



**HIGH-RESOLUTION
RECORDS OF GRAIN-SIZE
AND DEPOSITIONAL
ENVIRONMENT
CORRELATED TO THE
HOMO ERECTUS
NARIOKOTOME BOY SITE,
WEST TURKANA, KENYA**

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H. van der Lubbe, Craig S. Feibel, Bruce
Wegter, and Andrew S. Cohen**

Lorenyang Lake
(1.9 Ma)

WTK13

TURKANA BASIN

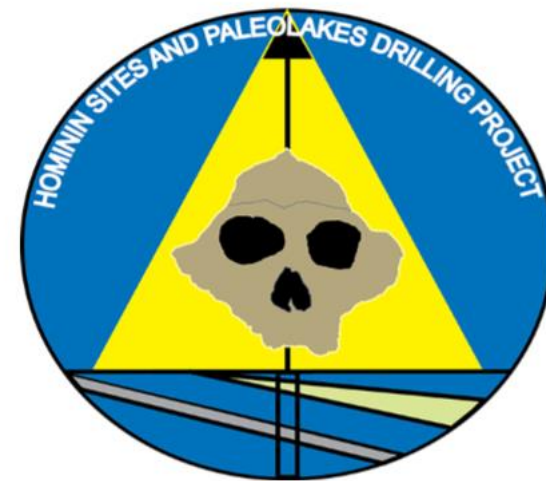
- Robust collection of hominin fossils
- Directly associated with Nariokotome Boy
- Contextualizes multiple evolutions:
 - Rift system
 - Savanna ecosystems
 - Hominins



