Zooplankton in Ecosystem Connectivity and Carbon Fluxes

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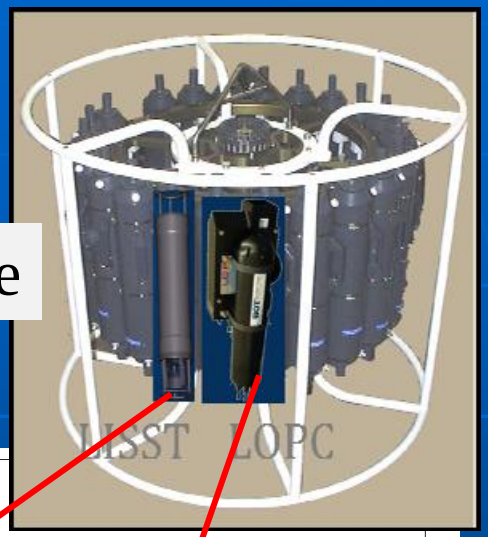
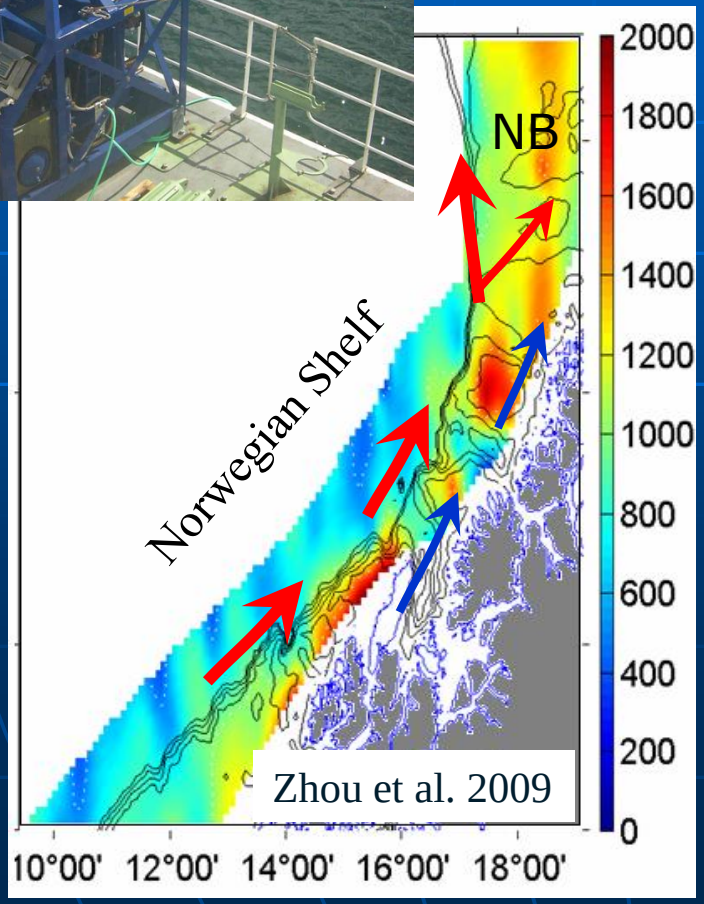
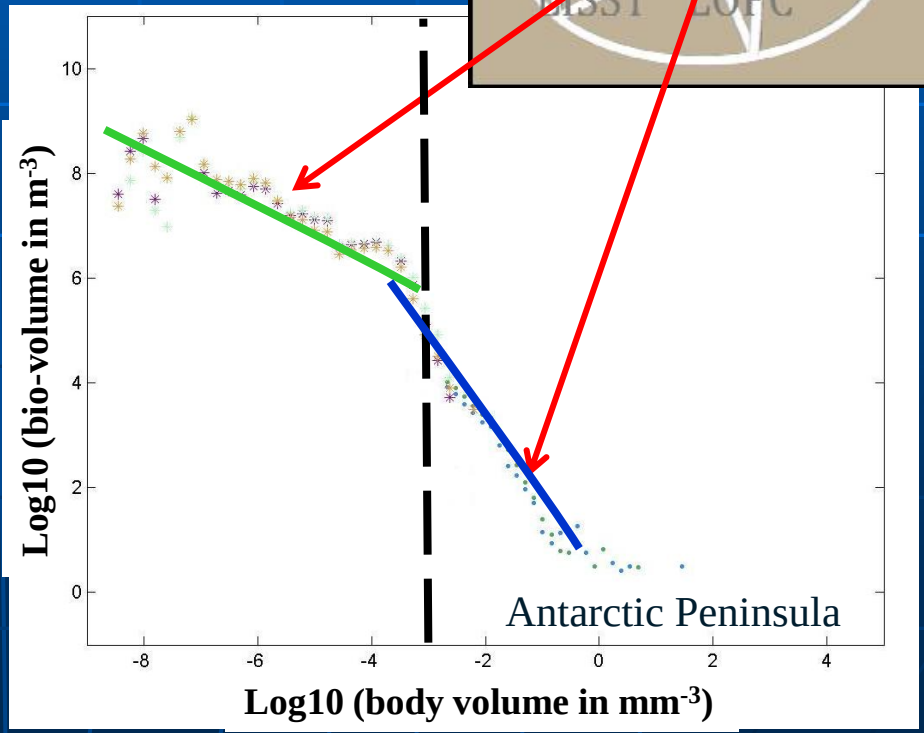
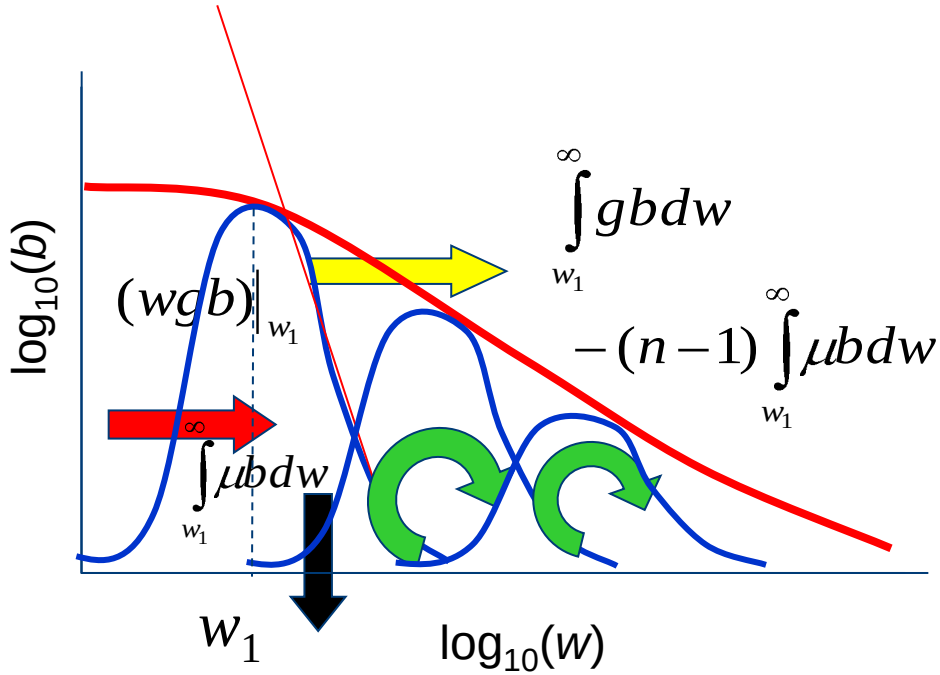


