

Adrean Webb

CONTACT INFORMATION	The University of Tokyo Graduate School of Frontier Sciences Dept. of Ocean Technology, Policy, and Env. 5-1-5 Kashiwanoha Kashiwa, Chiba, 277-8563, Japan	<i>Phone:</i> +81 80-7724-6530 <i>E-mail:</i> adrean.webb@gmail.com <i>URL:</i> www.adreanwebb.com
RESEARCH INTERESTS	Mathematical modeling of geophysical flow and turbulence, nonlinear waves, numerical analysis, asymptotic analysis, climate change.	
EDUCATION	<p>Ph.D. Applied Mathematics, University of Colorado Boulder, Aug. 2013. Advisor: B. Fox-Kemper. Committee: M. Ablowitz, B. Fornberg, N. Flyer, K. Julien, and P. Sullivan. Dissertation Title: Stokes Drift and Meshless Wave Modeling.</p> <p>M.S. Applied Mathematics, University of New Hampshire, May 2007. Advisor: M. Shubov. Thesis Title: Mathematics of Carbon Nanotube Vibrations: An Eigenvalue Problem.</p> <p>B.S. Physics, University of Oklahoma, May 1998. <i>Attended Kings College (Aberdeen, Scotland) and Ritsumeikan University (Kyoto, Japan) in 1997 and 1995.</i></p>	
RESEARCH EXPERIENCE	<p>Project Researcher: Department of Ocean Technology, Policy, and Environment, The University of Tokyo (Kashiwa, Japan) under T. Waseda, Oct. 2014 – present. <i>A NEDO project to estimate the available wave energy resources for Japan (completed), and an ArCS project to forecast the Arctic wave field (current).</i></p> <p>Postdoctoral Research Scientist: Department of Ocean Sciences, Tokyo University of Marine Sciences and Technology (Tokyo, Japan) under H. Yamazaki, Aug. 2013 – Sept. 2014. <i>A multi-project appointment to model estuarine dynamics in Iwate, Japan.</i></p> <p>Research Assistant: Cooperative Institute for Research in the Environmental Sciences (CIRES), University of Colorado Boulder under B. Fox-Kemper, Jan. 2009 – Dec. 2012. <i>A NASA grant to model Langmuir turbulence on a global scale.</i></p> <p>Research Assistant: National Center for Atmospheric Research (Boulder, CO), July 2010. <i>Designed a student lab to use the MIT Integrated Global System Model for the IMAGE Theme of the Year, Summer Graduate School on Mathematics of Climate Change.</i></p> <p>Visiting Scholar: Institute for Pure and Applied Mathematics (IPAM), University of California, Los Angeles, March – June 2010. <i>Three-month program on model and data hierarchies for simulating and understanding climate.</i></p> <p>Research Assistant: CIRES, University of Colorado Boulder under B. Fox-Kemper, May – Dec. 2008. <i>A CIRES Innovative Research Grant to estimate the importance of Langmuir turbulence in global ocean models.</i></p>	
REFEREED PUBLICATIONS	<p>[R.1] L. Qing, B. Fox-Kemper, Ø. Breivik, and A. Webb, 2017. Statistical Models of Global Langmuir Mixing. <i>Ocean Modelling</i>, in press. URL http://dx.doi.org/10.1016/j.ocemod.2017.03.016.</p> <p>[R.2] A. Webb, T. Waseda, W. Fujimoto, K. Horiuchi, K. Kiyomatsu, K. Matsuda, Y. Miyazawa, S. Varlamov, and J. Yoshikawa, 2016. A High-Resolution, Wave and Current Resource Assessment of Japan: The Web GIS Dataset. <i>Proceedings of the 3rd Asian Wave and Tidal Energy Conference (AWTEC 2016)</i>. URL http://tinyurl.com/AAWEBB002</p>	

