

Fiona A. Lo
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EDUCATION

University of Washington, M.S., Atmospheric Sciences, 1996. Thesis: Zonal Flow Vacillation: The Interaction Between Eddies and Zonal Mean Flow.
California Institute of Technology, B.S., Planetary Science, 1992.

PROFESSIONAL EXPERIENCE

NorthWest Research Associates Inc., *Support Scientist*, Seattle, WA. 2010-present.

- Develop method to analyze energy fluxes of inertial and tidal waves from observation float data from the Sagasso Sea.
- Downloaded and ran OSU TOPEX/Poseidon global model of ocean tides.
- Processed and analyzed sandbar migration, shoreline and beach erosion at North Head Beach at the mouth of the Columbia River. Analysis of long-term trend, seasonal cycle of sandbar migration. Analysis of effect of storms on sandbar and shoreline movement. Analysis and comparison of Argus shoreline with USGS shoreline. Streamlined code in Matlab for efficiency for the Argus Beach Monitoring Stations. Organized and automated functions for computing and analyzing shoreline migration and beach erosion. Assisted in data maintenance and debugging of software issues with Argus. Contributed to biannual reports.
- Comparison of coupled climate models from the Coupled Model Intercomparison Project Phase 5 (CMIP5) to investigate the variability of the global water cycle. Analyzed global moisture fluxes, precipitation, evaporation and cloud water content.
- Provide preliminary analysis of using a method designed to extract temporal and spectral structure from bivariate ocean current data and applied it to global wind data. Organized and processed the Cross Calibrated Multi-Platform (CCMP) ocean surface winds for the analysis.
- Analyzed and interpreted observed aircraft vortex data to investigate the evolution of aircraft vortices. Investigated environmental factors, such as wind, shear, potential temperature and eddy dissipation rate for effects on the duration of vortices. Analyzed vortex decay rate for different regions of flight and during take off and landing. Ran Lidar simulator model, and used results to analyze the biases in Lidar measurements on vortex vertical and lateral position and circulation decay. Evaluated Lidar simulation data for various sensitivities in Lidar parameters. Developed visualization tool to analyze Airbus A380 wake vortex data. Analyzed signal to noise ratio (SNR) measurements from Lidar data, and Lidar simulator. Evaluated the quality of vortex measurement in terms of SNR. Added SNR data into vortex database.

Cornell University, Earth and Atmospheric Sciences Dept., *Visiting Research Assistant*, Ithaca, New York. 2012-present.

- Analysis of earth system models from CMIP5 to analyze the simulation of the seasonal cycle and interannual variability of leaf area index compared with observed satellite data. Studied skill metrics with which to evaluate the earth system models.
- Using global climate models from CMIP5, analyzed the drought conditions based on precipitation, temperature, vegetation and carbon production for different future scenarios. Pinpointed deficiencies in models on the representations of vegetation in future predictions.
- Using climate models from CMIP5, analyzed effect of global total aerosols on climate. Looked at change between historical 19th century simulations and different future scenarios increased concentration of anthropogenic CO₂. Investigated the carbon and vegetation vulnerability by analyzing the change in variability between pre-Industrial times and the 20th and 21st century.
- Ran and modified the National Center for Atmospheric Research Community Earth System Model (NCAR CESM). Provided software support in modifying existing code to allow for optimization of biogeochemical parameters in the land model component of the CESM.

Australian Bureau of Meteorology, The Centre for Australian Weather and Climate Research, Seasonal Prediction, Climate Variability Group, *Professional Officer Level 4*, Melbourne, Australia. 2006-2008.

- Developed seasonal forecast for the North Australian Wet Season from rainfall data. Using statistical logistic regression, created a probabilistic forecast for the onset and duration of the wet season. Manipulated station and gridded rainfall data for input into model. Used cross-validated technique to verify model. Provided operational forecast to users in the cattle industry. Communicated with users to provide an understandable forecast.
- Used the Bureau's operational seasonal forecast model (Predictive Ocean Atmosphere Model for Australia, POAMA) rainfall output to analyze the forecast skill of onset and duration of the North Australia Wet Season.

National Snow and Ice Data Center, Cooperative Institute for Research in Environmental Sciences, University of Colorado, *Associate Scientist III*, Boulder, CO. 2000-2005.

- Analyzed the North American Monsoon System to understand the relationship between spring snow and summer precipitation in the western US. Analyzed the progression of CCSM3 model surface fluxes related to snow mass and summer precipitation.
- Generated assimilated Arctic precipitation products. Acquired and analyzed satellite, model and observational datasets for Arctic precipitation assimilation. Conducted quality control and optimization of disk space, memory allocation, data format and size for ease of use.
- Implemented an Arctic precipitation prediction model using assimilated data.
- Assisted in the development and implementation of ArcticRIMS, a near-real time monitoring of the Arctic hydrology budget project. Created scripts to automate acquiring, processing, regridding and reformatting of hydrological and meteorological observational and model data. Streamlined programs to run hydrologic model. Used IDL for visualization of data and provided plots for ArcticRIMS website.
- Responsible for pre-processing, filtering and quality control of raw Mongolian soil temperature, air temperature, snow depth, precipitation station data and Chinese soil temperature data.
- Supervised students to assist with digitizing data.
- Participated in Cold Land Processes Experiment: provided quality control and data entry in the field.

Climate Diagnostics Center, [now called The Physical Sciences Division of Earth System Research Laboratory], Cooperative Institute for Research in Environmental Sciences, University of Colorado, *Associate Scientist II*, Boulder, CO. 1997-99.

