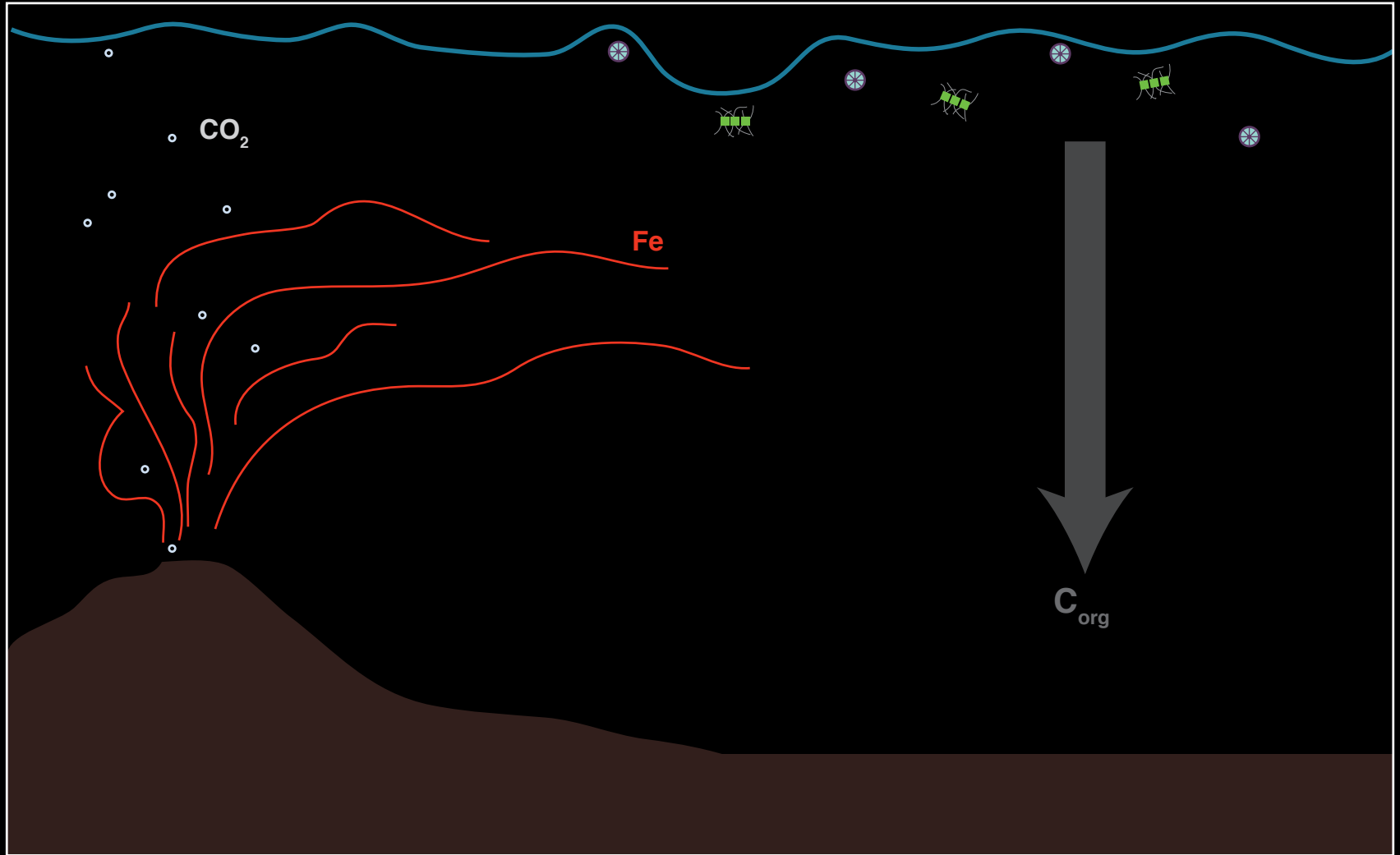


VOICE : Preliminary Results for Glacial-Interglacial Variability in Volcanic Activity

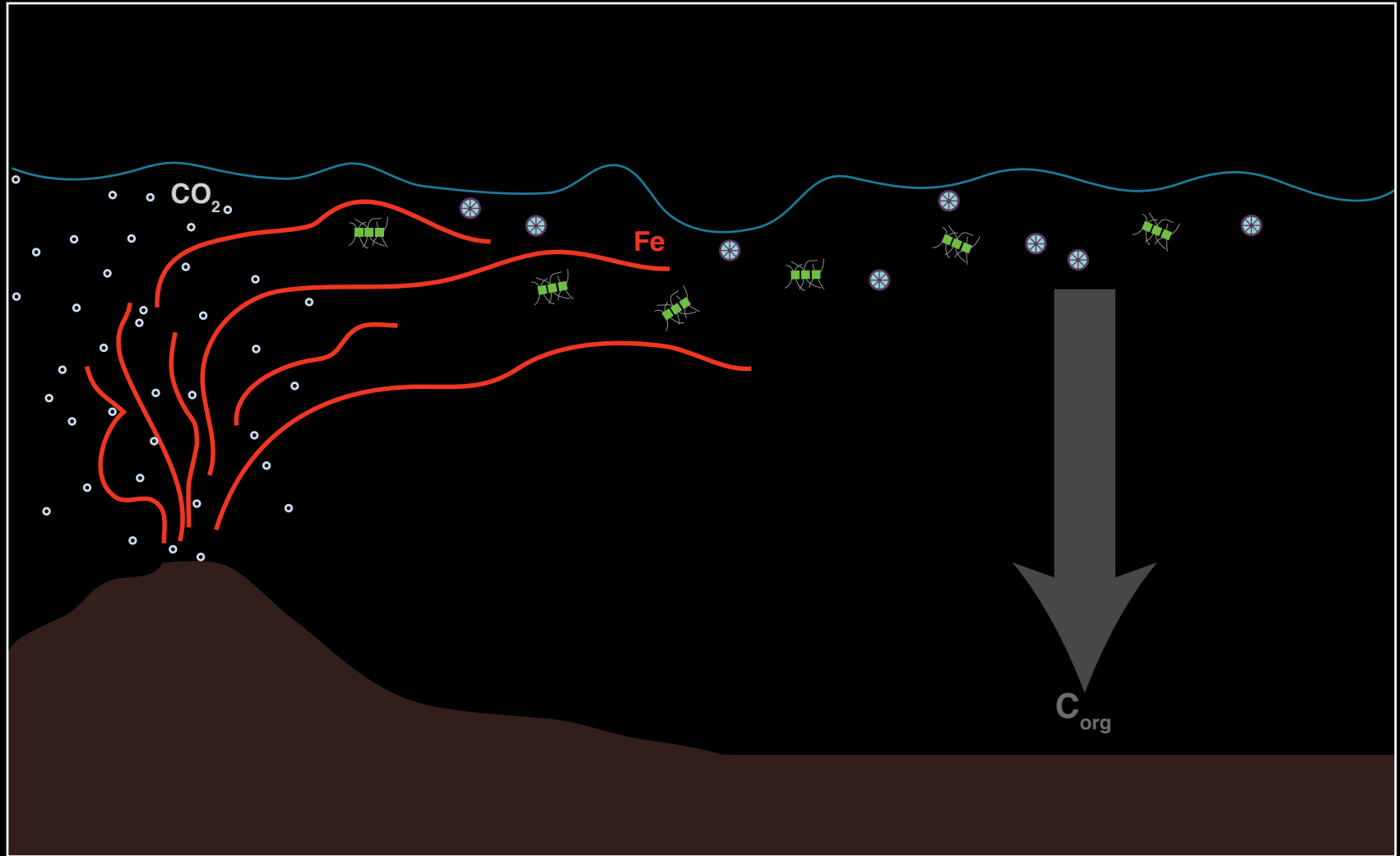
December 15, 2014

Kassandra Costa, Jerry McManus,
Christina Hernandez, Kelly Luis,
Anna LoPresti, Tianjia Liu

