



# The Nippon Foundation / GEBCO Indian Ocean Bathymetric Compilation Project

Rochelle Wigley<sup>1\*</sup>, Norhizam Hassan<sup>2</sup>, Mohammad Chowdhury<sup>3</sup>, Roshan Ranaweera<sup>4</sup>, Xinh Le Sy<sup>5</sup>, Hemanaden Runghen<sup>6</sup>, Jan Erik Arndt<sup>7</sup>

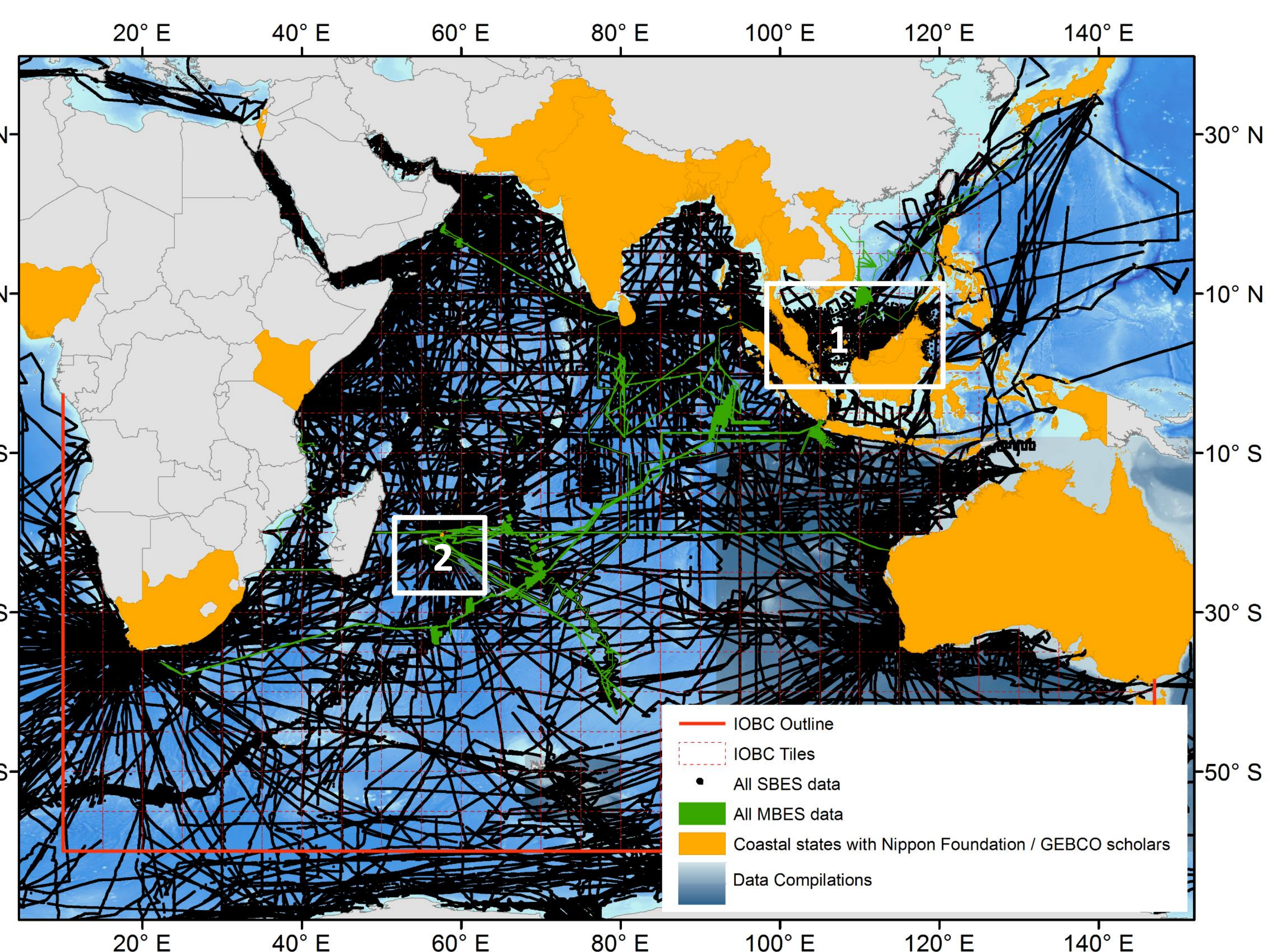
1: Center for Coastal and Ocean Mapping/Joint Hydrographic Center, University of New Hampshire; 2: National Hydrographic Center of Malaysia; 3: University of Chittagong; 4: National Hydrographic Office, National Aquatic Resources Research and Development Agency; 5: Vietnam Maritime University; 6: Mauritius Oceanography Institute; and 7: Alfred Wegener Institute Helmholtz-Center for Polar and Marine Research. \* Corresponding author: [rochelle@ccom.unh.edu](mailto:rochelle@ccom.unh.edu)