- [R.3] T. Waseda, A. Webb, K. Kiyomatsu, W. Fujimoto, Y. Miyazawa, S. Varlamov, K. Horiuchi, T. Fujiwara, T. Taniguchi, K. Matsuda, and J. Yoshikawa, 2016. Marine energy resource assessment at reconnaissance to feasibility study stages; wave power, ocean and tidal current power, and ocean temperature power (in Japanese). *Journal of the Japan Society of Naval Architects and Ocean Engineers*, **23**:189–198. URL <http://doi.org/10.2534/jjasnaoe.23.189>.
- [R.4] A. Webb and B. Fox-Kemper, 2015. Impacts of wave spreading and multi-directional waves on estimating Stokes drift. *Ocean Modelling*, **96**:49–64. URL <http://dx.doi.org/10.1016/j.ocemod.2014.12.007>.
- [R.5] Q. Li, A. Webb, B. Fox-Kemper, A. Craig, G. Danabasoglu, W.G. Large, and M. Vertenstein, 2015. Langmuir mixing effects on global climate: WAVE-WATCH III in CESM. *Ocean Modelling*, **103**:145–160. URL <http://dx.doi.org/10.1016/j.ocemod.2015.07.020>.
- [R.6] S. Haney, B. Fox-Kemper, K. Julien, and A. Webb, 2015. Symmetric and Geostrophic Instabilities in the Wave-Forced Ocean Mixed Layer. *Journal of Physical Oceanography*, **45**(12):3033–3056. URL <http://dx.doi.org/10.1175/JPO-D-15-0044.1>.
- [R.7] A. Webb and B. Fox-Kemper, 2011. Wave spectral moments and Stokes drift estimation. *Ocean Modelling*, **40**(3–4):273–288. URL <http://dx.doi.org/10.1016/j.ocemod.2011.08.007>.
- SUBMITTED PUBLICATIONS
- [S.1] W. Fujimoto, T. Waseda, and A. Webb, 2017. On Observed Freak Waves under Distinct Directional Spectra in Deep Water near Japan. *Journal of Physical Oceanography*.
- [S.2] M.S. Long, W.C. Keene, J. Zhang, B. Reichl, Y. Shi, T. Hara, J.S. Reid, B. Fox-Kemper, A.P. Craig, D.J. Erickson, I. Ginis, and A. Webb, 2015. Evaluation of Primary Marine Aerosol Production in the Community Atmosphere Model (CAM) Using A Prognostic Wind-Wave Model. *Journal of Geophysical Research: Atmospheres*.
- [S.3] K. Sasmal, E. Masunaga, A. Webb, O. Fringer, E. Gross, M. Rayson, and H. Yamazaki, 2015. A three dimensional numerical study of river plume mixing processes in Otsuchi Bay, Japan. *Journal of Oceanography*.
- PUBLICATIONS IN PROGRESS
- [P.1] A. Webb, N. Flyer, and B. Fox-Kemper, 2017. A meshless approach to global ocean surface wave modeling using RBF-generated finite differences. *Journal of Computational Physics*.
- [P.2] A. Webb, T. Waseda, and K. Kiyomatsu, 2017. A 21-year high-resolution wave resource assessment of Japan: Model setup and validation. *Ocean Dynamics*.
- OTHER PUBLICATIONS
- [O.1] A. Webb, 2013. Stokes Drift and Meshless Wave Modeling. *Ph.D. Thesis*, University of Colorado Boulder, 251 pages. URL <http://tinyurl.com/AAWEBB001>.
- HONORS AND AWARDS
- Outstanding Young Scientist Award: First Place**, 7th International Workshop on Modeling the Ocean (Canberra, Australia), **June 2015**.
- Best Presentation Award: Third Place**, 7th International Workshop on Modeling the Ocean (Canberra, Australia), **June 2015**.
- Outstanding Student Presentation Award**, 2012 Ocean Sciences Meeting (Salt Lake City, UT), **Feb. 2012**.
- GRANTS
- NSF Travel**, IPAM Workshop on Geophysical and Astrophysical Turbulence (Los

Angeles, CA), **Oct. 2014**.