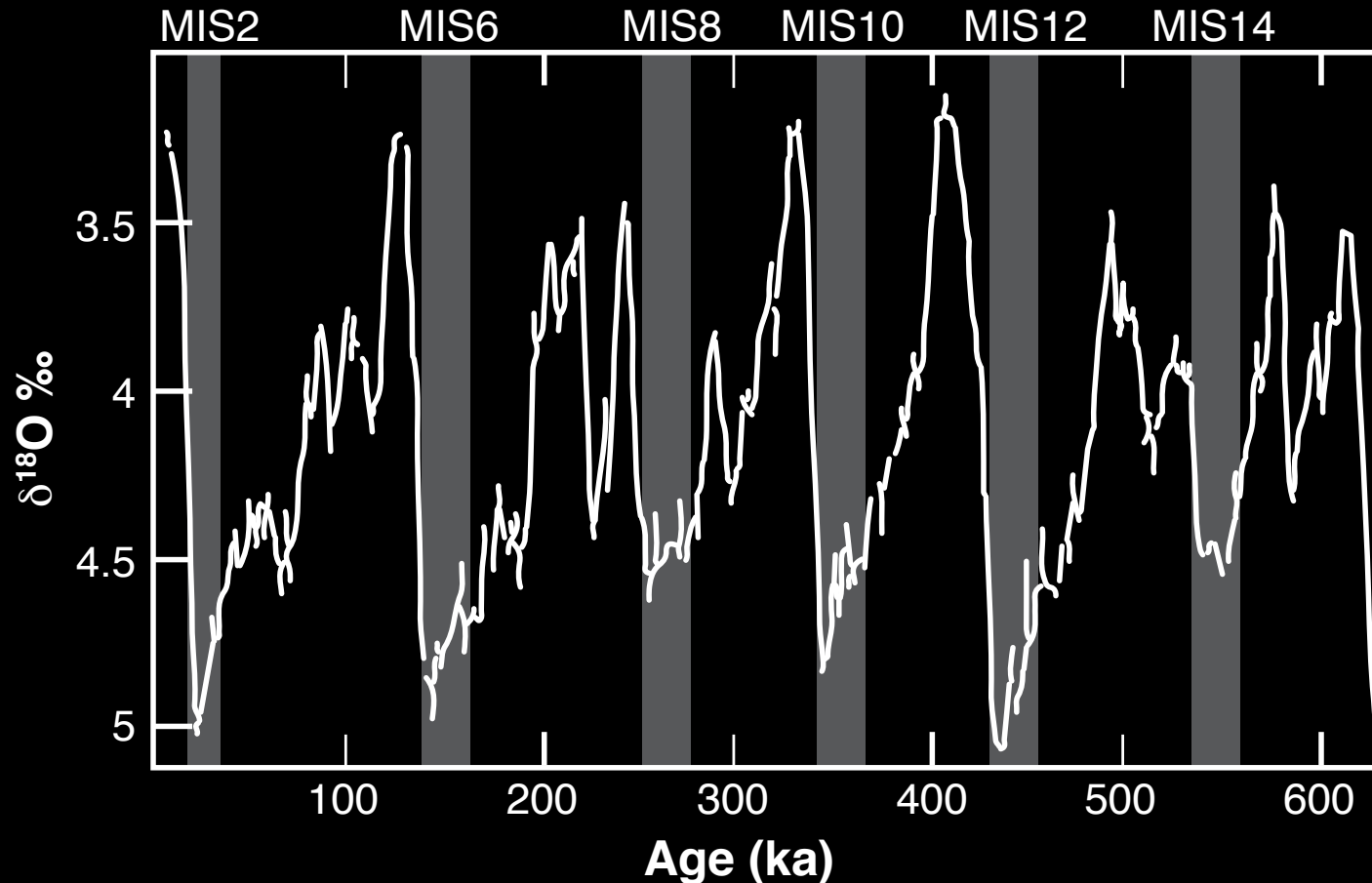
Volcanoes, Ocean, & Carbon



Volcanoes, Ocean, Ice, & Carbon



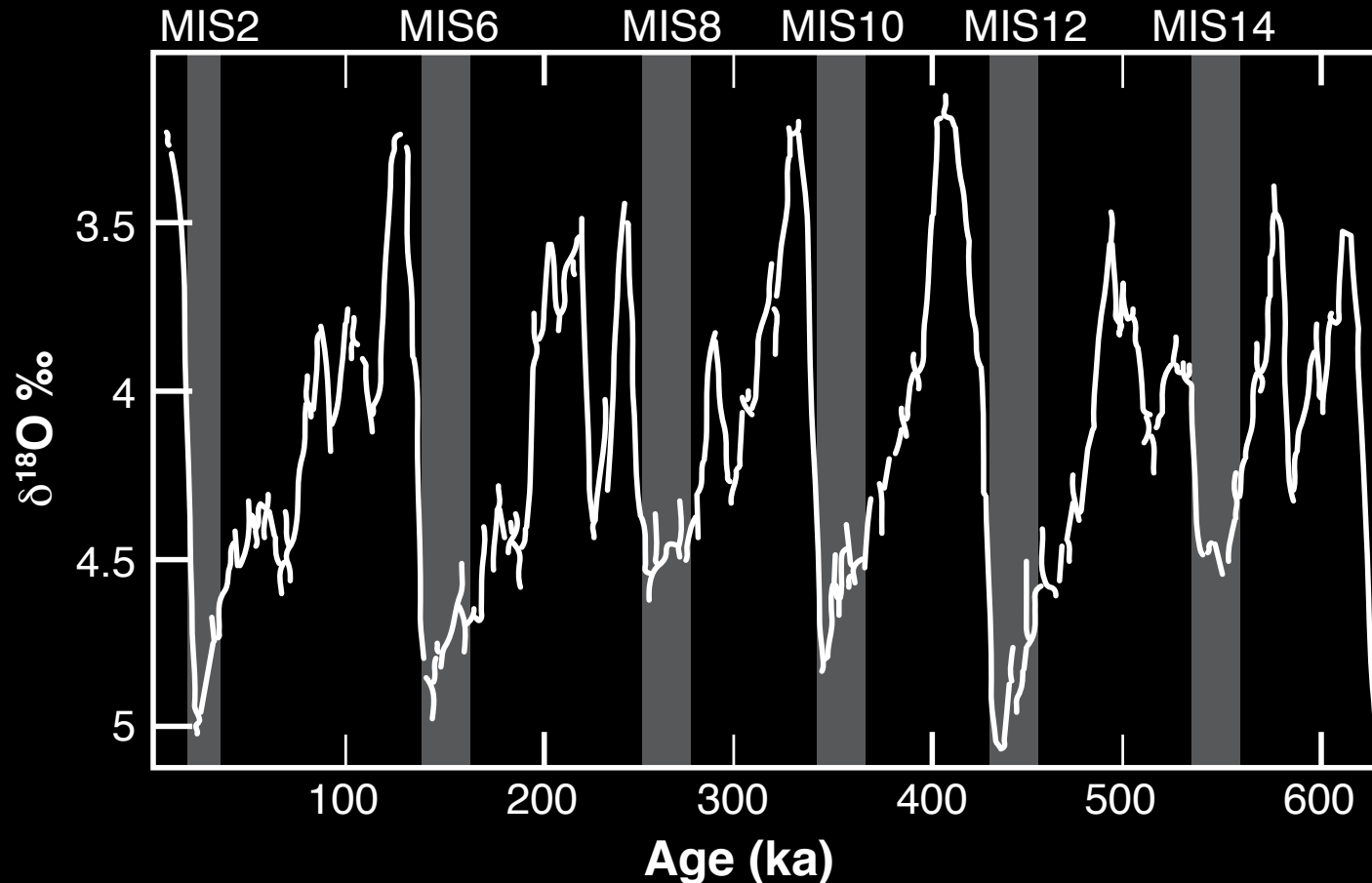
Changes in ice volume...



