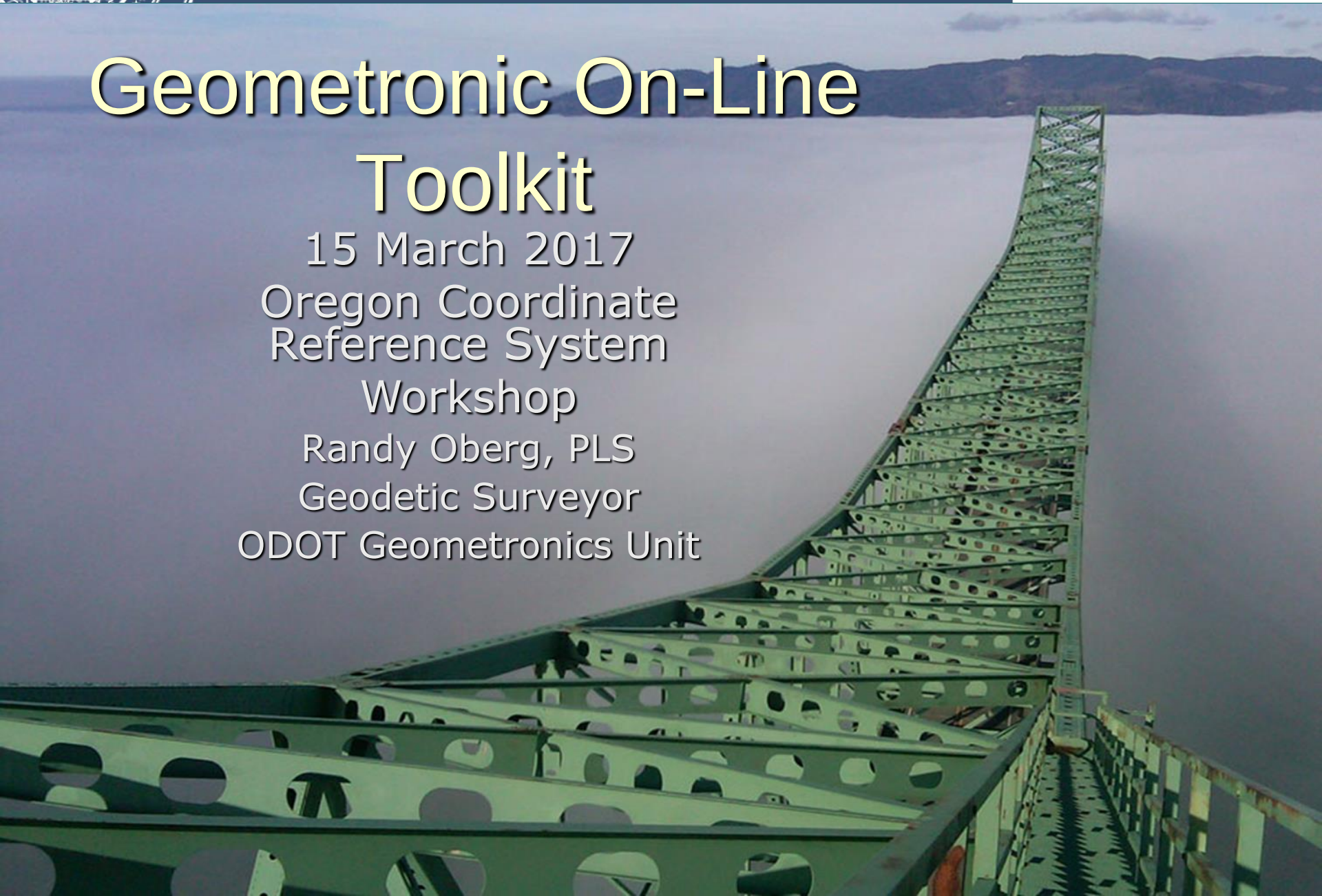
Geometronic On-Line Toolkit

15 March 2017

Oregon Coordinate Reference System Workshop

Randy Oberg, PLS
Geodetic Surveyor
ODOT Geometronics Unit



Geometronics Online Toolkit

- Current Products Available
  - OCRS
  - ORGN
- Future Products
  - Lidar
  - Benchmarks
  - ????
- ODOT TransGIS Platform
- Administrator Ken Bays and Randy Oberg

Oregon Department of Transportation

http://www.oregon.gov/ODOT/HWY/THEORGN/Pages/Theorgn-Home.aspx

Oregon Real-Time GNSS N...

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Oregon Real-Time GNSS Network

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- Home
- Alerts
- ORGN Status Map
- ORGN Coordinates
- Products & Services
- Station List
- GLONASS
- About RINEX Data
- RINEX Data
- Rover Account Request
- ORGN Partners
- Contacts
- Support Documents
- Site Reconnaissance
- Links

The ORGN is fully Functional



DATUM REALIZATION FOR THE OREGON REAL-TIME GNSS NETWORK

On Friday, 8 March 2013, the Oregon Real-time GNSS Network (ORGN) was transitioned to a new datum realization: NAD 83(2011) epoch 2010.00. Please visit our ORGN Coordinates page for more in depth information on this transition.

GLONASS and the Oregon GNSS Network

Please see our GLONASS web page for information about GLONASS and the Oregon Real-time GNSS Network.

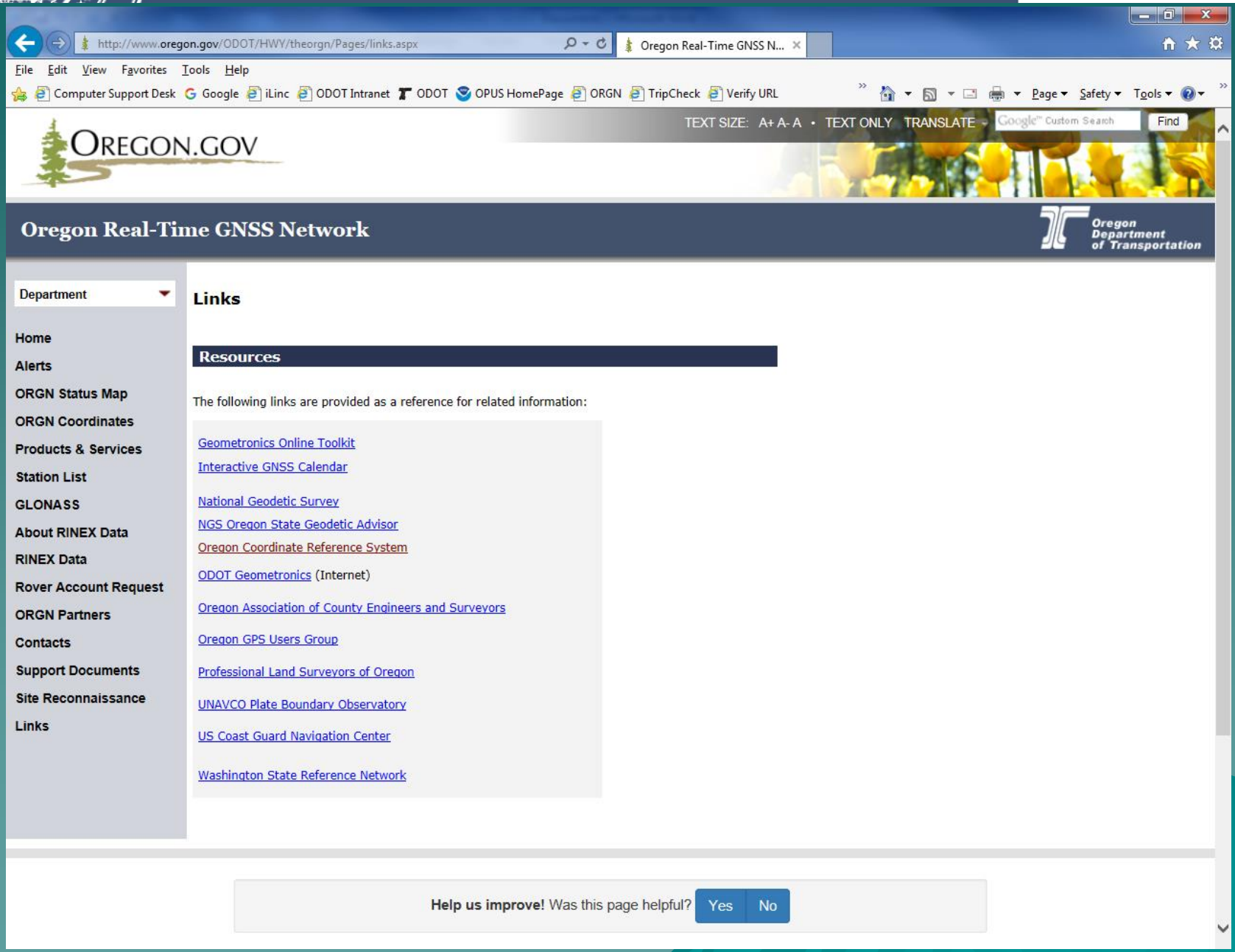
OVERVIEW

The Oregon DOT Geometronics Unit is operating and expanding the Oregon Real-time GNSS Network, a network of permanently installed, continuously operating GNSS reference stations.

The ODOT Geometronics Unit is responsible for enhancing and maintaining the vertical and horizontal geodetic control infrastructure across the state of Oregon. The establishment and operation of the ORGN in Oregon helps us accomplish this mission.

This GNSS network consists of GNSS Continuously Operating Reference Stations (CORS) that provide [illegible] to field GNSS users over the internet. GNSS users that are

http://www.oregon.gov/ODOT/HWY/theorgn/Pages/Theorgn-Home.aspx



http://www.oregon.gov/ODOT/HWY/theorgn/Pages/links.aspx

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- Links

Links

Resources

The following links are provided as a reference for related information:

Geometronics Online Toolkit
Interactive GNSS Calendar

National Geodetic Survey
NGS Oregon State Geodetic Advisor
Oregon Coordinate Reference System
ODOT Geometronics (Internet)
Oregon Association of County Engineers and Surveyors
Oregon GPS Users Group
Professional Land Surveyors of Oregon
UNAVCO Plate Boundary Observatory
US Coast Guard Navigation Center

Washington State Reference Network

Help us improve! Was this page helpful? Yes No

http://www.oregon.gov/ODOT/HWY/GEOMETRONICS/Pages/ocrs.aspx

Oregon Real-Time GNSS Netw... | Geometronics Oregon Coor...

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Geometronics

Oregon Department of Transportation

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- About Us
- Contact Us
- Benchmark Retrieval
- Forms & Requests
- Geodetic Control
- Links
- Manuals & Documents
- Maps & Plans Center
- OCRS: OR Coord Ref Sys
- ORGN (GPS Network)
- Remote Sensing
- Right of Way Engineering
- Search Geometronics
- Survey Conference
- Survey Operations

Oregon Coordinate Reference System

About the 'OCRS'

The Oregon Coordinate Reference System is based on a group of low distortion map projection coordinate systems. Low distortion projections are based on true conformal map projections designed to cover significant portions of urban and rural areas of the state. The term 'low distortion' refers to both the horizontal distortion from presenting a curved surface on a plane and the vertical distortion because these projections are also scaled to a regional height representative of the area to be covered. The advantages of a low distortion projection are;

- Grid coordinate zone distances closely match the same distance measured on the ground.
- Limited distortion and reduced convergence angle.
- Easy to transform between other coordinate zone systems.
- Maintains a relationship to the National Spatial Reference System (NSRS). Can cover entire cities and counties making them GIS friendly.

Back to the top

History

The utilization of electronic survey data by surveyors and GIS professionals is bringing awareness of

http://www.oregon.gov/ODOT/HWY/theorgn/Pages/Maps.aspx

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ORGN Status Map

The **ODOT Geometronics Online Toolkit** is a tool that works within the ODOT TransGIS website and provides maps and status of both the Oregon Real-time GNSS Network and the Oregon Coordinate Reference System.

