Auxiliary Material
The International Bathymetric Chart of the Arctic Ocean (IBCAO) Version 3.0

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1.0. Download information and available Digital Bathymetric Models (DBM)

IBCAO Version 3.0 can be downloaded from www.ibcao.org. Four different DBMs are provided in GMT netCDF (see http://gmt.soest.hawaii.edu/) and Esri ARC grid formats.

The four different DBMs:

a) (**IBCAO_V3_500m_RR**). DBM compiled with all multibeam, dense single beam and land data added at 500 x 500 m resolution in a final step using the remove-restore method. This DBM is recommended for analyses requiring the best possible resolution where data exists. Well surveyed areas are clearly distinguished in this grid, specifically if there are nearby areas with sparse data that appear smooth.

Resolution: 500 x 500 m grid cells
Projection: Polar stereographic, true scale 75°N (if scale factor is applied it should be set to 0.982966757777337), latitude of origin 90°N, longitude of origin 0°.
Horizontal Datum: WGS84
Vertical Datum: Mean Sea Level
Extent (Polar stereographic coordinates): Easting -2904000 to 290400;
Northing -2904000 to 290400
Grid dimension: 11617 x 11617

b) (**IBCAO_V3_500m_SM**) DBM compiled with the land data added at 500 x 500 m resolution in a final step using the remove-restore method. This DBM portrays the seafloor with a general and smooth appearance. The smooth representation of the seafloor was achieved by applying a Cosine tapered filter over 6000 m (see gridding methods described in 4.0.). This DBM may be better suited for overview map making than the version described in a) due to its more homogenous and smooth appearance.
Resolution: 500 x 500 m grid cells
Projection: Polar stereographic, true scale 75°N (if scale factor is applied it should be set to 0.982966757777337), latitude of origin 90°N, longitude of origin 0°.
Horizontal Datum: WGS84
Vertical Datum: Mean Sea Level
Extent (Polar stereographic coordinates): Easting -2904000 to 290400;
Northing -2904000 to 290400
Grid dimension: 11617 x 11617

c) (**IBCAO_V3_30arcsec_RR**) A re-projected version of IBCAO_V3_500m_RR.
Resolution: 30 x 30 arc seconds
Projection: Geographic
Horizontal Datum: WGS84
Vertical Datum: Mean Sea Level
Extent: East-West, -180 to 180; South-North: 64°N to 90°N
Grid dimension:3121 x 43201

d) (**IBCAO_V3_30arcsec_SM**) A re-projected version of IBCAO_V3_500m_SM.
Resolution: 30 x 30 arc seconds
Projection: Geographic
Horizontal Datum: WGS84
Vertical Datum: Mean Sea Level
Extent: East-West, -180 to 180; South-North: 64°N to 90°N
Grid dimension: 3121 x 43201

2.0. Source Data

Table A1. Multibeam cruises included in IBCAO Version 3.0 in addition to those used in the Version 2.0 [see *Jakobsson et al.*, 2008]. *USGCG Healy* cruises prior to 2008 were included in IBCAO Version 2.0, but are listed here since they now were added to a higher resolution than previously. Where appropriate, a reference to a data repository is used instead of a reference to specific publication. The listed cruises are shown in Figure 1 of the main article.

