



Oregon Real-time GNSS Network (ORGN) Products & Update



Oregon GNSS Users Group
2021 Annual Meeting

Eric Zimmerman
Randy Oberg



Oregon Real-time GNSS Network

- ◆ MAX (Master Auxiliary), not VRS (Virtual Reference Station)
- ◆ On the NSRS, NAD83 2011 epoch 2010.00
- ◆ Started 2006 with 4 stations Ashland, Grants Pass, Prospect and Central Point
- ◆ Network of 100+ continuously operating reference stations
- ◆ Multi constellation GPS, GLONASS & Galileo
- ◆ Cooperative Network (UNAVCO, WSRN, TURN, Counties, Cities, Schools, Private)
- ◆ Many brands of receivers, Leica, Trimble, Septentrio, Topcon.
- ◆ Over 1700 rover accounts (Survey, Construction, Inspection, Agriculture, UAV, Mobile Scanning)
- ◆ Offering Many products in many formats.
- ◆ RINEX for Post Processing
- ◆ Managed by ODOT (Randy and Eric)



The ORGN move to NATRF 2022

- ◆ The ORGN will change Realization from NAD83 2011 epoch 2010.00 within 6 months of NGS releasing NATRF2022
- ◆ The ORGN will be in line with the current National Spatial Reference System (NSRS)
- ◆ The ODOT will re-compute coordinates on all ORGN stations using OPUS Projects.
- ◆ Notifications will be made in advance concerning the date of the move to NATRF2022.



National Geodetic Survey

Positioning America for the Future

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Delayed Release of the Modernized NSRS

NOAA's National Geodetic Survey (NGS) is announcing a delay in the release of the modernized National Spatial Reference System (NSRS).

In 2007, NGS began planning for the modernized NSRS, acquiring its first airborne gravimeter, creating and initiating the Gravity for the Redefinition of the American Vertical Datum (GRAV-D) project and by 2008 had codified its modernization plans into a Ten Year Plan. At that time, the target completion date was 2018. By 2013, that date seemed unlikely, due to both the broadening of the GRAV-D coverage area and the experience of five years of operational planning and execution.

In 2013, NGS revised its 2008 Plan, and targeted 2022 as the date of the release of the modernized NSRS. This date was reinforced with a 2018 Strategic Plan revision. By 2017, confidence in hitting the 2022 target was high enough to reach final agreement with Canada and Mexico on a naming convention for certain components, to include "2022" in their names.

Since 2017, operational, workforce, and other issues have arisen and compounded, causing NGS to recently re-evaluate whether a successful roll-out by 2022 is possible. The most significant impacts have been in workforce hiring and retention, and in meeting GRAV-D data collection milestones, which underpin the NSRS modernization efforts.

NGS is currently conducting a comprehensive analysis of ongoing projects, programs, and resources required to complete NSRS modernization and will continue to provide regular updates on our progress. To get the latest news on NSRS modernization and track our progress, subscribe to [NGS News](#) or visit our ["New Datums" web pages](#).

Further details, and more answers are available on this [FAQ](#)

