

Portland Vancouver ULTRA-Ex* Overview



Alan Yeakley + many others

School of the Environment
Portland State University

*Urban Long-Term
Research Area - Exploratory



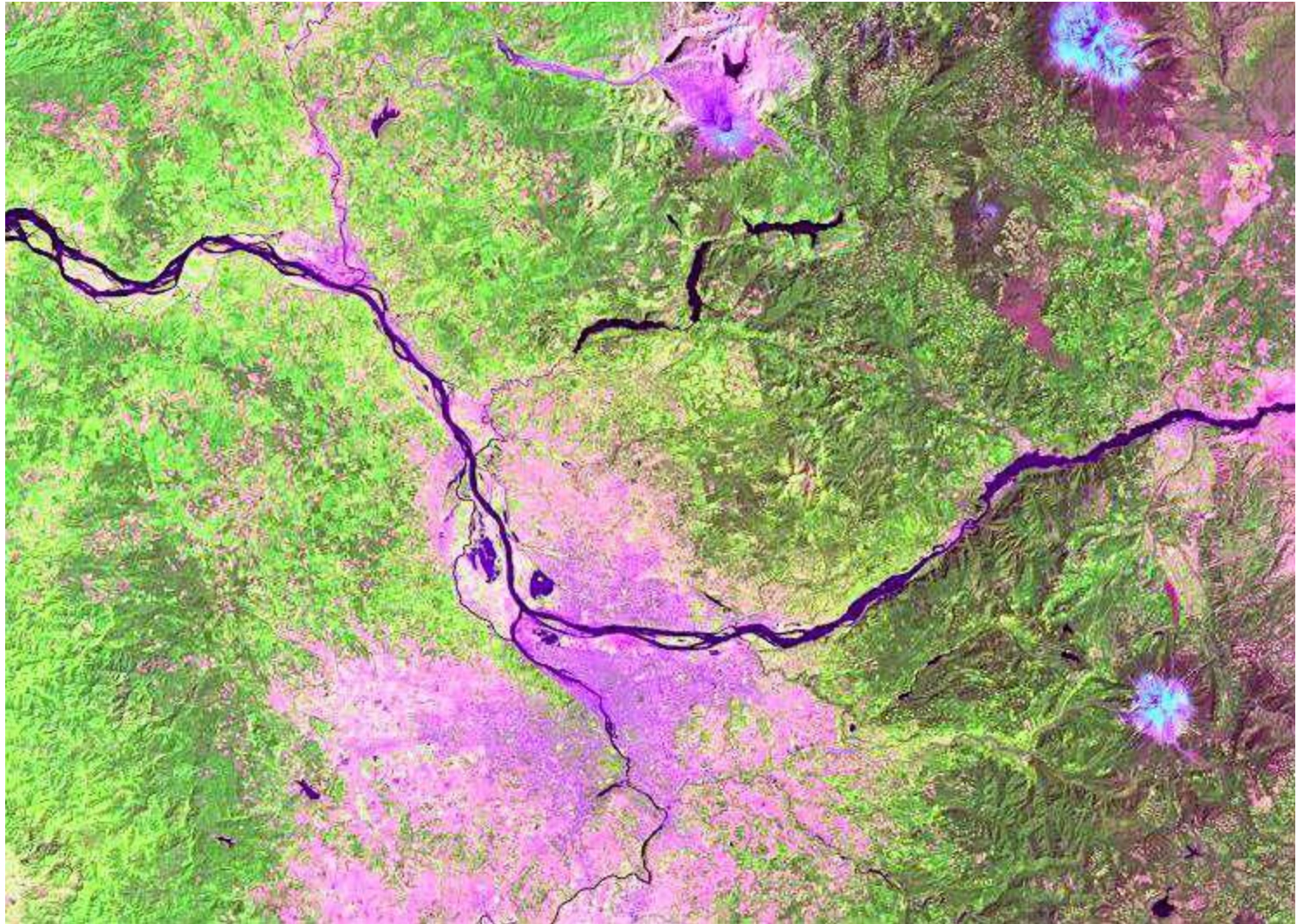
Portland-Vancouver ULTRA-Ex

Geographical Setting

Washington

Columbia
River

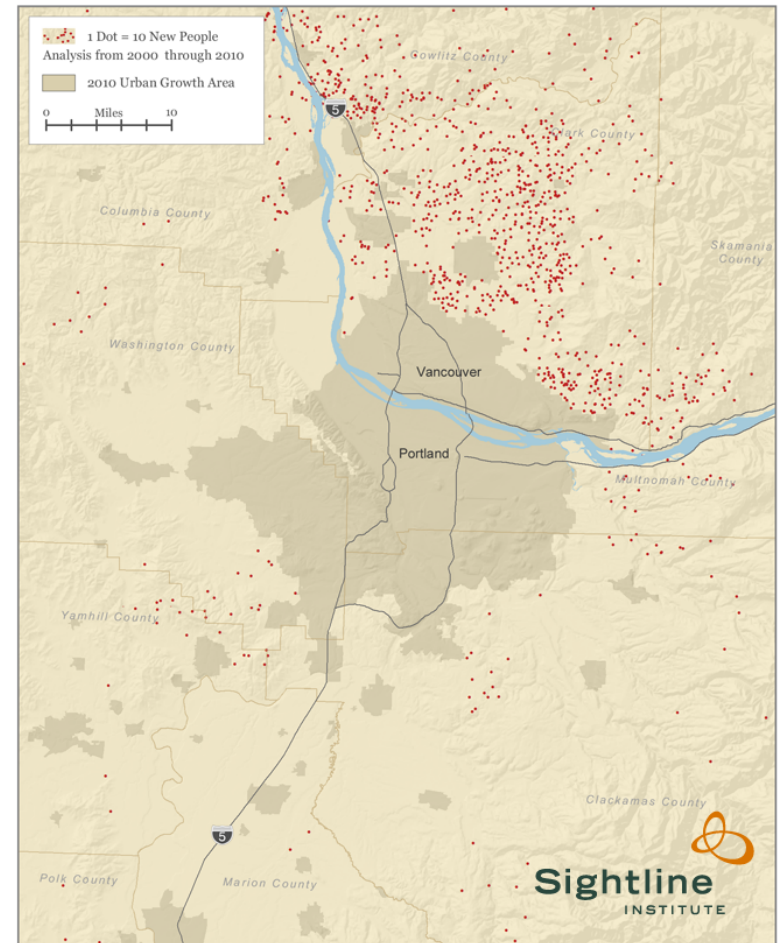
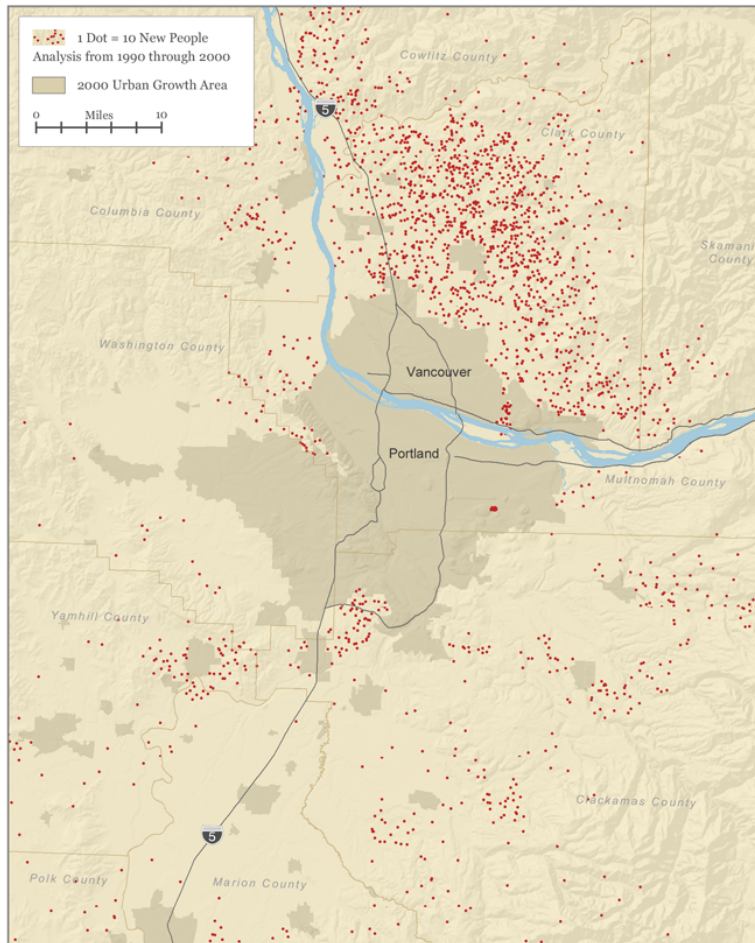
Oregon



