

Integrating Climate Change Resilience at ODOT: A Data-Driven GIS Approach

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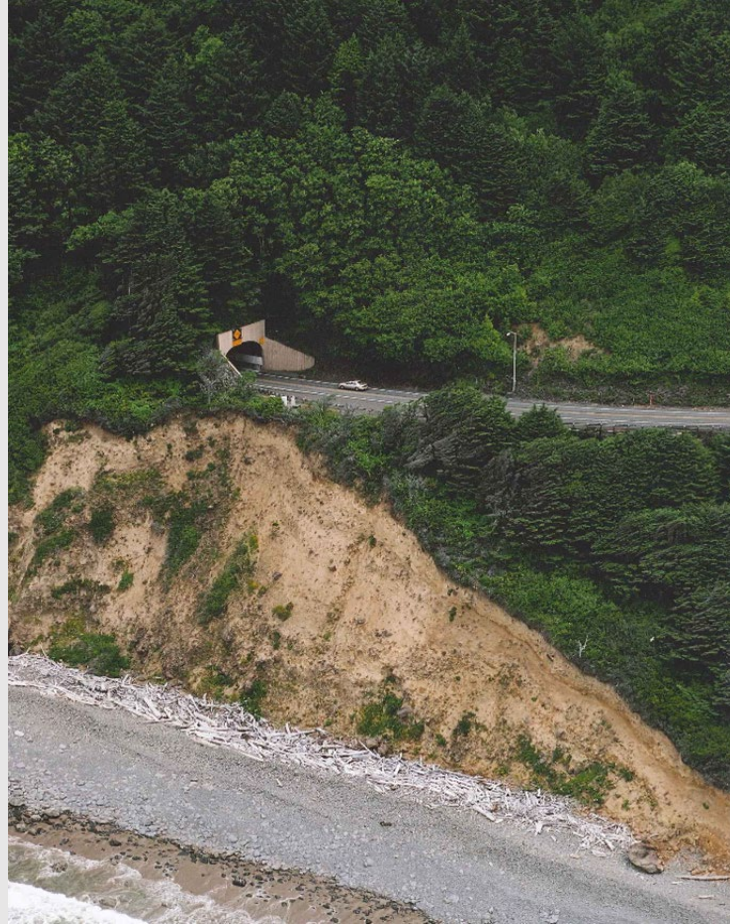
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Extreme Rain, Snow and Flooding



