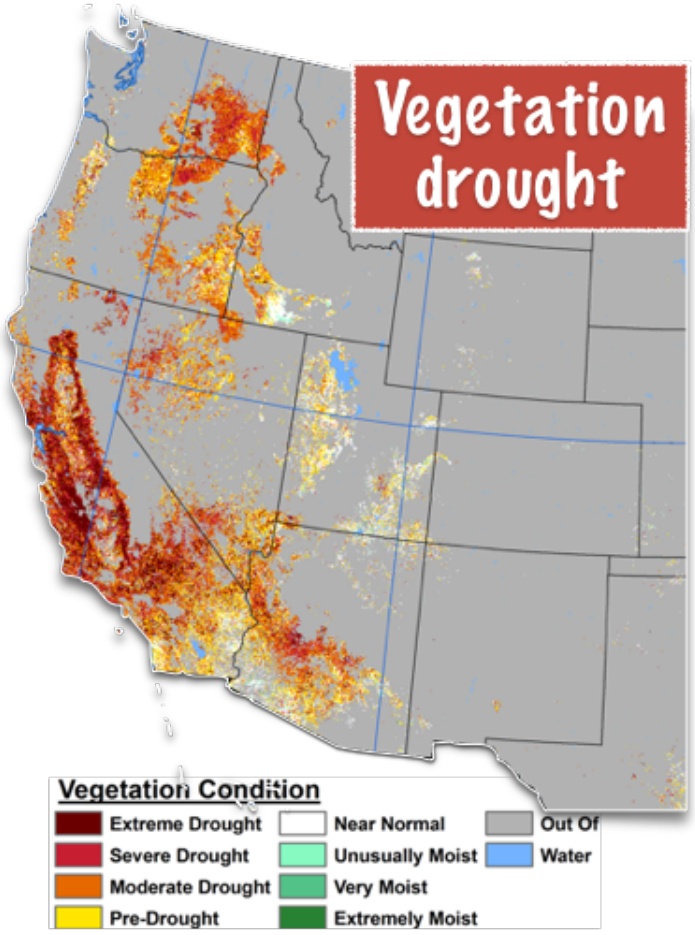
Looking ahead beyond baseline of drought - Climate amplification in the West

