

Proposal to NGS of Oregon's Version of SPCS 2022

Endorsement Request

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Proposal Status

- November 2019 – GPL review at OGIC request
- January 2020 (Today) – OGIC endorsement request, letter signed by chair
- February 2020 – Submission to NGS



Background

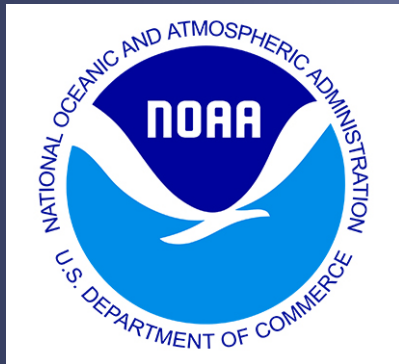
Stateplane Coordinate System 2022

New Datums: Replacing NAVD 88 and NAD 83

To improve the National Spatial Reference System (NSRS), NGS will replace the North American Datum of 1983 (NAD 83) and the North American Vertical Datum of 1988 (NAVD 88) with a new geometric reference frame and geopotential datum in 2022.

New Datums = New Stateplane

Stateplane is tied to a specific datum (e.g. NAD 83 and NAD 27) so the NGS is creating a new modernized version for 2022.



National Geodetic Survey

SPCS 2022 Change

SPCS NAD83
Single Tier

North & South Zones



SPCS 2022
Multiple Tiers

Default

New Statewide



Default

North & South
Zone Update



Optional

New local low
distortion zones





OGIC Oregon Lambert

1. Our existing statewide coordinate system, Oregon Lambert, must be updated to the 2022 datum in order to stay relevant and useful
2. Oregon Lambert is not included in ORS & OAR
3. The NGS will be creating a new statewide coordinate system as part of SPCS 2022
4. SPCS 2022 for Oregon will be adopted into ORS & OAR

Proposal for Endorsement: Oregon's Version of SPCS 2022



Tier 1: A single statewide zone that will **replace** the existing OGIC endorsed coordinate system with equal or better performance



Tier 2: North and South zones that are equivalent to the existing standard zones in OAR.



