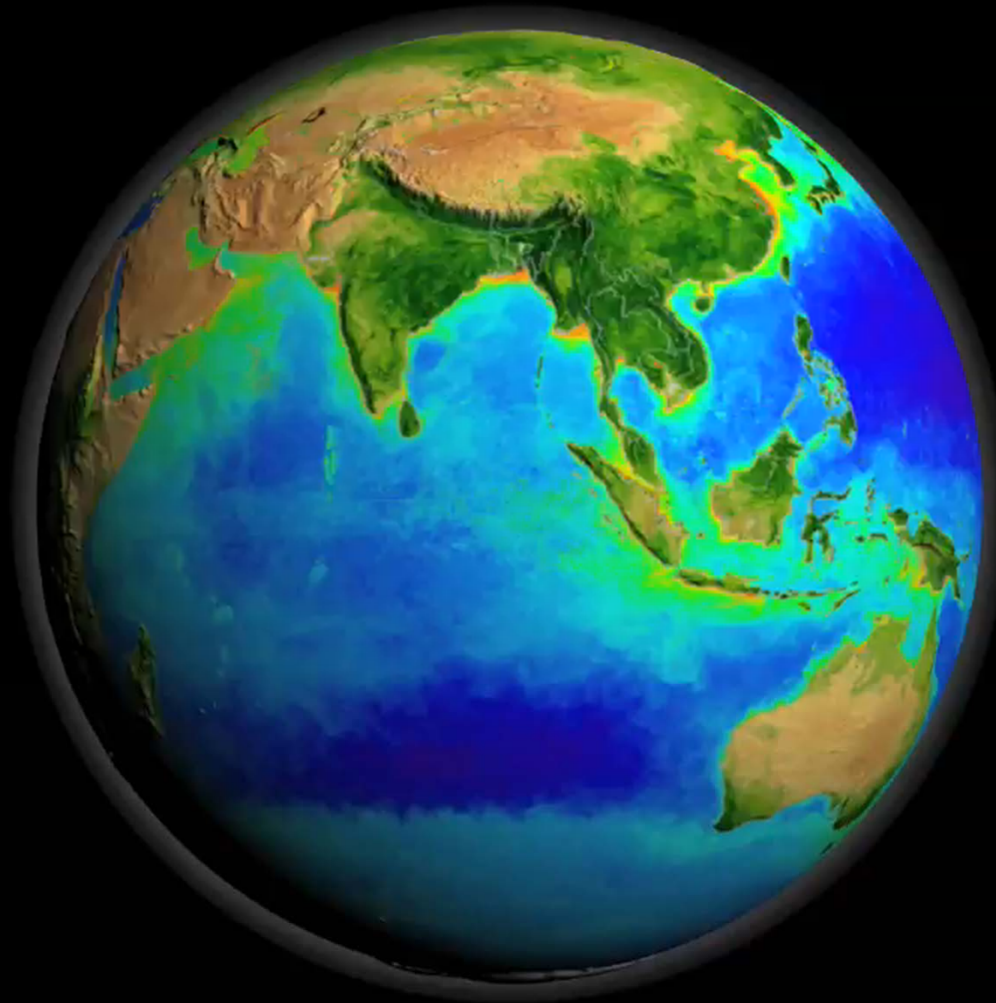


Marine Particles and Trace Elements

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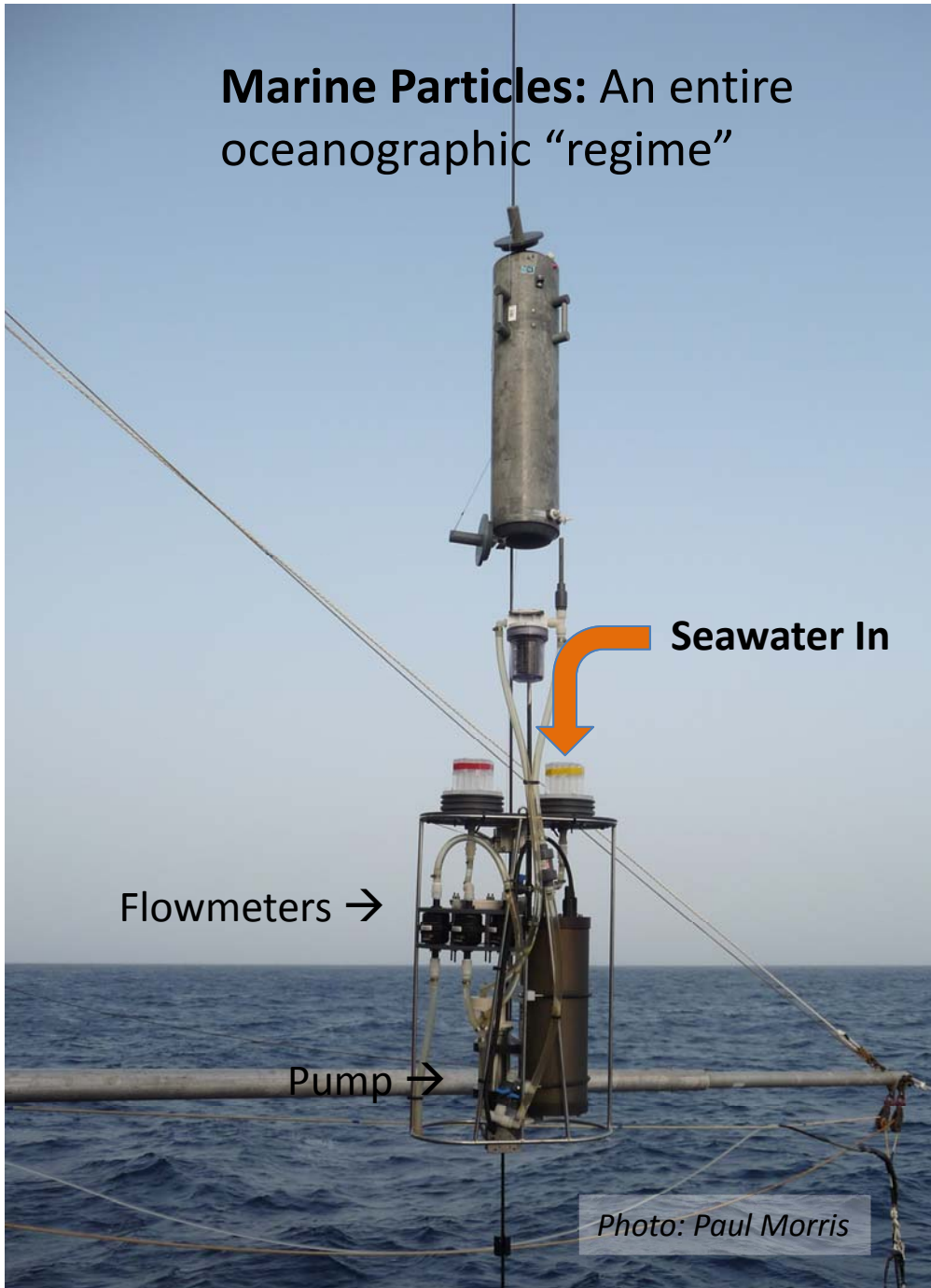
The biosphere is a highly dynamic, responsive system!



“Biogenic particles”

SeaWiFS satellite-observed inter-annual cycles of chlorophyll production by Earth’s surface biosphere (NASA).

Marine Particles: An entire oceanographic “regime”



Large Particles ($> 51 \mu\text{m}$)

Aggregates of fine material
Marine snow
Fecal pellets
Larger organisms/eukaryotes

51 micron polyester prefilter

Small Particles ($0.8 - 51 \mu\text{m}$)

