Kristen M. Thyng

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Education

Ph.D. Mechanical Engineering, University of Washington, June 2012.

"Numerical Simulation of Admiralty Inlet, WA, with Tidal Hydrokinetic Turbine Siting Application"

Committee: James J. Riley (chair), Alberto Aliseda, Mitsuhiro Kawase, Brian Polagye, and Dale Durran.

M.Sc. Applied Mathematics, University of Washington, 2007.

B.A. Physics, Whitman College, 2005.

Minor: Mathematics, *Honors:* Walter Brattain Scholarship, *Study Abroad:* Semester at Sea, Fall 2001.

Employment

Texas A&M University, Department of Oceanography

Assistant Research Scientist, Robert D. Hetland, 2015–Present.

Postdoctoral Research Associate, Robert D. Hetland, 2012–2015.

University of Washington, Department of Mechanical Engineering

Research Assistant, James J. Riley, 2007–2012.

Prometheus Energy Co.

Jr. Scientist, John A. Barclay, Summer 2006.

Whitman College, Physics Department

Fairbank Physics Research Assistant, Kurt Hoffman, Summer 2004.

First-Year Physics Lab Assistant, Fall 2003–Spring 2004.

First-Year Physics Lab Reorganization, Mark Beck, Summer 2003.

Research

Publications

Peer-reviewed

Roc, T, Funke, S. W., Thyng, K. M. (2015). Standard methodology for tidal array project optimisation: An idealized study of the Minas Passage. *Proceedings European Wave and Tidal Energy Conference*. Nantes, France. *(accepted)*

Thyng, K. M. and R. D. Hetland, "TracPy: Wrapping the Fortran Lagrangian trajectory model TRACMASS" *Proceedings of the 13th Python in Science Conference (SciPy 2014)*.

Roc, T., Greaves, D., Thyng, K. M., Conley, D. (2014). Tidal turbine representation in an ocean circulation model: Towards realistic applications. *Ocean Engineering*, 78, 95–111. doi:10.1016/j.oceaneng.2013.11.010.

Thyng, K. M., Hetland, R. D., Ogle, M. T., Zhang, X., Chen, F., & Campbell, L. (2013). Origins of *Karenia brevis* harmful algal blooms along the Texas coast. *Limnology & Oceanography: Fluids & Environments*, 3, 269-278. doi: 10.1215/21573689-2417719.

Thyng, K. M., Riley, J. J., & Thomson, J. (2013). Inference of turbulence parameters from a ROMS simulation using the k-ε closure scheme. *Ocean Modelling*, 72(C), 104–118. doi: 10.1016/j.ocemod.2013.08.008.

Thyng, K. M. & Roc., T. (2013). Tidal current turbine power capture and impact in an idealised channel simulation. *Proceedings European Wave and Tidal Energy Conference*. Aalborg, Denmark.

Roc, T., Thyng, K. M., & Conley, D. (2011). Applying a numerical decision-making tool for tidal current turbine (TCT) planning projects to the Puget Sound estuary - Early Results. *Proceedings European Wave and Tidal Energy Conference*. Southampton, UK.

Kawase, M., & Thyng, K. M. (2010). Three-dimensional hydrodynamic modelling of inland marine waters of Washington State, United States, for tidal resource and environmental impact assessment. *Renewable Power Generation, IET*, 4(6), 568–578. doi:10.1049/iet-rpg.2009.0195.

Other and Products

Thyng, K. M., C. H. Barker, K. Jordahl, D. Cherian (2014). TracPy, Zenodo, doi:10.5281/zenodo.10433.

Thyng, K. M. (2012). Numerical Simulation of Admiralty Inlet, WA, with Tidal Hydrokinetic Turbine Siting Application (Doctoral dissertation).

Thyng, K. M., & Riley, J. J. (2010, September). Idealized headland simulation for tidal hydrokinetic turbine siting metrics. In OCEANS 2010 (pp. 1-6). IEEE.

Conference and Seminar Presentations

K. M. Thyng, Simon W. Funke, Thomas Roc, "Python in tidal energy: three tools used in a collaboration on array optimization," SciPy Conference 2015, Austin, TX, July 10, 2015.