ODOT Geometronics Online Toolkit

There are two components of the **Geometronics Online Toolkit**:

1. Oregon Coordinate Reference System
2. Oregon Real-time GNSS Network

The Oregon Coordinate Reference System (OCRS) component of the Online Toolkit allows users to determine the best Oregon Coordinate Reference System low-distortion projection zone for their project. Users can display all of the OCRS zones on a map. They can also view the actual distortion of a particular OCRS zone in the vicinity of their project by placing a point, line or polygon on the map.

The Oregon Real-time GNSS Network (ORGN) component of the Online Toolkit allows users to view the status of ORGN sites, view a map of coverage areas in Oregon where real-time GNSS correctors from the ORGN are available, and display/download a list of ORGN stations with the current coordinates for each station and a link to the particular website for each station. For more information about the Oregon Real-time GNSS Network, please see the ODOT ORGN website at: www.TheORGN.net


ORGN
OCRS
Lidar
Geometronics Toolkit
ODOT TransGIS

Questions?

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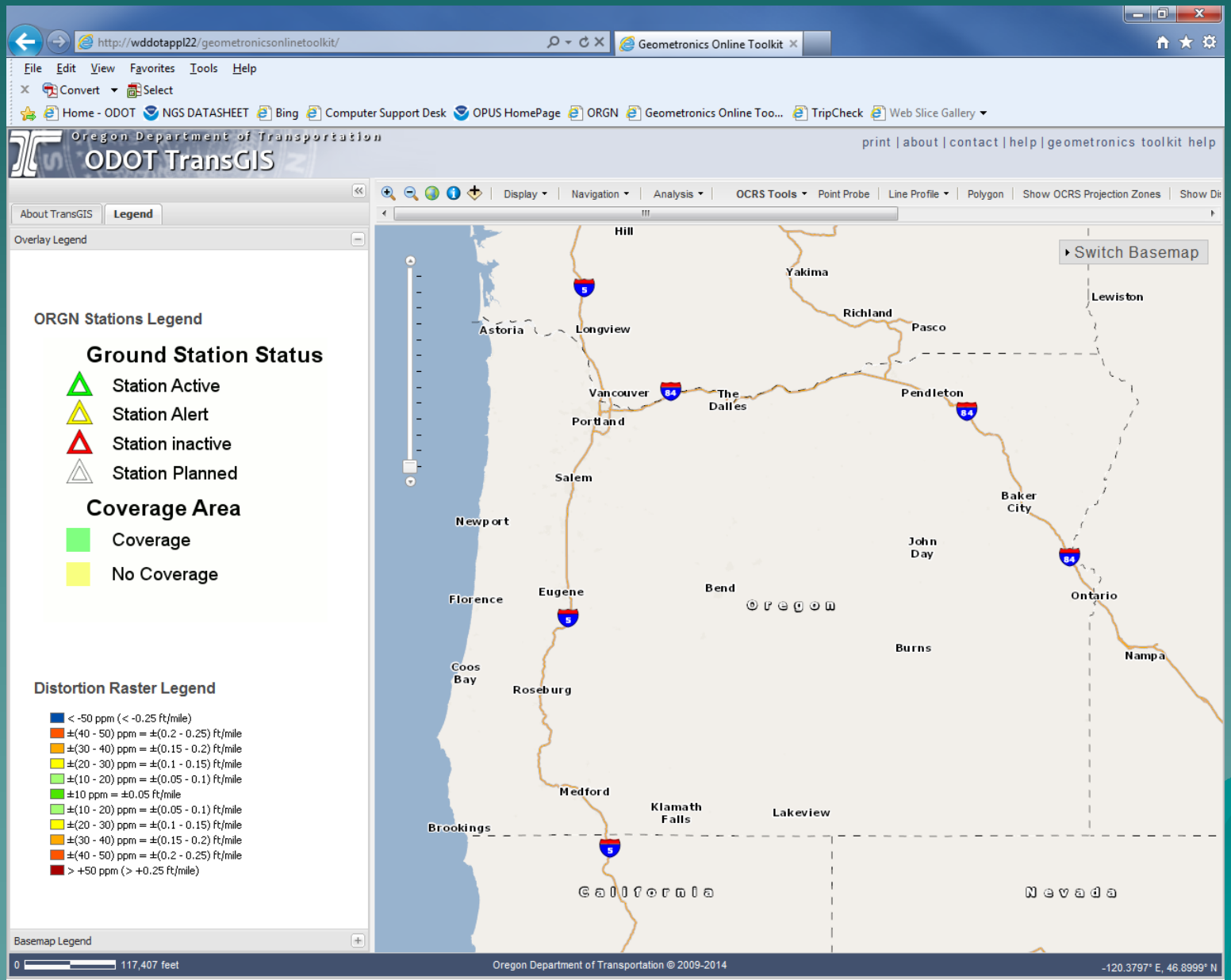
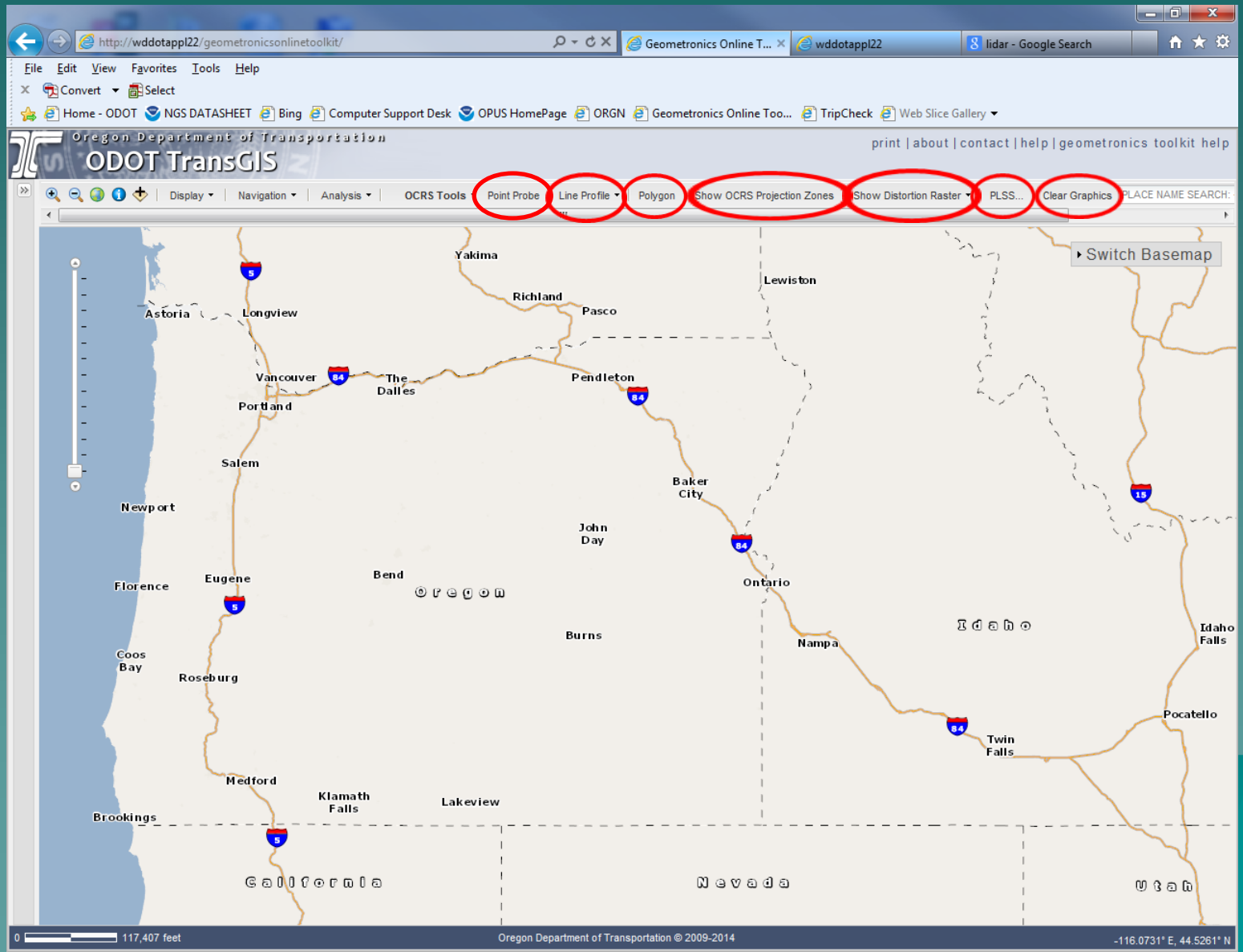


