

# Carbon cycling in Antarctic benthic communities subject to glacier retreat

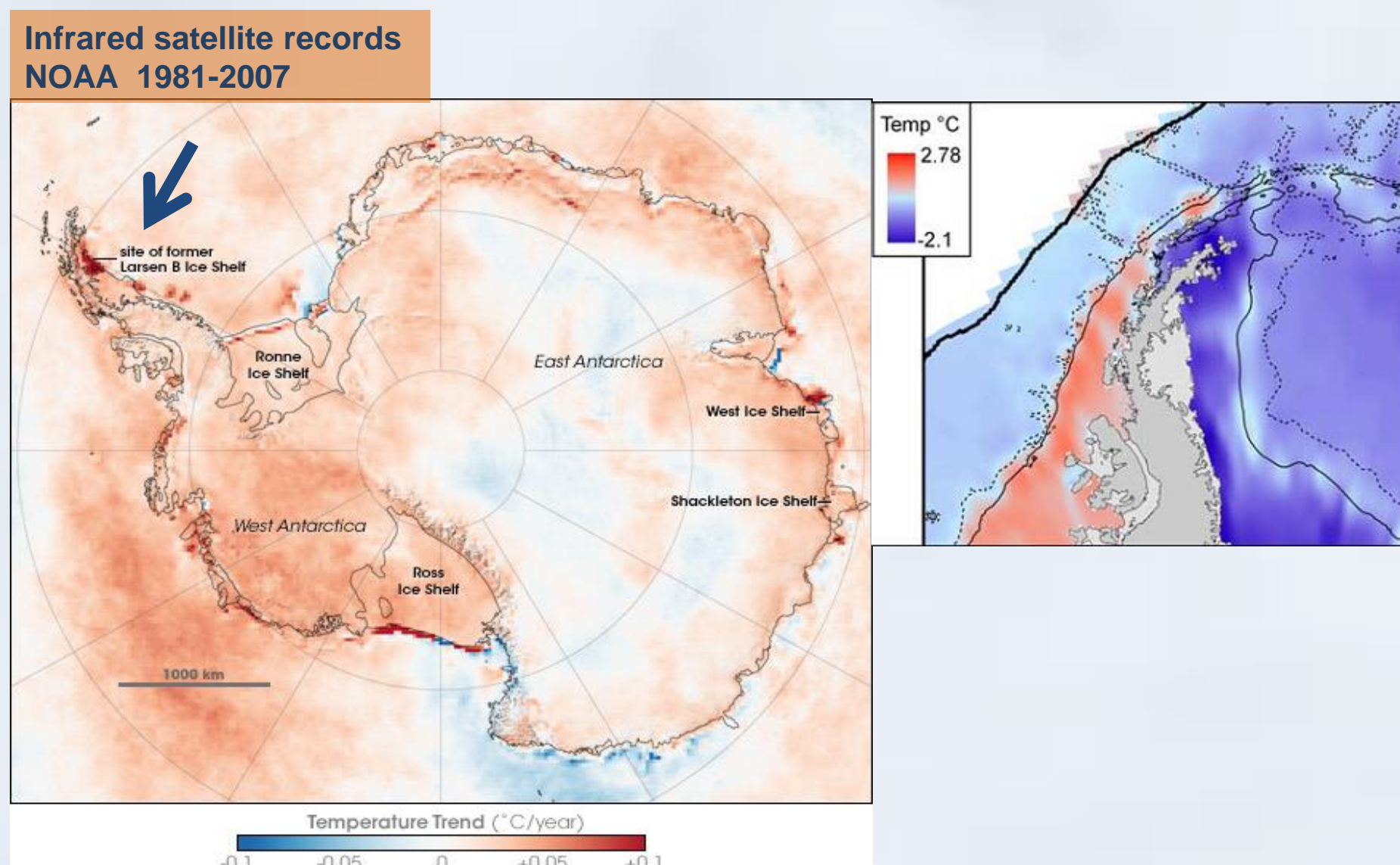


