# Adrean A. Webb

*Curriculum Vitae*


**Contact Information**

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**Research Interests**

Ocean wave dynamics, coastal hazards, climate change, numerical modeling, and meshless methods.

**Education**

**Ph.D. Applied Mathematics**, University of Colorado Boulder, **Aug 2013**. Advisors: B. Fox-Kemper and K. Julien.

**M.S. Applied Mathematics**, University of New Hampshire, **May 2007**.

**B.S. Physics**, University of Oklahoma, **May 1998**. *Also attended King's College (Aberdeen, Scotland) in 1997 and Ritsumeikan University (Kyoto, Japan) in 1995.*

**Academic Positions**

**Associate Professor (Specially-Appointed):** Institute of Science Tokyo/Tokyo Institute of Technology (Tokyo, Japan), Department of Physics, **Apr 2022–present**.

**Associate Professor (Specially-Appointed):** Kyoto University (Kyoto, Japan), Disaster Prevention Research Institute (DPRI), Coastal Disaster Research Section, **Apr 2020–Mar 2022**.

**Assistant Professor (Specially-Appointed):** Kyoto University (Kyoto, Japan), DPRI, Coastal Disaster Research Section, **Sep 2017–Mar 2020**.

**Scientist (Specially-Appointed):** The University of Tokyo (Tokyo, Japan), Department of Ocean Technology, Policy, and Environment, **Oct 2014–Aug 2017**.

**Postdoctoral Fellow:** Tokyo University of Marine Sciences and Technology (Tokyo, Japan), Department of Ocean Sciences under H. Yamazaki, **Aug 2013–Sep 2014**.

**Research Assistant:** University of Colorado Boulder, Cooperative Institute for Research in the Environmental Sciences (CIRES) under B. Fox-Kemper, **May 2008–Dec 2012**.

**Non-Academic Positions**

**Instructor:** Kyoto City Board of Education (Kyoto, Japan), **Apr 2002–Mar 2005**.

**Instructor:** GEOS (Kansai & Chubu, Japan), **Apr 2000–Mar 2002**.

**Systems Analyst:** MCI WorldCom/EDS Communications (Tulsa, OK), **Apr 1998–Mar 2000**.

**Visiting Positions**

**Visiting Scientist:** University of Chicago (Chicago, IL), Institute for Mathematical and Statistical Innovation, *Confronting Global Climate Change*, **Sep 2022**.

**Visiting Scientist:** University of California Santa Barbara (Santa Barbara, CA), Kavli Institute for Theoretical Physics, *Planetary Boundary Layers in Atmospheres, Oceans, and Ice on Earth and Moons*, **Jun 2018**.

**Visiting Scientist:** University of California Los Angeles (Los Angeles, CA), Institute for Pure and Applied Mathematics (IPAM), *Model and Data Hierarchies for Simulating and Understanding Climate*, **Mar–Jun 2010, Dec 2011, Dec 2012**.

**Visiting Teaching Assistant:** National Center for Atmospheric Research (NCAR; Boulder, CO), Institute for Mathematics Applied to Geosciences (IMAGe), *NCAR Summer Graduate School on Mathematics of Climate Change*, **Jul 2010**.

## Refereed Journal Publications

[R.1] L. Erikson, J. Morim, M. Hemer, I. Young, X.L. Wang, L. Mentaschi, N. Mori, A. Semedo, J. Stopa, V. Grigorieva, S. Gulev, O. Aarnes, J.-R. Bidlot, O. Breivik, L. Bricheno, T. Shimura, M. Menendez, M. Markina, V. Sharmar, C. Trenham, J. Wolf, C. Appendini, S. Caires, N. Groll, & A. Webb **(2022)**. Global ocean wave fields show consistent regional trends between 1980 and 2014 in a multi-product ensemble. *Communications Earth & Environment*, *3*, Article 320. https://doi.org/10.1038/s43247-022-00654-9.

[R.2] S. Mori, T. Shimura, T. Miyashita, A. Webb, & N. Mori **(2022)**. Future changes in extreme storm surge based on a maximum potential storm surge model for East Asia. *Coastal Engineering Journal*, *64*:630–647. https://doi.org/10.1080/21664250.2022.2145682.

[R.3] I. Odériz, N. Mori, T. Shimura, A. Webb, R. Silva, & T.R. Mortlock **(2022)**. Transitional wave climate regions on continental and polar coasts in a warming world. *Nature Climate Change*, *12*:662–671. https://doi.org/10.1038/s41558-022-01389-3.

[R.4] I. Odériz, R. Silva, T.R. Mortlock, N. Mori, T. Shimura, A. Webb, R. Padilla-Hernandez, & S. Villers **(2021)**. Natural variability and warming signals in global ocean wave climates. *Geophysical Research Letters*, *48*, Article e2021GL093622. https://doi.org/10.1029/2021GL093622.