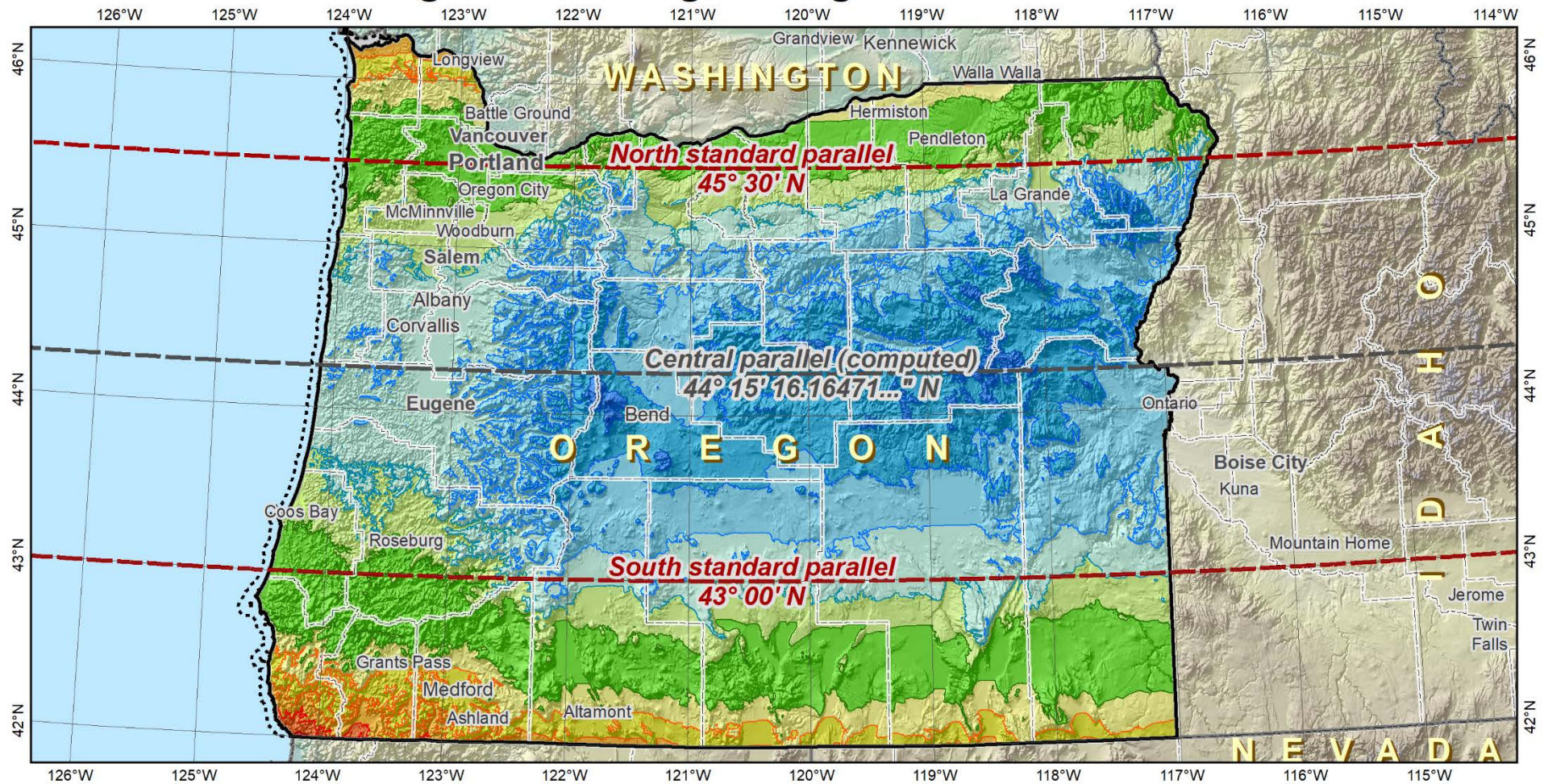
Tier 3: Approximately 39 zones representing regional low distortion coordinate systems which are the current core of the OCRS administered by ODOT and in OAR



What's Next

- State proposals and intent submitted to NGS by March 2020
- NGS and State collaboration on any design changes by March 2021
- Implementation and adoption by NGS before 2022
- OGIC endorsement of SPCS tiers around 2022
- OAR adoption through ODOT/OCRS Committee around 2022

Existing NAD 83 design: Oregon Statewide Lambert



Lambert Conformal Conic projection
North American Datum of 1983

Central parallel: 44° 15' 16.2...\" N
Central parallel scale: 0.999 762 835...

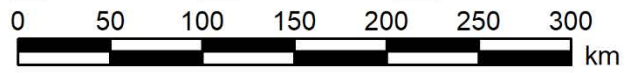
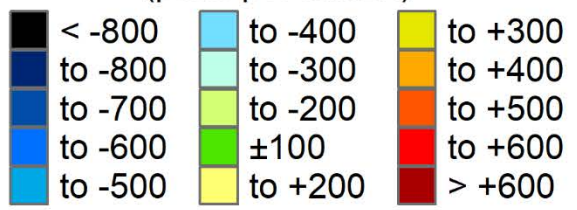


