

Jih-Wang Aaron Wang

Research Scientist

SUMMARY

I am a weather forecaster, professional numerical modeler, and scientist. I pursue weather prediction accuracy, and estimate forecast uncertainty in the NWP models. I am always fascinated by the nature of Nonlinear Geophysics – predictability, chaos, and uncertainty. I believe a responsible meteorologist should treat weather forecasts as probabilistic forecasts and help the non-technical audiences understand the impact of weather and climate change.

EDUCATION

Ph.D.

Atmospheric and Oceanic Sciences
University of Colorado at Boulder

Research Focus: Tropical Cyclone Impacts,
Air-Sea Interactions, Ocean Circulation
Modeling

M.S.

Atmospheric Science
Colorado State University

Research Focus: Carbon Cycle, Land Surface
Modeling, Regional Atmospheric Modeling

B.S.

Atmospheric Science
National Taiwan University

COMPUTER SKILLS

- ★ Linux/Unix System
- ★ Microsoft Windows
- ★ Microsoft Office
- ★ R
- ★ Python
- ★ Fortran
- ★ C/C++
- ★ MPI & OpenMP
- ★ IDL
- ★ NCL
- ★ High Performance Computing (HPC) System

WORK EXPERIENCE

Research Scientist II

CIRES & PSL/ESRL/NOAA May 2018 – present

Weather and climate observations and simulations; foundational research.

- Designed and conducted hurricane ensemble forecast experiments to estimate the impact of new meteorological observations.
- Simulated the impact of the climate model's stochasticity on rainfall statistical distribution and identified changes due to climatological SST variations.
- Interpreted reanalysis and climate data from weather centers (e.g., GFS analyses, ERA-Interim, ERA5, JRA55, CMIP5) and investigated their credibility.
- Led conference sessions, presented research results, participated in research working groups, and developed novel research topics.

Research Scientist I

CIRES & PSL/ESRL/NOAA January 2014 – April 2018

Weather and climate observations and simulations; foundational research.

- Analyzed the impact of the warming climate on precipitation statistical distribution shifts, and quantified their dynamic and thermodynamic attributions.
- Collaborated across research groups to diagnose the operational NCEP GFS model for its sensitivity to observation feeds, assimilation procedures, and simulation performance for an El Niño event.
- Investigated scale-dependent predictability and forecast uncertainty in the climate models and analyzed the impact of initial conditions and stochasticity.

Postdoctoral Research Associate

CIRES & PSL/ESRL/NOAA December 2012 – December 2013

Collaborative research in earth science.

- Quantified the ocean energy budget and simulated sea level change induced by tropical cyclones' hazardous conditions.
- Hosted meetings for collaborative projects between the US and Taiwan.
- Coordinated and participated in the collaborative research works between the US research entities and the Taiwan Central Weather Bureau.

PROFESSIONAL ACTIVITIES

American Geophysical Union

Member since 2003

- Fall Meeting NG Session Lead Convener, 2020
- Fall Meeting NG Session Chair, 2021

American Meteorological Society

Member Since 2016

European Geophysical Union

Member Since 2020

REFERENCES

Prashant D. Sardeshmukh

CIRES & PSL/ESRL/NOAA

Senior Research Scientist

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Gilbert P. Compo

CIRES & PSL/ESRL/NOAA

Senior Research Scientist

T: (303)497-6115

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Cecile Penland

PSL/ESRL/NOAA

Research Scientist

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E: cecile.penland@noaa.gov

Professional Research Assistant

CIRES

August 2006 – December 2007

Project design, funding, and implementation.

- Designed and built a memory-based statistical model to examine global warming effect on surface temperature and humidity trend.
- Applied satellite images to land use discretion for modeling.

Numerical Modeling

- NCEP Global Forecast System (GFS; Spectral and Finite Volume versions)
- Weather Research and Forecasting (WRF) model
- Regional Atmospheric Modeling System (RAMS)
- HYbrid Coordinate Ocean Model (HYCOM)
- NCAR-DOE Community Earth System Model (CESM)

SELECT PUBLICATIONS & PRESENTATIONS

See [Jih-Wang Aaron Wang - Google Scholar](#) for more publications

Wang, J.-W. A., L. C. Slivinski, P. D. Sardeshmukh, G. P. Compo, G. A. Wick, A. Kren, and C. McColl, 2020-12-15: Targeted in-situ observations improve hurricane intensity predictions, but not track predictions? AGU Fall Meeting 2020, USA.

Wang, J.-W. A., and P. D. Sardeshmukh, 2021: Inconsistent Global Kinetic Energy Spectra in Reanalyses and Models. *J. Atmos. Sci.*, 78(8), 2589-2603. DOI: 10.1175/JAS-D-20-0294.1.

AMS Annual Meeting Presentation:

<https://ams.confex.com/ams/2019Annual/webprogram/Paper351753.html>

Wang, J.-W. A., P. D. Sardeshmukh, G. P. Compo, J. S. Whitaker, L. Slivinski, P. Pegion, and C. McColl, 2019: Sensitivities of the NCEP Global Forecast System. *Mon. Weather Rev.*, 147(4), 1237-1256. DOI:10.1175/MWR-D-18-0239.1

AMS Annual Meeting Presentation:

<https://ams.confex.com/ams/2019Annual/webprogram/Paper349531.html>

Wang, J.-W., W. Han, and R. L. Sriver, 2012: Impact of Tropical Cyclones on Ocean Heat Budget in the Bay of Bengal during 1999. Part II: Processes and Interpretations. *J. Geophys. Res. – Oceans*, 117, Article No. C09021, doi:10.1029/2012JC008373.

Wang, J.-W., K. Wang, R. A. Pielke Sr., J. C. Lin, and T. Matsui, 2008: Towards a robust test on North America warming trend and precipitable water content increase. *Geophysical Research Letters*, Vol. 35, L18804, doi:10.1029/2008GL034564.

Wang, J.-W., A. S. Denning, L. Lu, I. T. Baker, K. D. Corbin, and K. J. Davis, 2007: Observations and simulations of synoptic, regional, and local variations in atmospheric CO₂. *Journal of Geophysical Research*, 112, D04108, doi:10.1029/2006JD007410.