

Summary of the February 4, 2016

Federal Geodetic Control Subcommittee Meeting

1315 East-West Hwy, Silver Spring, Maryland 22031

Meeting Chair: Juliana Blackwell, Director of the National Geodetic Survey

Secretariat: Brian Shaw

FGCS Membership and Attendance

Department of Agriculture

US Forest Service – [Absent]

Farm Service Agency – David Davis

Department of Commerce

US Census Bureau – Charles Spicer

National Oceanic and Atmospheric Administration

National Geodetic Survey (NGS) – Juliana Blackwell, Dan Roman, Joe Evjen, Tom Soler, Ross Mackay, Yan Wang, Rick Foote, Bill Stone, Dru Smith, Vicki Childers, Christine Gallagher, Kendall Fancher, Dana Caccamise, Dave Conner

Center for Operational Oceanographic Products and Services (CO-OPS) - Kelly Kriner

Department of Homeland Security

US Coast Guard- [Absent]

Federal Emergency Management Agency – Paul Rooney

Department of Defense

National Geospatial-Intelligence Agency – [Absent]

US Army Corps of Engineers – Mark Huber, Jim Garster

US Naval Observatory – [Absent]

Department of the Interior

Bureau of Indian Affairs – [Absent]

Bureau of Land Management – Mike Londe

Bureau of Ocean Energy, Management – [Absent]

Fish and Wildlife Service – [Absent]

National Park Service – Neil Winn, Tim Smith

Office of Surface Mining, Reclamation, and Enforcement – [Absent]

US Bureau of Reclamation – [Absent]

US Geological Survey – Larry Hothem

Department of State

International Boundary Commission – [Absent]

International Boundary and Water Commission – [Absent]

Department of Transportation

Federal Aviation Administration – [Absent]

Independent Agencies

National Aeronautics and Space Administration – [Absent]

Tennessee Valley Authority – [Absent]

Federal Communications Commission – [Absent]

Industry

Terrasurv – John Hamilton

NGS Activities – Juliana Blackwell

Geodetic Control Theme Personnel

Airborne Gravity – Monica Youngman

CORS – Giovanni

Geoid Models – Yan

Geodetic Control Information – Krishna

NGS and FGCS Activities

NGDA Dataset Assessment – complete

www.geoplatform.gov/a16geocontrol-home

Strategic Plan for Datasets – near completion

FGCS Update to Coordination Group – 11/10/15 last update

There will be a letter going out to all Federal Agencies to determine a POC for their agency. Larry recommends sending to all the people listed in the FGCS member's page.

GSA's 2015 Guidance for Real Property Inventory reporting – update

Why is GSA using WGS84 not NAD83 and NAVD88?

Larry mentioned there is a document by USGS that started using OPUS to get NAD83 and in the end was using WGS84. NGS needs to provide more guidance for academic and other offices.

Dru mentions that he attended an academic conference and is trying to work with educators to provide up to date information in current text books.

Mike Londe mentions that this group is using new mobile devices that put out WGS84. People are black boxing it.

Paul Rooney mentions that many things developed for Google Maps etc use WGS84 so this is probably driving the user needs.

2015 FGDC Report

Highlights – Geospatial Summit, Educational Videos, Orbits, New Datums, GPS on Bench Marks

NSRS Modernization – Dru Smith

Dru is now the NSRS Modernization Manager to help NGS move towards the new datums

[NGS Ten Year Plan](#) Goal 2 Modernizing and Improve the NSRS

Objectives

1. Replace NAD83

First foundation CORS installed (Richmond FL)

Mathematical Connection to IGSxx (ITRF2014 just released)

2. Replace NAVD88 [and IGLD85]

GRAV-D: 48% of the nation complete

Staffing/Time issues

Common gravity between US and Canada

Dynamic Heights from GPS

Geoid monitoring service

Leveling in GPS/geoid world

GPS campaign for transformations, analysis first and then field campaigns

GSVS11/14/17 – testing the science for aerial gravity geoid improvements

Low and flat, high and flat, high and rugged

3. Re-invent Bluebooking

Bluebooking is very important but a lot of work to get data submitted to NGS

OPUS-Projects (OP) and similar products will be the loading for the future

Technical Memorandum published for using OP for Airport Surveys

Showed that OP is equivalent to current methods

Replace IDB with a new NSRS geospatial database

Started and target for completion 2020

Organize historic GPS data for reprocessing and loading through OP into NSRS DB

Sharing OP to OPUS Sharing

4. Fix the Toolkit

Most of it is in archaic programming language (FORTRAN) and needs to be updated

Coordinate Conversion Tool (current beta w/ limited functionality, completed ~2018)

