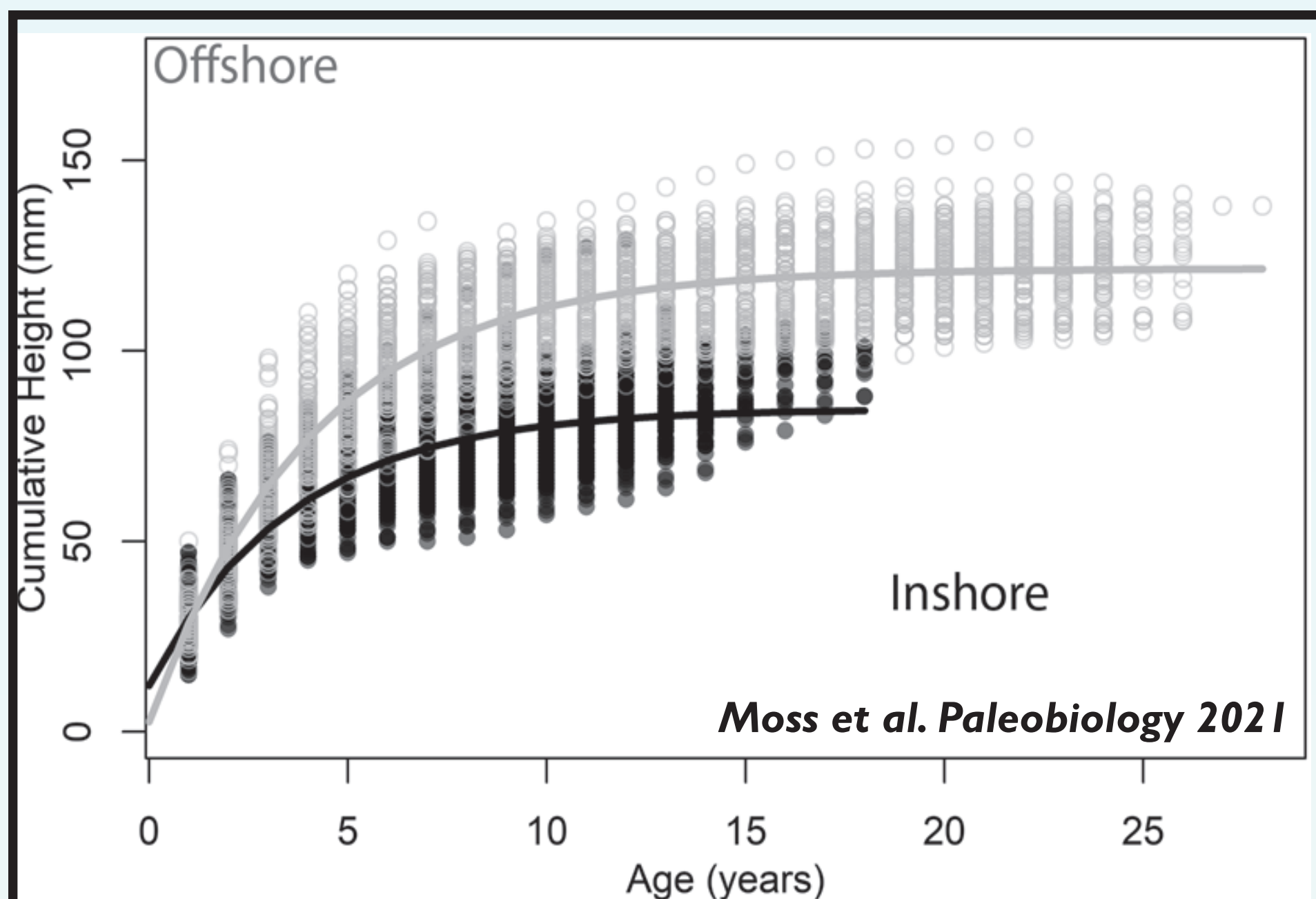
