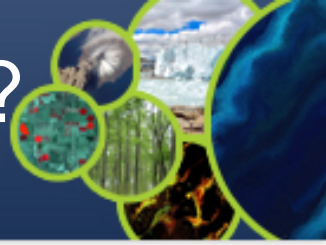


CEOS WGCV Dresden Meeting Global DEM Task

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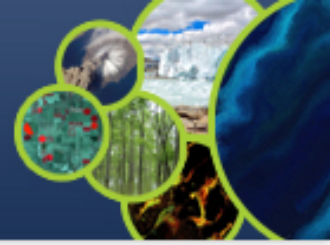
Based on discussions held in Dresden on
2/24/15



- Recognition that a global DEM is required for the georadiometric correction of EO sensors. EO-derived DEMs now available to meet this need
- Need to quantify the precise geometric and radiometric requirements for current and future EO sensors for 10-15m, 30m & 90m DEMs
- Need to assess whether spaceborne DEMs are “fit for purpose” and whether CEOS users need “bare earth” or can work with heights “somewhere in the canopy-top”
- This will require a study on simulation of the geometric & radiometric requirements
- Need to quantify the error characteristics of the different candidate DEM sources in a much more thorough fashion than previously done
- Need to be able to display the information content of each DEM source as well as perform inter-comparisons between them and against other independent sources such as RA, ICESAT, higher-resolution EO-DEM (e.g. PRISM, TerraSAR-X stereo) and national mapping sources (e.g. DEMqis)

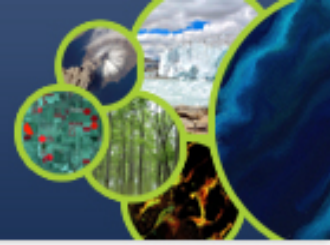
For > 250m, need a publically available, verified, open license solution

- recommendation that **GMTED2010** be used for coarse resolution sensor geometric and radiometric calibration (>250m grid-spacing)
- add cross-references on the **WGCV** web-pages to this **GMTED2010**
- webGIS/DEMqis as the best way of demonstrating the quality
- consider use citizen science, as well as GeoCache for assessing the visual quality for artifacts



For DEM grids of resolution $\geq 30\text{m}$ and $\leq 250\text{m}$, nothing available that has been validated and cannot recommend a baseline solution for global DEM

- Unless and until the SRTM3 v3.0 is validated, we cannot recommend any global DEM for $\text{IFoV} \leq 250\text{m}$, CEOS “bare earth” DEM
- It is recommended that the data provider (NASA-JPL) and USGS will work together on a combined data quality statement for SRTM3 v3.0 for 90m DEMs
- There must be a consolidated plan to validate SRTM3 v3.0
- When do we know the job is done
- DRAGON for China evaluations, ESA-QA4EO for European, US for other areas
- Potentially use webGIS/DEMqis as the best way of demonstrating the quality
- Citizen science project for global DEM evaluation



For DEM grids of resolution $\geq 30\text{m}$ and $\leq 250\text{m}$, nothing available that has been validated and cannot recommend a baseline solution for global DEM at the present time

- What does Sentinel-2 use?
- for Landsat-8 processing, USGS use a 1 arc-second DEM based on SRTM1 and filling in gaps from other assets.
- ACTION: discuss options with USGS Jim Storey and Dean Gesch for any new work in this area
- BB and GS will liaise about opening up a communication channel on use of USGS DEM
- PlanetDEM to be asked to provide quality information on their product

What does Landsat use?

Standard Terrain Correction (Level 1T) - provides systematic radiometric and geometric accuracy by incorporating ground control points while employing a Digital Elevation Model (DEM) for topographic accuracy.

Geodetic accuracy of the product depends on the accuracy of the ground control points and the resolution of the DEM used:

Ground control points used for Level 1T correction come from the [GLS2000](#) data set. DEM sources include [SRTM](#), [NED](#), [CDED](#), [DTED](#), and [GTOPO30](#)

- explore Crowd-sourced global cellphone locations
- OpenStreetMap as a source of 3D locations (JPM found out subsequently that no heights are currently acquired but they could be in future)
- explore whether Google corporation might be interested in supporting such a crowd-sourced validation/quality assessment?
- Very high resolution sensors ≤ 30 metres, many in CEOS, but not considered here.
 - JAXA option (PRISM), others in the future?

- Subsequent discussions with Adina Gillespie (SSTL Business manager on secondment to UKSA and responsible for preparing report on CEOS support have indicated that
 - The door is not completely shut for TMSG support by UKSA although it is shut on support for my continuation as TMSG chair
 - However, UKSA insist that to meet their innovation agenda, they require leadership by a body who can provide partial support on global mapping
 - UKSA will approach the Ordnance Survey (OS) to see if they wish to take on this role
 - They are still waiting for ESA to call as they are interested in discussing any future global DEM tasks

- Propose that TMSG be re-named “Global DEM SG” and focus solely on this task
- A small team of experts be invited (with travel funding) to define requirements, work on simulation, test different DEM fusion methods, assess impact of non “bare-earth” DEM retrieval
- Leadership undecided but JPM prepared to lead this if non-UKSA support is available. May be able to obtain UKSA support for OS representative if OS can be involved.
- Otherwise, what about USGS or IGN in leadership role if they bring their own funding?