



BICC(27?): Developing a globally synchronized ice core chronology and updated bipolar holocene layer count

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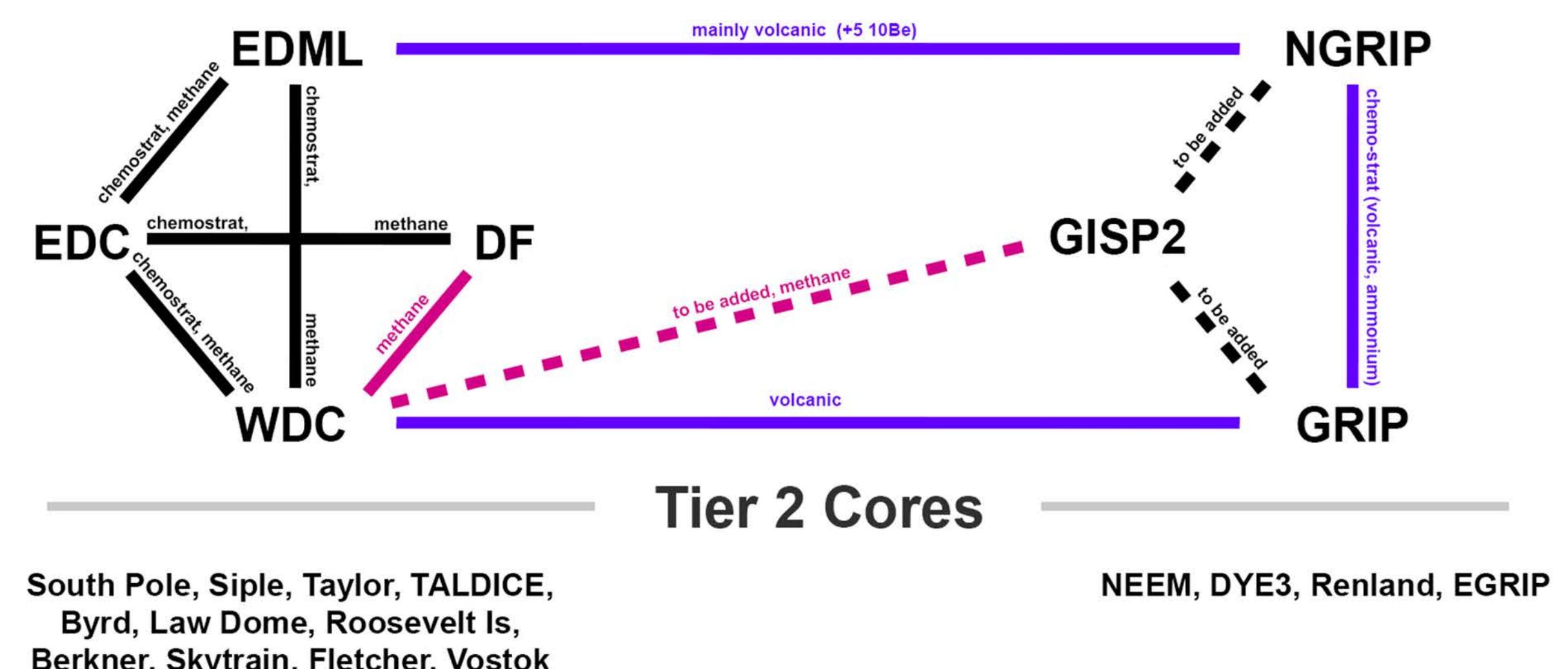
Introduction

- The GICC and the AICC have been great resources in deriving consistent timescales amongst cores. However, there currently lacks a Bipolar Ice Core Chronology (BICC) implementing records from both hemispheres. We seek to release a synchronized global chronology with accessible data interfaces. BICC will build upon preexisting efforts in meaningful ways. For example, AICC does not currently include many important cores, such as the WD layer count, or recent bipolar synchronizations. Additionally, constraints could be improved in the last 60ka.
- A true bipolar chronology would prove exceedingly useful to future researchers seeking to implement chronologies into their project, especially with improved data availability. BICC also seeks to reduce error and discrepancies, especially in bipolar dynamics studies.
- Paleochrono* is a Bayesian probabilistic model primarily for synchronizing ice core records, which is utilized for BICC. Supporting information, such as enhanced layer counts or additional gas data, will be manually analyzed.