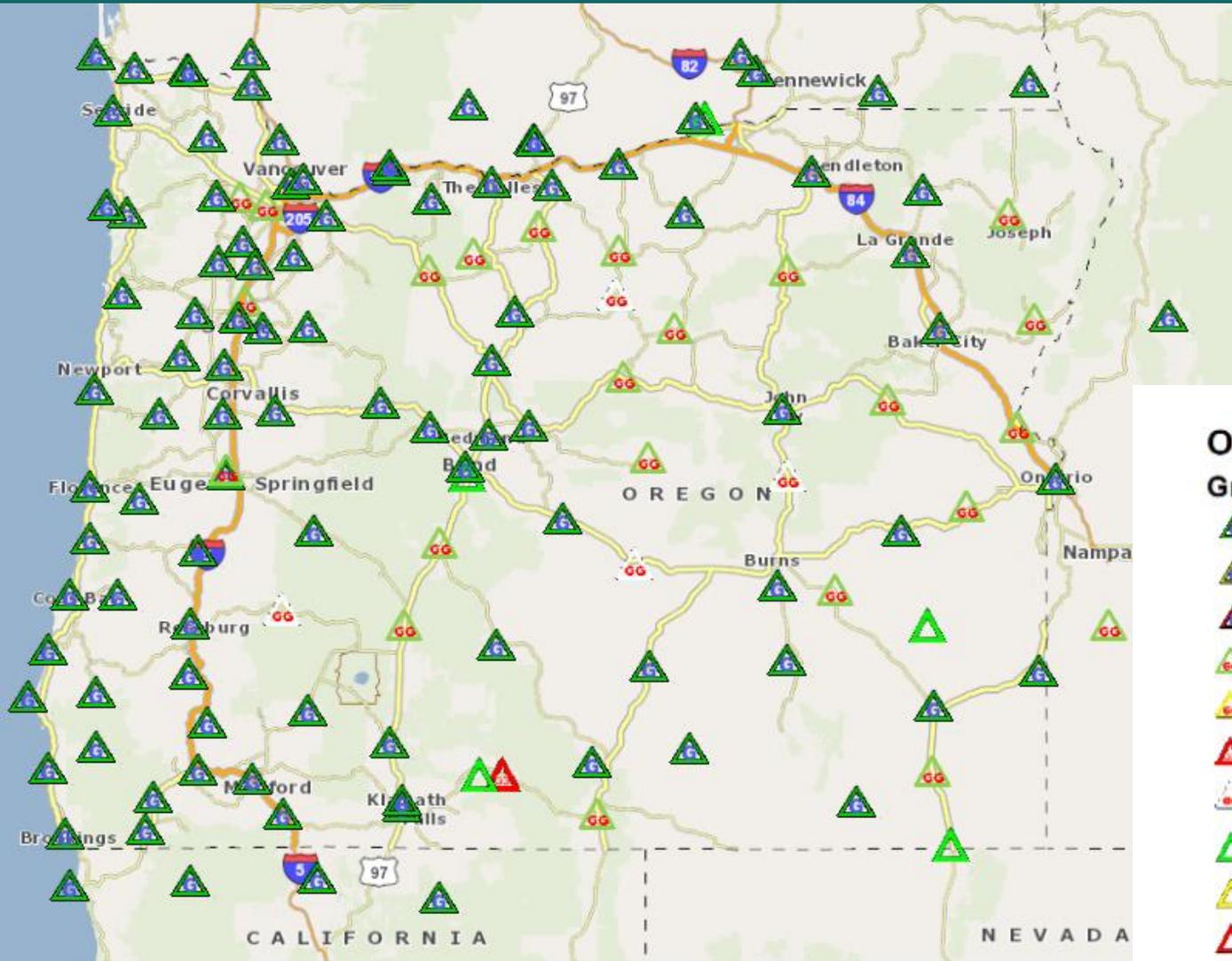


Oregon Department of Transportation



"All Stations List"