Major Glaciations = 2, 6, 10, 12

Minor Glaciations = 8, 14

Changes in ice volume...



Major Glaciations = 2, 6, 10, 12

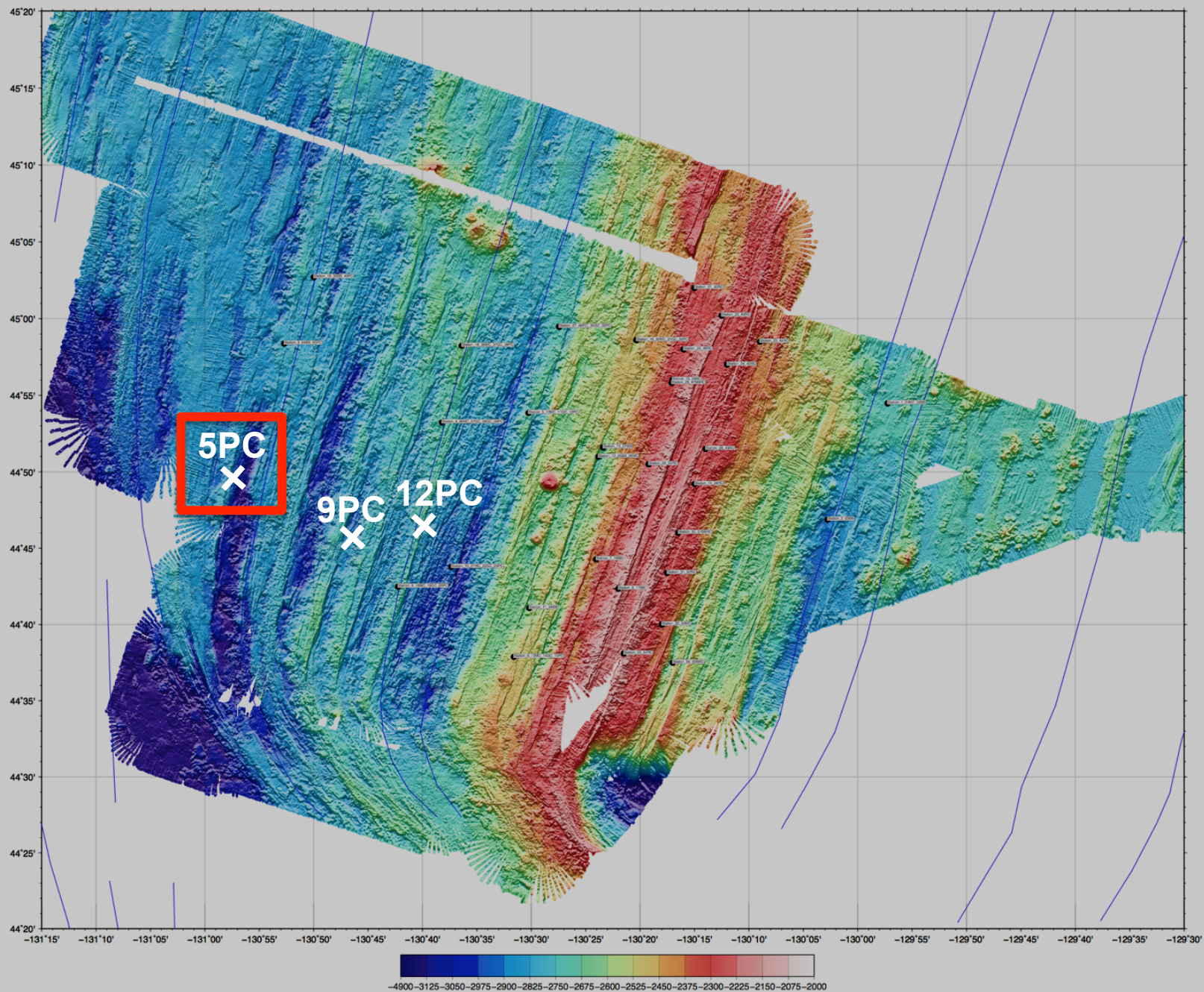
Minor Glaciations = 8, 14

First Order Questions:

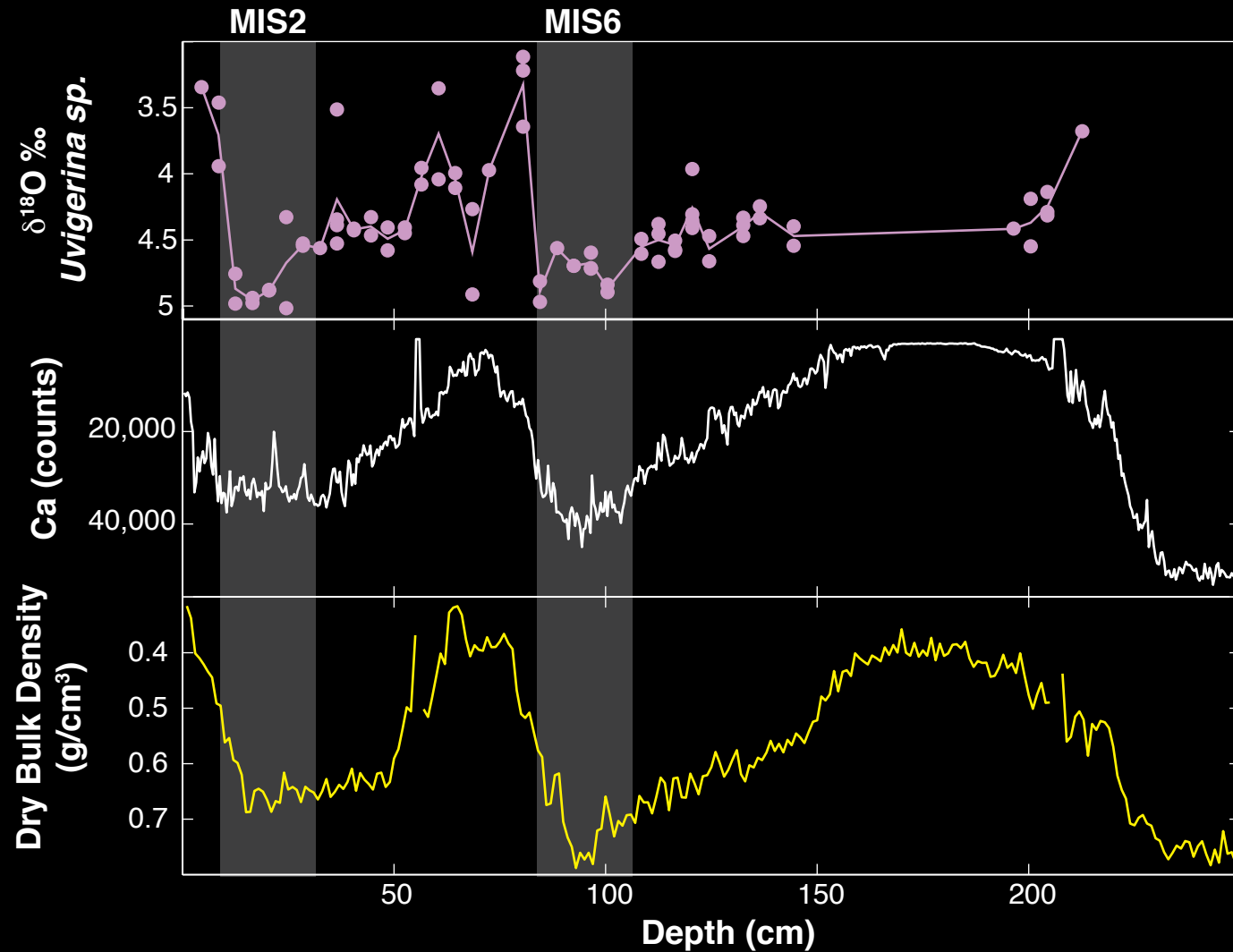
- Do we see enhanced volcanic activity during glacial periods?
- Do we see enhanced biological activity during glacial periods?

Preliminary Data:

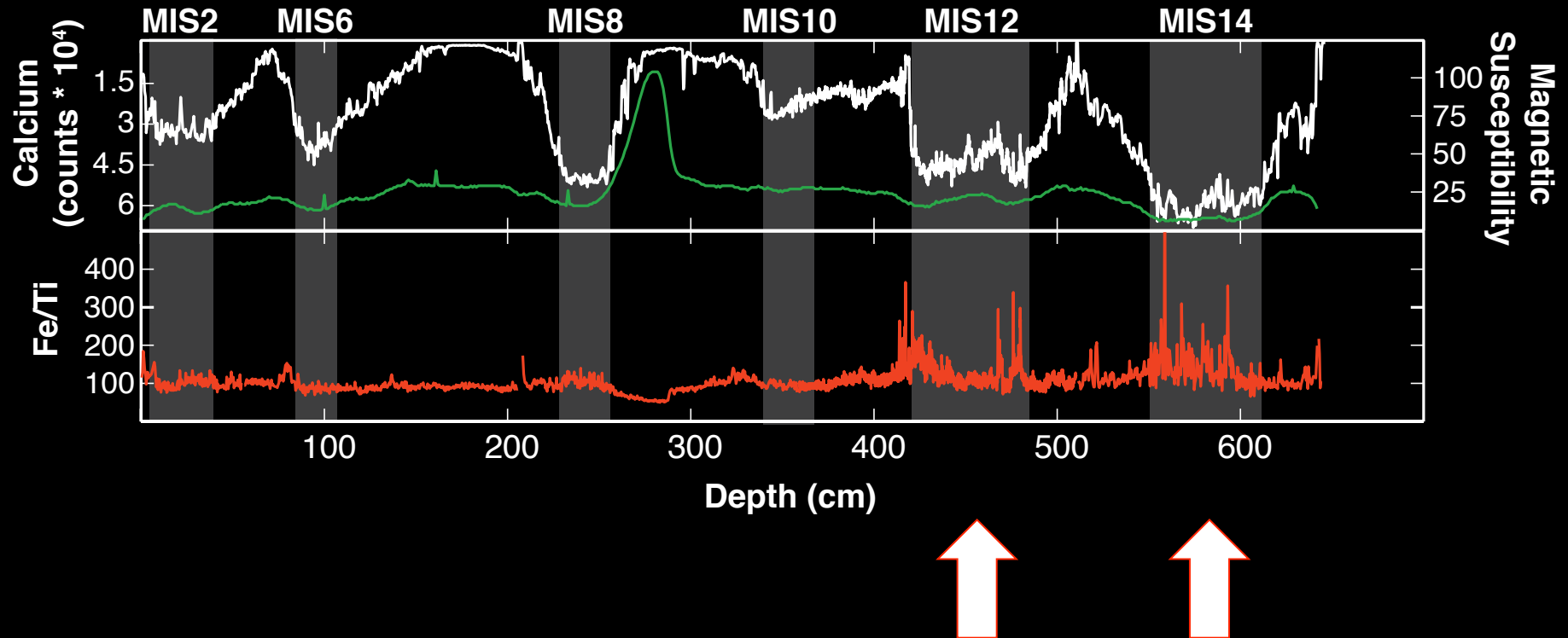
- *Uvigerina* sp. $\delta^{18}\text{O}$, Dry Bulk Density & Ca XRF
 - Stratigraphy
- Fe/Ti (XRF)
 - Volcanic activity
- Ba/Ti, Si/Ti (XRF)
 - Biological productivity



