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INSTITUT NATIONAL
DE L'INFORMATION
GÉOGRAPHIQUE
ET FORESTIÈRE

Institut national de l'information géographique
et forestière - EUREF 2021 - National report
FRANCE



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NATIONAL REPORT FRANCE

EUREF 2021 Symposium
online from Ljubljana, Slovenia

Sébastien Saur, IGN, service of geodesy and metrology



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GNSS PERMANENT NETWORK

RGP Network

IGN acts as a coordinator of ~50 partners
(private networks, public and scientific sector..)

519 permanent stations (30/04/2021)
 470 stations in continental Europe
 34 stations are integrated in EPN and 168 in EPN densification network
 Hourly, daily and weekly solutions

2019/2020: important network densification in overseas territories
(French West Indies and French Guyana): 6→30 stations.

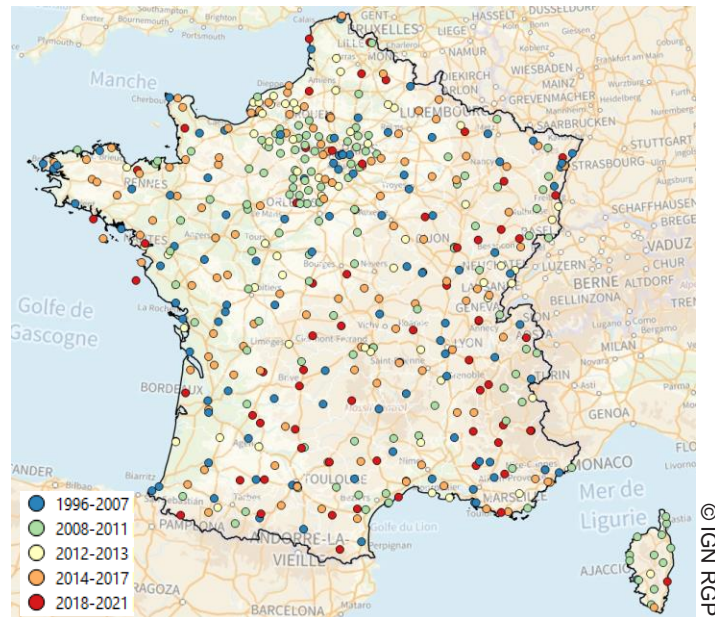
Services

Website : <http://rgp.ign.fr> >3000 visitors / month
 RINEX data download : ~3700 dl / month - ~500 Gb / month

Online GNSS processing service (differential and PPP): ~450 processings / month

Perspectives

Development of a new infrastructure: full-GNSS RINEX3 operating center (→ mid-2022)



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CONTRIBUTIONS TO THE GLOBAL GEODETIC INFRASTRUCTURE

IGS

- IGS reference frame combination center
- Global data center



EUREF / EPN

- Analysis center and local data center



DORIS

Partnership with CNES

- Network maintenance and evolution
- IDS data center
- IDS analysis center



REGINA

Partnership with CNES

Global GNSS network of 37 stations with real-time capacities, integrated in the IGS network

- 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



NEW REALIZATION OF THE FRENCH NATIONAL REFERENCE FRAME RGF93

RGF93 v2b was officially released on January 4th, 2021

Corresponds to ETRF2000 epoch 2019.0

Reprocess of more than 20 years of GNSS data and cumulative solution in ITRF14

➔ *New coordinates for the ~470 RGP stations and for the geodetic benchmarks.*

Average coordinate differences:

3 mm E, N

8 mm U (with significant gradient)