Erosion & Landslides

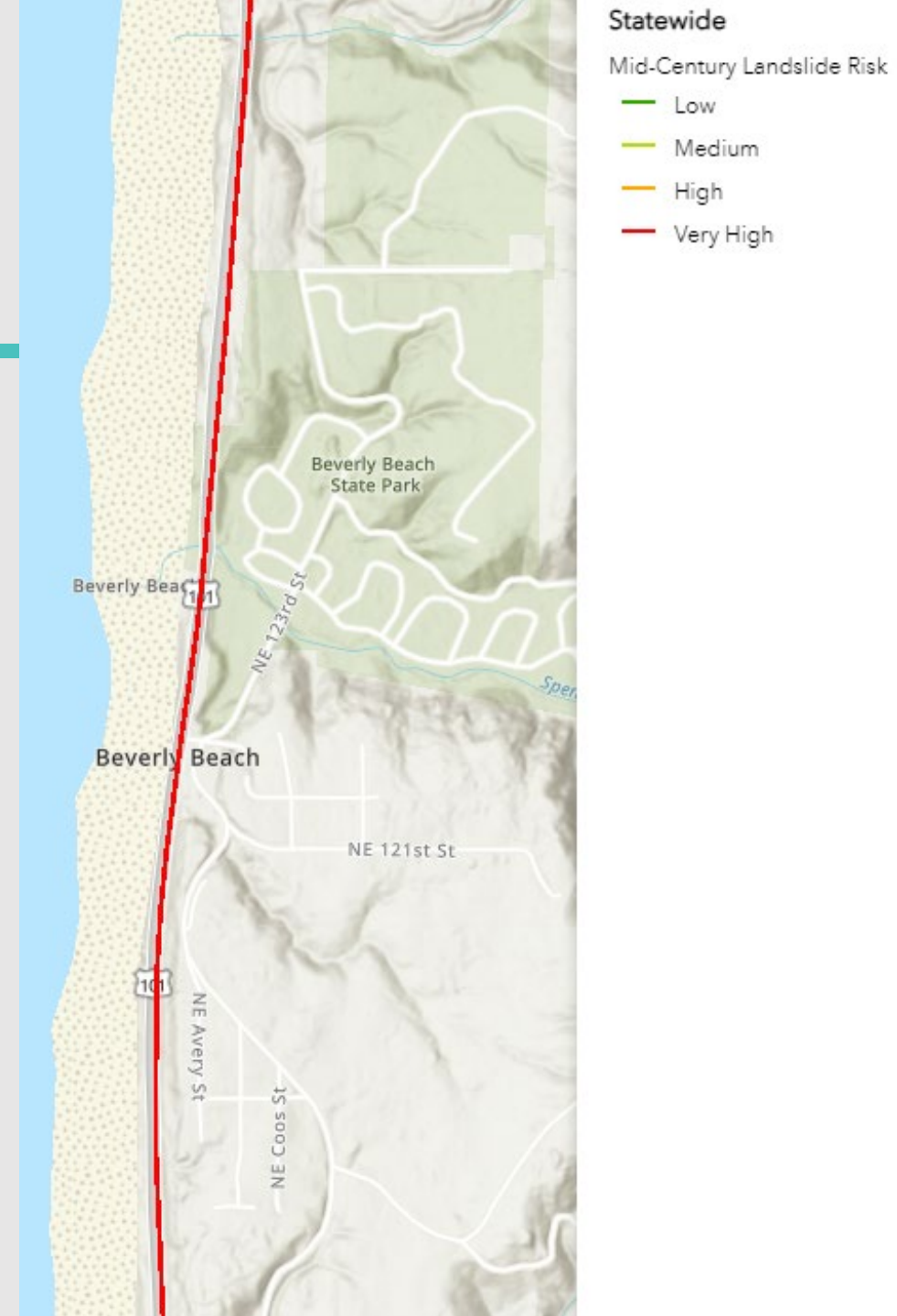


Wildfires

Understanding Risks

What are the risks and where are they located?

ODOT wanted to understand risks to the system into the future, leading to a climate hazard risk assessment of 9 climate hazards relevant to Oregon.





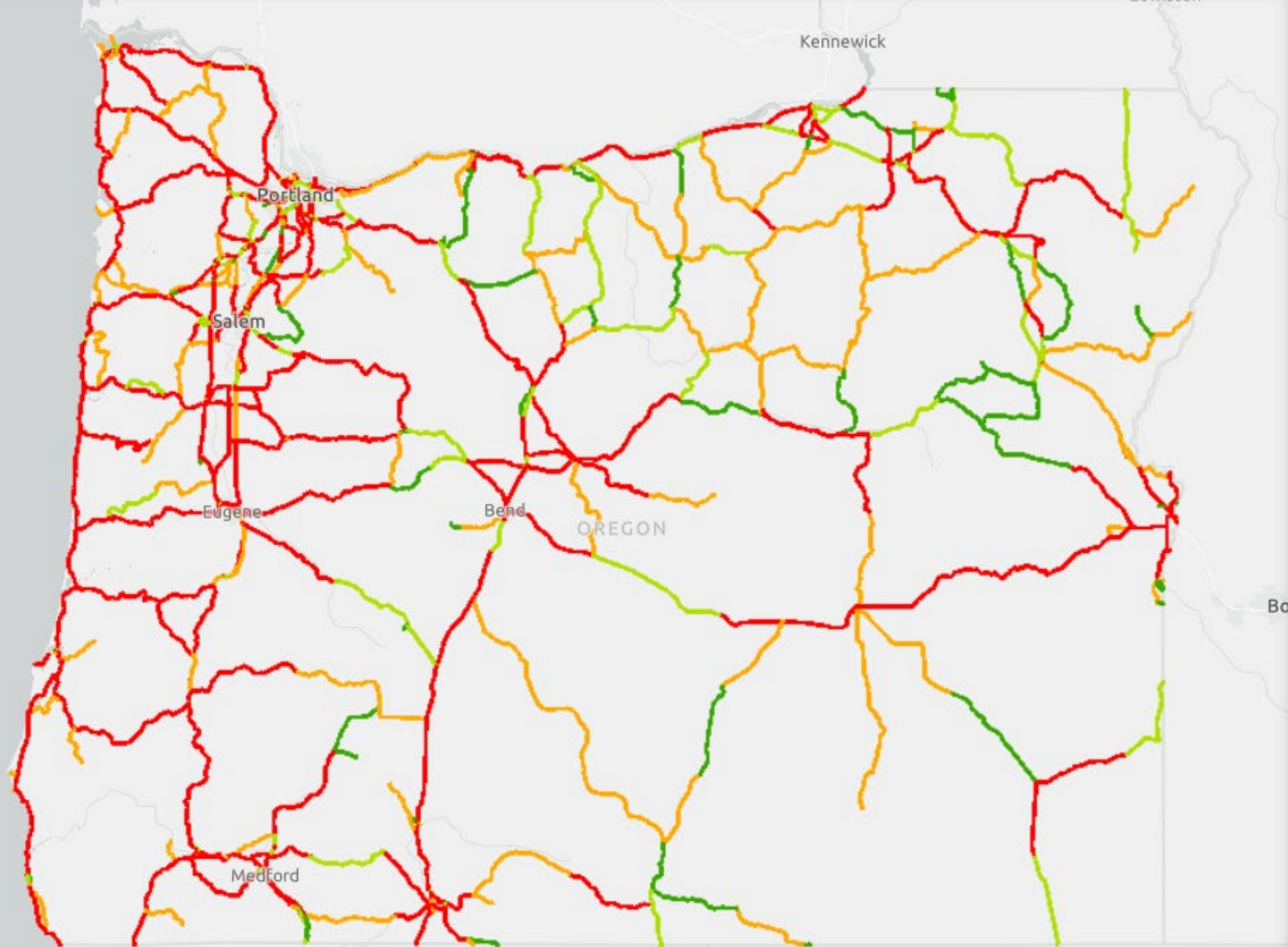
- ✓ Very heavy precipitation
- ✓ Very heavy snowfall
- ✓ Inland flooding
- ✓ Coastal flooding



