

**OREGON GPS USERS GROUP
MEETING MINUTES**

Date: June 11, 2015

Location: Hollinshead Barn, Bend, Oregon

Chair: Jim Elam

Attendees:

Jerry Anderson	Mark Armstrong	John Aschenbach
Fred Ast	Pat Barott	Ken Bays
Robert Bell	Mike Berry	Kevin Blakley
Bruce Bothel	George Cathey	Stuart Duce
Jim Elam	Murray Frazee	Scott Freshwaters
Ray Griffin	Bill Ham	Robin Heikes
David Hills	Dennis Keister	Joe Kunches
Jim Lahm	Lisa Lee	Doug Liles
John Minor	Chris Munson	Randy Oberg
Eric Osman	Ty Parsons	Jonathan Rawlings
Michele Sims	Lloyd Smith	Richard Templin
John Waffenschmidt	Dan Weller	Mike Wood
Steve Lee	Jeff Kern	

Called to Order: 9:10 am

Adjourned: 3:25 pm

Contact Hours: 4.5 hours

Business Meeting (9:10-9:35 am):

Chair Jim Elam welcomed all attendees, and had everyone introduce themselves.

Treasurer John Minor reported a checking account balance of \$11,088. He also stated that Michael Dennis was probably going to be the presenter at the Spring 2016 Workshop, and the topic was tentatively on coordinate conversions.

Secretary Chris Munson said that OGUG is working on communications with its members and friends, and believes that improvements have been made.

OGUG member George Cathey suggested the US Army Corps of Engineers benchmark program as a possible future workshop topic.

David Hills, Chair-Elect, thanked George for his suggestion, and encourage others to offer suggestions for future workshops. David then made a short presentation on the Malheur Wildlife Refuge. The refuge was originally surveyed by the USDA-Biological Service. High water together with winter ice has destroyed 50 miles of fences and monuments. Cattle belonging to neighboring ranchers are destroying habitat. The US Fish and Wildlife Service does not have the money to do a full cadastral survey, but wants to put up fences in approximate locations to prevent further habitat degradation. David asked for

volunteers to help recover corners and stake fence lines. Volunteers would work under David's federal authority and his Oregon professional land surveyor's license. Pat Barott volunteered, and Mark Armstrong stated that he would be there in August to help. Eric Osman and Mike Berry will also be volunteering.

Chair Elam adjourned the business meeting.

**Presentation by Mike Berry—Deschutes County Surveyor (9:35-10:45 am)
1914-1915 Tumalo Project—Dam Fiasco at Bull Flat**

The Desert Lands Act caused a land and population boom in Central Oregon. William Laidlaw, an investor, bought the Three Sisters Irrigation Company and renamed it the Columbia Southern Irrigation Company. He sold 30 square miles as irrigated land; however, only 6 square miles actually had irrigation. He made huge profits at the expense of the government and landowners. Laidlaw also subdivided the town of Laidlaw (now called Tumalo) into 800 lots, which was more lots than the City of Bend at that time. Laidlaw left in 1906 with all of the money he had made.

A new company bought Columbia Southern and determined a reservoir was needed, but they didn't have the money to construct one. In 1913, citizens petitioned the State of Oregon for help. A new reservoir would be able to irrigate 20 square miles. This was a large project and required two dams to be constructed. The project was completed in 1914, and the governor closed the sluice gates for the planned 1,105 acre reservoir, but due to poor geology, only a 160 acre reservoir was created. Holes and whirlpools appeared throughout the reservoir area. It was attempted to fill the holes with junk and dynamite, but to no avail. The eventual reservoir water line was 40 feet below the planned fill line. Olaf Laurgardd, the project engineer, had previously stated that the ground under the reservoir was solid rock, but this was never tested. Laurgardd was later licensed as the first professional engineer in Oregon, and was the City Engineer for Portland for many years.

The modern day successor of the Columbia Southern Irrigation Company is the Tumalo Irrigation District; they currently irrigate 11 square miles of land.

