Seabed 2030

The Seabed 2030 Base Line

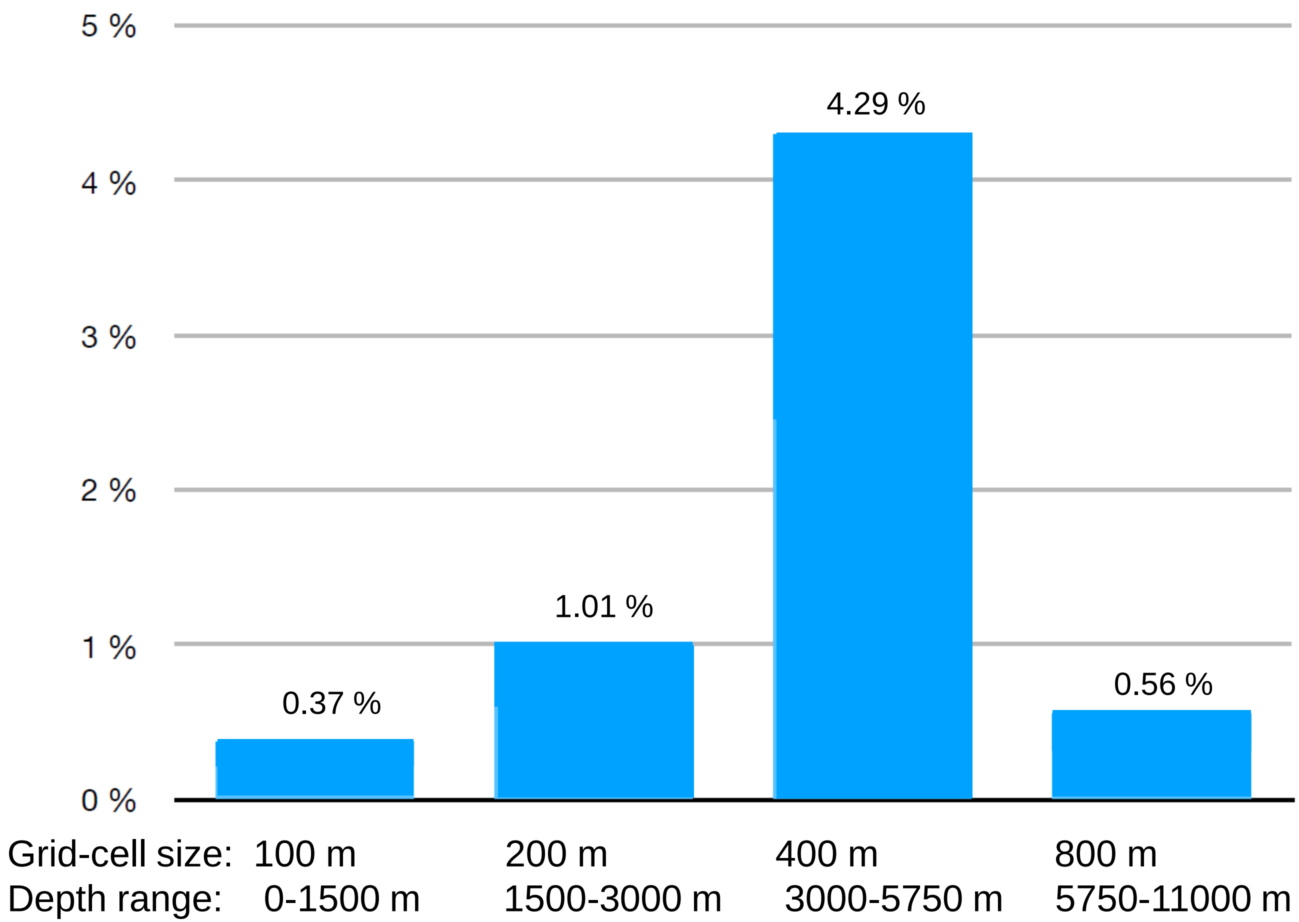
"The mapped portion of the World Ocean in GEBCO_2014 considering the Seabed 2030 mapping resolution target based on depths"

Presentation outline:

