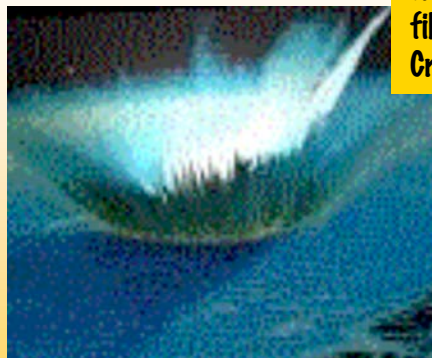
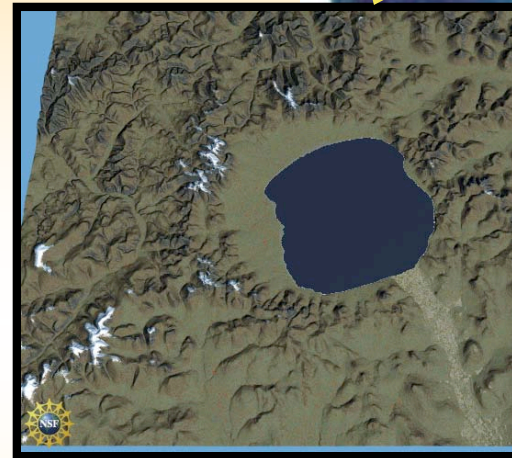
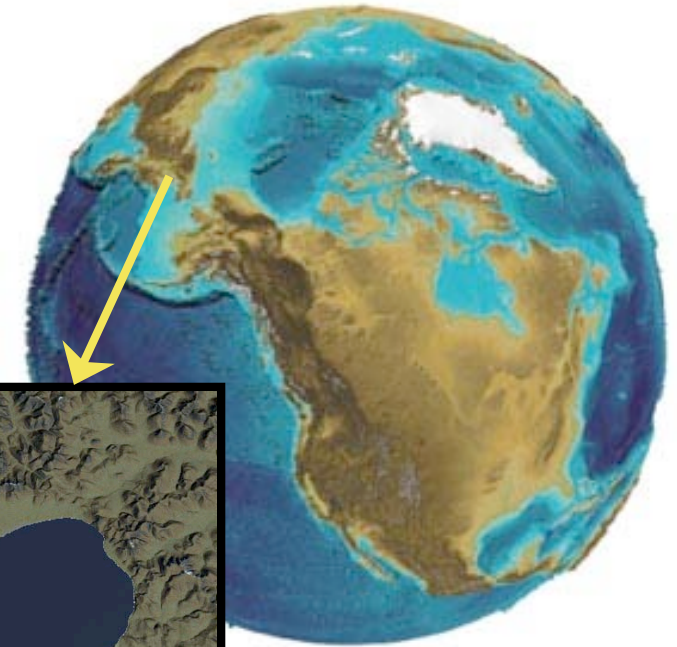


EL'GYGYTGYN CRATER LAKE

100 km north of the Arctic Circle,
Created 3.6 My ago

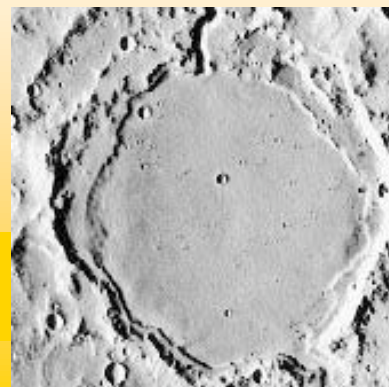
Paleoclimate and Arctic Climate
Evolution

