

Critical Areas Monitoring and Adaptive Management Workshop

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High Resolution Change Detection 2006-2013: King County

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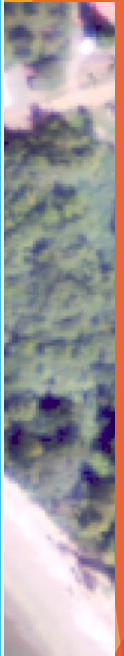
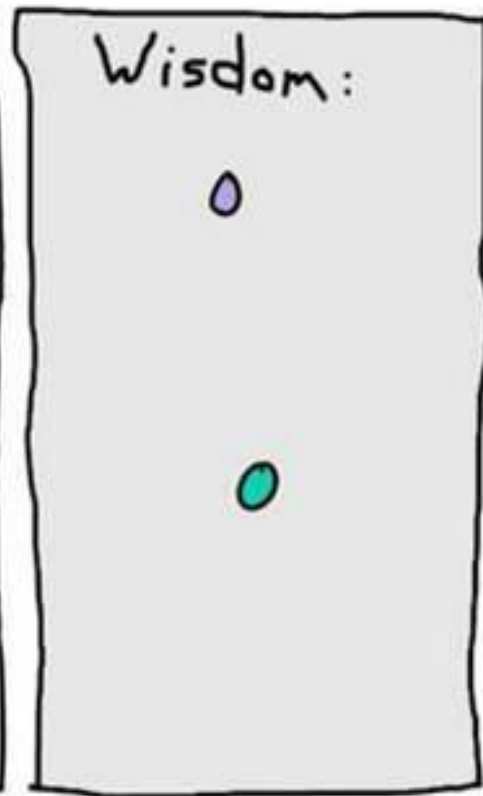
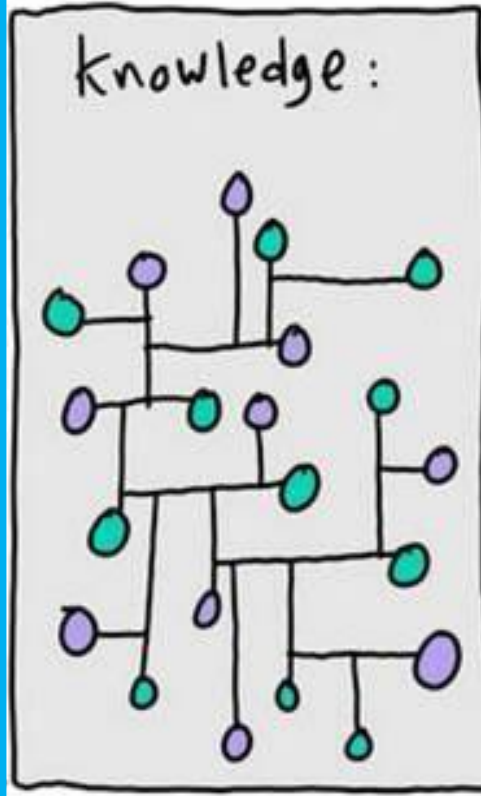
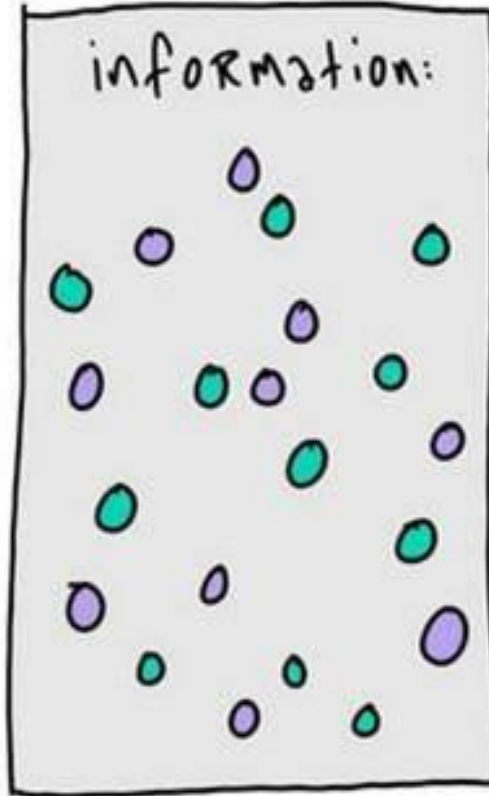


