

# The TIGA data assembly centre SONEL: Recent developments & Perspectives



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## TIGA

TIGA (Tide Gauge Benchmark monitoring) has become a Working Group of the International GNSS Service (IGS) in 2011. It aims at processing and reprocessing GNSS data from **permanent stations at or near tide gauges** in order to provide robust estimates of their vertical land movement. Related important products are the **weekly position time series, the offset discontinuities and the accurate average positions of the tide gauges in the latest ITRF.**

## SONEL

SONEL aims at providing high-quality **continuous observations of sea- and land levels at the coast** from tide gauges (relative sea levels, France) and from modern geodetic techniques (vertical land motion and absolute sea levels, Worldwide in cooperation with the PSMSL) for studies on long-term sea level trends, but also calibration of satellite altimeters.



GPS antenna on tide gauge station in Male (Maldives)



www.sonel.org

Since 2001 SONEL acts as the primary TIGA data centre. It focuses on collecting, archiving and distributing observations from GNSS stations at or near tide gauges, but also from the IGS core stations to support each TIGA analysis centre (TAC) in its processing and reference frame alignment.

## Displaying TIGA ACs solutions

**ACs** (Analysis Centres) are shown in the top navigation bar: ULR, GFZ, DGF, EUREF, NGS, TIGA.

**Mean coordinates** (Reference epoch: 2003.0027):  
 Longitude (\*): -4.49659506  
 Latitude (\*): 48.38049333  
 Height (m): 65.8401

**Estimated velocity** (mm/yr): -1.14 +/- 0.12

**Estimated offsets** (mm):

Year	Offset (mm)	Code
2003-162	4.2 +/- 0.7	M
2005-076	-1.1 +/- 1.8	U
2006-207	-7.0 +/- 1.9	M
2008-163	10.4 +/- 0.5	M
2009-131	1.8 +/- 0.5	M

Legend for offsets:  
 M Material change or malfunction  
 E Earthquake  
 U Unknown  
 - Position discontinuity  
 - Velocity discontinuity

The main plot shows **BRST - Weekly solutions (detrended)** with Height in meters on the y-axis (ranging from -0.015 to 0.015) and time on the x-axis (2000 to 2010). A **Detrended weekly time series** label points to this plot.

**Requested files from the ACs**  
 Global (stacked) solution SINEX file  
 Discontinuities file  
 Times series files (1 per station)