- ✓ Landslides
- ✓ Coastal erosion
- ✓ Freeze/thaw



- ✓ Wildfires
- ✓ Very hot days

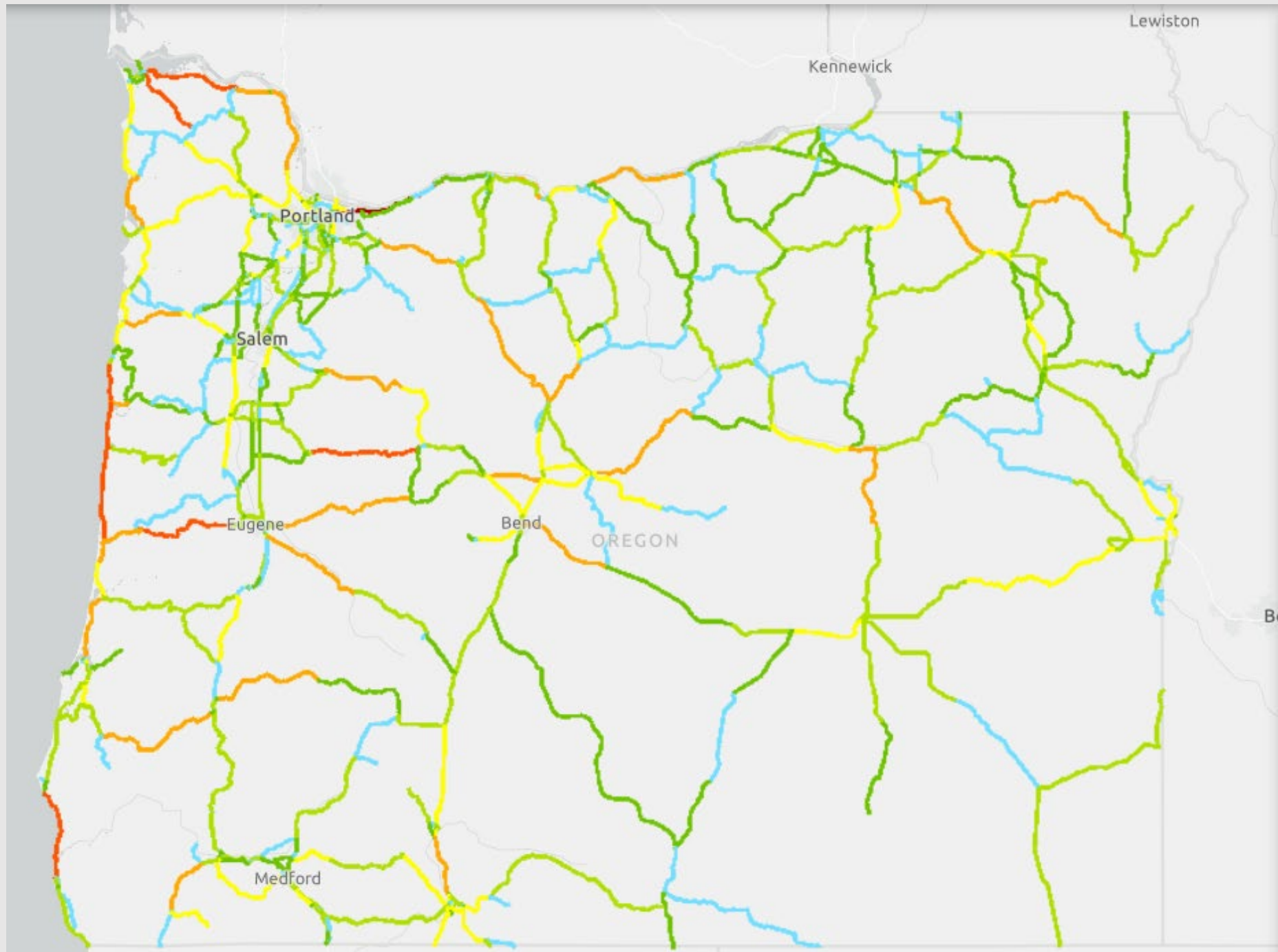


Legend

Statewide

Inland Flooding Risk

- Low
- Medium
- High
