

**Mountains to the sea: Sediment and
Carbon Accumulation in Oregon's
Estuaries and Continental Shelf**

**Kris Richardson
IDES Symposium
July 2012**

**Mentoring Professors:
Rob Wheatcroft & Miguel Goñi
Oregon State University**

Source: K.Richardson

Wilson River, Tillamook County, November 2011

Outline

- Background/motivation
- Objectives
- Methodology
- Results

Background & Motivation

In Cascadia,

- Large amounts of sediment
- Strong hydroclimatic and tectonic forcings.
- Notable disturbance on land – timber harvest, forest roads, fire

Hydroclimatic and land use effects are entangled.

Previous work is very small scale.

Sedimentary record can reveal processes in river basins.

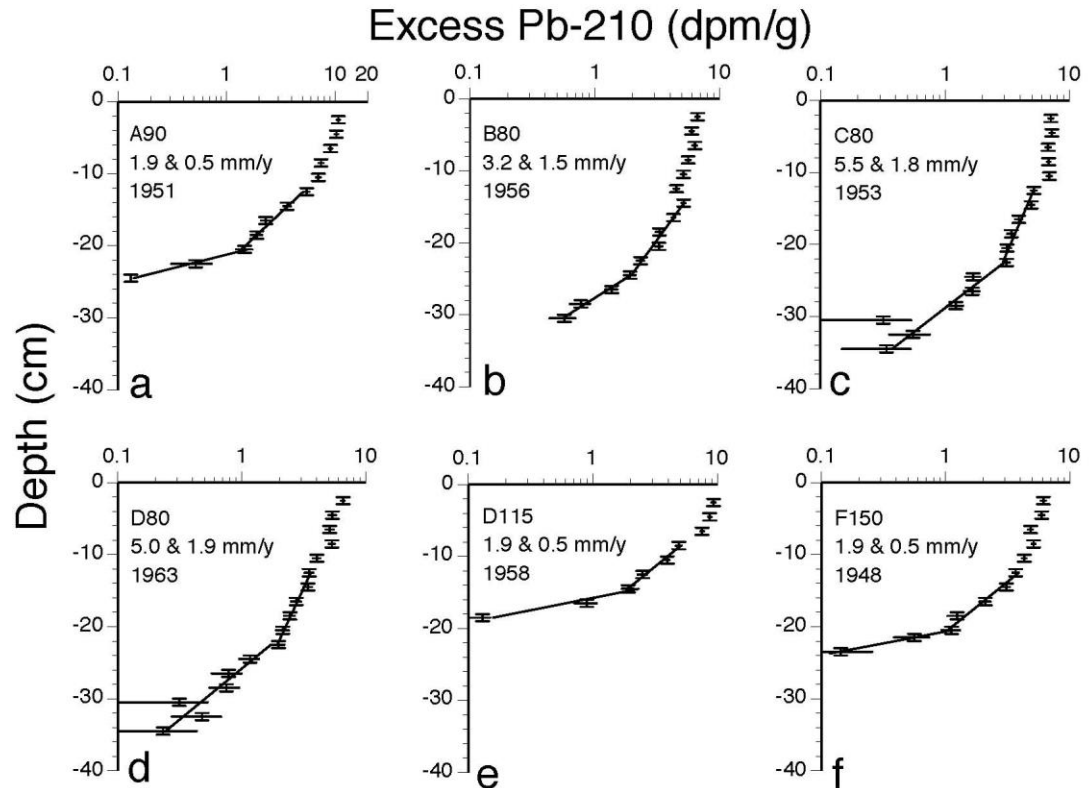


Motivation, continued

Apparent sediment accumulation rate increase offshore near Umpqua River

➤ Slopes of line change

➤ Inflection point:
mean age 1958
(+/- 7 years)