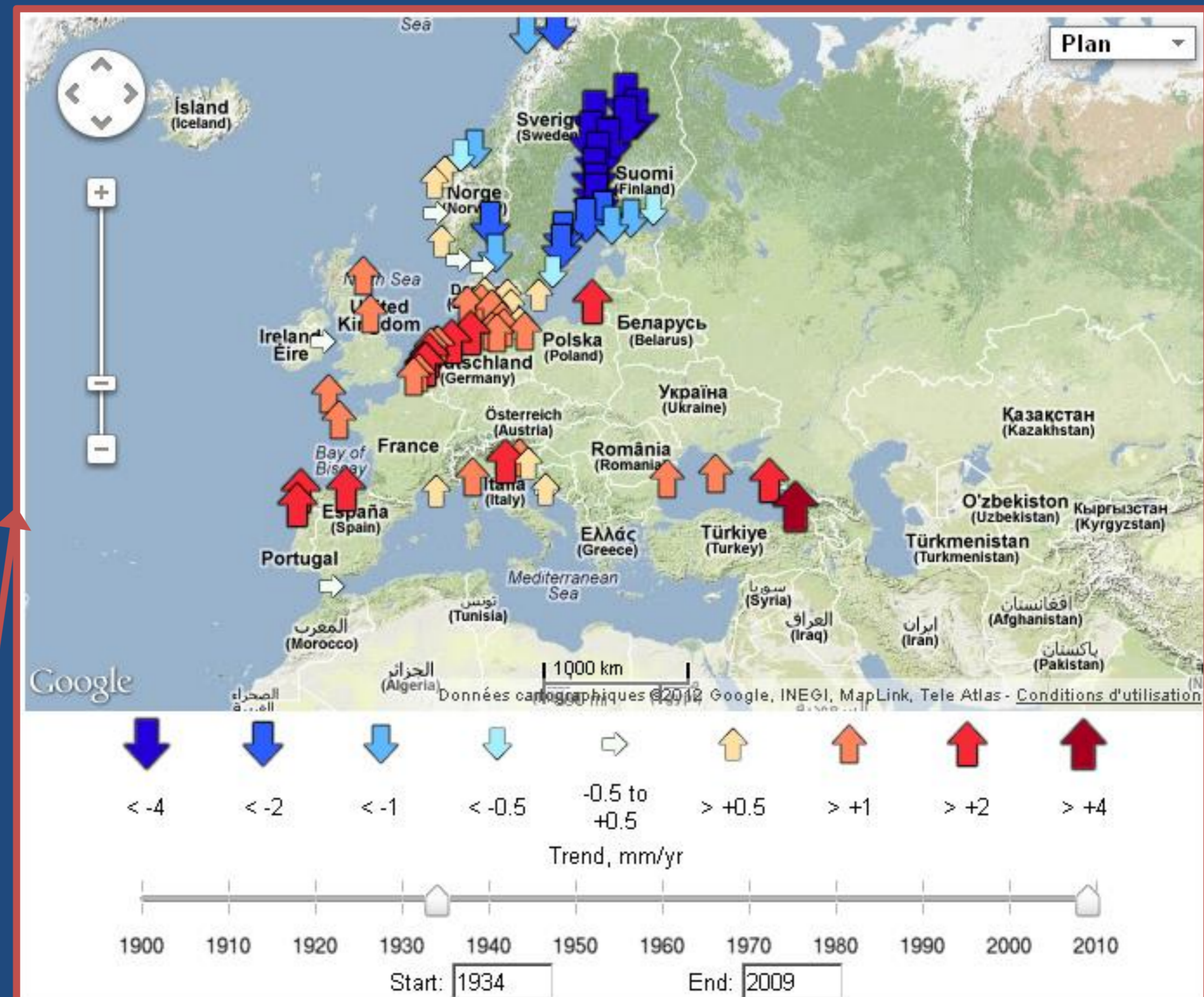
```
# Site: BRST File created: 2012-06-18T11:44:53
# Analysis Centre: Consortium ULR
# Solution code: ULR5
# Datum: ITRF2008 (ellipsoid: GRS80)
# Reference epoch: 2003.0027 (average station position between 2009.4 - 2011.0)
# X : 4231162.6063 +/- 0.0009 m
# Y : -332746.7157 +/- 0.0004 m
# Z : 4745130.9103 +/- 0.0009 m
# Longitude : -4.49659506 degrees VE : 16.62 +/- 0.05 mm/yr
# Latitude : 48.38049333 degrees VN : 16.84 +/- 0.08 mm/yr
# Height : 65.8401 m VH : -1.14 +/- 0.12 mm/yr
# Note: Stochastic model is wv_pl noise
# Note: Residual position time series are detrended
# Note: Following position offsets were also removed:
#Offset 2003.44384 7
#Offset 2005.20822 7
#Offset 2006.56712 7
#Offset 2008.44336 7
#Offset 2009.35890 7
#
# Year DN DE DR SDN SDE SDR
1998.8219 0.0007 -0.0009 -0.0011 0.0028 0.0022 0.0087
1998.8411 0.0011 -0.0011 0.0019 0.0011 0.0010 0.0031
1998.8603 0.0013 -0.0003 -0.0009 0.0012 0.0011 0.0034
1998.8795 0.0012 0.0013 0.0011 0.0010 0.0009 0.0028
1998.8986 0.0013 0.0002 0.0020 0.0011 0.0010 0.0032
1998.9178 0.0012 0.0003 -0.0002 0.0011 0.0010 0.0032
1998.9370 0.0005 0.0017 0.0030 0.0011 0.0010 0.0031
1998.9562 -0.0007 0.0002 0.0007 0.0011 0.0010 0.0031
1998.9753 -0.0002 -0.0006 0.0030 0.0011 0.0010 0.0031
1998.9945 0.0010 -0.0012 0.0046 0.0011 0.0011 0.0033
1999.0137 0.0020 -0.0005 0.0029 0.0011 0.0010 0.0032
1999.0329 0.0017 0.0003 0.0016 0.0010 0.0010 0.0031
1999.0521 0.0025 -0.0009 -0.0033 0.0010 0.0010 0.0031
1999.0712 0.0016 -0.0008 0.0041 0.0011 0.0011 0.0033
1999.0904 0.0005 0.0001 -0.0017 0.0010 0.0010 0.0030
1999.1096 0.0005 0.0006 0.0028 0.0010 0.0010 0.0031
1999.1288 -0.0002 -0.0013 0.0002 0.0011 0.0012 0.0033
1999.1479 -0.0015 -0.0017 0.0017 0.0011 0.0010 0.0032
```

## Future developments

**New home page: highlighting the SONEL products**

- Vertical GNSS velocity fields
- Relative & absolute sea level trends

The website features a navigation menu with links to Home, About SONEL, Data, Programmes (GLOSS), CGPS@TG, Users, Documentation, and Partners & Contacts. There are also sections for 'Welcome to SONEL', 'News', 'Observations', and 'Sea- and land levels at the coast'.



PSMSL derived trends (<http://www.psmsl.org/products/trends/>)

Following the map of relative sea level trends from the Permanent Service for Mean Sea Level (PSMSL), the objective is to display dynamically the absolute sea level trends calculated from different CGPS@TG datasets solution.