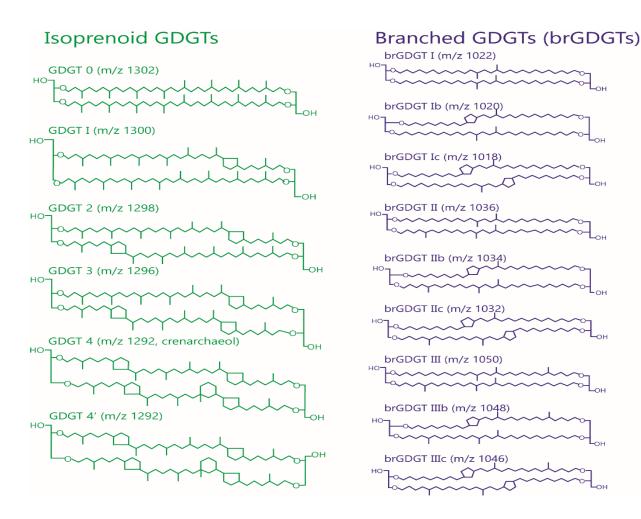
GDGTs in HSPDP Cores

Is there any hope for paleotemperature reconstruction?

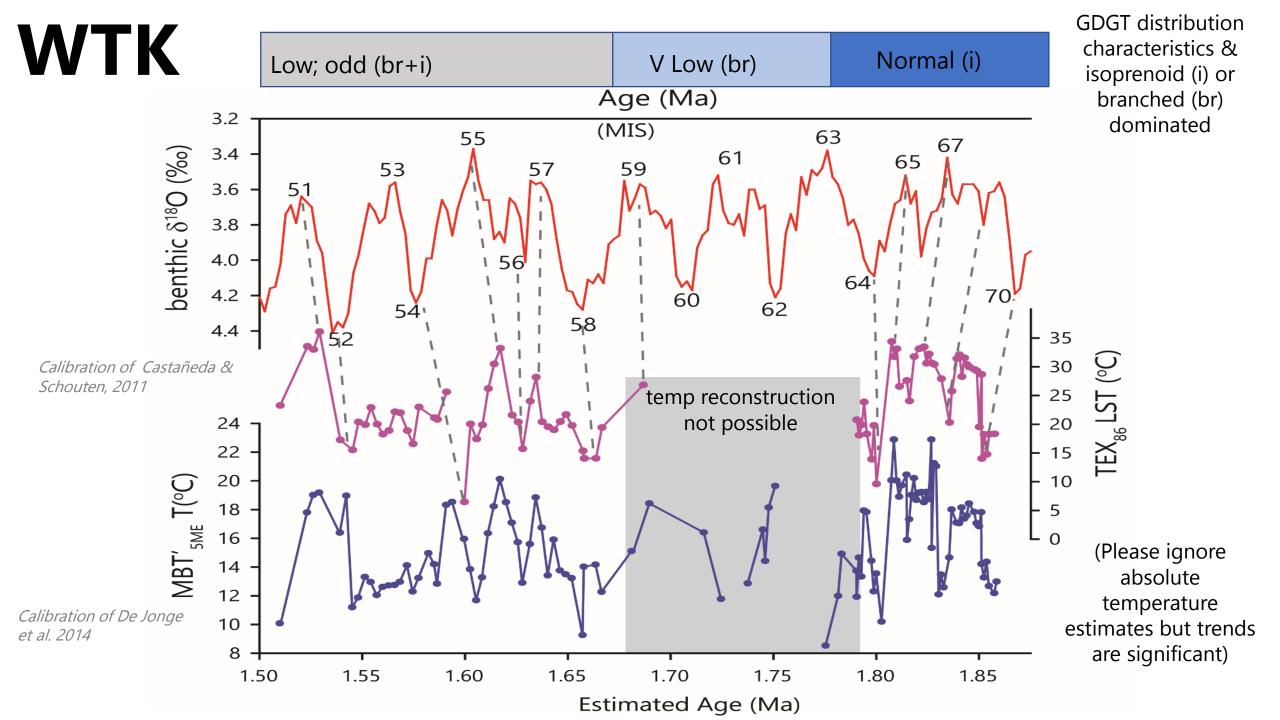
Megan Thompson-Munson & Isla S. Castañeda

