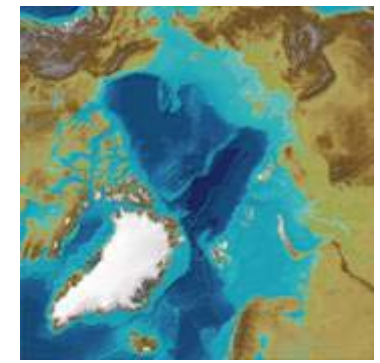
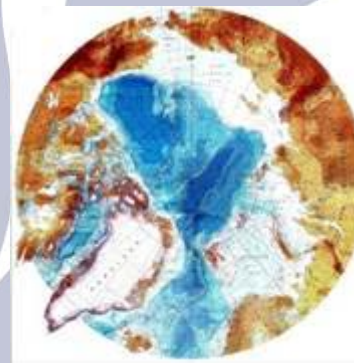


International Bathymetric Chart of the Arctic Ocean (IBCAO)

Martin Jakobsson

Department of Geological Sciences, Stockholm University



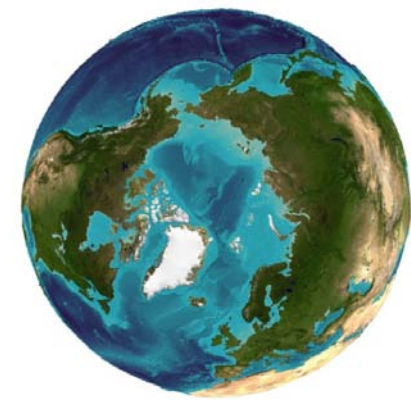
1500

1800

1900

2000

International Bathymetric Chart of the Arctic Ocean (IBCAO)



- Initiated 1997 in St Petersburg, Russia
- Originally endorsed by the Intergovernmental Oceanographic Commission (IOC), the International Arctic Science Committee (IASC), the International Hydrographic Organization (IHO)

THE INTERNATIONAL BATHYMETRIC CHART OF THE ARCTIC OCEAN
PARTICIPATING COUNTRIES AND ORGANIZATIONS

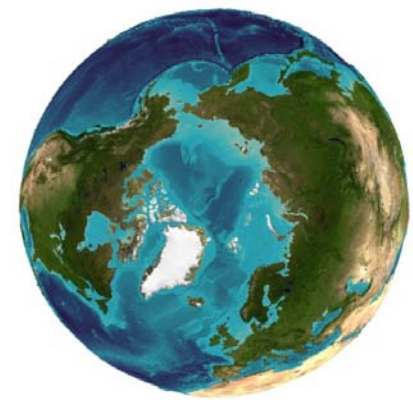
	Geological Survey of Canada
	Royal Danish Administration of Hydrography and Navigation
	Alfred Wegener Institute
	Icelandic Hydrographic Service
	Norwegian Petroleum Directorate
	Head Department of Navigation and Oceanography Research Institute for Geology and Mineral Resources of the World Ocean
	Stockholm University
	Five Oceans Consultants National Geophysical Data Center Tulane University

EB-IBCAO, March 2000

Chairman: Ron Macnab

**First compilation published
2000 in EOS:**

Jakobsson, M., Cherkis, N., Woodward, J., Macnab, R., Coakley, B., 2000. New grid of Arctic bathymetry aids scientists and mapmakers. EOS, Transactions American Geophysical Union 81, 89, 93, 96.

