

William (Will) Chapman

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Research Interests: Weather and Climate Predictability, Climate Dynamics, Air-Sea interaction, Machine Learning / Deep Learning, Numerical Weather Prediction Post-Processing

EDUCATION

Scripps Institution of Oceanography

Ph.D. in Climate Science, Advisors: Dr. Shang-Ping Xie, Dr. Marty Ralph

La Jolla, Ca

Current

Stanford University

M.Sc. in Civil & Environmental Engineering

Palo Alto, Ca

2015

University of California San Diego

B.Sc. in Environmental Engineering

La Jolla, Ca

2012

PROFESSIONAL APPOINTMENTS

Scripps Institution of Oceanography

Graduate Research Assistant

La Jolla, Ca

2016-Current

National Center for Atmospheric Research

Research Applications Lab - Visiting Graduate Student

Boulder, Co

2019

Stanford University

Graduate Research Assistant

Palo Alto, Ca

2015-2016

Scripps Institution of Oceanography

Undergraduate Research Assistant

La Jolla, Ca

2011-2012

University of California San Diego

Interim Assistant Resident Dean - Sixth College

La Jolla, Ca

2012, 2015

PUBLICATIONS

- [1] S. Meech, S. Alessandrini, **W. Chapman**, and L. Delle Monache, "Post-processing rainfall in a high-resolution simulation of the 1994 piedmont flood", *Bulletin of Atmospheric Science and Technology*, Jan. 2021, ISSN: 2662-1509.
- [2] **W. Chapman**, A. Subramanian, M. Sierks, S. Xie, and F. Ralph, "Monthly modulation of enso teleconnections: Implications for potential predictability in north america", *Journal of Climate*, in review, 2020.
- [3] S. E. Haupt, **W. Chapman**, C. Kirkwood, S. Adams, S. Lerch, N. Robinson, and A. C. Subramanian, "Towards implementing ai post-processing in weather and climate: Proposed actions from the oxford 2019 workshop", *Philosophical Transactions of the Royal Society A*, accepted, 2020.
- [4] Prabhat, K. Kashinath, M. Mudigonda, S. Kim, L. Kapp-Schwoerer, A. Graubner, E. Karaismailoglu, L. von Kleist, T. Kurth, A. Greiner, K. Yang, C. Lewis, J. Chen, A. Lou, S. Chandran, B. Toms, **W. Chapman**, K. Dagon, C. A. Shields, T. O'Brien, M. Wehner, and W. Collins, "ClimateNet: An expert-labelled open dataset and deep learning architecture for enabling high-precision analyses of extreme weather", *Geoscientific Model Development Discussions*, vol. 2020, pp. 1–28, 2020.
- [5] G. Schamberg, **W. Chapman**, S.-P. Xie, and T. P. Coleman, "Direct and indirect effects—an information theoretic perspective", *Entropy*, vol. 22, no. 8, p. 854, 2020.

- [6] A. M. Wilson, **W. Chapman**, A. Payne, A. M. Ramos, C. Boehm, D. Campos, J. Cordeira, R. Garreaud, I. V. Gorodetskaya, J. J. Rutz, *et al.*, “Training the next generation of researchers in the science and application of atmospheric rivers”, *Bulletin of the American Meteorological Society*, vol. 101, no. 6, E738–E743, 2020.
- [7] **W. Chapman**, S. E. Haupt, C. Kirkwood, S. Lerch, M. Matsueda, and A. C. Subramanian, “Data from: Towards implementing ai post-processing in weather and climate: Proposed actions from the oxford 2019 workshop”, 2019.
- [8] **W. Chapman**, A. Subramanian, L. Delle Monache, S. Xie, and F. Ralph, “Improving atmospheric river forecasts with machine learning”, *Geophysical Research Letters*, vol. 46, no. 17-18, pp. 10 627–10 635, 2019.
- [9] M. Z. Jacobson, M. A. Delucchi, Z. A. Bauer, S. C. Goodman, **W. Chapman**, M. A. Cameron, C. Bozonnat, L. Chobadi, H. A. Clonts, P. Enevoldsen, *et al.*, “100% clean and renewable wind, water, and sunlight all-sector energy roadmaps for 139 countries of the world”, *Joule*, vol. 1, no. 1, pp. 108–121, 2017.

PEER-REVIEWED CONFERENCE PAPERS

1. Yu, Yang, KR, Moy, **W., Chapman**, PL O'Neill, and R Rajagopal, "Assessing climate change vulnerability of microgrid systems.", 2016 *IEEE Power and Energy Society General Meeting (PESGM)*. IEEE, 2016
2. A. Jakubisin, **W. Chapman**, and M. Sierks, "Sustainability and the Student Affairs Professional", *National Association of Student Personnel Administrators Annual Conference*, March 2015

