

**NOTES FROM THE 24 JULY 2012 FEDERAL GEODETIC CONTROL
SUBCOMMITTEE MEETING (SILVER SPRING, MD)**

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

FGCS Membership and Attendance

Department of Agriculture

US Forest Service – [absent]

Farm Service Agency – David Davis

Department of Commerce

US Census Bureau – Frederick Malkus

National Institute of Standards and Technology – [absent]

National Geodetic Survey – Gordon Adams, Colin Becker, Juliana Blackwell, Vicki Childers, Dave Doyle, Mark Eckl, Joe Evjen, Kendall Fancher, Pam Fromhertz, Christine Gallagher, Bill Henning, Marti Ikehara, Jeremy McHugh, Renee Shields, Dru Smith

Department of Homeland Security

US Coast Guard – LCDR Guillermo Vega

Federal Emergency Management Agency – Paul Rooney

Department of Defense

National Geospatial-Intelligence Agency – Nathaniel Ovans

US Army Corps of Engineers - Mark Huber, James Garster

US Naval Observatory – Brian Luzum

Department of the Interior

Bureau of Indian Affairs – [absent]

Bureau of Land Management – Mike Londe

Bureau of Ocean Energy, Management – Steven Schwartz

Fish and Wildlife Service – [absent]

National Park Service –Karl Brown, Neil Winn

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

US Bureau of Reclamation – Cory Stolsig

US Geological Survey – [absent – Larry Hothem gave prior notice that he had to attend a conflicting meeting]

Department of State

International Boundary Commission – [absent]

International Water and Boundary Commission – [absent]

Independent Agencies

National Aeronautics and Space Administration – [absent]

Environmental Protection Agency – [absent]

Tennessee Valley Authority – [absent]

Federal Communications Commission – Donald Campbell

Others

California Department of Transportation – Scott Martin, Mark Turner
California Spatial Reference Center – John Canas

Juliana Blackwell (Chair, NGS) – Welcome, Introductions

We met last in January and have a packed agenda today. I thank you for participating. There are some things that are not on today's agenda that we will discuss at future meetings. RTN will be addressed after the NGS RTN Symposium which is being rescheduled for Spring 2013.

Mark Eckl (NGS) and Joe Evjen (NGS) - Update on progress towards new datums

Mark Eckl (NGS) -- We have recently released a new Gravimetric Geoid (USGG12) and hybrid geoid 2012 (Geoid12). We are still on track for defining a new vertical reference surface and, in fact, have reached an important agreement with the Canadians on this surface. LOCUS has been released. VTDP has also been released and will allow us to look at the change in vertical motion over time. We also completed the GSVS 2011. This Survey took a hard look at the GRAV-D data. We hope to do another GSVS in 2013 somewhere in the center of the country in a place with more mass between the surface and the Geoid. In January Monica Youngman briefed this group on the floodplain mapping project. We have continued to develop GRAV-D software: [1] Newton reduces gravity data [2] Isaac allows people to evaluate gravity data in the field.

Dave Doyle (NGS) – Are the software packages ready to be shared?

Vicki Childers (NGS) and Juliana-- We Blackwell (NGS)– We intend to share them in the future when they are more “polished” and when documentation is complete.

Juliana Blackwell – GRAV-D data is a key performance measure not just for NGS within NOAA and DOC, but also within FGDC. We will be reporting out annually on our progress with this airborne gravity collection.

Nathan Ovans (NGA) – Is the gravity data going to be made available?

Mark Eckl – About 18% is available publicly now. The rest will be made publically available as it is processed.

Vicki Childers – You can see what data is available now here: http://www.ngs.noaa.gov/GRAV-D/data_products.shtml. We intend to release everything after we have processed it fully.

Juliana Blackwell – One thing we (NGS and FGCS) need to improve on is to ensure that other data portals are linked to our Web site to find our data.

Mark Eckl – OPUS now does utilize the new Geoid models.

--- End of Mark Eckl's Q+A --- Beginning of Joe Evjen's presentation---

Joe Evjen (NGS) – The current geometric datum is NAD 83 and the international community is coalescing around international geodetic standards through the IGS. We have a project to align the geometric datum to

the geopotential datum. We intend to release both the geometric and geopotential datums in 2022. On 30 June, 2012, we adjusted coordinates on all our passive marks by a cm or two. That was a correction. We now know where the marks are to within 7 mm. The change that is coming in 2022 is two orders of magnitude greater than that. We will remove the 2 m bias that now exists in the geometric center. We need to ensure that each agency's data products are ready for that change. Then FGCS needs to adopt the new geometric datum. There will be a period of time where we have NAD 83 and the new geometric datum. We will also need to build the tools to enable agencies to move between the two datums seamlessly.

