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# IGS Infrastructure Status

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IGS Infrastructure Committee Chairman  
Navigation Support Office, ESA/ESOC

IGS Workshop, Pasadena, CA, USA.  
24/06/2014



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# Overview

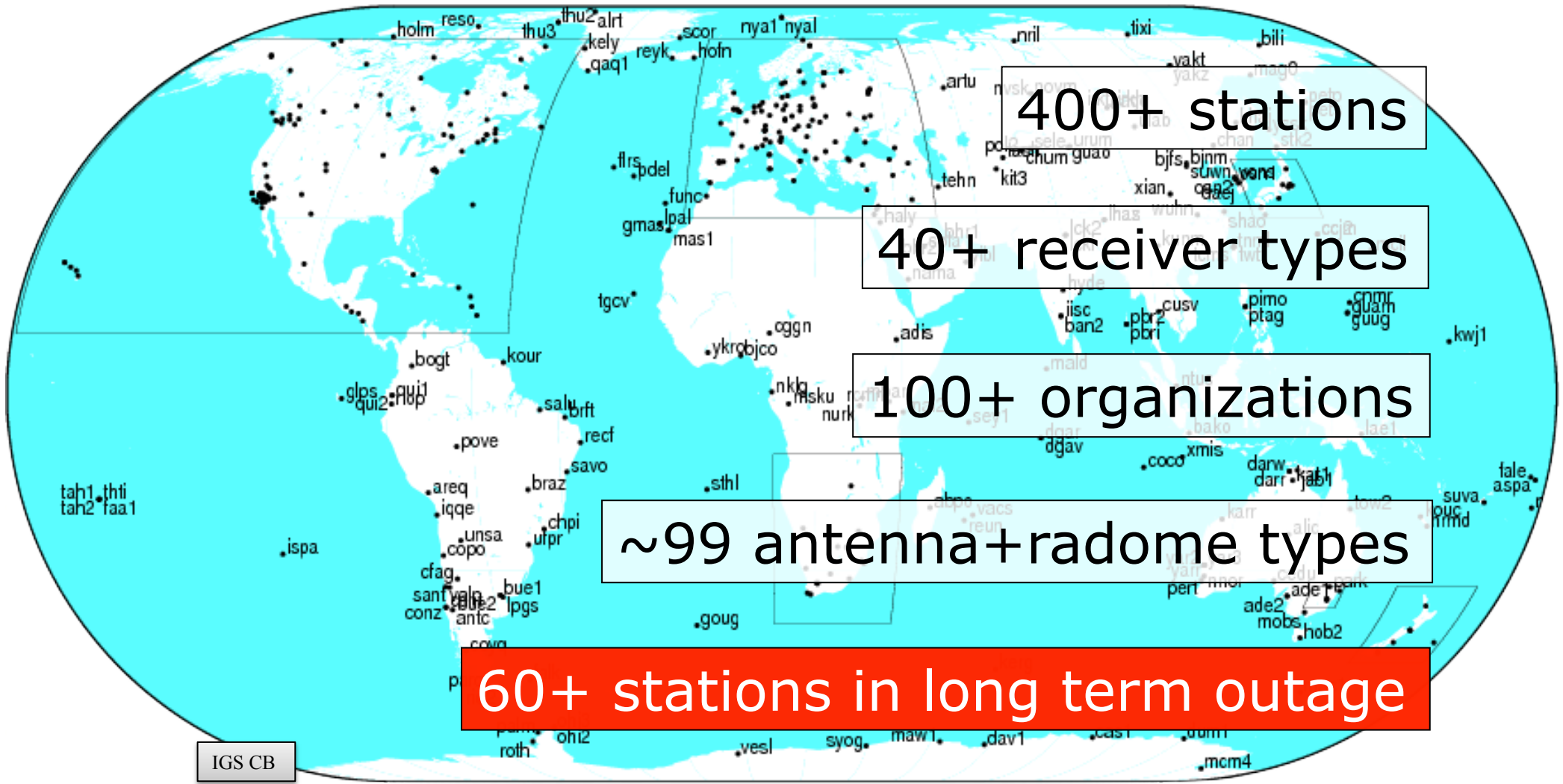


- 20 years of IGS Infrastructure ...
- Reference Frame station progress
- Current Challenges
- Infrastructure moving forward
- Conclusions