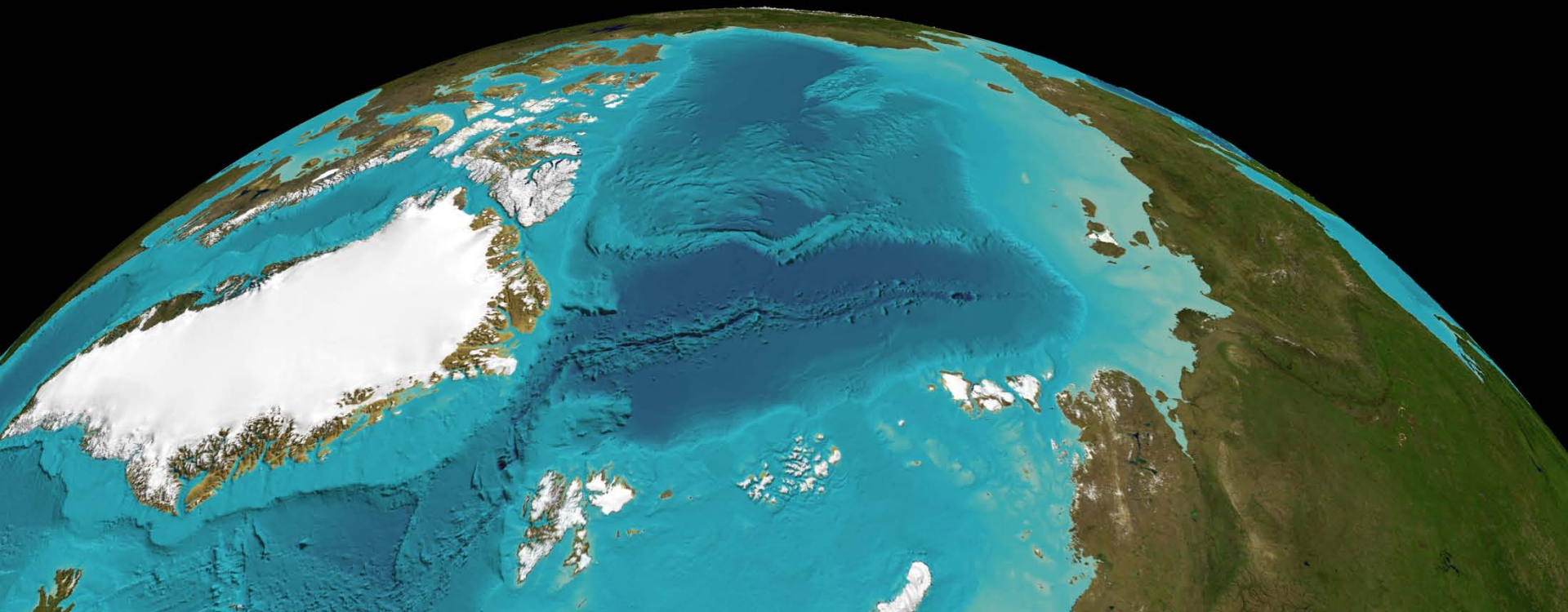


IBCAO:

**A collaboration project between
Hydrographic Organizations, Research
institutions, Universities and Navies**

Main goals:

1. Compile the best possible regional portrayal of the Arctic Ocean north of 64°N
2. Provide our compilation to GEBCO's global bathymetric grid (currently 30°x30° arc second resolution)

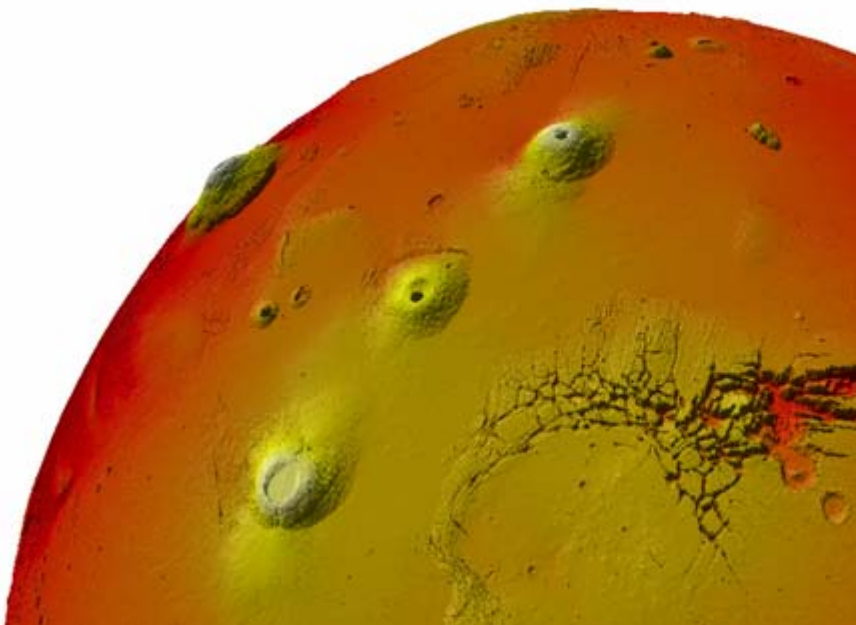


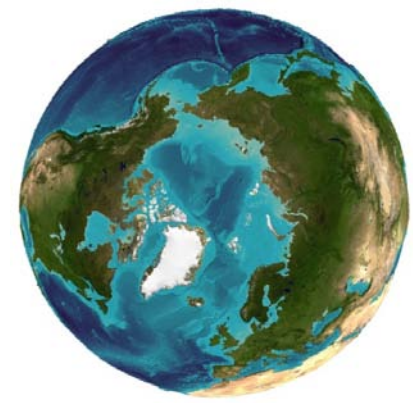
Status 2011:

< 7 % of the central Arctic Ocean is mapped with multibeam

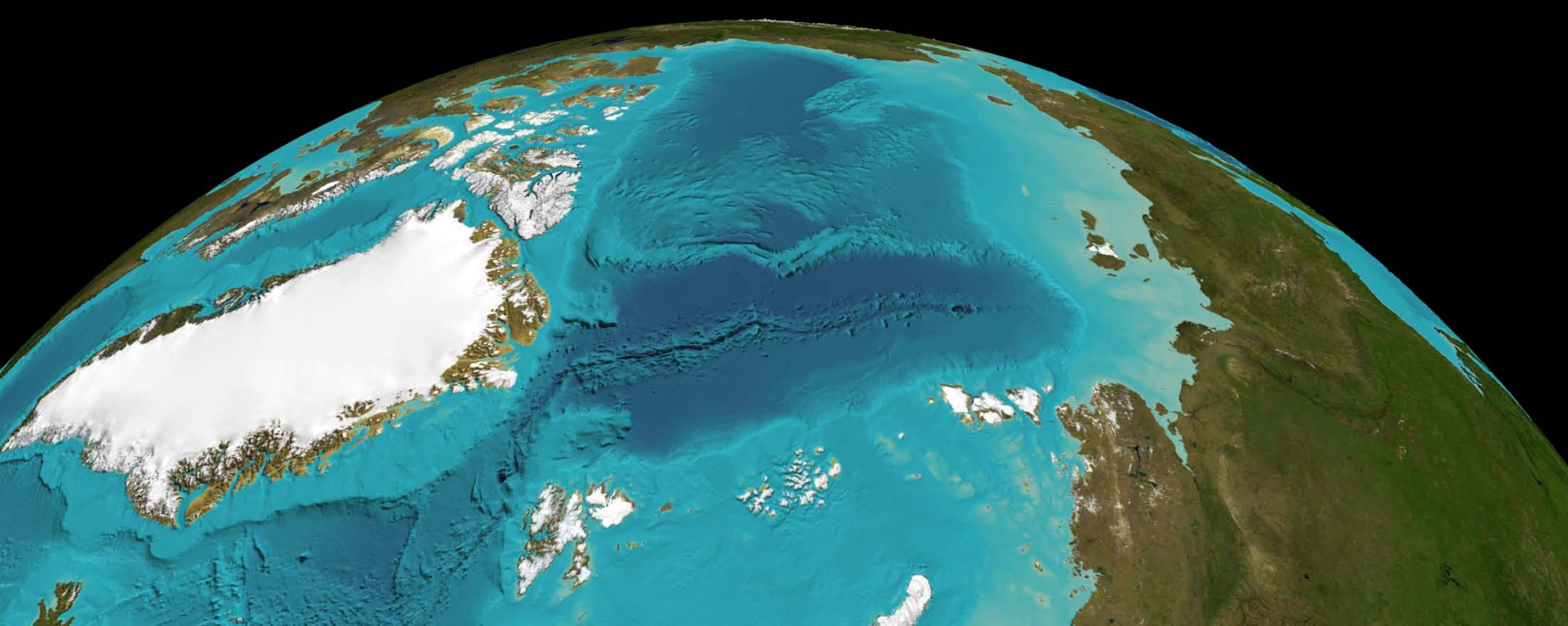
Mars was mapped already in 1998 and 1999 by NASA's Mars Orbiter Laser Altimeter (MOLA).

From Mars Express High-Resolution Stereo Camera (HRSC) images, DTMs of 50x50 m resolution are produced and ortho-images with 12.5 m resolution (*Gwinner, et al., EPSL, 2010*)





IBCAO Version 3.0



Arctic-Antarctic Seafloor Mapping Meeting 2011

Stockholm May 3-5



New IBCAO Editorial Board

- **Steve Forbes**, Canadian Hydrographic Service (Canada)
- **Richard Petersen**, Danish Maritime Safety Administration (Denmark)
- **Hans-Werner Schenke**, Alfred Wegener Inst. for Polar and Marine Research (Germany)
- **Hanne Hodnesdal**, Norwegian Mapping Authority, Hydrographic Service (Norway)
- **Riko Noormets**, UNIS, the University Center of Svalbard (Norway/Svalbard)
- **Michele Rebesco**, Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS) (Italy)
- **Boris Fridman**, North-West center of geoinformation (Russian Federation)
- **Yulia Zarayskaya**, Geological Institute of Russian Academy of Science (Russian Federation)
- **Martin Jakobsson**, Stockholm University (Sweden) Interim Chairman
- **Bernard Coakley**, University of Alaska Fairbanks (USA)
- **Larry Mayer**, University of New Hampshire (USA)
- **Julian Dowdeswell**, University of Cambridge (UK)

Board is not closed, more representatives may be recruited, eg Iceland, China, Republic of Korea, and Japan

