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3-D Visualization of IBCAO

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Best wishes! Fabio Carocci

17. The new gravity map of the Arctic

Bernie Coakley, University of Alaska, Fairbanks AK, USA

Begun at ICAM III in 1998, the Arctic Gravity Project has been carried forward to completion by NIMA under the leadership of Steve Kenyon of NIMA and Rene Forsberg of KMS. Data incorporated in this grid were collected from submarines (US SCICEX program), P-3 Orion aircraft (flown by the US Naval Research Laboratory), satellites (data reduction by US NOAA and University College London) and ships operating on behalf of various government agencies, e.g. Germany's Alfred Wegener Institute, the Norwegian Petroleum Directorate, and the Geological Survey of Canada. The observations collected from these moving platforms were combined with point measurements collected on land and ice by Canadian and Russian agencies to create an entirely new map, covering the same area as the IBCAO bathymetry grid.

It is expected that this data and map will soon be made available through the project's website at NIMA; http://www.nima.mil/GandG/agp/index.htm. Members of the IBCAO Editorial Board will be notified when the data set is released.

18. Future Arctic operations by research vessels of the USA

Phil McGillivary, USCG, Alameda CA, USA

Report not available.

19. 3D visualization of IBCAO

Martin Jakobsson (CCOM/JHC) and Ron Macnab (GSC Retired)

The IBCAO model lends itself well to computer 3D visualization since it is a digital grid model containing both bathymetric and topographic information. A 3D shaded relief is capable of visualizing the seafloor morphology in a much more natural appearing form than a traditional contour map. Information between contours is revealed, and the applied shading gives the viewer a "3D impression" which makes the morphology easier to perceive. However, good high quality 3D software packages have not been readily available for the broader public due to high licensing costs and hardware requirements. Recent developments within the software industry, as well as the rapid evolution of hardware, have changed this situation. Today advanced 3D visualization software may be easily operated on a high-end laptop.

In order to promote their software, some companies have released viewers that are free for downloading. One such software package is *Fledermaus*, created by Interactive Visualization Systems (IVS; www.ivs.unb.ca). IVS have recently released *iView3D*, which supports the viewing of 3D objects in the *Fledermaus* format. Accordingly, we have rendered the IBCAO model using *Fledermaus* - the files will be made available through the IBCAO web page, along with information on how to obtain a demo of *iView3D* (Figures 19-1 and 19-2).

Another 3D visualization package is *HHViewer* (Helical Systems, http://www.helical.ns.ca/), which uses the Helical Hyperspatial Code (HHCode) for the efficient compression of multidimensional data sets in a binary interleaved format. A trial version of the viewer may be downloaded from the Company's website, along with an Arctic data set that features the IBCAO grid fused with grids that describe the magnetic and gravity fields, and sediment thickness. Figures 19-3, 19-4, and 19-5 illustrate some of the visualization possibilities that are available with this combination of software and data.

