



Holocene chronostratigraphy and paleoclimate implications of dune fields across southern Utah

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#dunetrekking #droughtstudy #redsandsotime #wherethewindblows





PROJECT INTRODUCTION

- Recent (20th – early 21st century) droughts – annual to multi-annual
- Medieval (900 – 1100 A.D.) droughts – decadal to multi-decadal and centennial
- Drought forecasts (late 21st century) – likely similar or greater duration than medieval droughts



View of annual drought impact at Lee's Ferry, courtesy US Geological Survey.



Abandoned Anasazi communities, Chaco National Historical Park and Hovenweep National Monument. Courtesy: National Park Service.

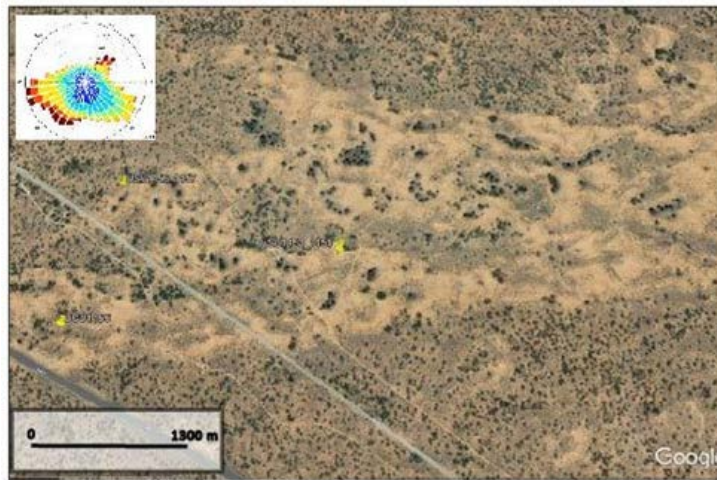
Understanding past climates can inform us about future climate change and aid us in developing adaptive strategies for changing conditions.



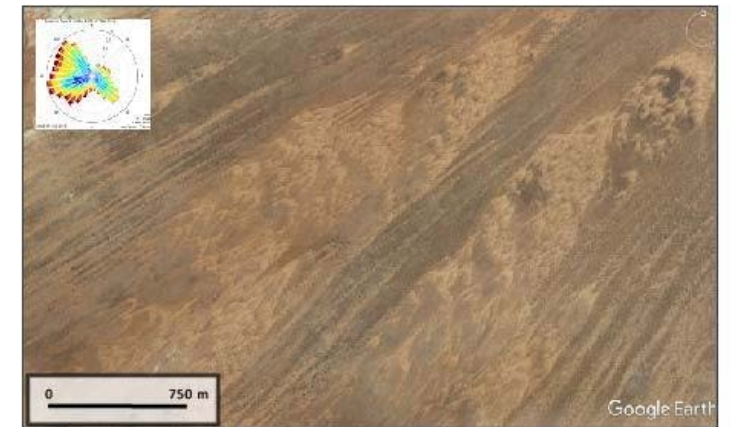
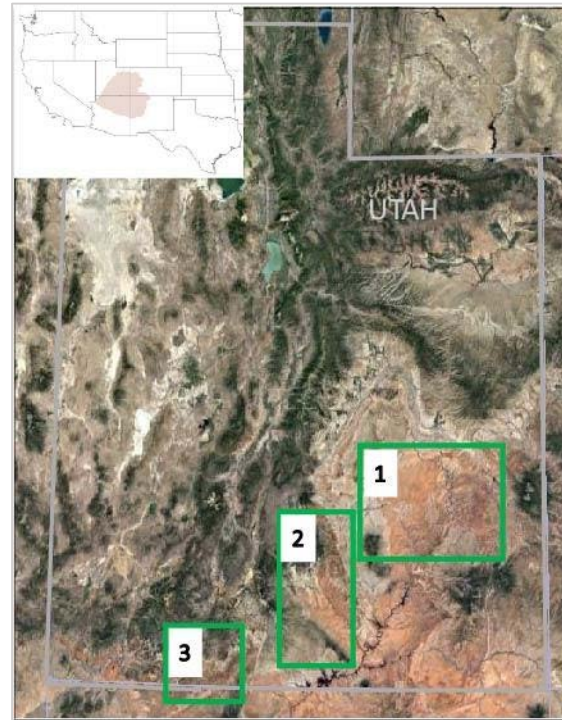
PROJECT LOCATION