- Generated an empirical prediction scheme to forecast the Madden-Julian Oscillation using statistical analysis. Analyzed skill and validity of the prediction.
- Developed algorithm to track air parcel trajectories to investigate moisture budgets.
- Maintained map room and website. Provided user support for requests regarding map room products.

Dept. of Atmospheric Sciences, University of Washington, *Research Assistant*, Seattle, WA. 1993-96.

- Investigated the interaction of transient eddies on zonal mean flow related to the Southern Annular Mode. Performed statistical analyses on GCM data. Developed Fortran and Matlab code for data analyses.
- Teaching assistant for Introduction to Atmospheric Science class: led discussion sections, wrote and graded exams and homework assignments, presented daily weather analysis, and organized labs and demonstrations for a class of 150 students.

Jet Propulsion Laboratory, *Research Analyst*, Pasadena, CA. 1992.

- Investigated the effect of greenhouse warming on surface winds over the Pacific and Atlantic Oceans. Analyzed wind observations for comparison with GISS and GFDL climate models.

National Center for Atmospheric Research, *Student Research Assistant*, Boulder, CO. 1990.

- Analyzed development of non-supercell tornadoes with Doppler radar reflectivity and wind velocity.
- Operated tornado-chase van and set up tornado field observations; sent up radiosondes and gathered surface meteorological data.

TEACHING EXPERIENCE

Chinese brush painting teacher: Bohua Chinese School, Aurora 7 Elementary School, private classes, Denver Art Museum workshop, 2000-2003.
University of Colorado tutor: undergraduate atmospheric sciences and math, 1999.
Assistant Coach: California Institute of Technology Women's Tennis Team, 1997.
Teaching Assistant: Introductory Atmospheric Sciences, University of Washington, 1995.
English Instructor: Beijing Astronautic Technology United Co, Beijing, China, 1992-93.

PUBLICATIONS

- N. Mahowald, F. Lo, Y. Zheng, L. Harrison, C. Funk, 2015: Leaf Area Index in Earth System Models: evaluation and projections. Submitted to *Earth System Dynamics* for publication.
- D. T. Shindell, J.-F. Lamarque, M. Schulz, M. Flanner, C. Jiao, M. Chin, P. J. Young, Y. H. Lee, L. Rotstayn, N. Mahowald, G. Milly, G. Faluvegi, Y. Balkanski, W. J. Collins, A. J. Conley, S. Dalsoren, R. Easter, S. Ghan, L. Horowitz, X. Liu, G. Myhre, T. Nagashima, V. Naik, S. T. Rumbold, R. Skeie, K. Sudo, S. Szopa, T. Takemura, A. Voulgarakis, J.-H. Yoon, and F. Lo, 2013: Radiative forcing in the ACCMIP historical and future climate simulations, *Atmos. Chem. Phys.*, 13, 2939-2974.
- IPCC, 2013: Annex II: Climate System Scenario Tables [Prather, M., G. Flato, P. Friedlingstein, C. Jones, J.-F. Lamarque, H. Liao and P. Rasch (eds.)]. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- B. Liepert, F. Lo, 2013: CMIP5 update of 'Inter-model variability and biases of the global water cycle in CMIP3 coupled climate models', *Environ Res. Lett.*, 8, 029401.
- F. Lo, M. Wheeler, S. Lennox, 2008: Improving Predictions of the North Australian Wet Season: Onset and Duration. *Centre for Australian Weather and Climate Research Technical Report*, No.1, 33pp. (ISBN: 978-1-921424-44-1)
- F. Lo, M. Wheeler, H. Meinke, A. Donald, 2007: Probabilistic forecasts of the Onset of the North Australian Wet Season. *Mon. Wea. Rev.*, 35, 10, 3506-3520.
- Donald, A., H. Meinke, S. Lennox, M. Wheeler, F. Lo, and A. de H N Maia, 2006: The MJO and agricultural decision making in northern Australia. *CLIVAR Exchanges*, Vol. 11, No. 3, p9-13.
- M.C. Serreze, A. Barrett, F. Lo, 2004: Northern High Latitude Precipitation as Depicted by Atmospheric Reanalyses and Satellite, *Mon. Wea. Rev.*, 133(2): 3,407-3,430.
- F. Lo and M.P. Clark, 2002: Relationships between Spring Snow Mass and Summer Precipitation in the Southwestern United States Associated with the North American Monsoon System, *J Climate*, v15, 1378-85.
- F. Lo and H. Hendon, 2000: Empirical Extended-Range Prediction of the Madden-Julian Oscillation, *Mon. Wea. Rev.*, v128, 2528-2543.
- D.L. Hartmann and F. Lo, 1998: Wave-Driven Zonal Flow Vacillation in the Southern Hemisphere, *JAS*, v55, no.8, 1303-1315.
- F. Lo, 1990: A Case Study of a Non-Supercell Tornado, NCAR internal publication.

PRESENTATIONS

- F. Lo, 2006: SOI-based forecast of northern Australian wet season. 17th Australia New Zealand Climate Forum, Canberra, Australia.
- F. Lo and M. P. Clark, 2001: Influence of Snow Mass in Modulating the North American Monsoon Precipitation. American Meteorological Society, 12th Symposium on Global Change and Climate Variations, Albuquerque, New Mexico.

PROGRAMMING EXPERIENCE

Matlab, IDL, FORTRAN, Perl, Excel, UNIX, Windows

FIELD EXPERIENCE

Cold Land Processes Experiment, Colorado, USA. 2003-2004.