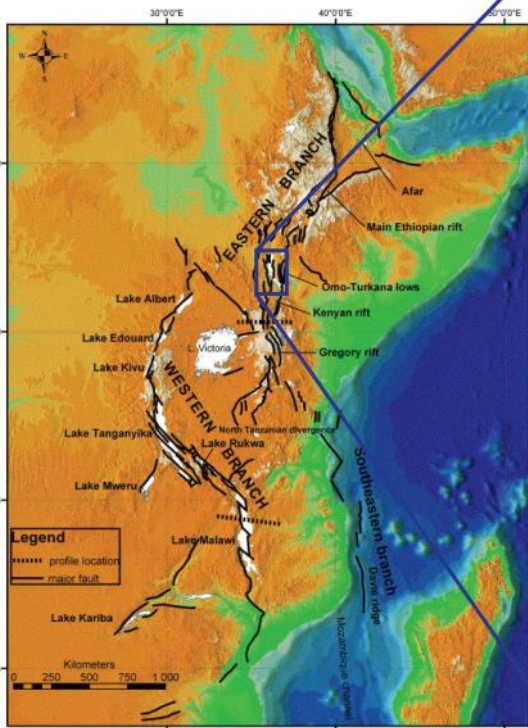
humanorigins.si.edu

Paleogeographic Reconstruction
By Patricia Schwindinger

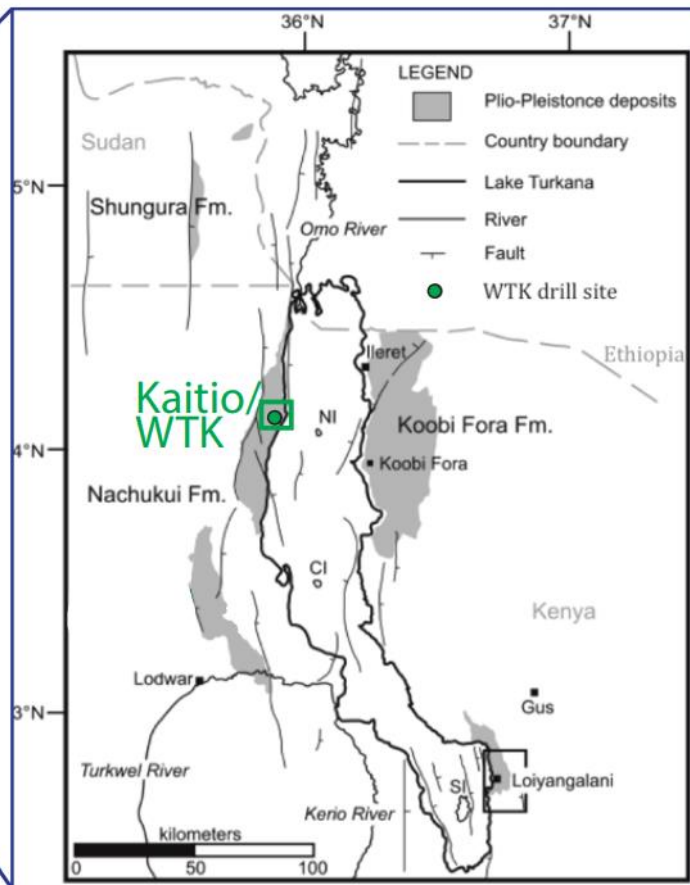
WTK13



