



50m Multibeam Dataset of Australia 2012: Methodology

Citation

Please use the following citation in order to reference this dataset:

Wilson, O., Buchanan, C., and Spinoccia, M. (2012). 50m Multibeam Dataset of Australia 2012. Geoscience Australia, Canberra.

The access website:

<http://www.ga.gov.au/marine/bathymetry/50m-multibeam-dataset-of-Australia-2012.html>

History

Geoscience Australia (GA) is the national custodian of an extensive multibeam dataset. Along with the multibeam data collected by the Australian Government, GA also holds numerous datasets submitted from other institutions in the international scientific community that have collected data in and around Australian waters. GA also welcomes any submissions of data within Australian waters from other sources and actively pursues any data that is publicly available, in order to keep their dataset as comprehensive and up to date as possible.

GA would like to make the releasable data that they hold readily accessible to external stakeholders in a usable format.

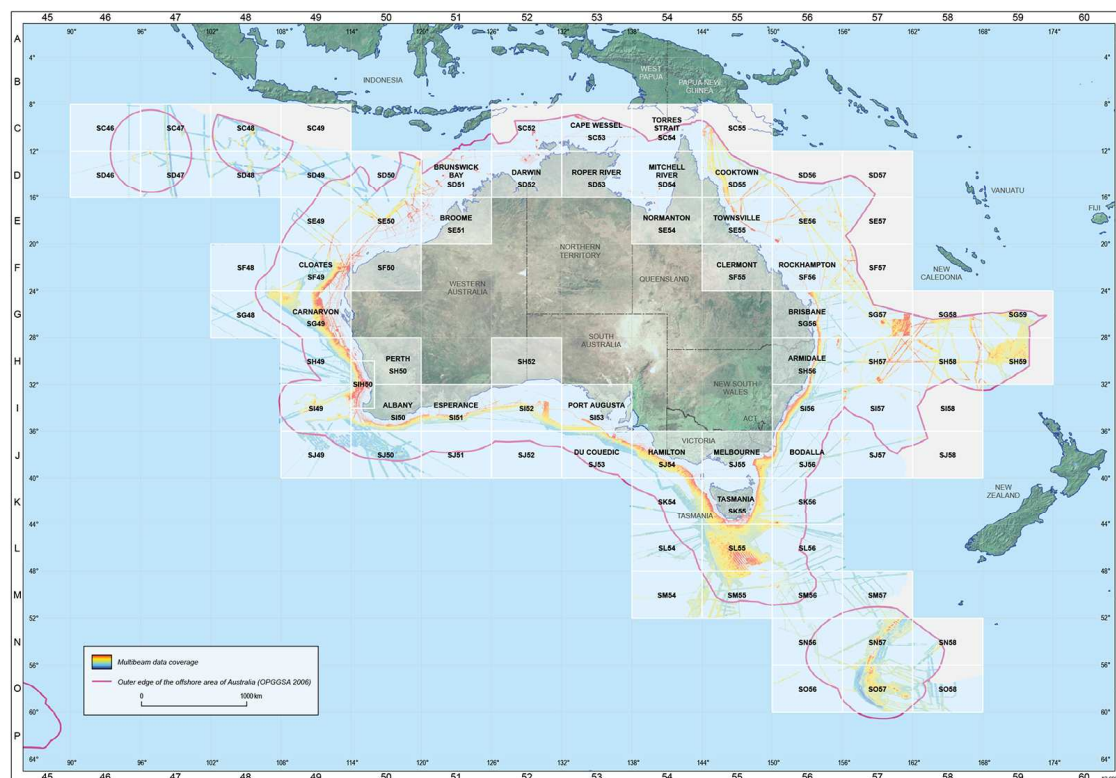
GA is releasing this data to facilitate the use of, and access to, bathymetry data in the wider mapping community. Since so much of the ocean remains poorly mapped, GA aims for the data to contribute to the collective knowledge in this area.

This dataset is a tiled compilation of all the multibeam data held by GA lying within the outer edge of the offshore area of Australia, as well as some data in international waters, as at August 2012. The data is gridded to a resolution of 50m, which allows for a significant amount of detail to be seen, and is much higher resolution than previously released GA bathymetry products.

