Antarctic Tide Gauge (ATG) Database

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Contact: Laurie Padman (ESR: padman@esr.org)

Citation: No present citation: check with Laurie Padman

Download: ftp://ftp.esr.org/pub/datasets/atg/atg_database_2017_0816.zip

Summary

The ATG database is a database of ocean surface height tide harmonic coefficients (amplitude and phase) from a variety of measurement systems. These coefficients are primarily intended for users interested in validation of tide models for the Antarctic seas including the areas covered by the large floating ice shelves [e.g., *King and Padman*, 2005].

Data contributing to the database vary widely in quality, from short records of unknown accuracy, to very precise, long-term records from bottom pressure recorders (BPRs) and GPS systems installed on ice shelves. This database provides sufficient quality control information (record length, time step, and measurement type) for a user to judge whether a tidal analysis at a particular site should be used for their application.

Data have been collected using a wide variety of measurement techniques. These include:

- Coastal Tide Gauge (CTG: e.g., floats in stilling wells);
- Bottom Pressure Recorder (BPR);
- Global Positioning System (GPS) on ice shelves;
- Gravimeters on ice shelves; and
- Wire length loggers on ice shelves.

The highest-quality data come from CTG, BPR and modern GPS records. The major tidal constituents are best separated if more than 1/2-year of data are available. Many Antarctic records are less than 29 days long, so that they are difficult to analyze for a sufficient number of major tides to develop reliable predictive models for that site. Nevertheless, because so few tide records exist in the region, these shorter records (and, of course, the intermediate-length records between 29 days and 1/2 year long) may be valuable to some users.

Information on each site can be viewed by downloading our ATG KML package for Google Earth. Information can also be viewed or downloaded as a single file.

Files in package

ATG_README.PDF	This file
ATG_ocean_height_2014_0207.txt	Text file containing ATG data (108 sites)
ATG_ocean_height_2017_0816.mat	Matlab file containing ATG data (108 sites)
height_file_ocean_text2mat_2017_0816.m	Script to convert *.txt file to *.mat

File structure

***.txt*:** this is the primary file for maintenance and update of individual site information. File structure is explained within the file. This file is converted to *.mat using the script height_file_ocean_text2mat_2017_0816.m.

***.mat*:** This file uses structure arrays to organize site data by site (structure **ATG**(*i*; *i*=1, 2,… 108)), and as vectors of specific quantities (structure **ATG_VECTORS**). Character array **header** repeats the first 18 lines of the *.txt file. Structures contain the following:

ATG = 1×108 struct array with fields:

constit	names of the 8 tidal constituents; same in each structure
lat, lon	latitude and longitude of site
site_id	=i
RecordLength	length of data record (days)
DeltaTime	time step in data record (seconds)
amp	8-element vector: amplitude (cm) for constituents 'constit'
Gphase	8-element vector: Greenwich phase for constituents 'constit'
SiteName	Name of site
MeasType	Text string description of measurement method
Reference	Citation, where available, for data and/or tidal analysis.

ATG_VECTORS

```
        constit: [8×2 char]
            lat: [108×1 double]
            lon: [108×1 double]
         site_id: [108×1 double]
    RecordLength: [108×1 double]
       DeltaTime: [108×1 double]
             amp: [108×8 double]
          Gphase: [108×8 double]
        SiteName: [108×50 char]
        MeasType: [108×120 char]
       Reference: [108×120 char]
```

Reference

King, M. A., and L. Padman (2005), Accuracy assessment of ocean tide models around Antarctica, *Geophys. Res. Lett.*, **32**, L23608, doi:10.1029/2005GL023901.