

Jim Thomson
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Civil & Environmental Engineering
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Education

- PhD, Physical Oceanography, Massachusetts Institute of Technology (2006),
Joint Program with the Woods Hole Oceanographic Institution.
- BA, Physics, Middlebury College, Magna Cum Laude (2000).

Experience

- Principal Oceanographer, Applied Physics Lab., Univ. of Washington (2011-present).
- Associate Professor, Civil & Environ. Eng., Univ. of Washington (2014-present).
- Adjunct Assistant Professor, Mechanical Eng., Univ. of Washington (2012-present).
- Assistant Professor, Civil & Environ. Eng., Univ. of Washington (2009-2014).
- Oceanographer, Applied Physics Lab., Univ. of Washington (2006-2010).
- Postdoctoral Investigator, Woods Hole Oceanographic Institution (2006).
- Graduate Research Assistant, Woods Hole Oceanographic Institution (2001-2006).

Research Areas

- Ocean surface waves
- Marine renewable energy (tidal and wave)
- Coastal and nearshore processes
- Environmental fluid mechanics
- Ocean instrumentation

Recognition

- APL Science & Engineering Award (2013).
- ONR Young Investigator Program (2007).
- Outstanding Paper Award, Ocean Sciences Meeting (2006).
- Gould Research Prize, Middlebury College (2000).
- Phi Beta Kappa (2000).

Certification

- US Coast Guard Captain's License, 100 ton coastal (1996-present).
- SCUBA diver (1991-present), American Academy of Underwater Sciences research diver (2001-present), Master diver (2006-present).
- US Security Clearance (2009-present).

Teaching

- CEE 347 Fluid Mechanics
- CEE 473 Coastal Engineering
- CEE 499 / ME 499 Senior Projects in Coastal Engineering / Marine Energy

Journal Articles

- Durgesh, V., J. Thomson, M. Richmond, and B. Polagye, Noise correction of turbulent spectra obtained from Acoustic Doppler Velocimeters, *Flow Measurement and Instrumentation*, **37** (2014).
- D'Asaro, E. , J. Thomson, A. Shcherbina, R. Harcourt, M. Cronin, M. Hemer, B. Fox-Kemper, Quantifying upper ocean turbulence driven by surface waves, *Geophys. Res. Letters*, **41** (2014).
- Schwendeman, M., J. Thomson, and J. Gemmrich, Wave breaking dissipation in a fetch limited sea, *J. Phys. Oceanog.*, **44** (2014).
- Rinehimer, J.P. and J. Thomson, Observations and modeling of heat fluxes on tidal flats, *J. Geophys. Res.*, **119** (2014).
- Thomson, J., E. D'Asaro, M. Cronin, E. Rogers, R. Harcourt, and A. Shcherbina, Waves and the equilibrium range at Ocean Weather Station P, *J. Geophys. Res.*, **118** (2013).
- Richard, J.B., J. Thomson, B. Polagye, and J. Bard, Method for Identification of Doppler Noise Levels in Turbulent Flow Measurements Dedicated to Tidal Energy, *Int. J. of Marine Energy*, **3-4** (2013).
- Thyng, K., J. Riley, and J. Thomson, Inference of turbulence parameters from ROMS, *Ocean Modeling*, **72** (2013).
- Palodichuk, M., B. Polagye, and J. Thomson, Resource mapping at tidal energy sites, *J. Ocean. Eng.*, **38**, (2013).
- Rinehimer, J. P., J. Thomson, and C. Chickadel, Thermal observations of ebb flows on fine-grained tidal flats: Evidence of exfiltration, *Cont. Shelf Res.*, **60S**, (2013).
- Polagye, B. and J. Thomson, Tidal energy resource characterization: methodology and field study in Admiralty Inlet, Puget Sound, US, *Proc. IMechE, Part A: J. Power and Energy*, **227**, (2013).
- Bassett, C., J. Thomson, B. Polagye, Sediment-generated noise and bed stress in a tidal channel, *J. Geophys. Res.*, **118**, (2013).
- Thomson, J., Observations of wave breaking dissipation from a SWIFT drifter, *J. Atmos. & Ocean. Tech.*, **29**, (2012).
- Bassett, C., B. Polagye, M. Holt, and J. Thomson, A vessel noise budget for Admiralty Inlet, Puget Sound, WA (USA), *J. Acous. Soc. Amer.*, **132** (2012).
- Thomson, J., M. Richmond, B. Polagye, V. Durgesh, Measurements of turbulence at two tidal energy sites, *J. Ocean. Eng.*, **37** (2012).
- Elgar, S., B. Raubenheimer, J. Thomson, M. Moulton, Resonances in an evolving hole in the swash zone, *J. Waterways, Port, Coastal, and Ocean Eng.*, **138** (2012).
- Thomson, J., Observations of thermal diffusivity and a relation to the porosity of tidal flat sediments, *J. Geophys. Res.*, **115** (2010).
- Thomson, J. J.R. Gemmrich, and A.T. Jessup, Energy dissipation and the spectral distribution of whitecaps, *Geophys. Res. Let.*, **36** (2009).
- Thomson, J. and A.T. Jessup, A Fourier-based method for the distribution of breaking crests from video observations, *J. Atmos. & Ocean. Tech.*, **26** (2009).
- Thomson, J., S. Elgar, and T.H.C. Herbers, Refraction and reflection of infragravity waves over complex bathymetry, *J. Geophys. Res.*, **112** (2007).