SELECTED CONFERENCES

1. **W Chapman**, "Deep-learning Applications for Environmental Science Artificial Intelligence for Feature Detection ", *20th Conference on Artificial Intelligence for Environmental Science - AMS 101st Annual Meeting - January 2021, 2020 Session Chair*
2. **W Chapman**, "AI, Ethics, and Inclusion for Geosciences, part 1", *20th Conference on Artificial Intelligence for Environmental Science - AMS 101st Annual Meeting - January 2021, 2020 Session Chair*
3. **W Chapman**, L Delle Monache, S Alessandrini, AC Subramanian, N Hayatbini, SP Xie, and FM Ralph, "Probabilistic Weather Prediction with Bayesian Neural Networks", *Machine Learning for Weather and Climate Modeling II - AGU Fall Meeting 2020, 2020*
4. P Gibson, **W Chapman**, A Altinok, MJ Deflorio, L Delle Monache, and D Waliser, "Interpretable Machine Learning applied to Seasonal Forecasting of Western US Precipitation", *Machine Learning for Weather and Climate Modeling III - AGU Fall Meeting 2020, 2020*
5. M Sierks, MD Dettinger, **W Chapman**, and M Ralph, "Assessing Vulnerability and Adaptive Management Under Climate Change Scenarios: Lessons from California's Largest Reservoir", *AGU Fall Meeting 2020, 2020*
6. **W Chapman**, TJ Kilpatrick, "Machine Learning for inpainting QuikSCAT winds in Hawaii's Lee Region", *AI Applied to Airborne or Spaceborne Earth Observation Datasets - 100th American Meteorological Society Annual Meeting, January 2020, 2020. AMS Student Presentation Award - 1st Place*
7. **W Chapman**, "Atmospheric River Forecast Model Bias Correction", *19th Conference on Artificial Intelligence for Environmental Science - 99th American Meteorological Society Annual Meeting, 2019.*
8. **W Chapman**, S.-P.Xie, and T.Kilpatrick, "Machine Learning to Improve QuikSCAT Ambiguity Selection Near Hawaii's Big Island", *The International Ocean Vector Science Team Meeting, May 2019.*

AWARDS

Microsoft AI for Earth Grant	2018–2020
Edward A. Frieman Prize (For Excellence in Graduate Research)	2020
AMS AI for Environmental Science Conference Student Presentation - 1st place	2019
UCSD Provost Honors 11x	2008–2012

SELECTED INVITED TALKS & SEMINARS

1. **W Chapman**, "Machine Learning in Python for Environmental Science Problems: Introduction to Machine Learning", *AMS committee on Artificial Intelligence Applications to Environmental Science, 20th Conference on Artificial Intelligence for Environmental Science - AMS 101st Annual Meeting - January 2021, 2020 Instructor - Supervised Learning Fundamentals*
2. **W Chapman**, L Delle Monache, S Alessandrini, AC Subramanian, N Hayatbini, SP Xie, and FM Ralph, "Deterministic and Probabilistic Methods for Improving Atmospheric River Forecasts with Machine Learning", *Scripps Institutional Seminar – November 17, 2020*
3. **W Chapman**, "Bayesian Neural Networks and NWP Forecast Post-Processing", *UCI/Columbia CBrain Meeting – April 21, 2020*

4. **W Chapman**, “AGU Tutorial on Machine Learning and Deep Learning for the Environmental and Geosciences”, *AGU Fall Meeting – December 08, 2019* **Instructor**
5. **W Chapman**, AC Subramanian, L Delle Monache, SP Xie, and FM Ralph, “Spatial Correction of NWP Forecasts”, *National Center for Atmospheric Research RAL – November 7, 2019*
6. **W Chapman**, T Kilpatrick, and SP Xie, “Comparative Field Reconstruction: Deep Learning, MCA, CCA”, *National Center for Atmospheric Research - Artificial Intelligence Affinity Group (AIAG) – Oct 9, 2019*
7. **W Chapman**, A Wilson, and FM Ralph, “Center for Western Weather and Water Extremes: Atmospheric River Colloquium”, *Western States Water Council and the California Department of Water Resources Subseasonal to Seasonal Workshop – May 23, 2019*
8. **W Chapman**, SP Xie, and FM Ralph, “High Impact Weather, Climate Extremes, and Non-Gaussian Statistics”, *Climate Science Policy Ocean/Atmos Ph.D. Student Seminar – February 8, 2019*
9. **W Chapman**, “No Red Meat or a New Electric Vehicle, Food Choices and Emissions”, *Connecting the Dots 2015: The Food, Energy, Water and Climate Nexus, Stanford University – April 17, 2015*

TEACHING & MENTORING EXPERIENCE

- **Intern Program Supervisor** at Scripps Institution of Oceanography
Center for Western Weather and Water Extremes (8 interns) Summer 2020
- **Intern Supervisor** at Scripps Institution of Oceanography
Anirudhan Badrinath: Deep Learning NWP Precipitation Post-Processing 2020
- **Intern Supervisor** at Scripps Institution of Oceanography
Laura Thapa (Now PhD. Candidate UCLA): Machine Learning for Physics Discovery 2019
- **Teaching Assistant** at Stanford University
Weather and Storms (CEE 263C) Fall 2015

TECHNICAL SKILLS

- **Languages:** Bash, Fortran, LaTeX, Objective C/C++
- **Modeling Tools:** NetCDF, CDO, NCO, HPC, Machine Learning, Open MPI
- **Development Tools:** Git/GitHub, Jupyter Suite
- **Scientific Visualization & Analysis:** Python, R, Matlab, Keras, Tensorflow