Methods

- The highest quality cores (Tier 1) are synchronized, with Tier 2 cores forced to match. We also update the Holocene layer count for WD2014 and GICC. The first 3200 years of WD2014 are forced to match GICC21, otherwise errors in both GICC05 and WD will be taken into account. BICC is split into the Holocene and Pleistocene, with layer counts taking focus in the former, Paleochrono in the latter.

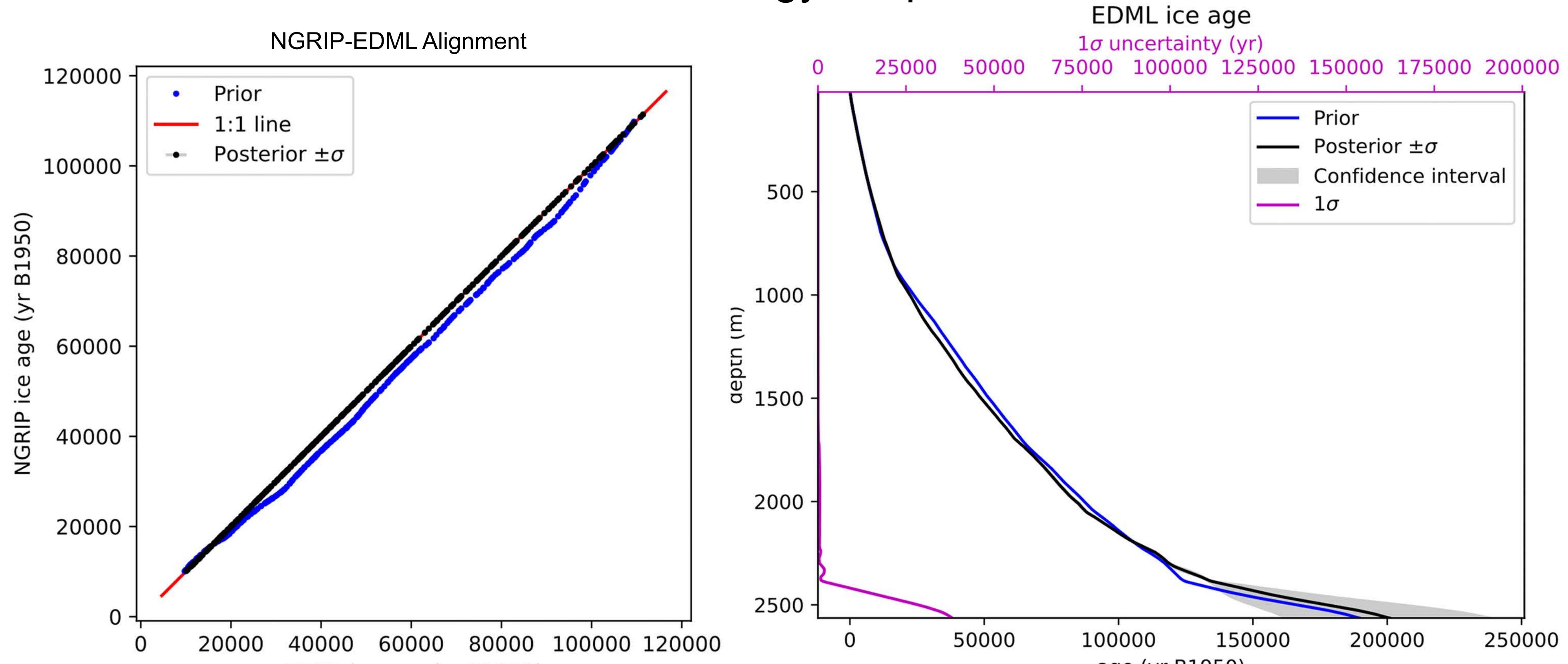
Antarctica — Tier 1 Cores — Greenland



Outcomes

- A chronology for each core, in air and ice. This includes modified layer counts of GICC and WD (& potentially EDML).
- This file will allow researchers to easily analyze climate changes between hemispheres, which could be especially useful for analyses of phenomena such as the bipolar seesaw/D-O events.
- The data will be published in two ways. 1) A python and matlab package allowing loading of all data directly within programs. 3) Raw files hosted on Github or Zenodo for non-code access.

Chronology Outputs



- Paleochrono outputs showing the synchronization between NGRIP and EDML, and EDML's ice age with depth. Priors are calculated using density, thinning, accumulation rate, and lock-in-depth (air).

Early Holocene WDC Additions/Removals

