

# Update on FY 2007 NSF IPY Competition

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# FY07 NSF IPY Competition

Solicitation had three emphasis areas

- 1) Understanding Change
- 2) Human/Biotic Systems
- 3) Education

- Goals include encouraging interdisciplinary work and new international collaborations – Achieved!
- Build on prior IPY investments
- Solicitation identified ~\$42M available
- Received 376 proposals that requested \$207M
- Anticipate 87 awards receiving ~\$46M
- 2<sup>nd</sup> “Humans” deadline may add up to \$2M in awards



# Understanding Change – Common Polar Topics

- Chemical and physical oceanography
- Sea ice/ocean interactions and processes
- Stratosphere/troposphere interactions
- Glacier, ice sheet, ice shelf, and ocean systems



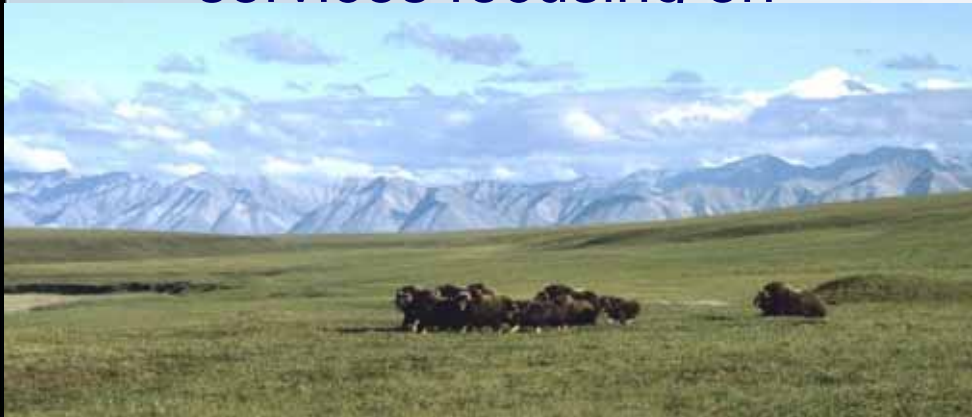
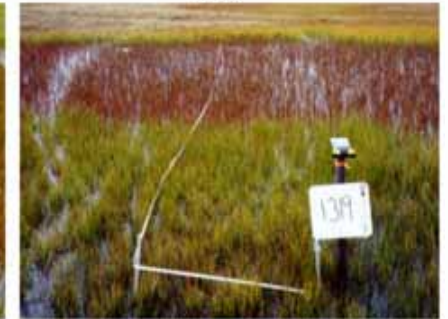
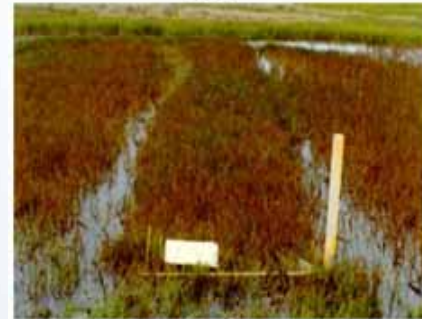
# Understanding Change

- Ecosystems
  - Microbes in soils
  - Past decadal –scale change
  - Projects of future change in ecosystem services focusing on



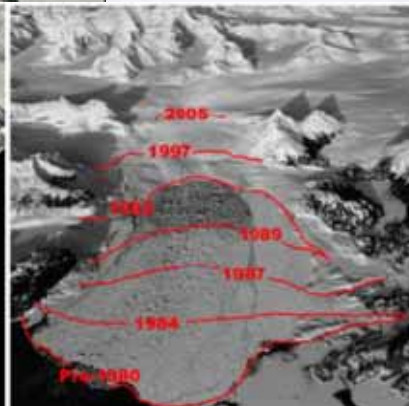
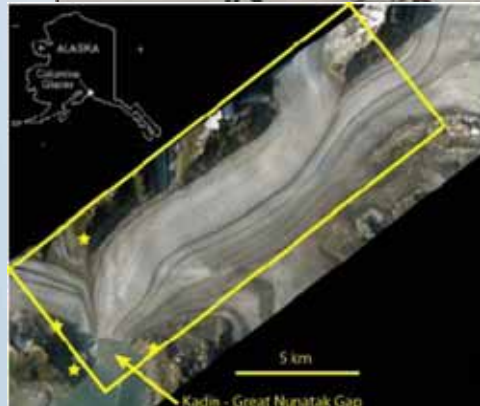
1972

