329-352.
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- Hult, E. L., Troy, C.D., and Koseff, J.R., "The mixing efficiency of interfacial waves breaking at a ridge: 1. Overall mixing efficiency," *Journal of Geophysical Research*, 116, C02003, doi:10.1029/2010JC006485., 2011.

- Rosman, J.H., Monismith, S.G., Denny, M.W., and Koseff, J.R., "Currents and turbulence within a kelp forest (*Macrocystis pyrifera*): Insights from a dynamically scaled laboratory model," *Limnology and Oceanography*, 55: 1145-1158, 2010.
- Steinbuck J. V., Genin A., Monismith S.G., Koseff J.R., Holzman R., and Labiosa R.G., "Turbulent mixing in fine-scale phytoplankton layers: Observations and inferences of layer dynamics," *Continental Shelf Research*, 30(5): 442-455, 2010.
- Hult, E.L., Troy, C.D., and Koseff, J.R., "Harmonic generation of interfacial waves at a submerged bathymetric ridge," *Journal of Geophysical Research-Oceans*, 115, CO2001, 2010.
- Hult, E.L., Troy, C.D., and Koseff, J.R., "The breaking of interfacial waves at a submerged bathymetric ridge," *Journal of Fluid Mechanics*, 637, 45-71, 2010.
- Genin, A., Monismith, S.G., Reidenbach, M.A., Yahel, G., and Koseff, J.R., "Intense benthic grazing of phytoplankton in a coral reef," *Limnology and Oceanography*, 54: 938-951, 2009.
- Reidenbach, M. A., Koseff, J.R., and Koehl, M. A. R., "Hydrodynamic forces on larvae affect their settlement on coral reefs in turbulent, wave-driven flow," *Limnology and Oceanography*, 54(1), 318-330, 2009.
- Lucas, L.V., Koseff, J.R., Monismith, S.G., and Thompson, J.K., "Shallow water processes govern system-wide phytoplankton bloom dynamics: A modeling study," *Journal of Marine Systems*, 75, 70-86, 2009.
- Rosman, J.H., Hench, J.L., Koseff, J.R., and Monismith, S.G., "Extracting Reynolds stresses from acoustic Doppler current profiler measurements in wave-dominated environments", *Journal of Atmospheric and Oceanic Technology*, 25, 2, Feb. 2008, 286-306.
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- Thompson, J.K., Koseff, J.R., Monismith, S.G., and Lucas, L.V., "Shallow water processes govern system-wide phytoplankton bloom dynamics: A field study," *Journal of Marine Systems*, Volume 74, Issues 1-2, November, 2008, 153-166.
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- Lowe, R. J., Falter, J.L., Koseff, J.R., Monismith, S.G., and Atkinson, M.J., "Spectral wave flow attenuation within submerged canopies: Implications for wave energy dissipation," *Journal of Geophysical Research*, 112, C05018, 2007, doi:10.1029/2006JC003605.

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- Falter, J. L., Atkinson, M.J., Lowe, R.J., Monismith, S.G., and Koseff, J.R., "Effects of nonlocal turbulence on the mass transfer of dissolved species to reef corals", *Limnology and Oceanography*. 52, 2007, 274-285.
- Crimaldi, J.P., and Koseff, J.R., "Structure of turbulent plumes from a momentumless source in a smooth bed", *Environmental Fluid Mechancis* 6 (6), December, 2006, 573-592.
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- Falter, J.L., Atkinson, M.J., Fleming, J.H., Bos, M., Lowe, R.J., Koseff, J.R., and Monismith, S.G., " A new mesocosm for simulating the effects of wave-driven water motion on the biogeochemistry of benthic reef communities, *Limnology and Oceanography: Methods*, 4, 2006, 68-79.
- Troy, C.D., and Koseff, J.R., "The viscous decay of progressive interfacial waves," *Physics of Fluids*, 18, 2006, 026602.
- McDonald, C. B., Koseff, J.R., and Monismith, S.G., "Effects of the depth to coral height ratio on drag coefficients for unidirectional flow over coral," *Limnology and Oceanography*, 51, 2006, 1294-1301.
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- Reidenbach M.A., Koseff J.R., Monismith S.G., Steinbuck J.V., and Genin A., "The effects of waves and morphology on mass transfer within branched reef corals", *Limnology and Oceanography*, 51(2), 2006, 1134-1141.
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- Lowe, R.J., Koseff, J.R., Monismith, S.G., and Falter, J.L., "Oscillatory flow through submerged canopies. Part 2. Canopy mass transfer," *Journal of Geophysical Research*, 110, C10017, 2005,

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