Zhaoxia Pu

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Education

Ph.D. 1997 Meteorology and Atmospheric Sciences, Lanzhou University, China; Ph. D. research completed at Environmental Modeling Center, NCEP/NOAA, MD, USA
Ph.D. Dissertation: Application of adjoint and quasi-inverse linear models of the NCEP operational global spectral model to sensitivity analysis and variational data assimilation. (Advisors: Dr. Eugenia Kalnay and Prof. Jifan Chou)

M. S. 1992 Meteorology and Atmospheric Sciences, Lanzhou University, China

B. S. 1989 Meteorology, Lanzhou University, China

Professional Appointments and Experience

2021-present	Member, NOAA Science Advisory Board, National Oceanic Atmospheric Administration (NOAA), U. S. Department of Commerce
2022-present	Adjunct Professor, Kahlert School of Computing, University of Utah
2014-present	Professor, Department of Atmospheric Sciences, University of Utah
2011-present	Affiliated Faculty (Professor), Global Change and Sustainability Center, University of Utah
2010-2014	Associate Professor, Dept. of Atmospheric Sciences, University of Utah
2004-2010	Assistant Professor, Dept. of Atmospheric Sciences, University of Utah
2000-2004	Associate Research Scientist, Goddard Earth Sciences and Technology Center, University of Maryland, Baltimore County. Worked at NASA Goddard Space Flight Center, Greenbelt, MD
1998-2000	Research Scientist, Universities Space Research Association. Worked at NASA Goddard Space Flight Center, Greenbelt, MD
1997-1998	UCAR Postdoctoral Fellow, Environmental Modeling Center, NCEP, NOAA Camp Springs, MD
1993-1996	Visiting Scientist (UCAR Ph.D. Student Fellow), Environmental Modeling Center, NCEP, NOAA, Camp Springs, MD

Current Research Overview

My research spans a wide range of areas in numerical weather prediction, including data assimilation, numerical modeling, and predictability at small-scale, mesoscale, synoptic scale, and sub-seasonal to seasonal (S2S) scale. The main focuses are advanced data assimilation for satellites, radar, and other remote sensing observations, mesoscale severe weather systems, earth system modeling, and coupled land-atmosphere data assimilation. My work also involves observing

system simulation experiments, targeting weather observations, studying atmospheric boundary layers over complex terrain, and applying artificial intelligence and machine learning in numerical weather and climate prediction. I have collaborated extensively with NOAA, NASA, DOE, ONR, and NSF and have conducted over 35 research projects. In recent years, my involvement has deepened in NOAA's Hurricane Forecasting Improvement Program, the Next-Generation Global Prediction System (NGGPS), and the Unified Forecasting System (UFS) programs, including both regional and global applications through the Joint Effort for Data assimilation Integration (JEDI). I am leading the data assimilation efforts for two NASA small-satellite missions (CYGNSS, TROPICS) and have participated in several recent NASA field campaigns and related research on Convective Processes Experiment (CEPX, CPEX-AW, and CPEX-CV). Additionally, I am the principal investigator for the NSF-funded field campaign and science project titled "Cold Fog Amongst Complex Terrain (CFACT)."

Honors and Awards

- Cohort member of the Provost's Banner Project for the Top 25 University Researchers. University of Utah. (2023).
- Fellow, American Meteorological Society (2019).
- Award of Appreciation for service as the Overall Program Co-Chair of the 96th American Meteorological Society Annual Meeting. American Meteorological Society. (2016).
- Outstanding Faculty Teaching Award, College of Mines and Earth Science, University of Utah. (2012).
- Fellow, Royal Meteorological Society, UK. (2010).
- Early Career Scientist Assembly, Visiting Research Award, NCAR. (2006).
- Outstanding Research Achievement Award**,** Code 912, Laboratory for Atmospheres, NASA Goddard Space Flight Center. (2000).
- Performance Award**,** Goddard Earth Sciences and Technology Center, University of Maryland, Baltimore County. (2000).
- UCAR postdoctoral fellow at NCEP/EMC, NOAA (1997).
- UCAR Ph.D. student fellow at NCEP/EMC, NOAA (1993).
- Outstanding Young Scientist Award for Innovative Research, Chinese Meteorological Society, Gansu Chapter, China. (1993).
- Best Graduate Research Paper Award, Lanzhou University. (1992).

Textbook

- **Pu, Z.**, F. Yang, B. Deng, H. Xu, and X. Zhou, 2005: *Atmospheric modeling, data assimilation and predictability* (Translated from E. Kalnay's textbook in English), China Meteorological Press. 300pp. (ISBN 7-5029-4007-3/P.1434)

Book Chapters (7)

[7] **Pu, Z.**, 2021: Improving Near-Surface Weather Forecasts with Strongly Coupled Land-Atmosphere Data Assimilation. Book Chapter, "Data Assimilation for Atmospheric, Oceanic and Hydrologic Applications (Vol. IV)", Ed. By S.K. Park and L. Xu, Springer.pp.507-523.

[6] **Pu, Z.** and E. Kalnay, 2018: Numerical Weather Prediction Basics: Models, Numerical Methods, and Data Assimilation. In: Duan Q., Pappenberger F., Thielen J., Wood A., Cloke H., Schaake J. (eds) *Handbook of Hydrometeorological Ensemble Forecasting*.

Springer, Berlin, Heidelberg.

[5] **Pu, Z.**, 2017: Surface data assimilation and near-surface weather prediction over complex terrain. Book Chapter, "Data Assimilation for Atmospheric, Oceanic and Hydrologic Applications (Vol. III)", Ed. By S.K. Park and L. Xu, Springer. pp.219-240.

[4] **Pu, Z.**, L. Zhang, S. Zhang, B. Gentry, D. Emmitt, B. Demoz, R. Atlas, 2017: The impact of Doppler wind lidar measurements on high-impact weather forecasting: Regional OSSE and data assimilation studies. Book Chapter, "Data Assimilation for Atmospheric, Oceanic and Hydrologic Applications (Vol. III)", Ed. By S. K. Park and L. Xu, Springer, pp.259-283.

[3] Thatcher, L. and **Z. Pu**, 2011: How vertical wind shear affects tropical cyclone intensity change: An overview. *Recent Hurricane Research - Climate, Dynamics, and Societal Impacts,* Anthony Lupo (Ed.), ISBN: 978-953-307-238-8, InTech.

[2] **Pu, Z.**, 2011: Improving Hurricane Intensity Forecasting through Data Assimilation: Environmental Conditions Versus the Vortex Initialization, *Recent Hurricane Research-Climate, Dynamics, and Societal Impacts,* Anthony Lupo (Ed.), ISBN: 978-953-307-238-8, InTech.

[1] **Pu, Z.** 2009: Assimilation of satellite data in improving numerical simulations of tropical cyclones: progress, challenge and development. *Data Assimilation for Atmospheric, Oceanic, and Hydrologic Applications",* Ed. by S.K. Park and L. Xu, The Springer-Verlag, P.163-176.

Peer-Reviewed Publications (130)

(underline denotes student or postdoc co-authors)

[130] Feng, C. and Z. Pu, 2024: All-sky assimilation of GOES-16 water vapor channels with accounting for cloud-dependent interchannel correlations. *Mon. Wea. Rev*., (submitted).

[129] Beal, R., **Z. Pu** , E. Pardyjak, S. Hoch, I. Gultepe, 2024: Evaluation of near-surface and boundary-layer meteorological conditions that support cold-fog formation using CFACT field campaign observations. *Q. J., Roy. Meteol. Soc.*, (under revision)

[128] Stoddard, J., and **Z. Pu**, 2024: Multi-scale interactions associated with two offshore rainfall events near the west coast of Sumatra. *Journal of Geophysical Research -Atmosphere.* (under review)

[127] Hou, Z., and **Z. Pu**, 2024: Roles of ENSO and MJO in seasonal precipitation across the western United States during the cold season droughts of 2020-2022. *Journal of Geophysical Research - Atmosphere*. (under review)

[126] Li, X., and **Z. Pu**, 2024: effects of surface moisture flux on the formation and evolution of cold fog over complex terrain with large eddy simulation. *Q. J., Roy. Meteol. Soc.* (under revision).

[125] Zhu, X., X. Li, J. Xue, G. Ou, and **Z. Pu**, 2024: In-event surrogate model training for regional transmission tower-line system dynamic responses prediction in realistic hurricane wind fields, *Engineering Structure.* (under revision).

[124] Hou, Z., and **Z. Pu**, 2023: Assessing CYGNSS Satellite Soil Moisture Data for Drought Monitoring with Multiple Datasets and Indicators. *Remote Sensing*, 2024, 16(1), **116**; https://doi.org/10.3390/rs16010116

[123] Li, X., **Z. Pu**, J. Zhang, Z. Zhang, 2023: A modified vertical eddy diffusivity parameterization in the HWRF model based on large eddy simulations and its impacts on the prediction of two landfalling hurricanes. *Frontiers in Earth Science.* **11**, 2023. https://doi.org/10.3389/feart.2023.1320192

[122] **Pu, Z.**, E. Pardyjak, S. Hoch, I. Gultepe, A. G. Hallar, A. Perelet, R. Beal, G. Carrillo-Cardenas, X. Li, M. Garcia, S. Oncley, W. Brown, J. Anderson, A. Vakhtin, 2023: Cold Fog Amongst Complex Terrain. *Bulletin of the American Meteorological Society.* **104**, E2030-E2052. https://doi.org/10.1175/BAMS-D-22-0030.1

[121] Cui, Z., and **Z. Pu**, 2023: The use of regional data assimilation to improve numerical simulations of diurnal characteristics of precipitation during an active Madden-Julian Oscillation event over the maritime continent. *Remote Sensing*. **15**(9), 2405; https://doi.org/10.3390/rs15092405.

[120] Feng, C. and **Z. Pu**, 2023: The impacts of assimilating Aeolus horizontal line-of-sight winds on numerical predictions of Hurricane Ida (2021) and a mesoscale convective system over the Atlantic Ocean. *Atmospheric Measurement Techniques (AMT)*. **16**, 2691–2708.