Contains the longest most continuous
terrestrial record of Arctic climate
change



18 km diameter crater;
12 km diameter lake

Modern analog of water-
filled craters like Gustav
Crater, Mars



Julie Brigham-Grette

UMass-Amherst, USA

Martin Melles

Univ Leipzig, AWI, Germany

Pavel Minyuk

NEISRI, Magadan, AARI Russia

Christian Koeberl

Univ Vienna, Austria

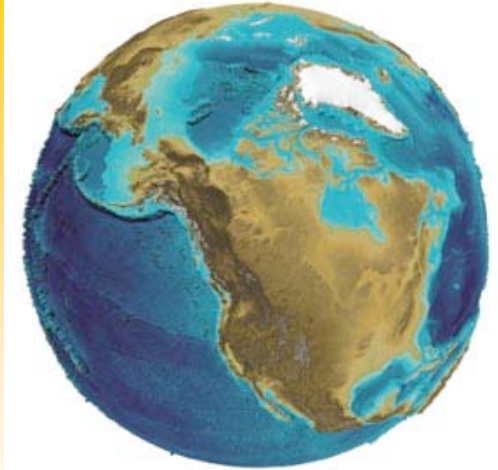
Project Timeline:

- ⚡ Jan 2004 Pre-Proposal for Drilling to ICDP
- Jan 2005 Full Proposal for Drilling to ICDP
- Oct. - Jan 2006 Science Proposals to Federal agencies in Collaborative Countries, USA, Germany, Austria, Canada