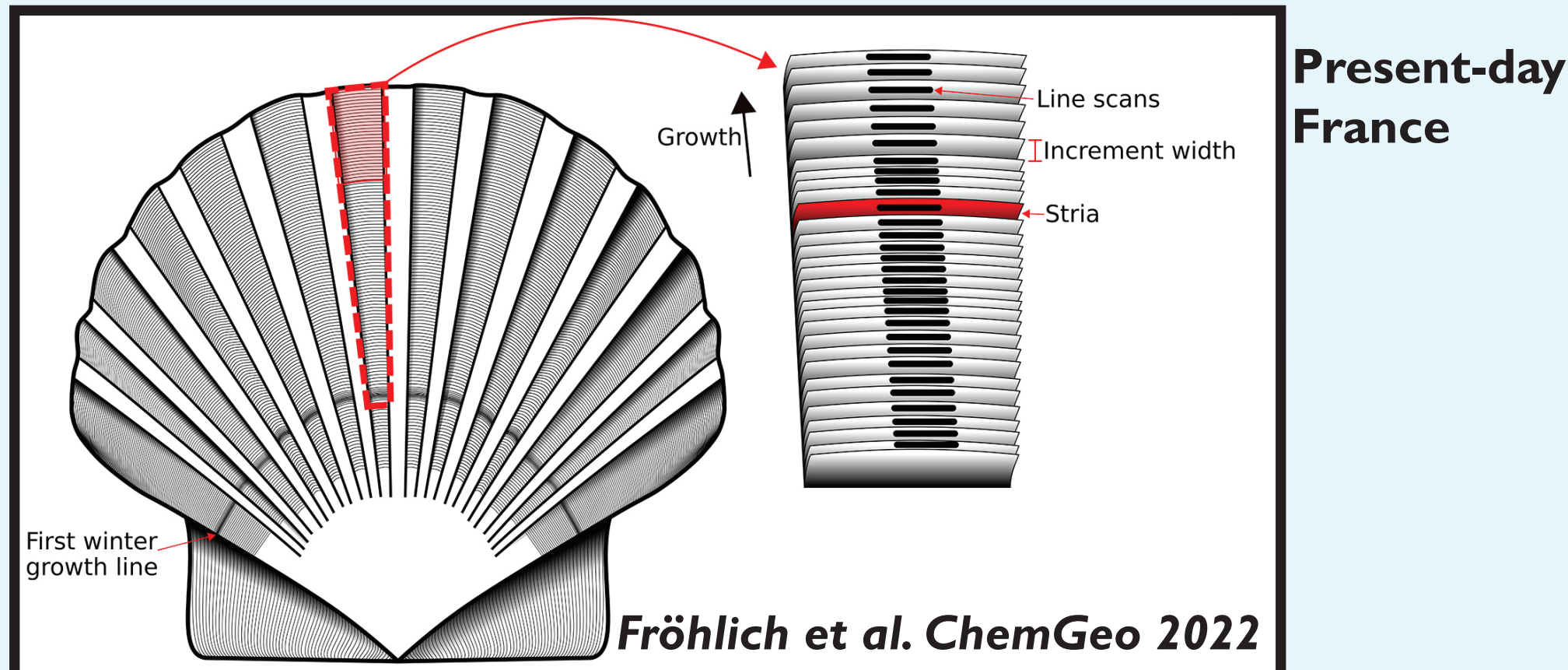