NOAA's
National
Geodetic
Survey

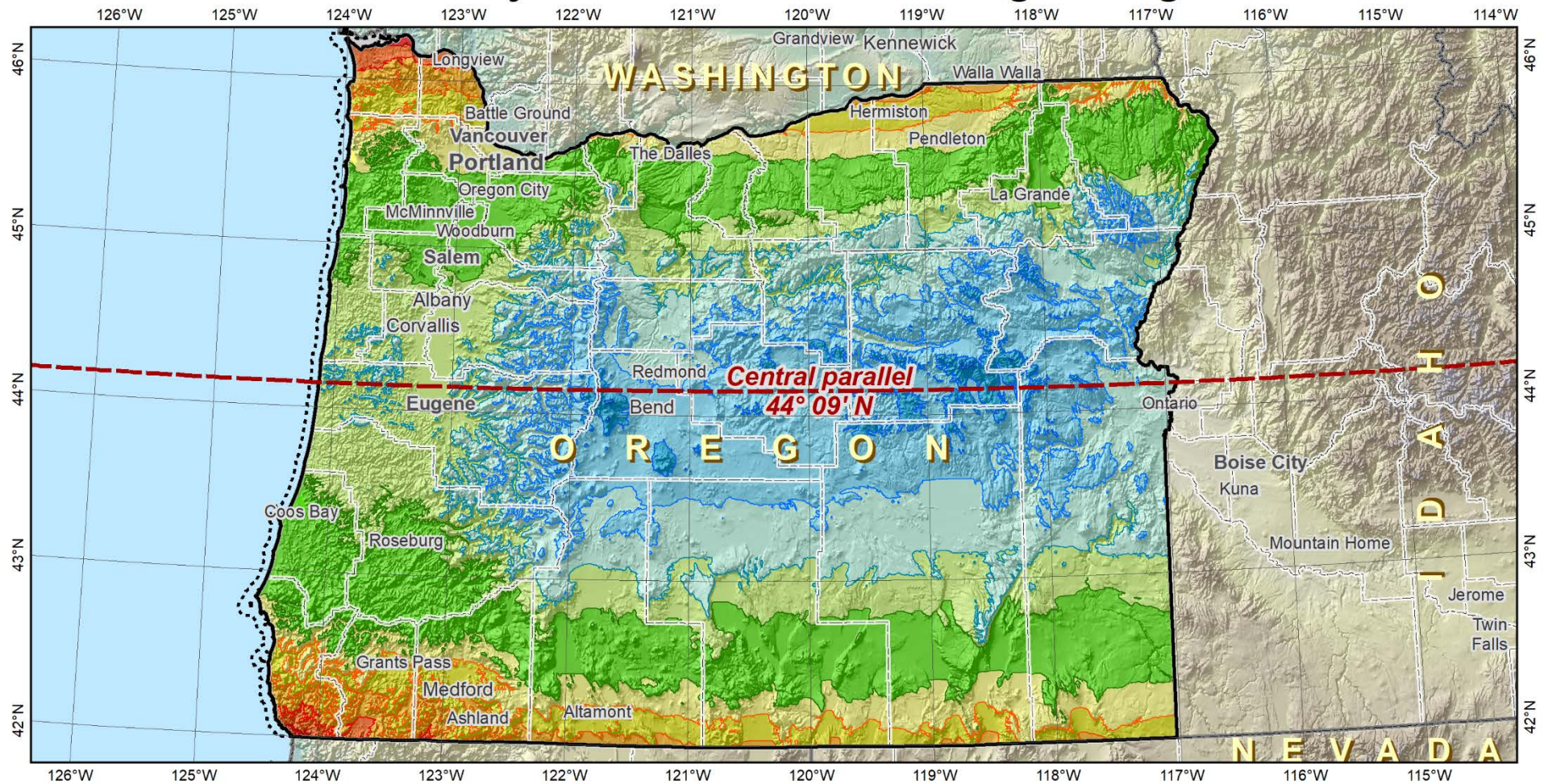
Areas within ±300 ppm distortion
(1:3,333 = ±1.58 ft per mile):
91% of population
81% of all cities and towns
62% of entire zone area

Distortion values (ppm)
Entire zone:
Min = -711 Range = 1239
Max = +527 Mean = -191
Weighted mean = -69
(weighted by population)
Cities and towns:
Min = -504 Range = 997
Max = +492 Mean = -102

Linear distortion at topographic surface (parts per million)



Preliminary SPCS2022 statewide design: Oregon



Lambert Conformal Conic projection
 North American Terrestrial Reference Frame of 2022
Central parallel: 44° 09' N
Central parallel scale: 0.999 85 (exact)