- Thomson, J., S. Elgar, B. Raubenheimer, T.H.C. Herbers, and R.T. Guza, Tidal modulation of infragravity waves via nonlinear energy losses in the surfzone, *Geophys. Res. Let.*, **33** (2006).
- Thomson, J., S. Elgar, and T.H.C. Herbers, Reflection and tunneling of ocean waves observed at a submarine canyon, *Geophys. Res. Let.*, **32** (2005).
- Pedlosky, J., and J. Thomson, Baroclinic instability of time-dependent currents, *J. Fluid Mech.*, **490** (2003).

Journal Articles – Pending

- Bassett, C., J. Thomson, P. Dahl, and B. Polagye, Flow noise and turbulence in two tidal channels, *J. Acoust. Soc. Amer.*, accepted.
- McCaffrey, K., B. Fox-Kemper, P. Hamlington, J. Thomson, Characterization of Turbulence Anisotropy, Coherence, and Intermittency at a Prospective Tidal Energy Site: Observational Data Analysis, *Renewable Energy*, submitted.

Conference Proceedings

- Kilcher, L, J. Thomson, J. Colby, Determining the spatial coherence of turbulence at MHK sites, *Marine Energy Technology Symposium (GMREC)*, Seattle, WA (2014).
- Davis, A., B. Fabien, J. Thomson, and T. Mundon, Modeling and Analysis of a Multi Degree of Freedom Point Absorber Wave Energy Converter, *Proceedings of the ASME 2014 33rd International Conference on Ocean, Offshore and Arctic Engineering (OMAE2014)*, June 8-13, 2014, San Francisco, USA , (2014).
- Deppe, W, J. Thomson, C. Krembs, and B. Polagye, Hypoxic intrusions to Puget Sound from the Ocean, *Oceans 2013 MTS/IEEE*, San Diego, CA (2013).
- Richard, J.B., J. Thomson, B. Polagye, and J. Bard, Method for Identification of Doppler Noise Levels in Turbulent Flow Measurements Dedicated to Tidal Energy, *European Wave and Tidal Energy Conference* (2013).
- Thomson, J., L. Kilcher, M. Richmond, J. Talbert, A. deKlerk, B. Polagye, M. Guerra, and R. Cienfuegos, Tidal turbulence spectra from a compliant mooring, *Marine Energy Technology Symposium (GMREC)*, Washington, DC (2013).
- Nair, B. et al, Low-cost utility-scale wave energy enabled by magnetostriction, *Marine Energy Technology Symposium(GMREC)*, Washington, DC (2013).
- Polagye, B. and J. Thomson, Implications of tidal phasing for power generation at a tidal energy site, *Marine Energy Technology Symposium(GMREC)*, Washington, DC (2013).
- Polagye, B. et al. Cross-flow turbine performance and wake characterization, *Marine Energy Technology Symposium(GMREC)*, Washington, DC (2013).
- Holman, R. and J. Thomson, Remote-sensing of bathymetry and currents in a tidal inlet, *Coastal Dynamics* (2013).
- Polagye, B., J. Thomson, M. Palodichuk, Multiscale tidal resource characterization: a case study of Admiralty Inlet, Puget Sound, WA (USA), *International Conference on Ocean Energy* (2012).
- Graber, J, J. Thomson, B. Polagye, A. Jessup, Land-based infrared imagery for marine mammal detection, *SPIE Remote sensing and Modeling of Ecosystems for Sustainability VIII* (2011).

