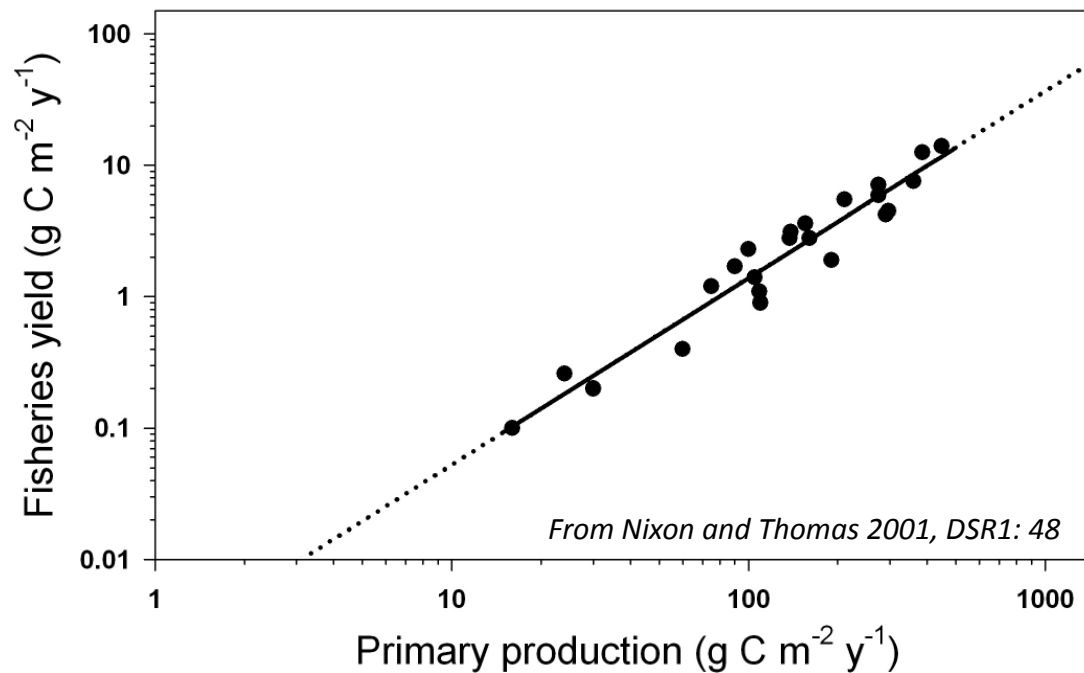


Key questions

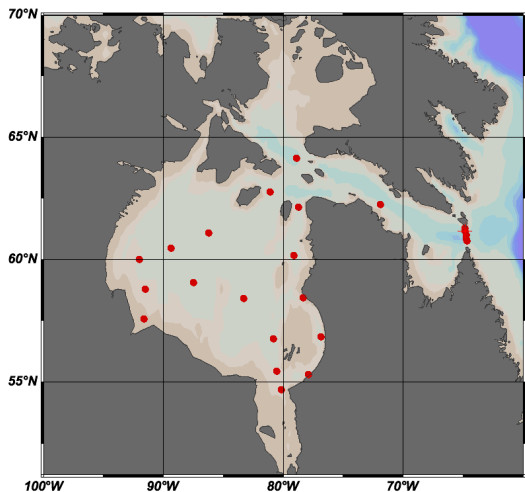
- How productive is the bay?
- How does the availability of light and nutrients affect PP?
- How much nutrients are supplied by rivers vs. marine processes?
- What are the functional groups driving PP?
- What are possible responses to climate change and human action?



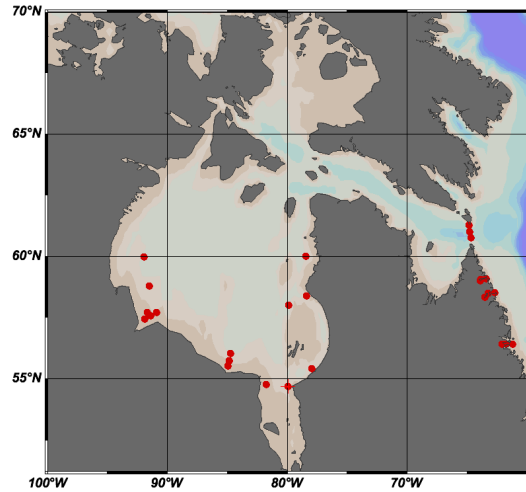
Datasets

- Annual cycles based on in situ data are not available
- Snapshots for summer & fall (ArcticNet / Hotspots, BaySys, MERICA)
- Annual/seasonal PP estimates from remote sensing and modeling

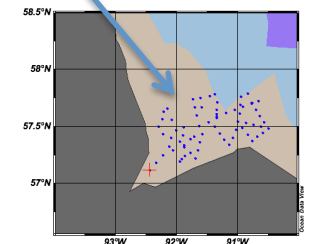
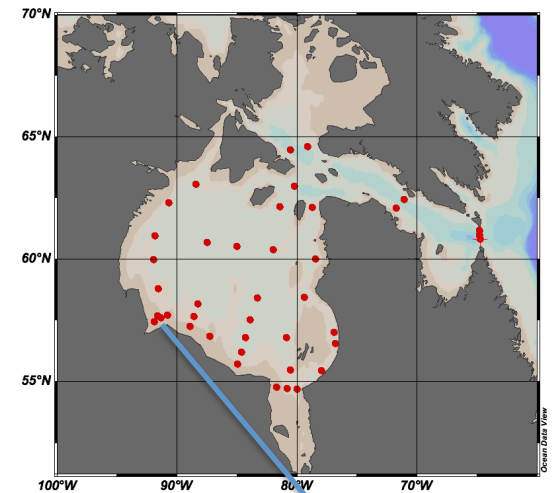
2005
22 Sept – 16 Oct



