Climate Science Research

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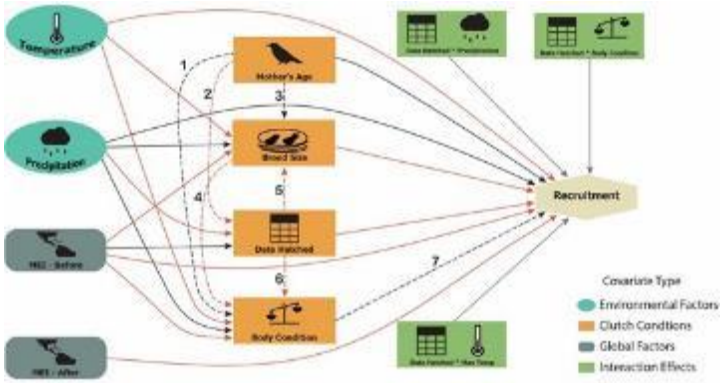
Population Ecology & Science Communication

- **Dr. Adele Balmer**
- Assistant Professor-in-Residence
- College of Sciences
- Email: adele.balmer@unlv.edu

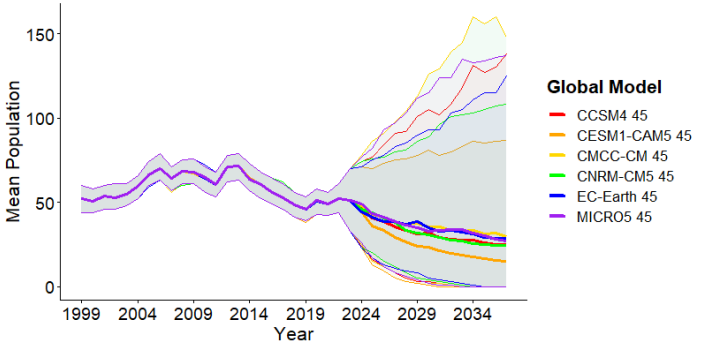
Expertise

- Science Education
  - Evidence-Based Practices
- Population Ecology
  - Population Forecasting
- Animal Behavior
  - Alternative Reproductive Tactics
- Ecological Modeling
- Science Communication
- Science Policy

Hypothesized structural equation model.



Population projections derived from an Integrated Population Model (IPM) and Bayesian Population Viability Analysis (BPVA), based on six general circulation models.



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Sedimentary Geology

Dr. Ganqing Jiang
Professor
Department of Geoscience
Phone: (702) 895-2708
Email: Ganqing.Jiang@unlv.edu

