Below Iceberg Alley: Tracking Antarctic ice loss from a previous global warming

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INTRODUCTION

- The origins of **iceberg-rafted debris (IRD)** from 'Iceberg Alley" in Antarctica can reveal ice sheet dynamics[1]
- **Mid -Pliocene Warm Period** (MPWP) (3.3-3 MYA) was around 3 ℃ warmer than pre-industrial temperatures and is a useful proxy for modern climate change[2]

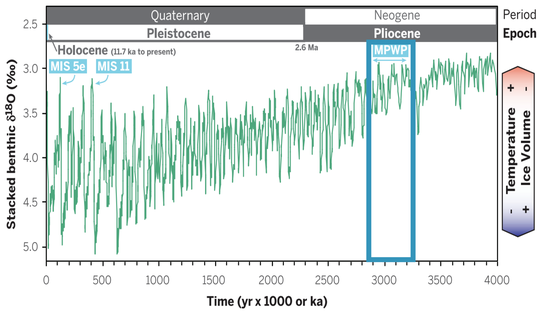

Figure 1: Stacked benthic d^{18}O during MPWP[4]

OBJECTIVE

- Determine the original source of IRD from Site U1537
- Use IRD source data to reconstruct ice sheets during the MPWP

METHODS & LOCATION

- Collect sediment core from Site U1537 from Dove Basin in Southern Ocean
- Use LST heavy liquid to separate diatoms from IRD
- Determine the weight percent of IRD from Site U1537

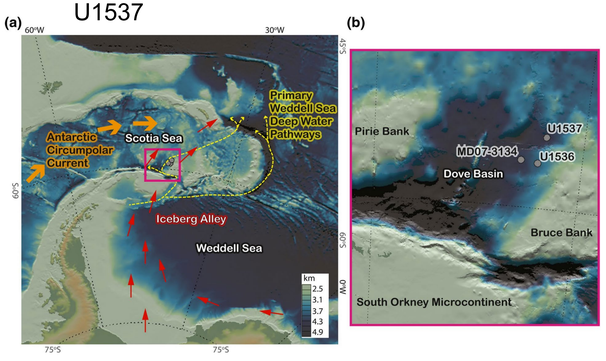

Figure 2: (a) Map of study area (b) with zoom in on Dove Basin with IODP U1537 core location [5]

Ice-rafted debris (IRD) from **Antarctic icebergs** can be used to determine **glacial patterns** during past global **warm periods**

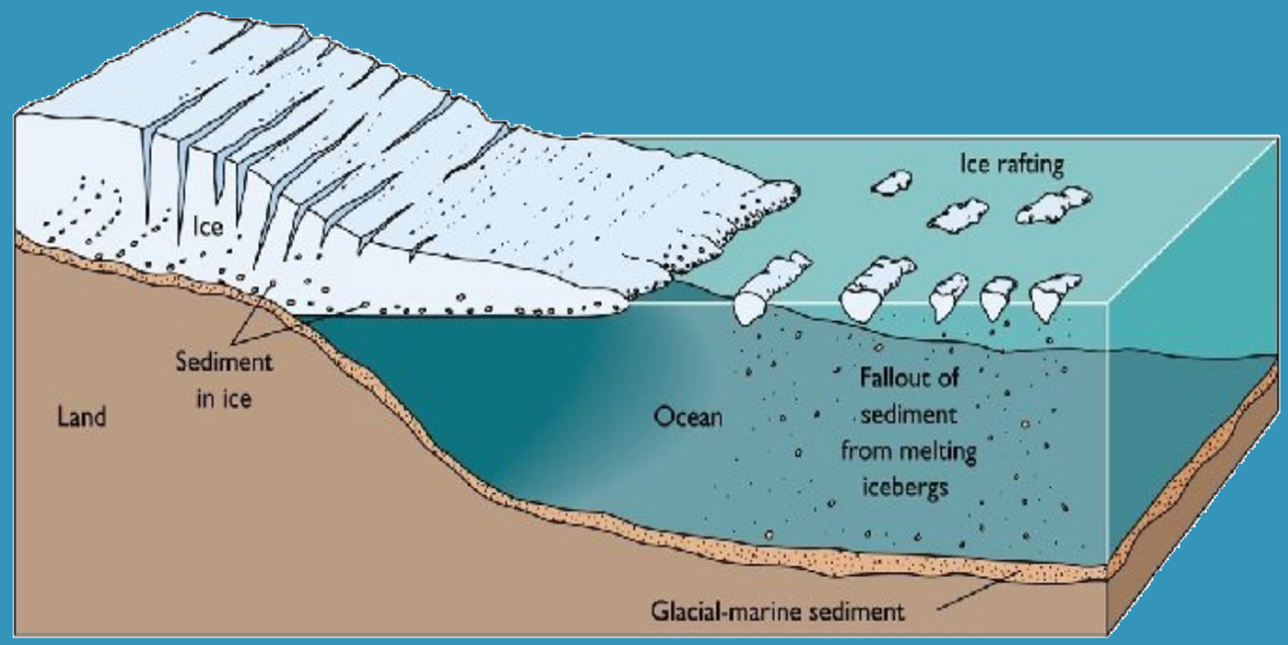

Figure 3: Process of ice-rafted debris (IRD) settling [3]

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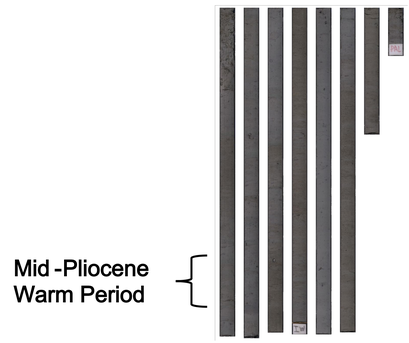

Figure 4: Site U1537A sediment core

RESULTS

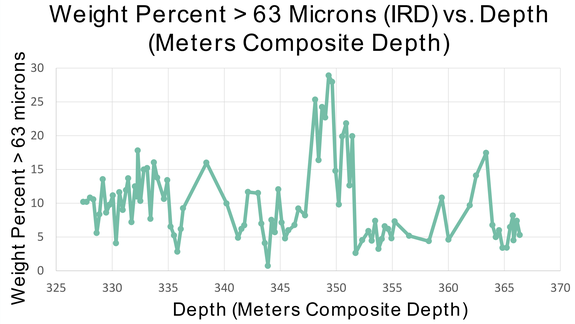

Figure 5: Weight percent IRD results

FUTURE WORK

- Determine the source of IRD hornblende grains via **^{40}Ar/^{39}Ar** dating from Site U1537
- Combine IRD records with paleoclimate modeling to determine **global sea level** during the MPWP

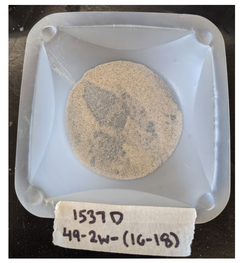

Figure 6:Sediment sample that might contain hornblendes

REFERENCES

1. 10.1016/j.epsl.2009.12.031
2. 10.1016/S0012-821X(03)00685-X
3. Vector ID: 1520365763
4. 10.1126/science.aaa4019
5. 10.1029/2020PA003994

IODP INTERNATIONAL OCEAN DISCOVERY PROGRAM
TRIO RONALD E. MCNAIR POST-BACCALAUREATE ACHIEVEMENT PROGRAM