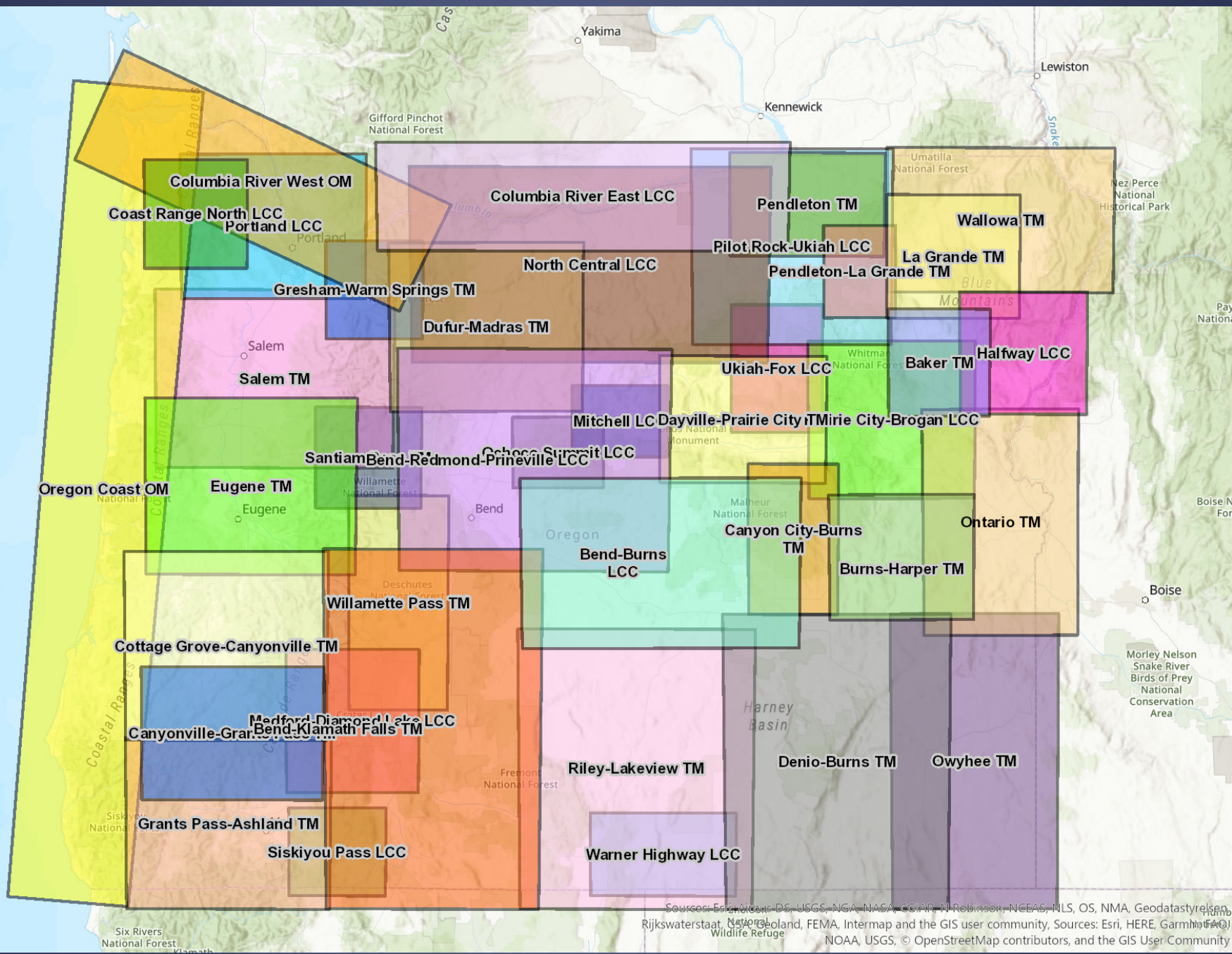
Areas within ±300 ppm distortion
(1:3,333 = ±1.58 ft per mile):
 93% of population
 88% of all cities and towns
 77% of entire zone area

Distortion values (ppm)
Entire zone:
 Min = -628 Range = 1191
 Max = +563 Mean = -112
 Weighted mean = +36
 (weighted by population)
Cities and towns:
 Min = -401 Range = 914
 Max = +513 Mean = -9