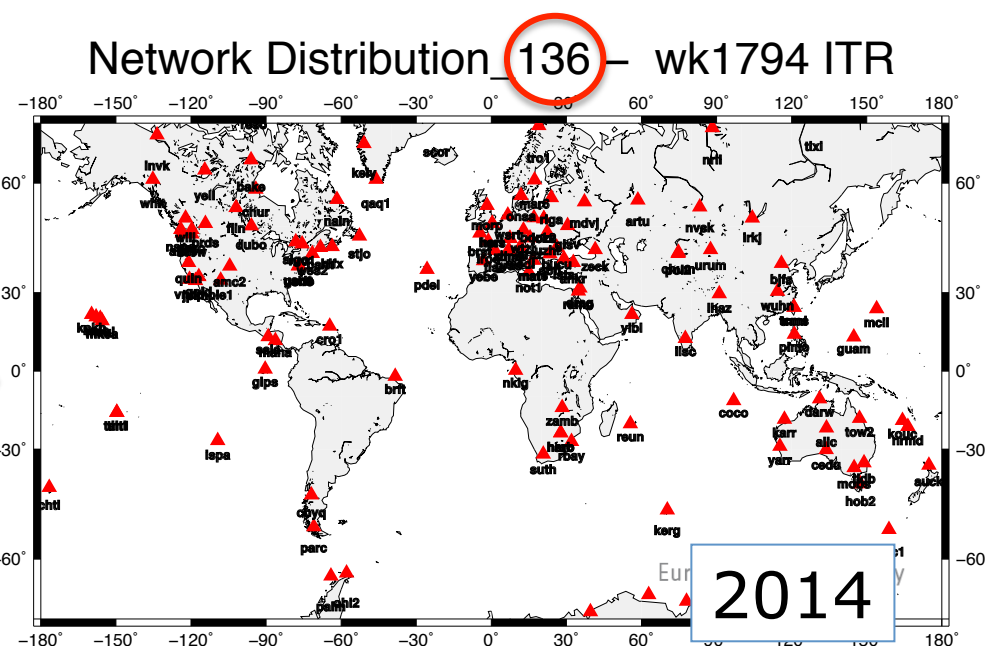
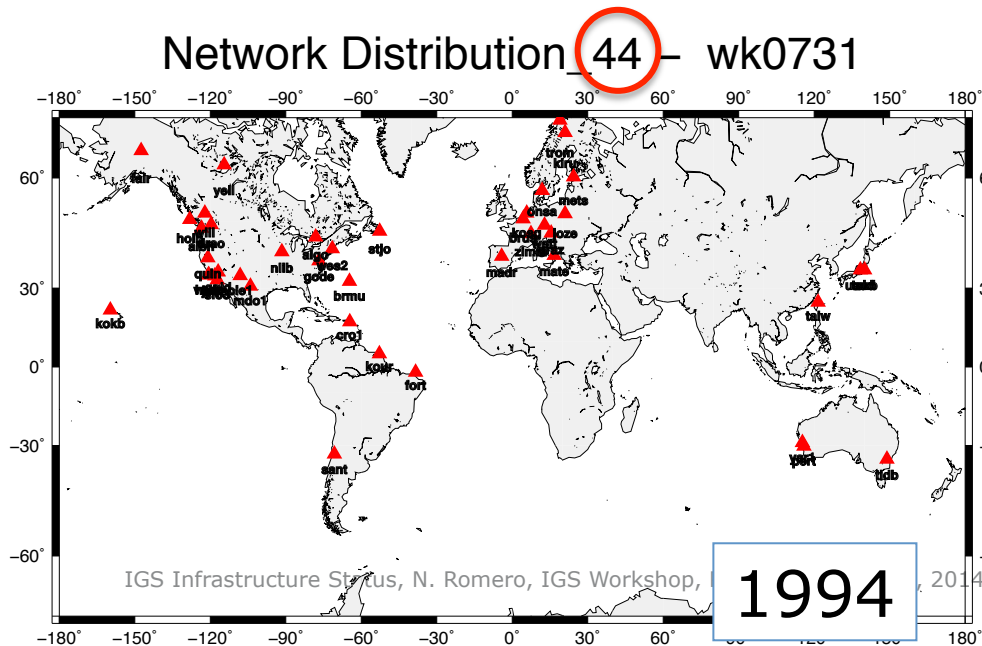