2000





# Understanding Change



- Sea Ice and Cloud cover
  - The role of halogens and sunlight
  - Macro & microphysical properties of clouds
- Glacier & ocean interactions
- Reanalysis



# Human Systems

- Archeology
  - complex dynamics of human-environment interaction
- Economics
  - Is the current mix of a wage economy and subsistence lifestyles stable or a transition process
- Anthropology
  - Living in a changing arctic – sea-ice, place names & routes
- Human genetics
  - tracing the geographic pattern of genetic variation
- Endangered languages
  - Dictionaries
  - Language planning



# Biotic Systems Emphasis

- How do polar marine ecosystems shift when ice shelves collapse? What are the implications for the structure and function of marine food webs?
- What is the genetic composition of the major primary producers in the polar oceans? What key genes are involved in biogeochemical cycling and how do they vary among different plankton groups?
- How will primary producers in the ocean respond to changing climate? How do these responses impact carbon transport in the Southern Ocean?
- How do microbes metabolize in extreme cold? What are the major molecular and biogeochemical pathways that allow cold-functioning, and how does metabolism affect permafrost dynamics?



# Partnerships

- NSF
  - BIO, EHR, GEO, OISE, OPP, SBE
- Interagency
  - NASA, NOAA, USGS, USN/NPS
- International
  - Argentina, Australia, Belgium, Canada, Chile, China, Denmark/Greenland, EU, Finland, France, Germany, Iceland, Italy, Netherlands, New Zealand, Norway, Russia, Spain, Sweden, Ukraine, United Kingdom





Argentina

Australia

Belgium

Canada

Chile

China

Czech Republic

Denmark (incl.  
Greenland, Faeroes)

Estonia

Finland

France

Germany

Iceland

Italy

Japan

Netherlands

New Zealand

Norway

Poland

Russia

Spain

Sweden

Switzerland

Ukraine

United Kingdom (incl.  
Scotland, Wales)

European Union

# Our Overall IPY Partners



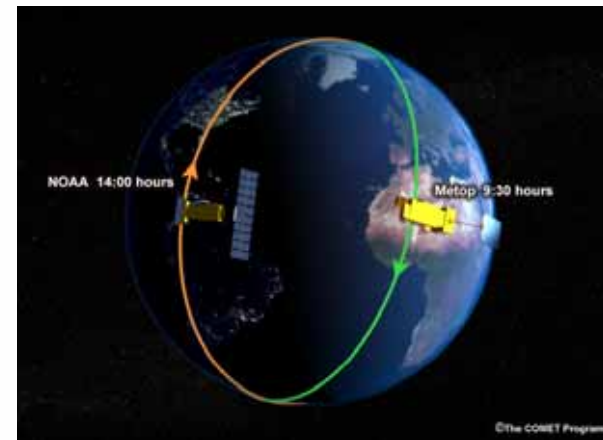
# Examples of Antarctic IPY Activities

- CONCORDIASI \*\*
- Ice Sheet Dynamics
  - Amundsen Sea Embayment & Antarctic Peninsula – but more later \*\*
  - ITASE x 2 \*
  - AGAP \*
  - POLENET \*
- Biotic Systems
  - Extended season research at DV's and Palmer – or what do the microbes do after sunset? \*\*
- South Pole Telescope – first light^; IceCube Science^
- ANDRILL^ and WAIS Divide Drilling^; & Oden^
- LIMA – Release anticipated 27 Nov 2007^