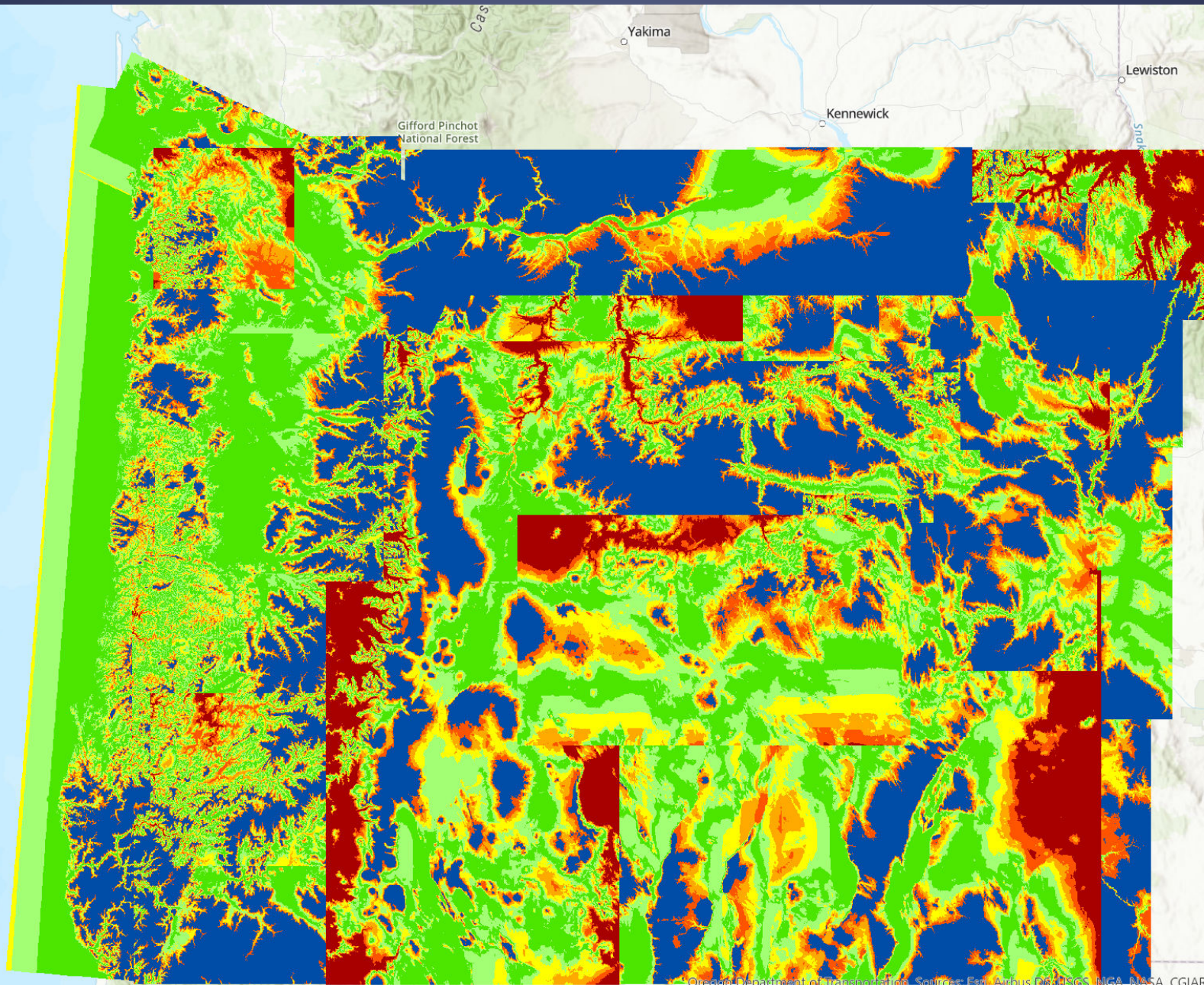
Linear distortion at topographic surface (parts per million)

< -800	to -400	to +300
to -800	to -300	to +400
to -700	to -200	to +500
to -600	±100	to +600
to -500	to +200	> +600

0 50 100 150 200 250 300 km



Sources: Esri, DeLorme, DS, USGS, NGA, NASA, CCAR, N Robinson, NCEAS, NLS, OS, NMA, Geodastatys, Rijkswaterstaat, NOAA, NOAA, FEMA, Intermap and the GIS user community, Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community