[R.5] N. Mori, T. Takemi, Y. Tachikawa, H. Tatano, T. Shimura, T. Tanaka, T. Fujimi, Y. Osakada, A. Webb, & E. Nakakita **(2021)**. Recent nationwide climate change impact assessments of natural hazards in Japan and East Asia. *Weather and Climate Extremes*, *32*(100309)1–23. https://doi.org/10.1016/j.wace.2021.100309.

[R.6] T. Waseda, T. Nose, T. Kodaira, K. Sasmal, & A. Webb **(2020)**. Climatic trends of extreme wave events caused by Arctic Cyclones in the western Arctic Ocean. *Polar Science*, *27*(100625)1–16. https://doi.org/10.1016/j.polar.2020.100625.

[R.7] K. Sasmal, T. Waseda, A. Webb, S. Miyajima, & K. Nakano **(2020)**. Assessment of wave energy resources and their associated uncertainties for two coastal areas in Japan. *Journal of Marine Science and Technology*, *26*:917–930. https://doi.org/10.1007/s00773-020-00781-y.

[R.8] A. Webb, T. Waseda, & K. Kiyomatsu **(2020)**. A High-Resolution, Long-Term Wave Resource Assessment of Japan with Wave-Current Effects. *Renewable Energy*, *161*:1341–1358. https://doi.org/10.1016/j.renene.2020.05.030.

[R.9] J. Morim, M. Hemer, X.L. Wang, N. Cartwright, C. Trenham, A. Semedo, I. Young, L. Bricheno, P. Camus, M. Casas-Prat, L. Erikson, L. Mentaschi, N. Mori, T. Shimura, B. Timmerman, O. Aarnes, Ø. Breivik, A. Behrens, M. Dobrynin, M. Menendez, J. Staneva, M. Wehner, J. Wolf, B. Kamranzad, A. Webb, J. Stopa, & F. Andutta **(2019)**. Robustness and uncertainties in global multivariate wind-wave climate projections. *Nature Climate Change*, *9*:711–718. https://doi.org/10.1038/s41558-019-0542-5.

[R.10] N. Mori, T. Yasuda, T. Arikawa, T. Kataoka, S. Nakajo, K. Suzuki, Y. Yamanaka, A. Webb, & 2018 Typhoon Jebi Coastal Disaster Survey Team **(2019)**. 2018 Typhoon Jebi Post-Event Survey of Coastal Damage in the Kansai Region, Japan. *Coastal Engineering Journal*, *61*(3):278–294. https://doi.org/10.1080/21664250.2019.1619253.

[R.11] W. Fujimoto, T. Waseda, & A. Webb **(2018)**. Impact of the four-wave quasi-resonance to freak wave shapes in the ocean. *Ocean Dynamics*, *69*(1):101–121. https://doi.org/10.1007/s10236-018-1234-9.

[R.12] Y. Kita, T. Waseda, & A. Webb **(2018)**. Development of waves under explosive cyclones in the Northwestern Pacific. *Ocean Dynamics*, *68*(10):1403–1418. https://doi.org/10.1007/s10236-018-1195-z.

[R.13] T. Nose, A. Webb, T. Waseda, J. Inoue, & K. Sato **(2018)**. Predictability of storm wave heights in the ice-free Beaufort Sea. *Ocean Dynamics*, *68*(10):1383–1402. https://doi.org/10.1007/s10236-018-1194-0.

[R.14] T. Waseda, A. Webb, K. Sato, J. Inoue, A. Kohout, B. Penrose, & S. Penrose **(2018)**. Correlated Increase of High Ocean Waves and Winds in the Ice-Free Waters of the Arctic Ocean. *Scientific Reports*, *8*(4489):1–9. https://doi.org/10.1038/s41598-018-22500-9.

[R.15] K. Sasmal, E. Masunaga, A. Webb, O. Fringer, E. Gross, M. Rayson, & H. Yamazaki **(2018)**. A three-dimensional numerical study of river plume mixing processes in Otsuchi Bay, Japan. *Journal of Oceanography*, *74*(2):169–186. https://doi.org/10.1007/s10872-017-0446-9.

[R.16] Q. Li, B. Fox-Kemper, Ø. Breivik, & A. Webb **(2017)**. Statistical models of global Langmuir mixing. *Ocean Modelling*, *113*:95–114. https://doi.org/10.1016/j.ocemod.2017.03.016.

[R.17] Q. Li, A. Webb, B. Fox-Kemper, A. Craig, G. Danabasoglu, W.G. Large, & M. Vertenstein **(2016)**. Langmuir mixing effects on global climate: WAVEWATCH III in CESM. *Ocean Modelling*, *103*:145–160. https://doi.org/10.1016/j.ocemod.2015.07.020.

