

NEEM – North Greenland Eemian Ice Drilling

14 nations are participating in NEEM

Denmark/Greenland

United States

Belgium

Netherlands

France

Canada

Germany

Japan

Sweden

Switzerland

China

South Korea

Iceland

United Kingdom

IPY – project 2007-2011

77.5N, 51W

Logistics by

Centre for Ice and Climate

NSF - Office Polar Program



NEEM Objective



Chart the full course of an interglacial from termination to inception at very high resolution

Determine a detailed climate record of the climate variations of our present interglacial period and previous interglacial, the Eemian period.

Make an improved assessment of the state of the Greenland ice sheet under such a warmer climate

NEEM seasons



**2007-Move equipment from
NGRIP to NEEM**



2008-Build camp



**2009+2010 - Drill and measure
2537 m ice core**



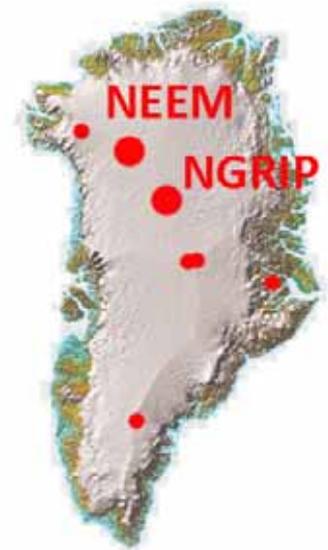
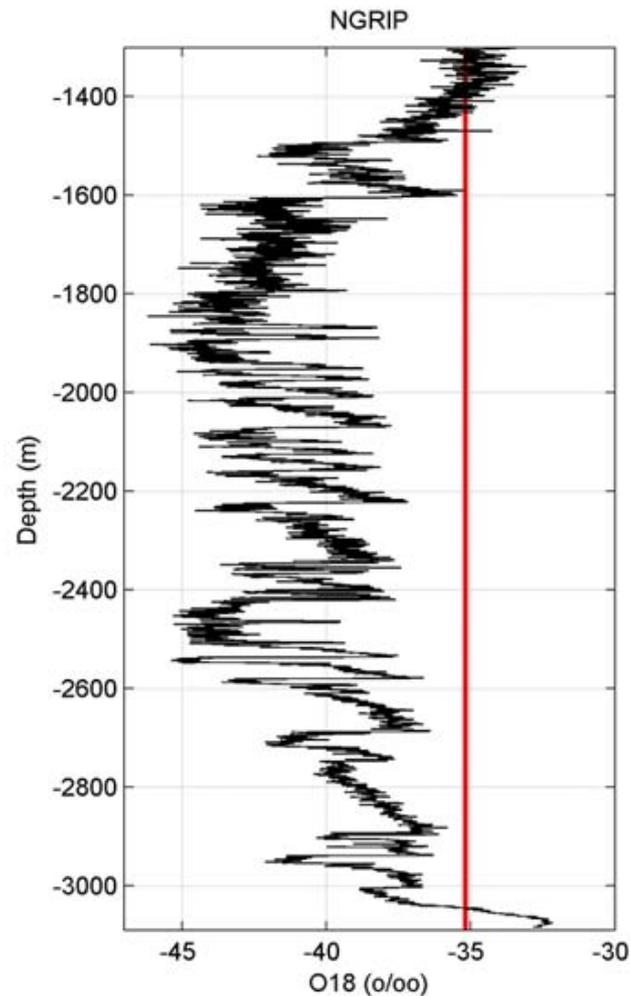
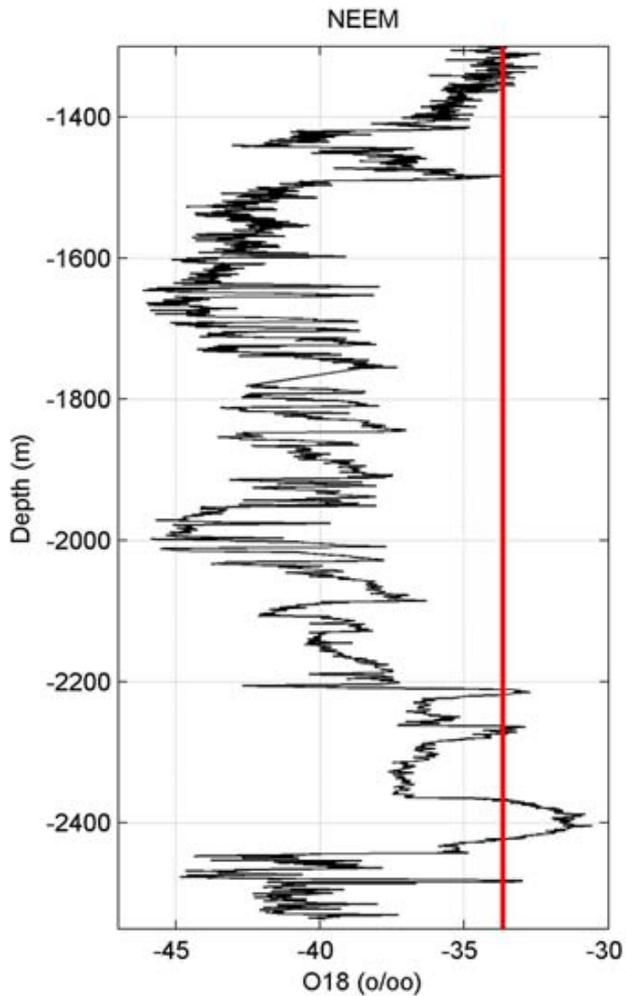
NEEM seasons