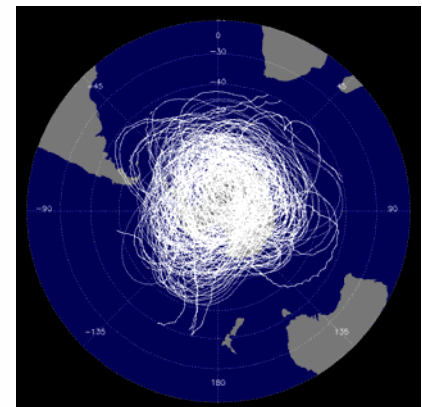
\* = 1<sup>st</sup> IPY Comp  
\*\* = 2<sup>nd</sup> IPY comp  
^ = Regular Programs



# CONCORDIASI



- **THORPEX-IPY Cluster Project**
- US: NCAR, U. Wyoming, Purdue U., UMBC/GMAO (funded by NSF)
- FRANCE: CNES, IPEV, LGGE, LMD, Météo-France
- ITALY: ENEA, PNRA, CNR
- INTERNATIONAL: ECMWF
- AUSTRALIA: Bureau of Meteorology Research Centre
- « Improved numerical weather forecasting and climate simulations by exploitation of in-situ, airborne remote-sensing and satellite data, advanced modeling systems and basic research into polar processes and into polar-global interactions. »
- Super-pressure balloons to be launched into polar vortex autumn 2008 (Austral spring) from McMurdo



<http://www.cnrm.meteo.fr/concordiasi/>



# Flashback to IGY – Ice Sheet Focus

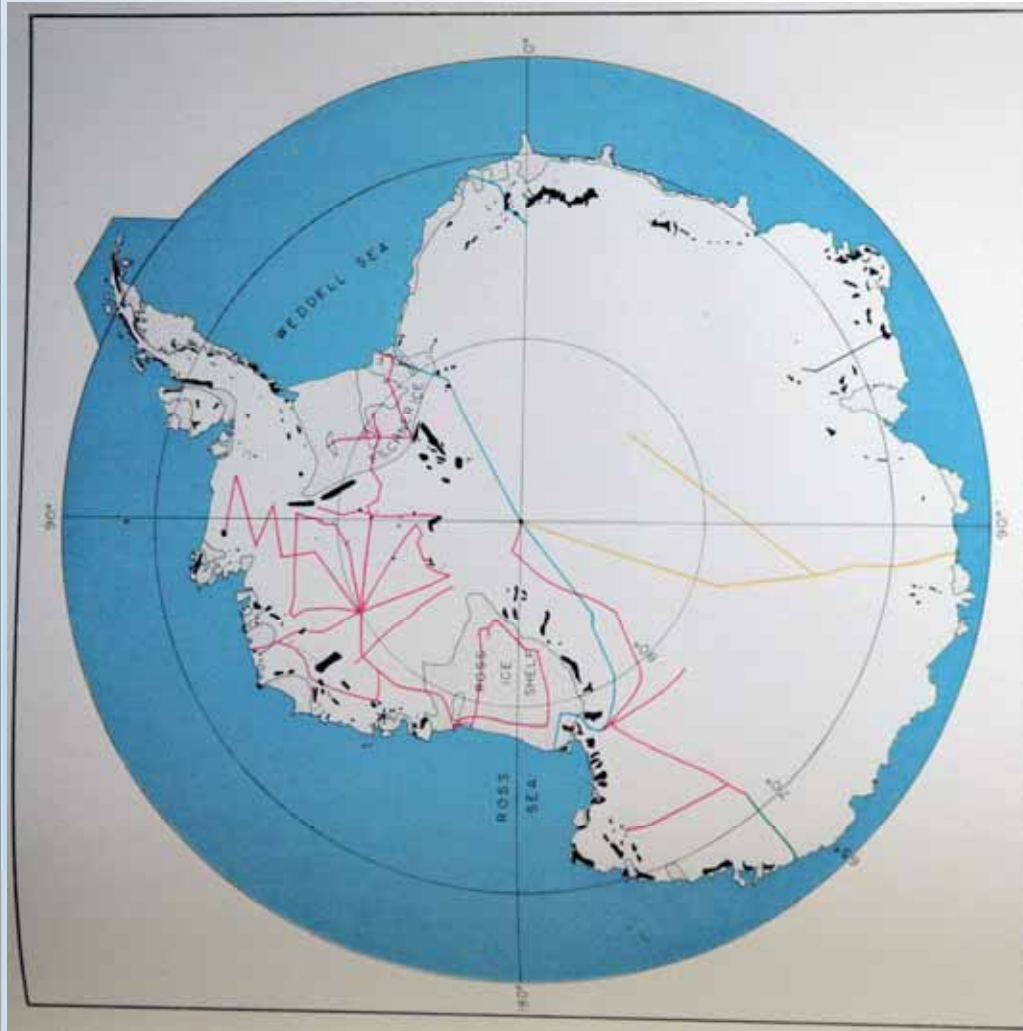
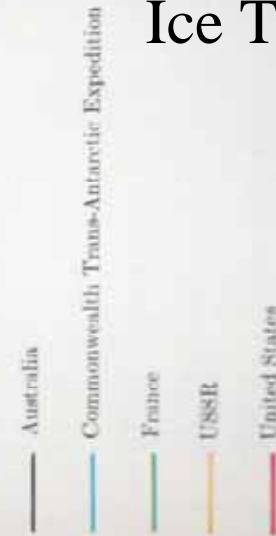