Ship	Cruise	Year	Reference	Support
IB Oden	ODEN SAT 2008 ODEN SAT 2009 LOMROG II EAGER 2011	2008 2009 2009 2011	[*Jakobsson et al.*, 2010] [*Jakobsson et al.*, 2010] [*Marcussen and LOMROG II Scientific Party*, 2011] [*Marcussen and EAGER 2011 Scientific Party*, 2011]	Knut and Alice Wallenberg Foundation, Swedish Polar Research Secretariat, Swedish Research Council (VR), Bert Bolin Centre for Climate Research, Continental Shelf Project of the Kingdom of Denmark
CCGC Amundsen	(data provided in batches of multiple cruises)	2003-2011	Data provided through University of New Brunswick and ArcticNet: http://www.omg.unb.ca/Projects/Arctic/google/	ArcticNet/Ocean Mapping Group, University of New Hampshire
RRS James Clark Ross	JR51 JR142 JR211	2000 2006 2008	[*Dowdeswell et al.*, 2002] [*Dowdeswell et al.*, 2010] [*Westbrook et al.*, 2009]	Natural Environment Research Council (NERC)
RV Akademik N. Strakhov	Cruise 24 Cruise 25 Cruise 26	2006 2007 2008	[*Zayonchek et al.*, 2010]	
RV Helmer Hanssen	JM09H JM10 HH11	2009 2010 2011	Data provided through The University Centre in Svalbard	The University Centre in Svalbard
BIO Hespérides	SVAIS	2007	[*Pedrosa et al.*, 2011]	Spanish IPY mapping projects including SVAIS (POL2006-07390/CGL), IPY-NICE STREAMS (CTM2009-06370-E/ANT) and DEGLABAR (CTM2010-17386)
RV Maria S. Merian	05/03	2007	[*Schumann et al.*, 2012]	
RV Mirai	MR99 MR00 MR02 MR04	1999 2000 2002 2004	Data provide through JAMSTEC Data Site for Research Cruises: http://www.godac.jamstec.go.jp/dataportal/index_eng.html	JAMSTEC
RV Knorr	166L14	2002	Provided through WHOI Data Library and Archives	
RV Nathaniel B Palmer	NBP0304	2003	[*Downey et al.*, 2007]	

	NBP0304B	2003		
RV OGS-Explora	EGLACOM	2008	[*Rebesco et al.*, 2011] [*Pedrosa et al.*, 2011]	OGS internal funding provided by Ministero Dell'Istruzione
RV Polarstern	ARX-X/2	1994	[*Hubberten*, 1995]	Alfred Wegener Institute for Polar and Marine Research, Bremerhaven
SV Kommandor Jack		2008	Data collected by Fugro for the Geological Survey of Denmark and Greenland	The Continental Shelf Project of the Kingdom of Denmark
USCGC Healy	HLY0201,03,04 HLY0302,03 HLY0402,03,04 HLY0501,02,03 HLY0602, HLY0703 HLY0804,05 HLY0904,05 HLY1002 HLY1102	2002 2003 2004 2005 2006 2007 2008 2009 2010 2011	[*Darby et al.*, 2005] Data provided through center for Coastal and Ocean Mapping/Joint Hydrographic Center, University of New Hampshire: http://ccom.unh.edu/ [*L.A. Mayer et al.*, 2010] [*L.A. Mayer and Armstrong*, 2011]	Cruises carried out for the US Article 76 project were supported by NOAA grants.
RV Marcus G. Langseth	MGL1112	2011	[*Coakley and Ilhan*, 2011]	National Science Foundation (NSF)

3.0. Source identification grid

A source identification grid has been compiled using the identical resolution and projection parameters as the polar stereographic IBCAO 3.0 grid (Figure A1). Source codes are derived by separating all the source data into the five categories: land (0), multibeam (1), single beam (2), Olex (3), contours from digitized maps (4), and other gridded bathymetric compilations (5). Using this categorization, the data is blockmedian filtered at a bin size of 2000 x 2000 m, which is the same as the depth data is filtered at prior to gridding (see 4.0.). The dominating source for the blockmedian bin is providing the source identification code for a particular grid cell. This allows the user to identify if a grid cell has been constrained by data, and if so, what kind of data. Grid cells unconstrained by data and subjected to interpolation are assigned a value of NaN.