Southern Utah

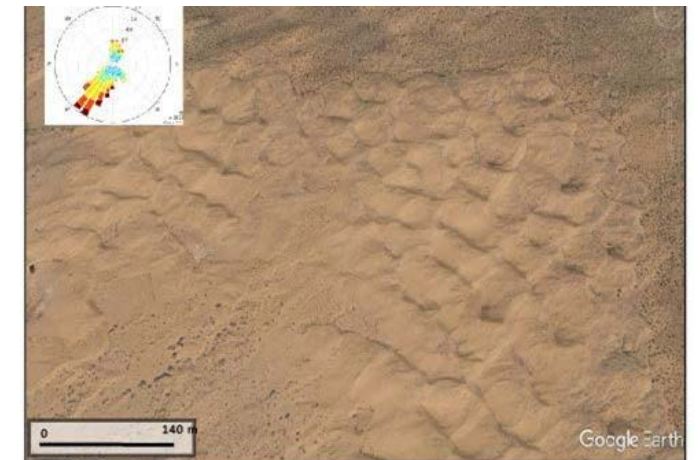
- is readily accessible
- fills a data gap
- offers a regional record



Area 3. Kanab dune field - stabilized (vegetated) sand sheet, partially stabilized, long parabolic dunes and blowout features.



Area 1. San Rafael Desert dune field - stable relict limbs, hairpin parabolic, active parabolic dunes.