Scientific Advisers

- Paul Bienhoff
- Norman Cherkis
- Ian Church
- Christian Marcussen
- John Farrell
- Ron Macnab
- Dave Monahan
- German Naryschkin
- George Newton
- Roy Wollvik
- and more to be included



IBCAO Version 3.0

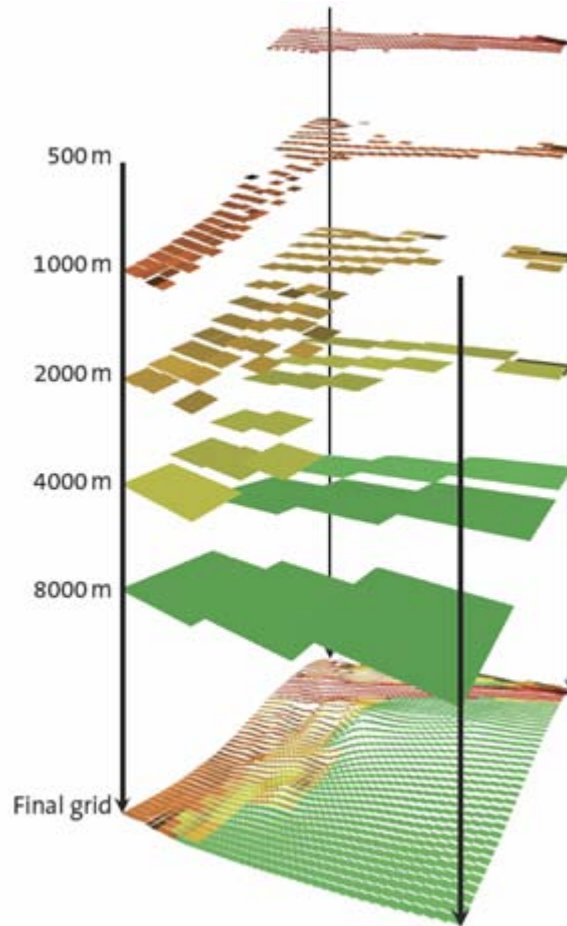


- Higher resolution: 500x500m, where possible
- To be gridded using algorithms tuned to data source density
- Better and more accessible source data information
- First snapshots planned to be presented during the American Geophysical Union (AGU) Fall Meeting in San Francisco, December
- Group authored article to accompany release
- Web page to be updated in time for 3.0 release
- New printed map based on IBCAO 3.0

Gridding heterogeneous data sets

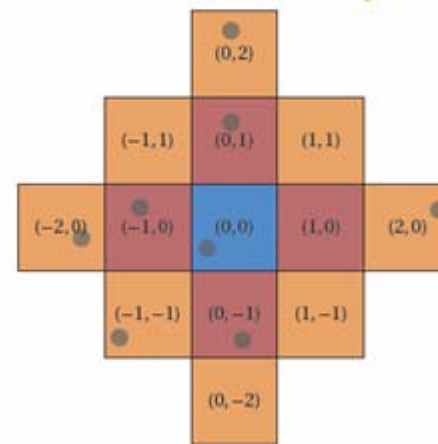


Stockholms universitet



a: Grid stacking

surface $-M\langle N_1 \rangle / \langle N_2 \rangle / \langle N_3 \rangle \dots$



