

**INTEGRITY CHECK ON GROUND CONTROL
POINTS USING NIGNET'S CONTINUOUSLY
OPERATING REFERENCE STATIONS**

By

Felix IYIOLA

Rasheed OGUNDELE

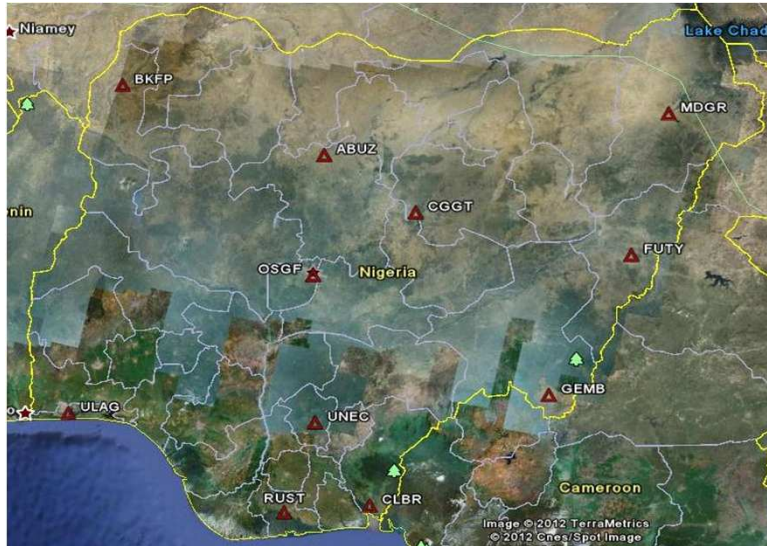
Caleb OLUWADARE

Olajide KUFONIYI



INTRODUCTION

- Mapping Projects require a network of horizontal and vertical controls
- OSGOF in 2008 initiated of project to establish Nigerian GNSS Reference Network (NIGNET)
- The project will contribute to African Geodetic Reference Frame (AFREF)
- OSGOF has established 11 CORS in Nigeria
- Osun State embarked of aerial mapping at large scale using high resolution aerial photographs



NIGNET CORS plotted on Google Earth image

INTRODUCTION

- The project involved the establishment of 124 Ground Control Points (GCPs) with GNSS receivers
- The state established 3 CORS with full installation completed, awaiting calibration tests
- The focus is to check the integrity of the GCPs using CORS from NIGNET and IGS networks
- A sample of GCPs was randomly selected with GNSS receivers mounted on them to obtain X, Y and Z coordinates

STUDY AREA

- The study covered 13 Local Government Areas within Osun State.
- 15 Ground Control Points were selected for GPS observation in the selected 13 Local Government Areas



Selected Ground Control Points in the study area (Plotted in Google Earth)

HARDWARE AND SOFTWARE USED

- 2 Pairs of Promark3 GPS Receivers
- 2 Garmin 72 CSX (Hand-held) Receivers
- Brian Laptop
- GNSS Solutions (Pomark3)
- Online Processing Software (Canadian Spatial Reference System)
- Hatanaka
- Microsoft Excel 2010

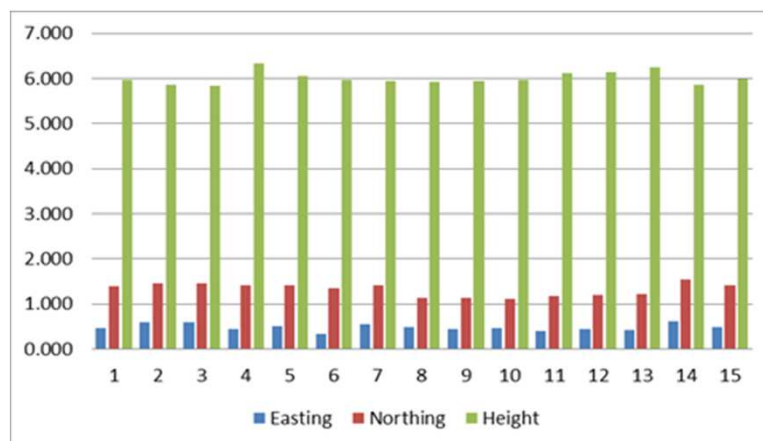
FIELDWORK/DATA PROCESSING

- GPS Receivers were configured for static survey
- Each selected GCP was occupied for one hour observation
- Raw GPS data was downloaded using GNSS Solutions
- NIGNET CORS data were downloaded and unzipped