- Bassett, C., J. Thomson, B. Polagye, Underwater noise measurements from a 1/7 scale wave energy converter, *Oceans 2011*, Hawaii (2011).
- Harding, S., J. Thomson, B. Polagye, M. Richmond, V. Durgesh, I. Bryden, Extreme value analysis of tidal stream velocity perturbations, *European Wave and Tidal Energy Conference* (2011).
- Thomson, J., M. Richmond, B. Polagye, and V. Durgesh, Quantifying turbulence for tidal power applications, *Oceans 2010 MTS/IEEE*, Seattle, WA (2010).
- Polagye, B., J. Epler, J. Thomson, Limits to the predictability of tidal current power, *Oceans 2010 MTS/IEEE*, Seattle, WA (2010).
- Epler, J., B. Polagye, J. Thomson, Shipboard acoustic Doppler current profiler surveys to assess tidal current resources, *Oceans 2010*, Seattle, WA (2010).
- Bassett, C., J. Thomson, B. Polagye, Characterizing Underwater Noise at a Tidal Energy Site, *Ocean 2010 MTS/IEEE*, Seattle WA (2010).
- Gooch, S., J. Thomson, B. Polagye, and D. Meggitt, Site Characterization for Tidal Power, *Oceans 2009 MTS/IEEE*, Biloxi, MS (2009).
- Thomson, J., More data, more people, more relevance, *Oceanography in 2025*, National Academy of Sciences workshop, Irvine, CA (2009).

Patent applications

- Thomson, J, J Talbert, A deKlerk, C Rusch, Z. Murphee, "Heave plates that produce large rates of change in tether tension without going slack, and associated systems and methods," US non-provisional application number 14/186,577 filed February 21, 2014.

Service

- Session chair, Marine Energy Technical Symposium (2014).
- National Academies NRC committee on Marine Hydrokinetic Energy (2010-2012)
- Workshop on Marine Energy projects in Chile (2011).
- Workshop on data gaps for Offshore Renewable Energy (2011).
- DOE SBIR-STTR Reviews (2011)
- NOPP review panel, Integrated Ocean Observing System (2010)
- Session chair, AGU fall meeting (2010)
- Chair, Marine Renewable Energy track, *Oceans 2010* conference
- NSF review panel, physical oceanography (2010)
- Maine Technology Asset Fund reviewer (2010)
- Session chair, Workshop on Environmental Effects of Tidal Energy (2010)
- Workshop on air-sea interactions under tropical cyclones (2010),
- Session chair, IEEE International Geoscience & Remote Sensing Symposium (2008)
- Journal peer reviews: Continental Shelf Research, Marine Pollution Bulletin, J. Phys. Oceanog., J. Atmos. Ocean. Tech., Ocean Modeling, Marine Geology, IEEE Trans. on Geosci. and Remote Sens., J. Waterway, Port, Coastal and Ocean Eng., J. of Fluid Mech., J. of Geophys. Res., Estuar. Coast. and Shelf Science, IEEE J. of Ocean. Eng..