2007
31 July – 16 August

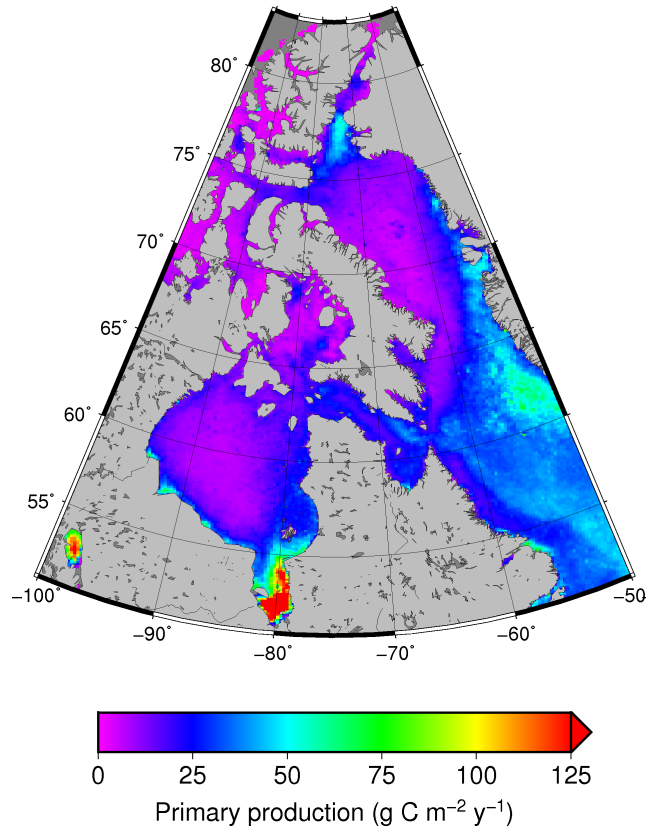


2010
7 July – 11 August



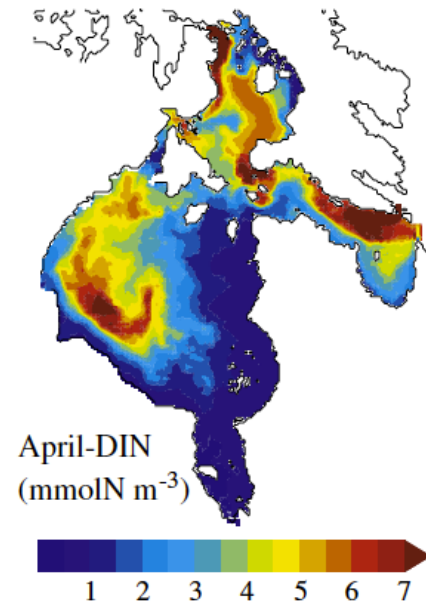
Estimates of Annual PP ($\text{g C m}^{-2} \text{y}^{-1}$)

Remote sensing
(1998-2010)



