

Landslide Data In Oregon:

GIS Standards Forum 2012

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Framework : Hazards FIT



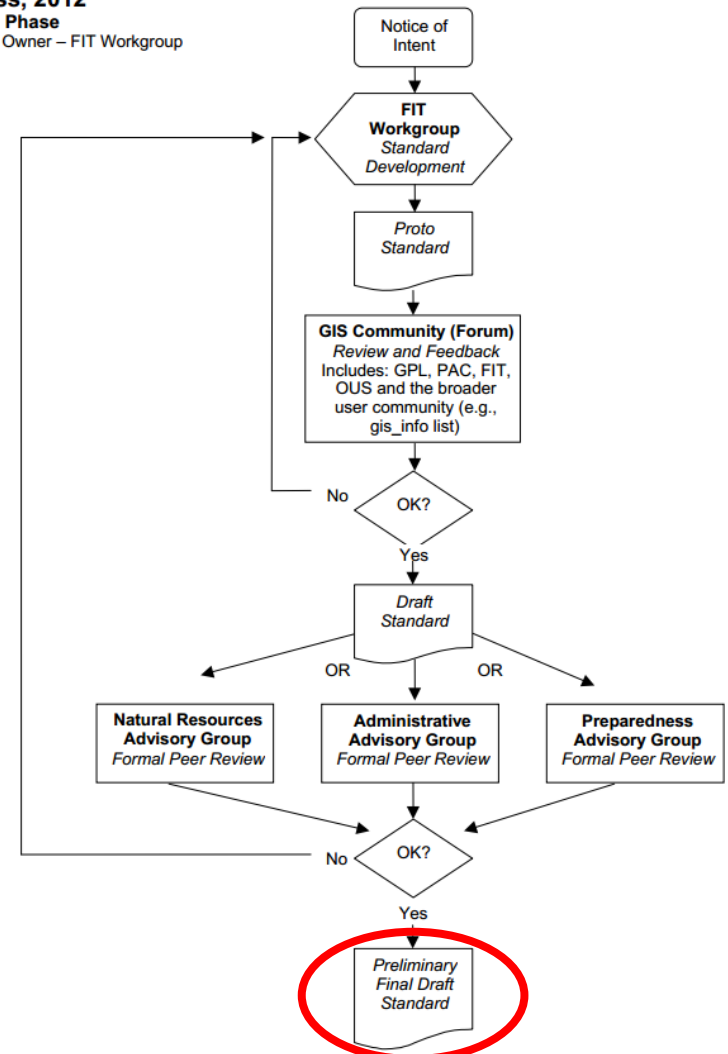
- Hazards Elements

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

Landslide Element Subcommittee Team

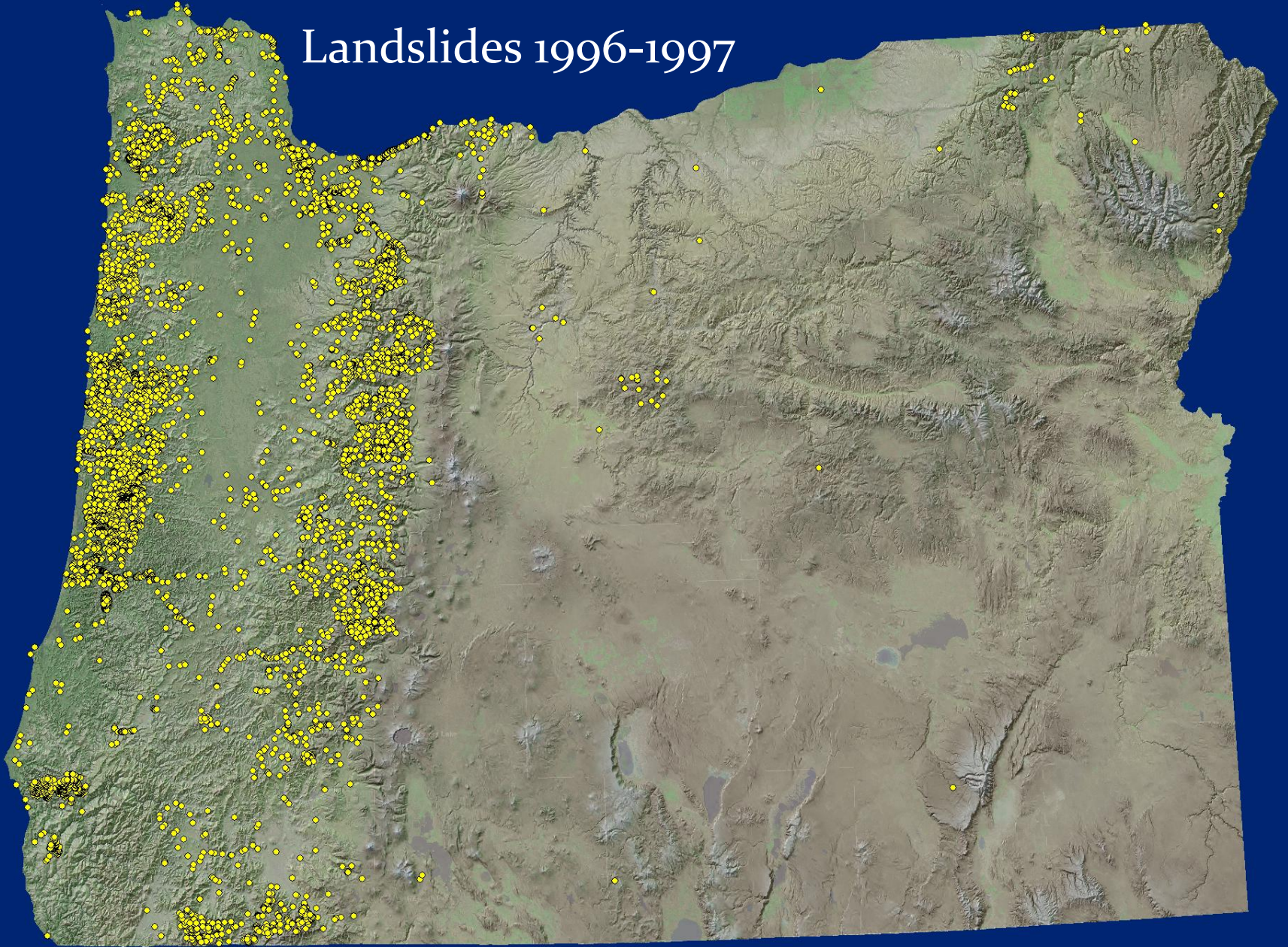
- Oregon Department of Geology and Mineral Industries (DOGAMI)
- Oregon Department of Transportation (ODOT)
- Washington County, Oregon
- City of Astoria, Oregon
- U.S. Geological Survey Landslide Program (USGS)

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



- I. Landslides 101
- II. SLIDO r1 and r2(2011)
- III. Future Updates to SLIDO

Landslides 1996-1997



3 Storms, 100s Millions \$ Damage,
5 deaths, 9,500 slides!

=Big Wake Up
Significant Problem

Many Different Types of Landslides

Classification or Naming Landslides

Primary Criteria:

1) Type of Material

2) Type of Movement

◆ **Soil (earth)**

◆ **Rock**

◆ **Debris
(mixture)**

I. **Slides**

II. **Flows**

III. **Spreads**

IV. **Falls**

V. **Topples**

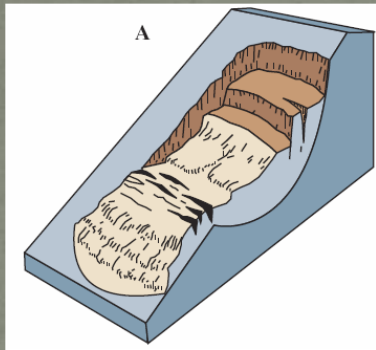
• **Complexes
(multiple types)**

Debris Flow, Rock Fall

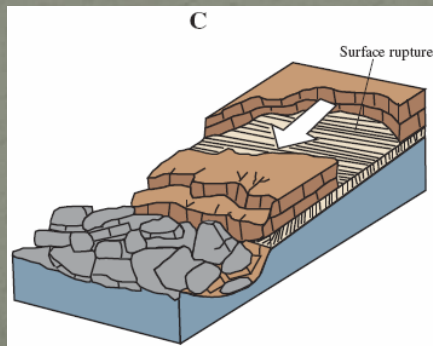
Slides

Soil or rock sliding on a surface of rupture (failure plane).
Commonly where weak soil overlies stronger soil or rock.

Rotational Slides (Slumps)



Translational Slide

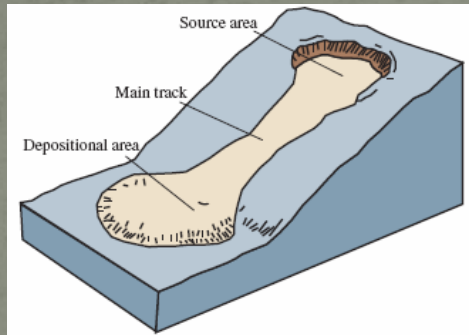


**The Zoo Landslide
(ancient Highlands Landslide)**

Flows

mixtures of water and/or soil-rock-debris which have become a liquefied slurry and move commonly very rapidly down slope.

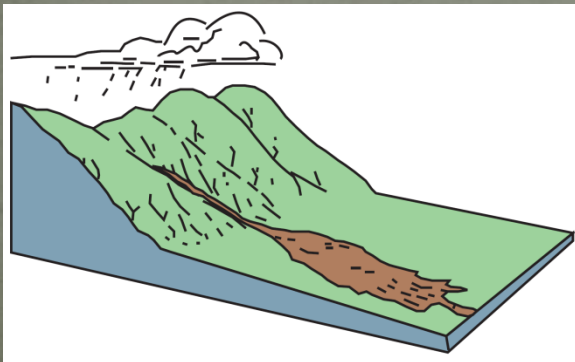
Non-channelized Flows (Earth Flows)



Earth Flow in the Portland Hills

Channelized Flows

(Debris flows or Rapidly Moving Landslides)



Debris Flow, HWY 30, Woodson



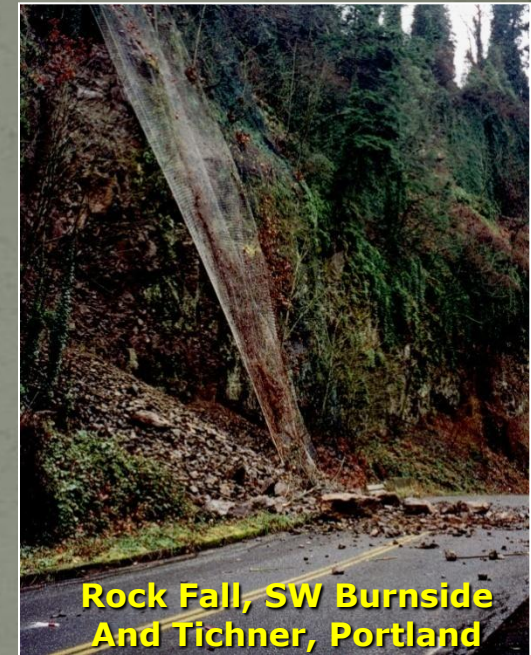
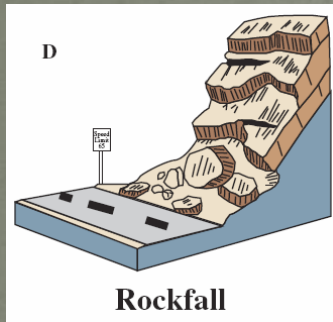
Debris Flow, Columbia River Gorge, Dodson

Falls & Topples

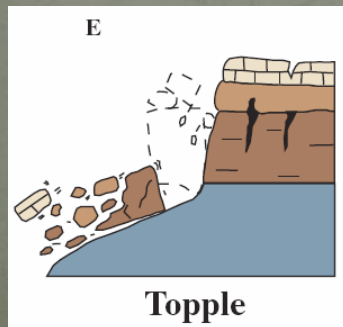
Falls are near vertical movements of masses of geologic materials, such as rocks and/or boulders. They usually occur very rapid.