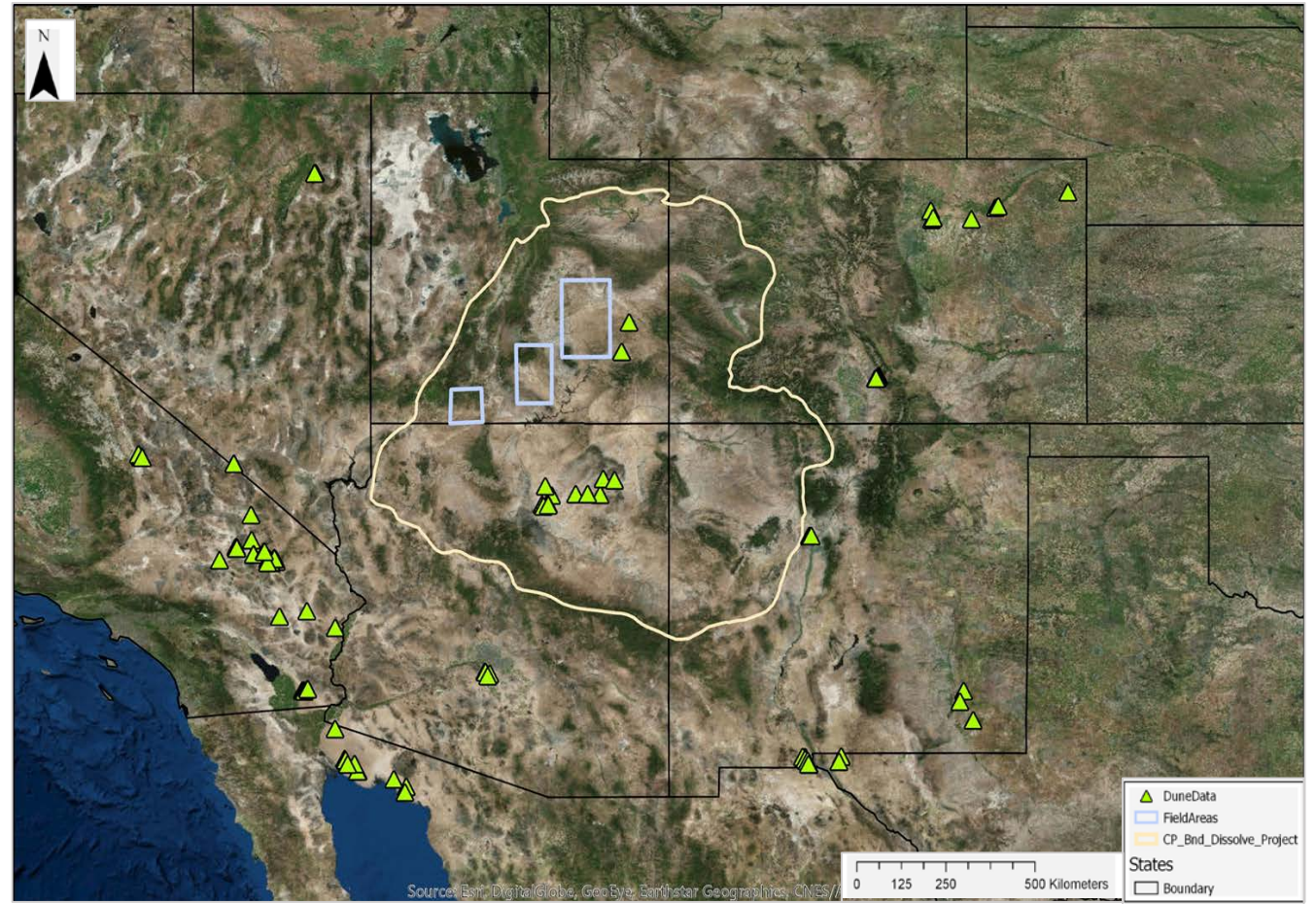


Area 2. Escalante Desert dune field - active barchan dunes, transverse ridges, overlie stabilized (vegetated) sand sheet.



RESEARCH QUESTIONS

- When have southern Utah dunefields been active during the Holocene age (past 12,000 years)?