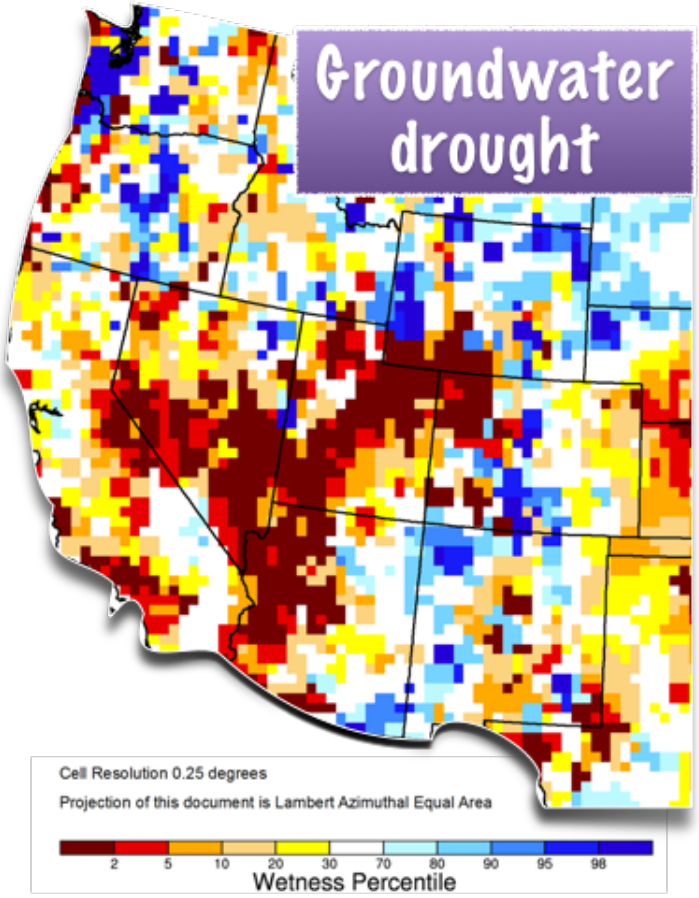
Utah Climate Center

