

The following was presented at DMT'10
(May 16-19, 2010).

The contents are provisional and will be
superseded by a paper in the
DMT'10 Proceedings.

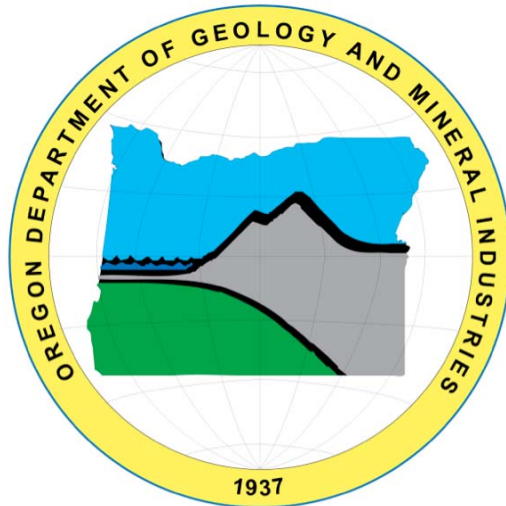
See also earlier Proceedings (1997-2009)

<http://ngmdb.usgs.gov/info/dmt/>



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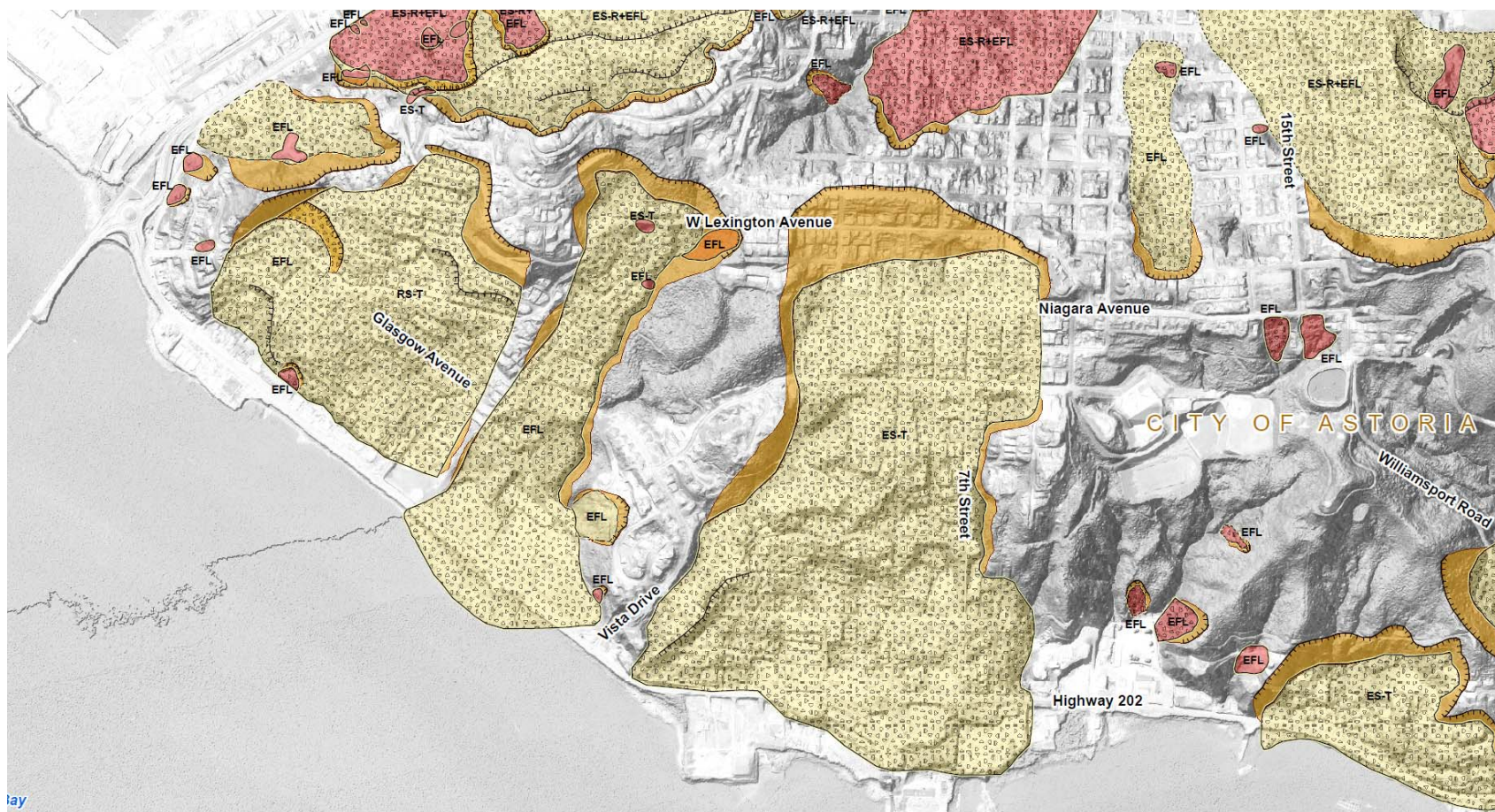
Mapping Regulatory Floodplains with Lidar and USGS StreamStats



Jed Roberts* and John English
*Oregon Department of Geology
and Mineral Industries (DOGAMI)*



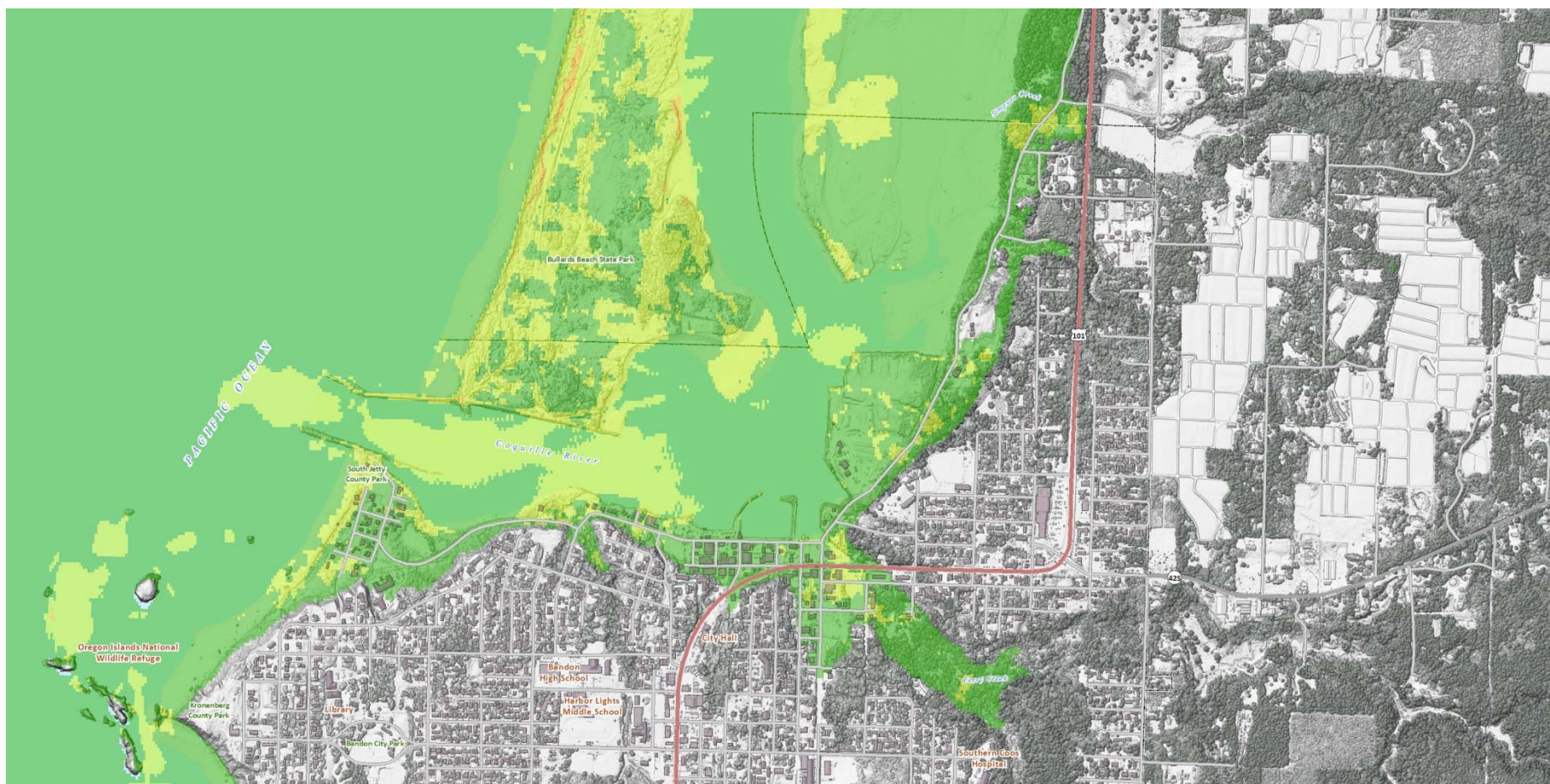
DOGAMI Ramping Up Natural Hazard Assessment Landslide Inventories...





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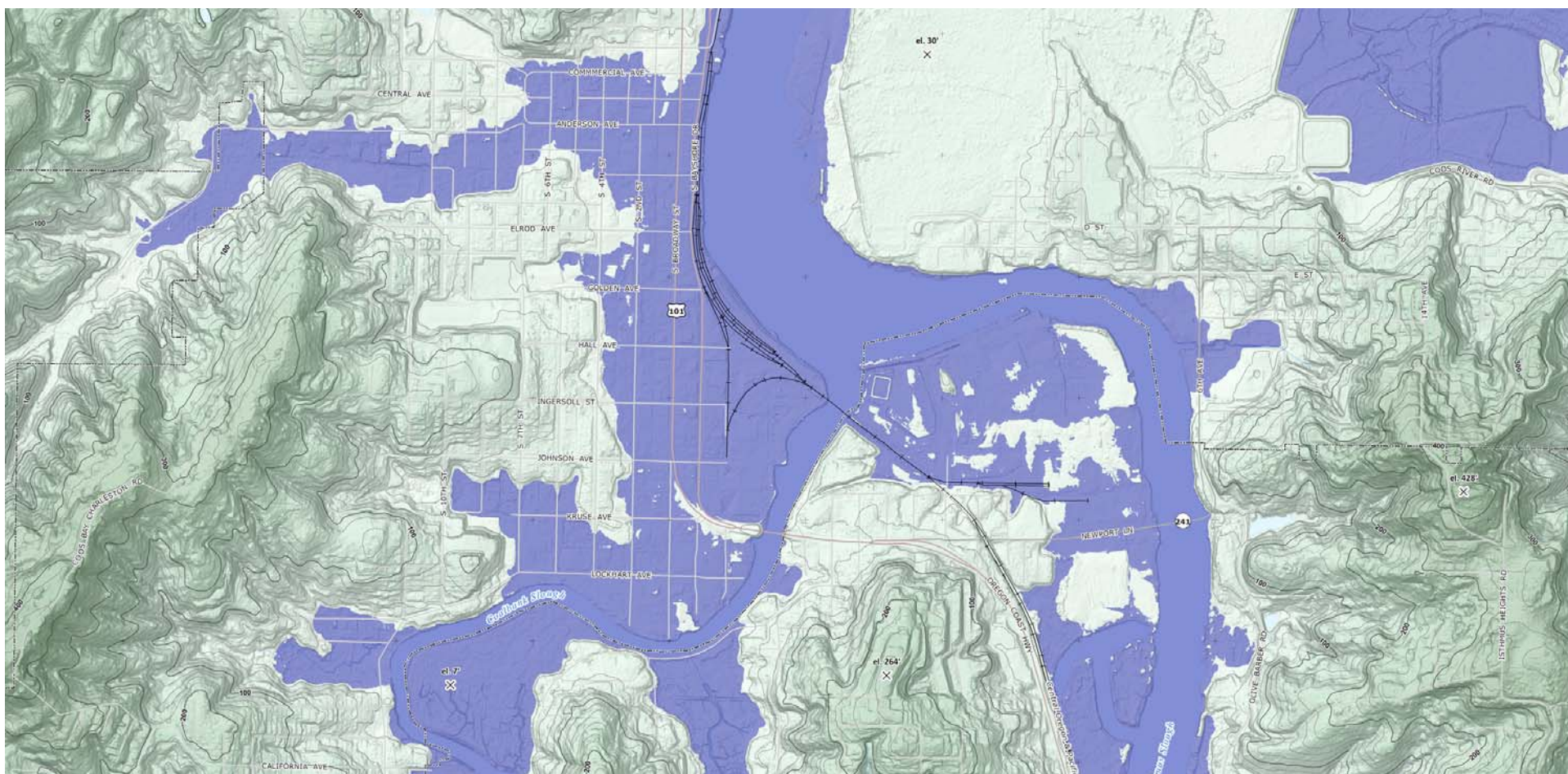
DOGAMI Ramping Up Natural Hazard Assessment Tsunami Inundation Modeling...