$N_1 \in \{0,1\}$

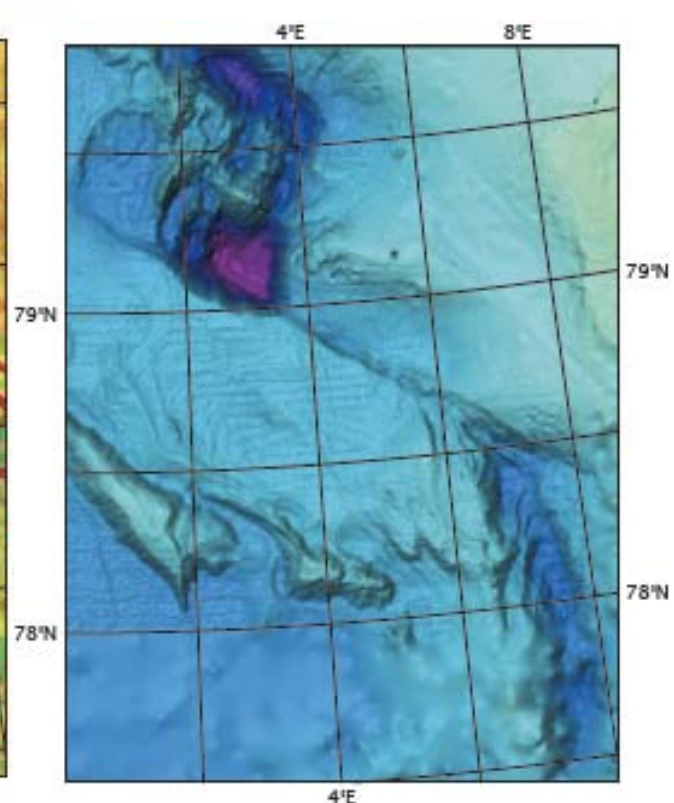
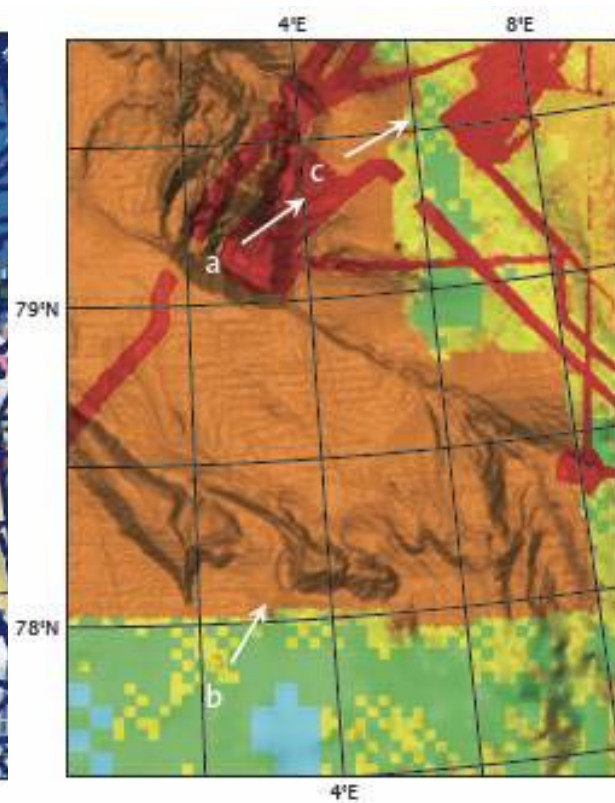
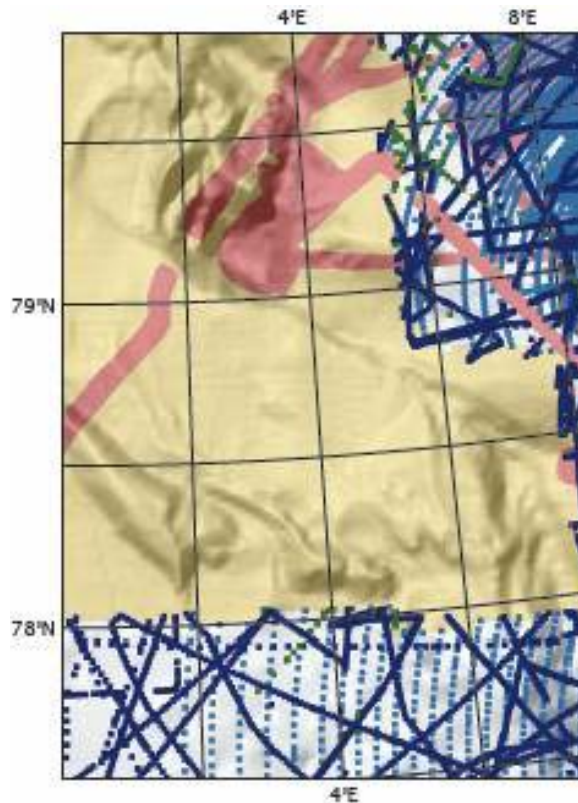
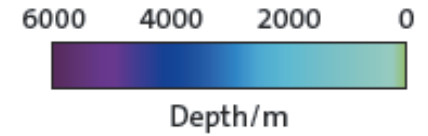
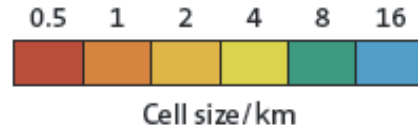
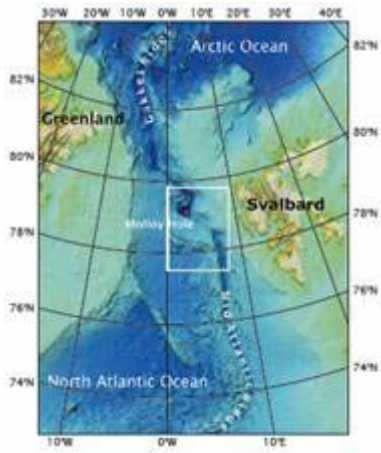
$N_2 \in \{0,1,\dots,4\}$

