

Critical Areas Monitoring and Adaptive Management Workshop

March 12, 2018

High Resolution Change Detection 2006-2013: Thurston County

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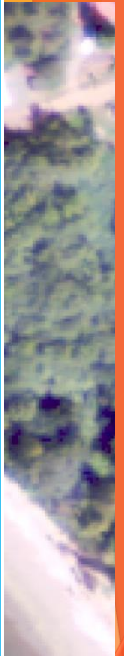
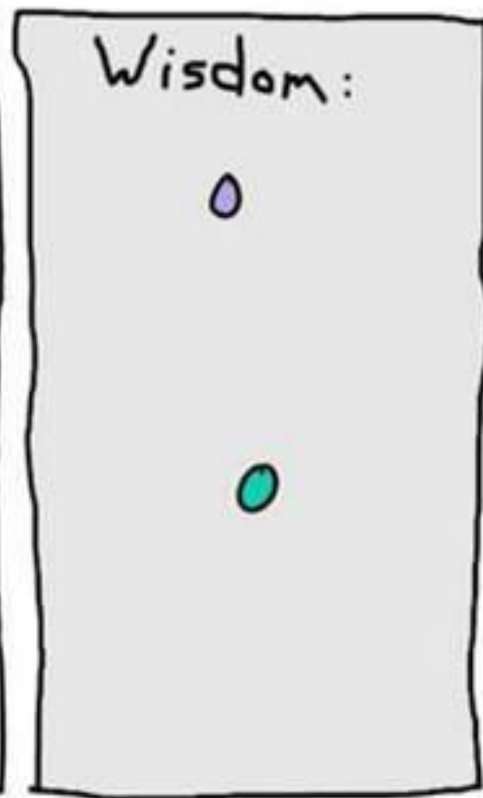
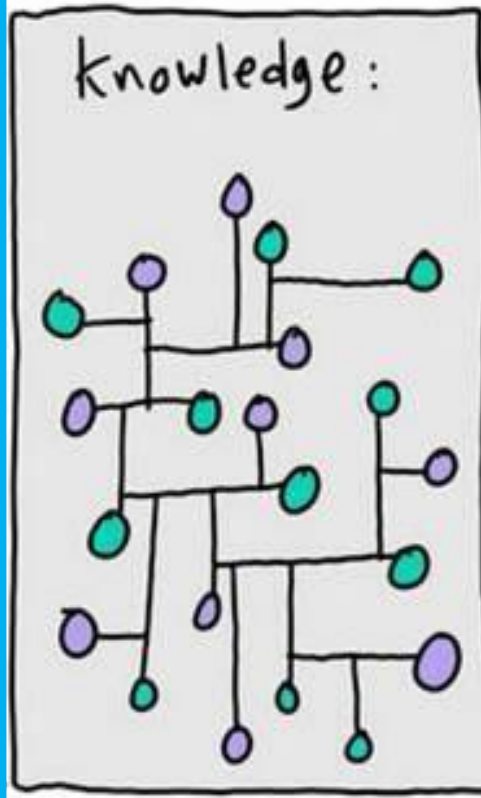
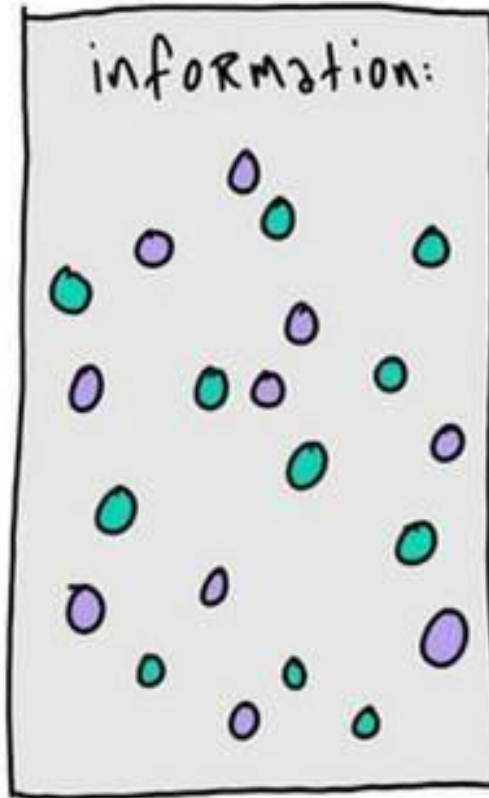