OCRS Tools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Display
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Show Distortion Raster
PLSS...
Clear Graphics
PLACE NAME SEARCH:
Switch Basemap
Yakima
Richland
Pasco
Lewiston
Astoria
Longview
Vancouver
The Dalles
Pendleton
Portland
Salem
Baker City
Newport
John Day
Florence
Eugene
Bend
Ontario
Oregon
Burns
Idaho
Nampa
Idaho Falls
Coos Bay
Roseburg
Pocatello
Twin Falls
Medford
Klamath Falls
Lakeview
Brookings
California
Nevada
Utah
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117,407 feet
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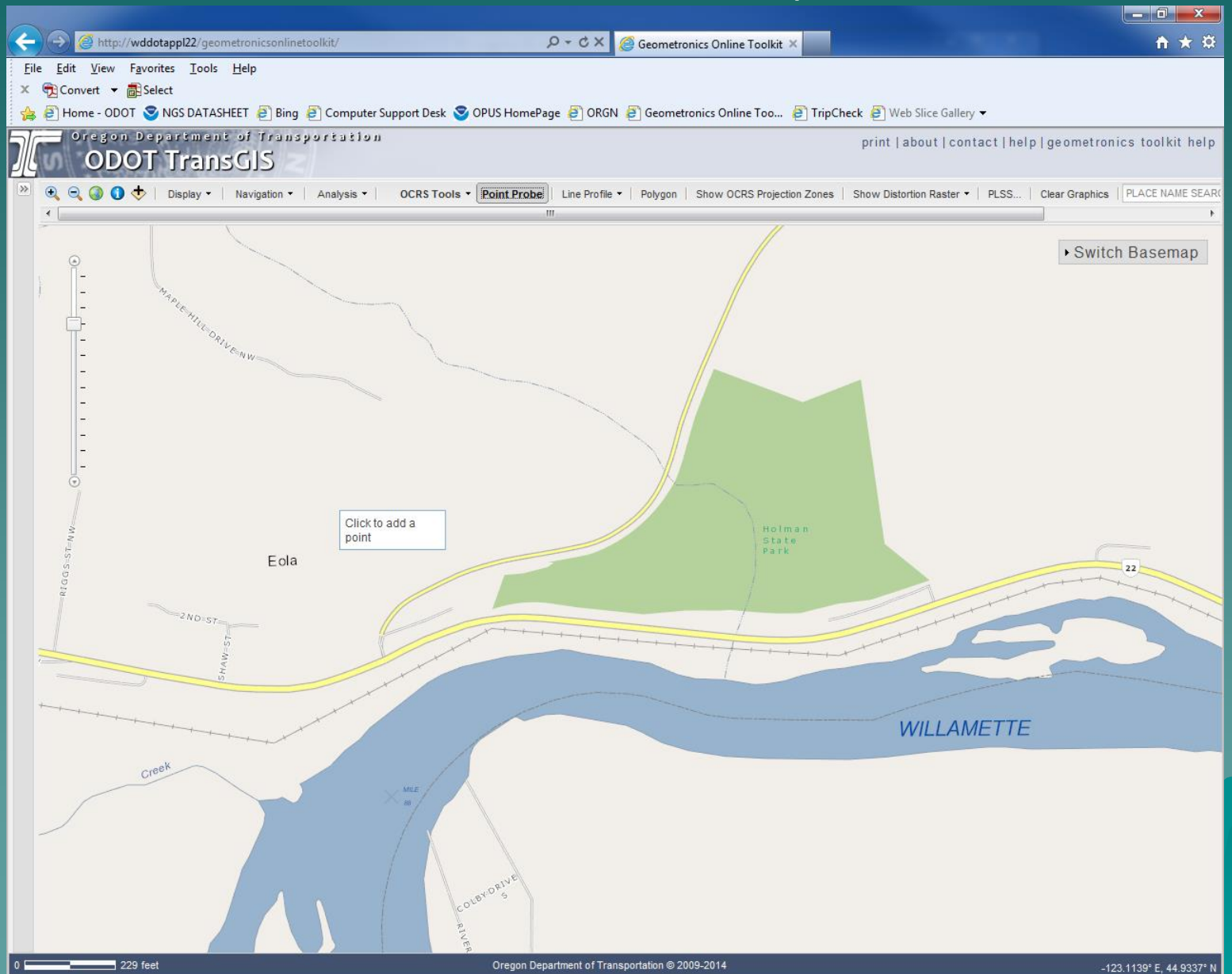
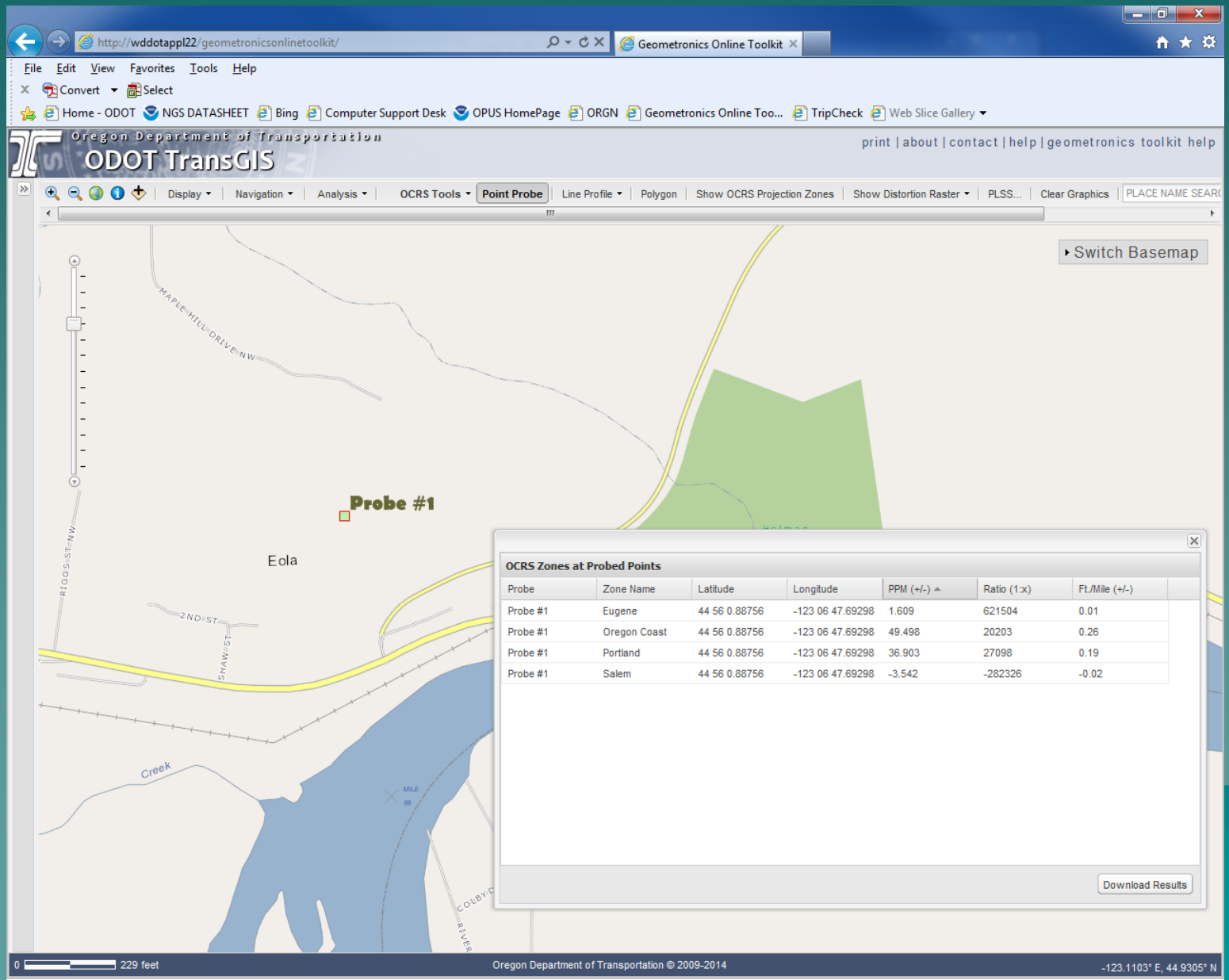
-116.0731° E, 44.5261° N

Point Probe – Click to add point

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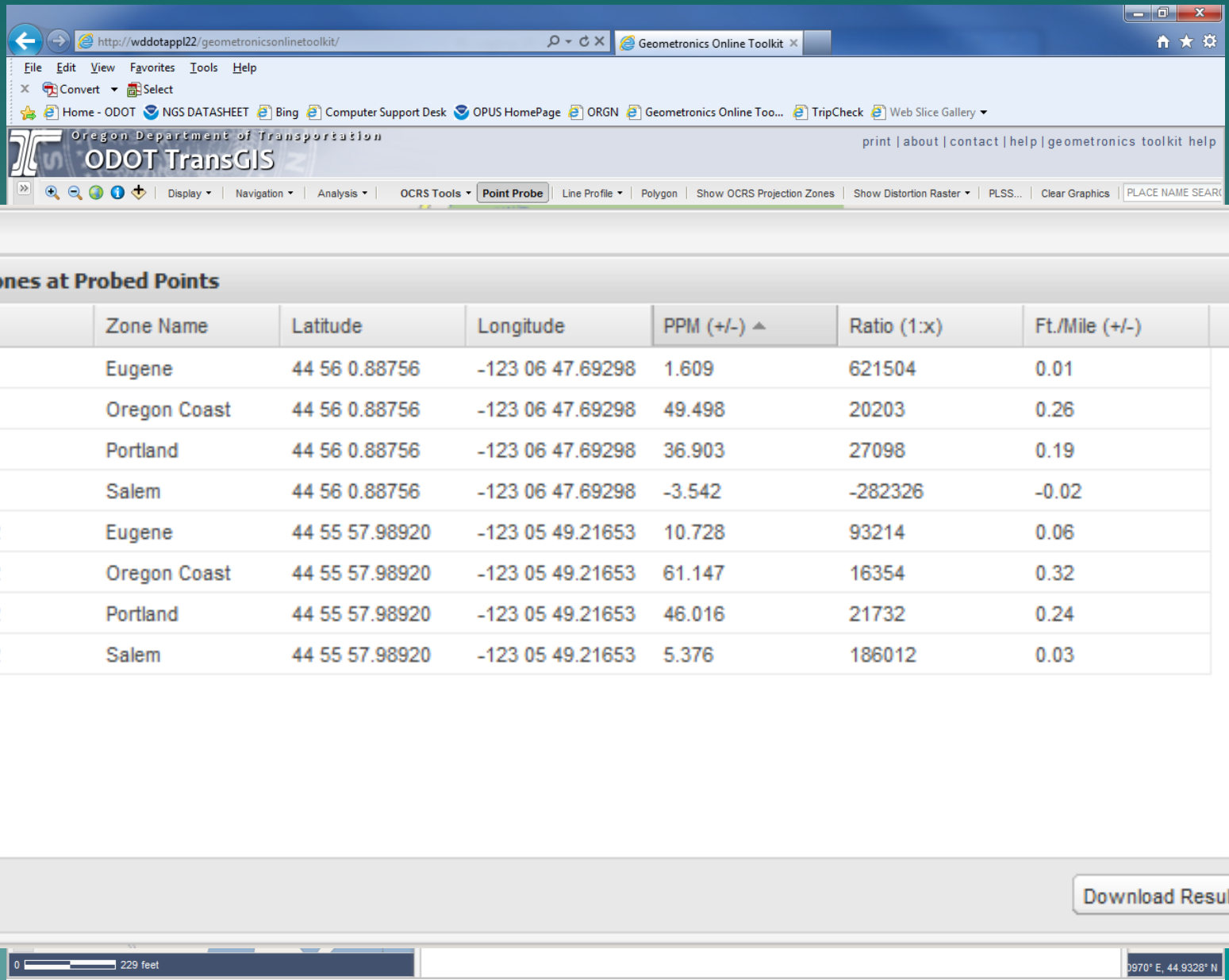
Display Navigation Analysis OCRS Tools Point Probe Line Profile Polygon Show OCRS Projection Zones Show Distortion Raster PLSS... Clear Graphics
Switch Basemap
Probe #1
Eola
MAPLE HILL DRIVE NW
RIGGS ST NW
2ND ST
SHAW ST
Creek
OCRS Zones at Probed Points
Probe | Zone Name | Latitude | Longitude | PPM (+/-) | Ratio (1:x) | Ft./Mile (+/-)
Probe #1 | Eugene | 44 56 0.88756 | -123 06 47.69298 | 1.609 | 621504 | 0.01
Probe #1 | Oregon Coast | 44 56 0.88756 | -123 06 47.69298 | 49.498 | 20203 | 0.26
Probe #1 | Portland | 44 56 0.88756 | -123 06 47.69298 | 36.903 | 27098 | 0.19
Probe #1 | Salem | 44 56 0.88756 | -123 06 47.69298 | -3.542 | -282326 | -0.02
Download Results
0 229 feet
Oregon Department of Transportation © 2009-2014
-123.1103° E, 44.9305° N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Display Navigation Analysis OCRS Tools Point Probe Line Profile Polygon Show OCRS Projection Zones Show Distortion Raster PLSS... Clear Graphics PLACE NAME SEAR
OCRS Zones at Probed Points
Probe | Zone Name | Latitude | Longitude | PPM (+/-) | Ratio (1:x) | Ft./Mile (+/-)
Probe #1 | Eugene | 44 56 0.88756 | -123 06 47.69298 | 1.609 | 621504 | 0.01
Probe #1 | Oregon Coast | 44 56 0.88756 | -123 06 47.69298 | 49.498 | 20203 | 0.26
Probe #1 | Portland | 44 56 0.88756 | -123 06 47.69298 | 36.903 | 27098 | 0.19
Probe #1 | Salem | 44 56 0.88756 | -123 06 47.69298 | -3.542 | -282326 | -0.02
Probe #2 | Eugene | 44 55 57.98920 | -123 05 49.21653 | 10.728 | 93214 | 0.06
Probe #2 | Oregon Coast | 44 55 57.98920 | -123 05 49.21653 | 61.147 | 16354 | 0.32
Probe #2 | Portland | 44 55 57.98920 | -123 05 49.21653 | 46.016 | 21732 | 0.24
Probe #2 | Salem | 44 55 57.98920 | -123 05 49.21653 | 5.376 | 186012 | 0.03
Download Results
0 229 feet

Download Results

probe	layerName	Latitude	Longitude	value	ratio	ftPerMile
Probe #1	Eugene	44.93357988	-123.113248	1.609	621504	0.01
Probe #1	Oregon Coast	44.93357988	-123.113248	49.498	20203	0.26
Probe #1	Portland	44.93357988	-123.113248	36.903	27098	0.19
Probe #1	Salem	44.93357988	-123.113248	-3.542	-282326	-0.02
Probe #2	Eugene	44.93277478	-123.0970046	10.728	93214	0.06
Probe #2	Oregon Coast	44.93277478	-123.0970046	61.147	16354	0.32
Probe #2	Portland	44.93277478	-123.0970046	46.016	21732	0.24
Probe #2	Salem	44.93277478	-123.0970046	5.376	186012	0.03