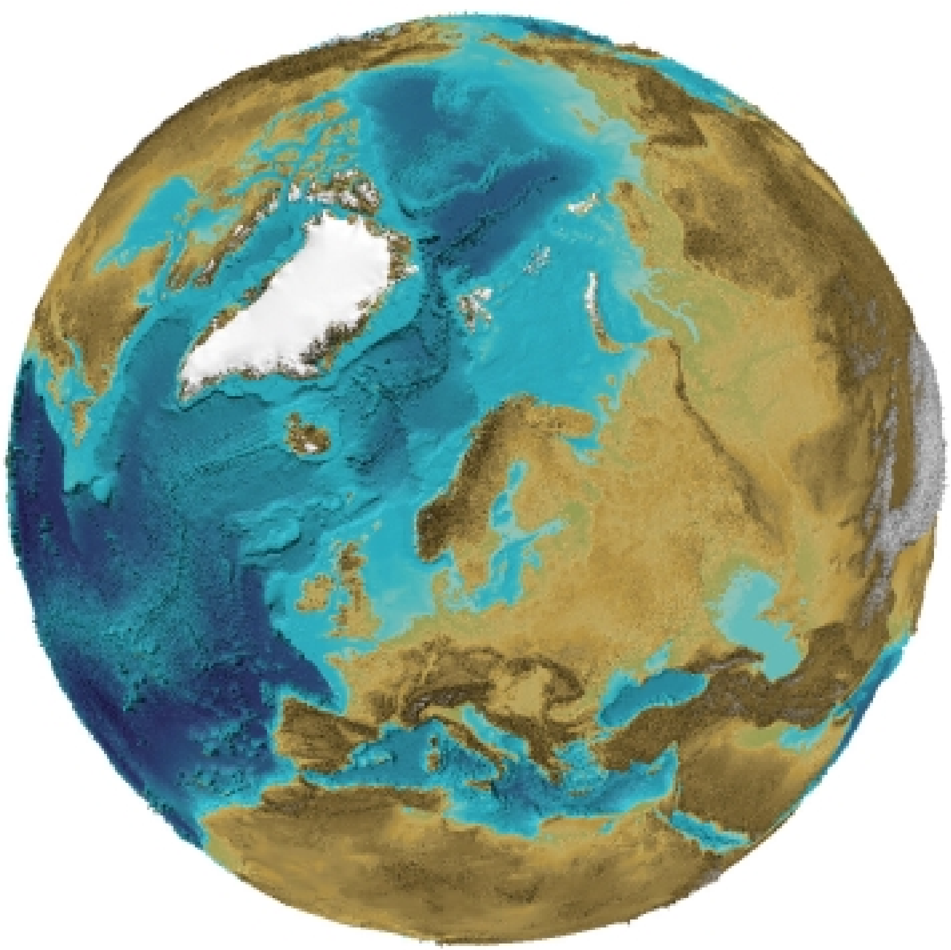

Figure 19-1. Visualization created with the *Fledermaus* software from IVS (www.ivs.unb.ca) of ETOPO2, a data set that is available through the National Geophysical Data Center (NGDC). ETOPO2 consists of IBCAO north of 64°N and the Predicted Topography (Smith and Sandwell, 1997) south of 64°N.

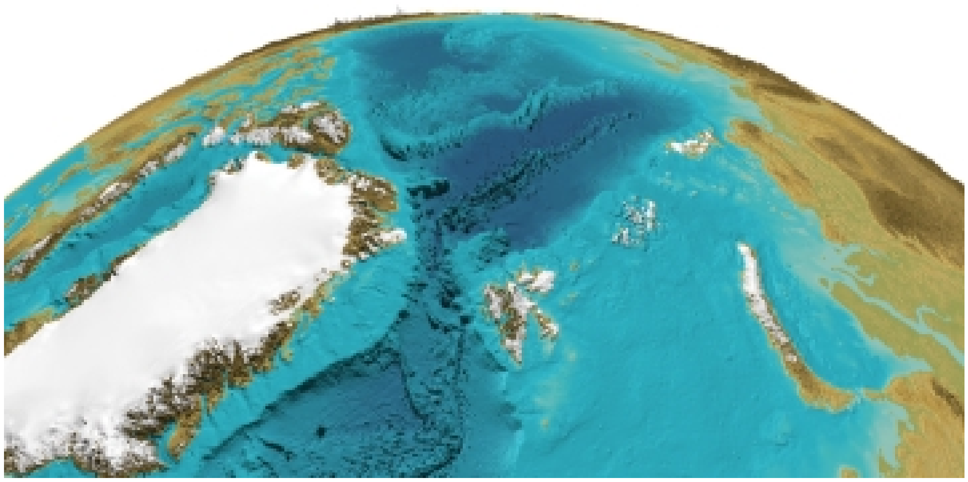

Figure 19-2. Detailed view of Figure 1.

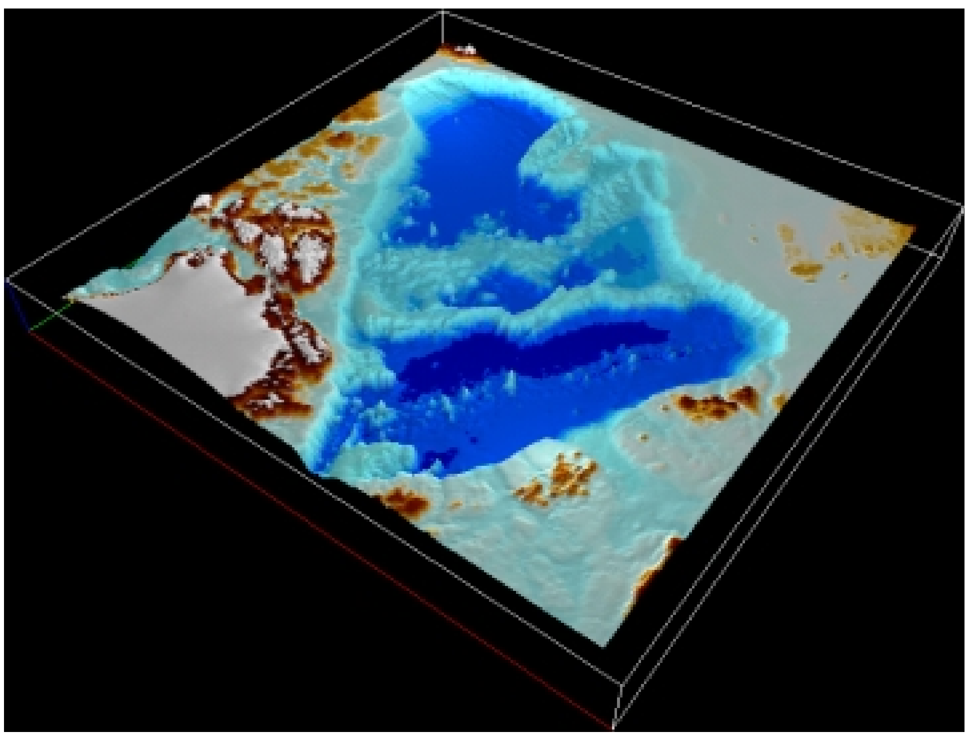

Figure 19-3. *HHViewer* rendition of the IBCAO grid, formatted in HHCode. Light blue: shallow water; dark blue: deep water.