[R.18] S. Haney, B. Fox-Kemper, K. Julien, & A. Webb **(2015)**. Symmetric and Geostrophic Instabilities in the Wave-Forced Ocean Mixed Layer. *Journal of Physical Oceanography*, *45*(12):3033–3056. https://doi.org/10.1175/JPO-D-15-0044.1.

[R.19] A. Webb & B. Fox-Kemper **(2015)**. Impacts of wave spreading and multi-directional waves on estimating Stokes drift. *Ocean Modelling*, *96*:49–64. https://doi.org/10.1016/j.ocemod.2014.12.007.

[R.20] A. Webb & B. Fox-Kemper **(2011)**. Wave spectral moments and Stokes drift estimation. *Ocean Modelling*, *40*(3–4):273–288. https://doi.org/10.1016/j.ocemod.2011.08.007.

Refereed Journal Publications (Japanese Academic Journals)

[R.21] T. Okada, T. Shimura, N. Mori, T. Miyashita, A. Webb, & R. Mizuta **(2022)**. Assessment of the impact of climate change on typhoons using a slab-ocean coupled atmospheric global circulation model with month fixed event attribution experiments. *Journal of Japan Society of Civil Engineers, Ser. B2 (Coastal Engineering)*, *78*(2) (in Japanese). https://doi.org/10.2208/kaigan.78.2_I_955.

[R.22] T. Okada, T. Shimura, A. Webb, T. Miyashita, N. Mori, & R. Mizuta **(2021)**. Development of coupled atmospheric-slab ocean model, global climate model and climate change impacts on tropical cyclones. *Journal of Japan Society of Civil Engineers, Ser. B2 (Coastal Engineering)*, *77*(2) (in Japanese). https://doi.org/10.2208/kaigan.77.2_I_961.

[R.23] A. Sabunas, N. Mori, N. Fukui, T. Shimura, T. Miyashita, & A. Webb **(2021)**. Assessing the social impacts of compound effects on projected storm surge and sea level rise in Viti Levu, Fiji. *Journal of Japan Society of Civil Engineers, Ser. B2 (Coastal Engineering)*, *77*(2). https://doi.org/10.2208/kaigan.77.2_I_943.

[R.24] Y. Araki, T. Yasuda, A. Webb, & N. Mori **(2020)**. Statistical prediction of storm surge height time series by convolutional neural network and its long-term projection. *Journal of Japan Society of Civil Engineers, Ser. B2 (Coastal Engineering)*, *76*(2):1093–1098 (in Japanese). https://doi.org/10.2208/kaigan.76.2_I_1093.

[R.25] A. Webb, T. Shimura, & N. Mori **(2019)**. Global Tropical Cyclone Track Detection and Analysis of the d4PDF Mega-ensemble Projection. *Journal of Japan Society of Civil Engineers, Ser. B2 (Coastal Engineering)*, *75*(2):1207–1212. https://doi.org/10.2208/kaigan.75.I_1207.

[R.26] A. Webb, T. Shimura, & N. Mori **(2018)**. A High-Resolution Future Wave Climate Projection for the Coastal Northwestern Atlantic. *Journal of Japan Society of Civil Engineers, Ser. B2 (Coastal Engineering)*, *74*(2):1345–1350. https://doi.org/10.2208/kaigan.74.I_1345.

[R.27] T. Waseda, A. Webb, K. Kiyomatsu, W. Fujimoto, Y. Miyazawa, S. Varlamov, K. Horiuchi, T. Fujiwara, T. Taniguchi, K. Matsuda, & J. Yoshikawa **(2016)**. Marine energy resource assessment at reconnaissance to feasibility study stages; wave power, ocean and tidal current power, and ocean temperature power. *Journal of the Japan Society of Naval Architects and Ocean Engineers*, *23*:189–198 (in Japanese). https://doi.org/10.2534/jjasnaoe.23.189.

## Refereed Conference Publications (Selected)

[R.28] S. Nakajo, K. Sooyoul, N. Mori, A. Webb, & T. Yasuda **(2023)**. Assessment of Uncertainty in Estimating Future Extreme Storm Surge Events in Osaka Bay Using Large Ensemble Typhoon Data. *Coastal Engineering Proceedings, 37*(155). https://doi.org/10.9753/icce.v37.management.155.

[R.29] K. Sasmal, T. Waseda, A. Webb, & A. Ribal **(2018)**. Assessment of a Wave Hindcast and a Wave Forecast System for Kozushima Island. *Proceedings of the Japan Society of Naval Architects and Ocean Engineers*, *27*:269–272. https://doi.org/10.14856/conf.27.0_269.