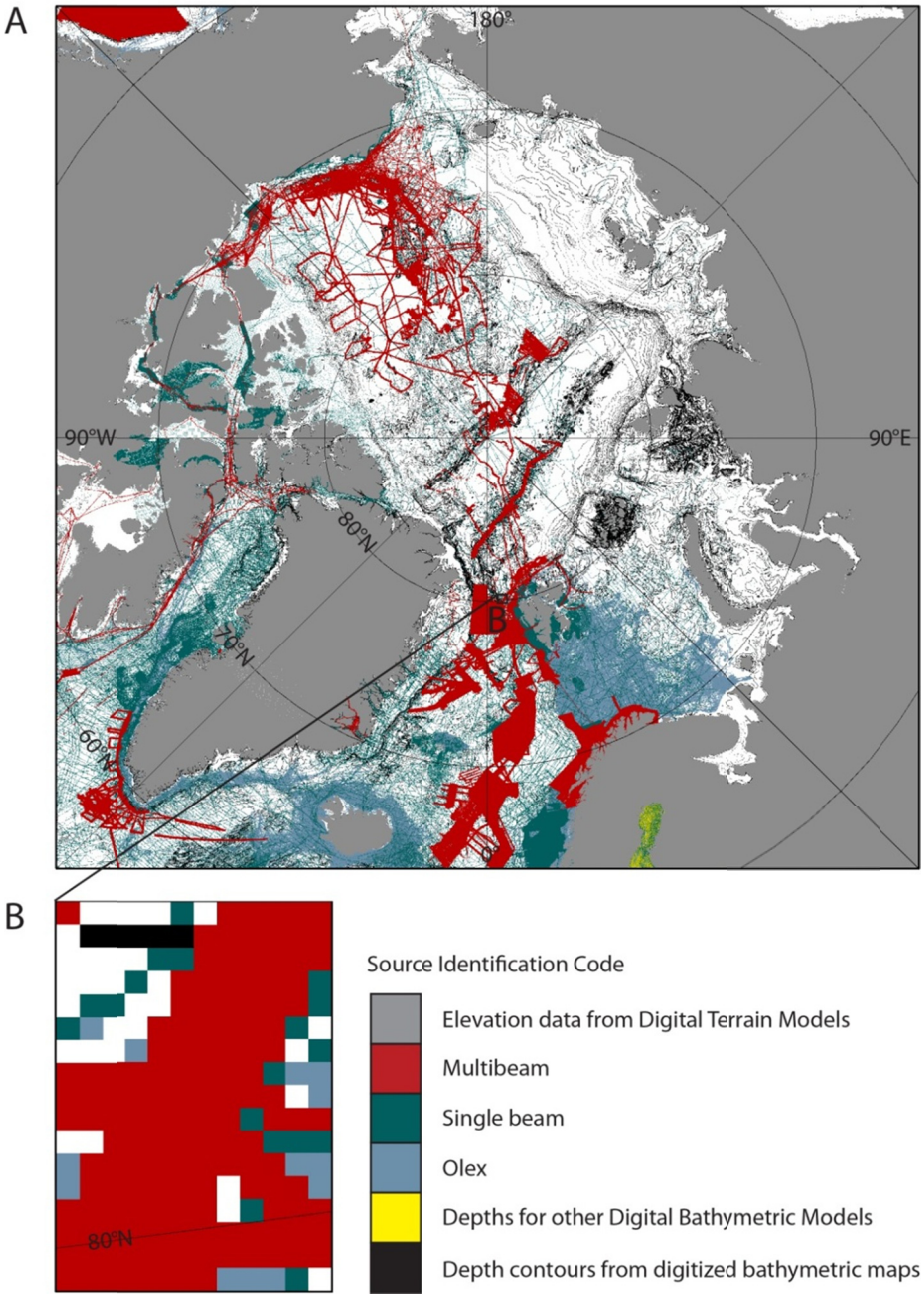