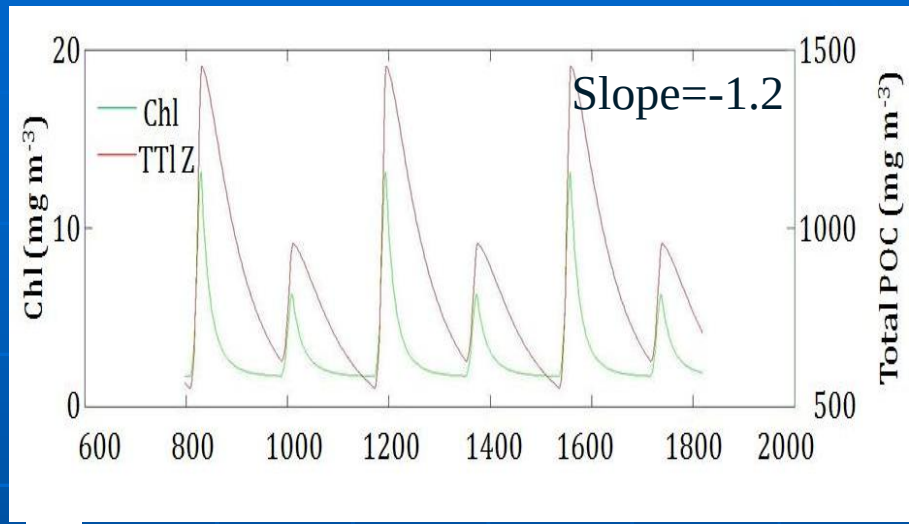


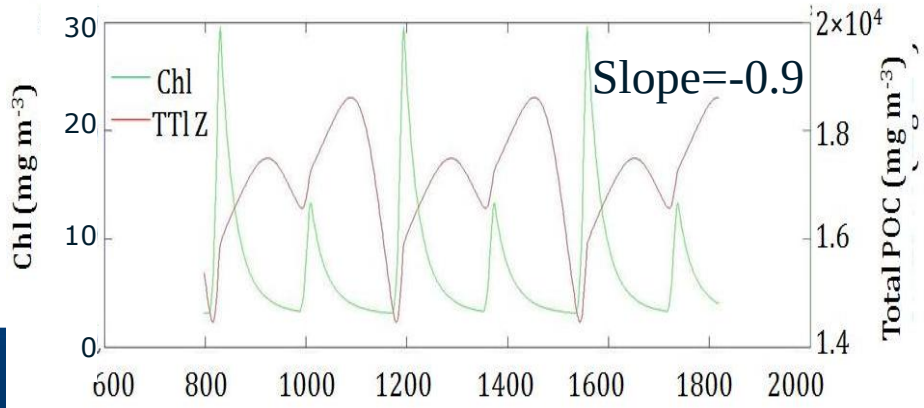


Size Spectrum Model



Zhou & Huntley, 1997; Zhou, 2006

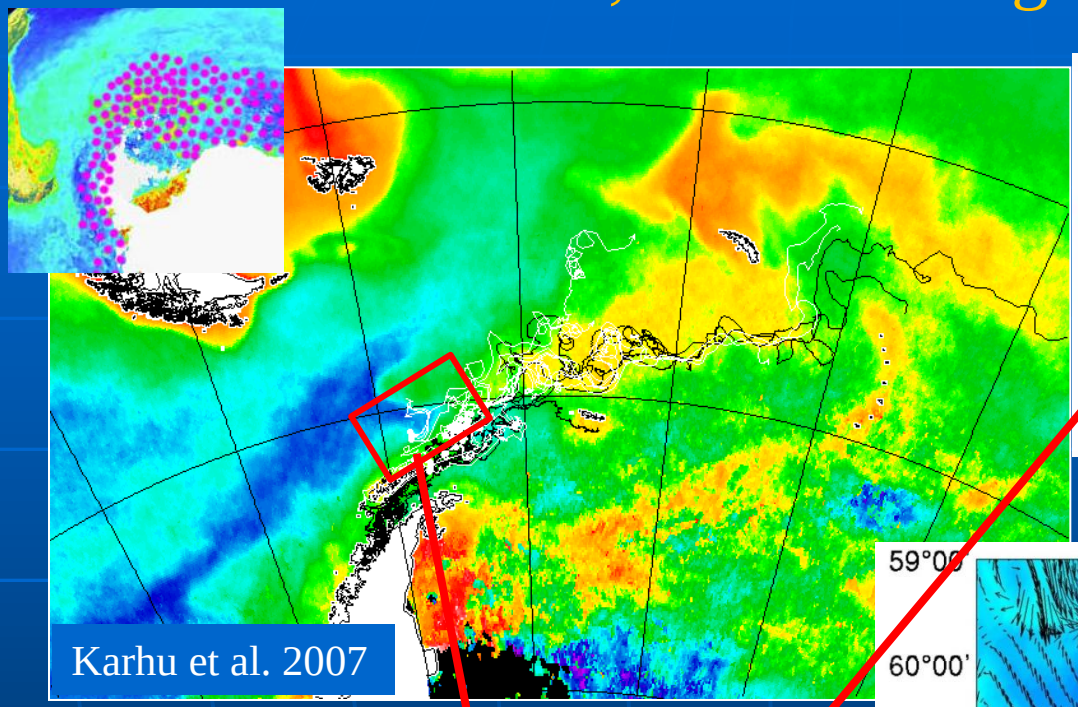