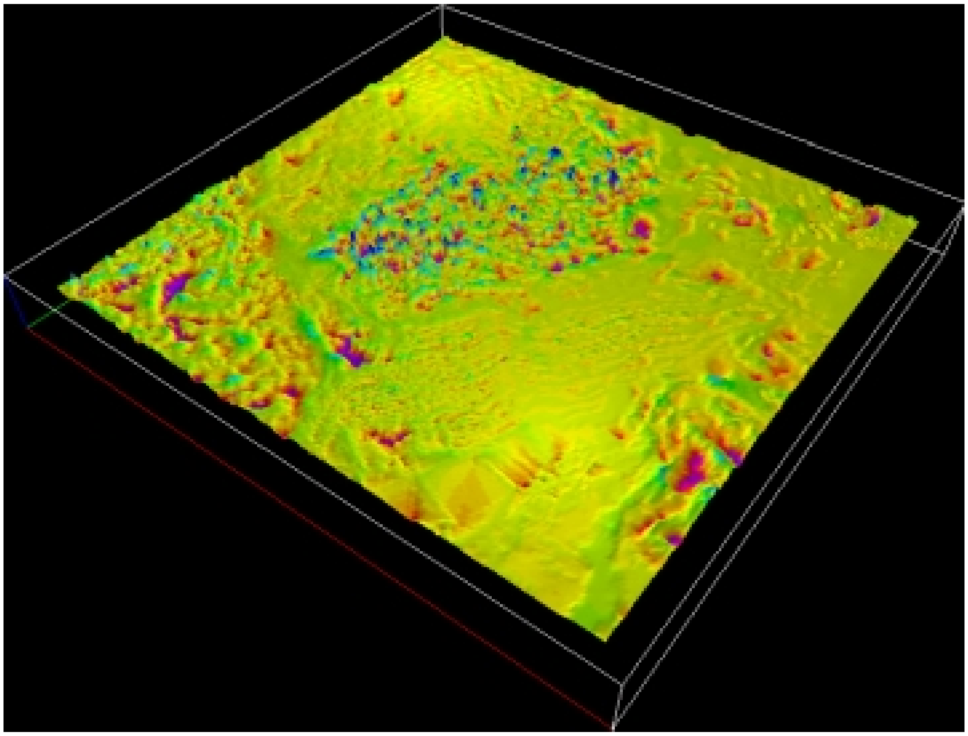

Figure 19-4. *HHViewer* rendition of the magnetic anomaly field of the Arctic Ocean fused with the IBCAO grid in HHCode. Red: positive anomaly; blue: negative anomaly.

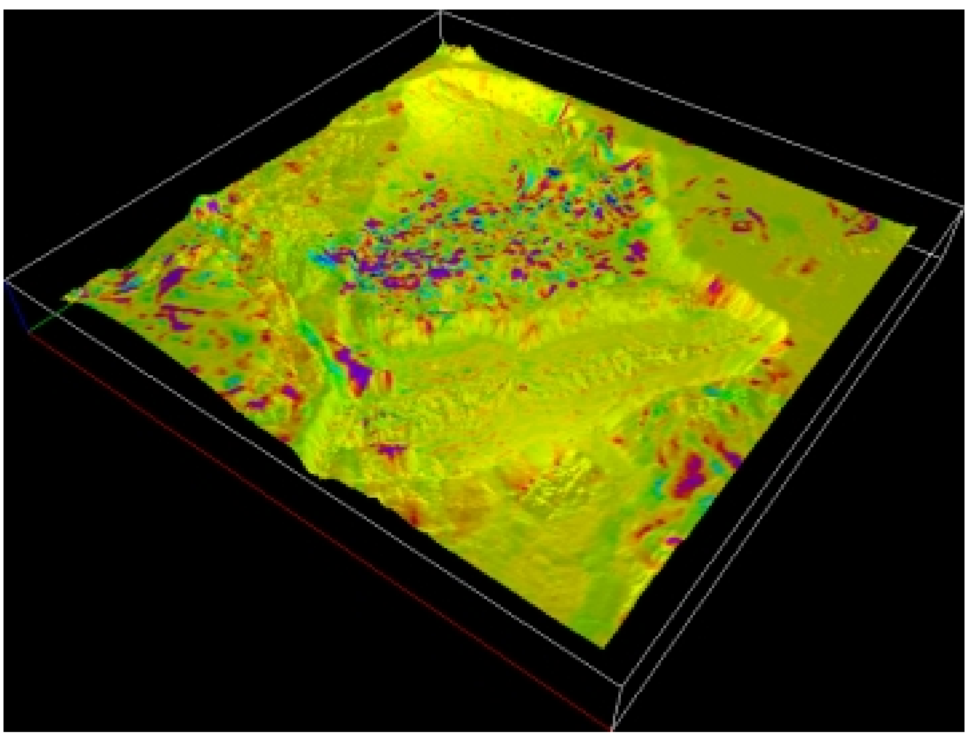

Figure 19-5. *HHViewer* rendition of the magnetic anomaly grid (colour) draped over the IBCAO bathymetric grid (grey tones).