- Very High

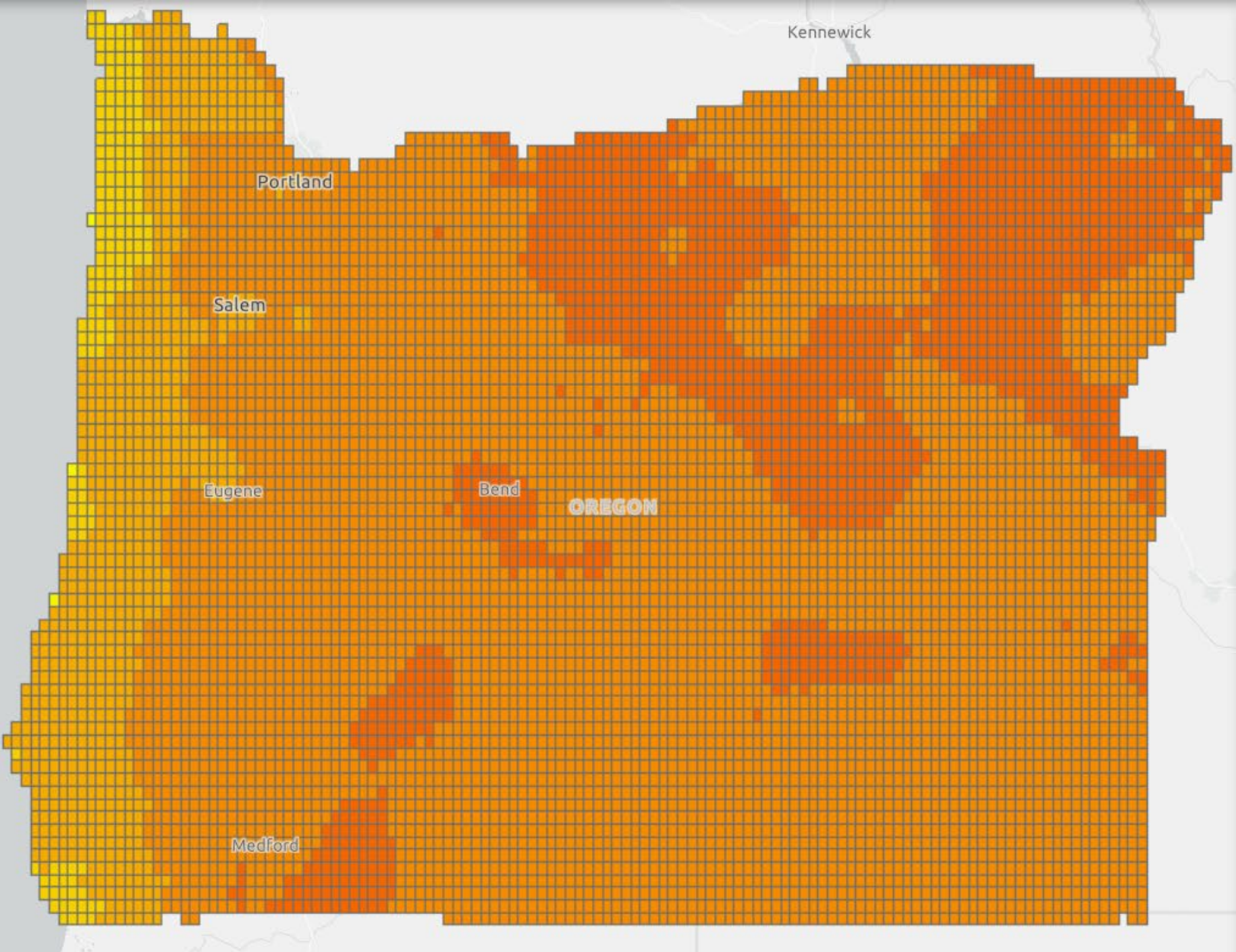


Legend

Statewide

Multi-Hazard Risk (Mid-Century)

- 0 - 1 hazards
- 2 hazards
- 3 hazards
- 4 hazards
- 5 hazards
- 6 hazards
- 7 hazards