K. M. Thyng and R. D. Hetland, "Texas and Louisiana coastline sensitivity and oil dispersion," 2015 Gulf of Mexico Oil Spill & Ecosystem Science Conference, Houston, TX, February 19, 2015.

K. M. Thyng and R. D. Hetland, "Cross-shelf transport and dispersion due to baroclinic instabilities," Physics of Estuaries and Coastal Seas (PECS), Porto de Galinhas, Brazil, October 21, 2014.

K. M. Thyng, "Perceptions of matplotlib colormaps," SciPy Conference 2014, Austin, TX, July 10, 2014.

K. M. Thyng and R. D. Hetland, "TracPy: Wrapping the FORTRAN Lagrangian trajectory model TRACMASS," SciPy Conference 2014, Austin, TX, July 10, 2014.

K. M. Thyng and R. D. Hetland, "What leads to transport in the northwestern Gulf of Mexico?," NASA MPOWIR speaker series, Goddard Space Flight Center, Greenbelt, MD, May 28, 2014. *(Selected seminar speaker)*

K. M. Thyng and J. J. Riley, "Tidal Hydrokinetic Energy and Site Characterization," Geology Departmental Seminar, Texas A&M University, November 22, 2013. *(Invited)*

K. M. Thyng and R. D. Hetland, "Effect of interannual and seasonal variability on oil fate along the Texas coastline," Estuarine and Coastal Modeling Conference, San Diego, CA, November 4, 2013.

K. M. Thyng, R. D. Hetland, and L. Campbell, "Physical mechanism for *Karenia brevis* bloom initiation in Texas," 7th Symposium on Harmful Algae, Sarasota, FL, October 29, 2013.

K. M. Thyng and R. D. Hetland, "Particle tracking on a structured numerical grid and applications in the

Gulf of Mexico," 12th International workshop on Multi-scale (Un)-structured mesh numerical Modeling for coastal, shelf, and global ocean dynamics (IMUM), University of Texas, Austin, September 17, 2013.

Panelist on best practices in data visualization, SciPy Conference, Austin, TX, June 27, 2013. *(Invited)*

K. M. Thyng, J. J. Riley, and M. Kawase, "Vorticity Dynamics in Admiralty Inlet, Puget Sound," Gordon Research Seminar: Coastal Ocean Circulation, University of New England, June 9, 2013. *(Invited)*

K. M. Thyng, R. D. Hetland, X. Zhang, L, Campbell, "Origins of Harmful Algal Blooms Along the Texas Coast," ASLO Aquatic Sciences Meeting, New Orleans, LA, February 21, 2013.

K. M. Thyng and J. J. Riley, "Turbulence Modeling in a Numerical Model for Tidal Hydrokinetic Energy Siting," Texas A&M University, October 13, 2011. *(Invited)*

T. Roc, K. M. Thyng, D. Conley, "Applying a numerical decision-making tool for tidal current turbine (TCT) planning projects to the Puget Sound estuary - Early Results," 8th European Wave and Tidal Energy Conference, Southampton, 2011.

K. M. Thyng and J. J. Riley, "Site Modeling for Tidal Turbines", 2nd Annual OSU-UW Northwest National Marine Renewable Energy Center Conference, University of Washington, May 5, 2011.

K. M. Thyng and J. J. Riley, "Understanding New Admiralty Inlet Simulation", MoSSea Users Group, School of Oceanography, University of Washington, May 4, 2011.

K. M. Thyng and J. J. Riley, "Modeling for Tidal Energy Analysis", MoSSea Users Group, School of Oceanography, University of Washington, January 19, 2011.

K. M. Thyng and J. J. Riley, "Tidal Energy and Turbine Siting Metrics", Mechanical Engineering Student Seminar, University of Washington, October 11, 2010.

K. M. Thyng and J. J. Riley, "Idealized Headland Simulation for Tidal Hydrokinetic Turbine Siting Metrics", OCEANS 2010 MTS/IEEE Seattle, September 21, 2010.

K. M. Thyng and J. J. Riley, "Working Toward Numerical Simulations of Admiralty Inlet for Tidal Hydrokinetic Energy," 4th Annual INORE Symposium, Dartmouth, UK, May 12, 2010.