[119] Ming, J., J. Zhang, X. Li, and **Z. Pu**, Mostafa Momen, 2023: Observational estimates of turbulence parameters in the atmospheric surface layer of landfalling tropical cyclones. **128**, e2022JD037768. *Journal of Geophysical Research - Atmosphere. e2022JD037768.*

[118] Li, X., **Z. Pu**, 2023: dynamic mechanisms associated with the structure and evolution of roll vortices and coherent turbulence in the hurricane boundary layer: a large eddy simulation during the landfall of Hurricane Harvey. *Boundary Layer Meteorology,* **186,** 615-636.

[117] Bunkers, M., J. Allen, W. Ashley, S. Bieda, K. Calhoun, B. Kirtman, K. Mahoney, L. McMurdie, C. Potvin, **Z. Pu**, and E. Ritchie. 2023: Comment–Reply Exchanges: Trends and Suggestions. *Wea. Forecasting*, **38**, 633-636.

[116] Bunkers, M., J. Allen, W. Ashley, S. Bieda, K. Calhoun, B. Kirtman, K. Mahoney, L. McMurdie, C. Potvin, **Z. Pu**, and E. Ritchie, 2023: Advantages to Writing Shorter Articles. *Wea. Forecasting*, **38**, 389–390.

[115] Feng, C., **Z. Pu**, 2022: a bias correction scheme with the symmetric cloud proxy variable and its influence on assimilating all-sky GOES-16 brightness temperature. *Monthly Weather Review*, **150**, 3305-3323.

[114] Li, X., **Pu, Z.**, 2022: Turbulence effects on the formation of cold fog over complex terrain with large-eddy simulation. *Geophysical Research Letters.***49** (11).

[113] Li, X., **Pu, Z.**; Zhang, J.A.; Emmitt, G.D. 2022: Combined assimilation of Doppler Wind Lidar and Tail Doppler Radar data over a hurricane inner core for improved hurricane prediction with the NCEP regional HWRF system. *Remote Sensing.* **14**, 2367. https://doi.org/10.3390/rs14102367.

[112] **Pu, Z**., Y. Wang, X. Li, C. Ruf, L. Bi, A. Mehra, 2022: Impacts of assimilating CYGNSS satellite ocean surface wind on prediction of landfalling hurricanes with the HWRF model. *Remote Sensing*. **14**, 2118.

[111] Hock, N., F. Zhang, **Z. Pu**, 2022: Numerical simulations of a Florida Sea Breeze and its interactions with associated convection: effects of geophysical representations in a numerical model. *Advances in Atmospheric Sciences*, **39**, 697-713.

[110] Wei, Y., and **Z. Pu**, 2022: Diurnal cycle of precipitation and near-surface atmospheric conditions over the maritime continent: impacts of land-sea contrast and ambient winds in cloud-permitting simulations. *Climate Dynamics*, **58**, 2421-2449.

[109] Zhu, B., **Z. Pu**, A. W. Putra, Z. Gao, 2022: Influence of assimilating radar data over a coastal station in western Sumatra with regional numerical simulations of precipitation during a madden-Julian oscillation, *Remote Sensing*, **14**, 42.

[108] Wei, Y., and **Z. Pu** 2021: Moisture variation with cloud effects during an BSISO over the eastern Maritime Continent in cloud permitting-scale simulations. *Journal of Atmospheric Sciences*. **78**,1869-1888.

[107] Li, X., **Z. Pu**, and Z. Gao, 2021: Effects of roll vortices on the evolution of Hurricane Harvey during landfall. *Journal of Atmospheric Sciences*. **78,** 1847-1867.

[106] Li, X., **Z. Pu**, and Z. Gao, 2021: The combination of Monte Carlo and ensemble probabilities in tropical cyclone forecasts near landfall. *Journal of Meteorological Research*. **35**, doi: 10.1007/s13351-021-0128-9.

[105] Wang, Y. and **Z. Pu**, 2021: Assimilation of radial velocity from coastal NEXRAD into hwrf for improved forecasts of landfalling hurricanes. *Weather and Forecasting*. **36**, 587-599.

[104] Zhang, F., **Z. Pu**, and C. Wang, 2021: Land-surface diurnal effects on the asymmetric structures of a post-landfall tropical storm. *Journal of Geophysical Research -Atmospheres*, **126**, 2020JD033842.

[103] Li, X., **Z. Pu**, 2021: Vertical eddy diffusivity parameterization based on a large eddy simulation and its impact on prediction of hurricane landfall. *Geophysical Research Letters*, https://doi.org/10.1029/2020GL090703.

[102] Lackmann, G., B. Ancell, M. Bunkers, B. Kirtman, K. Kosiba, A. McGovern, L. McMurdie, Z. Pu , E. Ritchie, H. P. Huntington, 2020: editorial: data availability principle and practice. *Weather and Forecasting*, **35**. 2217.

[101] Wei, Y., **Z. Pu**, C. Zhang, 2020: diurnal cycle of precipitation over the Maritime Continent under modulation of MJO: Perspectives from a cloud-permitting simulations. *Journal of Geophysical Research - Atmospheres*, **125**, e2020JD032529

[100] Lin, L-F, and **Z. Pu**, 2020: Improving near-surface short-range weather forecasts using strongly coupled land-atmosphere data assimilation with GSI-EnKF, *Mon. Wea. Rev.*, **148**, 2863-2888.

[99] Cui, Z., **Z. Pu**, G. D. Emmitt, S. Greco, 2020: The impact of airborne Doppler Aerosol WiNd lidar (DAWN) wind profiles on numerical simulations of tropical convective systems during the NASA Convective Processes Experiment (CPEX). *Journal of Atmospheric and Oceanic Technology*, **37**, 705-722.

[98] Zhang, S., **Z. Pu**, 2020: Evaluation of the four-dimensional ensemble-variational hybrid data assimilation with self-consistent regional background error covariance for improved hurricane intensity forecasts. *Atmosphere*, 2020, 11, 1007.

[97] Xue, J., F. Mohammadi, X. Li, M. Sahraei-Ardakani, G. Ou, and **Z. Pu**, 2020: Impact of transmission tower-line interaction to the bulk power system during hurricane, *Reliability Engineering and System Safety*, **203**, https://doi.org/10.1016/j.ress.2020.107079.

[96] Zhang, T., C. Zhao, C. Gong, **Z. Pu**, 2020: Simulation of wind speed based on different driving datasets and parameterization schemes near Dunhuang wind farms in northwest of China. *Atmosphere*, **11**, 647, http://dx.doi.org/10.3390/atmos11060647.

[95] Feng, J., Y. Duan, Q. Wan, H. Hu, **Z. Pu**, 2020: Improved prediction of landfalling tropical cyclone precipitation in China based on assimilation of radar radial winds with new super-observation processing. *Weather and Forecasting.* **35**, 2523-2539.

[94] Lin, L-F, and **Z. Pu**, 2019: Examining the impact of SMAP soil moisture retrievals under weakly- and strongly coupled data assimilation with WRF-Noah. *Monthly Weather Review***, 147**, 4345-4366. http://journals.ametsoc.org/doi/10.1175/MWR-D-19-0017.1.

[93] Zhang, F., C. Wang, **Z. Pu**, 2019: Genesis of Tibetan Plateau vortex: Roles of surface

diabatic and atmospheric condensational latent heating. J*ournal of Applied Meteorology and Climatology*, **53**, 2633-2651.

[92] Gultepe, I., Sharman, R., Williams, P.D. et al. 2019: A review of high impact weather for aviation meteorology. *Pure Appl. Geophys*., https://doi.org/10.1007/s00024-019-02168-6.

[91] Ma, M., Y. Chen, F. Ding, **Z. Pu**, and X. Liang, 2019: Representative analysis of air quality monitoring sites in urban areas of a mountainous city. *J. Meteor. Res.*, **32**, 219-235. doi:10.1007/s13351-019-8145-7.

[90] Liu, J., and **Z. Pu**, 2019: does soil moisture have an influence on near-surface temperature? *Journal of Geophysical Research - Atmospheres*, **124**, 6444-6466.

[89] Cui, Z., **Z. Pu**, V. Tallapragada, R. Atlas, C. Ruf, 2019: A preliminary impact study of CYGNSS ocean surface wind speeds on numerical simulations of hurricanes. *Geophysical Research Letters*, **46**, https://doi.org/10.1029/2019GL082236.

[88] Hodges, D., and **Z. Pu**, 2019: Characteristics and variations of low-level jets and environmental factors associated with summer precipitation extremes over the Great Plains. *Journal of Climate*, **32**, 5123-5144. https://doi.org/10.1175/JCLI-D-18-0553.1.

[87] Zhang, S., and **Z. Pu**, 2019: Numerical simulation of rapid weakening of Hurricane Joaquin with assimilation of high-definition sounding system dropsondes during the Tropical Cyclone Intensity Experiment: Comparison of 3DEnVar and 4DEnVar. *Weather and Forecasting*, **34**, 521-538. https://doi.org/10.1175/WAF-D-18-0151.1.

[86] Zhang, F. and **Z. Pu**, 2019: Sensitivity of numerical simulations of near-surface atmospheric conditions during an ice fog event over heber valley to snow depth and surface albedo. *Journal of Applied Meteorology and Climatology*, **58**, 797-811. https://doi.org/10.1175/JAMC-D-18-0064.1.

[85] Saunders, P., Y. Yu, **Z. Pu**, 2019: Sensitivity of numerical simulations of Hurricane Joaquin (2015) to cumulus parameterization schemes: Implications for processes controlling hairpin turn in the track., *Journal of Meteorological Society of Japan*, doi:10.2151/jmsj.2019-030. **97**, 577-595. https://doi.org/10.2151/jmsj.2019-030.

[84] Zhang, F, **Z. Pu**, and C. Wang, 2019: Impacts of initial soil moisture on the numerical simulation of a post-landfall storm. *Journal of Meteorological Research*, **33**, 206-218. doi: 3 10.1007/s13351-019-8002-8.

[83] **Pu, Z.**, C. Yu, V. Tallapragada, J. Jin, W. McCarty, 2019: The impact of assimilation of GPM microwave imager clear-sky radiance on numerical simulations of Hurricanes Joaquin (2015) and Matthew (2016) with the HWRF model. *Mon. Wea. Rev.*, **147**, 175-198.