1. ***Summary statistics**: Mapped portion of the World Ocean in GEBCO_2014 at Seabed 2030 resolution targets*
2. ***Methods:** Calculation of the statistics*
3. ***Background and explanations:***
   - *Seabed 2030 depth-dependent mapping resolution target*
   - *Calculation of the mapped portion in GEBCO_2014*
   - *Why the grid cell size resolution matters when calculating how much of the World Ocean is mapped*

Summary statistics

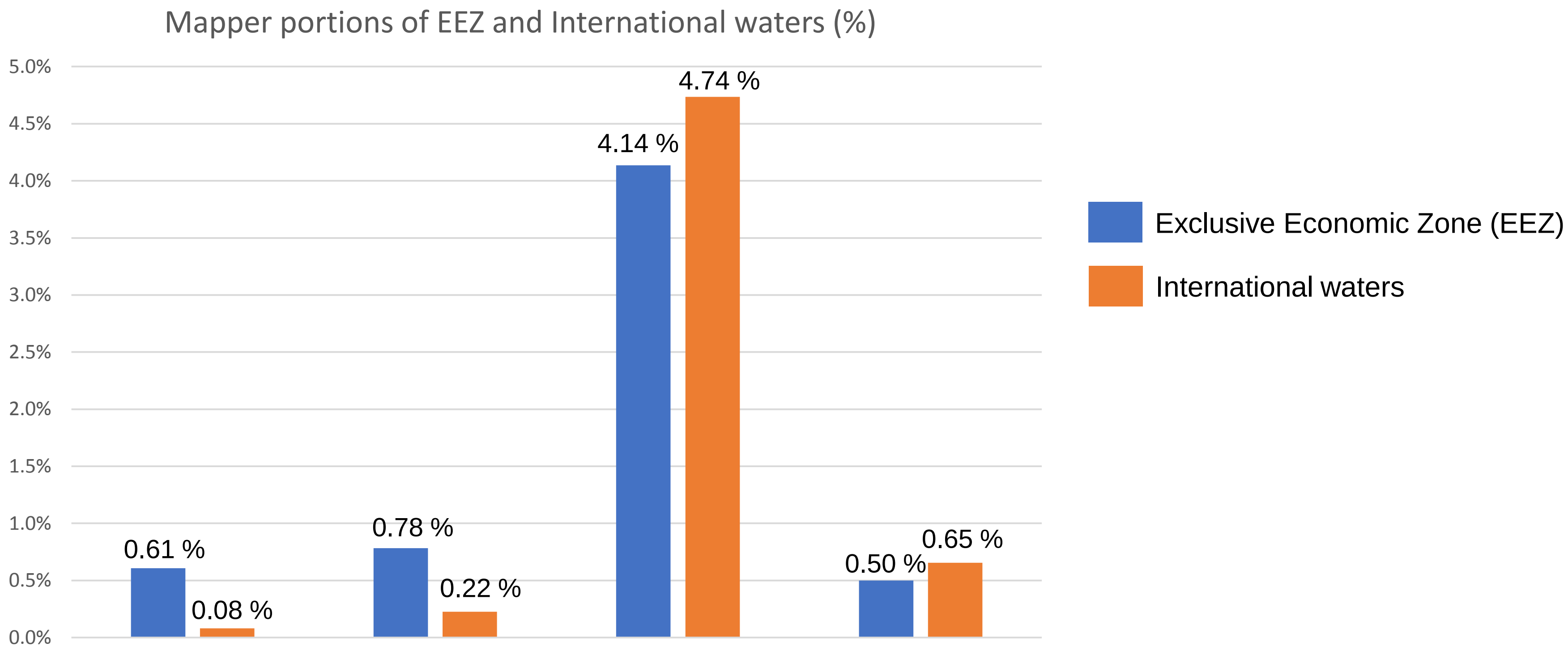
Summary: ~6 % of the World Ocean was mapped in the GEBCO_2014 grid considering the Seabed 2030 grid cell resolution target at different depth intervals



Summary statistics

Summary: 6.0/5.7 % of the EEZ/International waters was mapped in the GEBCO_2014 grid considering the Seabed 2030 grid cell resolution target at different depth intervals.

(This calculation does not make a distinction of an EEZ for Antarctic waters, all data in Antarctic waters are considered to be outside countries EEZs.)