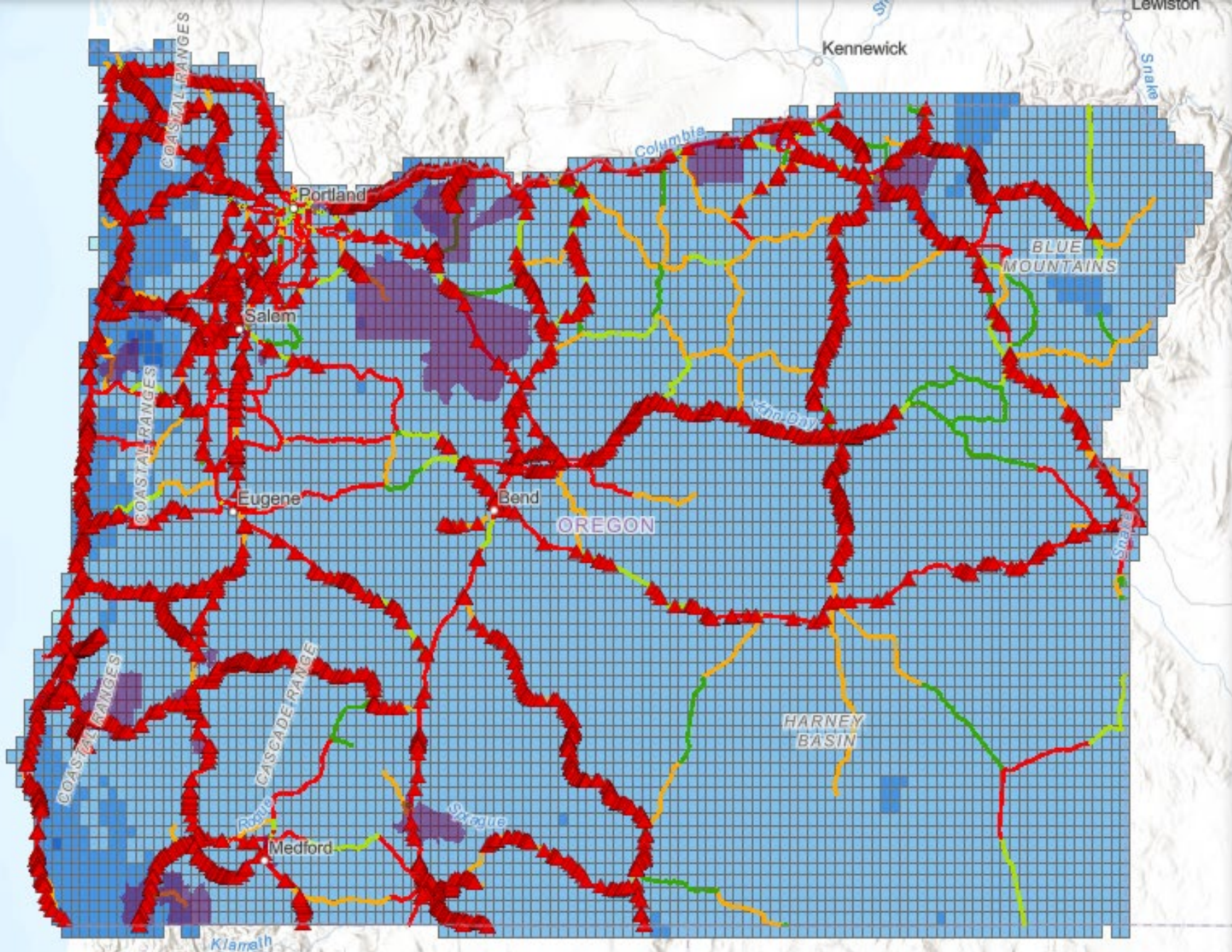
Legend

Future Climate Hazards

Very Hot Days

Mid-Century Very Hot Days (change in °F)

- 14.1 - 16.0
- 12.1 - 14.0
- 10.1 - 12.0
- 8.1 - 10.0
- 6.1 - 8.0
- 4.1 - 6.0
- 2.1 - 4.0
- ≤2



Legend

Structures

Culvert Ratings (2021)

- Critical
 - ▲ Critical

Statewide Equity Layer

- High Disparity
 -

Statewide

Inland Flooding Risk

- Low
- Medium
- High
- Very High

Future Climate Hazards

Very Heavy Precip

Mid-Century Very Heavy Precip (change in inches)

- 0.41 - 0.50
- 0.31 - 0.40
- 0.21 - 0.30
- 0.11 - 0.20
- 0.010 - 0.10
- <=0.0

Plentiful Storytelling Options

- Asset condition ratings, traffic flow data, regional boundaries, ODOT statewide social equity data, and more...
- Historical climate data
- Future climate data
- Social equity data
- Curated risk and resilience layers