Excel Spreadsheet

- Arrange Columns
- Sort Ascending or Descending
- Easy for Preparing Reports

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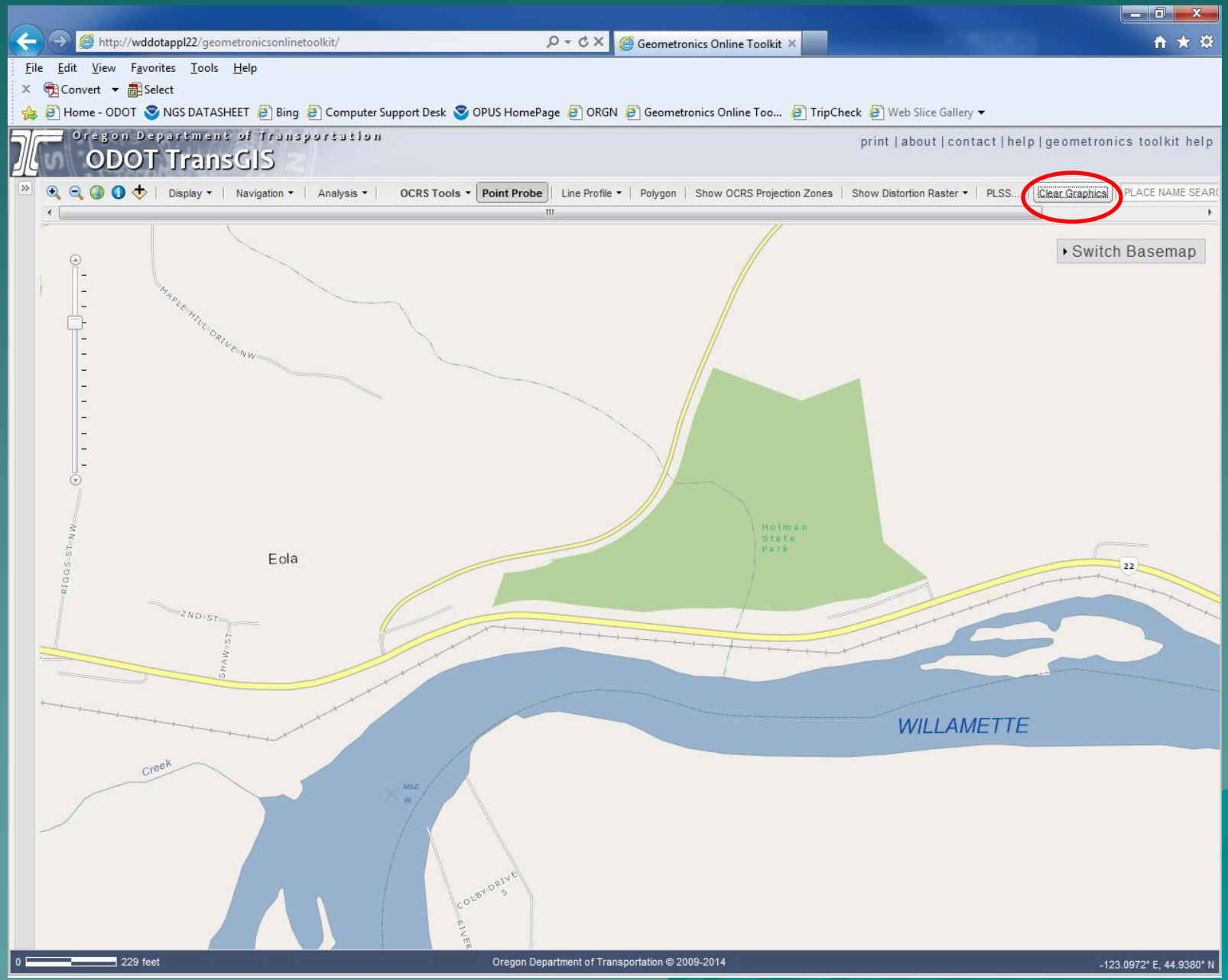

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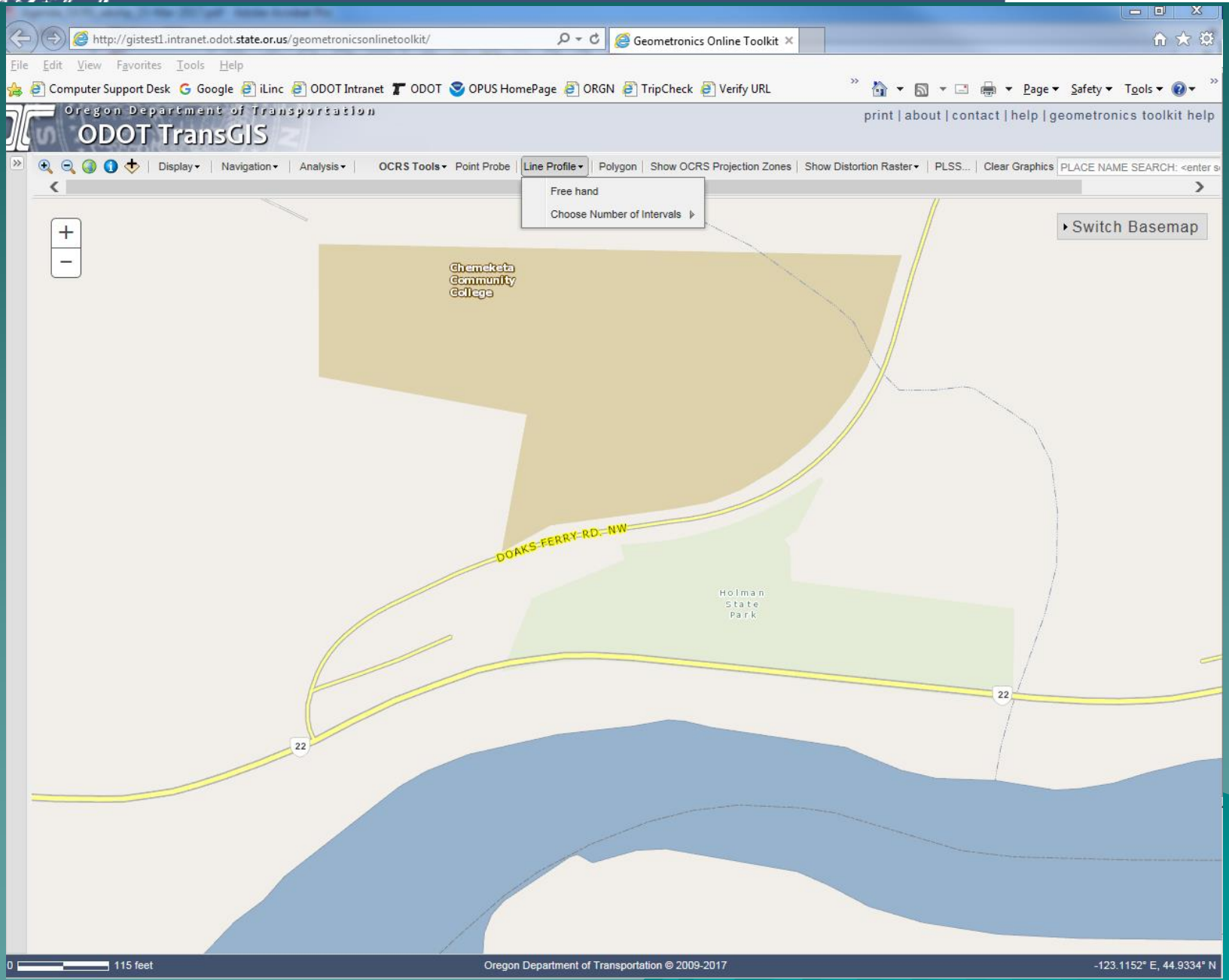