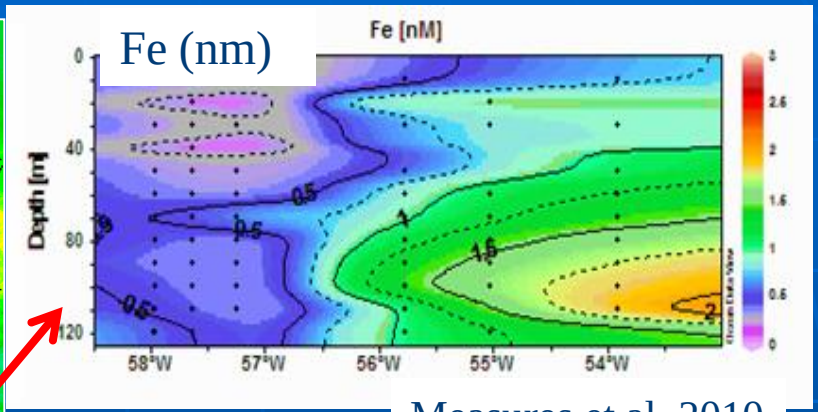


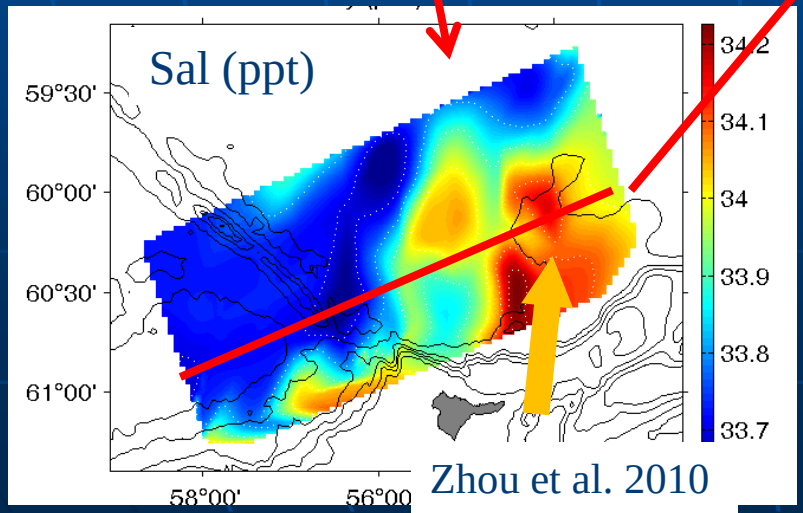
Zhou et al. 2010

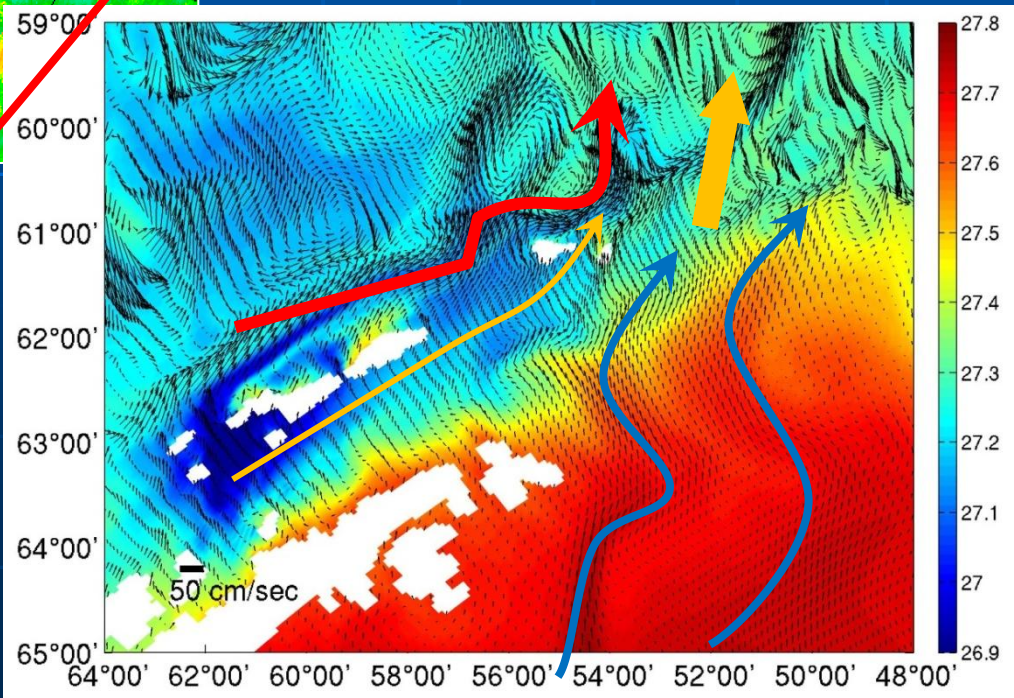
1. Size distribution & vital rates
2. Biomass transfer
3. Trophic interactions and levels (slope)

Natural Fe fertilization and productivity in Antarctic Peninsula, Drake Passage, and Scotia Sea