Overview



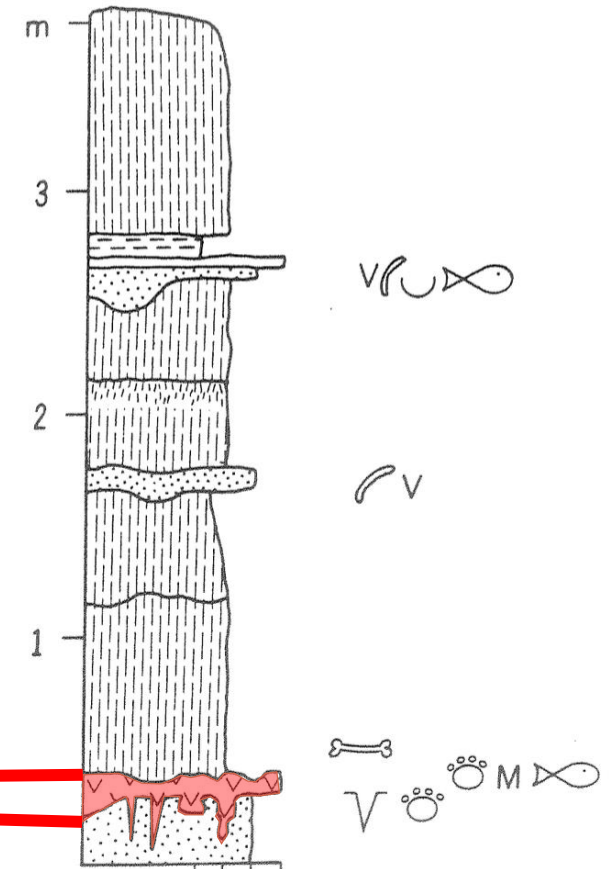
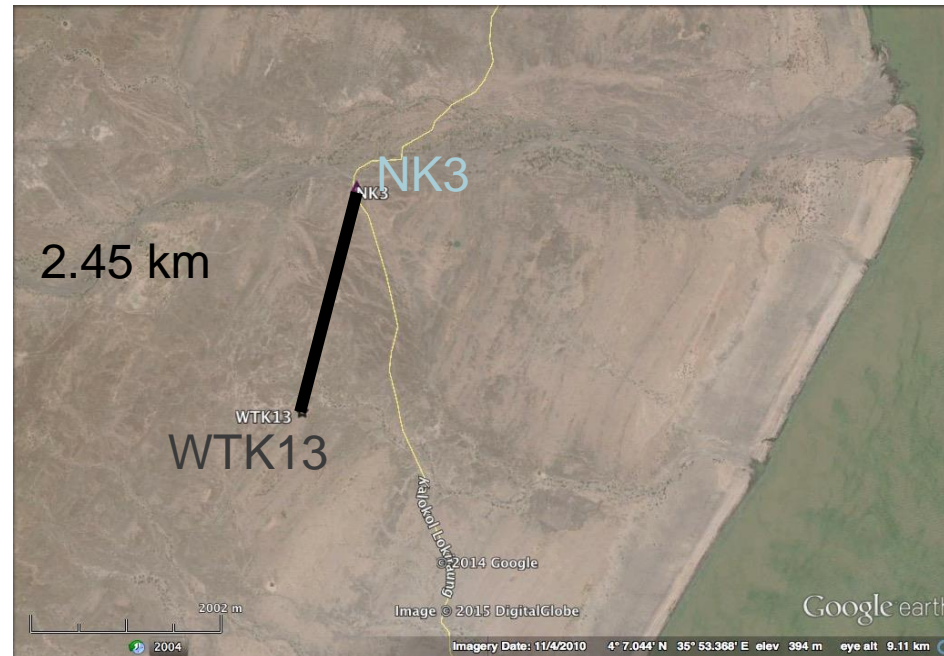
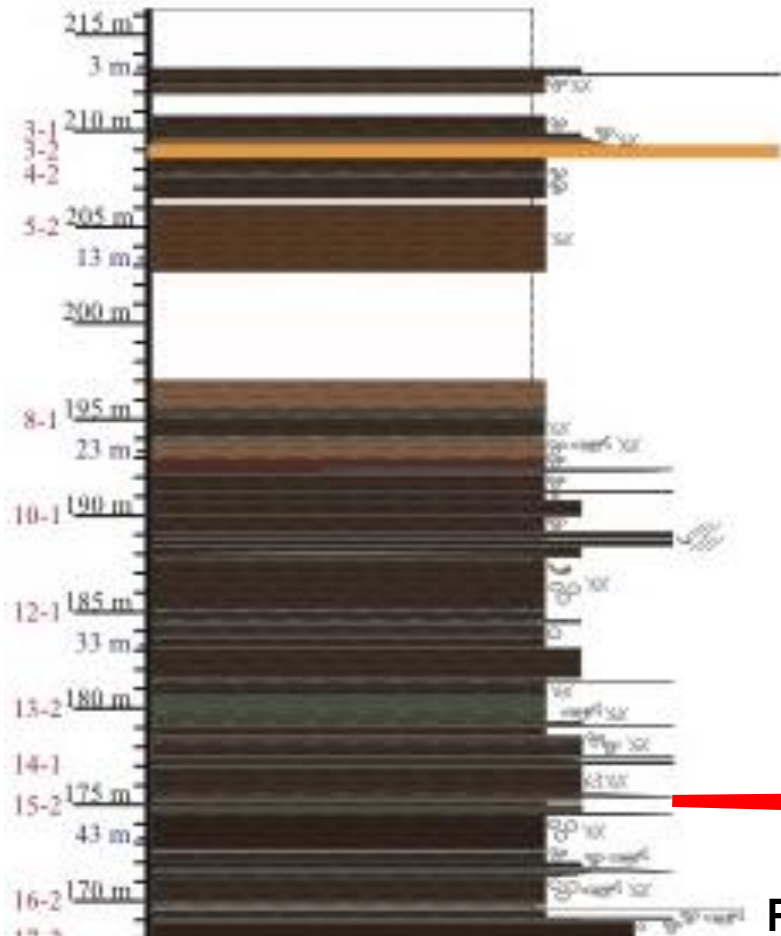
East African Rift System
Chorowicz, 2005