Toppling failures are distinguished by the forward rotation of the mass about some pivot point

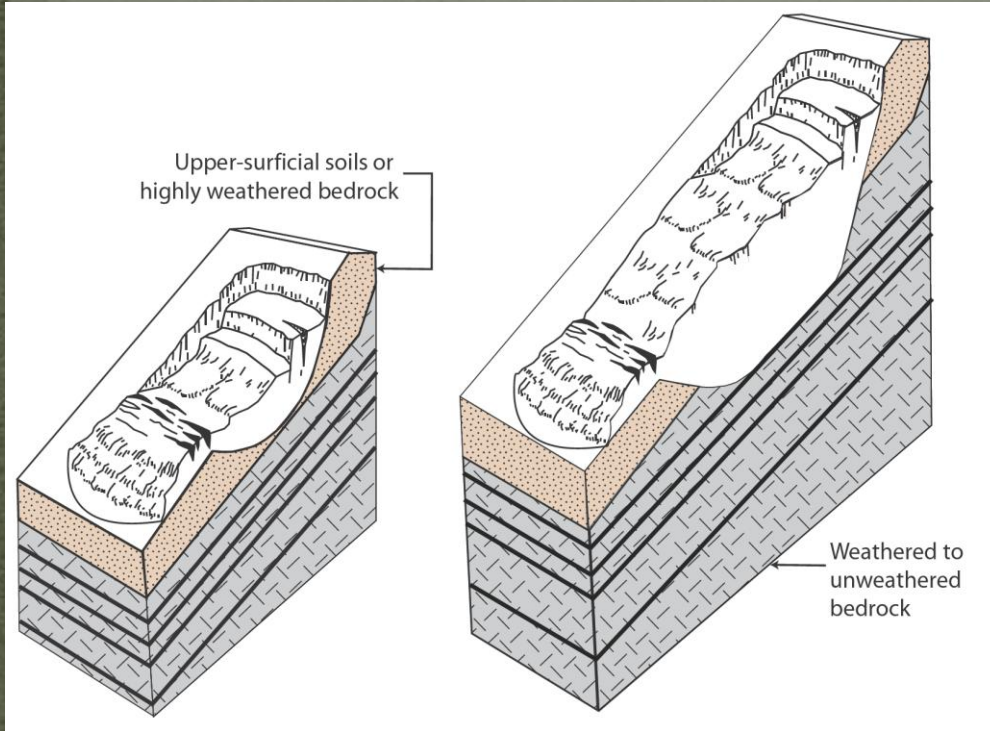
Falls



Topples

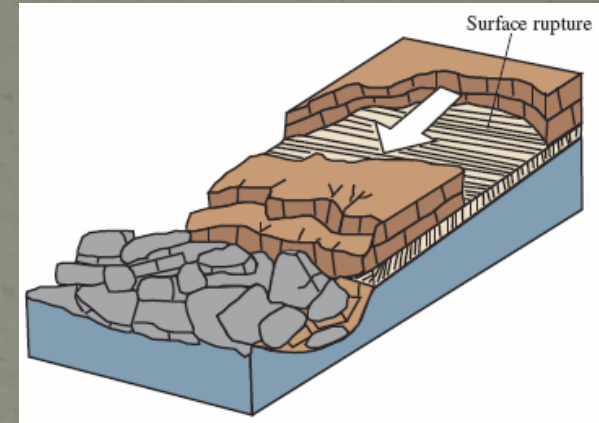


Other Differences

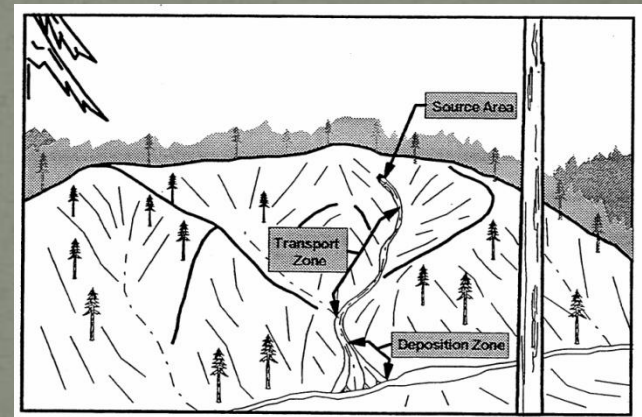


Shallow-Seated

Deep-Seated



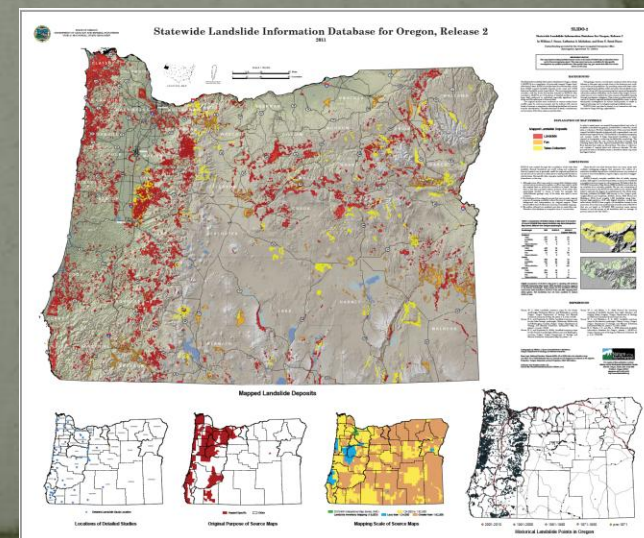
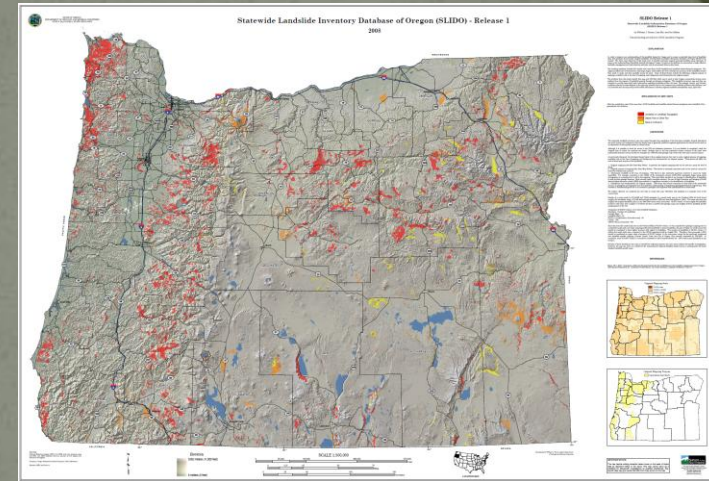
Slow (inches per year)



Fast (50mph) and
Travel Far (miles)

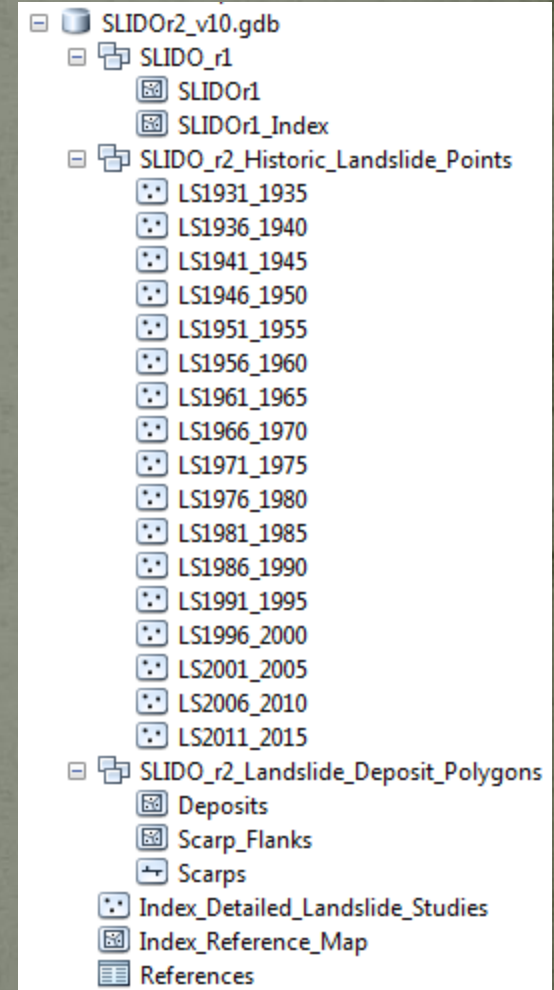
SLIDO – Statewide Landslide Information Database for Oregon

1. SLIDO Release 1, 2008
 - Compilation of previously mapped landslide polygons
 - Mostly scan old paper maps and digitize
 - 257 studies, 15,000 landslides, single shapefile
2. SLIDO Release 2, 2011
 1. More polygons, mainly from lidar mapping
 2. New historic points database
 3. New detailed studies locations database
 4. New reference details



SLIDO R2

1. SLIDO r1
2. Historic Points
3. Mapped Polygons
 1. Deposits
 2. Scarp_Flanks
 3. Scarps
4. Detailed Studies (individual slides)
5. Reference Map and Table



HISTORIC POINTS

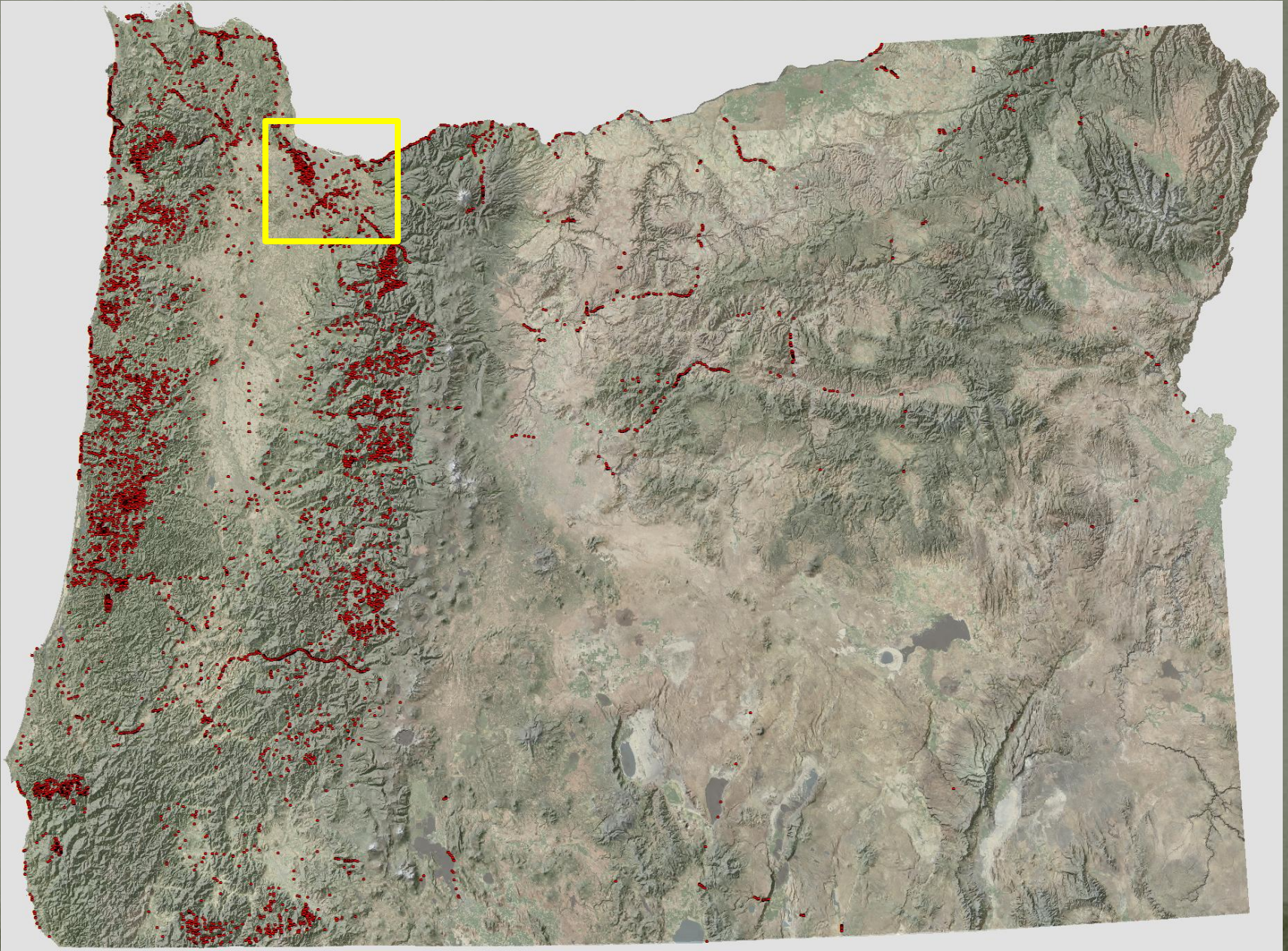
Current Data in SLIDO R2 &
Future Updates