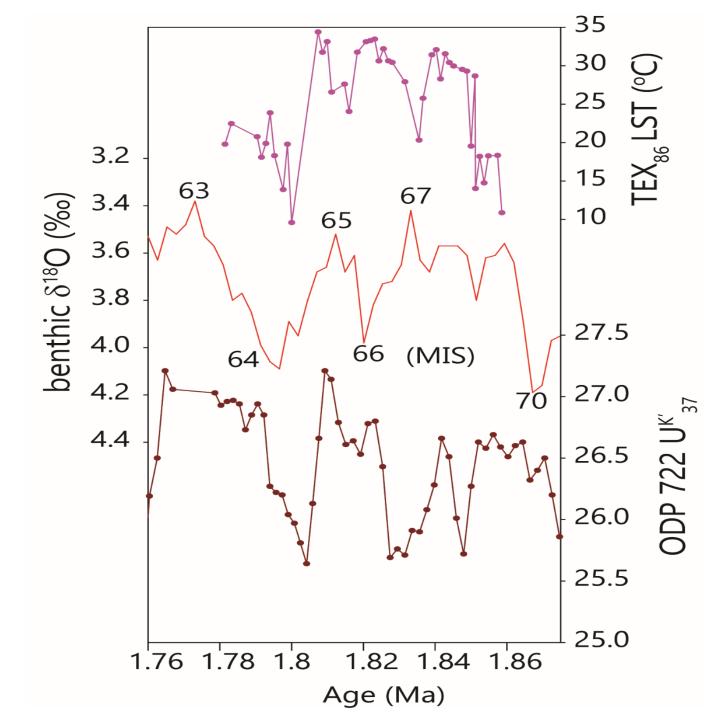
University of Massachusetts Amherst



Glycerol Dialkyl Glycerol Tetraethers (GDGTs):

- Isoprenoid GDGTs TEX₈₆ paleothermometer
- Branched GDGTs Methylation of branched Tetraethers (MBT) paleothermometer
- Modern large, deep lakes tends to be dominated by iso-GDGTs (especially in E Africa)
- Smaller, shallower lakes tends to be dominated by brGDGTs

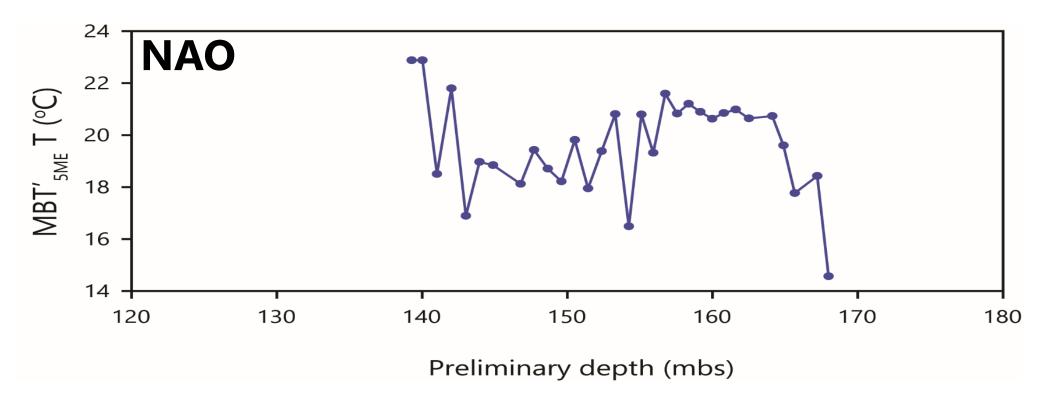




WTK summary

- Concentrations of GDGTs vary throughout the WTK core.
- The highest concentrations are found in the interval from ca. 1.86-1.78; isoprenoid GDGTs dominate in this interval.
- The rest of the core tends to be dominated by brGDGTs; some distributions are unlike modern lakes.
- At WTK, it seems feasible that temperature variability recorded by iso-and brGDGTs corresponds to glacial-interglacial cycles, particularly in the older part of the record.

