Description of Files for Oceanographic Applications of EGM2008

WARNING

DO NOT USE THE FOLLOWING GRIDS FOR GPS/LEVELING WORK

(1) und_min1x1_egm2008_Nmax2190_MeanTide_TP_global.gz

Contains POINT values of geoid undulations in **meters**, on a 1'x1' global grid (CENTER of cell registration), computed from **EGM2008** to degree 2190. The file is global, and contains valid values for ALL 1'x1' cells, regardless whether they are located over land or over ocean. The geoid undulations (height anomalies to be exact) refer to the **"Mean-Tide"** system, as far as the Permanent Tide is concerned. This way they are consistent with the altimetry-derived Sea Surface Heights (SSH).
The geoid undulation values were computed with respect to an **"IDEAL"** mean-Earth ellipsoid as far as its semi-major axis is concerned. That is, the zero-degree term of the geoid undulations is set to ZERO, and the semi-major axis of this **"IDEAL"** ellipsoid remains numerically unspecified. However, the geoid undulations refer to an ellipsoid whose flattening is equal to:

$$f = 1/298.257 \tag{1}$$

so that these geoid undulations are consistent with the flattening used to report SSH from the TOPEX/Poseidon mission.

(2) DOT2008A_to180_TP_meter.gz

This file contains fully-normalized spherical harmonic coefficients $\{\overline{HC}_{nm}, \overline{HS}_{nm}\}$ of the Dynamic Ocean Topography (DOT) in units of **meters**, from a model designated **DOT2008A**. This model was estimated using the **DNSC08B** Mean Sea Surface and the **EGM2008** geoid model. The $\{\overline{HC}_{nm}, \overline{HS}_{nm}\}$ coefficients are consistent with the series:

$$\zeta(\theta,\lambda) = \sum_{n=0}^{N\max} \sum_{m=0}^{n} \left(\overline{HC}_{nm} \cos m\lambda + \overline{HS}_{nm} \sin m\lambda\right) \cdot \overline{P}_{nm}(\cos\theta) \tag{2}$$

This model is complete to degree and order 180. The file contains **16471** ASCII formatted records, each record containing:

$$\{n, m, \overline{HC}_{nm}, \overline{HS}_{nm}\} \rightarrow \{2i5, 2d25.15\} \tag{3}$$

This file can also be read with free format.

(3) dot_min1x1_dot08a_Nmax180_TP_global.gz

Contains POINT values of the Dynamic Ocean Topography in **meters**, on a 1'x1' global grid (CENTER of cell registration), computed from **DOT2008A** to degree and order 180. The file is

global, and contains values for ALL 1'x1' cells, regardless whether they are located over land or over ocean. **Values over non-oceanic locations should be disregarded.**
The spectral content of the **DOT2008A** model (Nmax=180) is inadequate to support as fine a resolution of DOT as 1'x1'. The grid is provided at 1'x1' so as to facilitate certain oceanic applications without much need for sophisticated interpolations by the user.

(4) read_2files_min01

Contains a FORTRAN program to read the 1'x1' grids and compute the statistics of the data.

(5) read_2files_min01.out01

Contains the output from a run of program "read_2files_min01".

Important Notes

(a) The gzipped gridded data files, when gunzipped, contain **933206400** bytes each.

(b) The gridded data files are sequential, unformatted, binary files containing REAL*4 values (see the "read_files_min01" program for details on their structure). The data are stored one latitude row at a time (from North to South), and within each row from East to West. In these 1'x1' files the first row has latitude 90°-0.5', and the first column has longitude 0.5' East.

(c) The data files were created on a SUN computer, which uses a **BIG ENDIAN** internal binary representation.

Statistics of Data Values

Statistics of Geoid Undulation Values (m)

Number of Values	233280000
Percentage of Area	100.000
Minimum Value	-106.369
Latitude of Minimum	4.692
Longitude of Minimum	78.758
Maximum Value	87.938
Latitude of Maximum	-8.392
Longitude of Maximum	147.375
Arithmetic Mean	-0.867
Area-Weighted Mean	0.000
Arithmetic RMS	29.225
Area-Weighted RMS	30.576
Arithmetic S.Dev.	29.212
Area-Weighted S.Dev.	30.576

Statistics of Dynamic Ocean Topography Values (m)

Number of Values	233280000
Percentage of Area	100.000
Minimum Value	-1.955
Latitude of Minimum	-60.708
Longitude of Minimum	358.458
Maximum Value	1.129
Latitude of Maximum	31.075
Longitude of Maximum	135.442
Arithmetic Mean	-0.196
Area-Weighted Mean	-0.026
Arithmetic RMS	0.636
Area-Weighted RMS	0.561
Arithmetic S.Dev.	0.605
Area-Weighted S.Dev.	0.561