Dave Doyle (NGS) – The majority of users use State Plane Coordinates. Has there or will there be an effort to discuss this change in datums with the federal, state, and local authorities? For example, do you think we will go to these authorities with model legislative language that they could easily modify for their purposes?

Joe Evjen – Are there any agencies on the phone that make significant use of State Plane Coordinates?

Juliana Blackwell (NGS) – After the meeting let's request input from all members about the use of State Plane Coordinates.

Mike Londe (BLM) – BLM cadastral surveying makes wide use of State Plane Coordinates as does the community of Wyoming surveyors.

Paul Rooney (FEMA) – We also make use of State Plane Coordinates.

Karl Brown (NPS) – Do we still plan to add the epoch tag to NAD 83?

Joe Evjen – NAD 83 has a specific definition.

Dru Smith (NGS) – We will need a new name and canned legislative language. We should use a name that is generic and flexible for many years of use.

Joe Evjen – We would like to do more work to find out what help or issues agencies (DOT federal or state and local, and USACE) will have as we move to a new geometric datum.

Bill Henning (NGS) – Will it be plate-fixed?

Joe Evjen -- I am leaning towards it will be floating with velocities.

Dave Doyle -- That will take a lot of education.

Dru Smith – The majority of folks at the 2010 geospatial summit told us they like fixed coordinates that don't change. We may in the future move away from plate fixed to floating, but now many users are used to plate-fixed coordinates.

Dave Doyle – I think we will need to look closely at PPP (Precise Point Positioning). In 5-15 years, a lot of people will be able to use PPP to position at the few cm level. The research in PPP shows that it will happen and we should put ourselves in the position to have good quality velocities and outreach and education, and metadata, to help people understand that shift.

Dru Smith - The capacity for PPP will rapidly grow as more GNSS constellations and orbits become available.

Juliana Blackwell – Let's have Joe lead the analysis of these options in order to make a decision on how we should move forward with the new datum definition.

Christine Gallagher (NGS) – Vertical Reference Systems Work Group

I am here to provide the update for VRSWG for Renee Shields.

We will continue our one-on-one meetings with agencies to plan for the transition.
Our next quarterly meeting will be in October.

Neil Winn (NPS) – Can you tell me more about the ArcGIS toolbox and what it does for the national adjustment?

Christine Gallagher (NGS) – It pulls data from the NGS database and provides more fields to analyze.

Joe Evjen (NGS) – It is really a visualization tool to sort vectors by accuracy and vintage.

Neil Winn – Will this be used to adjust data sets in the future?

Juliana Blackwell (NGS) – We need to figure out how we can make it available to others to use for their own adjustments.

Neil Winn – We have software that causes us problems.

Dave Doyle (NGS) – I think Michael Dennis (NGS) is meeting with Kevin Kelly (ESRI) to discuss this now.

Dru Smith (NGS) – I can envision that ESRI might build an add-on package with our help that can do least squares adjustments for say, a quarter million points.

Juliana Blackwell -- We are in the process of vetting another transformation that will help resolve some of these issues.

Dru Smith – Yes we have a working command-line driven program that transforms between 2007 and 2011 coordinates.

Mike Londe (BLM) – We have a critical need for transformations that let us go from one realization / datum to another. Secondly, we need to get these transformations into commercial software.

Dave Doyle – When we developed NADCON to go from NAD27 to NAD83, we moved forward with a federal register notice through FGCS.

Dru Smith – I am trying to get this software on the official NGS beta Web site.

Juliana Blackwell (NGS) – Renew Charter / propose tasks for work groups

Renewal of the FGCS charter is something that we should take a look at as part of cleaning house. The current charter is from ~1995. The recent GAO study that is ongoing brought this into the light for us too. So, it is something we want to put out to the group to get confirmation that we should indeed update it. Secondly, we should talk about how to go about revising it. I propose that we collectively look at the charter, perhaps through Work Group leads or perhaps identify one or two folks to lead this update. Eventually, an updated charter would need to be approved by the FGDC secretariat. Perhaps this can be done virtually between now and the next FGCS meeting in January.