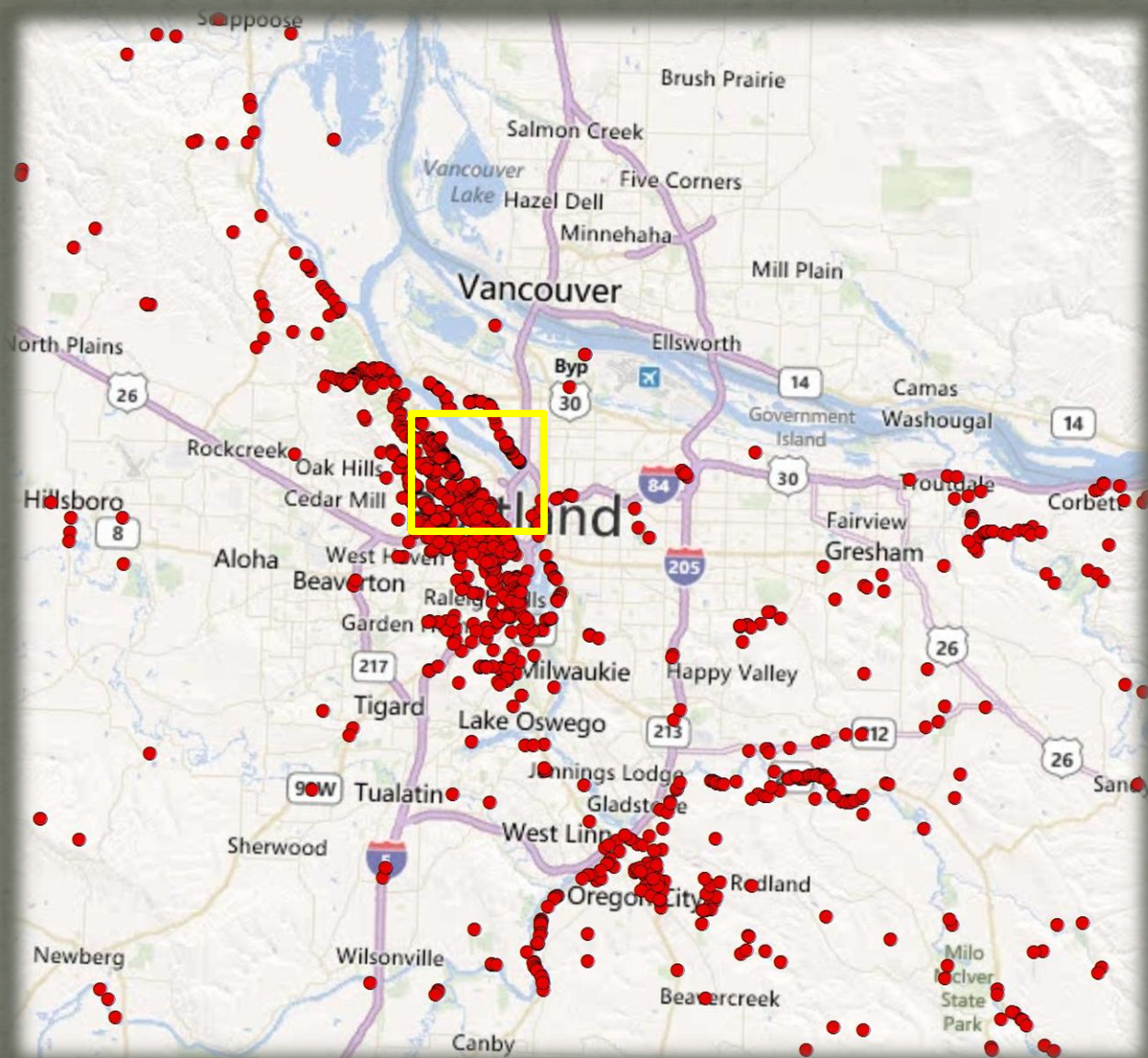
Historic Landslide Points

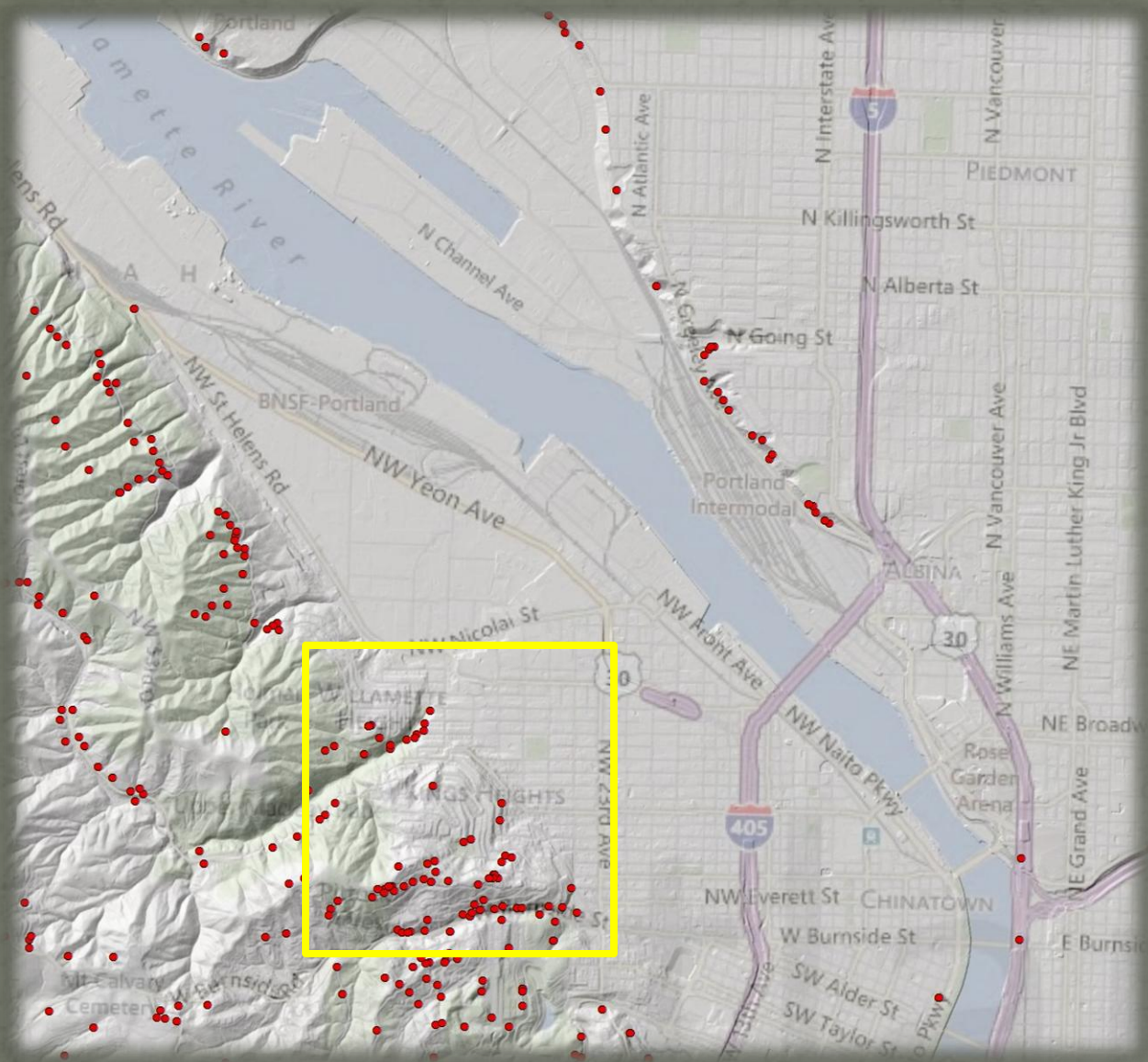
- Centroid points of historic (~1849+) landslides
- Data was compiled from several datasets (primarily 96-97 database and ODOT)
- Each point includes 25 fields (data source, location method, date, size, damage, etc.)