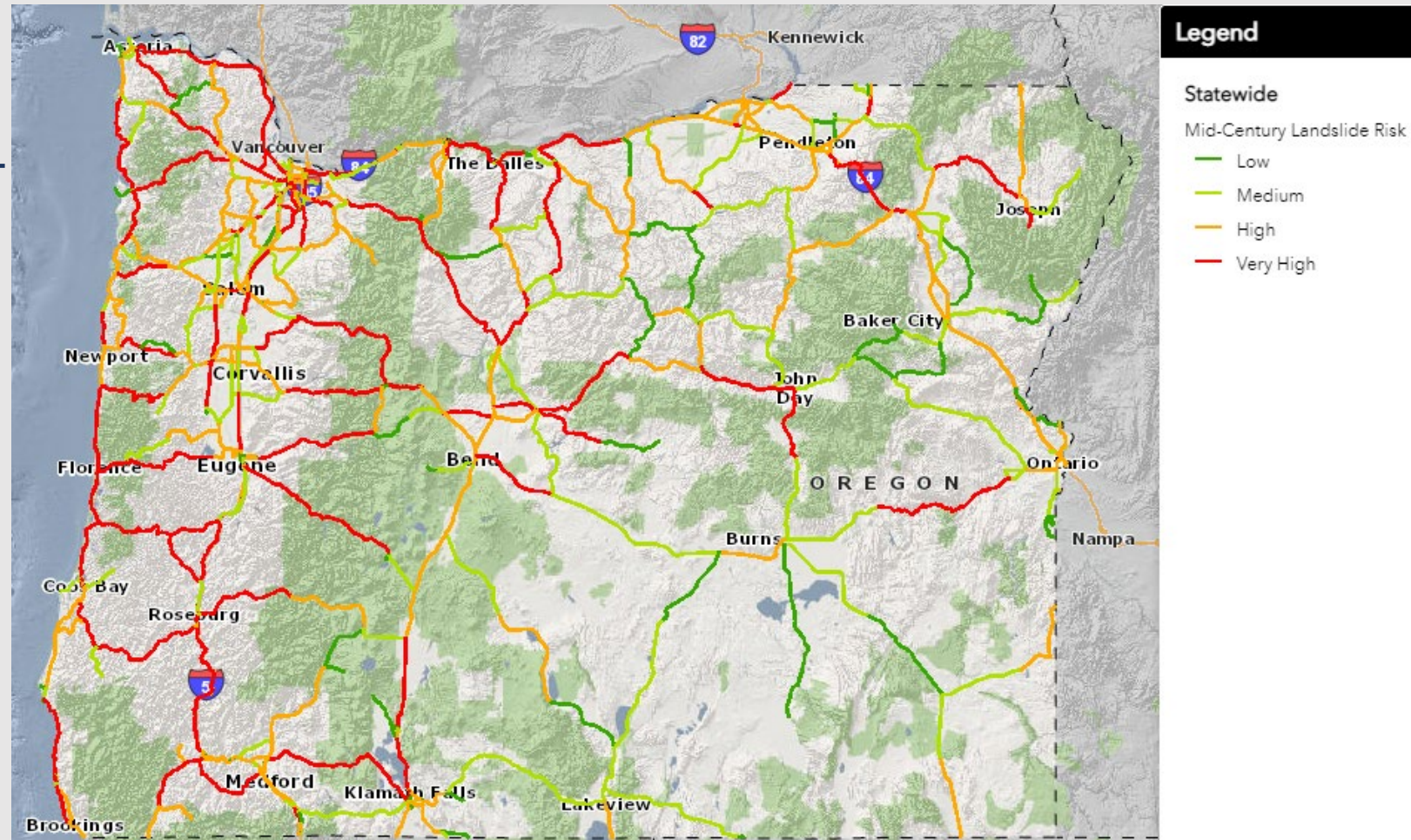
The screenshot shows the 'ODOT Data' interface with a list of layers. The layers are organized into a tree structure with expand/collapse icons (right-pointing chevrons) and checkboxes. The 'Incident Response Data (TOCs, 2013-2020*)' layer is expanded, showing its sub-layers. The 'Highway Network' layer is also expanded, showing its sub-layers. The 'Landslides' layer is expanded, showing its sub-layers. The 'ODOT Unstable Slopes Status' layer is checked.

Layer	Checked	Expanded
ODOT Maintenance Stations	<input type="checkbox"/>	▶
Non-State Public Roads	<input type="checkbox"/>	▶
ODOT Regions	<input type="checkbox"/>	▶
Structures	<input checked="" type="checkbox"/>	▼
Bridge Conditions (2021)	<input checked="" type="checkbox"/>	▶
Seismic Program Bridges	<input type="checkbox"/>	▶
Culvert Ratings (2021)	<input checked="" type="checkbox"/>	▶
Incident Response Data (TOCs, 2013-2020*)	<input checked="" type="checkbox"/>	▼
Flood/High Water Events	<input type="checkbox"/>	▶
Wildfire	<input type="checkbox"/>	▶
Winter Events	<input type="checkbox"/>	▶
Highway Network	<input checked="" type="checkbox"/>	▼
State Highways	<input type="checkbox"/>	▶
Seismic Program Highways	<input type="checkbox"/>	▶
Pavement Conditions	<input checked="" type="checkbox"/>	▶
Fix It Priority Corridors STIP 2024-2027	<input type="checkbox"/>	▶
Functional Classification	<input type="checkbox"/>	▶
Traffic Flow	<input type="checkbox"/>	▶
Truck Flow	<input type="checkbox"/>	▶
Landslides	<input checked="" type="checkbox"/>	▼
Unstable Slopes Fail Hazard	<input checked="" type="checkbox"/>	▶
SLIDO Historic Landslides	<input type="checkbox"/>	▶
ODOT Unstable Slopes Status	<input checked="" type="checkbox"/>	▶

Map Applications

Locate low resilience to:

- Inform policy & practice at ODOT
- Target or prioritize projects
- Communicate challenges
- Collaborate with partners
- Communicate eligibility for resilience-focused funding opportunities





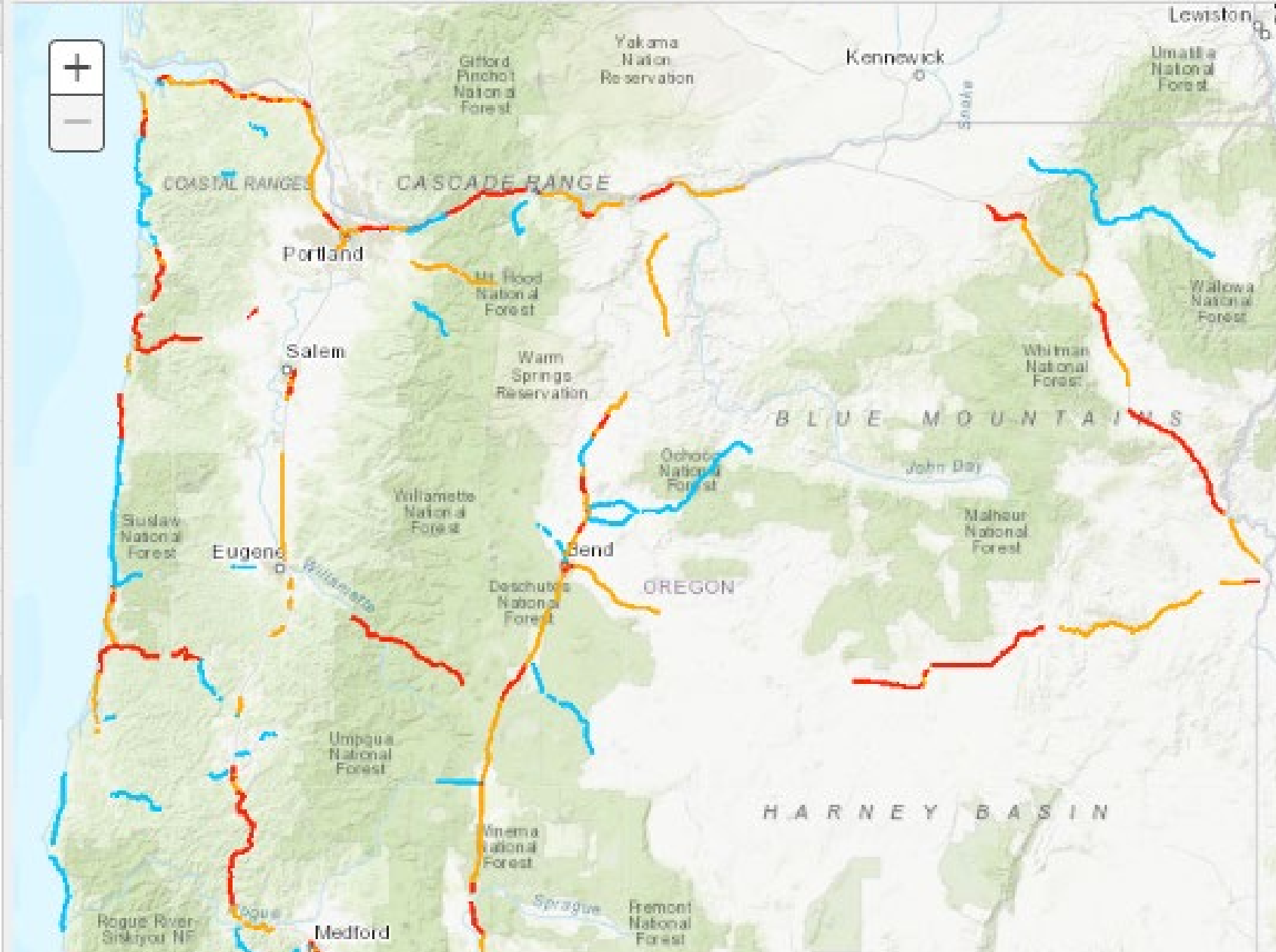
ODOT Climate Hazard Map Demonstration



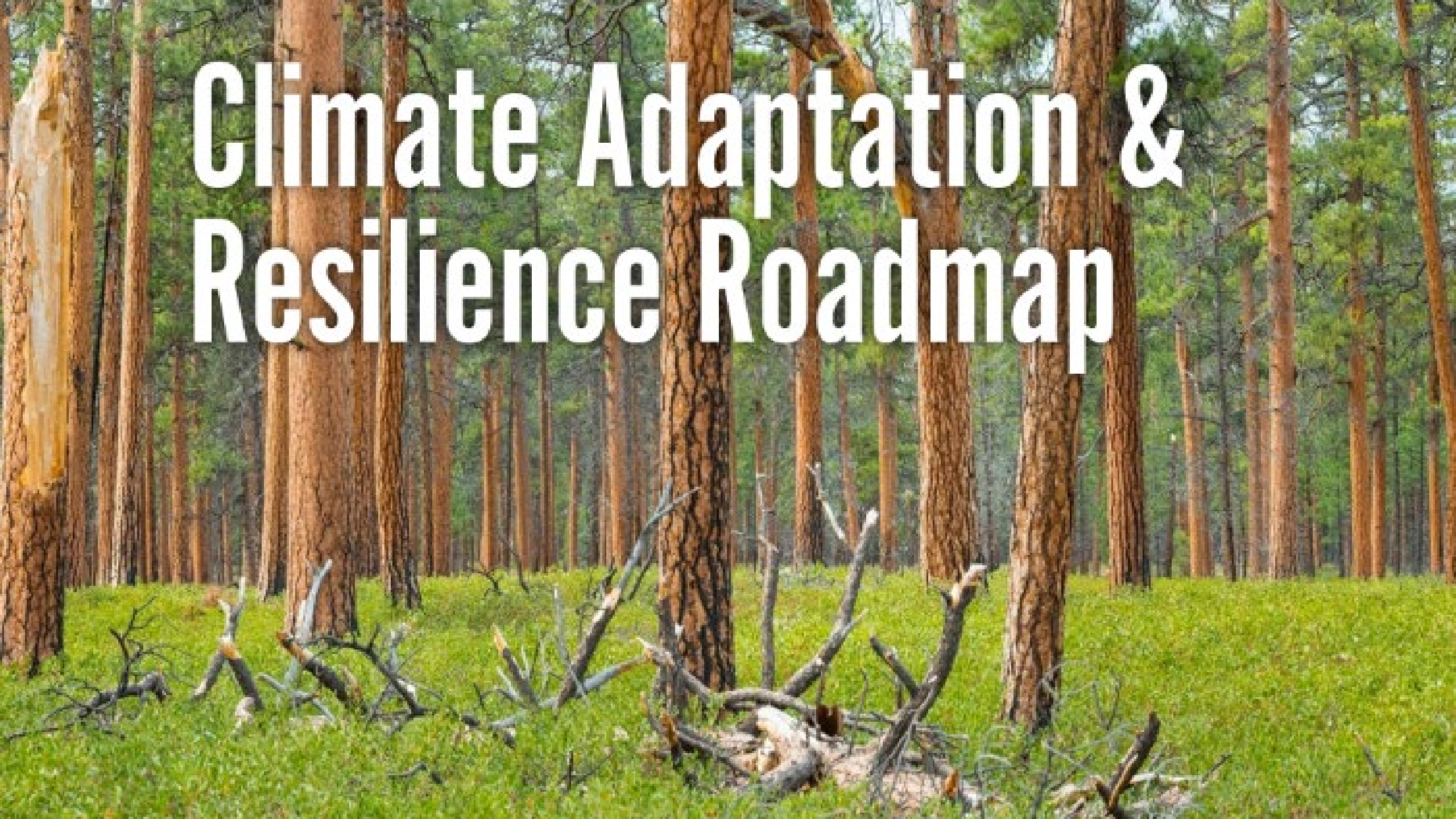
Select layers from categories (and click Apply):

- Structures +
- Drainage +
- Equipment - Highway +
- Roadway +
- Roadside +
- Freight +
- Rail +
- Public Transportation +
- Traffic Data +
- Road Network +
- Classifications +
- Safety +
- Projects & Needs for Scoping +
- Planning and Climate Change Resilience -

- Multi-Hazard Risk (Mid-Century)
- Resilience Corridors
- Coastal Flooding Risk
- Inland Flooding Risk
- Coastal Erosion Risk
- Late-Century Landslide Risk



Climate Adaptation & Resilience Roadmap



ArcGIS Online Web Application

- Created with ArcGIS Web AppBuilder
- Services hosted on ODOT ArcGIS Server
 - Available Externally
 - 50+ Layers
- [Application Link](#)
- [REST Services Link](#)

The screenshot displays the ArcGIS Web AppBuilder interface for the ODOT Climate Hazard Risk application. The interface is divided into a top navigation bar, a left sidebar, and a main map area. The top navigation bar includes 'Home', 'ArcGIS Web AppBuilder', and 'ODOT Climate Hazard Risk'. The left sidebar contains a 'Theme' tab, a 'Map' tab, a 'Widget' tab (which is currently selected), and an 'Attribute' tab. Below the tabs, there is a 'Set the widgets in this controller' button. The main map area shows a hazard risk map with various colored regions and labels like 'Lafayette', 'Dayton', 'Eola Crest', 'Lakebrook', 'Kelizer', and 'Salem'. The bottom of the map area has a scale bar and a legend.

The background of the slide is a light gray surface covered with numerous small, light-colored wooden blocks. Each block has a dark gray question mark printed on its top face. The blocks are scattered across the entire page, creating a textured, repetitive pattern. A thin, solid teal horizontal line runs across the upper portion of the slide, just above the main text.

Questions?



**Oregon
Department
of Transportation**