CIRES, SIAM, and Departmental Travel, SIAM Conference on Mathematical and Computational Issues in the Geosciences (Padova, Italy), **June 2013**.

NSF Travel, IPAM Climate Modeling Reunion Conference (Lake Arrowhead, CA), **Dec. 2012**.

Department Travel, European Centre for Medium-Range Weather Forecasts Workshop on Ocean Waves (Reading, England), **June 2012**.

NSF Travel, IUGG Conference on Mathematical Geophysics (Edinburgh, Scotland), **June 2012**.

NSF Travel, IPAM Climate Modeling Reunion Conference (Lake Arrowhead, CA), **Dec. 2011**.

Department Travel, 12th International Workshop on Wave Hindcasting and Forecasting (Waikoloa, Hawaii), **Nov. 2011**.

NSF Funding, Model and Data Hierarchies for Simulating and Understanding Climate, IPAM (Los Angeles, CA), **March – June 2010**.

NSF Travel, 1st PRIMA Congress: Special Session on the Mathematics of Climate Change (Sydney, Australia), **July 2009**.

NSF Travel, SIAM Conference on Mathematical and Computational Issues in the Geosciences (Leipzig, Germany), **June 2009**.

NSF Funding, Climate Change Summer School, Mathematical Sciences Research Institute (Berkeley, CA), **July – Aug. 2008**.

NSF Travel, SIAM Minisymposia on Climate Change, Joint Mathematics Meeting (San Diego, CA), **Jan. 2008**.

SOFTWARE AND
TOOLBOXES

Stokes Drift MATLAB Toolbox: A complete set of Stokes drift functions for calculating depth-dependent and depth-integrated approximations. URL <http://www.mathworks.com/matlabcentral/fileexchange/48678-stokes-drift-for-directional-random-seas>.

SERVICE
EXPERIENCE

Seminar Coordinator: Long Program, IPAM (Los Angeles, CA), **March – May 2010**. *Organized weekly informal seminars for visiting scholars.*

REFEREE WORK

National Science Foundation Grant; Proceedings of the Royal Society A; Ocean Modelling; Coastal Engineering Journal; Journal of Waterway, Port, Coastal, and Ocean Engineering.

PRESENTATIONS
(SELECTED)

Oral (Invited): *A Meshless Numerical Approach to Spectral Wave Modeling*. ICERM Localized Kernel-Based Meshless Methods for Partial Differential Equations Workshop (Providence, RI), **Aug. 2017**.

Oral: *Ocean wave forecasting system for the Northern Sea Route*. Spring 2017 Meeting of JASNAOE (Tokyo, Japan), **May 2017**.

Oral: *Arctic wave field reanalysis and observation in 2016*. The 32nd International Symposium on Okhotsk Sea & Polar Oceans (Monbetsu, Japan), **Feb. 2016**.

Oral: *A High-Resolution, Wave and Current Resource Assessment of Japan: The Web GIS Dataset*. AWTEC 2016 (Singapore), **Oct. 2016**.

Oral: *A Wave and Current Resource Assessment of Japan: Web GIS Dataset*. Fall 2016 Meeting of the Oceanographic Society of Japan (Kagoshima, Japan),

Sept. 2016.