[R.30] K. Sasmal, A. Webb, T. Waseda, & S. Miyajima **(2018)**. Wave energy resource assessment: A comparative study for two coastal areas in Japan. *Advances in Renewable Energies Offshore: Proceedings of the 3rd International Conference on Renewable Energies Offshore (RENEW 2018)*:67–71. CRC Press. https://www.crcpress.com/Advances-in-Renewable-Energies-Offshore-Proceedings-of-the-3rd-International/Soares/p/book/9781138585355.

[R.31] T. Waseda, T. Nose, & A. Webb **(2018)**. Comparison of the Long-Term Trends of the Largest Waves in the Ice-Free Arctic Waters from Different Reanalysis Products. *ASME 2018 37th International Conference on Ocean, Offshore and Arctic Engineering; Vol. 3: Structures, Safety, and Reliability.* https://doi.org/10.1115/OMAE2018-77971.

[R.32] T. Waseda, A. Webb, K. Sato, J. Inoue, A. Kohout, B. Penrose, & S. Penrose **(2017)**. Arctic Wave Observation by Drifting Type Wave Buoys in 2016. *Proceedings of the International Offshore and Polar Engineering Conference, (2017)*:16–20. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85038896140&partnerID=40&md5=a7145051b81587c884118159836d1926.

[R.33] A. Webb, T. Waseda, W. Fujimoto, K. Horiuchi, K. Kiyomatsu, K. Matsuda, Y. Miyazawa, S. Varlamov, & 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).* http://tinyurl.com/AAWEBB002.

## Other Publications

[R.34] T. Mortlock, A. Webb, I. Odériz, N. Mori, R. Silva, & T. Shimura **(2022)**. Climate-fuelled wave patterns pose an erosion risk for developing countries. *The Conversation*, 16 June 2022. Also appears in *Phys.org, Maritime Executive, and others.* https://theconversation.com/climate-fuelled-wave-patterns-pose-an-erosion-risk-for-developing-countries-184064.

[R.35] M. Hemer, X.L. Wang, A. Webb, & COWCLIP contributors **(2018)**. Report of the 2018 Meeting for the WCRP-JCOMM Coordinated Ocean Wave Climate Project (COWCLIP), Paris, 21-23 May, 2018. *JCOMM Technical Report*, *92*. https://tinyurl.com/AAWEBB004.

[R.36] A. Webb **(2013)**. Stokes Drift and Meshless Wave Modeling. *Ph.D. Thesis*, University of Colorado Boulder, 251 pages. http://tinyurl.com/AAWEBB001.

## Datasets, Software, & Toolboxes

**Dataset:** Tropical cyclone track dataset created from the "Database for Policy Decision making for Future climate change (d4PDF)". Kyoto University, **Aug 2019**. `http://www.coast.dpri.kyoto-u.ac.jp/english/?page_id=1760`.

**Interactive Dataset:** Led development of "Web GIS Dataset: A High-Resolution, Wave and Current Resource Assessment of Japan". The University of Tokyo, **Oct 2016**. `http://www.todaiww3.k.u-tokyo.ac.jp/nedo_p/en/`.

**Dataset:** Contributing author of the "Monthly mean enhancement factor climatology for langmuir mixing parameterization" dataset. Brown University Library, **Oct 2016**. `https://doi.org/10.7301/Z0348H86`.

**MATLAB Toolbox:** Complete set of Stokes drift functions for calculating depth-dependent and depth-integrated approximations, **Dec 2014**. `http://www.mathworks.com/matlabcentral/fileexchange/48678-stokes-drift-for-directional-random-seas`.

## Grants

**PI:** Kakenhi Grant-in-Aid for Scientific Research (C) by Ministry of Education, Culture, Sports, Science and Technology (MEXT) and Japan Society for the Promotion of Science (JSPS), **Apr 2025–Mar 2028**. *Quantifying future coastal hazards in Japan and East Asia from storm waves generated during extreme tropical cyclone events*, 4.6M JPY.

**PI:** Kakenhi Grant-in-Aid for Early-Career Scientists by Ministry of Education, Culture, Sports, Science and Technology (MEXT) and Japan Society for the Promotion of Science (JSPS), **Apr 2020–Mar 2025**. *Urban shoreline amplification of storm surge during extreme tropical cyclones: Current and future flood risks*, 4.3M JPY.

**PI:** Education Enhancement Cycle Grant by Tokyo Institute of Technology, **Sep 2022–Mar 2024**. *Student-centered mini-lessons to help students master difficult introductory Physics topics*, 1M JPY.

**Co-PI** with J. Behrens, N. Mori, and A. Chabchoub: Kyoto University-Universität Hamburg Funding Program, **Sep 2021–Mar 2022**. *Joining Forces in Modeling and Assessment of Coastal Hazard Intensification Due to Climate Change*, 4000 EUR.

