



NUTRIENT DYNAMICS ACROSS BLOOM STAGES

Trace metals

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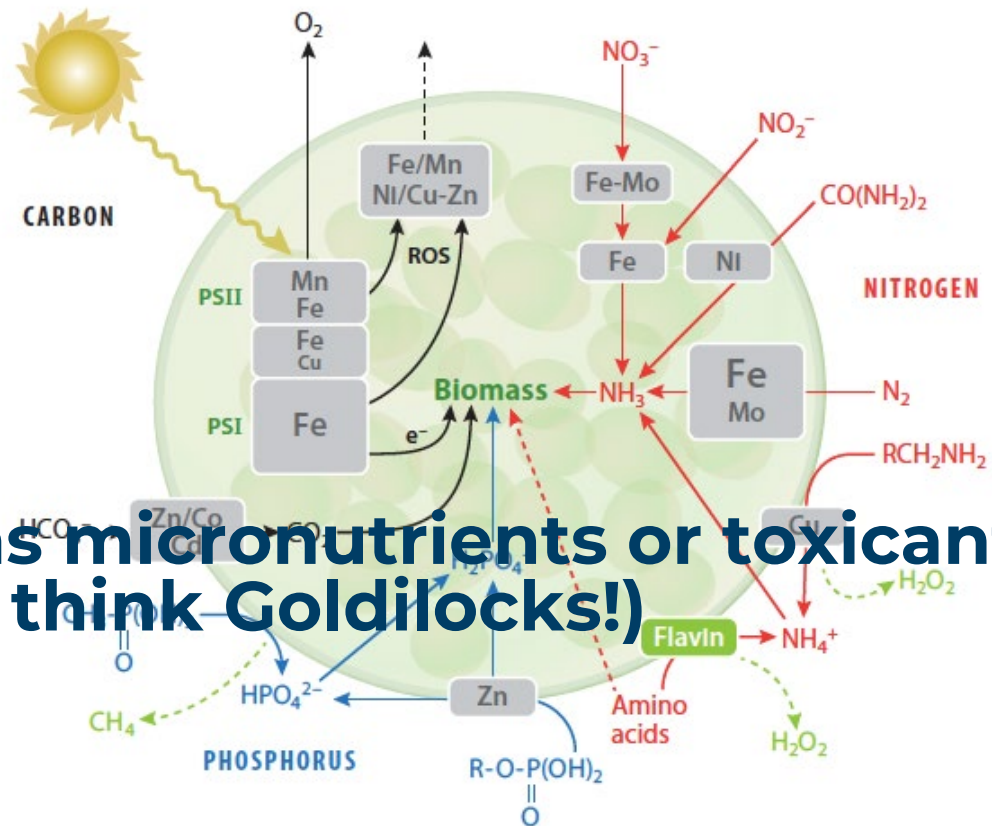
Oregon State University



IMAGE BY NOAA-NCCOS

BACKGROUND

Trace metals used as co-factors in enzymes for nutrient uptake, photosynthesis, reactive oxygen species



Can serve as micronutrients or toxicants (too little vs. too much – think Goldilocks!)



BLOOM INITIATION

Dust = Fe → *Trichodesmium* spp. → new N → *K. brevis*?

Saharan dust and Florida red tides: The cyanophyte connection

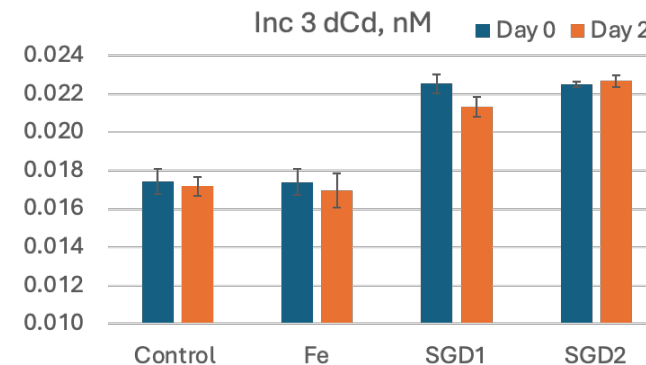
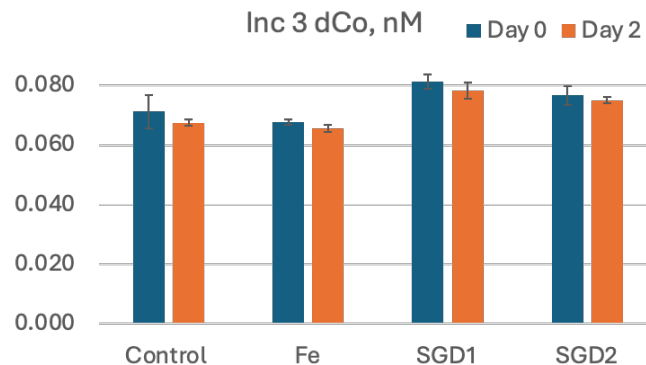
John J. Walsh

