Format Description for Global Extreme Sea Level Analysis, Version 4.0[1], 18 July. 2016

Web: http://gesla.org   **Email: gesla.help@gmail.com**

Filenames

All filenames should be in the form <site name>-<contributor's code>-<country>-<contributor>.

"contributor's code" represents the code that the contributor generally uses for this particular site. <contributor> should be an abbreviated name. Any spaces in any field should be replaced by an underscore ("_"). Lower case should be used throughout the fields <site name>, <country> and <contributor>. Upper case is only allowed in <contributor's code> if the code actually specifies it. If the contributor's code contains a "-", then it should be changed to a "_" in the filename. If a contributor's code does not exist, then <site name> should be used instead. It should be noted that there should be exactly *three* "-" characters in a filename.

Examples of (fictitious) filenames are: `hobart-H_3142-australia-ntc` and `san_francisco_2-9554888-usa-noaa`. In the first example, the contributor's code was originally "`H-3142`" and the "`-`" has been changed to "_". In the latter example, "`san_francisco_2`" has been used to differentiate the file from another file at a similar location which may have been called "`san_francisco`".

Height Units

All heights are to be given in metres.

Header information

Each file must have only one header. If the site has been relocated by a substantial amount, then the file should be broken into two, each carrying its own header.

All header lines are labelled with the Unix "comment" ("#").

There can be any number of header lines. Lines 1 to15 (which contain mandatory *labelled data*) should be as specified below. Lines 16 and higher may contain other header information in any order.

The following list describes header information which contains *labelled data*. The labels (e.g. "`DATUM INFORMATION`") must be used exactly as specified so that they can be found by character searching. The prefixes "`probably`" and the entry "`unknown`" may be used for the labelled data where absolutely necessary – for example, in many cases the `COORDINATE SYSTEM` will not be known with certainty and an informed guess is required (e.g. coordinates which may have been taken from a U.K. Ordnance Survey map could be classified by the entry "`COORDINATE SYSTEM probably Airy 1830`").

1.   The first line (`FORMAT VERSION`) gives the format version number (e.g."`2.0`"), followed by the web link and email address for GESLA.

2.   The second line (`SITE NAME`) gives the site name.

3.   The third line (`COUNTRY`) gives the country name in English[2].

4.   The fourth line (`CONTRIBUTOR`) gives the supplier of the data.

5.   The fifth line (`LATITUDE`) gives an approximate latitude for the gauge. `LATITUDE` is in decimal degrees, to four decimal places, with a range of -90.0000 to +90.0000.

6.   The sixth line (`LONGITUDE`) gives an approximate longitude for the gauge. `LONGITUDE` is in decimal degrees, to four decimal places, with a range of -180.0000 to +180.0000.

7.   The seventh line (`COORDINATE SYSTEM`) gives the coordinate system to which the `LATITUDE` and `LONGITUDE` refer. This is normally "`WGS84`".

8.   The eighth line (`START DATE/TIME`) gives the start date and time of the data in the file, with the

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[1] A file may possibly be misread if the version number "units" of its own format and of the reading program are different. However changes in the "tenths" integer only indicate cosmetic changes and should not affect the way in which a file is read.

[2] The country name should be as defined at: `http://www.iso.org/obp/ui`

format `yyyy/mm/dd hh:mm:ss`. 24 hr clock is mandatory and UTC is recommended.

9.   The ninth line (`END DATE/TIME`) gives the end date and time of the data in the file, with the format `yyyy/mm/dd hh:mm:ss`. 24 hr clock is mandatory and UTC is recommended.

10.   The tenth line (`TIME ZONE HOURS`) gives the difference from UTC in decimal hours (positive east of Greenwich); for a example, for Australian Eastern Standard Time, the value would be "`10`" or "`10.0`". For data in UTC (the usual case), then the value is "`0`" or "`0.0`" .

11.   The eleventh line (`DATUM INFORMATION`) gives the datum to which the data are referred. This should be consistent with the list of datums described under "L111" (to access this list, you need to hit "search") at http://seadatanet.maris2.nl/v_bodc_vocab/welcome.aspx. Requests for datums to be added to this list should be emailed to Roy Lowry at `rkl@bodc.ac.uk`.

12.   The twelfth line (`INSTRUMENT TYPE`) describes the tide gauge used to take the most recent measurements. It should be one from the list: "`bubbler`", "`pressure`", "`float`", "`acoustic`", "`radar`" and "`other`". Any changes of instrument type during the record should be noted as comments in the header.