Oregon vs Washington

Exurban Growth in the Portland Metro Region

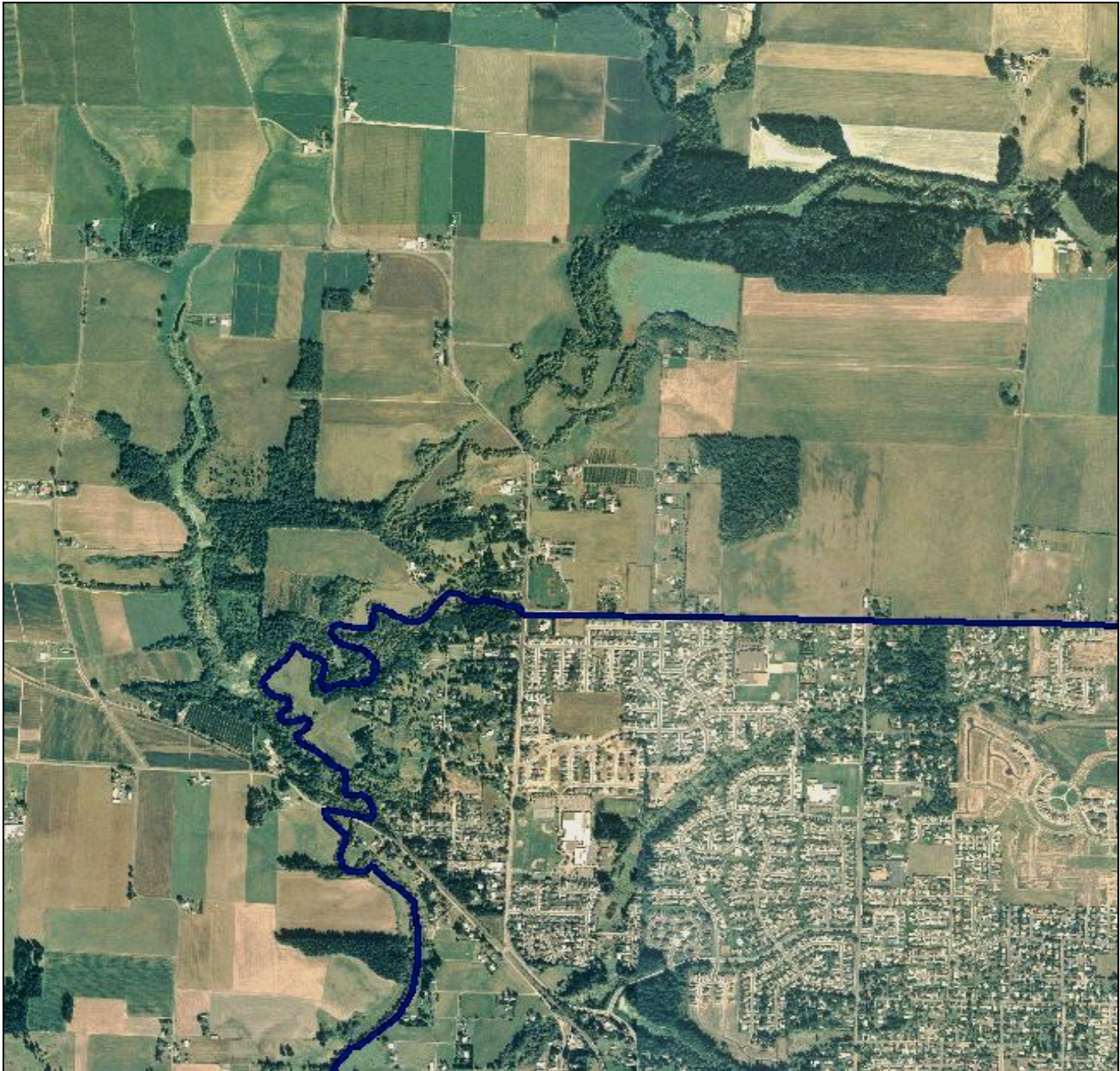
1990-2000 2000-2010



Each red dot = 10 new people

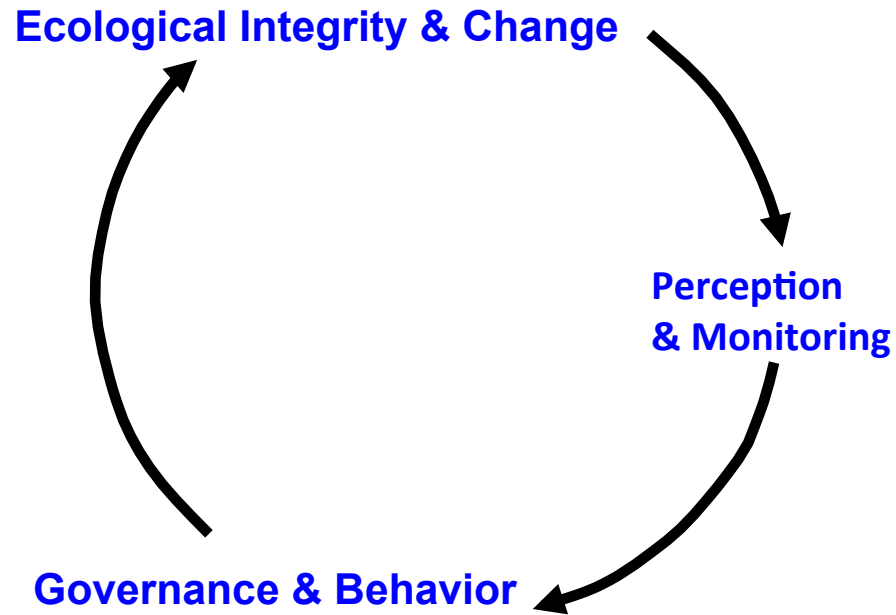
Source: Sightlines

Contained urban growth in Oregon



← UGB

UGB = urban growth boundary



More specifically:

Do differences in levels of **governance** affect the **resilience** of urban ecosystems?

Do alternative **land use planning** strategies affect **urban ecosystem integrity** & **services**?

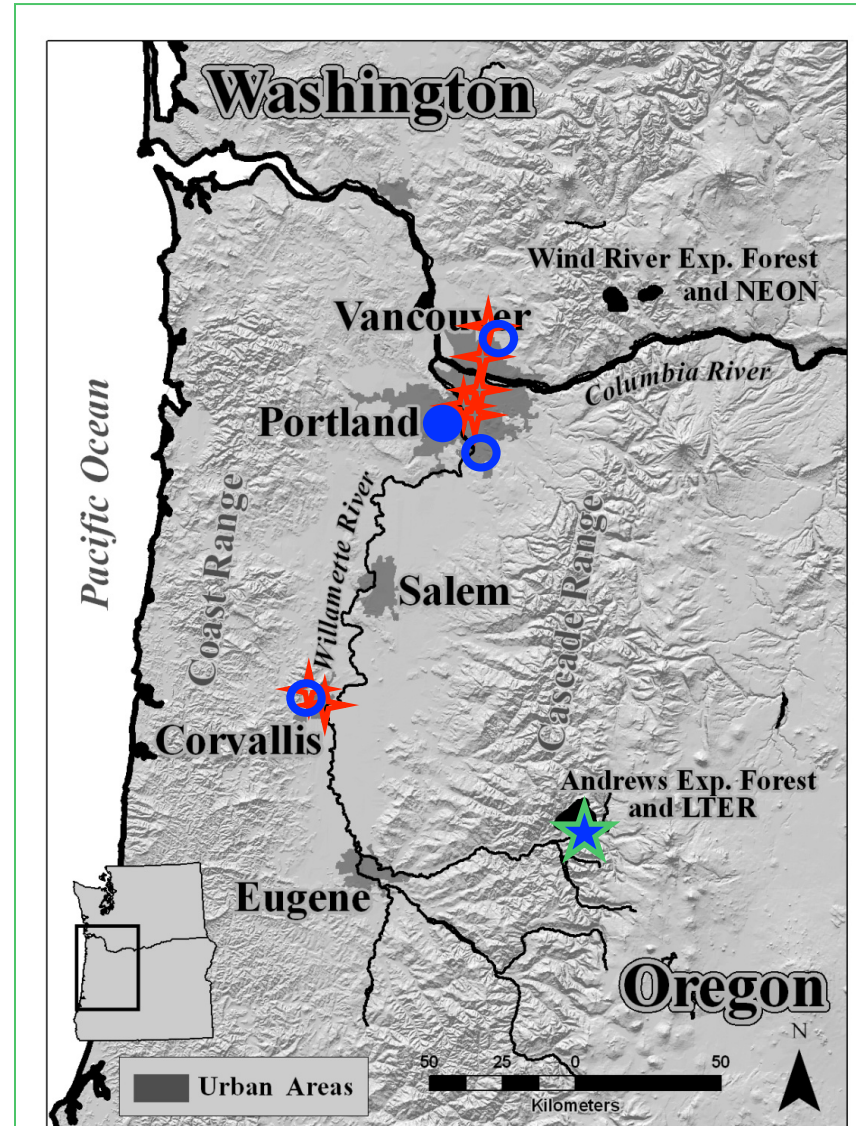
Does **monitoring** ecosystem services provide a **feedback loop** in urban socio-ecological systems?