N Awash GDGTs

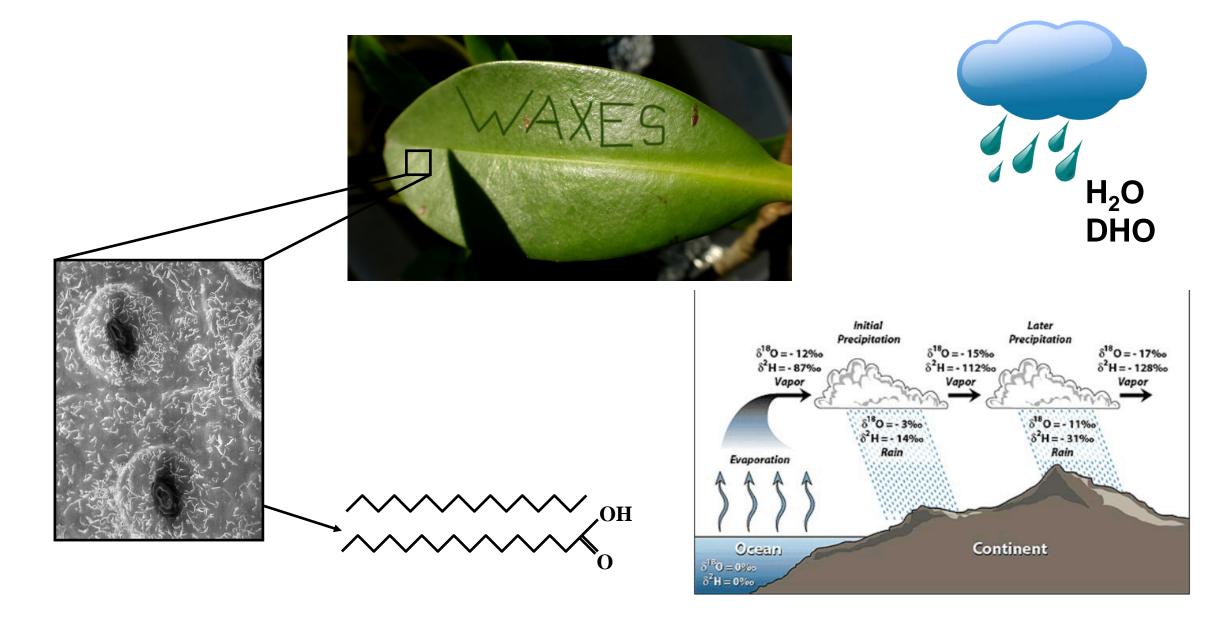


- Throughout much of the core GDGT concentrations are too low for paleo-temperature reconstruction (particularly top part of core).
- In the N Awash core, from ~140-170 m depth, brGDGTs dominate. Reconstructed temperatures in this interval hint at a climate signal... to be further investigated.





