

Adrean Webb

CONTACT INFORMATION	Kyoto University Disaster Prevention Research Institute Maritime Disaster Section Gokasho, Uji, Kyoto, 611-0011, Japan	<i>Phone:</i> (+81) 0774-38-4141 <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, and 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 Assistant Professor: Disaster Prevention Research Institute (DPRI), Maritime Disaster Section, Kyoto University (Kyoto, Japan), Sept. 2017 – present. <i>A Tougou project to investigate waves and storm surges in a coupled climate system on long time scales.</i></p> <p>Project Researcher: Department of Ocean Technology, Policy, and Environment, The University of Tokyo (Kashiwa, Japan) under T. Waseda, Oct. 2014 – Aug. 2017. <i>A NEDO project to estimate the available wave energy resources for Japan and an ArCS project to forecast the Arctic wave field.</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 JOURNAL PUBLICATIONS	<p>[R.1] T. Waseda, A. Webb, K. Sato, J. Inoue, A. Kohout, B. Penrose, and S. Penrose, 2018. Correlated increase of high ocean waves and winds in the ice-free waters of the Arctic Ocean. <i>Scientific Reports</i>, in press.</p> <p>[R.2] K. Sasmal, E. Masunaga, A. Webb, O. Fringer, E. Gross, M. Rayson, and H. Yamazaki, 2018. A three dimensional numerical study of river plume mixing processes in Otsuchi Bay, Japan. <i>Journal of Oceanography</i>, 74(2):169–186. URL</p>	

<https://doi.org/10.1007/s10872-017-0446-9>.

[R.3] L. **Qing**, B. **Fox-Kemper**, Ø. **Breivik**, and A. **Webb**, 2017. Statistical models of global Langmuir mixing. *Ocean Modelling*, **113**:95–114. URL <http://dx.doi.org/10.1016/j.ocemod.2017.03.016>.

[R.4] 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.5] 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.6] Q. **Li**, A. **Webb**, B. **Fox-Kemper**, A. **Craig**, G. **Danabasoglu**, W.G. **Large**, and M. **Vertenstein**, 2015. Langmuir mixing effects on global climate: WAVEWATCH III in CESM. *Ocean Modelling*, **103**:145–160. URL <http://dx.doi.org/10.1016/j.ocemod.2015.07.020>.

[R.7] 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.8] A. **Webb** and B. **Fox-Kemper**, 2011. Wave spectral moments and Stokes drift estimation. *Ocean Modelling*, **40**(3):273–288. URL <http://dx.doi.org/10.1016/j.ocemod.2011.08.007>.

REFEREED
CONFERENCE
PUBLICATIONS

[C.1] T. **Waseda**, A. **Webb**, K. **Sato**, J. **Inoue**, A. **Kohout**, B. **Penrose**, and S. **Penrose**, 2017. Arctic Wave Observation by Drifting Type Wave Buoys in 2016. *The 27th International Ocean and Polar Engineering Conference, International Society of Offshore and Polar Engineers*. URL <https://www.onepetro.org/conference-paper/ISOPE-I-17-569>.

[C.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. *Proceedings of the 3rd Asian Wave and Tidal Energy Conference (AWTEC 2016)*. URL <http://tinyurl.com/AAWEBB002>.

OTHER
PUBLICATIONS

[O.1] Q. **Li**, B. **Fox-Kemper**, and A. **Webb**, 2017. WAVEWATCH III in CESM and Langmuir mixing. *POP2 Reference Manual Addendum*, LANL Tech Note LAUR-10-018253, in press. URL <http://tinyurl.com/AAWEBB003>.

[O.2] A. **Webb**, 2013. Stokes Drift and Meshless Wave Modeling. *Ph.D. Thesis*, University of Colorado Boulder, 251 pages. URL <http://tinyurl.com/AAWEBB001>.

SUBMITTED
PUBLICATIONS

[S.1] T. **Nose**, A. **Webb**, and T. **Waseda**, 2018. Predictability of storm wave heights in the ice-free Beaufort and Chukchi Seas. *Ocean Dynamics*.

[S.2] W. **Fujimoto**, T. **Waseda**, and A. **Webb**, 2018. Impact of the four-wave quasi-resonance to freak wave shapes in the ocean. *Ocean Dynamics*.

[S.3] Y. **Kita**, T. **Waseda**, and A. **Webb**, 2018. Development of Waves under Explosive Cyclones in the Northwestern Pacific. *Ocean Dynamics*.

[S.4] T. **Waseda**, T. **Nose**, and A. **Webb**, 2018. Comparison of long-term trends of the largest waves in the ice-free Arctic waters from different reanalysis products. *Proceedings of the ASME 2018 37th International Conference on Ocean, Offshore and Arctic Engineering (OMAE2018)*.

- [S.5] 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*.
- PUBLICATIONS IN PROGRESS [P.1] A. **Webb**, N. **Flyer**, and B. **Fox-Kemper**, 2018. RBF-FD method for a multiple scale system: global ocean surface waves. *Journal of Computational Physics*.
- [P.2] A. **Webb**, T. **Waseda**, and K. **Kiyomatsu**, 2018. A High-Resolution, Long-Term Wave Resource Assessment of Japan with Wave-Current Effects. *Applied Energy*.
- [P.3] H. **Tamura**, A. **Webb**, T. **Waseda**, T. **Fujiki**, K. **Kawaguchi**, and D. **Ambe**, 2018. Interannual variability of ocean swell spreading in the Kuroshio. *Coastal Engineering Journal*.
- 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 **ICERM Travel**, ICERM Workshop on Localized Kernel-Based Meshless Methods for Partial Differential Equations (Providence, RI), **Aug. 2017**.
- 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; Geophysical Research Letters; Ocean Modelling; Coastal Engineering Journal; Journal of Waterway, Port, Coastal, and Ocean Engineering; Conference Proceedings (AWTEC2016).

PRESENTATIONS
(SELECTED)

Oral: *A High-Resolution Wave Climate Projection for the Coastal Northwestern Atlantic*. DPRI Annual Meeting 2018, Kyoto University (Kyoto, Japan), **Feb. 2018**.

Oral (Invited): *A Meshless Approach to Spectral Wave Modeling*. Civil and Construction Engineering Seminar, Oregon State University (Corvallis, OR), **Feb. 2018**.

Oral: *A Meshless Approach to Spectral Wave Modeling*. Workshop on Mathematical Aspects and Applications of Nonlinear Wave Phenomena, Research Institute of Mathematical Sciences (Kyoto, Japan), **Oct. 2017**.

Poster: *First steps toward a wave forecasting system for the Northern Sea Route*. International Workshop on Wave Hindcasting and Forecasting/Coastal Hazards Symposium (Liverpool, UK), **Sept. 2017**.

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: *Arctic wave field model analysis and observation in 2016*. 9th International Workshop on Modeling the Ocean (Seoul, Korea), **July 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. 2017**.

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: *Impacts of wave spreading and multidirectional waves on estimating Stokes drift.* Joint Wave Seminar: JAMSTEC and The University of Tokyo (Tokyo, Japan), **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), **Sept. 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 – 2016**); Japan Society for Industrial and Applied Mathematics (**2016 – present**).

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