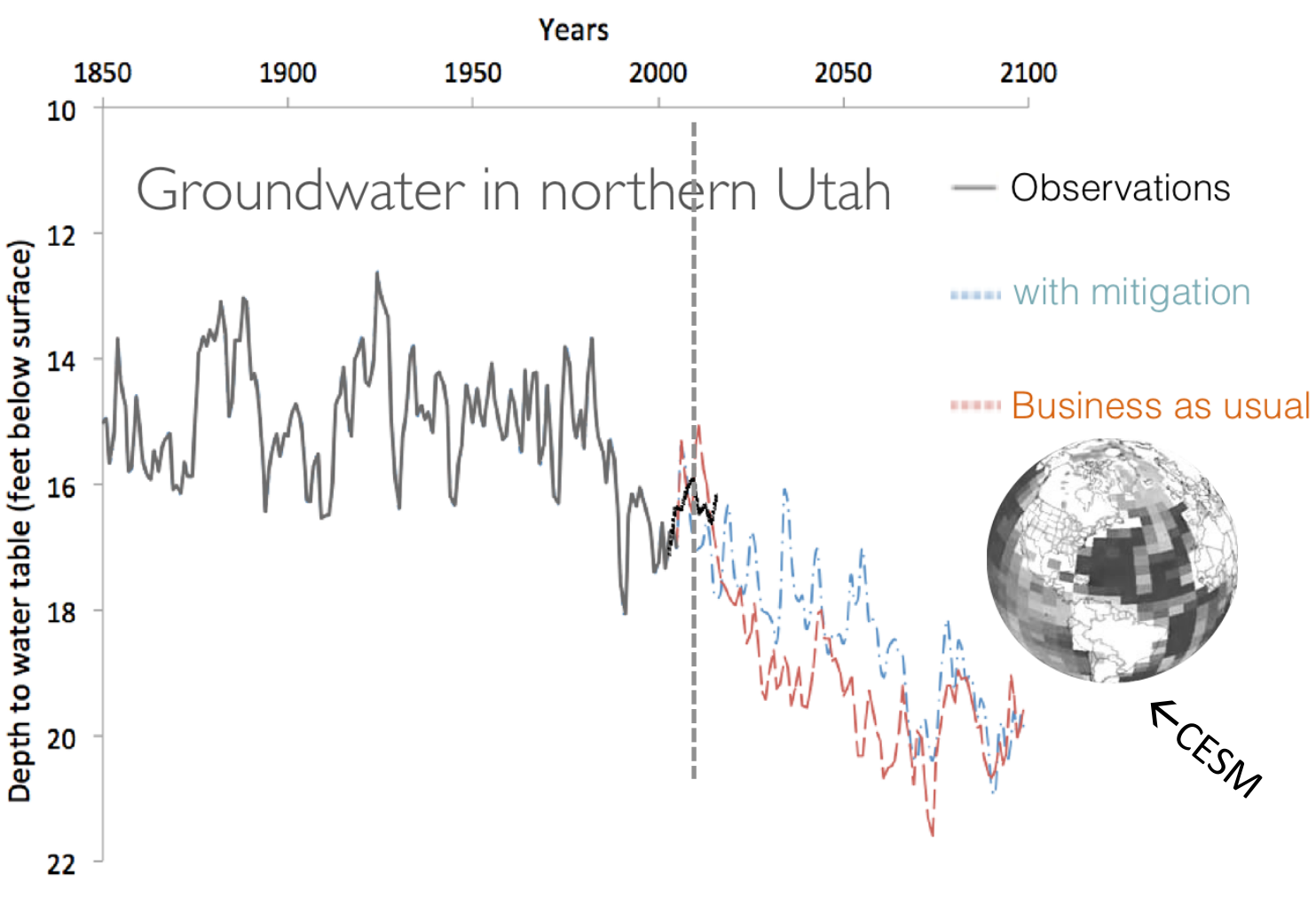
Climate Science Program -
Utah State University