Grid-cell size: 100 m 200 m 400 m 800 m

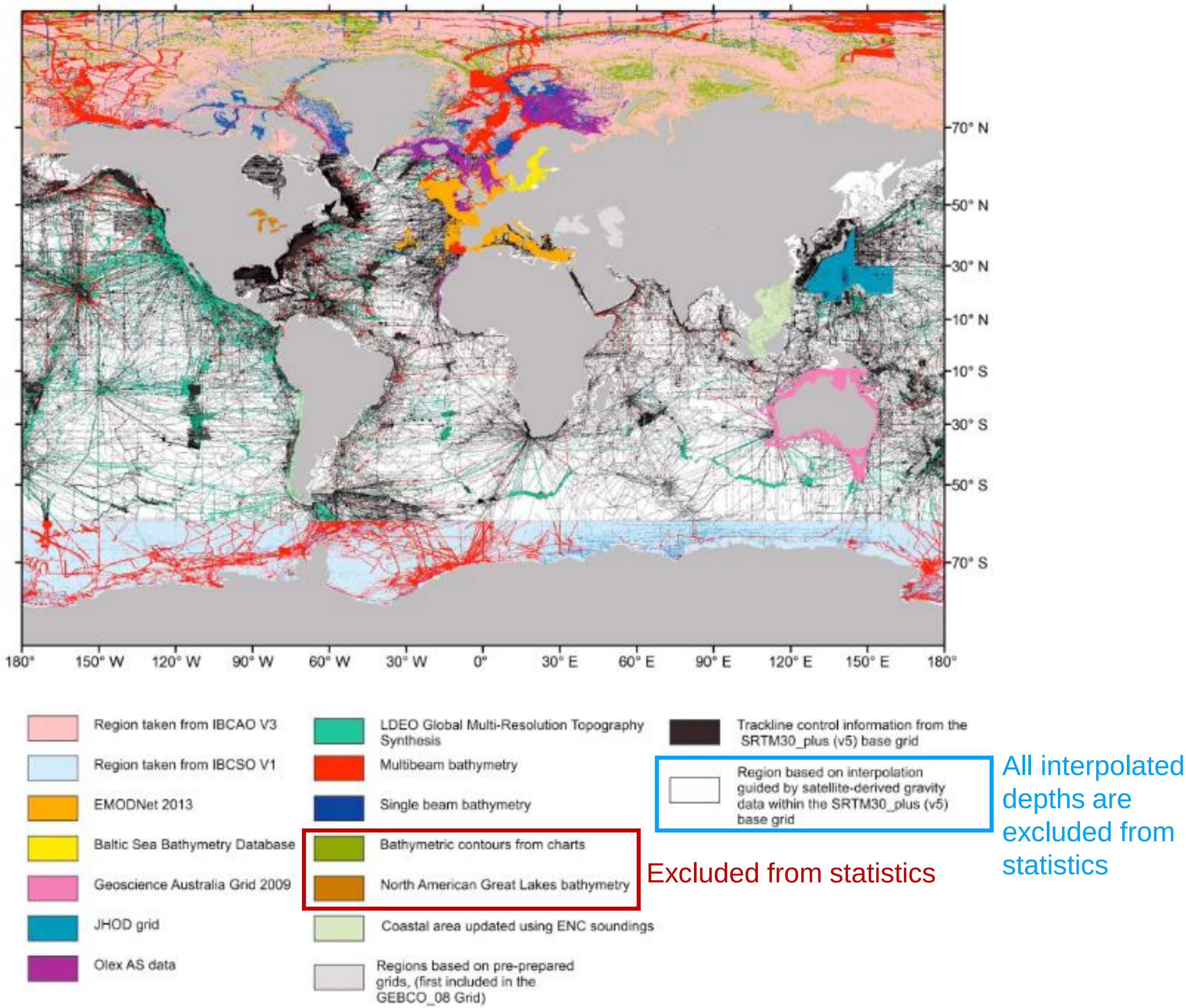
Depth range: 0-1500 m 1500-3000 m 3000-5750 m 5750-11000 m