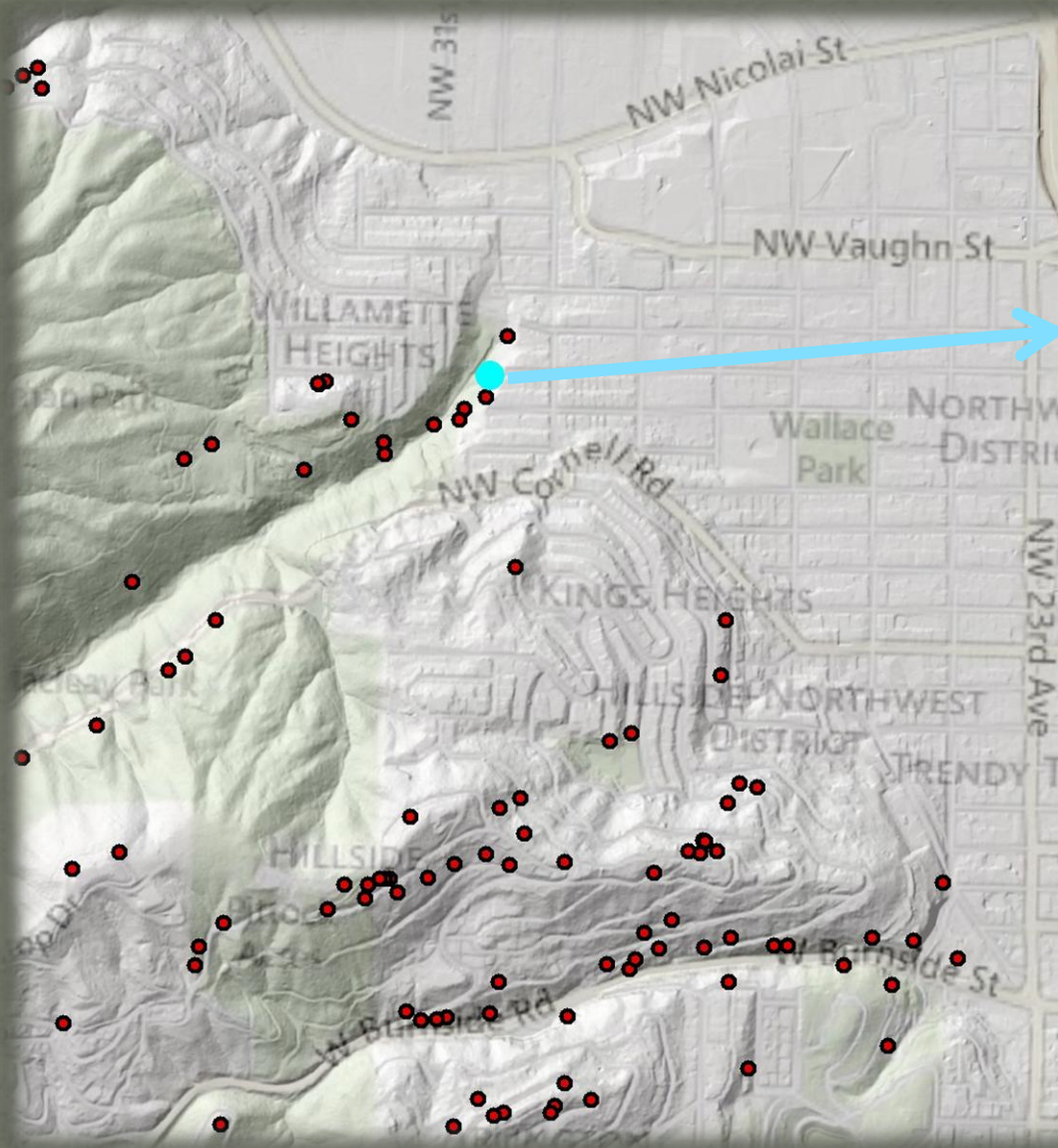
DATA_SOURCE	LOC_METHOD	ORIG_ID	SLIDE_NAME	DATE	LENGTH	WIDTH	DEPTH	SLOPE	TYPE_MOVE	MOVE_CLASS	CONTR_FACT	LOSSES	TYPE_MTRL	AREA_ft2	VOLUME	DEEP_SHAL	Annual_Cost	Repair_Cost	COMMENTS	DAMAGES
Multnomah Coun	Digital 1:24 USGS Q	849	TH3	Feb-96	150	25	30	0		Slide-Rotational	Road Related - Cut		Earth		0					Road Block-near by h
Multnomah Coun	Digital 1:24 USGS Q	850	TH4	Feb-96	300	8	0	38		Flow	Road Related		Earth		0					Road closed
Multnomah Coun	Digital 1:24 USGS Q	851	DV1	Feb-96	200	5	35	42		Slide-Rotational	Road Related		Earth		0					Road unsafe
Multnomah Coun	Digital 1:24 USGS Q	852	RD1	Dec '96-	70	16	32	42		Flow	Road Related		Earth		0					Road Closed
Multnomah Coun	Digital 1:24 USGS Q	853	GC1	Feb-96	150	7	30	38		Slide-Rotational	Road Related		Earth		0					Road unsafe
Multnomah Coun	Digital 1:24 USGS Q	854	GC2	Feb-96	0	0	0	38		Slide-Rotational	Road Related		Earth		0					Road unsafe
Multnomah Coun	Digital 1:24 USGS Q	855	GC3	Feb-96	50	6	25	35		Flow	Road Related		Earth		0					Road unsafe
Multnomah Coun	Digital 1:24 USGS Q	856	BL1	Feb-96	120	6	27	0		Flow	Road Related		Earth		0					Road closed
Multnomah Coun	Digital 1:24 USGS Q	857	HN1	Feb-96	300	30	25	38		Flow	Road Related		Earth		0					Road closed
Multnomah Coun	Digital 1:24 USGS Q	858	LF1	Feb-96	75	12	25	38		Flow	Road Related		Earth		0					Road closed
Multnomah Coun	Digital 1:24 USGS Q	859	LF2	Feb-96	120	12	18	45		Flow	Road Related		Earth		0					Road closed
Wasco County	Vicinity and Locatio	860	Mosier Creek	Feb-96	55	16	30	37		Slide-Translatio			Earth		17650					Threaten integrity of r
Wasco County	Vicinity and Locatio	861	Huskey Road	Feb-96	40	40	19	38		Slide-Translatio			Earth		850					Damaged integrity of
Wasco County	Vicinity and Locatio	862	Wilson Road	Feb-96	55	25	40	38		Slide-Translatio			Earth		6500					Damaged integrity of
Wasco County	Vicinity and Locatio	863	Chenoweth Cr	Feb-96	130	130	100	38		Slide-Translatio			Earth		203750					Threaten integrity of r
Oregon Departm	1:24k Garabaldi Qu	866	G-1	1998/19	60	50	9	0		Fall/Topple			Rock/Debris		27000				Debris/Rock Slide of w	none/potential road bl
Oregon Departm	1:24k Netarts Quad	868	Nk-2	1998/19	20	18	3	0		Fall/Topple			Rock/Debris		1080				Sloughing of sandston	none/road blockage?
Oregon Departm	1:24k Netarts Quad	869	Nk-3	1998/19	20	10	3	0		Fall/Topple			Rock/Debris		600				Sloughing of sandston	none/road blockage?
Oregon Departm	1:24k Netarts Quad	870	Nk-4	1998/19	30	20	5	0		Fall/Topple			Rock/Debris		3000				Sloughing of sandston	none
Oregon Departm	1:24k Netarts Quad	871	Nk-5	1998/19	40	35	3	0		Slide-Rotational	Road Related		Fill		4200				Recent patching	ongoing road sag
Oregon Departm	1:24k Netarts Quad	872	Nk-6	1998/19	60	175	2.5	0		Slide-Rotational	Road Related		Fill		26250				May be flank effect of l	Tension cracks and b
Oregon Departm	1:24k Netarts Quad	873	Nk-7	1999	500	200	20	0		Slide-Translatio	Road Related		Fill/Debris/Earth		2000000				Road cracked and und	Road completely blo
Oregon Departm	1:24k Netarts Quad	874	Nk-8	1998/19	50	60	3	0		Slide-Rotational	Road Related		Fill		900					ongoing road sag
Oregon Departm	1:24k Nestucca Ba	876	SandLake Rd	Jan-99	500	650	30	0		Slide-Translatio	Road Related		Earth		9750000					Complete failure in lar
Oregon Departm	1:24k Neskowin Qu	880	Nk-2	1997	300	600	8	0		Slide-Rotational	Road Related		Fill		1440000				From ODOT Region 2 r	
Oregon Departm	Digitized from field	896		Dec '96-	0	0	0	0			Road Related				0					
Oregon Departm	Digitized from field	897		Dec '96-	0	0	0	0			Road Related				0					
Oregon Departm	Digitized from field	898		Dec '96-	0	0	0	0			Road Related				0					
Oregon Departm	Digitized from field	899		Dec '96-	0	0	0	0		Flow			Debris		0					

10,636 Historic Landslide Points









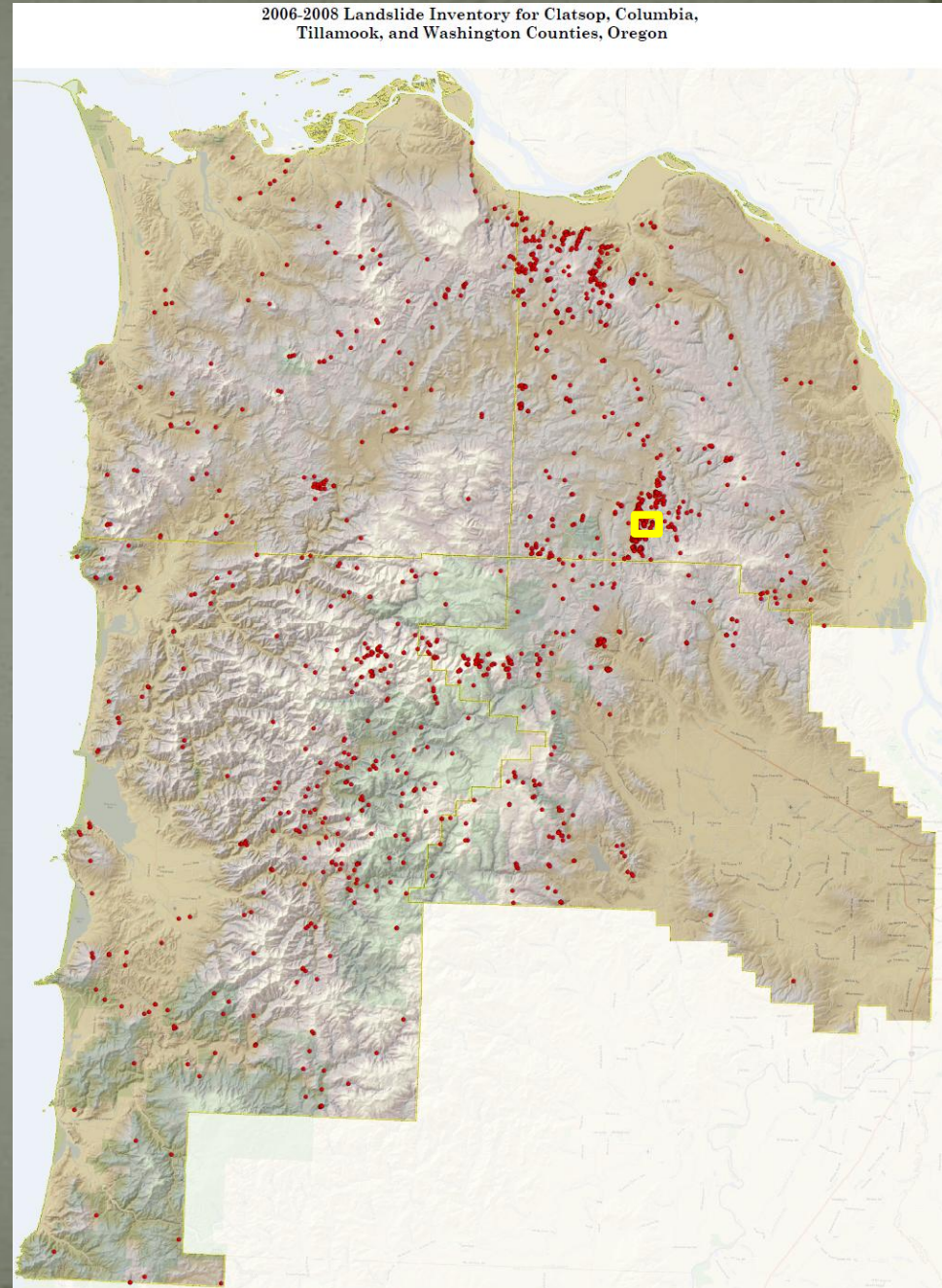
Location:	745,391.107 1,387,142.478 Feet
Field	Value
FID	1580
Shape	Point
REF_ID_COD	HoffrJ2000
UNIQUE_ID	
DATA_SOURC	Portland Metro Data Resource Center/Portland State University
LOC_METHOD	GIS file provided - digitized from field mapping on 1:24k quads.
ORIG_ID	2191
SLIDE_NAME	Dead End of NW Savier St.
DATE	Feb-96
LENGTH_ft	10
WIDTH_ft	15
DEPTH_ft	2
SLOPE	30
TYPE_MOVE	
MOVE_CLASS	Flow
CONTR_FACT	Human/Water
TYPE_MTRL	Earth
AREA_ft2	0
VOLUME_ft3	297
DEEP_SHAL	
DAMAGES	
LOSSES	
COMMENTS	
Annual_Cos	0
Repair_Cos	0

Future Updates to Historic Points

- ODOT data
 - Keep adding as they get put into GIS
 - Add future landslides
- Future storms
 - Example: January 2012 storm – 40 slide
- Orthophotos
 - Example: 2007 storm
 - 1995, 2000, 2005, 2009, 2011
- Aerial Photos
 - Example: Mt. Hood (points and sometimes polygons)
 - 1930s to present

Differential Photo Analysis

- 2007 December Storm
- Multiple studies document 1,000s of landslides SW Washington
- No regional studies in Oregon
- 2005-2009 NAIP
- 1,400 landslides
- Method Paper Coming Soon !