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# IGS Network



- Infrastructure encompasses all the underpinnings that make the IGS ... stations, data formats, data centers, etc.
- We have come a long way in 20 years ... big increase of reference stations ... the most important stations of all



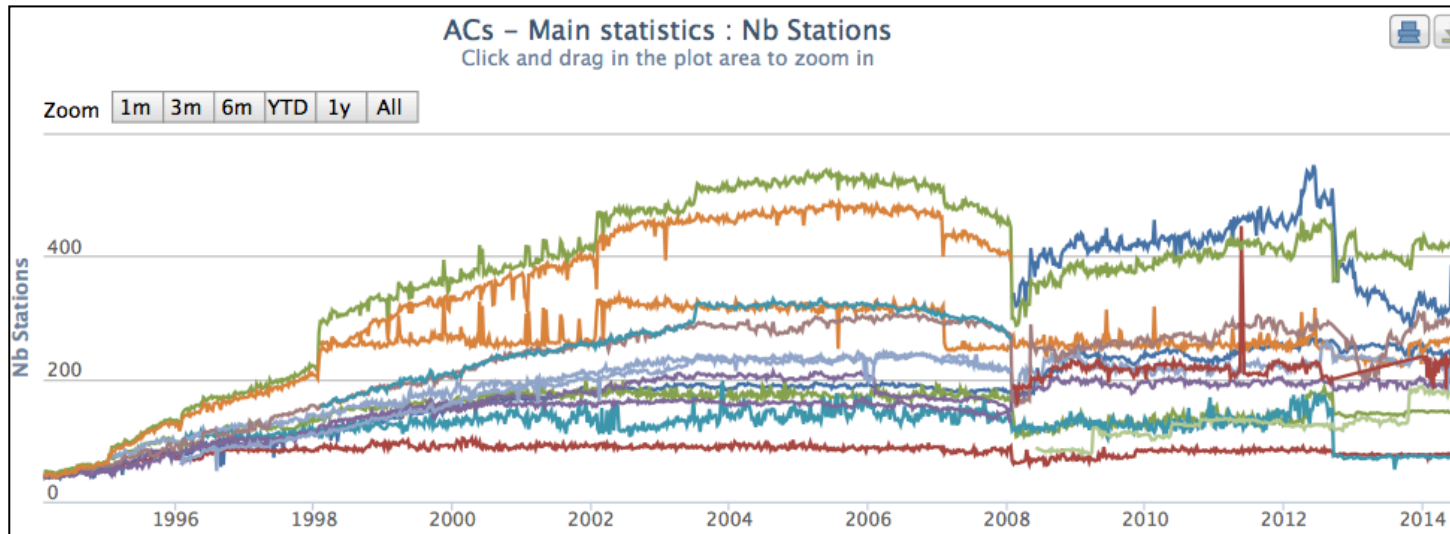


# Reference Frame Station progress...

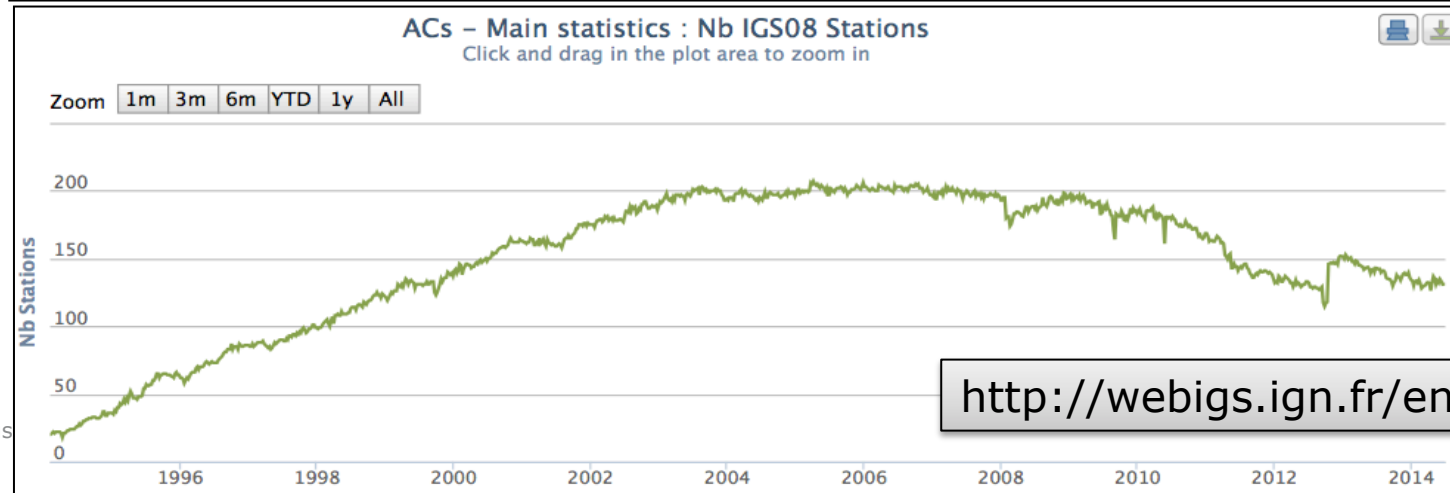


- The position for the ITRF stations enable the orbits to disseminate the ITRF worldwide.. Having enough stable stations is critical ...