[82] Li, Y., **Z. Pu**, and J. Feng, 2018: The influence of ENSO on upper-level jets. *Journal of Lanzhou University (Natural Sciences)*, **53**, 127-136.

[81] Zhang, S., **Z. Pu**, C. Velden, 2018: Impact of enhanced atmospheric motion vectors on HWRF hurricane analysis and forecasts with different data assimilation configurations. *Mon. Wea. Rev.*, **146**, 1549-1569.

[80] Hodges, D. and **Z. Pu**, 2018: Characteristics and variations of low-level jets in the contrasting precipitation extremes of 2006 and 2007 over the Southern Great Plains. *Theoretical and Applied Climatology*, DOI: 10.1007/s00704-018-2492-7.

[79] Lin, L.-F. and **Z. Pu**, 2018: Characteristics of background error covariance of soil moisture and atmospheric states in strongly coupled land-atmosphere data assimilation. *Journal of Applied Meteorology and Climatology,* **57**, 2507-2529.

[78] **Pu, Z.**, C. Lin, X. Dong, and S. Krueger, 2018: Sensitivity of numerical simulations of a mesoscale convective system to ice hydrometeors in bulk microphysical parameterization.

Pure and Applied Geophysics. https://doi.org/10.1007/s00024-018-1787-z.

[77] Zhang, F, **Z. Pu,** and C. Wang, 2018: Impacts of initial soil moisture on the numerical simulation of a post-landfall storm. *J. Meteor. Res.*, doi:10.1007/s13351-019-8002-8.

[76] Chachere, C. and **Z. Pu**, 2018: Numerical simulations of an inversion fog event in the Salt Lake Valley during the MATERHORN-fog field campaign. *Pure and Applied Geophysics*, https://doi.org/10.1007/s00024-018-1770-8.

[75] Li, Y., C. Zhao, T. Zhang, W. Wang, H. Duan, Y. Liu, Y. Ren, **Z. Pu**, 2018: Impacts of land-use data on the simulation of surface air temperature in Northwest China. *Journal of Meteorological Research*, **32**, 896-908.

[74] Ren, Y., Y. Li, **Z. Pu**, T. Zhang, H. Duan, W. Wang, 2018: Effect of updated RegCM4 land use data on near-surface temperature simulation in China, *Journal of Meteorological Research*, **32,** 469-490.

[73] Duan, H., Y. Li, T. Zhang, **Z. Pu**, C. Zhao, Y. Liu, 2018: Evaluation of the forecast accuracy of near-surface temperature and wind in Northwest China based on the WRF model. *Journal of Meteorological Research*, **32**, 469-490. doi: 10.1007/s13351-018-7115-9.

[72] **Pu, Z**, C. Yu, V. Tallapragada, J. Jin, W. McCarty, 2017: Assimilation of GPM microwave Imager clear-sky radiance in improving hurricane forecasts. *JCSDA Quarterly Newsletter*, Fall 2017. https://doi.org/10.7289/V50P0X8R.

[71] Lin, C-Y, Z. Zhang, **Z. Pu**, F. Wang, 2017: Numerical simulations of an advection fog event over the Shanghai Pudong Airport with the WRF model. *Journal of Meteorological Research*, **31**, 874-889.

[70] Doyle, J. D., J. Moskaitis, J. Feldmeier, R. Ferek, M. Beaubien, M. Bell, D. Cecil, R. Creasey, P. Duran, R. Elsberry, W. Komaromi, J. Molinari, D. Ryglicki, D. Stern, X. Wang, C. Velden, B. Barrett, T. Allen, P. Black, K. Emanuel, J. Dunion, E. Hendricks, P. Harr, L. Harrison, D. Herndon, W. Jeffries, S. Majumdar, J. Moore, **Z. Pu**, R. Rogers, E. Sanabia, G. Tripoli, D.-L. Zhang, 2016: A view of tropical cyclones from above: The Tropical Cyclone Intensity (TCI) Experiment. *Bulletin of the American Meteorological Society*, **99**, 2113-2134.

[69] Zhang, F., **Z. Pu**, and C. Wang, 2017: Effects of boundary layer vertical mixing on the evolution of hurricanes over land. *Mon. Wea. Rev*., **145**, 2343-2361.

[68] Zhang, F. and **Z. Pu**, 2017: Effects of vertical diffusion of surface heat and moisture fluxes on the evolution of landfalling hurricanes. *Journal of Atmospheric Sciences*, **74**, 1879-1905.

[67] Li, Y., P. Ye, **Z. Pu**, J. Feng, B. Ma. 2017: Historical statistics and future changes in long -duration blocking highs in key regions of Eurasia. *Theoretical and Applied Climatology*, DOI: 10.1007/s00704-017-2079-8.

[66] Li, Y., P. Ye, J. Feng, J. Wang, L. Yao, and **Z. Pu**, 2017: Simulation and projection of blocking highs in key regions of the Eurasia by CMIP5 models. *J. Meteorl. Soc. Japan*, **95**, 147-165, doi:10.2151/jmsj. 2017-008.

[65] Zhang, S., **Z. Pu**, D. J. Posselt, and R. Atlas. 2017: Impact of CYGNSS ocean surface wind speeds on numerical simulations of a hurricane in observing system simulation experiments. *Journal of Atmospheric and Oceanic Technology*, 34, 375-383.

[64] Liu, J., F. Zhang, **Z. Pu**, 2017: Numerical simulations of the rapid intensification of Hurricane Katrina (2005): Sensitivity to boundary layer parameterization schemes. *Advances in Atmospheric Sciences*, **34** (4), doi: 10.1007/s00376-016-6209-5.

[63] Boukabara, S. A.; T. Zhu; H. Tolman; S. Lord; S. Goodman; R. Atlas; M. Goldberg; T. Auligne; B. Pierce; L. Cucurull; M. Zupanski; M. Zhang; I. Moradi; J. Otkin; D. Santek; B.

Hoover; **Z. Pu**; X. Zhan; C. Hain; E. Kalnay; D. Hotta; S. Nolin; E. Bayler; A. Mehra; S. Casey; D. Lindsey; L. Grasso; K. Kumar; A. Powell; J. Xu; T. Greenwald; J. Zajic; J. Li; J. Li; B. Li; J. Liu; L. Fang; P. Wang; T.-C. Chen 2017: S4: An O2R/R2O infrastructure for optimizing satellite utilization in NOAA numerical modeling systems. *Bull. Amer. Meteor. Soc.*, **98**, 2359-2378.

[62] **Pu, Z.**, S. Zhang, M. Tong and V. Tallapragada. 2016: Influence of the self-consistent regional ensemble background error covariance on hurricane inner-core data assimilation with the GSI-based hybrid system for HWRF, *J. Atmos. Sci.,* **73**, 4911-4925.

[61] **Pu, Z.**, C. Chachere, S. Hoch, E. Pardyjak, I. Gultepe, 2016: Numerical Prediction of Cold Season Fog Events Over Complex Terrain: The Performance of the WRF Model During MATERHORN-Fog and Early Evaluation, *Pure and Applied Geophysics*, doi:10.1007/s00024-016-1375-z.

[60] Chachere, C., and **Z. Pu**, 2016: Connection between cold air pools and mountain valley fog events in Salt Lake City, *Pure and App. Geo.,* doi:10.1007/s00024-016-1316-x.

[59] Gultepe, I., H. J. S. Fernando, E. Pardyjak, S. Hoch, Z. Silver, E. Creegan, L. Leo, **Z. Pu**, S. De Weker, and Chaoxun Hang, 2016: Mountain ice fog: Observations and predictability. *Pure and Applied Geophy*. doi:10.1007/s00024-016-1374-0.

[58] Fernando, H. J. S., E. R. Pardyjak, S. Di Sabatino, F. K. Chow, S. F. J. De Wekker, S. W. Hoch, J. Hacker, J. C. Pace, T. Pratt**, Z. Pu**, W. J. Steenburgh, C. D. Whiteman, Y. Wang, D. Zajic, B. Balsley, R. Dimitrova, G. D. Emmitt, C. W. Higgins, J. C. R. Hunt, J. C. Knievel, D. Lawrence, Y. Liu, D. F. Nadeau, E. Kit, B. W. Blomquist, P. Conry, R. S. Coppersmith, E. Creegan, M. Felton, A. Grachev, N. Gunawardena, C. Hang, C. M. Hocut, G. Huynh, M. E. Jeglum, D. Jensen, V. Kulandaivelu, M. Lehner, L. S. Leo, D. Liberzon, J. D. Massey, K. McEnerney, S. Pal, T. Price, M. Sghiatti, Z. Silver, M. Thompson, H. Zhang, and T. Zsedrovits, 2015: The MATERHORN - Unraveling the intricacies of mountain weather. *Bull. Amer. Meteor. Soc.,***96,** 1945-1967.

[57] **Pu, Z.**, and C. Lin, 2015: Evaluation of double-moment representation of ice hydrometeors in bulk microphysical parameterization: Comparison between WRF numerical simulations and UND-Citation data during MC3E, *Geoscience Letters,* **2015**, 2:11. DOI: 10.1186/s40562-015-0028-x.

[56] Hodges, D., and **Z. Pu**, 2015: The climatology, frequency, and distribution of cold season fog events in northern Utah. *Pure and Applied Geophysics.* **173**, 3197-3211.

[55] Thatcher, L., and **Z. Pu**, 2014: Characteristics of tropical cyclone genesis forecasts and underdispersion in high-resolution ensemble forecasting with a stochastic kinetic energy backscatter scheme. *Tropical Cyclone Research and Review*, **3**, 203-217.

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the impact of Doppler wind lidar (DWL) measurements on the numerical simulation of a tropical cyclone, *Advances in Meteorology*, Vol. **2010**, Article ID 743863, 14pp, doi:10.1155/2010/743863.

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[8] **Pu, Z.-X.**, and E. Kalnay, 1996: An inexpensive technique for using past forecast errors to improve future forecast skill: Part II --- a quasi-inverse linear method. *NCEP Office Note,* No. 415b, NCEP, NWS/NOAA, 38pp.