## Background

The Indian Ocean Bathymetric Compilation (IOBC) project, undertaken by a group of Nippon Foundation / GEBCO Scholars, is focused on building a regional bathymetric data compilation of publically-available bathymetric data within the Indian Ocean region from 30°N to 60°S and 10°E to 147°E.

This capacity-building project is envisioned to connect multi-national, multi-disciplinary scholars and colleagues from within all of the involved nations and organizations, resulting in additional capacity-building in this field of multi-resolution bathymetric grid generation in their communities. The skills transferred, through training workshops, further supports the ongoing development of the Nippon Foundation / GEBCO scholar's network.

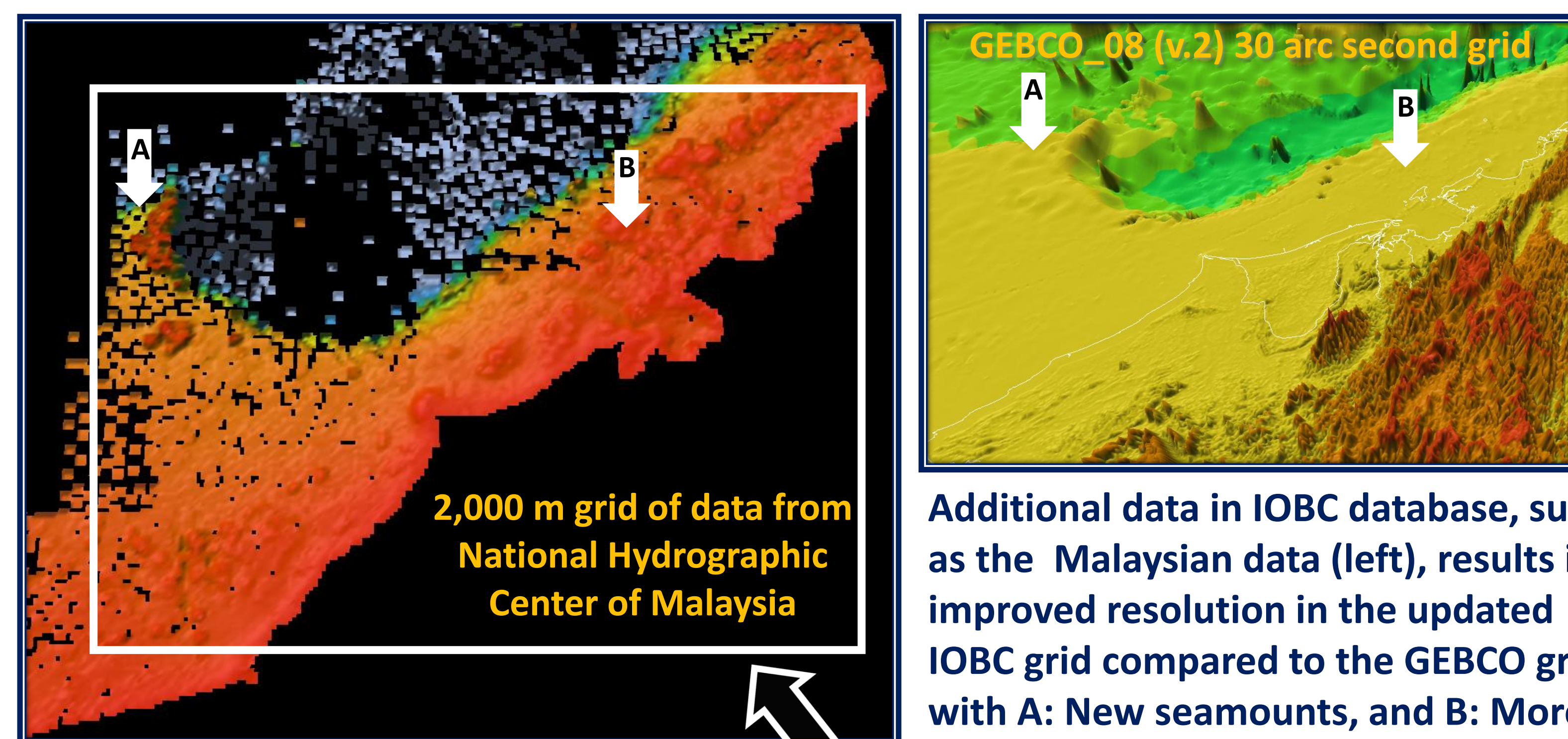
An updated regional bathymetric map and grid of the Indian Ocean will be an invaluable tool for all fields of marine scientific research, for improved prediction models and the sustainable management of all marine resources, including both fisheries and deep-water mineral resources. The most up-to-date depth data for modeling regional scale oceanographic processes such as tsunami-wave propagation behavior and other geohazard models may also have an impact on public safety.



