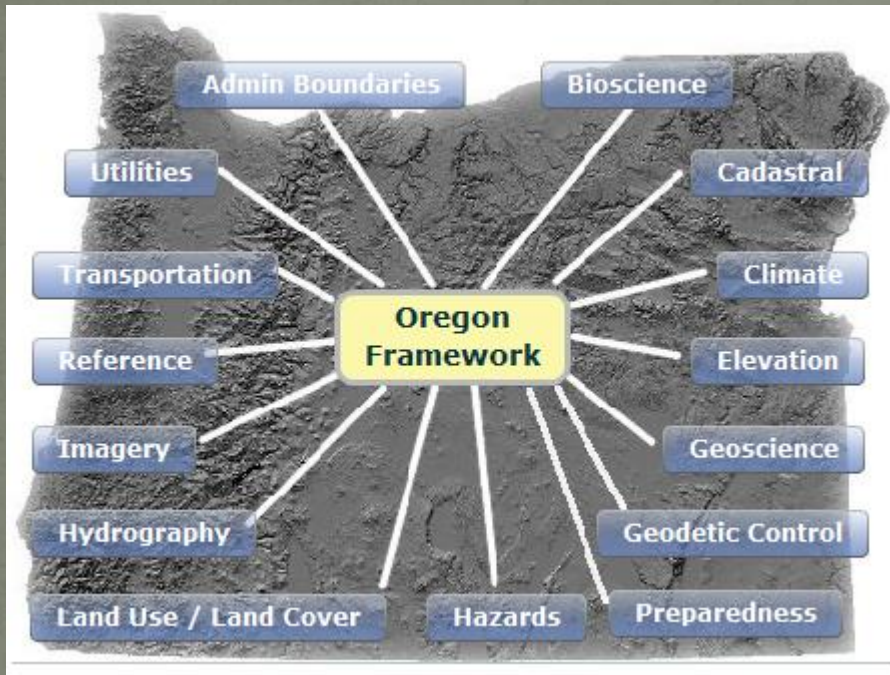


Hazards Framework Implement Team (FIT)

Example: Landslide Workgroup

Steve Lucker & Bill Burns
DLCD-DOGAMI

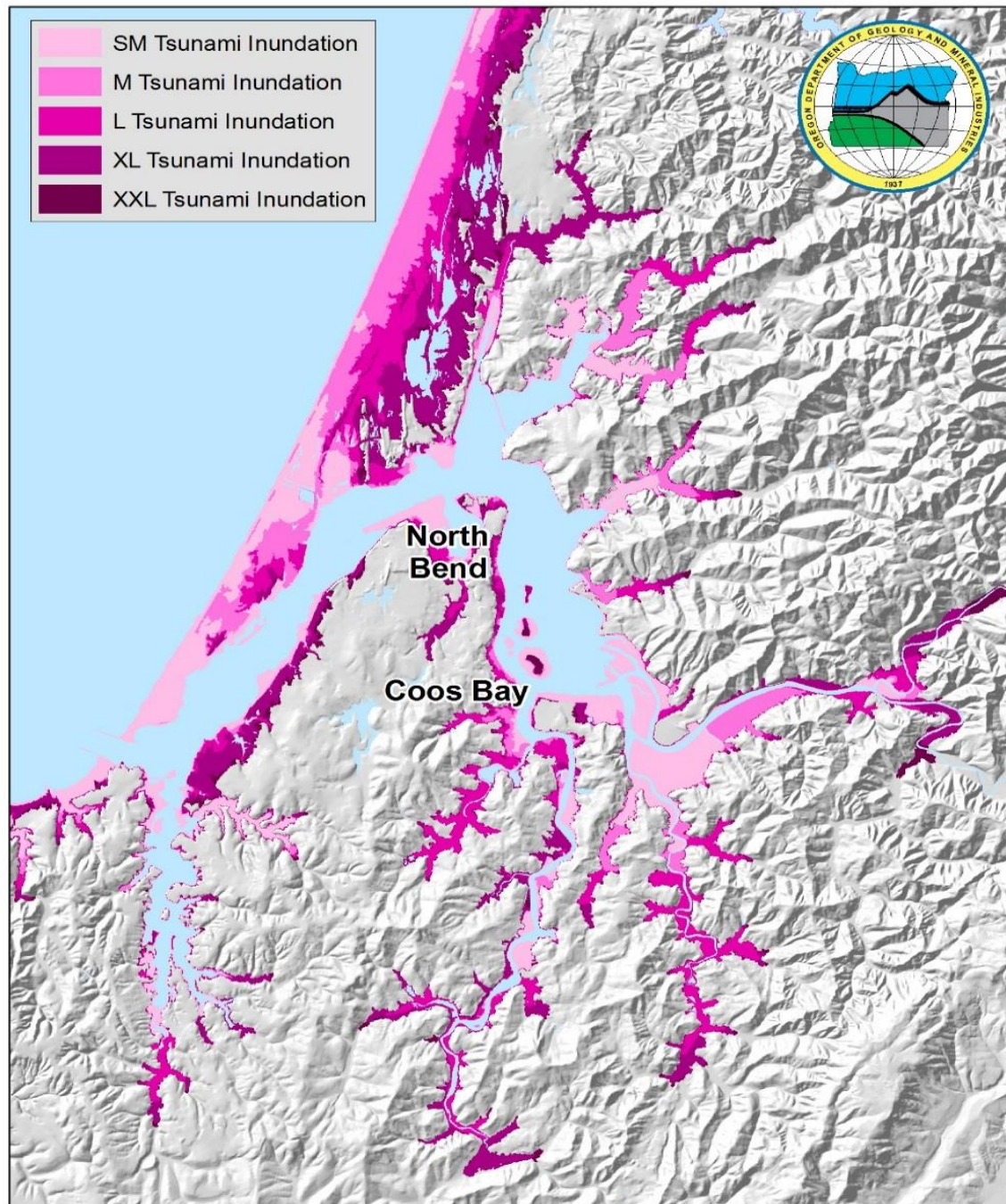
FIT Elements - Hazards Theme



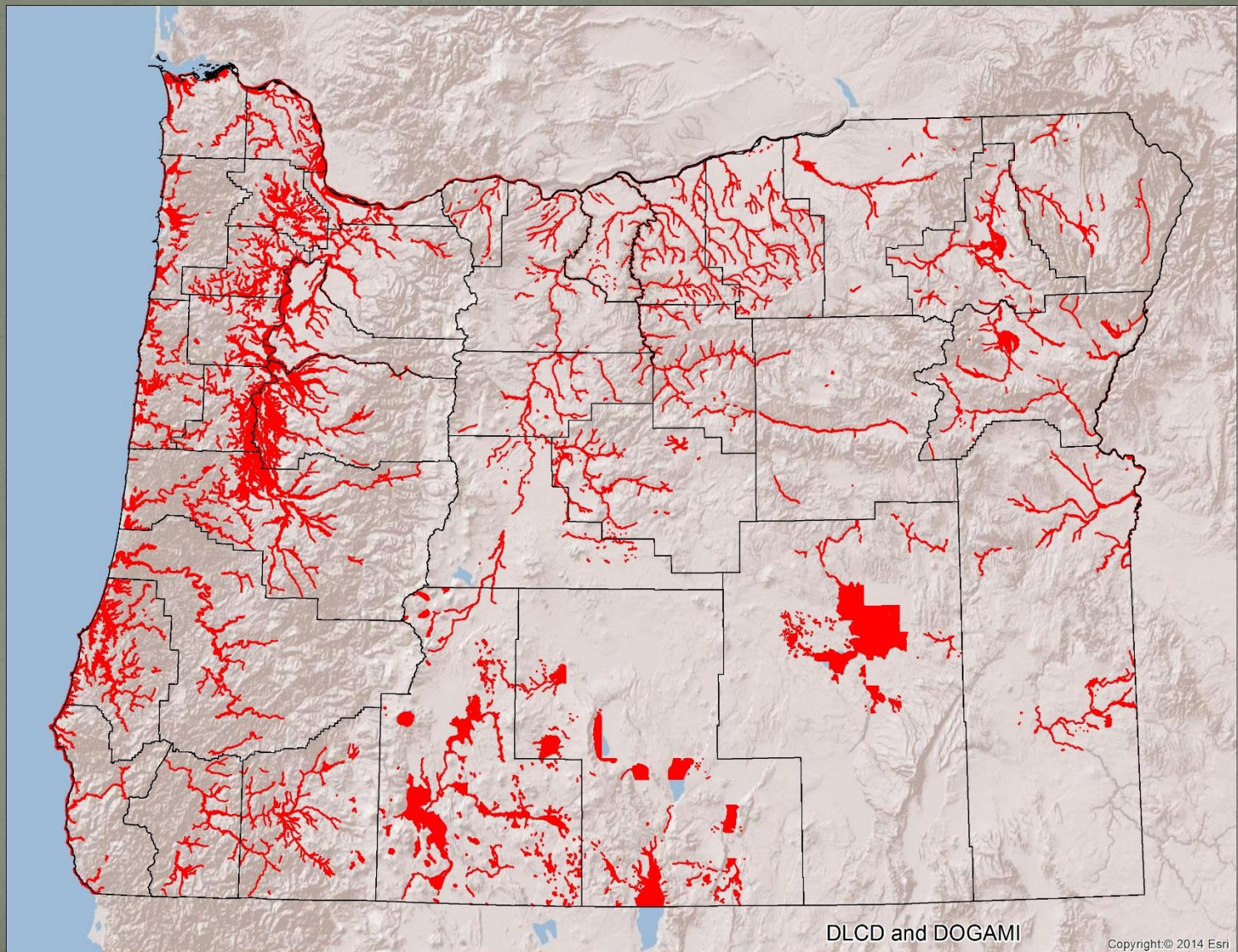
- Hazards Workgroups
 - Floods
 - Landslide
 - Earthquake
 - Wildfire
 - Tsunami
 - Volcano
 - Natural Hazardous Materials
 - Geologic Floodplain
 - Coastal Erosion
 - Climate