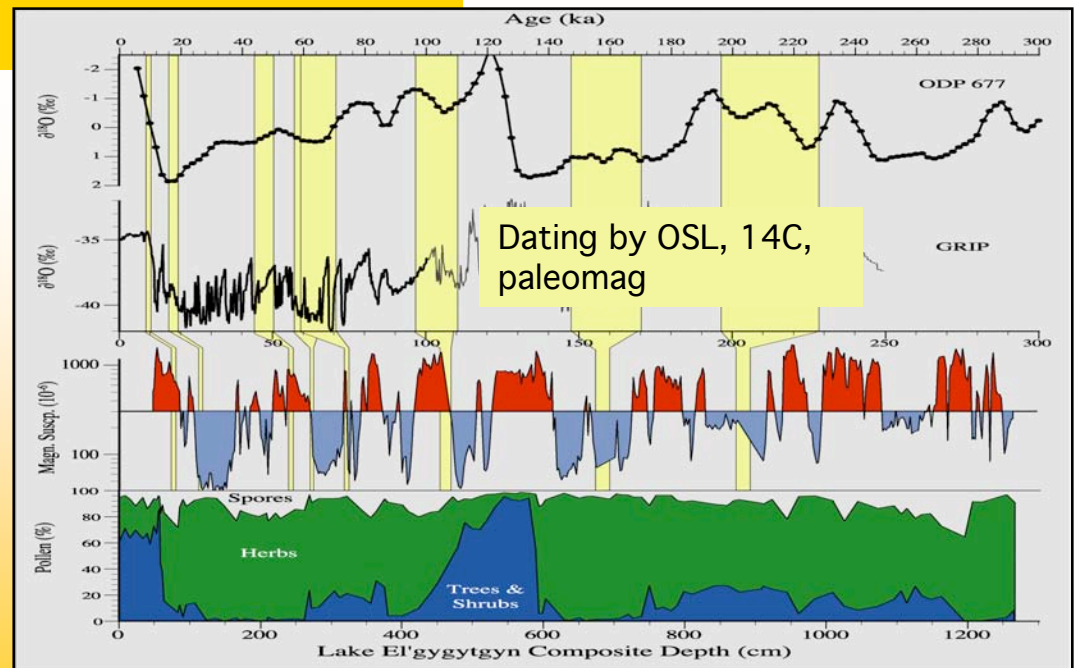
If successful,

Spring 2007 or 2008

Mobilization, Drilling, Demob



ATM & OPP



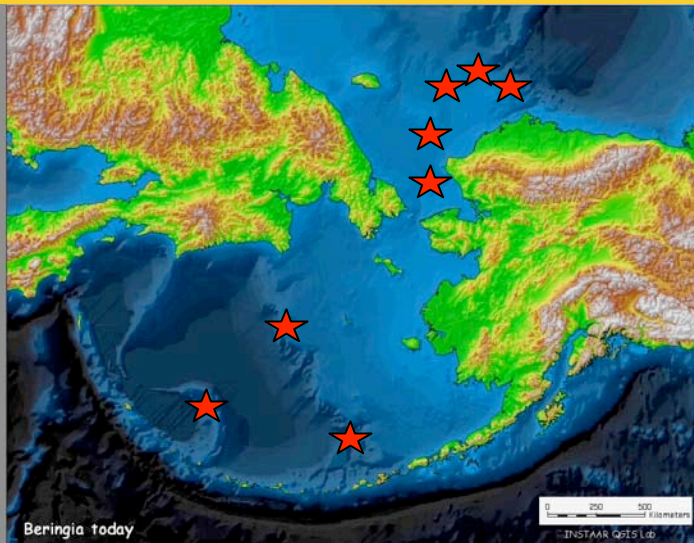
USCGC Healy

Keigwin
Brigham-Grette
&
Driscoll

Paleoceanography and post-glacial sea level history of Bering and Chukchi Seas -- 2002



UMass/WHOI/SCRIPPS
Collaboration





Objectives:

- Sea level history of the Bering strait
- Sea Ice history of the Chukchi and Bering Seas
- Paleoproductivity
- Sea level/sea ice influence on Alaska and NE Russia
- impact of flooding Bering Strait on the water balance of the Arctic Ocean and salinity of the North Atlantic.

• **UMass**

**Zachary Lundeen (MS) -
*Carbon/Nitrogen isotopes and
productivity of the post-glacial Chukchi
Sea***

**Beth Caissie (MS) - *Diatom
biostratigraphy and Sea Ice history***

Lake sediment paleoclimate research in Lofoten Island, Arctic Norway

Raymond S. Bradley

Jon Pilcher (Queens University Belfast)

Pierre Francus (Institut National de la Recherche Scientifique, Université
du Quebec)

Lesleigh Anderson



Laminated sediments & climate Ellesmere Island

Ray Bradley and Ted Lewis PhD

May to August 2001 to 2003 at Lake Tuborg



Land-Atmosphere-Ice and Snow Interactions in the High Arctic, Hazen Plateau, Ellesmere Island



Ray Bradley,
Doug Hardy, and
Carsten Braun



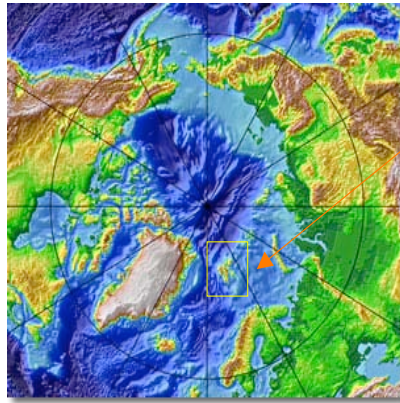
NSF Svalbard REU Program: MODERN PROCESS STUDIES & HOLOCENE CLIMATE CHANGE



Al Werner, Mt Holyoke
Steve Roof, Hampshire
Julie Brigham-Grette, UMass
Ross Powell, Northern Ill
Mike Retelle, Bates

- **local weather** (weather/temp. stations)
- **glacial system** (mass-balance/ablation rates/term pos.)
- **meltwater system** (discharge/sed. flux)
- **lacustrine system** (sed. processes/rates)
- **sediment record**
- ✓ **lamination stratigraphy**

Imagine Yourself ...