Importance of Land Cover Change

- Habitat quantity, quality, and connectivity affect species persistence and ecosystem resiliency
- Land cover change provides the best coarse scale measures of ecosystem change



New Tool Built on New Technology

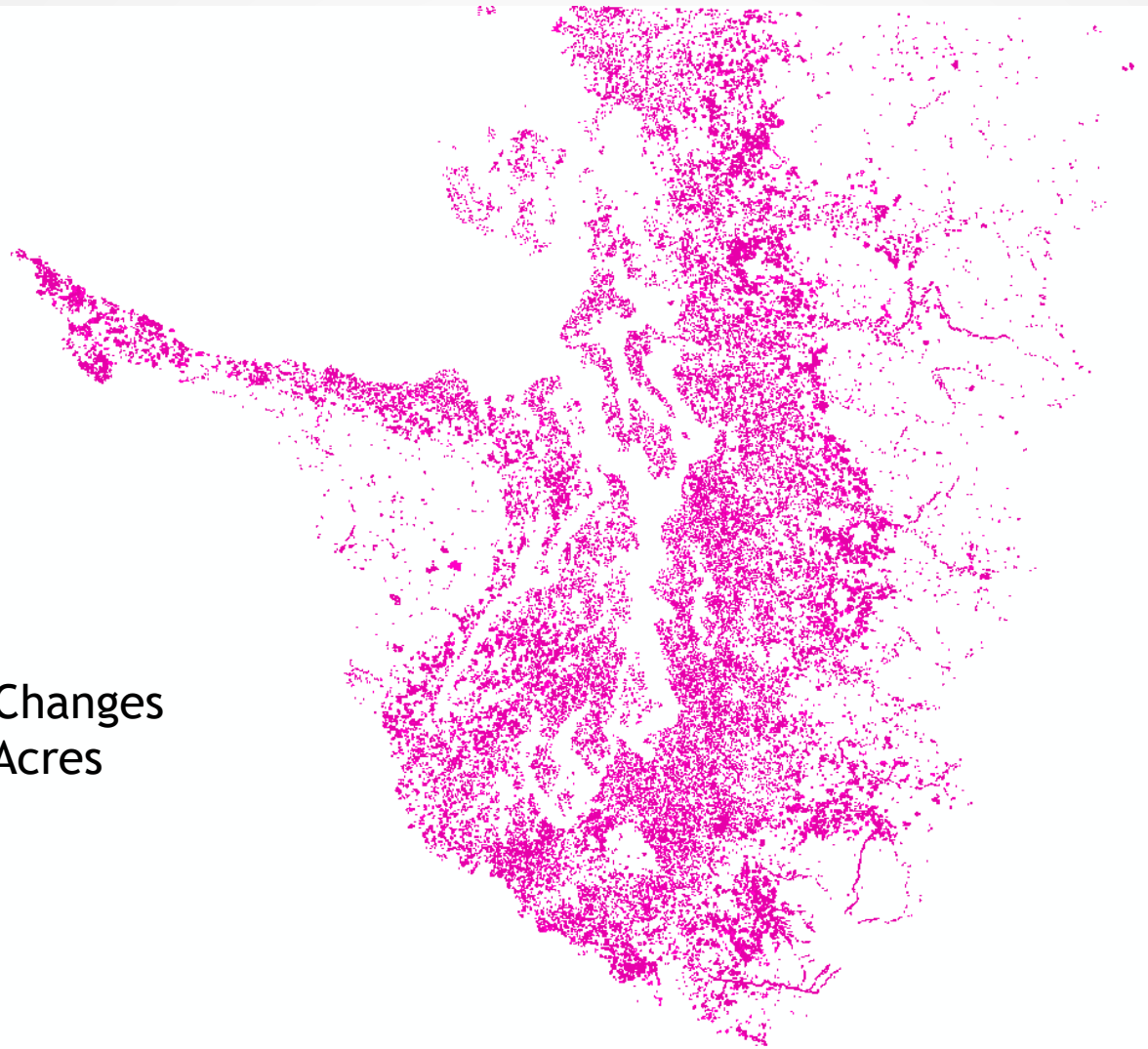


What the HRCD Shows Us:

- Where trees are lost
- Where roads and buildings are built
- Where these events occur in places you are concerned about (e.g., greenbelts, parks, stream corridors, wetlands)



179,166 Changes
626,974 Acres



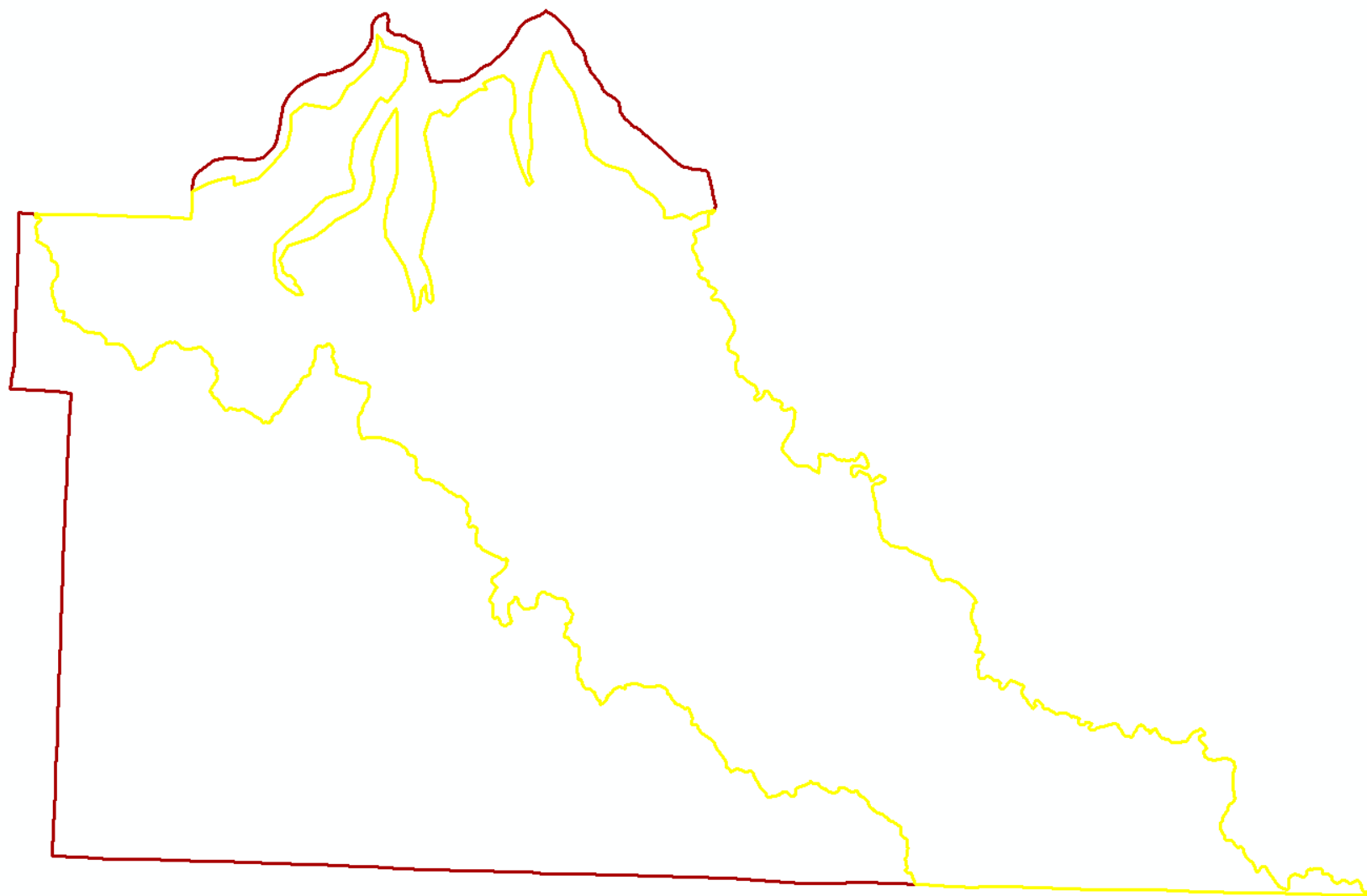


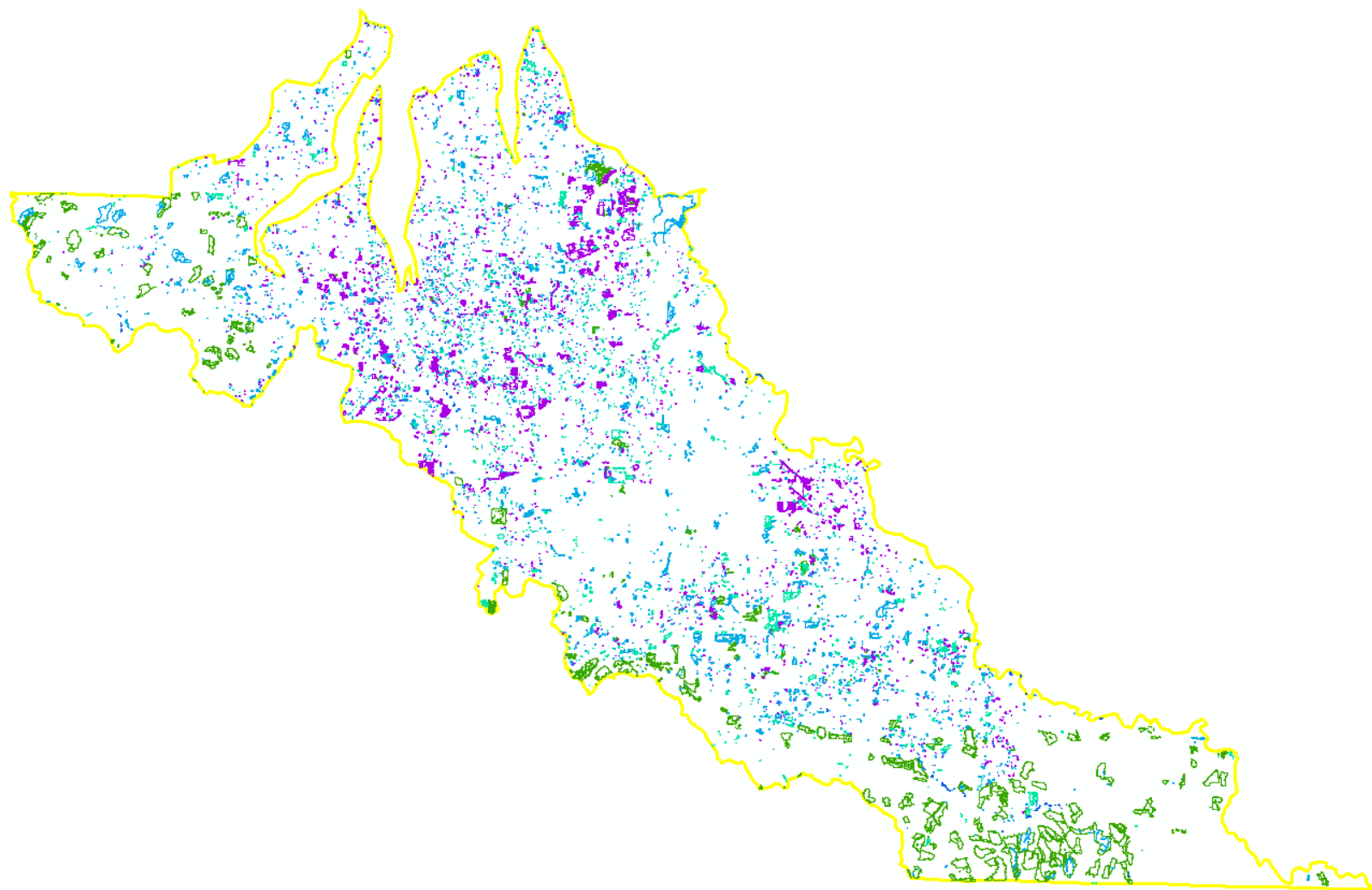
A closer look at HRCD attributes:

Initial Land Class Code	Initial Land Class Name	Change Agent Code	Change Agent Name
1	Permanent Human-use, >90% Impervious	1	Development
2	Bare Ground	2	Commercial Forestry
3	Working Lands	3	Tree Removal
4	Mixed Permanent Human-use, <25% Tree Cover	4	Stream
5	Mixed Permanent Human-use, >25% Tree Cover	5	Redevelopment
6	Mixed, Not Permanent Human-use	6	Retention Pond
7	Forest, >90% Tree Cover	7	Other - Natural
8	Herbs/Shrubs	8	Other - Non-natural

How much change is occurring?