September 3, 2021							
Oregon Real-Time GPS Network: NAD 83 (2011) epoch 2010.00 Coordinates							
Station ID	Ref ID	Location	Latitude	Longitude	Ellipsoid Height (meters) @ ARP	Site Logs	GNSS
AGNS	292	Agness	42 33 09.94155	124 03 32.74455	51.783	AGNS	GNSS
ANAT	201	Anatone, WA	46 07 58.29503	-117 08 07.48104	1087.785	ANAT	GNSS
ARLN	202	Arlington	45 42 29.52532	-120 10 59.71154	120.812	ARLN	GNSS
ASHL	203	Ashland	42 10 50.47299	-122 40 12.55241	609.147	ASHL	GNSS
BASQ	270	Basque Maintenance Yard	42 24 41.78354	-117 51 46.84978	1349.14	BASQ	GG
BEND	205	Bend, City of	44 03 25.75727	-121 18 54.81222	1096.257	BEND	GPS
BLYI	204	Bly	42 24 24.82755	-121 02 56.57850	1313.889	BLYI	GG
BNDM	278	Bend (ODOT Maintenance)	44 05 21.80729	-121 18 27.07893	1070.737	BNDM	GNSS
BRNT	222	Burnt River School (Unity)	44 26 24.77044	-118 11 28.89155	1213.195	BRNT	GG
BURN	271	Burns Jct	42 46 46.18843	-117 50 36.65278	1181.437	BURN	GNSS
CABL	206	Cape Blanco	42 50 09.94322	-124 33 47.99844	38.291	CABL	GNSS
CATH	207	Cathlamet, WA	46 11 50.27547	-123 22 02.11302	56.670	CATH	GNSS
CHEM	208	Chemult	43 13 27.88494	-121 47 08.94043	1440.413	CHEM	GG
CHZZ	256	Tillamook	45 29 1.44035	-123 58 41.18384	51.145	CHZZ	GNSS
COBO	209	Beaverton, City of	45 29 08.88914	-122 47 50.56291	47.207	COBO	GG
COND	210	Condon	45 14 16.44888	-120 10 52.90279	865.844	COND	GG
CRAN	213	CRAN-Crane	43 24 56.80137	-118 34 29.70705	1248.78	CRAN	GG
CRCK	211	Castle Rock, WA	46 16 28.54448	-122 54 45.09357	1.470	CRCK	GNSS
CTPT	212	Central Point	42 22 36.08473	-122 53 38.19500	370.975	CTPT	GNSS
DANP	247	Richland WA	46 16 48.13634	-119 16 34.52974	104.175	DANP	GNSS
ELG2	341	Elgin	45 33 53.49145	-117 55 42.27526	816.489	ELG2	GNSS
ENTR	214	Enterprise	45 25 52.50655	-117 17 17.03741	1127.055	ENTR	GG
FWRD	215	Farewell Bend POE	44 17 30.78145	-117 13 17.85372	631.934	FWRD	GG
GLWD	217	Glenwood, WA	46 01 11.36775	-121 17 18.92579	561.420	GLWD	GNSS
GOBS	200	Goldendale, WA	45 50 19.73131	-120 48 52.77805	621.955	GOBS	GNSS
GOLY	218	Goldendale, WA	45 49 43.29747	-120 48 08.78726	500.605	GOLY	GNSS
GRAS	219	Grass Valley (BLM)	45 21 51.87542	-120 47 14.62113	877.871	GRAS	GG
GTPS	220	Grants Pass	42 26 04.16523	-123 17 50.51054	279.017	GTPS	GNSS
HALF	221	Halfway	44 52 20.58922	-117 05 59.32893	783.937	HALF	GG
HRPR	242	Harper School	43 51 57.12128	-117 36 28.54898	761.430	HRPR	GG
IDMU	243	Murphy, ID	43 13 00.30277	116 33 03.77402	849.414	IDMU	GG
JIME	223	Hillsboro (Washington County)	45 31 23.21435	-122 59 25.84156	53.404	JIME	GG
JUNT	226	Juntura	43 44 37.73932	-118 04 42.47825	891.128	JUNT	GNSS
KENI	224	Kennewick, WA	46 11 52.36515	-119 09 31.01687	146.534	KENI	GNSS
KFRG	225	Klamath Falls/ Rhine Cross	42 13 27.00263	-121 47 01.91272	1240.584	KFRG	GNSS
LAPN	230	La Pine (Deschutes County)	43 39 52.55204	-121 30 21.55207	1279.374	LAPN	GG
LCS1	244	Albany (Linn County)	44 38 03.65081	-123 06 23.93574	59.437	LCS1	GNSS
LCS2	245	Sweet Home (Linn County)	44 23 46.23808	-122 44 03.16230	145.121	LCS2	GNSS
LCS3	246	Halsey	44 22 39.21880	-123 08 32.76680	72.279	LCS3	GNSS
LFLO	227	Florence (Lane County)	43 59 00.96717	-124 08 27.89123	-8.045	LFLO	GNSS
LKWW	340	Lakeview	42 10 19.53310	-120 20 47.99347	1433.513	LKWW	GG
LPSB	228	Eugene (Lane County)	44 03 04.40823	-123 05 24.24852	118.092	LPSB	GNSS
LWCK	229	Ilwaco, WA (new grd mount)	46 16 41.26480	-124 03 13.78335	39.288	LWCK	GNSS
MCSQ	232	Salem (Marion County)	44 58 25.70394	-122 57 20.63752	53.181	MCSQ	GG
Installd		New Antenna	Leica AT504GG LEIS		20-Aug-21		
MDMT	198	Medicine Mtn	42 25 06.01388	-121 13 17.70830	1711.070	MDMT	GPS
MDRS	234	Madras	44 39 50.49280	-121 07 49.44945	736.344	MDRS	GNSS
Installd		New Antenna	SEPCHOKE B3E6 SPKE		1-Sep-21		
MTCL	282	Mitchell	44 33 54.73236	-120 08 47.57968	878.279	MTCL	GG
NOSE	291	Roman Nose Lookout	43 54 42.83694	-123 44 19.33929	849.378	NOSE	GNSS
NWRG	235	Newberg, City of	45 18 00.17226	-122 58 31.85086	42.923	NWRG	GNSS
OAKR	236	Oakridge	43 44 18.00507	-122 26 40.37847	376.301	OAKR	GNSS
OB3C	237	Eugene	44 03 57.45920	-123 05 53.27982	112.197	OB3C	GG
ODOT	238	ODOT TLC Building, Salem	44 53 47.96707	-123 00 02.84584	51.587	ODOT	GNSS
ONAR	239	Ona Beach	44 30 52.26862	-124 04 28.19861	17.895	ONAR	GNSS



ORGN Stations Legend

Ground Station Status

- GNSS Active
- GNSS Alert
- GNSS Inactive
- GLONASS Active
- GLONASS Alert
- GLONASS Inactive
- GLONASS Planned
- GPS Active
- GPS Alert
- GPS Inactive
- GPS Planned

Coverage Area

- No Coverage
- Coverage



Station Pages (website)

Go To ▼

Station - GTPS



Looking North



Looking South



Looking West



Looking East

Equipment Specifications

Manufacturer: Trimble
Receiver Model: NetR9
Antenna: Zephyr 3 Geodetic (TRM 115000.00 NONE)
Elevation Mask: 0 Degrees

File Logging

File Type: RINEX
Logging Interval: 5 Seconds
Operation Time: 24x7 log files
Rollover: Hourly

Station Information

Site ID: GTPS
Location: GTPS - Grants Pass
PID: 220

Position at Antenna Reference Point

Antenna Ref Point:
NAD83 (2011) epoch 2010.00
Latitude: 42° 26' 04.16523"N
Longitude: 123° 17' 50.51054"W
Ellip. Hgt.: 279.017m

Tracking GPS and GLONASS

Location Address: 345 NE Agness Ave,
Grants Pass, OR 97526
Organization: Oregon Department of
Transportation