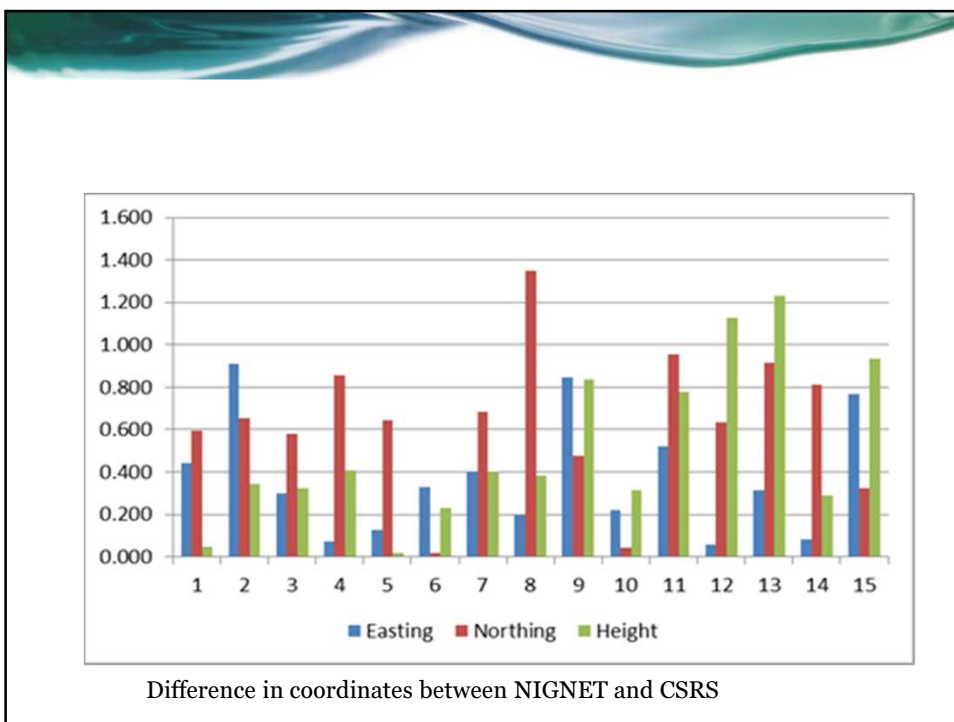
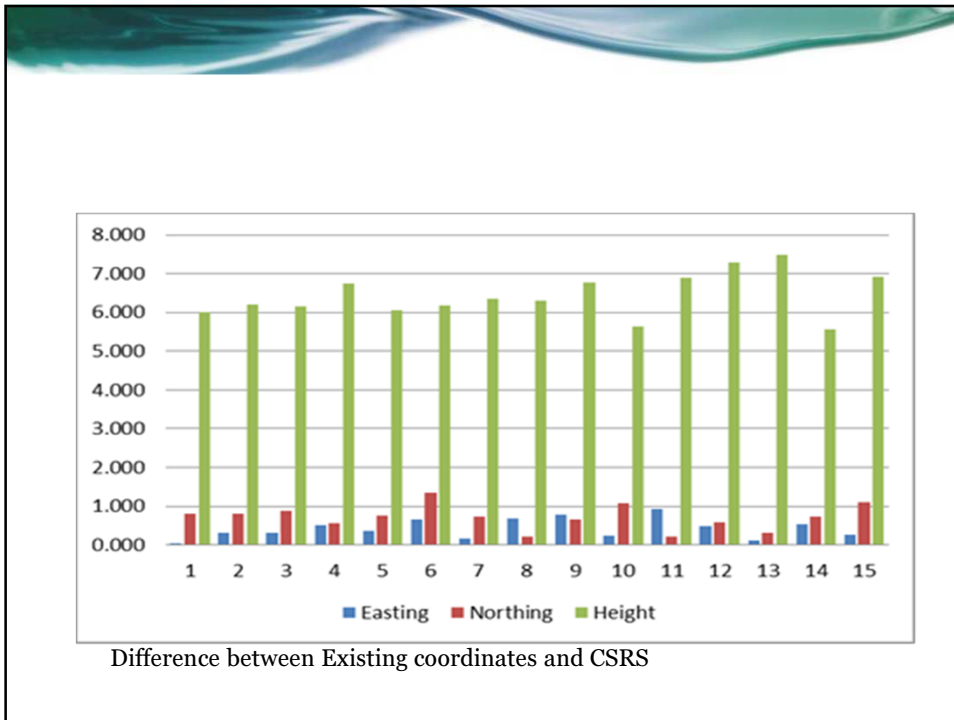
DATA PROCESSING

- Raw GPS data was converted to RINEX and submitted for online processing (Canadian Spatial Reference System)
- The result from CSRS was compared with NIGNET CORS and existing coordinates of the selected Ground Control Points.

ANALYSIS OF RESULT



Difference between Existing coordinates and NIGNET



CONCLUSION

- The study has demonstrated the reliability of the nation's CORS network as well as that of the ground control points recently established in the state of Osun
- Ground Control Points established for the mapping project in Osun State are reliable and will yield accurate results for the project and other applications.
- The establishment of CORS network in the state will ensure uniform coordinate system and permanently eliminate the use of local origin.

RECOMMENDATIONS

- All states of the federation should embrace NIGNET CORS for unified coordinate system and eradication of local origin
- The country should decide on which reference ellipsoid to adopt (Clarke 1880 or WGS 84)