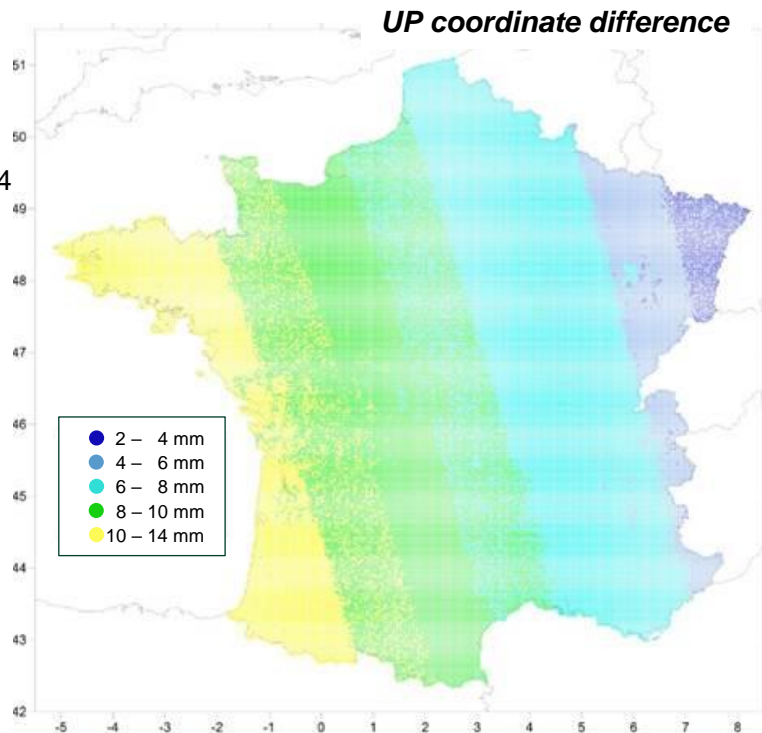
This new realization allow any end user (including PPP users) to have access to the national reference frame with a sub-centimetric accuracy.

NEW ALTIMETRIC CONVERSION GRID RAF18b

Adaptation of the quasi-geoid QGF16 on GNSS-leveled points in RGF93 v2b

Internal accuracy: 3 mm (std dev on 10 000 computation points)

External accuracy: 1 cm (std dev on 5 000 check points)



SCIENTIFIC LEVELING

Impact of the COVID-19 pandemic and lockdowns

National leveling network (ERNIT)

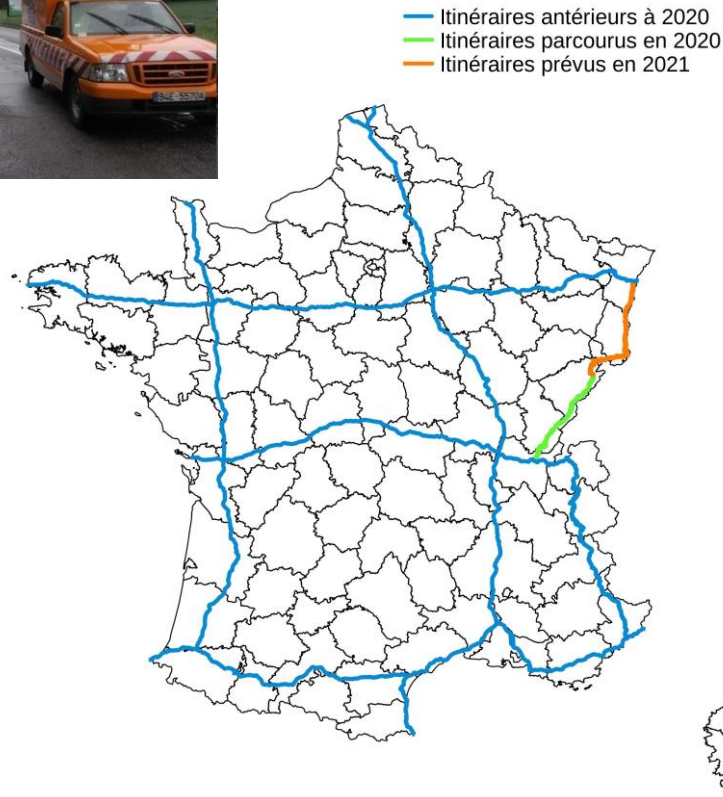
Maintenance of the national network in the south-east of France
Tie survey of 3 tide gauges in the Mediterranean coast

- ➔ 2021: maintenance of the network in Corsica and tide gauges tie surveys
- ➔ 2022: Switch from “standard” maintenance process to inSAR-based planification of the maintenance