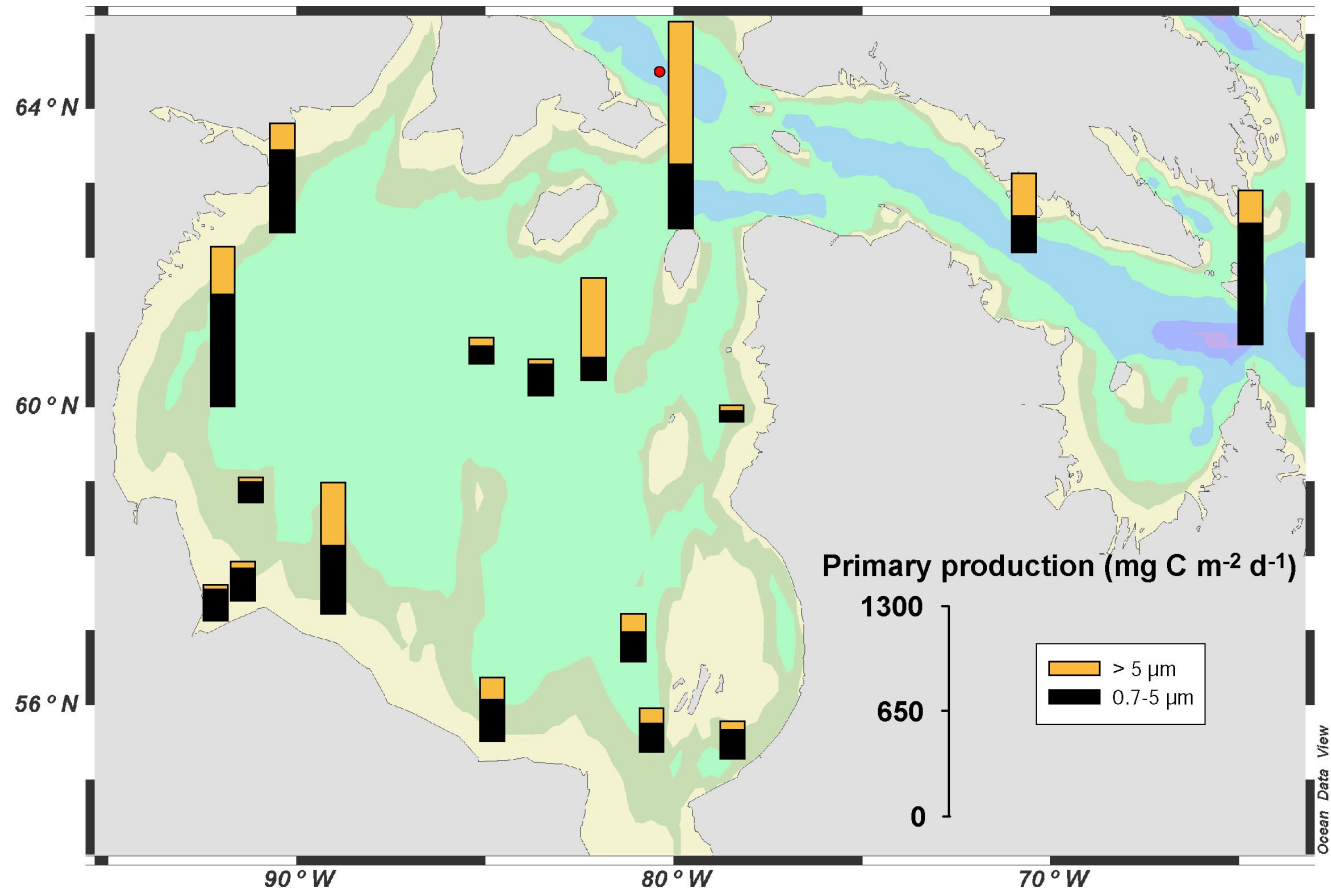
Bélanger et al., in prep

Model
(2003)