Svalbard

As a member of a combined student and faculty team

Working in the Norwegian arctic



Pursuing your own research in climate change

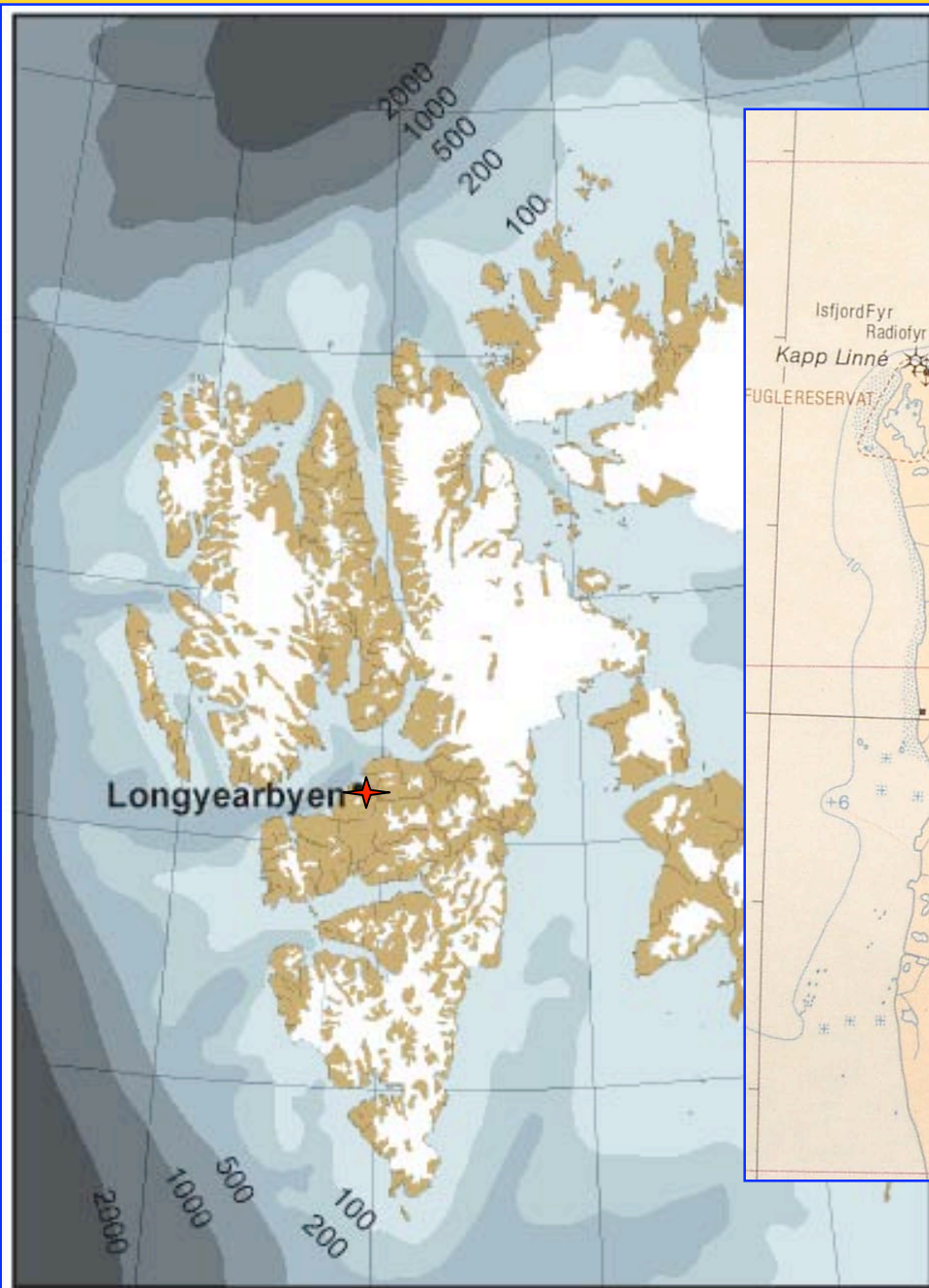
The Svalbard REU project allows you to do all this and more!