Outreach

- Volunteering:

- Polar Science Weekend (2014)
- Pacific Science Center *Science EXPO* (2012-present),
- Ocean Inquiry Project (2009-present),
- UW College of Engineering Discovery Days (2010-present),
- Washington Weekend open house demonstrations (2007).
- Invited talks / guest lectures:
 - Pacific Science Center “Cool jobs” series (2013),
 - Columbia River Maritime Museum “Science on Tap” (2013),
 - PSC Environmental Science and Technology Practicum (2012),
 - Washington Dept of Ecology seminar series (w/ Christopher Krembs) (2011),
 - Panelist, Washington Ocean Energy Conference (2011),
 - COSEE Community College Faculty Summer Teaching Institute (2011),
 - Institute for Journalism and Natural Resources (2011),
 - Panelist, Ocean Renewable Energy Conference V / EnergyOcean (2010),
 - Mid-C Seminar (2010),
 - Nortek User Symposium (2010),
 - Panelist, Global Marine Renewable Energy Conference (2010),
 - UW Water Center series (2010),
 - UW Energy Future lecture (2009),
 - Pacific Science Center *Science Cafe* with KCTS public television (2009),
 - Society of Naval Architects and Marine Engineers (2009),
 - Marine Technology Society (2008),
 - UW Fisheries (2007-2008),
 - Cape Cod Community College (2005).
- Media coverage:
 - King 5 Weather Special, “Beyond the Forecast: Power Play” (21 Nov 2013).
 - Santiago Times, “Tides are changing to expand renewable energy options in Chile” (20 Feb 2013).
 - New York Times “Scientists at Work” blog (2012-2013) and Science Times article (16 Oct 2012).
 - AGU online research highlight and blog post (fall 2012)
 - UW TV, “UW 360: tidal energy research in Puget Sound,” (Dec 2011)
 - MSNBC, “IBM sees energy, money in motion of the ocean,” (1 Nov 2011)
 - CNNMoney, “Renewable tidal energy’s reality check,” (21 Oct 2011)
 - KUOW, “Harnessing tides in the Northwest” (25 Aug 2011).
 - Seattle Times, NW Jobs profile (12 June 2011).
 - KUMO news radio (9 June 2011).
 - King 5 news (8 June 2011).
 - KUOW & Oregon Public Radio, “Researchers Study Potential Impact Of Tidal Power Turbines,” (25 May 2011).
 - Seattle Times, “Admiralty Inlet an ideal spot for tidal power,” (14 Dec 2010).
 - King 5 news, “Tides could be tapped for clean energy,” (14 Oct 2010).
 - King 5 news, “[Infrared] Camera paints orca portrait,” (26 Aug 2010).
 - King 5 news, “Fresh water in mud flats,” (5 Apr 2010).
 - Seattle Times (May 2009)
 - KUOW, May 2009

Graduate Student Advising

- S. Zippel, PhD (expected 2017)
- M. Schwendeman, MS (2012), PhD (expected 2016)
- ARCS Fellow C. Bassett, MS (2010), PhD (2013)
 - NSF Graduate Research Fellow
- J.P. Rinehimer, PhD (2013)
 - National Defense Industry Association Fellow, UW CEE Henry Gray Fellow
- W. Deppe, MS (2013)
- M. Palodichuk, MS (2012)
- S. Henriksen, MS (2011)
- J. Graber, MS (2011)
- S. Gooch, MS (2009)

Graduate Student Committees

- H. Dosser, PhD (expected 2015)
- B. Kilbourne, PhD (expected 2015)
- M. Mckeon, PhD (expected 2014)
- R. Hale, PhD (expected 2014)
- Y. Yuan, PhD (2012)
- D. Nowacki, MS (2010)
- J. Epler, MS (2010)
- M. Avener, MS (2009)