AC Station usage



ITRF available weekly station position sln



<http://webigs.ign.fr/en/tfcc/>



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# Overall Challenge



**IGS RT**  
Speed, RTCM, Global

**IGS MGEX**  
New Signal and  
Format Needs,  
Global + Regional

**IGS RF**  
Stable long term  
Time Series, Global

## What we face

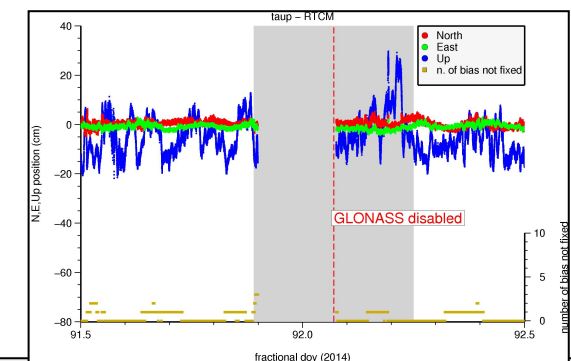
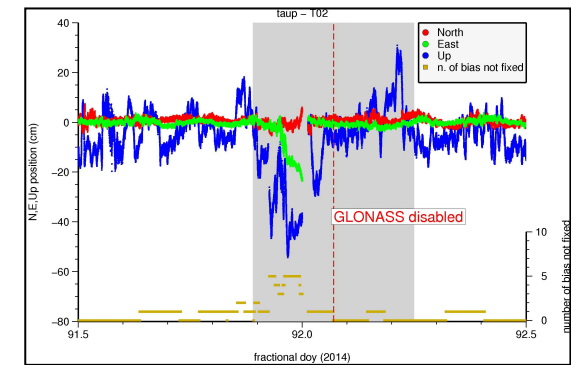
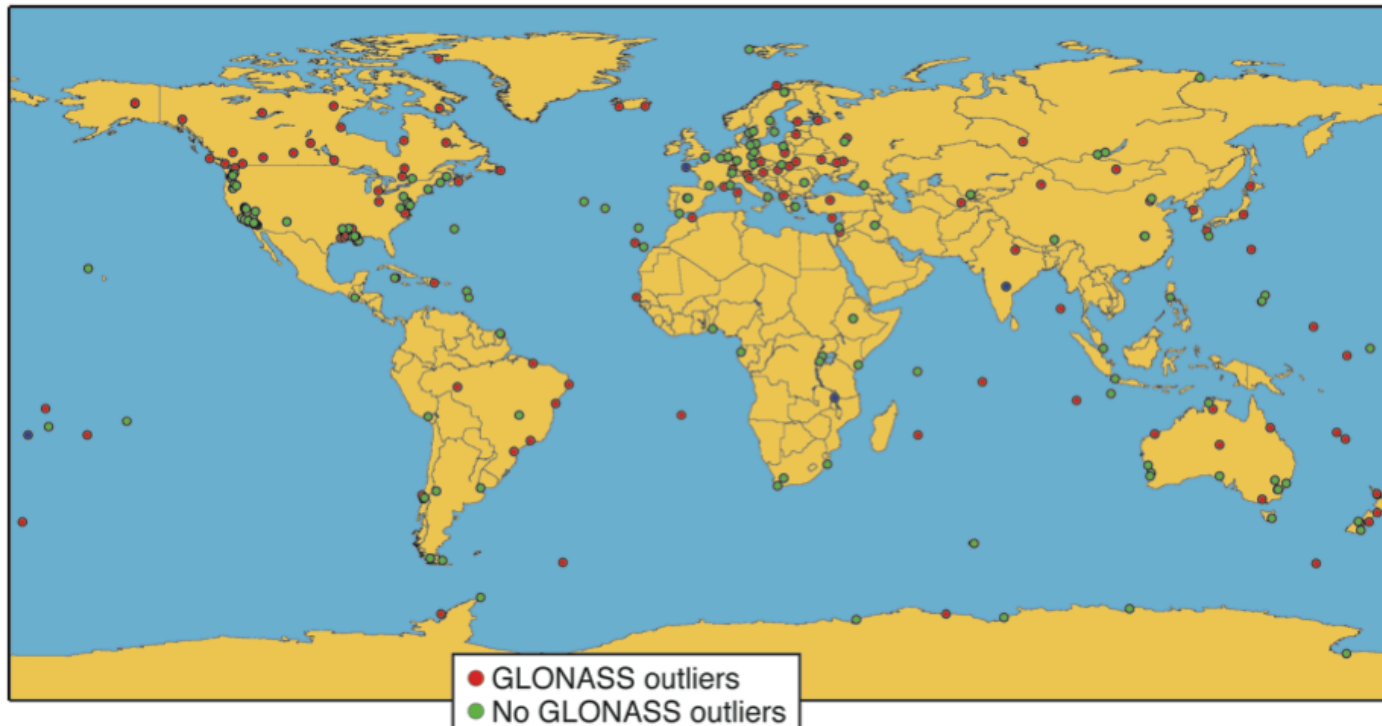
**IGS Station Network**  
Need strong management from NC with IC, AC, MGEX, etc help.

