

## Curriculum Vitae

### Tetsu Hara

Professor  
Graduate School of Oceanography  
University of Rhode Island  
Narragansett, RI 02882

### Professional Preparation

University of Tokyo, Civil Eng., B.Eng. 1983  
University of Tokyo, Civil Eng., M.Eng. 1986  
Massachusetts Institute of Technology, Civil Eng., Ph.D. 1990  
Woods Hole Oceanographic Institution, Applied Ocean Physics and Engineering, Postdoctoral Scholar/Investigator, 1990-1992

### Appointments

2003-present: Professor, Graduate School of Oceanography, University of Rhode Island  
1997-2003: Associate Professor, Graduate School of Oceanography, University of Rhode Island  
1992-1997: Assistant Professor, Graduate School of Oceanography, University of Rhode Island

### Synergistic Activities (broader impact of my professional and scholarly activities)

I served as an editor of Journal of Atmospheric and Oceanic Technology from 2016 to 2022.

I served as an associate editor of Journal of Geophysical Research (Oceans) from 1996 to 1998.

I served on American Meteorological Society Air-Sea Interaction Committee from 2010 to 2016.

I have developed a new graduate level course entitled "Air-Sea Interaction", which covers air-sea fluxes, surface wave dynamics, near surface turbulence, and other related topics. I have developed a new undergraduate/graduate level course entitled "Ocean waves and storm surge modeling".

Our research group has developed a variety of novel numerical techniques in fluid dynamics and a variety of software to process ocean surface gravity wave data and near surface turbulence data.

Our research group has contributed to the development of software and hardware of a scanning laser slope gauge that measures the spectrum of ocean surface short wind waves.

### Individuals I served as Thesis Advisor or Postgraduate-Scholar Sponsor

Austen Blair, Xuanyu Chen (U. Colorado), Yalin Fan (Naval Research Lab.), Kurt Hanson, Nyla Husain, Christian Janssen (U. Hamburg), Andrey Karachintsev, Tobias Kukulka (U. Delaware), Yackar Mauzole, Il-Ju Moon (Jeju U., Korea), Brandon Reichl (NOAA Geophysical Fluid Dynamics Laboratory), Nicholas Scott (Riverside Research), Qingtao Song (Key Laboratory of Space Ocean Remote Sensing and Application, China), Michael Sutherland, Nobuhiro Suzuki (Helmholtz-Zentrum Geesthacht, Germany), Cheng-An Tung, Mete Uz (NSF), Eric VanInwegen, Hua Wei, Xiaohui Zhou (Princeton), Dmitry Zuykov.

### Bibliography

Key:

J = Articles in Professional Journals (refereed)

C = Papers in Conference Proceedings (refereed)

B = Book and Book Sections

P = Popular Articles

O = Other

T = Thesis

Underlined key = Papers by students and staff resulting from work completed at my direction

## 2022

J Zhou, X., T. Hara, I. Ginis, E. D'Asaro, J-Y. Hsu, and B. G. Reichl, 2022: Drag Coefficient and Its Sea State Dependence under Tropical Cyclones. *J. Phys. Oceanogr.* 52(7); <https://doi.org/10.1175/JPO-D-21-0246.1>

J Husain, N. T., T. Hara, and P. P. Sullivan, 2022: Wind Turbulence over Misaligned Surface Waves and Air–Sea Momentum Flux. Part I: Waves Following and Opposing Wind. *J. Phys. Oceanogr.* 52(1); <https://doi.org/10.1175/JPO-D-21-0043.1>

J Husain, N. T., T. Hara, and P. P. Sullivan, 2022: Wind Turbulence over Misaligned Surface Waves and Air–Sea Momentum Flux. Part II: Waves in Oblique Wind. *J. Phys. Oceanogr.* 52(1); <https://doi.org/10.1175/JPO-D-21-0044.1>

J Kouhi, S., M. R. Hashemi, M. Spaulding, and T. Hara, 2022: Modeling the impact of sea level rise on maximum water elevation during storm surge events: a closer look at coastal embayments. *Climate Change*, 171:31; <https://doi.org/10.1007/s10584-022-03342-x>

## 2020

J Chen, X., T. Hara, and I. Ginis, 2020: Impact of Shoaling Ocean Surface Waves on Wind Stress and Drag Coefficient in Coastal Waters: Part I Uniform Wind. *J. Geophys. Res. (Oceans)*. <https://doi.org/10.1029/2020JC016222>

J Chen, X., I. Ginis, and T. Hara, 2020: Impact of Shoaling Ocean Surface Waves on Wind Stress and Drag Coefficient in Coastal Waters: Part II Tropical Cyclones. *J. Geophys. Res. (Oceans)*. <https://doi.org/10.1029/2020JC016223>