2005 NAIP



2009 NAIP



Mapped Historic Landslide Points

First Return



Bare Earth



MAPPED POLYGONS

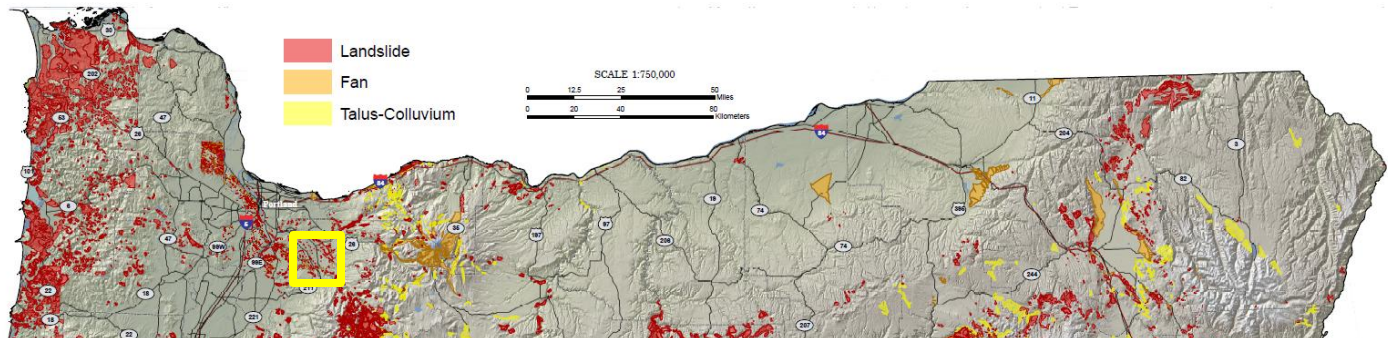
Current Data in SLIDO R2 &
Future Updates

Mapped Polygons

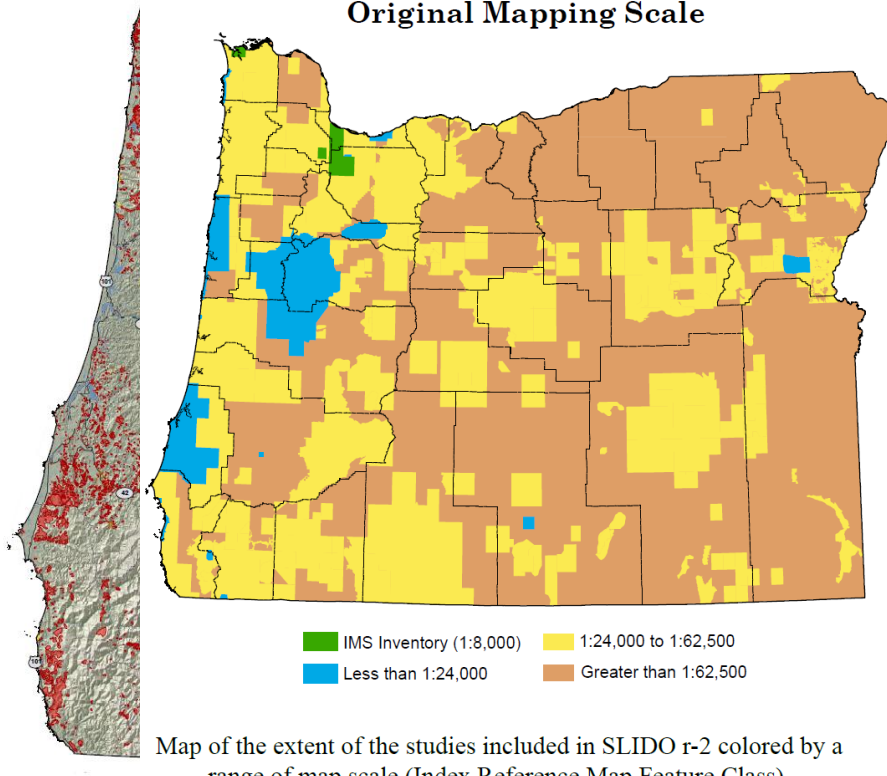
- Mostly compilation of mapped landslide deposits (polygons)
 - Results in polygons on top of polygons due to authors interpretation
 - Do not know which author is correct, therefore we included all polygons to be conservative
- Lidar-based mapping areas we stamp out ALL existing data and replaced with new
 - This is primary process for future updates.
- Each polygon includes 31 fields (2,100 out of 22,000 <10%)

OBJECTID *	SHAPE *	UNIQUE_ID	TYPE_MOVE	MOVE_CLASS	MOVE_CODE	CONFIDENCE	AGE	DATE_MOVE	NAME	GEOL	SLOPE	HS_HEIGHT	FAN_HEIGHT	FAIL_DEPTH	DEEP_SHAL	HS_I51	IS1_IS2	IS2_IS3	IS3_IS4	HD_AVE	DIRECT	AREA	VOL	QUADNAM	REF_ID_COD	MAP_UNIT_L	Descrip	SHAPE_Length	SHAPE_Area
558	Polygon	Oregon_City_539	Slide	Complex-Earth SI	ES-R-EFL	Low (≤+10)	Pre-His	<Null>	<Null>	Obo, QTs	20	50	<Null>	40.987808	Deep	<Null>	<Null>	<Null>	<Null>	<Null>	180	352920.16	16582	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	2276.465085	352921.557253
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560	Polygon	Oregon_City_541	Slide	Complex-Earth SI	ES-R-EFL	Moderate (11-2)	Pre-His	<Null>	<Null>	Oqh, QTs	22	25	<Null>	23.181511	Deep	142	<Null>	<Null>	<Null>	142	270	521067.19	12079	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	2929.209791	521069.26395
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564	Polygon	Oregon_City_547	Slide	Rock Slide-Rotat	RS-R	Moderate (11-2)	Pre-His	<Null>	<Null>	Tl	23	20	<Null>	18.410688	Deep	50	50	<Null>	<Null>	50	135	950969.94	17854	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	4476.740089	950913.785131
566	Polygon	Oregon_City_549	Slide	Complex-Earth SI	ES-R-EFL	Moderate (11-2)	Pre-His	<Null>	<Null>	Tl	20	15	<Null>	14.096342	Shallow	118	72	101	<Null>	97	45	754551.13	10638	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	4082.395013	754554.169296
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569	Polygon	Oregon_City_204	Slide	Complex	RS-R-EFL	High (≥+30)	Pre-His	<Null>	<Null>	Tl	15	65	<Null>	62.787521	Deep	125	175	<Null>	<Null>	150	247.5	3419776	21471	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	9743.291654	3419789.557812
571	Polygon	Oregon_City_555	Slide	Complex-Earth SI	ES-R-EFL	Moderate (11-2)	Pre-His	<Null>	<Null>	Tl, Qff	14	15	<Null>	14.554908	Shallow	<Null>	<Null>	<Null>	<Null>	315	254649.97	37064	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	2528.669708	254650.993837	
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575	Polygon	Oregon_City_560	Slide	Complex-Earth SI	ES-R-EFL	Moderate (11-2)	Pre-His	<Null>	<Null>	Obo, QTs	35	35	<Null>	28.676849	Deep	<Null>	<Null>	<Null>	<Null>	135	175689.66	50382	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	1798.628149	175690.362415	
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579	Polygon	Oregon_City_565	Slide	Complex	RS-R-EFL	Moderate (11-2)	Pre-His	<Null>	<Null>	Obo, QTs	25	55	<Null>	49.852325	Deep	350	240	<Null>	<Null>	295	180	1686232.4	84062	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	7032.445814	1686239.150537
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581	Polygon	Oregon_City_234	Slide	Complex	RS-R-EFL	High (≥+30)	Pre-His	<Null>	<Null>	Tl	15	40	0	38.638477	Deep	100	100	150	0	117	135	3270775	12637	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	8524.348839	3270788.663515
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587	Polygon	Oregon_City_577	Slide	Complex-Earth SI	ES-R-EFL	High (≥+30)	Pre-His	<Null>	<Null>	Tbc, Tl	15	60	<Null>	57.957714	Deep	111	177	<Null>	<Null>	144	292.5	1362900.5	78990	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	5874.315863	1516329.868844
597	Polygon	Oregon_City_587	Slide	Complex-Earth SI	ES-R-EFL	Moderate (11-2)	Pre-His	<Null>	<Null>	Tvc, Tl	20	15	<Null>	14.096342	Shallow	108	244	<Null>	<Null>	176	337.5	1813292.06	25660	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	1945.90984	181329.787682
598	Polygon	Oregon_City_588	Slide	Complex-Earth SI	ES-R-EFL	High (≥+30)	Pre-His	<Null>	<Null>	Tl	14	20	<Null>	19.405544	Deep	141	<Null>	<Null>	<Null>	141	90	455582.94	88412	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	3894.891159	455584.751515
601	Polygon	Oregon_City_592	Slide	Complex-Earth SI	ES-R-EFL	Moderate (11-2)	Pre-His	<Null>	<Null>	Tl	23	40	<Null>	18.411768	Deep	130	<Null>	<Null>	<Null>	130	135	514072.63	94849	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	3597.31521	598662.845281
608	Polygon	Oregon_City_600	Slide	Complex-Earth SI	ES-R-EFL	Moderate (11-2)	Pre-His	<Null>	<Null>	Tl	30	40	<Null>	34.64591	Deep	76	<Null>	<Null>	<Null>	76	315	284585.97	98599	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	2616.463166	284587.991739
609	Polygon	Oregon_City_601	Slide	Earth Slide-Rotat	ES-R	Moderate (11-2)	Histon	<Null>	<Null>	Tbc	22	15	<Null>	13.908906	Shallow	<Null>	<Null>	<Null>	<Null>	337.5	54592.914	75932	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	981.599982	54593.131967	
610	Polygon	Oregon_City_603	Slide	Complex-Earth SI	ES-R-EFL	Moderate (11-2)	Pre-His	<Null>	<Null>	Tl	20	14	<Null>	13.156587	Shallow	<Null>	<Null>	<Null>	<Null>	1257.414015	73923.414	97257	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	1257.414015	73923.707268	
615	Polygon	Oregon_City_608	Slide	Complex-Earth SI	ES-R-EFL	Moderate (11-2)	Pre-His	<Null>	<Null>	Tl	18	30	<Null>	28.533245	Deep	112	<Null>	<Null>	<Null>	112	90	211573.75	60368	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	2388.568146	211574.595547
616	Polygon	Oregon_City_609	Slide	Complex-Earth SI	ES-R-EFL	Moderate (11-2)	Histon	<Null>	<Null>	Tl	20	35	<Null>	32.891464	Deep	<Null>	<Null>	<Null>	<Null>	337.5	72763.32	23932	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	1006.658622	72763.61522	
620	Polygon	Oregon_City_615	Slide	Earth Slide-Rotat	ES-R	Moderate (11-2)	Histon	<Null>	<Null>	Tbc, Tl	28	25	<Null>	22.076742	Deep	<Null>	<Null>	<Null>	<Null>	360	55057.512	12154	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	929.774022	55057.730063	
621	Polygon	Oregon_City_616	Slide	Earth Slide-Rotat	ES-R	Moderate (11-2)	Histon	<Null>	<Null>	Tbc, Tl	28	40	<Null>	35.322978	Deep	<Null>	<Null>	<Null>	<Null>	337.5	52229.297	18448	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	845.012283	52229.506126	
622	Polygon	Oregon_City_617	Slide	Complex	RS-R-EFL	Moderate (11-2)	Pre-His	<Null>	<Null>	Tl, Tbc	10	40	<Null>	39.392956	Deep	130	<Null>	<Null>	<Null>	130	157.5	555501.31	21922	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	3809.031681	625300.409993
623	Polygon	Oregon_City_618	Slide	Earth Slide-Rotat	ES-R	Moderate (11-2)	Histon	<Null>	<Null>	Tvc	20	15	<Null>	14.096342	Shallow	<Null>	<Null>	<Null>	<Null>	45	7371.8901	10391	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	345.582649	7371.919724	
626	Polygon	Oregon_City_621	Slide	Earth Slide-Rotat	ES-R	Moderate (11-2)	Histon	<Null>	<Null>	Tl	20	25	<Null>	23.493904	Deep	<Null>	<Null>	<Null>	<Null>	315	37168.758	87323	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	712.279979	37168.907188	
627	Polygon	Oregon_City_622	Slide	Complex-Earth SI	ES-R-EFL	Moderate (11-2)	Histon	<Null>	<Null>	Tl	25	50	<Null>	45.320297	Deep	<Null>	<Null>	<Null>	<Null>	22.5	57054.969	25857	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	1042.736991	57055.198859	
628	Polygon	Oregon_City_623	Slide	Complex-Earth SI	ES-R-EFL	Moderate (11-2)	Pre-His	<Null>	<Null>	Tl	25	16	<Null>	14.502495	Shallow	87	<Null>	<Null>	<Null>	87	202.5	96066.711	13932	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	1330.767024	96067.993702
630	Polygon	Oregon_City_627	Slide	Complex	RS-R-EFL	High (≥+30)	Pre-His	<Null>	<Null>	Tbc	30	40	<Null>	34.64591	Deep	100	100	122	<Null>	107	315	527566.06	18281	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	3631.631876	527568.166677
631	Polygon	Oregon_City_628	Slide	Complex	RS-R-EFL	Moderate (11-2)	Pre-His	<Null>	<Null>	Tbc	40	70	<Null>	53.638832	Deep	77	168	88	<Null>	111	67.5	237911.92	12761	Oregon_Ct	BurnWJ2010a	<Null>	Landslide	2669.359062	237912.874375