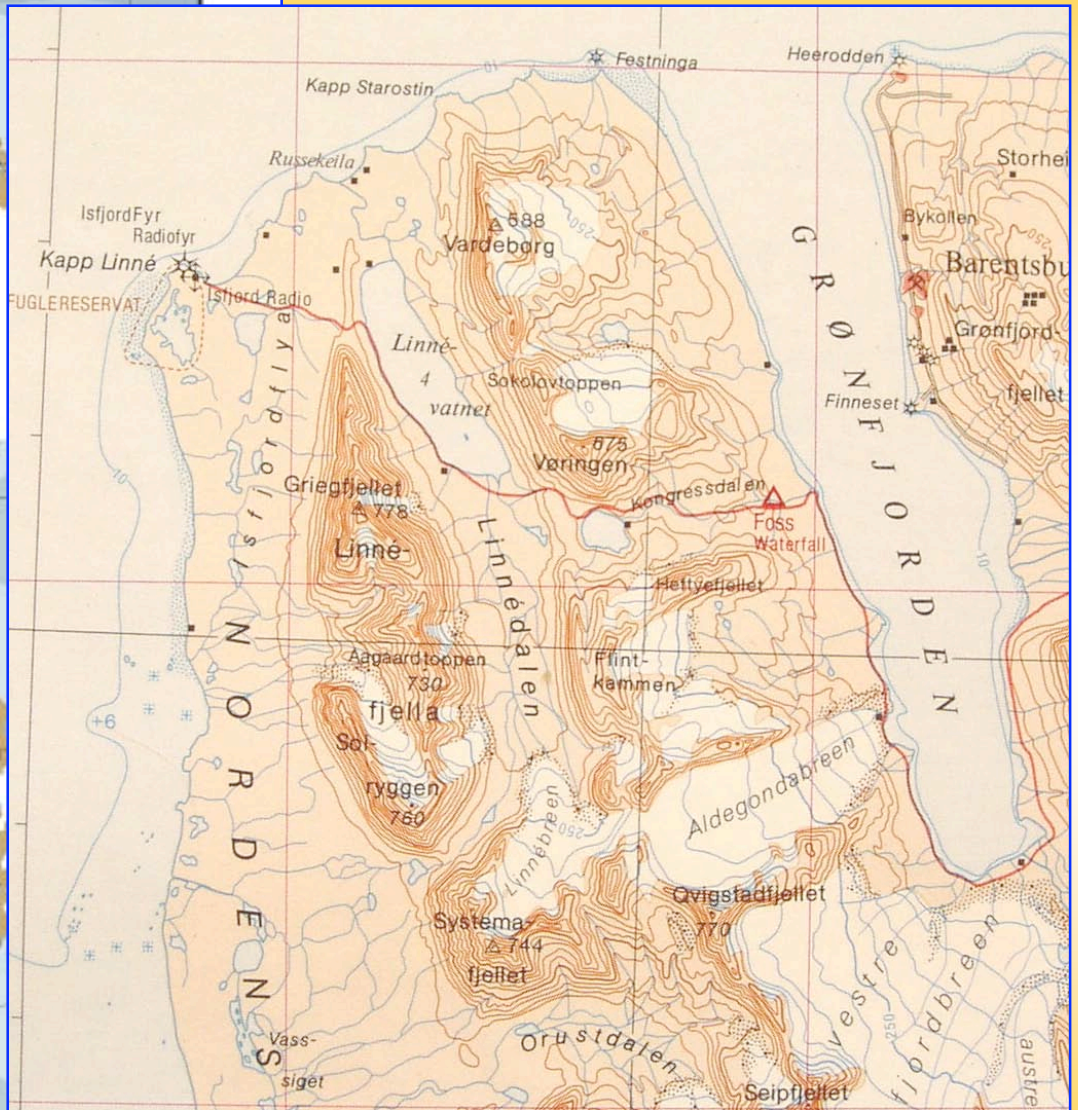
Please Visit: www.mtholyoke.edu/go/svalbard



1936



81°



12°

16°

20°

24°

Paleoenvironmental and Marine Ecological Research in the Arctic



Bates College, Lewiston, Maine

contacts: Mike Retelle, Dept. of Geology mretelle@bates.edu
Will Ambrose, Dept. of Biology wambrose@bates.edu