## 2019

J Husain, N., T. Hara, M. Buckley, K. Yousefi, F. Veron, and P. Sullivan, 2019: Boundary layer turbulence over surface waves in a strongly forced condition: LES and observation. *J. Phys. Oceanogr.* 49(8); <https://doi.org/10.1175/JPO-D-19-0070.1>

J Wang, D., T. Kukulka, B. G. Reichl, T. Hara, I. Ginis, 2019: Wind-Wave Misalignment Effects on Langmuir Turbulence in Tropical Cyclones Conditions. *J. Phys. Oceanogr.* 49(10); <https://doi.org/10.1175/JPO-D-19-0093.1>

J Li, Q. et al., 2019: Comparing Ocean Surface Boundary Vertical Mixing Schemes Including Langmuir Turbulence; *Journal of Advances in Modeling Earth Systems*; <https://doi.org/10.1029/2019MS001810>

## 2018

J Bigdeli, A., T. Hara, B. Loose, and A. T. Nguyen, 2018: Wave Attenuation and Gas Exchange Velocity in Marginal Sea Ice Zone. *Journal of Geophysical Research: Oceans*, 123. <https://doi.org/10.1002/2017JC013380>

**J** Wang, D., T. Kukulka, B. G. Reichl, T. Hara, I. Ginis, P. Sullivan, 2018: Interaction of Langmuir turbulence and inertial currents in the ocean surface boundary layer under tropical cyclones. *J. Phys. Oceanogr.*, 48(9); <https://doi.org/10.1175/JPO-D-17-0258.1>

**J** Chen, X., I. Ginis, and T. Hara, 2018: Sensitivity of Offshore Tropical Cyclone Wave Simulations to Spatial Resolution in Wave Models. *J. Mar. Sci. Eng.*, 6(4), 116; <https://doi.org/10.3390/jmse6040116>

## 2017

**J** Blair, A., Ginis, I., Hara, T., & Ulhorn, E., 2017: Impact of Langmuir turbulence on upper ocean response to Hurricane Edouard: Model and observations. *Journal of Geophysical Research: Oceans*, 122. <https://doi.org/10.1002/2017JC012956>

## 2016

**J** Reichl, B. G., D. Wang, T. Hara, I. Ginis, and T. Kukulka, 2016: Langmuir Turbulence Parameterization in Tropical Cyclone Conditions. *J. Phys. Oceanogr.*, 46, 863-886.

**J** Reichl, B. G., I. Ginis, T. Hara, B. Thomas, T. Kukulka, and D. Wang, 2016: Impact of Sea-State-Dependent Langmuir Turbulence on the Ocean Response to a Tropical Cyclone. *Monthly Weather Review*, 144, 4569-4590.

## 2015

**J** Rabe, T. J., T. Kukulka, I. Ginis, T. Hara, B. Reichl, E. D'Asaro, R. R. Harcourt, P.P. Sullivan, 2015: Langmuir Turbulence Under Hurricane Gustav (2008). *J. Phys. Oceanogr.*, 45, 657-677.

**J** Hara, T. and P. P. Sullivan, 2015: Wave Boundary Layer Turbulence over Surface Waves in a Strongly Forced Condition. *J. Phys. Oceanogr.*, 45, 868-883.

**J** Banari, A., Y. Mauzole, T. Hara, S. T. Grilli, and C. F. Janssen, 2015: The simulation of turbulent particle-laden channel flow by the Lattice Boltzmann method. *International Journal for Numerical Methods in Fluids*, Published online in Wiley Online Library ([wileyonlinelibrary.com](http://wileyonlinelibrary.com)). DOI: 10.1002/fld.4058.

## 2014

**J** Reichl, B. R., T. Hara, and I. Ginis, 2014: Sea state dependence of the wind stress over the ocean under hurricane winds. *J. Geophys. Res.*, 119, 30-51.

**J** Suzuki, N., T. Hara, and P. P. Sullivan, 2014: Impact of Dominant Breaking Waves on Air-Sea Momentum Exchange and Boundary Layer Turbulence at High Winds. *J. Phys. Oceanogr.*, 44, 1195-1212.

## 2013

**J** Suzuki, N., T. Hara, and P. P. Sullivan, 2013: Impact of Breaking Wave Form Drag on Near-Surface Turbulence and Drag Coefficient over Young Seas at High Winds. *J. Phys. Oceanogr.*, 43, 324-343.

## 2011

**J** Suzuki, N., T. Hara, and P. P. Sullivan, 2011: Turbulent airflow at young sea states with frequent wave breaking events: large eddy simulation. *J. Atmos. Sci.*, 68, 1290-1305.

## 2010

**J** Fan, Y., I. Ginis, T. Hara, and I. J. Moon, 2010: Momentum Flux Budget Across Air-sea Interface under Uniform and Tropical Cyclone Winds. *J. Phys. Oceanogr.*, 40, 2221–2242.