Break (10:45-11:05)

**Presentation by Joe Kunches—Director of Space Weather at ASTRA LLC (11:05 am-12:00 pm)
Space Weather and the Impact of Storm on GPS Observations**

Joe previously worked for 35 years at the National Weather Service—Space Weather Prediction Service.

On July 23, 2012, a huge eruption of the Sun missed the Earth. It was the largest eruption in 150+ years. The last storm of that magnitude did hit the Earth, and the induction from the storm was so strong that it burnt down several telegraph offices and poles in 1859.

Coronal mass ejections dramatically increase GPS errors, and loss of lock occurs. The L2 and L5 frequencies are more susceptible to error than the L1 frequency.

Solar flares can completely block GPS signals. We are in a downturn of the solar cycle. The most recent cycle was quieter than the solar maximum that occurred around the year 2000. We may be entering a

“grand minimum” of very quiet solar activity. The last grand minimum occurred between 1645 and 1715.

The categories of geomagnetic storms range from G1 (light) to G5 (extreme). Even during a quiet phase of solar activity, large storms can occur. GPS users can obtain geomagnetic storm predictions from NOAA, and can also get Alaska scintillations from ASTRA.

Ken Bays followed up at the end of Joe’s presentation, and said that the current advice is not to RTK GPS during geomagnetic storms ranging from G3-G5, radio blackouts ranging from 3-5, and solar storms ranging from 4-5.

Lunch (12:00-1:00 pm)

Vendor Reports (1:00-1:25 pm)

John Aschenbach of Resource Supply presented on CHC X90 and X900 GPS receivers.

Jim Lahm of Electronic Data Solutions presented on Trimble GIS GPS receivers.

Presentation by David Hills—US Fish and Wildlife Service (1:25-2:15 pm) National Refuges in Hawaii

David stated that there are many endangered birds and marine life in Hawaii, mostly due to invasive species. Surveying the national refuges that protect these species in Hawaii is a challenge.

Traditional land tenure as by watershed, from the sea to the mountains, and was called “Ahupu’a”. Commoners received one-quarter acre, together with access, fishing, and water rights called a “Kuleana”. The Kuleana was delineated by the house lot and actual line of cultivation by the occupant.

In resurveying Hawaiian refuges, the USFWS ran into poor previous surveys and bad legal descriptions; these descriptions were often difficult to retrace on the ground.

The “Hawaiian Survey” was created with help from the US Coast and Geodetic Survey, and many triangulation stations were established at that time.

Hawaii uses the Torrens system, and has a land court deals with registered land. Lands not registered are “regular lands”.

No survey recording exists like in Oregon, and many surveys are not monumented. Monuments don’t control surveys—measurements do. The advent of GPS has led to a lot of double-corner setting, since Hawaii doesn’t have publicly recorded surveys or the concept of “original monuments”, so they go back to the original triangulation stations.

In the past, the King owned land up to the farthest reach of the waves in the winter time. Today, shoreline surveys that measure this winter time reach are required prior to development.

Break (2:15-2:25 pm)

Update by Mark Armstrong—National Geodetic Survey (2:25-3:05 pm)

New datums are scheduled to be operational in 2022. GEOCON is now operational for datum conversions.

GRAV-D will be flown in Northern Oregon this year; the goal of GRAV-D is a 1 cm geoid model. GRAV-D will have an approximate 1.7 meter difference with NAVD88 in Oregon, will be much closer to NGVD29.

OPUS Projects sharing will be live around Spring 2016. OPUS Projects trainings are ongoing.

Oregon State University has a grant to study NGS58 and NGS59, the guidelines for GPS-derived ellipsoid and orthometric heights.

NGS is rewriting the PAGES software to allow for OPUS occupations down to 30 minutes in length.

Update by Ken Bays—Oregon Department of Transportation (3:05-3:25 pm)

The Plate Boundary Observatory (PBO) is scheduled to end in 2018.

ODOT has funding to upgrade 39 ODOT sensors and Leica Spider software to GLONASS.

The Geometronics tool kit is now available and online.