Importance of Land Cover Change

- 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

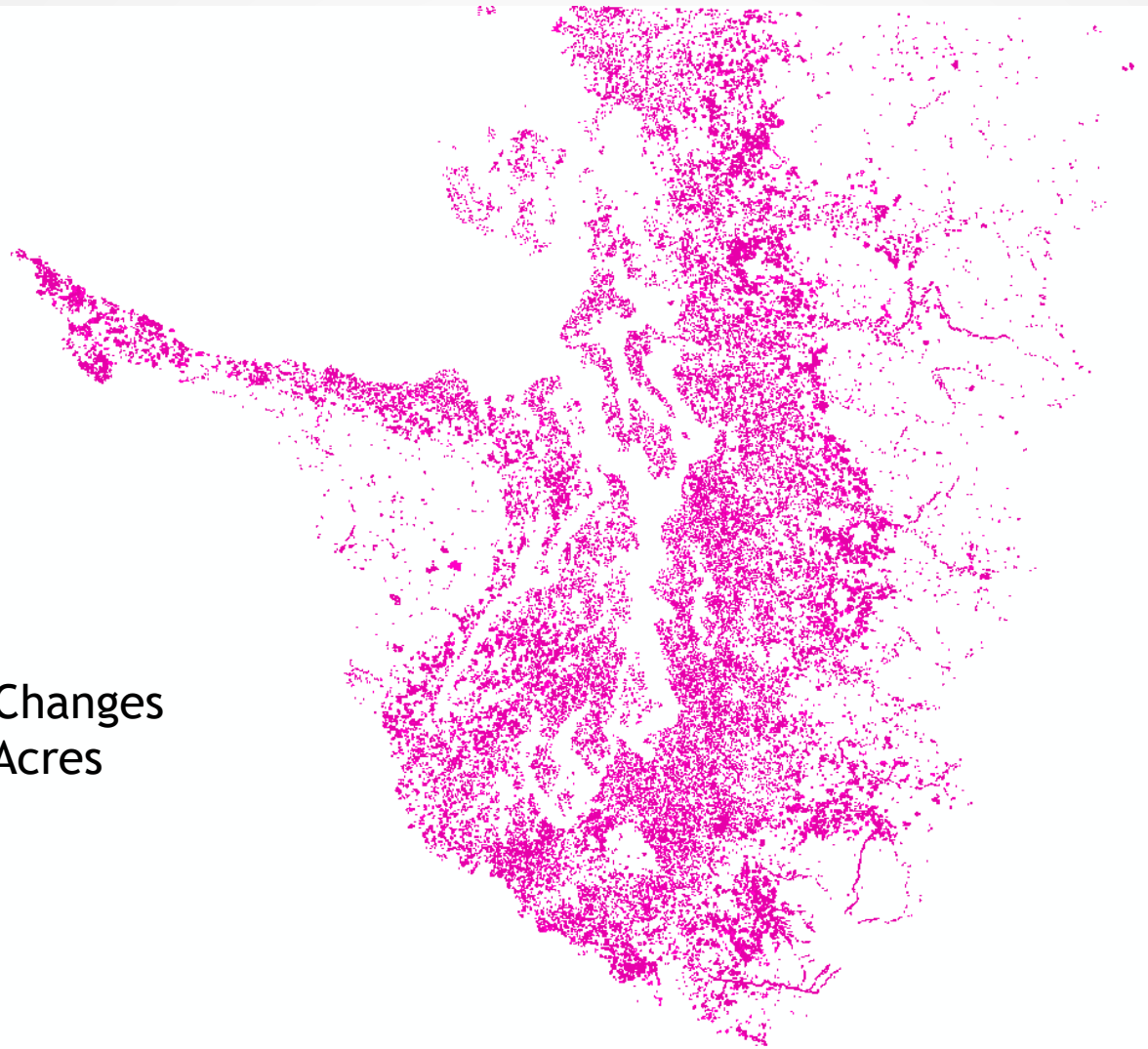


What the HRCD Shows Us:

- 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



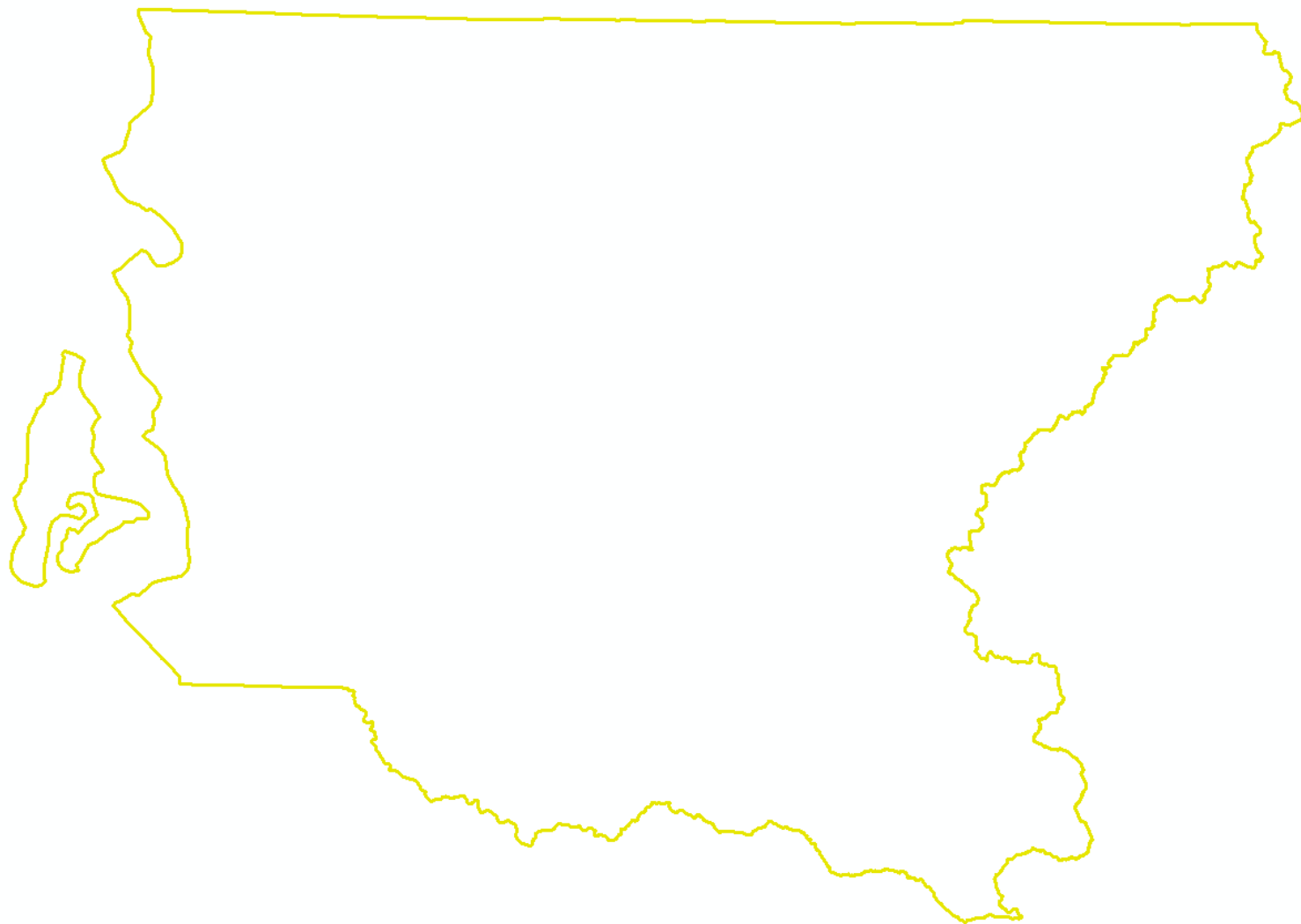


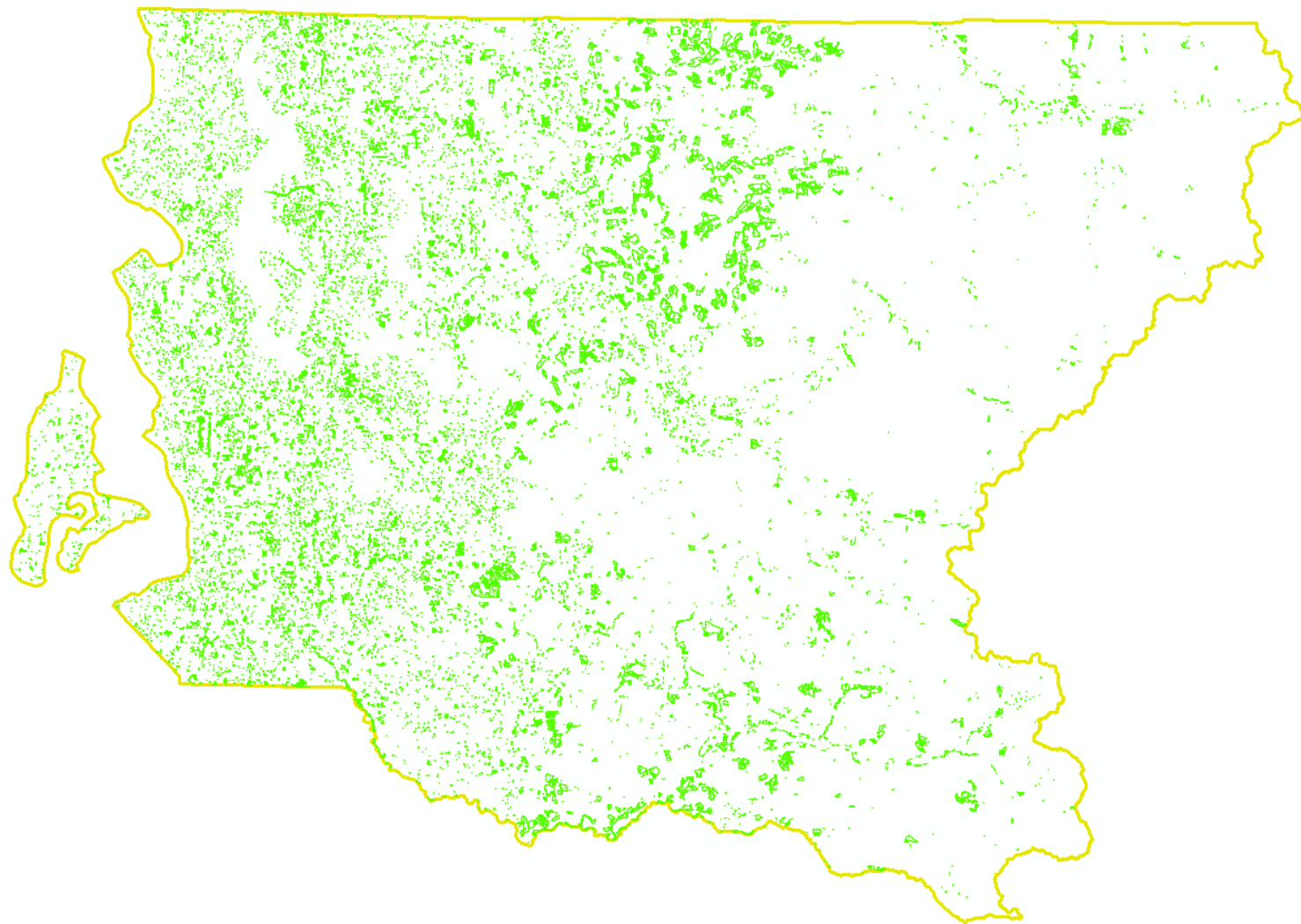
A closer look at HRCD attributes:

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

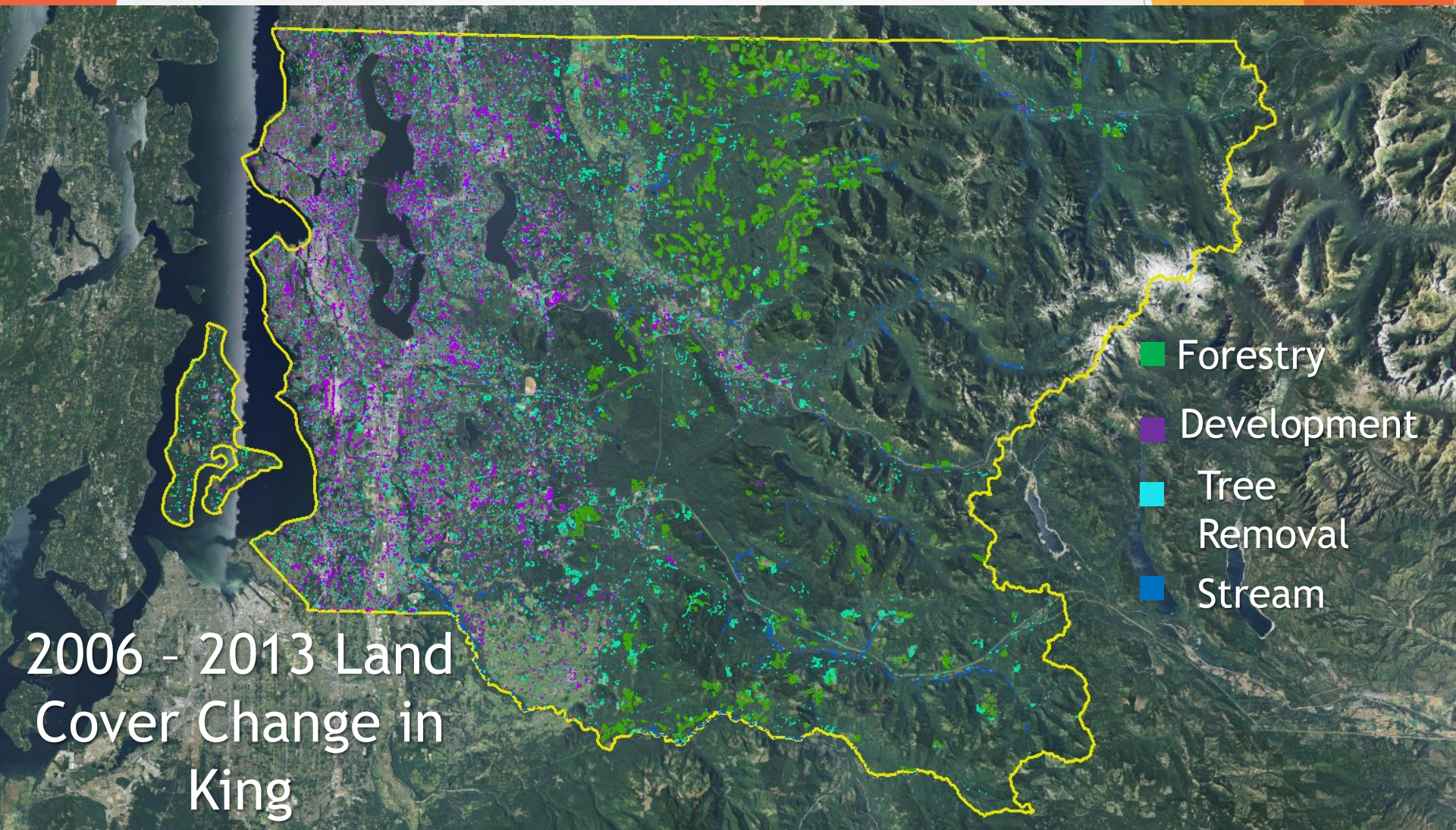




A satellite map of King County, Washington, with the county boundary highlighted by a yellow line. The map shows a mix of urban areas, particularly around the city of Seattle, and vast forested mountain regions. Several large bodies of water, including Lake Washington and various reservoirs, are visible. The terrain is rugged with significant elevation changes.