**J** Bogucki, D., M. Carr, W.M. Drennan, P. Woiceshyn, T. Hara, and M. Schmeltz, 2010: Preliminary and novel estimates of CO<sub>2</sub> gas transfer using a satellite scatterometer during the 2001 GasEx experiment. *Int. J. Remote Sensing*, 31, 75-92.

**J** Kukulka, T., T. Hara, L. Wu, 2010: Computations of wind wave coupling, *Ann. of Diff. Eqs.*, 26(3), 322-331.

## 2009

**J** Fan, Y., I. Ginis, and T. Hara, 2009: The Effect of Wind-Wave-Current Interaction on Air-Sea Momentum Fluxes and Ocean Response in Tropical Cyclones. *J. Phys. Oceanogr.*, 39, 1019–1034.

**J** Fan, Y., I. Ginis, T. Hara, C. W. Wright, and E. J. Walsh, 2009: Numerical simulations and observations of surface wave fields under an extreme tropical cyclone. *J. Phys. Oceanogr.*, 39, 2097–2116.

## 2008

**J** Moon, I. J., I. Ginis, and T. Hara, 2008. Impact of the Reduced Drag Coefficient on Ocean Wave Modeling under Hurricane Conditions, *Monthly Weather Review*, 136, 1224-1234.

**J** Kukulka, T., and T. Hara, 2008: The effect of breaking waves on a coupled model of wind and ocean surface waves. Part I: Mature seas, *J. Phys. Oceanogr.*, 38, 2145-2163.

**J** Kukulka, T., and T. Hara, 2008: The effect of breaking waves on a coupled model of wind and ocean surface waves. Part II: Growing seas, *J. Phys. Oceanogr.*, 38, 2164-2184.

## 2007

**J** Kukulka, T., T. Hara, and S. E. Belcher, 2007. A model of the air-sea momentum flux and breaking-wave distribution for strongly forced wind waves, *J. Phys. Oceanogr.*, 37, 1811-1828.

**J** Moon, I. J., I. Ginis, T. Hara, and B. Thomas, 2007. A Physics-Based Parameterization of Air–Sea Momentum Flux at High Wind Speeds and Its Impact on Hurricane Intensity Predictions, *Monthly Weather Review*, 135, 2869-2878.

**C** Hara, T., E. VanInwegen, J. Wendelbo, C. Garbe, U. Schimpf, B. Jaehne and N. Frew, 2007. “Estimation of air-sea gas and heat fluxes from infrared imagery based on near surface turbulence models”, in *Transport at the Air Sea Interface - Measurements, Models and*

*Parameterizations*, edited by Garbe, C.S., Handler, R.A., Jähne, B., Section 17, Springer Verlag (peer reviewed).

## 2006

J Song, Q., P. Cornillon, and T. Hara, 2006. Surface wind response to oceanic fronts, *J. Geophys. Res.*, 111, C12006, doi:10.1029/2006JC003680.

## 2005

J Kukulka T. and T. Hara, 2005. Momentum flux budget analysis of wind-driven air-water interfaces, *J. Geophys. Res.*, 110(C12020).

J Scott, N. V., T. Hara, E. J. Walsh, and P. Hwang, 2005. Observations of steep wave statistics in open ocean waters, *J. Atmos. Oceanic Tech.*, 22(3) 258-271.

J Scott, N. V., T. Hara, P. Hwang, and E. J. Walsh, 2005. Directionality and crest length statistics of steep waves in open ocean waters, *J. Atmos. Oceanic Tech.*, 22(3)272-281.

## 2004

J Song, Q., T. Hara, P. Cornillon, and C. A. Friehe, 2004. A comparison between observations and PSU/NCAR MM5 simulations of the marine atmospheric boundary layer across a temperature front. *J. Atmos. Oceanic Tech.*, 21(2), 170-178.

J Hara, T., and S. E. Belcher, 2004. Wind profile and drag coefficient over mature ocean surface wave spectra. *J. Phys. Oceanogr.*, 34(11), 2345-2358.

J Moon, I. J., T. Hara, I. Ginis, S. E. Belcher, and H. L. Tolman, 2004. Effect of surface waves on air-sea momentum exchange: I. Effect of mature and growing seas. *J. Atmos. Sci.*, 61(19), 2321-2333.

J Moon, I. J., I. Ginis, and T. Hara, 2004. Effect of waves on air-sea momentum exchange: II. Behavior of drag coefficient under tropical cyclones. *J. Atmos. Sci.*, 61(19), 2334-2348.

J Frew, N. M., E. J. Bock, U. Schimpf, T. Hara, H. Haussecker, J. B. Edson, W. R. McGillis, R. K. Nelson, S. P. McKenna, B. M. Uz, and B. Jaehne, 2004. Air-sea gas transfer: its dependence on wind stress, small-scale roughness and surface films, *J. Geophys. Res.*, 109(C8S17).

J Moon, I. J., I. Ginis, T. Hara, 2004. Effect of surface waves on Charnock coefficient under tropical cyclones. *Geophysical Research Letters*, 31(L20302).