Dru Smith (NGS) – I think the best way forward, is to find those who have an interest, to go through this charter and update it. A temporary committee can be formed with a volunteer chair. All interested parties can send their comments to the chair between now and the next meeting.

Joe Evjen (NGS) – I think it is important to look at other examples of charters in FGDC. This is also an opportunity for agencies to gain more leverage within the FGCS, if they so desire.

Colin Becker (NGS) – I volunteer to lead the group to update this charter.

Mike Londe (BLM) – I will participate on the Work group.

Juliana Blackwell – Ok, thanks; done. Colin will be in contact with you all to get your input.

Discussion / Questions / Comments: suggested topics: special projects, regional issues (e.g., IGLD), models and tools

On the phone, are there any questions that you would like to ask at this time?

Mike Londe (BLM) – We need to have the tools available at the time (or very close in time) of the release of new datums to transform between realizations / datums.

Bill Henning (NGS) – We need to consider the errors associated with datums and transformations. We don't want people to get more accuracy out of a tool than is really there.

Dru Smith (NGS) – You will be able to see the magnitudes of the changes yourself for the new transformation tools 2007 → 2011. In some areas it is very noisy. It will be up to our users to decide if it is worth using the transformation tools. We will have to help educate them about how to make that decision.

Mike Londe – From a metadata point of view, there needs to be a transformation.

Juliana Blackwell – We have a program in hand. It is not beautiful, but it works. We will put it out in beta form in the next few weeks. We would love feedback from everyone in the different FGCS agencies.

Dru Smith – It is a beautiful piece of science, but it is not pretty in the sense that it is driven by a command line interface. It will make a lot of pretty plots and good metadata. The engine simply grabs data from grids.

Paul Rooney (FEMA) – Do you publish a simple reference publication that tells the maximum shift associated with transformations? That would be very helpful to know when a transformation will result in a ‘big’ difference.

Dru Smith – No, we don’t have that specific kind of publication, but it would be nice.

Dave Doyle (NGS) – We do really need to provide that kind of simple publication for folks to easily discern the magnitude of changes. At the same time, we have a lot of people who push a button to transform, but don’t understand what is going on in the black box. This is a national transformation tool, and because it is national in scope, perhaps we should consider building a way for users to create their own local transformations since most surveyors are not dealing with national datasets.

Pam Fromhertz (NGS) – I put together a 1-pager for Colorado. It captured the differences between the Horizontal and Vertical datums and geoid models. We could use what I made as a starting point for making the publication that Paul requested. I am not sure how to do that, but a minimum and maximum should be very useful to everyone.

Neil Winn (NPS) – I am thinking that most people are depending on software to make these transformations. I think we need to be clearer to them about how the transformations work.

Dave Doyle – We have done outreach to a manufacturer’s user group several years ago in Corbin, VA on these issues. We have mixed relationships with manufacturers. 99% of users will rely on software provided by manufacturers and rarely will they attend training that NGS puts on.

Bill Henning – Pragmatically, if I was to go and do a job on a project before we have a new geometric datum, I would simply use passive marks and calibrate my site without the need for transformations.

Juliana Blackwell – One takeaway from this discussion is our need to improve NGS’s relationship with manufacturers. We (NGS) need a better way to keep an open dialogue with manufacturers.

Karl Brown (NPS) – A topic to keep in mind is CORS data streaming.

Juliana Blackwell – We don’t have that on the agenda today, but it will be discussed at a future meeting.

Bill Henning – We will have a Real Time Network Symposium next Spring. One of the specific questions to be addressed at the Symposium is Real Time streaming. We (NGS) are hoping to move forward on this topic after questions get answered in the Spring after the Symposium occurs. The Symposium will be in Memphis, TN – more details to come as plans develop. Another big issue: what is NGS’s role in terms of validating Real Time Networks to ensure alignment to the National Spatial Reference System?

Neil Winn – NDGPS is potentially on the chopping block and that makes this issue more important.

David Davis (FSA) – Horizontal velocity is an issue for us in the Farm Service Agency with regard to control points for aerial photographs. For example, we need to know if there has been enough movement to justify us doing a transformation.

Juliana Blackwell – You should be able to look at existing HTDP models to estimate horizontal velocity.

David Davis – We did just that and discovered that in most places the velocities are insignificant, but there are other places where it is significant such as Southern CA and Alaska.