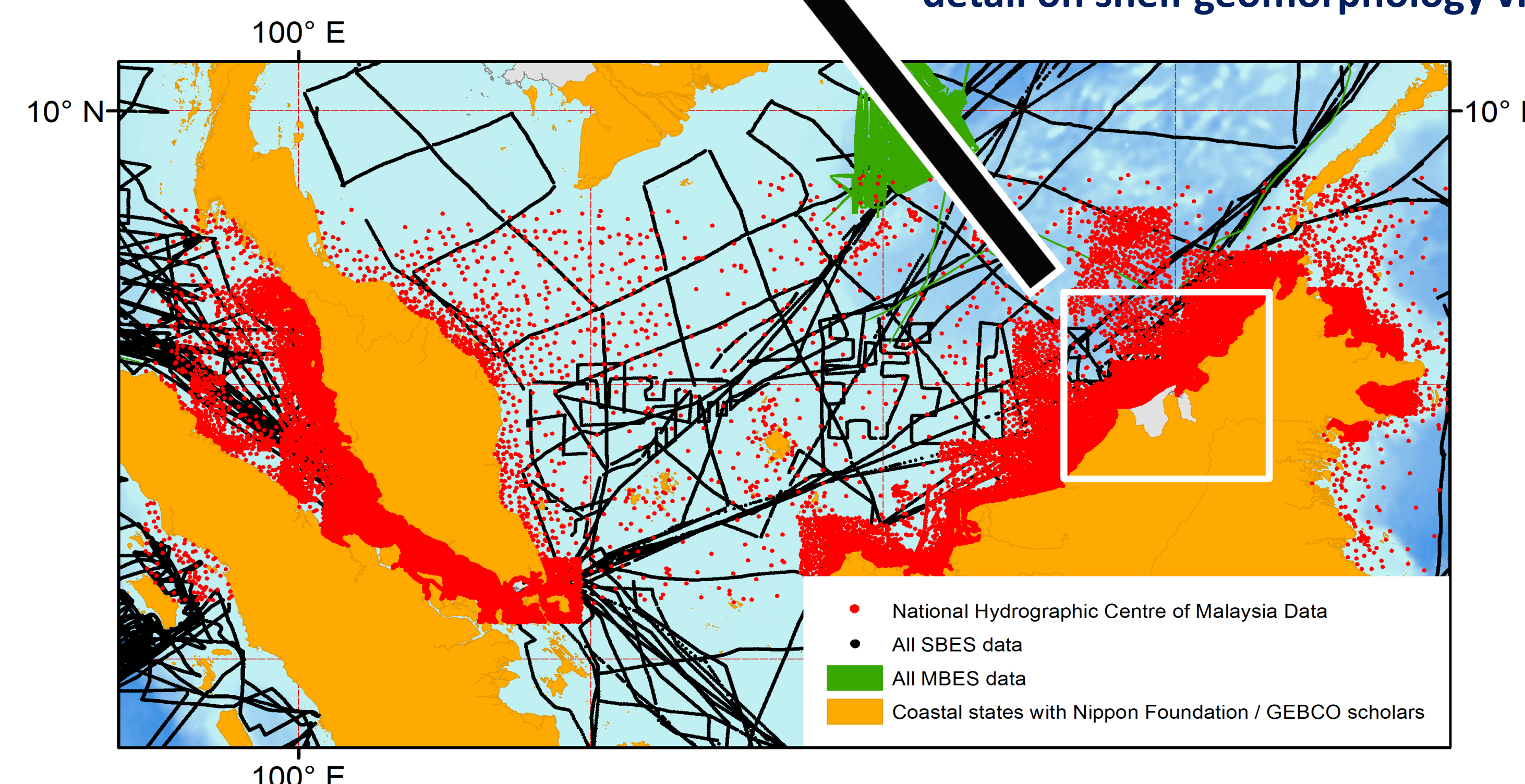
The IOBC database includes single beam and multibeam data as well as data complications, including the Australian (250 m) & Kerguelen (100 m) grids (from Geoscience Australia) and the Strakhov29 transit 200 m grid (from Russian Academy of Sciences) with the GEBCO 2014 30 arc-second grid in the background.

