

Ou Wang
Curriculum Vitae

Contact Information

Jet Propulsion Laboratory
California Institute of Technology
4800 Oak Grove Dr, M/S 300-323
Pasadena, CA 91109-8099
Phone: (818) 393-3204
Fax: (818) 393-6720
Email: Ou.Wang@jpl.nasa.gov

Research Interests

- Ocean state estimation through adjoint method and Kalman filter
- Adjoint sensitivity studies of ocean state
- Global and regional sea level change
- Large-scale ocean dynamics and thermodynamics

Education

- B.S., Physical Oceanography, Ocean University of China, China (1992)
- Ph.D., Physical Oceanography, Department of Oceanography, Texas A&M University (2002)

Professional Experience

- February 2007-Present: Technologist, Jet Propulsion Laboratory, California Institute of Technology
- June 2006-February 2007: Assistant Researcher, University of California, Los Angeles. Working at Jet Propulsion Laboratory as an affiliate.
- Postdoctoral Research Associate, Jet Propulsion Laboratory, California Institute of Technology, June 2003-June 2006. Research areas include El Nino related ocean variability using forward models and its adjoint, estimating meso-scale variability by data assimilation.
- Postdoctoral Research Associate, Texas A&M University, May 2002-June 2003. Studying ocean circulation in the Gulf of Mexico analytically and numerically.

Awards

- 2025 JPL Team Award
- 2024 JPL Voyager Award
- 2021 NASA Group Achievement Award
- 2020 JPL Voyager Award
- 2014 JPL Mariner Award

Peer Reviewed Publications

- Long, Xiaoyu, Matthew Newman, Sang-Ik Shin, Magdalena Balmeseda, John Callahan, Gregory Dusek, Liwei Jia, Benjamin Kirtman, John Krasting, Cameron C. Lee, Tong Lee, William Sweet, **Ou Wang**, Yan Wang, and Matthew J. Widlansky (2025).

Evaluating Current Statistical and Dynamical Forecasting Techniques for Seasonal Coastal Sea Level Prediction. *Journal of Climate*, 38, 1477-1503.
<https://doi.org/10.1175/JCLI-D-24-0214.1>

- Li, Jui-Lin F., Li-Chiao Wang, Kuan-Man Xu, Yu-Cian Tsai, Yu-Sung Huang, Wei-Liang Lee, Jonathan H. Jiang, **Ou Wang**, Jia-Yuh Yu, Graeme Stephens, Tzu-Yun Liu (2024). Exploring the Relationship Between Upper Ocean States and the Falling Ice Radiative Effects using ECCO Product and Global Climate Models. *Environmental Research Communications*, 6. <https://doi.org/10.1088/2515-7620/ad9c1d>
- Nakayama, Yoshihiro, Alena Malyarenko, Hong Zhang, **Ou Wang**, Matthias Auger, Yafei Nie, Ian Fenty, Matthew Mazloff, Armin Köhl, and Dimitris Menemenlis (2024). Evaluation of MITgcm-based ocean reanalyses for the Southern Ocean. *Geosci. Model Dev.*, 17, 8613–8638. <https://doi.org/10.5194/gmd-17-8613-2024>
- **Wang, Ou**, Tong Lee, Thomas Frederikse, Rui M. Ponte, Ian Fenty, Ichiro Fukumori, and Benjamin D. Hamlington (2024). What forcing mechanisms affect the interannual sea level co-variability between the Northeast and Southeast Coasts of the United States? *Journal of Geophysical Research: Oceans*, 129, e2023JC019873.
<https://doi.org/10.1029/2023JC019873>
- Piecuch, Christopher G., Ichiro Fukumori, Rui M. Ponte, Michael Schindelegger, **Ou Wang**, and Mengnan Zhao (2022). Low-Frequency Dynamic Ocean Response to Barometric-Pressure Loading. *Journal of Physical Oceanography*, 52, 2627-2641.
<https://doi.org/10.1175/JPO-D-22-0090.1>
- Frederikse, Thomas, Tong Lee, **Ou Wang**, Ben Kirtman, Emily Becker, Ben Hamlington, Daniel Limonadi, and Duane Waliser (2022). A hybrid dynamical approach for seasonal prediction of sea-level anomalies: A pilot study for Charleston, South Carolina. *Journal of Geophysical Research: Oceans*, 127, e2021JC018137.
<https://doi.org/10.1029/2021JC018137>
- **Wang, Ou**, Tong Lee, Christopher G. Piecuch, Ichiro Fukumori, Ian Fenty, Thomas Frederikse, Dimitris Menemenlis, Rui M. Ponte, and Hong Zhang (2022). Local and remote forcing of interannual sea-level variability at Nantucket Island. *Journal of Geophysical Research: Oceans*, 127, e2021JC018275.
<https://doi.org/10.1029/2021JC018275>
- Chandanpurkar, Hrishikesh A., Tong Lee, Xiaochun Wang, Hong Zhang, Severine Fournier, Ian Fenty, Ichiro Fukumori, Dimitris Menemenlis, Christopher G. Piecuch, John T. Reager, **Ou Wang**, John Worden (2022). Influence of nonseasonal river discharge on sea surface salinity and height. *J. Adv. Model. Earth Sys.*, 14, e2021MS002715. <https://doi.org/10.1029/2021MS002715>
- Fukumori, Ichiro, **Ou Wang**, and Ian Fenty (2021). Causal Mechanism of Beaufort Sea's Sea-level and Freshwater Content Change, *Journal of Physical Oceanography*, Vol. 51, Issue 10. <https://doi.org/10.1175/JPO-D-21-0069.1>
- Zhao, Mengnan, Rui M. Ponte, **Ou Wang**, and Rick Lumpkin (2021). Using Drifter Velocity Measurements to Assess and Constrain Coarse-Resolution Ocean Models, *Journal of Atmospheric and Oceanic Technology*, Vol. 38, Issue 4.
<https://doi.org/10.1175/JTECH-D-20-0159.1>
- Nakayama, Yoshihiro, Dimitris Menemenlis, **Ou Wang**, Hong Zhang, Ian Fenty, and An T. Nguyen (2021). Development of adjoint-based ocean state estimation for the Amundsen and Bellingshausen Seas and ice shelf cavities using MITgcm/ECCO,