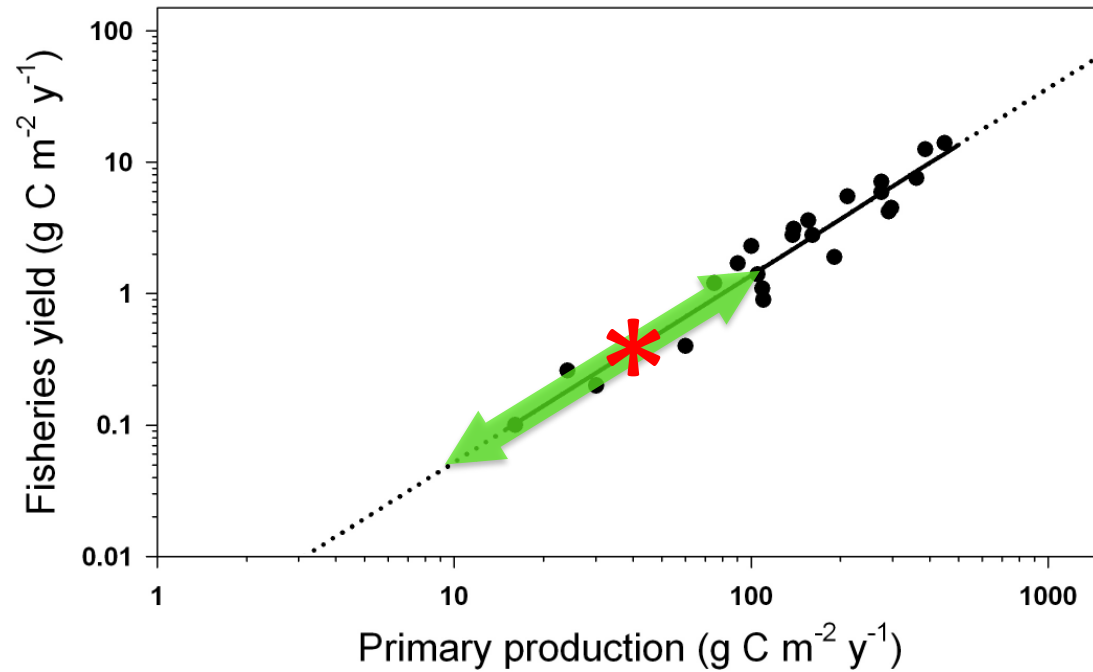


Sibert et al. 2011

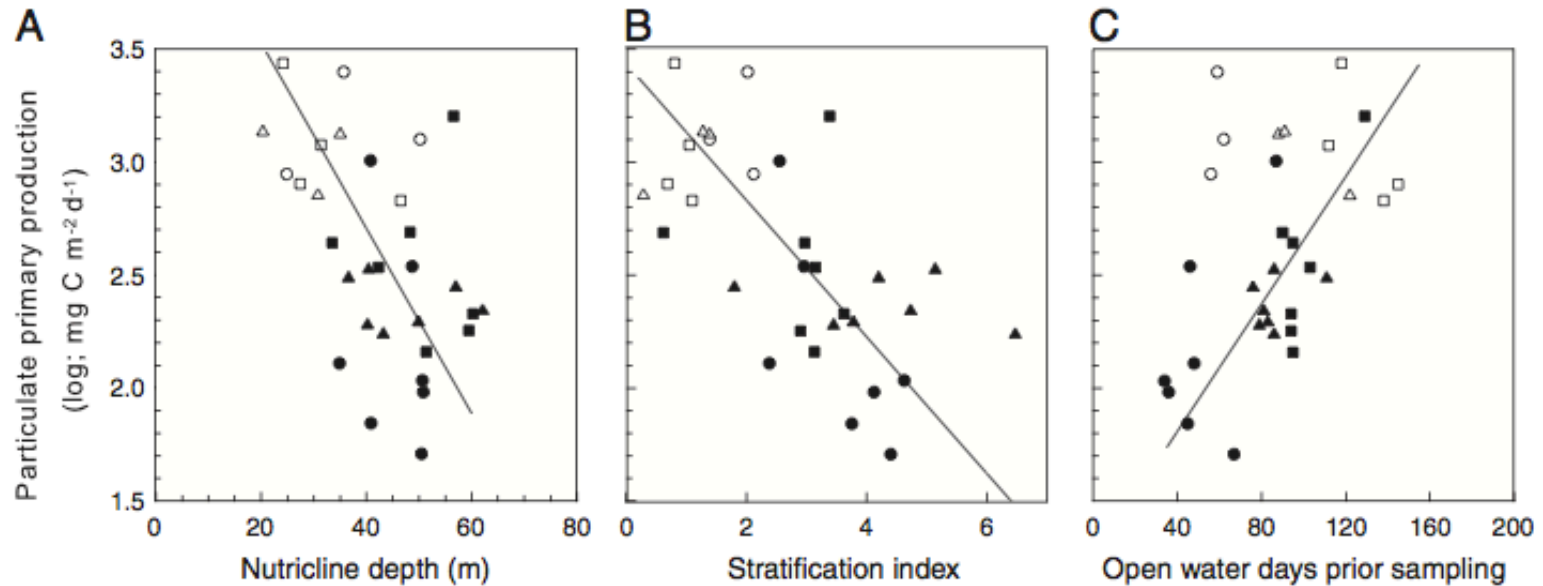
Daily PP during July 2010 ($\text{mg C m}^{-2} \text{d}^{-1}$)



The maritime portion of HB is generally oligotrophic

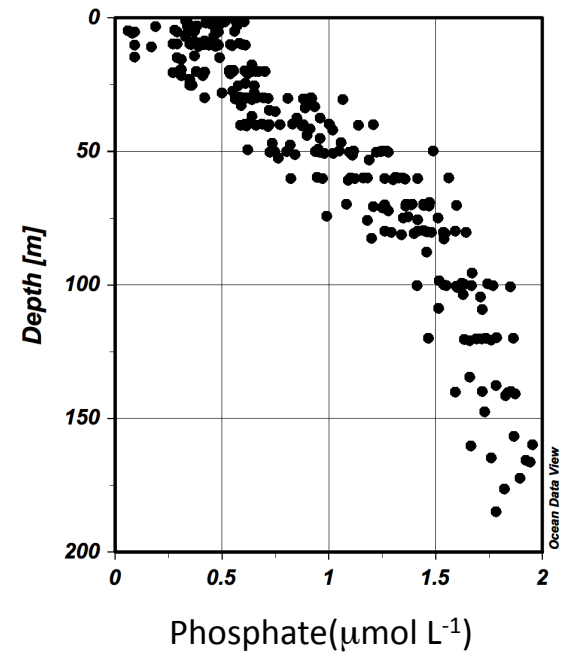
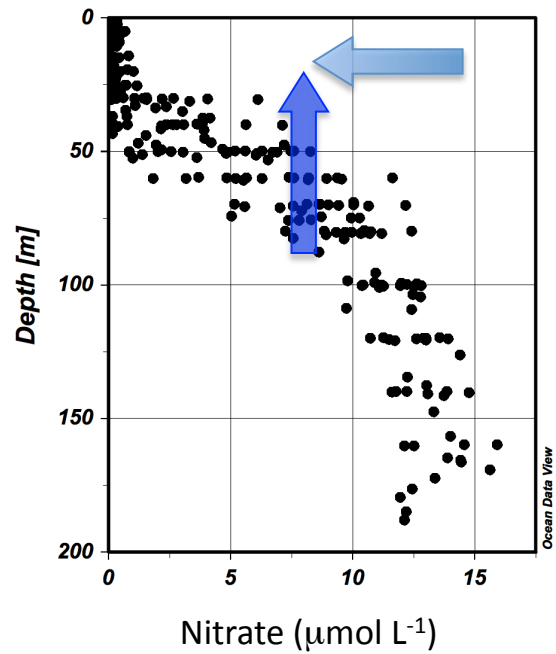
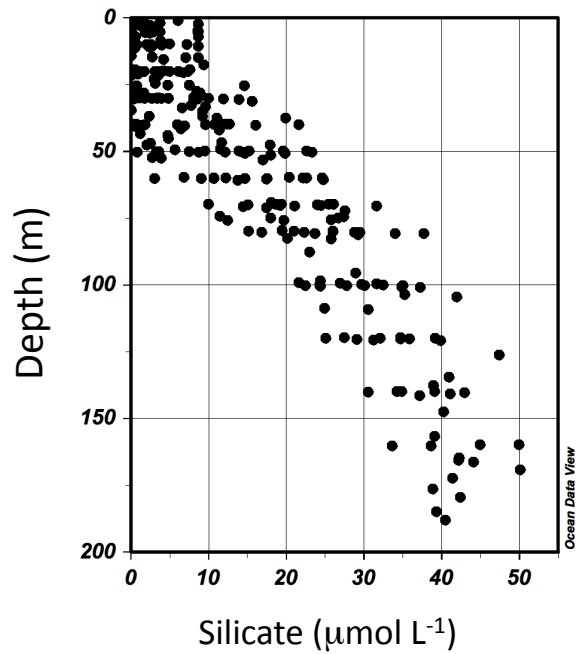


