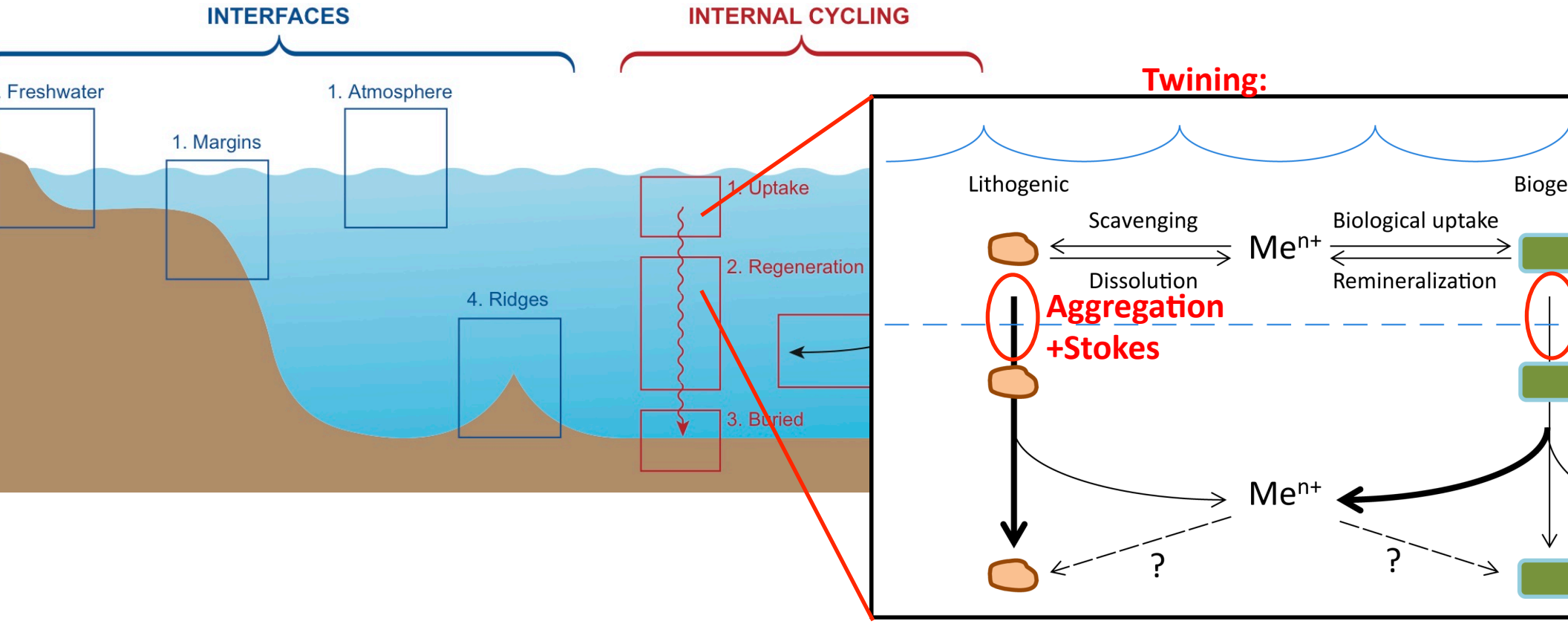
Theme 3: Export, recycling, and remineralization



