The Poles and the Planet
International Polar Year 2007-8

Dr Rhian A Salmon,
IPY International Programme Office

International Science School, Sydney, Tuesday, July 3rd, 2007
The Arctic

September 1979

NSIDC
The Arctic

September 1979

Ice/ Space

September sea ice extent - 28 years
Percent change of September sea ice area
Percent change of September sea ice area

1979 > > > > > > 2006
Percent change of September sea ice area

About 8% decrease per decade

1979 > > > > > > 2006
Percent change of September sea ice area

1979 > > > > > > 2006
Percent change of September sea ice area

1979 > > > > > 2006

Tipping Point?
Air/Land
Air/Land
Air/Land

Ocean/People
More hydrocarbon reserves in the Arctic than in Saudi Arabia

Russian industry is and has been a major polluter of the Arctic

Europe already gets most of its gas from the Russian Arctic
People/Ice/Ocean

Arctic warming projections
ACIA
Reindeer Herding and Climate Change
Earth/Land/People
Earth/Land/People

Alaska

January

Caribou Herd

Porcupine

Central Arctic

NWT

Yukon

Arctic National Wildlife Refuge

Brooks Range

Porcupine

Central Arctic

January
photo: Livia Monami
thanks to Baldvin Kristjánsson, polarbear project
photo: Christian Morel
What key questions are being asked by researchers in the Arctic regarding People?

photo: Christian Morel
What key questions are being asked by researchers in the Arctic regarding People?

And how would you investigate these?

photo: Christian Morel
What key questions are being asked by researchers in the Arctic regarding People?

Health
Contamination
Climate Change
Local Culture
Economics
Permafrost
Food sources
Survival

And how would you investigate these?

photo: Christian Morel
New seismic tomography and modelling techniques are providing unprecedented detail of heat transfer from the Earth’s interior. Potentially important in ice sheet stability.

Ocean Marine Census

thanks to Katrin Linse and AWI staff on Polarstern 06-07
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Marine Census

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Marine Mammal Explorations of Polar Oceans

Temperature

Individual dives, one animal, 4 months

Temperatures Measured by Diving Seal
Individual dives, one animal, 4 months

Temperatures Measured by Diving Seal

Temperature

Depth

1000 meters!

Marine Mammal Explorations of Polar Oceans

Fall Winter

1000 meters!
Temperature

Individual dives, one animal, 4 months

Marine Mammal Explorations of Polar Oceans

Temperatures Measured by Diving Seal

1000 meters!

Day dives deeper than night dives!

Depth

Fall Winter
Salinity sections, > 3,500 dives
Marine Mammal Explorations of Polar Oceans

Salinity sections, > 3,500 dives

Thanks to: Dr Christophe Guinet
Plates and Gates

Plate Tectonics & Polar Gateways
Plates and Gates

Continent movements: 100 million years

Plate Tectonics & Polar Gateways
Plates and Gates

Continent movements: 100 million years
Plates and Gates

Gateways open \(~30\) million years ago

Thanks to:
Roy Livermore,
BAS
Plates and Gates

Continent movements: 100 million years

Plate Tectonics & Polar Gateways

Polar ice caps
Deep cold ocean
Polar ecosystems
Space

Several projects are studying auroral phenomena and other Sun-Earth connections. The IceCube project will also contribute to understanding of cosmic rays and other aspects of nuclear and particle physics.

Neutrinos may derive from black holes, gamma ray bursters and supernova remnants.

IceCube Project at South Pole
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Key messages in IPY:
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- Shrinking Ice and Snow
- Neighbours in the North
- Global Linkages
- New Frontiers of Science
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How Can I Get Involved?
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look out for student opportunities

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become a polar ambassador

look out for student opportunities

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This Thursday: global webcast

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<table>
<thead>
<tr>
<th>What do I Know?</th>
<th>What Do I Want to Know?</th>
<th>What Did I Learn?</th>
</tr>
</thead>
</table>

Photo: Students On Ice
The End

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