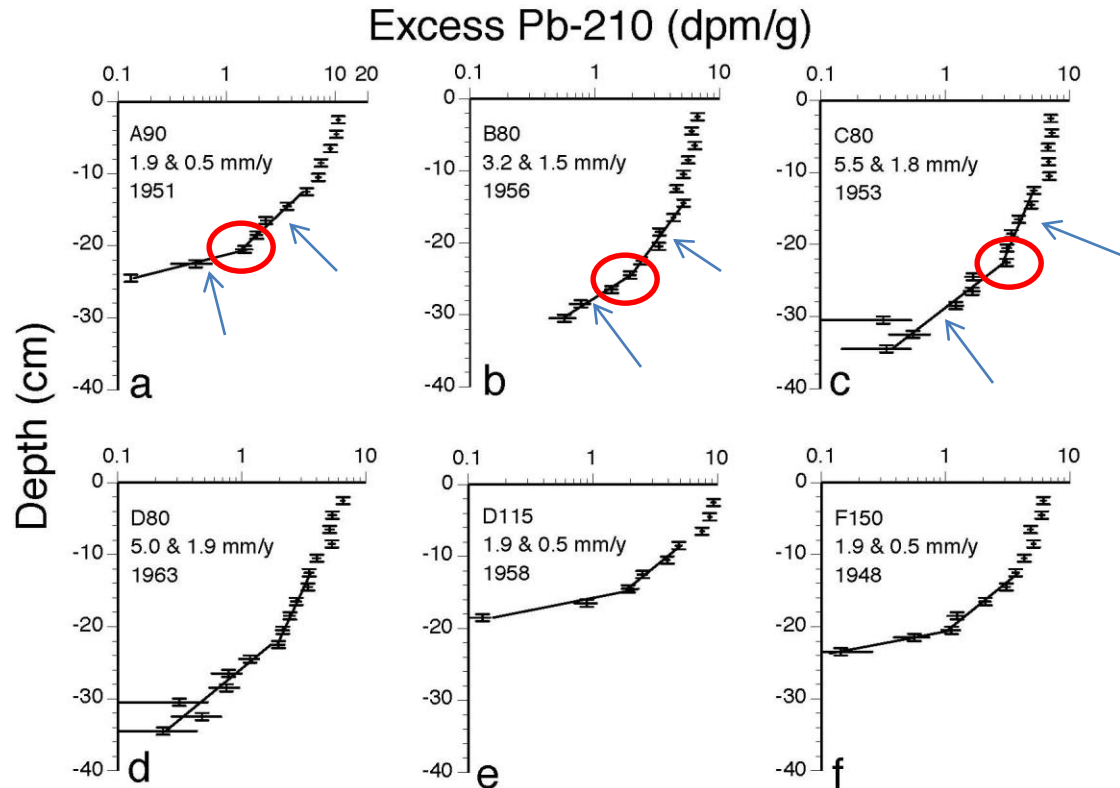


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Objectives

- Do characteristics of disturbance change?
 - timber harvest area
 - timber harvest intensity
- Is there interaction with other factors which impact sediment production?
 - slope
 - rock type
 - precipitation
- Approximate sediment accumulation.

Methodology

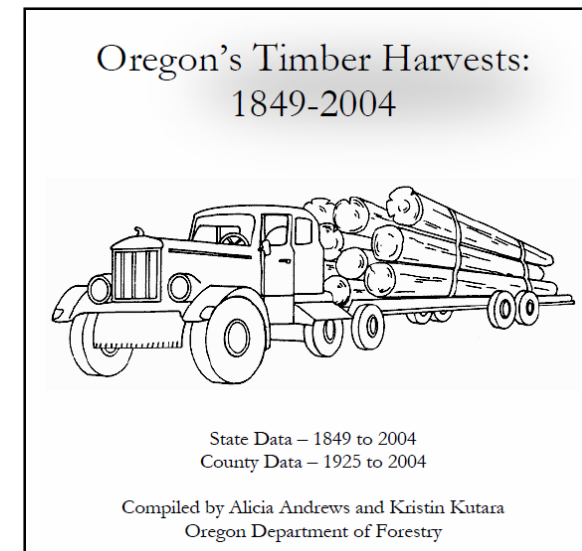
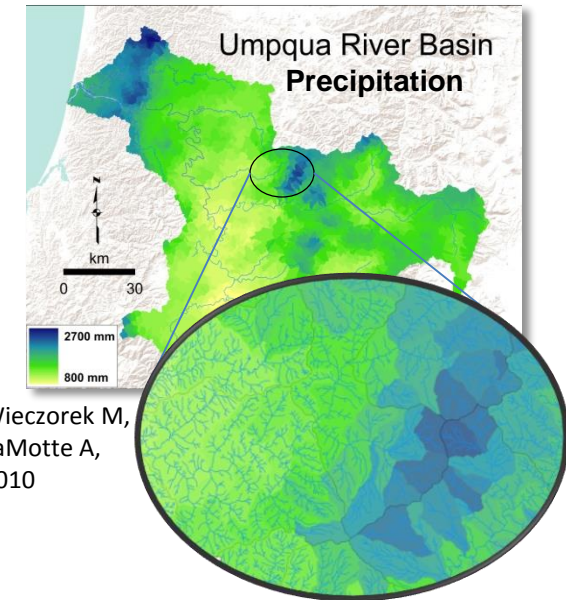
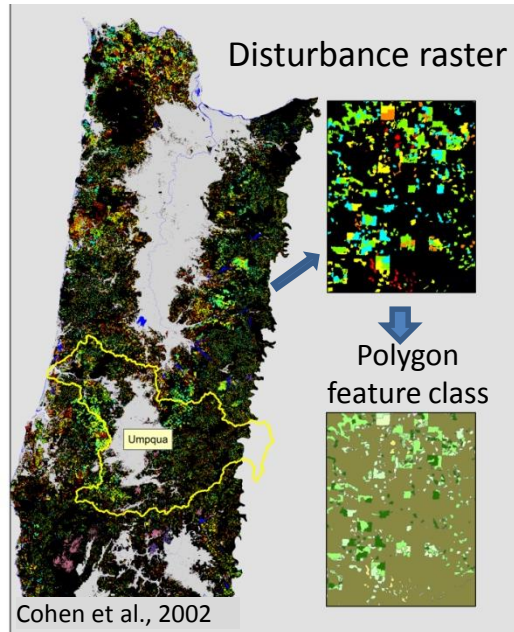
Three important and interesting data sets