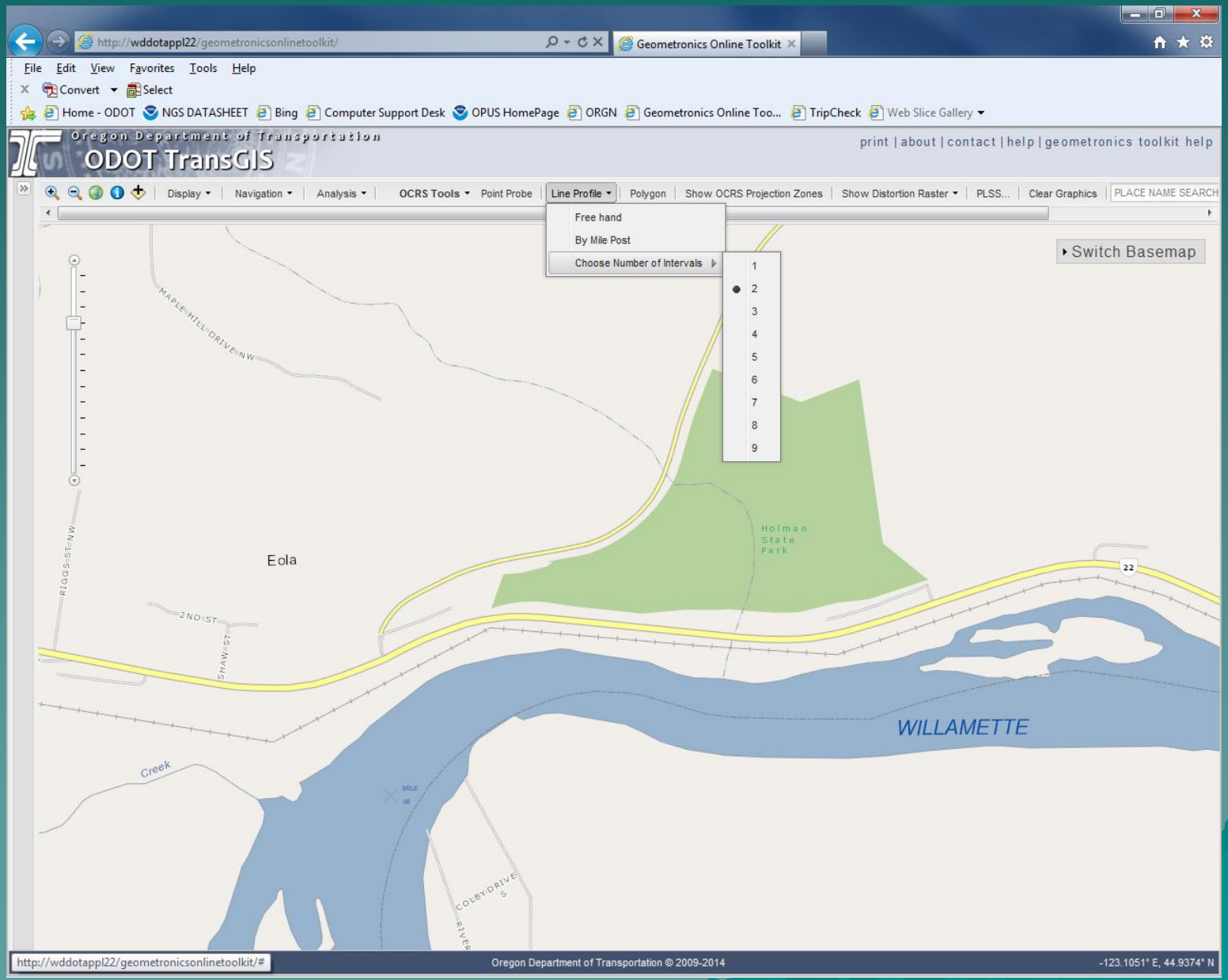
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Display Navigation Analysis OCRS Tools Point Probe Line Profile Polygon Show OCRS Projection Zones Show Distortion Raster PLSS... Clear Graphics PLACE NAME SEARCH
Free hand
By Mile Post
Choose Number of Intervals
1
2
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Switch Basemap
MAPLE HILL DRIVE NW
RIGGS ST NW
2ND ST
SHAW ST
Eola
Holman State Park
22
WILLAMETTE
Creek
COLBY DRIVE S
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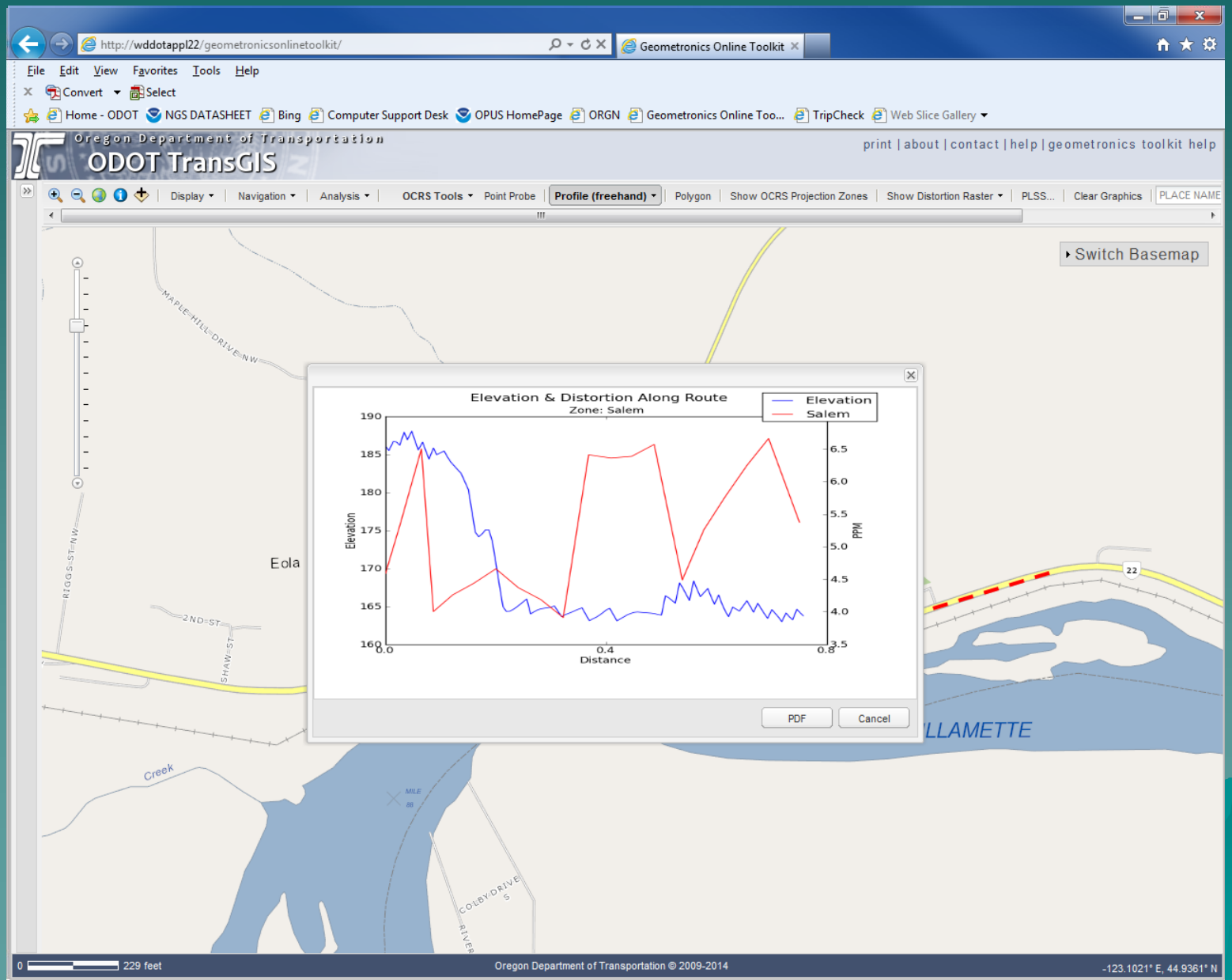
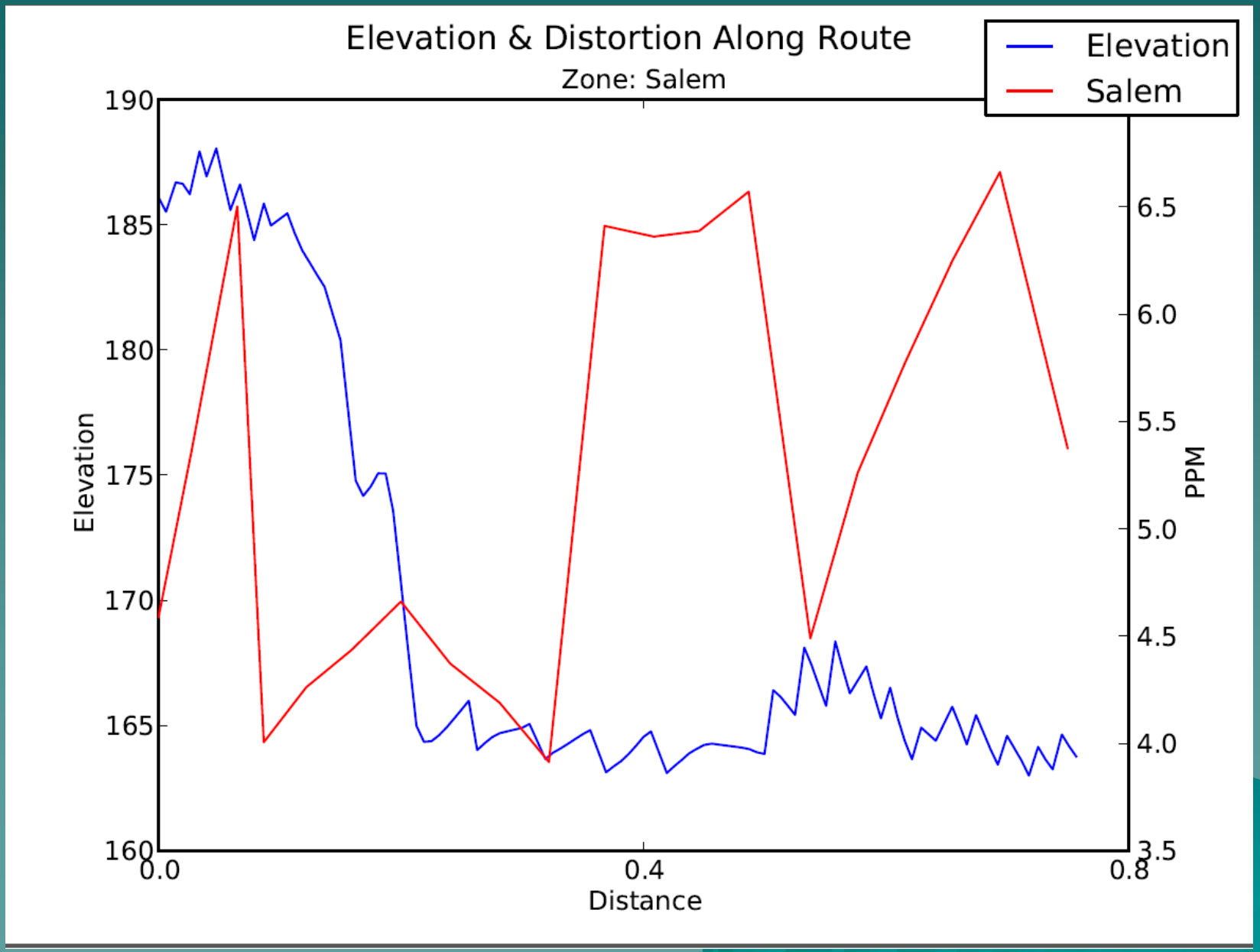


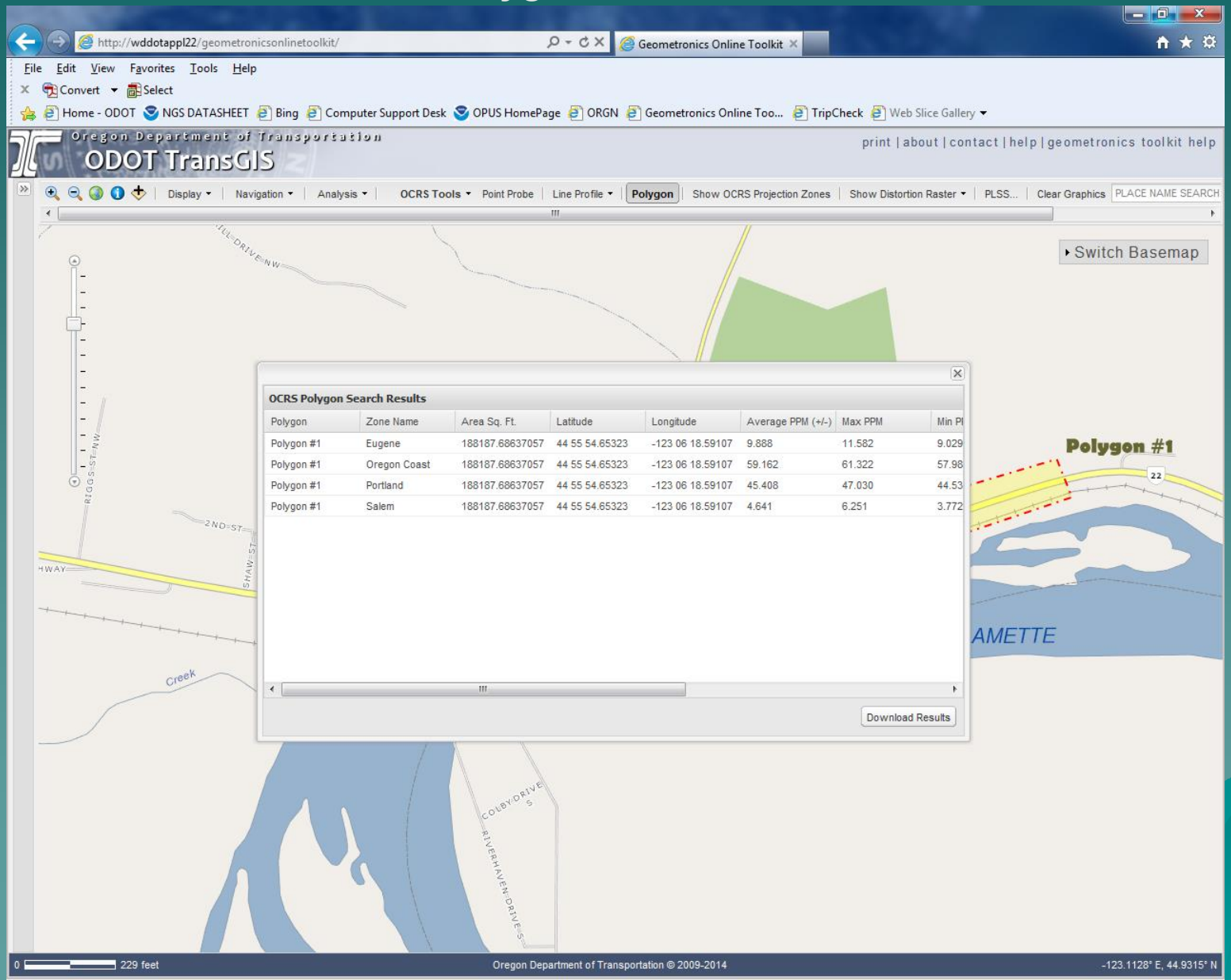
Eola Hwy 22


Elevation & Distortion Along Route
Zone: Salem
Elevation
Salem
190
185
180
175
170
165
160
Elevation
6.5
6.0
5.5
5.0
4.5
4.0
3.5
PPM
0.0
0.4
0.8
Distance