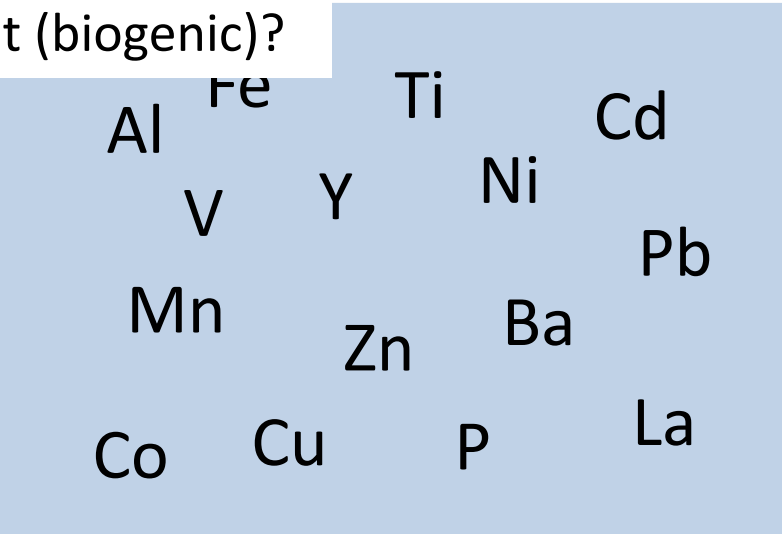
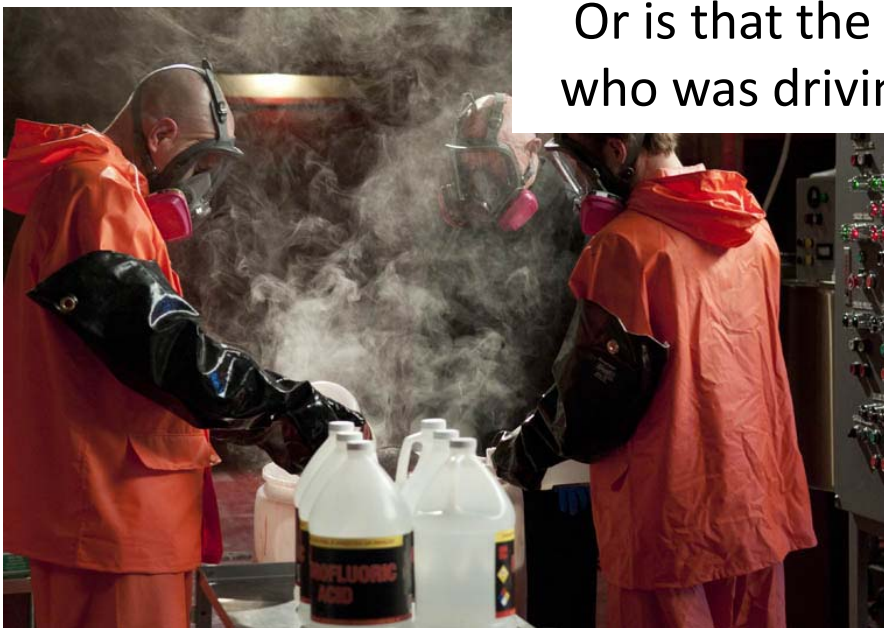
Bacteria
Phytoplankton
Small eukaryotes
Organic exudates, proteins
Biogenic minerals
Dust from land, sed.

