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.

Research Experience

Texas A&M University, Department of Oceanography

Assistant Research Professor, 2016–Present.

Assistant Research Scientist, 2015–2016.

Postdoctoral Research Associate, 2012–2015.

University of Washington, Department of Mechanical Engineering

Research Assistant, 2007–2012.

Research

Publications

Peer-reviewed

Thyng, K. M. and R. D. Hetland (2018). Seasonal and interannual cross-shelf transport in Texas and Louisiana. *Continental Shelf Research*, 160, 23-35. doi:10.1016/j.csr.2018.03.006.

Khade, V., Kurian, J., Chang, P., Szunyogh, I., **Thyng, K.**, Montuoro, R. (2017). Oceanic Ensemble Forecasting in the Gulf of Mexico: An application to the case of the Deep Water Horizon oil spill. *Ocean Modelling*, 113, 171âĂŞ184. doi:10.1016/j.ocemod.2017.04.004.

Thyng, K. M. and R. D. Hetland (2017). Texas and Louisiana coastal vulnerability and shelf connectivity. *Marine Pollution Bulletin*, Volume 116, Issues 1–2, Pages 226–233. doi:10.1016/j.marpolbul.2016.12.074.

Fitzsimmons, J. N., T. M. Conway, J.-M. Lee, R. Kayser, **K. M. Thyng**, S. G. John, and E. A. Boyle (2016), Dissolved iron and iron isotopes in the Southeastern Pacific Ocean, *Global Biogeochem. Cycles*, 30, doi:10.1002/2015GB005357.

Thyng, K. M., C. A. Greene, R. D. Hetland, H. M. Zimmerle, and S. F. DiMarco (2016). True colors of oceanography: Guidelines for effective and accurate colormap selection. *Oceanography* 29(3):9–13, doi:10.5670/oceanog.2016.66.

Bacosa, H. P., **K. M. Thyng**, S. Plunkett, D. L. Erdner, Z. Liu (2016). The tarballs on Texas beaches following the 2014 Texas City "Y" Spill: Modeling, chemical, and microbiological studies, *Marine Pollution Bulletin*, Volume 109, Issue 1, 15 August 2016, Pages 236-244. doi:10.1016/j.marpolbul.2016.05.076.

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

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

Roc, T., D. Greaves, **K. M. Thyng**, D. Conley (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., R. D. Hetland, M. T. Ogle, X. Zhang, F. Chen, & L. Campbell (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., J. J. Riley, & J. Thomson (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. & T. Roc. (2013). Tidal current turbine power capture and impact in an idealised channel simulation. *Proceedings European Wave and Tidal Energy Conference*. Aalborg, Denmark.

Roc, T., **K. M. Thyng**, & D. Conley (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., & **K. M. Thyng** (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

Martin T. Sherman, Reginald Blaylock, Kelly Lucas, Mark E. Capron, Jim R. Stewart, Steven F. DiMarco, **Kristen Thyng**, Robert Hetland, MH Kim, Corey Sullivan, Zach Moscicki, Igor Tsukrov, M. Robinson Swift, Michael D. Chambers, Scott C. James, Maureen Brooks, Brian von Herzen, Anthony Jones, Don Piper (2018). SeaweedPaddock: Initial Modeling and Design for a Sargassum Ranch. *Proceedings of Oceans 18 Conference*, Charleston, NC, October 22–25.

Thyng, K. M. and M. Marta-Almeida (2017). "Texas Automated Buoy System," Renovated website for Texas General Land Office. `http://pong.tamu.edu/tabswebsite/`.

Thyng, K. M. (2015). cmocean: Beautiful colormaps for oceanography. `https://github.com/matplotlib/cmocean`.

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, R. Hetland, K. Whilden, N. Fernando, E. Turner, C. Schoenbaechler, S. Socolofsky. "Freshwater inflow to and around Galveston Bay due to Hurricane Harvey," Hurricane Harvey Research Sympo-

sium, Port Aransas, TX, August 23, 2018.

K. M. Thyng and M. Marta-Almeida, "Website for interacting with oceanographic data and numerical model output," SciPy Conference 2018, Austin, TX, July 12, 2018.