The role of vertical stratification

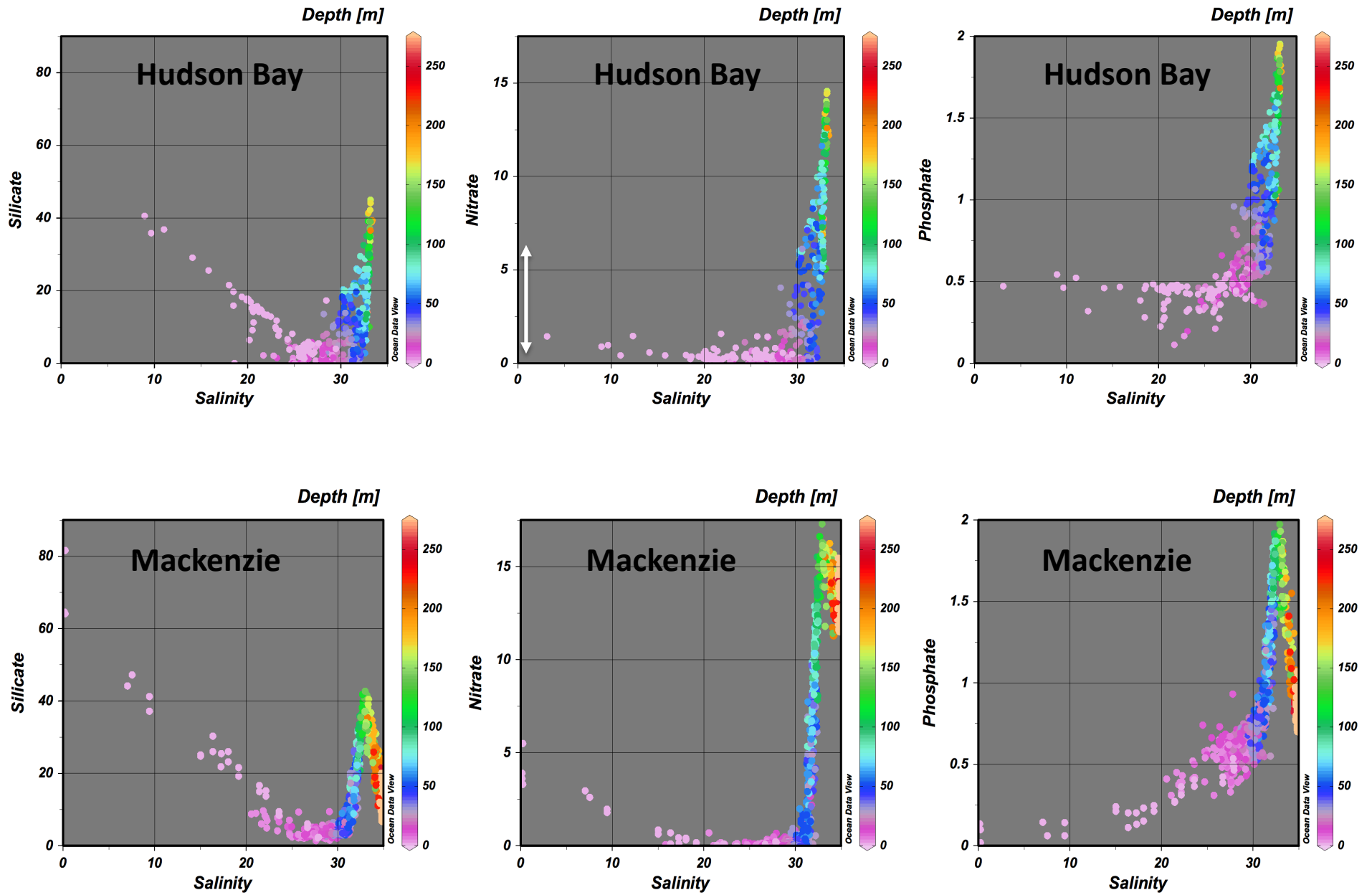


From Ferland et al. 2011

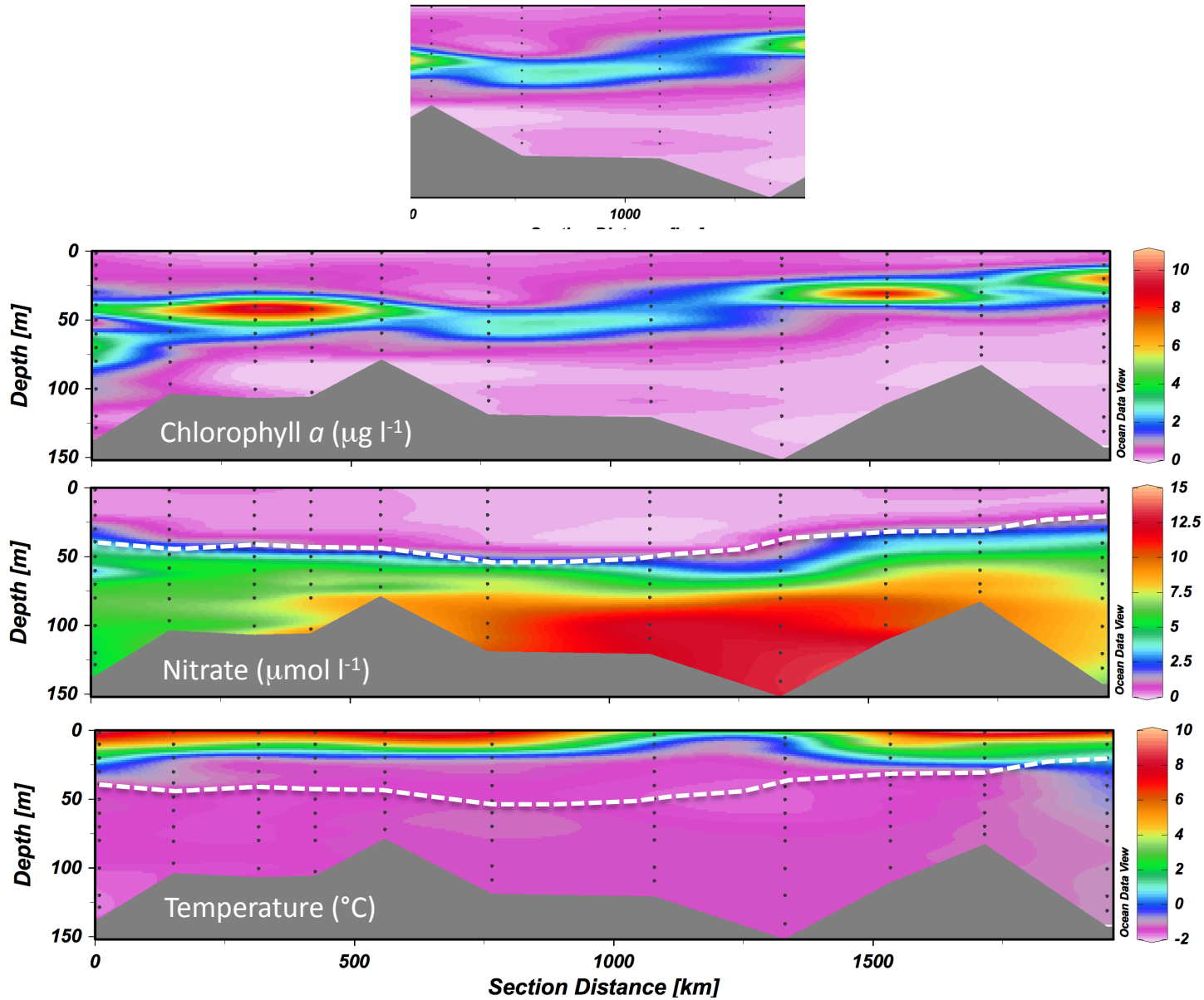