Overview – FIT goals

- The FIT collaborates on identifying the primary natural hazards GIS datasets in the State, setting standards, identifying stewards, providing public access and data downloading capacity, and some context as to how and when to use the data.
 - Collaborative partnership focused on maintenance of key GIS data
 - Creation of GIS standards, data, and stewardship



“100-Year” Floodplain

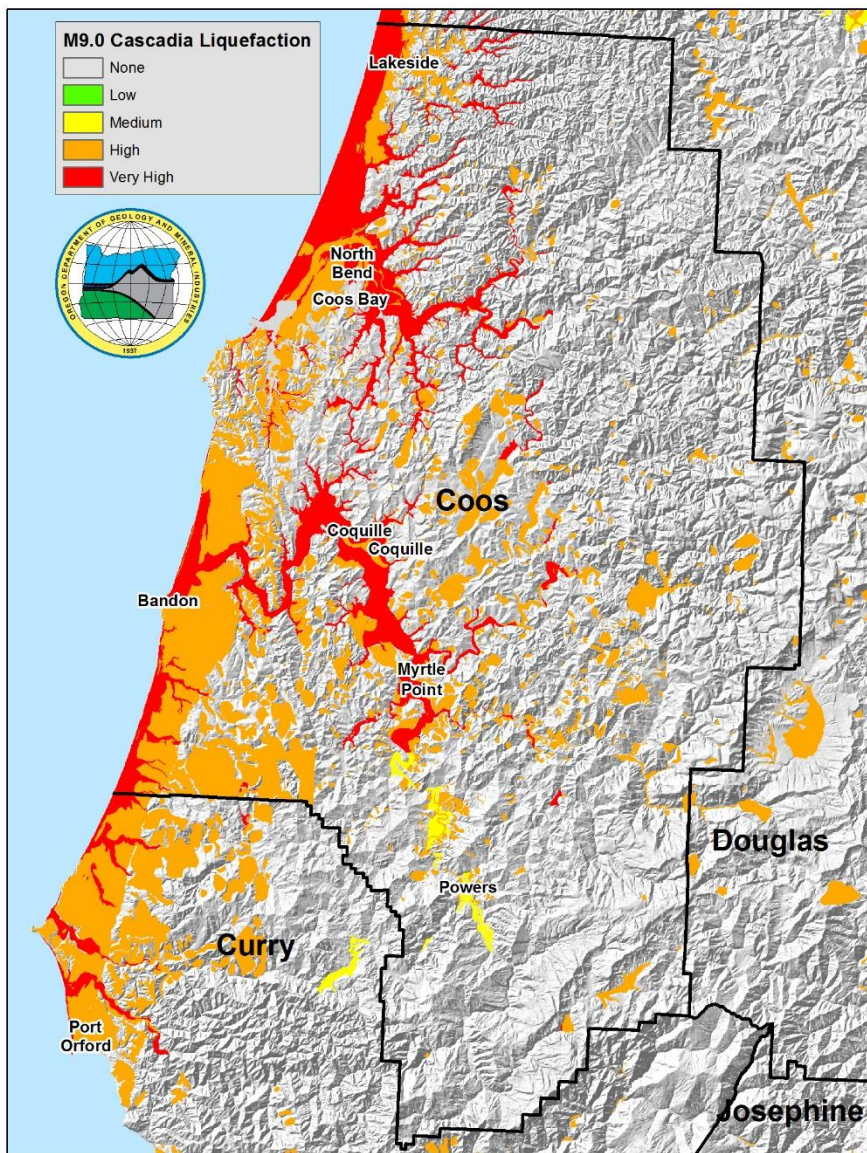


DLCD and DOGAMI

Copyright © 2014 Esri

M9.0 Cascadia Liquefaction

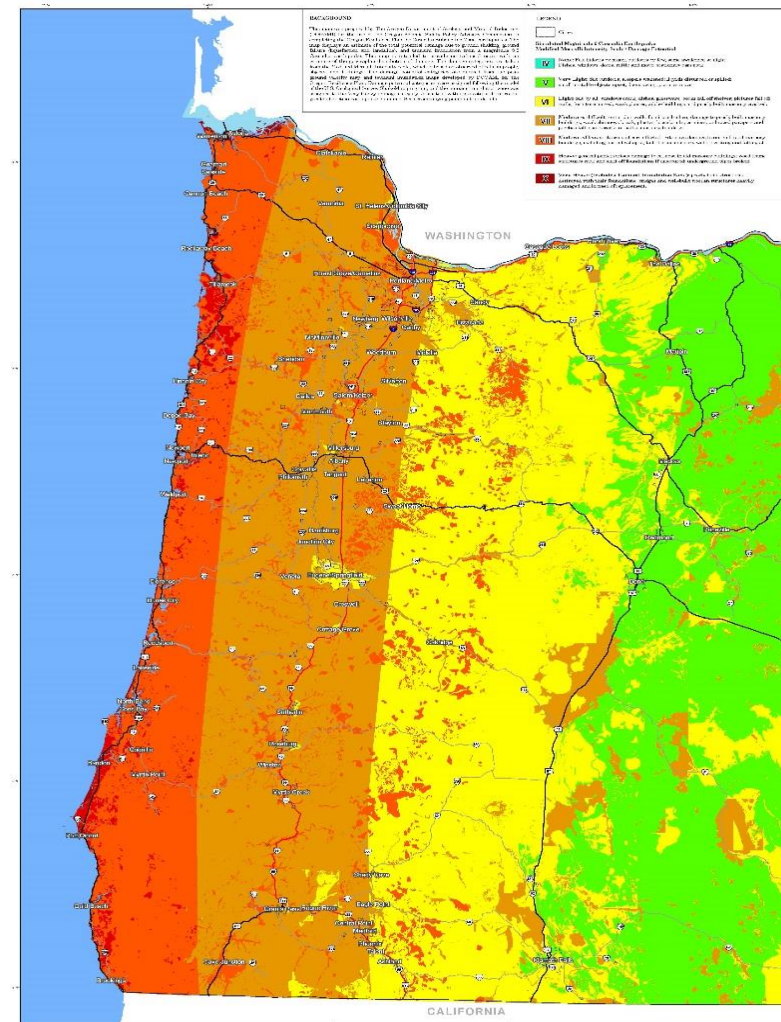
- None
- Low
- Medium
- High
- Very High



Map of Earthquake and Tsunami Damage Potential for a Simulated Magnitude 9 Cascadia Earthquake

2008

U.S. GEOLOGICAL SURVEY
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
F-007



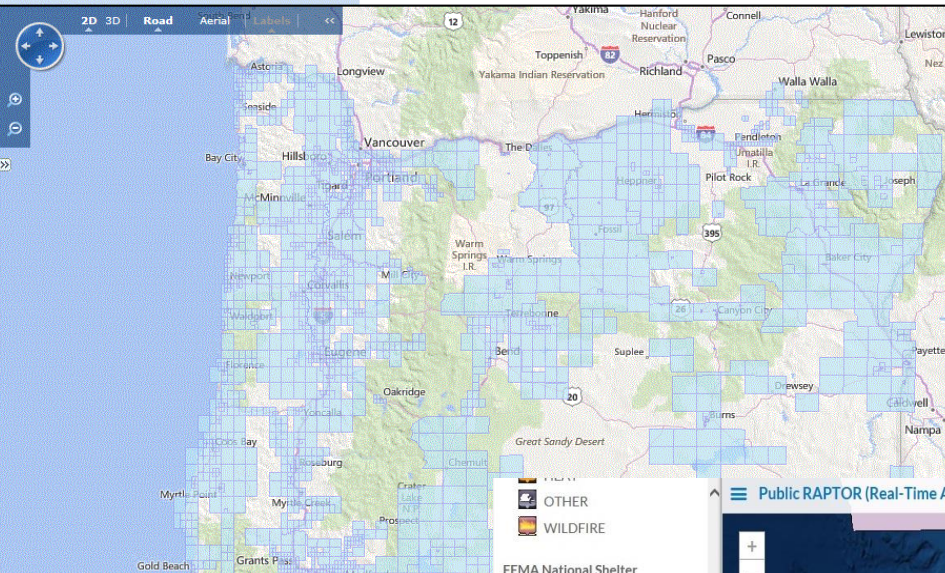
Current conversation and action

- One-stop shop for hazard data – making authoritative data “discoverable”
- Considering the users – how can data be “packaged” and served to benefit the major users?
 - from the community perspective (Goal 7 “actionable”)
 - scale appropriate for use
- -Data development – what needs to be accomplished.
- -Ancillary data – how to recognize parallel datasets that don’t fall directly under the “FIT”