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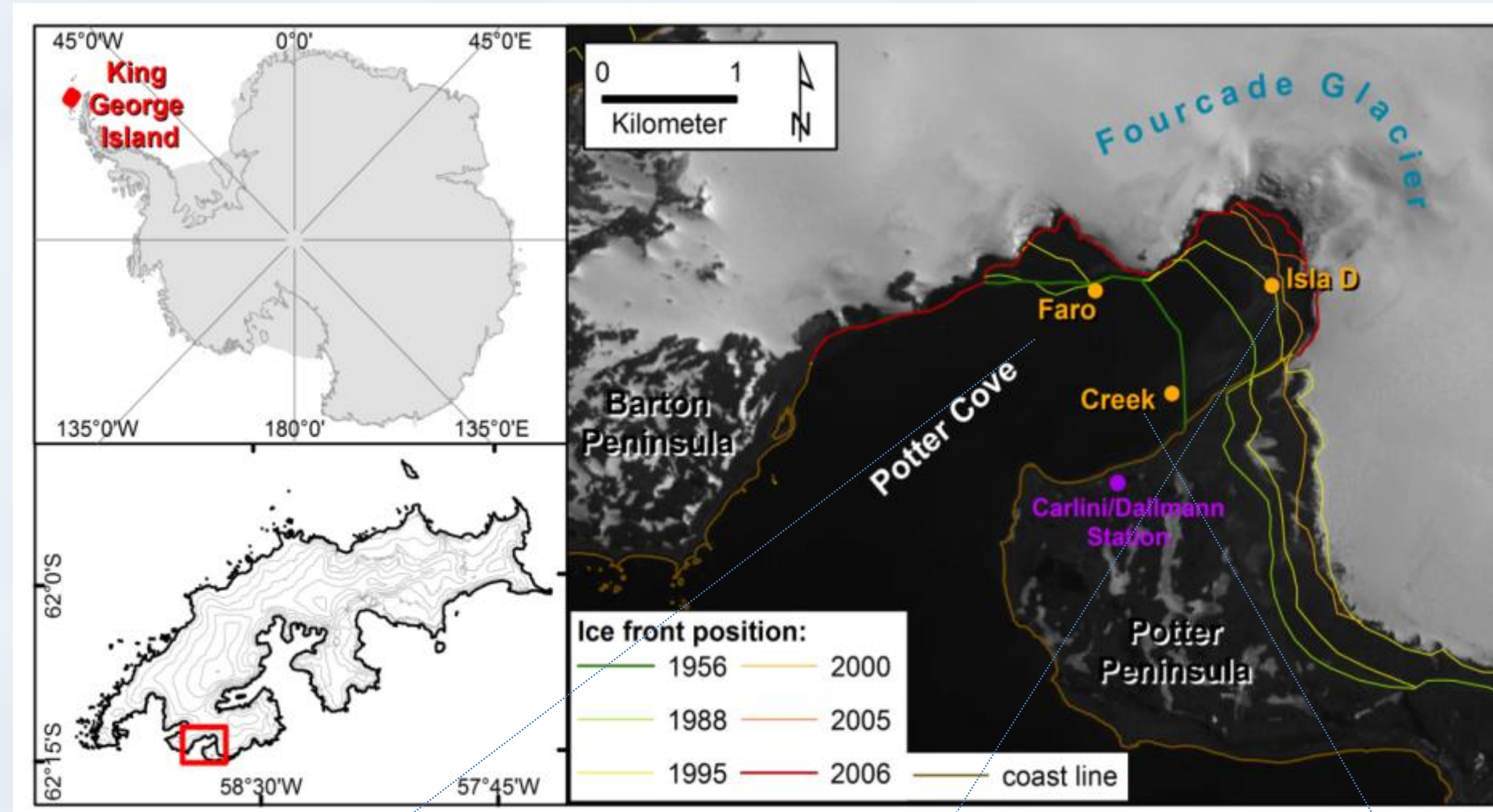