$N_3 \in \{0,1,\dots,8\}$

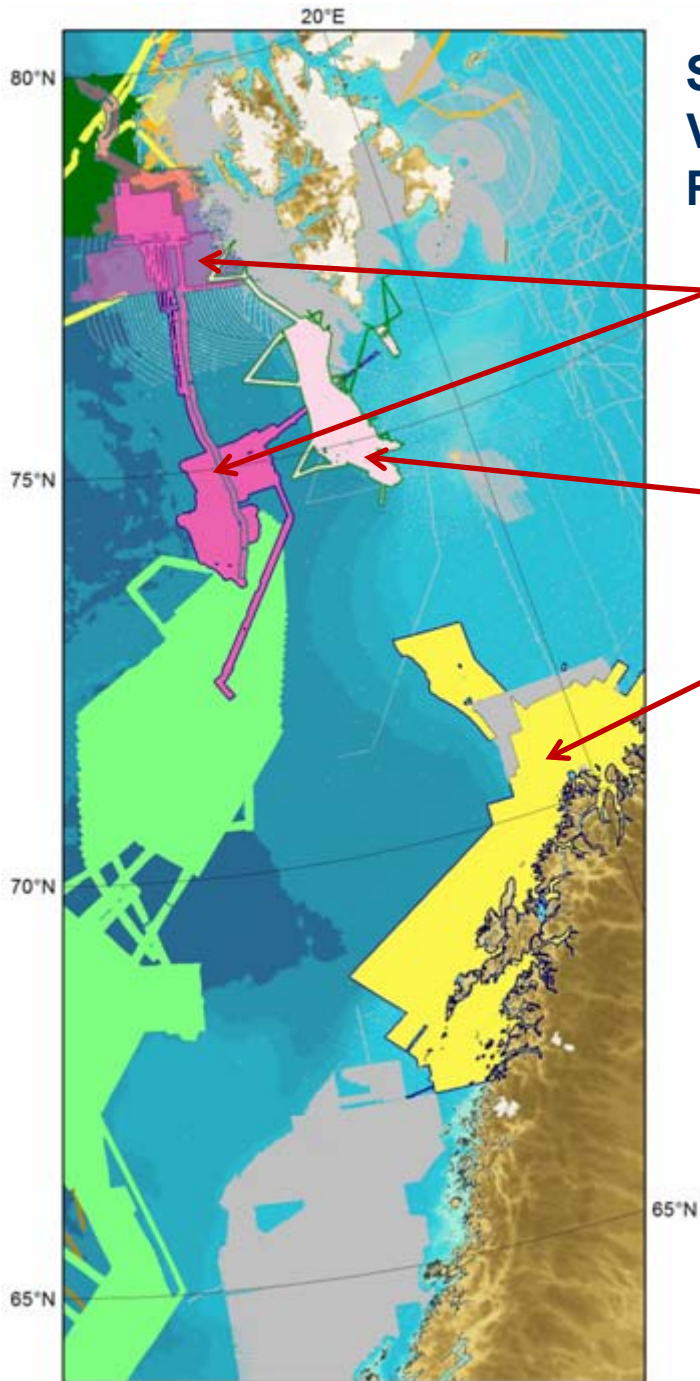
b: Surface masking

Hell, B., and Jakobsson, M, Gridding heterogeneous bathymetric data sets with stacked continuous curvature splines in tension, accepted Marine Geophysical Researches.