G-IG cycles in Calcium: 05PC

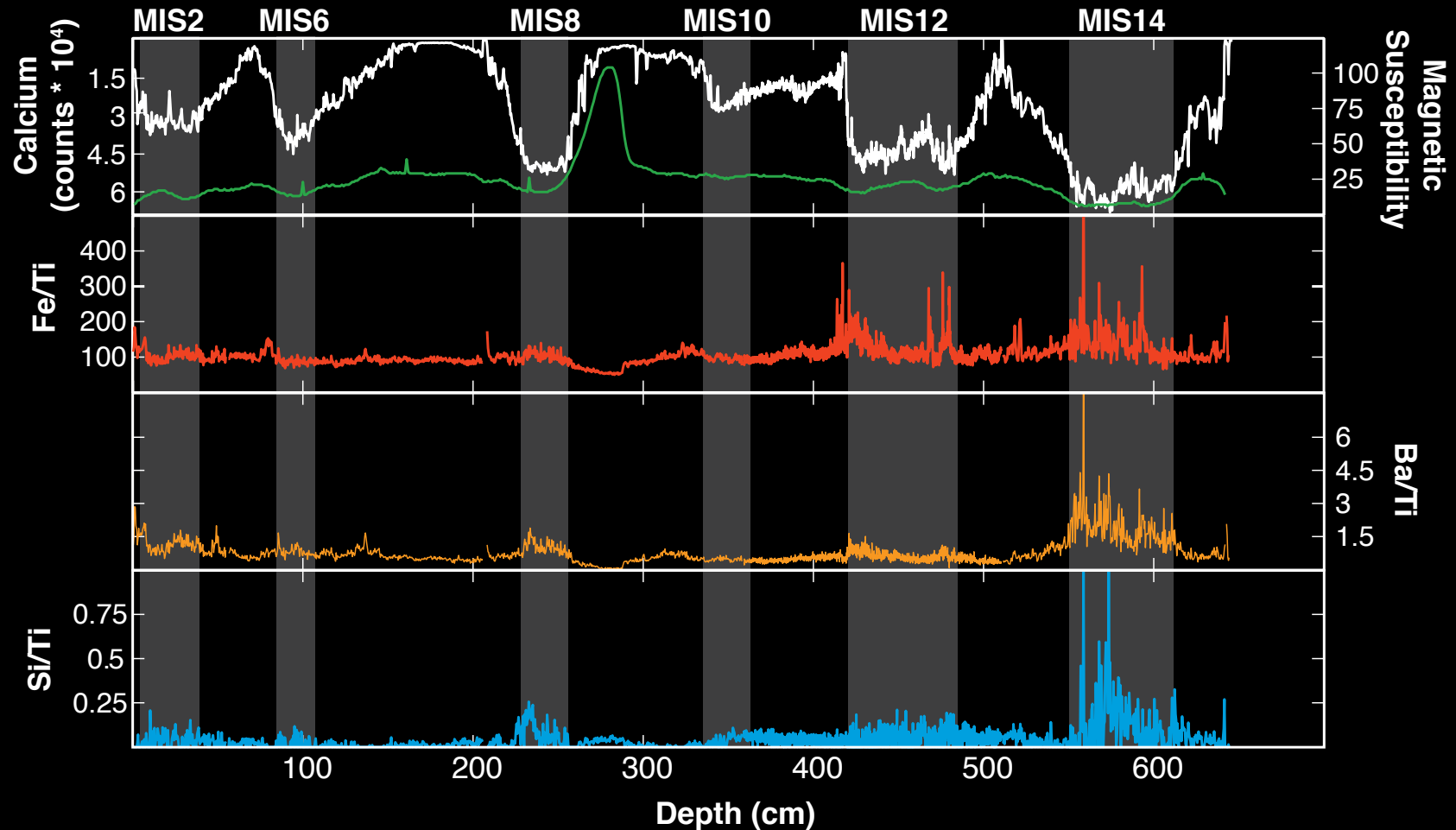


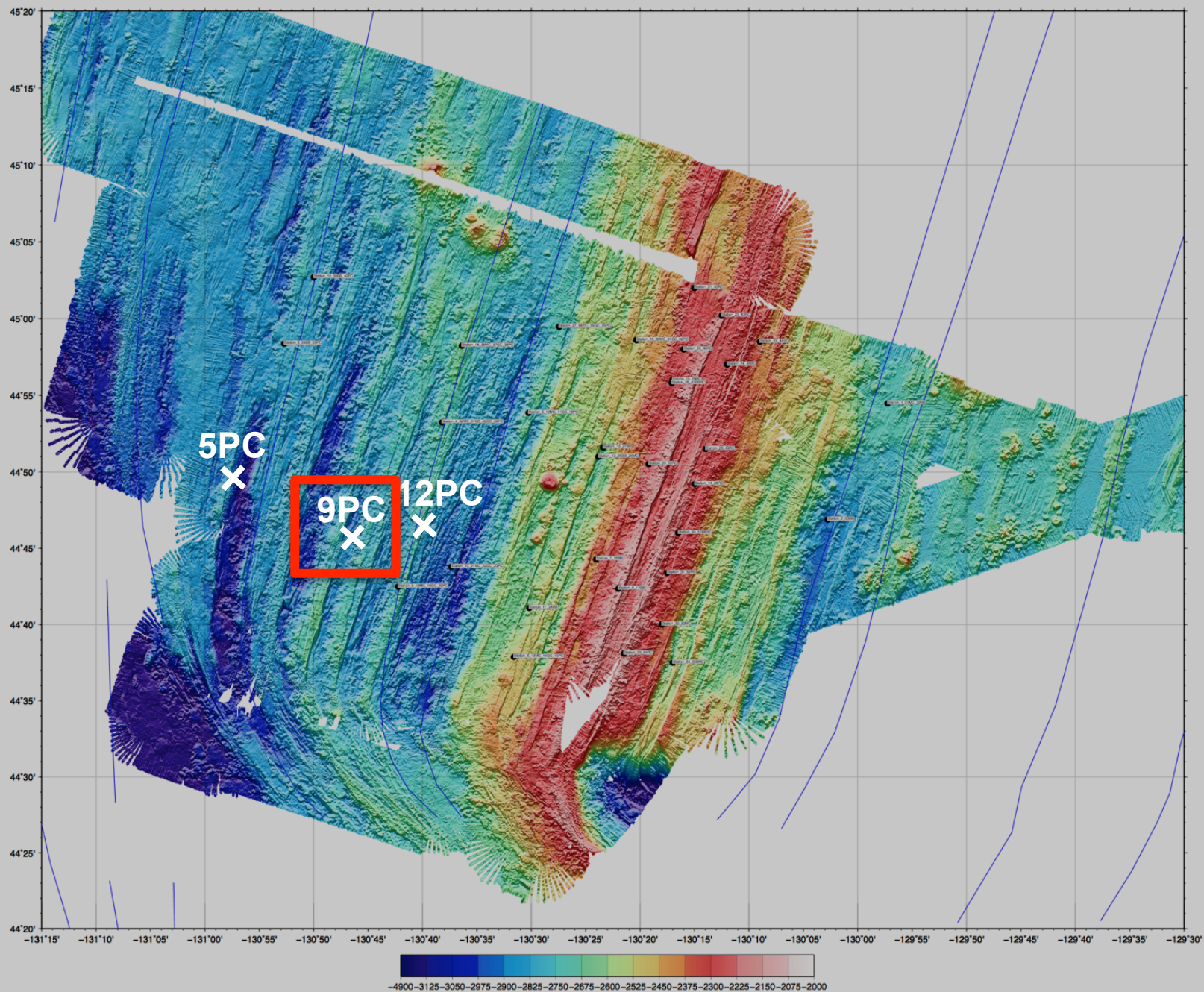
05PC: Volcanic activity in MIS 12 and 14