Important Links

- [Site Log](#):
- [RINEX Data](#):
- [Alerts/Advisories](#):
- [Superseded coordinates NAD83 \(CORS96\) epoch 2002](#):



ORGN Station Facts

- ◆ Total Stations
 - 132 Stations (47 ODOT Owned)
 - 103 In the Network
 - 29 Redundant
 - **5 Planned (Adel)**

- ◆ Breakdown:
 - GNSS Stations ~ 102
 - GG Stations ~ 24
 - GPS Only ~ 6



ORGN Taking Control

- ◆ Lane County
 - LFLO ~ Florence (NGS CORS) GNSS
 - LPSB ~ Eugene (NGS CORS) GNSS
- ◆ Marion County
 - WDBN ~ Woodburn (NGS CORS) GNSS
 - STAY ~ Stayton (NGS CORS) GNSS
 - MCSO ~ Salem (NGS CORS) GG
- ◆ Deschutes County
 - LAPN ~ LaPine GG
 - BEND ~ City of Bend GPS
- ◆ Polk County - PCS2 ~ Dallas GNSS
- ◆ Yamhill Co. – NWBG ~ Newberg (NGS CORS) GNSS



Resent Upgrades to full GNSS Thanks to CWU



2019

TILL

SEAS

ONAB

LFLO

REED

RDL2

YONC

RSBG

GTPS

2020

NWBG

2021

LPSB

KFRC

PSPT

PKDL

OAKR

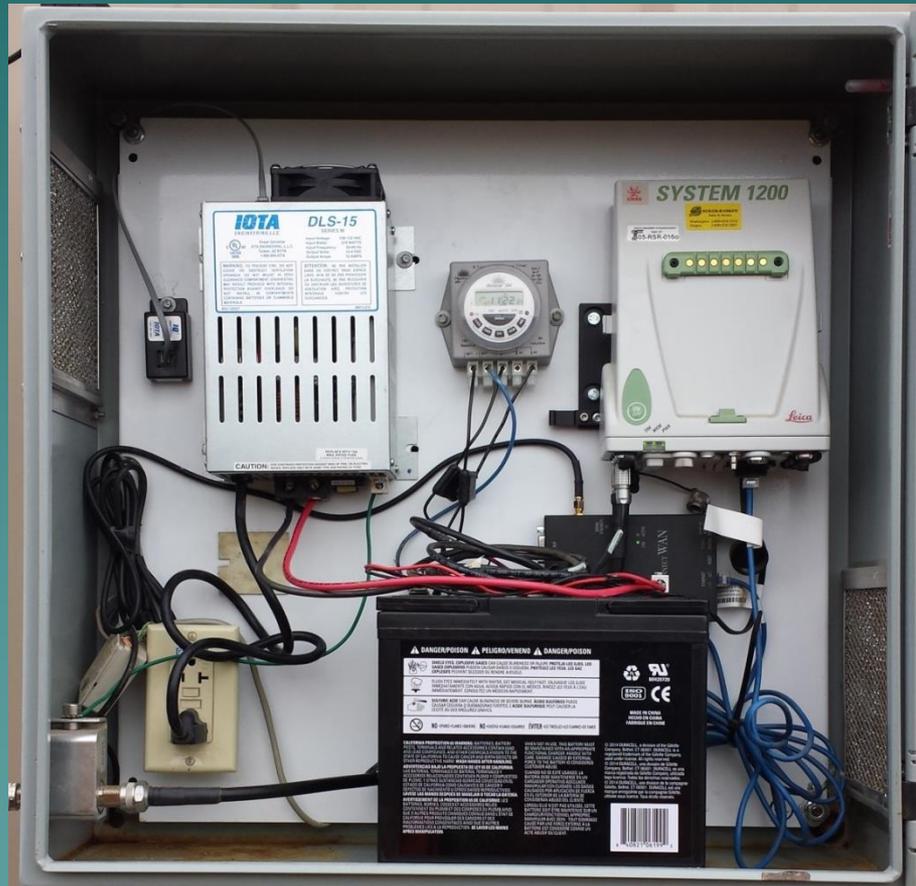
PNVL



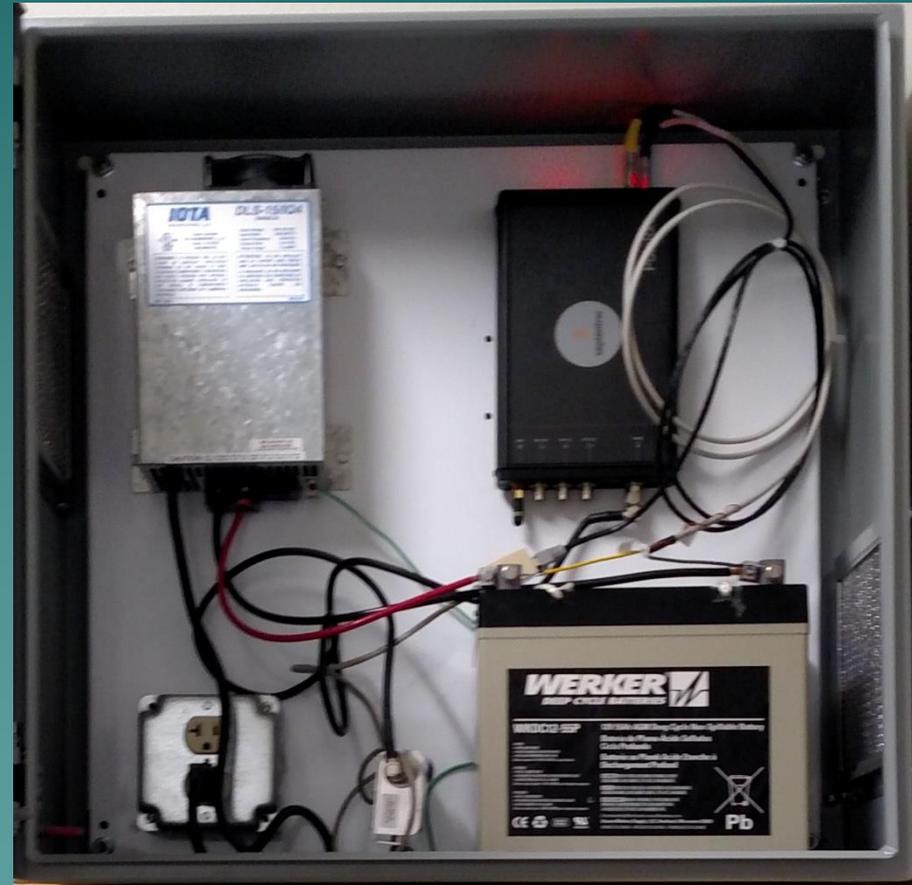