Test area in the Fram Strait



Typical heterogeneous sounding database



**Some examples: To be included in IBCAO
Version 3.0
Release early 2012**

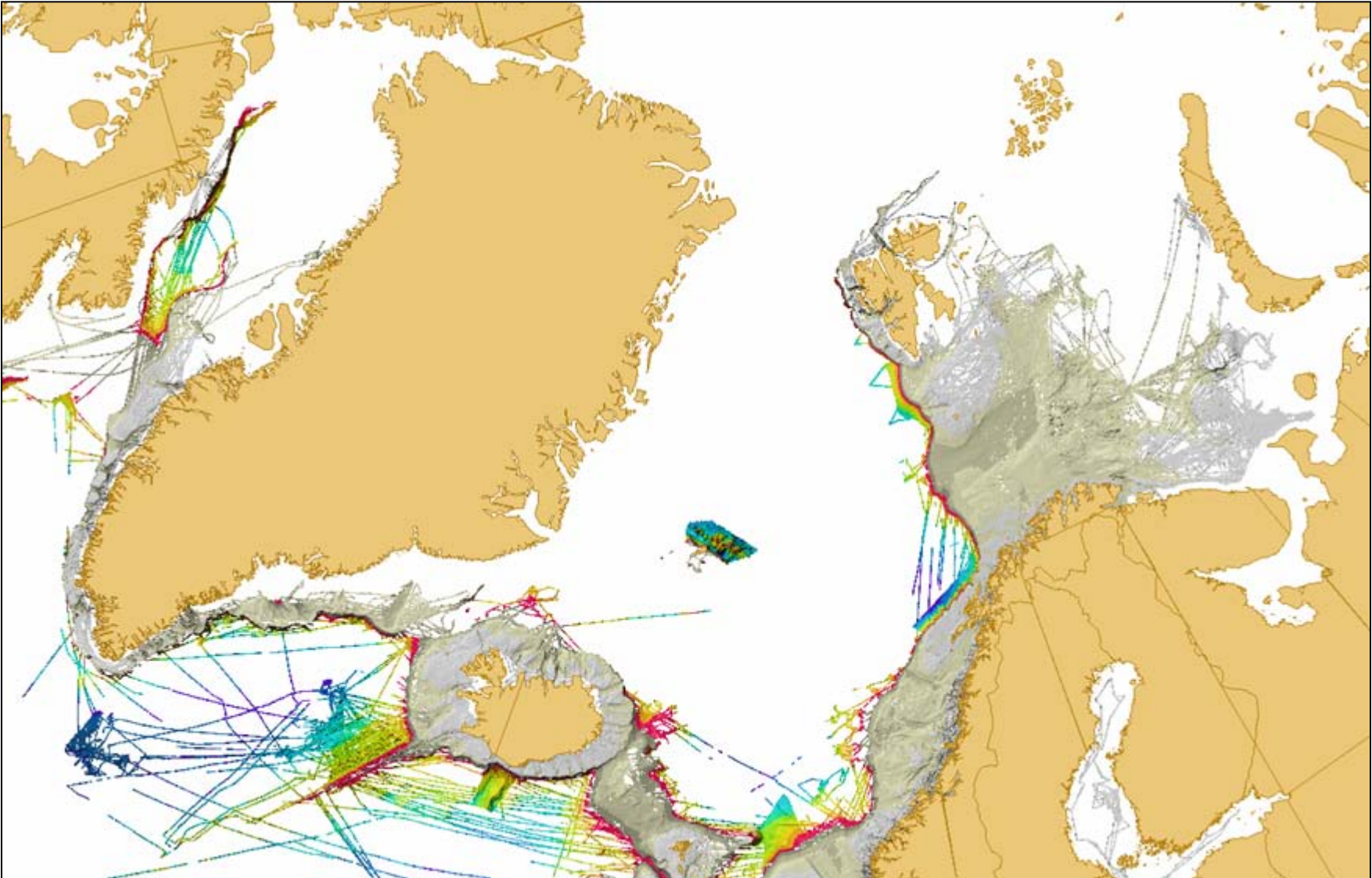
**The Geological Institute of Russian
Academy of Sciences (GIN RAS)**