FIG. 2—Over-snow traverses during and subsequent to IGY which involved seismic measurements of ice thickness:

IGY-era Traverses with Seismic Soundings for Ice Thickness



- How much ice?
- What was the history of glaciation?

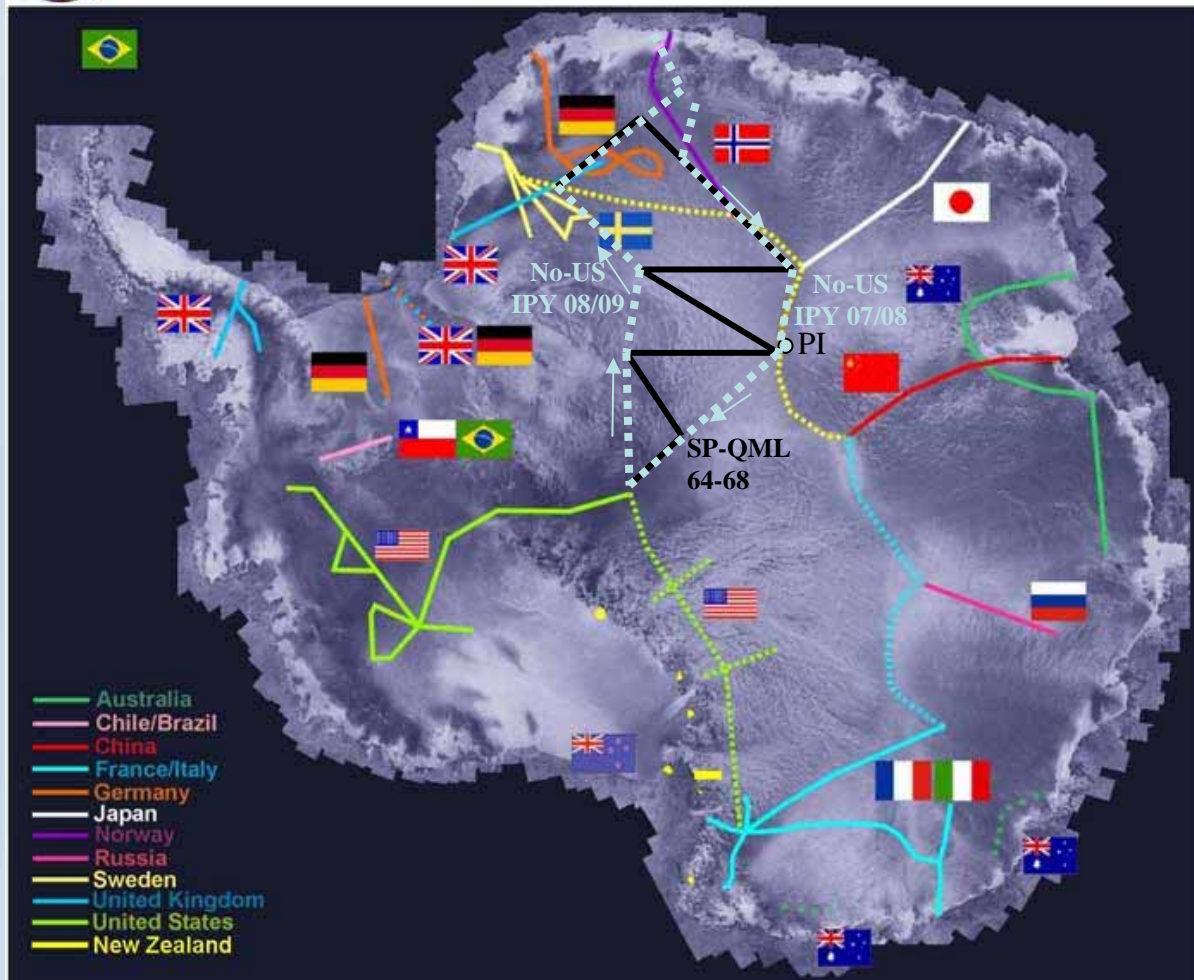




# ITASE and IPY



ITASE - completed and proposed traverses, August 2002



- 8 traverses during 07-09 IPY time frame
- US involved in 2
- Norway-US (light blue dotted line)  
<http://traverse.npolar.no/>
- US ITASE (green dotted line)
- Will set stage for continent scale synthesis of accumulation and temperature records.



# ITASE and IPY: US-Norway Traverse



Departing Troll 12 Nov 2007 – <http://traverse.npolar.no/>



International Polar Year 2007-2008  [www.ipy.gov](http://www.ipy.gov)