Expertise:
Sequence and chemostratigraphy
sedimentology
Carbonate diagenesis

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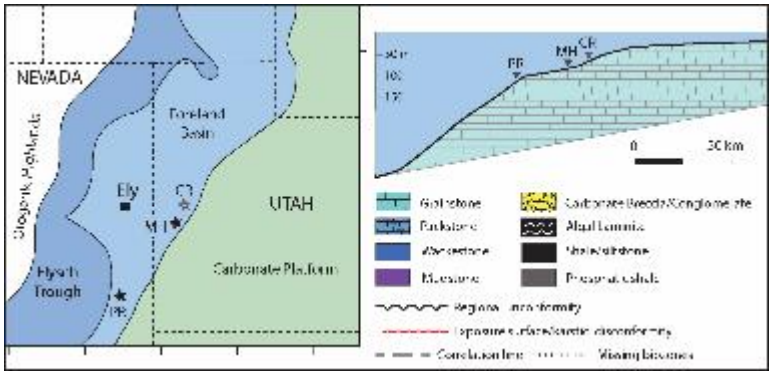
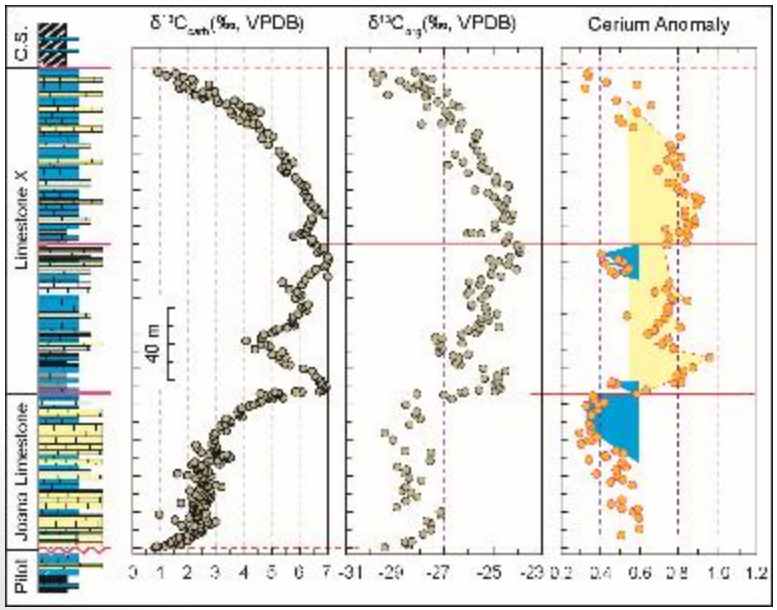
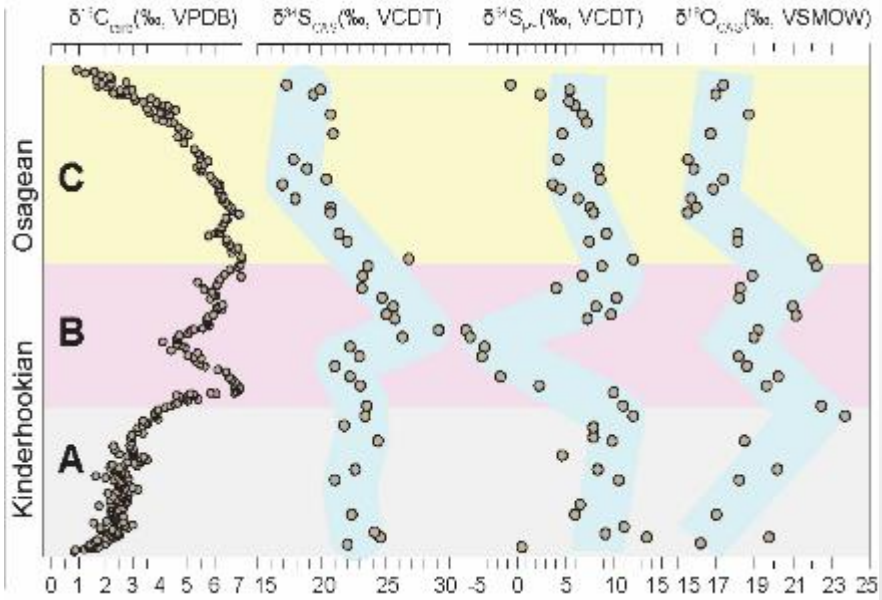
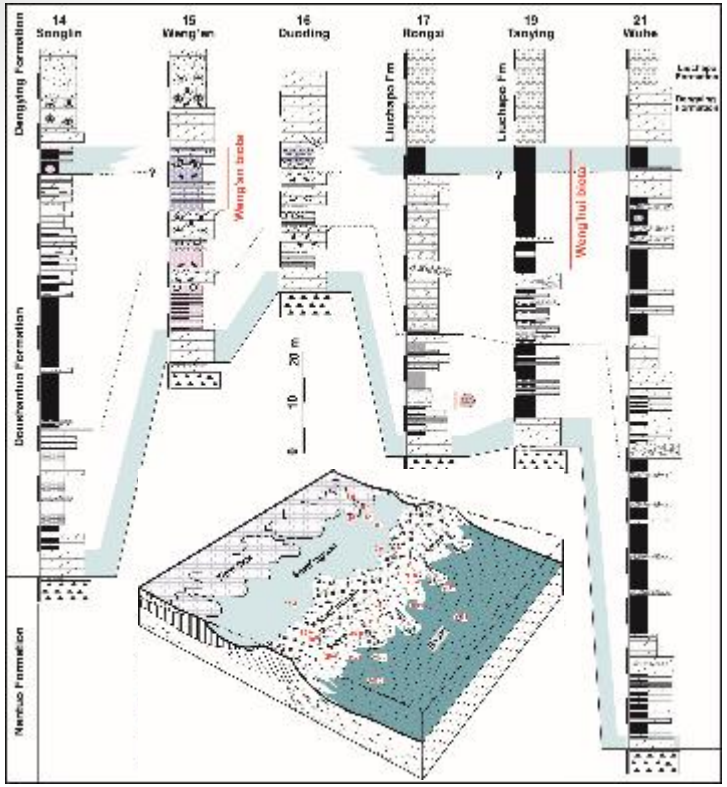