**IGS projects/experiments**  
Need dedicated networks to be accepted to IGS ntwrk.

**IGS "Ntwk of Ntwks"**  
NC/IC need to identify more regional bodies with good active stations to underpin all IGS efforts; SIRGAS, EUREF, European Space Agency AFREF,



- **GLONASS ephemerides** “time of applicability” problem; April, 2014
- Due to heterogeneity and depth of IGS network no effect on products but several receivers stopped tracking GLO or showed problems...





# IGS

## Challenges



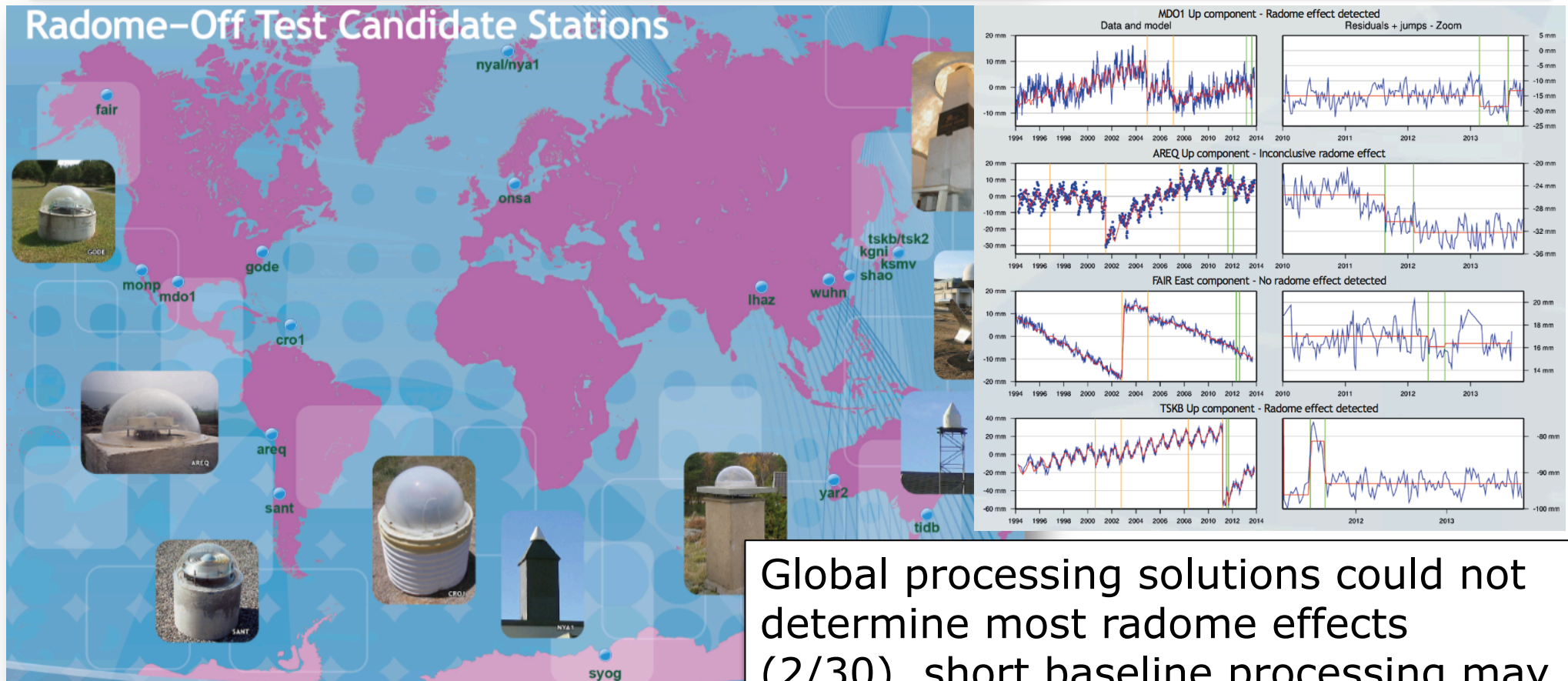
**NGA** added its stations for the **repro1** effort, they consist of 22 double stations at 11 sites – stations have been out since '09