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[6] **Pu, Z.-X.** and J. Chou, 1994: The adjoint method and its numerical applications to four-dimensional assimilation of mesoscale remote sensing data. *Plateau Meteorology*, **13**, 419-429.

[5] **Pu, Z.-X.**, 1993: Inverse methods and their application in numerical weather prediction. *Meteorological Learning,* **12**, 10-15.

[4] **Pu, Z.-X.**, 1992: The nonlinearity of atmospheric dynamics and long-range weather forecast *(translation from Russian)*. Meteorological *Science and Technology*, No.1**,** 23-29.

[3] Chen, Q., and **Z.-X. Pu**, 1992: Evolutions of the mesoscale rainstorm system in Beijing-Tianjin-Hebei areas. *The 1st Annual Summary of Severe Storm Laboratory*, Chinese Academy of Meteorological Sciences, 38-52.

[2] **Pu, Z.-X.**, and C. Qiu, 1991: Two-dimensional numerical simulation of the mountain- Valley circulation over the Lanzhou area. *Journal of Lanzhou University (Natural Version)*, **27.** 169-175.

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Other Publications

- **Book Review (2)**

[2] **Pu, Z.** 2009: Book review: “Eye to the sky: Exploring our atmosphere", *Bull Amer. Meteorol. Soc.* **90**, 541-542.

[1] **Pu, Z**., 2006: Book review: "Atmospheric modeling, data assimilation and predictability", *Bull. Amer. Meteorol. Soc.,* **87**, 98-100.

- **Government Reports (2)**

[2] *Report of the External Review for the Cooperative Institute for Modeling the Earth System* (CIMES - Princeton University and NOAA GFDL), National Oceanic and Atmospheric Administration, June 2022.

[1] *Priorities for Weather Research*. (U.S. Congress-mandated report), National Oceanic and Atmospheric Administration, December 2021.

Research Grants

Pending

[40] Assimilation of CYGNSS data for improved understanding and prediction of tropical cyclones and tropical convection", NASA, 07/01/2024-06/30/2027, Institutional PI.

[39] Enhancing Subseasonal to Seasonal (S2S) Prediction Using the NCEP Unified Forecast System with Strongly Coupled Data Assimilation in JEDI. NOAA, 08/01/2024-07/31/2026, PI.

[38]A Multi-University Consortium for Advanced Data Assimilation Research and Education (CADRE), National Oceanic and Atmospheric Administration, 3/11/2024-3/10/2027, PI.

Current Awards

[37] Joint assimilation of TROPICS/CYGNSS satellite data for improved understanding and prediction of tropical cyclones, NASA TROPICS (MIT subcontract), 10/01/2023-09/30/2024, PI.

[36] Assimilation of all-sky GOES-R data at high temporal and spatial resolution for improved understanding and prediction of tropical convection. NASA, 08/01/2023 - 06/30/2026. PI.

[35] Understand and predict the severe drought events in the western United States and their influence on water resources and human health. University of Utah 1U4U Program. 06/01/2023-12/01/2024. PI.

[34] Cold fog amongst complex terrain (CFACT). National Science Foundation, 06/2021-05/2025. PI.

[33] Understanding the diurnal variation of precipitation and winds over the Maritime Continent under the influence of the MJO using satellite multi-sensor observations and cloud-permitting numerical simulations with ensemble-based data assimilation. NASA, 07/09/2021 – 07/08/2024, PI.

[32] Improving numerical weather forecasting and S2S prediction with the NCEP Unified Forecast System through strongly coupled land-atmosphere data assimilation in JEDI. NOAA, 09/01/2021-08/31/2024. PI.

[31] Enhancing coupled land-atmosphere modeling with NASA’s unified WRF using strongly coupled data assimilation. NASA, 08/01/2021-07/31/2024, [PI: Z. Pu]

[30] Assimilation of CYGNSS Ocean Surface Wind Speeds and Soil Moisture Retrievals for Improved High-impact Weather Forecasting. NASA CYGNSS Science Team (University of Michigan subcontract), 09/2021-09/2024. PI.

[29] The Properties of Convective Systems in the Tropics and Their Relationships to the

Tropospheric Environment and Surface Winds: A Study Using Advanced Data Assimilation with NASA Field Campaign and Satellite Observations. NASA, 05/01/2020-04/30/2025, PI.

[28] Elements: Open Access Data Generation Engine for Bulk Power System under Extreme Windstorms. NSF, 07/01/2020-06/30/2024. co-PI.

Past Awards

[27] Enhancing the prediction of landfalling hurricanes through improved assimilation of surface observations and NEXRAD data with the GSI-based ensemble-variational hybrid system and JEDI, NOAA, 09/1/2019 - 8/31/2022. PI.

[26] Producing and diagnosing a regional analysis with data assimilation at a cloud-permitting scale to support YMC and PISTON. NOAA, 09/01/2017-08/31/2020 and No-cost extension till 08/31/2022. PI.

[25] EAGER: Real-time: Effective power system operation during hurricanes using historical and real-time data, National Science Foundation, 9/15/2018-9/14/2021. co-PI.

[24] Assimilating GPM satellite radiances and CYGNSS ocean surface winds into the NCEP new-generation non-hydrostatic global forecast model for improved prediction of tropical convection. NASA, 03/01/2017-08/31/2021. PI.

[23] Assimilation of CYGNSS Ocean Surface Wind Speeds with NCEP GSI-Based Ensemble -Variational Data Assimilation Systems for Improved Understanding and Prediction of Tropical Cyclone and Tropical Convection, NASA CYGNSS Science Team, 03/2019 -05/2021. PI.

[22] NASA CPEX study with DAWN. Subcontract from Simpson Weather Associates, Inc. through NASA Award. 05/15/2017 -11/15/2020. PI.

[21] Enhancing surface data assimilation and near-surface weather forecasts in NGGPS through improved coupling between the land surface and atmosphere. NOAA/NWS, 09/01/2016 -08/31/2020. PI.

[20] Automated power preventing system during hurricanes. Utah Science Technology and Research (USTAR), 04/01/2018-03/31/2020, co-PI.

[19] Interaction between landfalling hurricanes and the atmospheric boundary layer using ensemble-based data assimilation. National Science Foundation (NSF), 02/2013-12/2019 [with no-cost extensions and supplementary funds]. PI.

[18] Understanding impacts of outflow on tropical cyclone formation and rapid intensity and structure changes with data assimilation and high-resolution numerical simulations. Office of Naval Research (ONR), 05/2016-07/2019. PI.

[17] Investigating the relationship between low-level jets and precipitation extremes with NASA MERRA, satellite observations and high-resolution data assimilation. NASA, 02/2015 -01/2019. PI.

[16] Assimilation of GPM satellite data for improving hurricane forecasting, NOAA/JCSDA, 08/2015-07/2018. PI.

[15] The impact of CYGNSS surface wind observations and 3-D winds on high-impact weather forecasting. NASA. 09/2013 – 08/2018. PI.

[14] Improving Vortex initialization in HWRF multiple-level nested domains with GSI hybrid data assimilation system. NOAA/NWS, HFIP, 09/2014-08/2017. PI.

[13] Understanding impacts of outflow on tropical cyclone formation and rapid intensity and structure changes with data assimilation and high-resolution numerical simulations. Office of Naval Research (ONR), 05/2013-12/2016. PI.

[12] Retrieving 4-dimensional atmospheric boundary layer structures from single level surface

observations and profiling data over a single station. Department of Energy, 09/2011-09/2015. PI.

[11] Mountain terrain atmospheric modeling and observations (MATERHORN) program. DOD MURI Program managed by ONR, 07/2011-04/2015**.** co-PI

[10] Properties of convective clouds over the western Pacific and their relationship to environmental conditions of tropical cyclones. Office of Naval Research, 01/2008-9/2013. PI.

[9] On the variable terrains and diurnal variations in surface data assimilation. National Science Foundation (NSF), 11/2008-10/2012. PI.

[8] The impact of Aqua satellite multi-sensor data on predicting and understanding of hurricane intensity change. NASA, 12/2007-12/2011. PI.

[7] Targeted Doppler lidar wind data for seasonal climate studies and high-impact weather forecasting. NASA, 03/2008 – 02/2012. PI.

[6] Integrating MODIS and TRMM satellite data with in-situ Chinese station data to study the impact of Tibetan winter snow on Asian summer precipitation and Northern Hemisphere atmospheric circulation, NASA Earth System Science Enterprise Fellowship Program, 09/2006-08/2008. PI.

[5] MM5 numerical simulation to support the studies on Raman lidar, from the University of Maryland, Baltimore County as a sub-award of NSF Grant # ATM-0129605, 09/2004-09/2005. PI.

[4] A US effort for ADM/Aeolus Calibration and Validation. European Space Agency. 06/2008-05/2011 (free of charge) [P. I.: R. M. Hardesty, Co-PIs: 18 U. S. scientists, including Z. Pu]

[3] Validation of Model Simulations of Anvil Cirrus Properties during TWP-ICE. DOE ARM Program, 05/2008 – 04/2011. co-PI.

[2] Properties of convective clouds over the eastern Atlantic, comparison with the east Pacific, and how they relate to the environment of the tropical waves in each location, NASA NAMMA Program, 05/2006-04/2009. co-PI.

[1] Convective cloud properties and effects on tropical cyclogenesis and cirrus production, NASA TCSP Program, 05/2005-04/2008. co-PI.