13.   The thirteenth line (`PRECISION`) gives the number of significant digits to which a value has been reliably measured.

14.   The fourteenth (and possibly subsequent) line (`NULL VALUE`) gives the null value(s) to be used. This is "`-99.9999`".

15.   The fifteenth line (`CREATION DATE UTC`) gives the initial creation date in UTC. Subsequent modification dates should be described in the header as comments.

16.   If a "`COLUMN`" (see below) is provided to give the elapsed since a given time origin, the following should also be specified:

    (a)   `ORIGIN DATE/TIME` giving the date and time of the time origin, with the format `yyyy/mm/dd hh:mm:ss`. 24 hr clock is mandatory and the time zone is as defined by the `TIME ZONE HOURS` label.

    (b)   `TIME UNITS` giving the units of elapsed time ("`days`", "`hours`", "`minutes`" or "`seconds`").

17.   Lines labelled "`COLUMN`" describe all of the columns recorded in the data file, including quality-control flags. There should be a brief description of each parameter and the units of measurement. Values should be reported to one tenth of the nominal precision.

The meaning of quality-control flags should be defined as comments in the header section.

Other relevant information should also be stored in the header section (e.g. tidal constants, comments on data, a description of the processing steps so far).

Body information

Free formatting should be used for the data columns (where data may be separated by any number of spaces). All columns must be defined in the header section.

Data included in the present extremes analyses should be indicated by the "used-in-extremes-analysis" flag (1 = used, 0 = not used). *This flag is mandatory.* In the example below, the data for "`2004/07/01 00:45:00`" contains an obvious spike in the height (which is also indicated by the quality-control flag), which has therefore been removed. This is the mechanism by which all data should be removed from future processing or inspection - *no data should ever be deleted during processing*.

Mandatory columns are: "`Date yyyy/mm/dd`", "`Time hh:mm:ss`", "`Observed sea level (m)`" and "`used-in-extremes-analysis flag`".

Comments (lines starting with "#") may be inserted in the data to indicate important events. In this regard, extra labels may be defined to identify specific events (e.g. the label "`EARTHQUAKE`" in the following example).

Example

```
# FORMAT VERSION 4.0   Web: http://gesla.org   Email: gesla.help@gmail.com
# SITE NAME Lowestoft
# COUNTRY United Kingdom
# CONTRIBUTOR Proudman Oceanographic Laboratory
# LATITUDE 52.4820
# LONGITUDE 1.7516
# COORDINATE SYSTEM probably WGS84
# START DATE/TIME 2004/07/01 00:00:00
# END DATE/TIME 2004/07/31 23:45:00
# TIME ZONE HOURS 0
# DATUM INFORMATION Admiralty Chart Datum (ACD)
# INSTRUMENT unknown
# PRECISION .002 (m)
# NULL VALUE -99.9999
# CREATION DATE UTC 2007/23/02
# ORIGIN DATE/TIME 2004/01/01 00:00:00
# TIME UNITS days
#
# COLUMN 1 Date yyyy/mm/dd
# COLUMN 2 Time hh:mm:ss
# COLUMN 3 Observed sea level (m)
# COLUMN 4 Observed sea-level quality-control flag
# COLUMN 5 Residual (observed - predicted sea level) (m)
# COLUMN 6 Residual quality-control flag
# COLUMN 7 TIME UNITS since ORIGIN DATE/TIME
# COLUMN 8 used-in-extremes-analysis flag (1 = used, 0 = not used)
#
# Quality-control flags for observed sea level and residual:
#
# 0 - no quality control
# 1 - correct value
# 2 - interpolated value
# 3 - doubtful value
# 4 - isolated spike or wrong value
# 5 - missing value
#
# Several earthquakes occurred within this data set. They are marked
# by lines like:
#
# <Start of line># EARTHQUAKE at yyyy/mm/dd hh:mm:ss of magnitude X
#
2004/07/01 00:00:00     1.0470 1      0.0683 1  182.00000  1
2004/07/01 00:15:00     0.9790 1      0.0810 1  182.01042  1
2004/07/01 00:30:00     0.9250 1      0.1032 1  182.02083  1
# EARTHQUAKE at 2004/07/01 00:32:00 of magnitude 3
2004/07/01 00:45:00     5.8750 4      0.1225 1  182.03125  0
2004/07/01 01:00:00     0.8300 1      0.1372 1  182.04167  1
```