22,154 Mapped Landslide Deposits

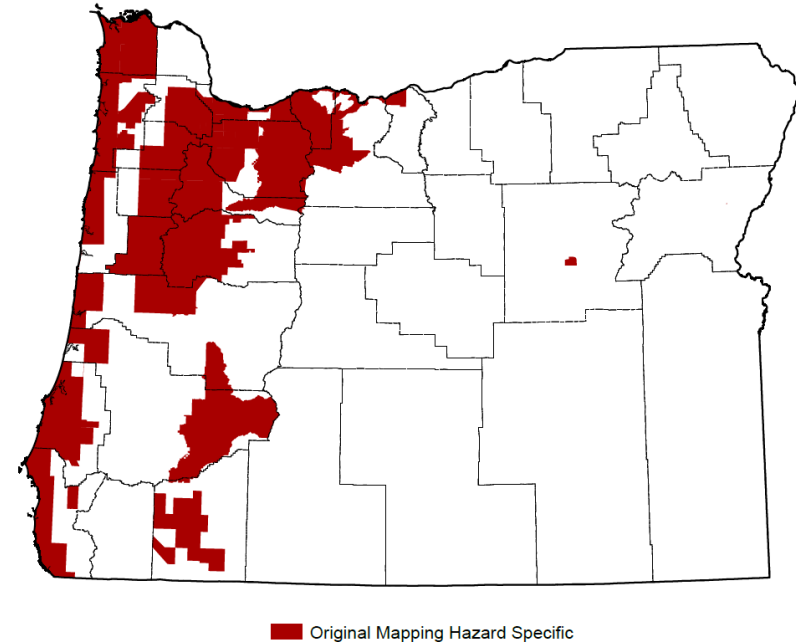


Original Mapping Scale

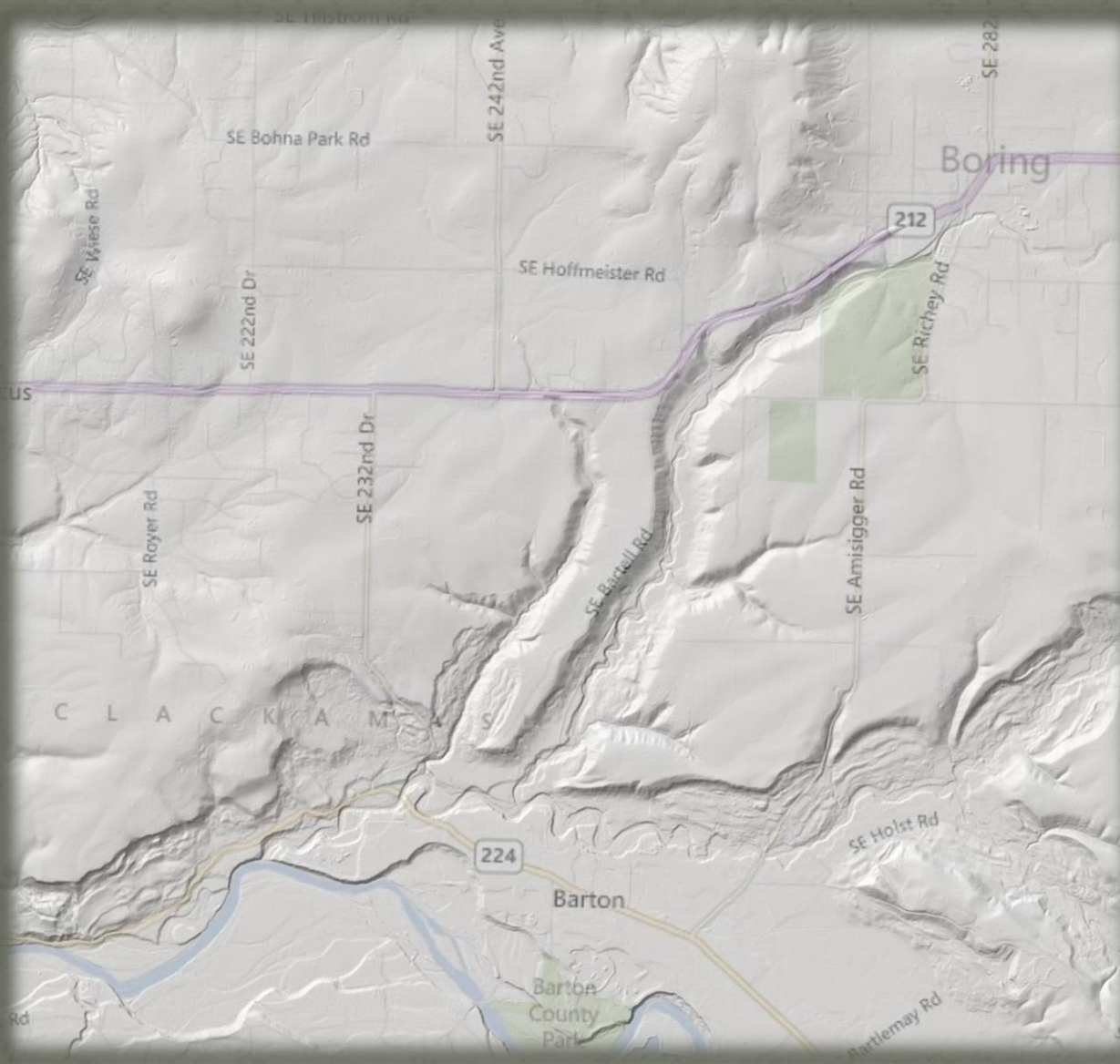


Map of the extent of the studies included in SLIDO r-2 colored by a range of map scale (Index Reference Map Feature Class).

Original Mapping Purpose

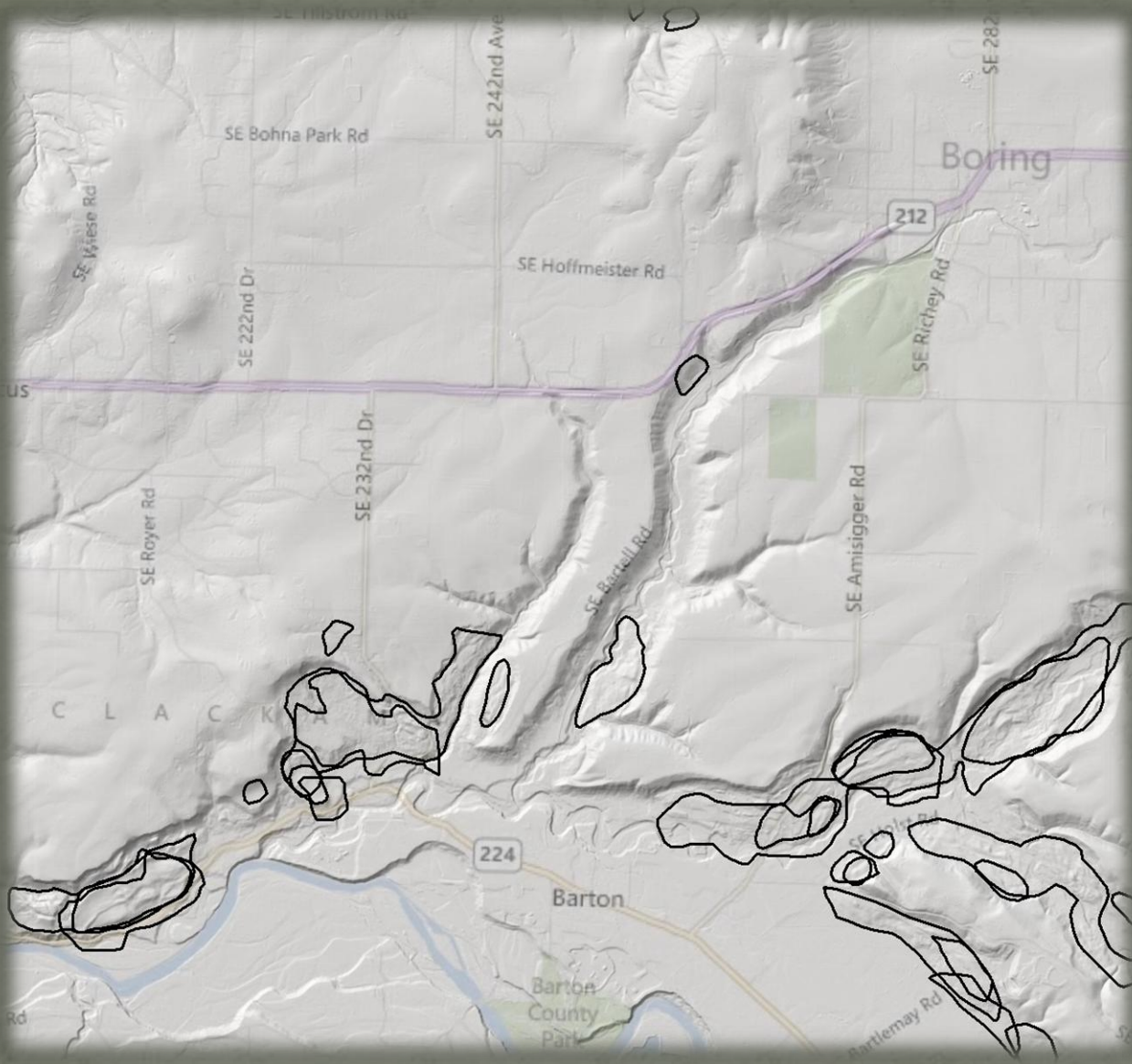


Map of areas where the original mapping purpose was hazard specific (red areas) versus general geologic mapping (Index Reference Map Feature Class).