Vertical nutrient distributions in maritime Hudson Bay (all expeditions)



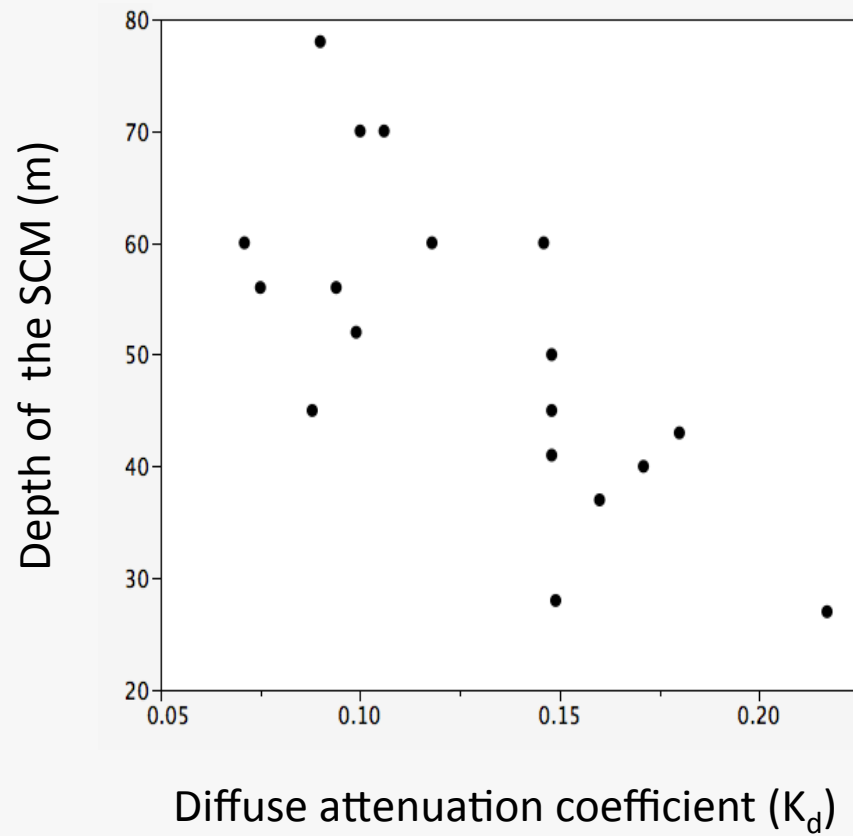
Nutrient-salinity relationships (color = depth)