PV ULTRA-Ex

Organizations Involved



PV ULTRA-Ex Information Management is in coordination with the HJ Andrews LTER



OUR APPROACH – Two Dimensions & Two Scales

Social Dimension

Land use and planning effects
Civic ecology/governance
Environmental education

Ecological Dimension

Riparian greenspaces

Water quality

Stormwater management



Tryon Creek, Lake Oswego, OR



East Portland bioswales

Project scale

- Riparian greenspace management
- Stormwater and green infrastructure
- Water quality analyses
- Economic analyses

Ultra wide scale

- Land use and planning effects
- Perceptions of residents
- Decision makers and environmental information
- Role of K-12 and citizen education

March 17, 2014

Proposed morning schedule from US presenters

TIME	TOPIC	PRESENTER
9.00	Intro to ULTRA-Ex	Alan Yeakley
9.10	Riparian greenspace analyses	Alan Yeakley
9.30	Water quality studies	Heejun Chang
9.55	Biogeochemistry in urban settings	Jen Morse
10.15	Water quality modeling	Denisse Fisher de Leon
10.30	Break	
10.45	Hedonic analyses	Noelwah Netusil
11.10	Community perceptions	Anita Morzillo
11.35	Institutions and climate change	Connie Ozawa
12.00	ULTRA-Ex major findings so far	Alan Yeakley
12.05	Discussion	All
12.15	BES and the City of Portland	Maggie Skendarian
12.30	Lunch	



OUR APPROACH – Two Dimensions & Two Scales

Social Dimension

Land use and planning effects
Civic ecology/governance
Environmental education

Ecological Dimension

Riparian greenspaces

Water quality

Stormwater management

Project scale

- Riparian greenspace management
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Ultra wide scale

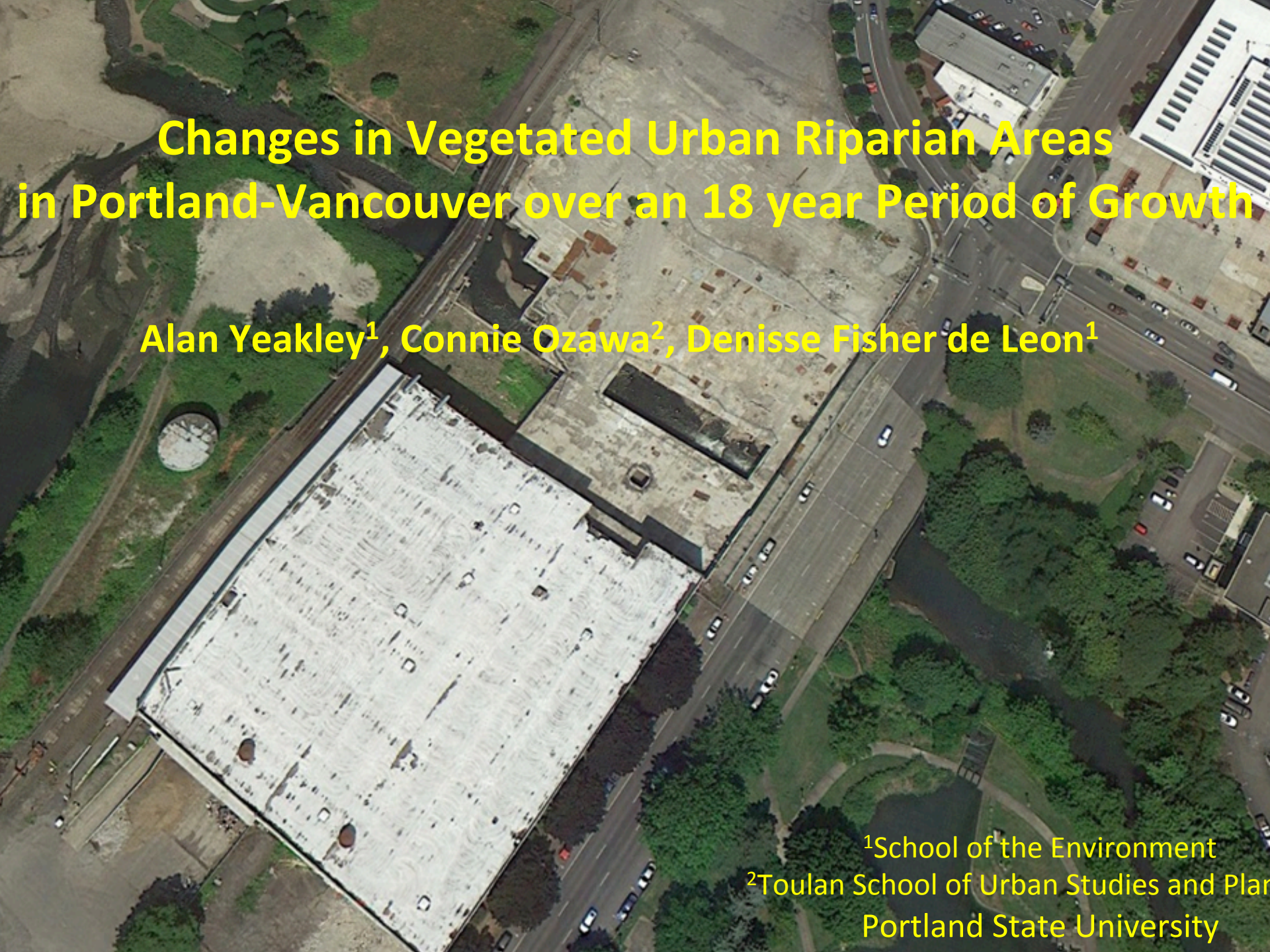
- Land use and planning effects
- Perceptions of residents
- Decision makers and environmental information
- Role of K-12 and citizen education



Tryon Creek, Lake Oswego, OR



East Portland bioswales



Changes in Vegetated Urban Riparian Areas in Portland-Vancouver over an 18 year Period of Growth

Alan Yeakley¹, Connie Ozawa², Denisse Fisher de Leon¹

¹School of the Environment

²Toulan School of Urban Studies and Planning

Portland State University

Research Objective

Determine the *extent and rate of riparian buffer loss*
in urbanizing areas under various regulatory
frameworks in Oregon and Washington cities for
the period 1990-2008

Methods – part 1

Data

- 1990 gray scale photographs at 1' resolution
- 2002 color photographs at 1' resolution
- 2007 & 2008 color photographs at 1' resolution
- Metro and County databases for stream locations and ownership patterns

Digitizing

- 0-200 m from permanent streams and wetland features
- Viewing scale: 1:1500
- Patch definitions*
 - minimum inter-patch distance of 5 m
 - area of a patch using 5 m x 5 m area

*Schuft et al. 1999. *Photogrammetric Engineering and Remote Sensing* 65: 1157-1167.

