

Global bathymetry and topography at 15 arc seconds: SRTM15+

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Introduction

In **Text S1** a web link is provided to an online Google Drive repository where all data sets generated as part of this study can be downloaded in various file formats, as described in Section 5 of the main text. In **Text S2** Instructions for how to view these data on a digital globe, using either GPlates (Müller et al., 2018) or Google Earth are provided. **Text S3** outlines the NAVO-NGA-NOAA-SIO Data Exchange Format (.cm file) and an example given. **Figure S1** shows a comparison between predicted bathymetry from SRTM_PLUS (V1) and SRTM15+V2.0 for a group of seamounts in the Southeast Pacific Ocean. **Text S4** describes how to donate shipboard data to the project. **Text S5** explains how to report data errors and keep track of known errors. **Text S6** is a disclaimer related to the data products.

Text S1. Supplementary data set access

To access the data products generated as part of this study, as outlined in Section 5 of the main text, please follow this link to where these data are hosted on figshare:

https://figshare.com/projects/SRTM15_V2_0/62045

All formats are contained within individual .zip files (e.g. gmt.zip) and contain a copy of all of the grids.

The Source Identification Table (SID Table) is contained in the subdirectory SRTM15+_SID_TABLE_V2.0 and contains the SID Table in ASCII text file format and two auxiliary command line BASH scripts to extract metadata associated with an input SID value.

Text S2. Digital Globe for data visualization

To view and interact with these data on a 'digital globe', readers are recommended to download and install the freely available GPlates software [<https://www.gplates.org/download.html>] and open the GPlates project [SRTM15+V2.0.gproj] located in the GPlates directory. Note, once unzipped the GPLATES directory requires 138 GB of space.

Google Earth Pro offers an alternative digital globe [<https://www.google.com/earth/>] for users that lack the required disk space for the Gplates project. The .kmz files in the GOOGLE_EARTH directory are only 40 KB in total as they are linked to raster data hosted at topex.ucsd.edu. However, this method requires a stable internet connection.

Text S3. NAVO-NGA-NOAA-SIO Data Exchange Format (.cm files)

The common file (filename.cm) consists of ASCII text with variable precision depending on the precision of the original data. There are eight columns as shown in Table S1.

Table S2 shows example from a multibeam grid from SIO cruise AVON07MV where the depth uncertainty is estimated to be 10 meters, but the navigation uncertainty is unknown.

Table S1: Data Exchange format (.cm file) description.

Feature	Unit	Notes
Time since an epoch	Seconds or the record sequence number	
Longitude	Decimal degrees	±180.0
Latitude	Decimal degrees	±180.0
Depth	Meters	Below sea level is negative
σ_H	Estimated uncertainty	0 = no estimate

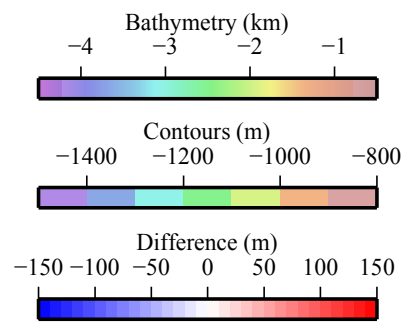
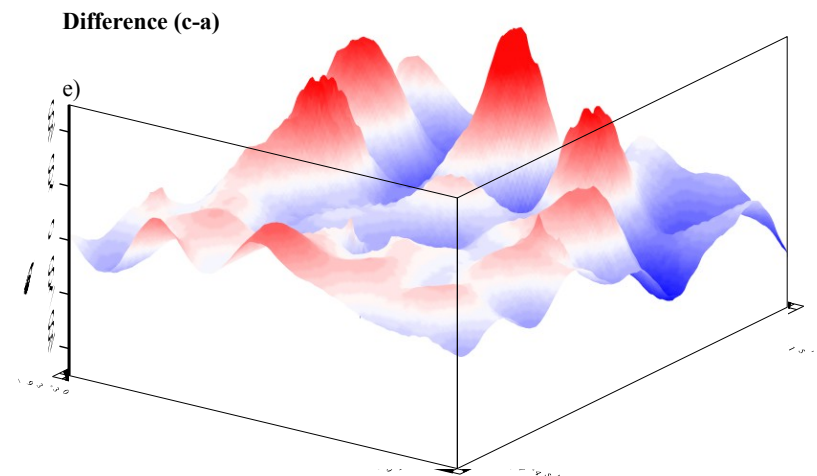
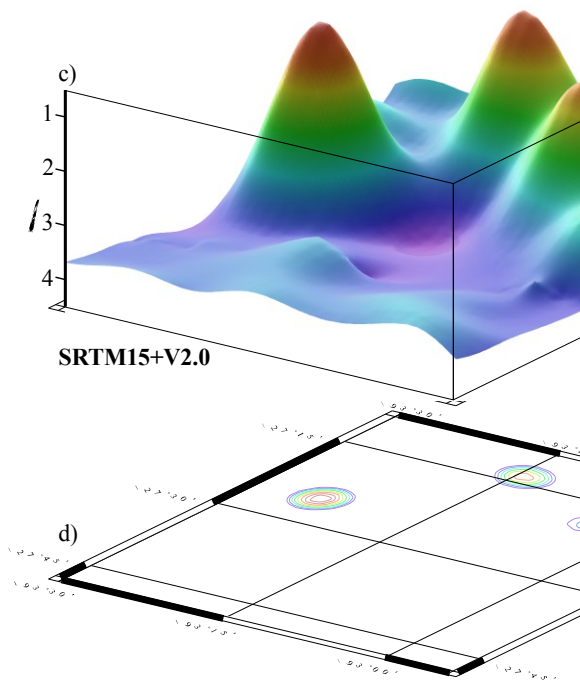
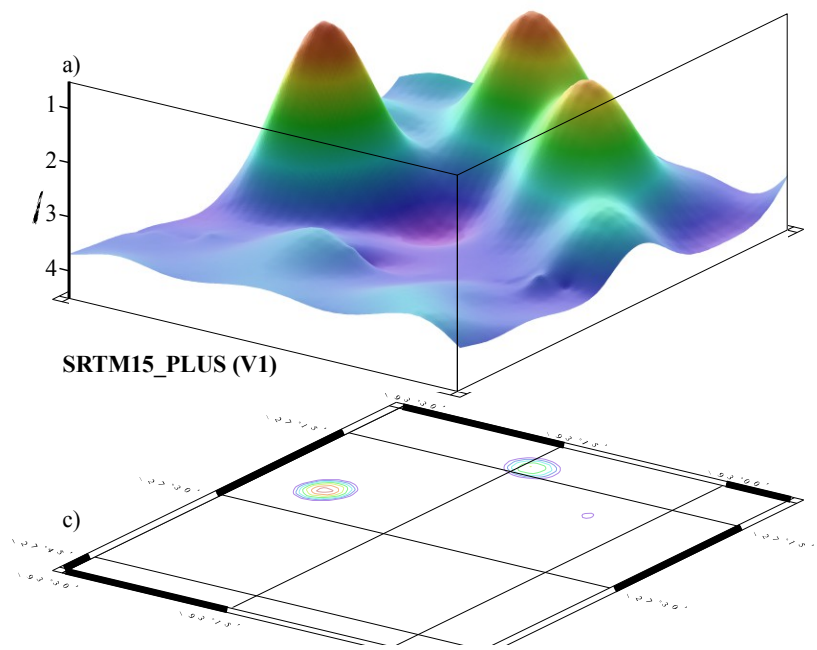
	in navigation (m)	
σ_D	Depth uncertainty (m)	9999 = edited data; -1 = no estimate
SID	Unique ID number for each source (0-65535).	Please set this field to zero.
Predicted depth	Meters	The depth (m) currently given in SRTM15+\$V2.0 for the given data point. Used internally at SIO for data editing.