Geoscientific Model Development, Vol. 15, Issue 8. <https://doi.org/10.5194/gmd-14-4909-2021>

- Severine, Fournier, Tong Lee, Xiaochun Wang, Thomas W. K. Armitage, **Ou Wang**, Ichiro Fukumori, Ron Kwok (2020). Sea Surface Salinity as a Proxy for Arctic Ocean Freshwater Changes, *Journal of Geophysical Research-Oceans*, Vol. 125, Issue 7, Article Number: e2020JC016110. <https://doi.org/10.1029/2020JC016110>
- Liu, Chao, Xinfeng Liang, Rui M. Ponte, Nadya Vinogradova, and **Ou Wang** (2019). Vertical redistribution of salt and layered changes in global ocean salinity, *Nature Communications*, Vol. 10, Article number 3445. <https://doi.org/10.1038/s41467-019-11436-x>
- Khazendar, Ala, Ian Fenty, Dustin Carroll, Alex Gardner, Craig M. Lee, Ichiro Fukumori, **Ou Wang**, Hong Zhang, Hélène Seroussi, Delwyn Moller, Brice P. Noël, Michiel R. den Broeke, Steven Dinardo, and Josh Willis (2019). Interruption of two decades of Jakobshavn Isbrae acceleration and thinning as regional ocean cools, *Nature Geoscience*, Vol. 10, Issue 4. <https://doi.org/10.1038/s41561-019-0329-3>
- Heimbach, Patrick and co-authors (incl. **Ou Wang**) (2019). Putting it all together: adding value to the global ocean and climate observing systems with complete self-consistent ocean state and parameter estimates. *Frontiers in Marine Science*, 6, UNSP 55. <https://doi.org/10.3389/fmars.2019.00055>
- Storto, Andrea and co-authors (incl. **Ou Wang**) (2017). Steric sea level variability (1993-2010) in an ensemble of ocean reanalyses and objective analyses, *Climate Dynamics*, Vol. 49, Issue 3, 709-729. <https://doi.org/10.1007/s00382-015-2554-9>
- Toyoda, Takahiro and co-authors (incl. **Ou Wang**) (2017). Intercomparison and validation of the mixed layer depth fields of global ocean syntheses, *Climate Dynamics*, Vol. 49, Issue 3, 753-773. <https://doi.org/10.1007/s00382-015-2637>
- Toyoda, Takahiro and co-authors (incl. **Ou Wang**) (2017). Interannual-decadal variability of wintertime mixed layer depths in the North Pacific detected by an ensemble of ocean syntheses, *Climate Dynamics*, Vol. 49, Issue 3, 891-907. <https://doi.org/10.1007/s00382-015-2762-3>
- Palmer, M. D. and co-authors (incl. **Ou Wang**) (2017). Ocean heat content variability and change in an ensemble of ocean reanalyses, *Climate Dynamics*, Vol. 49, Issue 3, 909-930. <https://doi.org/10.1007/s00382-015-2801-0>
- Takamitsu, Ito and **Ou Wang** (2017). Transit Time Distribution Based on the ECCO-JPL Ocean Data Assimilation, *Journal of Marine Systems*, Vol. 167, 1-10. <https://doi.org/10.1016/j.jmarsys.2016.10.015>
- Fukumori, Ichiro, **Ou Wang**, William Llovel, Ian Fenty, Gael Forget (2015). A near-uniform fluctuation of ocean bottom pressure and sea level across the deep ocean basins of the Arctic Ocean and the Nordic Seas. *Progress in Oceanography*, Vol. 134, 152-172. <https://doi.org/10.1016/j.pocean.2015.01.013>
- Piecuch, Christopher G., Ichiro Fukumori, Rui M. Ponte, **Ou Wang** (2015). Vertical Structure of Ocean Pressure Variations with Application to Satellite-Gravimetric Observations, *Journal of Atmospheric and Oceanic Technology*, Vol. 32, Issue 3, 603-613. <https://doi.org/10.1175/JTECH-D-14-00156.1>
- Balmaseda, M. A. and co-authors (incl. **Ou Wang**) (2015). The Ocean Reanalyses Intercomparison Project (ORA-IP), *Journal of Operational Oceanography*, Vol. 8, S80-S97. <https://doi.org/10.1080/1755876X.2015.1022329>