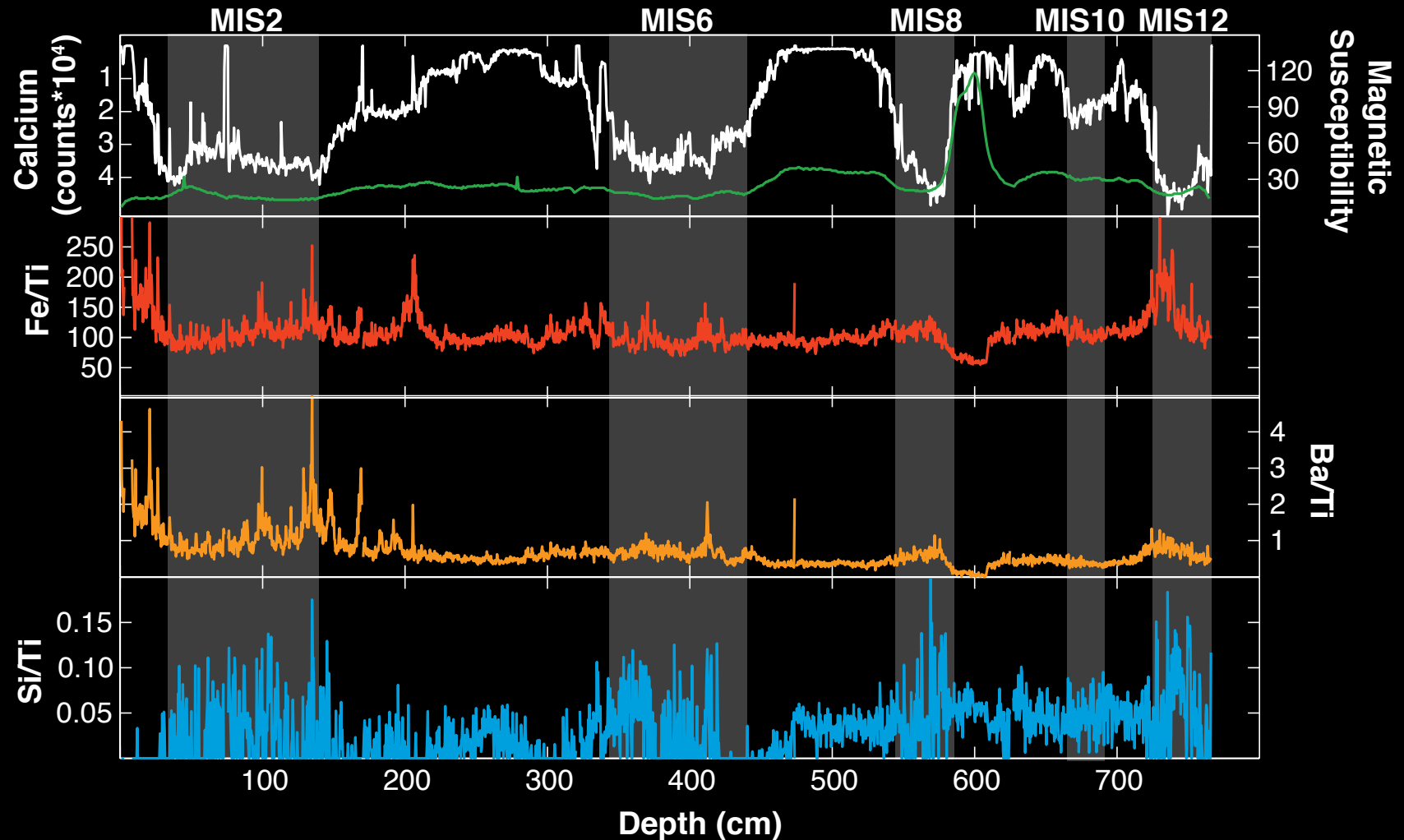


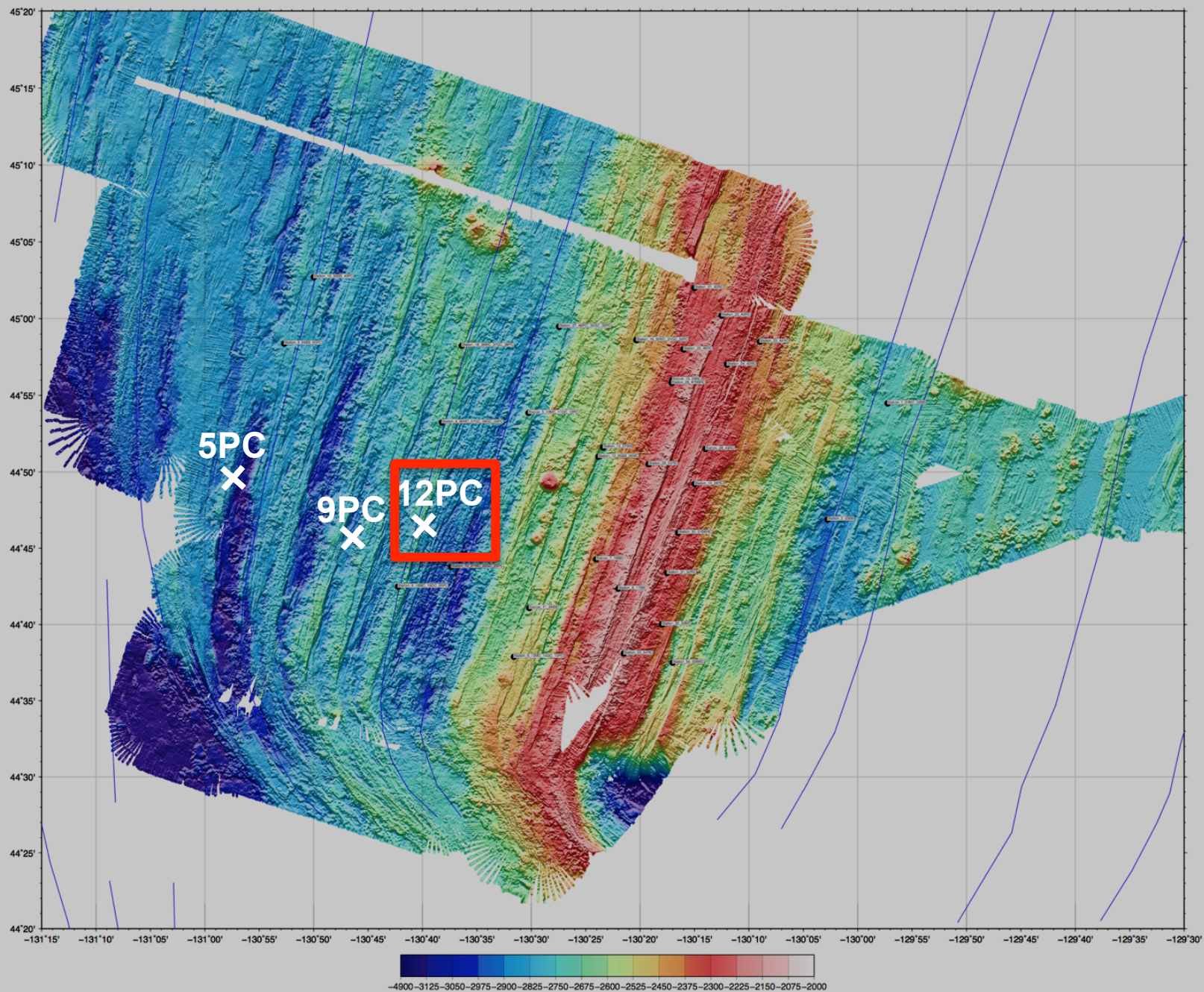
05PC: Biological activity in MIS 14, MIS12?, MIS8?



