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 — La Jolla, Ca
Ph.D. in Climate Science, Advisors: Dr. Shang-Ping Xie, Dr. Marty Ralph — Current

Stanford University — Palo Alto, Ca
M.Sc. in Civil & Environmental Engineering — 2015

University of California San Diego — La Jolla, Ca
B.Sc. in Environmental Engineering — 2012

PROFESSIONAL APPOINTMENTS

Scripps Institution of Oceanography — La Jolla, Ca
Graduate Research Assistant — 2016-Current

National Center for Atmospheric Research — Boulder, Co
Research Applications Lab - Visiting Scientist — 2019

Stanford University — Palo Alto, Ca
Graduate Research Assistant — 2015-2016

Scripps Institution of Oceanography — La Jolla, Ca
Undergraduate Research Assistant — 2011-2012

University of California San Diego — La Jolla, Ca
Interim Assistant Resident Dean - Sixth College — 2012, 2015

PUBLICATIONS

[1] **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.

[2] S. E. Haupt, **W. Chapman**, C. Kirkwood, S. Lerch, M. Matsueda, 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.

[3] S. Meech, S. Alessendrini, **W. Chapman**, and L. Delle Monache, "Post-processing of rainfall high-resolution simulation of the 1994 piedmont flood", *Bulletin of Atmospheric Science and Technology*, 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 Learing in Python for Environmental Science Problems: Introduction to Machine Learning", AMS committe 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 — Summer 2020
  Center for Western Weather and Water Extremes (8 interns)
- **Intern Supervisor** at Scripps Institution of Oceanography — 2020
  Anirudhan Badrinath: Deep Learning NWP Precipitation Post-Processing
- **Intern Supervisor** at Scripps Institution of Oceanography — 2019
  Laura Thapa (Now PhD. Candidate UCLA): Machine Learning for Physics Discovery
- **Teaching Assistant** at Stanford University — Fall 2015
  Weather and Storms (CEE 263C)

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