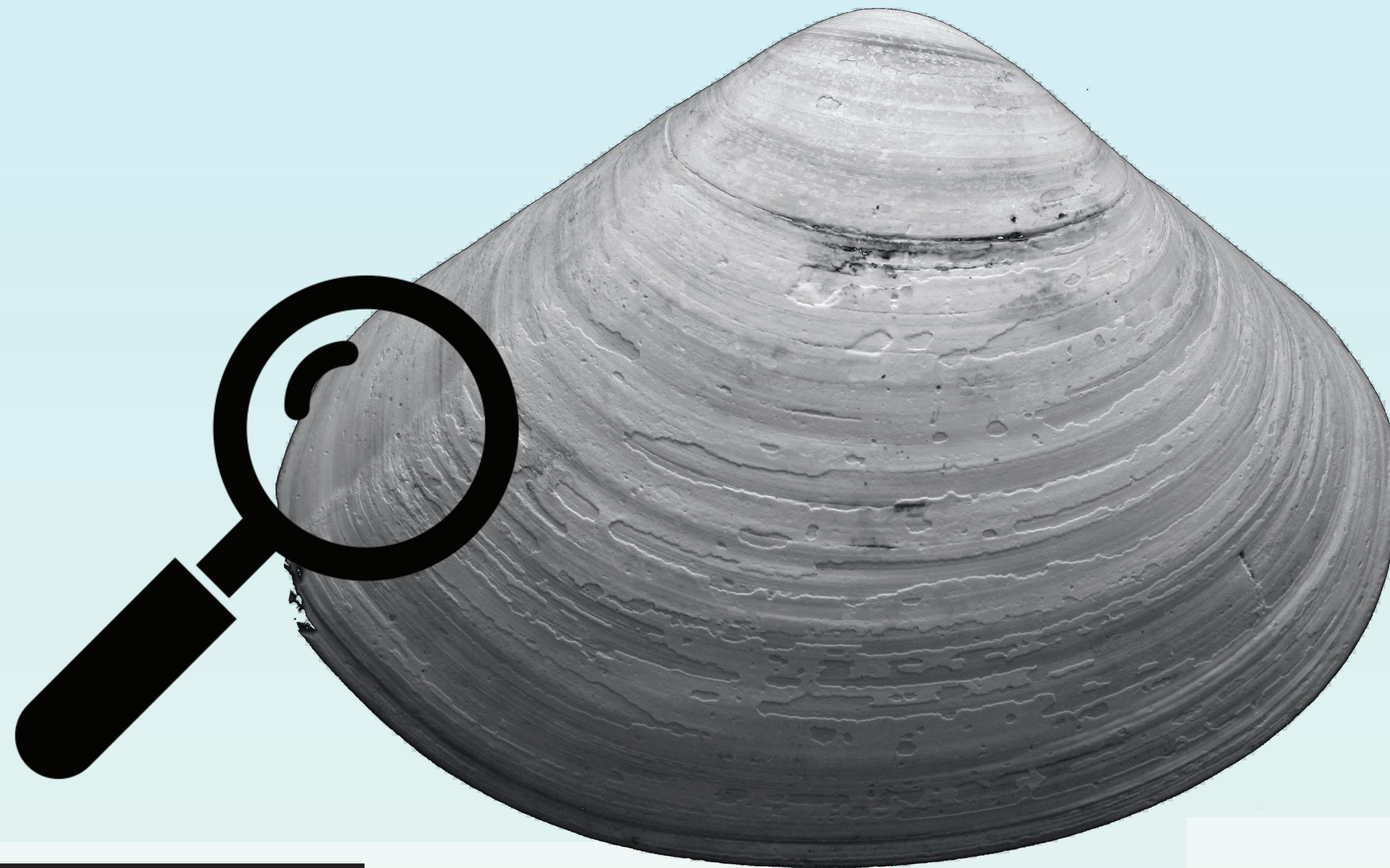