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DOGAMI Ramping Up Natural Hazard Assessment And now... Riverine and Coastal Flood Mapping





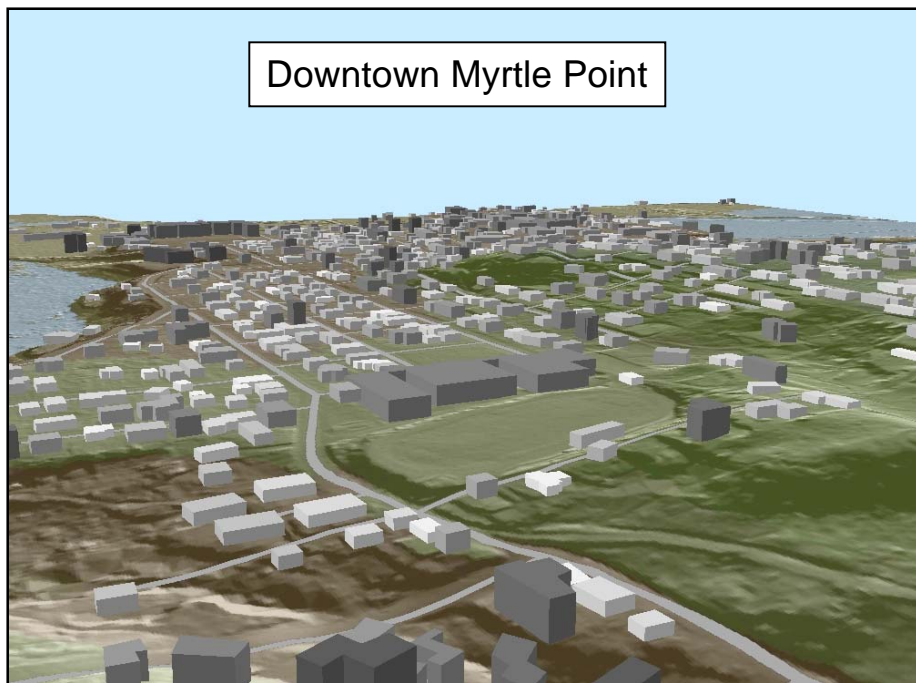
Funded by FEMA's RiskMAP Program

Project deliverables include:

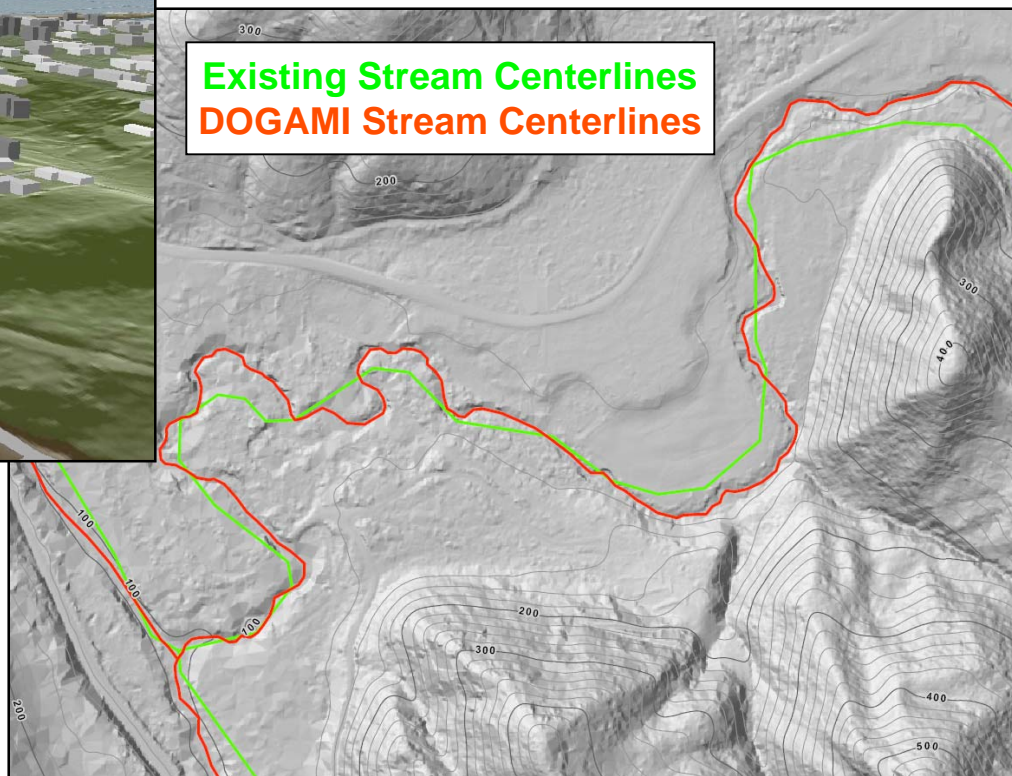
- 1) New and improved lidar base maps – **done!**
- 2) Redelineation of flood zones to fit lidar – **done!**
- 3) Development of flood stage elevations – **done!**
- 4) Loss estimation maps and reports – **in progress**
- 5) Multi-hazard web mapping tool – coming soon



Lidar Base Mapping | Feature Extraction



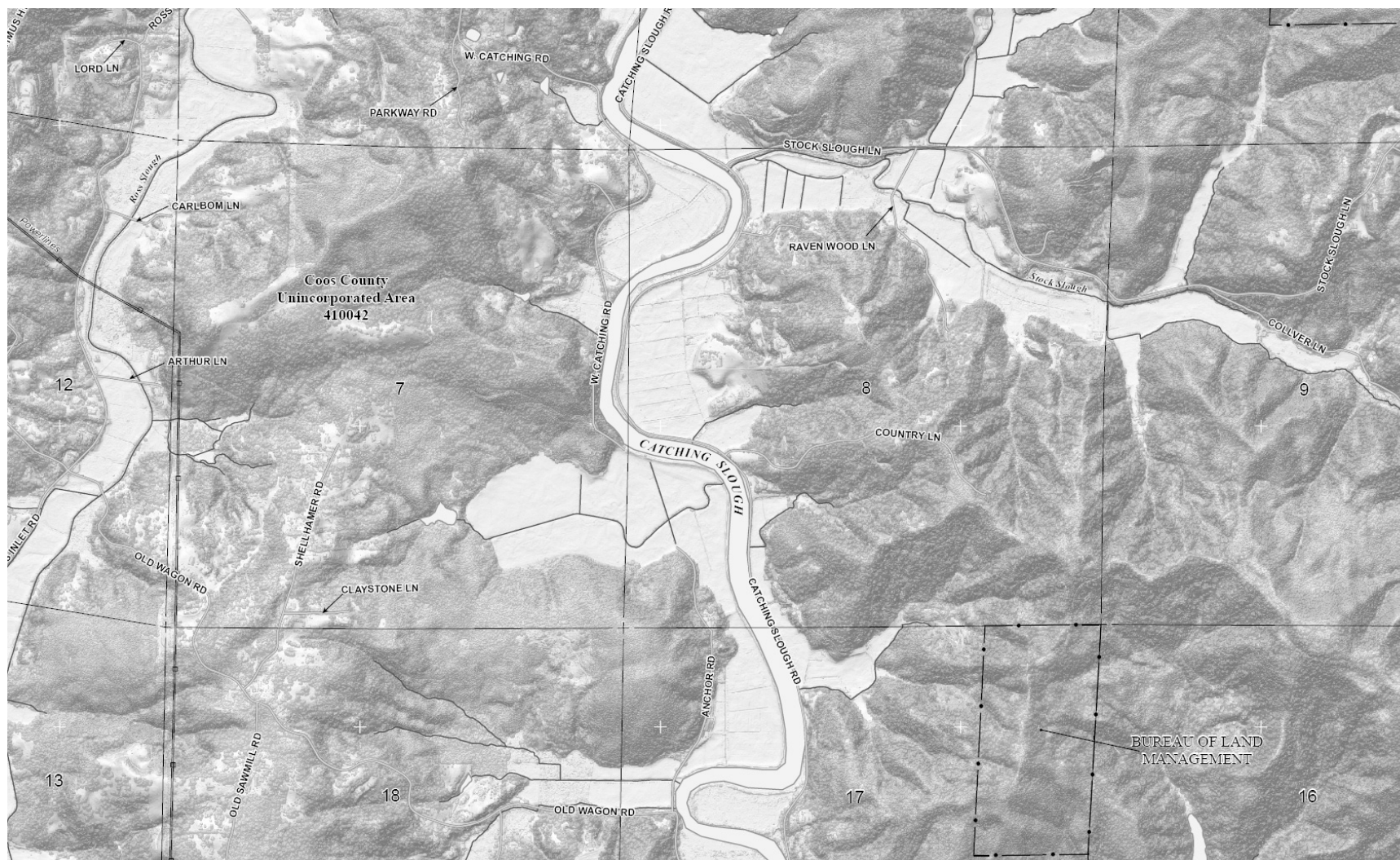
- 3D Building Footprints
- Transmission Lines



- Stream Centerlines
- Water Bodies
- Clean Contours
- Canopy Model



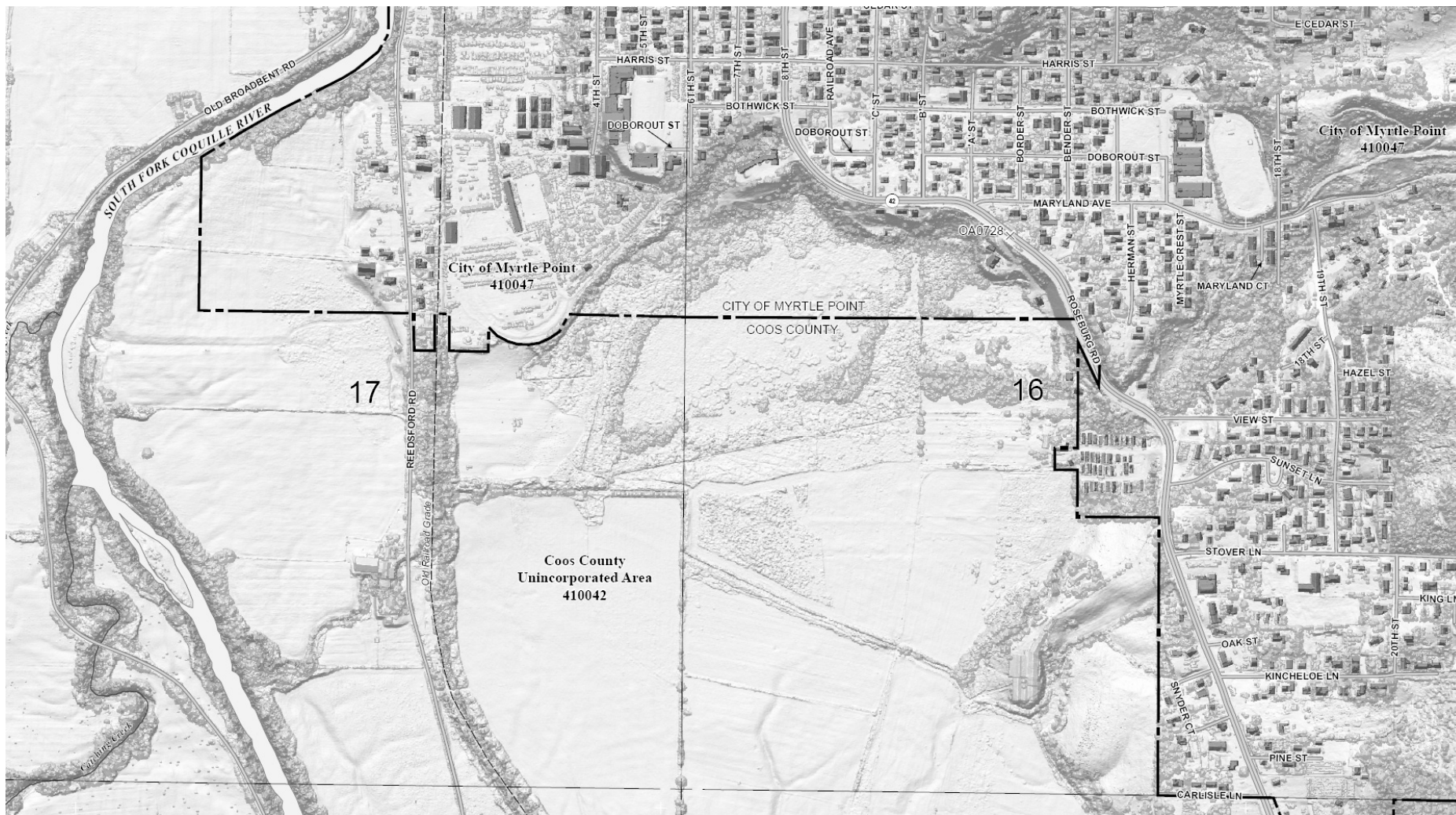
Lidar Base Mapping | Flood Insurance Rate Map