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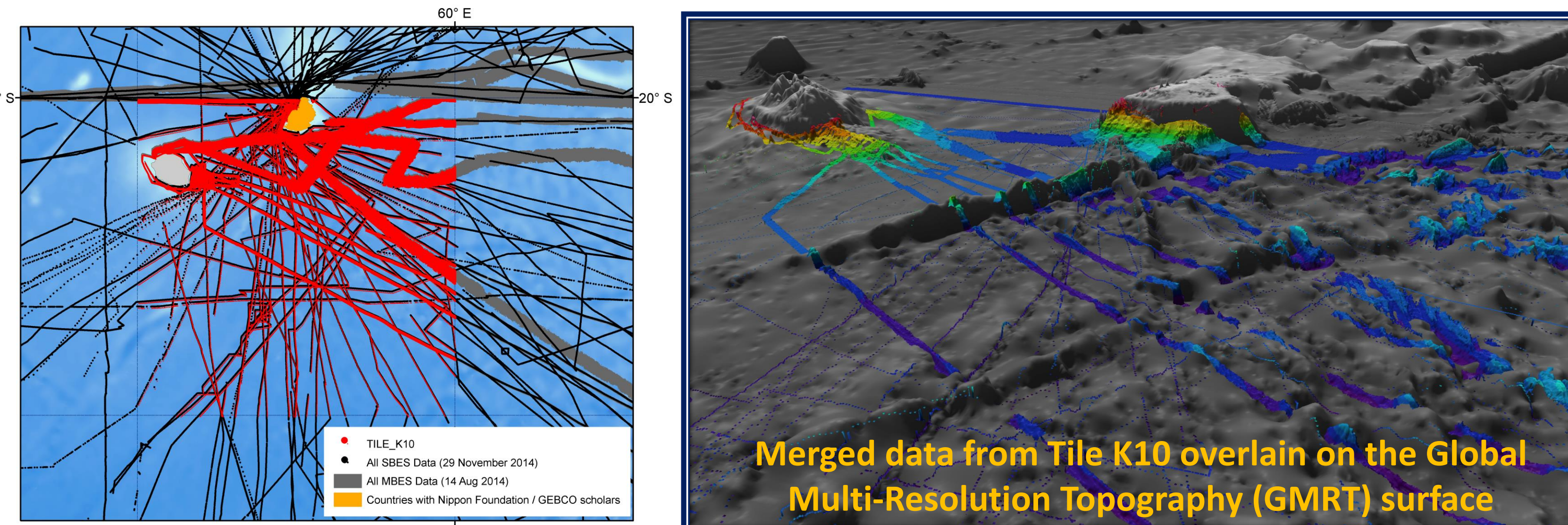
## 1: Benefits



