

## **NGS Webinar Series**

### **Q&A Document**

#### ***It's 2022 - Are You Done Yet?***

June 9, 2022 | 2:00-3:00 pm, ET

Presenter: Dru Smith, Ph.D., NSRS Modernization Manager, NGS

**Q: Where is the leveling elevation shown? (from the new Datasheet design demo)**

**A:** NAPGD 2022 orthometric heights will be shown on the new datasheet under the Geopotential coordinates section.

**Q: Will the survey epoch coordinates in the new design only going to be from opus projects or any opus shares?**

**A:** OPUS-Share will not exist in the future, but a service where users submit their data to us via OPUS-S will exist. Those submissions, and the submissions through OPUS-Projects (and eventually OPUS 6) will all be bundled together for both SEC and REC adjustment projects.

**Q: The new datasheet set up looks very good. The output datasheet still looks daunting and almost unreadable with the line numbers repeatedly I use the plain text data sheets to do custom data retrievals. This is straightforward given their format. Dealing with these new formats which are nice to look at is harder. Will the "traditional" format data sheets be retained? entered along the left side of the sheet. Can your cleaner datasheet (perhaps in PDF with cleaner fonts) be created?**

**A:** Coordinates in the new NSRS will not appear in the traditional datasheet format. Coordinates in the old NSRS will be retained in the traditional datasheet format however, and available as a link from the new datasheet.

**Q:For the new datasheet. If a user sets all the information he/she wants, it would be good to have an option to create a multi-page report that can be saved as a PDF or printed. Thoughts? Or, a human/machine readable XML file!**

**A:** We will take this into consideration.

**Q:Will OPUS Projects 5.x (or OP 6.0) will be released by the end of this year? and**

**Q: When is OPUS 5.x production version being released?**

**A:** OPUS-Projects 5.0 is currently available on our BETA site. We are in the middle of updating it to address a number of bugs that were found during BETA

testing. The new update also ensures it builds all of the necessary files for submitting a project to NGS for loading into the IDB. Our goal is to release OPUS-Projects 5.x to PROD before the end of the year.

Also, from a terminology standpoint, there is no “OP 6”, it is just “OPUS 6”. And NGS does not believe OPUS 6 will be available until around 2024 or 2025, and then only with GNSS.

**Q: Will RINEX 4.0 file format be supported in OPUS-S?**

Eventually, yes. At this time, OPUS-S supports RINEX 2 and 3 files.

**Q: As a CORS owner is there any support I can provide to the overall efforts? Is there a specific CORS owner collaboration group/call?**

**A:** The entire NCN is being modernized. As part of that modernization, NGS will be asking for owner/operators to abide by some new standards for metadata. These new standards are not yet worked out, but we will release them soon.

**Q: I noticed mention of additional GRAV-D observations on the Great Lakes due to their unique characteristics. What about the Gulf of Mexico with its unique circulation patterns?**

**A:** There are no extra GRAV-D observations in the Great Lakes. No special consideration of any bodies of water are part of the plan.

**Q: Is there a beta test for M-PAGES?**

**A:** We are in the middle of implementing M-PAGES into OPUS-S. Once that work is done, we will release it to our BETA server for external testing. Our goal is to do this by the end of the year. At that time, we will appreciate any of your testing feedback.

**Q: why nadcon and vertcon over ncat? (This was in reference to the poll question I believe)**

**A:** NADCON and VERTCON are tools \*within\* NCAT. Users will not see NADCON or VERTCON as a stand alone tool.

**Q: Will the new data sheet information be available through a API system?**

**A:** Yes.

**Q: How does all of this affect the timing of the replacement of the US Survey foot?**

A: It won't have an effect. The US Survey Foot will always be supported for legacy State Plane Coordinate Systems (SPCSs) such as SPCS 83. Only the future SPSCS2022 which will be based on the modernized NSRS will solely use international feet.

**Q: Reading the NGS Newsletter blurb on work related to the impact of height when combining clocks. I wonder whether the use of precise clocks for heighting (relativistic geodesy) will become the basis for a future height system?**

A: The implementation of networked, precise ("optical") clocks is not currently mature enough to include in the current round of the NSRS modernization efforts. However, NGS is actively working with NIST and other institutions to monitor progress in both the accuracy and portability of the clocks as well as efforts to link them over long (continental) scales. It is easy to imagine this technology coming into much wider use on a timescale of, say, 10 years or so. This is definitely an active area of research at NGS.