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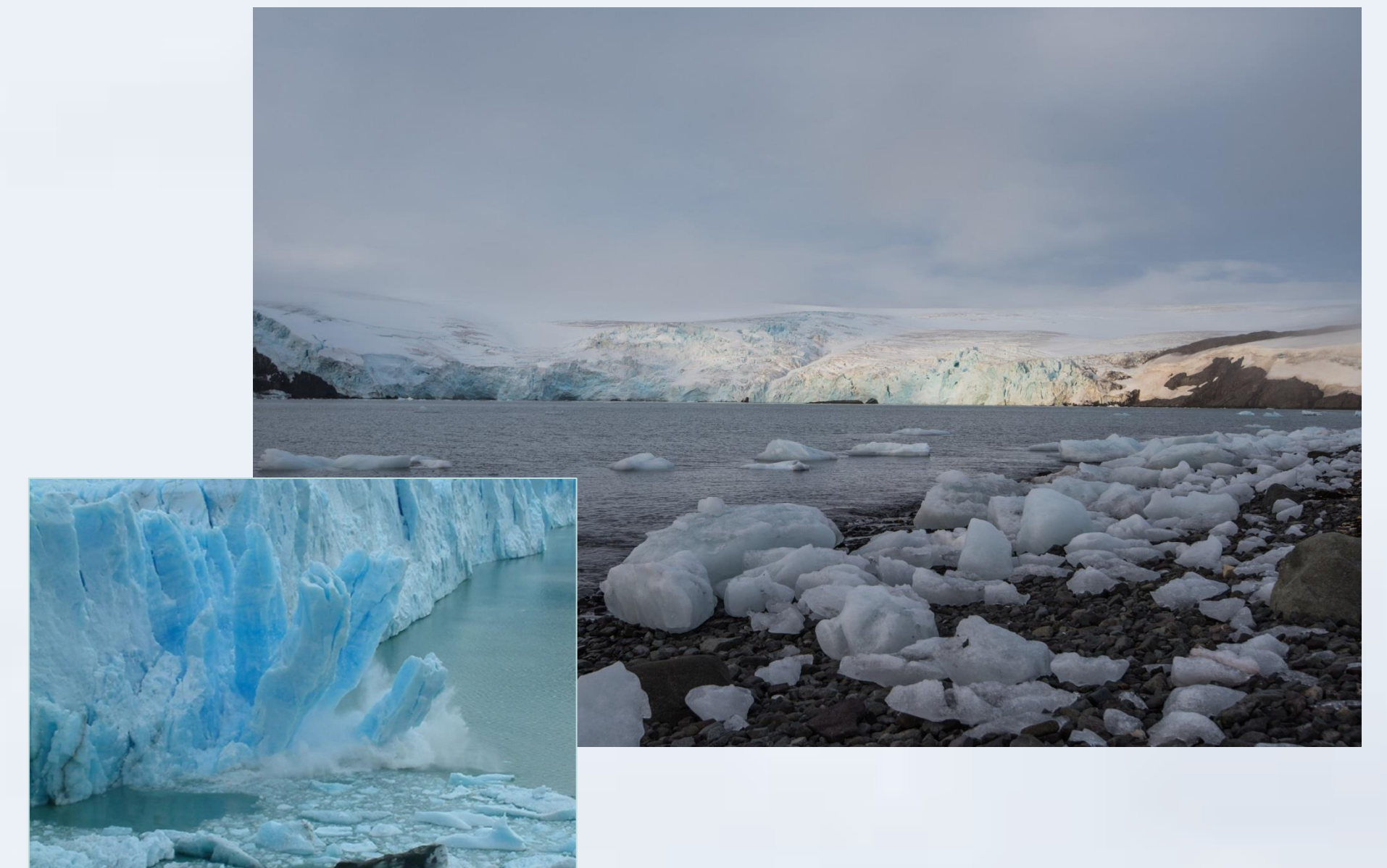
## Western Antarctic Peninsula: One of the fastest warming regions on Earth