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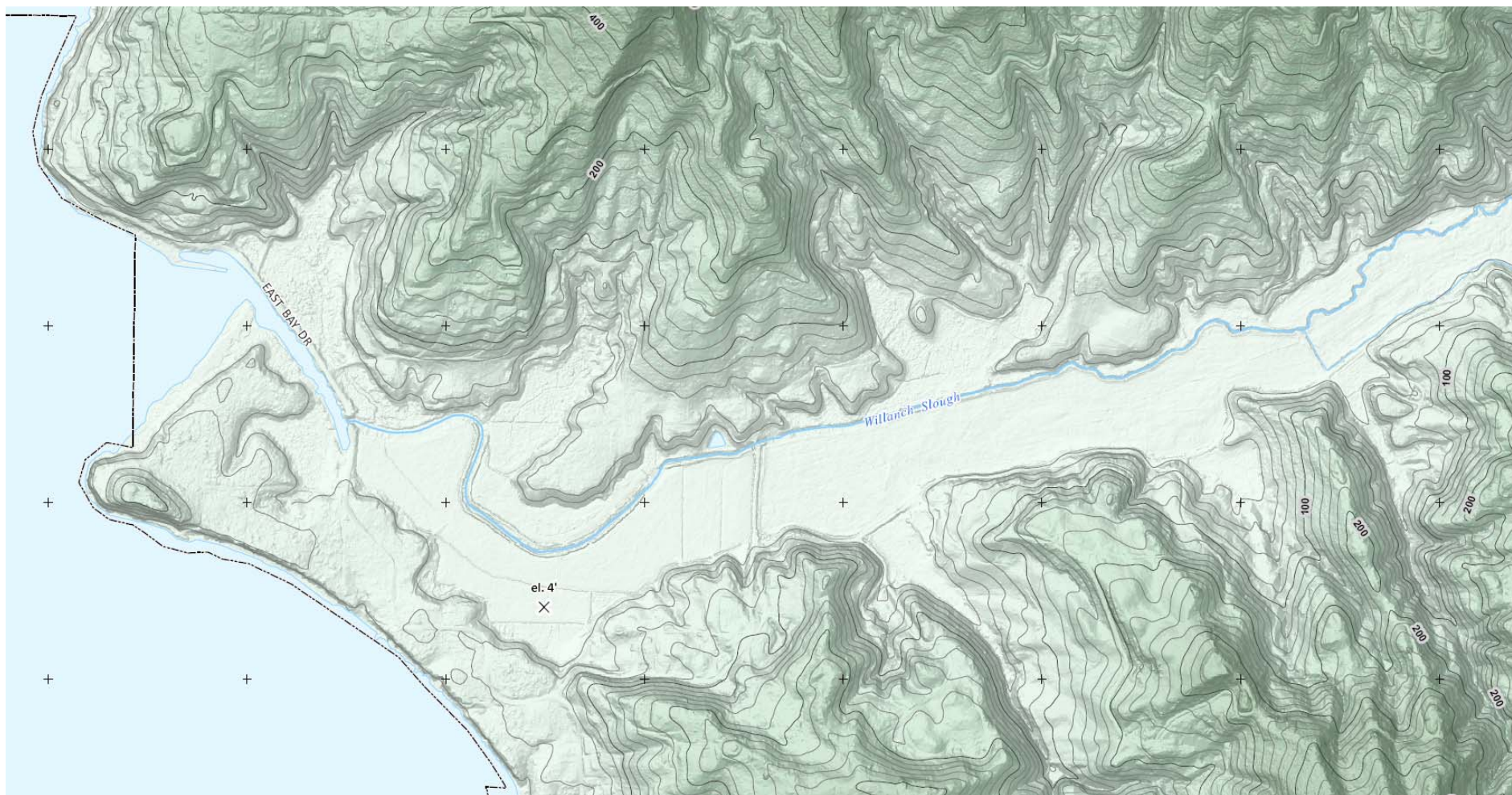
Lidar Base Mapping | Flood Insurance Rate Map





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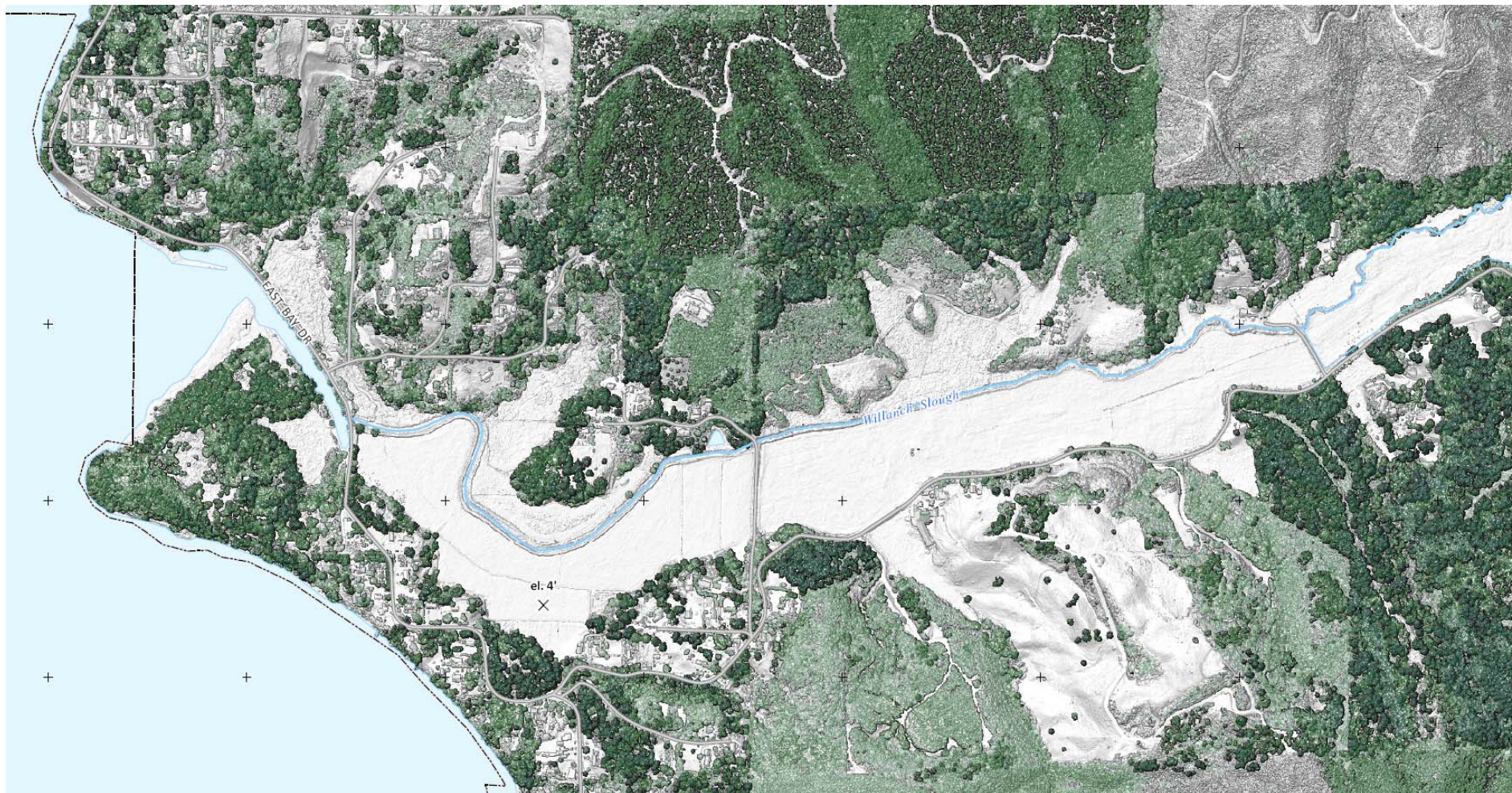
Lidar Base Mapping | Web Tool Base Map





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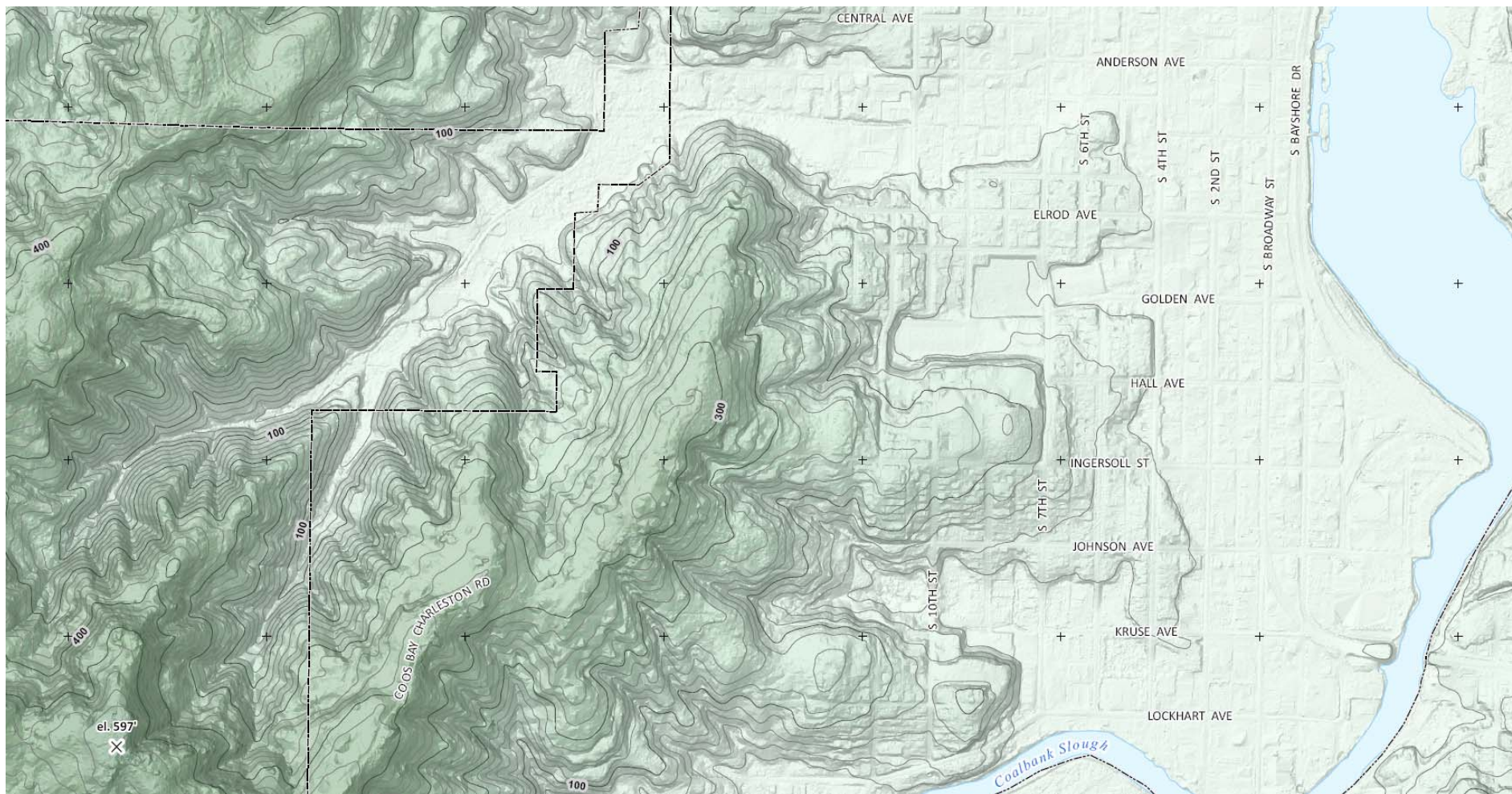
Lidar Base Mapping | Web Tool Base Map