K. M. Thyng and J. J. Riley, "Tidal Energy in the Puget Sound", SIAM UW, April 21, 2009.

K. M. Thyng and J. J. Riley, "Tidal Energy in the Puget Sound", SIAM UW, May 29, 2008.

Poster Presentations

K. M. Thyng, "Perceptual colormaps in matplotlib with an application in oceanography," SciPy Conference 2015, Austin, TX, July 8, 2015.

K. M. Thyng and R. D. Hetland, "Texas-Louisiana Shelf and Coast Connectivity," Gordon Research Conference: Coastal Ocean Modeling, University of New England, June 7–12, 2015.

T. Roc, K. M. Thyng, and S. W. Funke, "Benchmarking Tidal Array Optimization: a Balance between Impacts & Economics of the Bay of Fundy - Early Results," 5th International Conference on Ocean Energy, November 4–6, 2014, Halifax, Canada.

K. M. Thyng and R. D. Hetland, "Cross-shelf transport and dispersion due to baroclinic instabilities," European Geosciences Union General Assembly 2014, April 27–May 2, Vienna, Austria.

K. M. Thyng and R. D. Hetland, "Texas-Louisiana Cross-shelf Transport due to Submesoscale Eddies," Ocean Sciences Meeting, Honolulu, Hawaii, February 23–28, 2014.

J. Kuehl, K. M. Thyng, and P. Chapman, "GISR Drift Card Program: Surface Transport Observation," Gulf of Mexico Oil Spill and Ecosystem Science Conference, Mobile, Alabama, January 26–29, 2014.

K. M. Thyng and R. D. Hetland, "Texas-Louisiana Shelf Connectivity and Time Variability using Particle Tracking," Gulf of Mexico Oil Spill and Ecosystem Science Conference, Mobile, Alabama, January 26–29, 2014.

K. M. Thyng and T. Roc, "Tidal current turbine power capture and impact in an idealised channel simula-

tion," 10th European Wave and Tidal Energy Conference, Aalborg, Denmark, September 2–5, 2013.

K. M. Thyng, J. J. Riley, and M. Kawase, "Vorticity Dynamics in Admiralty Inlet, Puget Sound," Gordon Research Conference: Coastal Ocean Circulation, University of New England, June 9–14, 2013.

ROMS Turbulence Parameter Comparisons with Field Data, The Physics of Estuaries and Coastal Seas (PECS) Symposium, 12–16 August 2012, New York City.

Nested ROMS Model of a Complex Estuarine Channel, Puget Sound, WA. Gordon Research Conference: Coastal Ocean Modeling, Mt. Holyoke College, South Hadley, MA, June 26–July 1, 2011.

Site Modeling for Tidal Turbines. Graduate and Professional Student Senate Science and Policy Summit, University of Washington, May 13, 2011.

Numerical Modeling for Tidal Hydrokinetic Turbine Siting. 4th Annual INORE Symposium, Dartmouth, UK, May 9, 2010.

Estuary Modeling for Tidal Energy in Puget Sound, WA. 3rd Annual INORE Symposium, Gent, Belgium, May 26, 2009.

Grants

Design of a Modern Web Interface to TGLO TABS Model and Data Products – Phase 2, Texas General Land Office, September 1, 2015 – August 31, 2017, $186,988, PI: K. M. Thyng, co-PI: R. D. Hetland.

Improving Oil Spill Predictions Near Shore and Across The Bay/Coastal Interface, Texas General Land Office, September 1, 2015 – August 31, 2017, $406,910, PI: B. R. Hodges, co-PIs: S. A. Socolofsky, K. M. Thyng.

Improving Hydrodynamic Predictions of Surface Currents Near the Texas Coast Used for Rapid Oil Spill Response – Phase 4, Texas General Land Office, September 1, 2015 – August 31, 2017, $376,560, PI: R. D. Hetland, co-PI: K. M. Thyng.

Other Funding Received

7th U.S. Harmful Algae Symposium travel award ($500) based on statement (2013).

International Collaboration Incentive Scheme grant, a collaborative research grant through the International Network for Offshore Renewable Energy (INORE) (2011).

Travel and conference funding for Gordon Research Conference: Ocean Modeling (2011).