## Potter Cove, King George Island



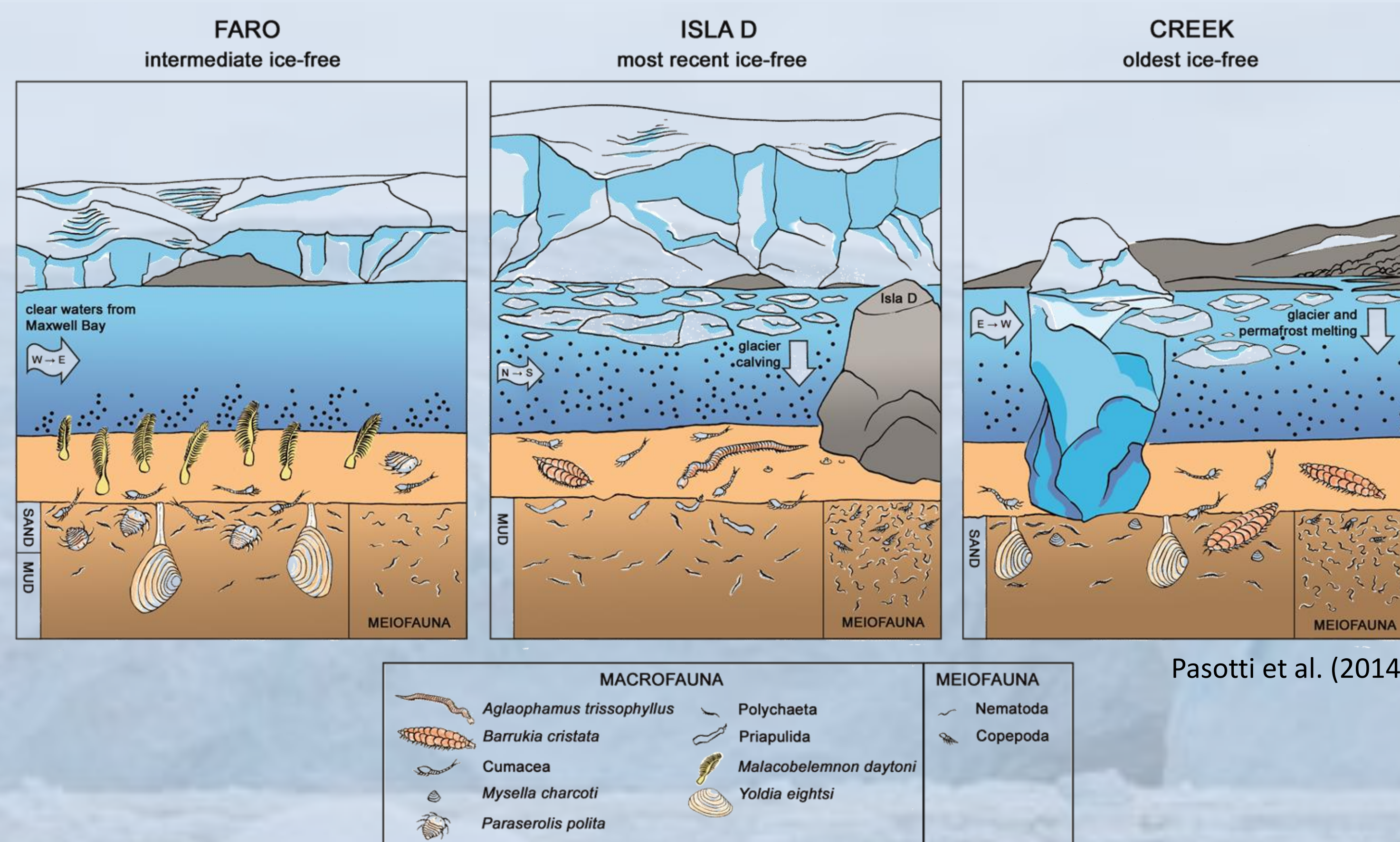
## Fourcade glacier rapidly retreating since 1950s



- Shallow bay (<50m water depth)
- Primary production dominated by macroalgae and benthic microalgae



Very productive area!