- Vinogradova, Nadya T., Rui M. Ponte, Ichiro Fukumori, **Ou Wang** (2014). Estimating satellite salinity errors for assimilation of Aquarius and SMOS data into climate models, *Journal of Geophysical Research-Oceans*, Vol. 119, Issue 8, 4732-4744. <https://doi.org/10.1002/2014JC009906>
- Fukumori, Ichiro and **Ou Wang** (2013). Origins of heat and freshwater anomalies underlying regional decadal sea level trends, *Geophysical Research Letter*, 40(3), 563-567. <https://doi.org/10.1002/grl.50164>
- Lee, Tong, William R. Hobbs, Joshua K. Willis, Daria Halkides, Ichiro Fukumori, Edward M. Armstrong, Akiko K. Hayashi, W. Timothy Liu, William Patzert, **Ou Wang** (2010). Record warming in the South Pacific and western Antarctica associated with the strong central-Pacific El Nino in 2009-10, *Geophysical Research Letters*, Vol. 37, L19704. <https://doi.org/10.1029/2010GL044865>
- Lee, Tong, **Ou Wang**, Wenqing Tang, W. Timothy Liu (2008). Wind stress measurements from the QuikSCAT-SeaWinds scatterometer tandem mission and the impact on an ocean model, *Journal of Geophysical Research-Oceans*, Vol. 113, Issue C12, C12019. <https://doi.org/10.1029/2008JC004855>
- **Wang, Ou**, Ichiro Fukumori, Tong Lee, Benny Cheng (2004). On the cause of Eastern equatorial Pacific Ocean T-S variations associated with El Nino, *Geophysical Research Letter*, Vol. 31, L15309. <https://doi.org/10.1029/2004GL020188>
- Reid, Robert O., and **Ou Wang** (2004). Bottom-trapped Rossby waves in an exponentially stratified ocean, *Journal of Physical Oceanography*, 961-967. [https://doi.org/10.1175/1520-0485\(2004\)034<0961:BRWIAE>2.0.CO;2](https://doi.org/10.1175/1520-0485(2004)034<0961:BRWIAE>2.0.CO;2)
- **Wang, Ou**, Ichiro Fukumori, Tong Lee, Gregory C. Johnson (2004). Eastern equatorial Pacific Ocean T-S variations with El Nino, *Geophysical Research Letter*, Vol. 31, L04305. <https://doi.org/10.1029/2003GL019087>