Hargrave et al. (2014)

- Drilled as part of Hominin Sites and Paleolakes Drilling Project
- 216 m drill core
- This study focused on 14 m interval
- Proximal to NK3 (next slide)

WTK13 AND NK3



Robyn L. Henerek

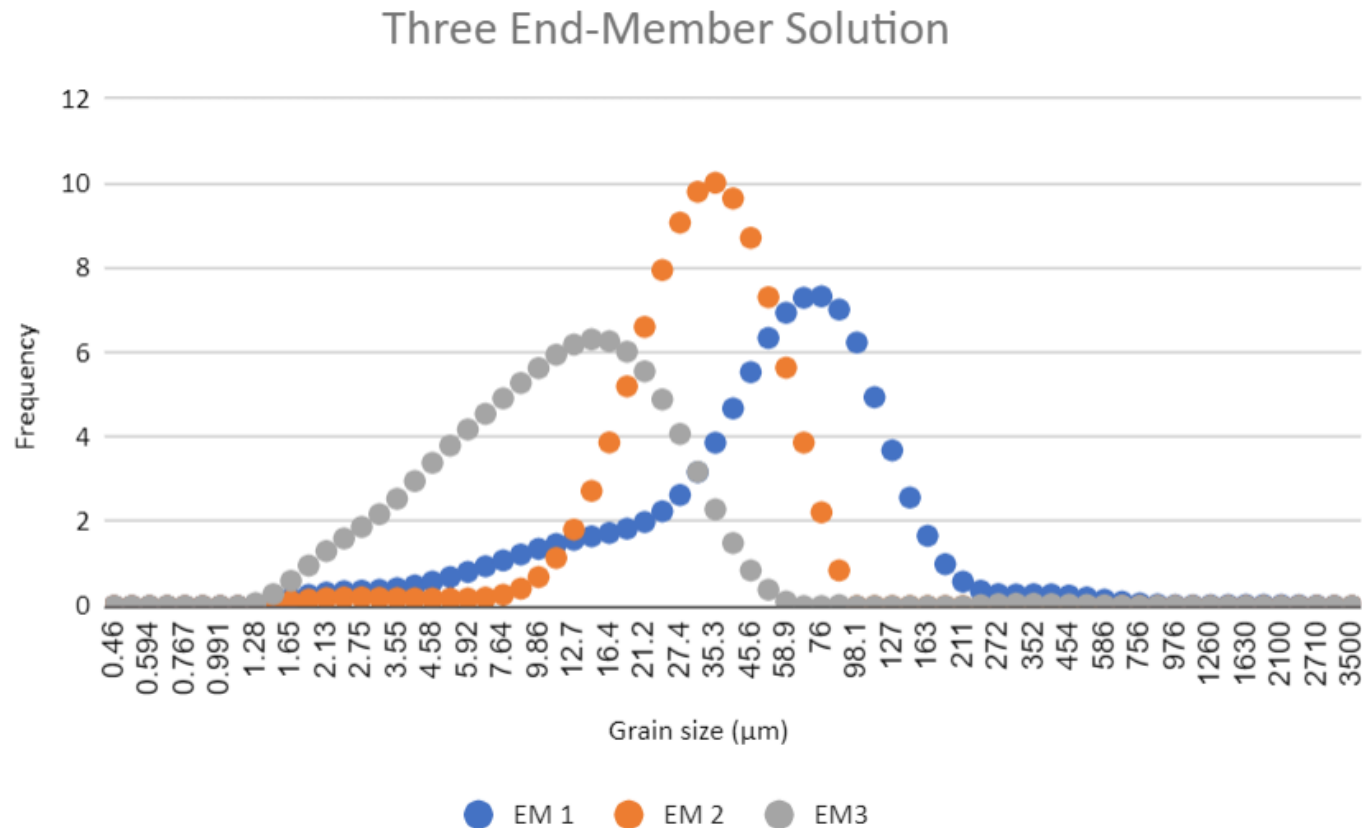
(Feibel and Brown, 1993)

METHODS

- 14 m interval of WTK13 drill core sampled continuously every 0.5 cm (~7 yrs)
- Scale relevant to a hominin life spans
- Sample pre-treatment: removal of carbonate, biogenic silica, organics
- Grain size: Malvern Mastersizer 3000 wet dispersion