Oral (Invited): *A Meshless Numerical Approach to Spectral Wave Modeling.* Workshop on Theoretical and Computational Methods of Nonlinear Water Waves, Waseda University (Tokyo, Japan), **May 2016.**

Oral: *A 20-Year High-Resolution Wave Resource Assessment of Japan.* Spring 2016 Meeting of the Oceanographic Society of Japan (Tokyo, Japan), **Mar. 2016.**

Oral: *A 20-Year High-Resolution Wave Resource Assessment of Japan with Wave-Current Interactions.* 2016 Ocean Sciences Meeting (New Orleans, LA), **Feb. 2016.**

Oral: *Progress on a 20-Year High-Resolution Wave Resource Assessment of Japan.* International Workshop on Wave Hindcasting and Forecasting/Coastal Hazards Symposium (Key West, FL), **Nov. 2015.**

Oral: *Update on a 20-Year High-Resolution Wave Resource Assessment of Japan.* Fall 2015 Meeting of the Oceanographic Society of Japan (Ehime, Japan), **Sep. 2015.**

Oral (Invited): *The role of wave-current interactions in marine renewable energy near Japan.* Disaster Prevention Research Institute, Kyoto University (Kyoto, Japan), **July 2015.**

Oral: *The role of wave-current interactions in marine renewable energy near Japan.* 7th International Workshop on Modeling the Ocean (Canberra, Australia), **June 2015.**

Oral: *Progress on a 20-Year High-Resolution Wave Resource Assessment of Japan.* Spring 2015 Meeting of the Oceanographic Society of Japan (Tokyo, Japan), **Mar. 2015.**

Oral (Invited): *Meshless and Unstructured Wave Modeling.* Joint Wave Seminar: JAMSTEC and The University of Tokyo (Tokyo, Japan), **Apr. 2014.**

Oral: *A Meshless Approach to Global Ocean Wave Modeling.* 2014 Ocean Sciences Meeting (Honolulu, HI), **Feb. 2014.**

Oral: *Development of a Three-Dimensional SUNTANS Model of Ōtsuchi Bay, Japan.* Tokyo University of Marine Science and Technology (Tokyo, Japan), **Feb. 2014.**

Oral (Invited): *A Meshless Approach to Global Ocean Wave Modeling.* Disaster Prevention Research Institute, Kyoto University (Kyoto, Japan), **Oct. 2013.**

Poster: *A First Step Towards Modeling the Impact of the 2011 Tōhoku Earthquake and Tsunami on Internal Dynamics in Ōtsuchi Bay, Japan.* 6th CJK IMBER Symposium (Tokyo, Japan), **Oct. 2013.**

Oral: *A Meshless Approach to Ocean Wave Modeling.* SIAM Conference on Mathematical and Computational Issues in the Geosciences (Padova, Italy), **June 2013.**

Oral (Invited): *A Meshless Approach to Ocean Wave Modeling.* Lawrence Berkeley National Laboratory (Berkeley, CA), **April 2013.**

Oral: *Waves and Langmuir Mixing in Climate Models.* CESM Ocean Model Working Group Meeting, NCAR (Boulder, CO), **Jan. 2013.**

Oral: *An Unstructured Approach to Ocean Wave Modeling.* Frontiers in Computational Physics: Modeling the Earth System (Boulder, CO), **Dec. 2012.**

Oral: *An Unstructured Approach to Ocean Wave-Generation Modeling.* IPAM Climate Modeling Reunion Conference (Lake Arrowhead, CA), **Dec. 2012.**

Poster: *An Unstructured Approach to Surface Ocean Wave Modeling.* CIRES' 45th Anniversary Celebration, University of Colorado Boulder, **Sept. 2012.**

Poster: *An Unstructured Approach to Surface Ocean Wave Modeling.* UGG Conference on Mathematical Geophysics (Edinburgh, Scotland), **June 2012.**

Poster: *Global Stokes Drift and Climate Wave Modeling.* CIRES Science Rendezvous, University of Colorado Boulder, **April 2012.**

Oral: *Global Stokes Drift and Climate Wave Modeling.* 2012 Ocean Sciences Meeting (Salt Lake City, UT), **Feb. 2012.**

Oral: *Global Stokes Drift and Climate Wave Modeling.* CIRES Graduate Student Seminar Series, University of Colorado Boulder, **Feb. 2012.**