Map Layers

- ☒ Geological Hazards
 - ☐ Flood Hazards
 - ☐ 100 Year Flood
 - ☐ 500 Year Flood
 - ☐ Floodway
 - ☒ FEMA Flood Panels for Download
 - ☐ Wildfire Risk
 - ☐ Oregon Taxlots

Find on Map



Choose Your Hazard Here

Layer Visibility

- ☐ Buildings
- ☒ Flood Hazard
- ☐ Cascadia Earthquake Hazard
- ☐ Coastal Erosion Hazard
- ☐ Volcano Hazard
- ☐ Earthquake Hazard
- ☐ Landslide Hazard

Layers Currently Shown

Flood Hazard

Type and Source of Flood Data

- ☒ Effective FEMA 100 yr Flood
- ☐ Preliminary FEMA 100 yr Flood
- ☐ State Digitized Flood Data
- ☐ Q3 FEMA Flood Data

FEMA National Shelter System (NSS)

Open Shelters

- ☒ Open

USGS Real-time Incidents

Floods

- ☒ Major Flooding
- ☐ Moderate Flooding
- ☐ Minor Flooding
- ☐ Near Flood Stage
- ☐ Low Water Threshold

U.S. Volcanoes

- ☒ Alert: Warning, Code: Red
- ☐ Alert: Watch, Code: Red
- ☐ Alert: Warning, Code: Orange
- ☐ Alert: Watch, Code: Orange
- ☐ Alert: Advisory, Code: Yellow
- ☐ Alert: Normal, Code: Green

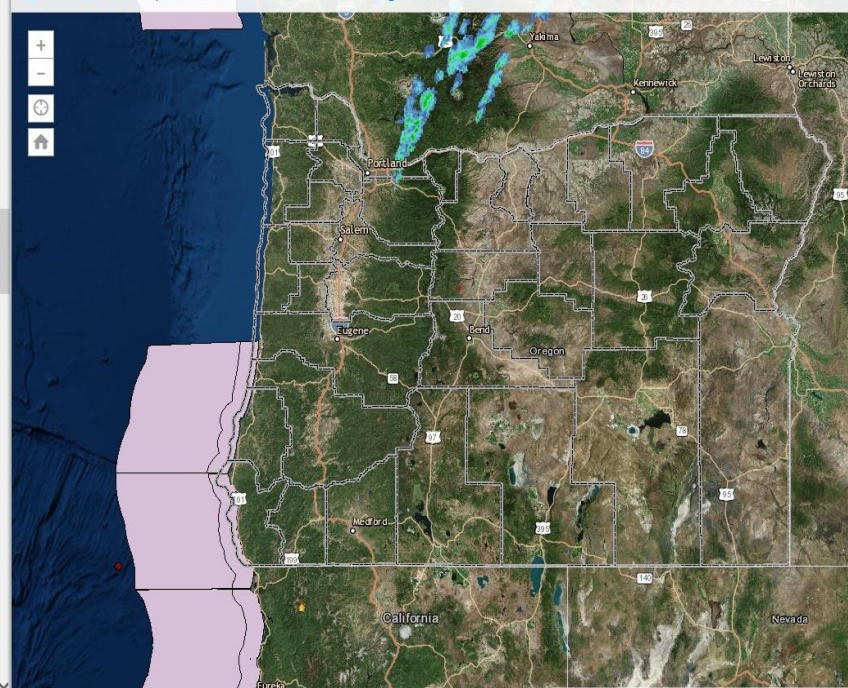
Other Volcanoes

- ☐ Recent Activity

Earthquakes

- ☐ 2.500000 - 3.000000

Public RAPTOR (Real-Time Assessment and Planning Tool for Ore...



Hazard Data Viewers - Each viewer draw from the same authoritative GIS source

Web services DOGAMI making available

- Statewide flood hazard database
- Landslide susceptibility
- Statewide Landslide Inventory Database for Oregon
- Tsunami regulatory line
- Tsunami inundation zones
- Coastal erosion zones
- Earthquake shaking scenarios
- Earthquake liquefaction potential
- Earthquake active faults (framework - OGDC)
- Channel migration potential

Example: Landslide Data Workgroup

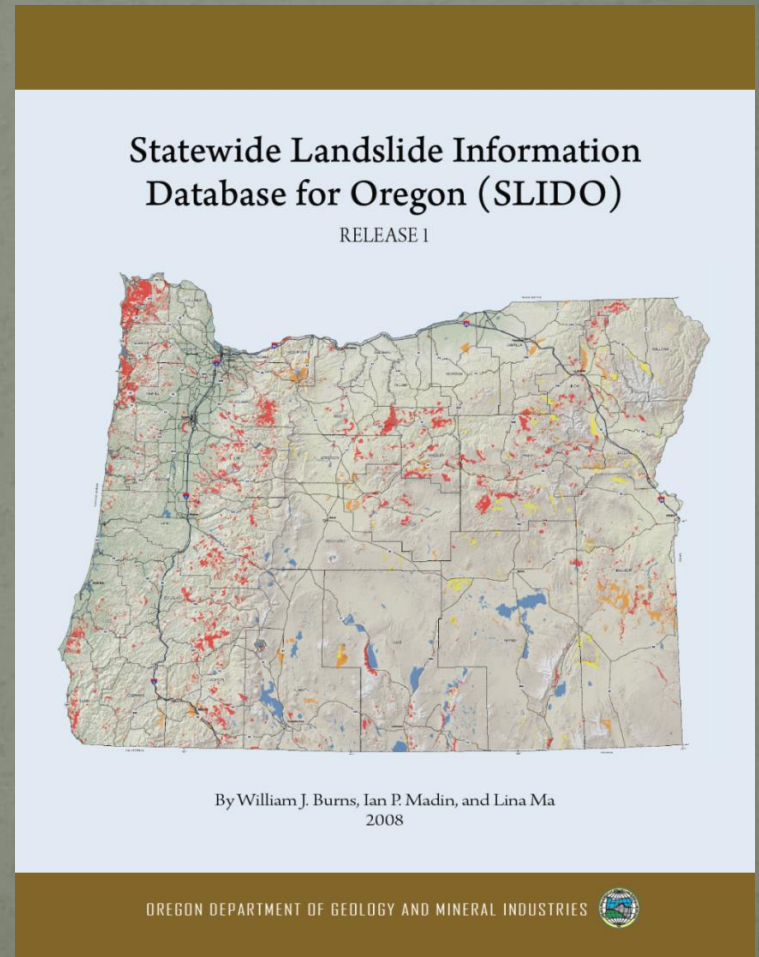


2005 -2010 Ramped Up Landslide Program at DOGAMI

- In 2007, published a study on comparison of GIS based landslide inventory mapping methods
- Two primary conclusions..
 1. The compilation of all previously identified landslides is a critical starting point
 2. Primary remote sensing dataset = LIDAR

SLIDO

- SLIDO R-1, 2008
- Compilation of Previously Mapped-Published Landslides
- 257 studies
- ~15,000 landslides
- Single GIS Shapefile