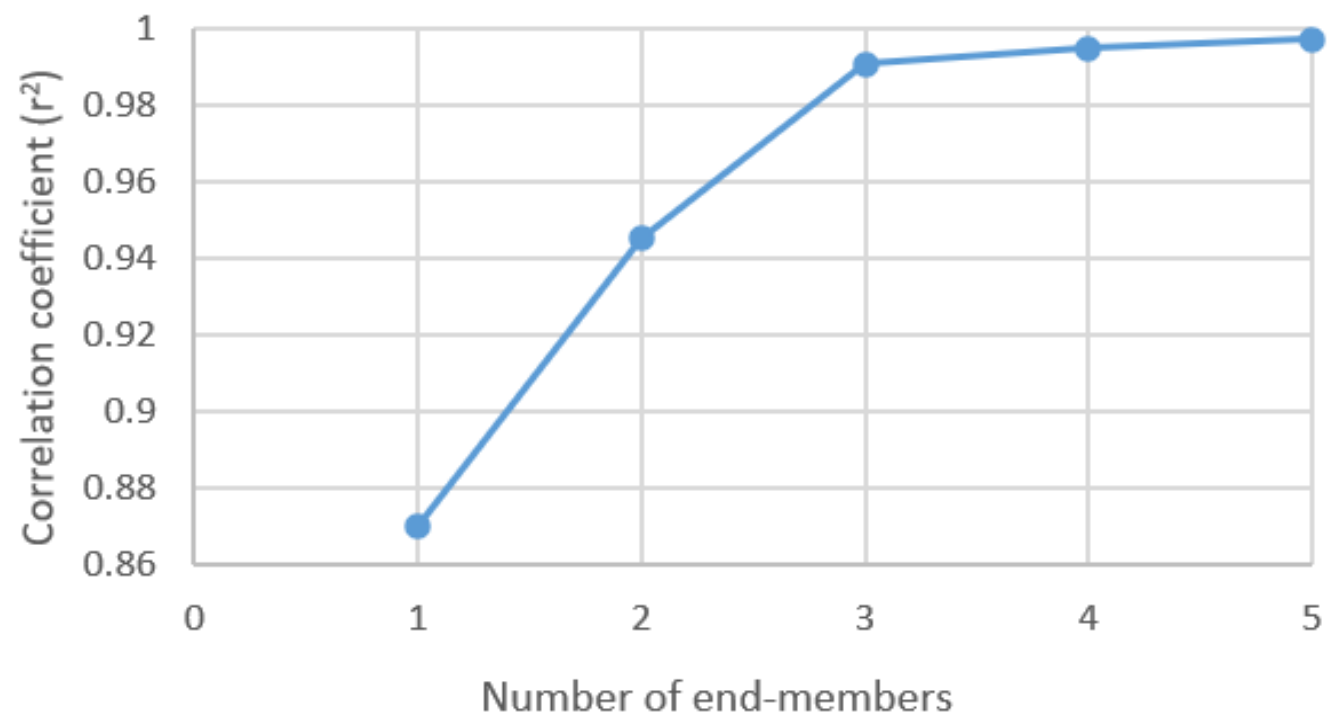


FINDINGS

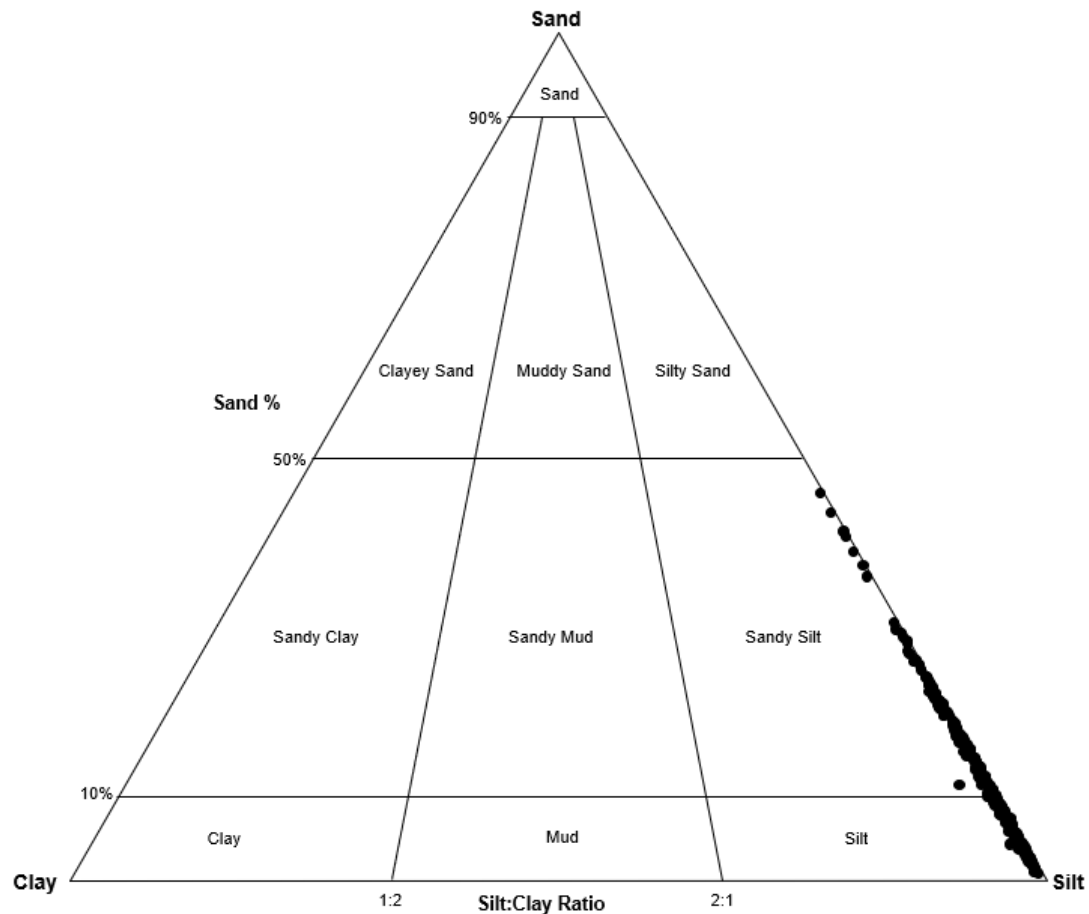


- Interval dominated by silt
- End-member modeling of silt explained 99% of population variability
- Abrupt fining transition occurred 38.83 mbsf
- Transition from Natoo Tuff to pedogenically modified interval