Eola Hwy22

0 0.075 0.15 0.3 Miles

Polygon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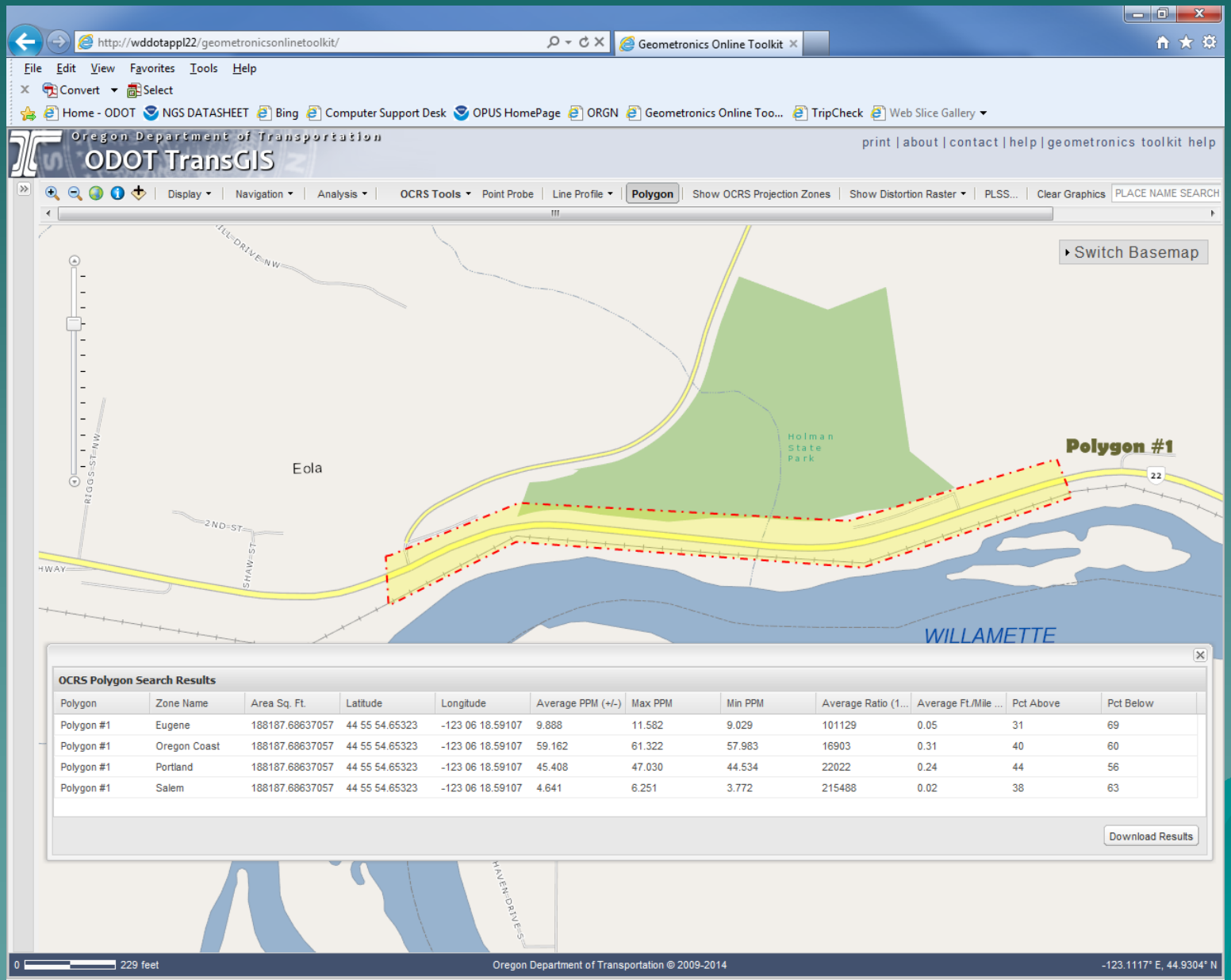
Display Navigation Analysis OCRS Tools Point Probe Line Profile Polygon Show OCRS Projection Zones Show Distortion Raster PLSS... Clear Graphics PLACE NAME SEARCH
Switch Basemap
OCRS Polygon Search Results
Polygon | Zone Name | Area Sq. Ft. | Latitude | Longitude | Average PPM (+/-) | Max PPM | Min Pl
Polygon #1 | Eugene | 188187.68637057 | 44 55 54.65323 | -123 06 18.59107 | 9.888 | 11.582 | 9.029
Polygon #1 | Oregon Coast | 188187.68637057 | 44 55 54.65323 | -123 06 18.59107 | 59.162 | 61.322 | 57.98
Polygon #1 | Portland | 188187.68637057 | 44 55 54.65323 | -123 06 18.59107 | 45.408 | 47.030 | 44.53
Polygon #1 | Salem | 188187.68637057 | 44 55 54.65323 | -123 06 18.59107 | 4.641 | 6.251 | 3.772
Download Results
Polygon #1
2ND ST
RIGGS ST NW
SHAW ST
COLBY DRIVE S
RIVERHAVEN DRIVE S
Creek
AMETTE
0 229 feet
Oregon Department of Transportation © 2009-2014
-123.1128° E, 44.9315° N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Switch Basemap
Eola
Holman State Park
Polygon #1
WILLAMETTE
OCRS Polygon Search Results
Polygon | Zone Name | Area Sq. Ft. | Latitude | Longitude | Average PPM (+/-) | Max PPM | Min PPM | Average Ratio (1... | Average Ft./Mile ... | Pct Above | Pct Below
Polygon #1 | Eugene | 188187.68637057 | 44 55 54.65323 | -123 06 18.59107 | 9.888 | 11.582 | 9.029 | 101129 | 0.05 | 31 | 69
Polygon #1 | Oregon Coast | 188187.68637057 | 44 55 54.65323 | -123 06 18.59107 | 59.162 | 61.322 | 57.983 | 16903 | 0.31 | 40 | 60
Polygon #1 | Portland | 188187.68637057 | 44 55 54.65323 | -123 06 18.59107 | 45.408 | 47.030 | 44.534 | 22022 | 0.24 | 44 | 56
Polygon #1 | Salem | 188187.68637057 | 44 55 54.65323 | -123 06 18.59107 | 4.641 | 6.251 | 3.772 | 215488 | 0.02 | 38 | 63
Download Results
0 229 feet
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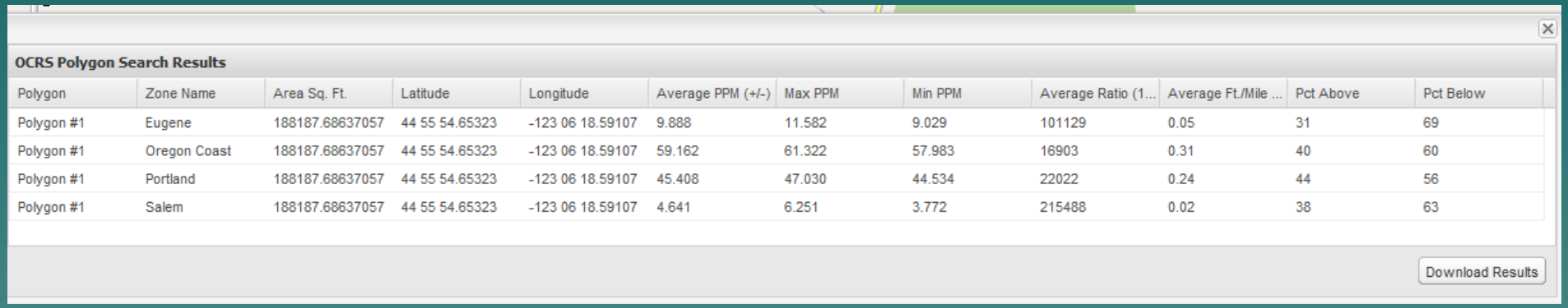
-123.1117° E, 44.9304° N



OCRS Polygon Search Results

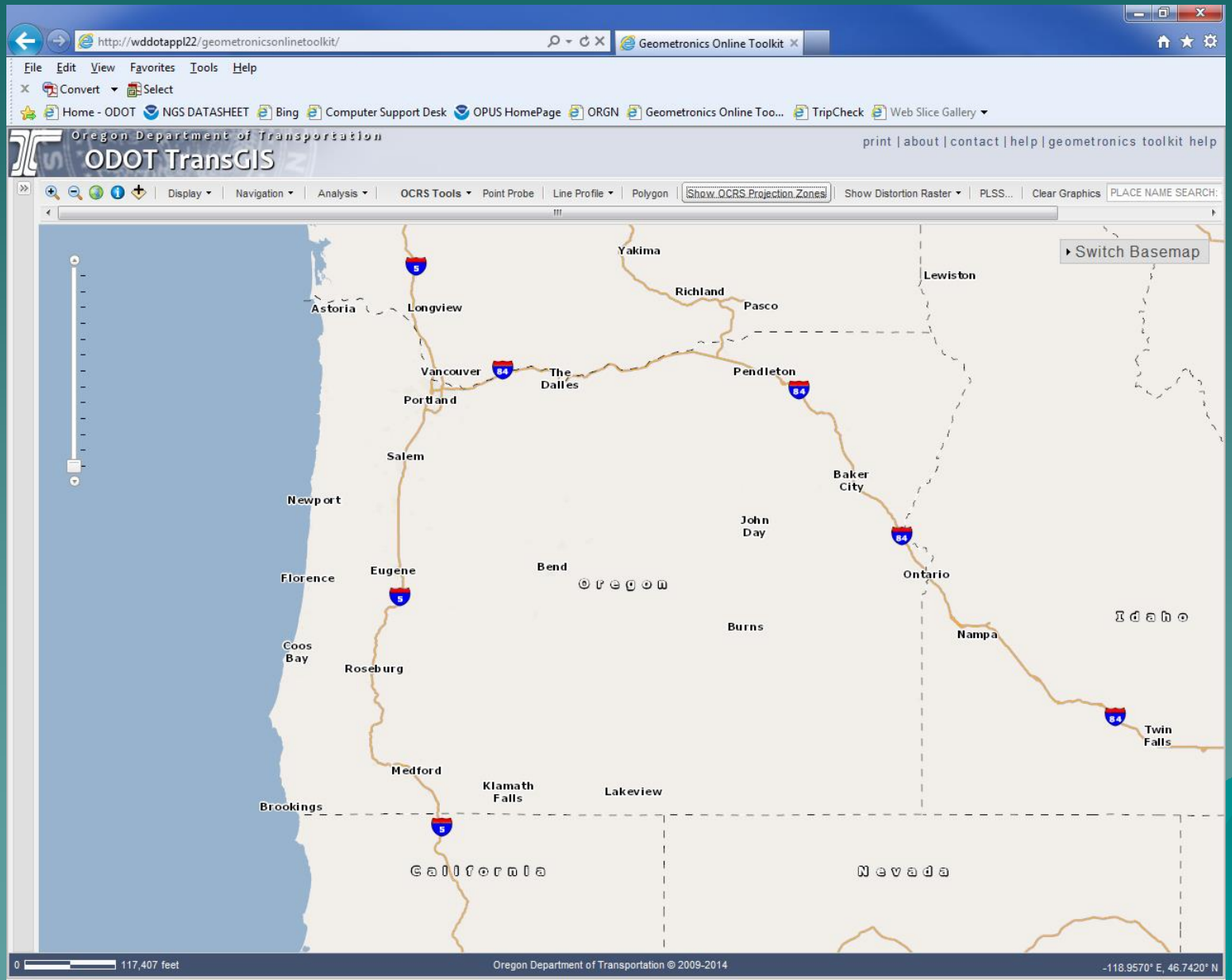
Polygon	Zone Name	Area Sq. Ft.	Latitude	Longitude	Average PPM (+/-)	Max PPM	Min PPM	Average Ratio (1...	Average Ft./Mile ...	Pct Above	Pct Below
Polygon #1	Eugene	188187.68637057	44 55 54.65323	-123 06 18.59107	9.888	11.582	9.029	101129	0.05	31	69
Polygon #1	Oregon Coast	188187.68637057	44 55 54.65323	-123 06 18.59107	59.162	61.322	57.983	16903	0.31	40	60
Polygon #1	Portland	188187.68637057	44 55 54.65323	-123 06 18.59107	45.408	47.030	44.534	22022	0.24	44	56
Polygon #1	Salem	188187.68637057	44 55 54.65323	-123 06 18.59107	4.641	6.251	3.772	215488	0.02	38	63