Methods – part 2

Banding

- **7.5 m** (25 ft – Washington County buffer regulation)
- **15 m** (50 ft – Metro Title 3 minimum)
- 22.5 m
- **30 m** (100 ft – corresponds to 50x100 ft lot dimension max)
- 45 m
- 61 m
- **100 m**
- 200 m (total)

Cover classes of vegetation within bands

- **Adjacent woody**
- Adjacent *unmanaged*
- Non-adjacent *woody*
- Non-adjacent *unmanaged*

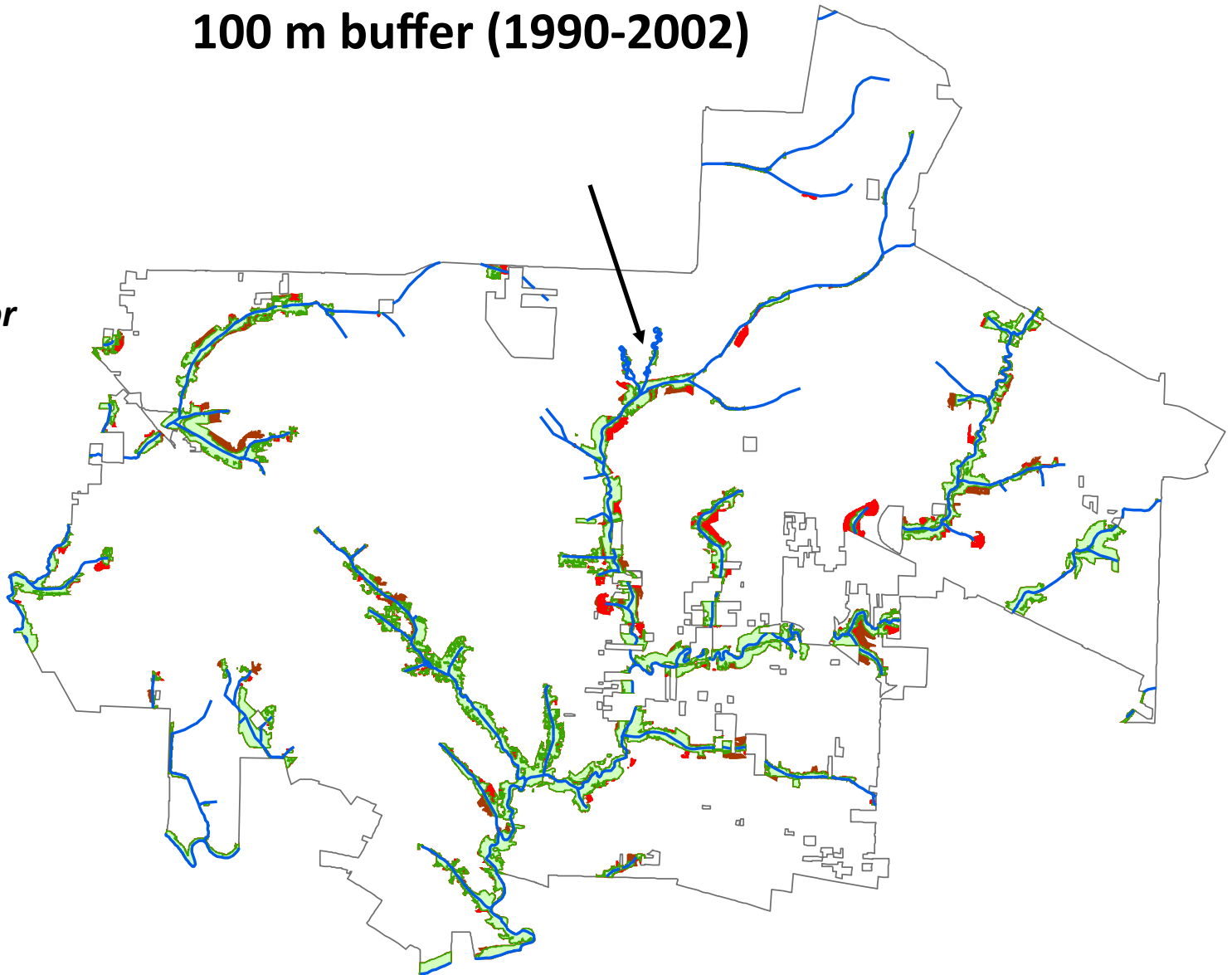
Earlier findings: 1990-2002 in Oregon

Hillsboro tree loss

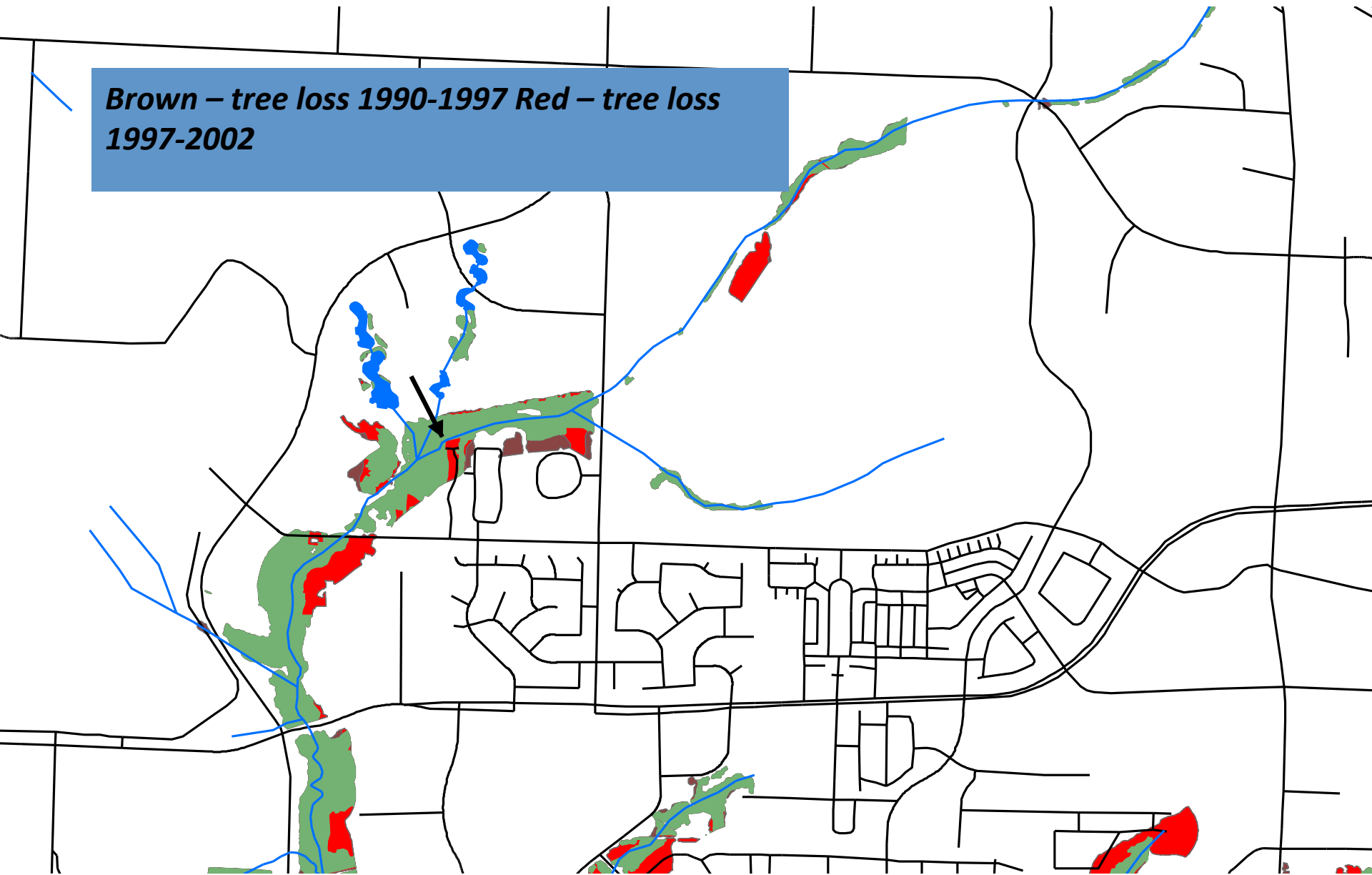
100 m buffer (1990-2002)

Brown = losses for
1990-1997

Red = losses for
1997-2002

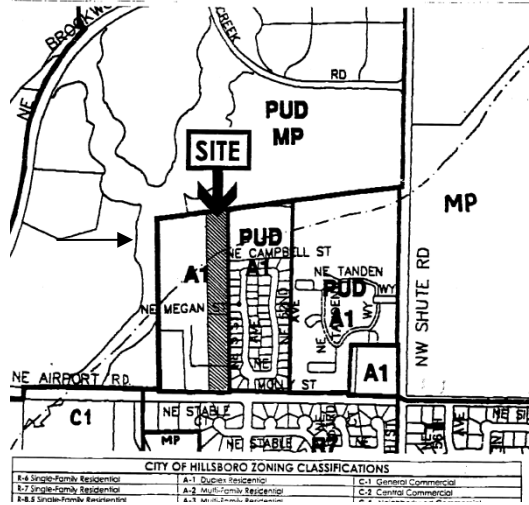


Brown – tree loss 1990-1997 Red – tree loss 1997-2002



An example of riparian area loss in Hillsboro ...