NGA upgraded equipment to unknown ITT receivers/antennas, we have identified the equipment into **rcvr\_ant.tab**, added calibration from NGS to **ANTEX** but data has  $\frac{1}{2}$  phase cycle ambiguity, and most stations moved the antennas, NGA data continues to be out.

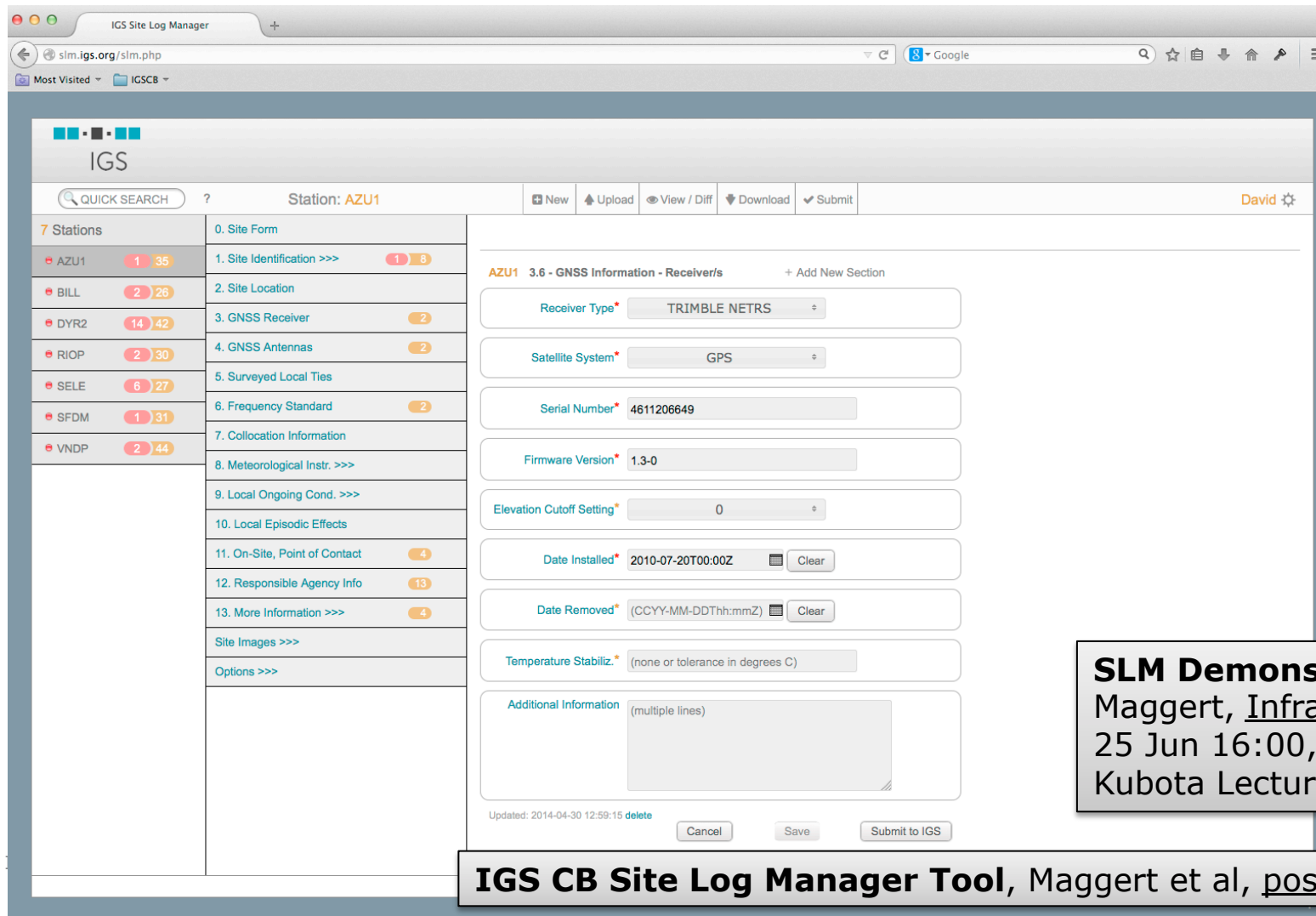


**Uncalibrated radomes** are a significant problem at co-located sites, where their ITRF08 tie discrepancies reached 99 mm!!



Global processing solutions could not determine most radome effects (2/30), short baseline processing may be tried.

- **IGS Site Log Manager Tool** to manage the station configurations ...



The screenshot shows the IGS Site Log Manager Tool interface in a web browser. The browser address bar shows `slm.igs.org/slm.php`. The page title is "IGS Site Log Manager". The main content area is titled "Station: AZU1" and includes a "QUICK SEARCH" field and a "New" button. The interface is divided into several sections:

- 7 Stations:** A list of stations with counts in red circles: AZU1 (1/35), BILL (2/26), DYZ2 (14/42), RIOP (2/30), SELE (6/27), SFDM (1/31), and VNDP (2/44).
- 0. Site Form:** A list of form sections: 1. Site Identification >>> (1/8), 2. Site Location, 3. GNSS Receiver (2), 4. GNSS Antennas (2), 5. Surveyed Local Ties, 6. Frequency Standard (2), 7. Collocation Information, 8. Meteorological Instr. >>>, 9. Local Ongoing Cond. >>>, 10. Local Episodic Effects, 11. On-Site, Point of Contact (4), 12. Responsible Agency Info (13), 13. More Information >>> (4), Site Images >>>, and Options >>>.
- AZU1 3.6 - GNSS Information - Receiver/s:** A form for configuring the receiver. Fields include:
  - Receiver Type: TRIMBLE NETRS
  - Satellite System: GPS
  - Serial Number: 4611206649
  - Firmware Version: 1.3-0
  - Elevation Cutoff Setting: 0
  - Date Installed: 2010-07-20T00:00Z
  - Date Removed: (empty)
  - Temperature Stabiliz.: (none or tolerance in degrees C)
  - Additional Information: (multiple lines)

At the bottom of the form, there are buttons for "Cancel", "Save", and "Submit to IGS". The page footer indicates "Updated: 2014-04-30 12:59:15 delete".