- Disturbance raster
- Timber harvest by county
- Precipitation

Umpqua River Basin used as initial study area

Board feet regressed to area harvested to see if a relationship exists

If so, harvest can be extended back in time.



Methodology

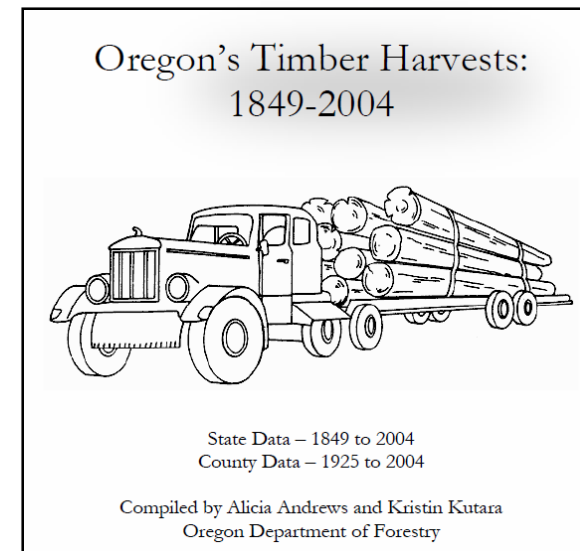
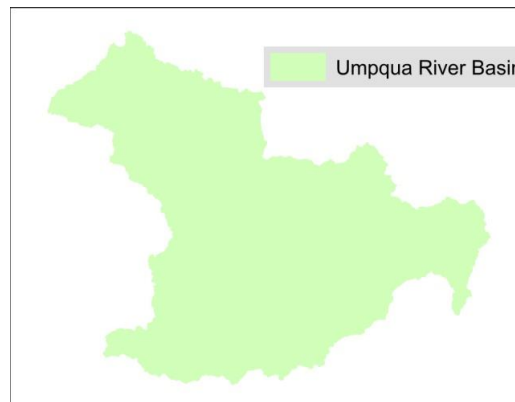
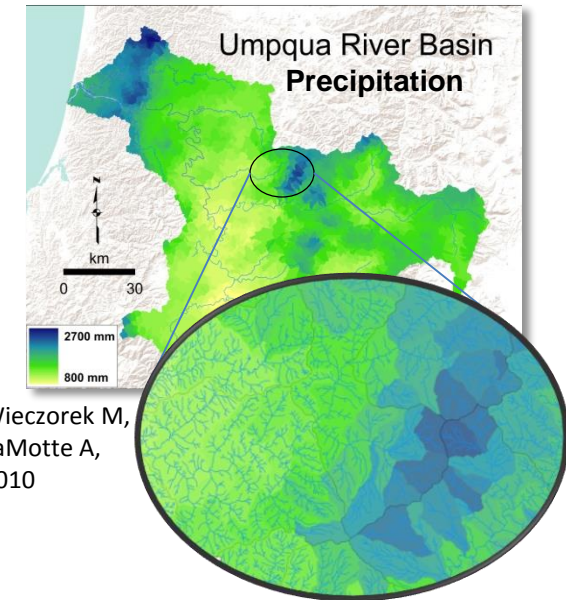
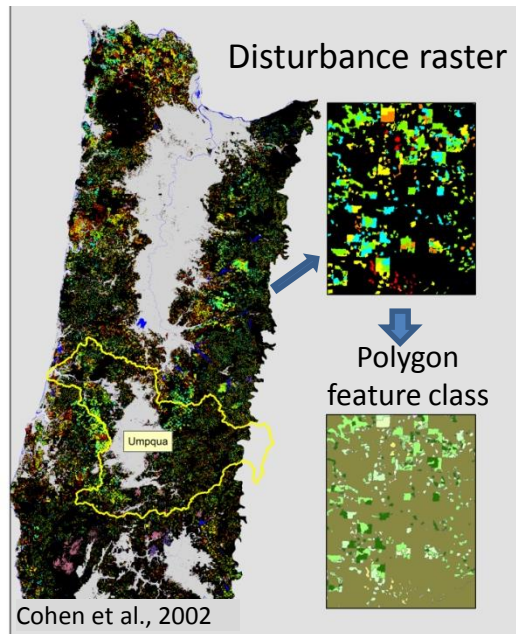
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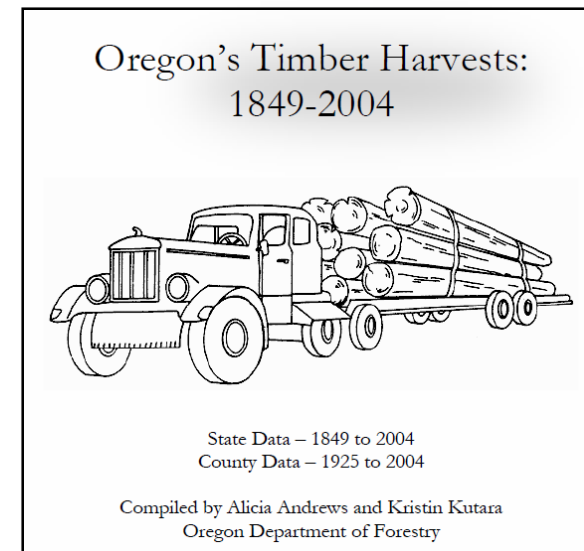