PUD 4-99: HIGHLANDS AT DAWSON CREEK NO. 2
 Request for Preliminary Development Plan Approval for
 a 50-Lot Attached Residential Planned Unit Development

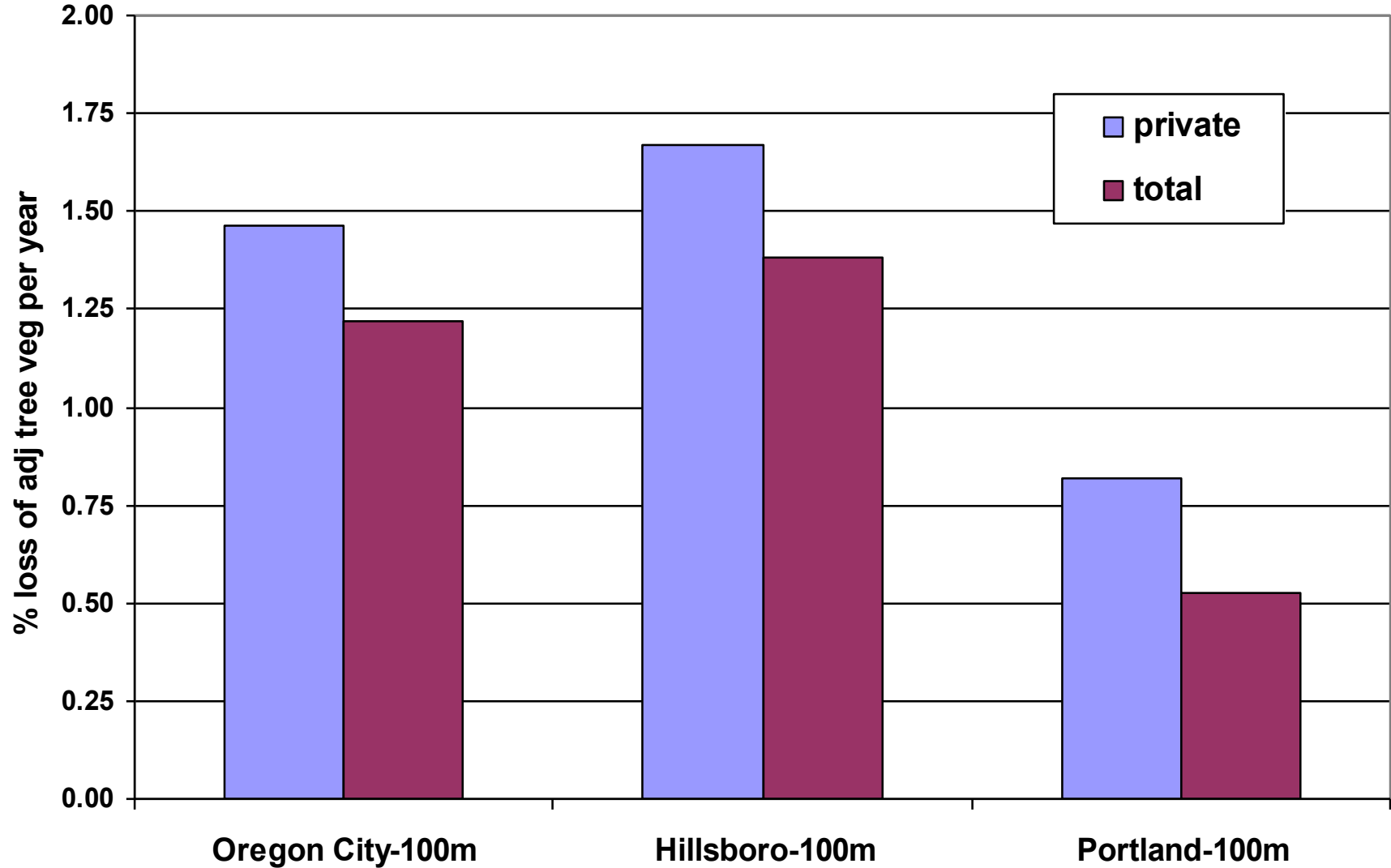


↑
Aug 2002
 ↓



% loss per year: 1990-2002

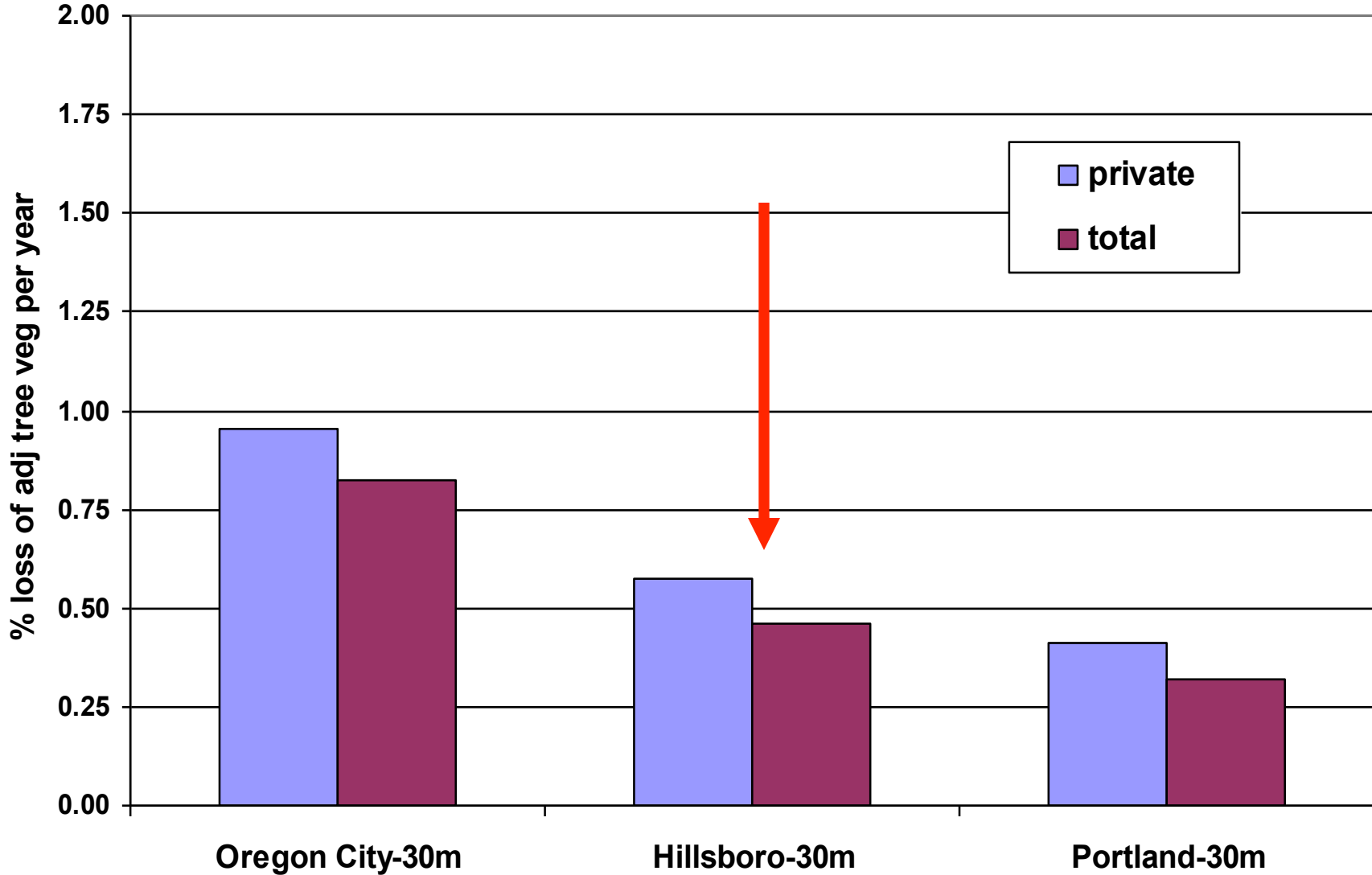
100 m - Adj Tree



Mirrors population growth