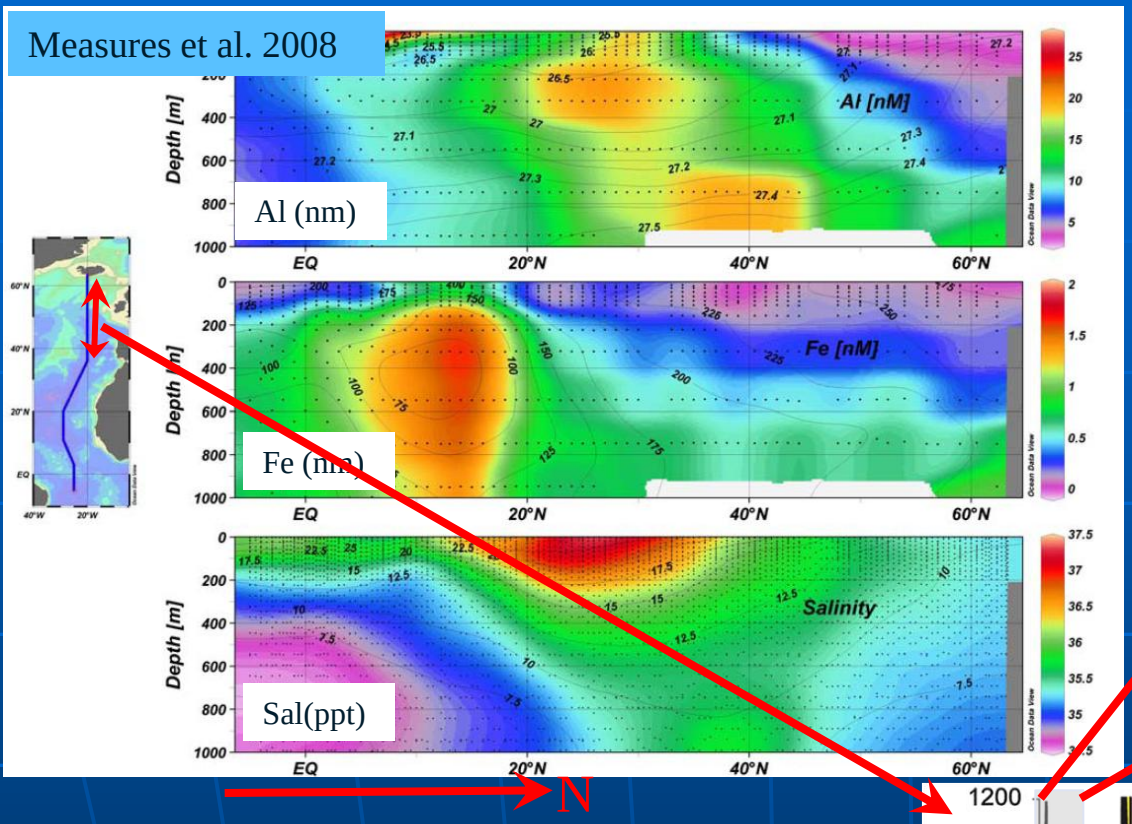


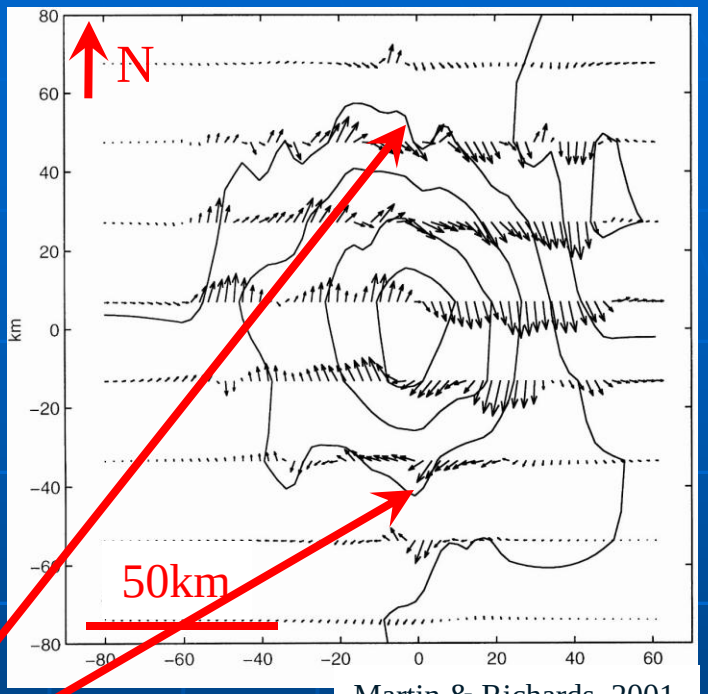




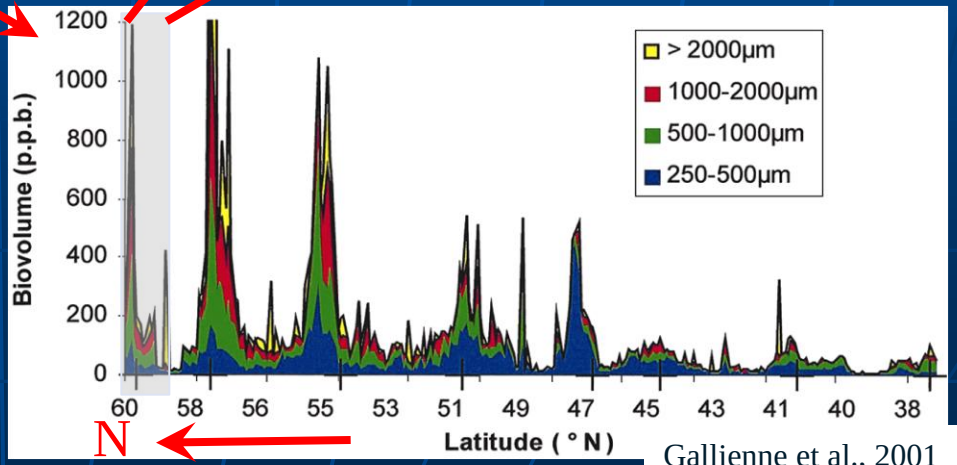
Meso-scale Processes

Measures et al. 2008





Martin & Richards, 2001

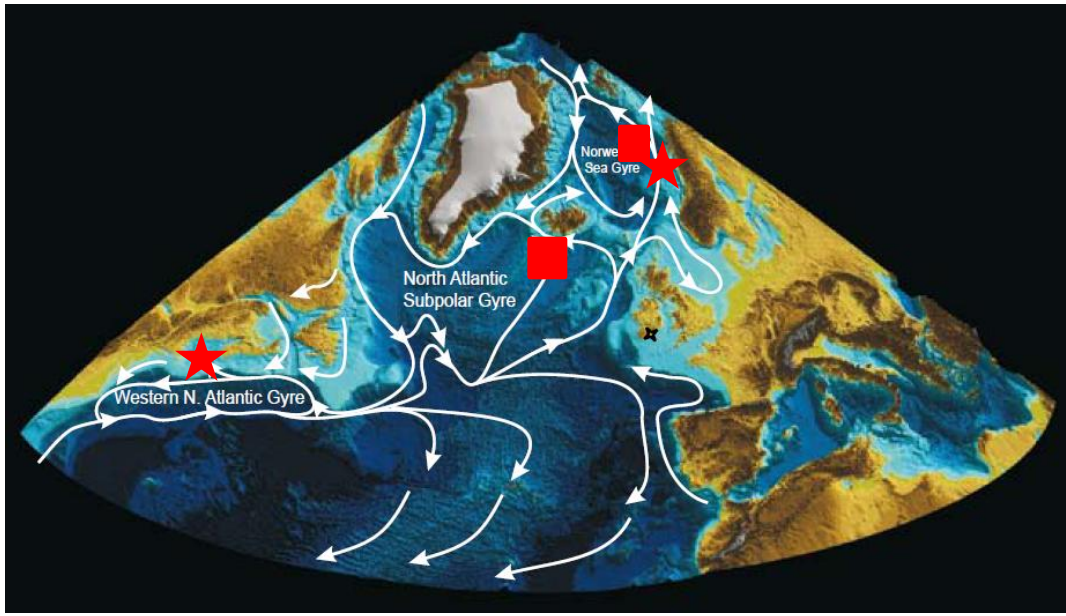


Gallienne et al., 2001

1. Iron limitation
2. Meso-scale eddies important to nutrients, PP & zoopl.
3. What is the role of zooplankton?
4. Need meso-scale surveys & high resolution model (R_d~20-40km)

Proposed Work (with others)

- Participate in meso-basin surveys & data analysis
  - US NW Atlantic Surveys
  - EU TransAlantic Cruises
- Numerical Modeling
  - 1-D size spectrum model
  - 3-D meso-scale short-term model (300x300 km^2) – embedded in large-scale models
  - Comparison with other models & between regions



★ 1-D model
■ 3-D meso-scale model

Objectives

- Shelf-basin exchange of nutrients and biota
- Meso-scale upwelling, productivity, and carbon fluxes
- Zooplankton size structure and vital rates
- Zooplankton roles in trophic linkages and carbon transfer