

# Group II: Biogeochemistry

- Original Question:

How will biogeochemistry of shelf and deep waters of the North Atlantic and Arctic respond to climate change and increasing human pressures?

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How will biogeochemistry of shelf and **open ocean** waters of the North Atlantic and Arctic respond to climate **variability** and increasing human pressures?

- Not just deep waters but all water depths
- Program may not be long enough to assess *change*
- Human pressures (other than increased CO<sub>2</sub>) on different scale than open ocean processes
- Should we set physical boundaries, i.e. just subpolar Atlantic?

# Subquestions Research Foci

- Linkage between subpolar Atlantic and Arctic
- Linkage between surface and deep
- Linkage between physics and biogeochemistry

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- Linkage between subpolar Atlantic and Arctic
  - How are changes in Arctic affecting subpolar N Atlantic (e.g. changing boundary condition)?  
*Example: melting sea ice → increased productivity in Arctic → reduction in downstream nutrients*
  - How do changes in subpolar N Atlantic affect Arctic?

# Subquestions Research Foci

- Linkage between subpolar Atlantic and Arctic
- Linkage between surface and deep
  - Upper 100 m most important for biological production
  - Depth at which remineralization occurs matters for nutrient fluxes
  - Transport at depth through the overturning circulation

# Subquestions Research Foci

- Linkage between subpolar Atlantic and Arctic
- Linkage between surface and deep
- Linkage between physics and biogeochemistry
  - How do changes in circulation and stratification affect fluxes of nutrients, oxygen and carbon?  
(perhaps covered by Group 1)
  - In particular, overturning flux vs. transport flux differences for biogeochemistry?
  - A “biogeochemical” OSNAP?

# Shelf and Shallow Seas

- What is connection between shelf/shallow seas and open ocean?
- What are effects of human impacts (besides increased CO<sub>2</sub>) on shallow seas and shelves?
  - River nutrient input
  - Atmospheric deposition (does it really matter?)