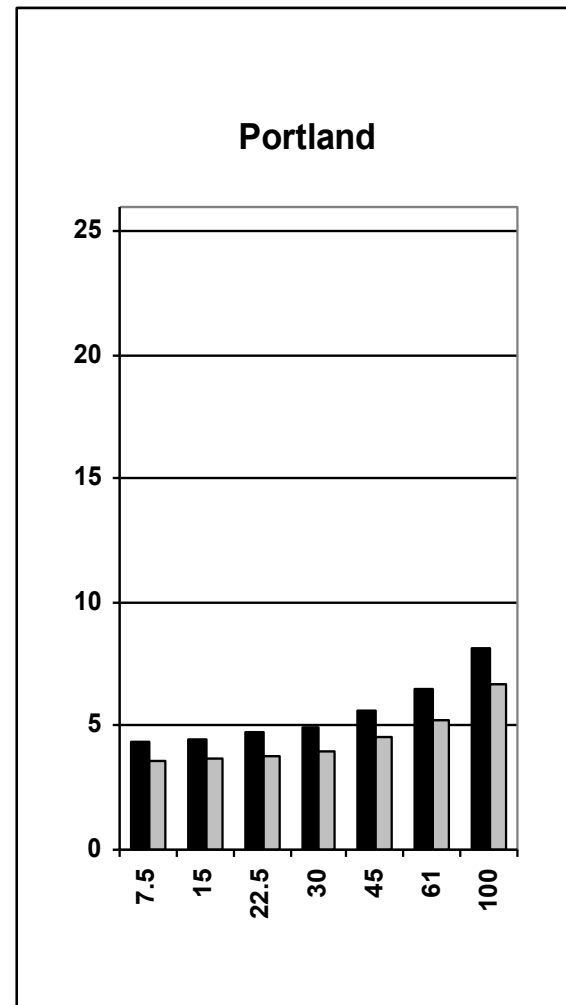
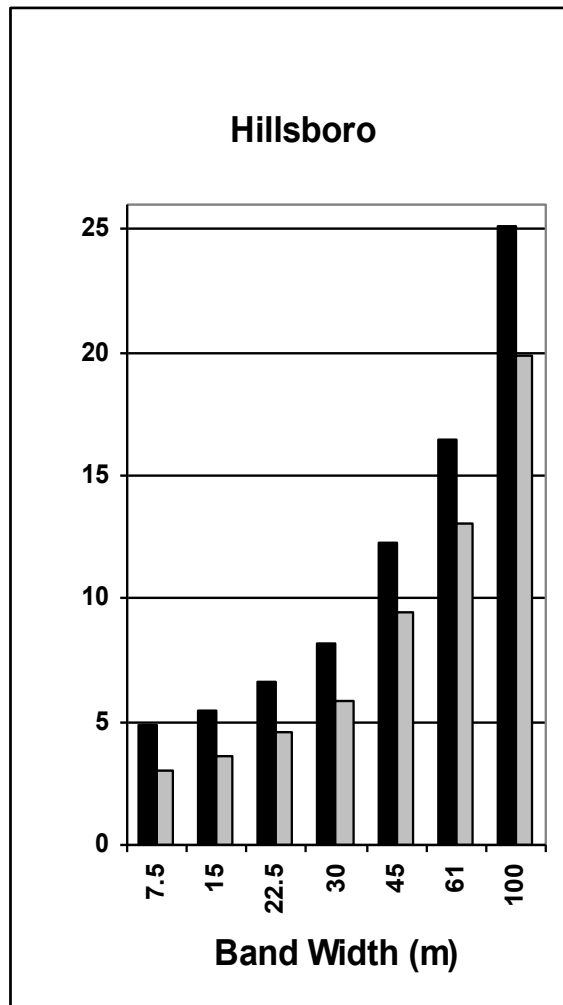
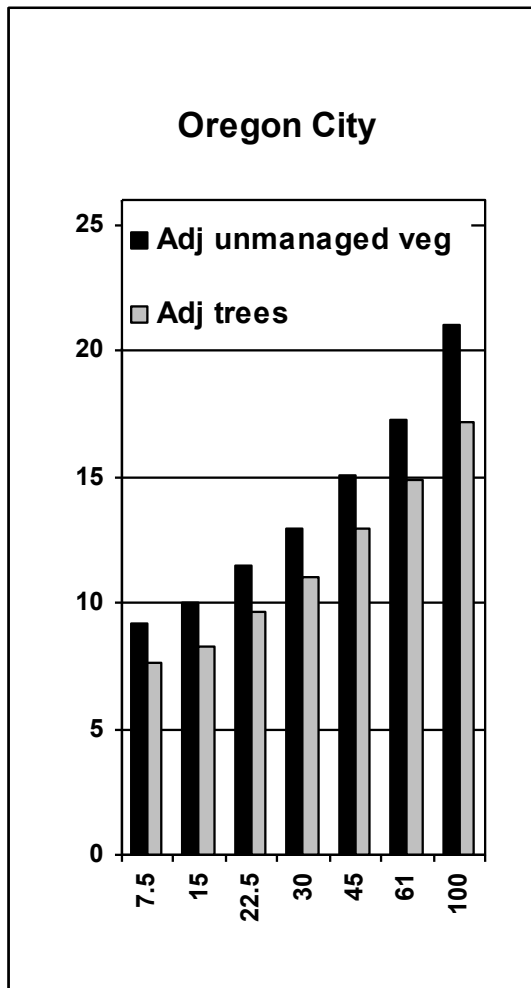
% loss per year: 1990-2002

30 m - Adj Tree



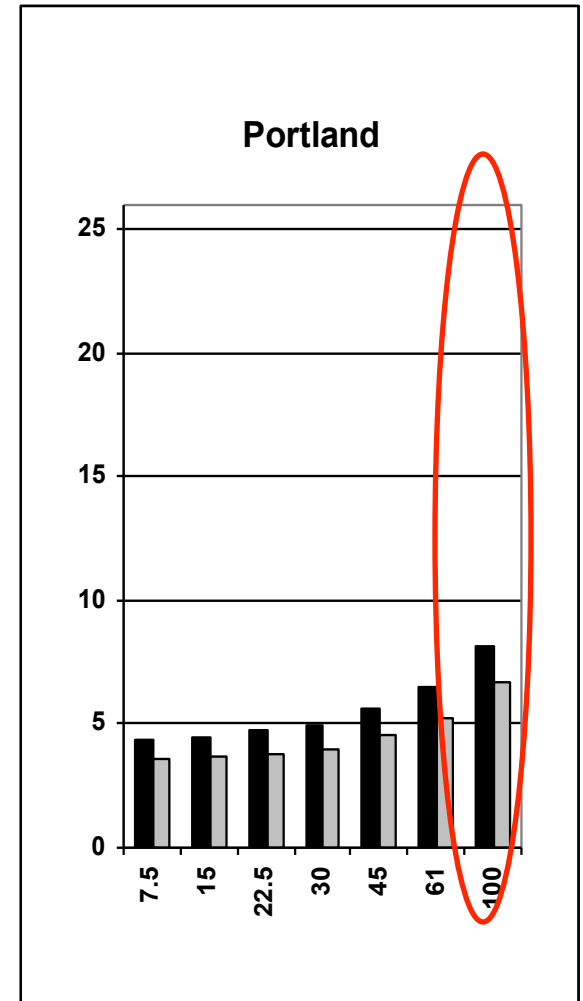
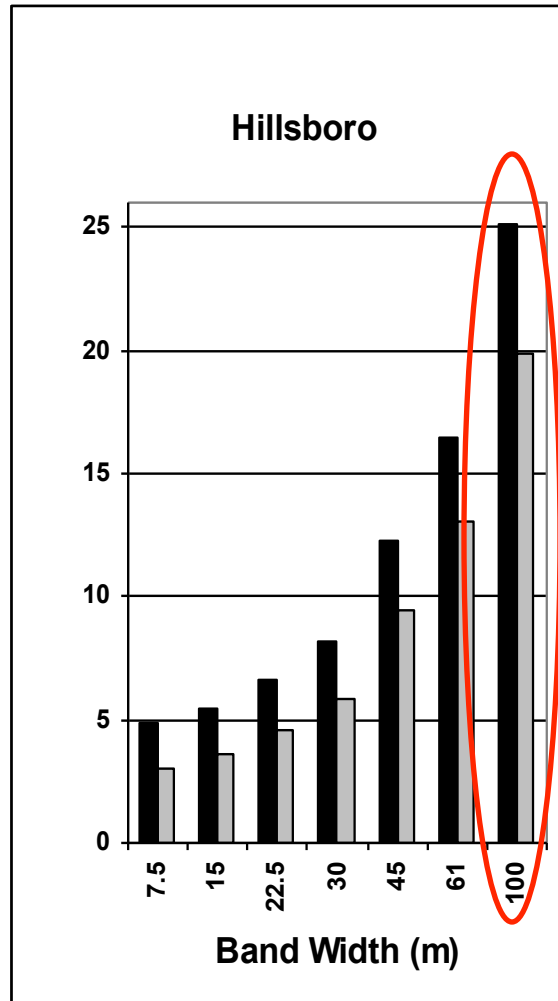
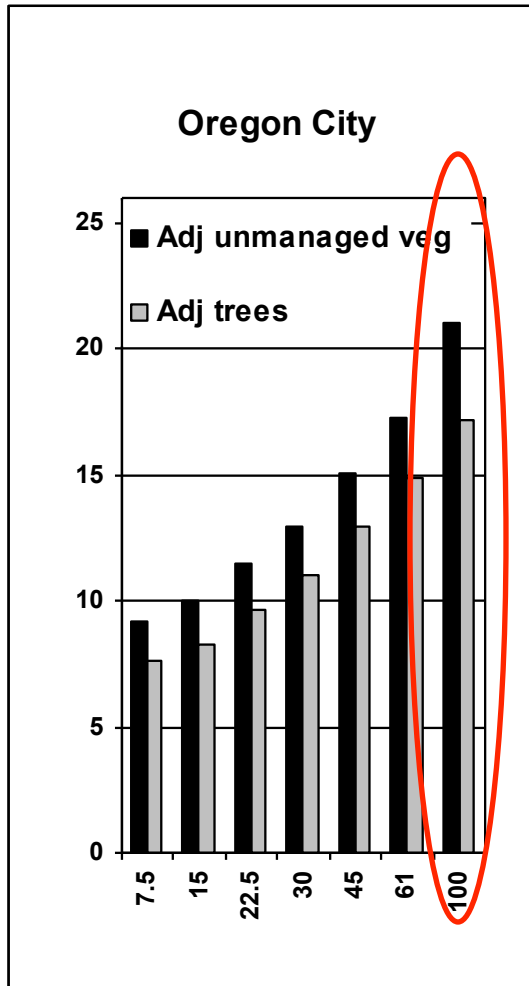
Biggest change is in Hillsboro