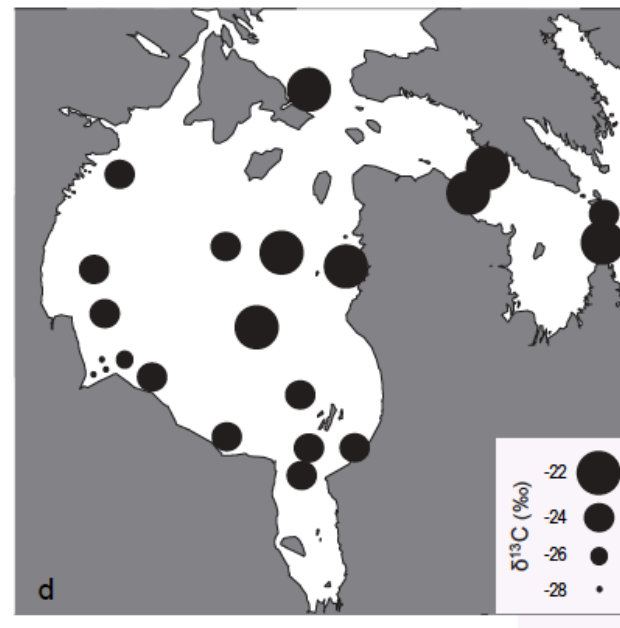
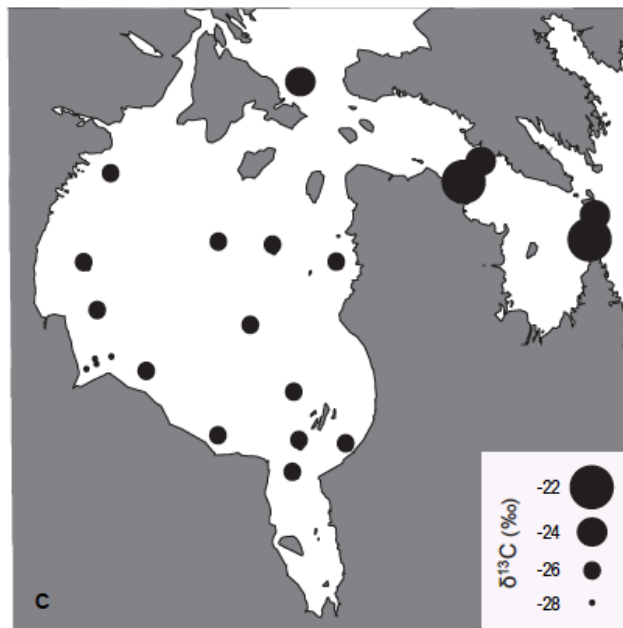
The subsurface chlorophyll maximum (SCM)



The SCM is deeper in clearer water

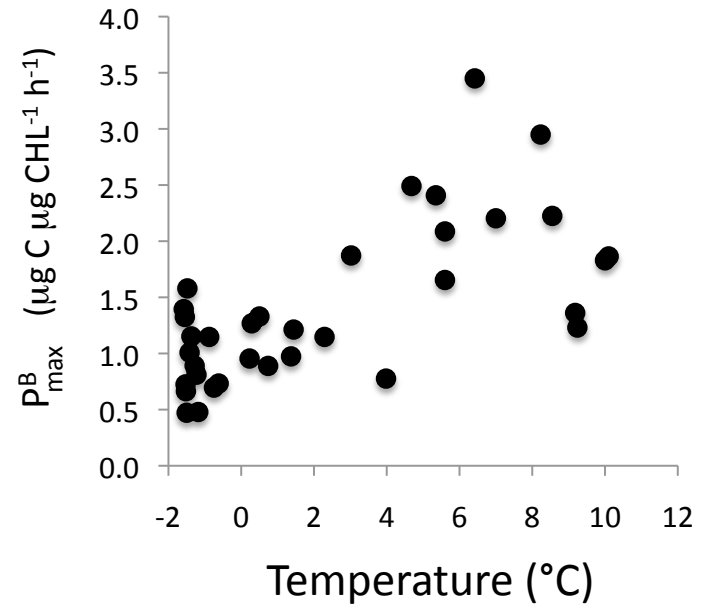
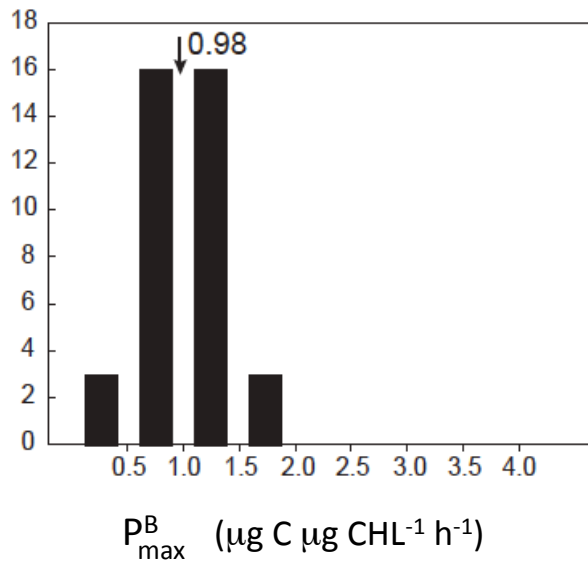
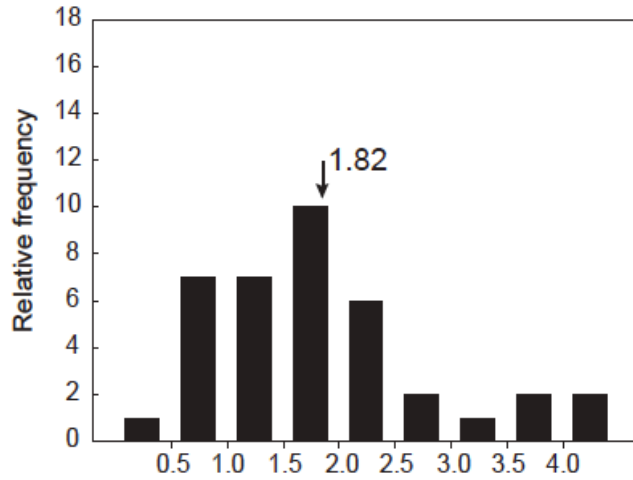