Methods

Calculation of the statistics

Calculation of the statistics

- All measured depths (multibeam, single beam, spot soundings) that were used to create GEBCO_2014 were included in the statistics.
- Contributed grids were included in the statistics where the underlying data not is available. <u>This will overestimate the mapped portion</u>
- Digitized nodes from depth contour maps are excluded from the statistics
- International waters implies the area outside of countries' EEZ (Exclusive Economic Zone).
- Antarctica is not considered to have an EEZ in our calculations of mapped portion of EEZ respective International waters.
- All calculations are based on counting grid cells filled with data in proportion to the total amount of grid cells covering the World ocean. The size of the grid cells are varied depending on the Seabed 2030 resolution target.
- IBCAO (64-90 N) and IBCSO (60-90 S) were calculated on a Polar Stereographic projection while the in-between region was calculated directly on WGS 84.



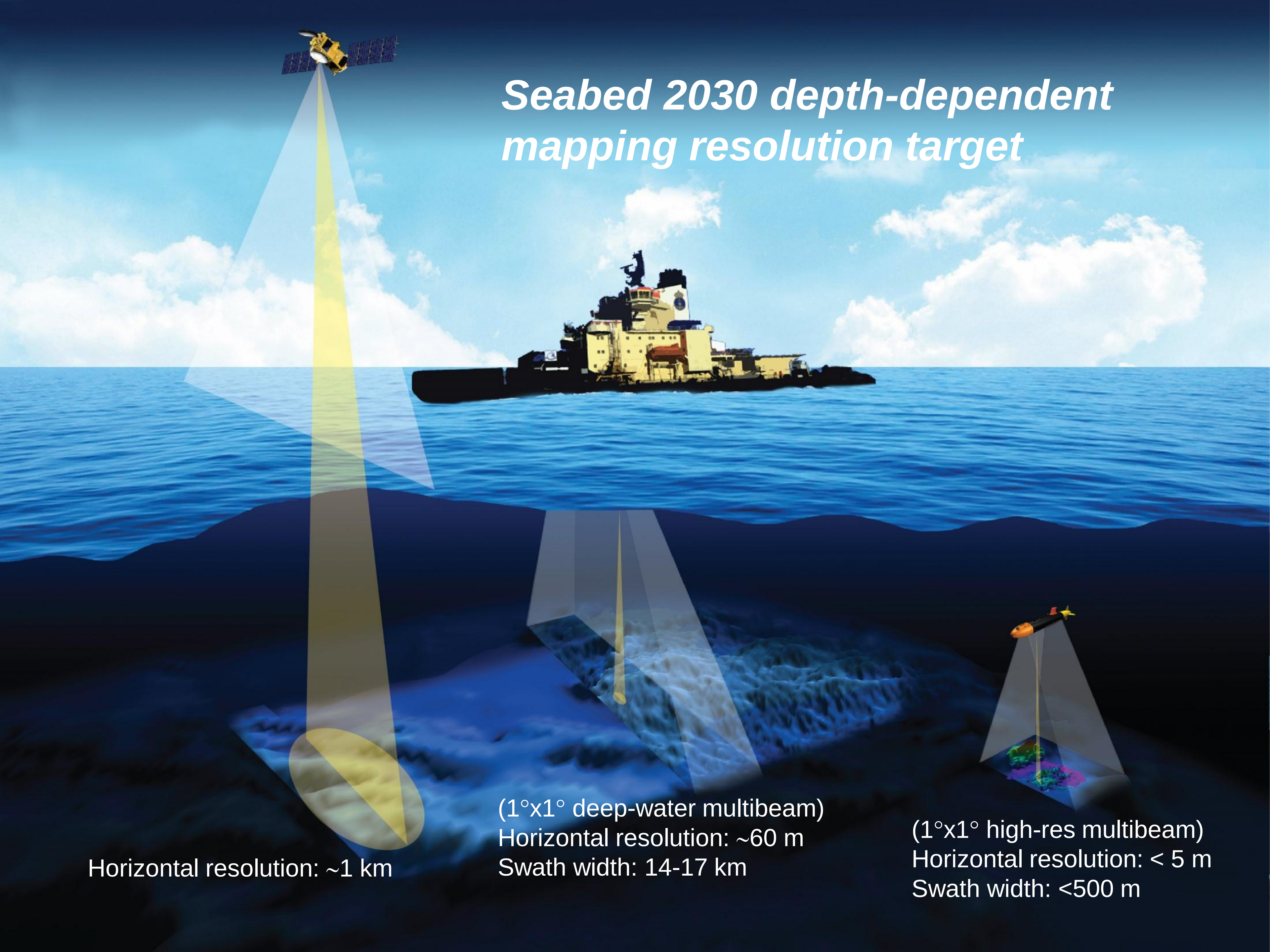
70° N
50° N
30° N
10° N
10° S
30° S
50° S
70° S
180°
150° W
120° W
90° W
60° W
30° W
0°
30° E
60° E
90° E
120° E
150° E
180°
Region taken from IBCAO V3
Region taken from IBCSO V1
EMODNet 2013
Baltic Sea Bathymetry Database
Geoscience Australia Grid 2009
JHOD grid
Olex AS data
LDEO Global Multi-Resolution Topography Synthesis
Multibeam bathymetry
Single beam bathymetry
Bathymetric contours from charts
North American Great Lakes bathymetry
Coastal area updated using ENC soundings
Regions based on pre-prepared grids, (first included in the GEBCO_08 Grid)
Trackline control information from the SRTM30_plus (v5) base grid
Region based on interpolation guided by satellite-derived gravity data within the SRTM30_plus (v5) base grid
Excluded from statistics
All interpolated depths are excluded from statistics