Niels J. de Winter

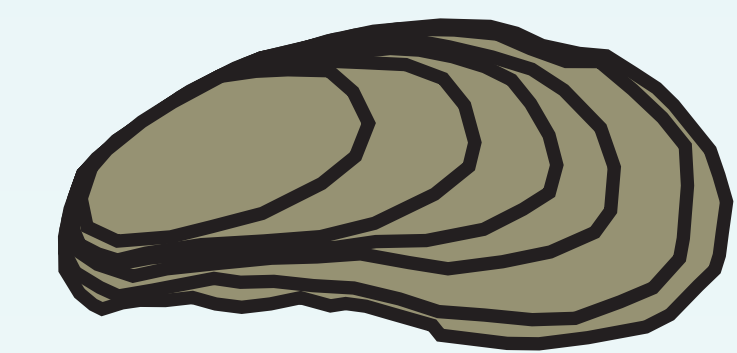
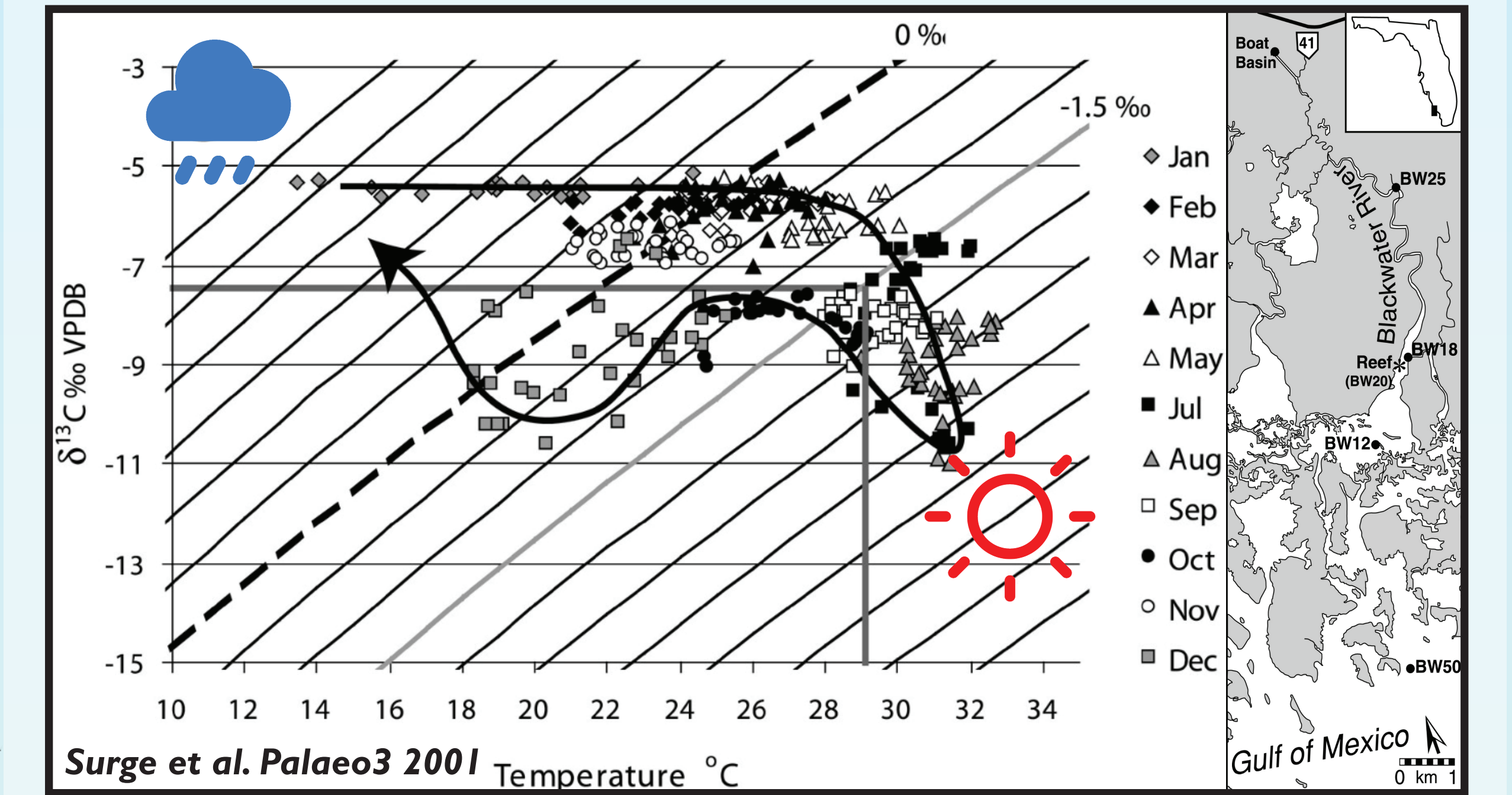
## Paleobiology



Mollusk shells are ideal archives for reconstructing climate and environment on the human timescale (days to decades). Their **incremental growth** records variability in their environment at a very fine timescale, their calcium carbonate shells have a high **preservation potential** throughout the Phanerozoic, and their **long evolutionary history and diversity** allows us to reconstruct their paleobiology throughout Earth's history and obtain information about their paleoenvironment across latitudes. Future work should focus on exploring how far we can push this archive towards ultra-high resolution reconstructions of climate, environment or even paleo-weather patterns!