In Java and will be a web service as well as a downloadable executable

NADCON 5 will be first to be integrated

Will include all old datums (CONUS, AK, HI, PR, VI and more)

VERTCON 3 will be integrated after NADCON is done

VDATUM and HTDP merge with above

5. Better Surveying

NGS58/59 update

OR State final report Dec 2015

Internal NGS discussions

Using leveling in GPS/geoid vertical datum

Will need OP for leveling, gravity, traverse (IERS surveys use traverses)

Legislation changes needed

Many states specifically reference NAD 83 and need to have it changed to broader language

NSPS, AAGS and NGS have formed a committee to determine this

Potential Names for New Datums

IERS definition of datum: A geodetic reference frame

Geodetic Reference Datum of 2022 (Geometrically tied to IGSxxx)

Can be used as a reference for latitude, longitude, ellipsoid height, orthometric height, dynamic height, gravity, deflection of the vertical

Would contain:

GEOID2022 (static and dynamic components) [NA, AS, GC]

Dru would do away with the concept of “the” coordinate at “the reference epoch”

Dru doesn’t believe in giving a coordinate on a point referencing an epoch when the point was not observed at that time.

Larry mentions there will be challenges with the geodetic registry

Outreach

New Datums webpage

(get something from the slideshow)

Questions?

How would you label an elevation, ellipsoid height, dynamic height under GRD2022 (Jim Garster)

NGS will need to make sure the specific heights etc are explicitly listed

We need to not make things too complicated for the surveyors with movement (Mike Londe)

NGS will continue to talk to our constituents to make sure we meet their needs and do not get too scientific

NPS concurs with Mike Londe (Tim Smith)

Leveling Procedures – Kendall Fancher

Providing a minor update to NGS 3

Historical Review of old leveling procedures (NGS-3 Chapter 4)

Zeiss River Crossing Equipment (Chapter 4.3)

Equipment is old and not many people have

Could acquire 1st order Class II Surveys

Ordinary Leveling Instruments (Chapter 4.4)

Designed for Fisher Level, antiquated

Not suitable for better than 2nd Order surveys

Why a New Procedure?

Not many people doing it but those that do wanted to borrow NGS equipment

This drove the need to create a modern method for people to perform with current equipment

Design Approach

Adopted for the use of modern digital readout theodolites (Total Stations)

Developed guidelines for creating Targets

Error Control

Followed same principles as old procedures to account for curvature, refraction, collimation errors. Also minimized random errors.

Limits and Tolerances

Used specifications for the Order/Class of leveling over distances

Details in presentation and guidelines

GPS on BM

GPS on BM website - <http://www.ngs.noaa.gov/GPSonBM/>

GPS on BM Web Map - <http://arcg.is/1F8A9v4>

Workgroup Updates

Fixed Reference Stations Work Group – Dan Roman

ITRF2014 Release

NGS is working to process all of the CORS data to prepare for the release of IGS14

OPUS, OPUS projects will shift into IGS14 once it IGS14 is released and updated

Internal discussions on how we replace NAD 83

Working not only on the science of the new datum but on the practical side of how to get all of the NGS products ready for new datums

Foundation CORS will be used to supplement the IGS stations globally to contribute to future IGS models and represent North America as effective as possible

Working to update OPUS-Projects to the NGSIDB as well as OPUS-Projects to OPUS-Share.

OPUS-Share just crossed over to 10,000 solutions shared!

Instruments Work Group - Kendall Fancher

No updates from the workgroup besides the leveling procedures

Larry questioned if NGS is involved with the equipment testing that will be happening in the Spring at White Sands, NM. This testing will test how close signals can be broadcast close to the GPS spectrum and how much it will impact GPS signals.

NGS is looking into how we can participate in the testing. NGS wants to be very rigorous in the testing since we are building towards attaining cm level positioning

Methodologies Work Group – Joe Evjen

NGS is currently working on a RTN validation tool. We are working with RTN operators to help with this process.