LANDSLIDE INVENTORY MAP OF THE SOUTHEAST QUARTER OF THE DAMASCUS QUADRANGLE, CLACKAMAS COUNTY, OREGON

FIGURE 1

PLATE 1

CHECKBOX

LEGEND

SYMBOLS

TABLE 1

TABLE 2

TABLE 3

TABLE 4

TABLE 5

TABLE 6

TABLE 7

TABLE 8

TABLE 9

TABLE 10

TABLE 11

TABLE 12

TABLE 13

TABLE 14

TABLE 15

TABLE 16

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TABLE 267

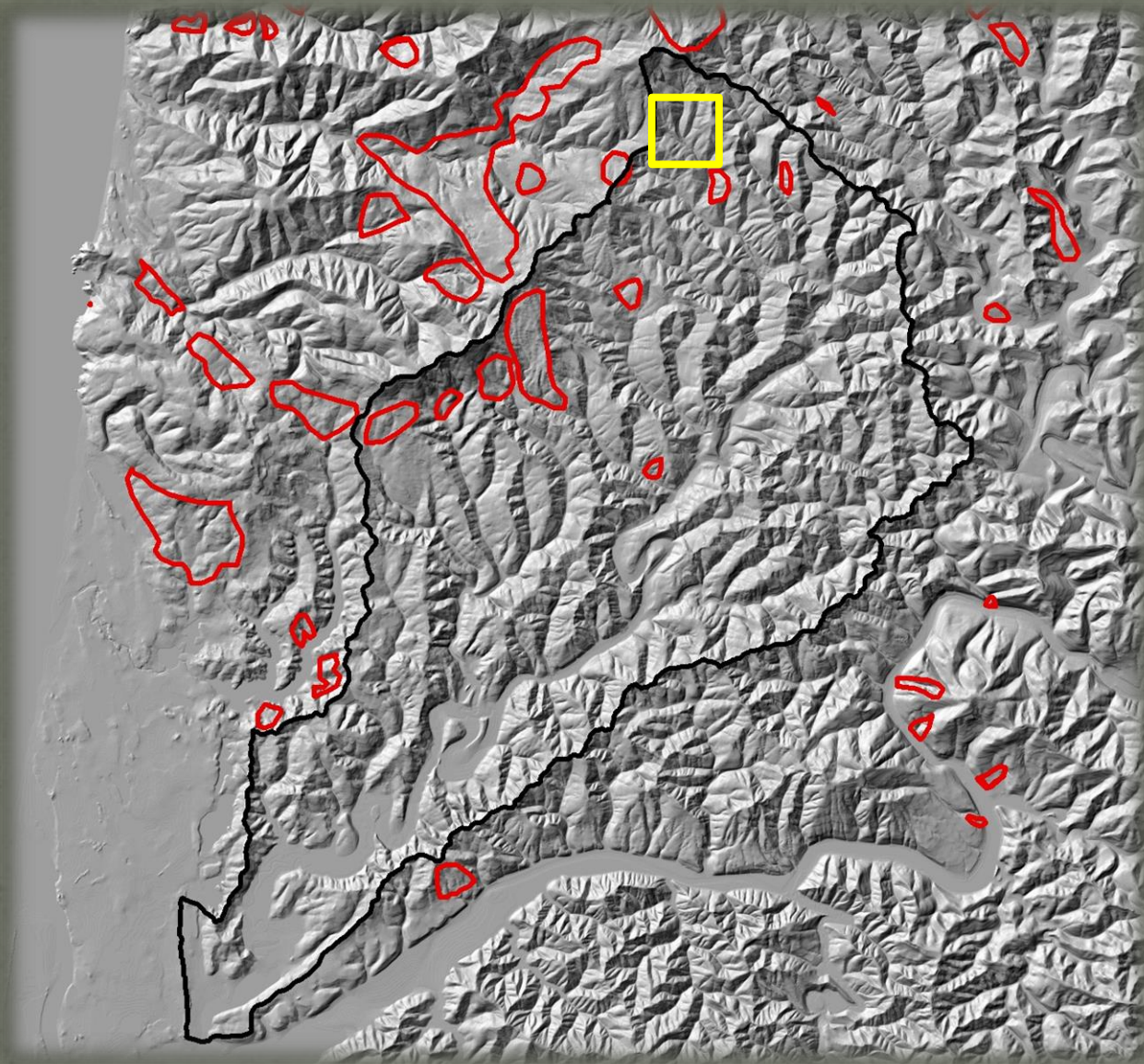
TABLE 268

TABLE 269

TABLE 270

TABLE 271

TABLE



Example: North Fork Siuslaw R

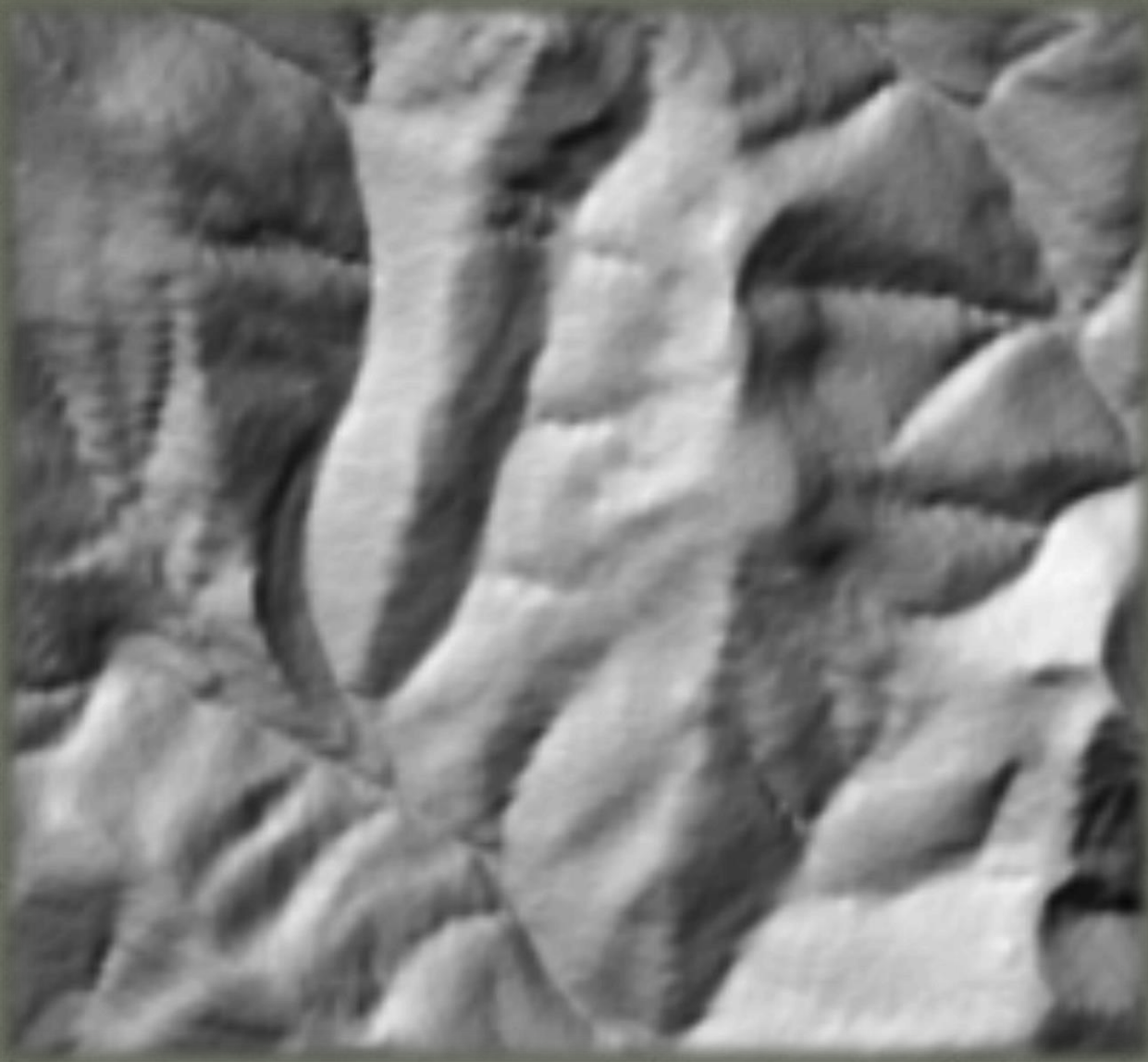
SLIDO = 9 slides
previously mapped

EPA Funding to
DOGAMI to help
DEQ understand
Landslides in Coast
Range Mountain
Watersheds



