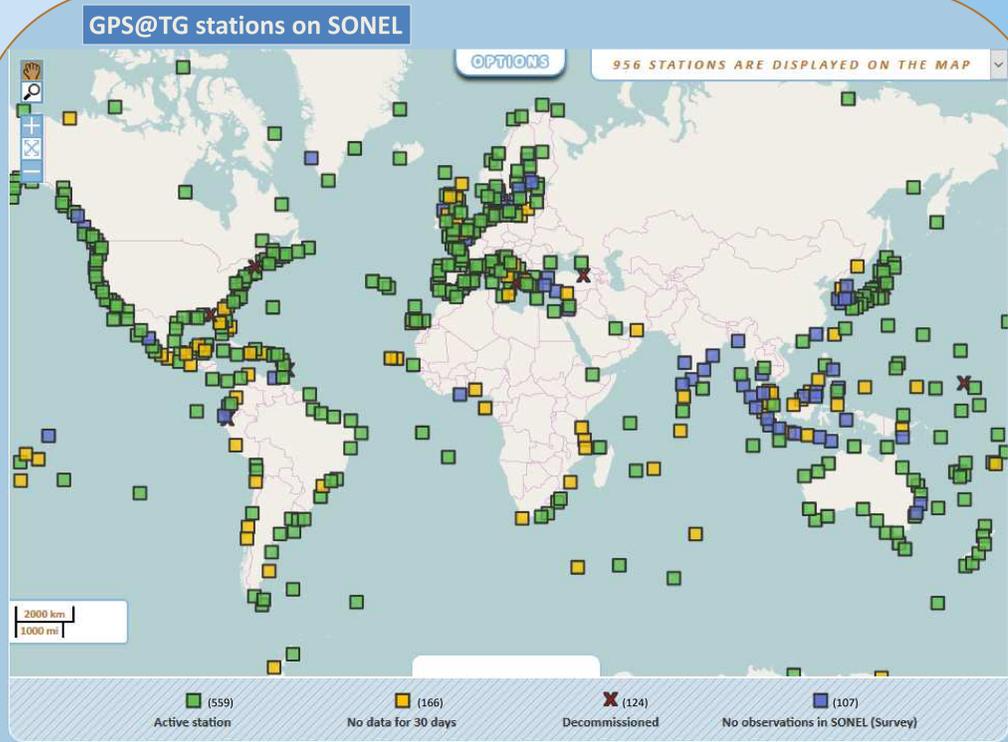
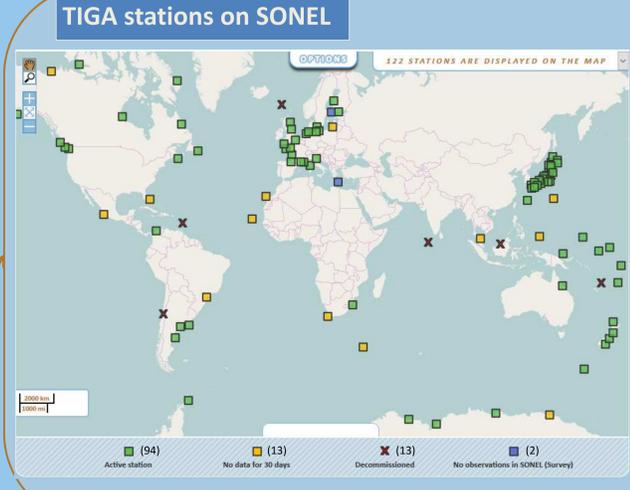


CONTEXT: The TIGA Working Group aims at providing an infrastructure built upon the IGS one for high-quality products stemming from the reanalysis of GNSS data at or near tide gauges (GNSS@TG). A basic TIGA activity is thus maintaining and promoting the expansion of the global GNSS@TG network, as well as the provision of its data and metadata. As GNSS Data Assembly Center for TIGA, SONEL collects and distributes GNSS at tide gauges observations, metadata and products, and provides web tools such as graphical daily indicators on the quality of the data delivered by each station or position time series graph.

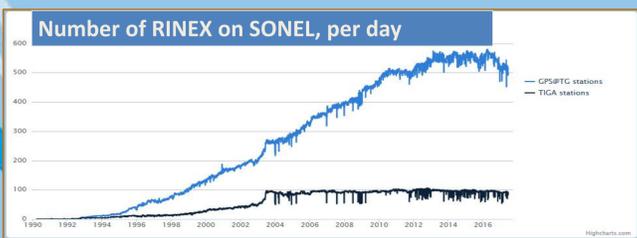


58% of GPS@TG stations are active and delivering data in 2017.
107 of identified GPS@TG stations (blue marked stations) have no information on SONEL – RINEX data and IGS sitelog files (2 TIGA stations).