Lidar + Basemap

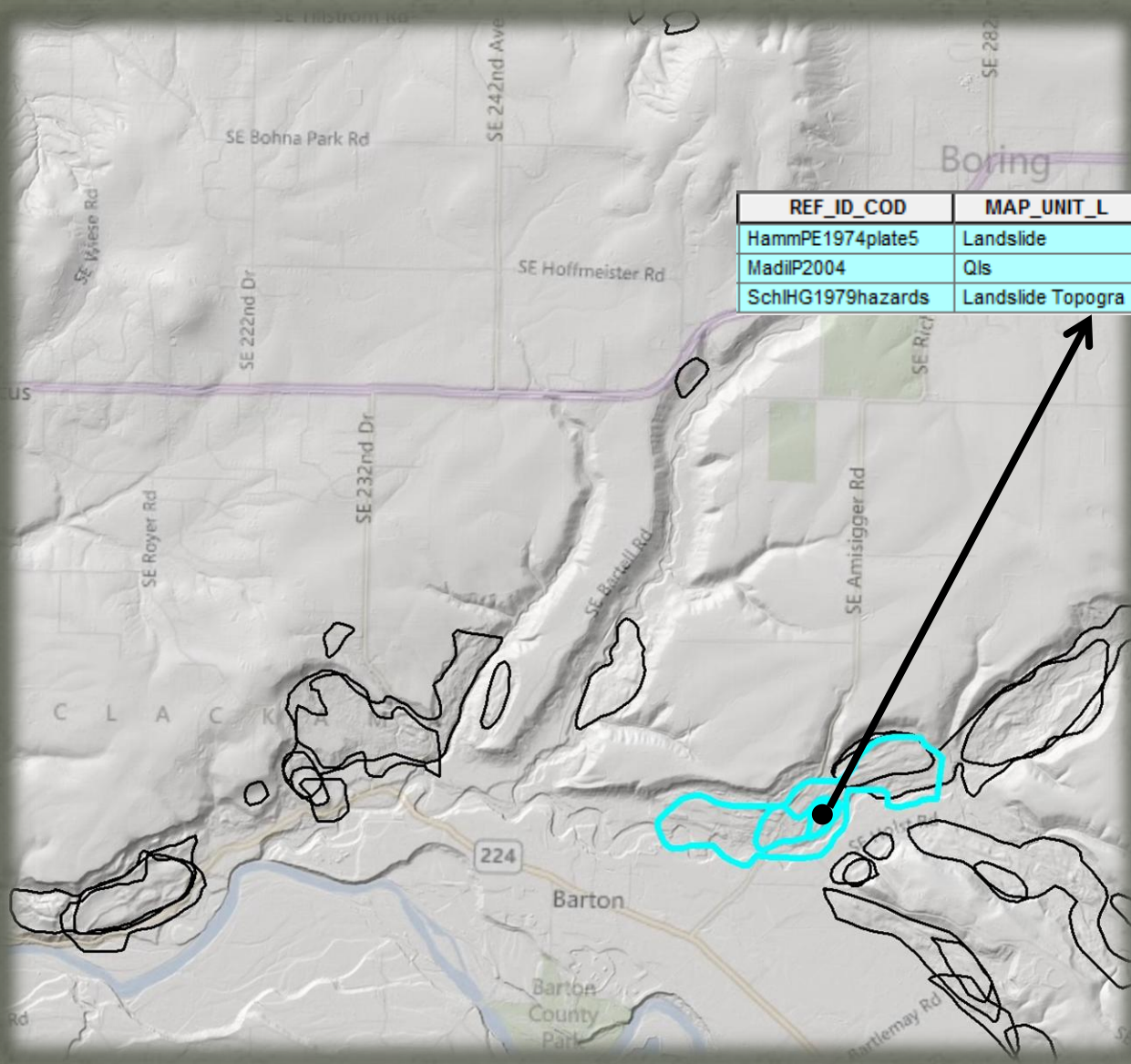
Can See the
Landslides !



SLIDO r2

Polygons on top of
polygons !

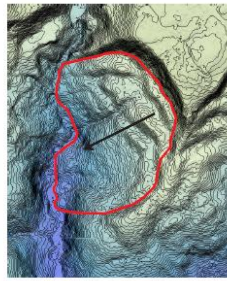
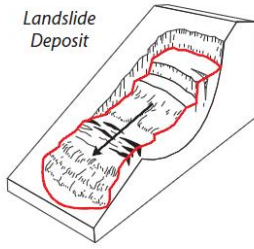
Generalized location
of all the landslide
features.



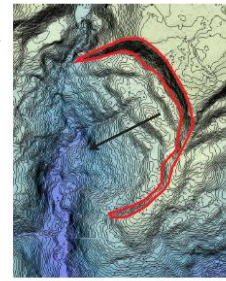
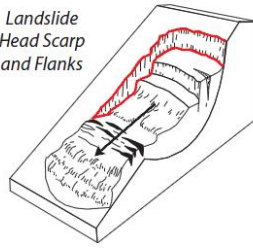
SLIDO r2

REF_ID_COD	MAP_UNIT_L	Descrip	SHAPE_Length	SHAPE_Area
HammPE1974plate5	Landslide	Landslide	16056.850481	6927731.490082
MadilP2004	Qls	Landslide	2327.43188	327521.908611
SchlHG1979hazards	Landslide Topogra	Landslide	4792.608738	1052415.773922

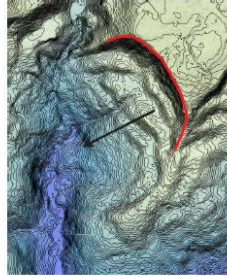
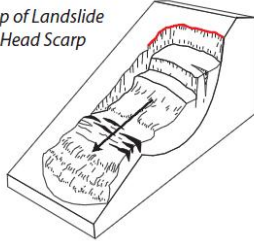
Landslide
Deposit



Landslide
Head Scarp
and Flanks



Top of Landslide
Head Scarp



Internal
Scarps

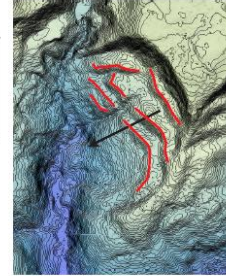
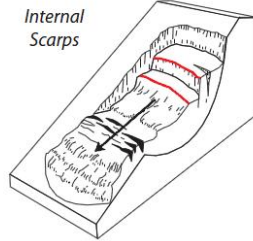
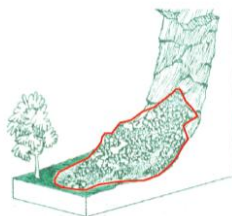
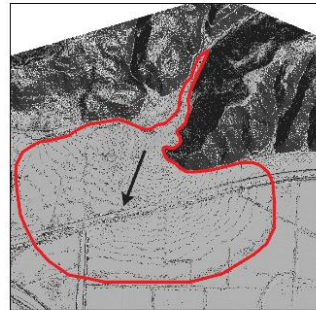
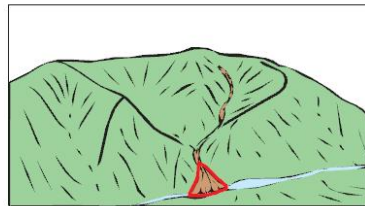


Figure 12. Block diagrams and map views showing the four kinds of spatial data compiled for each landslide.



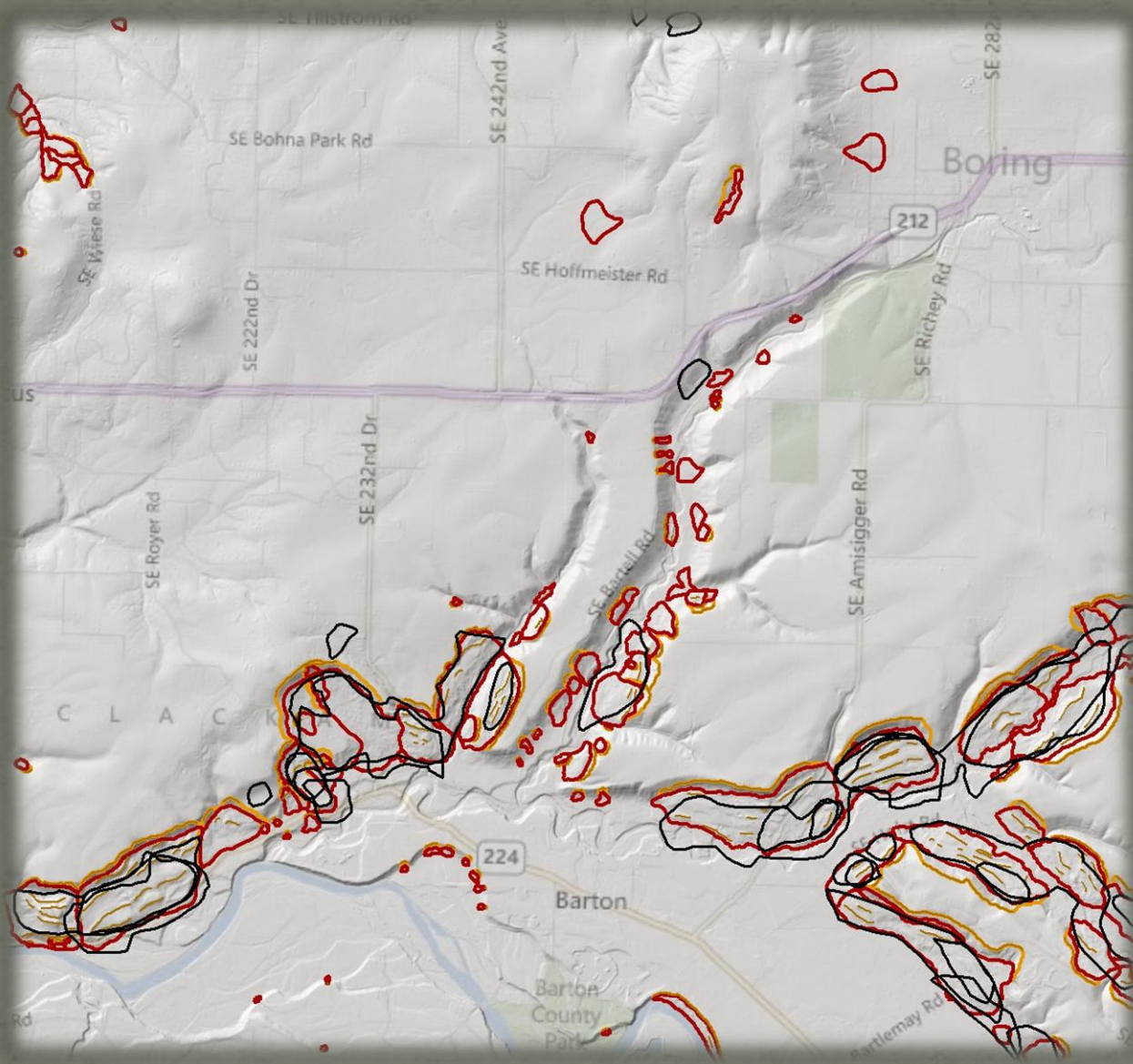
Lidar-based Polygons

Main Deposit (red)

Head Scarp & Flanks
(orange)

Internal Scarps
(brown)

