# Definitive Global Map of Ocean Floor Doubles Data



The data available to produce the definitive map of the world's ocean floor has more than doubled, just two years after the launch of an international effort to produce a complete map by the year 2030. Following the efforts of The Nippon Foundation-GEBCO Seabed 2030 Project, coverage of the world's ocean floor has now increased from 6% to 15%. This is equivalent to around 32,000,000 square kilometres of bathymetric data, an area greater than the landmass of African. Heeding the call from Seabed 2030, the industry is now making significant contributions to the mission with around 570,000 square kilometres of data – roughly the size of Kenya – being donated by industry partners for inclusion into the map.

The new figures were presented by Dr Graham Allen, Acting Director of Seabed 2030, to more than 100 representatives of international governments and organizations at the 101st meeting of the Maritime Safety Committee, at the International Maritime Organisation (IMO) in London.

## Dual Boost

The project's efforts to map the entire ocean floor were given a dual boost with the news that a team made up of alumni of The Nippon Foundation-GEBCO Postgraduate Training Programme at the University of New Hampshire, USA, had won the US$4 million grand prize in the Shell Ocean Discovery XPRIZE, a competition to stimulate technological innovation in ocean mapping. It was also announced that XPRIZE and Seabed 2030 would enter into a partnership to deepen cooperation in pursuit of mapping of the world's entire ocean floor.

## Bathymetric Datasets

The General Bathymetric Chart of the Oceans (GEBCO) is the only intergovernmental organization with a mandate to map the entire ocean floor. With its origins in 1903, pioneered by Prince Albert I of Monaco and inspired by the work of Professor Julien Thoulet, GEBCO aims to produce the most authoritative, publicly-available bathymetric datasets for the world's oceans.

## Mapping the World's Ocean Floor

A complete map of the world's ocean will facilitate a better understanding of fundamental processes including ocean circulation, benthic habitat distributions, weather systems, tides, sediment transport, tsunami wave propagation, and climate change. This new depiction of ocean floor topography will help identify underwater hazards and inform sustainable marine resource management and infrastructure development – all aspects vital to the future of ocean exploration.

## Incorporate all Currently Available Data

Seabed 2030 was launched at the UN Ocean Conference in 2017 by Mr Yohei Sasakawa, Chairman of The Nippon Foundation, as a collaborative international project with the objective of producing a complete and definitive map of the world's ocean floor by 2030. To achieve this, Seabed 2030 aims to incorporate all currently available data into the GEBCO grid; to identify existing data, not in publicly available databases and seek to include them; identify the areas for which no data exist, and inspire and inform future mapping missions in these areas.

Based on the assessments made by Seabed 2030, less than 20% of the ocean floor has been mapped with modern survey instruments, and not all of the data was included in the 2014 GEBCO grid. At the target resolutions adopted by the Seabed 2030 project, the grid published in 2014 was only 6% complete.

## Four Regional Centres

As part of the Seabed 2030 Project, four regional centres were established to coordinate and oversee the sourcing and compilation of bathymetric data from portions of the world ocean. These regional centres are based at the Alfred Wegener Institute in Germany, covering the Southern Ocean; Stockholm University in Sweden, in partnership with the University of New Hampshire, USA, for the Arctic and North Pacific Ocean; the Lamont Doherty Earth Observatory at Columbia University, USA, covering the Atlantic and Indian Oceans; and the National Institute of Water and Atmospheric Research (NIWA) in Wellington, New Zealand, covering the South and West Pacific Ocean. All four centres have convened regional mapping meetings that brought together representatives from industry, academia, and government. Regional data products are fed from these centres into a Global Data and Coordination Centre hosted at the British Oceanographic Data

Centre, National Oceanography Centre, in Southampton, UK.

## Onboard Sonar Systems

The recently released GEBCO 2019 Grid represents a major global increase in the resolution at which bathymetric data is presented, doubling that of the 2014 grid. It has been developed using datasets from all Seabed 2030 regional centres and contains data contributed through agreements with a wide variety of partners, including public and private sector organizations.

These partners include Fugro, one of the world's leading private sector off-shore survey companies, which agreed to leave its onboard echosounders switched on while travelling between client projects in order to collect transit data, and committed to opening discussions with clients to investigate how proprietary data can be shared with the scientific community without compromising commercially sensitive details.

Also, Texas-based surveying company Ocean Infinity will donate 120,000 square kilometres of data collected during its search for the missing Malaysian airliner MH370, while in 2019 the Five Deeps Expedition agreed to donate all bathymetric data collected during its pre-dive surveys at the deepest points of each ocean, and to optimise its tracks between sites and collect transit data for the project. To assist these efforts and further the development of ocean science through capacity building programmes, Seabed 2030 has provided expert mappers to operate these onboard sonar systems.

The new grid is available to download at www.gebco.net.

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