

## DATA SCIENCE YEAR AT THE UDP 2022 SEMINARS – SEPTEMBER

**Speaker: Mark Risser, Research Scientist, Lawrence Berkeley National Lab, USA**  
Wednesday September 28, 2022, at 11.30 am Chilean time

- Title of the seminar: Detecting changes in extreme rainfall with attribution to anthropogenic emissions
- Abstract: The gridding of daily accumulated precipitation--especially extremes--from ground-based station observations is problematic due to the fractal nature of precipitation, and therefore estimates of long period return values and their changes based on such gridded daily data sets are generally underestimated. To address this issue, we present a method for deriving “probabilistic” high-resolution data sets specifically designed to characterize the climatological properties of extreme precipitation by applying spatial statistical analyses to the extreme statistics of daily precipitation. Our methodology is appropriate for heterogeneous spatial domains and furthermore is scalable to an arbitrarily large network of weather stations. An important application of our approach is the detection of both natural and anthropogenically-induced changes in the climatology of extreme precipitation, for which we develop a robust statistical technique to identify significant pointwise changes while carefully controlling the rate of false positives. All uncertainty quantification is based on resampling methods, and we utilize supercomputing to quickly analyze, conduct inference, and detect seasonal changes in extremes for a network of approximately 5000 weather stations from the Global Historical Climatology Network over the contiguous United States. Human-induced greenhouse gas emissions generally result in larger and more frequent extreme events, although there are also important areas where the opposite is true.
- Registration at: <https://forms.gle/YHo9qPvtfNHeU5NP6>



Mark Risser is a Research Scientist in the Climate Division at the Lawrence Berkeley National Laboratory. He received his Ph.D. in Statistics from the Ohio State University in 2015. His thesis advisor was Catherine Calder. His primary goal as a statistician is to use data science, Bayesian modeling, and computational tools to identify and quantify climate change. His primary research is in climate, spatial/environmental statistics, and Bayesian modeling, but he also has interests in extreme value analysis, multiple testing, computational methods, and data visualization.

### Local Organizing Committee UDP

Alba Martínez-Ruiz, Paula Fariña, Raúl Pezoa-Zamorano, Francisco Jara-Moroni

### Supporting Institutions – Endorsements