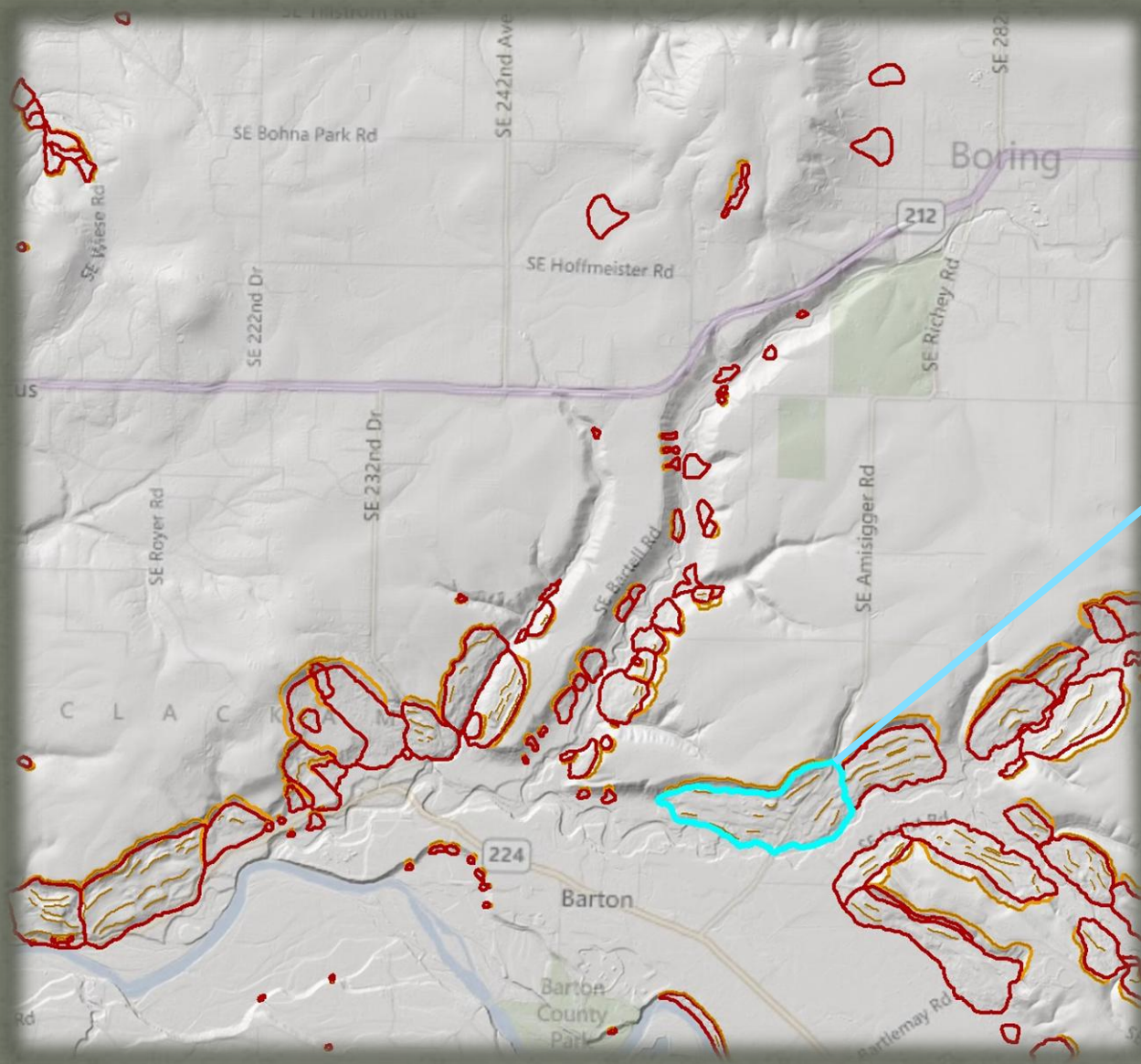
Publish as:
Interpretive Map
Series (IMS)



Lidar-Based Polygons

Plus SLIDO r2

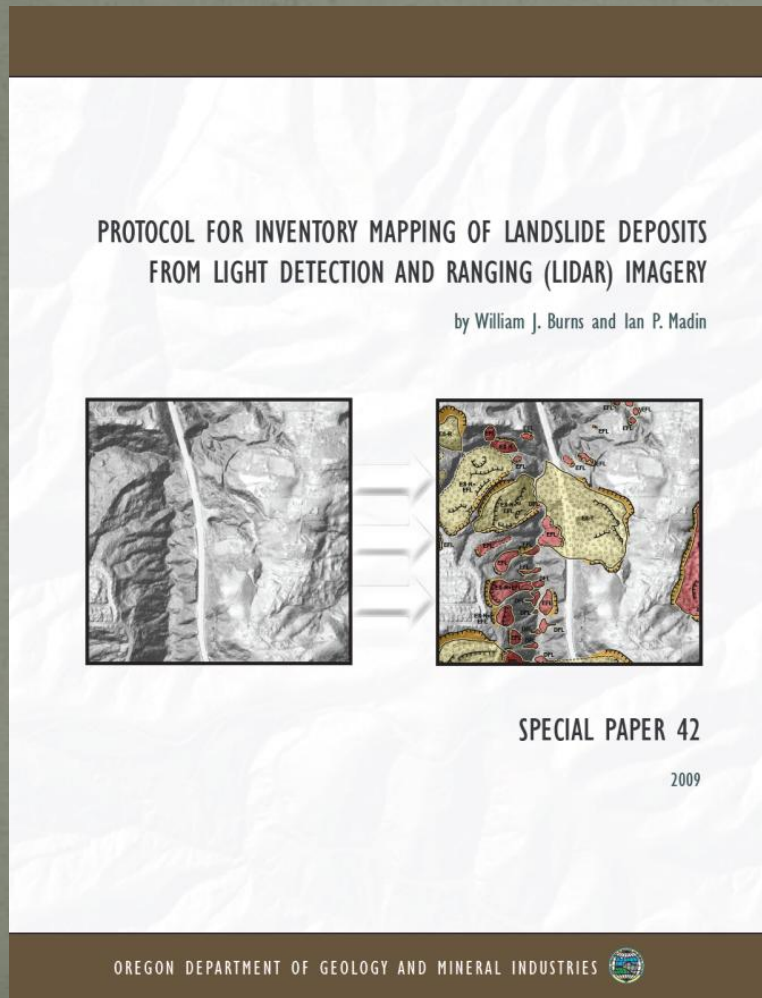
Some come and
some go !



Location: 826,870.522 1,333,331.971 Feet

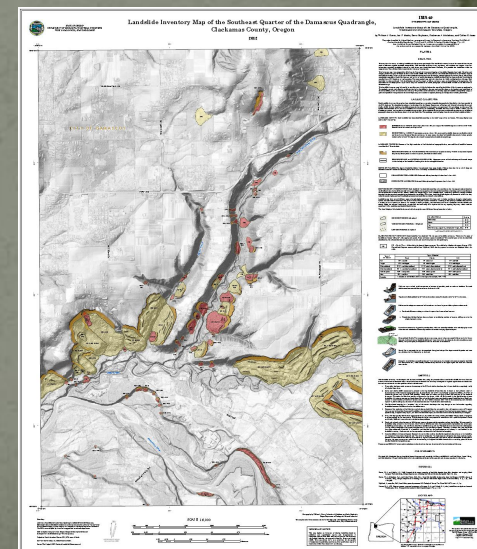
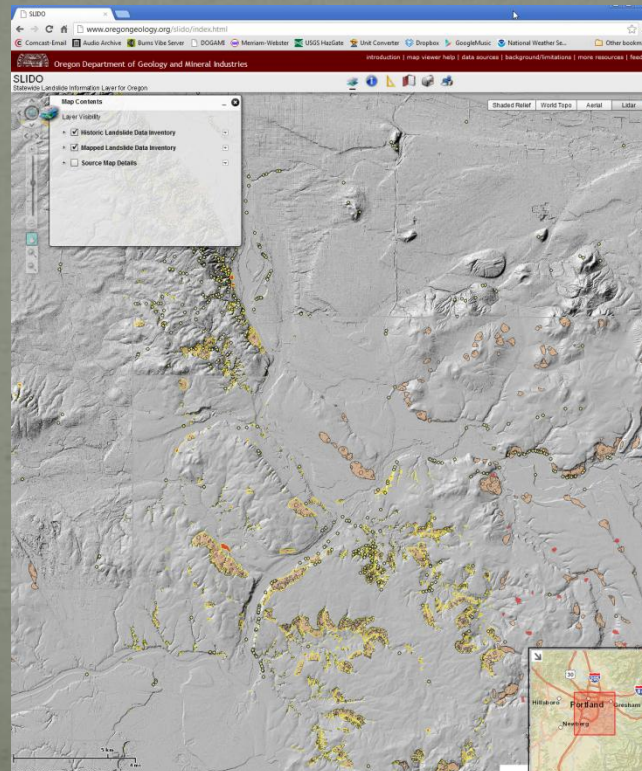
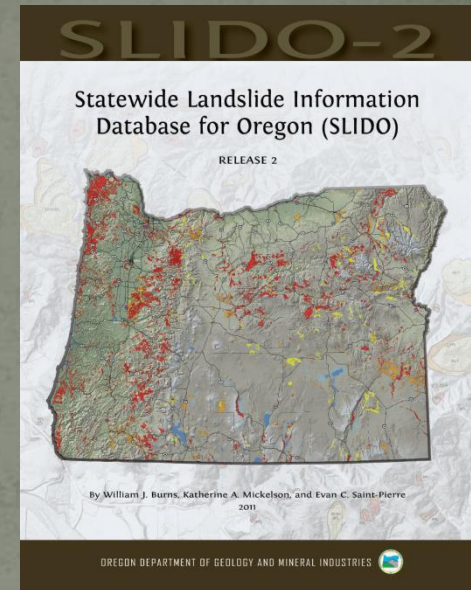
Field	Value
OBJECTID	61
SHAPE	Polygon
SHAPE_Length	10572.065648
SHAPE_Area	4405170.340066
UNIQUE_ID	Damascus_175
TYPE_MOVE	Complex
MOVE_CLASS	Complex
MOVE_CODE	RS-T+ES-R+EFL
CONFIDENCE	High (=>30)
AGE	Pre-Historic (>150yrs)
DATE_MOVE	<null>
NAME	
GEOL	QTs
SLOPE	8
HS_HEIGHT	150
FAN_HEIGHT	<null>
FAIL_DEPTH	148.5491
DEEP_SHAL	Deep
HS_IS1	307
IS1_IS2	626
IS2_IS3	311
IS3_IS4	<null>
HD_AVE	<null>
DIRECT	157.5
AREA	4405152.5
VOL	654381440
QUADNAME	Damascus

Created a Protocol for Inventory Mapping of Landslides From Lidar - SP-42: Burns and Madin, 2009



- Activity
 - Historic or Prehistoric
- Depth of Failure
 - Shallow or Deep
- Certainty of Identification
 - Low, mod, high
- Type of Landslide
 - Slide, flow, fall, topple, spread
- Slope, geology, direction...
- 30 attributes in the GIS files

- Geodatabase from Oregon Spatial Data Library
- View Interactive Web Map (DOGAMI)
- Publications from DOGAMI



Oregon Spatial Data Library

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[DOWNLOAD](#)

[ORIGEN EXPLORER](#)

[LAUNCH MAP VIEWER](#)

Search

Landslides

☒ Records shown from this Site
Click here to select different site or collapse search.

[Additional Options](#)
[Clear](#)
[WHERE](#)

☒ Anywhere
 ☐ Intersecting
 ☐ Fully within

FRAMEWORK DATA

[Admin Boundaries](#) | [Bioscience](#) | [Cadastral](#) | [Climate](#) | [Elevation](#) | [Geospatial Context](#) | [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 features drive shallow landslides.

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[Metadata](#)
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SLID0 2 r2011 Landslide Datasets

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 events can exceed \$100 million (Wang and others, 2002). As population...

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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.

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Oregon Tsunami Inundation Line

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

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See results through REST API: [GEOSS](#) [ATOM](#) [HTML](#) [FRAGMENT](#) [KML](#) [JSON](#)

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Why do we want to know where existing landslides are located?

Example: Neighborhood in East Astoria
Small amount of grading caused big problem



Grading



Neighborhood starts moving



Compared to recent mapping



Regulation?

- City or county regulation tied to new maps
 - Building permit or proposed grading permit conditions
 - Must assure site will be more stable during and after construction
 - Could have been avoided?



Why is All of this Important ?

Oregon is Landslide Country!

- Landslide hazards are unique
- Example: Earthquake & Flood hazards
 - Have been studied in detail for centuries
 - Much better understanding of the hazard
 - Resulted in availability of insurance
 - Also, lots of help from the Federal Government (FEMA, USGS, NOAA, NEHRP, etc) pre & post disasters
- Majority of events, all is lost.

Questions ?