Drought picture depends on how it's measured



2-4 March 2015



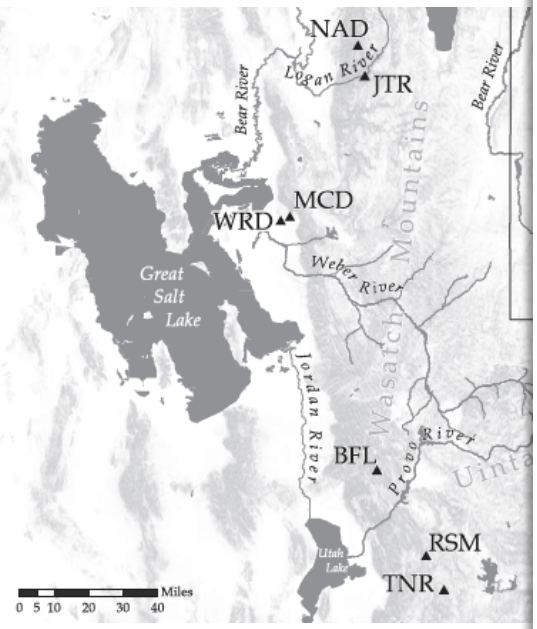


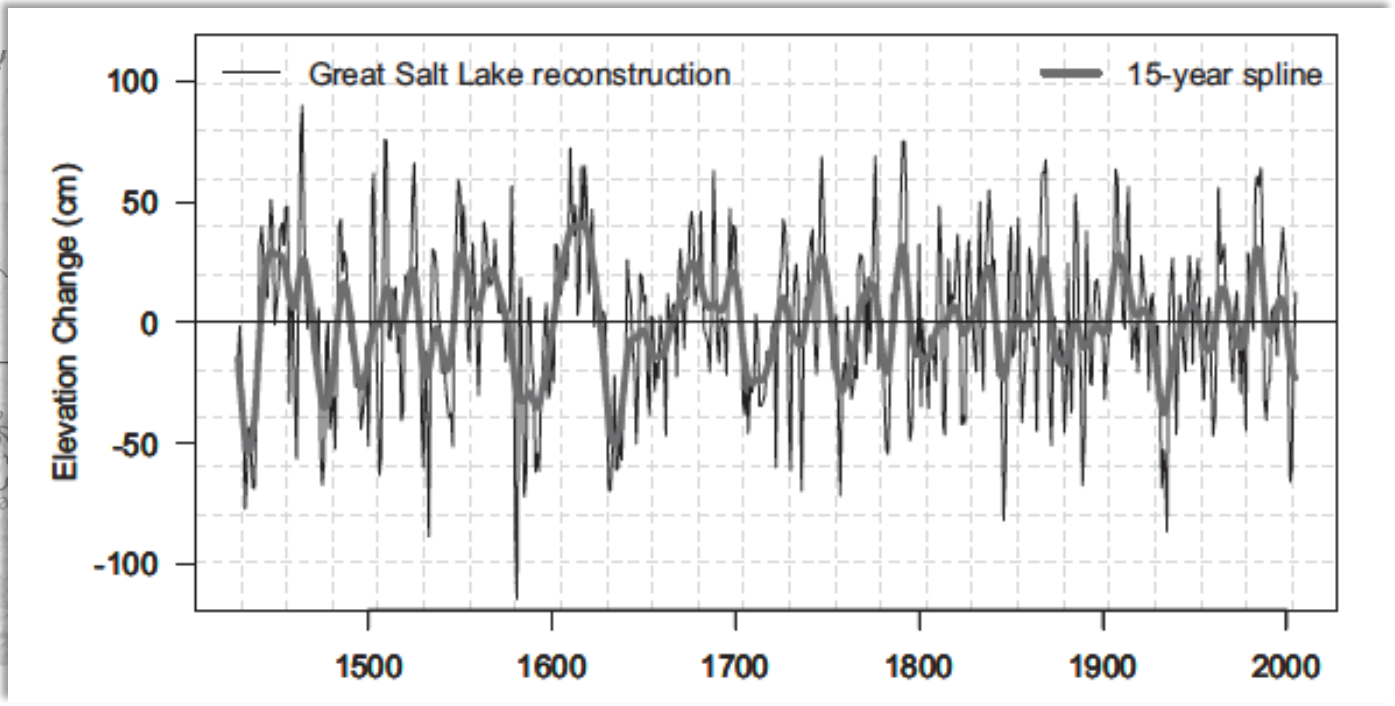
Climate forcing alone (without human withdrawal) can reduce groundwater level