- Need geography of interest mapped in GIS
- Intersect with HRCD
- Tree loss and impervious gain by change agent
- Example: Data has been used to set benchmarks and/or determine if goals are met in VSP





An aerial photograph of a coastal region in Washington state, showing a large watershed area outlined in yellow. The watershed includes a major urban center, surrounding rural areas with fields and forests, and a large body of water (Puget Sound) to the north. The text 'Thurston ~264,375 acres In PS Watershed' is overlaid on the left side of the map.

Thurston
~264,375 acres
In PS Watershed

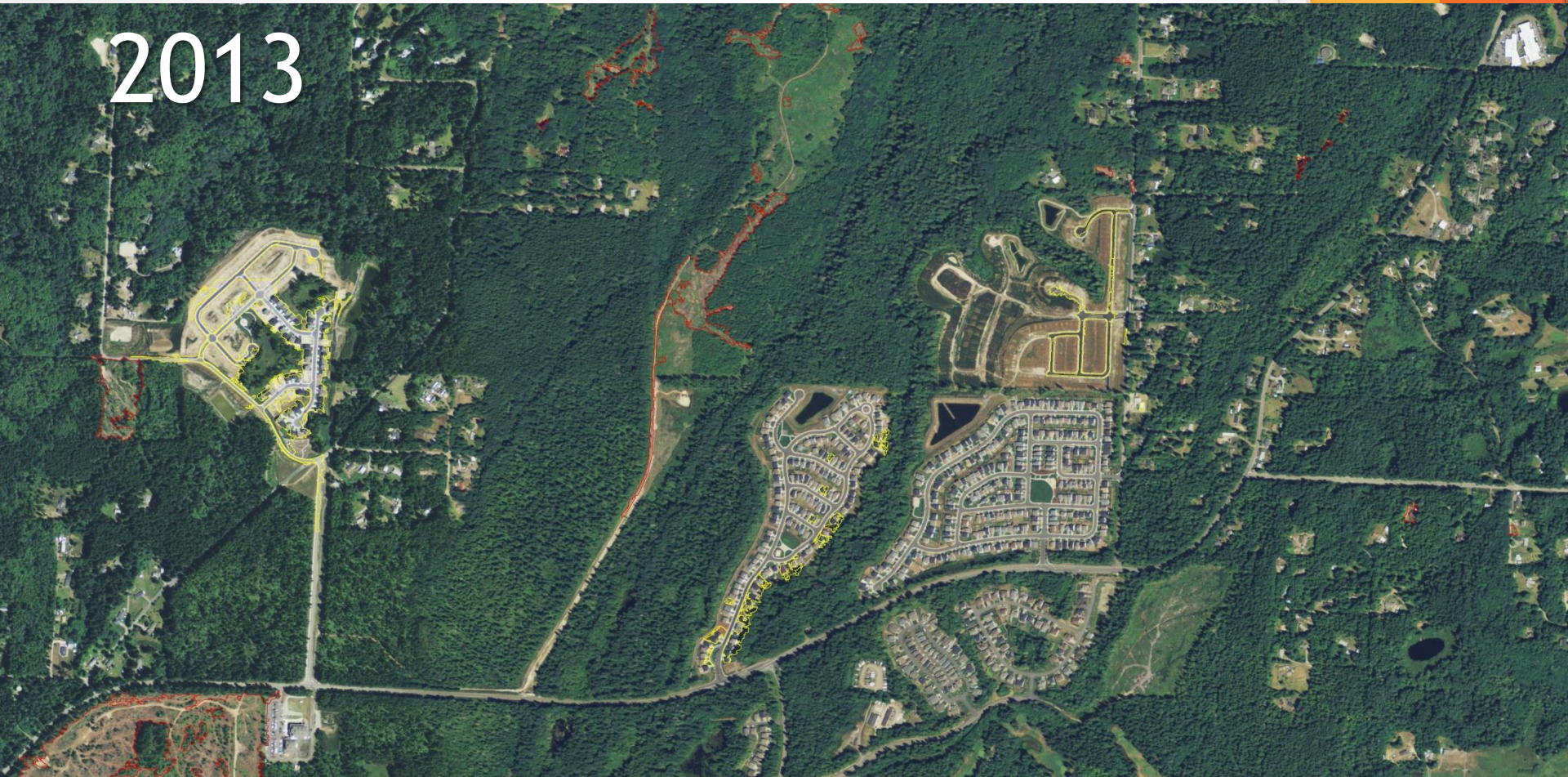
From: WA DNR

2006 - 2013 Land Cover Change in Thurston

- 
- Forestry
 - Development
 - Tree Removal
 - Stream

A Zoomed in Look...

2013



Thurston

2006 - 2013

Change Type	Count of Total Change	Sum of Total Change2	Sum of Canopy Loss	Sum of Imperv gain
Forestry	910	27,630.31	26,233.44	1,438.06
Development	5,003	8,417.97	4,502.04	4,966.08
Tree Removal	7,723	6,591.44	6,319.93	150.43
Retention Pond	83	964.90	501.29	451.13
Redevelopment	261	329.20	166.60	69.79
Other, Natural	333	99.04	97.11	1.73
Other, Non-Natural	392	86.15	0.10	0.00
Stream	182	76.71	68.28	4.10
Grand Total	14,887	44,195.73	37,888.78	7,081.32

- Between 2006 and 2013, ~16.7% of the county (within the PS watershed) experienced land cover change
- Lacey: ~16,610 sq ft of new imperviousness per new person
- Olympia: ~9,860 sq ft of new imperviousness per new person
- Tumwater: ~5,400 sq ft of new imperviousness per new person

*All population statistics from
US Census Bureau*

How Does This Compare to the Rest of the Puget Sound?