**A very modern and effective camp for 35 scientists
The most comprehensive ice core analysis program ever performed
in the field.
(15% logistic staff; 50% young scientists, 35% senior scientists)**



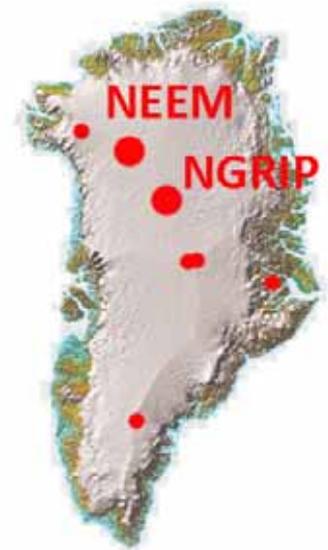
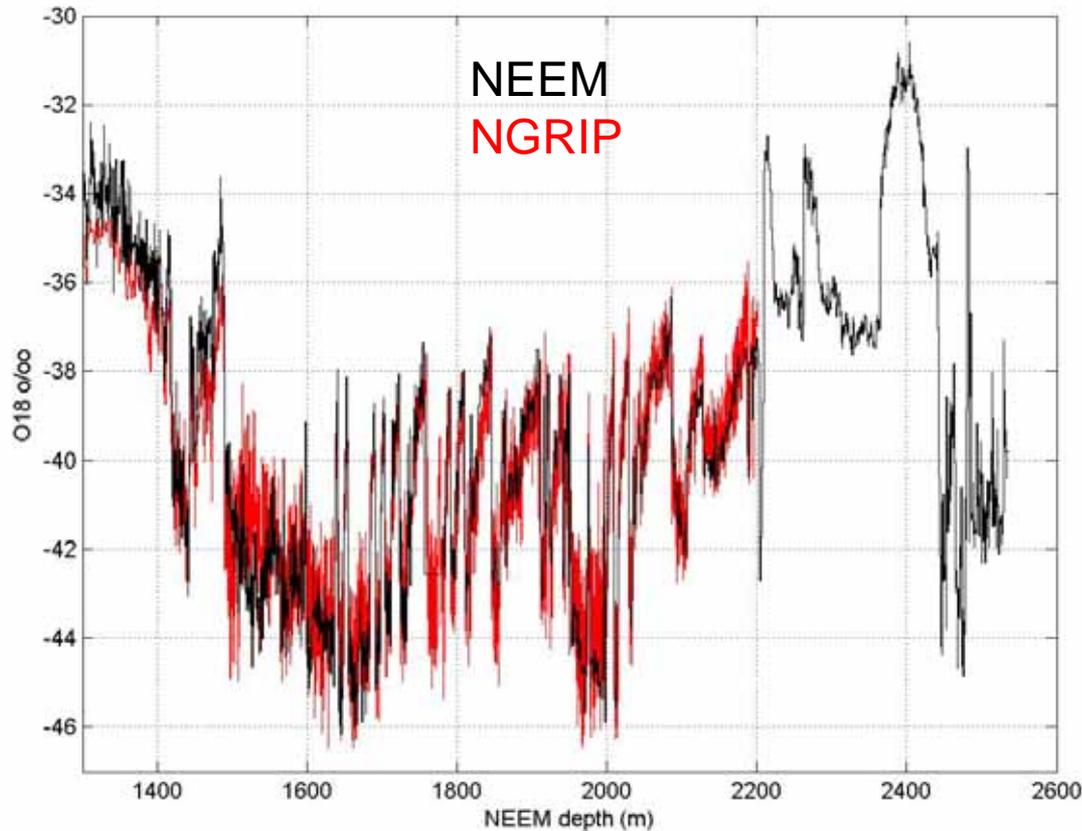
Compare NEEM and NGRIP