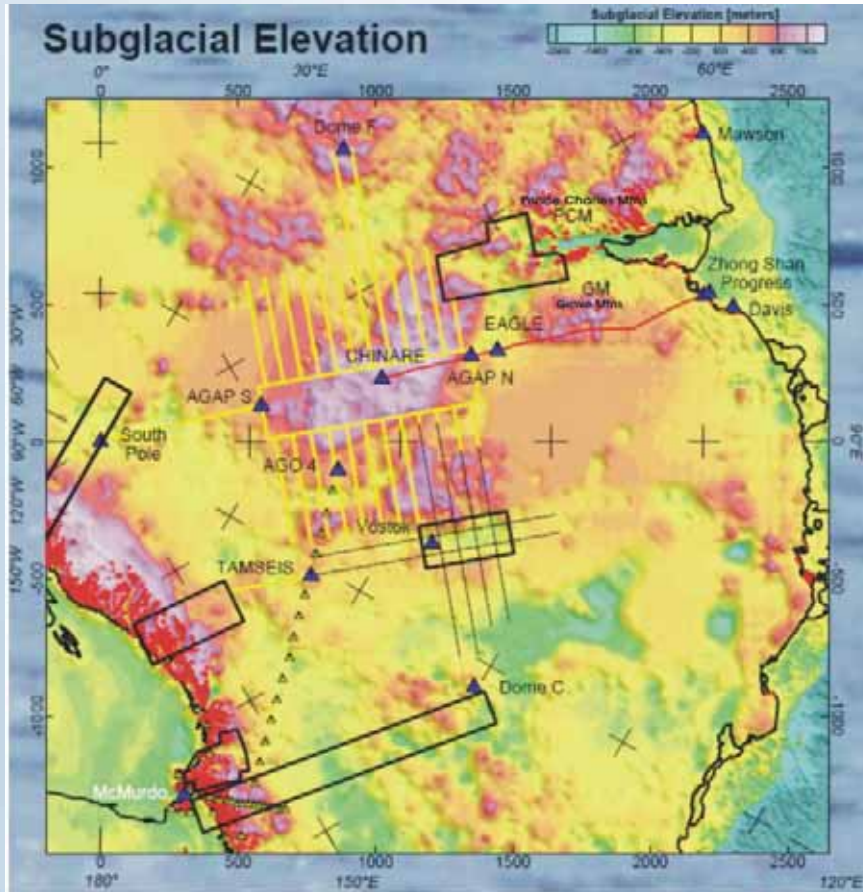




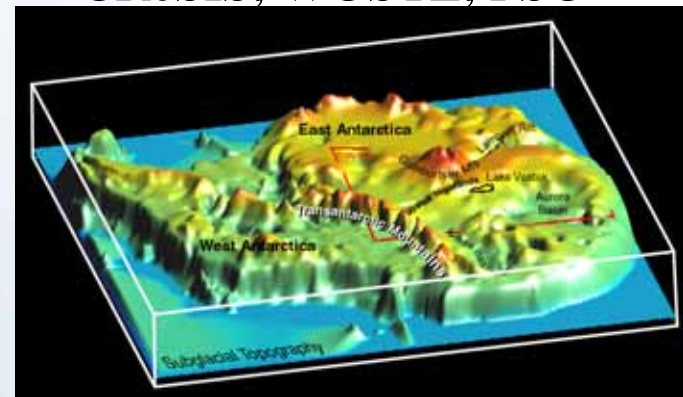
# IPY AGAP – New Partnerships

## Gamburtsev Subglacial Mtns

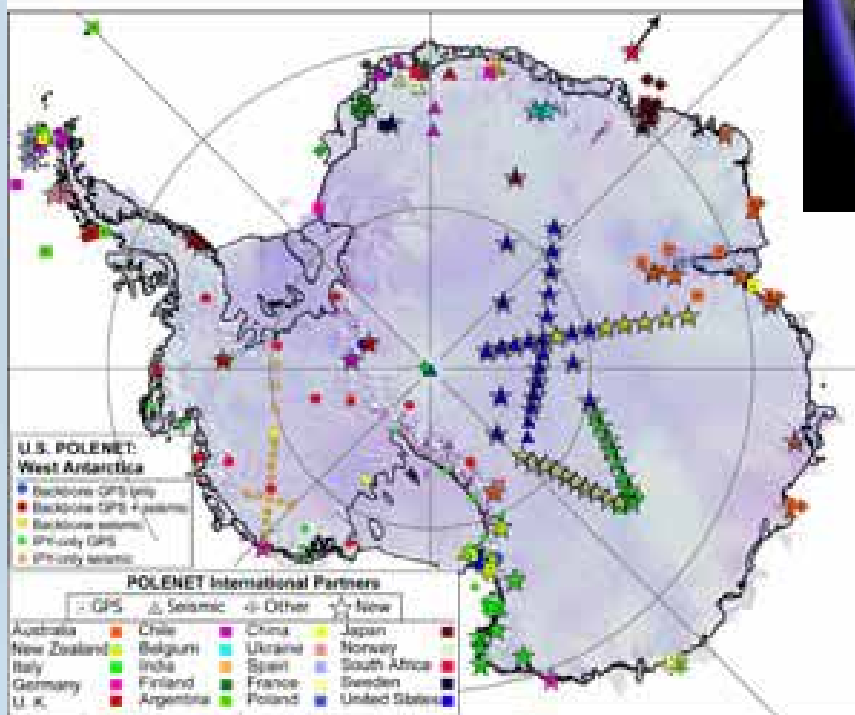