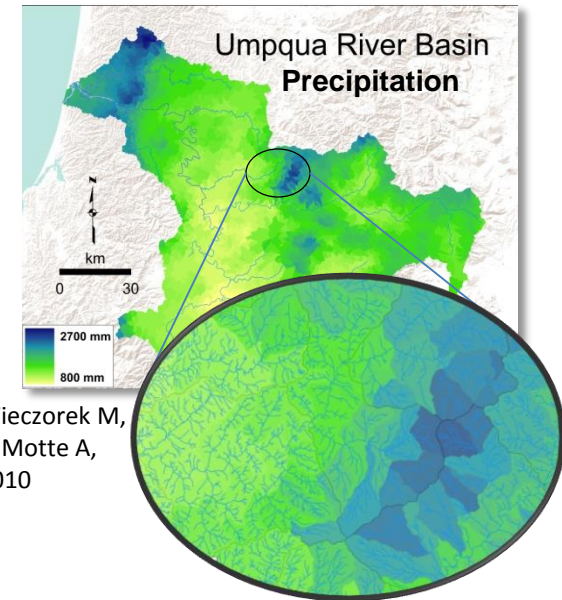
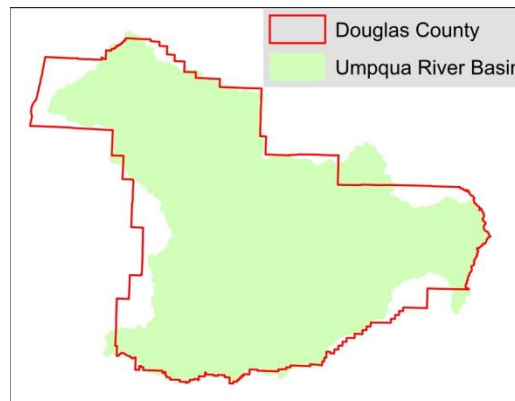
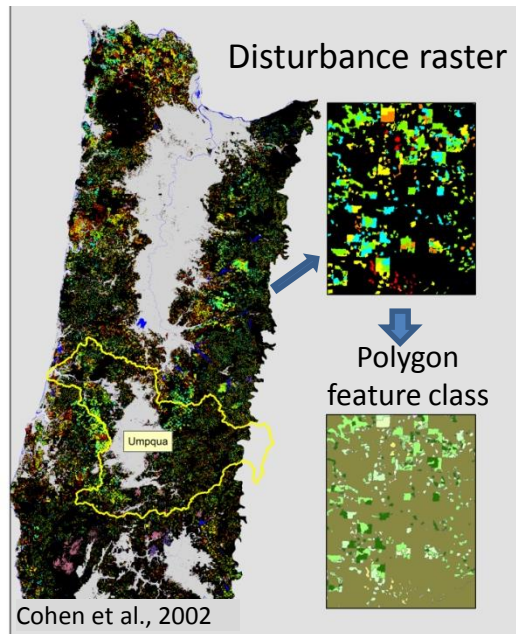
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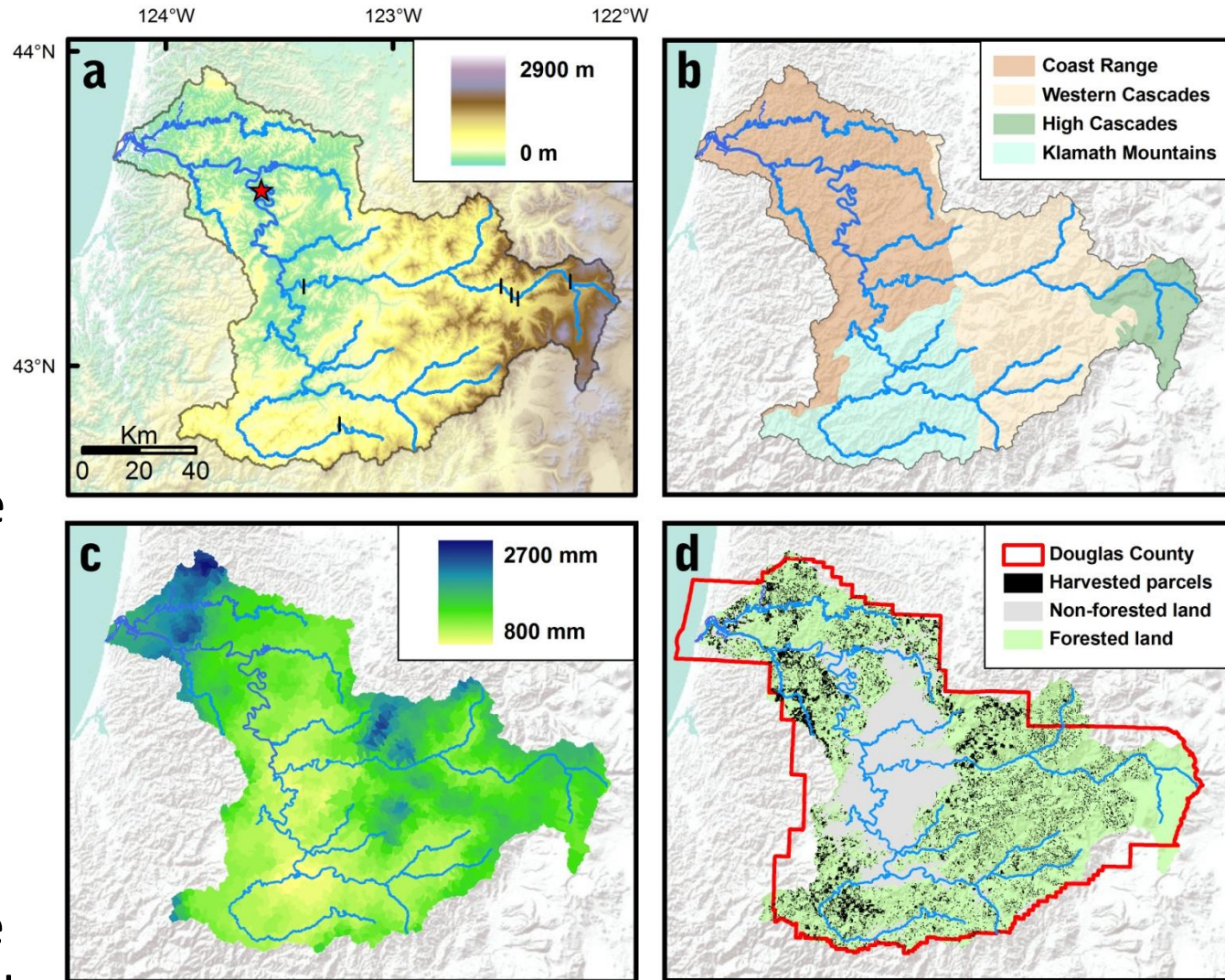
Results