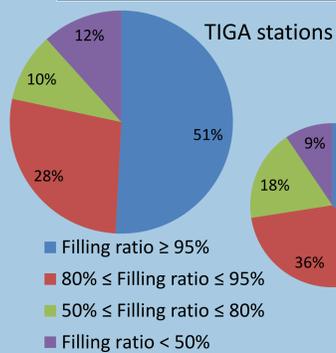


12.8% = TIGA network

Three requirements to commit to TIGA:
i. Availability of GNSS data & sitelog at the TDCs
ii. Tide gauge data being sent to the PSMML or UHSLC
iii. Provision of the TOS (TIGA Observing Station) form



Quality of GNSS stations



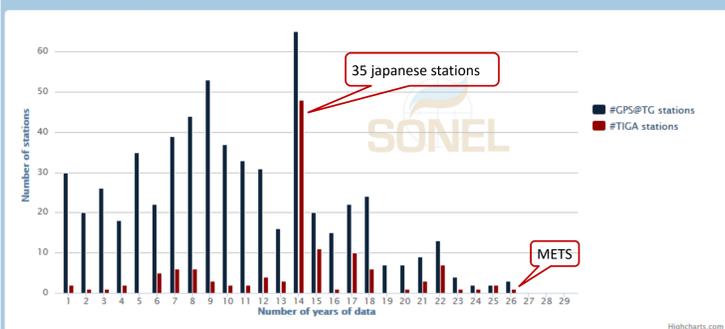
51% of the TIGA stations have a filling ratio of the observations completeness $\geq 95\%$.

36% for GPS@TG stations on SONEL.

Over 92% of TIGA station have more than 95% of good data.

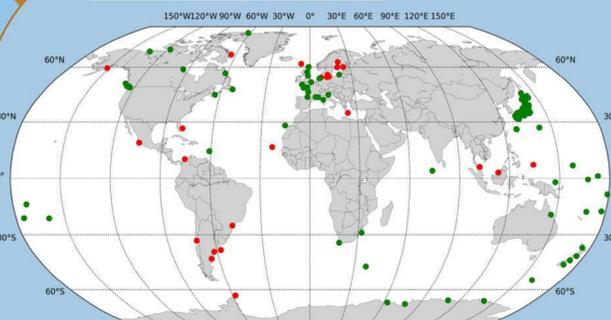
Time series lengths

SONEL collects GPS data since the day 1991-079. This graph shows the number of stations whose serie's length reaches x (years) value. Only the GPS stations whose filling ratio is over 70% are considered.



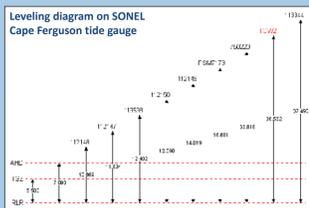
GNSS – Tide gauge ties

Status on SONEL: 'Stability of the datums' field



Tie information is really important to know geodetic stability of the tide gauge and get measurements of geocentric sea level.

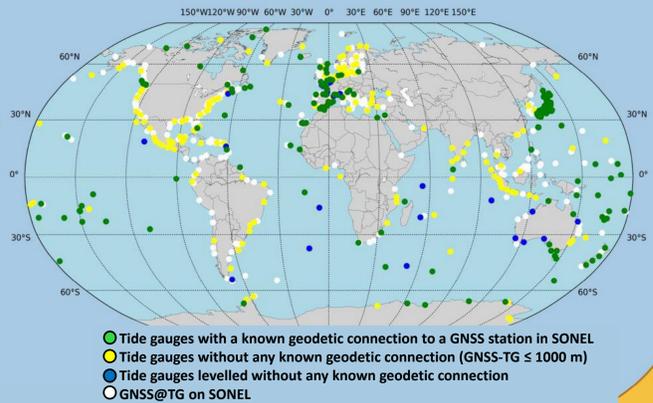
For these reasons, it is required in the TIGA Form (3.4.1 section)



91 TIGA stations have leveling information.
31 TIGA stations have no leveling information.

ON SONEL

160 tide gauges have a known geodetic link to the nearby GNSS station.
269 tide gauges < 1km from the GNSS, without any identified geodetic tie.



● Tide gauges with a known geodetic connection to a GNSS station in SONEL
● Tide gauges without any known geodetic connection (GNSS-TG ≤ 1000 m)
● Tide gauges levelled without any known geodetic connection
○ GNSS@TG on SONEL



Identified problems with TIGA stations

- Problems with data:
 - PALA -> no data since 2015-090
 - FREE -> no data since 2001-294
 - KLPD -> no data since 2012-309
 - PLUZ -> no data since 2013-229
- No information & no data:
 - DEGE
 - GVDO

12% of TIGA stations have less than 50% of data:
BINT, CART, FREE, GETI, KLPD, MANZ, MNZO, PALA, PLUZ, SIMO.
FFTZ, OHIG, TGCV, VALP have better GNSS stations installed nearby.

- Repair or replace off line stations.
- Give public access to RINEX data and metadata.
- Extend TIGA's GNSS@TG network.
- Perform regular leveling campaign.

Main limitations and perspectives

- **A map with only green or orange stations.** Reduce the number of blue stations (with no information available).
- **Operator management:** give the station operators the access to the stations management and the facilities offered by the TDC's tools.
- **Undertake repeated leveling connections** for at least 5 years, for satellite altimetry comparisons or calibrations.