Example: North
Fork Siuslaw R

2009 Air Photo



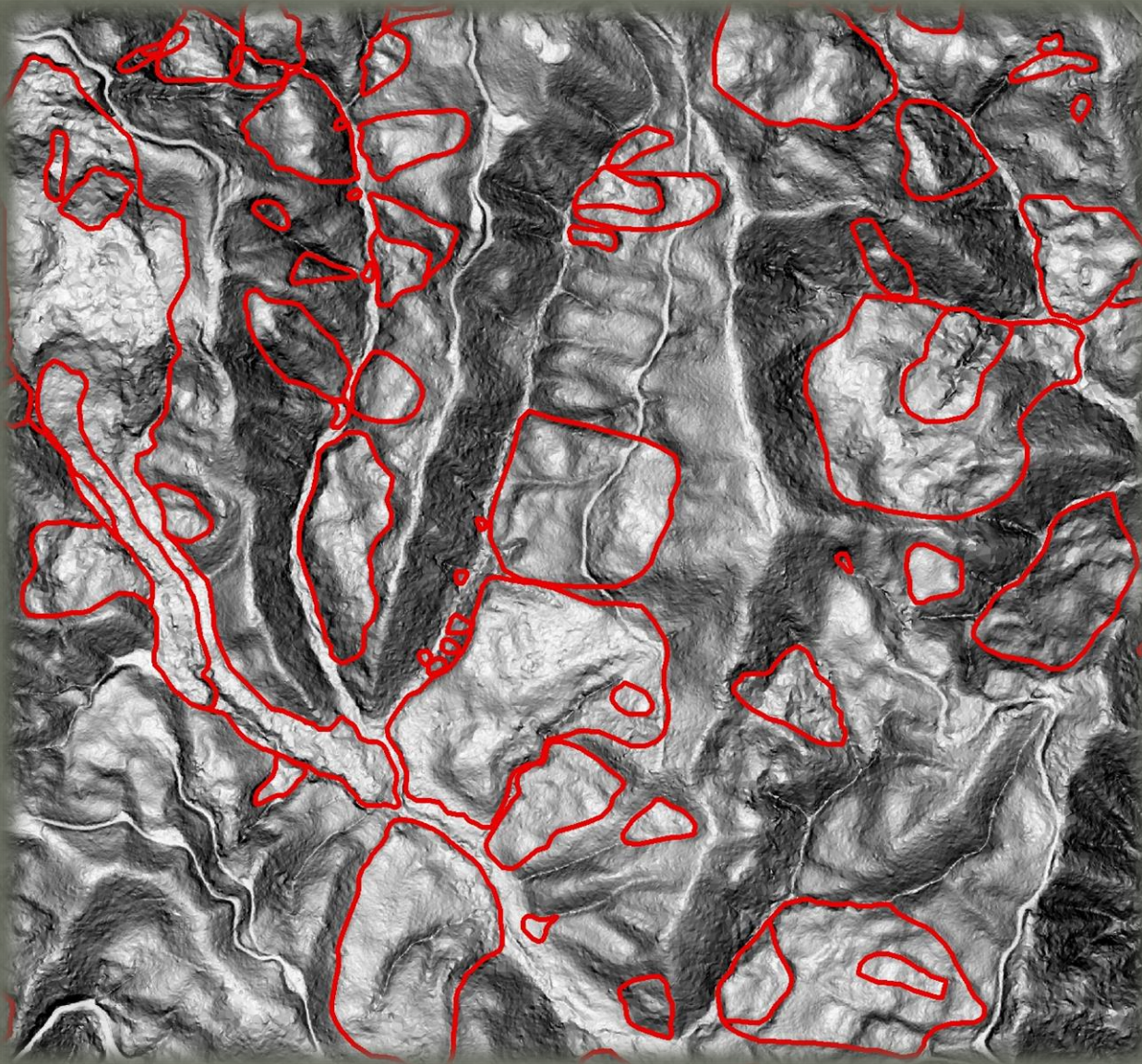
**Example: North
Fork Siuslaw R**

10m NED



**Example: North
Fork Siuslaw R**

1m lidar DEM



Example: North Fork Siuslaw R

1m Lidar DEM +
Landslides

SLIDO = 9 slides

Summary — North Fork Siuslaw Watershed Landslide Inventory

Landslide deposits mapped

Total 1,323

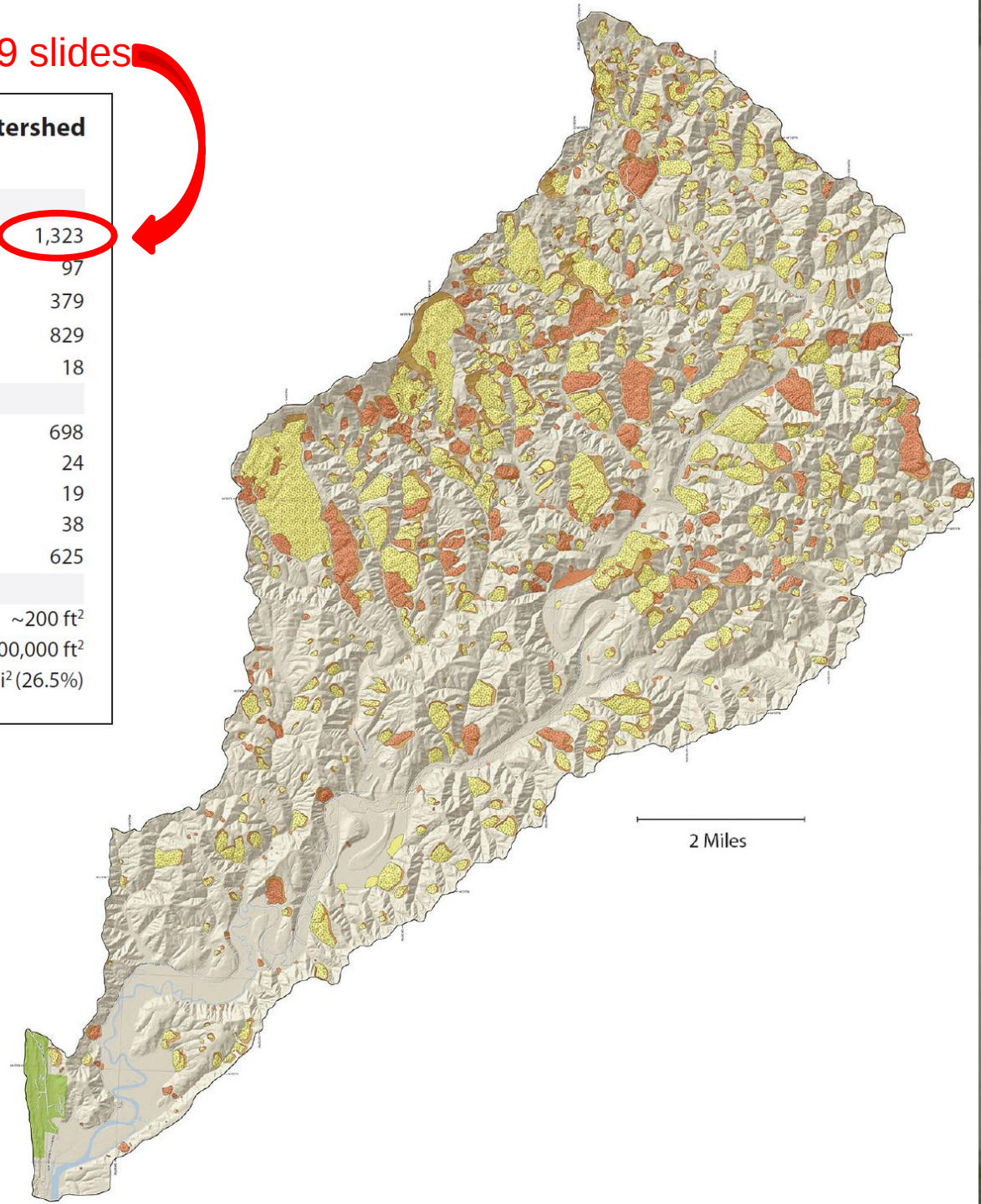
Shallow	97
Debris flow fan	379
Deep	829
Other (e.g., rock fall)	18

Time of movement

Historic (within the last 150 years)	698
late 1970s to early 1980s	24
1996-1997 storm	19
2005-2009	38
Prehistoric	625

Area

Minimum landslide	~200 ft ²
Maximum landslide	~30,000,000 ft ²
Watershed coverage	15.8 mi ² (26.5%)



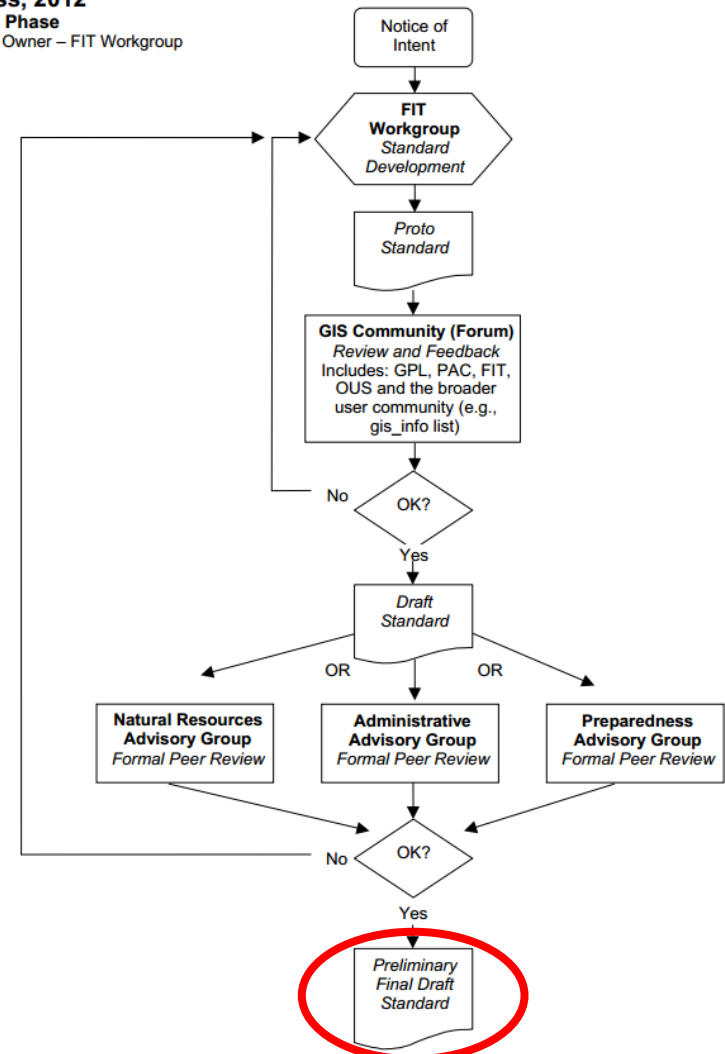
Landslide Data Workgroup Formed in 2010

- First task = Create a GIS standard for SLIDO
- Second Task = Applied for a GEO grant to update SLIDO R₁ to R₂
 - SLIDO R₂ needs to have the same structure as SP-42