Download Results

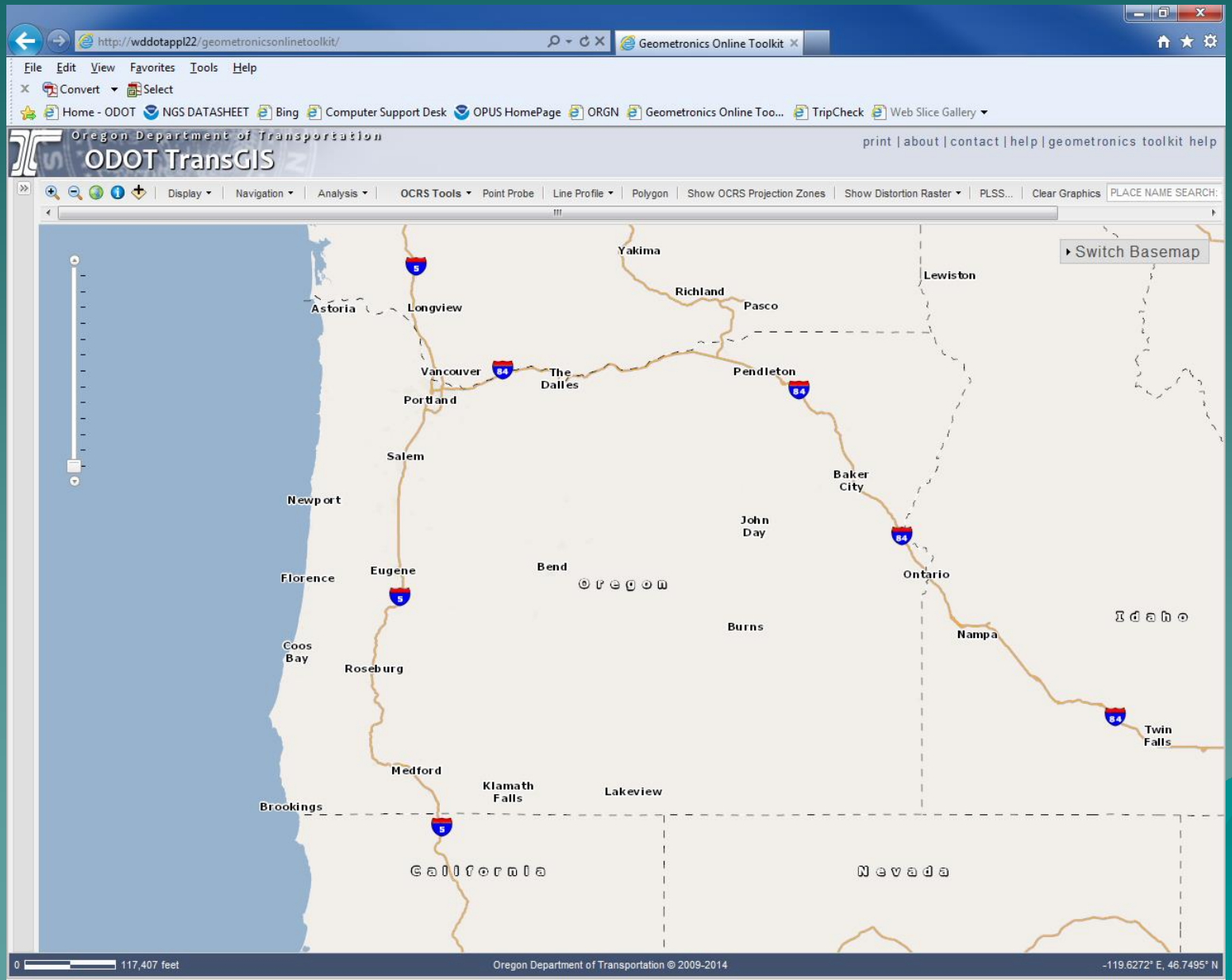
Downloaded Results

PolygonNum	layerName	Area	Latitude	Longitude	Average	Max	Min	ratio	ftPerMile	PctAbove	PctBelow	NumPoints
Polygon #1	Eugene	188187.6864	44.93184812	-123.1051642	9.888	11.582	9.029	101129	0.05	31	69	15173700
Polygon #1	Oregon Coast	188187.6864	44.93184812	-123.1051642	59.162	61.322	57.983	16903	0.31	40	60	17100000
Polygon #1	Portland	188187.6864	44.93184812	-123.1051642	45.408	47.03	44.534	22022	0.24	44	56	15173700
Polygon #1	Salem	188187.6864	44.93184812	-123.1051642	4.641	6.251	3.772	215488	0.02	38	63	15173700

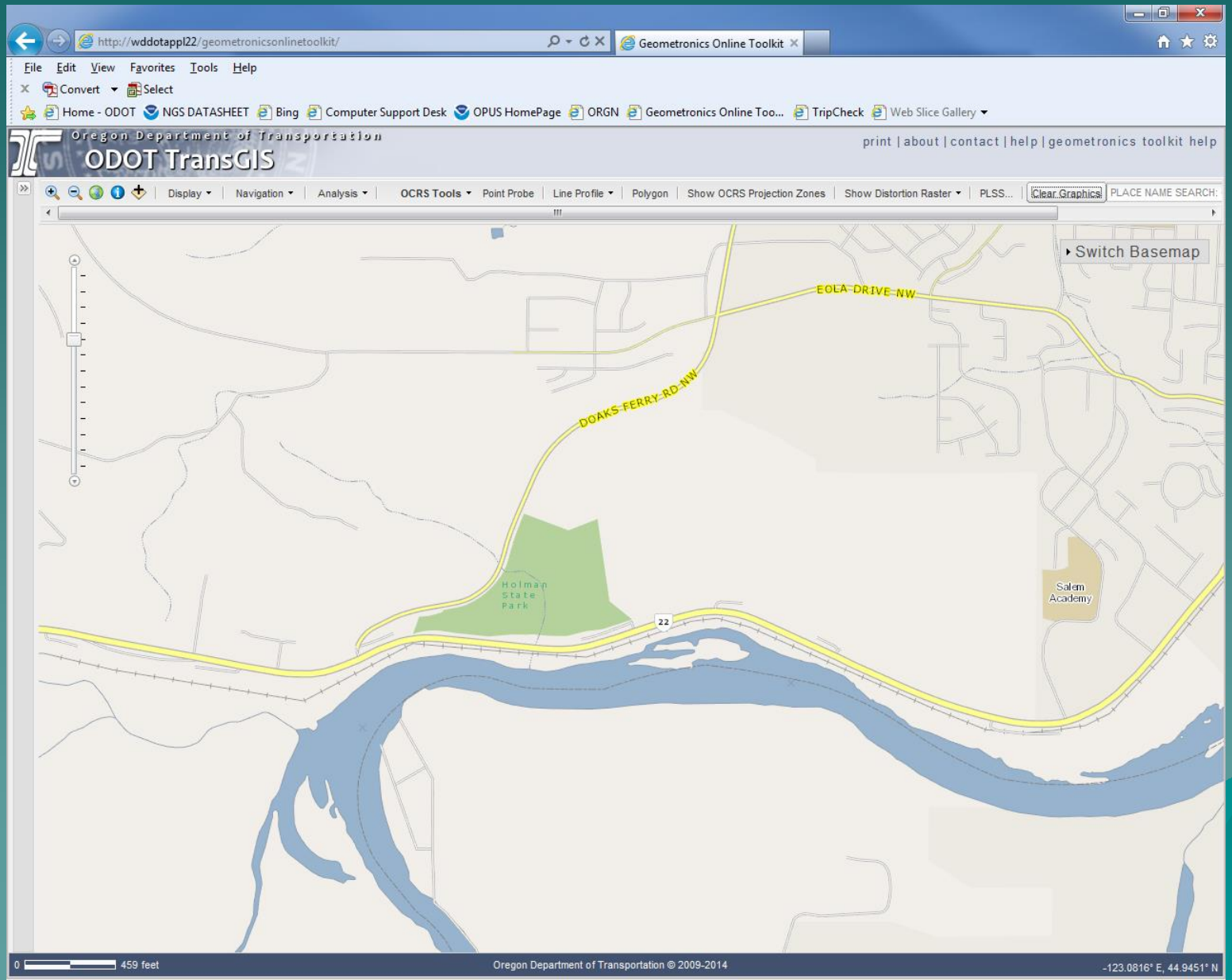
Show OCRS Projection Zones



Show Distortion Raster



PLSS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Display Navigation Analysis OCRS Tools Point Probe Line Profile Polygon Show OCRS Projection Zones Show Distortion Raster PLSS... Clear Graphics PLACE NAME SEARCH:
Switch Basemap
EOLA DRIVE NW
DOAKS FERRY RD NW
Holman State Park
Salem Academy
22
0 459 feet
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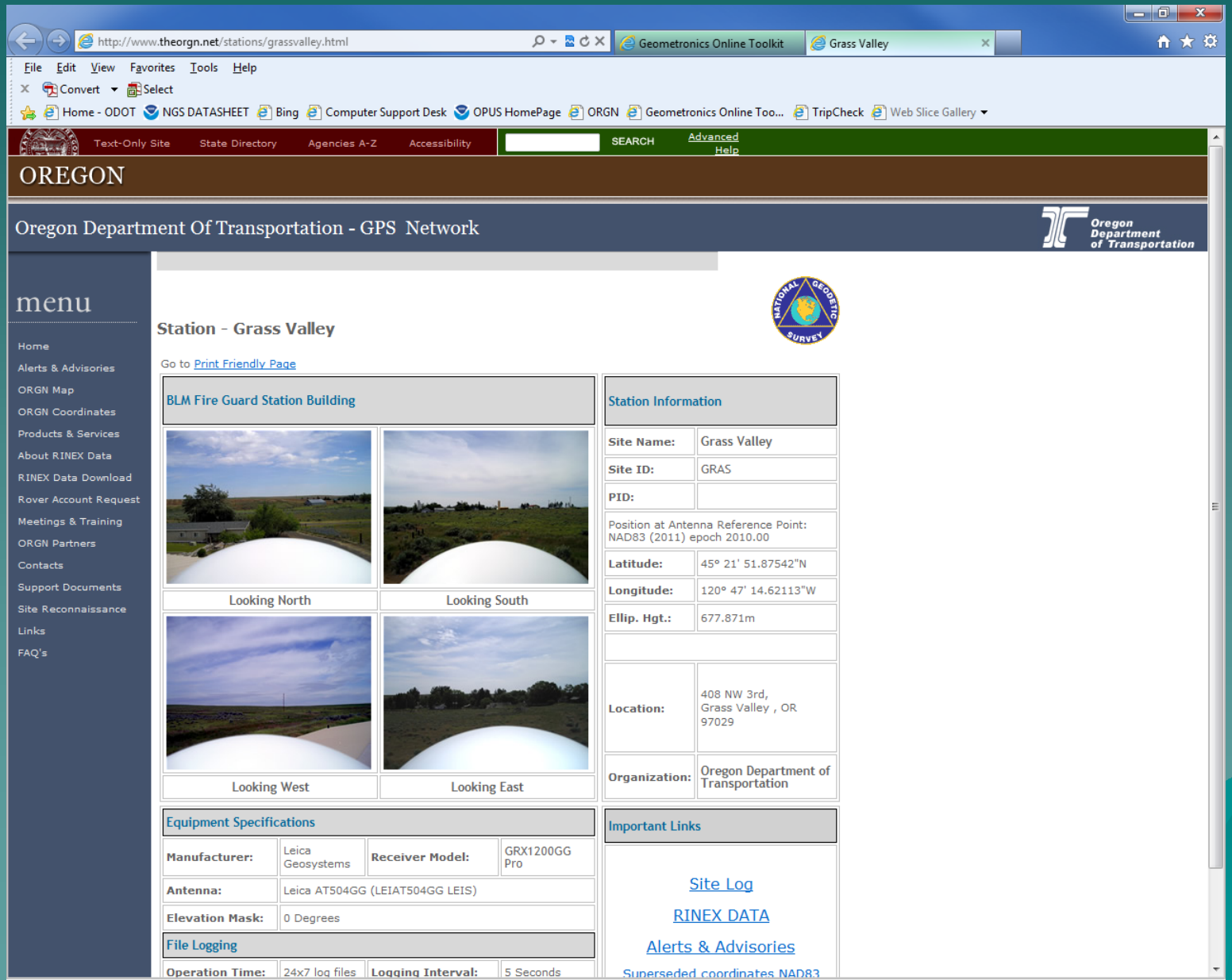
-123.0816° E, 44.9451° N