"Abiotic"
Adsorpt/desorpt
Th, Al

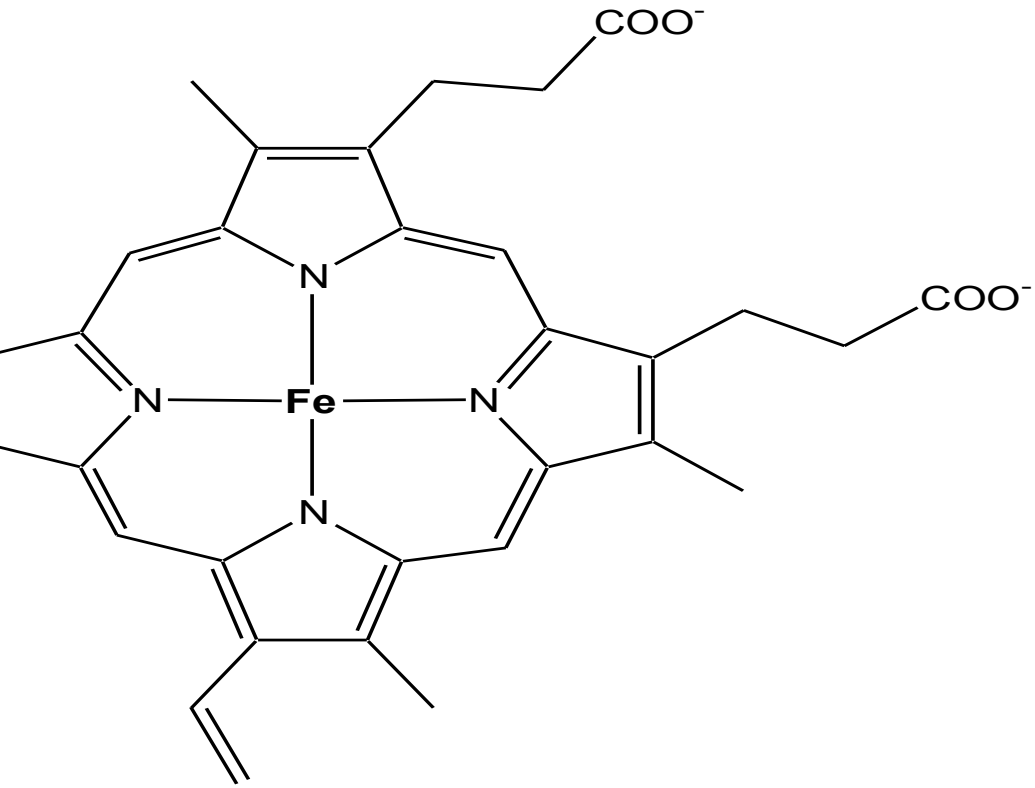
"Mixed"

Fe, Cu, Zn, Co

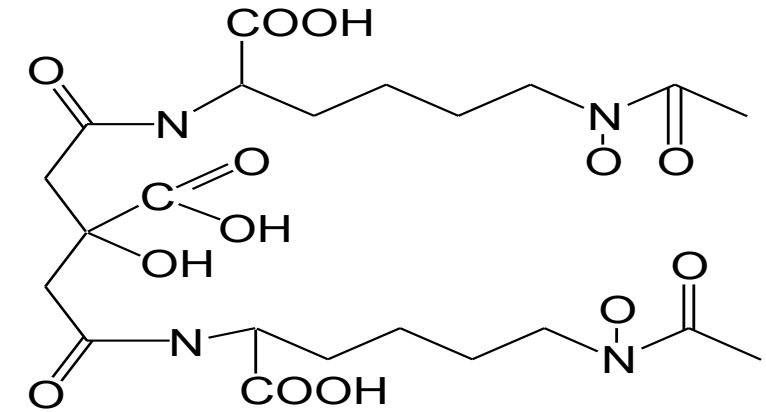
"Bio
Photosy
C

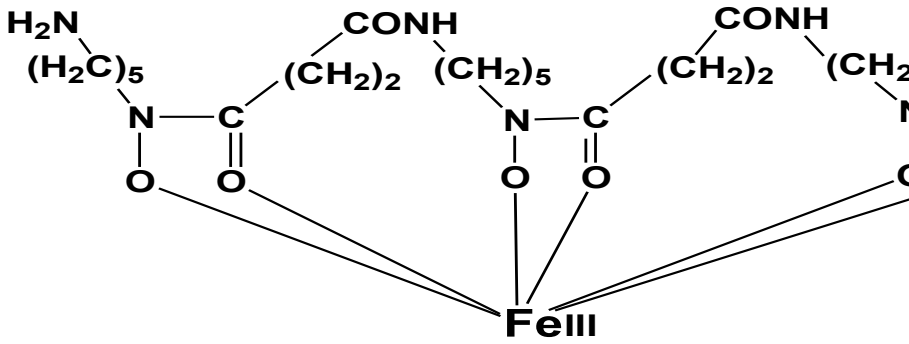
beau:

How bacteria act to short-circuit diatom Fe export and keep the ferrous wheel spinning



