The Role of Ocean Warming in Central West Greenland Ice Stream Retreat: LGM through Deglaciation EGIC WGC IC NC

Greenland GIS Vulnerable to Atlantic Water
Purpose

- When did GIS retreat from LGM position
- What was phasing relative to LIS and IIS margins?
- Role of ocean warming and climate change in initiating and sustaining ice retreat.
Paleoenvironments represented in Hemipelagic sediments

**LGM Stadial:** Ice Sheet advanced into a heavily sea-ice covered environment. Little calving.

**Interstadial:** WGC Atlantic Water enters Baffin Bay.
- Marine productivity.
- Ice margins retreat
- IRD belt forms where ice bergs from N Baffin Bay meet AW.
VC46, Upper Umanak Fan

NBB, Distal IRD
Total Carbonate, wt. %
0 5 10 15 20

Meltwater
‘Glacial Marine’ species, %
0 40 80

Ocean Warming
Warm fauna, %
0 20 40 60

IRD belt

14.1
14.4
150

GIS calving
15 ka*

Meltwater

Subm, P

IRD

Depth, cm
0 5 10 15 20 25 30
#

>2mm/2 cm

C. neoteretis, %

AlW

I. helenaæ, %

Cold Arctic

*15 ka deglaciation age assumed from VC45, Umanak outer shelf.
Conclusions

• Ocean Warming from Atlantic Water advection via the WGC preceded retreat from GIS limit at shelf edge: dates pending.

• Deglaciation underway by 15 ka. Strong WGC during Bølling/Allerød interstadial.

• Document history using multiple proxies: forams, IRD stratigraphy, mineralogy.

• Come to poster to see details.