Landslide Element Subcommittee Team

- Oregon Department of Geology and Mineral Industries (DOGAMI)
- Oregon Department of Transportation (ODOT)
- Washington County, Oregon
- City of Astoria, Oregon
- U.S. Geological Survey Landslide Program (USGS)

FIT Standards Development Process, 2012 Drafting Phase Standard Owner – FIT Workgroup



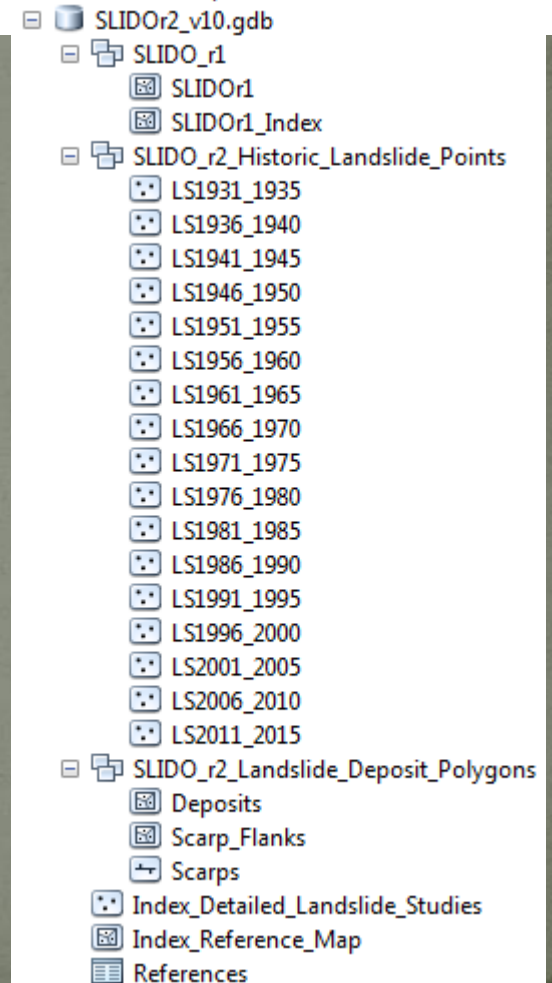
SLIDO R-2

Upgraded to a GeoDatabase

1. Historic Points
2. Mapped Deposits
3. Reference Map and Table

Same Structure as the SP-42 method

- 1) **SLIDO r-1 Feature Dataset (the original SLIDO release-1 data)**
- 2) **Historic Landslide Points Feature Dataset**
- 3) **Landslide Deposit Polygons Feature Dataset**
- 4) Index Detail Landslide Studies Feature Class
- 5) Index Reference Map Feature Class
- 6) Reference Table



SLIDO-3

- 2014
- 347 Studies
- 37,226 Landslides
- 12,075 historic landslide points
- Continuous Updates
- On the Web map, streaming, downloadable
- Latest R3.2, 2015

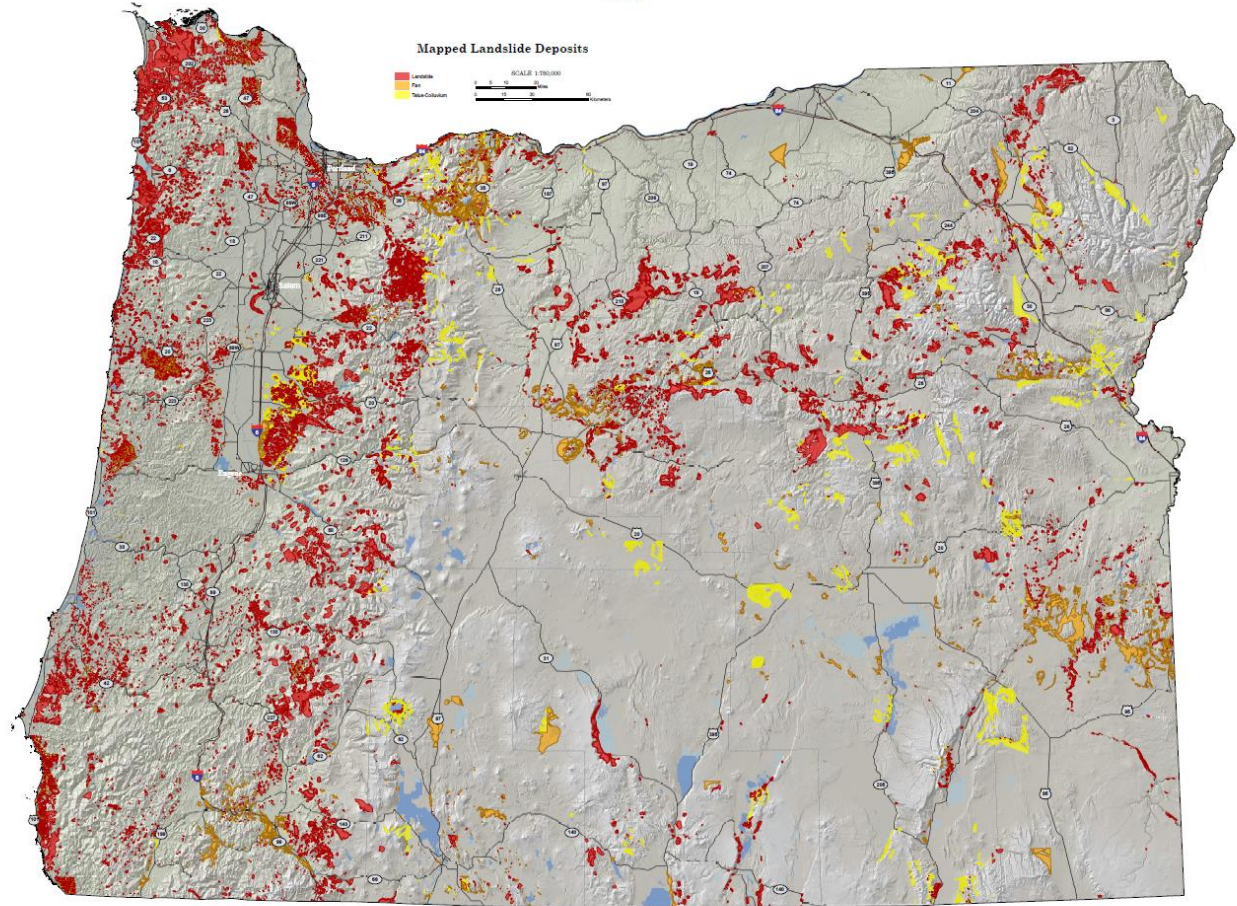


STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
1000 NE Oregon Street, Suite 1000, Portland, Oregon 97232
Phone: 503.945.7000, Fax: 503.945.7001, Email: info@dmr.state.or.us
Web: www.dmr.state.or.us

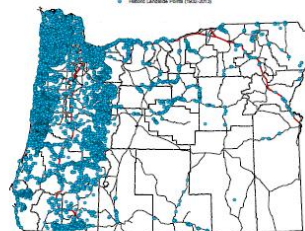
Statewide Landslide Information Database for Oregon Release 3.0 (SLIDO-3.0)

2014

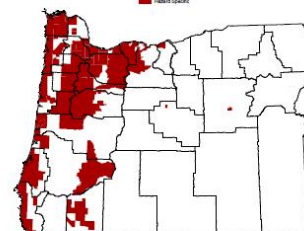
SLIDO Release 3.0
Statewide Landslide Information Database for Oregon
Release 3.0 (SLIDO-3.0)
by William J. Burns and Robin J. Wainwright



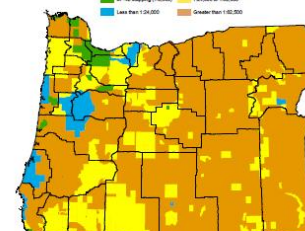
Historic Landslide Points



Original Mapping Purpose



Original Mapping Scale



Geography by William J. Burns/Oregon Department of Geology and Mineral Industries.
This map also includes data from historical aerial photos and maps by the U.S. Geological Survey (USGS) and the U.S. Army Corps of Engineers (USACE).
Data: USGS National Elevation Dataset (NED) 1/3 arc second resolution and USGS 1/3 arc second resolution and USGS 1/3 arc second resolution and USGS 1/3 arc second resolution.
Source: USGS National Elevation Dataset (NED) 1/3 arc second resolution and USGS 1/3 arc second resolution and USGS 1/3 arc second resolution and USGS 1/3 arc second resolution.