Upgrade GPS to GNSS Capable

Leica 1200 Sensor



Septentrio PolaRx5



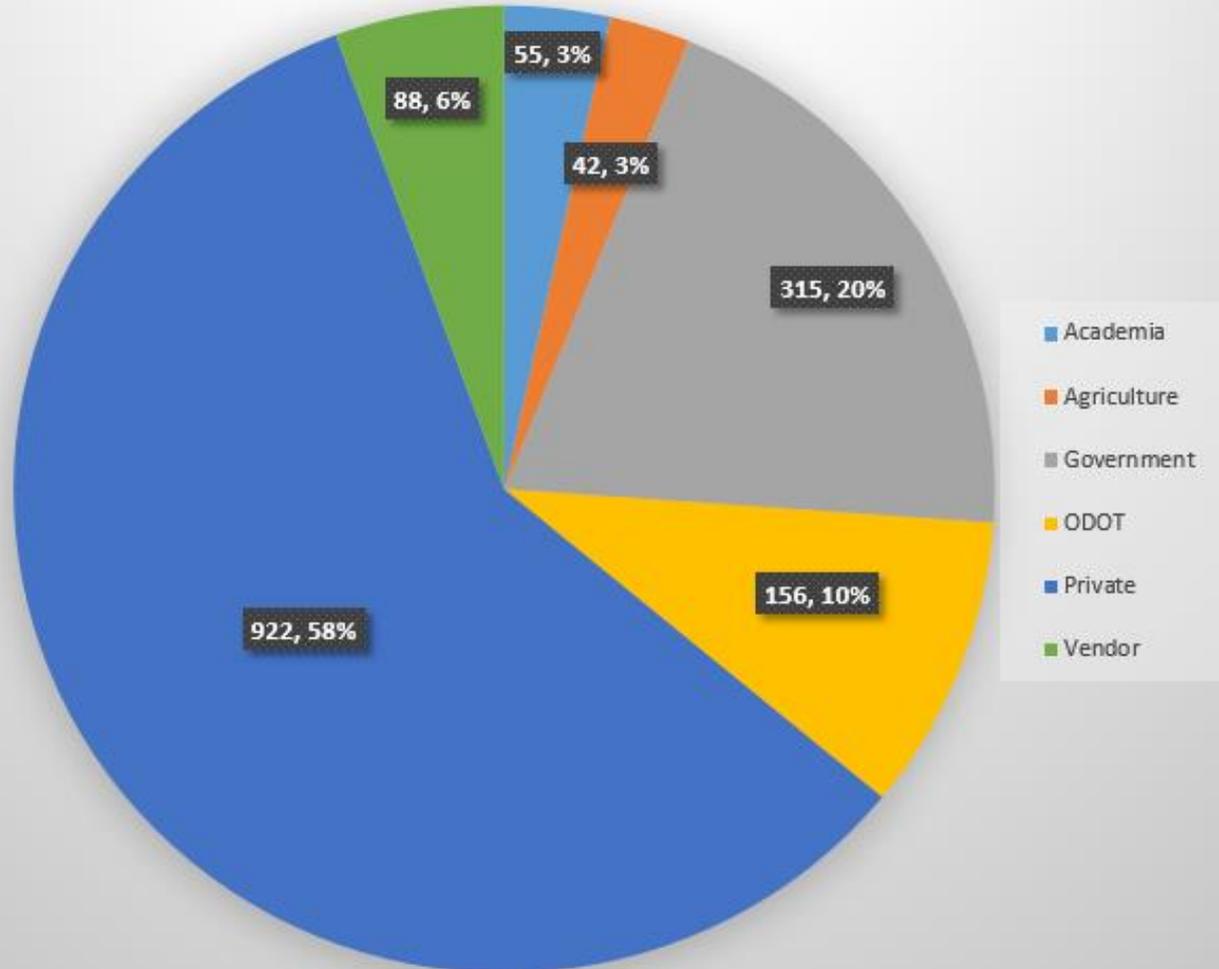


Oregon Department of Transportation



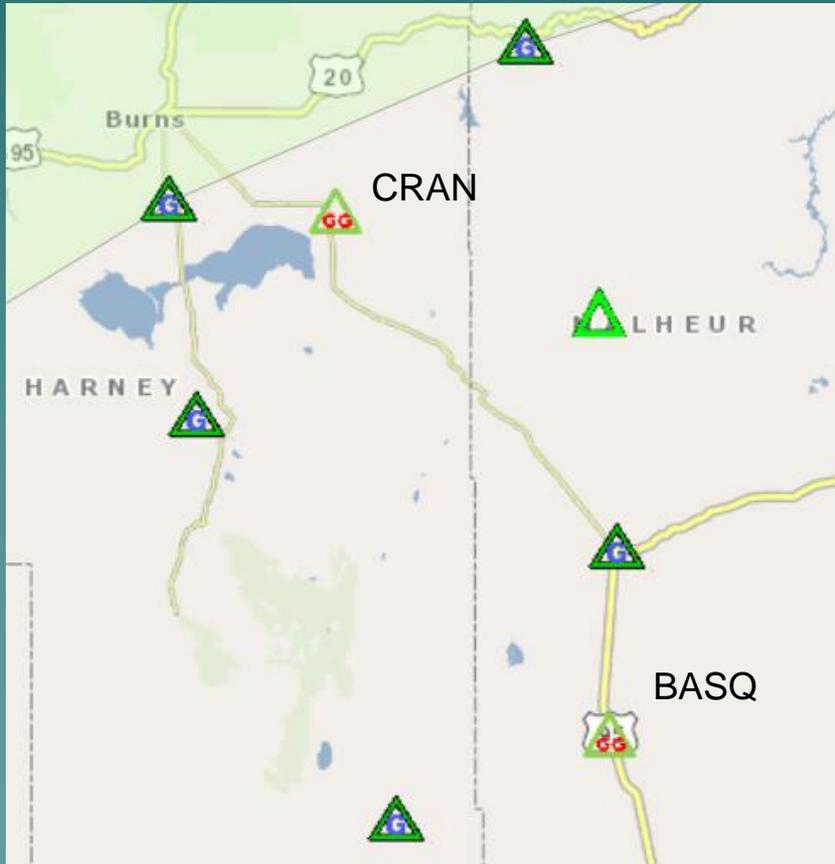


1578 ORGN Rover Accounts





Newly created ORGN Stations - Basque and Crane Adel in Planning Stage





RINEX Links

RDL2	247	Riddle Elementary	42 57 16.04072	-123 21 43.92194	199.189	RDL2	GNSS
REDM	287	Redmond Airport	44 15 35.14682	-121 08 52.31545	920.342	REDM	GNSS
REED	285	Reedsport	43 42 03.61242	-124 06 28.01374	-13.784	REED	GNSS
RSBG	216	Roseburg (ODOT Tech Ctr)	43 14 06.04984	-123 21 33.72789	135.623	RSBG	GNSS
SEAS	288	Seaside	45 59 03.19809	-123 55 20.66063	-11.705	SEAS	GNSS
SHLD	29	Sheldon Wild	41 52 06.10645	-119 00 56.41132	1458.074	SHLD	GPS
SKCO	223	Stevens, WA	45 41 39.27428	-121 53 02.19401	43.009	SKCO	GNSS
SPRA	290	Spray (ODOT)	44 49 36.07476	-119 46 34.64026	567.247	SPRA	GG
STAY	231	Stayton (ODOT)	44 49 50.53241	-122 49 15.03333	111.236	STAY	GNSS