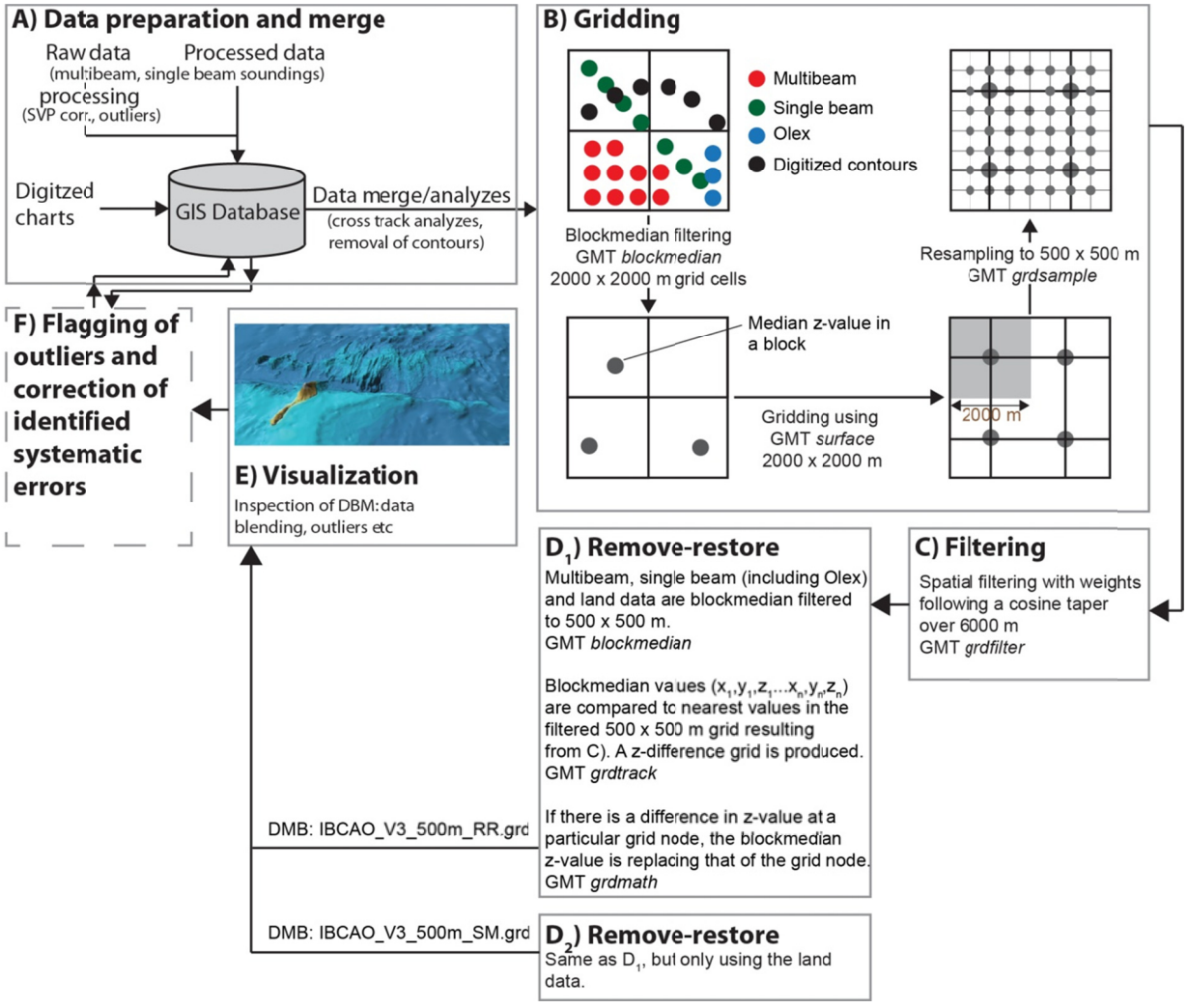