Other Publications

- Fenty, Ian, Kevin Marlis, Duncan Bark, and Ou Wang (2024) ECCO-GROUP/ECCO-obs-pipeline: Aurelia aurita. Zenodo. <https://doi.org/10.5281/zenodo.10871305>
- **Wang, Ou** and Ian Fenty (2023). Instructions for reproducing ECCO Version 4 Release 4. Zenodo. <https://doi.org/10.5281/zenodo.7789915>
- ECCO Consortium, Ichiro Fukumori, **Ou Wang**, Ian Fenty, Gael Forget, Patrick Heimbach, Rui Ponte (2020). Synopsis of the ECCO Central Production Global Ocean and Sea-Ice State Estimate (Version 4 Release 4). Zenodo. <https://doi.org/10.5281/zenodo.3765929>
- **Wang, Ou** (2019). Instructions for reproducing ECCO Version 4 Release 3. https://ecco-group.org/docs/ss_instructions_ECCO_V4r3.pdf
- Fukumori, Ichiro, **Ou Wang**, Ian Fenty, Gael Forget, Patrick Heimbach, and Rui M. Ponte (2017), ECCO Version 4 Release 3, <http://hdl.handle.net/1721.1/110380>. <https://doi.org/1721.1/110380>

Recent Presentations

- **Wang, Ou**, Tong Lee, Thomas Frederikse, Ian Fenty, and Ichiro Fukumori (2024). Deepening our knowledge of ocean dynamics associated with sea level change. NASA Sea Level Change Team 10-Year Anniversary and Annual Meeting, New York, NY

- **Wang, Ou,** Tong Lee, Thomas Frederikse, Rui Ponte, Ian Fenty, Ichiro Fukumori, and Benjamin Hamlington (2024). What forcing mechanisms affect interannual sea level co-variability between the Northeast and Southeast Coasts of the United States? ECCO 2024 Annual Meeting, Austin, TX
- **Wang, Ou,** Ian Fenty, and Ichiro Fukumori (2023). ECCO Version 5 progress: Multi-grid optimization. ECCO 2023 Annual Meeting, Pasadena, CA
- **Wang, Ou,** Ian Fenty, and Ichiro Fukumori (2022). Including ice shelf melt in ocean and sea-ice state estimation. US CLIVAR Workshop on Future US Earth System Reanalysis, Boulder, CO and Virtual (poster)
- **Wang, Ou,** Tong Lee, Christopher G. Piecuch, Ichiro Fukumori, Ian Fenty, Thomas Frederikse, Dimitris Menemenlis, Rui M. Ponte, and Hong Zhang (2022). Local and remote forcing of interannual sea-level variability at Nantucket Island, Ocean Sciences Meeting 2022 (virtual)

Teaching Experience

- Served as a lecturer and instructor at the ECCO Hackathon 2024, held in Pasadena, CA, in October 2024.
- Served as a lecturer in ECCO summer school held in Friday Harbor, WA in May 2019, and provided hands-on instruction to participating students.
- Co-mentor for summer students at Jet Propulsion Laboratory, California Institute of Technology.

Synergistic Activities

- Consortium for Estimating the Circulation and Climate of the Ocean (ECCO), 2003-present. Technical point of contact for the end-to-end elements of the ocean state estimation system of the ECCO central product, including input forcing and observations, error estimate, forward model, its adjoint and assimilation code, production, outputs, documentations, and analysis tools.
- NASA Sea Level Change Team, 2020-2024
- Contributor to the Massachusetts Institute of Technology General Circulation Model (MITgcm) at <https://github.com/MITgcm/MITgcm>.
- Contributor to the Python analysis tool package ECCOv4-py at <https://github.com/ECCO-GROUP/ECCOv4-py> and various other code repositories at <https://github.com/ECCO-GROUP/>.

Review Panels and Activities

- NASA FINESST Program reviewer (2023)
- NASA ROSES Physical Oceanography review panel (2018)
- NSF proposal
- Journal of Physical Oceanography
- IEEE Transactions on Geoscience and Remote Sensing
- IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing
- Earth System Science Data
- American Geophysical Society Monograph
- EOS

Professional Societies and Affiliations

- American Geophysical Society