TDLS	293	The Dalles	45 36 27.74446	-121 07 46.16461	26.928	TDLS	GNSS
TILL	294	Tillamook	45 27 18.45224	-123 49 50.70234	-4.247	TILL	GNSS
TPW2	255	Tongue Point	46 12 26.52726	123 46 06.04741	-14.555	TPW2	GNSS
UKIA	296	Ukiah	45 07 58.05613	-118 56 11.63734	1009.481	UKIA	GG
VCWA	297	Vancouver, WA	45 37 03.44358	-122 30 57.79917	77.405	VCWA	GNSS
WALA	298	Walla Walla, WA	46 05 29.42010	-118 15 29.25508	369.235	WALA	GNSS
WAMC	299	Wamic (Wasco County)	45 13 25.77255	-121 16 25.01410	528.536	WAMC	GG
WDBN	233	Woodburn (ODOT)	45 10 15.09672	-122 52 12.13083	40.17	WDBN	GNSS
WMSG	300	North Warm Springs JCT	45 07 52.53770	-121 35 50.13199	1048.432	WMSG	GG
YONC	301	Yoncalla	43 38 02.78725	-123 17 53.82392	87.296	YONC	GNSS
Useful Links							
Superseded Coordinates NAD83(CORS96)(Epoch2002)							
PBO RINEX Files							
PBO High-Rate RINEX							
WSRN		Look for Reference Data Shop after logging in					
Archive Data		Converting Compact RINEX to RINEX for use with	Active Data				

