INSTITUT NATIONAL
DE L'INFORMATION
GÉOGRAPHIQUE
ET FORESTIÈRE

NATIONAL REPORT FRANCE

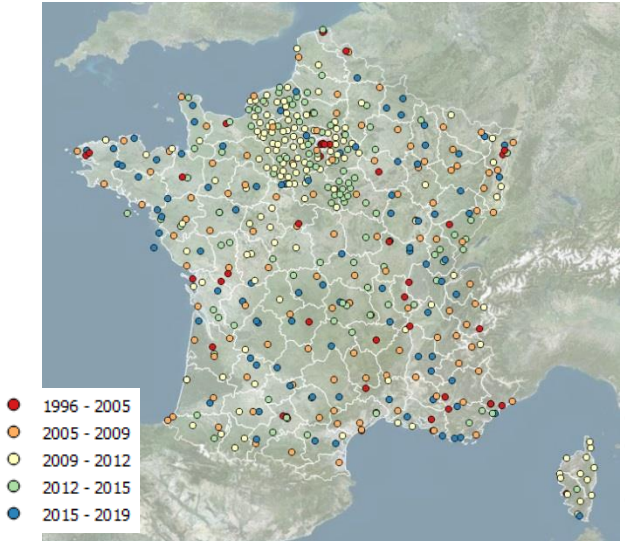
EUREF Symposium 2019 - TALLINN

GNSS PERMANENT NETWORK

Network

IGN acts as a coordinator of many partners
(private networks, public and scientific sector..)

521 permanent stations (17/05/2019) ***+28 in the past 12 months***
496 stations in continental Europe
21 stations are integrated into EPN and 95 into EPN densification network



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Services

Website : http://rgp.ign.fr >3000 visitors / month
RINEX data download : ~3000 dl / month

Online GNSS processing service: ~300 processings / month
Since March 2019 : experimental online PPP service


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Perspectives

Development of the networks in Guyana, Guadeloupe and Martinique
Development of a new infrastructure: full-GNSS RINEX3 data center (→ dec 2020)

CONTRIBUTIONS TO THE GLOBAL GEODETIC INFRASTRUCTURE

IGS

- IGS reference frame combination center
- Global data center

EUREF

- Analysis center and local data center

DORIS

Partnership with CNES

- Network maintenance and evolution
- IDS data center

REGINA

Partnership with CNES

Global GNSS network of 36 stations with real-time capacities

- Operational infrastructure management
- Redundant mission center.

SONEL

Partnership between CNRS, IGN, SHOM, LEGOS, LIENSs

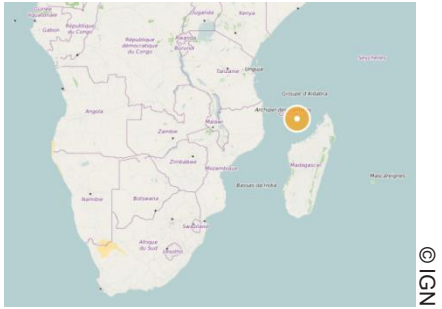
Network for sea-level observation from tide gauges and GNSS
GNSS datacenter for GLOSS (Global Sea Level Observing System)

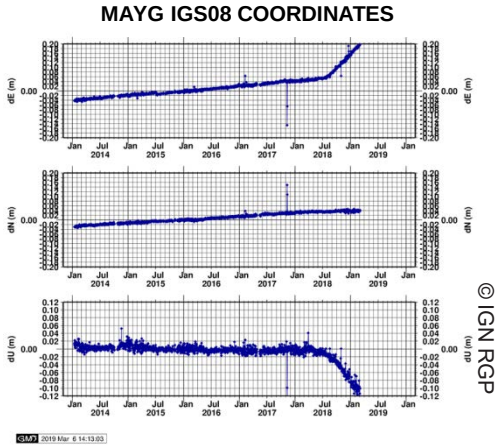
- GNSS data center
- GNSS stations implantation, management and measurement

GEODETIC COORDINATION - MAYOTTE

Context

Important and continuous seismic activity observed in Mayotte Island since May 2018.
First observations of geometric deformations in Nov. 2018 on MAYG permanent station (CNES-REGINA / RGP).
Hypothesis of a submarine volcanic eruption ca. 30 km east of Mayotte, **confirmed by the discovery of the volcano on May 16th**.

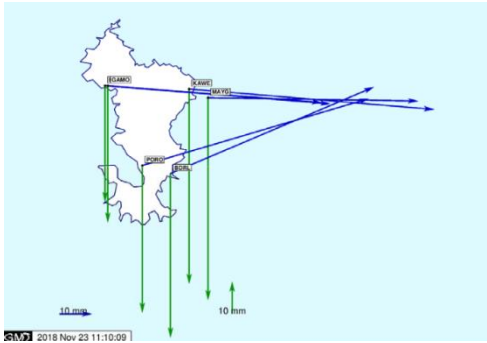




The project

Scientific and operational partnership between IGN, CNES, private networks (TERIA, Lél@), SHOM, LACy, ENS, IPGS, IPGP/OVPF

Gathering and dissemination of all GNSS data and products made on and around Mayotte, in order to help the scientific community to understand the telluric event.