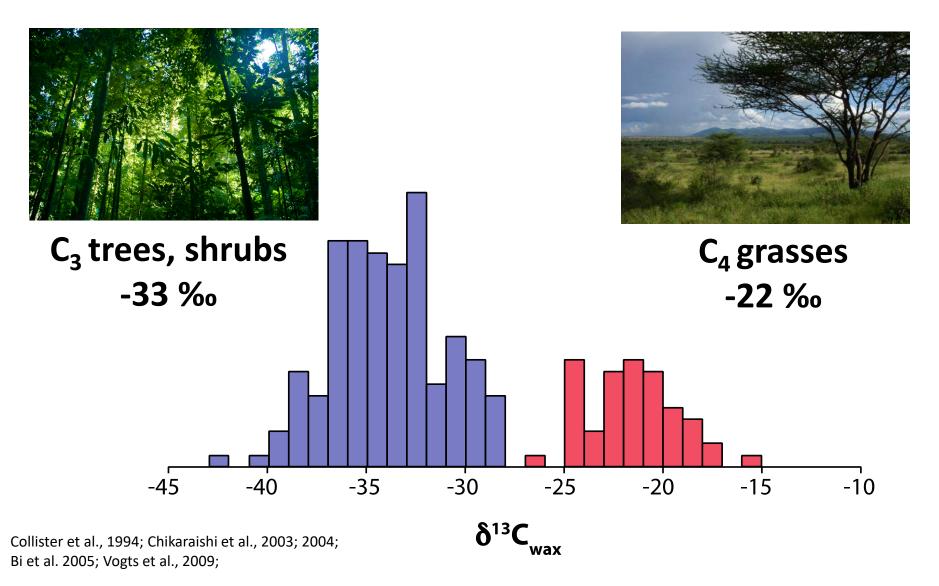
Past precipitation from leaf wax δD





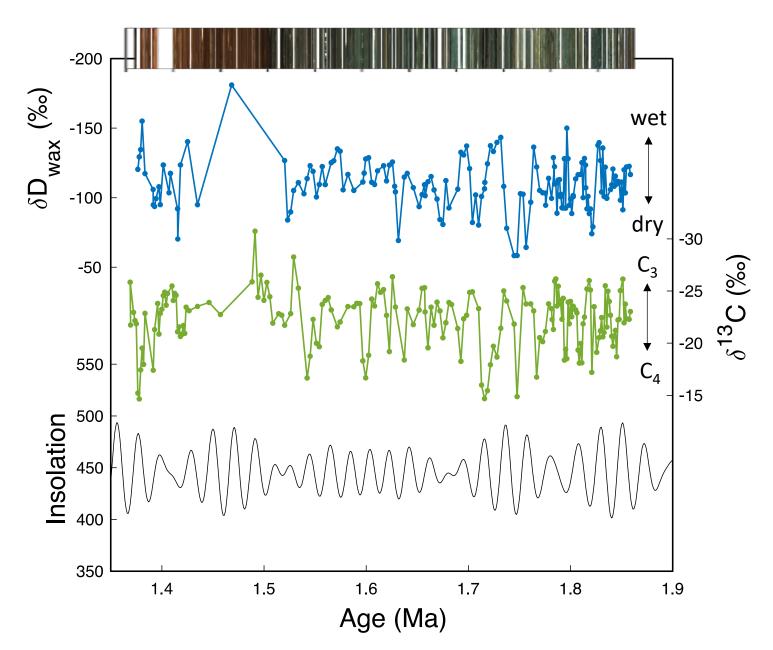
Past vegetation from leaf wax δ^{13} C

 δ^{13} C of leaf wax records C₃ vs. C₄ vegetation





WTK leaf wax: δD and $\delta^{13}C$

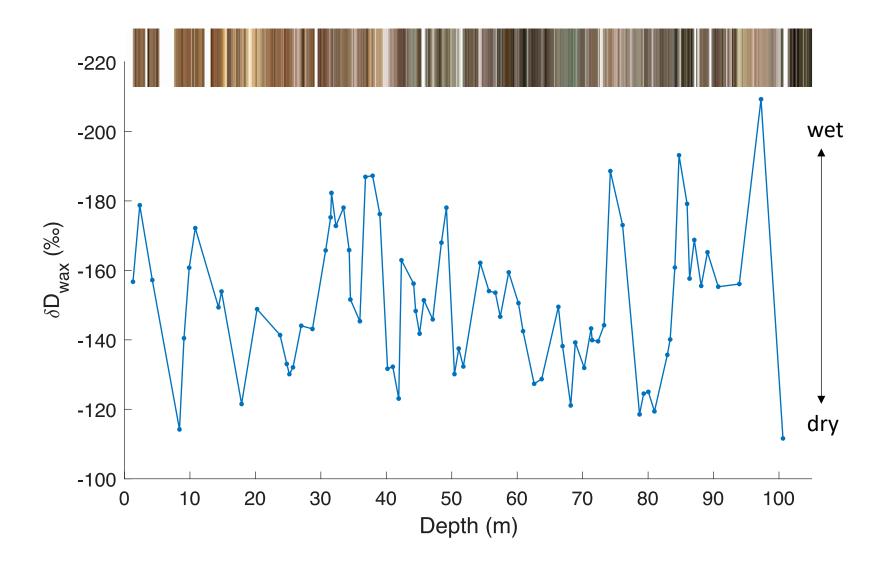


- 1. No change in mean δD or $\delta^{13}C$ through time
- 2. Amplitude variability and periodicity potentially modulated by insolation
- 3. Interval of high amplitude variation at ~1.75 Ma

Come see my poster for further interpretation!



NAO leaf wax: δD



- 1. No change in mean δD through time
- Mean is ~50 ‰ more depleted than WTK (location, Pliocene vs. Pleistocene)
- 3. Amplitude variability similar to WTK



Current status of analyses

**Analytical budgets for WTK and NAO exhausted

Site	Work completed	Timeline
West Turkana	159 samples analyzed for δD 177 samples analyzed for δ ¹³ C ~200 samples analyzed for GDGTs	Paper in draft form, to be submitted – early 2017
Northern Awash	92 samples analyzed for δD ~200 samples analyzed for GDGTs	δD and $\delta^{13} C$ complete – March
Tugen Hills	Pilot samples did not yield lipids	Need mud and money
Lake Magadi	20 pilot samples processed GDGTs detected, need further evaluation	Pilot analyses and resampling of core – Spring Complete analyses – Summer
Olorgesailie	13 pilot samples analyzed for $\delta^{13}C$ (δD needs further evaluation) GDGTs detected, need further evaluation	Resampling of core – Spring Complete δ^{13} C analyses – Summer