Introduction

Most of California’s water comes from what scholars call hybrid stream flow which inputs come from snow melt as well as precipitation. Significant run-off loss and poor adaptations to possible water variability could be problematic for ecosystems, urban, rural, and health sectors along with economic activity. General assessment of temperature increases in Northern California confirms a warming mean temperature will result in snowline retreat, or increase in elevation, resulting in less snow cover (Powell et al., 2011).

Data and Methods

Acquired Data

- Landsat Imagery from USGS LM 4-5 (1990-2008)
- Big Chico Creek Watershed (GIC)
- DEM from USGS National elevation Dataset

We classified each year of the imagery for snow using isoclusters. Once classified, we clipped the data to our watershed and converted classified snow to vector entities. We masked our elevation to search for areas above 600m to avoid error in terrain that’s more heterogeneous. After that, we calculated the areas of the shapefiles. The shapefiles were then converted into trimesters for zonal statistical analysis.

Conclusions

- Aggregate predictions about hydrologic behavior can sometimes be inaccurate for local analyses.
- ENSO events may also have little or no effect on study regions of this size. Snow accumulation on mellow slopes occurred statistically significant with trimesters although linear trends in snow cover resulted in more snow accumulation over time for the study region.
- Also statistically significant is the mean increase in elevation for classified snow. This is a widespread concern for snow under warming conditions.
- The difference in means for trimester 1 and 3 is also significant meaning that accumulation is occurring less on slopes more exposed to direct radiation.
- Snow frequencies also correlate well with elevation and the most frequency takes place at the top of the canyon.

References

- Satish Kumar Regonda and Balaji Rajagopalan, Martyn Clark, John Pittick, Seasonal Cycle Shifts in Hydroclimatology over the Western United States, Journal of Climate. 2004 (http://civil.colorado.edu/~balaji/my-papers/regonda-et-al-jcli-paper.pdf)

Special thanks to the entire faculty in the Department of Geography at CSU Chico for whom made this analysis possible!