1990-2002 % Adjacent Riparian Vegetation Lost



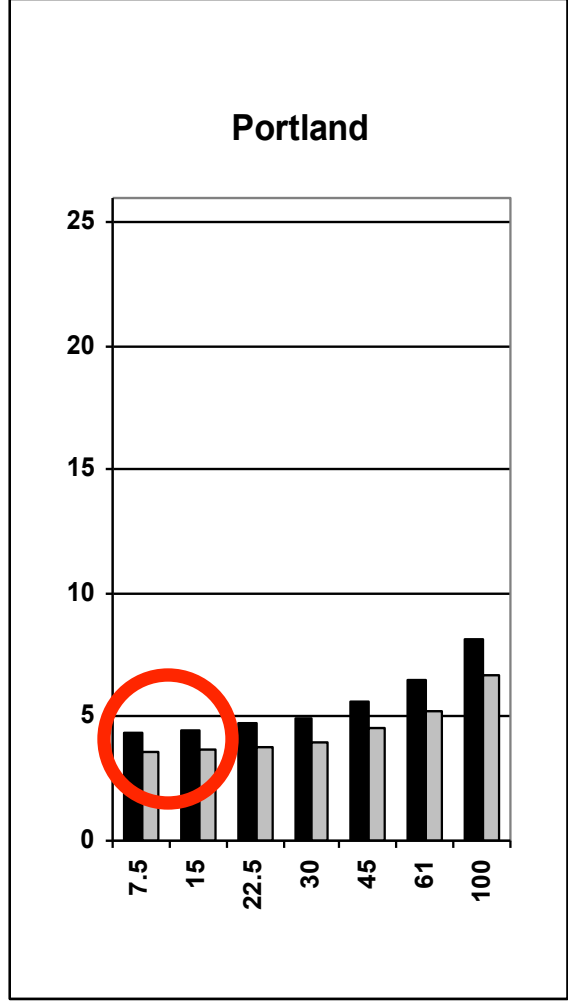
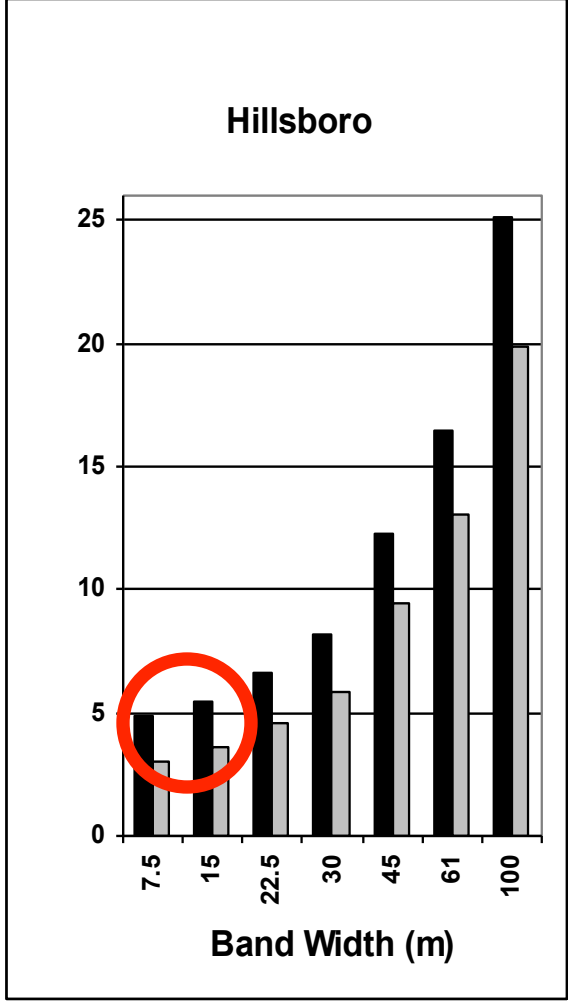
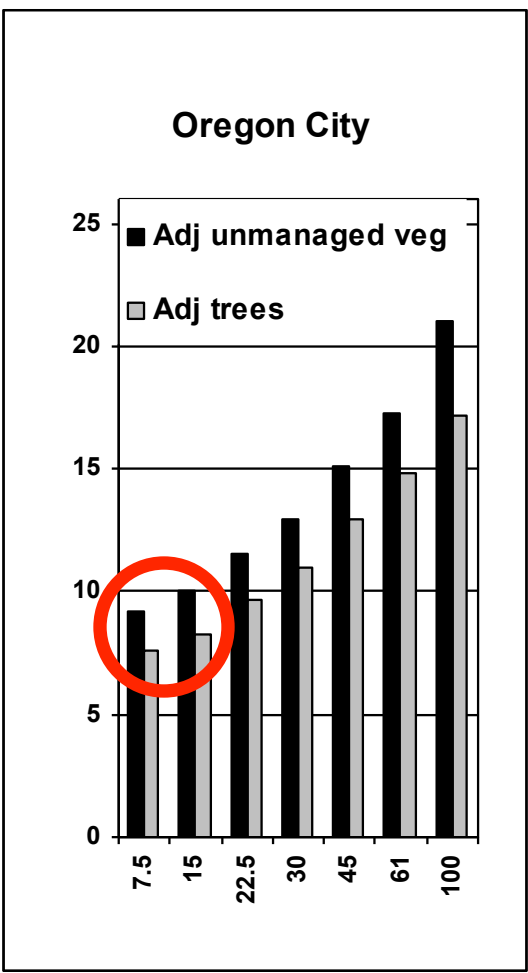
100 m = development pressure

