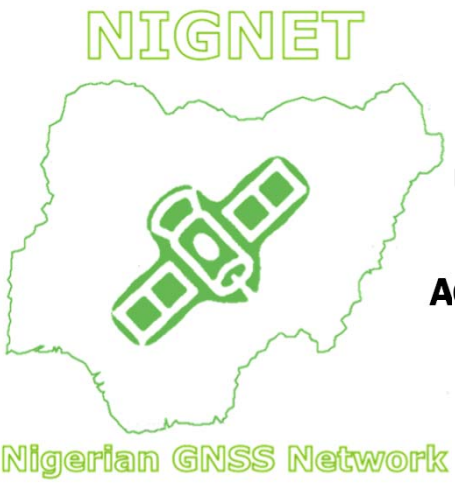
NIGNET

The New Permanent GNSS Network of Nigeria



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Summary

- Motivations to implement NIGNET
  - National level – new reference frame
  - Continental level – AFREF
  - Global level – ITRFxx / IGS
- Roadmap to establish NIGNET
  - Network Design
  - Network Implementation
  - Current Status
- Initial Results
  - Abuja and Lagos CORS stations
  - Other stations installed recently
- Future Plans

Reasons to promote NIGNET

The common reference system in use is the
Minna Datum
(φ= 9 º 38' 09".000; λ= 6 º 30' 59".000)
Ellipsoid: Clarke 1880 (modified)

However, during the last decades, many geodetic pillars materializing the reference frame have been destroyed, and only a small percentage of beacons are still usable. Furthermore, the original network was implemented using techniques having lower accuracy and requiring the installation of points at locations of difficult access (e.g., top of hills).

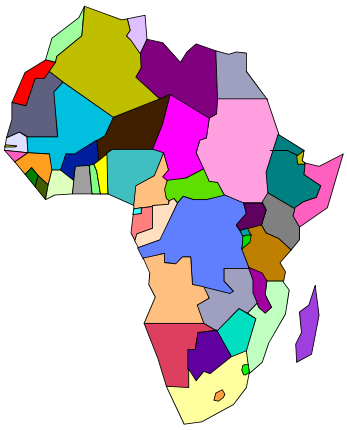
AFREF

AFRICAN REFERENCE FRAME

AFREF is an effort carried out by the international community, in particular the African countries, to establish a continental reference system, consistent and homogeneous with the global reference system (ITRS) as a basis for the national reference networks.

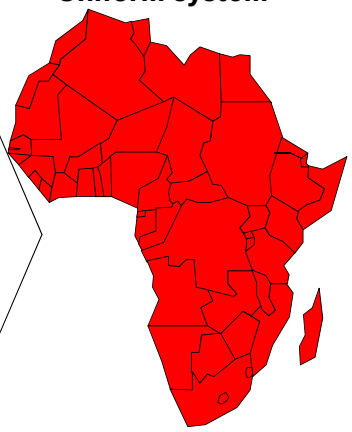
Way to go...

Non-uniform systems



GNSS stations + ITRS

Uniform system



- GNSS stations will realize and maintain AFREF
- AFREF will be based on ITRFxx (currently ITRF2005)

FIG 2010 – Sydney, Australia – 13 April 2010 5

AFREF

OTHER GOALS

- To realize a unified vertical datum and to support efforts to establish a precise African geoid.
- To determine the relationship between the existing national reference frames and the new system (and ITRS) in order to preserve legacy information of the existing frames.
- To provide a sustainable development environment for technology transfer so that these activities will enhance the national networks and other GNSS related applications.

FIG 2010 – Sydney, Australia – 13 April 2010 6

Relation with IGS

IGS stations will be the backbone of the AFREFxx realization by providing the link to ITRFxx

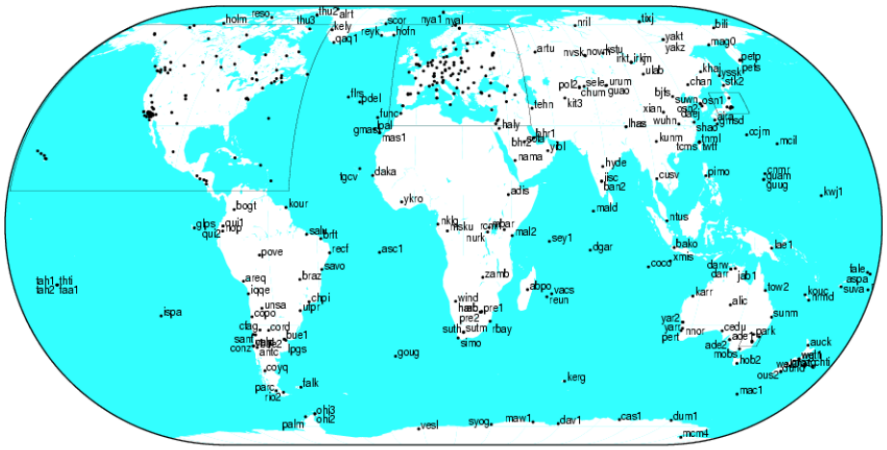


FIG 2010 – Sydney, Australia – 13 April 2010 7

Situation in Africa (middle 2009)

