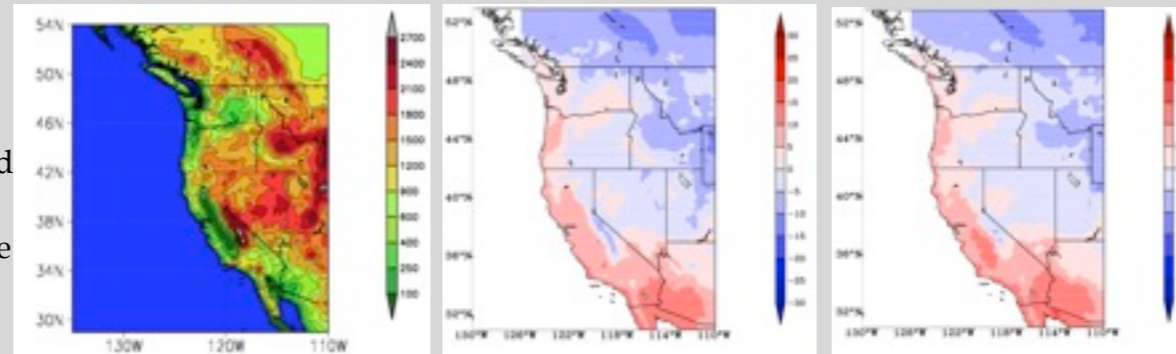
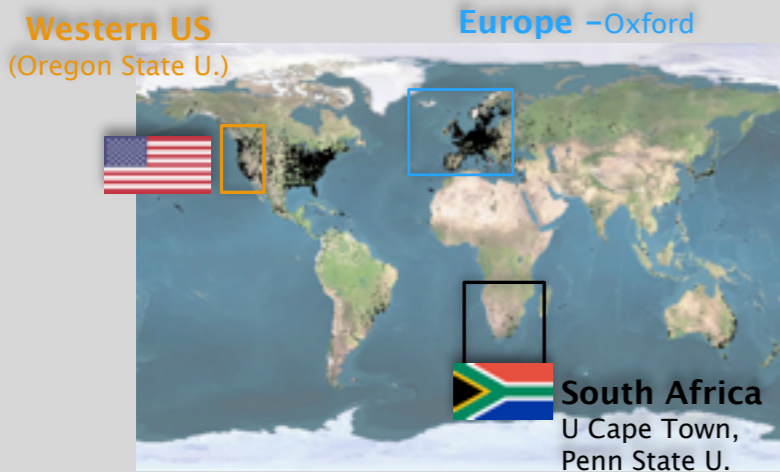


# Superensemble of Regional Climate Modeling for the Western US using Climateprediction.net

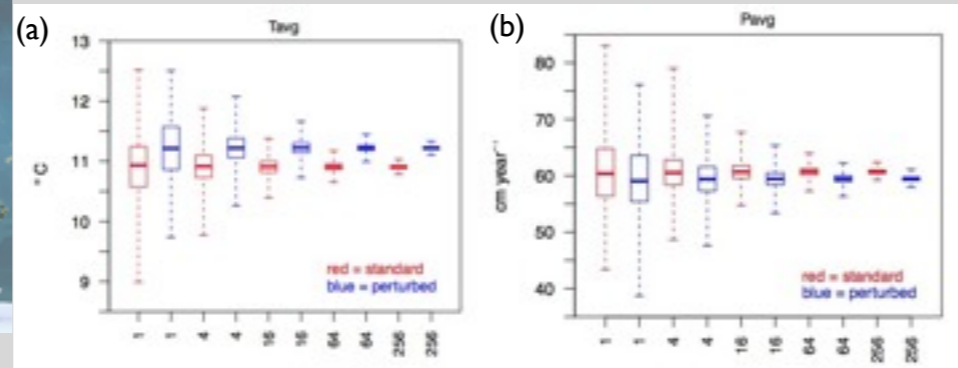
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**Background:** For over a decade, a citizen science experiment called climateprediction.net organized by Oxford University has used computer time contributed by tens of thousands of volunteers around the world to create superensembles of global climate simulations. Now a partnership between Oregon State University, Oxford University, and the UK Meteorological Office brings these computing resources to bear on regional climate modeling for the Western US.