- Precipitation is greater in Coast Range

- However, precipitation is variable

- Harvest was more intense in Coast Range

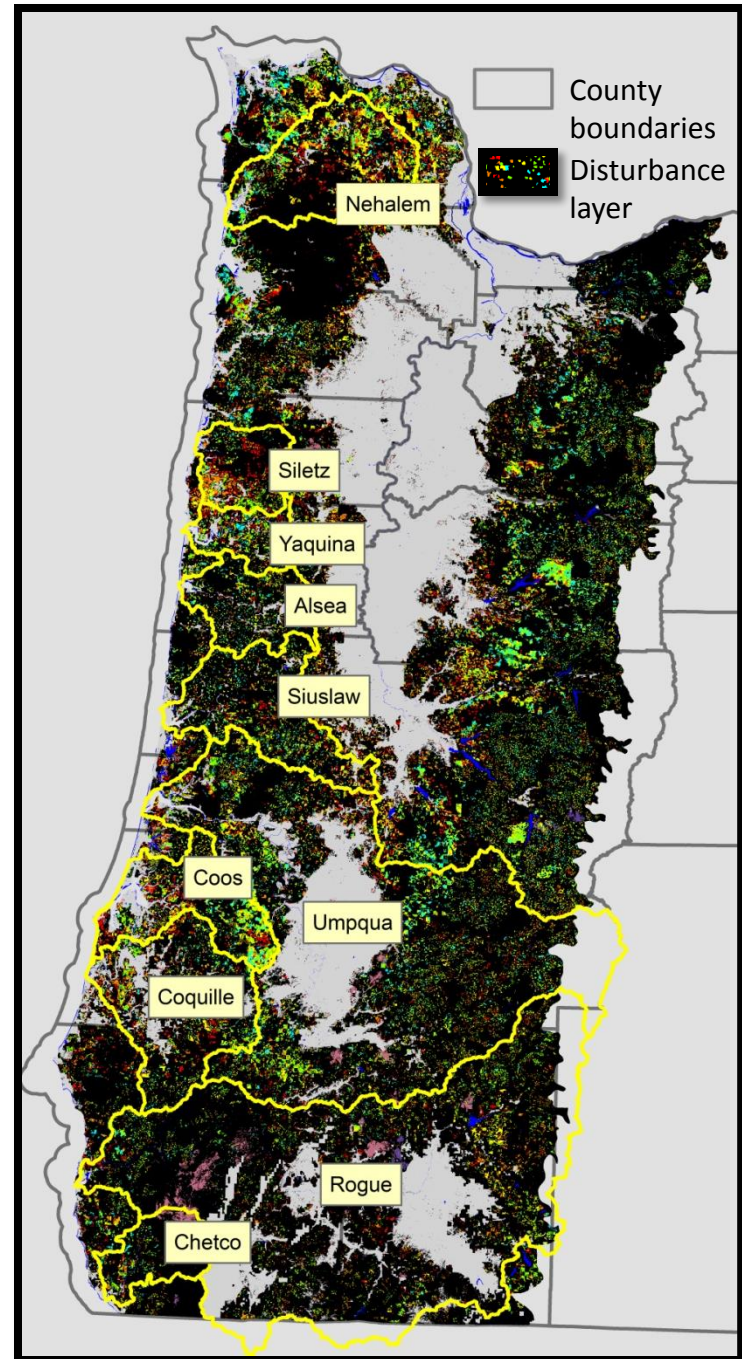
- Rates of harvest on industrial land were more intense than on public land



Discussion

1. The regression relationship of BF to area harvest is poor.
2. However, it will continued to be pursued.
3. Regress BF to area harvested by county first, then by catchment.
4. Analysis will extend to ten basins in the Oregon Coast Range.

Cohen et al., 2002



Acknowledgements

- Rob Wheatcroft and Miguel Goñi for mentoring and teaching
- Colleen Sullivan, grad student in Geography, for GIS advice
- Core Lab staff and faculty for sharing the love of cores
- IDES staff for mentoring and organizing a successful experience.

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Sources of error

- Converting raster to polygon.
- Mismatch of county and watershed boundaries.
- Missing data for harvest (see right).