**SLM Demonstration, D. Maggert, Infra Splinter Mtg, Wed 25 Jun 16:00, Room 101 (Lees-Kubota Lecture Hall)**

**IGS CB Site Log Manager Tool, Maggert et al, poster session PS08**

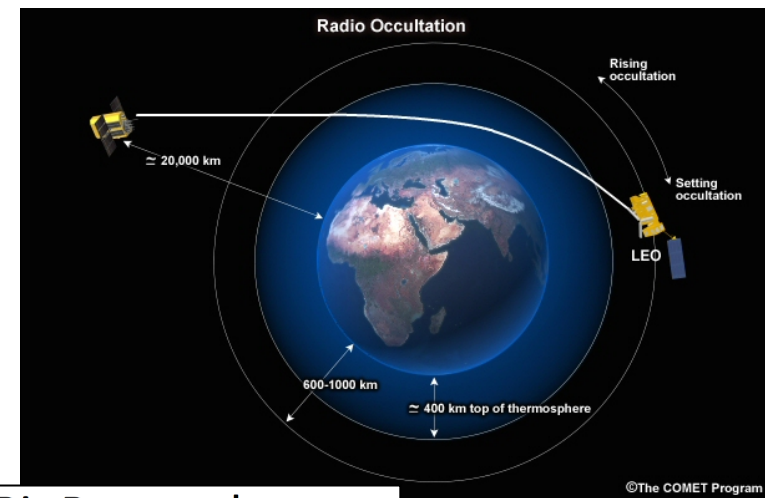
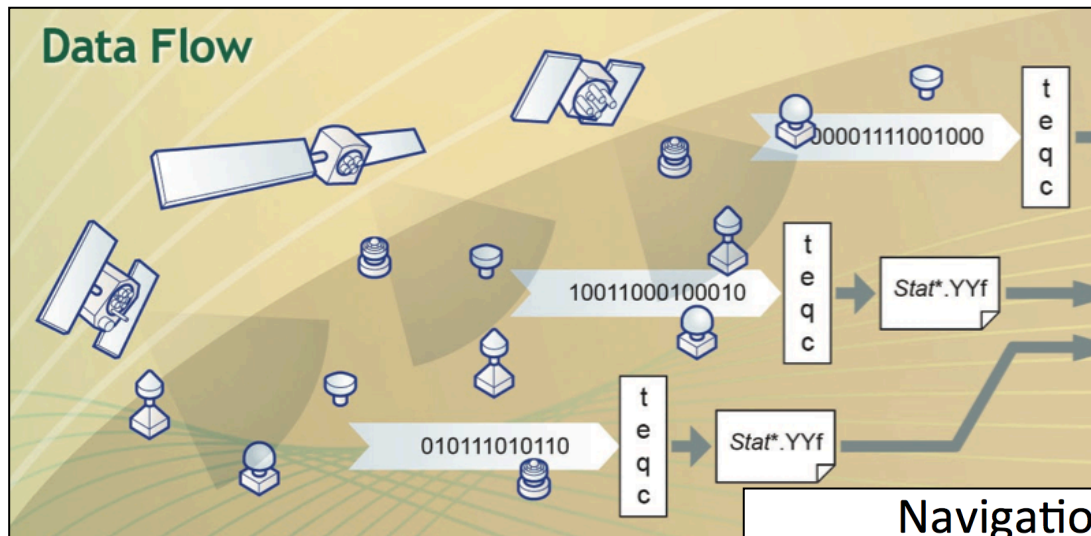


# IGS

## Moving Forward ...

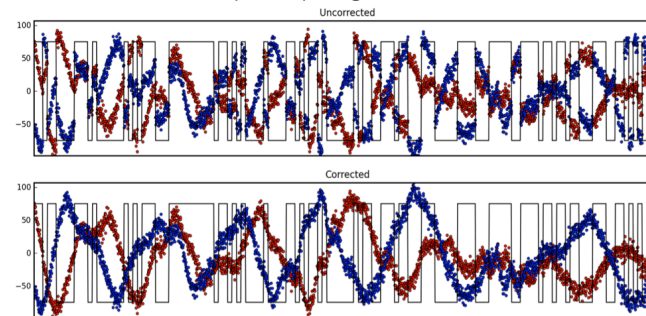


- **NavBits** to store the navigation bits for open loop GNSS signal processing from many IGS stations ...



### Navigation Bit Removal

I and Q components (arbitrary units) of the row-sampled open-loop signal before (top) and after (bottom) Navigation Bit Removal





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# *Thank You!*

Please contact the IC with questions and concerns through one of its members or me:

[Ignacio.Romero@esa.int](mailto:Ignacio.Romero@esa.int)

Also contact the NC at: [cb@igs.org](mailto:cb@igs.org)



**Infrastructure Splinter Mtg** – Room 101  
(Lees-Kubota Lecture Hall - Wed 16:00 – 17:30)