## Awards

**Treatise Encouragement Award**: Y. Araki, M. Yasuda, A. Webb, & N. Mori. In *65th Coastal Engineering Lectures*. Japan Society of Civil Engineers, **Oct 2020**.

**Outstanding Young Scientist Award: First Place**. In *7th IWMO*. International Workshop on Modeling the Ocean (Canberra, Australia), **Jun 2015**.

**Best Presentation Award: Third Place**. In *7th IWMO*. International Workshop on Modeling the Ocean (Canberra, Australia), **Jun 2015**.

**Outstanding Student Presentation Award**. In *TOS/ALSO/AGU 2012 Ocean Sciences Meeting*. American Geophysical Union (Salt Lake City, UT), **Feb 2012**.

## Supported Travel

[1] *Confronting Global Climate Change*, Institute for Mathematical and Statistical Innovation, University of Chicago (Chicago, IL), **Sep 2022**. [2] *Planetary Boundary Layers in Atmospheres, Oceans, and Ice on Earth and Moons*. Kavli Institute for Theoretical Physics, University of California Santa Barbara (Santa Barbara, CA), **Jun 2018**. [3] *Localized Kernel-Based Meshless Methods for Partial Differential Equations*. Institute for Computational and Experimental Research in Mathematics, Brown University (Providence, RI), **Aug 2017**. [4] *IPAM Workshop on Geophysical and Astrophysical Turbulence*, Institute for Pure and Applied Mathematics, University of California Los Angeles (Los Angeles, CA), **Oct 2014**. [5] *SIAM Conference on Mathematical and Computational Issues in the Geosciences*, Society for Industrial and Applied Mathematics (Padova, Italy), **Jun 2013**. [6] *IPAM Climate Modeling Reunion Conference*, Institute for Pure and Applied Mathematics, University of California Los Angeles (Lake Arrowhead, CA), **Dec 2012**. [7] *ECMWF Workshop on*

*Ocean Waves*, European Centre for Medium-Range Weather Forecasts (Reading, England), **Jun 2012**. [8] *IUGG Conference on Mathematical Geophysics*, International Union of Geodesy and Geophysics (Edinburgh, Scotland), **Jun 2012**. [9] *IPAM Climate Modeling Reunion Conference*, Institute for Pure and Applied Mathematics, University of California Los Angeles (Lake Arrowhead, CA), **Dec 2011**. [10] *12th Wave Workshop*, International Waves Workshop (Waikoloa, Hawaii), **Nov 2011**. [11] *Model and Data Hierarchies for Simulating and Understanding Climate*. Institute for Pure and Applied Mathematics, University of California Los Angeles (Los Angeles, CA), **Mar–Jun 2010**. [12] *1st PRIMA Congress: Special Session on the Mathematics of Climate Change*, Pacific Rim Mathematical Association (Sydney, Australia), **Jul 2009**. [13] *SIAM Conference on Mathematical and Computational Issues in the Geosciences*, Society for Industrial and Applied Mathematics (Leipzig, Germany), **Jun 2009**. [14] *MSRI Climate Change Summer School*. Mathematical Sciences Research Institute (Berkeley, CA), **Jul–Aug 2008**. [15] *Climate Program at Joint Mathematics Meeting*, American Mathematical Society (San Diego, CA), **Jan 2008**.

## Invited Presentations (Selected)

[1] Detection and Analysis of Tropical Cyclones Within the D4PDF Mega-Ensemble Projection. In *Atmosphere-Climate Seminar*. Argonne National Laboratory (Lemont, IL), **Sep 2022**.

[2] Detection and Analysis of Tropical Cyclones Within the D4PDF Mega-Ensemble Projection. In *ARCC2021*. International Workshop on Adaptation Research for Climate Change in Asia (Virtual), **Nov 2021**.

[3] Detection and Analysis of Tropical Cyclones and Associated Coastal Extreme Waves Within the D4PDF Mega-Ensemble Projection. In *AOGS 18th Annual Meeting*. Asia Oceania Geosciences Society (Virtual), **Aug 2021**.

[4] Future Nearshore Wave Climate Projection for the Northwestern Atlantic. In *CASPO Seminar*. Scripps Institution of Oceanography, University of California San Diego (San Diego, CA), **Feb 2020**.

[5] Projected Changes in Ocean Wave Climate. In *Session 7: Climate*. Kyoto University-Universität Hamburg Symposium, Kyoto University (Kyoto, Japan), **Oct 2018**.

[6] A Meshless Approach to Spectral Wave Modeling. In *Coastal Seminar*. Department of Civil and Construction Engineering, Oregon State University (Corvallis, OR), **Feb 2018**.