## Paleoceanography

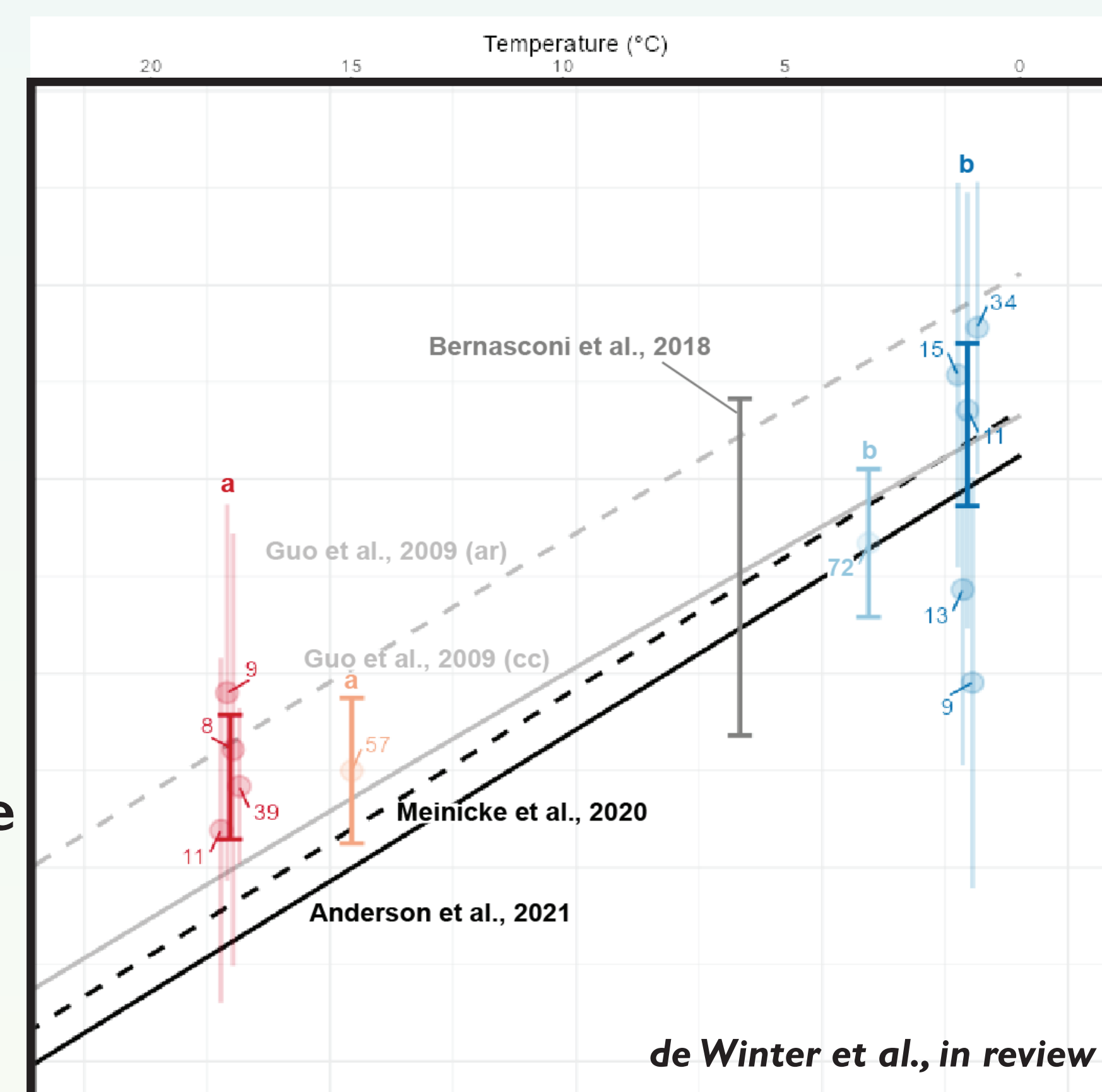


$^{13}\text{C}$   $^{12}\text{C}$   