Pasotti et al. (2014)

glacier disturbance  
(ice scouring,  
melt water run-off,  
inorganic deposition)



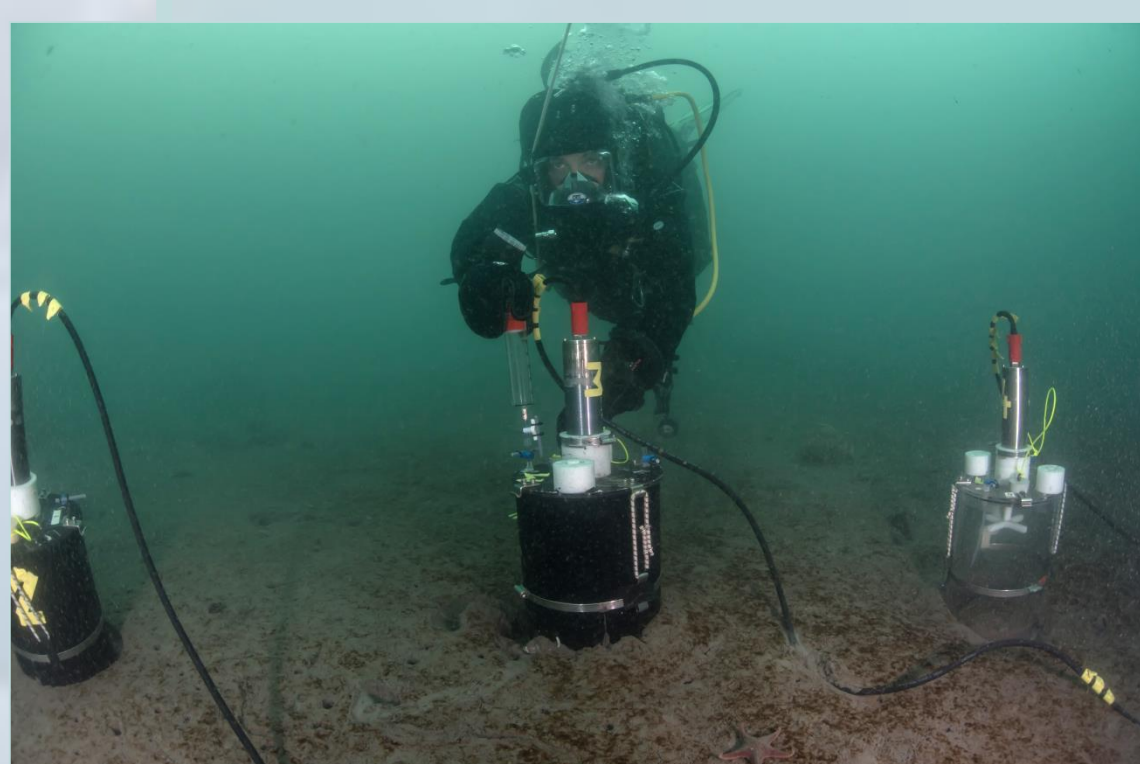
very contrasting  
benthic communities



## How do benthic assemblages recycle organic matter?



In situ deployment of benthic chambers and sediment profiler with oxygen sensors by skilled divers at 9m water depth



Measure O<sub>2</sub> dynamics in overlying water in dark and transparent chambers over 24h cycle

Benthic chambers:  
Total Oxygen Uptake (TOU)  
by sediment community

Total oxygen uptake (TOU) is a measure for carbon cycling in the sediment.

