OREGON GNSS USERS GROUP
MEETING MINUTES

Date: August 18, 2023

Location: Chemeketa Eola Northwest Wine Studies Center--Chemeketa Community College
215 Doaks Ferry Road Northwest, Salem, Oregon 97304

Board Members Present: Samantha Tanner, Chair
Alycia Lenzen, Chair-Elect
Eric Zimmerman, Treasurer
Chris Munson, Secretary

Called to Order: 9:05 am
Adjourned: 3:25 pm
Contact Hours: 5.0 hours

Business Meeting (9:05-9:15)

- Welcome by Samantha Tanner, Chair.
- Treasurer's Report by Eric Zimmerman. Balance of $10,185 in bank account at the beginning of the year, with around $900 in dues coming in since then. The current balance is $9,500, prior to making disbursements for today's meeting. Today's meeting is expected to cost around $1,900, including amounts already paid. All amounts are approximate.
- The next meeting of the Oregon GNSS Users Group (OGUG) will occur in January at the Professional Land Surveyors of Oregon annual conference.

"Using Coordinate Systems—Which is Better LDP or LDP?", presented by Kevin LaVerdure, PLS—Lead Operations Surveyor, Oregon Department of Transportation Geometronics Unit (9:15-9:45)

- Kevin defined Low Distortion Projection and Local Datum Plane. Used for large survey areas that have distortion due to curvature of the Earth.
- An advantage of local datum planes is that they are scaled to fit your exact project area. A disadvantage is that it doesn't work as well when meshing with nearby projects.
- Low distortion projections can fit large areas with minimal distortion, with defined coordinates for everyone's use.
- How to choose:
    - Kevin's first choice is a low distortion projection, specifically from the Oregon Coordinate Reference System (OCRS).
    - If distortion using an OCRS zone is too much for your specific project, then use a local datum plane.
- To make a local datum plane, do not use an OCRS zone with a scale factor—it's confusing. Instead use a State plane zone with a scale factor.
- Kevin discussed the 39 OCRS zones across the state.
- Common questions for creating local datum planes were answered.
- Kevin finished by summarizing his presentation.

"User Based Low Distortion Projections Utilizing Site Calibration/Localization Routines", presented by Bob Green, PLS—Geospatial Analyst, Frontier Precision (9:45-10:30)

- GNSS site calibration/localization basics.
    - Project settings.
    - COGO settings.
    - Calibration process.
    - Datum transformation.
    - Define projection.
    - Commonly used mapping projections.
    - It's important to begin the site calibration process using the control point closest to the north-south meridian (center) of the project.
- Horizontal adjustment
    - Generally use at least 3 points for a horizontal adjustment.
    - You can use 2 points if you want to rotate to a certain basis of bearings. If so, the first point must be a 3D point and the second point a 2D point.
    - A minimum of 5 points are recommended for good geometry in both the horizontal and vertical.
- Transformation begins first with rotation, then translation. Rotation is at the mathematical center of the calibration. Then a scale factor is applied (or not). Residuals (the differences between what you surveyed and what you wanted it to be) are then given.
- Overview of recent geoid models.
    - Differences between GEOID12B and GEOID18.
    - Differences between NAVD88 and NAPGD2022. Around 1 meter vertical change in Oregon.
- Bob then continued discussing the site calibration process and results.

Break (10:30-10:45)

"Establishing Project Control: A Few Challenges & Recommendations", presented by Chase Simpson, EIT, LSIT—Instructor of Geomatics & Faculty Research Assistant, Oregon State University School of Civil & Construction Engineering (10:45-11:30)

- Four things to know when using geospatial data:
    - Geodetic datum definition.
    - Grid coordinate systems.
    - Vertical datums & height adjustment.
    - Accuracy estimation & reporting.
- What is the purpose of a "control" survey?
- Surveying methods:
    - Conventional
    - GNSS
- Recommend procedures for leveraging the Oregon Real-time GNSS Network (ORGN).
- Combining observations of different types.
- Recommend post-processing ORGN vectors.
- Real-Time Network (RTN) base stations can have errors.
- General recommendations for project control.

- Disadvantages of performing localizations.
- When to use horizontal and vertical calibrations and localizations.

"Challenges with managing Linear Distortion in remotely sensed data: Two Case Studies", presented by Michael Olsen—CH2M Hill Professor, Oregon State University School of Civil & Construction Engineering (11:30-12:10)

- Case Study #1: Dotting the Coast
    - Coordinate system options.
    - Distance distortion.
    - Distance differences.
    - Impact on adjacent scan matching.
    - What to do?
- Case Study #2: Eagle Creek Debris Flow Mapping
    - Coordinate system chaos.
    - What tools are available to transform?
        - National Geodetic Survey (NGS) VDATUM
        - NGS NCAT
    - Processing times:
        - VDATUM/12 days
        - EZProj/4 hours
    - Better to handle transformation at point cloud level rather than raster level.
    - Repeat data helps identify issues.

Lunch (12:10-12:55 pm)

Panel Question and Answer Period (12:55-1:35)

Group Activies (1:35-3:10)

- Four different project scenarios distributed amongst tables to review and formulate survey plans.
- Groups presented their survey plans and general discussion ensued.

Additional Question and Answer Period (3:10-3:25)

Adjourned at 3:25 pm

Minutes **APPROVED** Board majority on November 21, 2023.

Respectfully submitted,

Chris Munson, Secretary
Oregon GNSS Users Group