Salinity

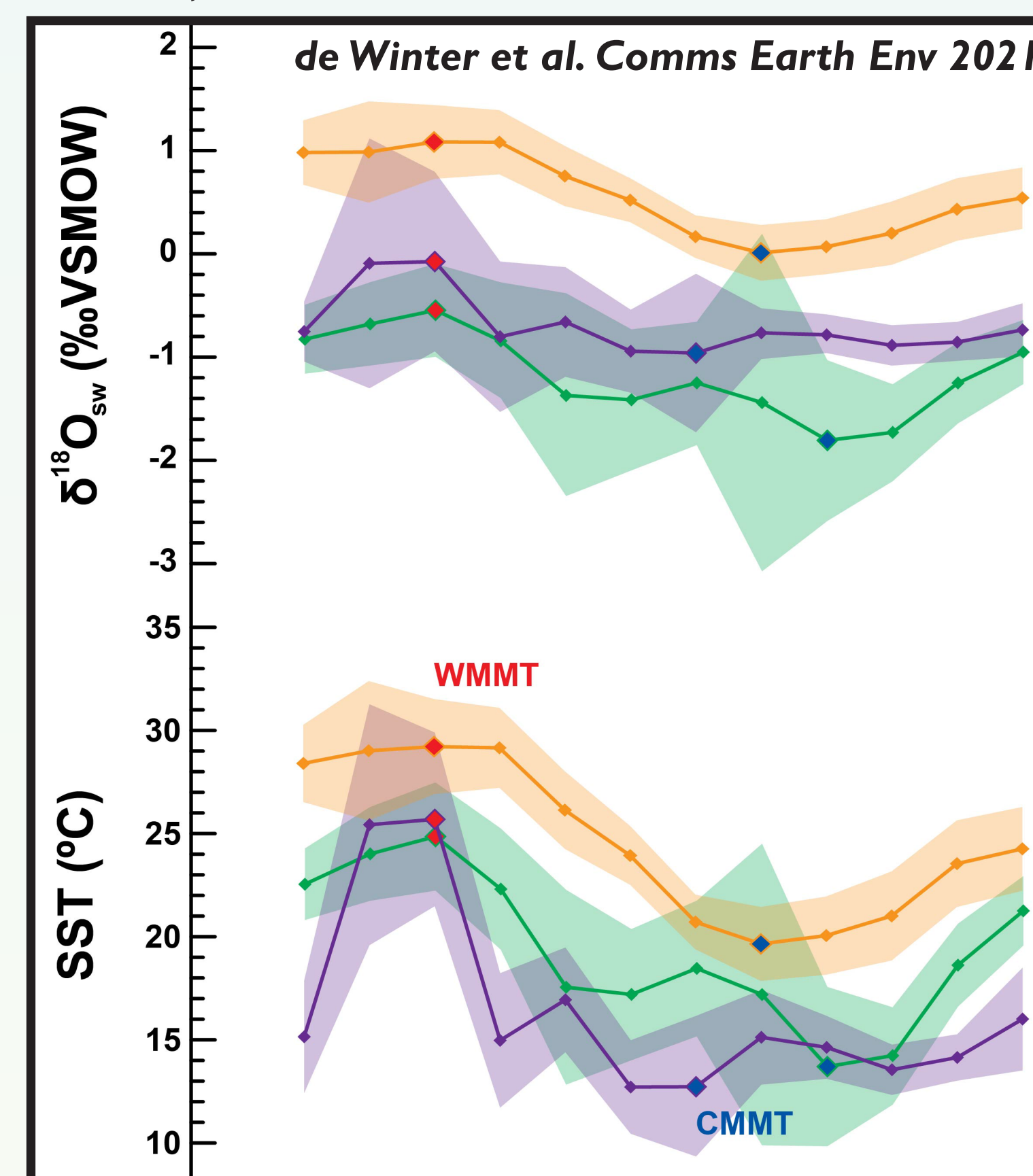
$^{18}\text{O}$   $^{16}\text{O}$   
Temperature