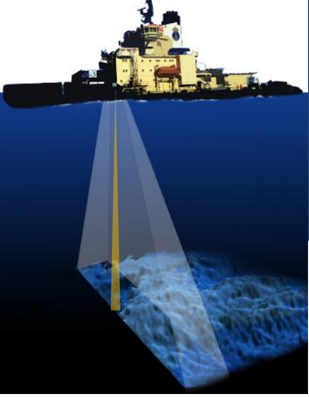
Calculation of the statistics

Technical procedure

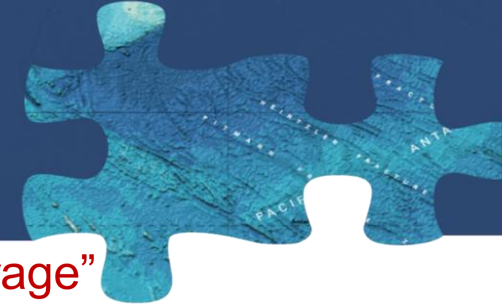
1. Collate all input data in three columns (x-coordinate, y-coordinate and depth value)
2. Pick one depth value per grid cell that has values by choosing the median depth using GMT blockmedian for all input data and for four resolutions (100 m, 200 m, 400 m and 800 m)
3. Split all data into a number (9–25) of sub regions (in order to fit into the computer memory) and make grid files
4. Resample the coarser resolutions to the highest resolution 100 x 100 m/3.2'' x 3.2''
5. Filter all data to each Seabed depth range for corresponding resolution (Polar areas/mid latitudes)
   - 100 m/3.2'' 0–1500 m
   - 200 m/6.5'' m 1500–3000 m
   - 400 m/13'' 3000–5750 m
   - 800 m/26'' 5750– m
6. Make a composite grid with all depth ranges in order to avoid edge overlaps
7. Mask data inside EEZ
8. Count data points inside and outside of EEZ

Background and explanations


Seabed 2030 depth-dependent mapping resolution target
Horizontal resolution: ~1 km
(1°x1° deep-water multibeam)
Horizontal resolution: ~60 m
Swath width: 14-17 km
(1°x1° high-res multibeam)
Horizontal resolution: < 5 m
Swath width: <500 m



Mapping with surface vessel, deep water multibeam (12 kHz 2°x 2°, 60 ° from nadir)

