

# GOAL: Sustainable delivery of ecosystem and climatic regulation services in the changing coupled North Atlantic/Arctic system

- A big-picture question to encompass
  - Physical change, connectivity
  - Local and remote effects
  - Hot spots (much change), Cold spots (little change)
  - Ice zones
  - Shelves
  - Mean state, variability and trends

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## Theme areas

- Total productivity (primary production, metabolic rates, fisheries pressure, OA, deoxygenation)
- Carbon sequestration
  - Biological pump
  - Solubility pump
- Large scale circulation
  - Surface to deep ocean connectivity
  - N. Atlantic / Arctic
  - Ocean-shelf coupling
- Sea ice
- Freshwater

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## Observational Approach

- Comparative studies across latitudinal range
- Augment existing observational infrastructure with new sensors, but will also need new sites
- Take advantage of autonomous observational capacity
- Follow Essential Ocean Variables (EOVs) for core measurements, with additions, including more ecological core observations
- Planning in cooperation with modeling community (physical, biogeochemical, socio-economic) to identify needs

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## Modeling Approach

- Use process study results to constrain parameterizations; use distributed observations for validation over space/time
- Regionally: End to end ecosystem modeling systems – physical climate to all trophic levels to socio-economic, with feedbacks
  - Optimized to national needs and regional goals.
- Model “intercomparison”/forum: Arctic has FAMOS, Atlantic does not have an intercomparison efforts at present (some discussion?)
- For use of paleo information : models need to include proxy variable