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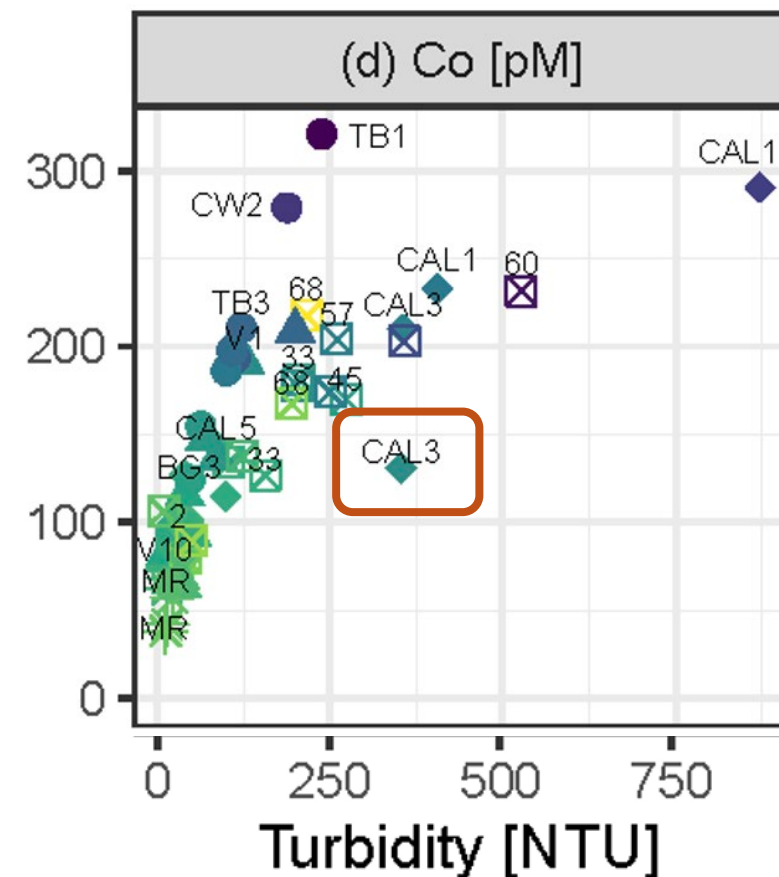
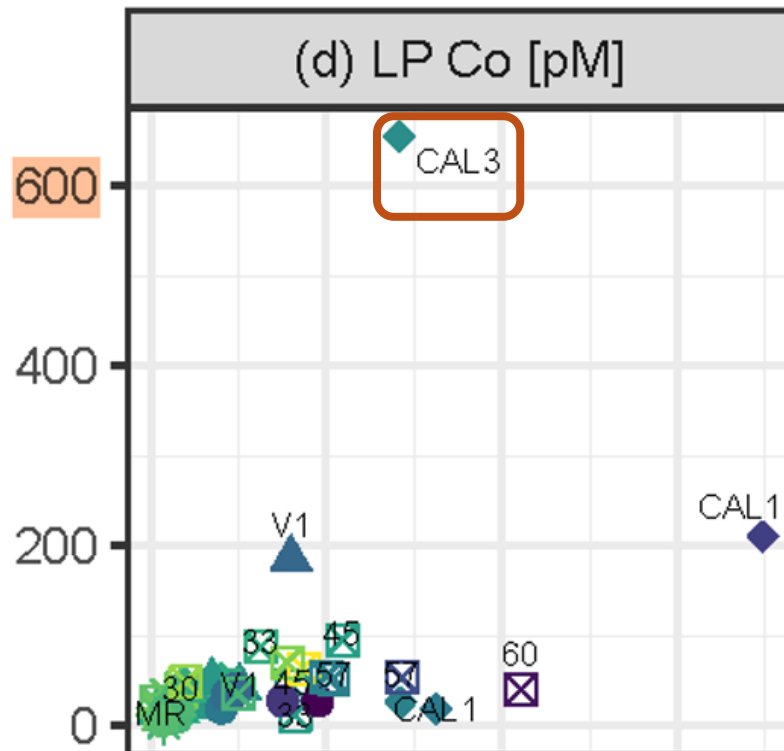
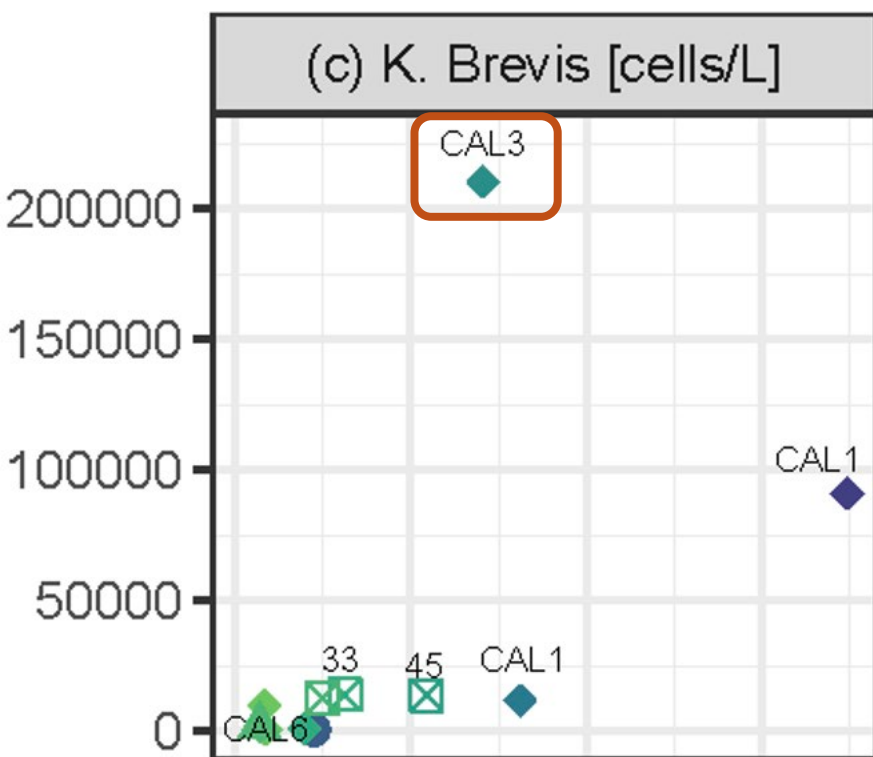
Florida Marine Research Institute, Florida Fish and Wildlife Conservation Commission, St. Petersburg, Florida