	Change Events (count)	Total Change (acres)	Canopy loss (acres)	Imperv Gain (acres)	County Acres	% of County Experiencing Land Cover Change (2006- 2013)
Thurston	14,887	44,195.73	37,888.78	7,081.32	264,376.78	16.72
Mason	10,046	70,835.04	70,331.95	534.69	485,771.05	14.58
Kitsap	11,468	32,413.43	30,606.64	2,248.88	256,618.14	12.63
Clallam	9,585	69,322.86	68,360.49	745.01	619,739.72	11.19
Pierce	31,695	107,898.40	94,287.17	13,241.89	1,044,117.90	10.33
King	36,241	85,090.37	73,092.78	10,544.11	1,406,406.39	6.05
Skagit	13,229	62,420.29	60,511.54	1,891.85	1,127,844.71	5.53
Snohomish	26,839	67,216.70	61,399.24	5,933.18	1,353,481.07	4.97
Jefferson	5,080	22,772.91	22,634.88	165.99	485,796.58	4.69
Whatcom	10,277	51,350.11	50,211.21	966.91	1,388,618.42	3.70
Island	6,235	3,776.73	3,172.72	606.58	141,223.32	2.67
San Juan	2,365	583.93	456.14	112.62	117,929.77	0.50
<i>Grand Total</i>	177,947	617,876.50	572,953.55	44,073.03	8,691,923.86	7.11

Critical Area Example: Thurston Wetlands

An aerial photograph of a coastal region with a yellow boundary line delineating a large area. Within this boundary, numerous patches of bright green are overlaid on the natural landscape, representing wetlands. The landscape includes a mix of green fields, brownish agricultural land, and dark water bodies. The text 'Thurston Wetlands (NWI): 20,873 acres' is positioned in the bottom-left corner of the image.

Thurston Wetlands
(NWI): 20,873 acres

An aerial photograph of a coastal area, likely Thurston, showing a mix of green fields, brown patches, and a large body of water at the top. A yellow line outlines a specific region. A small orange square is located within this region.