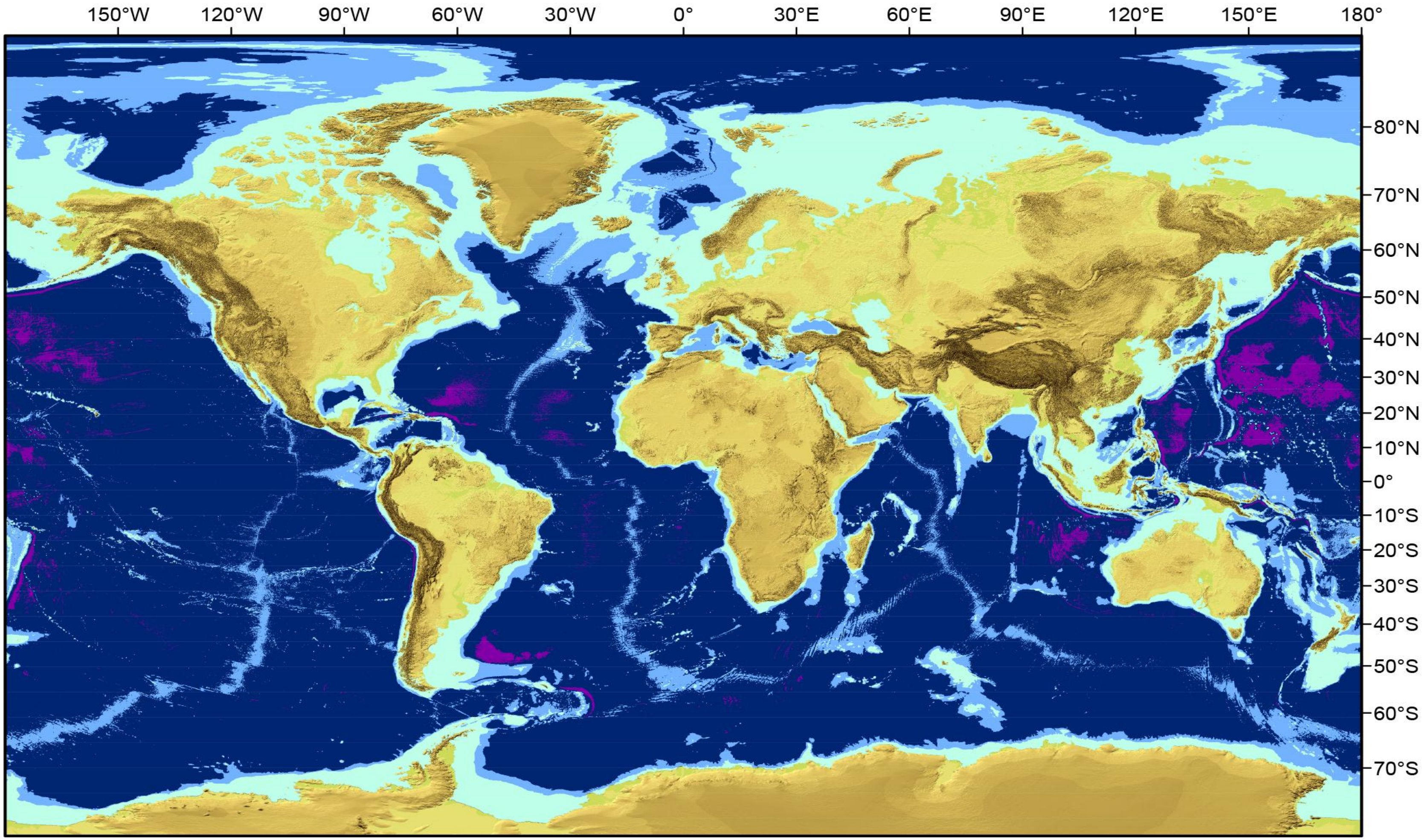


Depth (m)	World Ocean area	"Resolution" ~Foot print	"Coverage" ~Swath width
0			
	9.7 %		
500		35	2000
	2.0 %		
1000		70	4000
	4.4 %		
2000		140	8000
	8.6 %		
3000		209	12000
	22.2 %		
4000		279	16000
	31.8 %		
5000		349	20000
	19.9 %		
6000		419	24000
	1.0 %		
7000		489	28000
	0.1 %		
8000		559	32000
	<0.1 %		
9000		628	36000
10000		698	40000
11000		768	44000