Determining heights using GPS (NGS 58/59)

Looking at both static and Kinematic

Spectrum Work Group – Larry Hothem

Status of GPS Adjacent Band Compatibility Assessment (ABC)

The “New” Lightsquared

Settlement “Coexistence Agreements”

GPS Innovation Alliance

Trimble, Garmin, John Deere, Topcon?

They requested consideration that testing was not needed

PNT ESG Meeting Tuesday February 2, 2016

Outcome: proceed with test in April

USGS has rigorous needs for many applications (HAZMUS)

Federally we need to do this testing to determine the impacts as well as to determine what can be allowed and not impact current applications

There are potential issues in the GNSS Spectrum Neighborhood and the Lightsquared Spectrum

Next Steps

Finalize list of proposed GPS receivers to be tested

5th workshop

Test procedure overview

Testing logistics

Who will participate

GPS/GNSS receiver testing April 18,2016, White Sands Missile Range, New Mexico

Open Discussion

Yan Wang – Questioned Dan about the CORS reprocessing

Dan Roman – We are hoping to get working on all the reprocessing prior to the end of May. NGS is working with cloud services and hoping to speed up the processing utilizing the cloud.

Yan – Asking about how many foundation CORS are planned?

Dan Roman – We are unsure but ideally to match with IGS they only need 700 km spacing. We also want to make sure there are ties to the VLBI stations. NGS will also look to take advantage of current monumentation.

Juliana Blackwell - These will be NGS owned but we are unsure on a number but probably 5-25.

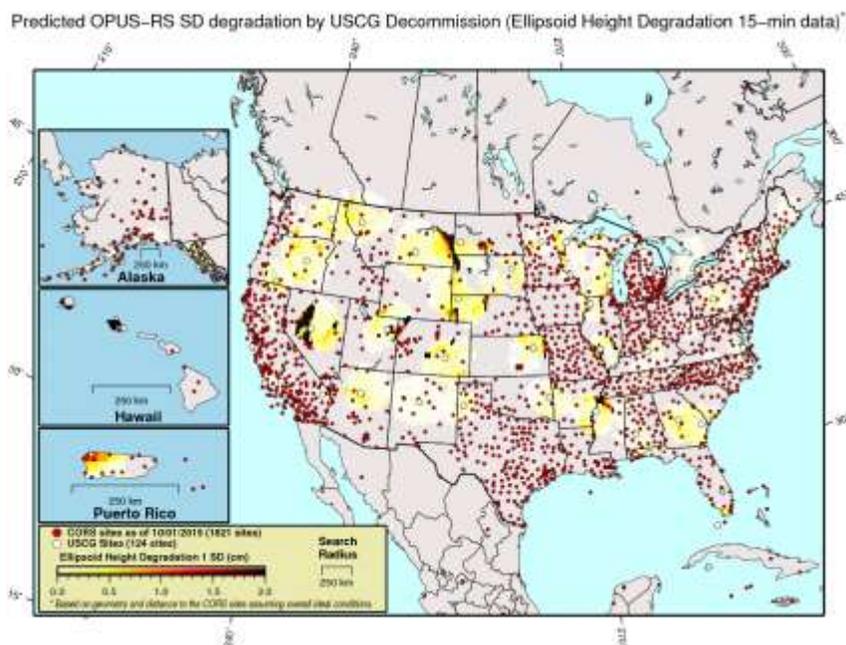
David Davis – Requests a copy of Larry's presentations

Larry – There are also presentations on gps.gov and links to the ABC workshops, Larry mentions the PNT Newsletter

Mike Londe – Asking about with the NDGPS sites down have there been any impacts on OPUS or CORS?

Joe Evjen – There will not be impacts to OPUS-Static but NGS has made maps of impacts to the OPUS-RapidStatic.

Mike Londe and NPS requests to see these maps, added below.



Mike Londe – Was talking with Pam Fromhertz (Rocky Mountain Regional Advisor) and how OPUS-Projects loading to the IDB but he was wondering if there is talk of OPUS-Share going into the NGSIDB?

Juliana and Dan – No there has not been discussion and is not currently planned

Joe – look to the sky for the last GPS-IIF satellite launch tomorrow morning.