Field Program Participation

- **2022**, Principal Investigator, Cold Fog Amongst Complex Terrain (CFACT), NSF. Heber Valley, Utah.
- **2022**, Mission Support Scientist, NASA Convective Processes Experiment – Cape Verde (CEPX-CV) field campaign. Eastern Atlantic Ocean.
- **2021**, Research Investigator and Mission Support Scientist, NASA Convective Processes Experiment – Aerosols and Winds (CEPX-AW) field campaign. Eastern Atlantic Ocean (St. Croix Virgin Island).
- **2020**, Research Investigator and Mission Support Scientist, NASA Convective Processes Experiment – Aerosols and Winds (CEPX-AW) field campaign dry-run.
- **2017**, Research Investigator, Convective Processes Experiment (CPEX), NASA, Gulf Mexico.
- **2015**, Research Investigator, Tropical Cyclone Intensification (TCI) 2015 field program, Office of Naval Research (ONR). The Atlantic Ocean.
- **2015**, Co-Principal Investigator and Mission Support Scientist, Mountain Terrain

Atmospheric Modeling and Observations (MATERHORN)-Fog (ONR), Heber Valley, Utah

- **2014**, Research Investigator, Tropical Cyclone Intensification (TCI) 2014 field program, Office of Naval Research (ONR), Atlantic Ocean.
- **2013**, Co-Principal Investigator and Field Supporting Scientist, Mountain Terrain Atmospheric Modeling and Observations (MATERHORN) (ONR), Dugway Proving Ground, Utah.
- **2012**, Co-Principal Investigator and Field Supporting Scientist. Mountain Terrain Atmospheric Modeling and Observations (MATERHORN) (ONR), Dugway Proving Ground, Utah.
- **2008**, Mission support scientist and Research Investigator, International TPARC/TCS08 field program, Western Pacific Ocean (Monterey Operational Center, CA).
- **2006**, Research Investigator, NASA African Monsoon Multidisciplinary Analyses (NAMMA) field program. Eastern Atlantic Ocean.
- **2005**, Research Investigator, NASA Tropical Cloud System Processes (TCSP) Program. The Atlantic Ocean.
- **2001**, Research Investigator, NASA Convection and Moisture Experiment (CAMEX-4). The Atlantic Ocean.
- **1997**, Field support team, International FASTEX Field Program. Performed real-time targeting experiments with adjoint and quasi-inverse linear methods of NCEP global model at NOAA NCEP EMC.

Course Instruction

Courses

- ATMOS 5100: Atmospheric Dynamics [Spring 2004 to 2024] https://home.chpc.utah.edu/~pu/dynamic.htm
- ATMOS 5500: Numerical Weather Prediction [Fall 2004 to 2023] https://home.chpc.utah.edu/~pu/5500.htm
- ATMOS 6500: Numerical Weather Prediction [Fall 2004 to 2023] https://home.chpc.utah.edu/~pu/6500.htm
- ATMOS 5000: Introduction to Atmospheric Sciences [Fall 2004 to 2019] https://home.chpc.utah.edu/~pu/5000/5000.html
- ATMOS 5810: Experiential Learning [2021-2023]
- ATMOS 6910: Graduate Special Topics [Sping/Fall 2004-2024]
- CS 6950: Independent Study [Spring 2023]
- DS 4940: Undergraduate Research (Data Science) [Fall 2023]
- CS 4999: Honors Thesis Project [Spring 2024]
- ATMOS 7810: Graduate Seminar [Last taught, Fall 2021]

Graduate Special Topics (*individual or group*)

- Advanced data assimilation https://home.chpc.utah.edu/~pu/6910.html
- Ensemble forecasting and predictability
- Extreme weather systems
- Mesoscale dynamics, modeling, and predictability
- Observing system simulation experiments

- Big data and machine learning
- Land-Atmosphere coupling and data assimilation
- Boundary layer and parameterization
- Hurricane and precipitation

Graduate Students Supervised

1. Li Xu, 2007 (year of completion): *Seasonal variations of snow cover over the Tibetan Plateau and ultimate effects on the East Asian summer monsoon*. ***M. S.***
2. Xuanli Li, 2008: *High-resolution numerical simulations of tropical cyclone intensity change with assimilation of satellite, radar and in-situ data*. ***Ph.D.*** **(Winner of Zipser graduate research award, 2009)**
3. Andrew Snyder, 2009: *Tacking and verification of tropical cyclone development in global ensemble prediction systems: Evaluations during recent field programs*. ***M. S.***
4. Levi Thatcher, 2010: *How vertical wind shear affects the rapid intensification of Typhoon Jangmi (2008)*. ***M.S.***
5. Minjin Ma, 2011: *Numerical simulations of the extreme atmospheric boundary layer heights over Northwest China and their impacts on chemical tracer transportations*. ***Ph.D.***
6. Linbo Wei, 2012: *Numerical simulation of wintertime inversion and data assimilating of late spring convection*. ***Ph.D.***
7. Xuebo Zhang, 2013: *Practical implementation of an ensemble transform Kalman filter*. ***M. S.*** (Computational Engineering Science Program).
8. Levi Thatcher, 2013: *High-resolution ensemble error growth and dimensionality in tropical cyclone genesis environments.* ***Ph.D.***
9. Zhan Li, 2013: *Studying the genesis of Typhoon Nuri (2008) with high-resolution numerical simulations and data assimilation.* ***Ph.D.***
10. Hailing Zhang, 2014: *Ensemble Kalman filter data assimilation in regions of complex terrain*. ***Ph.D.*** **(Winner of Zipser graduate research award, 2013)**
11. Chao Lin, 2014: *Evaluation of double-moment representation of warm-rain and Ice hydrometeors in bulk microphysical parameterization*. ***M.S.***
12. Catherine Chachere, 2016: *Cold season inversion in Salt Lake City: Connections to valley variables and numerical simulations*. ***M.S.***
13. Yafan Yu, 2016: *Evaluation of tropical cyclone forecasts from a global model and comparison with regional mesoscale numerical simulations of Hurricane Joaquin*. ***M. S.***
14. Nessa Hock, 2017: *Numerical simulations and sensitivity studies of a Florida sea breeze and its associated convection in the gray-zone spacing*. ***M.S.***
15. Chaulam Yu, 2017: *The impact of assimilation of GPM clear-sky radiance on hurricane forecasts with HWRF model*. ***M.S.***
16. Feimin Zhang, 2017: *Influences of boundary layer vertical mixing and land surface parameterizations on numerical simulations of landfalling hurricanes*. ***Ph.D.***
17. Shixuan Zhang, 2017: *Improving hurricane vortex initialization and prediction through inner -core data assimilation with ensemble-variational hybrid methods*. ***Ph.D.*** **(Winner of AMS best student poster presentation award, 2016)**
18. Peter Saunders, 2019: *Studying the sudden onset and evolution of outer rainband precipitation of Hurricane Harvey (2017) using numerical simulations with data assimilation and cloud initiation*. ***Ph.D.***

19. Xin Li, 2020: *Characteristics and effects of turbulent structure in the atmospheric boundary layer driven by weak and strong forces*. ***Ph.D.***
20. Zhiqiang Cui, 2020: *Assimilation of satellite-derived winds and soil moisture data for improved high-impact weather and short-range climate prediction.* ***Ph.D.***
21. Derek Hodges, 2020: *Interactions between low-level jets and precipitation extremes with climatology, mesoscale numerical simulations, and ensemble-based non-Gaussian data assimilation*. ***Ph.D.*** **(Winner of Fukuta best graduate student publication award, 2019).**
22. Bojun Zhu, 2022: *The diurnal variation and offshore propagation of precipitation at western Sumatra coast under the winter MJO*. ***Ph.D.***
23. Michael Pletcher, 2022: *Numerical simulation of ITCZ convection, the Saharan air layer, and an easterly wave in the tropical Atlantic Ocean and Caribbean Sea during NASA CPEX-AW*. ***M. S.***
24. Rebecca Beal, 2023: *Evaluation of near-surface and boundary-layer meteorological conditions of fog formation with cold fog amongst complex terrain observations and validation of high-resolution model simulations.* ***M.S.***

Current Graduate Research Assistants (6)

1. Chengfeng Feng Ph.D. student since 2018, Chair
   (Winner of Zipser graduate research award, 2023; Winner of AMS best student oral presentation award, 2023)
2. Qien Huang Ph.D. student since 2021, Chair
3. Michael Pye M.S. student since 2022, Chair
4. Max Johncox M.S. student since. 2023, Chair
5. Alexander Garber M.S. student since 2023, Chair
6. Johnathan Stoddard M.S. student since 2023, Chair

Graduate Committees (31)

1. Zac Cleveland, Department of Atmospheric Sciences, Ph.D. Candidate
2. Fatemehalsadat Jafarishiadeh, Electrical & Computer Engineering, Ph.D. Candidate
3. Zhoucan Xu Department of Atmospheric Sciences, Ph.D. completed 10/2022
4. Timbwaoga Ouermi School of Computing, Ph.D. Candidate, Ph.D. completed 05/2022
5. Trey Alvey Department of Atmospheric Sciences, Ph.D. completed 12/2018
6. Andrew Lesage Department of Atmospheric Sceinces, Ph.D. completed 08/2017
7. Zheng Wu Department of Atmospheric Sciences, M.S. completed 07/2017
8. Prabhat Thakur Department of Atmospheric Sceinces, Ph.D. 2015-2016
9. Jeffrey Massey Department of Atmospheric Sceinces, Ph.D. completed, 06/2015
10. Zhuocan Xu Department of Atmospheric Sceinces, M.S. completed, 05/2015
11. John McMillan Department of Atmospheric Sceinces, Ph.D. completed, 07/2014
12. Jessica Liptak Department of Atmospheric Sceinces, Ph.D. completed, 05/2014
13. Gabriel Susca-Lopata Department of Atmospheric Sceinces, M.S. completed, 05/2014
14. Junsu Kim Department of Atmospheric Sceences, Ph.D. completed, 01/2014
15. Andrew Lesage Department of Atmospheric Sceinces, M.S. completed, 10/2012
16. Ryan Oats Department of Atmospheric Sceinces, M.S. completed, 01/2013
17. Jon Zawislak Department of Atmospheric Sciences, Ph.D. completed, 08/2013
18. Adam Varble Department of Atmospheric Sciences, Ph.D. completed, 08/2013
19. Chris Schwartz Department of Atmospheric Sciences, Ph.D completed, 06/2013

20. Danial Tyndall	Department of Atmospheric Sciences, Ph.D. completed, 07/2011
21. Peter Bogenschutz	Department of Atmospheric Sciences, Ph.D. completed, 02/2011
22. Chris Pannell	Department of Atmospheric Sceinces, M.S. completed, 08/2010
23. Jon Zawislak	Department of Meteorology, M.S. completed, 07/2008
24. Danial Tyndall	Department of Meteorology, M.S. completed, 07/2008
25. Bradon Kerns	Department of Meteorology, Ph.D. completed, 05/2008
26. Stephanie Houser	Department of Mateorology, M.S. completed, 12/2007
27. David Myrick	Department of Meteorology, Ph.D. completed, 09/2006
28. Yaping Li	Department of Meteorology, Ph.D. completed, 05/2006
29. Min Deng	Department of Meteorology. Ph.D. completed, 03/2006
30. Yuying Zhang	Department of Meteorology, Ph.D. completed, 12/2005
31. Rahul Agarwal	Civil & Environ. Eng. Dept., Ph.D. candidate, 2004-2005