[7] A Meshless Numerical Approach to Spectral Wave Modeling (supported). In *Localized Kernel-Based Meshless Methods for Partial Differential Equations*. Institute for Computational and Experimental Research in Mathematics, Brown University (Providence, RI), **Aug 2017**.

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

[9] The role of wave-current interactions in marine renewable energy near Japan (supported). In *Coastal Disaster Research Seminar*. DPRI, Kyoto University (Kyoto, Japan), **Jul 2015**.

[10] Meshless and Unstructured Wave Modeling. In *Joint Wave Seminar*. JAMSTEC and The University of Tokyo (Tokyo, Japan), **Apr 2014**.

[11] A Meshless Approach to Global Ocean Wave Modeling (supported). In *Coastal Disaster Research Seminar*. DPRI, Kyoto University (Kyoto, Japan), **Oct 2013**.

[12] A Meshless Approach to Ocean Wave Modeling (supported). In *Brownbag Seminar*. Lawrence Berkeley National Laboratory Seminar (Berkeley, CA), **Apr 2013**.

[13] Waves and Langmuir Mixing in Climate Models. *CESM Ocean Model Working Group Meeting*, National Center for Atmospheric Research (Boulder, CO), **Jan 2013**.

[14] An Unstructured Approach to Ocean Wave-Generation Modeling. *IPAM Climate Modeling Reunion Conference*, Institute for Pure and Applied Mathematics, University of California Los Angeles (Lake Arrowhead, CA), **Dec 2012**.

[15] Global Stokes Drift and Climate Wave Modeling. *IPAM Climate Modeling Reunion Conference*, Institute for Pure and Applied Mathematics, University of California Los Angeles (Lake Arrowhead, CA), **Dec 2011**.

[16] Preliminary Linear Stability Analysis of Langmuir Circulation with Aligned and Misaligned Wind-Wave Components. *IPAM Climate Modeling Culminating Workshop*, Institute for Pure and Applied Mathematics, University of California Los Angeles (Lake Arrowhead, CA), **Jun 2010**.

[17] Demonstrated Sensitivity to Langmuir Mixing in a Global Climate Model (CCSM). *IPAM Long Program Seminar*. Institute for Pure and Applied Mathematics, University of California Los Angeles (Los Angeles, CA), **May 2010**.

## Contributed Presentations (Selected)

[18] *Workshop on Meshless Methods and Modeling Natural Hazards*. DPRI, Kyoto University (Kyoto, Japan), **May 2024**.

[19] *Climate Model Evaluation and Uncertainty Workshop* (poster), Institute for Mathematical and Statistical Innovation, University of Chicago (Chicago, IL), **Sep 2022**.

[20] *68th Coastal Engineering Lectures*, Japan Society of Civil Engineers (Virtual), **Nov 2021**.

[21] *JpGU 2021*, Japan Geoscience Union Meeting (Virtual), **Jun 2021**.

[22] *Global Tropical Cyclones & Ocean Waves Meeting*, Coordinated Ocean Wave Climate Project (Virtual), **Jun 2021**.

[23] *2021 COWCLIP Workshop*, Coordinated Ocean Wave Climate Project (Virtual), **May 2021**.

[24] *TOS/ALSO/AGU 2020 Ocean Sciences Meeting* (poster), American Geophysical Union (San Diego, CA), **Feb 2020**.

[25] *2nd International Workshop on Waves, Storm Surges and Coastal Hazards*, International Waves Workshop (Melbourne, Australia), **Nov 2019**.

[26] *66th Coastal Engineering Lectures*, Japan Society of Civil Engineers (Kagoshima, Japan), **Oct 2019**.

[27] *JpGU Meeting 2019*, Japan Geoscience Union (Chiba, Japan), **May 2019**.

[28] *WISE 2019 Meeting* (poster), Waves In Shallow Environments (Jyozankei, Japan), **May 2019**.

[29] *65th Coastal Engineering Lectures*, Japan Society of Civil Engineers (Tottori, Japan), **Nov 2018**.

[30] *AOGS 15th Annual Meeting*, Asia Oceania Geosciences Society (Honolulu, HI), **Jun 2018**.

[31] *2018 COWCLIP Workshop*, Coordinated Ocean Wave Climate Project (Paris, France), **May 2018**.

[32] *Mathematical Aspects and Applications of Nonlinear Wave Phenomena Workshop*. Research Institute of Mathematical Sciences, Kyoto University (Kyoto, Japan), **Oct 2017**.

[33] *1st International Workshop on Waves, Storm Surges and Coastal Hazards* (poster), International Waves Workshop (Liverpool, UK), **Sep 2017**.

[34] *9th IWMO*, International Workshop on Modeling the Ocean (Seoul, Korea), **Jul 2017**.

[35] *Spring 2017 Meeting*, Japan Society of Naval Architects and Ocean Engineers (Tokyo, Japan), **May 2017**.