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Lidar Base Mapping | Web Tool Base Map





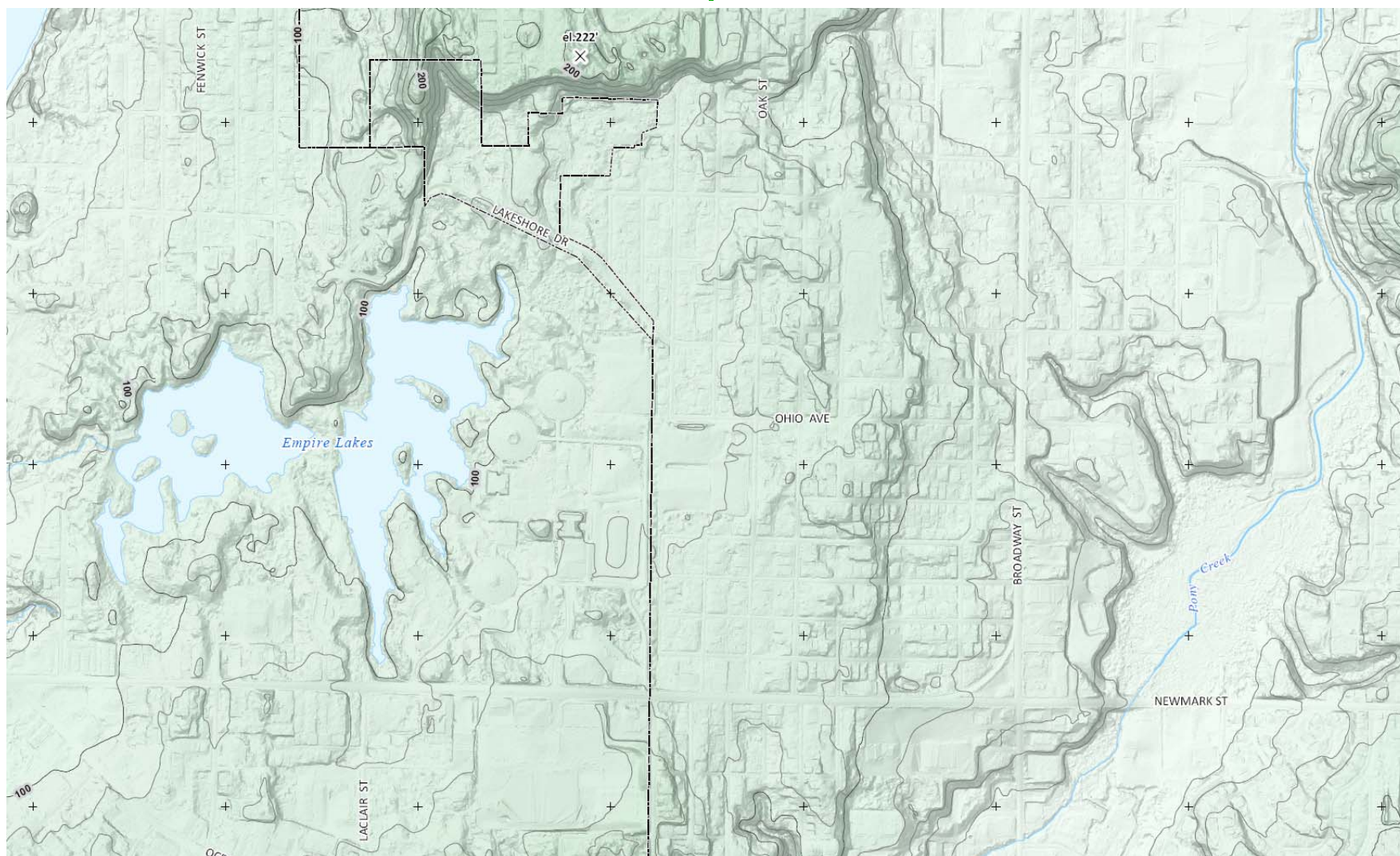
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Lidar Base Mapping | Web Tool Base Map





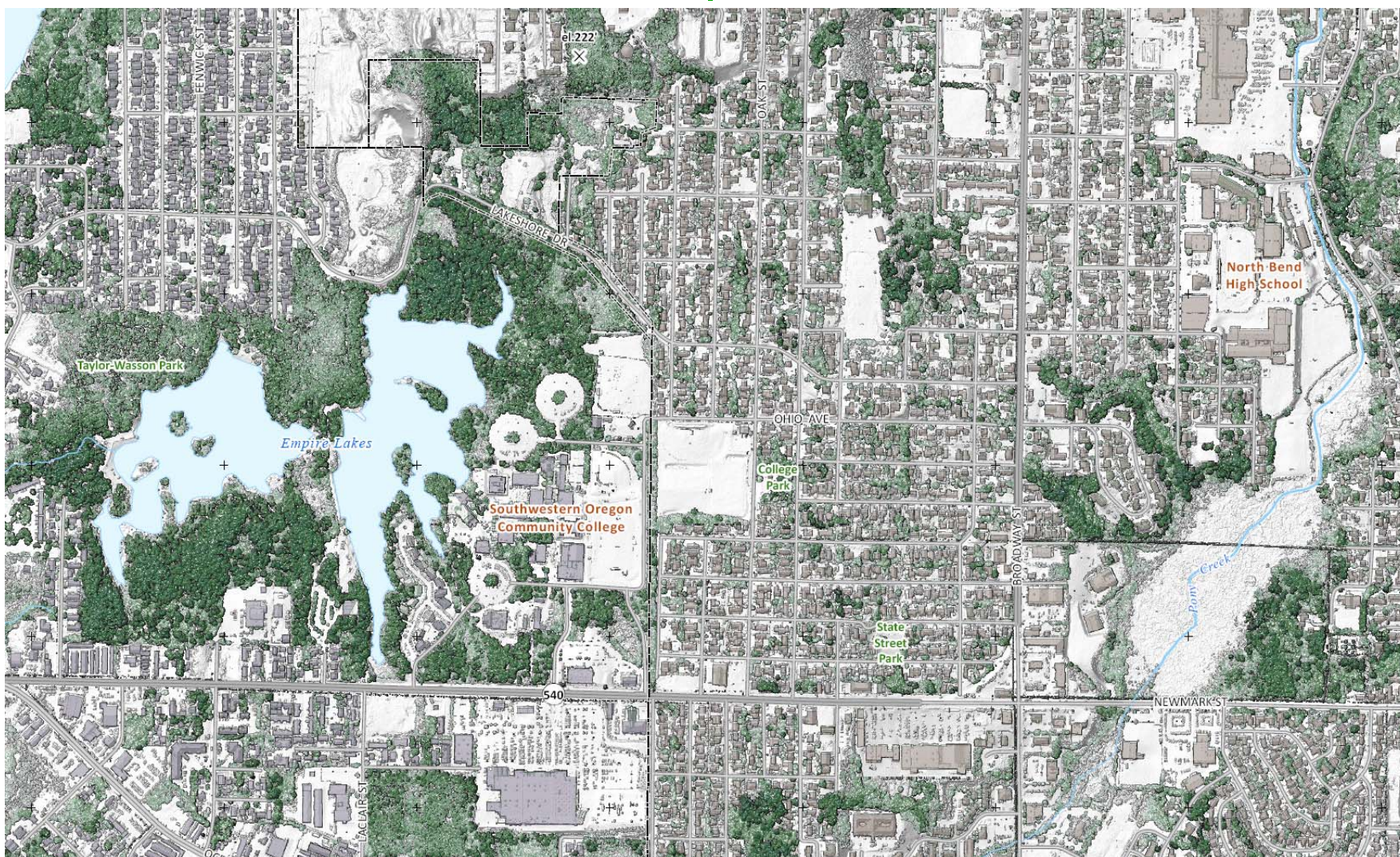
Lidar Base Mapping | Web Tool Base Map





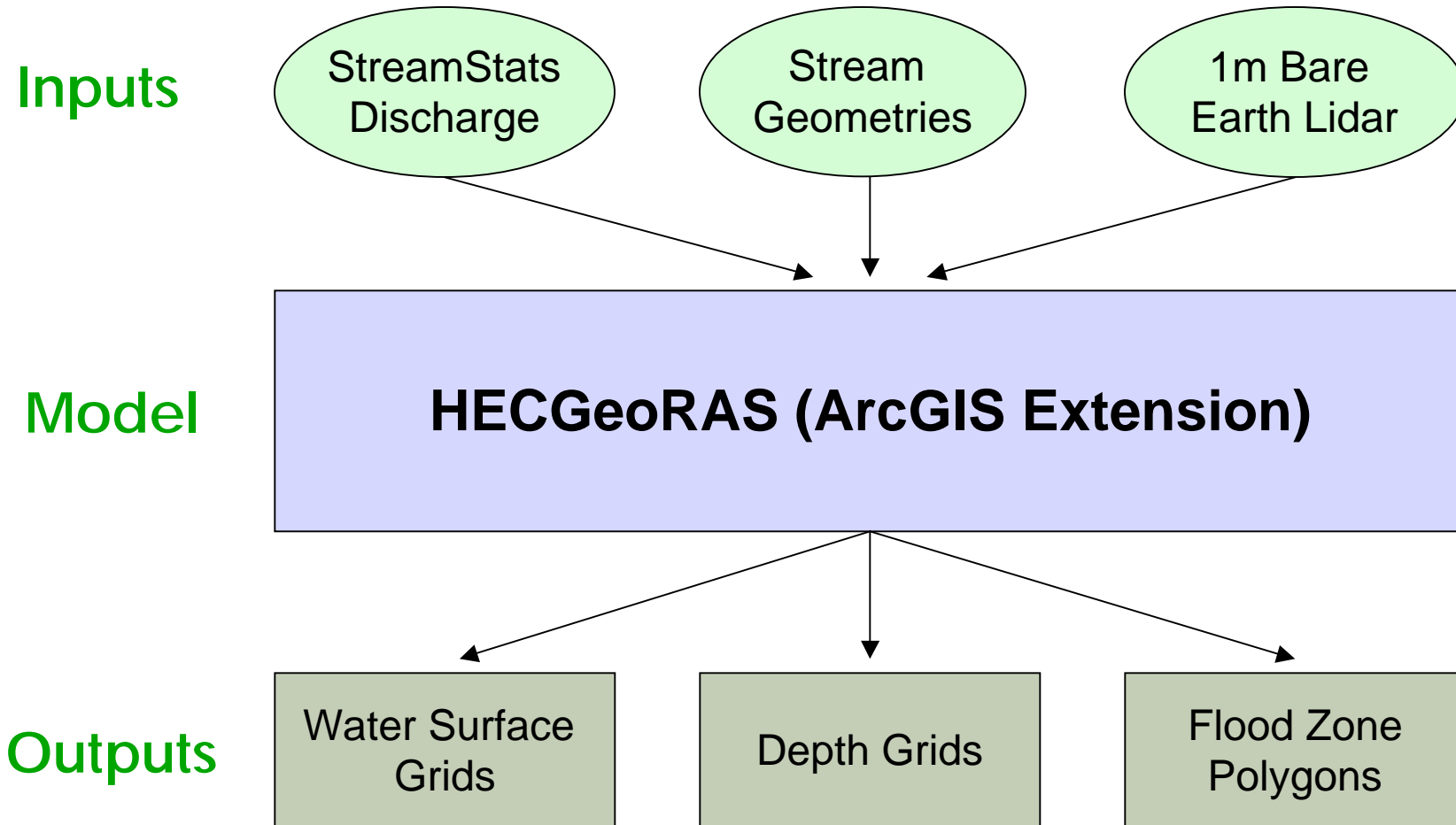
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Lidar Base Mapping | Web Tool Base Map