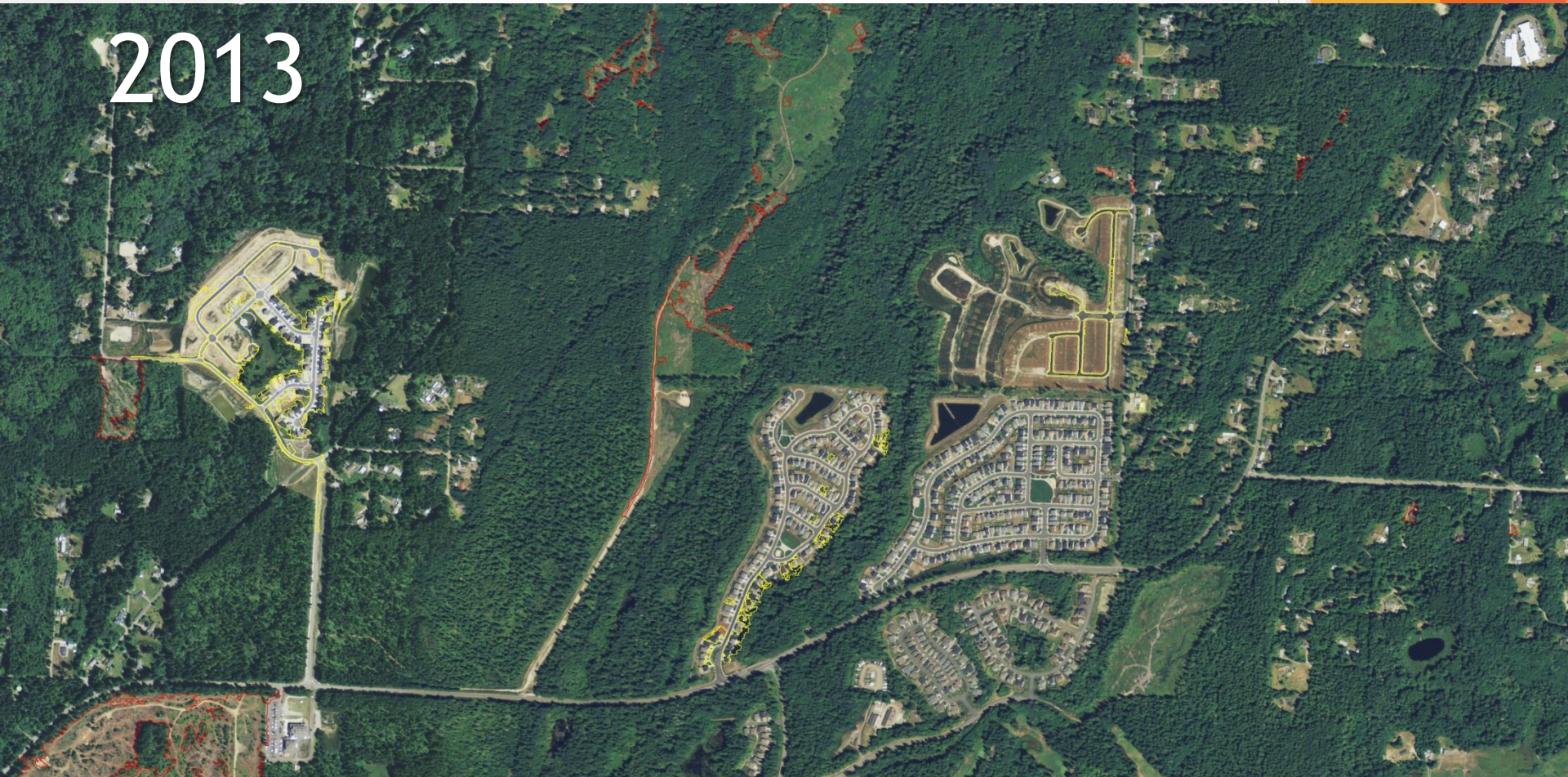
King County
~1,406,400
acres

From: WA DNR



A Zoomed in Look...

2013



King 2006 - 2013

Change Type	Count of Total Change	Sum of Total Change2	Sum of Canopy Loss	Sum of Imperv Gain
Forestry	2,877	52,409.04	52,181.33	1,077.63
Tree Removal	15,926	14,090.84	13,776.51	646.45
Development	11,884	13,065.30	4,668.40	7,948.84
Redevelopment	1,826	2,548.26	376.29	451.13
Stream	1,492	951.45	852.73	124.54
Retention Pond	223	851.21	522.42	290.86
Other, Natural	964	648.02	642.02	3.69
Other, Non-Natural	1,049	526.25	73.08	0.95
Grand Total	36,241	85,090.37	73,092.78	10,544.11

