

SHIFTING SHORELINES: A GEOARCHAEOLOGICAL PERSPECTIVE ON THE LATE

PLEISTOCENE JORDAN VALLEY

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BACKGROUND:

Understanding the ancient environments humans would have interacted with is key to archaeologists properly interpreting the people who once lived at the sites they study.

In my PhD, I'm analyzing the Damya Formation, thought to be deposited in the Jordan Valley (Figure 1) by the Damya Lake (~16–15/14 kya; 1), to better understand the effects such a lake might have had on the peoples living nearby.

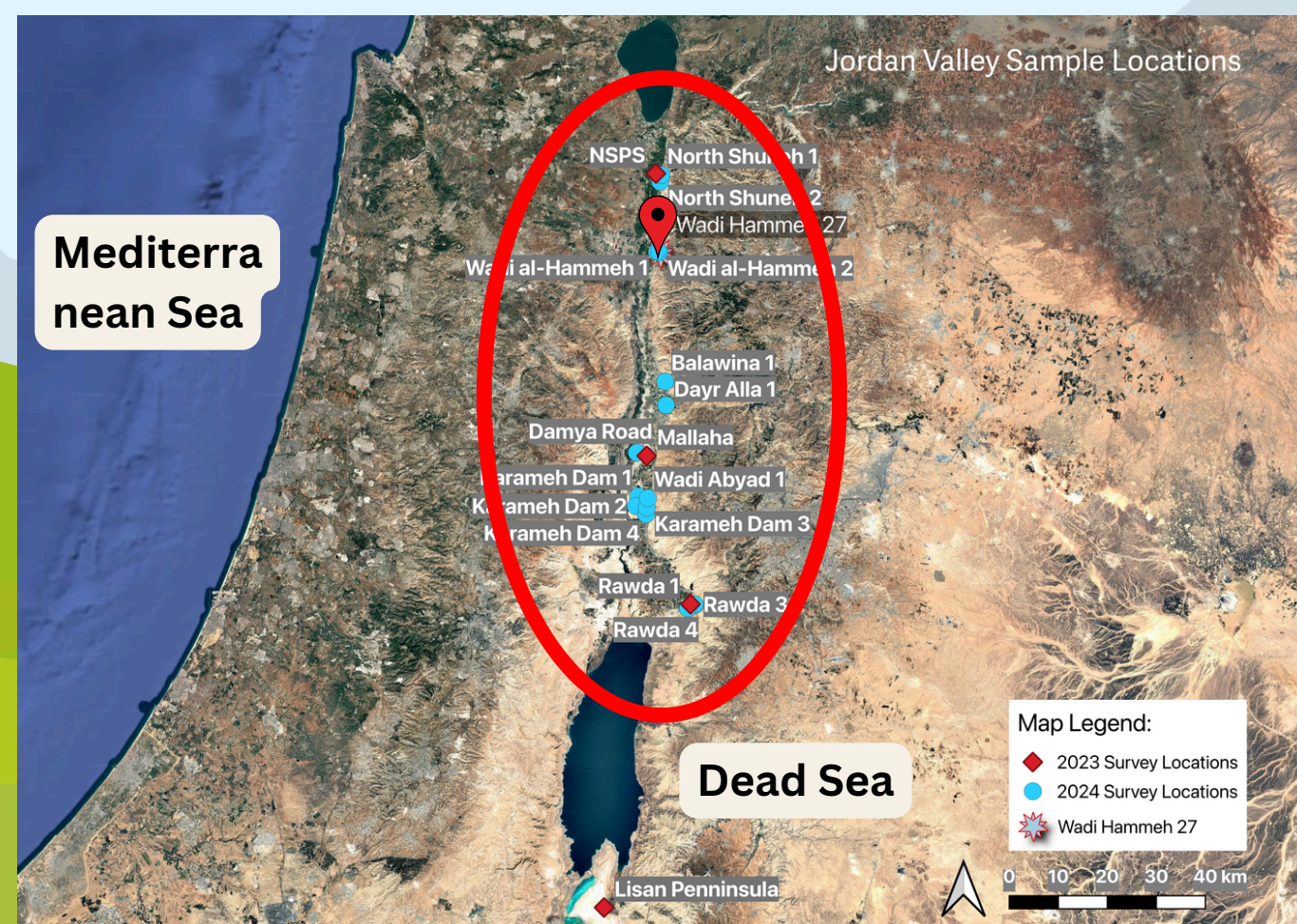
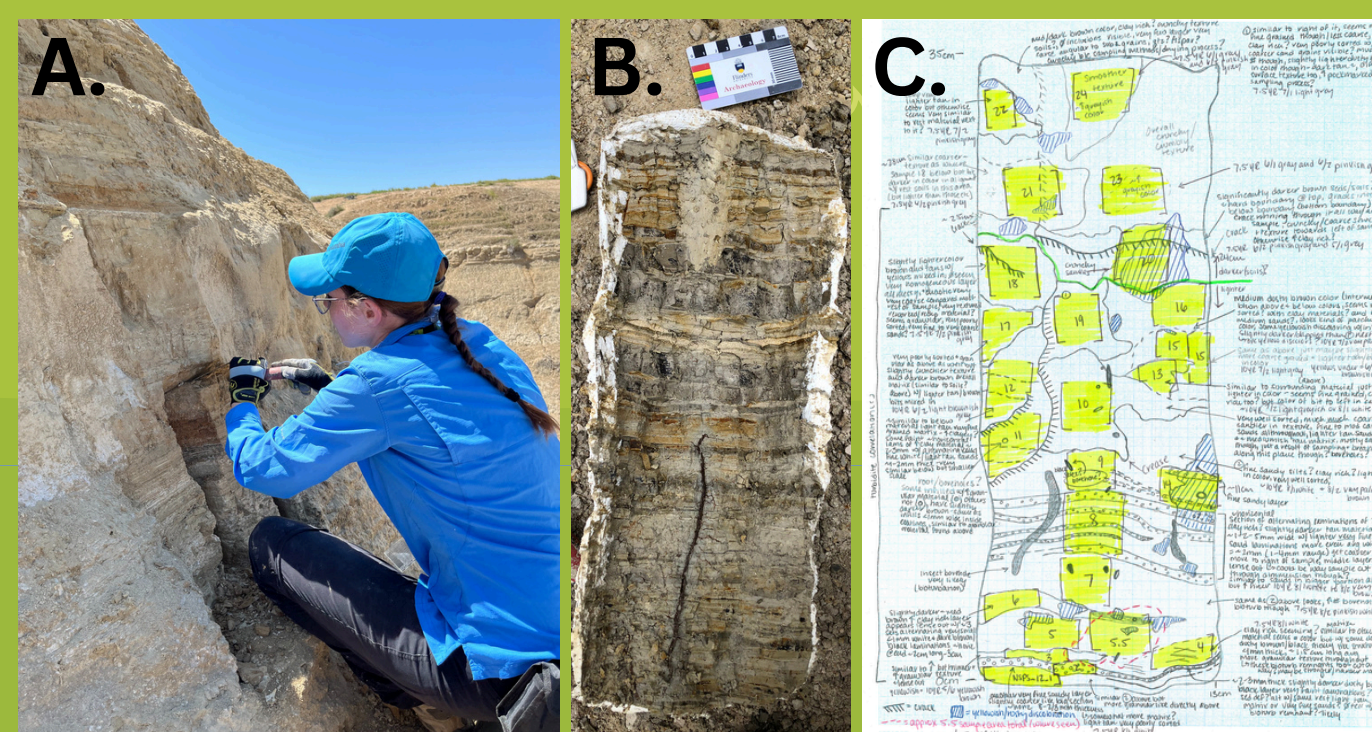