Wetland Change in Thurston:

■ 794 changes

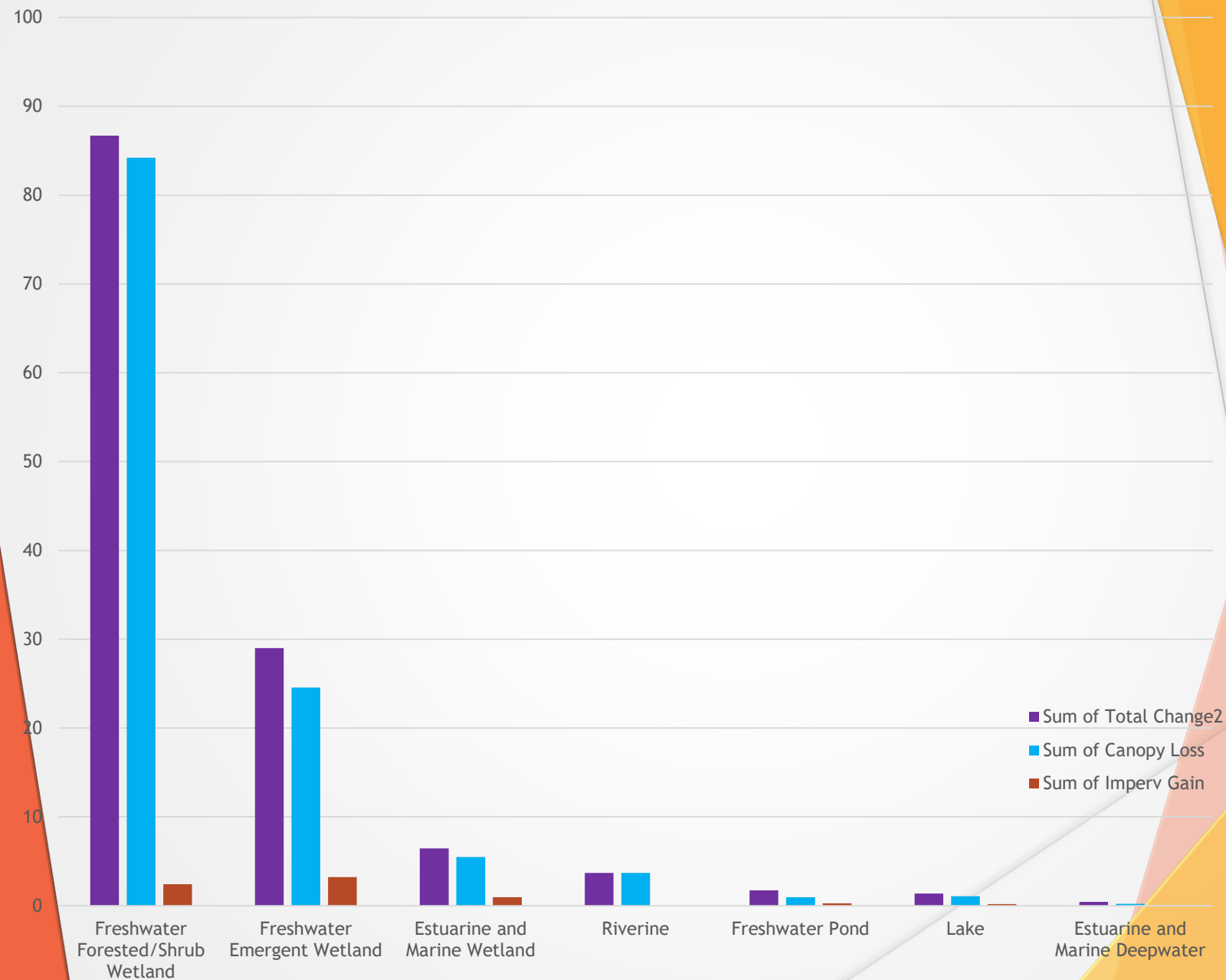
~129 acres

Thurston Wetlands

2006-2013 Land Cover Change

Row Labels	Count of Total Change	Sum of Total Change2	Sum of Canopy Loss	Sum of Imperv Gain
Tree Removal	306	66.41	65.51	0.42
Other, Natural	129	26.32	25.95	0.36
Forestry	85	16.34	16.05	0.31
Stream	158	9.93	9.93	0.00
Development	86	7.24	2.22	5.85
Other, Non-Natural	14	1.48	0.06	0.00
Redevelopment	13	0.99	0.14	0.05
Retention Pond	3	0.64	0.31	0.02
Grand Total	794	129.35	120.17	7.01