## Paleotemperature

Modern cultured bivalves

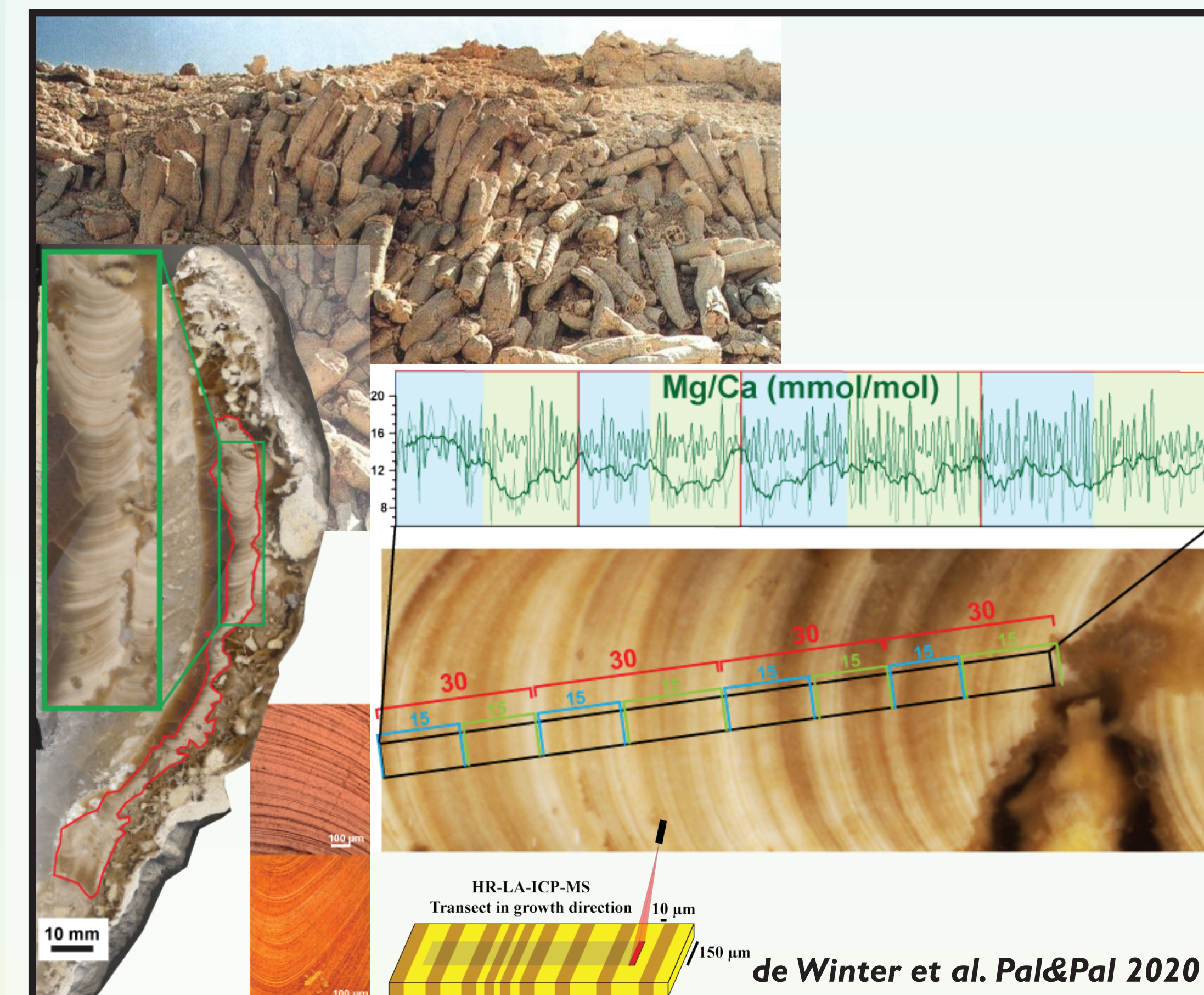


Sweden, 78 Ma

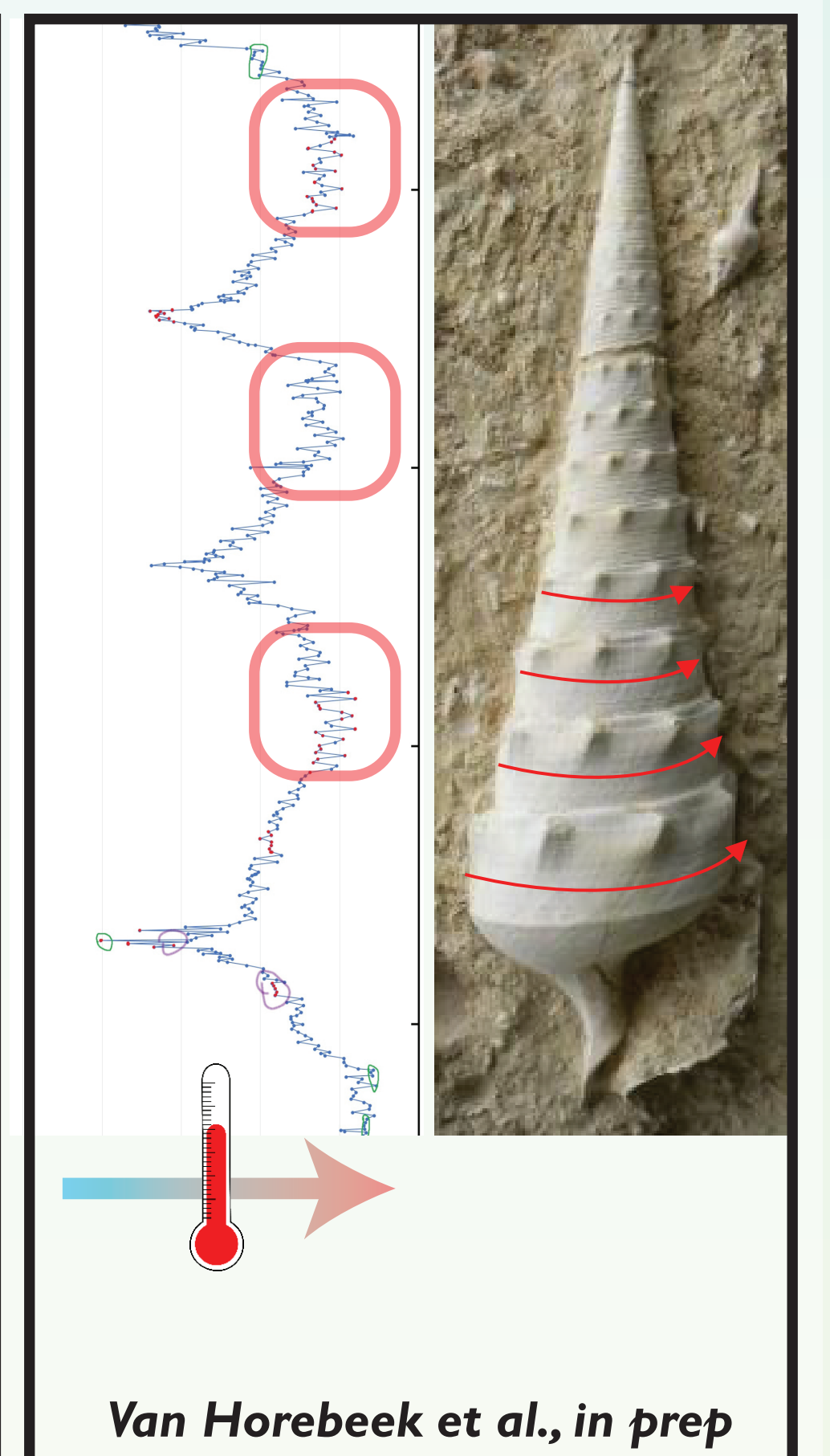


## Paleo-weather?

Oman, 75 Ma



France, 45 Ma



$^{18}\text{O}$   $^{16}\text{O}$   
 $^{13}\text{C}$   
Clumped isotope thermometry