Additional data in IOBC database, such as the Malaysian data (left), results in improved resolution in the updated IOBC grid compared to the GEBCO grid, with A: New seamounts, and B: More detail on shelf geomorphology visible.



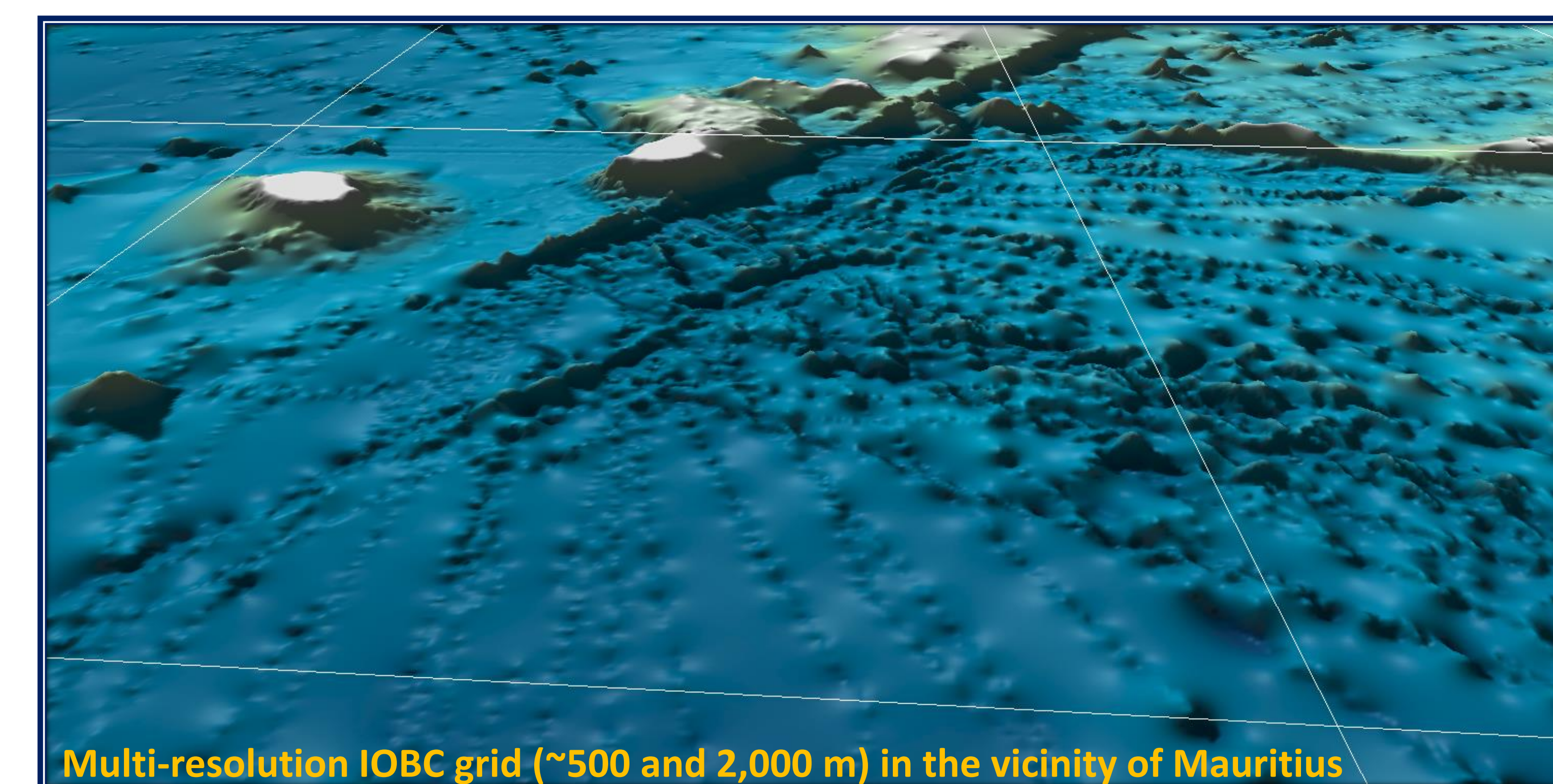
## 2: Work flow



- The IOBC area was subdivided into 5° by 5° working tiles (dashed red lines in figure to the left).
- All IOBC single beam and processed multibeam data is merged into a single XYZ file (with additional columns for weight and an identifier number added) for each 5° by 5° working tiles as shown above for the data from Tile K10 in vicinity of Réunion and Mauritius.
- Data from the individual tiles is then cleaned using QINSy-Fledermaus 3D Editor tool in order to prepare data for IOBC grid generation.

## 3: Capacity-building

One of the main objectives of this IOBC project is the creation of a network of Nippon Foundation / GEBCO Scholars working together, from the thirty Scholars from fourteen nations bordering on the Indian Ocean, who have graduated from the Postgraduate Certificate in Ocean Bathymetry (PCOB) training program at the University of New Hampshire.



Multi-resolution IOBC grid (~500 and 2,000 m) in the vicinity of Mauritius

The Second Training workshop for the IOBC project, held in Malaysia, introduced the IOBC working group attendees to the methodology and gridding algorithm of the International Bathymetric Chart of the Southern Ocean compilation (Arndt et al., 2013).

### Bathymetric Compilation of South-West Indian Ocean

Rochelle Wigley, Gustavo Adolfo Gomez-Pimpolo Crespo, Hemanaden Runghen, Daisi Horvath, Tomer Katar, Rami Nord, Dillon Sanchez Espinosa  
Center for Coastal and Ocean Mapping – Joint Hydrographic Center (CCOM-JHC) – University of New Hampshire