DISCLAIMER
This map was prepared for informational purposes only and is not intended for use in any legal proceeding. The map is provided as a service to the public and is not intended to be used as a basis for any legal action. The map is provided as a service to the public and is not intended to be used as a basis for any legal action.



EXPLANATION
The Statewide Landslide Information Database for Oregon Release 3.0 (SLIDO-3.0) is a compilation of previously mapped landslide hazard data in Oregon. SLIDO-3.0 is a compilation of previously mapped landslide hazard data in Oregon. SLIDO-3.0 is a compilation of previously mapped landslide hazard data in Oregon. SLIDO-3.0 is a compilation of previously mapped landslide hazard data in Oregon.

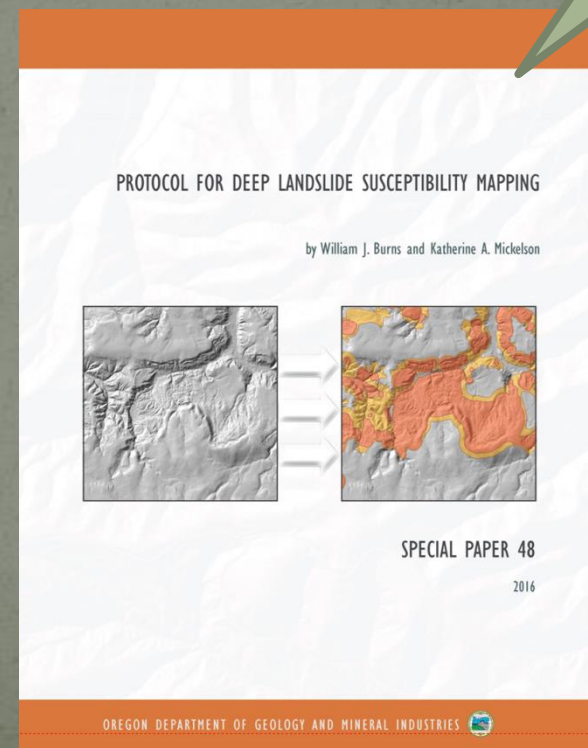
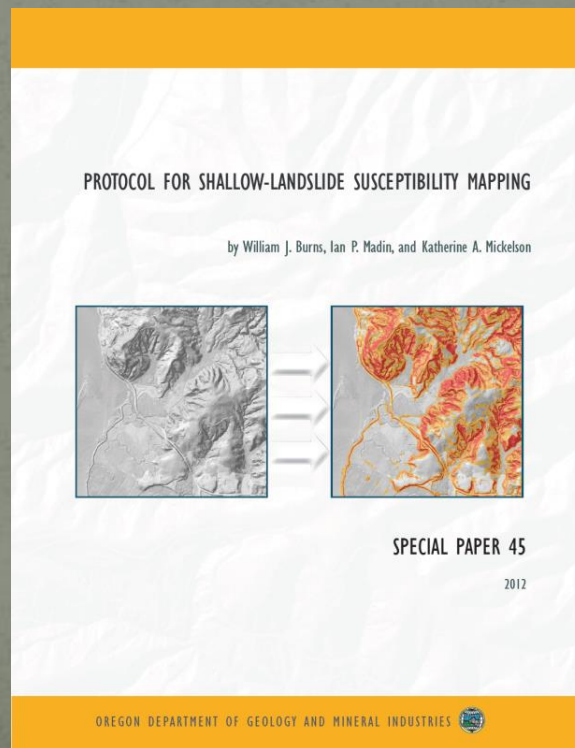
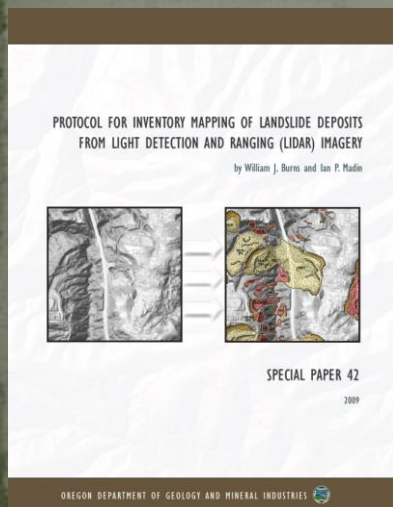
MAP LIMITATIONS
1. Although every effort was made to ensure that the data are accurate and reliable, the data are not intended to be used as a basis for any legal action. The map is provided as a service to the public and is not intended to be used as a basis for any legal action.

REFERENCES
Burns, W.J., Wainwright, R.J., 2014. Statewide Landslide Information Database for Oregon Release 3.0 (SLIDO-3.0). Oregon Department of Geology and Mineral Industries, SLIDO-3.0 Release 3.0.

Currently Working on SLIDO 4.0

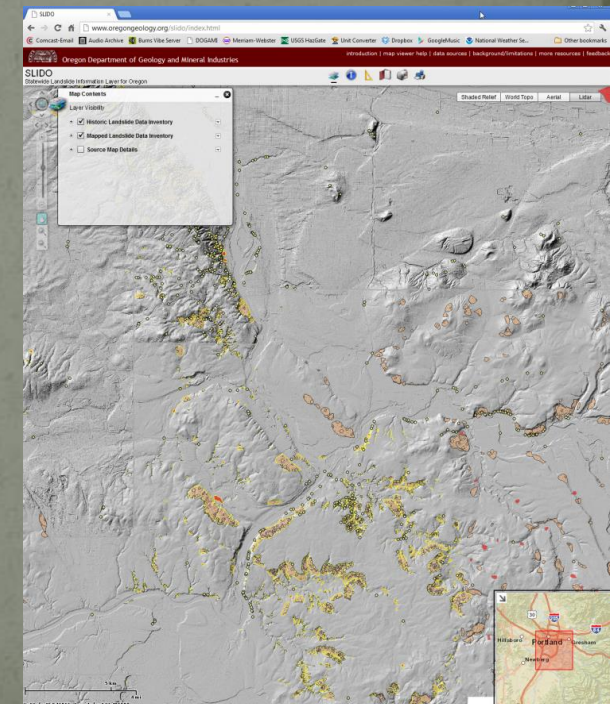
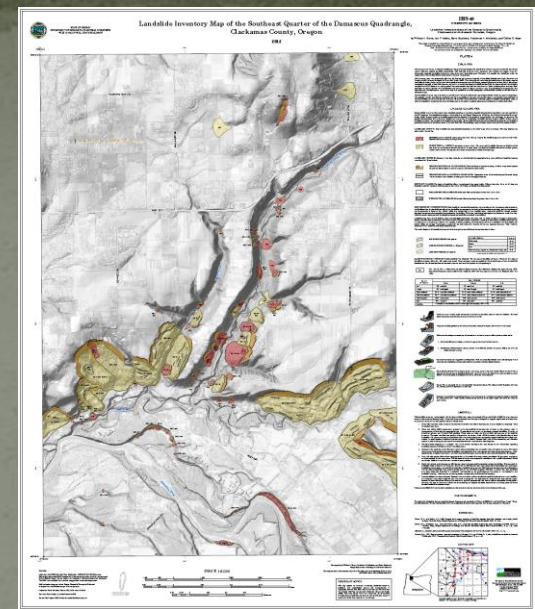
- Will include landslide susceptibility
- Statewide Overview Map
- Detailed Shallow and Deep Susceptibility

Due out soon!



Data Availability

- DOGAMI
 - Original publications from DOGAMI
 - View on the Web map
 - Stream to GIS
 - Download database
- Geodatabase from Oregon Spatial Data Library



Oregon Spatial Data Library

HOME SEARCH DOWNLOAD LAUNCH MAP VIEWER

Search

Landslides

Records shown from: This Site

Additional Options

WHERE

Anywhere Intersecting Fully within

FRAMEWORK DATA

Admin Boundaries | Bioclimate | Cadastre | Climate | Elevation | Geodetic Control | Geoscience | Hazards | Hydrography | Imagery | Land Use/Land Cover | Transportation | Utilities | Reference

Results 1-4 of 4 record(s)

Expand results Zoom To Results Zoom To Searched Area

Mid West-Coast Shallow Landslide Risk

This layer looks at landslide risk based largely on slope and concavity; therefore, this model works well in situations where topographic factors drive shallow landslides.

Download Preview Website Details Metadata Zoom To

SLIDO v2 2011 Landslide Deposits

One of the primary chronic and most devastating geologic hazards in Oregon is landslides. Average annual repair costs for landslides in Oregon exceed \$10 million and severe winter storm losses can exceed \$100 million (Wang and others, 2003). As population...

Download Preview Website Details Metadata Zoom To

Mid West-Coast Landslide - Erosion Risk

This layer defines areas that could potentially contribute coarse and fine sediments to stream networks by evaluating where soils at high risk of erosion lie upon areas prone to shallow landslides. Results from the Landslide Model have not been validated.

