THE LATE HOLOCENE DROUGHT: A PERSISTENT DRY PERIOD BETWEEN 2800 AND 1800 CAL YR BP ACROSS THE CENTRAL GREAT BASIN

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7.0 m core

8080 cal yr BP basal date
2 aquifer types within the Great Basin:
• Carbonate rock aquifers – old deep water
• Valley fills – young surface water

Stone house Spring is a valley fill aquifer:
• Young water - likely recharged within the last 60 years
• Originates primarily from winter precipitation in local mountains
• Variable flow over time; likely influenced by climate variability
Age model and sedimentation rates based on 12 radiocarbon ages

The graph shows a linear relationship between depth (cm) and age (cal yr B.P. x 10^3) with a sedimentation rate of 6.8 years/cm. The data points at various depths are 6.8, 22.9, 11.6, 13.7, 22.8, 14.0, 1.4, and 4.8 respectively.
Stonehouse Meadow summary data
Humboldt – High runoff
Diamond Pond, Harney Basin, Southern Oregon

(Wigand 1987)
Mission Cross Bog

Mensing et al., 2007
SOI +  
PDO +  
PDO -  
AMO +  
AMO -  

(Wise 2010)
Pollen (L. Heusser) in TN062-0550 off Eureka, California

- **Sequoia**: Spring upwelling and/or winter moisture from the Pacific
- **Oak**: Drier climate, inland from coast
- **Alder**: Colonizes wet, shade-free areas along river banks

Increase fog = coastal upwelling and/or warm winter moisture from the Pacific
Decrease = drying winter
Increase fog = coastal upwelling and/or warm winter moisture from the Pacific

Unpublished data care of Linda Heusser and John Barron
Lake Elsinore, Southern California (Kirby et al., 2004)
Chironomid based summer temperature reconstruction from Stella Lake, Snake Range, eastern Nevada

(Reinemann et al., 2009, Quat. Res.)
Neoglacialion begins ~ 3200 cal yr BP

Glacial maxima – 2800 cal yr BP
2200 cal yr BP

(Bowerman and Clark, 2011)
Summary

• Persistent Late Holocene drought ~2800 – 1800 cal yr BP across central Great Basin
• Sites in northern Great Basin wet during this period, suggesting a northerly storm track
• “Potential” mechanism, a persistent –PDO
• Some evidence that southern California also experienced this drought
• Few available temperature records indicate cooler than modern temperatures
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