Seasonal supply of metals from groundwater?



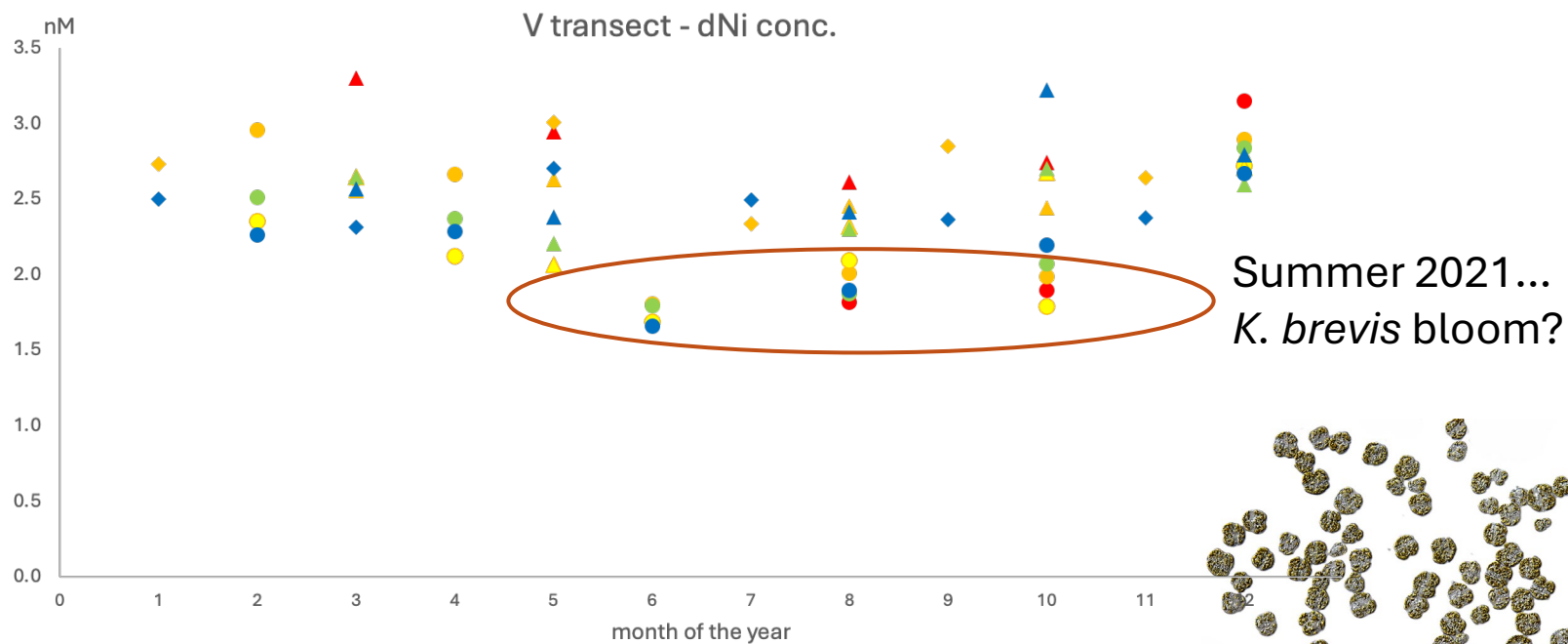
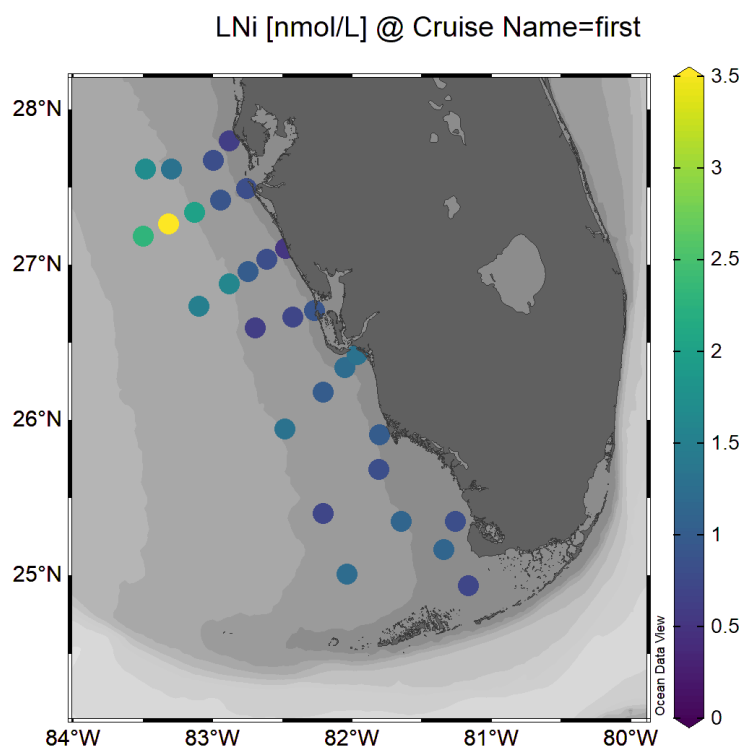
BLOOM MAINTENANCE

Enrichment of Co and Cd in *K. brevis* cells?



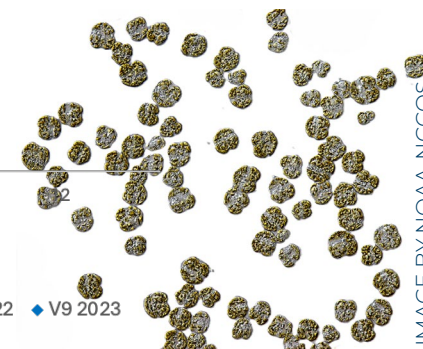
BLOOM TERMINATION

Macronutrients are always low on West Florida Shelf
-- Of trace metals, bioavailable Ni is notably depleted inshore



● V1 2021 ▲ V1 2022 ● V3 2021 ▲ V3 2022 ◆ V3 2023 ● V5 2021 ▲ V5 2022 ● V7 2021 ▲ V7 2022 ● V9 2021 ▲ V9 2022 ◆ V9 2023

Buck et al. in prep.



REFLECTION

- **Hard to say yet, just getting started!**
- **Do wish we included speciation samples (labile as well as total dissolved), but requires large volumes**



ACKNOWLEDGEMENTS

FWC sampling team, Chloe Mikus, Matt Garrett, Kate Hubbard

Collaborators on HAB project at USF, TAMU; STING project collaborators

Chris Kelble, Ian Smith, and NOAA-AOML team

Captains and crews of R/V F.G. Walton Smith, R/V Weatherbird II, R/V Atlantic Explorer, R/V Endeavor

Funded by FWC Contract 20035