Assumed 2°x2°

Assumed 4 x water depth

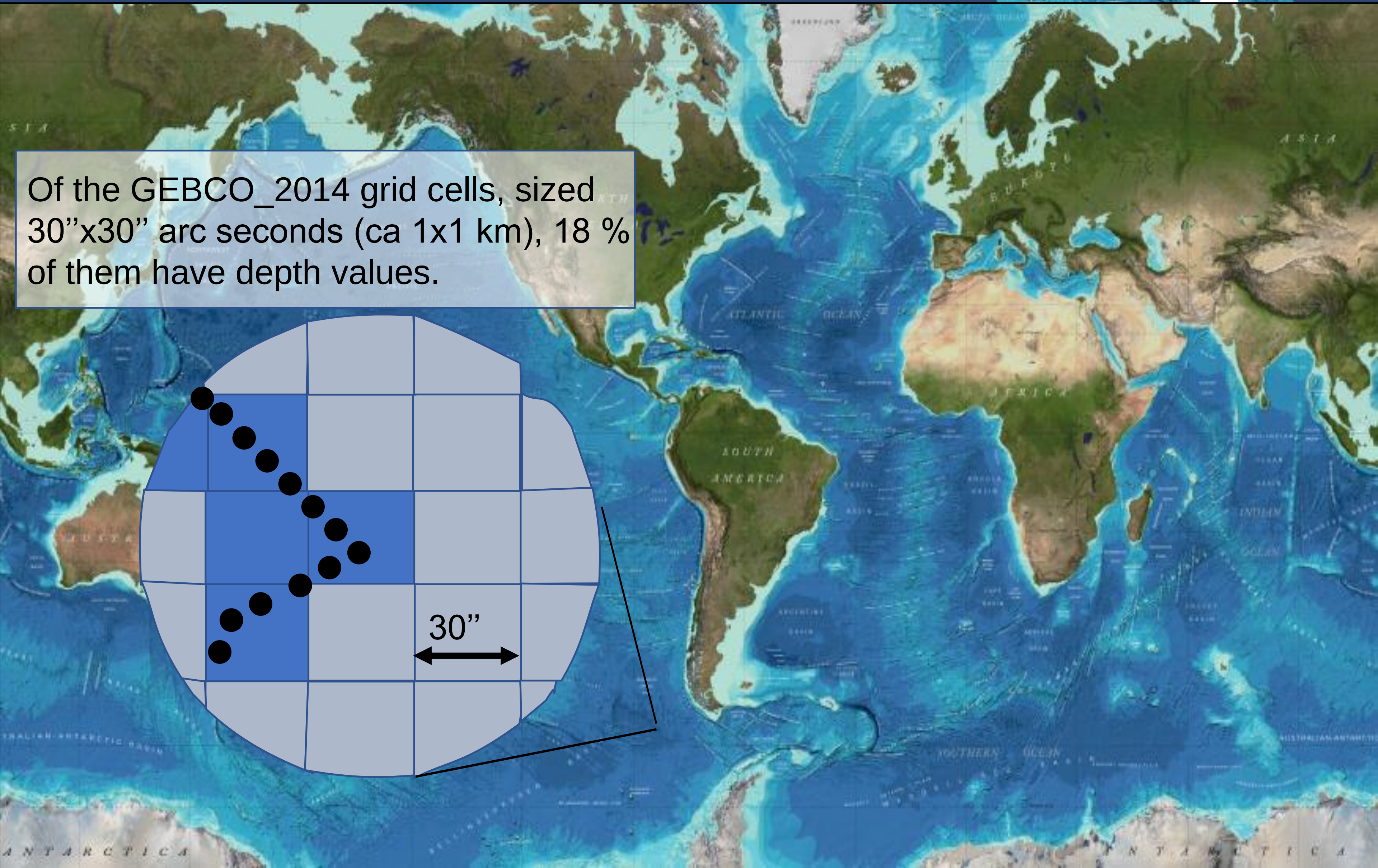
Seabed 2030 grid-cell size at different depths



100x100 m (0-1500 m)
200x200 m (1500-3000 m)
400x400 m (3000-5750 m)
800x800 m (5750-11000 m)

How was the calculation of the mapped portion in GEBCO_2014 originally done?

Of the GEBCO_2014 grid cells, sized 30’’x30’’ arc seconds (ca 1x1 km), 18 % of them have depth values.



Estimates of the mapped portion of the world ocean vary based on the grid resolution used

The higher grid resolution we aim for, the smaller portion of the World Ocean have been mapped!

18 % mapped
GEBCO_2014 (grid cell size 30''x30'', ca 1000x1000 m)

6 % mapped
Seabed 2030 variable grid resolution