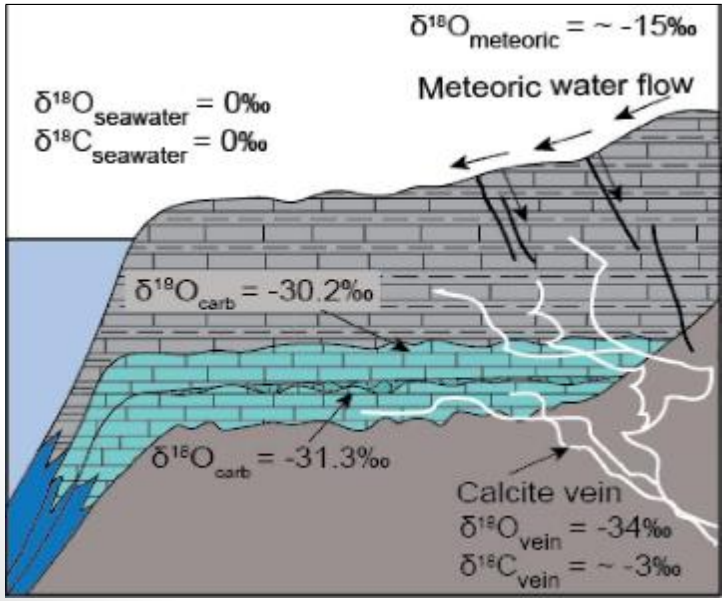
- Sequence and chemostratigraphy
- Paleogeographic reconstruction
- Applications of stable isotopes and rare earth elements
- Paleoenvironmental change across major perturbations of the carbon cycle and mass extinctions







- **Basin analyses and paleoceanography**
- **Fluid migration and carbonate diagenesis**
- **Tracing fluid migration in sedimentary basins using stable isotopes and trace elements**
- **Carbonate aquifer**



Climate Science and Paleoclimatology

Matthew S. Lachniet

Professor

Department of Geoscience

Phone 702-895-4388

Matthew.Lachniet@unlv.edu

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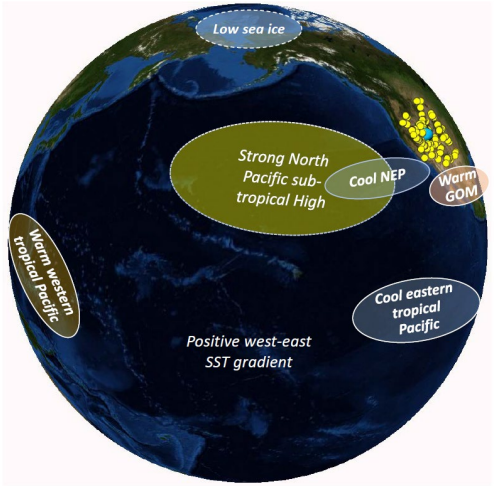
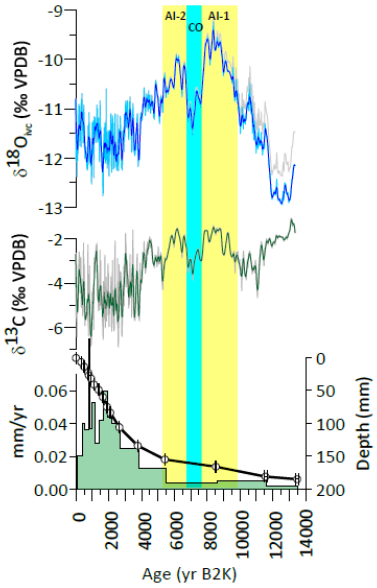
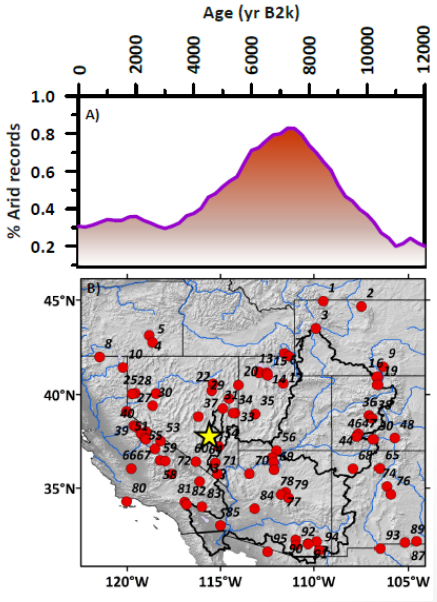
Paleoclimatology