K. M. Thyng, "Along-coast connectivity in Texas and Louisiana," Ocean Sciences, Portland, OR, February 12–16, 2018.

K. M. Thyng, "Effective and Accurate Colormap Selection," American Geophysical Union (AGU) Fall Meeting, San Francisco, CA, December 15, 2016. ***(invited)***

K. M. Thyng, "Custom Colormaps for Your Field," PLOTCON, New York, New York, November 17, 2016. ***(invited)***

K. M. Thyng, "Shelf-bay-coast connectivity in the NW Gulf of Mexico," Physics of Estuaries and Coastal Seas (PECS), The Hague, The Netherlands, October 10, 2016.

K. M. Thyng and R. D. Hetland, "Submesoscale eddies increase particle transport and dispersion over the Texas-Louisiana shelf," Liege Colloquium, Liege, Belgium, May 27, 2016.

K. M. Thyng, S. W. Funke, T. Roc, "Tidal Farm Array Optimization: Dynamics, Engineering, and Environment," Ocean Sciences, New Orleans, LA, February 26, 2016.

K. M. Thyng and R. D. Hetland, "Transport on and across the Texas shelf," Department of Oceanography, Texas A&M University, College Station, TX, October 19, 2015.

K. M. Thyng and R. D. Hetland, "Transport on and across the Texas shelf," Department of Marine and Coastal Sciences, Rutgers University, New Brunswick, NJ, October 12, 2015. ***(invited)***

S. W. Funke, **K. M. Thyng**, T. Roc, "Standard methodology for tidal array project optimisation: An idealized study of the Minas Passage," 11th European Wave and Tidal Energy Conference, Nantes, France, September 9, 2015.

K. M. Thyng and R. D. Hetland, "Texas-Louisiana Shelf and Coast Connectivity," Lagrangian Analysis and Prediction of Coastal and Ocean Dynamics, Winter Harbor, ME, July 29, 2015.

K. M. Thyng, "Perceptual colormaps in matplotlib for oceanography," SciPy Conference 2015, Austin, TX, July 10, 2015.

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," Department of Geology, Texas A&M University, November 22, 2013.

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, "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.

Poster Presentations

* indicates student presenter

C. M. Morabito-Gonzalez*, **K. M. Thyng**, S.W. Funke, "Analysis of Hydrodynamic Impact Induced by Tidal Turbine Arrays," Ocean Sciences, Portland, OR, February 6–8, 2018.

K. M. Thyng, S. Socolofsky, K. Whilden, "Measuring Freshwater Exports from Galveston Bay after Hurricane Harvey," Ocean Sciences, Portland, OR, February 6–8, 2018.

K. M. Thyng, "Using Satellite Images to Characterize the Galveston Bay Tidal Plume," Gulf of Mexico Oil Spill & Ecosystem Science Conference (GoMOSES), New Orleans, LA, February 12–16, 2018.

L. Campbell, D. Henrichs, **K. M. Thyng**, "Expanding the Network of Imaging FlowCytobots for Early Warning of HABs," 9th US Symposium on Harmful Algae, Baltimore, MD, November 11–17, 2017.

K. M. Thyng, D. Feng, B. Hodges, "When does material exit Galveston Bay?," Gordon Research Conference: Coastal Ocean Dynamics, University of New England, June 11–16, 2017.

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 simulation," 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.

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

K. M. Thyng and J. J. Riley, 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.

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

K. M. Thyng and J. J. Riley, Numerical Modeling for Tidal Hydrokinetic Turbine Siting. 4th Annual INORE Symposium, Dartmouth, UK, May 9, 2010.

K. M. Thyng and J. J. Riley, Estuary Modeling for Tidal Energy in Puget Sound, WA. 3rd Annual INORE Symposium, Gent, Belgium, May 26, 2009.

Grants

Consortium for Simulation of Oil-Microbial Interactions in the Ocean (CSOMIO), Gulf of Mexico Research Institute, January 1, 2018–December 31, 2019. co-PIs: K. M. Thyng and R. D. Hetland at TAMU for $165,128; Florida State University is lead institution.

Measuring freshwater exports from Galveston Bay after Hurricane Harvey, NSF RAPID, October 15, 2017 – August 31, 2018, $134,964, PI: K. M. Thyng, co-PI: S. Socolofsky.

Improving Hydrodynamic Predictions of Surface Currents Near the Texas Coast Used for Rapid Oil Spill Response – Phase 5, Texas General Land Office, September 1, 2017 – August 31, 2019, $438,591, PI: R. D. Hetland, co-PI: K. M. Thyng.