**Q: what about Geoid 18. I did not see it your list**

A: GEOID18 is a hybrid geoid, and in fact, the last hybrid geoid NGS will ever produce. It only supports the current NSRS and will be obsolete with the new NSRS.

**Q: Is there a journal/proceedings paper published on the combined Canada and USA 2022 geoid?**

A: We do have a [NOAA technical report NO. 78](#) (in printing) for the US and Canadian geoid model xGEOID20. xGEOID20 is not the final model, but can be considered as a proto type of geoid2022.

**Q: Not sure if this is for this meeting - will the various SPCS2022 projections accepted by NGS have downloadable mosaic maps depicting distortion that can be presented on web maps?**

A: NGS will create linear distortion rasters for every SPCS2022 zone and these will be available in a standard raster format. Distortion rasters of existing SPCS 83 zones will also be available to allow comparison of performance. Although we don't yet know whether we will create SPCS2022 distortion web maps, the rasters can be used by others in their own web maps. We also don't know whether we will make static distortion maps for all individual zones, although we will create static maps showing multiple zones. Partial sets of preliminary static distortion maps and data are available for download at <https://geodesy.noaa.gov/pub/SPCS/DistortionMaps/> and at

<https://geodesy.noaa.gov/pub/SPCS/MapData/>, respectively. These will be updated as SPCS2022 zones designs are finalized.

**Q: Can NGS presentation materials be used without a license?**

**A:** Yes, NGS presentation materials can be used without approval, as they are part of the public domain. We would appreciate acknowledgement, but it is not necessary to use the materials.

**Q: How periodic do you recommend that CORS reference coordinates need to be computed and compared?**

I assume this question is in regards to CORS in a real-time network. If that is the case, then NGS recommends that you check the alignment of the base stations' coordinates in your RTN on at least an annual basis. OPUS can be used for processing data collected at your RTN base stations, and solutions from OPUS can be compared with your published coordinates.

**Q: Are heights changing only due to subsidence; aren't there areas undergoing rebound? isostatic adjustment**

**A:** Many things cause heights to change, yes.

**Q: Reference coordinates should be 3 sigmas confidence interval?**

**A:** All coordinates will have a defined set of statistics. Users are welcome to use whichever statistic suits them.

**Q: Is NGS working with the GIS vendors concerning Datum definitions and transformations.**

**A:** Yes.

**Q: Will geoid separation (leveling minus GNSS Geoid elevations) be computed and displayed in the data sheet??**

**A:** Geoid undulation will be defined through GEOID2022 and yes, it will be shown on datasheets.

**Q: Since new OPUS will support 4+ constellations, does this mean CORS data will be available for download with 4 constellation?**

**A:** Yes. NGS is currently ingesting RINEX3 files from hundreds of CORSs in the NOAA CORS Network. For stations with multi-GNSS collection capabilities, their RINEX3 files hold the multi-GNSS signals. In the near future, these files will be available for download

**Q: Are there any specific resources to plan and execute a robust GNSS densification program in our County (in a stable crustal area) for NGS/OPUS submittal to tighten up the geoid model in our back yard?**

**A:** GEOID2022 will not be impacted by a GNSS densification program. It is purely gravimetric with no GNSS nor leveling data whatsoever.

**Q: Will NGS be submitting the SPCS2022 projections to EPSG? Some survey software allows for EPSG projection configuration using the EPSG projection ID. There are hundreds if not thousands already.**

**A:** NGS plans to provide projection definitions for all SPCS2022 zones in machine-readable format, such as Well-Known Text (WKT) representations that can be imported into the EPSG Geodetic Parameter Dataset (<https://epsg.org/home.html>) and other geospatial software. We will also work directly with EPSG to ensure the definitions and supporting metadata meet their needs and can be added to their dataset in the most efficient manner possible. In addition, we will provide all SPCS2022 zone definitions so that they can be added to the ISO Geodetic Registry (<https://geodetic.isotc211.org/>).