Conference Abstracts

- Maloy et al, Using ferries for marine water quality monitoring in the Salish Sea, *Pacific Estuarine Research Society* (2014).
- Gemmrich, J., S. Vagle, J. Thomson, Breaking waves turbulence and bubbles, EGU General Assembly (2014).
- Thomson et al, Do waves mix river plumes?, Ocean Sciences Meeting (2014).
- Schwendeman, M. and J. Thomson, Wave breaking in mixed seas, Ocean Sciences Meeting (2014).
- Zippel, S. and J. Thomson, Wave breaking by depth and currents, Ocean Sciences Meeting (2014).
- McCaffrey, K., P. Hamlington, B. Fox-Kemper, and J. Thomson, Anisotropy and coherent turbulence at a tidal energy site, Ocean Sciences Meeting (2014).
- Bassett, C., J. Thomson, and B. Polagye, Shifting gravel and the acoustic detection of killer whales, *AGU Fall meeting* (2012).
- D'Asaro, E., A. Scherbina, R. Harcourt, and J. Thomson, Did Langmuir see Langmuir Cells? *AGU Fall meeting* (2012).
- Farquharson, G. and J. Thomson, radar measurements at New River Inlet, *AGU Fall meeting* (2012).
- Rinehimer, J.P., J. Thomson, and C. Chickadel, Super-heating flooding fronts on tidal flats, *AGU Fall meeting* (2012).
- Schwendeman, M., J. Thomson, and J. Gemmrich, Wave breaking dissipation in fetch-limited seas, *AGU Fall meeting* (2012).
- Thomson, J., T. Ozkan-Haller, A. Grilli, and A. Hamilton, The ocean wave resource, *AGU Fall meeting* (2012).
- Thomson et al, Demonstration of a mid-water mooring for tidal turbulence measurements, *AGU Fall meeting* (2012).
- Zippel, S. and J. Thomson, Wave breaking at New River Inlet, *AGU Fall meeting* (accepted for 2012).

- Thyng, K., J. Riley, and J. Thomson, Turbulence comparisons between data and a ROMS simulation in the Puget Sound estuary for tidal hydrokinetic turbine siting, *PECS* (2012).
- Gemmrich, J., Thomson, J, M. Schwendeman, Observations of fetch-limited wave evolution, *WISE* (2012).
- Talbert, J, C. Meining, J. Thomson, Deep Water Mooring Design for a Datawell Directional Waverider Buoy, *ONR/MTS Buoy Workshop*, Victoria, BC (2012).
- Henriksen, S, D. Malcolm, and J. Thomson, Errors from use of effective turbulence in site suitability assessments, *EWEA Wind Power Conference*, Copenhagen (2012).
- Thomson, J, J. Gemmrich, M. Schwendeman, Observations of fetch-limited wave evolution, *Ocean Sciences* (2012).
- Gemmrich, J., S. Vagle, J. Thomson, Breaking waves, turbulence, and bubbles, *Ocean Sciences* (2012).
- Rinehimer, J. P., J. Thomson, C.C. Chickadel, The Role of Tidal Flats in the Coastal Heat Budget: Source or Sink?, *Ocean Sciences* (2012).
- Schwendeman, M., J. Thomson, J. Gemmrich, Spectral energy dissipation in broad-band wave fields, *Ocean Sciences* (2012).
- Bassett, C., J. Thomson, B. Polagye, Ambient noise from cobbles shifting under fast currents, *Ocean Sciences* (2012).
- Henriksen, S, D. Malcolm, and J. Thomson, Errors from use of effective turbulence in site suitability assessments, *AWEA Wind Power Conference*, Atlanta GA, (2012).
- Richmond, M, J. Thomson, V. Durgesh, B. Polagye, Field measurements of turbulence for marine and hydrokinetic inflow conditions at Marrowstone Island, WA, *AGU fall meeting* (2011).
- Krembs, K., D. Mora, J. Thomson, B. Polagye, Admiralty Reach as conduit for low oxygen water intrusions into Puget Sound, *Salish Sea Conference* (2011).
- Cronin et al, Ongoing Ocean Station P Time Series, *World Climate Research Programme* (2011).
- Polagye, B., S. Kramer, S. Parker-Stetter, J. Thomson, Developing capabilities for blade strike monitoring of tidal hydrokinetic projects, *AFS meeting* (2011).
- Bassett, C., B. Polagye, J. Thomson, Approaches to ambient noise characterization at tidal energy sites, *AFS meeting* (2011).
- Horne, J., S. Parker-Stetter, B. Polagye, J. Thomson, K. Fresh, B. Hanson, Characterizing and Monitoring Marine Nekton at Puget Sound's Renewable Energy Site, *ASA/AFS Acoustics workshop* (2011).
- B. Polagye, J. Wood, C. Bassett, D. Tollit, and J. Thomson, Behavioral Response of Harbor Porpoises to Vessel Noise in a Tidal Strait, *ASA annual meeting* (2011).
- Bassett, C., B. Polagye, J. Thomson, Estimating the acoustic impact of a tidal energy project, *ASA annual meeting* (2011).
- McClure, B., J. Horne, and J. Thomson, Economical Evaluation of Biological Parameters at Potential MHK Sites Utilizing the Automated, Autonomous Hydroacoustic Systems, *Hydrovision 2011*.
- Thomson, J, and J. Talbert, Dissipation from a Drifter, *AGU fall meeting* (2010).
- Rinehimer, J., J. Thomson, and C. Chickadel, Observations of ebb flows on tidal flats: Evidence of dewatering?, *AGU fall meeting* (2010).
- Polagye, B., J. Thomson, C. Bassett, J. Epler, Comprehensive Characterization of a Tidal Energy Site, *AGU fall meeting* (2010).
- Polagye, B., C. Bassett, and J. Thomson, Passive acoustics, *Renewable Ocean Energy and the Marine Environment* (2010).
- Thomson, J., C. Chickadel, J.P. Rinehimer, Classification of intertidal sediments using infrared sensing, *Ocean Sciences Meeting* (2010).
- Cronin, M., C. Sabine, S. Emerson, M. Robert, M. Alford, J. Nystuen, E. D'Asaro, J. Thomson, R. Harcourt, C. Eriksen, Ongoing Ocean Station P Time Series, *Ocean Sciences Meeting* (2010).
- Bassett, C., J. Thomson, B. Polagye, Characterizing Underwater Noise at a Tidal Energy Site, *Ocean Sciences Meeting* (2010).
- Giffen, D., B. Raubenheimer, S. Elgar, J. Thomson, Wind-driven flows on a mesotidal flat, *Ocean Sciences Meeting* (2010).