Figure 1: (above) Map of Jordan Valley Region; Study Area and WH27 marked; (below) a. Natasha Nagle in the field, b. oriented sediment sample, c. sedimentary drawing of an oriented sample



CONTROVERSY:

Prior research has focused primarily on the underlying Lisan Fm, deposited by the preceding Lisan Lake (~70–16ka; 2, 7), or the highly saline Dead Sea (since ~10 ka; 3).

Most doubt/ignore the existence of the Damya Lake, or insist it was smaller, shallower, more ephemeral, and just as saline as the Lisan Lake; directly contradicting limited research on the Damya Fm and archaeological evidence (4, 5), and which would have made life at Natufian sites like Wadi Hammeh 27 (WH27, ~14 ka) more difficult (5,6).

METHODS:

Two field seasons, 2023 and 2024, noted and described all remaining/accessible Damya Fm outcrops (n=18) along the Eastern Jordan Valley.

>500 geological and 19 dating (OSL) samples were taken to confirm outcrop chronology.

170 mineralogy (XRD), 720 particle size, 335 magnetic susceptibility, and 32 microfossils samples analyzed.

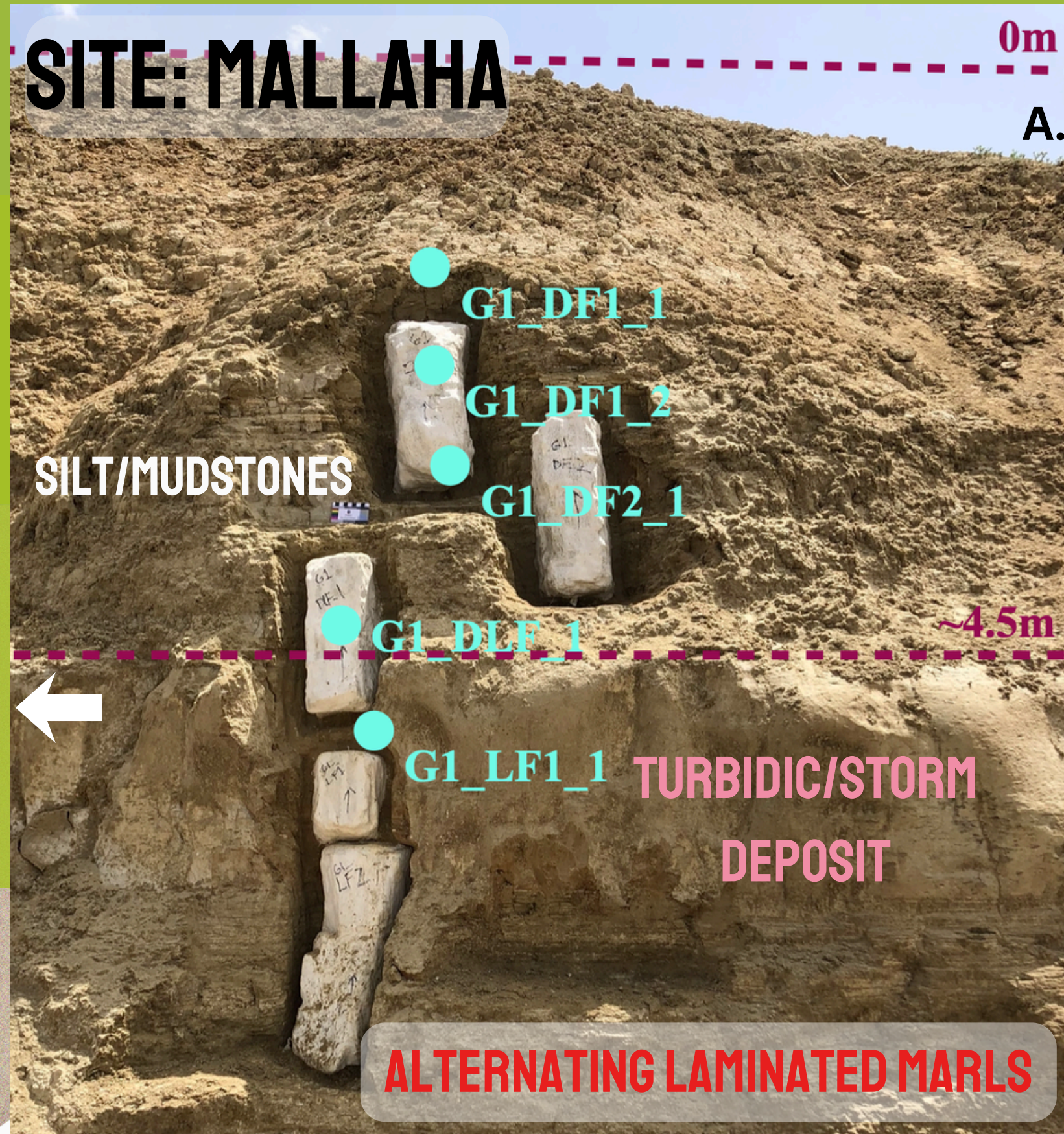
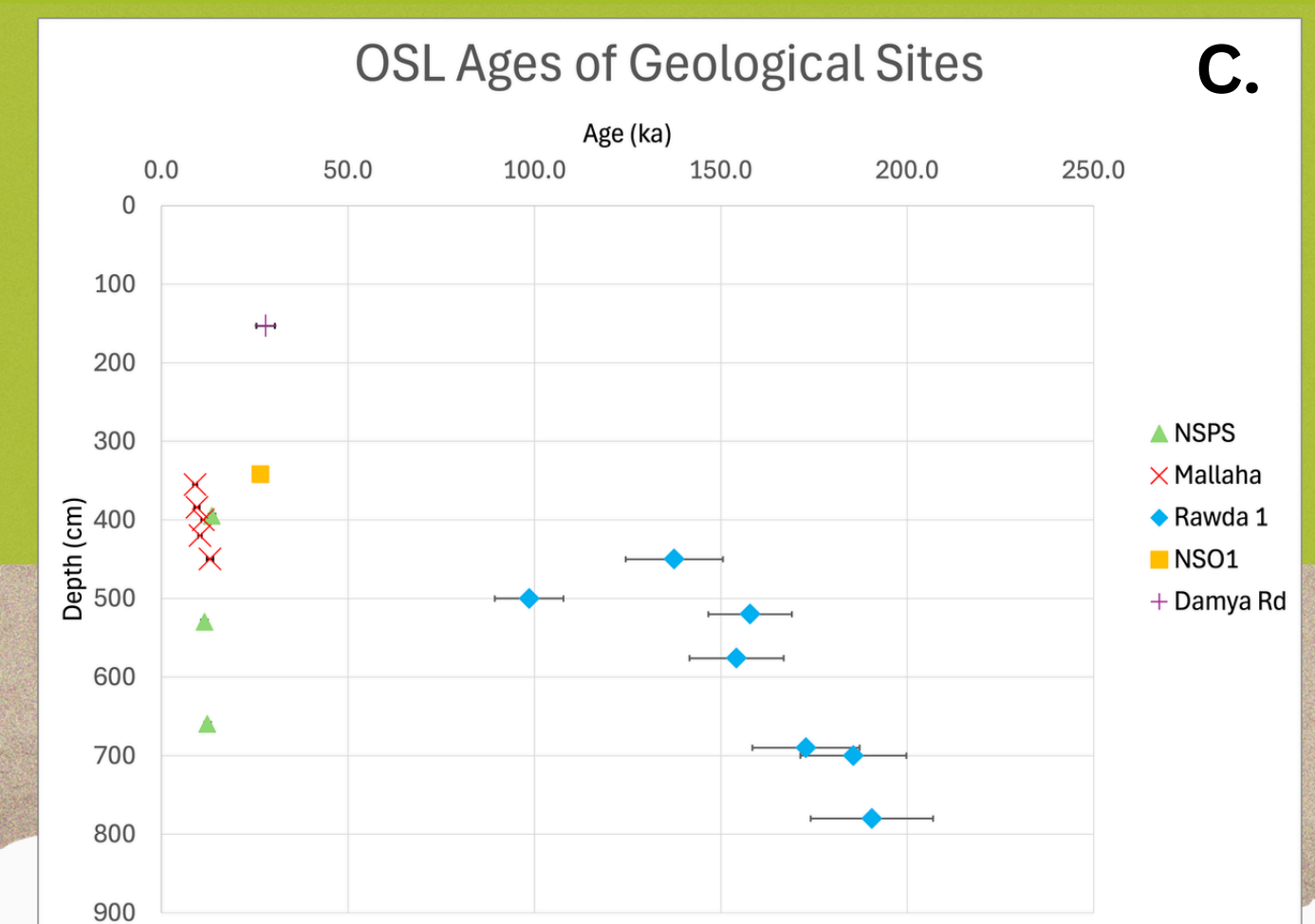
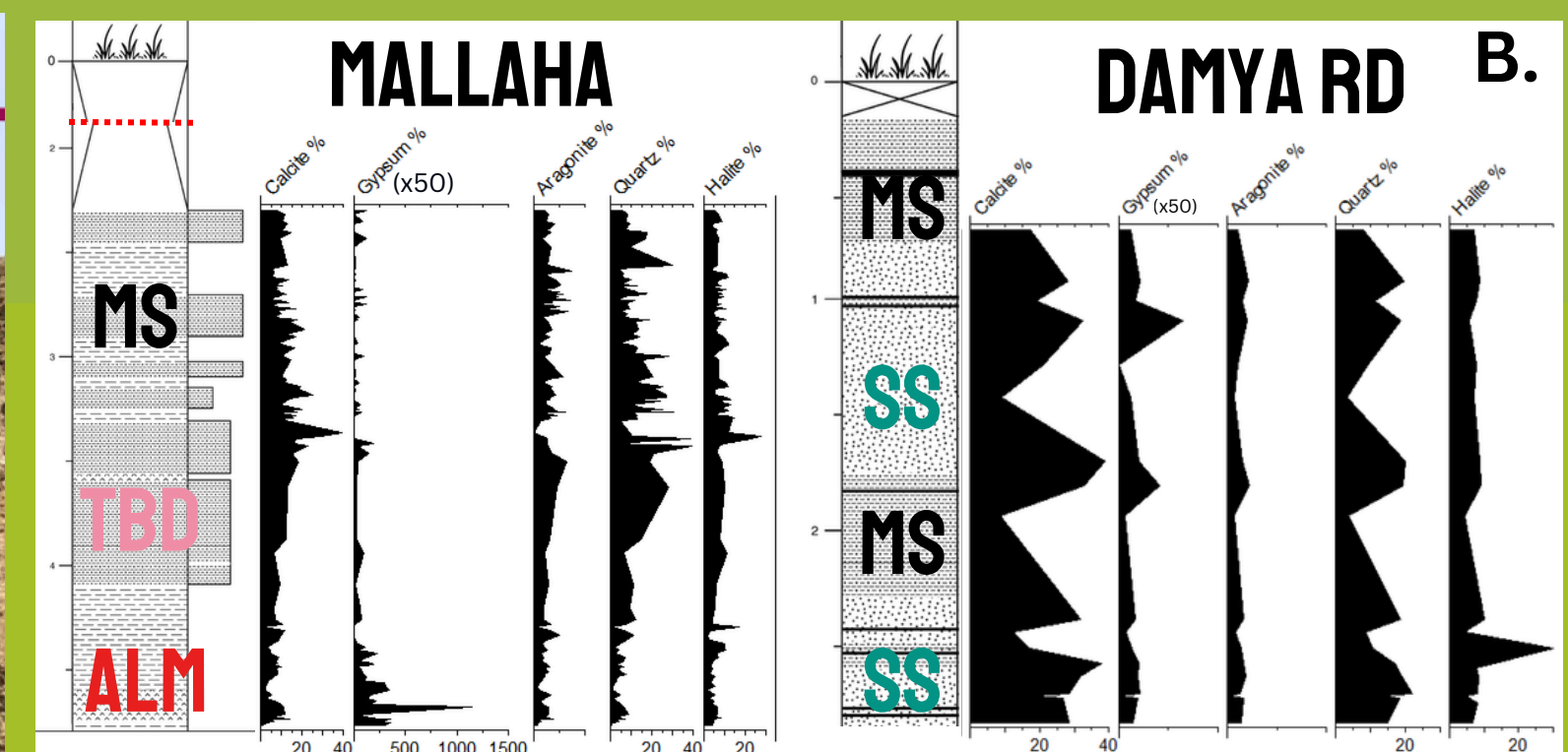