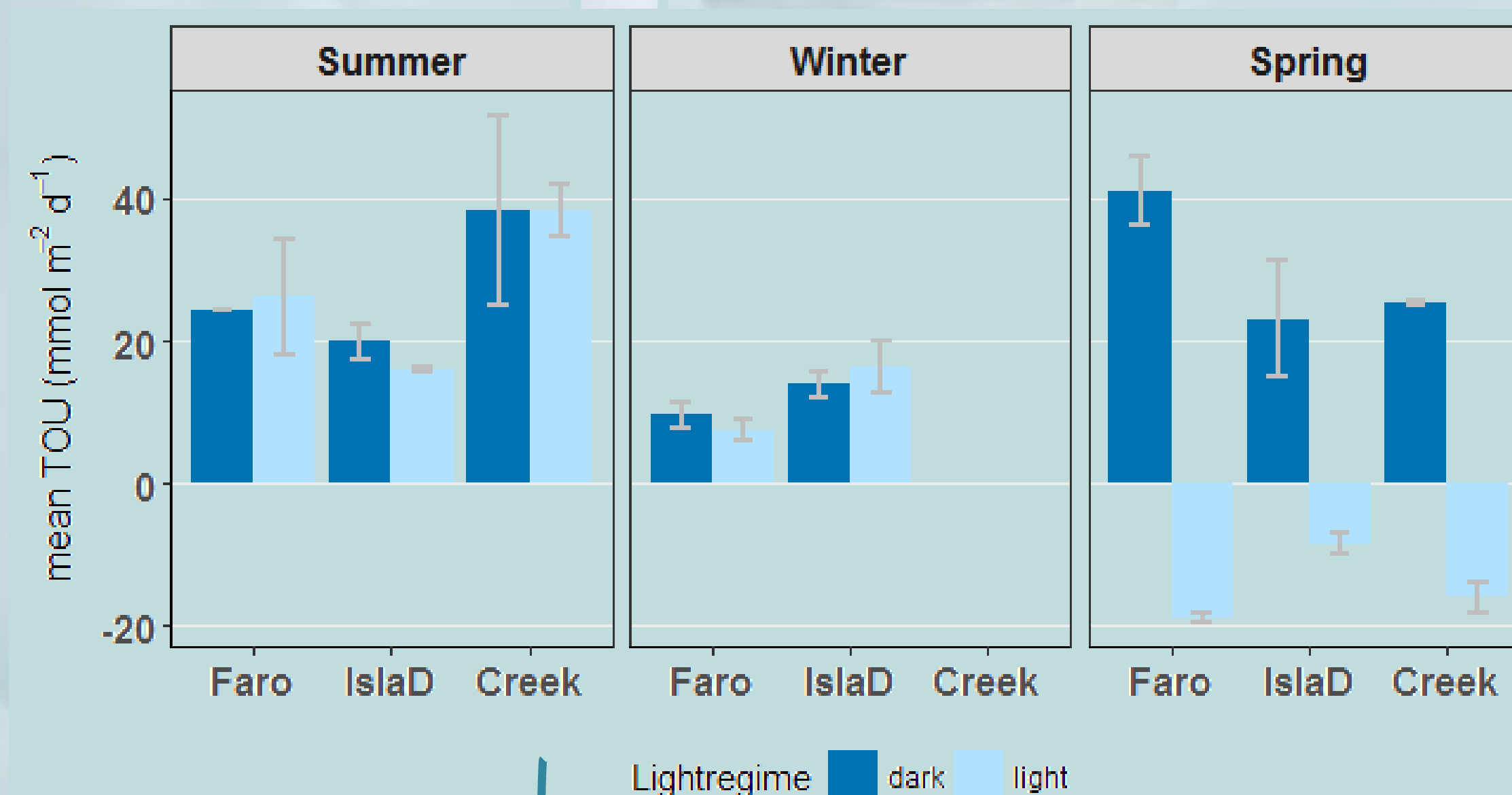
TOU rates comparable to temperate regions  
→ confirms productivity of area

Fauna mediated oxygen uptake (TOU – DOU) is high  
→ strong role of macrobenthos

Sediment profiler + oxygen sensors:  
Diffusive Oxygen Uptake (DOU) calculated from O<sub>2</sub> profile in sediment

## Are there seasonal differences in organic matter cycling?

Chamber deployment in austral summer, winter (under ice!) and spring 2015



Yes,

there are seasonal differences in organic matter cycling:

→ Lower TOU in winter as compared to spring and summer

→ Net primary production is only observed in spring

Work in progress, still samples and data on benthic community structure (density and biomass), pigment and organic matter content of the sediment left to analyze before we can draw conclusions!



Winter under ice deployments