Tristan Ballard

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SUMMARY

- Strong statistical background with several research projects implementing advanced data science techniques
- Selected for Spotlight talk at NeurIPS 2020 workshop: Tackling Climate Change with Machine Learning
- Experience managing large geospatial and time series datasets in R and Python
- Passion for developing data-driven solutions to global challenges

RESEARCH EXPERIENCE

Ph.D. Student, Stanford University   9/15-present
- Developed recurrent neural network for predicting river temperature and quantified historical distributional shifts using quantile regression
- Challenged a high-impact model of Gulf of Mexico water quality on statistical grounds

Research Assistant, Duke University   9/13-5/15
- Evaluated a Bayesian model averaging method for combining multiple climate model predictions
- Forecast an Ethiopian precipitation intensification using climate models

Research Assistant, Duke University   1/14-5/14
- Designed error metrics for Markov chain Monte Carlo simulations of wind power

Research Assistant, Columbia University   6/13-8/13
- Modeled the relationship between drought and duck populations in the Great Plains

WORK EXPERIENCE

Data Science Fellow, Sust Global, Inc.   6/20-present
- Built a novel image super-resolution neural network enhancing spatial resolutions eight-fold in wildfire risk assessments
- Developed scalable models for asset-level risk assessments from climate hazards like droughts and cyclones

EDUCATION

Stanford University
- Ph.D. in Earth System Science   2021
- M.S. in Statistics   2020
- Activities: Stanford Datathon 2nd place, Collegiate Nationals Cycling competitor

Duke University
- B.A. in Statistics, B.S. Environmental Science, *magna cum laude*   2015

RELEVANT COURSEWORK

- Deep Learning
- Machine Learning
- Nonparametric Statistics
- Bayesian Statistics
- Stochastic Processes
- Time Series Analysis
- Data Systems
- Geostatistics

SKILLS

- Proficient in R (5+ years). Experience with Keras, Python, Dask, GCP, SQL, Unix

PUBLICATIONS

Ballard, T. and Michalak, M., 2021: Detecting the changing shape of U.S. river temperature distributions using quantile regression. *In Prep.*

Ballard, T. and Michalak, M., 2021: River heatwaves under climate change. *In Prep.*

Ballard, T. and Erinjippurath, G., 2020: FireSRnet: Geoscience-Driven Super-Resolution of Future Fire Risk from Climate Change. *Tackling Climate Change with Machine Learning Workshop at NeurIPS 2020.*

Ballard, T., A. Michalak, G. McIsaac, N. Rabalais, and R. Turner, 2019: Comment on "Legacy nitrogen may prevent water quality goals in the Gulf of Mexico." *Science,* 365, 6455.

Ballard, T., E. Sinha, and A. Michalak, 2019: Long-term changes in precipitation and temperature have already impacted nitrogen loading. *Environmental Science and Technology,* 53, 5080-5090.

Swain, D.L., D. Singh, D.E. Horton, J.S. Mankin, **T. Ballard**, and N. Diffenbaugh, 2017: Remote linkages to anomalous winter atmospheric ridging over the northeastern Pacific. *JGR-Atmospheres*, 122, 12194-12209.

Li, L., W. Li, **T. Ballard**, G. Sun, M. Jeuland, 2015: CMIP5 model simulations of Ethiopian Kiremt-season precipitation: Current climate and future changes. *Climate Dynamics*, 46, 2883-2895.

Ballard, T., R. Seager, J.E. Smerdon, B.I. Cook, A.J. Ray, B. Rajagopalan, Y. Kushnir, J. Nakamura, and N. Henderson, 2014: Hydroclimate variability and change in the Prairie Pothole Region, the "Duck Factory" of North America. *Earth Interactions*, 18, no. 14, 1-28.