- Are multiple dunefields active at the same time?
- Do periods of dunefield activity correlate with other drought proxy data in the Colorado Plateau?



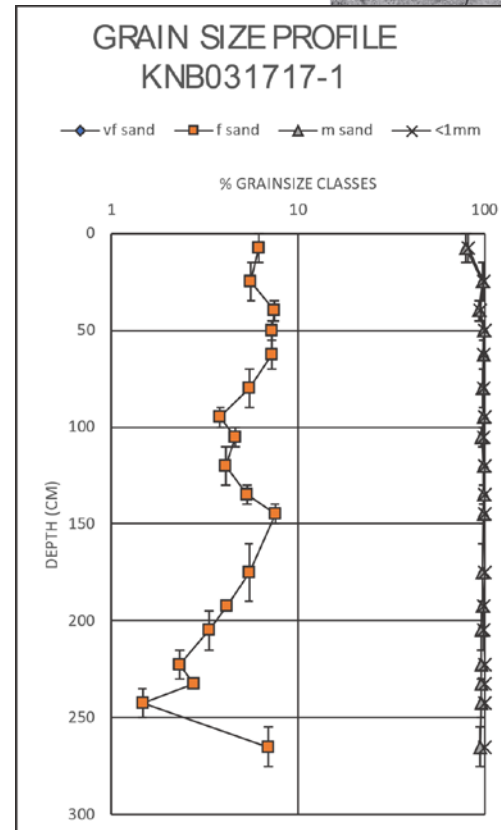
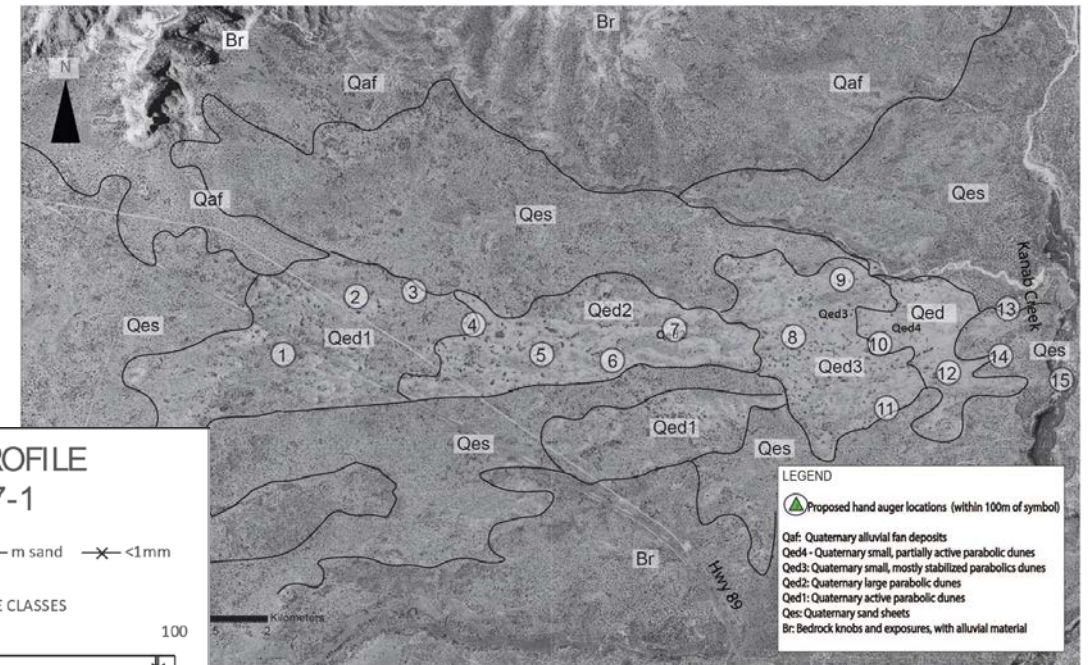
Hypothesis:

Dune activity occurring concurrently across southern Utah suggests regional drought (decadal or longer) occurred at that / those times.



APPROACH & METHODS

- Map geomorphic units in dunefields
- Hand-auger coreholes to sample and characterize dune sediments

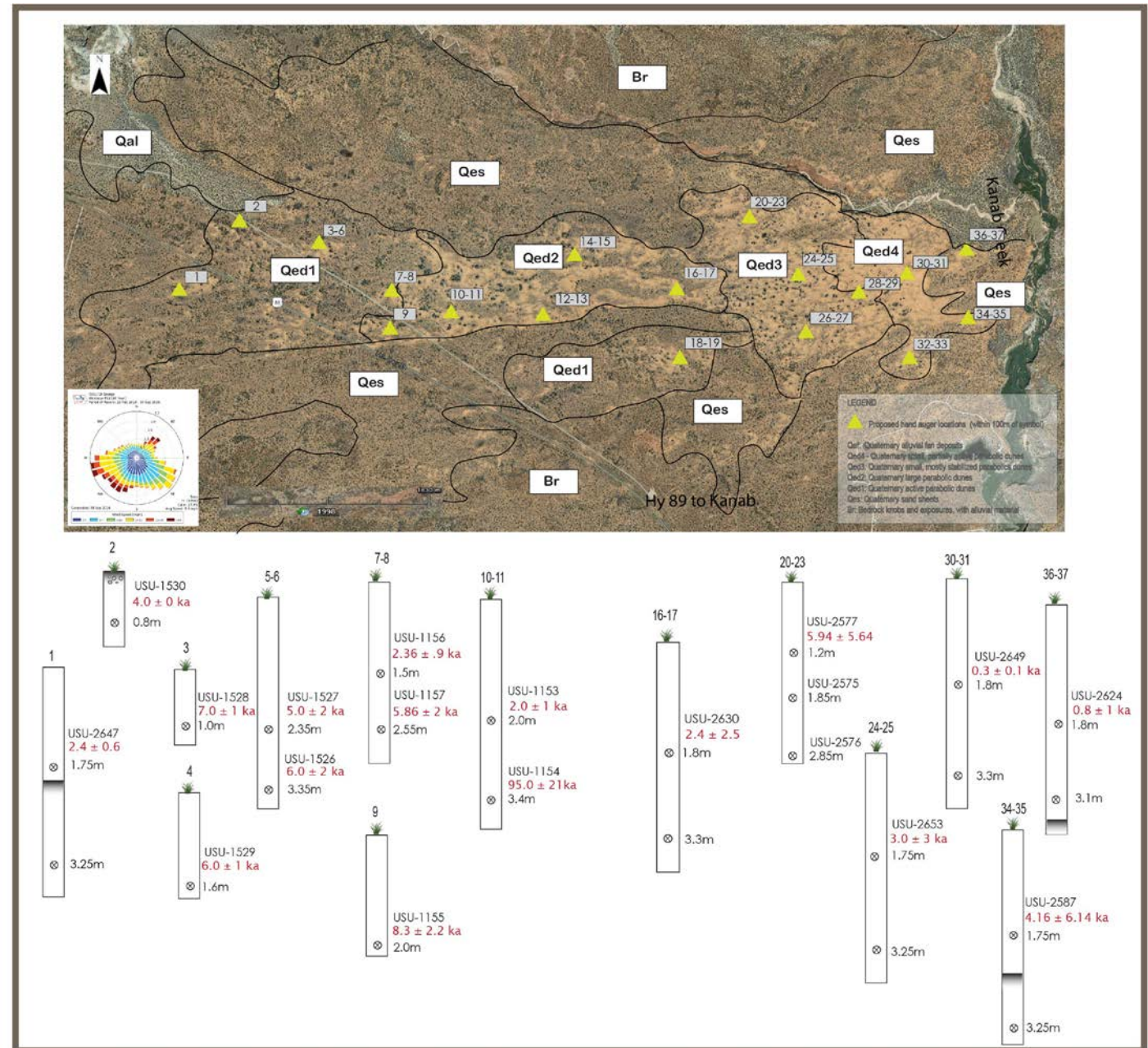


- Analyze corehole grain size samples and sorting (paleoenvironments)
- Obtain age control
 - Radiocarbon dating (charcoal)
 - Luminescence dating (mineral grains)