Organisation of Data

The data is organised into 4° latitude x 6° longitude tiles, consistent with the 1:1 million scale land maps provided by GA. The tiles are labelled with SX00, where X is a letter representing the distance from the equator and the two numbers represent a WGS84 UTM zone. There is one tile that does not fit the pattern; SIH50m covers both the H and I latitudes. This tile was created to cover the Perth region, which would otherwise be bisected. The image below shows the position of the specific tiles. If you have downloaded the relevant index documents or have a copy of the complete dataset, a high resolution version of this index image is included.

50m Multibeam Dataset of Australia 2012



Not to be used for Navigation Purposes

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APPLYING GEOSCIENCE TO AUSTRALIA'S MOST IMPORTANT CHALLENGES

GA 12/6517 | GeoCat 729-02
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Data Processing

Multibeam data submitted to GA, in various raw data formats is read into the CARIS™ bathymetry processing software directory structure HDCS_Data. Once the data has been loaded into HIPS, the data is QC'ed for sound velocity, navigation, tidal and attitude errors. Dramatic spikes or obvious anomalies are edited. Should the data be required for high resolution use, the data is reviewed at greater detail to remove anomalies to the resolution required. Data included in this product has been processed to varying degrees. The dataset includes areas that have had only minimal processing. However, GA considers this data useful to external stakeholders and is releasing it as fit for purpose.

The following filetypes were exported for this dataset: CARIS™ grid files *.csar and *.csar0, geoTIFs, XYZ files and ESRI Grids.

Please note that bathymetric data released by GA is not to be used for navigation purposes.

Data Projection

Each tile that makes up this dataset is projected into the relevant WGS 84 UTM zone for its' location. The UTM- Universal Transverse Mercator geographic coordinate system divides the earth into 60 zones, each a 6 degree band of longitude, and uses a secant transverse Mercator projection in each zone. The specific UTM zone of each tile is specified within the tile name (see Organisation of Data).

One geoTIF, is provided that represents the entire dataset. Given that it covers multiple UTM zones, the geoTIF was projected as WGS84 Web Mercator (Auxiliary Sphere). This is a suitable spherical projection for a regional or global map and is used by Google, OpenStreetMap etc.

Data Compilation and Gridding

The CARIS™ map sheets, termed Fieldsheets were created within CARIS HIPS to the extents of the 1:1million map tile system. Using GA's internal database search tool, the surveys contained within those tiles were listed and selected.

Once the data was loaded into CARIS™ HIPS, a Base Surface (CARIS™ term for a gridded surface) was created from the data that lay in the extent of the Fieldsheet. The Base Surface tool grids the data using a weighted gridding technique to the specified resolution (in this case 50m) and creates a CARIS grid file comprised of two filetypes; a *.csar and a *.csar0.

The gridding technique used was the CARIS 'Swath Angle' gridding that uses a weighting scheme based on a beam's intersection angle with the seafloor. The swath angle weight ensures that higher weight is given to beams from the inner part of a swath (which are usually more accurate) than to outer beams from adjacent track lines. The range weight is used to determine how a sounding is applied to a node. Range weight is inversely proportional to distance from the node. The calculated node positions are determined by the corner coordinates of the field sheet.