Postdoctoral Researchers/Research Associates Supported/Supervised (9)

1. Ms. Rebecca Beal, Research Associates, 09/2023-present
2. Dr. Zhaolu Hou, Visiting Scientist (Postdoctoral researcher), 09/2022 - 09/2023
3. Dr. Xin Li, Research Associates (Postdoctoral Researcher), 07/2020 - 07/2022
4. Dr. Yuntao Wei, Visiting Scientist (Postdoctoral Researcher), 08/2019 – 04/2021
5. Dr. Liao-Fan Lin, Postdoctoral Research Associates, 08/2017 – 09/2019
6. Dr. Junkai Liu, Research Associates, 11/2016 – 04/2018
7. Dr. Lei Zhang, Research Associates, 01/2015 – 12/2015
8. Dr. Feifan Zhou, Research Associates, 04/2014 – 10/2014
9. Dr. Lei Zhang, Postdoctoral Researcher, 07/2008 – 01/2011

Visiting Scholars Supported/Supervised (11)

1. Dr. Ying Wang, Visiting Scientist, 08/2019 -09/2020
2. Dr. Hongxiong Xu, Visiting Scientist, 02/2018- 05/2018
3. Dr. Yan Li, Visiting Scientist, 02/28/2016-02/28/2017
4. Ms. Linlin Song, Visiting Research Associate, 01/2016-01/2017
5. Dr. Aijuan Bai, Visiting Scholar, 02/2015 - 08/2015
6. Dr. Caiyan Lin, Visiting Scholar, 09/2014-02/2015
7. Mr. Jianjun Liu, Visiting Scholar, 02/2014-08/2014
8. Ms. Haixia Duan, Visiting Scholar, 10/2011-01/2012
9. Mr. Liang Zhang, Visiting Scholar, 10/2011-01/2012
10. Mr. Weiyu Ding, Visiting Research Associate, 07/2009-12/2009
11. Mr. Jianhua Zhao, Visiting Scholar, 11/2007-04/2008

Undergraduate Research Supervised/Supported (10)

1. Grace Liu (2023-present)
2. Halle Schwartzhoff (01/2023-12/2023)
3. Johnathan Stoddard (05/2021-06/2023)
4. Alex Lukinbeal (2017-2018)
5. Roland Christensen (2015-2016)
6. Derek Hodges (2014-2015)

7. Chris W. Pace (2012-2014)
8. Martin Schroeder (2010-2011)
9. Matthew Brewer (2009)
10. Levi Thatcher (2007)

Invited Talks, Seminars, and Lectures (73)

[73] **Invited Town Hall Meeting Panelists**: "*Exploring the Challenges and Opportunities in the Satellite Data Value Chain: Linking Satellite Instruments to Applied Use".* 104th AMS Annual Meeting. January 31, 2024. Baltimore, MD.

[72] **Invited Seminar,** "*Enhancing Prediction of Landfalling Hurricanes Through Advanced Data Assimilation and Improved PBL Parameterization*". National Taiwan University, November 3, 2023.

[71] **Invited Talk,** "*The Impacts of CYGNSS Ocean Surface Winds on Numerical Prediction of Tropical Cyclones*". International Conference on GPS Radio Occultation. Taipei, Taiwan, October 30 -November 3, 2023.

[70] **Invited Seminar,** *" The Impacts of Doppler Wind Lidar Profile Measurements on High-Impact Weather Forecasting"*. National Central University, Taiwan, October 30, 2023.

[69] **Invited Keynote**, "*Advances and Challenges in the Prediction of Landfalling Tropical Cyclones and Implications for Risk Management over the Coastal Urban Regions*." Climate, Weather, and Water Forum, Hong Kong, June 5-7, 2023.

[68] **Invited Talk**, " *Strongly coupled land-atmosphere data assimilation and its influence on near-surface weather forecasting."* NOAA Weather Program Office Weeks 3-4/S2S Webinar, April 3, 2023

[67] **Invited Seminar**, "*Cold Fog Amongst Complex Terrain (CFACT): Observations, Modeling and Prediction of Cold Fog*". NCAR Earth Observing Laboratory, March 28, 2023.

[66] **Invited Seminar**, " *Advancing Numerical Weather and Climate Prediction through the Synthesis of Mathematics and Atmospheric Sciences".* Department of Mathematics, The University of Utah, October 24, 2022.

[65] **Invited Seminar**, " *Cold Fog Amongst Complex Terrain (CFACT): Observations, Modeling and Prediction of Cold Fog*". Department of Atmospheric and Oceanic Science, University of Maryland, March 31, 2022.

[64] **Invited Seminar**, "*Data Assimilation and Machine Learning at the Frontier of Earth System Modeling and Prediction*". Department of Climate and Space Science and Engineering, University of Michigan, November 4, 2021.

[63] **Invited Seminar**, "*Enhancing the Prediction of Landfalling Hurricanes Through Improved Data Assimilation and PBL Parameterization: An update*." NOAA HWRF Monthly Seminar, June 10, 2021.

[62] **Invited Seminar** "*Assimilation of CYGNSS data for improved hurricane analysis and prediction*." GNSS-R Payload and Research Investigations of Satellite Mission (PRISM) Seminar. National Taiwan University, Taiwan. June 4, 2021.

[61] **Invited Talk** "*Land-atmosphere interactions in numerical weather and climate Prediction. Perspectives from coupled land-atmosphere data assimilation*". AGU Fall Meeting, December 1-17, 2020.

[60] **Invited talk**, "*Diurnal Cycle of Wind and Precipitation over the Maritime Continent under Modulation of MJO: Perspectives from Cloud-Permitting Simulations and Data Assimilation*." Years of Maritime Continent and PISTON Campaign Webinar Series,

Climate Variability & Predictability Program, NOAA Climate Program Office. October 22, 2020.

[59] **Invited talk**: "*Enhancing the Prediction of Landfalling Hurricanes Through Improved Data Assimilation and PBL Parameterization*." NOAA HWRF Monthly Seminar. September 3, 2020.

[58] **Invited talk**, "*Assimilation of satellite radiances and retrieved data products for improved numerical prediction of tropical cyclones: Promises, challenges, and trade-offs*". 2nd Applications workshop, NASA Time-Resolved Observations of Precipitation structure and storm Intensity with a Constellation of Smallsats (TROPICS). Miami, FL, February 18-19, 2020.

[57] **Invited Seminar**, "*Big Data and Data Science in Weather and Climate Prediction*". Cuiying Lecture, Lanzhou University, Lanzhou, China. July 22, 2019.

[56] **Invited Seminar**, "*Assimilation of GPM and CYGNSS satellite data for improved tropical cyclone prediction*". National Center for Numerical Weather Prediction, Chinese Meteorological Administration, Beijing, China, July 3, 2019.

[55] **Invited Seminar**, "*Improving Vortex Initialization and Hurricane Forecasting Through 3dEnVar and 4dEnVar Hybrid Data Assimilation Methods*". Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, China, July 2, 2019.

[54] **Invited Seminar**, "*Improving Vortex Initialization and Hurricane Forecasting Through 3dEnVar and 4dEnVar Hybrid Data Assimilation Methods*". College of Physics, Peking University, Beijing, China, July 1, 2019.

[53] **Invited Seminar**, "*Problems, challenges, and advances in Surface data assimilation*". Meteorological Data and Information Center, Chinese Meteorological Administration, Beijing, China, June 28, 2019.

[52] **Invited Seminar**, "*Impacts of Doppler wind lidar measured wind profiles on severe weather forecasting*". State Key Laboratory of Severe Weather, Chinese Academy of Meteorological Sciences. Beijing, China, June 27, 2019.

[51] **Invited Seminar**, " *Direct assimilation of GPM microwave imager clear-sky radiance with a hybrid variational-ensemble data assimilation system*". College of Atmospheric Sciences, Lanzhou University, Lanzhou, China. December 26, 2018.

[50] **Invited Talk**, "*Background error covariance in strongly coupled land-atmosphere data assimilation and influence on soil-moisture data assimilation*". 2018 KIAPS International Symposium on the Global NWP System Modeling, Nov. 12 – Nov. 14, 2018, Seoul, South Korea.

[49] **Invited Seminar**, "*Assimilation of GPM microwave imager clear-sky radiance in improving hurricane prediction*". Korean Institution of Atmospheric Prediction System. Seoul, South Korea, November 15, 2018.

[48] **Distinguished Lecture**, "*Data assimilation and big data in earth science: Concept, application, and new frontier*". Guy F. Atkinson Distinguished Lecture Series, Department of Geology and Geophysics, University of Utah, September 20, 2018.

[47] **Keynote Presentation**, "*Big data and artificial intelligence in numerical weather and climate prediction: An introduction*". 13th Annual Indonesia-US Ocean and Climate Observations, Analysis and Applications Partnership Workshop. June 27-29, 2018, Jakarta, Indonesia.

[46] **Invited Training Lecture**, *Numerical prediction and data assimilation for weather, climate, and geosciences, Pre-workshop Training Lectures (8 hours*), 13th Annual

Indonesia-US Ocean and Climate Observations, Analysis and Applications Partnership Workshop. June 26, 2018, Jakarta, Indonesia.

[45] **Invited Talk**, *Characteristics of covariances between land and low-atmosphere states and their influences on coupled data assimilation*. 15th Annual Meeting Asia Oceania Geosciences Society. Jun 03-08, 2018, Hawaii, USA.

[44] **Invited Talk**, *Enhancing tropical cyclone prediction with advanced assimilation of GPM and CYGNSS satellite observations*. 15th Annual Meeting Asia Oceania Geosciences Society. Jun 03-08, 2018, Hawaii, USA.

