

Ongoing and Future Research Interests in the Arctic

Lamont-Doherty Earth Observatory



Marine Geology and Geophysics

- **J. Cochran** Structure and development of Arctic basins and ridges
Bathymetry (swath mapping), gravity, and magnetic measurements from submarines, ice breakers, AUVs
- **S. Goldstein** Volcanism and magma formation along the Gakkel Ridge
Collection of ridge samples by dredging and geochemical analysis of the samples
- **M. Tolstoy** Environmental noise in the Arctic – marine mammals, sea ice deformation, seismic events
Moored hydrophones
- **S. Webb** Long-term broad band seismic measurements – monitoring global events in seismically quiet Canada Basin
Seafloor broad band seismic sensor

Physical and Chemical Oceanography

- **D. Martinson** Seasonal evolution of the surface mixed layer and halocline
CTD measurements from ice camps and ice breakers, numerical models including sea ice formation
- **P. Schlosser, W. Smethie, B. Newton**
Freshwater origin and circulation in the Arctic Ocean
Halocline and subsurface circulation of the Arctic Ocean
Arctic Ocean outflow to the Nordic Seas and formation of NADW
CTD measurements, collection of water from submarines, ice breakers, ice camps, and aircraft and analysis for anthropogenic and freshwater tracers, numerical modeling
- **T. Takahashi** CO₂ uptake and transport out of the Arctic Ocean
CO₂, alkalinity, nutrient and oxygen measurements from seasonal cruises of the Iceland Marine Research Institute



Paleoclimate and Paleoecology

- **P. Biscaye** Paleowinds from dust records in the Greenland Ice Sheet and modern day transport of dust to Greenland
Chemical analysis of dust from the Greenland Ice core and from snow and firn to determine mineralogy and hence origin of dust
- **R. D'Arrigo** Arctic temperature record for past several hundred
- **G. Jacoby** years
Tree ring analysis from Alaska, the Taimyr Peninsula and Siberia
- **D. Peteet** Abrupt climate change, carbon sequestration and tree migration rates in Arctic wetlands
Collection of sediments and analysis of pollen content

Marine Biology

- **R. Sambrotto** Net biological production in Canada Basin from water column budgets of CO₂ and O
Respiration in the upper halocline
CTD, florescence, nutrient and oxygen observations from submarines and ice breakers

Ice

- **B. Tremblay** Sea ice export from the Arctic Ocean
Numerical models
Thermal conductivity of snow and ice
In situ measurements
- **S. Pfirman** Sea ice origin and flow paths
Pollutant Transport by sea ice
Satellite observations of sea ice

Education

- **S. Pfirman** Exploring the Poles - an undergraduate course for
- **R. Bell** non-science majors. Covers climate, climate variability and the impact of climate variability
- **Most PIs** Graduate and/or undergraduate students are involved in most research projects

Concerns of LDEO Scientists about Arctic research

- Funding for small (1-4 PIs) proposals
- Ability to make time series observations
- New Technology
 - Cabled Observatories
 - AUVs/ROVs
- Access to the Arctic Ocean
 - Icebreakers
 - Aircraft
 - Submersibles
 - Long-term moorings