Gifford Pinchot National Forest

Yakima

Kennewick

Lewiston

Lez Perce National Historical Park

Payson National

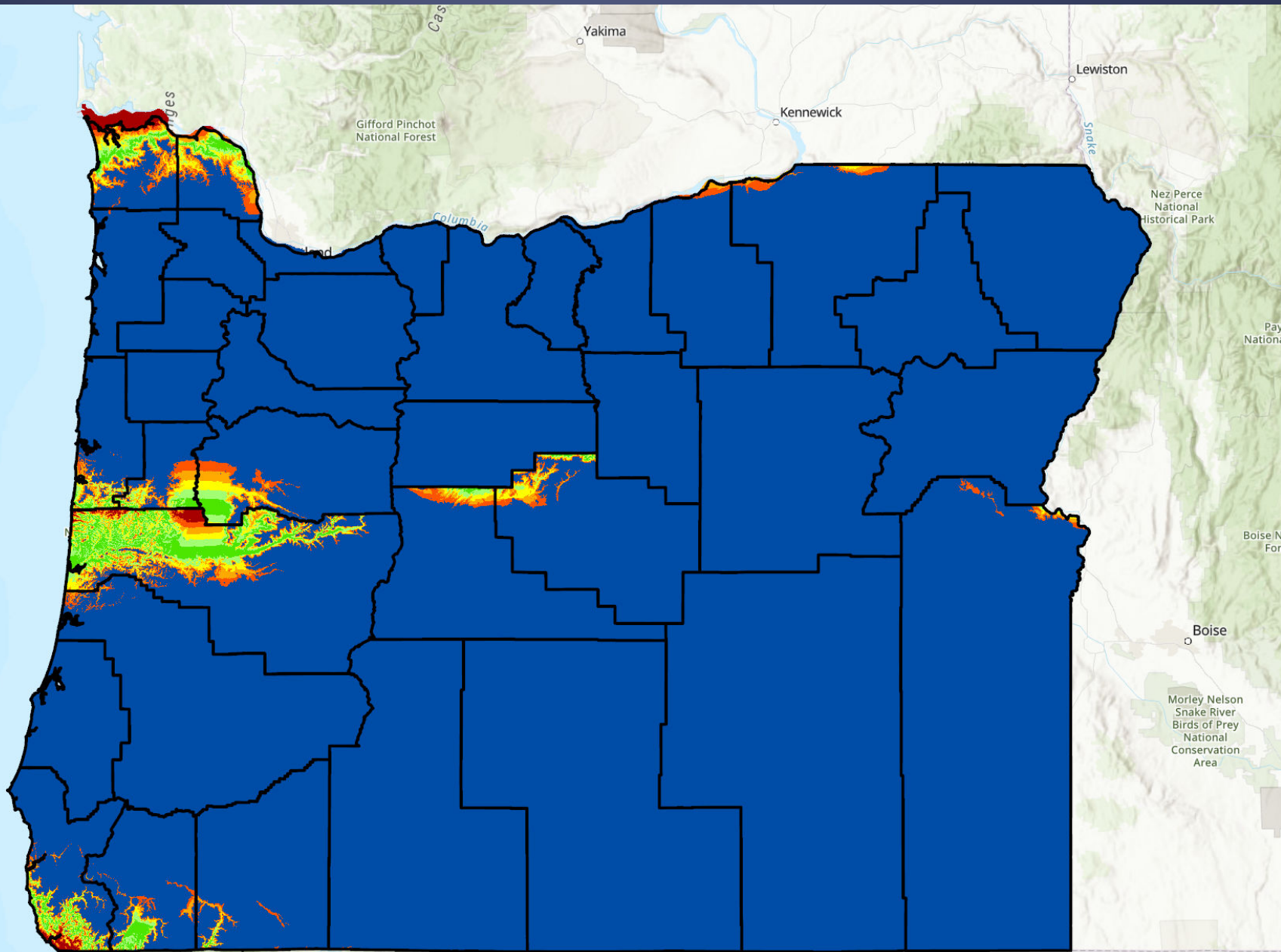
Boise National Forest

Boise

Morley Nelson Snake River Birds of Prey National Conservation Area

Six Rivers National Forest

Oregon Department of Transportation, Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Gebruiksstyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community
Wildlife Refuge
Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community