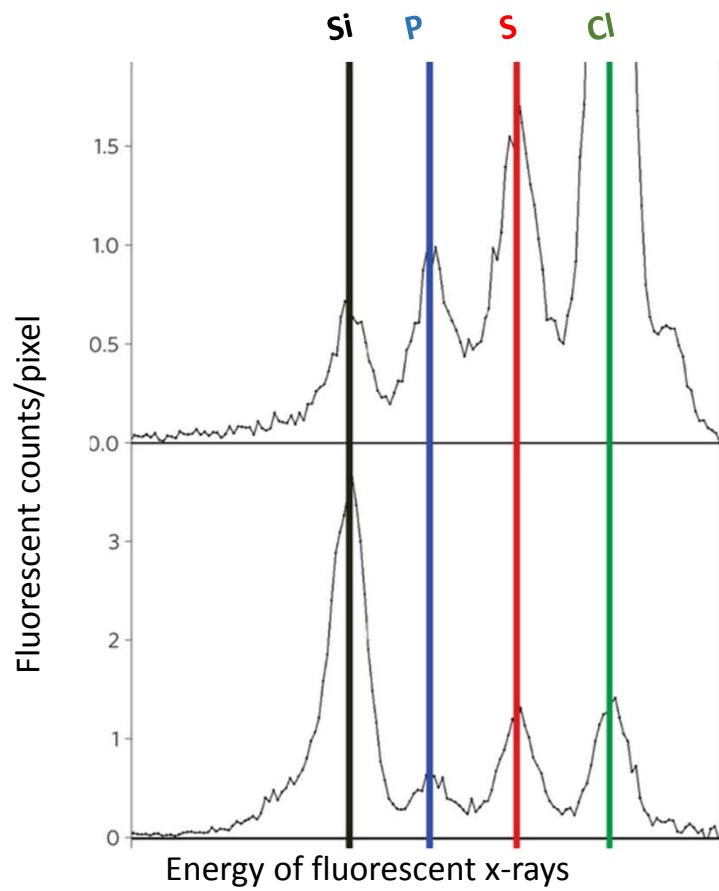
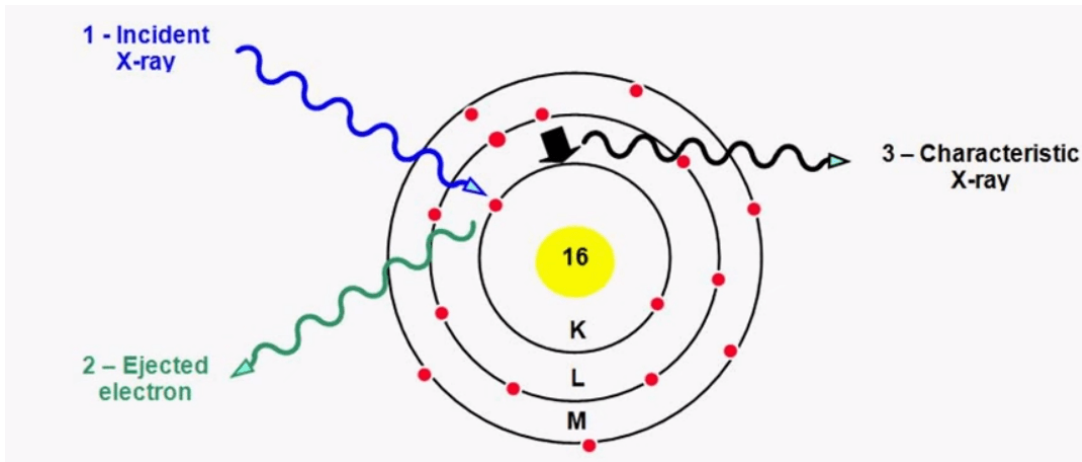
Paired $0.8\mu\text{m}$ Supor (polyethersulfone) filters



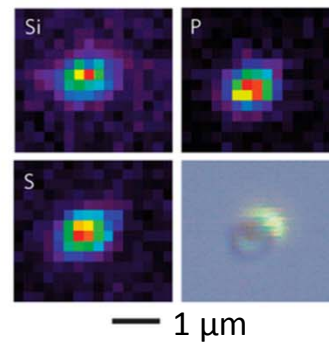
Is that a Ferrari (lithogenic)?

Or is that the bank executive who was driving it (biogenic)?

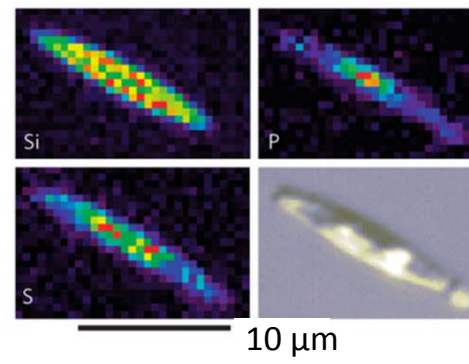




Synechococcus



Diatom



Baines et al. 2012, *Nature Geo.*

Dan Ohnemus: dan@uga.edu

- Collection of marine particles in clean manners
 - Large (>10 L) and small volume techniques
- Measurement of abundances of elements within them
 - Bulk techniques (total and weak digests)
 - Non-destructive, cell-specific techniques (synchrotron mapping)
 - Differentiation among sediments, living organisms, other phases
- Optical techniques for measuring suspended particles
 - Transmissometry, backscatter
 - Phase differentiation
- Simple modeling of elemental transport