- **Bates College senior theses supported by NSF ESH-PALE grant 98-09963, *Reconstructing late Holocene climate change in the central Canadian High arctic using laminated sediments and related process studies*, Bates College, M. Retelle, P.I**
- **Apfelbaum, Michael.,1999, *Paleoenvironmental reconstruction based upon laminated sediments from two high arctic coastal lakes, southwestern Devon Island, Nunavut, Canada.***
- **Babineau Z., Chelan, 1999, *Paleoenvironmental reconstruction from laminated marine sediments, Barlow Inlet, Cornwallis Island, Canada***
- **Patridge, Whitney, 1999, *Modern sediment transport and deposition in a high arctic lacustrine environment: relationship between depositional dynamics and climate, Sawtooth Lake, Ellesmere Island, Canada.***
- **Zimmerman, Wendy, 2000, *Analysis of laminated sediments from two lakes on Bathurst Island, arctic Canada.***
- **Hershberger, Jeffrey, 2000, *A paleomagnetic record of a high arctic isolated marine inlet: Cape Hurd Lake, Devon Island, Nunavut, Canada***
- **Roberts, Sarah, 2000, *The evolution of a coastal meromictic basin from a marine inlet, Cape Hurd Lake Nunavut, Canada***
- **Trafton, Ben, 2000, *Late Holocene paleoclimate reconstruction using laminated sediments from meromictic Cape Hurd Lake, Devon Island, Nunavut, Canada***
- **Fasy, Mary-Katherine, 2001, *Paleoclimate reconstruction from laminated sediments, Cape Hurd Lake, Nunavut, Canada.***
- **Janukajtis, Forrest, 2001, *The evolution of a meromictic basin, Cape Hurd Lake, Devon Island, Nunavut Canada***
- **Carter, Polly, 2002, *Late Holocene paleoenvironmental reconstruction from laminated sediments, Danielle Point Lake, Bathurst Island, Nunavut, Canada.***
- **Saenger, Casey, 2002, *Holocene basin evolution and paleoclimate reconstruction from laminated sediments, Cape Hurd Lake, Devon Island, Nunavut Canada***
- **Haas, Amelia, 2003, *Paleoenvironmental reconstruction using laminated sediments from a high arctic isolation basin: Depot Point Lake, Cornwallis Island, Canada.***
- **Felton, Anna, 2004, *Organic carbon cycling in laminated sediments from coastal lacustrine and marine environments, eastern Canadian arctic***
- **Putnam, Aaron, 2004, *Recent sedimentation in a transect of high arctic isolation basins: Queen Elizabeth Archipelago, Nunavut, Canada***
- ***In addition to presentation and defense of theses, students presented their work at one or more of the following conferences: sectional and national Geological Society of America meetings, Annual Arctic Workshop, Arctic Forum Poster session and Geological Society of Maine Annual Meeting***

Department of Biology Bates College Theses, William G. Ambrose, Jr. Advisor

Grable, M. 1999 Distribution, abundance, and respiration of infauna on the Chukchi Shelf. Thesis, Bates College, Lewiston, Maine 50 pp

Lewis, J. 2003. The growth of *Serripes geoenlandicus*, *Mya arenaria*, and *Clinocardium nuttalli* in relation to environmental conditions at Kotzebue Sound, Alaska. Thesis, Bates College, Lewiston, Maine 43 pp

Nordstrom, L. 2003. Annual growth in *Macoma balthica* in Kotzebue Sound, Alaska as an indicator of environmental change. Thesis, Bates College, Lewiston, Maine 44 pp.

Tilney, P. 1999. The contribution of epibenthos to carbon remineralization and abundance of ice algae in the Chukchi Sea. Thesis, Bates College, Lewiston, Maine 72 pp.

All of these theses above were presented at one or more of the following national meetings: Annual Benthic Ecology Meetings, Northeastern Estuarine Research Society, Arctic Workshop, or ASLO.

Additional Presentations

***Feldman, Z., W.G. Ambrose, P.E. Renaud.** "Feeding habits of six high latitude fishes". 25th Annual Benthic Ecology Meeting, Portland, Maine, April 1997

Lanoué, C.B., W.G. Ambrose, Jr., L.M. Clough. "A survey of growth lines in Arctic bivalves" 28th Annual Benthic Ecology Meeting, Baton Rouge, Louisiana; March 1999

Publications:

Ambrose, W.G., Jr., L.M. Clough, P.R. Tilney*, L. Beer. 1998 Role of echinoderms in benthic remineralization in the Chukchi Sea. *Marine Biology*. 139:937-949.

Ambrose, W.G., Jr., L.M. Clough, C. von Quillfeldt, P.R. Tilney*, T. Tucker *In Review* The Sub-ice Algal Community in the Chukchi Sea: Large and Small Scale Patterns of Abundance Based on Images from a Remotely Operated Vehicle

Funding

NOAA National Undersea Research Program, West Coast and Polar Regions Center
NSF, Office Polar Programs, Arctic Natural Science