- Study of the causes, timing, and consequences of climate change on timescales ranging from decades to millennia
- Cause of aridity in the Great Basin and Western United States
- Influence of ocean temperatures on precipitation in Nevada
- Cave archives of past climate with sites in Nevada, Mexico, Central America, and elsewhere







Dryland ecology, hydrology and climate dynamics

Dr. Matthew Petrie
Assistant Professor
School of Life Sciences
ph: 702-895-5844
e: matthew.petrie@unlv.edu

Expertise:

Vegetation ecology and near-surface hydrology
Forest regeneration
Climate dynamics and climate change forecasting
Extreme events
Landscape ecology
Manipulative field experimentation

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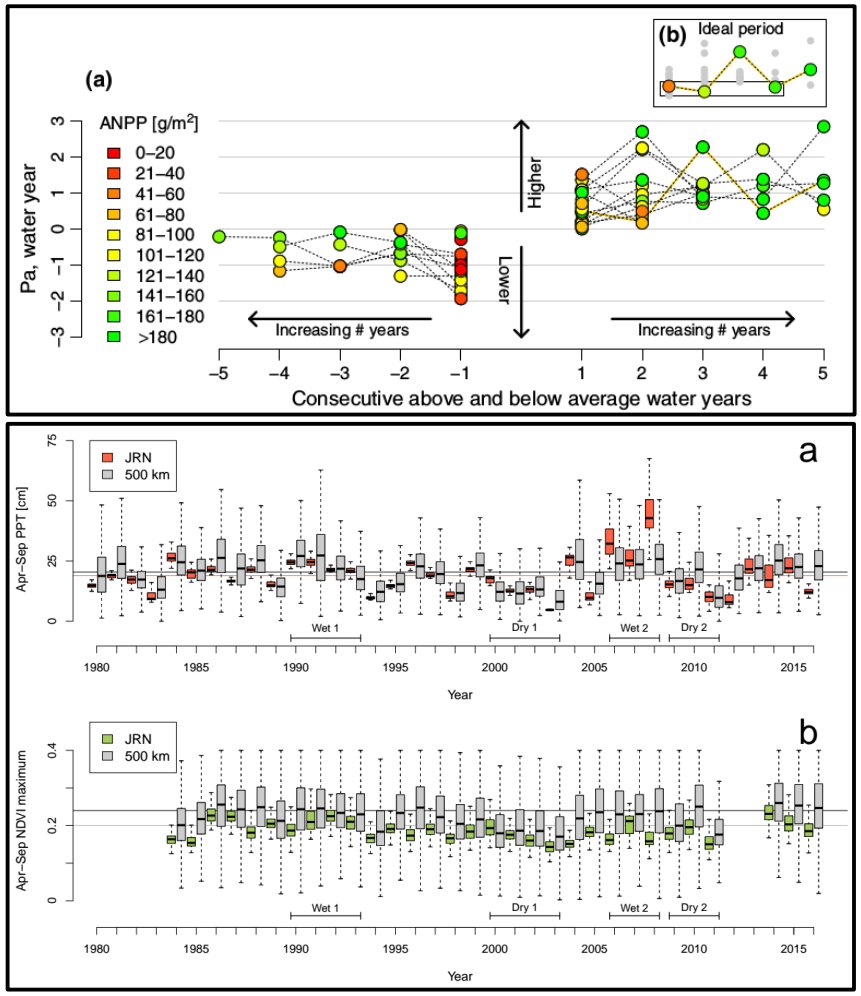
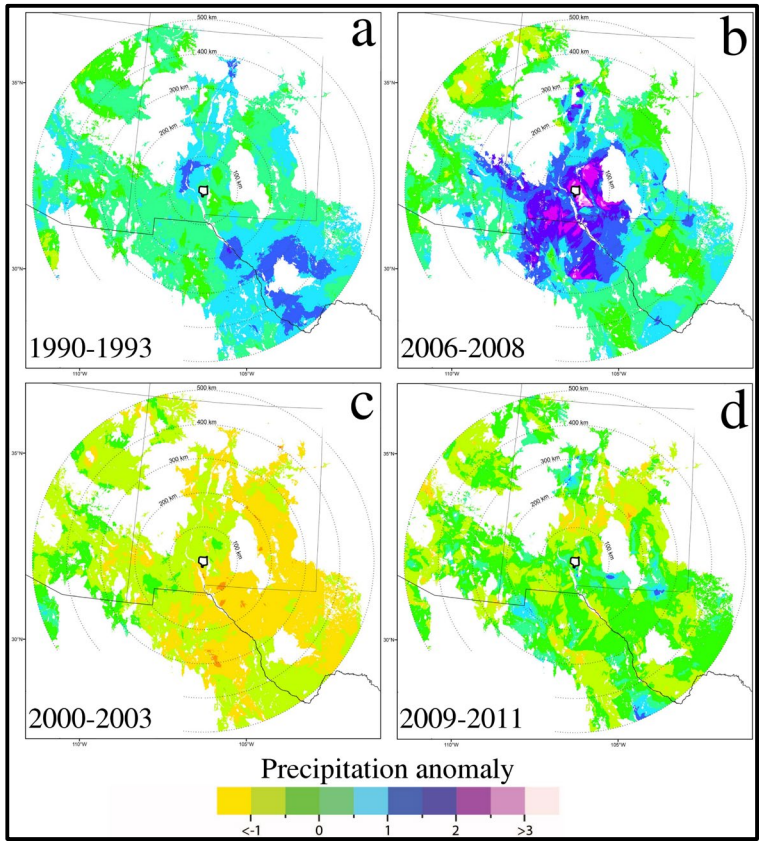
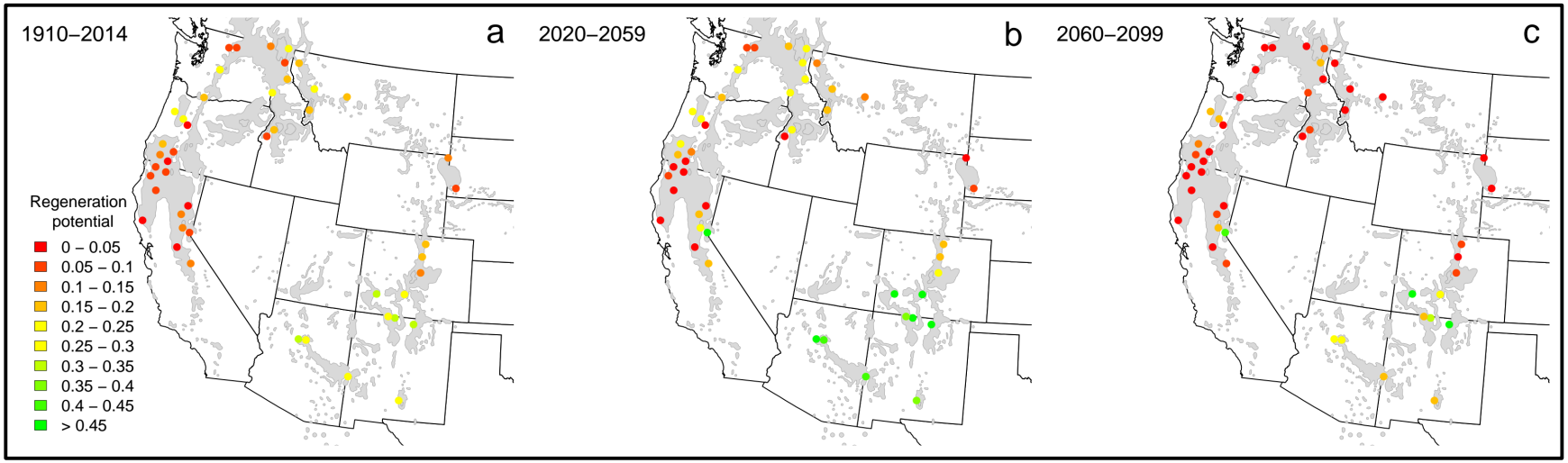
Linking extreme climate events and ecological dynamics across space and time