Study ~600-yr. Great Salt Lake reconstruction

By Amy Joi O'Donoghue

February 18th, 2015 @ 7:01





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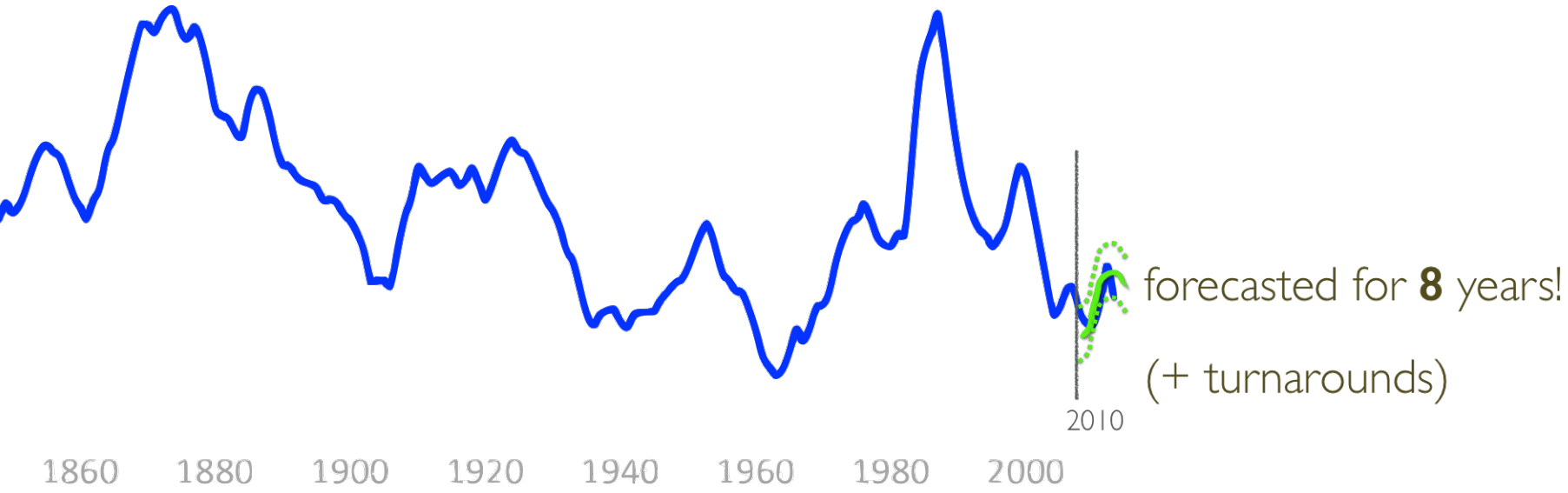
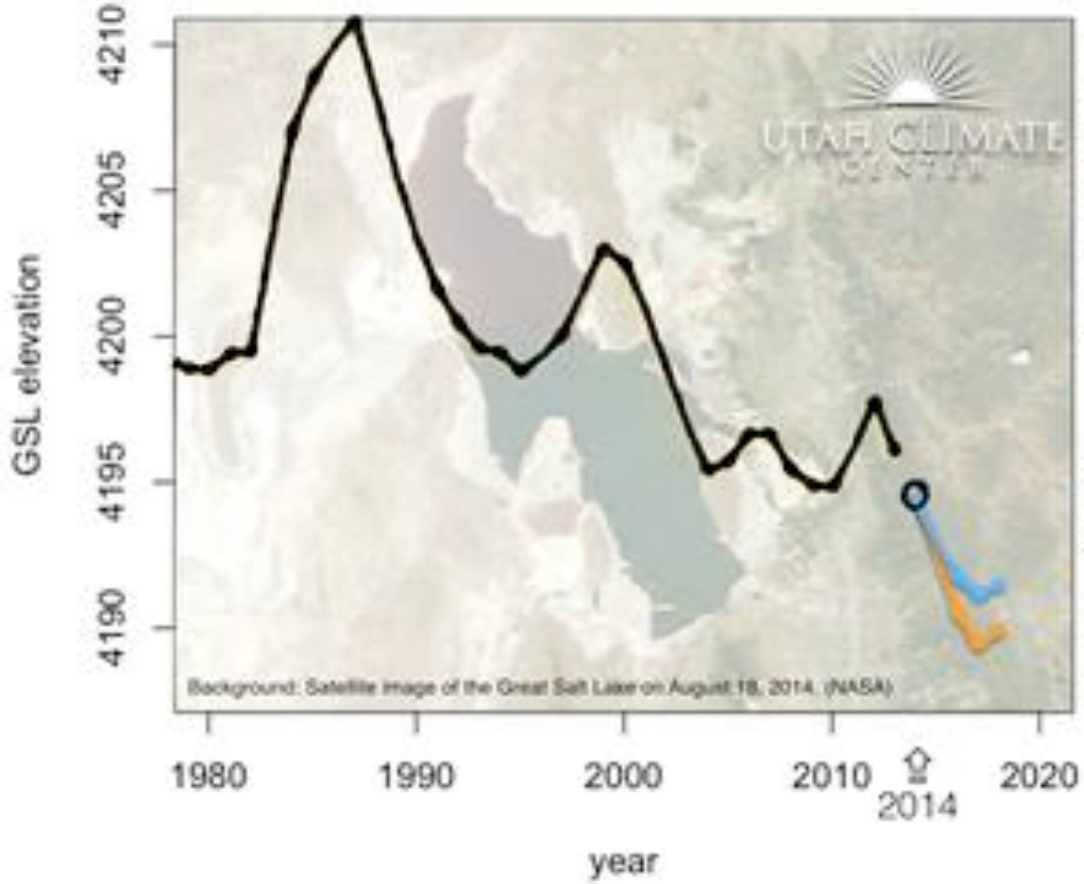
Warm, dry winter in store for Utah?

By Matthew K. Jensen | Posted: Sunday, November 4, 2012 12:00 am

"My anticipation is that we're moving into three or four years of drying,"