Red lines: $\delta^{18}\text{O}$ of the recent 400 years



Compare NEEM and NGRIP



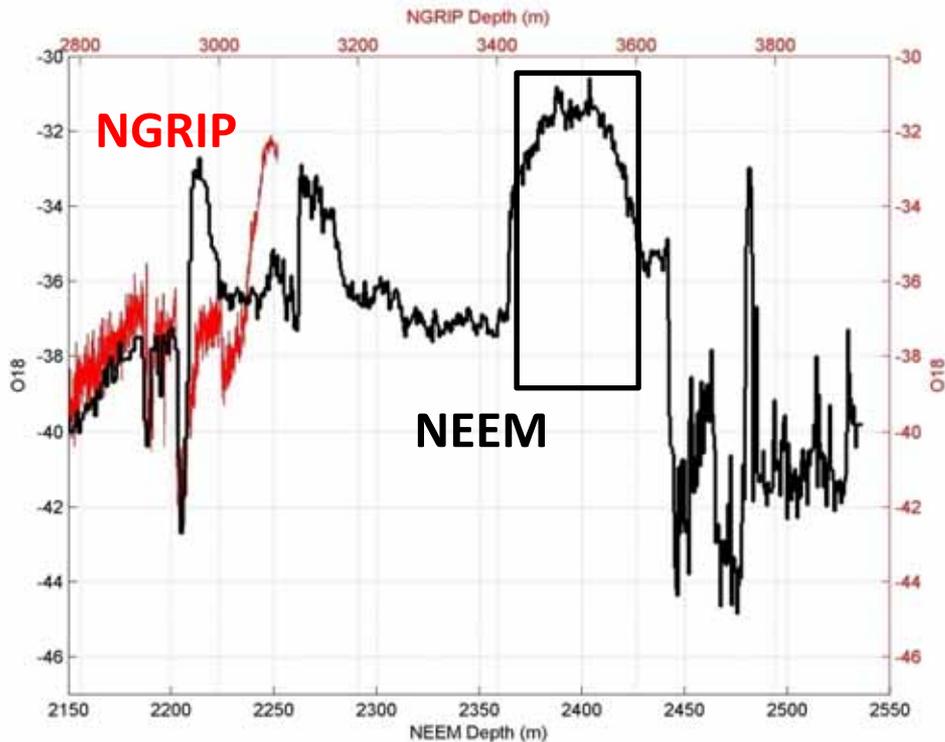
The records match back to 108,000 years b2k at the NEEM depth 2,200m