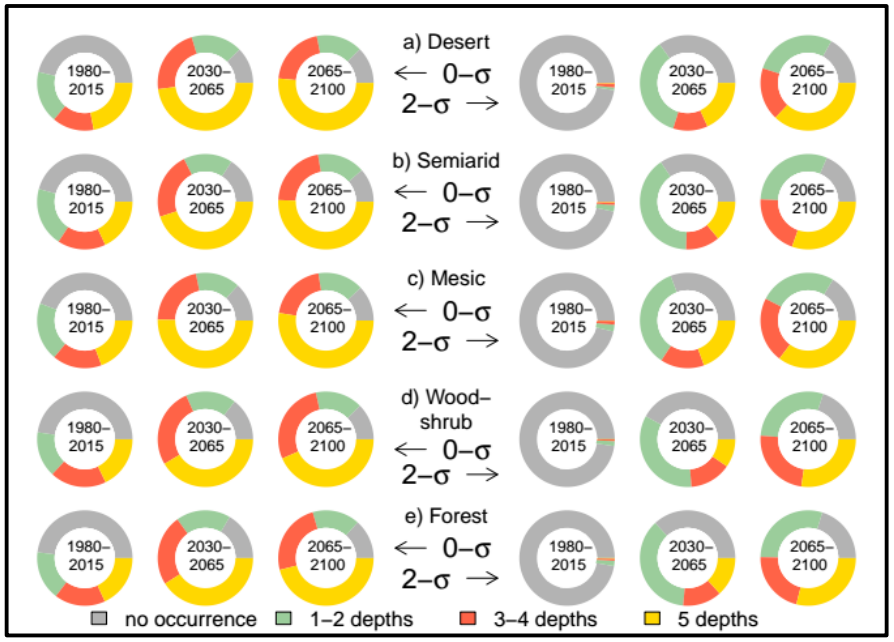




Above: Disentangling locally- and regionally-observed ecological responses to multiyear high and low rainfall periods. Multiyear periods are a key component of understanding climate impacts to arid and semiarid regions. Our research focuses on the physical mechanisms that shape ecological responses, providing a foundation for understanding the effects of local and regional extreme events in a changing climate.

Forecasting climate change impacts





Above: Natural forest regeneration may decline substantially throughout the western US in the 21st century. We study how climate, landscape properties, and the stress tolerance of tree populations will shape the future of western forests.

Left: Forecasts for increasing belowground extreme temperature events in a changing climate. We use downscaled climate model projections to forecast the increasing occurrence of moderate (0-σ) and very high (2-σ) extreme temperature events throughout multiple depths in the soil profile for ecosystems of the central and western US.