Total fit between measured and modeled grain-size data

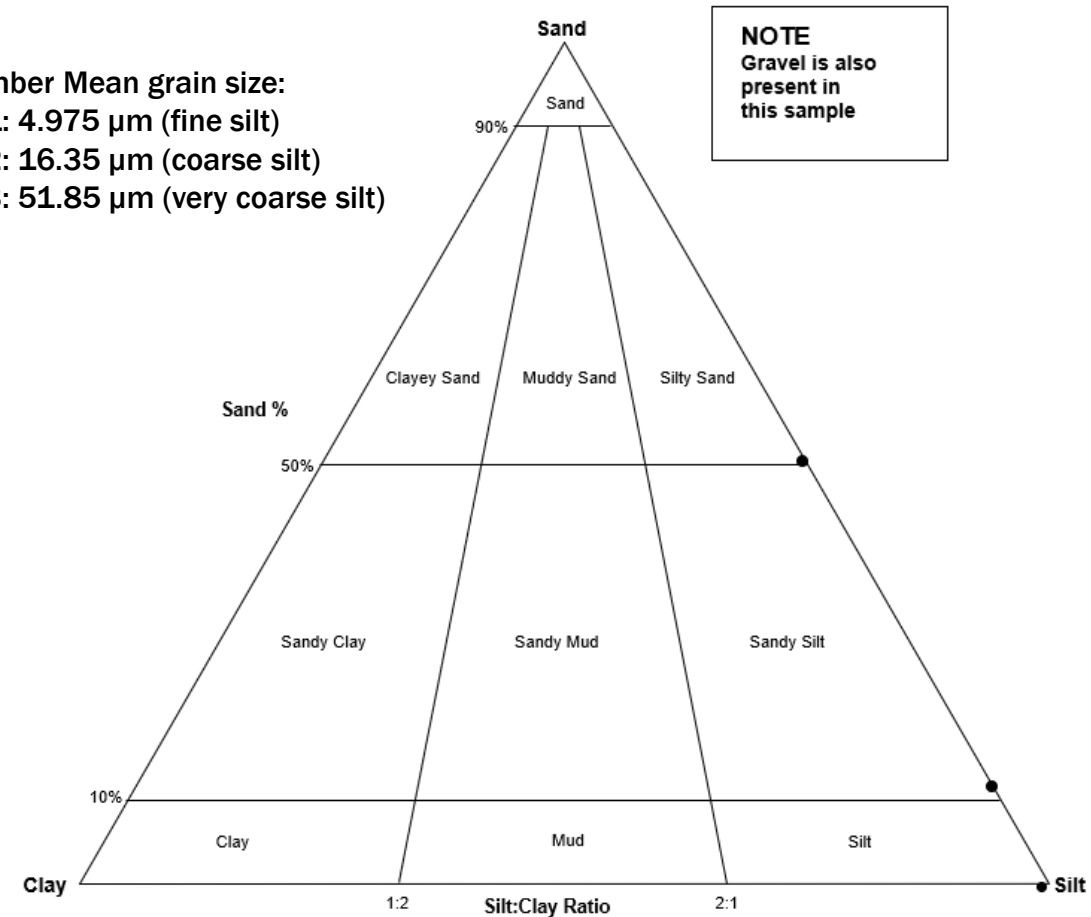


SAMPLE AND END-MEMBER CLASSIFICATION



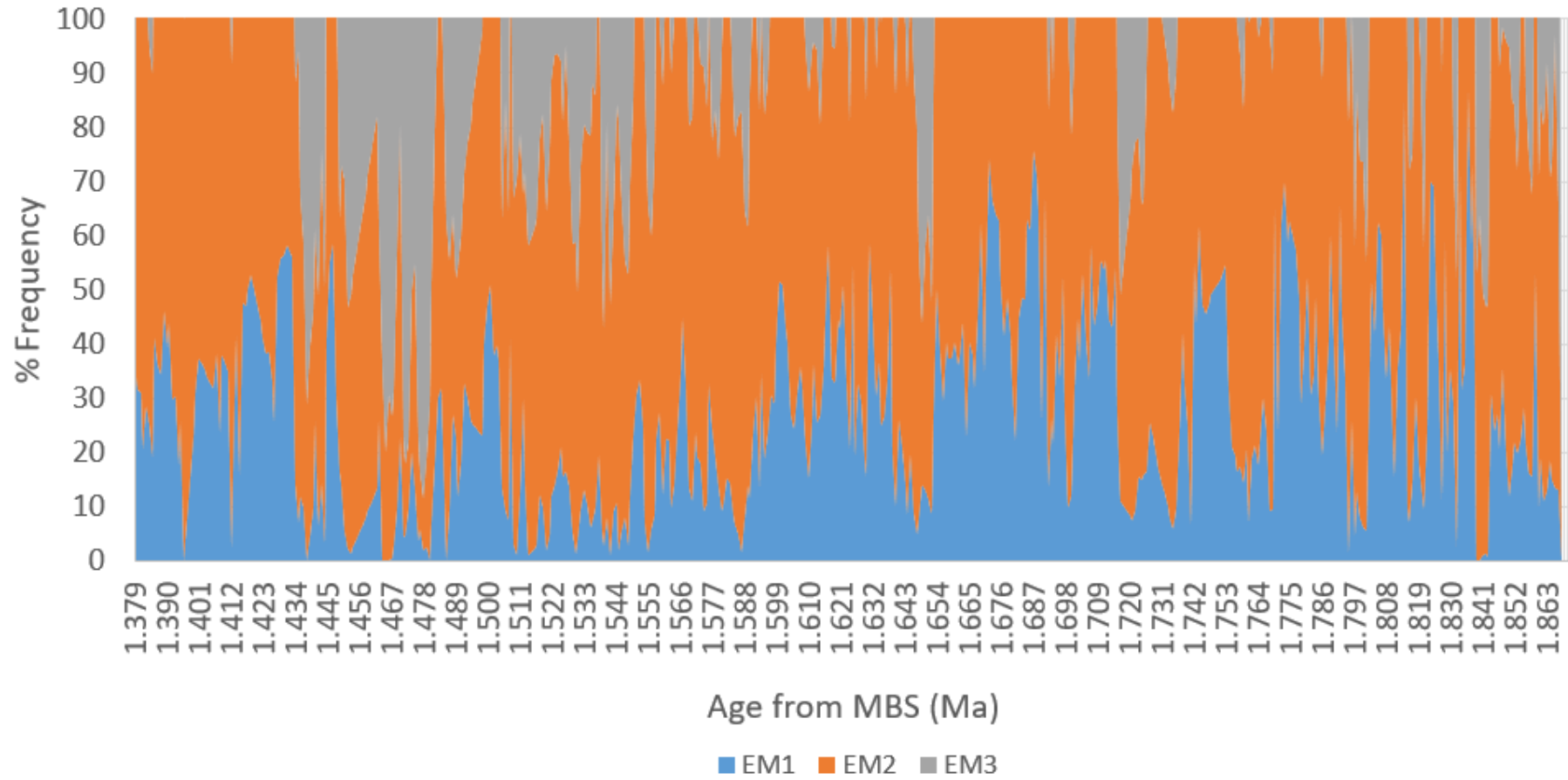
End-Member Mean grain size:

- EM1: 4.975 μm (fine silt)
- EM2: 16.35 μm (coarse silt)
- EM3: 51.85 μm (very coarse silt)



NOTE
Gravel is also present in this sample

% Frequency of Three End-Member Solution by Age (Ma)



CONCLUSIONS

- **Silt dominated deposition throughout this interval**
- **Transition from Nattoo Tuff to pedogenically modified interval corresponds to the surface in which Nariokotome Boy was recovered**
- **Depositional changes quantifiable at the scale of descriptive facies analyses**

IMPORTANT CONTACT INFORMATION

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Hamilton



REFERENCES

Chorowicz, J., 2005, The East African rift system: *Journal of African Earth Sciences*, v. 43, p. 379-410.

Feibel, C.S., and Brown, F.H., 1993, Microstratigraphy and Paleoenvironments, *in* Walker, A., and Leakey, R., eds., *The Nariokotome Homo erectus Skeleton*: Cambridge, MA, Harvard University Press, p. 21-39.

Hargrave, J.E., Hicks, M.K., and Scholz, C.A., 2014, Lacustrine carbonates from Lake Turkana, Kenya: A depositional model of carbonates in an extensional basin: *Journal of Sedimentary Research*, v. 84, p. 224-237.