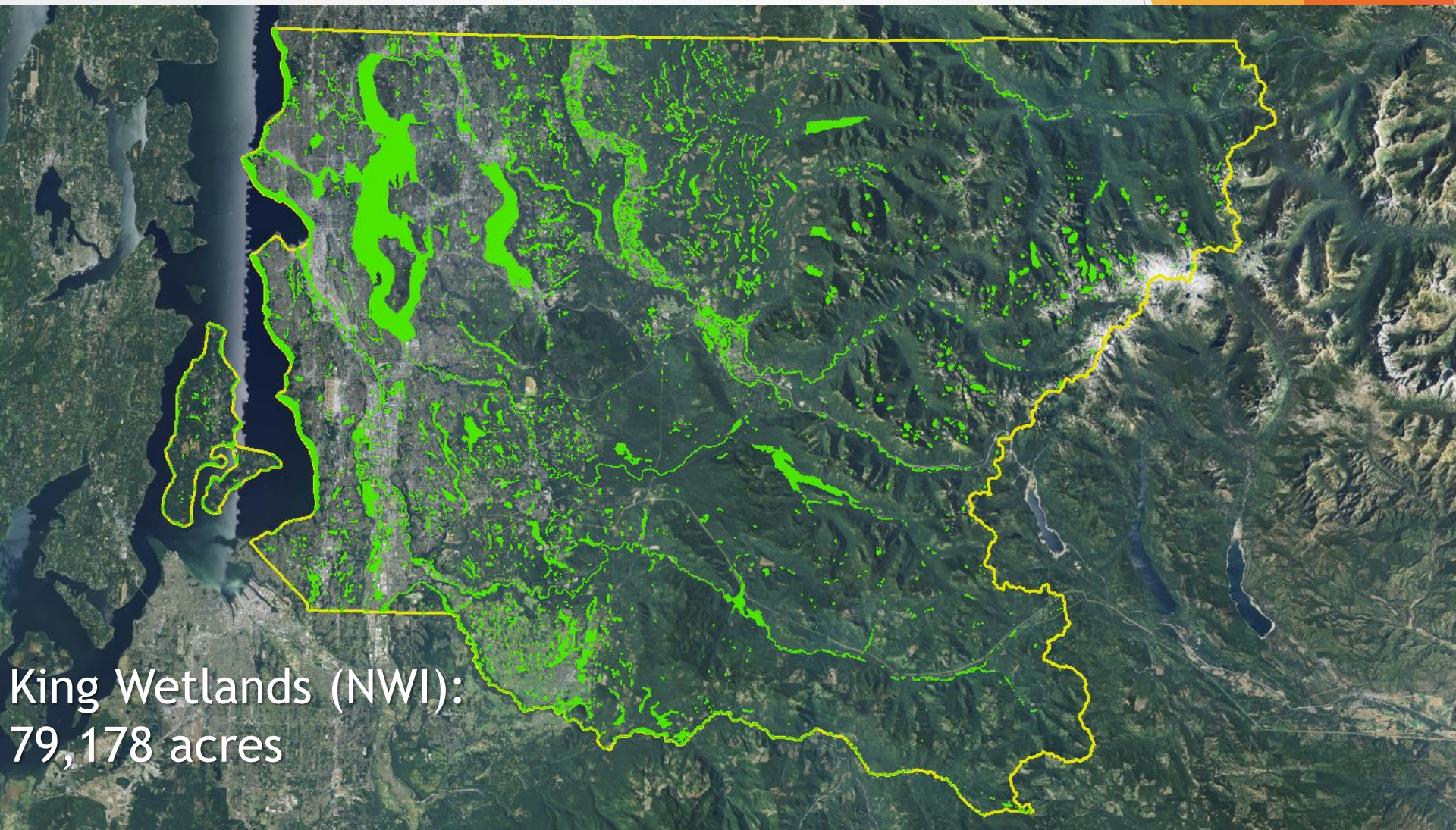
- Between 2006 and 2013, ~6.1% of the county experienced land cover change
- ~3,360 sq ft of new imperviousness per new person