[36] *32nd International Symposium on Okhotsk Sea & Polar Oceans*, Okhotsk Sea and Cold Ocean Research Association (Monbetsu, Japan), **Feb 2017**.

[37] *AWTEC 2016*, Asian Wave and Tidal Energy Conference (Singapore), **Oct 2016**.

[38] *Fall 2016 Meeting*, Oceanographic Society of Japan (Kagoshima, Japan), **Sep 2016**.

[39] *Spring 2016 Meeting*, Oceanographic Society of Japan (Tokyo, Japan), **Mar 2016**.

[40] *TOS/ALSO/AGU 2016 Ocean Sciences Meeting*, American Geophysical Union (New Orleans, LA), **Feb 2016**.

[41] *14th Wave Workshop*, International Waves Workshop (Key West, FL), **Nov 2015**.

[42] *Fall 2015 Meeting*, Oceanographic Society of Japan (Ehime, Japan), **Sep 2015**.

[43] *7th IWMO*, International Workshop on Modeling the Ocean (Canberra, Australia), **Jun 2015**.

[44] *Spring 2015 Meeting*, Oceanographic Society of Japan (Tokyo, Japan), **Mar 2015**.

[45] *TOS/ALSO/AGU 2014 Ocean Sciences Meeting*, American Geophysical Union (Honolulu, Hi), **Feb 2014**.

[46] *6th CJK IMBER Symposium* (poster), Integrated Marine Biosphere Research (Tokyo, Japan), **Oct 2013**.

[47] *SIAM Conference on Mathematical and Computational Issues in the Geosciences*, Society for Industrial and Applied Mathematics (Padova, Italy), **Jun 2013**.

[48] *Frontiers in Computational Physics: Modeling the Earth System*, Journal of Computational Physics (Boulder, CO), **Dec 2012**.

[49] *IUGG Conference on Mathematical Geophysics* (poster), International Union of Geodesy and Geophysics (Edinburgh, Scotland), **Jun 2012**.

[50] *TOS/ALSO/AGU 2012 Ocean Sciences Meeting*. American Geophysical Union (Salt Lake City, UT), **Feb 2012**.

[51] *12th Wave Workshop* (poster), International Waves Workshop (Waikoloa, Hawaii), **Nov 2011**.

[52] *AGU 2010 Ocean Sciences Meeting*, American Geophysical Union (Portland, OR), **Feb 2010**.

## Department Presentations (Selected)

[53] *DPRI Annual Meeting*, DPRI, Kyoto University (Kyoto, Japan), **Feb 2022**.

[54] *Joint Meeting*, SI-CAT and Tougou-CD Programs, Ministry of Education, Culture, Sports, Science, and Technology (Kyoto, Japan), **Jan 2020**.

[55] *Tougou-D Research Meeting*, Tougou Program, Ministry of Education, Culture, Sports, Science, and Technology (Kyoto, Japan), **Jul 2019**.

[56] *DPRI Annual Meeting*, DPRI, Kyoto University (Kyoto, Japan), **Feb 2019**.

[57] *Joint Meeting*, SI-CAT and Tougou-CD Programs, Ministry of Education, Culture, Sports, Science, and Technology (Tokyo, Japan), **Jan 2019**.

[58] *DPRI Annual Meeting*, DPRI, Kyoto University (Kyoto, Japan), **Feb 2018**.

[59] *OTPE Seminar*, Department of Ocean Technology, Policy, and Environment, The University of Tokyo (Kashiwa, Japan), **Jul 2017**.

[60] *ArCS 2nd Plenary Meeting*, Arctic Challenge for Sustainability, Ministry of Education, Culture, Sports, Science and Technology (Kanagawa, Japan) **Mar 2017**.

[61] *ArCS Kickoff Meeting*, Arctic Challenge for Sustainability, Ministry of Education, Culture, Sports, Science and Technology (Kanagawa, Japan) **Apr 2016**.

[62] *Joint Wave Seminar*, JAMSTEC and The University of Tokyo (Tokyo, Japan), **Nov 2015**.

[63] *NEDO Joint Meeting*, New Energy and Industrial Technology Development Organization (Tokyo, Japan) **Jul 2015**.

[64] *NEDO Meeting*, New Energy and Industrial Technology Development Organization (Tokyo, Japan) **Feb 2015**.

[65] *SUNTANS Symposium*, Department of Ocean Sciences, Tokyo University of Marine Science and Technology (Tokyo, Japan), **Feb 2014**.

[66] *CIRES' 45th Anniversary Celebration* (poster), Cooperative Institute for Research in the Environmental Sciences, University of Colorado Boulder (Boulder, CO), **Sep 2012**.