– Dr. Gillies, State Climatologis



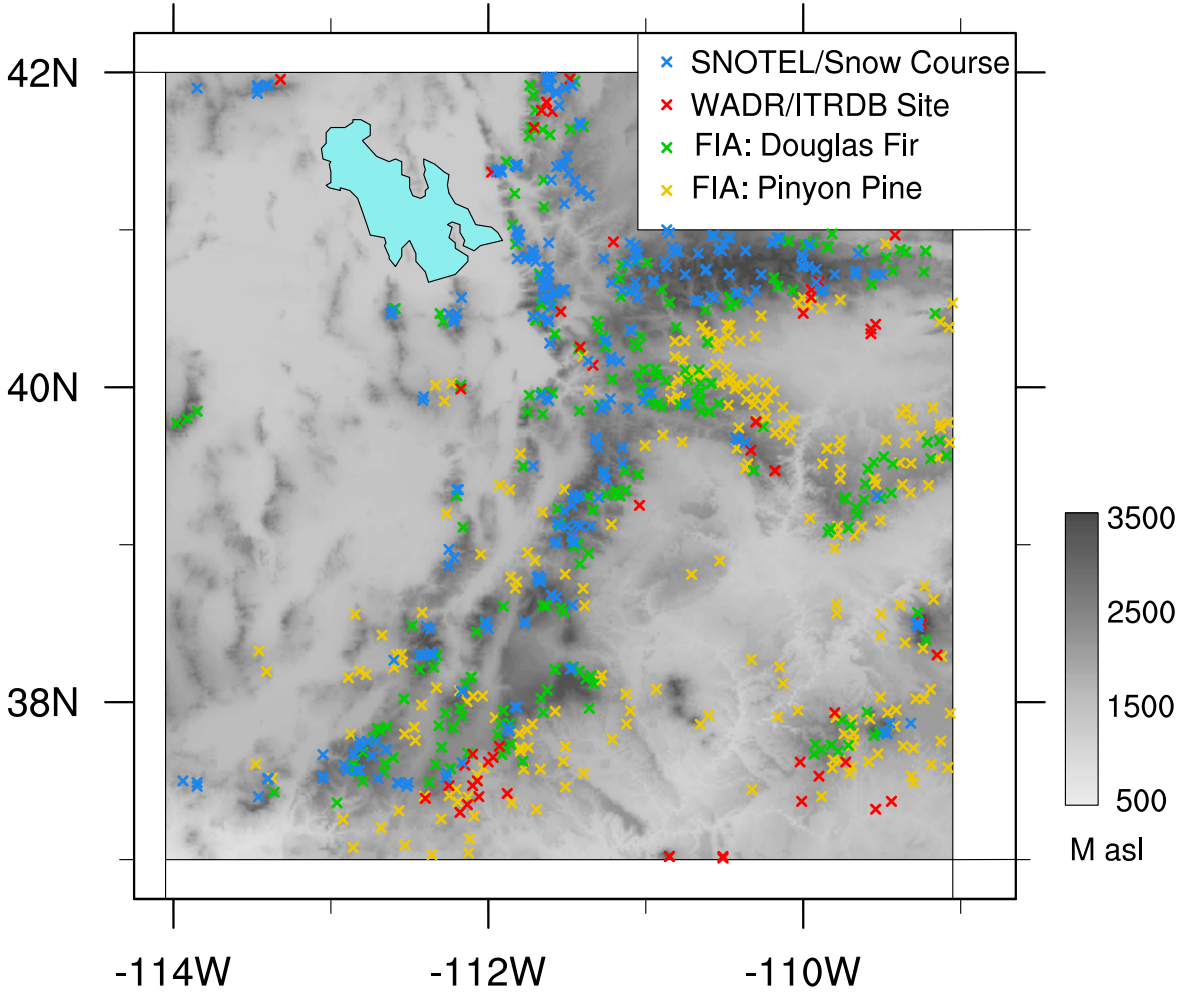


Based upon previous research conducted at USU and Utah Climate Center (1,2), the level of the Great Salt Lake (GSL) is predicted to continue a decline towards 2017, at which point the lake level will begin to rise.