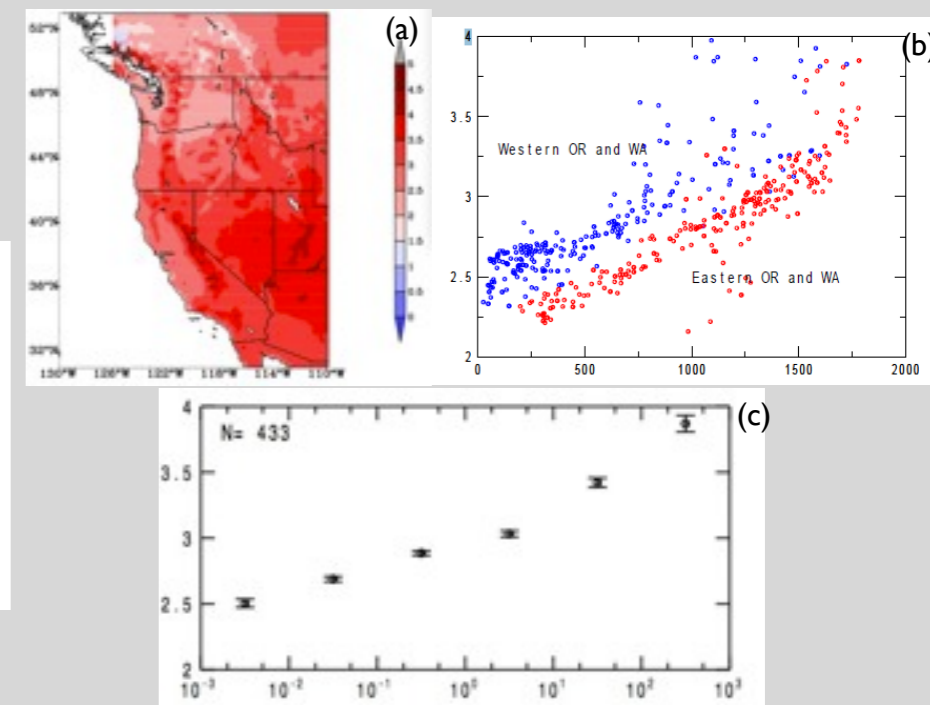


**Regional** model domain and elevation (left), simulated winter seasonal temperature (center), and observed winter seasonal temperature from NARR (right). The pattern correlation between our model and NARR for winter seasonal temperature is 98%.

**Experimental Design:**  
 1960-2010 observed SST  
 Vary initial conditions  
 Vary model parameters  
 2030-2049 with SST perturbations  
 Vary initial conditions  
 Vary model parameters  
 Vary SST perturbations

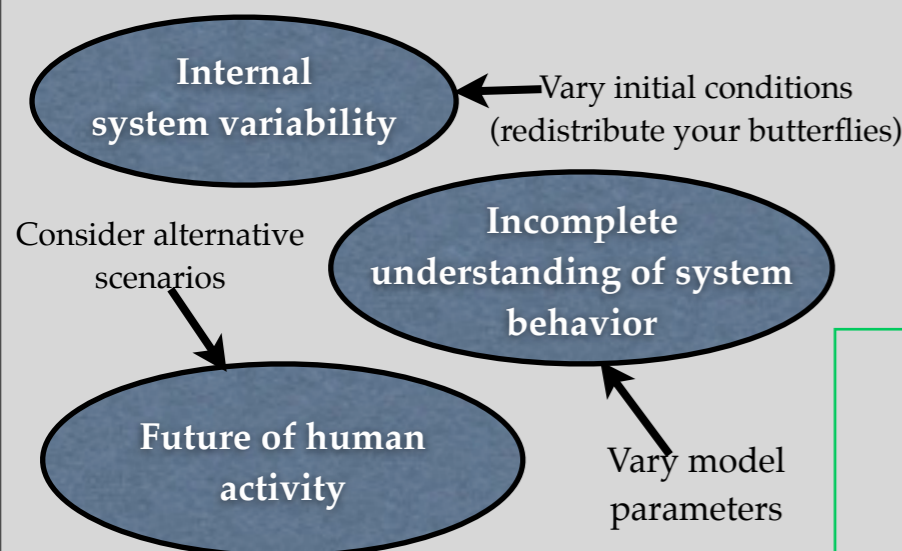


Representation of the decrease in uncertainty with increasing ensemble size for annual mean temperature (a) and annual mean precipitation (b) for a single year (Dec 2008 through Nov 2009), averaged over the western US domain. The variability in Standard Physics experiment is a measure of the model sensitivity to initial conditions, and the variability in the Perturbed Physics experiment is a measure of the model sensitivity to perturbing the physical parameterizations in the model. Box-and-whiskers show the median, inner quartiles, and extremes.



Changes in quantities, 2029-2048 minus 1985-2004, averaged over 433 simulations. (a) Change in spring temperature (C). (b) Scatterplot of change in temperature vs elevation; each dot represents the average difference at one model grid point. (c) Temperature change in the PNW binned by change in April snow water equivalent. The level of regional information is encouraging and exciting.

## Quantifying three sources of uncertainty



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