Figure 2: a. example of one site (Mallaaha) containing materials typically associated with low energy lake deposits (alternating laminated marls), storm or turbidic events, and silt/mudstones (OSL Samples labelled); b. example mineral compositions (percentages) from two localities and corresponding stratigraphic columns, less gypsum and more quartz can indicate wetter periods (mudstones (MS), sandstones (SS), turbidic/storm deposits (TBD), and alternating laminated marls (ALM) marked as observed in the field) c. OSL Ages returned for the geological sites sampled (ka = thousands of years)



PRELIMINARY RESULTS:

- Rather than only covering ~20 ka years of deposition, my samples unexpectedly retained ~200 ka of geological history in the Valley!
- Northmost sites sampled (~7 km S of Syrian border) contain deep lake deposits (ALM)
- Damya deposits (mineralogy and fossils) indicate a generally wetter environment with periods of higher rainfall, periodically interrupted by dryer/hotter periods with high evaporation
- Periods of high storm events (TBD) affected the lakes/Valley across their history

PRELIMINARY CONCLUSIONS:

- A series of ~5 lakes spanned the full Jordan Valley with many periods of increase and decrease in size
- Low energy, lake deposits at the higher latitudes indicate the Damya lake was much larger for much longer than believed
- Lake deposits in the N. central Valley until at least ~9 ka confirm the saline Lisan Lake did not transition directly into the hyper-saline Dead Sea by ~11–10 ka
- WH27 was a brackish to freshwater lakeside settlement (easy living!); site abandonment could have begun due to a period of slow lake receding after ~13 ka