GNSS REPROCESSING AND GLOBAL SOLUTION

Network and processing

Complete reprocessing of all GNSS data between 1998 and Dec. 2018 with Bernese GNSS Software and IGS14 products
Ca 940 stations (RGP, EPN, IGS14 + some others)

- 1 reprocessing of global network (IGS, EPN, some RGP and some others) from 1998 to mid-2017, IGN's EPN contribution after mid-2017
- 1 reprocessing of "continental Europe" network (RGP, and some EPN) from 2001 to 2018
- 1 reprocessing of "America" network (RGP Guyana and Caribbean stations, IGS and other)

⇒ Daily solutions obtained by combining these solutions each day with CATREF

Combination of weekly (till 2011) and daily solutions (from 2011) using CATREF software
Solution aligned to IGS14 datum

Solutions

Combined global solution in IGS14

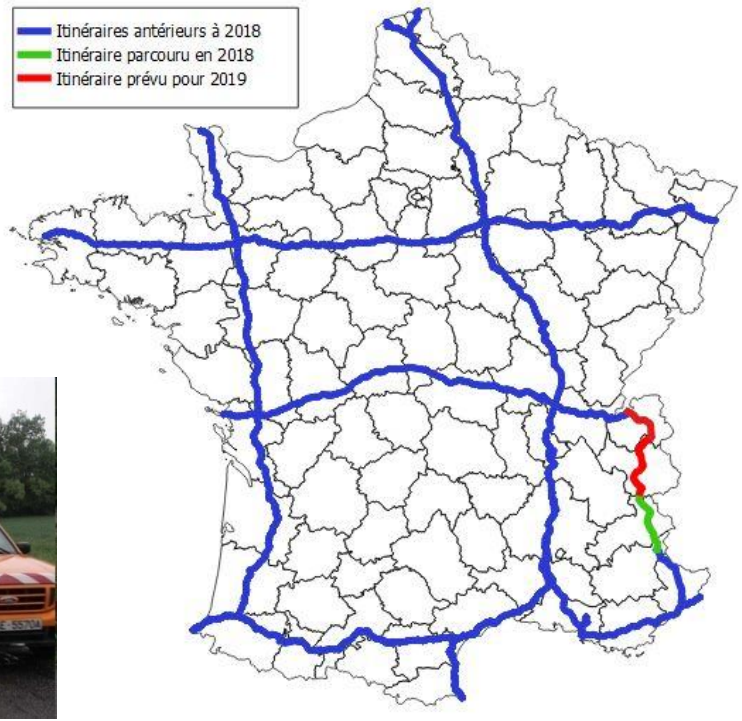
Regional solutions for the maintenance
of the national reference system RGF93

Work in progress
Results expected in June 2019

SCIENTIFIC LEVELING NETWORK

National leveling network

Maintenance of the national leveling network
A 12-Years project (2008-2020)



NIREF

140km in 2018 in the central Alps
2019 : up to Geneva

GRAVIMETRIC NETWORK

National Gravimetric Network

Maintenance of the national gravimetric network

- 15 absolute points
- 22 lines (relative measurements)
- 16 gradients

Test zone in Brittany

High gravimetry variability area -> adaptation of operating mode

- 38 absolute points
- 38 gradients

Saint-Pierre et Miquelon

New altimetric conversion grid

- 9 absolute points (+ gradient)
- 7 relative points

NEW QUASI-GEOID QGF16
NEW ALTIMETRIC CONVERSION GRID RAF18

Gravimetric quasi-geoid QGF16

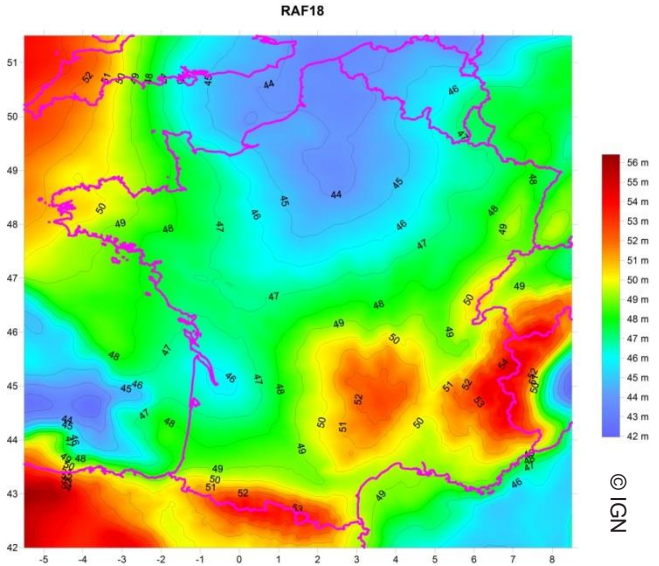
Input data:

- dense gravimetric terrestrial and marine data: 1 000 000 points
- DTM: 30m resolution in France, Sandwell for sea part, SRTM for foreign countries
- global gravity model: EGM08, degree 720

Processing method

- RTM method
- Stokes integral, 2°

Accuracy: 7 cm (stdev on 10 000 control points) min: -19 cm, max: +44 cm



Altimetric conversion grid RAF18

Adaptation of QGF16 on 10000 high accuracy GNSS-levelled points
Normal heights expressed in French altimetric system IGN69

Internal accuracy: 3 mm (stdev on 10 000 computation points)
External accuracy: 1 cm (stdev on 5 000 check points)

EVOLUTION OF FRENCH REGULATIONS

New decree related to geodetic references

Definition of the applicable terrestrial and vertical reference systems for **any localized data**

- ETRS89 + EVRS for continental France
- ITRS + local vertical references for overseas territories

➔ New legal reference system in the French West Indies (Guadeloupe and Martinique): RGAF09

Responsibility of IGN and SHOM for maintenance and publication of reference systems.

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THANK YOU FOR YOUR ATTENTION

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