Juliana Blackwell – We can follow up with you to see more specifically how we can help you with that.

Renee Shields (NGS) – It might be beneficial if, for specific topics, like horizontal velocities, we set up ad hoc workgroups to discuss the needs and issues (paraphrased from online comment).

Juliana Blackwell (NGS) – FGCS input to ongoing GAO study of Federal Coordination of Geospatial Data

[1] The GAO conducted a review of Federal initiatives aimed at coordinating investments in geospatial data. They were seeking to answer two key questions: (1) Have Federal initiatives been effectively established and implemented to coordinate investments in geospatial data? (2) Does unnecessary duplication of investments in geospatial data continue to exist?

[2] The GAO review focused on three FGDC themes. During the study, we learned that these three themes were not targeted for any particular reason, but rather were chosen more or less at random to represent the breadth of the FGDC themes.

Transportation
Federal Geodetic Control
Spatial Water Data

[3] The first round of geodetic control questions asked for an overview of the theme followed by some very specific questions about goals, reports, plans, partnerships, and standards.

[4] The second round of geodetic control questions focused on data sets, standards, and metadata posted to the Web.

Next steps:

JUL / AUG - they will draft a Statement of Facts to be followed by an exit conference at which we (FGCS leadership) can provide clarification or corrections.

Late summer - draft report

Fall - final report - they will give the stakeholders (DOC and NOAA etc.) the chance to review the report before it is made public.

Dru Smith (NGS) – Introduction to draft NGS 10 Year Plan for future discussion

We have been operating under the current NGS 10 year plan since 2008. 2013 is the five-year mark since the release of that plan. We are in the process of writing a new 10 year strategic plan. The first plan was put together by many people, but I edited it and put it all together. It was a little ambitious. Since then, I have matured and received training in how to do strategic planning. This new plan was begun by looking at the mission of NGS. We then wrote a vision statement saying what the world would be like if we did our job perfectly. From the vision, several goals were developed. Goals show broad efforts that we plan to make. The objectives are SMART (specific, measurable, achievable, realistic, and time-bound). We then asked all NGS employees to contribute objectives. We got over 100 ideas for objectives. Some were duplicative. Some were very detailed and coalesced with other very detailed ideas to form objectives. We plan to have a complete draft available in a few weeks for your review. I would really like to know who would be willing and interested to read this draft plan and provide feedback because you all know better than us, how we can best do our work. For now I just want to run through the plan to introduce you to it. Please email Dru if you have an interest in reviewing this plan. Are there any questions?

Juliana Blackwell (NGS) – We do want your input on the Goals and Objectives, and I also hope that you all can help us ensure that we did not miss any “strategies” (next level below Objectives) that will help us achieve the objectives.

Nathan Ovans (NGA) – A lot of these are very similar problems or questions that NGA has recently answered or is starting to answer. We have the potential to offer lessons learned.

Juliana Blackwell – We would like comments from the FGCS on the draft plan. We will also send out a notice when the plan is officially published.

Karl Brown (NPS) – I read the first 10 year plan and applaud your efforts.

Juliana Blackwell – We aim to have the final strategic plan released in January 2013.

Juliana Blackwell (NGS) – Closing remarks

Thank you for your participation today! Our next meeting will be in January, 2013. Colin Becker will be the new FGCS secretariat after Jeremy leaves on August 24 to go to school. After that date, please contact Colin for FGCS-related business.

Actions from this meeting

- [1] NGS needs to ensure that other data portals are linked to our Web site to find geodetic control data and metadata.
- [2] Request input from all FGCS members about the use of State Plane Coordinates.
- [3] Develop a draft template legislative language for states to use to implement and codify new datums.
- [4] Do more work to find out what help or issues agencies (DOT federal or state and local, and USACE) will have as we move to a new geometric datum.

[5] Decide how our plans to move to a new geometric datum will be affected by the looming boom in PPP usage in the next 5-15 years.

[6] Put the beta command-line driven software for transformations up on the official NGS beta Web site.

[7] Follow up with David Davis (FSA) to see more specifically how we can help him with his issues related to horizontal velocity and control points for aerial photography.

[8] Schedule the topic of CORS Real Time data streaming for discussion at the FGCS meeting that immediately follows the Real Time Networks Symposium (currently scheduled for Spring, 2013).

[9] Assign any individual work items to be tackled by ad hoc FGCS work groups.

[10] Send out draft NGS strategic plan to FGCS members for comment.