Six Rivers National Forest

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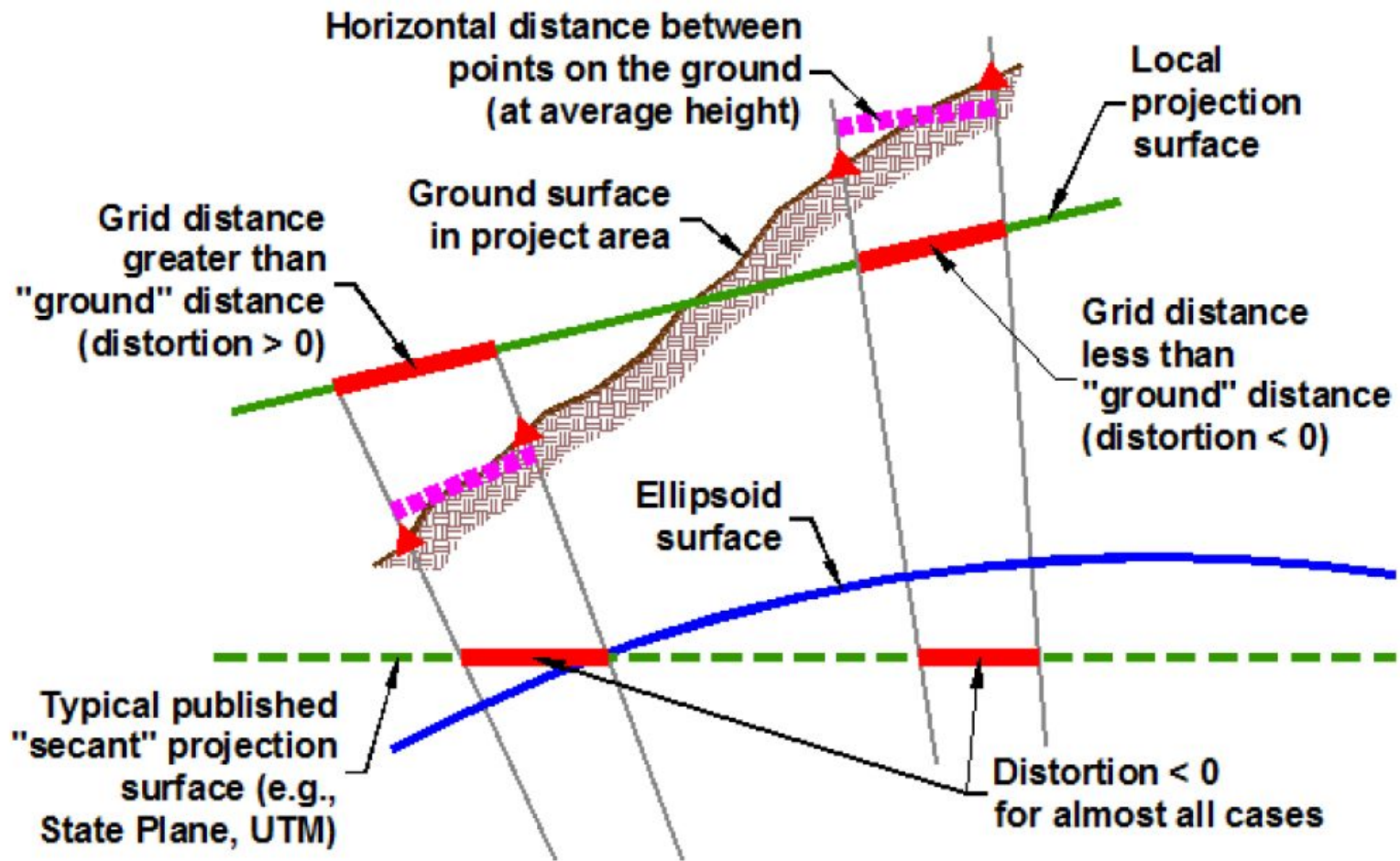


Figure 2. Sketch of linear distortion due to ground height above the reference ellipsoid.