*All population statistics from
US Census Bureau*

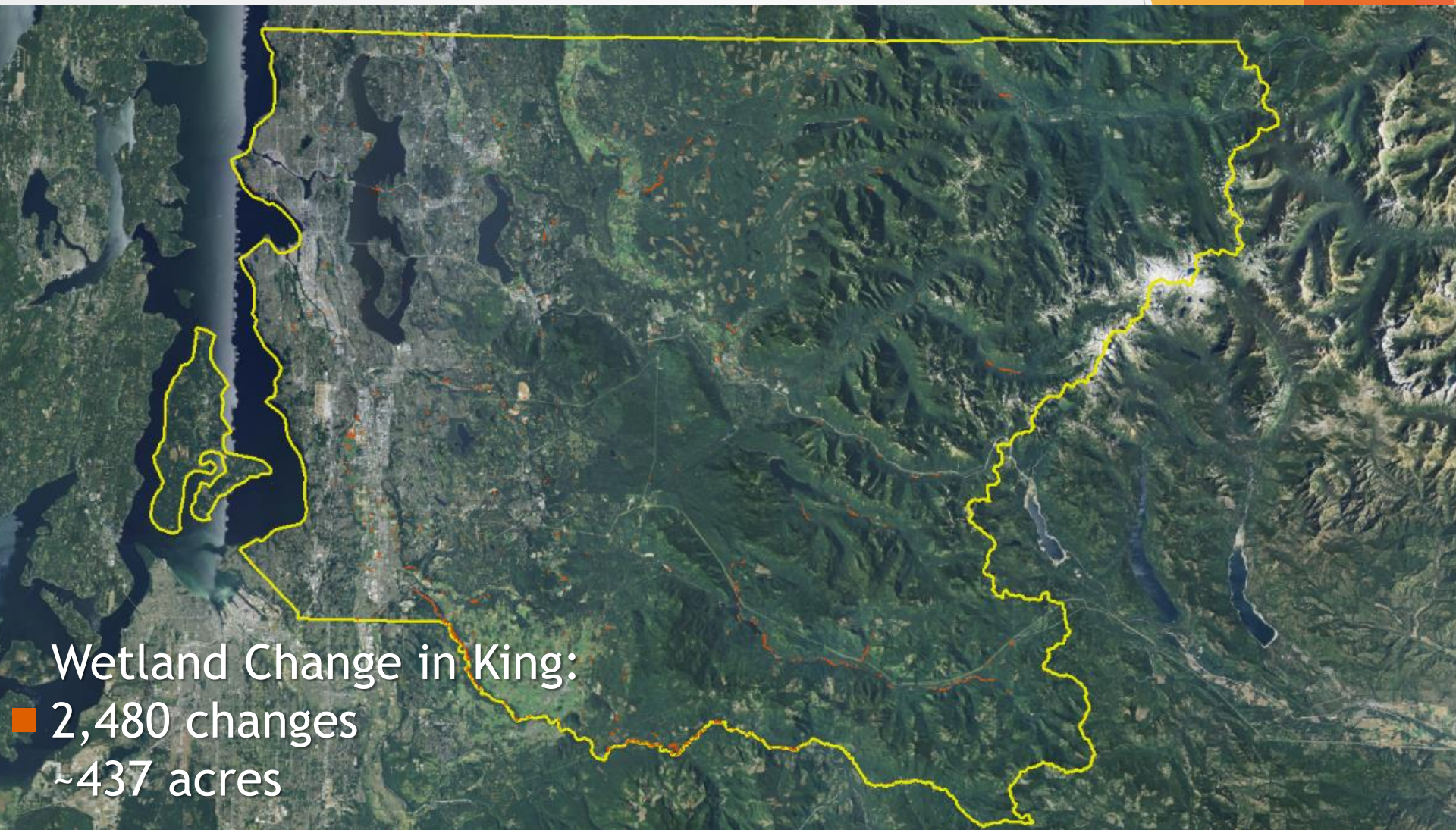
How Does This Compare to the Rest of the Puget Sound?