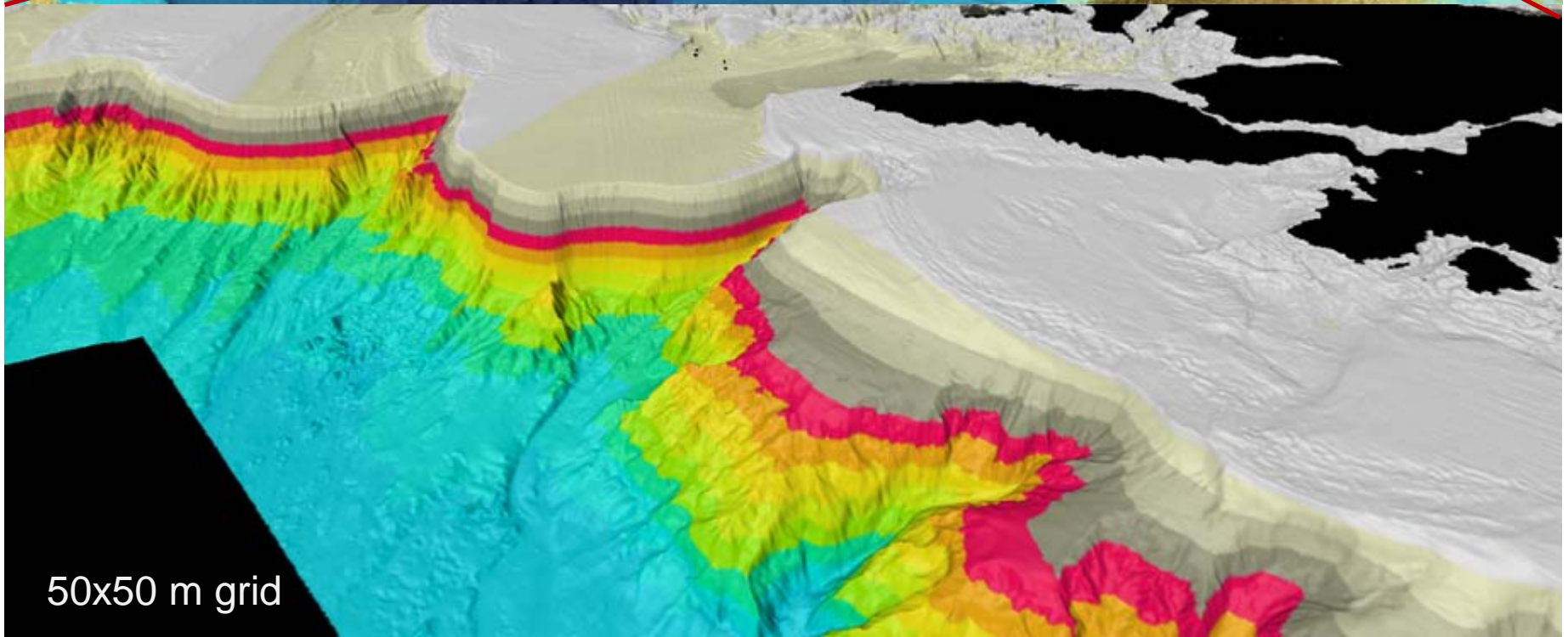
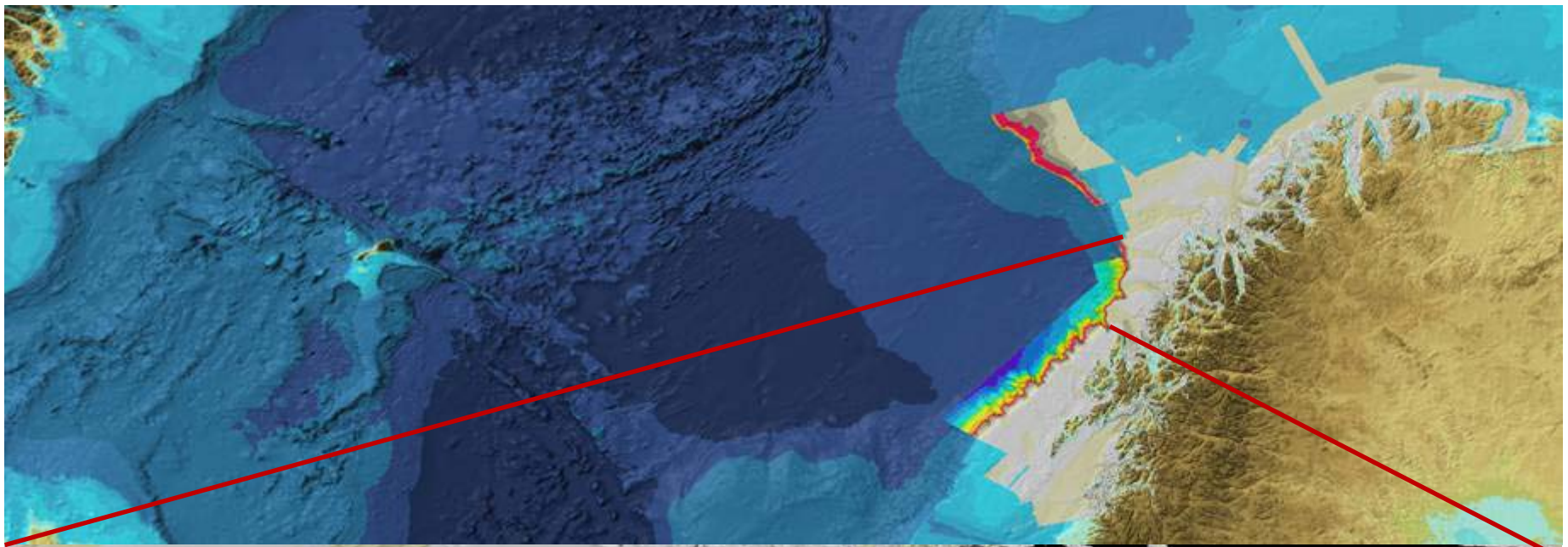
OGS, Italy

MAREANO, Norway

***In other parts of the Arctic region:*
New data from Arctic Net, Danish Maritime
Safety Administration, Canadian
Hydrographic Service, NOAA, US Navy,
LDEO, BAS, University of Cambridge, UNIS, +
many academic institutions**

OLEX contribution





50x50 m grid



IBCAO presentation at ARHC

We specifically emphasized that we hope for a:

1. close cooperation and liaison with ARHC
2. bathymetric data exchange or..
3. ARHC contribution of high resolution gridded bathymetric data sets for the Arctic Ocean continental shelf areas