Extending and Improving Texas Bay/Estuary Oil Spill Simulations, Texas General Land Office, September 1, 2017 – August 31, 2019, $463,738, PI: B. R. Hodges, co-PIs: S. A. Socolofsky, K. M. Thyng.

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.

Selected Other Conferences and Workshops Attended

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

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

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

Python for Geoscientists (OCNG 469/669), Spring 2018, undergrad/graduate class (21 students).

Python for Geoscientists (OCNG 469/669), Fall 2017, undergrad/graduate class, distance option (26 students).

Python for Geoscientists (OCNG 469/669), Fall 2016, undergrad/graduate class, distance option (10 students).

Python for Geoscientists (OCNG 489/689), Spring 2016, undergrad/graduate class (18 students).

Introduction to Oceanography (OCNG 251), Fall 2015, undergraduate class (68 students).

Introduction to Oceanography (OCNG 251), Spring 2015, undergraduate class (46 students).

University of Washington, Department of Mechanical Engineering

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

Mentoring

Chair

Xiliang Diao, PhD, Oceanography

Member

James Fiorendino, PhD, Oceanography

Undergraduate

REU Student: Molly Kerwick, Summer 2018.

REU Student: Cassidy Gonzalez-Morabito, Summer 2017.

Field Work

Cruises

Galveston Bay: R/V Trident, NSF RAPID, October 8, 2017 (included 1 graduate student)

Texas continental shelf: R/V Point Sur, NSF RAPID, September 27–29, 2017 (included 5 graduate and 3 undergraduate students)

Additional Field Opportunities for Students

Galveston Bay: R/V Trident, NSF RAPID, June 21, 2018 (2 graduate and 4 undergraduate students)

Galveston Bay: R/V Trident, NSF RAPID, April 29–30, 2018 (1 graduate and 2 undergraduate students)

Texas continental shelf: R/V Pelican, NSF RAPID, March 25–27, 2018 (included 4 graduate and 5 undergraduate students)

Galveston Bay: R/V Trident, NSF RAPID, November 12–13, 2017 (2 graduate students)

Texas continental shelf: R/V Point Sur, NSF RAPID, November 6–8, 2017 (included 5 graduate and 4 undergraduate students)

Honors & Awards

SciPy John Hunter Excellence in Plotting Competition 2015: Honorable mention.

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.

Service

Topic editor of Journal of Open Source Software, 2018–present.

Co-chair of Earth, Ocean and Geoscience mini-symposium and program committee member, SciPy conference, 2018.

Panel: "State of Diversity & Inclusion in the SciPy Community," SciPy conference, 2017.

Chair of Earth, Ocean and Geoscience mini-symposium, SciPy conference, 2017.

NSF Panel Reviewer, Division of Graduate Education, 2017.

Member of Program Committee, JupyterCon 2017.

Pen pal with young female student in mathematics (2016).

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

Co-chair for tutorials and on program committee, SciPy Conference 2014 and 2015.

Organizer and fund raiser for diversity event at SciPy conference, 2013 and 2014.

Math and Science Fair, Lockwood Elementary School, December 15, 2010 and March 15, 2011; Emerson Elementary School, June 8, 2010.

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

Referee: PLOSone; Nature Energy; PNAS; Geophysical Research Letters; Journal of Geophysical Research – Oceans; Ocean Modelling; GSA Today; Maryland Sea Grant; Estuaries & Coasts; EuroSciPy; Journal of Marine Science and Engineering; NSF: Division of Ocean Sciences; Ocean Dynamics; Arctic and Marine Oilspill Program (AMOP) Technical Seminar on Environmental Contamination and Response; Packt Publishing; International Conference on Ocean, Offshore and Arctic Engineering (OMAE); National Oceanic and Atmospheric Administration; European Wave and Tidal Energy Conference

Professional Activities

Member, American Geophysical Union (2010–Present); Society for Industrial and Applied Mathematics, (2008–2013); Association for the Sciences of Limnology and Oceanography (2012–2013); Institute of Electrical and Electronics Engineers (2010–2012).

Skills

Extensively used ROMS ocean modeling code, past use of SUNTANS ocean modeling code.

Expert in Python and LaTeX; skilled in FORTRAN and MatLab; proficient in C and PHP.

Extensive experience with Linux system administration, using a cluster, and parallel computing.

Experience with HTML and CSS.

Last updated: September 5, 2018