Figure A1. A) Source Identification grid (SID). B) Enlarged area of the SID grid northwest of Svalbard.

4.0. Gridding

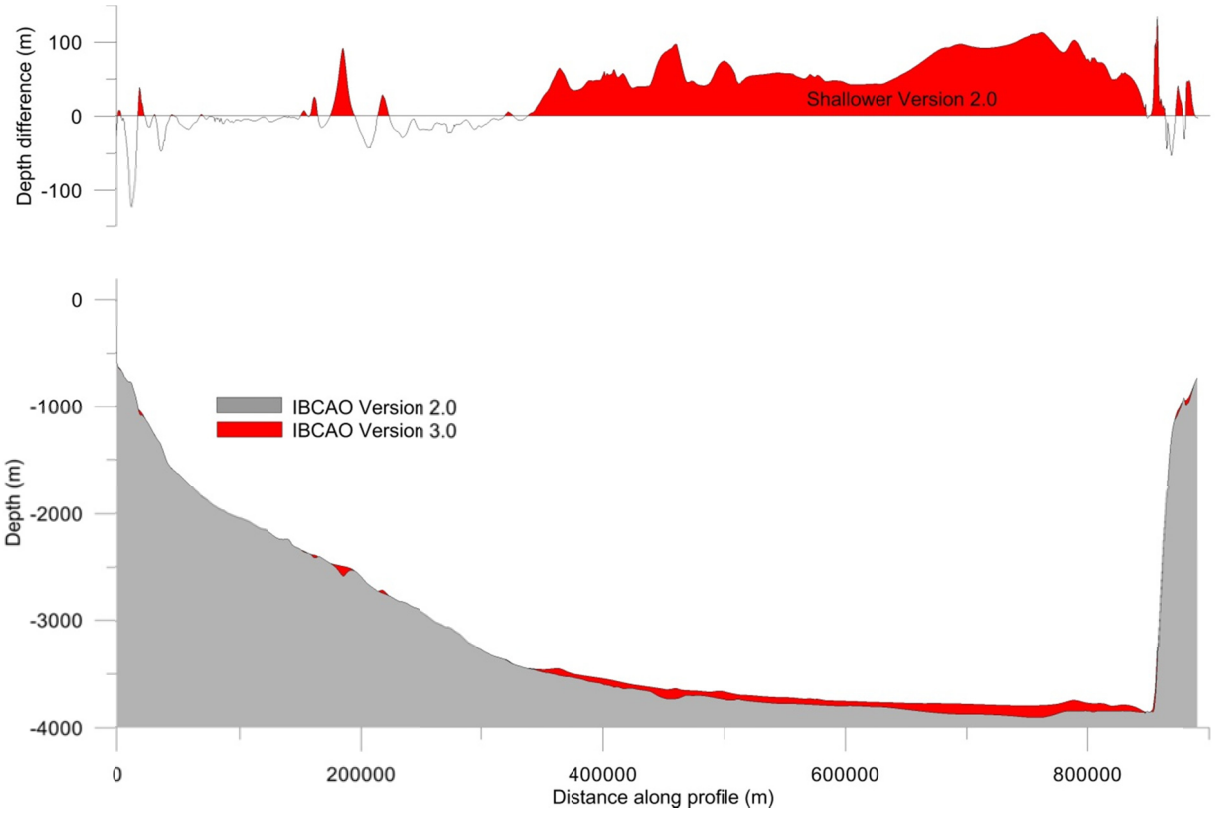
A Schematic illustration of the IBCAO compilation procedure is shown in Figure A2. The main difference from the procedure used to compile IBCAO 2.0, is the final step consisting of adding multibeam, single beam (including Olex), and land data using the remove-restore method. Only single beam soundings with dense spatial coverage (close to or less than 500 m between soundings) are added in this final process, i.e. sparse random tracklines are omitted.

Figure A2. Panels **A-F** describes the most important components in the DBM compilation process.



5.0.Comparison between IBCAO 3.0 and 2.0.

Figure A3. Comparison along a bathymetric profile across the Canada Basin, from the Mackenzie trough (left) to Northwind Ridge (right). This shows that IBCAO 2.0 represented the deep flat Canada Basin slightly too deep.



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