LAND COVER CHANGE IN THURSTON COUNTY WETLANDS BY WETLAND TYPE, 2006 - 2013



Thurston Wetlands

2006-2013 Land Cover Change

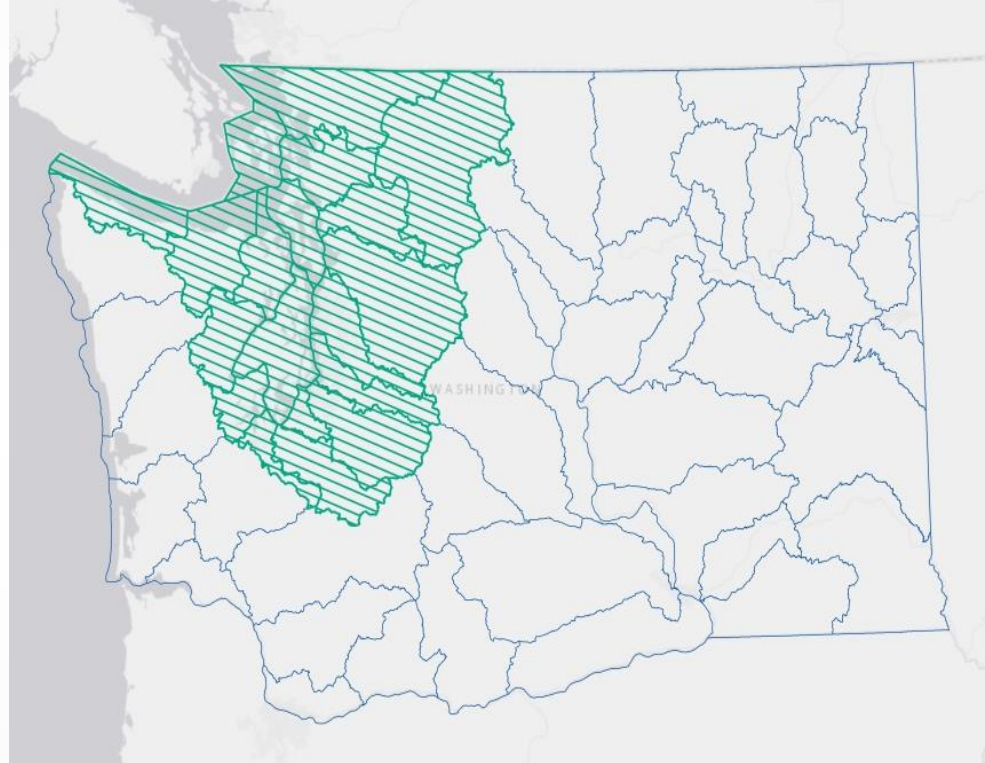
- ▶ ~0.6% of NWI mapped wetlands in Thurston County experienced land cover change
 - ▶ Note: this does not necessarily mean Thurston County *lost* 0.6% of their wetlands
- ▶ Most of change occurred within Freshwater Forested/Shrub Wetland type
 - ▶ Freshwater Forested/Shrub Wetland types make up ~33% of wetlands by area in Thurston
 - ▶ More than 67% of change by area in this wetland type

Many, many ways to analyze the data

- ▶ Analysis is in service to a management decision
- ▶ This is where your community insights come in
 - ▶ NWI accuracy
 - ▶ Information only as useful as your weakest input
 - ▶ Understand the conclusions you can draw
- ▶ Limited only by the availability of data about the area you want to evaluate
- ▶ What land conversion patterns are you looking for?

Other HRCD Notes

- Simple to use
- Accurate to ~1/20th acre
- Three time periods available
- Technical assistance also at WDFW!
- Visit www.pshrcd.com to download data and learn more!



Thank you

For more information,

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Questions?