Travel funding from the Graduate School Fund for Excellence and Innovation (GSFEI), University of Washington (2010).

Symposium and travel funding, International Network of Offshore Renewable Energy researchers (2010)

Symposium and travel funding, International Network of Offshore Renewable Energy researchers (2009)

Energy Summer School funding, U.K. Energy Research Council (2008).

Professional Activities

Member, American Geophysical Union, 2010–Present.

Member, Society for Industrial and Applied Mathematics, 2008–2013.

Member, Association for the Sciences of Limnology and Oceanography, 2012–2013.

Member, Institute of Electrical and Electronics Engineers, 2010–2012.

Other Conferences and Workshops Attended

MPOWIR Pattullo Conference for women in physical oceanography, Airlie Center, Warrenton, Virginia, October 6–9, 2013.

Gulf Of Mexico: Oil Spill & Ecosystem Science Conference, January 21–23, 2013, New Orleans, Louisiana.

Subsea Blowout Modeling Workshop, University of California, Berkeley, November 27–28, 2012.

OCEANS 2010 MTS/IEEE, Seattle, September 20–23, 2010.

2010 Ocean Sciences Meeting, Oregon Convention Center, February 22–26, 2010.

Eleventh International Conference on Estuarine and Coastal Modeling, Seattle, WA, November 4–6, 2009.

U.K. Energy Research Council (UKERC) Energy Summer School 2008, Roehampton, London, UK, June 23–27, 2008.

Teaching

Texas A&M University, Department of Oceanography

Introduction to Oceanography (OCNG 251), Spring 2015, undergraduate class.

Guest Lecturer: Introduction to Oceanography (OCNG 251), Spring 2014, undergraduate class.

Guest Lecturer: Python for Geoscientists (OCNG 689), Fall 2013, graduate class.

Guest Lecturer: Introduction to Physical Oceanography (OCNG 410), Spring 2013, undergraduate class.

University of Washington, Department of Mechanical Engineering

Teaching Assistant, Thermodynamics, ME 323, Dr. Philip Malte, Fall 2007.

Workshops

Teaching Methods, Center for Teaching Excellence, Texas A&M University (2013).

Honors & Awards

SciPy John Hunter Excellence in Plotting Competition 2014: 3rd place.

NASA MPOWIR (Mentoring Physical Oceanography Women to Increase Retention) selected speaker, 2014.

SciPy John Hunter Excellence in Plotting Competition 2013: 2nd place.

Outstanding Female Award, Mechanical Engineering. Society of Women Engineers, University of Washington. January 25, 2012.

Best Symposium Poster, INORE Symposium, 2010.

Walter Brattain Scholarship, 2001-2005.

Service

Program Committee, SciPy Conference 2015.

Associate Chair for Gordon Research Seminar on Coastal Ocean Modeling (2015).

Co-chair for tutorials, SciPy Conference 2015.

Diversity Committee: co-organizer and fund raiser for event, SciPy Conference 2014.

Program Committee, SciPy Conference 2014.

Co-chair for tutorials, SciPy Conference 2014.

Organizer and fund raiser for Women in Scientific Computing event, June 27, 2013.

Math and Science Fair, Lockwood Elementary School, March 15, 2011.

Math and Science Fair, Lockwood Elementary School, December 15, 2010.

Math and Science Fair, Emerson Elementary School, June 8, 2010.

An Introduction to Tidal Energy Research in the Puget Sound. UW Robinson School Summer Challenge, July 19, 2010.

Volunteer at 3rd Annual Global Marine Renewable Energy Conference, Bell Harbor International Convention Center, April 14–15, 2010.

Referee: Maryland Sea Grant, Estuaries & Coasts; EuroSciPy; Journal of Marine Science and Engineering; NSF: Division of Ocean Sciences; Ocean Dynamics; Packt Publishing; International Conference on Ocean, Offshore and Arctic Engineering (OMAE); National Oceanic and Atmospheric Administration; European Wave and Tidal Energy Conference

Skills

Extensively utilized SUNTANS and ROMS ocean modeling codes.

Proficiency in Python, FORTRAN, C, MatLab, and LaTeX.

Linux system administration.

Experience using a cluster and parallel computing.

Experience with HTML and CSS.

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