Climate Change; Renewable Energy; Astronomy

Dr George Rhee
Department of Physics and Astronomy
Phone: (702) 895-4453
email: grhee@physics.unlv.edu

"Expertise:"

Observational Astronomy/Cosmology

Renewable Energy

Colorado River flow projections

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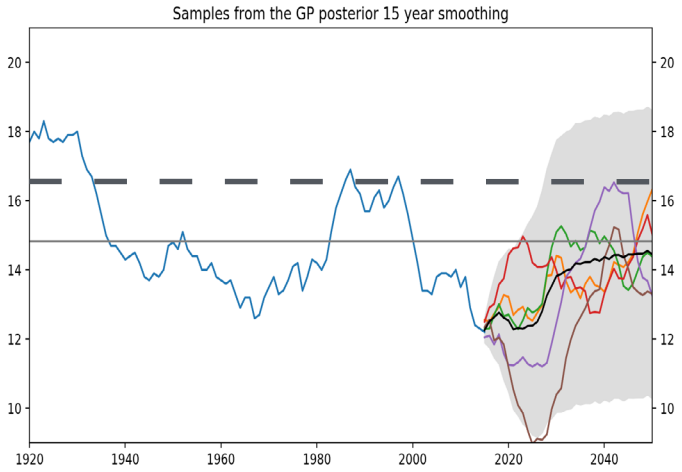
Climate Change

River flow projections using statistics from tree ring data from the upper Colorado River Basin. Gaussian processes with known covariance can be used to predict properties of river flows. Figure shows predictions for Colorado river flow 2015-2050.



Astrophysics

Interested in:

Dark matter distribution in galaxies inferred from the rotation of neutral hydrogen gas in disks

Properties of galaxies in extreme low density environments (voids)

Measuring the masses of black holes using the variability of the central region in Seyfert galaxies and quasars. spectral and brigtness measurements

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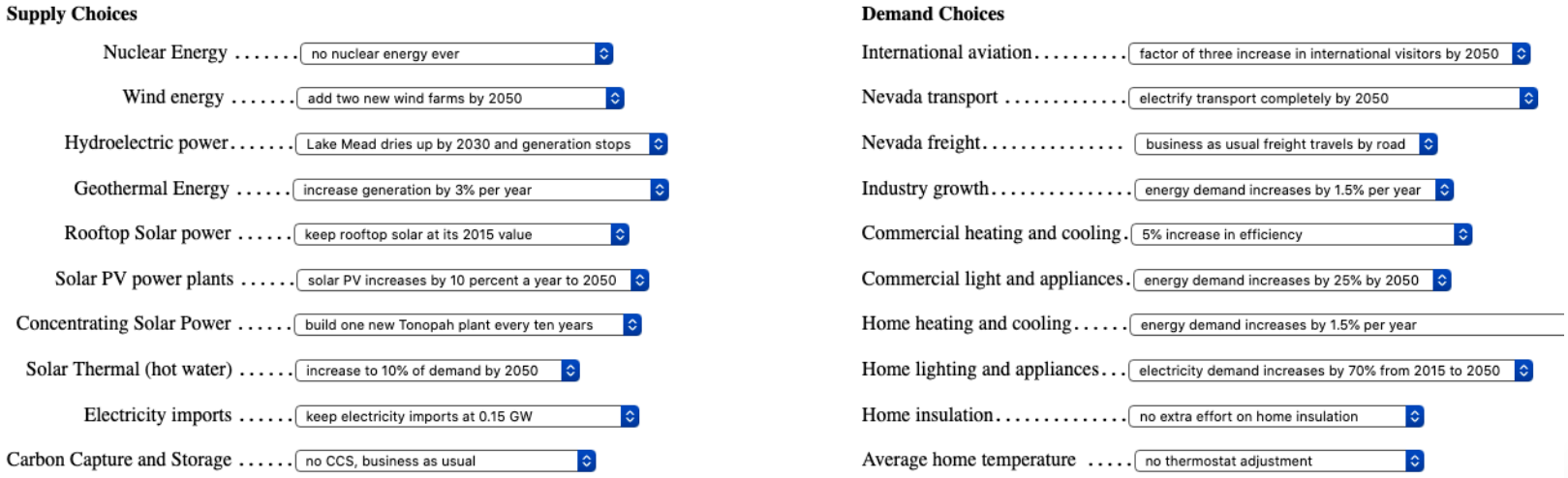
Renewable Energy

Created an online calculator allowing the user to choose supply and demand options to make plans to zero out emissions in Nevada by 2050. http://nv2050.physics.unlv.edu/. I

Interview on KPNR and writeup describing the idea: https://knpr.org/desert-companion/2018-12/do-math



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