Table S2: Example for .cm file format.

Time/OR	LONGITUDE	LATITUDE	DEPTH	σ_H	σ_D	SID	PD
1	-159.00500	31.08760	-5998	0	10	53914	-5780
2	-159.00200	31.06510	-5984	0	10	53914	-5796
3	-158.97100	31.06280	-5955	0	10	53914	-5805

Figure S1. Comparison between SRTM15_PLUS (V1) and SRTM15+V2.0 predicted bathymetry.

a) Predicted bathymetry for three conical shaped seamounts in the Southeast Pacific Ocean, ~ 2,250 km offshore central Chile. b) Contours of depths between 800–1500 m depth, showing the tops of the seamounts. c) and d) same as in (a) and (b) but for SRTM15+V2.0. e) The difference in elevations between (a) and (c). Although these seamounts are resolved in both models, note that, as best shown in the contour plots (c and d), the peaks of the seamounts are better resolved in SRTM15+V2.0, owing to the shorter wavelength information included in this model. The change in depth for the seamount peaks are on the order of 100-200 m. Also note the “waffle” texture in (a - SRTM15_PLUS (V1)) is removed in (b - SRTM15+V2.0). This was caused by an artifact in the gridding algorithm that is removed in V2.0.



Text S4. Shipboard sounding data donations

If you or your institution have or are planning to acquire new bathymetry data, please consider contributing these to the next iteration of SRTM15+. The simplest way to contribute your data is to get in contact via email to: dsandwell@ucsd.edu. Contributions will be accepted in any data format and in any state (raw or processed). However, please consider converting your data to the Data Exchange Format as outlined in Supplementary Text S3.

Text S5. Error reporting and changelog

While every effort has been made to ensure reliability within the limits of present knowledge, the accuracy and completeness of the SRTM15+V2.0 Data Products cannot be guaranteed. Please check the `changelog.txt` file in the supplementary data repository for a list of regions with known errors. Also, please periodically check for update versions of the data products within the data repository.

Please report any erroneous areas to us via e-mail to btozer@ucsd.edu and dsandwell@ucsd.edu using the e-mail title “SRTM15+V2.0 erroneous data” and include in your mail the regions bounding coordinates and a description of the error. Ideally, supply a .kml polygon that encompasses the region.

Text S6. Disclaimer

- The “SRTM15+V2.0 Data Products” include, but are not limited to, the following data in any file format (1) SRTM15+V2.0; (2) Marine Free air anomalies V27; (3) Marine Vertical Gravity Gradient V27; (4) SRTM15_V2.0_SID; (5) Gravity/Topography Correlation Coefficient.

- **None** of the SRTM15+V2.0 Data Products should be used for navigational purposes or for any other purpose involving personal safety.

- The SRTM15+V2.0 Data Products are made available 'as is'. While every effort has been made to ensure reliability within the limits of present knowledge, the accuracy and completeness of the SRTM15+V2.0 Data Products cannot be guaranteed. No responsibility can be accepted by the authors of this study, or those involved in the data products creation or publication for any consequential loss, injury or damage arising from its use or for determining the fitness of SRTM15+V2.0 Data Products for any particular use.

- The SRTM15+V2.0 Data Products are based on data from many different sources of varying quality and coverage.

- As the SRTM15+v2.0 grid is created by interpolation of measured data, the resolution of SRTM15+v2.0 grid may be significantly different to that of the resolution of the underlying measured data.