	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: King Wetlands



King Wetlands (NWI):
79,178 acres

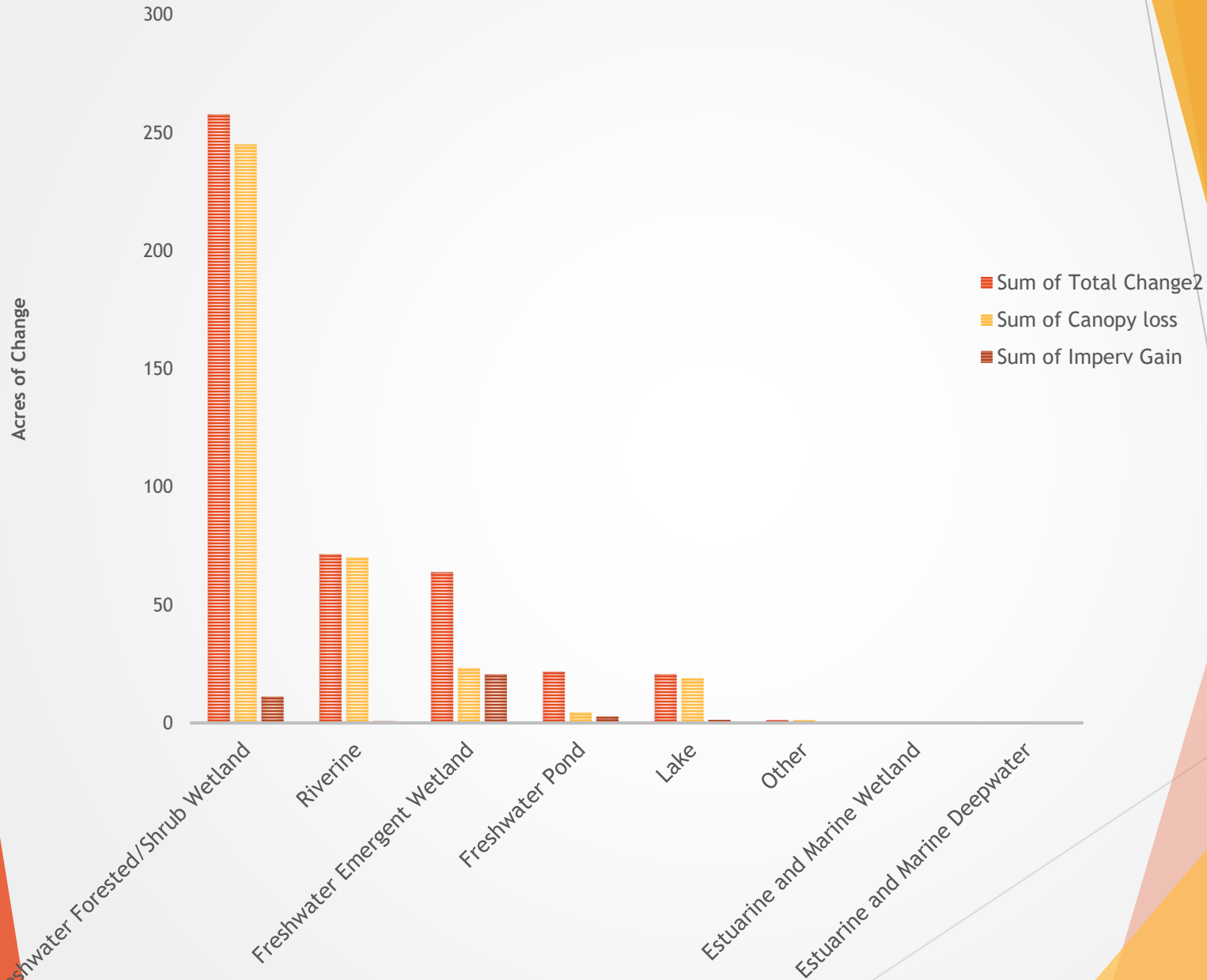


King Wetlands

2006-2013 Land Cover Change

Change Type	Count of Total Change	Sum of Total Change2	Sum of Canopy loss	Sum of Imperv Gain
Stream	1,246	178.95	178.82	0.00
Forestry	133	77.01	76.79	0.66
Development	314	52.39	7.93	34.56
Tree Removal	518	50.13	49.67	0.05
Other, Natural	133	47.35	47.35	0.00
Other, Non-Natural	80	19.14	0.79	0.00
Redevelopment	38	7.74	0.11	0.11
Retention Pond	18	4.52	1.62	1.09
Grand Total	2,480	437.23	363.07	36.47

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



King Wetlands

2006-2013 Land Cover Change

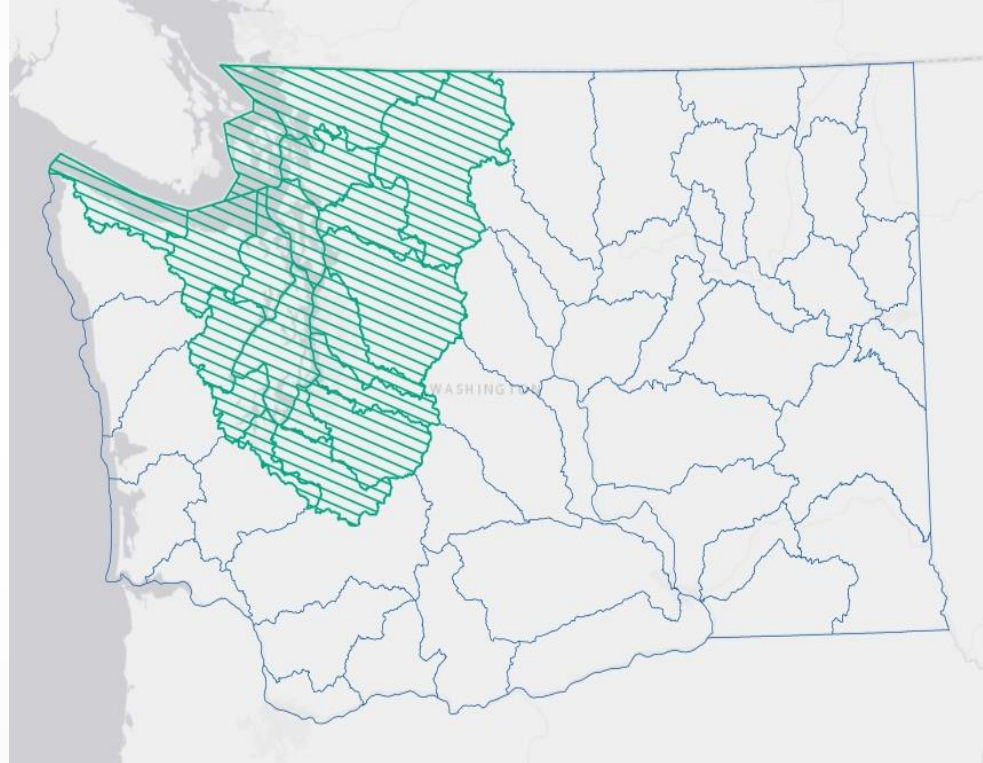
- ▶ ~0.6% of NWI mapped wetlands in King County experienced land cover change
 - ▶ Note: this does not necessarily mean King County *lost* 0.6% of their wetlands
- ▶ Most of change occurred within Freshwater Forested/Shrub Wetland type
 - ▶ Freshwater Forested/Shrub Wetland types make up ~21% of wetlands by area in King
 - ▶ More than 58% of change by area in this wetland type

Many, many ways to analyze the data

- ▶ 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?