[67] *CIRES Science Rendezvous* (poster), Cooperative Institute for Research in the Environmental Sciences, University of Colorado Boulder (Boulder, CO), **Apr 2012**.

[68] *CIRES Graduate Student Seminar Series*, Cooperative Institute for Research in the Environmental Sciences, University of Colorado Boulder (Boulder, CO), **Feb 2012**.

[69] *Dynamical Systems Seminar*, Department of Applied Mathematics, University of Colorado Boulder (Boulder, CO), **Dec 2011**.

[70] *SIAM Graduate Student Chapter*, Department of Applied Mathematics, University of Colorado Boulder (Boulder, CO), **Apr 2011**.

## Service Experience

**Review Editor:** Editorial board member of Coastal and Offshore Engineering, Frontiers in Built Environment, **Jan 2021–Present**.

**Website Administrator:** Coordinated Ocean Wave Climate Project, **Nov 2017–Present**. `https://cowclip.org/`.

**Workshop Proposer & Organizer:** *Workshop on Meshless Methods and Modeling Natural Hazards*. DPRI, Kyoto University (Kyoto, Japan), **May 2024**.

**Session Proposer:** Waves, Storm Surges, and Related Hazards. Japan Geoscience Union Meeting, *JpGU 2022–2023*, **Nov 2021–2022**.

**Workshop Organizer:** Local committee member and session chair of *International Workshop on Adaptation Research for Climate Change in Asia (ARCC2021)*, **Oct–Nov 2021**.

**Conference Session Moderator:** Wave Modeling, virtual International Conference on Coastal Engineering (vICCE), **Oct 2020**.

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

## Referee Work

**Grants:** National Science Foundation Grant. **Journals:** Coastal Engineering Journal; Geoscientific Model Development; Geophysical Research Letters; Journal of Advances in Modeling Earth Systems; Journal of Climate; Journal of Geophysical Research: Oceans; Journal of Marine Science and Technology; Journal of Physical Oceanography; Journal of Waterway, Port, Coastal, and Ocean Engineering; Ocean

Modelling; Physics of Fluids; Proceedings of the Royal Society A.; Scientific Advances
**Proceedings:** Asian Wave and Tidal Energy Conference (2016).

## Media Coverage (Selected)

**Nature Climate Change:** Cover issue, **Sep 2019**. https://www.nature.com/nclimate/volumes/9/issues/9.

**NHK News:** Typhoon Jebi flood survey (in Japanese), **Sep 2018**. https://www3.nhk.or.jp/kansai-news/20180907/0007008.html

**Asahi Newspaper:** Typhoon Jebi flood survey (in Japanese), **Sep 2018**. https://www.asahi.com/articles/ASL975DWFL97PLBJ005.html?iref=pc_photo_gallery_bottom

## Additional Training

**Summer Workshop:** National Center for Atmospheric Research (Boulder, CO), *Community Atmosphere Model*, **Jul 2009**.

**Graduate Summer School:** Mathematical Sciences Research Institute (MSRI; Berkeley, CA), *MSRI Climate Change Summer School*, **Jul–Aug 2008**.

## Advising

**PhD Students:** A. Sabunas, **2018–2021**.

**Masters Students:** H. Koike, **2019–2021**.

**Undergraduate Students:** S. Watanabe, **2016**; N. Yugo, **2016**; D. Lechner (IAESTE Internship), **2016**; J.F. Dietz (IAESTE Internship), **2015**.

## Teaching Experience (Postdoctoral)

**Instructor:** Department of Physics, Institute of Science Tokyo. Advanced Writing in Physics (grad; **Fall 2022, 2024**), Basic Writing in Physics (grad; **Fall 2022–2025**), Fundamentals of Electromagnetism (**Fall 2022–2025**), Fundamentals of Mechanics (**Spring 2022–2025**).

**Course Supervisor:** Department of Physics, Institute of Science Tokyo. Exercises in Physics II (**Fall 2022–2025**), Exercises in Physics I (**Spring 2022-2025**).

## Teaching Experience (Predoctoral)

**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 (**Spring 2013, Summer 2008, Fall 2008**), Calculus III (**Fall 2007**), Differential Equations (**Spring 2008**).

**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 I (**Fall 2006**), Calculus II (**Spring 2007**), Finite Mathematics (**Fall 2005**).

## Professional Associations

Society for Industrial and Applied Mathematics (**2007–2017, 2019–2025**); American Geophysical Union (**2010–2016, 2018–2025**); Amercain Association of Physics Teachers (**2023–2025**); Japan Society for Industrial and Applied Mathematics (**2016–2017**); Oceanographic Society of Japan (**2015–2016**).

## Languages

English, Japanese (JLPT N3 level certification), C, FORTRAN, HTML, Julia, LaTeX, Mathematica, MATLAB, Python, UNIX.