Blue prediction is derived from GSL and tropical Pacific sea surface temperature (1);

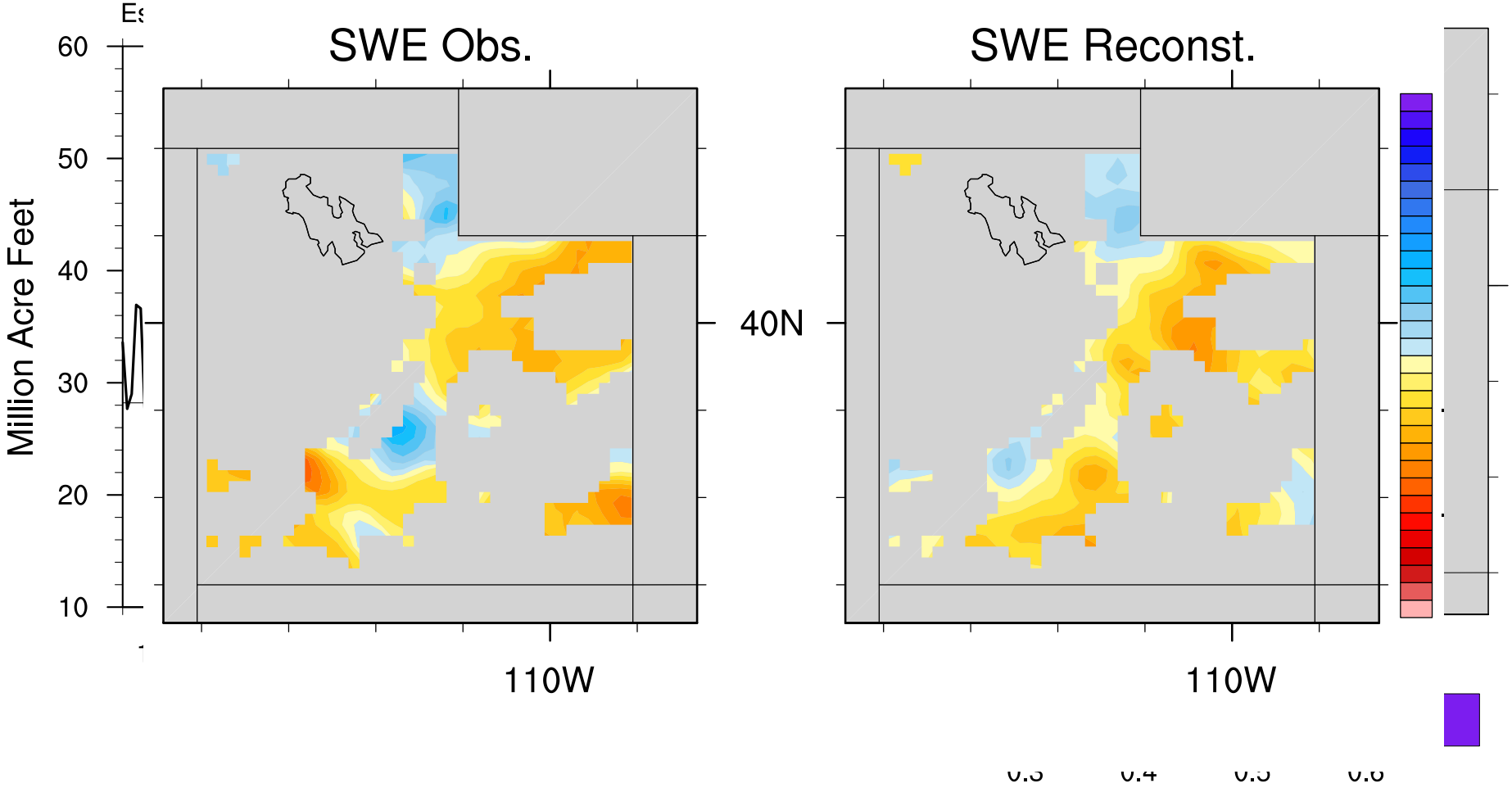
orange prediction is produced with a 700+ year long tree-ring reconstruction of GSL level (2).

