

## International Digital Elevation Model Service (IDEMS)

<http://www.cse.dmu.ac.uk/EAPRS/iag/>

*Director: Philippa Berry (UK)*

### Overview

The International Digital Elevation Model Service (IDEMS) is one of the more recently formed of the IAG services, and it continues to grow and establish a community of academic and industrial contributors. Among the significant events over this period are the release of several Global Digital Elevation Models at varying spatial resolutions, and the steadily increasing requirements for related surface hydrology information, both for synergy with GRACE data and in support of climate change investigations. Results from this reporting period are briefly summarised below.

### Activities

#### 1. GDEM data

Several new GDEMs have been released over the reporting period, including lower resolution models such as GETASSE30 and high/multiple resolution models including ACE2. The ACE2 GDEM was released on 1 July 2009; this model was produced with a core contribution from the SRTM dataset plus over 70 million altimeter derived heights and additional ground truth. The model development was funded by the European Space Agency, and the model is freely available. Key contributions to the datasets from the geodetic community enabled fused models to be also produced in response to a range of geodetic requirements, including bathymetry and Mean Sea Surface data from DNSC08, providing combined datasets for users at a range of spatial resolutions. An example is given in Figure 1. This and other new and existing GDEMs may be obtained via links from the IDEMS webpages.

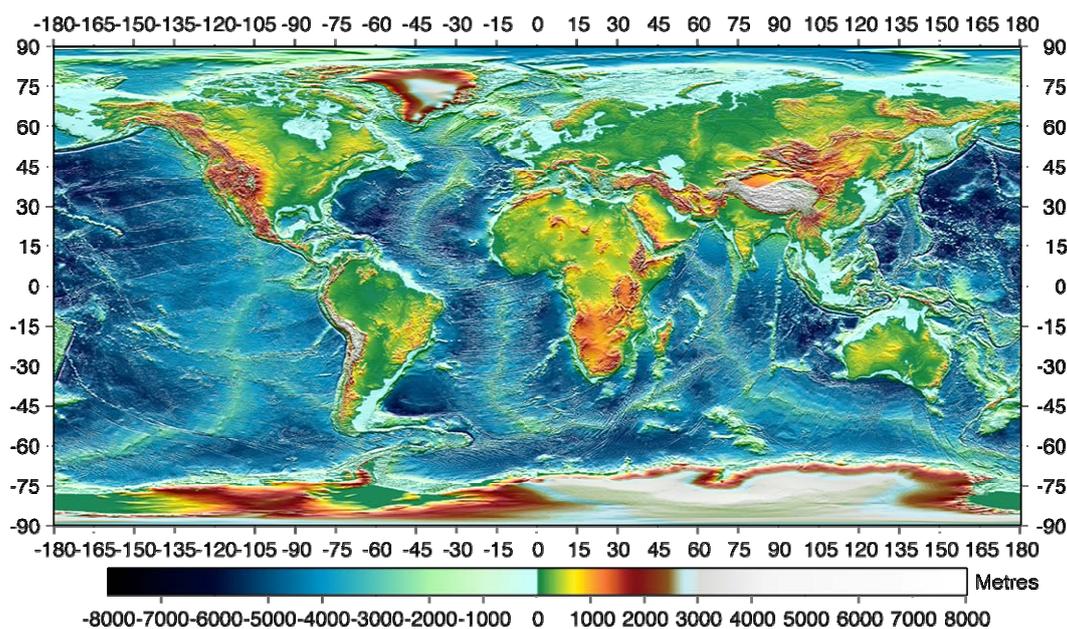


Figure 1.1: Fused ACE2 dataset with DNSC08 bathymetry

A recurring topic of queries and discussion over this period has related to the comparison of GPS measurements with Digital Elevation Models at varying spatial resolutions.

A tutorial will shortly be added to the IDEMS webpages on the effects of generalising DEM data to coarser spatial resolutions, and the implications for comparisons with point measurements such as GPS. This is a recurring area of difficulty, and misunderstandings cause naïve researchers to submit conference/journal papers that contain technical errors.

## **2. Inland Surface Water**

A growing number of queries both to the IDEMS webpages and directly to DEM researchers over this period relate to liquid flow over topography and disparity in DEM information content and precision for hydrological purposes. There is sustained interest in representation of inland water within DEMs: several groups report adding max/min water level data in a separate hydrology layer for the largest lakes, and interest in river and lake height changes continues to grow. These data are primarily utilized to support large scale climate studies, and the requirement is therefore global/continent scale in nature, in contrast to the 'traditional' detailed information for individual water-bodies, already well served by the hydrological community. A second key use is in synergy with GRACE data on a range of spatial and temporal scales.

This forms part of a rapidly expanding user community for surface hydrology data on basin and continental scales, encompassing remote sensing information, ground based measurements and hydrological models. The IDEMS webpages and activities are being progressively augmented to include sites offering satellite derived height and spatial extent measurements, river modeling initiatives including access to in-situ data, and large-scale outreach programmes such as the WMO (WHYCOS) and ESA (TIGER) initiatives.

To monitor the accessibility and usefulness of this information, enhanced search engine monitoring software has been recently put in place on the IDEMS webpages: results to date show a roughly 50/50 split between take-up of DEM and hydrology related information, which is an interesting and unexpected result. This will be monitored over the next reporting period.

### **Future activities**

IDEMS meetings will continue on an ad-hoc basis at relevant conferences and workshops: in addition it is planned to exploit existing freely available software to study the viability of virtual workshops to assist information dissemination on specific topics. It is planned to progressively enhance links to source DEM data and code held in institutes/universities (with a continuing emphasis on open source code!), to add new publications as these are notified to us and to continue to define and service requirements for regional and global surface inland water datasets.