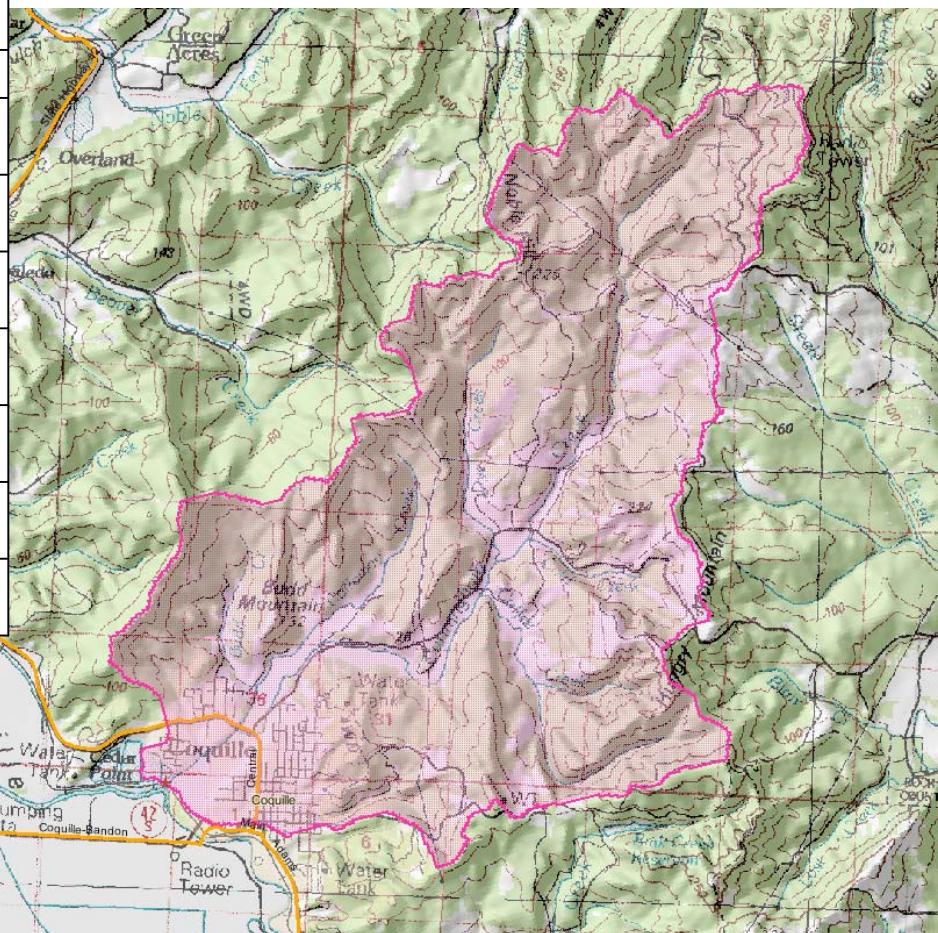
Development of Flood Stage Elevations





USGS StreamStats for Oregon

Statistic	Flow (ft ³ /s)	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Min	Max
PK2	944	27	2.4	596	1500
PK5	1500	25	3.7	969	2320
PK10	1890	26	5	1220	2940
PK25	2420	27	6.4	1530	3840
PK50	2840	28	7.2	1760	4580
PK100	3280	29	7.9	1980	5430
PK500	4350	33	8.9	2480	7620



Basin Flow Statistics
for 1% Chance Flood



17 Other States with USGS StreamStats

Connecticut

Colorado

Delaware

Idaho

Illinois

Indiana

Kentucky

Maryland

Massachusetts

New Hampshire

New York

North Carolina

Ohio

Oklahoma

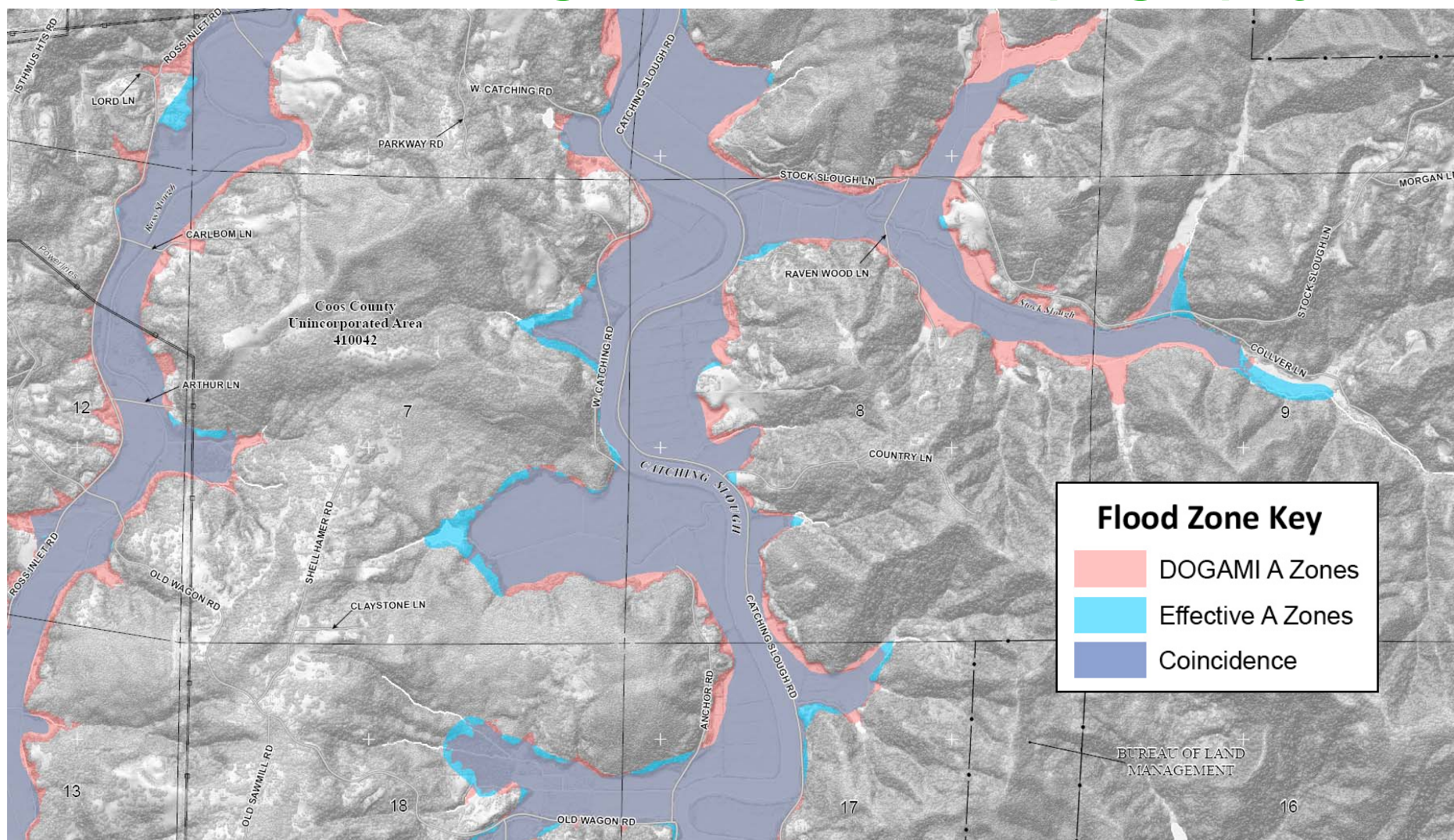
Pennsylvania

Tennessee

Utah

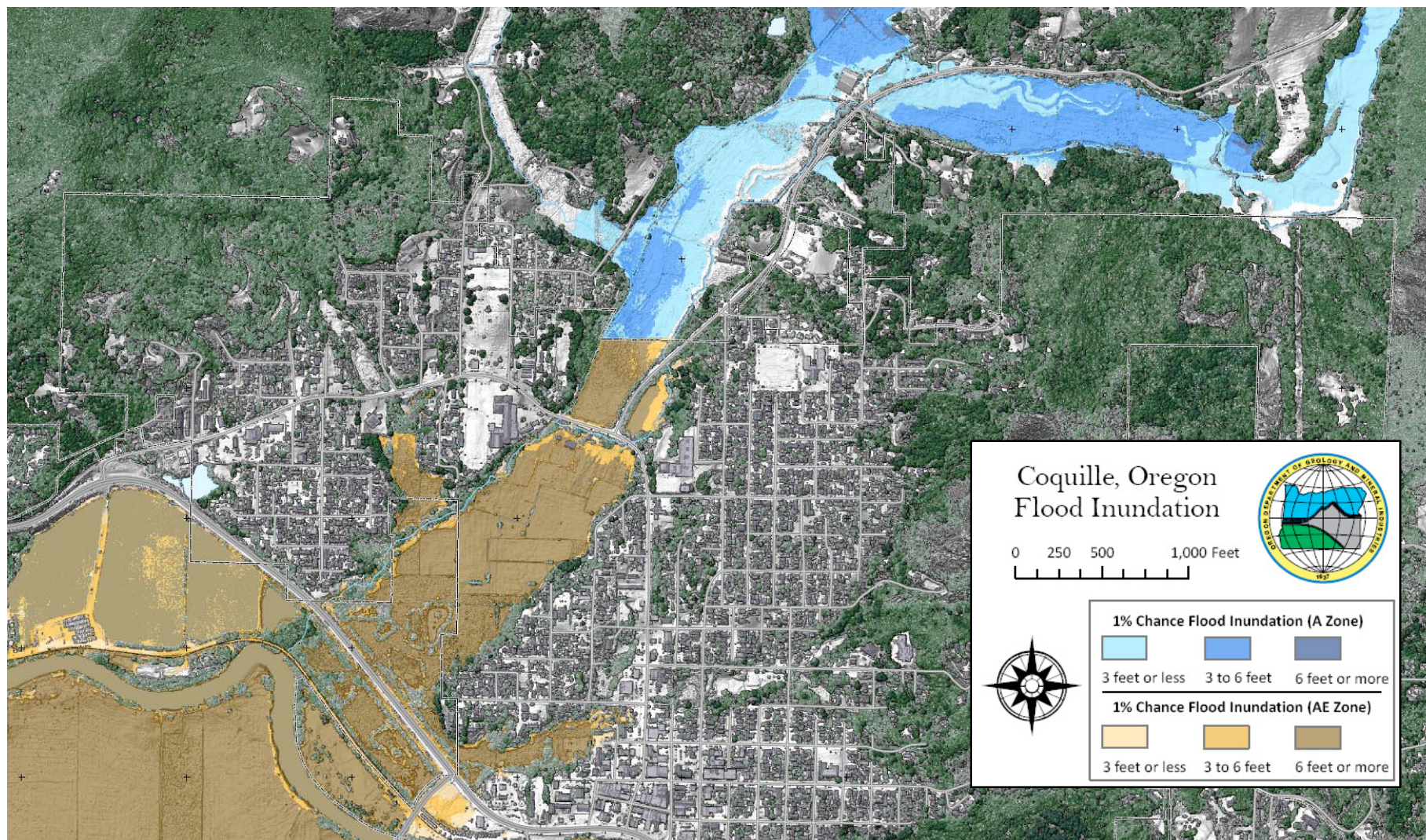


What Has Changed with Better Topography?