[43] **Invited Seminar**, "*Progress and prospects of radar data assimilation supporting hurricane research and forecasting*." Earth Observing Laboratory, National Center for Atmospheric Research (NCAR), Boulder, CO, April 10, 2018.

[42] **Invited Seminar**. "Hybrid data assimilation methods and vortex initialization." College of Atmospheric Sciences, Lanzhou University, Lanzhou, China, June 7, 2017.

[41] **Invited Talk**, *Near-surface weather prediction and data assimilation over complex terrain: Lessons learned from MATERHORN*, 1st MPOUNTAOM Workshop (A preparation for Beijing 2022 Winter Olympics), June 21-23, 2017, Institute of Urban. Meteorology, Beijing, China.

[40] **Invited Talk**, *Big data assimilation and arid meteorology*, The 11th Symposium on Arid Climate Change and Disaster Reduction & Sino-UK Workshop on Drought Monitoring, Early-Warning, and Numerical Modeling. June 7-8, 2017. Lanzhou, China.

[39] **Invited Seminar**, "*Data Assimilation: An Independent and Collaborative Science for Weather and Climate Studies*". State Key Laboratory of Severe Weather, Chinese Academy of Meteorological Sciences. Beijing, China, December 23, 2016.

[38] **Invited Seminar**, "*Assimilation of Radar and Satellite Observations in Improving Tropical Cyclone Forecasting*". Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, China, August 5, 2016.

[37] **Invited Talk**, *Application of data assimilation to improve weather and climate modeling over complex terrain*. The 10th Symposium on Arid Climate Change and Disaster Reduction & Sino-US Workshop on Drought Monitoring, Early-Warning, and Numerical Modeling. July 25-26, 2016. Lanzhou, China.

[36] **Invited talk**, *Improving vortex initialization through assimilation inner-core observations*.13th Annual Meeting Asia Oceania Geosciences Society, 31 Jul to 5 Aug 2016, Beijing, China.

[35] **Invited talk**, *Surface data assimilation and near-surface weather prediction over complex terrain*. 13th Annual Meeting Asia Oceania Geosciences Society, 31 Jul to 5 Aug 2016, Beijing, China.

[34] **Invited Seminar**, *Assimilation of Radar and Satellite Observations in Improving Tropical Cyclone Forecasting*. Numerical Weather Prediction Center, Chinese Meteorological Administration. Beijing, China. June 17, 2016.

[33] **Invited Seminar**: "*Numerical weather prediction over complex terrain: Challenges and progresses*". Gansu Meteorological Bureau, Chinese Meteorological Administration, Lanzhou, China. December 30, 2015.

[32] **Invited Seminar**: "*Data assimilation and numerical weather prediction over complex terrain*". Lanzhou University, Lanzhou, China, June 26, 2015.

[31] **Invited Seminar**: "*Numerical weather prediction: Recent development, progress and future direction"*. Chengdu University of Information and Technology, Chengdu, China,

June 23, 2015.

[30] **Invited Training Lecture**, One-week intensive training class on numerical weather prediction, Northwestern Regional Center of Numerical Weather Prediction, Chinese Meteorological Administration, Lanzhou, February 2015. China.

[29] **Invited talk**, *Evaluation of high-resolution surface analyses and forecasts with ensemble Kalman filter data assimilation in regions of complex terrain*, Asia Oceanic Geosciences Society (AOGS) 11th Annual Meeting. July 28- August 1, 2014, Sapporo, Japan.

[28] **Invited Seminar**: "*Evaluation of high-resolution surface analyses and forecasts with ensemble data assimilation in regions of complex terrain*", National Center for Atmospheric Research (NCAR), Boulder, CO. May 16, 2013.

[27] **Invited Presentation** (invited by NSF Geoscience Division), "*The impact of ensemble -based data assimilation on the predictability of landfalling hurricanes*". 67th Interdepartmental Hurricane Conference, Tropical cyclone Research Forum. March 5-7, 2013, NOAA Center for Weather and Climate Prediction College Park, MD.

[26] **Invited presentation**, "*Assimilation of satellite data in improving numerical simulation of tropical cyclones: Results from recent field programs".* JCSDA 10th Workshop on Satellite Data Assimilation, October 10-12, 2012, College Park, MD.

[25] **Invited talk**, "*Numerical simulation of tropical cyclones with assimilation of satellite, radar and in-situ observations: lessons learned from recent field programs*", 8th Asia Oceania Geosciences Society Annual Meeting, August 8-12, 2011, Taipei, Taiwan.

[24] **Invited Seminar**, "*Assimilation of satellite data in improving mesoscale severe weather forecasting: Progress, Challenge and Development*" in the College of Atmospheric Sciences and Key Laboratory of Mesoscale Severe Weather, Ministry of Education, Nanjing University, China, June 15, 2011.

[23] **Invited seminar**: "*Numerical simulations of tropical cyclones with assimilation of satellite, radar and in-situ observations: lessons learned from recent field programs and real-time experimental forecasts"*. NOAA Atlantic Oceanographic and Meteorological Laboratory (AOML), Hurricane Research Division (HRD). Miami, Florida. January 14, 2011.

[22] **Invited talk**, *Validation of AIRS temperature and moisture profiles over tropical oceans and their impact on numerical simulations of tropical cyclones.* NASA AIRS science team meeting, November 3-5, 2010, Greenbelt, MD.

[21] **Invited seminar**: "*The potential impact of tropospheric wind profile measurements on high-impact weather forecasting: Results from recent field campaigns and observing system simulation experiments",* NASA Goddard Space Flight Center, Maryland. July 27, 2010.

[20] **Invited seminar**: "*Numerical simulation of tropical cyclones with assimilation of satellite, radar and in-situ observations: lessons learned from TCS-08 case studies*", Naval Research Laboratory, Monterey, California, July 7, 2010.

[19] **Invited talk**, *Assimilation of satellite data in improving high-impact weather forecasting: progress, challenge and development*, AMS 23rd conference on weather and forecasting/19th conference on numerical weather prediction. June 1, 2009, Omaha, NE.

[18] **Invited seminar**: "*Improving hurricane intensity forecasting through data assimilation: Environmental conditions versus vortex initialization*". NOAA Atlantic Oceanographic and Meteorological Laboratory (AOML). Miami, Florida. March 19, 2009.

[17] **Invited Seminar**: "*Data assimilation for the inverse problem: A perspective from NWP".* Tomography & Modeling Group, Department of Geology and Geophysics, University of Utah. December 4, 2008.

[16] **Invited Seminar**: "*The impact of radar data assimilation on mesoscale severe weather forecasting*". China Meteorological Administration, Beijing, China. June 18, 2008.
[15] **Invited Seminar**: "*Application of data assimilation in improving climate modeling*", National Climate Center, Beijing, China. June 17, 2008.
[14] **Invited talk**, *Application of data assimilation techniques in regional climate studies. The second international symposium on arid climate change and sustainable development*, Lanzhou, China, September 12, 2007.
[13] **Invited seminar**: "*Seasonal variations of snow cover over the Tibetan Plateau*", Key Open Laboratory of Arid Climatic Change and Disaster Reduction, Gansu Province and China Meteorological Administration, Lanzhou, China, June 4, 2007.
[12] **Invited seminar**: "*Assimilation of satellite data for improving tropical cyclone forecasts*", Division of Numerical Weather Prediction, National Meteorological Center, China Meteorological Administration, Beijing, China. August 18, 2006.
[11] **Invited Lecturer**, Summer school on numerical weather prediction, Key Open Laboratory of Arid Climate and Disaster Reduction, Gansu Province and CMA, Lanzhou, China, August 10-17, 2006.
[10] **Co-Lead Training Lecturer**, Summer school on numerical weather prediction, Xinjiang Regional Meteorological Center, CMA, China, August 1-7, 2006.
[9] **Invited lecture series**, Atmospheric Data Assimilation, College of Atmospheric Sciences, Lanzhou University, China, May 22 – June 8, 2005.
[8] **Invited presentation**, Utah Science Day Lecture: "Making an accurate weather forecast", Utah Science Day, University of Utah. November 12, 2005.
[7] **Invited seminar**, "*Application of data assimilation in improving atmospheric modeling*", Center for Numerical Weather Prediction, Chinese Academy of Meteorological Sciences, Beijing, China. June 8, 2005.
[6] **Invited seminar**, "*Application of data assimilation in improving atmospheric modeling*", Gansu Arid Meteorological Institute, Chinese Meteorological Administration, Lanzhou, China. June 6, 2005.
[5] **Invited seminar**, "*Atmospheric Predictability and Ensemble Forecasting*", Lanzhou University, China, June 3, 2005.
[4] **Invited Seminar**: "*Adaptive weather observations: The concept and recent applications*", Department of Meteorology, University of Utah, 2004.
[3] **Invited Seminar**, "*Application of data assimilation in improving atmospheric modeling*", Department of Meteorology, University of Utah, UT, September 29, 2003.
[2] **Invited Seminar**, "*Application of data assimilation in improving hurricane modeling and forecasts*", Hurricane Research Division, NOAA, Miami, FL, July 14, 2003.
[1] **Invited Seminar**, "*Application of data assimilation in improving atmospheric modeling*", Department of Meteorology, Pennsylvania State University, PA, May 22, 2003.

Professional Services, Leadership, and Synergistic Activities

- **Science Advisory Boards**
  - Member, External Advisory Committee, NSF NCAR Earth System Predictability Across Timescales. 2023-present
  - Member, NOAA Science Advisory Board (SAB); 2021-present
  - SAB Liaison, Environmental Information Services Working Group. NOAA SAB, 2021-

present.
- Chair, Review Panel for Princeton University's Cooperative Institution for Modeling of the Earth System (CIMES) with NOAA Geophysical Fluid Dynamics Laboratory. 2022.
- Core study team/Executive team member, Congress mandated U. S. Priorities for Weather Research (PWR). 2021-2023.
- Member, NOAA Open Data / Open Science work plan team. 2022.
- Member, NCAR CISL High Performance Computing User Committee. 2021-present.
- Member, NCAR Computational Information System Laboratory (CISL) High-Performance Computing Allocation Panel (CHAP). 2018-2022.
- Science advisory board member, UCAR Development Testbed Center (DTC), 2018-2022.