NEEM matched to NGRIP GICC05 using 733 match points

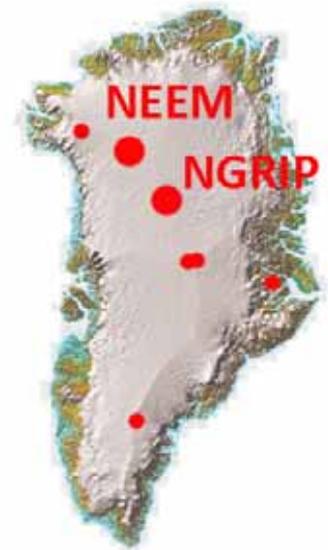
NEEM and NGRIP below 2200 m



NGRIP reaches
123.000 years back



NEEM climate
record is disturbed
below 2,200 m

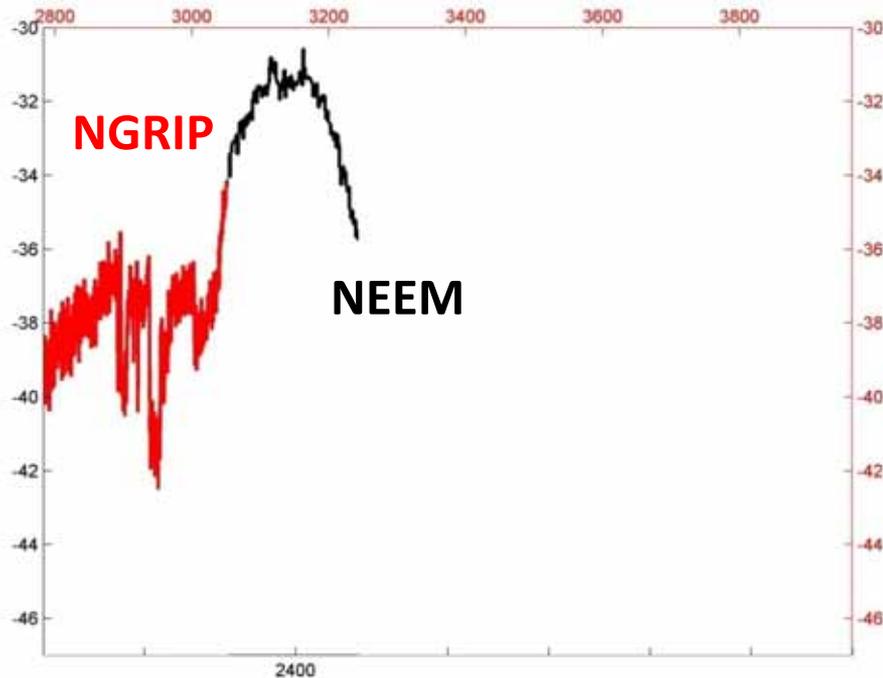


But the warm part
of the Eemian is undisturbed

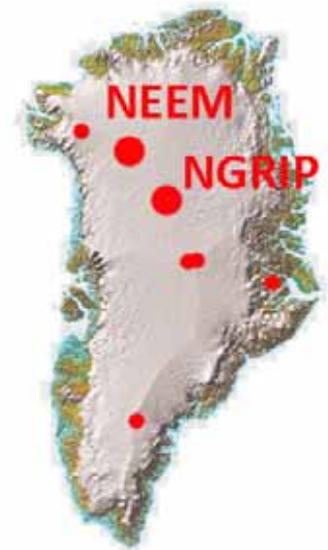
NEEM and NGRIP below 2200 m



**NGRIP reaches
123.000 years back**



**NEEM climate
record is disturbed
below 2200 m**



**But the warm part
of the Eemian is undisturbed**

**So together we have a climate
record reaching back to 130,000
years before present.**



Reaching into the basal layers



Looking for biological material in the basal layers will be very exciting in the next years.

July 27th, 2010 at the depth 2537 m we reached into layers with basal material.



NEEM 2011 Objectives



To log the deep borehole, perform experiments with drilling in basal ice in the deep hole, experiments with replicate coring

To support associated programs, such as a 420 m shallow ice core, pit studies, shallow core sampling, strain net measurements, set-up and operation of a seismic station and unmanned airborne radar survey.

To provide housing and food for 15-28 participants during the 105 day field season.



Selected 2011 projects



NEEM Borehole Temperature Measurements and Associated Studies

USGS, CIC, IMAU, LGGE, UoW, Berkeley,

Tests of Unmanned aircraft system (Meridian).

CReSIS University of Kansas.

Surface Water Vapor Isotope Monitoring

INSTAAR, CIC, LSCE de CNRS

The future – a new deep drilling?