Survey of CGPS sites: 118

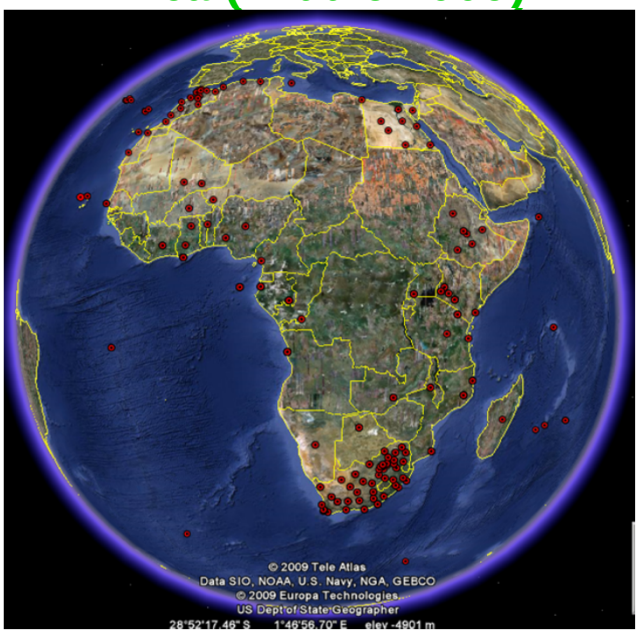


FIG 2010 – Sydney, Australia – 13 April 2010 8

AFREF - Available Stations in Africa

May 2008
47 stations

January 2009
43 stations

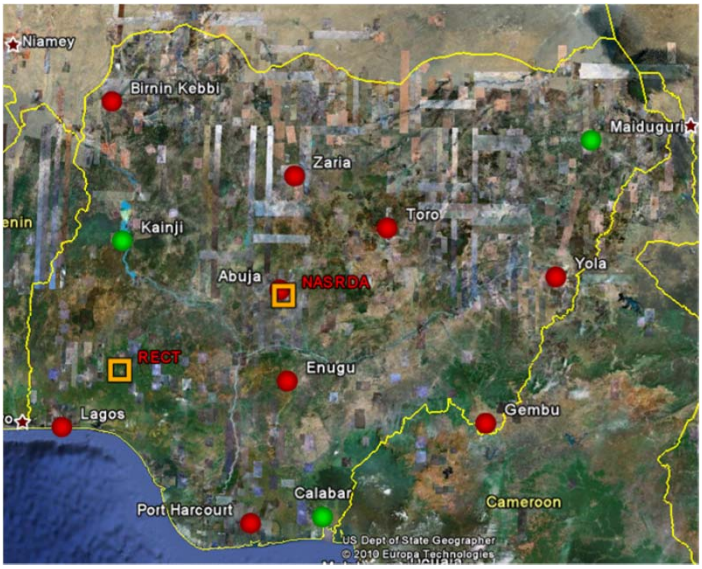
Many stations have significant data gaps.
But the coverage is improving...

NIGNET

9 stations installed

3 stations planned to 2010

NIGNET



+ 2 stations in collaboration with NASRDA and RECTAS

NIGNET stations – Examples

Univ. Lagos

Top of the building to avoid obstructions

NIGNET stations – Examples

Birnin Kebbi

Dedicated Building

NIGNET stations – Examples

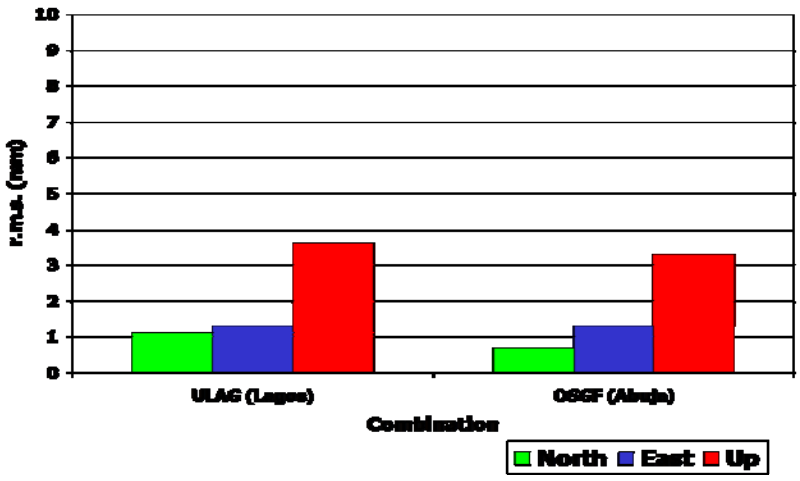
Toro

Exposed Rock

NIGNET stations – Examples

- State-of-art Receiver+Antenna
- Mobile Communications
- Powered by Panel Solars

Quality of the Estimated Positions



12 weeks used

Future Plans & Summary

- NIGNET will establish a new and modern reference frame for Nigeria.
- NIGNET will be linked and will also contribute to realize AFREF in West Africa
- OSGoF will collaborate with other partners to densify the NIGNET at National and State level.
- By providing an accurate reference frame, NIGNET will also contribute to support activities related with other technical and scientific applications.

And the effort will continue...

THANK YOU...

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