Age Control for the Buck Tank Draw
Mammoth Site

Evan Millsap,
April 12, 2018
Research Questions

1. What is the depositional age of the mammoth-bearing sediment at Buck Tank Draw?

2. Does this fill a gap in the fossil record for the Colorado Plateau?

3. What was the climate like at this time?
Context

Devils Hole Climate Record

Adapted from Landwehr et al. 2011
Alluvial Damming

**Warm**

- Bedrock
- Steep gradient of C. Tributary = erosion
- Colorado River (Base level)

**Cool**

- Bedrock
- Shallow gradient = deposition
- Colorado River (agrades)
- Bayou sediments (Qpl)
- River sediments
Buck Tank Draw Vertebrate Fossils

Photo credit: David Rankin

NOTE: replace bovid with another mammoth fossil

Bayou sediment (Qpl)

Bedrock (Jcu)
Study area
When did the Buck Tank Draw Mammoth die?

- Law of Superposition
- Optically Stimulated Luminescence Dating
- Mammoth is between 100.8 and 120.2 ka

**Stratigraphic section of sediment layers at Buck Tank Draw**

- Red sand with well developed soil horizon near top.
- Well-sorted pink sand with river-deposited bedding. Coarsens upward.
- Olive-green silty clay. Mammoth tusk and molars exposed and eroding out of this layer.
- >2 m thick sandy deposit.
- <1 m thick sandy deposit.
- Olive-green silt-rich clay containing vertebrate fossils.

**Diagram**

- Increasing depth
- Thousand Years Before Present
Does this fill a gap in the fossil record?

Adapted from Mead et al. 89 and Mead et al. 92
Climate

Devils Hole Climate Record

Delta 18O (ppm)

Thousand Years Before Present

Cool

Warm

Photo credit: David Rankin
Summary

1. The sedge seeds and oxyloma shells indicate a wetter, cooler climate. This is reinforced by the Devils Hole Climate data.

2. The Buck Tank Draw Mammoth died between 100.8 and 120.2 thousand years ago. This number may become more precise as we process more aliquots.

3. This is the oldest dated mammoth in the Colorado Plateau and it fills a gap in the Colorado Plateau fossil record.

4. Now that this mammoth has been dated, other undated sites could perhaps be correlated to this one.
Acknowledgements

- Field assistance/site discovery: David Rankin
- Lab Assistance: Carlie Ideker
- Faculty Advising: Tammy Rittenour
- James Mauch, Harriet Cornachione, and Alex Short