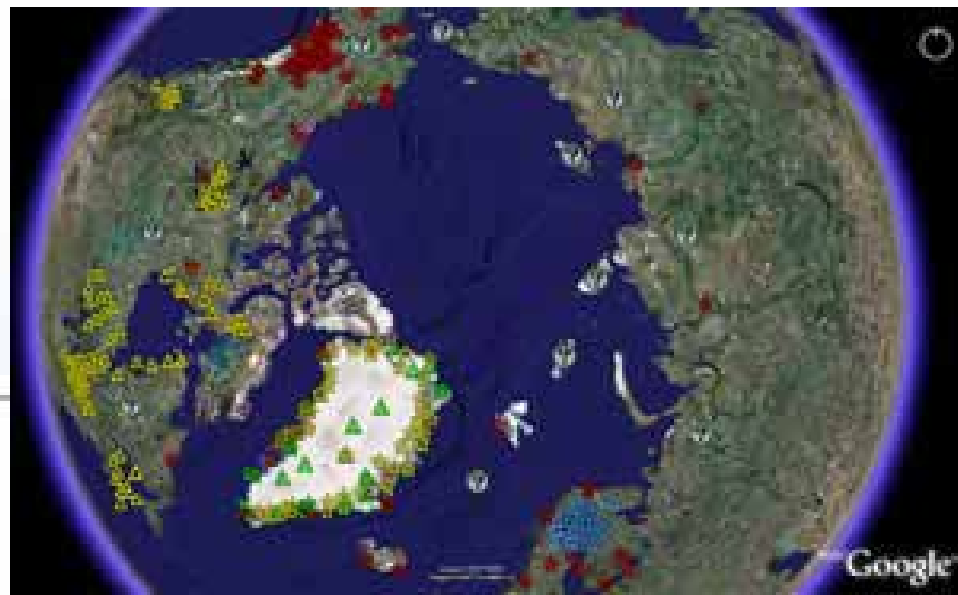
- Location of first ice sheet
- Tectonic enigma
- Potentially very old ice
- US, China, Germany, UK
- LDEO, USGS, ECSU, KU & CReSIS, WUSTL, PSU