Oral: *Global Stokes Drift and Climate Wave Modeling.* IPAM Climate Modeling Reunion Conference (Lake Arrowhead, CA), **Dec. 2011.**

Oral: *Global Stokes Drift and Climate Wave Modeling.* Applied Mathematics Dynamical Systems Seminar, University of Colorado Boulder, **Dec. 2011.**

Poster: *Global Stokes Drift and Climate Wave Modeling.* 12th International Workshop on Wave Hindcasting and Forecasting (Waikoloa, Hawaii), **Nov. 2011.**

Oral: *Impacts of Wind-Wave Interaction on Climate.* Graduate Student SIAM Chapter, University of Colorado Boulder, **April 2011.**

Oral: *Preliminary Linear Stability Analysis of Langmuir Circulation with Aligned and Misaligned Wind-Wave Components.* IPAM Climate Modeling Culminating Workshop (Lake Arrowhead, CA), **June 2010.**

Oral: *Demonstrated Sensitivity to Langmuir Mixing in a Global Climate Model (CCSM).* IPAM Long Program Seminar (Los Angeles, CA), **May 2010.**

Oral: *Demonstrated Sensitivity to Langmuir Mixing in a Global Climate Model (CCSM).* 2010 Ocean Sciences Meeting (Portland, OR), **Feb. 2010.**

Oral: *Wave Modeling and Langmuir Mixing.* CCSM Ocean Model Working Group, NCAR (Boulder, CO), **Dec. 2009.**

Poster: *Windrows in global models: Does Langmuir mixing matter for climate?* ATOC Poster Conference, University of Colorado Boulder, **Nov. 2009.**

Poster: *Global Model Sensitivity to Parameterizing Langmuir Circulation.* CIRES Science Rendezvous, University of Colorado Boulder, **April 2009.**

Poster: *Global Model Sensitivity to Parameterizing Langmuir Circulation.* ESSL Advisory Poster Session, NCAR (Boulder, CO), **Nov. 2008.**

Oral (Invited): *Mathematical Analysis of the SIR Model.* Department of Health and Human Services (Concord, NH), **April 2007.**

TEACHING
EXPERIENCE

Teaching Assistant: Department of Applied Mathematics, University of Colorado Boulder. Calculus II (**Spring 2013**).

Instructor: Department of Applied Mathematics, University of Colorado Boulder. Calculus II Workgroup (**Fall 2008**).

Teaching Assistant: Department of Applied Mathematics, University of Colorado Boulder. Calculus II (**Summer & Fall 2008**), Differential Equations (**Spring 2008**), Calculus III (**Fall 2007**).

Instructor: Department of Mathematics, University of New Hampshire. Calculus II (**Summer 2007**), online course in Pre-Calculus (**Summer 2006**), Pre-Calculus (**Spring 2006**).

Teaching Assistant: Department of Mathematics, University of New Hampshire. Calculus II (**Spring 2007**), Calculus I (**Fall 2006**), Finite Mathematics (**Fall 2005**).

Instructor: Kyoto City Board of Education (Kyoto, Japan), **April 2002 – Mar. 2005**. *Responsible for improving the English communicative skills of eight junior high schools.*

Instructor: GEOS (Kansai & Chubu, Japan), **April 2000 – April 2002**. *Regional English instructor at two private schools.*

PROFESSIONAL
EXPERIENCE

System Analyst: MCI WorldCom/EDS Communications (Tulsa, OK), **April 1998 – April 2000**. *Migrated mainframe software for business expansion into local markets.*

PROFESSIONAL
ASSOCIATIONS

Society for Industrial and Applied Mathematics (**2007 – present**); American Geophysical Union (**2009 – present**); Oceanographic Society of Japan (**2015 – present**); Japan Society for Industrial and Applied Mathematics (**2016 – present**).

LANGUAGES

Japanese (JLPT N3 level certification), C, Fortran, Mathematica, Matlab, Python, UNIX.