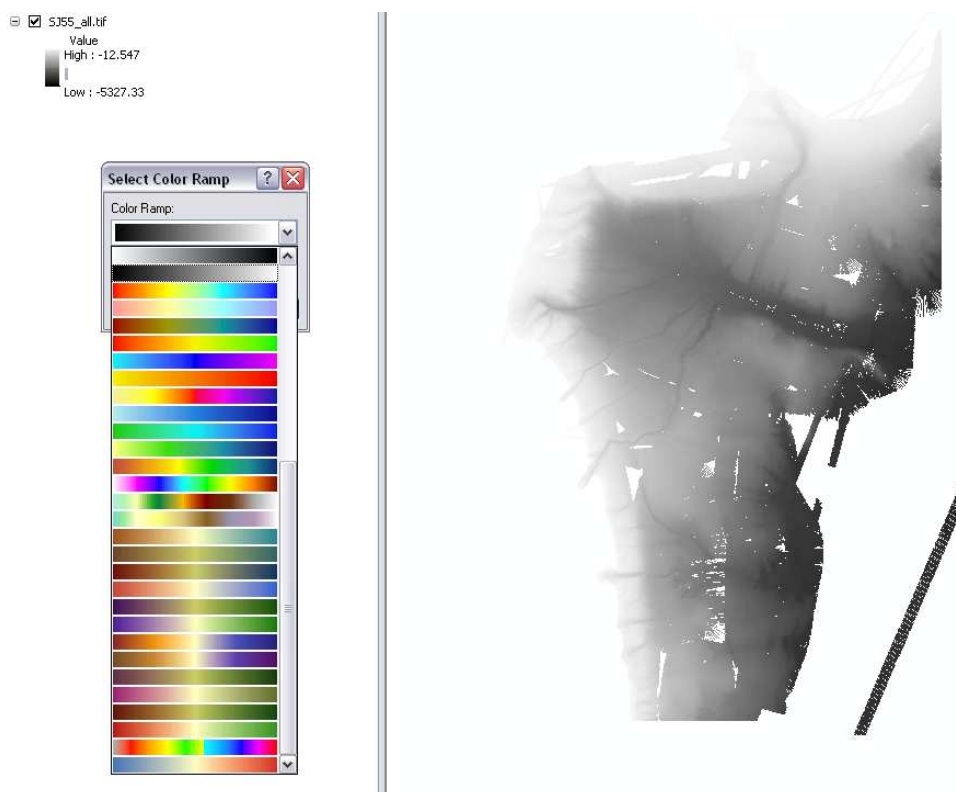
CARIS™ Grid Files

The grid files (*.csar/*.csar0) were copied from the CARIS™ system into the relevant directory for the 50m Multibeam Dataset of Australia, 2012. The files are viewable with the free to download CARIS™ software EasyView. EasyView can be downloaded from the CARIS™ website: <http://www.caris.com>

GeoTIF

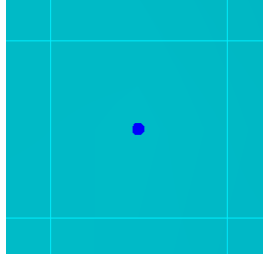
One overall geoTIF was created for the entire dataset; 50mMultibeamDatasetAustralia2012_Overview. This TIF is an 8 bit geoTIF with the spatial reference projection WGS84 Web Mercator (Auxiliary Sphere). The individual tile geoTIFs are 32 bit. They are projected into the relevant UTM zones. For each tile, two TIFs were created: One geoTIF using the CARIS automatic depth range and colour scheme of 'Rainbow' and titled SX00_tile and a second geoTIF using the depth range of 0-7,000m and the colour scheme rainbow. This second geoTIF is titled SX00_all and is provided so that multiple geoTIFs can be viewed alongside each other with the same colour/depth range. A colour bar image is provided to allow depth estimation by colour.

If loading these geoTIFs into ESRI ArcMap, please note that in versions prior to 10.1 the image will default to greyscale. This can be easily changed by clicking on the colour ramp and selecting a new one as below. For versions 10.1 and newer, this shouldn't happen.



ASCII xyz

The xyz files are comma separated and projected into the relevant UTM zone for the tile. Files over 300MB were split into multiple files. The files all have the header 'x,y,z'. Eastings and northings are provided to 1 decimal place and depth is given as an integer. The eastings and northings represent the centre of the grid pixel:



ESRI Grid format

ESRI ASCII grids were produced for every tile using the new export function in CARISTM Base Editor 4.0. The ASCII grids were then converted to ESRI grid format, the ESRI proprietary binary and non metadata ASCII formats. ESRI grid format produces much smaller files than the ASCII grids exported from Base Editor and so are much faster to access.

Multibeam Dataset Metadata

The multibeam metadata files were created from GA's internal database search tool. If more information is required an index is provided with further details about each survey that is included in this dataset. The index is arranged by the four digit GA survey code. So to access all metadata, the GA survey codes can be noted and looked up on the index spreadsheet.

Data Availability

The individual tiles and index documents are available for download from GA's website:
<http://www.ga.gov.au/marine/bathymetry/50m-multibeam-dataset-of-Australia-2012.html>

The full dataset can be requested by following the links on the above URL.

Future Releases

Newer versions of this product are planned for the future. Unfortunately we do not have the capacity to respond to individual requests for the processing of specific areas, or for regular updates to this product. As a matter of course new releasable surveys will be made publicly available as individual downloads and stakeholders are invited to check for new survey releases in their areas of interest by regularly checking the GA website for updates.

GA is also in the process of developing an online discovery and delivery system which will allow for easy selection and download of bathymetry data.

Contact Us

For any queries, data submissions or helpful suggestions regarding this dataset please contact:

BathymetryRequests@ga.gov.au