FIA Tree-ring Dataset



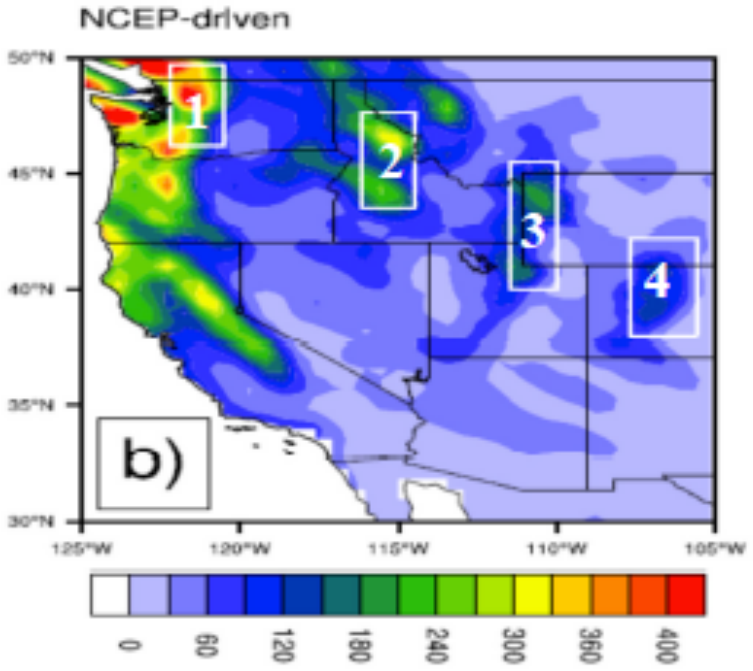
FIA SWE

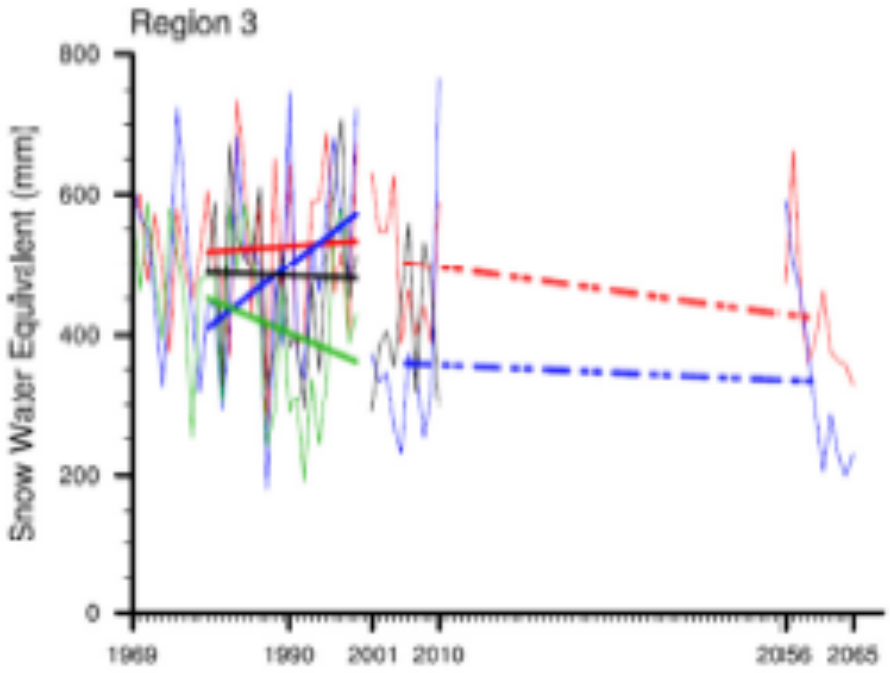
year: 1974



Modeling Utah SWE

WRF model used to downscale and bias-correct coarse-resolution global climate model for western U.S., yielding regional detail





Decadal Prediction

- Part of CMIP5 experiments
- Models initialized with observations, then allowed to run freely for 10-30 yrs.
- Results both show models' ability to reproduce climate teleconnections at longer time scales, and to test useful predictive ability of models

Summary

- Efforts in past climate give us a better understanding of range of variability and return intervals of extremes
- Current forecast products give useful information for short- to medium-term management
- Further research in modeling offer the potential for long-term planning