ORGN Tools


http://www.theorgn.net/stations/grassvalley.html
Geometronics Online Toolkit
Grass Valley
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Convert Select
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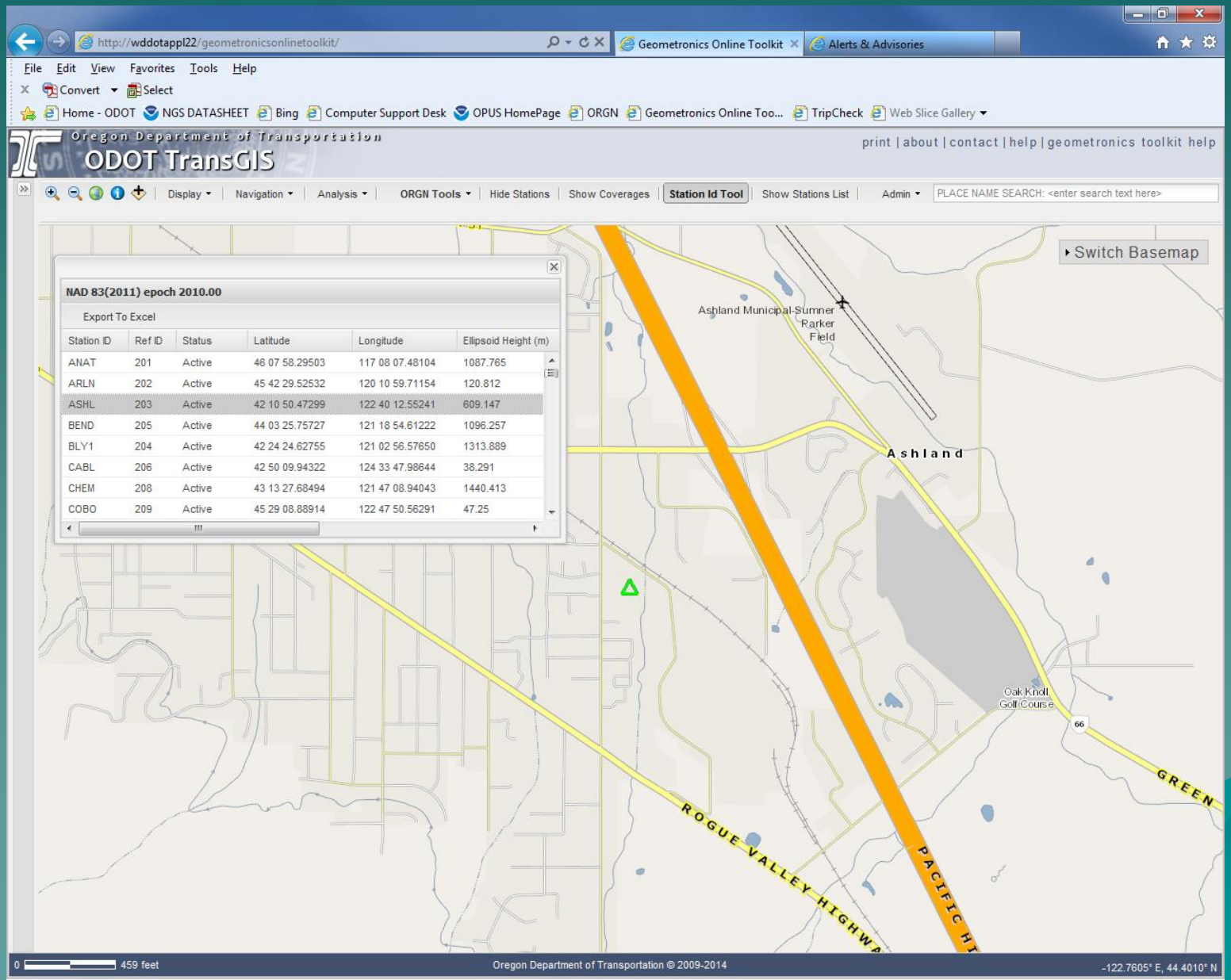
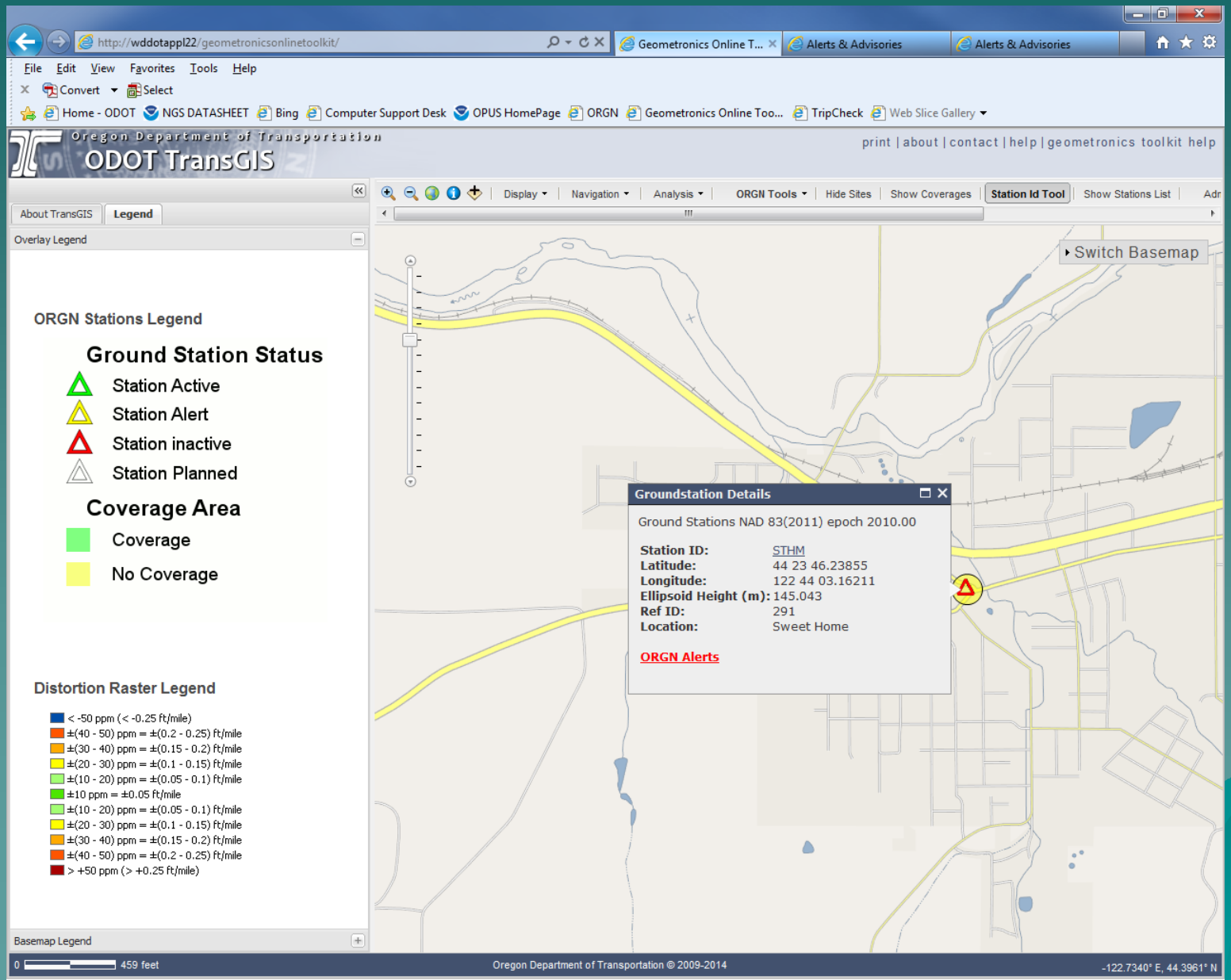
Links
FAQ's
Station - Grass Valley
Go to Print Friendly Page
BLM Fire Guard Station Building
Looking North
Looking South
Looking West
Looking East
Station Information
Site Name: Grass Valley
Site ID: GRAS
PID:
Position at Antenna Reference Point: NAD83 (2011) epoch 2010.00
Latitude: 45° 21' 51.87542"N
Longitude: 120° 47' 14.62113"W
Ellip. Hgt.: 677.871m
Location: 408 NW 3rd, Grass Valley , OR 97029
Organization: Oregon Department of Transportation
Equipment Specifications
Manufacturer: Leica Geosystems
Receiver Model: GRX1200GG Pro
Antenna: Leica AT504GG (LEIAT504GG LEIS)
Elevation Mask: 0 Degrees
File Logging
Operation Time: 24x7 log files
Logging Interval: 5 Seconds
Important Links
Site Log
RINEX DATA
Alerts & Advisories
Superseded coordinates NAD83

Oregon Department of Transportation

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ODOT TransGIS
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About TransGIS
Legend
Overlay Legend
ORGN Stations Legend
Ground Station Status
Station Active
Station Alert
Station inactive
Station Planned
Coverage Area
Coverage
No Coverage
Distortion Raster Legend
< -50 ppm (< -0.25 ft/mile)
±(40 - 50) ppm = ±(0.2 - 0.25) ft/mile
±(30 - 40) ppm = ±(0.15 - 0.2) ft/mile
±(20 - 30) ppm = ±(0.1 - 0.15) ft/mile
±(10 - 20) ppm = ±(0.05 - 0.1) ft/mile
±10 ppm = ±0.05 ft/mile
±(10 - 20) ppm = ±(0.05 - 0.1) ft/mile
±(20 - 30) ppm = ±(0.1 - 0.15) ft/mile
±(30 - 40) ppm = ±(0.15 - 0.2) ft/mile
±(40 - 50) ppm = ±(0.2 - 0.25) ft/mile
> +50 ppm (> +0.25 ft/mile)
Basemap Legend
Display Navigation Analysis ORGN Tools Hide Sites Show Coverages Station Id Tool Show Stations List
Switch Basemap
Groundstation Details
Ground Stations NAD 83(2011) epoch 2010.00
Station ID: STHM
Latitude: 44 23 46.23855
Longitude: 122 44 03.16211
Ellipsoid Height (m): 145.043
Ref ID: 291
Location: Sweet Home
ORGN Alerts
0 459 feet
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-122.7340° E, 44.3961° N