- **Science Teams**
  - Leader, Tropical cyclone and data assimilation working group, NASA Cyclone Global Navigation Satellite System (CYGNSS) Satellite Mission, 2020-present.
  - NWP Cal/Val Science Team member, *ADM/Aeolus* Satellite Mission, European Space Agency, 2018-present.
  - Applications team member, NASA TROPICS Satellite Mission, 2018-present.
  - Science team member, NOAA Climate Program (CVP) Years of Maritime Continent (YMC) Science, 2017-2021.
  - Science team member, NASA Cyclone Global Navigation Satellite System (CYGNSS) Satellite Mission, 2016-present.
  - Science team member, NASA Energy and Water Cycle Program, 2015-2020.
  - Member, Department of Energy Atmospheric Radiation Measurement (DOE/ARM) Value-added Products, User Strategic Planning Meeting (Invited). 2014.
  - Member, NOAA Hurricane Forecast Improvement Project (HFIP) data assimilation strategies team, 2013-present.
  - Member, Space-based Wind Lidar Working Group, USA, 2009-present.
- **AMS Committees**
  - Chair, American Meteorological Society annual meeting oversight committee, 2012-2015.
  - Member, American Meteorological Society annual meeting oversight committee, 2010-2012.
  - Member, American Meteorological Society (AMS) Weather Analysis and Forecasting Committee, 2006-2012.
- **Editorial Boards**
  - Editor, *Weather and Forecasting*, American Meteorological Society (AMS), 2016-present.
  - Editor, *Journal of Meteorological Research,* Springer Publisher, 2016-present.
  - Editor of the Special Issue "Remote Sensing for High Impact Weather and Extremes", *Remote Sensing*, 2023-present.
  - Guest Chief Editor*,* a special issue, *"Weather and Climate under complex terrain and variable land surfaces: Observations and numerical simulations,"* for the Journal of Meteorological Research. 2017-2018.
  - Organizer, AMS Journal Special Collection – MATERHORN. 2014-2018.
  - Associate Editor, *Weather and Forecasting.* 2014-2016.
  - Editor board member, *ISRN Meteorology*. 2011-2014.
  - Guest Editor, Special issue "Advanced Data Assimilation and Predictability Studies on High-Impact Weather and Climate", *Advances in Meteorology.* 2009-2010.
  - Associate Editor, *Monthly Weather Review*. 2006-2007.

- **Conference Chairs**
  - Conference Program Chair (with Robert Atlas). *28th Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (IOAS-AOLS).* 104th Annual Meeting, American Meteorological Society (AMS), January 27- February 1, 2024, Baltimore, MD**.** **(**2023-2024).
  - Conference Program Chair (with Robert Atlas). *27th Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (IOAS-AOLS).* 103rd Annual Meeting, American Meteorological Society (AMS), January 8-12, 2023, Denver, CO**.** **(**2022-2023).
  - Overall Program Chair, 96th AMS Annual Meeting, January 9-15, 2016, New Orleans, LA, (2015-2016).
  - Science and conference committee member, *46th Canadian Meteorological and Oceanographic Society (CMOS) Congress and AMS 25th conference on weather and forecasting and 21st conference on numerical weather prediction*, May 29 – June 1, 2012, Montreal, Canada. (2011-2012).
  - Conference Program co-Chair (with Carolyn Reynolds), *AMS 24th conference on weather and forecasting and 20th conference on numerical weather prediction*, January 23-27, 2011. Seattle, WA. (2010-2011).
  - Conference Program co-Chair, *AMS 22nd Conference on Weather and Forecasting and 18th Conference on Numerical Weather Prediction*, June 25-29, 2007, Park City, UT, USA. (2006-2007).
- **Conference Session Chair**
  - Chaired over 60 conference sessions in various professional conferences and workshops since 2006, including 7 session chairs in recent 3 years.
- **Selected Program/Project Review Panels since 2014**
  - 2023/05 NASA Review Panel, *Making Earth System Data Records for Use in Research Environments.*
  - 2023/05 DOE Review Panel, *Early Career Program*
  - 2022/10 NCAR CISL supercomputing allocation review panel.
  - 2021/04 NSF National AI Institution Review Panel
  - 2021/04 NCAR CISL supercomputing allocation review panel
  - 2021/01 NASA New Investigator Program Review Panel
  - 2020/10 NCAR CISL supercomputing allocation review panel
  - 2020/04 DOE Review Panel, *Early Career Program*
  - 2020/04 NCAR CISL supercomputing allocation review panel
  - 2020/03 NASA Review Panel, *Earth Science Research from Operational Geostationary Satellite Systems*
  - 2019/10 NCAR CISL supercomputing allocation review panel
  - 2019/10 NASA Review Panel, *Decadal Survey Incubation Study Teams: Planetary Boundary Layer and Surface Topography and Vegetation*
  - 2019/06 NSF Review Panel, *Cyberinfrastructure for Sustained Scientific Innovation*
  - 2018/01 NASA Review Panel, *Ocean Vector Winds Science Team*
  - 2017/09 NASA Review Panel, *The Science of TERRA, AQUA, and SUOMI NPP*
  - 2017/02 NASA Review Panel, *Modeling, Analysis, and Prediction (MAP) Program*
  - 2017/01 NSF Review Panel, *PREEVENTS Track 2*
  - 2016/12 Review Panel, *Chinese Meteorological Administration key research project*

- 2016/09 NASA Review Panel, *NASA Data for Operational Applications (NDOA)*
- 2015/08 Review Panel, *NSF Earth Cube Program*
- 2014/02 NSF Review Panel, *Graduate Research Fellowship Program*

- **Professional Review Activities**

Reviews for professional and faculty tenure promotion

University of Connecticut
DOE Pacific Northwest National Lab
National Center for Atmospheric Research
Texas A&M University
Penn State University
Indiana University Bloomington
Florida International University
University of Maryland, Baltimore County
Texas Tech University
University of Colorado, Boulder

Review Proposals

National Science Foundation (NSF)
National Aeronautics and Space Administration (NASA)
National Oceanic and Atmospheric Administration (NOAA)
U.S. Civilian Research and Development Foundation (CRDF)
U.S.-Israel Binational Science Foundation
National Environmental Research Council (NERC) of UK
Vienna Science and Technology Fund (WWTF)
Mitacs Canada
Austrian Science Fund (FWF)
Swiss National Science Foundation
Competitive Research Grants (CRG) program at King Abdullah University of Science and Technology (KAUST)

Review for Scholarship Program

Davison Fellows Scholarship

Reviews for over 50 professional journals, including the following

Monthly Weather Review
Journal of Atmospheric Sciences
Weather and Forecasting
Journal of Applied Meteorology and Climatology
Journal of Geophysical Research - Atmospheres
Journal of Climate
Quarterly Journal of the Royal Meteorological Society
Bulletin of American Meteorological Society
Journal of Meteorological Society of Japan
Tellus
Nature
Science
Geophysical Research Letters
Journal of Advances in Modeling Earth Systems
Advances in Atmospheric Sciences

Advances in Meteorology
Pure and Applied Geophysics
Journal of Meteorological Research
Journal of Atmospheric and Solar-Terrestrial Physics
Natural Hazards
Atmospheric Research
Atmospheric Environment
Journal of Theoretic and Applied Climatology
Climate Dynamics
Remote Sensing
Atmosphere

Book reviews

Cambridge University Press
Oxford University Press
American Meteorological Society
Springer

University Service for University of Utah

Member, Senate committee on academic freedom and faculty rights, (2021/06-present)
Chair, Linda K. Amos Award committee, University of Utah (2021/2022)
Member, Executive committee, Utah women in higher education network, (2021/07-2022/06)
Member, Presidential commission on the status for woman, (2018-2021)
Member, Presidential strategic enrollment and marketing committee, (2018-2021)
Member of the university diversity committee (07/2014 – 06/2016)
Co-Chair of the university diversity committee (07/2013 - 06/2014)
Member of the funding incentive seed grant program (07/2011- 06/2015)
Member of the graduate fellowship committee (2014)
Member of graduation committee (Baccalaureate), 07/2005-06/2011
Member of the faculty committee on community and governmental relations, 07/2005-06/2011
Lecturer, Utah Science Day, University of Utah, November 12, 2005

College Service (College of Mine and Earth Sciences)

Member, College Council, 2018-present
Member, College Faculty Relations (Retention, Promotion, and Tenure) Committee, 2015- present
Grand Marshall, College Convocation, 2018
Member of College Teaching Award Committee, 2015
Banner Carrier, College Convocation, 2014
Member of distinguish lecture committee, 2014-2016
Chair, Teaching Award Committee, 2013
Member of Computer Committee, 2010-2012
Grand Marshall, College Convocation, 2011
Member of Teaching Award Committee, 2008-2010
Member of Library Committee, 2006-2008
Member of Loan Committee, 2004-2006

Department Service (Atmospheric Sciences)

Faculty review committee, 2023/09 -present
Director of Graduate Studies (DOGS), 12/2004-06/2012; 07/2013/-06/2018
Member of the Department Committee on Doctoral Advancement (CODA), 2008- present
Member of the department auxiliary faculty review committee, 2007-2023
Coordinator and manager of the graduate qualifying exam, 2008, 2009, 2010, 2012, 2014, 2015
Member of the department curriculum committee, 2005-2017
UCAR member meeting, 10/2007
Member of the department compensation committee, 2006-2007

Professional Affiliations

American Meteorological Society
American Geophysical Union
American Association for the Advancement of Science
Royal Meteorological Society

Conference Presentations

[340] Pu, Z., C. Feng, C. Ruf, and W. Blackwell, 2024: Joint Assimilation of TROPICS and CYGNSS for improved hurricane prediction. *Joint 20th Annual Symposium on Operational Environmental Satellite Systems and 26th Conference on Satellite Meteorology, Oceanography, and Climatology. 104th AMS Annual Meeting*, January 27-February 1, 2024, Baltimore, MD.

[339] Pye, M., and Z. Pu, 2024: Synoptic Scale Conditions and Land-Atmosphere Interactions During the Western U.S. Drought of 2021 and 2022. *38th Conference on Hydrology*. *104th AMS Annual Meeting*, January 27-February 1, 2024, Baltimore, MD.

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