Links: for PBO RINEX, High Rate RINEX.
Also, Archived RINEX Data.



NTRIP Products

167.131.109.57

- ◆ Port 9879
 - All single-base correctors by name: GPS-only GG and GNSS.

- ◆ Port **9881**
 - Network (multi-base) & nearest-single-base correctors:
all are **GPS-Only**.

- ◆ Port 9882 (**Recommended Port*)
 - Network (multi-base) & nearest-single-base correctors:
all are GG (with several newly created GNSS ones)



Port 9879

- ◆ **Port 9879:** (This port has GPS-only, GPS + GLONASS and a few GNSS single base correctors, No NMEA stream required)
- ◆ -All single-base correctors by name: GPS-only, GG and GNSS.
- ◆ -The desired corrector is selected by the user from the mount point list (*source table*) on Port 9879.
- ◆ -**GPS-only** correctors in the source table are named with the four character site ID and the appendage "**_Single**", for example, **RSBG_Single**. These single-base GPS-only correctors are all in the RTCM2.3 format.
- ◆ -**GG** correctors in the source table are named with the four character site ID and the appendage "**_Single_GG3x**", for example, **RSBG_Single_GG3x**. These single-base GG correctors are all in the RTCM3x format.
- ◆ -**GNSS** correctors in the source table are named with the four character site ID and the appendage "**_Single_GNSS**", for example, **STAY_Single_GNSS**. These single-base GNSS correctors are all in the RTCM3x MSM4 format.



Port 9881

- ◆ **Port 9881: All correctors** on this port are **GPS-only** correctors.
- ◆ -Network (multi-base) & Nearest-single base correctors.
- ◆ -Available mount points on the source table:
 - **"Nearest_Single_RTCM23"** (for older rovers not RTCM3 capable)
 - **"Nearest_Single_RTCM3"** (for newer RTCM3 capable rovers)
 - **"MAX_RTCM3"** (network multi-base corrector: RTCM3x format)
 - **"IMAX_RTCM23"** (network multi-base corrector: RTCM2.3)
 - **"IMAX_RTCM3"** (network multi-base corrector: RTCM3x format)
 - **IMAX_RTCM3_AG"** (mobile operations, stays connected to initial station)
 - **"IMAX_CMR+"** (Trimble format)
 - **"IMAX_CMR_AG"** (Trimble format, mobile operations, stays connected to initial station)
- ◆ -The user selects the desired corrector from the mount point list (source table) and then ORGN Spider operating software automatically selects the best master reference station for MAX and i-MAX correctors, or the nearest reference station for a Nearest-Single corrector.
- ◆ -**Important:** Spider automatically selects the optimal base station based on your rover location, so if using the MAX, i-MAX or Nearest-single corrector, your rover **must** be configured to send its location to the ORGN by enabling the **"send GGA"** NMEA message output on your rover.



Port 9882

- ◆ **Port 9882:** All correctors on this port are **GG** correctors (+). **
- ◆ - Network (multi-base) & Nearest-single-base correctors: **all are GG**
- ◆ - Available mount points on the source table:
 - ** Updated 20 July 2020. *If your equipment is new enough and can handle their advanced message format, it's advised to utilize the **_GNSS** correctors, as they will assist you in tracking both GPS and GLONASS satellites. If not, stick with the other recommended corrector types.*
 - **"Nearest_Single_GNSS"**
 - **"IMAX_GNSS"** (network multi-base corrector: RTCM3x [MSM4] format)
 - **"IMAX_GNSS_AG"** (mobile operations, stays connected to initial station)

 - **"Nearest_Single_GG_RTCM3"**
 - **"MAX_GG_RTCM3"** (network multi-base corrector: RTCM3x format)
 - **"IMAX_GG_RTCM3"** (network multi-base corrector: RTCM3x format)
 - **"IMAX_GG_CMR"** (Trimble format)
 - **"IMAX_GG_CMR_AG"** (Trimble format, mobile operations, stays connected to initial station)
- ◆ - The user selects the desired corrector from the mount point list (source table) and then ORGN Spider operating software automatically selects the best master reference station for MAX and i-MAX correctors, or the nearest reference station for a Nearest-Single corrector.
- ◆ - **Important:** Spider automatically selects the optimal base station based on your rover location, so if using the MAX, i-MAX or Nearest-single corrector, your rover **must** be configured to send its location to the ORGN by enabling the **"send GGA"** NMEA message output on your rover.