- Aerogeophysikalische Messgebiete und regionale Einzelprofile der letzten 10 Jahre (nur USA, D)
- Aerogeophysikalisches Messgebiet und regionale Einzelprofile, geplant bei AGAP
- Chinesische Landtraverse nach Dome A
- Stationen, Depots
- TamSeis-Profil



# Understanding Change – Polar Ice Sheets and Sea Level



## PoleNet – critical for:

- Isostatic rebound to constrain ice mass change in both polar regions
- Reducing dependence of GRACE findings on models of rebound





# Extended Season Research: The Transition to Polar Night

- **Research Questions:**
  - How does the ecosystem of the Dry Valley Lakes adapt to the onset of polar night?
  - How do marine bacterioplankton communities adapt to winter?
  - What physiological, biochemical, and genomic changes take place?
- **Partner Nations:**
  - **Dry Valley Lakes: New Zealand, United Kingdom**
  - **Marine Phytoplankton: France, Australia, Canada, United Kingdom**



# Questions?



# Synopsis of IPY NSF-Wide Competition\* Proposals and \$'s

Theme	Proposals Received	Projected Awards	\$M Requested	\$M Award Projected	Success Rate*	Success Rate by \$
Understanding Change	249	50	\$118.2	\$25.4	20.1%	21.5%
Human & Biotic Systems	52	17	\$34.2	\$11.2	32.7%	32.7%
Human		[10]		[\$8.0]		
Biotic		[7]		[3.2]		
Education	75	20	\$54.8	\$9.7	26.7%	17.7%
Total	376	87	\$207.2	\$46.3	23.1%	22.3%

\* Participating Programs from OPP, BIO, EHR, OISE, SBE, and GEO.  
Funds from FY07 and anticipated FY08 appropriations.  
2nd "Human Systems" competition could add another 2M in awards.  
Success Rate by "Proposal Count" (not project count) and by \$.



# IPY Education Awards 2007

Anticipate funding 14 projects

Increase in awards for K-12 audiences

Involve Arctic peoples and underrepresented groups

Increase international distribution of IPY science

Emphasize IPY research to public audiences in informal settings (e.g., radio, web, museums)

Audience	2006	2007
K-12	2	5
Undergraduate	2	1
Graduate	1	1
Informal Science Education	4	7
<b>Total</b>	<b>9</b>	<b>14</b>