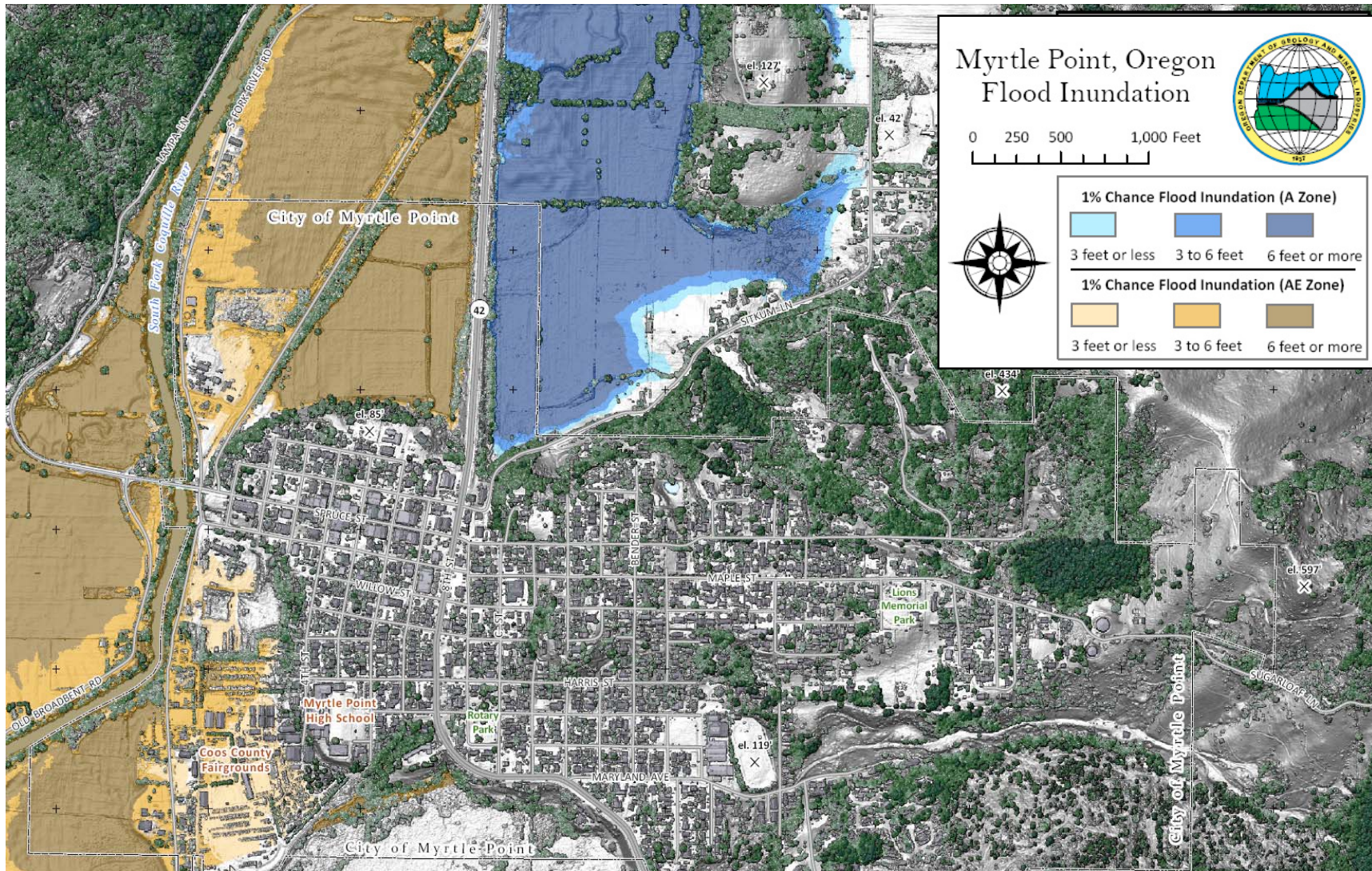


Depth Grid Mapping



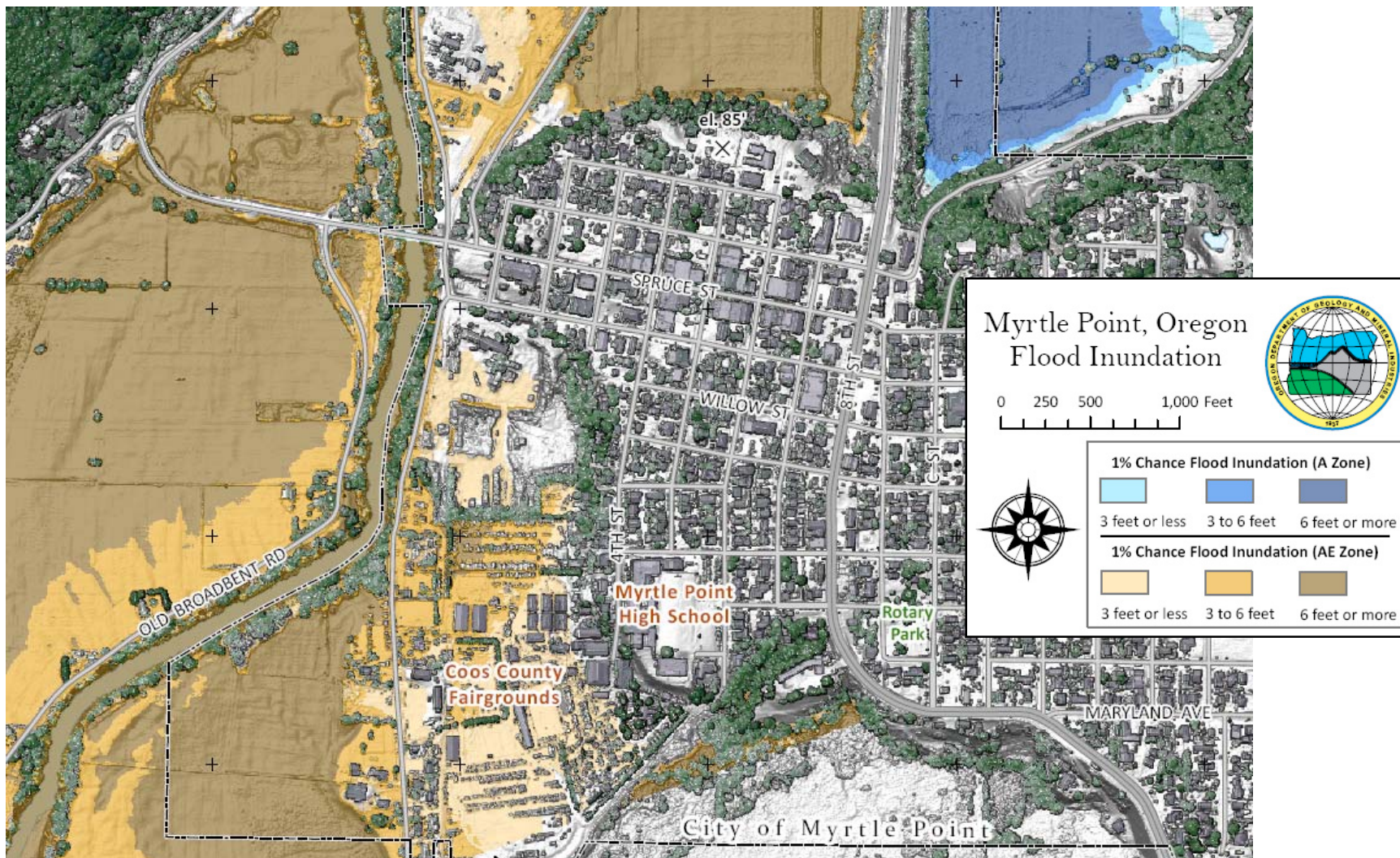


Depth Grid Mapping



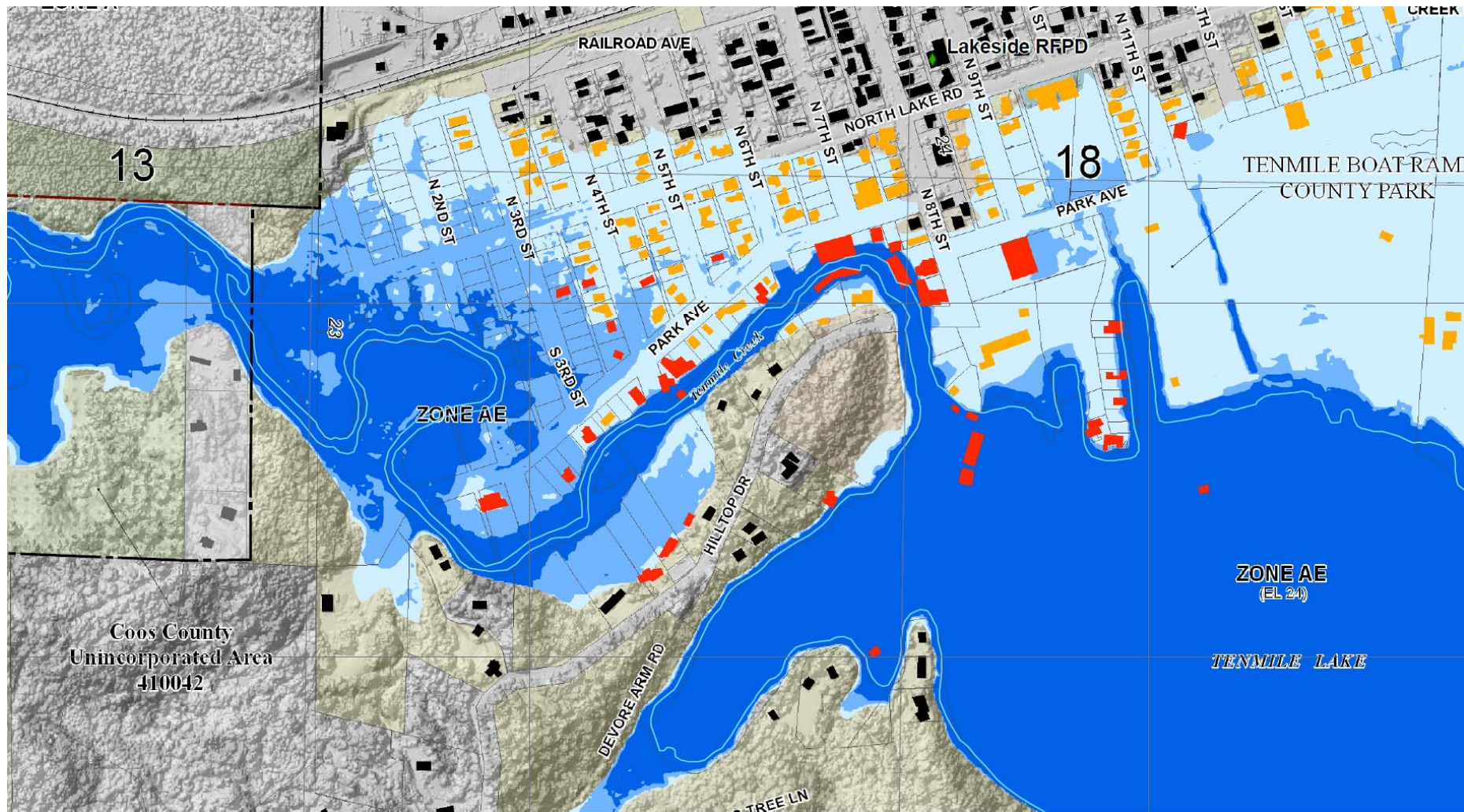


Depth Grid Mapping



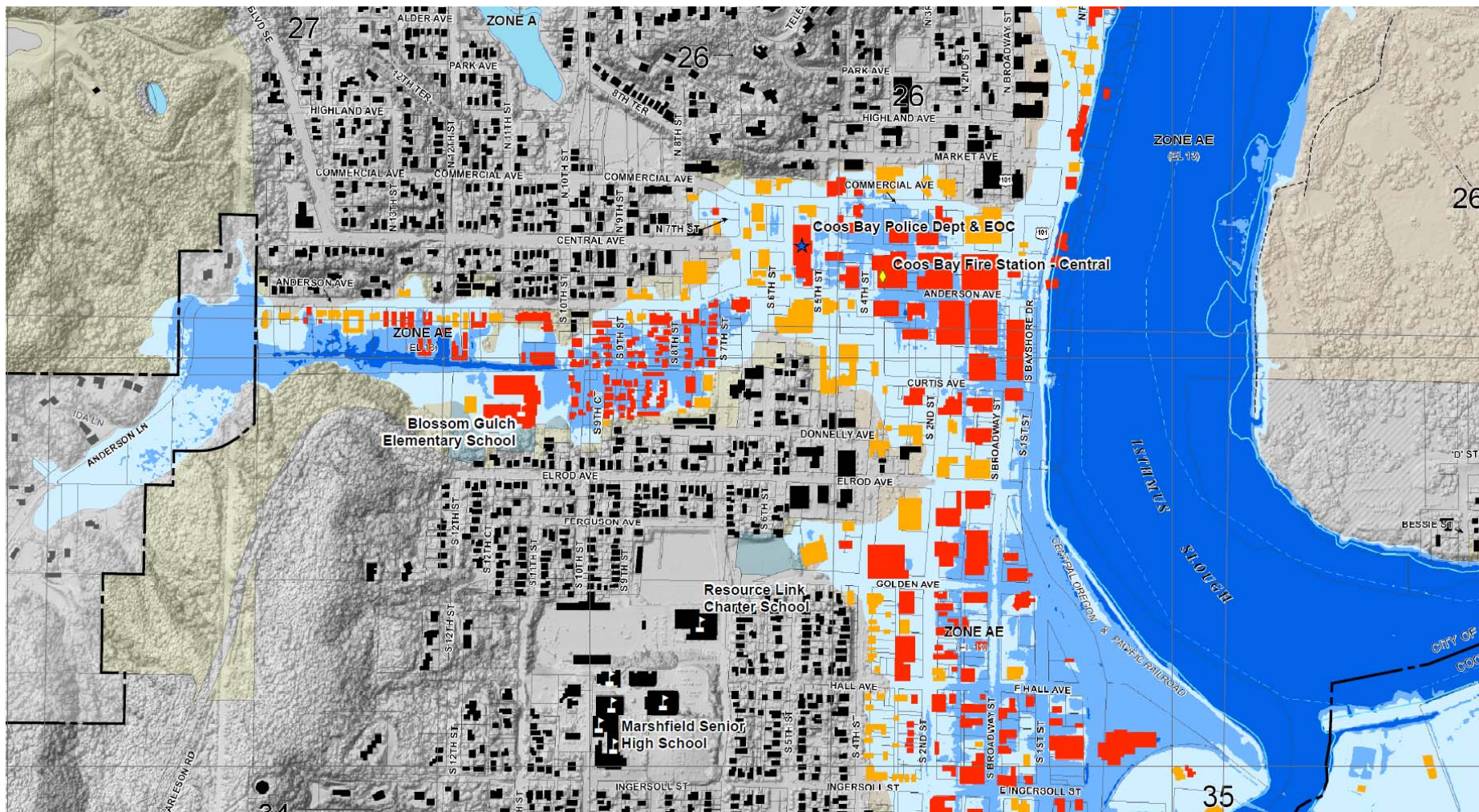


Loss Estimation



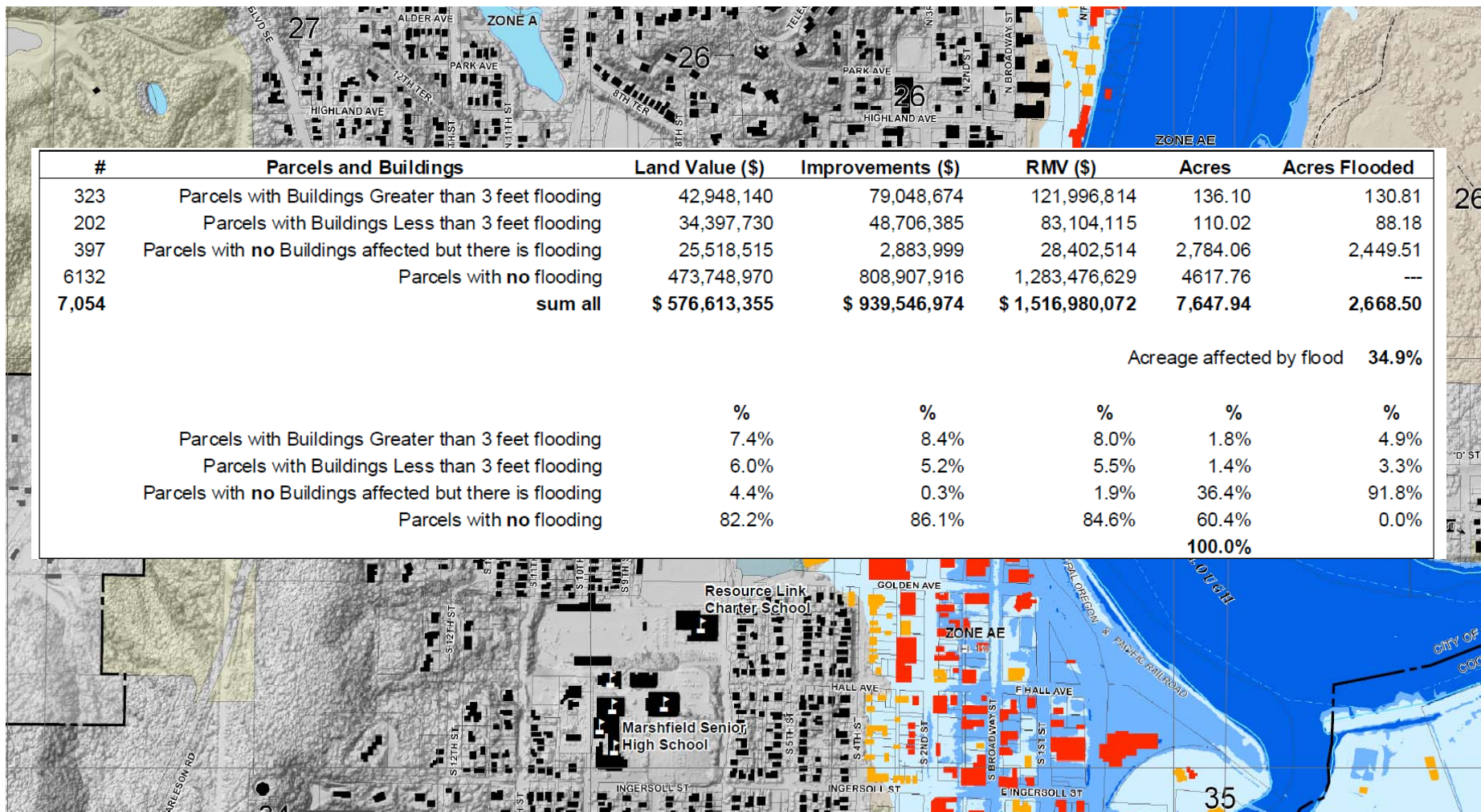


Loss Estimation





Loss Estimation

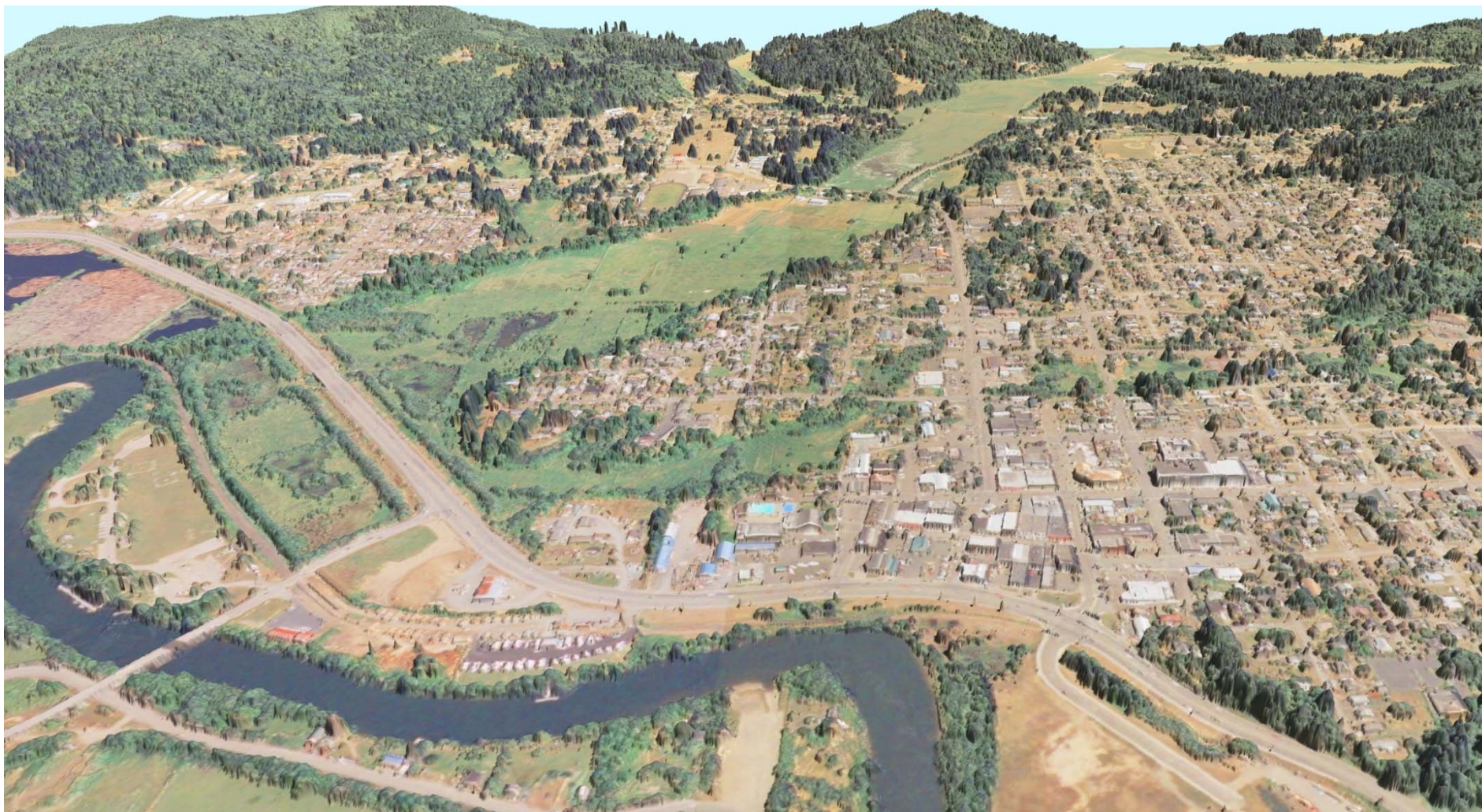


#	Parcels and Buildings	Land Value (\$)	Improvements (\$)	RMV (\$)	Acres	Acres Flooded
323	Parcels with Buildings Greater than 3 feet flooding	42,948,140	79,048,674	121,996,814	136.10	130.81
202	Parcels with Buildings Less than 3 feet flooding	34,397,730	48,706,385	83,104,115	110.02	88.18
397	Parcels with no Buildings affected but there is flooding	25,518,515	2,883,999	28,402,514	2,784.06	2,449.51
6132	Parcels with no flooding	473,748,970	808,907,916	1,283,476,629	4617.76	---
7,054	sum all	\$ 576,613,355	\$ 939,546,974	\$ 1,516,980,072	7,647.94	2,668.50
Acreage affected by flood						34.9%
		%	%	%	%	%
	Parcels with Buildings Greater than 3 feet flooding	7.4%	8.4%	8.0%	1.8%	4.9%
	Parcels with Buildings Less than 3 feet flooding	6.0%	5.2%	5.5%	1.4%	3.3%
	Parcels with no Buildings affected but there is flooding	4.4%	0.3%	1.9%	36.4%	91.8%
	Parcels with no flooding	82.2%	86.1%	84.6%	60.4%	0.0%
100.0%						