Download Preview Website Details Metadata Zoom To

Oregon Tsunami Inundation Line

Scientific findings of the last several years have shown that the Oregon coast is vulnerable to great (M 8-9) earthquakes that can occur on the offshore Cascadia subduction zone fault system. Tsunamies caused by any large-scale disturbance of these...

Download Preview Website Details Metadata Zoom To

See results through REST API: GEOJSON ATOM HTML FRAGMENT KML JSON

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The Near Future

- Creating a formal *Oregon Landslide Risk Reduction Workgroup*
- More than data sharing
- Primary purpose is to facilitate collaboration of the broad group working on landslide risk reduction in Oregon
- Proposed in the Hazards FIT, Landslide Theme

Possible Goals of the Landslide Workgroup

- Better communication and collaboration
- Informed focus on future efforts
- Share existing data
- Promote landslide awareness and preparedness

Lidar is the key to life:



DOGAMI

New datasets and tools

Example: Depth Grids

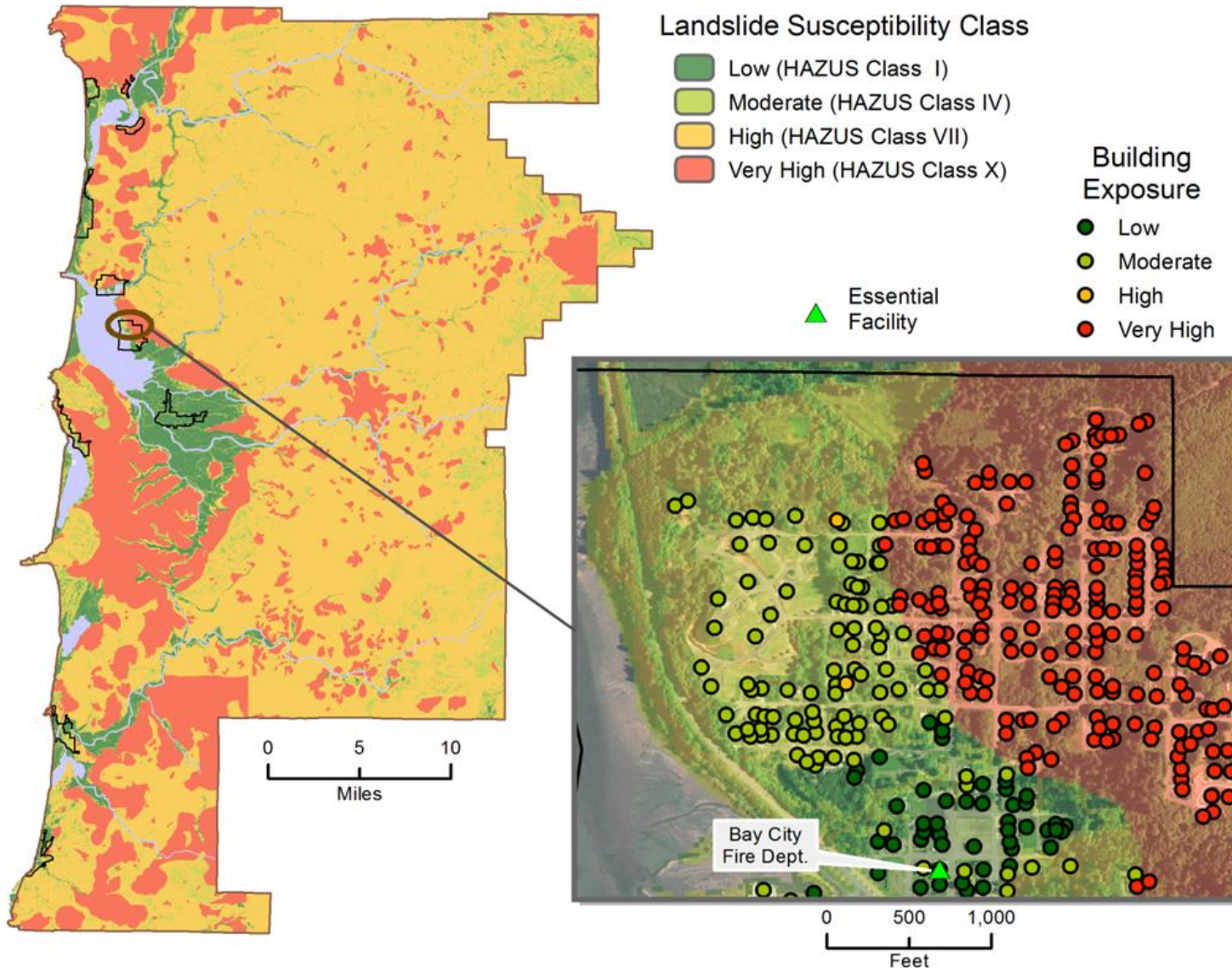


Develop GIS
Data to Identify
Risk

Capture or
Develop
Hazard Data

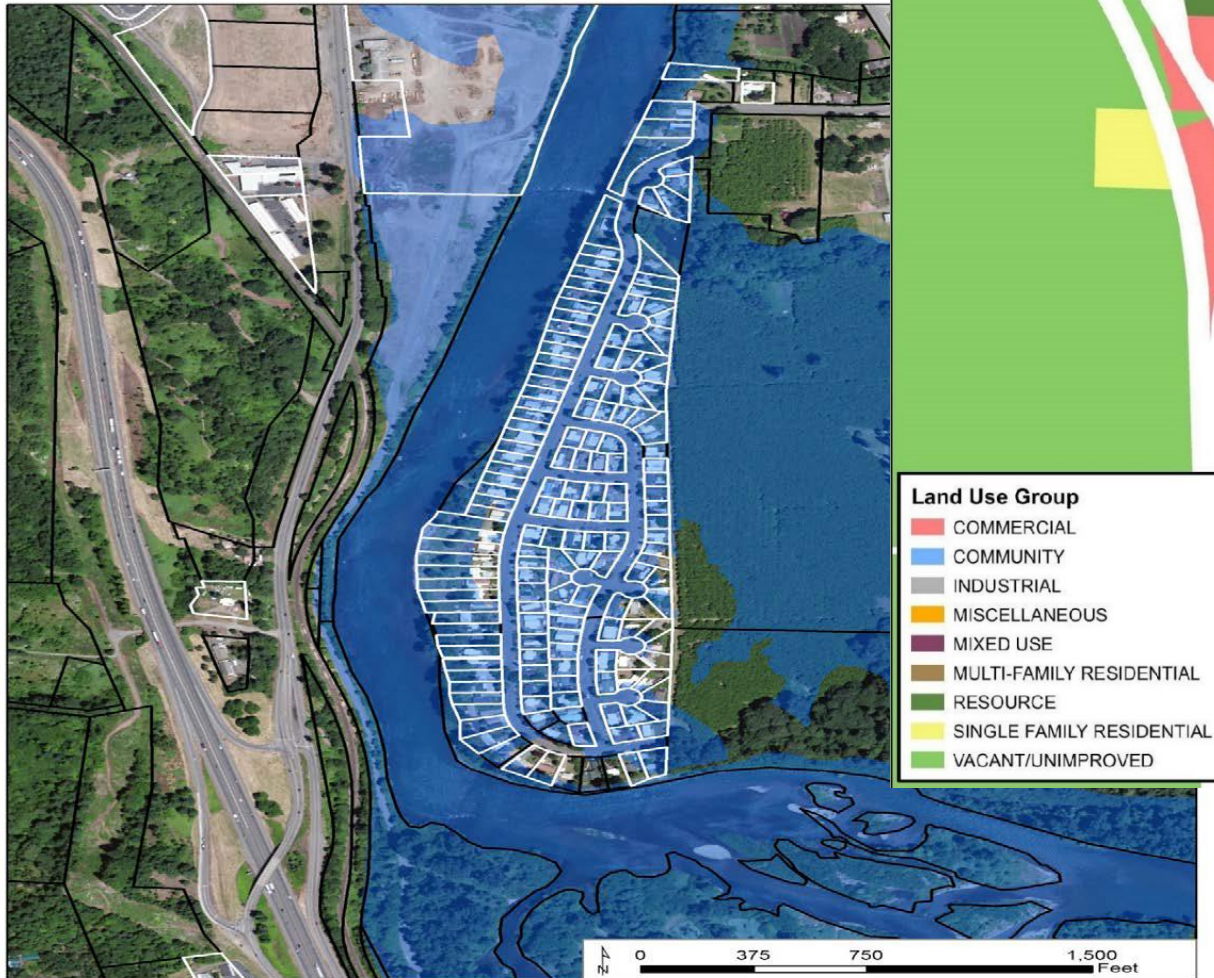
Estimate Losses

Develop
Mitigation
Action
Statements



Example:
HAZUS

Coordinate with other FITs





Ultimate Goal

*Enable communities
to be successful;
incentivize local
preparation and
mitigation activities*

*The Map is only the
beginning of the
conversation!*

Questions ?