"East" Site Server

GNSS Spider 7.5.2.8679 - [site server EAST]

File View Management Raw Data Status Tools Window Help

Management	Site Name	Site C...	Comm Activity	Data Recv
site server EAST	MTCL Mitchell	MTCL	receive data	99.6
Sites	OAKR	OAKR	receive data	99.9
ANAT-ANATONE	ONTO-Ontario DHS	ONTO	downloading	99.3
ARLN-Arlington	P018 Jordan	P018	receive data	99.7
BASQ-Basque	P022-sLaGrande	P022	receive data	99.9
BEND-dir	P023-Riggins ID	P023	receive data	99.9
BLY1	P062-sSilverkdi	P062	receive data	99.7
BNDM Bend Maint	P063-Shaniko	P063	receive data	99.9
BRNT-Unity	P366 Dean Mt.	P366	connecting	0.0
BURN Burns Jct	P380 OIT	P380	receive data	99.9
CHEM-CHEMULT	P381 AlkaliLake	P381	receive data	98.3
COND-CONDON	P385s SantJctDir	P385	receive data	99.9
CRAN-Crane	P386-sJohnDaydir	P386	receive data	99.8
	P387 Sisters	P387	receive data	99.6
	P388 Willow Sprg	P388	receive data	99.9
	P389-sBrothers	P389	receive data	99.8
	P390 JackAss	P390	no response	0.0
	P391 BuckskinMt	P391	receive data	99.7
	P392 WrightsPt	P392	receive data	99.9
	P393 Barren Vly	P393	receive data	99.9
	P394-Baker	P394	receive data	99.9
	P429 Cascadedr3	P429	receive data	99.9
	P445s Wasco Air	P445	receive data	99.7
	P447sMorrowAir	P447	receive data	98.7
	P450Paterson	P450	receive data	100.0
	P672-TULELAKE	P672	receive data	99.9
	P736_Chilquin	P736	receive data	99.9
	P738 Hart Mtn	P738	receive data	99.8
	P739Mcdermitt	P739	receive data	99.9
	P784-Montague	P784	receive data	99.8
	PDTN Pndltn-new	PDTN	receive data	100.0
	PKDL- Parkdale	PKDL	receive data	99.9
	PSPT-Prospect	PSPT	receive data	99.6

13.04.2021 22:25 13.04.2021 22:30 13.04.2021 22:35 13.04.2021 22:40 13.04.2021 22:45 13.04.2021 22:50

Site Map Site Sensor Raw Data Status File Products RT Products RT Positioning PP Positioning

Content	Site	Date/Time	User	Category	Text
All	BNDM Ben...	13.04.2021 22:50:49	Spider Ser...	General	Ephemeris data updated. GAL Satellite: 36, Sig: INAV, IODE: 82, Time: 04-14-2021 05:39:59.
All Sites	BNDM Ben...	13.04.2021 22:50:49	Spider Ser...	General	Ephemeris data updated. GAL Satellite: 3, Sig: INAV, IODE: 82, Time: 04-14-2021 05:39:59.
Query (Offline)	BNDM Ben...	13.04.2021 22:50:47	Spider Ser...	General	Ephemeris data updated. GAL Satellite: 15, Sig: INAV, IODE: 82, Time: 04-14-2021 05:39:59.
	BNDM Ben...	13.04.2021 22:50:47	Spider Ser...	General	Ephemeris data updated. GAL Satellite: 5, Sig: INAV, IODE: 82, Time: 04-14-2021 05:39:59.
	BNDM Ben...	13.04.2021 22:50:47	Spider Ser...	General	Ephemeris data updated. GAL Satellite: 9, Sig: INAV, IODE: 82, Time: 04-14-2021 05:39:59.

For Help, press F1 0/75 Remote User level: Administrator Local time: 22:50:54 OK



FAQ's

- ◆ What is the difference between MAX & IMAX?
- ◆ Can I use 2 rovers on the same account?
- ◆ How far outside of the network can you go and still get correctors?
- ◆ How far away from the master station can I be and still get correctors?
- ◆ Can I use the AG product, and is the accuracy less?
- ◆ Why does my rover change master station (bounces between master stations)?



Questions?

“I think one thing my experience has taught me is to trust, but verify everything” - *Shelby Griggs*

Randy Oberg, Lead Geodetic Surveyor
503.986.3041 (o); 503.881.2889 (c)
Randy.D.Oberg@odot.state.or.us

Eric Zimmerman, Geodetic Associate
503.986.3037 (o); 503.779.5069 (c)
Eric.P.Zimmerman@odot.state.or.us

Oregon Real-time GNSS Network

<https://www.oregon.gov/odot/orgn/pages/index.aspx>