PRELIMINARY RESULTS

KANAB DUNE FIELD Geomorphic Map & Core Locations

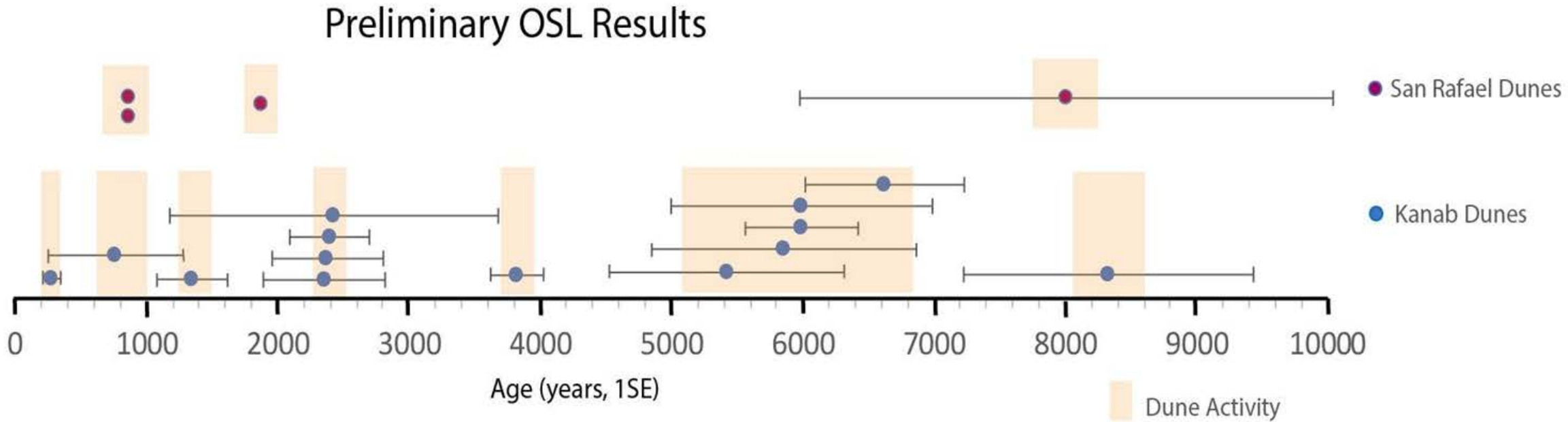




PRELIMINARY AGE RESULTS

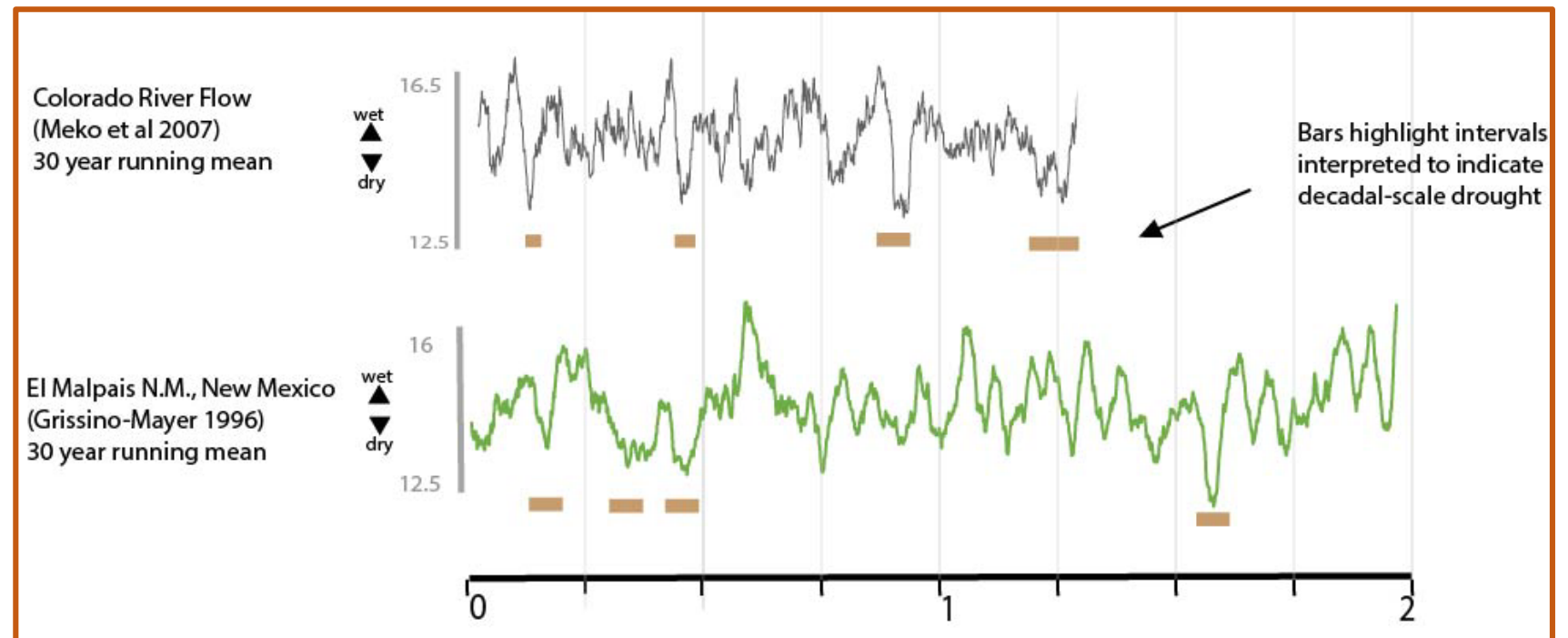
Hypothesis:

Concurrent dune activity across southern Utah suggests regional drought (decadal or longer) occurred at that / those times.



FUTURE WORK

- Collect dune samples – San Rafael and Escalante dunefields
- Obtain age records (luminescence and radiocarbon dating)
- Develop stratigraphy / paleoenvironmental chronologies
- Comparison with other climate proxy records for Colorado Plateau



Example of other climate data
– Colorado Plateau Region



GRATITUDE

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