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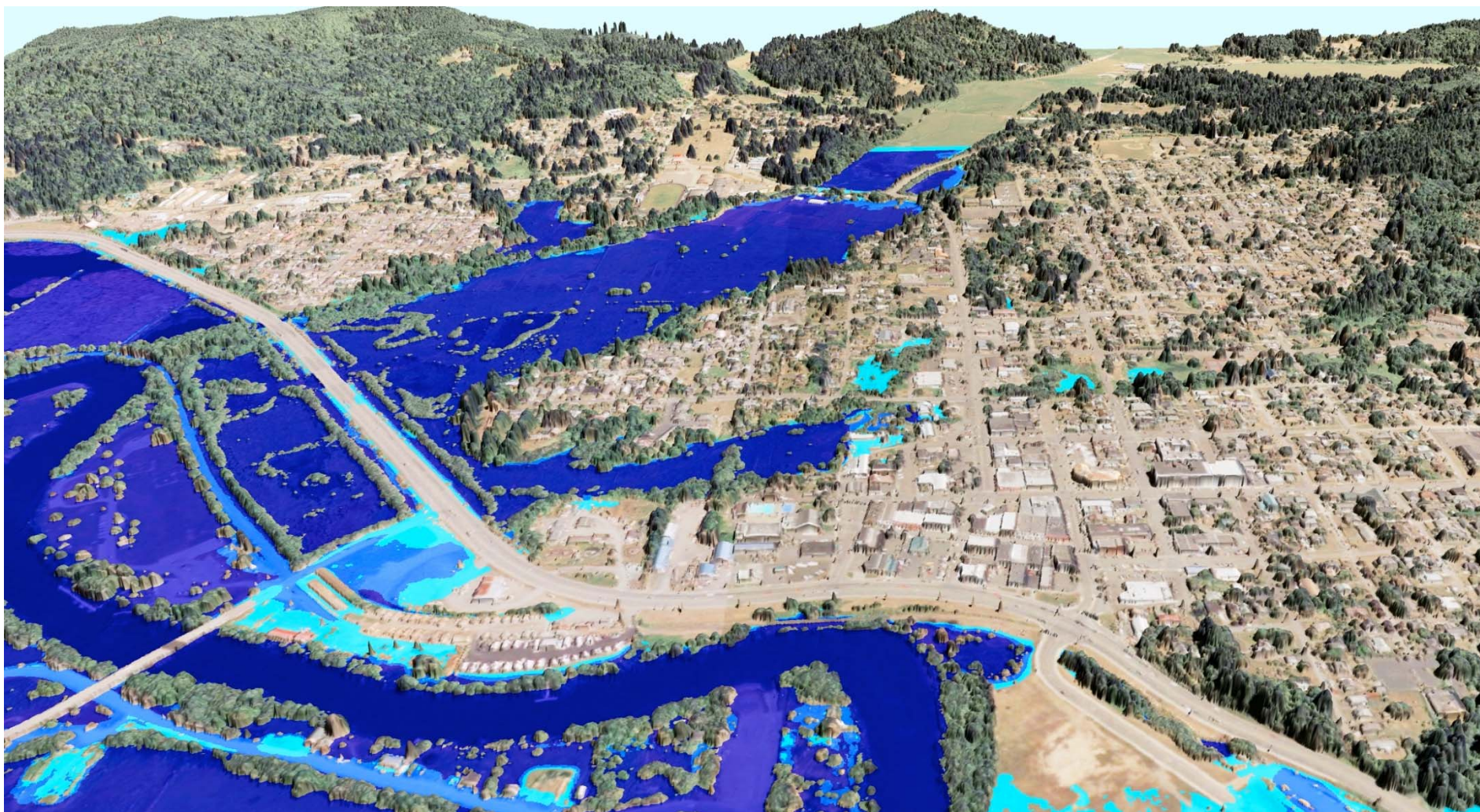
3D Flood Inundation Visualizations





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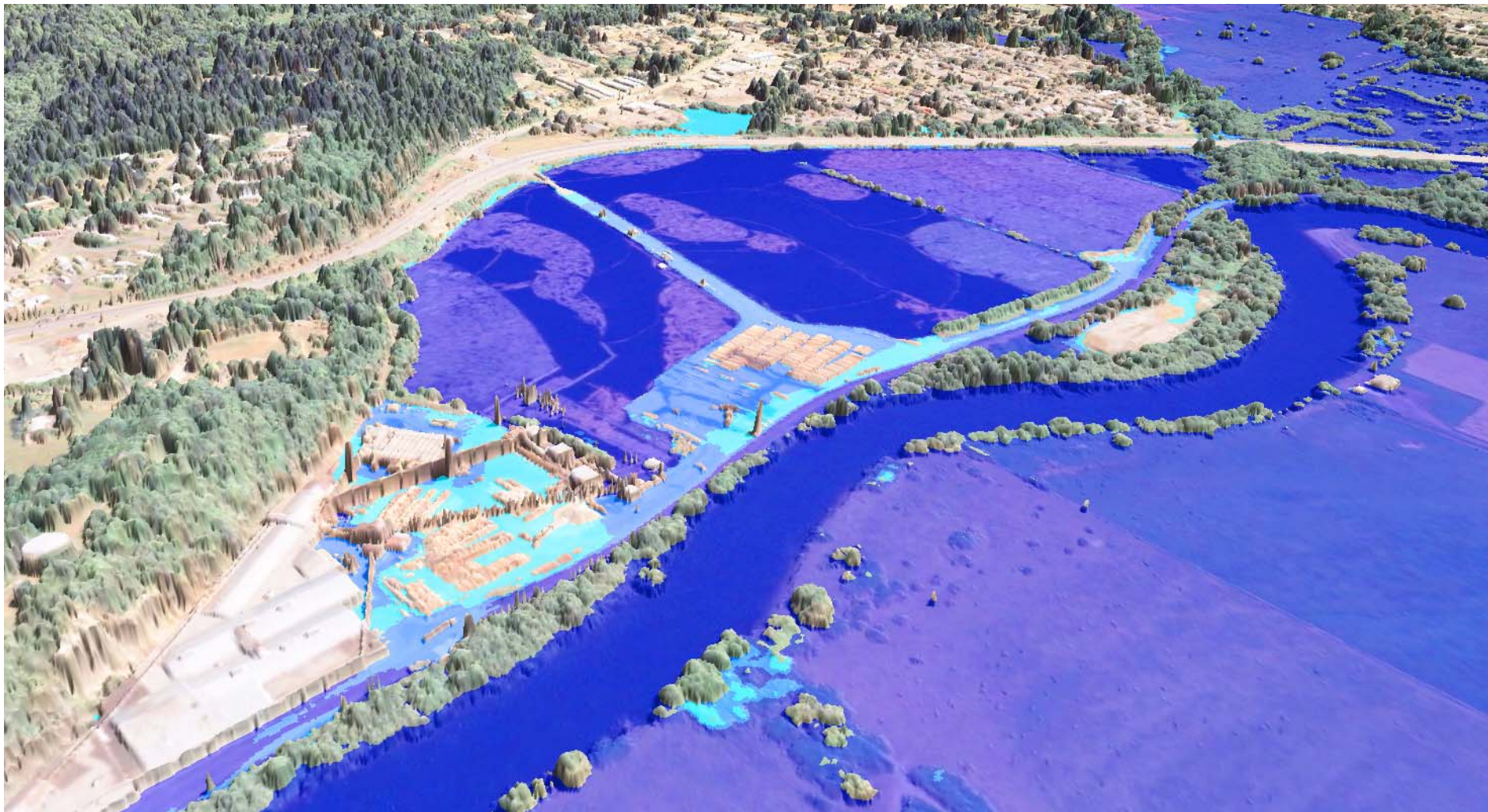
3D Flood Inundation Visualizations





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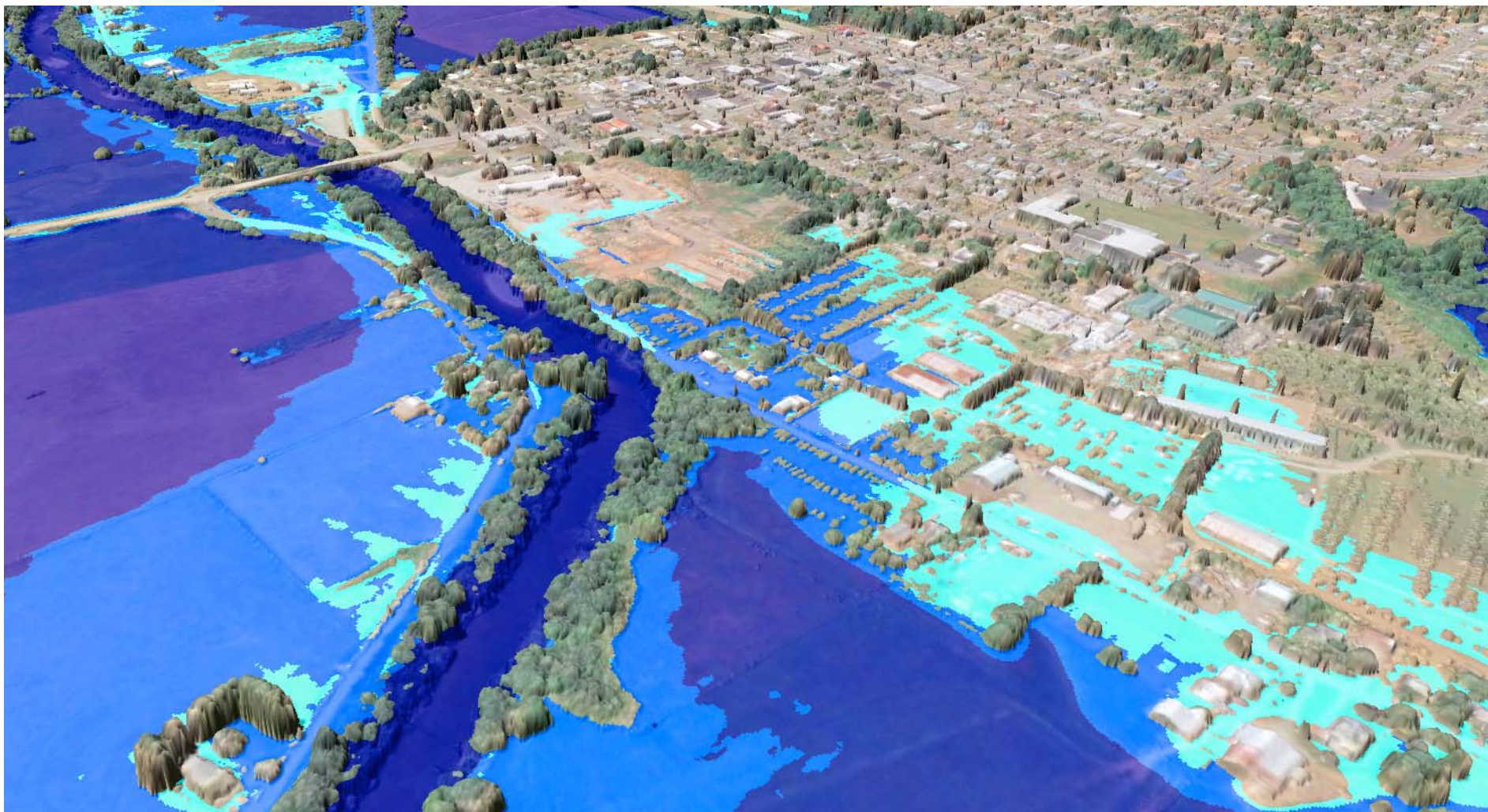
3D Flood Inundation Visualizations





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3D Flood Inundation Visualizations





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3D Flood Inundation Visualizations





Acknowledgements

John English, DOGAMI – Flood Modeling Method
Mat Tilman, DOGAMI – Loss Estimation

Software List

ArcGIS 9.3.1 (ESRI)
HEC-GeoRAS 4.2.92 (USACE) – Flood Model Setup
HEC-RAS 4.0 (USACE) – Flood Model Engine
Fledermaus (IVS 3D) – 3D Visualizations

Contact Me

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