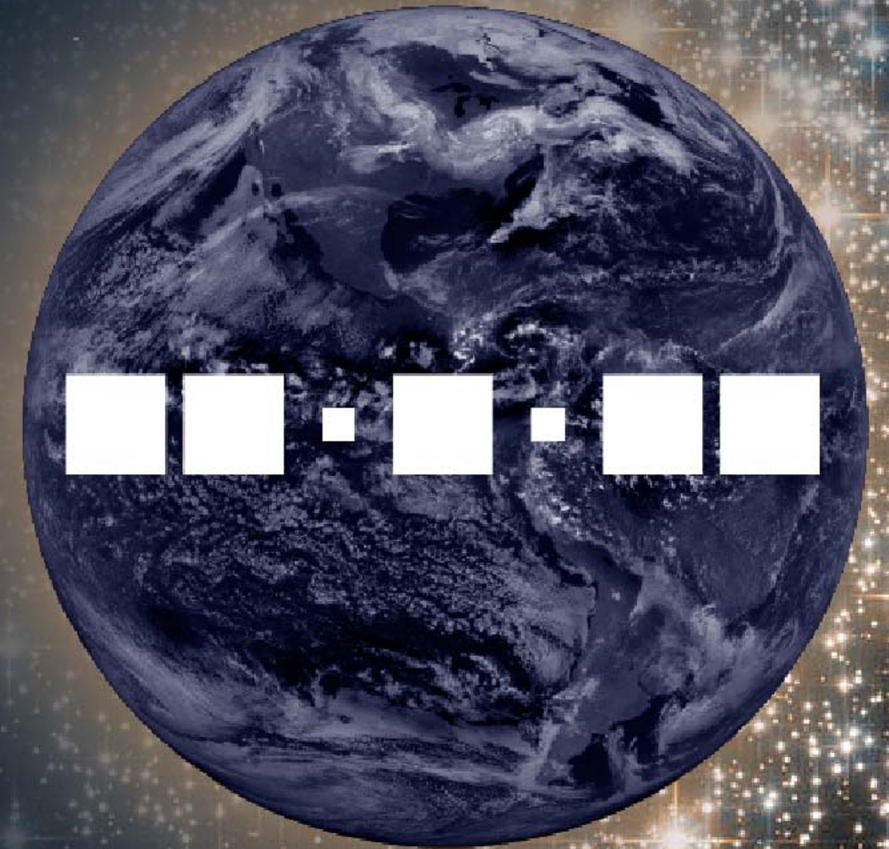




Tide Gauge Benchmark Monitoring WG

Tilo Schöne (Chair)



2022 Virtual Workshop
“Science from Earth to Space”

Session Information

Rapporteur: Tilo Schöne

Participants:

- Gary Mitchum
- Guy Wöppelmann
- Benjamin Männel
- Elizabeth Prouteau
- Tilo Schöne
- ...
- (IGS Workshop - Tide Gauge (TIGA).XLS)

Agenda:

- Gary Mitchum: A brief history of the GLOSS, TIGA partnership
- Guy Wöppelmann: Estimates of vertical land motion at tide gauges from multiple solutions (IGS-repro3 and others)
- Benjamin Männel: Results of the GFZ's TIGA repro3 contribution
- Status of the TIGA Network and status of SONEL (prepared by Elizabeth Prouteau)



Key Issues

- Review the status (e.g., coverage) of the TIGA-repro3 contribution, do we meet the requirements of the community (coverage, stability, “products”)
- Need of a dedicated TIGA combination (e.g. with ULR, GFZ, UoL, ...)
- Discuss ways to improve the situation with leveling TGBM/ARP
- Impact of multi-GNSS combinations on long-term homogeneity of the vertical of GPS-only time series (req. sub-mm/a) at tide gauges

Major Accomplishments

- University of La Rochelle and GFZ Potsdam processed large networks of GNSS@TG stations in IGS-repro3, UoLuxembourg plans a dedicated repro3 effort for TIGA
- Results (time series) are (or soon will be) available at the SONEL.ORG
 - TIGA/GFZ-repro3: doi 10.5880/GFZ.1.1.2022.001
 - SONEL ULR7 plans also a DOI
- SONEL acts also as TIGA-WG DC and hosts TIGA-NC
- Collected number of levelling ties increased at SONEL, also integration with PSMSL/IGS
- different studies using results from TIGA solutions
- SONEL provides an excellent service for the GLOSS, TIGA, and sea level community
- TIGA NC at SONEL provides an excellent service to keep the network up-to-date and growing

Discussion Highlights

- Understanding sea level change and coastal hazards requires a stable reference frame and GNSS@TideGauge time series
- Community appreciates SONEs capability for displaying time series from different solutions/ACs
 - more efforts are needed to (study and) explain differences between solutions at a specific site
- Can we provide better service to non-IGS users, non-GNSS experts?
 - comparison of solutions
 - combination of TIGA-repro3 (GFT and UoL are not in the IGS-repro3 solution)
 - Outreach at sea level conferences

Emerging Ideas (1)

- Work with GLOSS-GE to get feedback for the QoS, define more stations, and connect to the TG community
- Work with IAPSO/CMSLT (President: Gary Mitchum)
 - to define and (later) provide a better service to non-expert GNSS users of time series and trends (what are and why we have different solutions and results)
 - analyze the impact in respect the sea level change estimates
 - Develop a test strategy for time series of GNSS@TG
 - CMSLT plans establishing a working group on GPS/GNSS datums, which will provide an excellent forum to get both communities together

Emerging Ideas (2)

- Develop a “How-to” for the IHO-TWCWG (action item from last GLOSS-GE)
- Guidelines for TIGA-labeled stations should be renewed
 - beyond the IGS CORS Guidelines, reflecting the way of the ARP to the TGZ
 - IOC manuals on Sea Level (IOC Manuals and Guides No. 14: Volumes I–V), especially IV

Possible Impediments

- Decline in number of GNSS@TG stations
- many legacy receivers, delivering GPS-only/RINEX2/spurious data/...
- still leaking sufficient levelling information for >50% of the stations
- need more groups processing TIGA and GNSS@TG stations during repro's

Recommendations (not yet drafted)

- Non-expert community needs guidelines for the understanding of jumps, drifts, non-concurrent GNSS time series from individual solutions

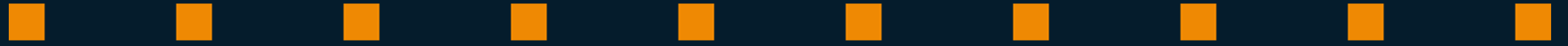
What the public should know about the IGS

- IGS provides a service essential to the sea level community by providing the frame where we can study sea level rise, regardless we live in a GIA- or subsidence-prone region.
- GNSS at radar altimetry satellites provides more stable orbits, thus, homogeneous time series of sea level change and results homogeneous to GNSS@TG
- GNSS is increasingly used by the tide gauge community to complement the tide gauge benchmark network and provide stable reference for the TGZ control



Tide Gauge Benchmarks
GNSS versus pillar





The END