NIREF

2020: Beginning of a ~480km leveling line between Geneva and Strasbourg

- ➔ 2021: completion up to Strasbourg
Two links with the Swiss network
and 1 with the German network (done or foreseen)
- ➔ 2022: start of a new line towards Dunkirk, links with the Belgian network



GRAVIMETRIC NETWORK

National Gravimetric Network

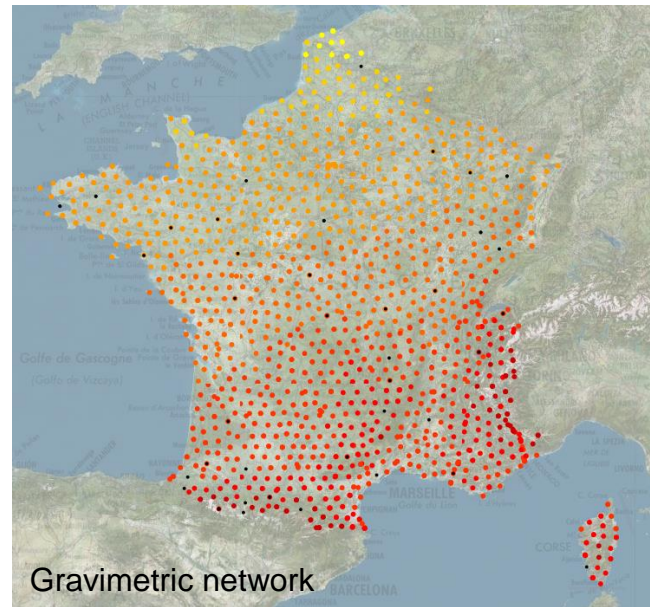
2020: Maintenance of the national gravimetric network
and measurements on the NIREF network

Network densification in the Pyrenees

45 absolute points

100 relative lines or gradients

➔ 2021: maintenance, measurements on the NIREF network
Densification in the region of Nantes



Géodésie de poche

“Geodesy in your pocket” - Android/iOS app

Access to all the geodetic information:

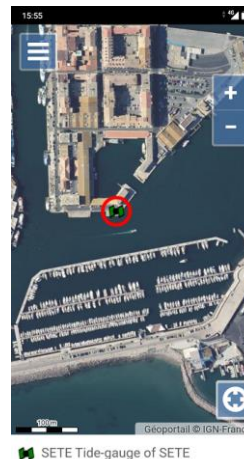
- benchmark data sheets
- CORS real-time status

User feedback gathering on the infrastructure: real-time update of the marker information with the smartphone, even offline.

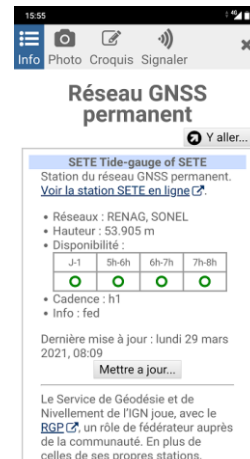
~150 reports per month in 2021.



● RN: NM109-175 (8.023 m)



SETI Tide-gauge of SETI



PERSPECTIVES

Geodetic infrastructure in Wallis and Futuna

Foreseen in 2022 (postponed since 2020 due to the pandemic situation).

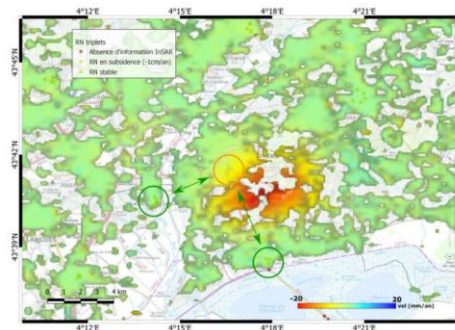
InSAR displacement maps

2020: Preliminary study for the use of InSAR data as input for the planification of the maintenance of geodetic networks.

2021: development phase, based on Gamma software and Copernicus data, in close cooperation with other French entities (BRGM, CNES, IPGP...). Evaluation of the potential interactions with the European Ground Motion Service

➔ ***towards a French ground motion service ?***

Refecion of the vertical reference surface model ~2023





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THANK YOU FOR YOUR ATTENTION