The SCM had a distinct $\delta^{13}\text{C}$ signature in 2010



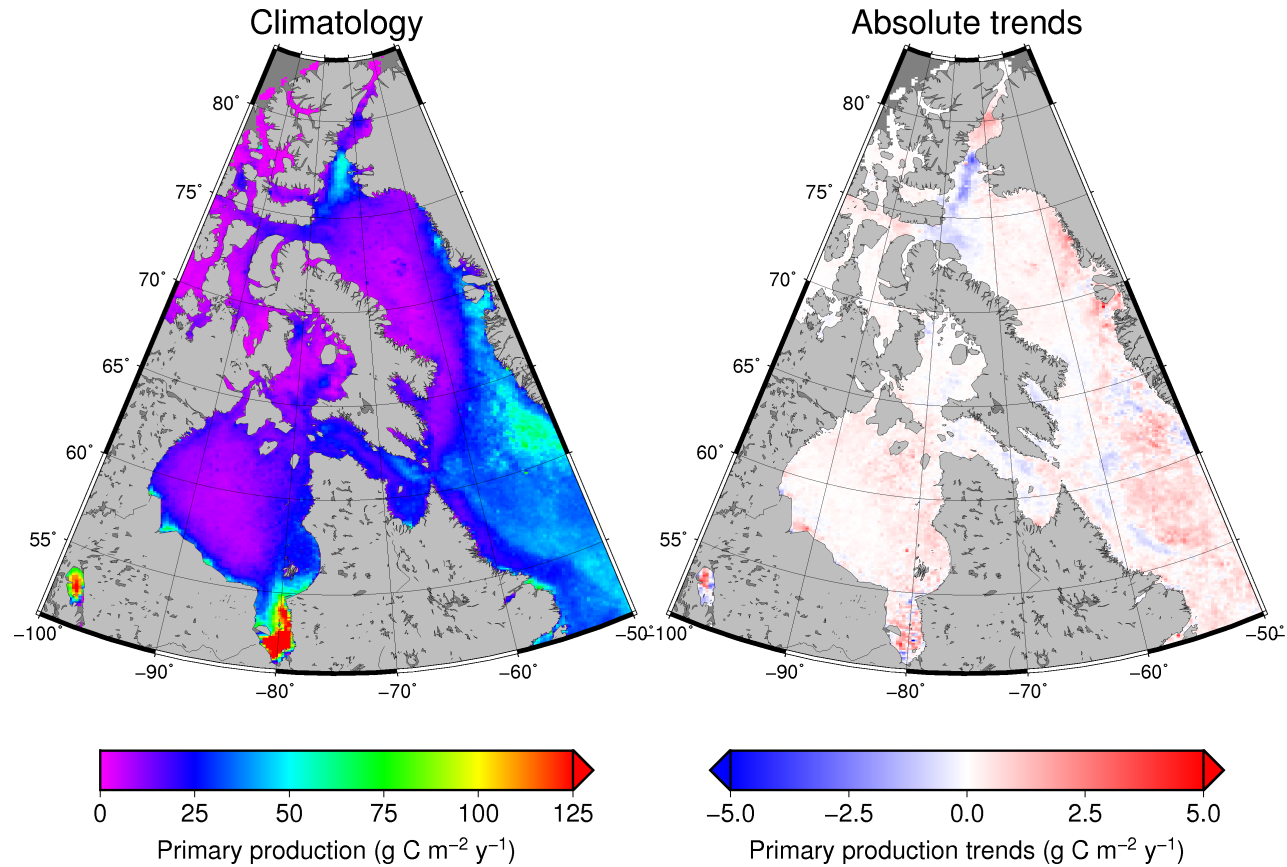
From Lapoussière et al. in prep.

Productivity of the SCM



From Lapoussière et al. in prep.

Trends in remote sensing estimates of PP (1998-2010)



Bélangier et al., in prep

Summary

- PP is low to moderate in HB and possibly increasing in the east
- The river supply of DIN appears to be small
- The SCM drives summer productivity + has unique $\delta^{13}\text{C}$ signature
- SCM contribution likely to increase with irradiance and warming

Knowledge gaps

- Define late-winter nutrient conditions offshore
- Annual cycle of DIN and DON deliveries by rivers?
- Assess indirect N supply pathways (degradation, photo-oxidation)
- Tune remote sensing algorithms and models
- Better characterize PP across SCM layers

Thank you!