- Jessup, A., J. Thomson, J. Gemmrich, Energy dissipation and the spectral distribution of whitecaps via remote sensing, *Ocean Sciences Meeting* (2010).
- Rinerhimer, J.P., J. Thomson, C. Chickadel, Thermal remote sensing of tidal flat hydrodynamics, *Ocean Sciences Meeting* (2010).
- Thomson J., B. Polagye, P. Malte, D. Meggitt, A. Copping, Proposed National Tidal Energy Facility, *Naval Energy Forum* (2009).
- Rinehimer, J., J. Thomson, C. Chickadel, Thermal remote sensing of tidal flat hydrodynamics, *Coastal and Estuarine Research Federation conference* (2009).
- Thomson, J, C. Chickadel, and T. Drexler, Tidal flat sediment classification via heat flux observations, *AGU fall meeting* (2008).
- Chickadel, C., J. Thomson, Thermal remote sensing of tidal flat bathymetry and circulation, *AGU fall meeting* (2008).
- Thomson, J., A. Jessup, and J. Gemmrich, Energy dissipation and the distribution of breaking crests, *WISE meeting* (2008).
- Thomson, J., A. Jessup, and J. Gemmrich, Remote estimation and validation of wave-breaking dissipation, *Ocean Sciences Meeting* (2008).
- Thomson, J., A. Jessup, and J. Gemmrich, Deep-water wave breaking signals: infrared and visual, *Argus Workshop* (2007).
- Thomson, J., S. Elgar, B. Raubenheimer, and T.H.C. Herbers, Infragravity energy loss in the surfzone via nonlinear interactions, *Ocean Sciences Meeting* (2006).
- Thomson, J., S. Elgar, and T.H.C. Herbers, Reflection and tunneling of ocean waves observed at a submarine canyon, *Gordon Conference* (2005).
- Thomson, J., S. Elgar, and T.H.C. Herbers, Observations of Wave Reflection from a Submarine Canyon, *AGU fall meeting* (2004).