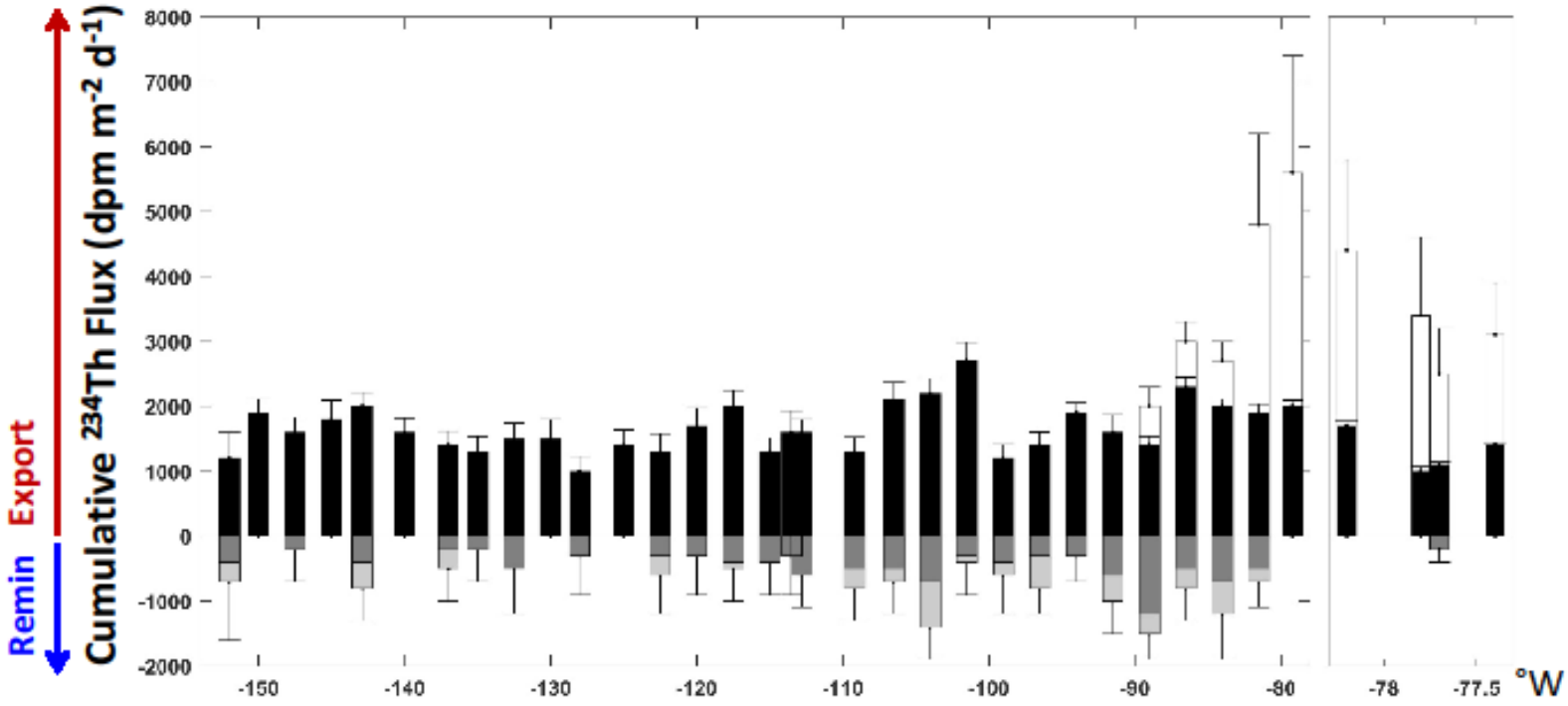
Heme





Siderophores

sseler:



'Remineralization' feature evident at 26 of 35 Stations

eith Moore:

simulations in our group suggest a lower rate on the unbound Fe can improve simulated
n areas with large iron inputs (dust plumes, hydrothermal vents).

c ligand-Fe models recently developed by Tagliabue and Völker, and currently for CESM
rman et al., in prep.).
treatment of L1 ligands with dynamic sources and sinks.

d L1 ligands were observed at the margins on GAO3.
this due to higher organic matter export?
nthesis efforts derive a ligand produced / POM remin ratio?

ly high dFe scavenging rates are required to match observations (especially sub-euphotic
100-500m).
s to include scavenging removal of ligand-bound iron.
ggregation-scavenging of colloidal ligands likely occurs.
ere also scavenging loss of Fe to particles that doesn't remove the ligands? Particles steals
om ligand or during dynamic cycling.

Theme 3: Unknowns and methods to address them

1. Quantifying (rates/fluxes) recycling/remineralization processes
   - Respiration
   - Adsorption
   - Mixed case (e.g., biotic+scavenged) that is probably the most common
   - Organic ligand complexation
2. Importance of dissolved and particulate organic matter
3. New technologies/methods for quantifying metal quotas
   - Cell sorting and identification of metal concentrations
   - Metal “sensors” on remote platforms (e.g., floats and gliders)
   - Others?