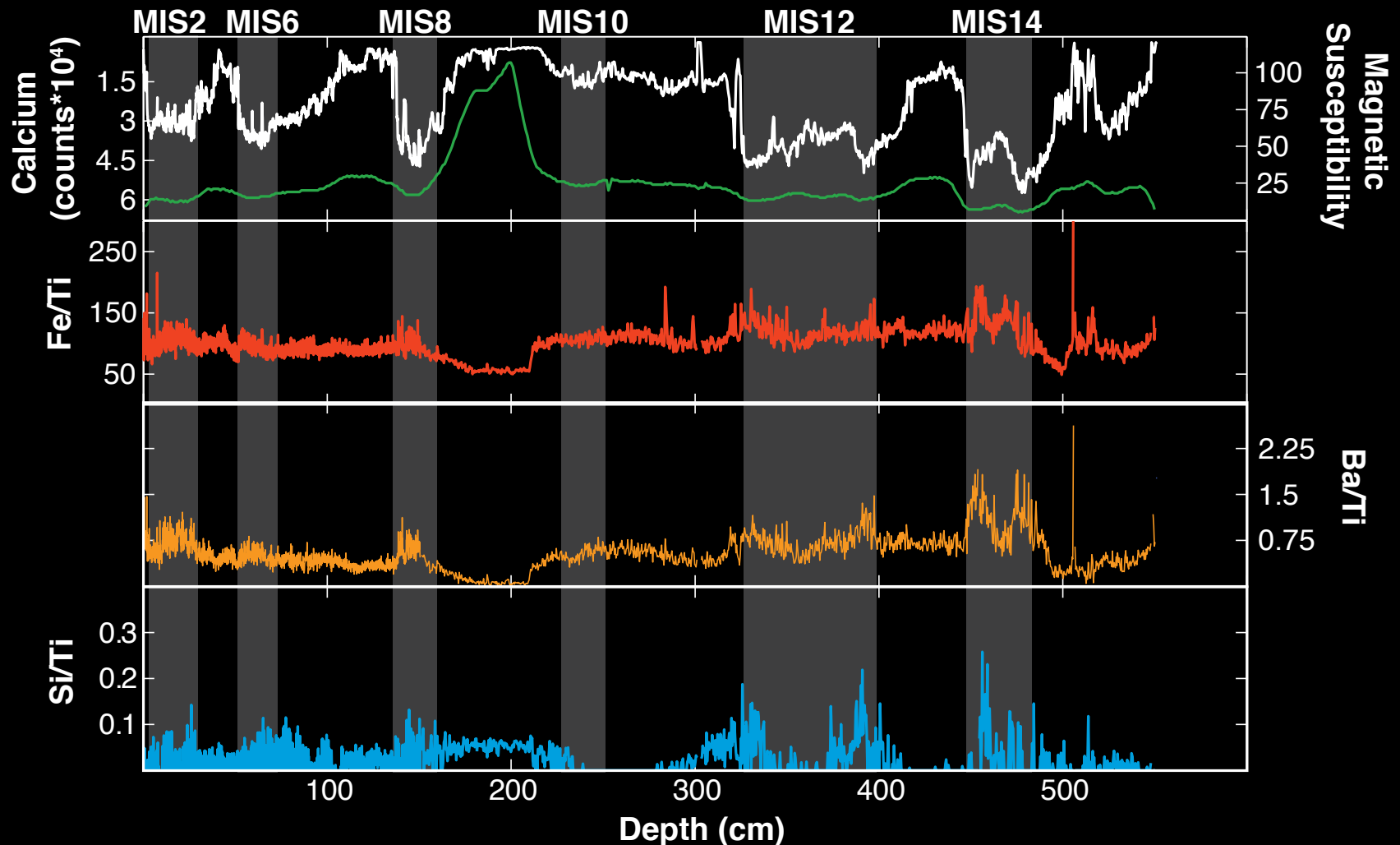


09PC: Volcanic activity in MIS12, MIS2?





12PC: Volcanic activity in MIS 14, MIS12?, MIS8?



Core Summary

Core	MIS2	MIS6	MIS8	MIS10	MIS12	MIS14
05PC VA	No	No	Yes	No	Yes	Yes
05PC BA	Yes	Yes	Yes	No	Yes	Yes
09PC VA	Yes	No	No	No	Yes	
09PC BA	Yes	Yes	Yes	No	Yes	
12PC VA	No	No	Yes	No	Yes	Yes
12PC BA	Yes	Yes	Yes	No	Yes	Yes

First Order Questions:

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- Do we see enhanced biological activity during glacial periods?

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Yes, but not every glacial period

- Do we see enhanced biological activity during glacial periods?