Organization	Data	Period
RODC (UK)	Single Beam	1994 - 1998
BSH (Germany)	Multi beam	1995 - 2005
MGDS (USA)	Single beam	1967 - 1986
JAMSTEC (Japan)	Multi beam	2000 - 2013
NGDC (The Netherlands)	Multi beam	2001 - 2007
IFREMER (France)	Multi beam	1984 - 2002

**Introduction**  
Raw data from various oceanographic and hydrographic organizations were collected, processed and compiled to create a bathymetric surface from the Indian Ocean and update GEBCO\_08 Grid (global 30 arc-second grid).

**Method**  
Raw data were initially converted into xyz files and then cleaned and processed using MB-System and QINSy-Fledermaus. The clean data was gridded in GMT using an applied block median filter (15 second mesh).

**Result**  
Resolution has improved from 30-second to 15-second, and may be applied to the next update of the GEBCO\_08 Grid. Select regions are shown, presenting the enhanced detail.

**Objective**  
To develop and present a bathymetric chart and grid of this area, complementing the "Bathymetric Compilation Project" presented by GEBCO scholars of 2011-2012 class at the University of New Hampshire. The results may be incorporated into various GEBCO grids.

**Acknowledgments**  
Our gratitude is to the organizations supplying the data for our work and for their cooperation. This work has been made possible due especially to the Nippon Foundation generous support, funding the GEBCO scholars program for 10 years. QINSy has donated Fledermaus license for processing data in this project.

The IOBC project has provided students a focus for class projects (as above) throughout their course work and has been used as basis for projects during their visits to other relevant institutions at the end of their academic year.