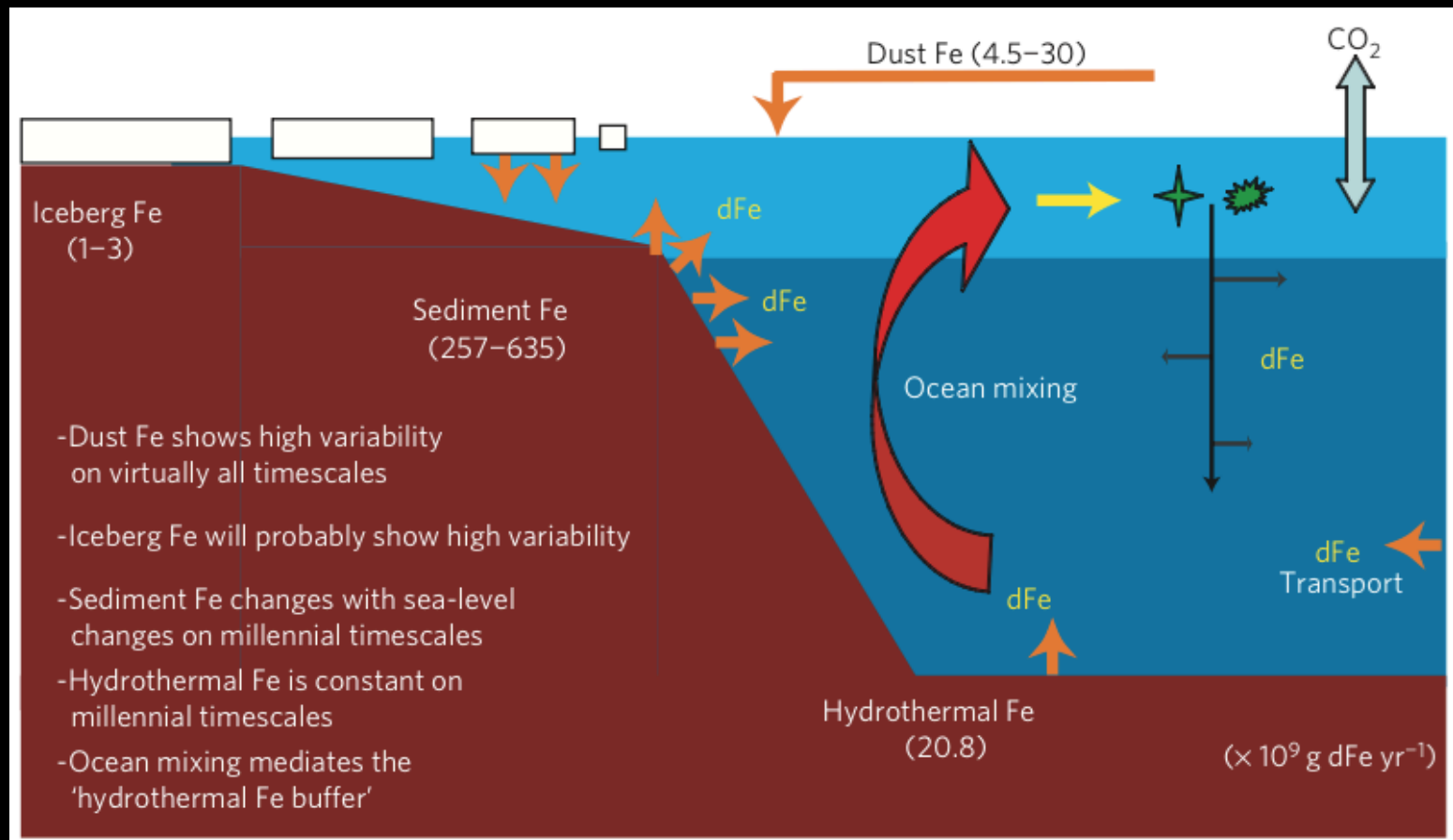
First Order Questions:

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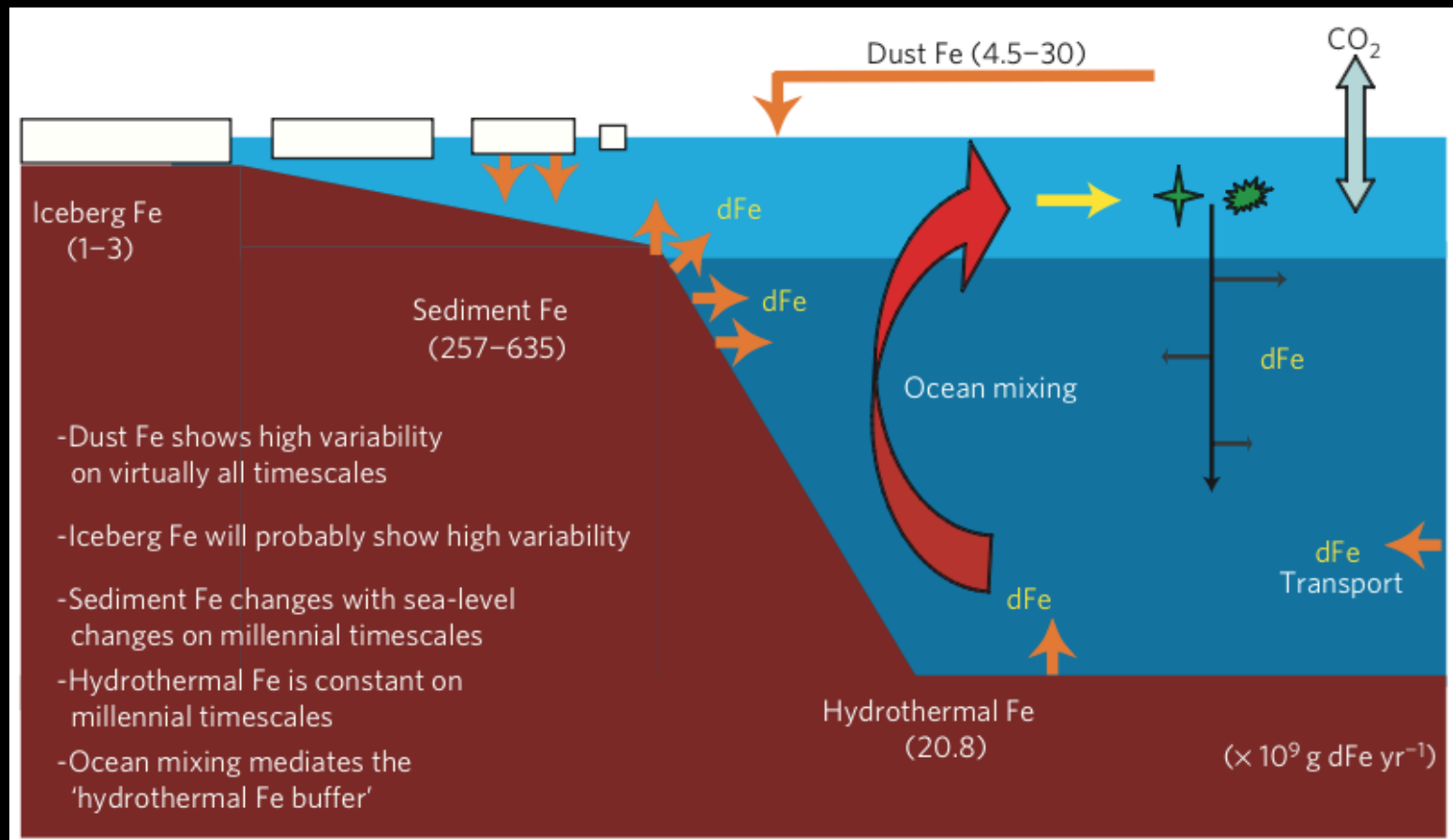
- Do we see enhanced biological activity during glacial periods?

*Yes, but may not be dependent on
volcanic activity*



How much does volcanic activity contribute to the regional Fe budget?

Fe and Mn fluxes; Pb isotopes; Th isotopes



How might stratification affect Fe delivery to surface waters and C storage in deep waters?

Ba, Si, and opal fluxes; $^{231}\text{Pa}/^{230}\text{Th}$; $\delta^{13}\text{C}$; Authigenic U

Upcoming in 2015

- Opal fluxes
- Authigenic U
- $^{231}\text{Pa}/^{230}\text{Th}$
- Fe, Mn, Ba, Si fluxes (^{230}Th normalized)
- Pb isotopes, Th isotopes
- Oxygen isotopes
- Elemental (XRF) scans on remaining cores
- ICP-MS calibration of elemental scans
- Carbon isotopes
- CaCO_3 %