1990-2002 % Adjacent Riparian Vegetation Lost



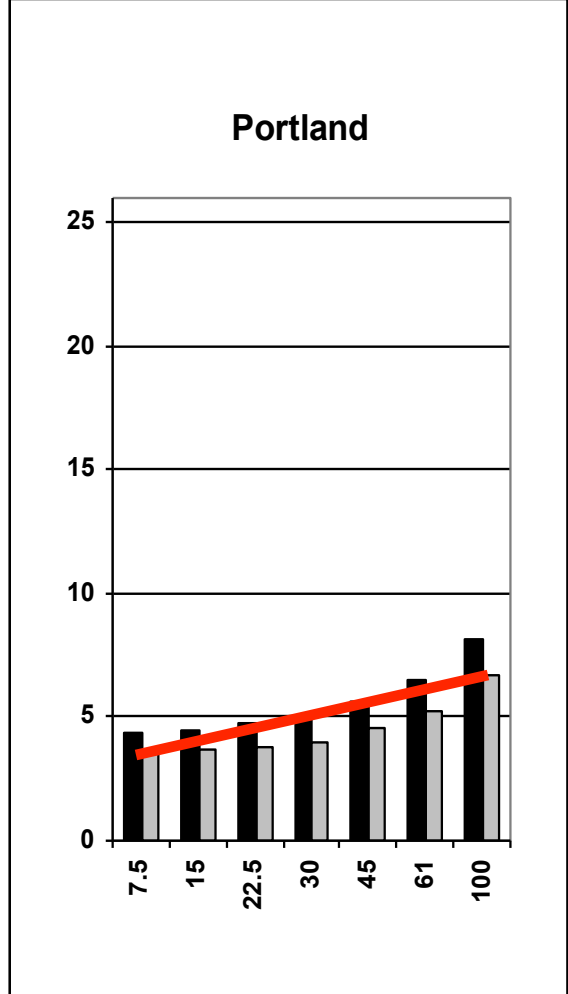
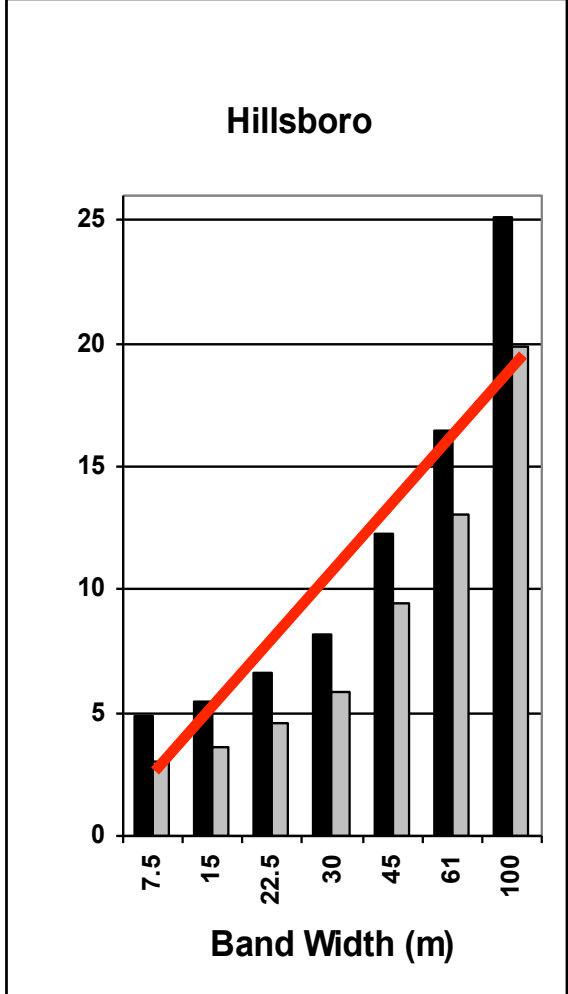
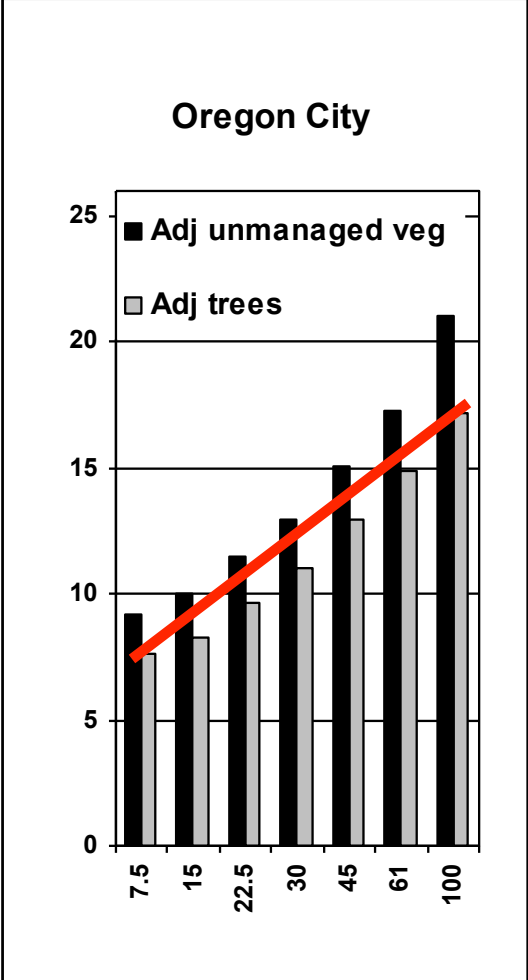
One indicator of regulatory effectiveness is the rate of loss near the stream (7.5 or 15 m)

1990-2002 % Adjacent Riparian Vegetation Lost



Another indicator of regulatory effectiveness is the diff. between 100 m and 7.5 (or 15) m

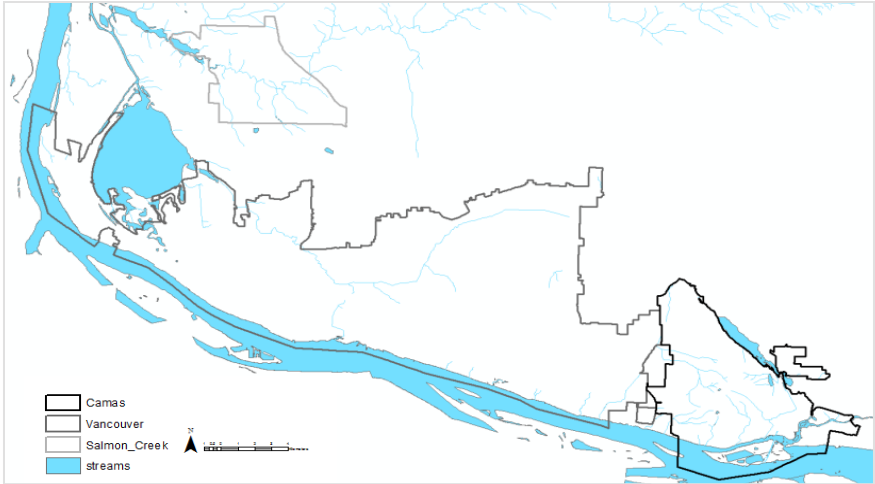
1990-2002 % Adjacent Riparian Vegetation Lost



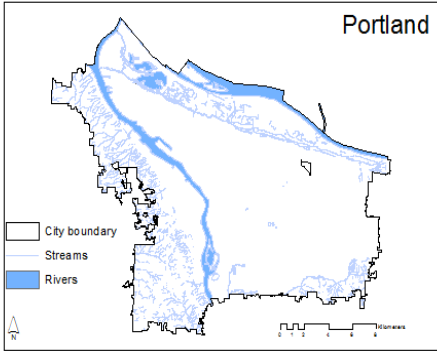
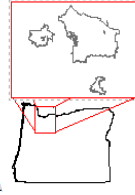
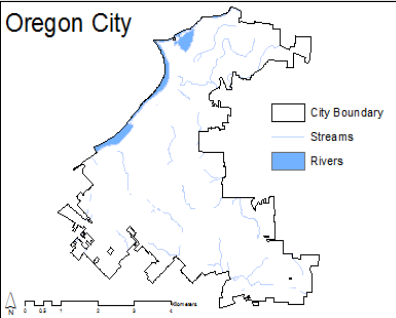
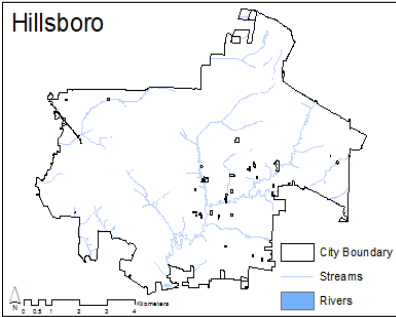
Results from 1990-2008 so far

Study Cities in WA & OR

Washington cities

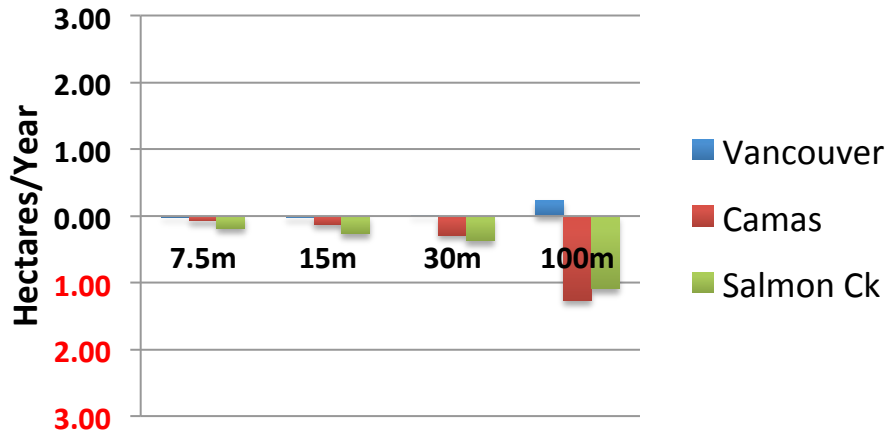


Oregon cities

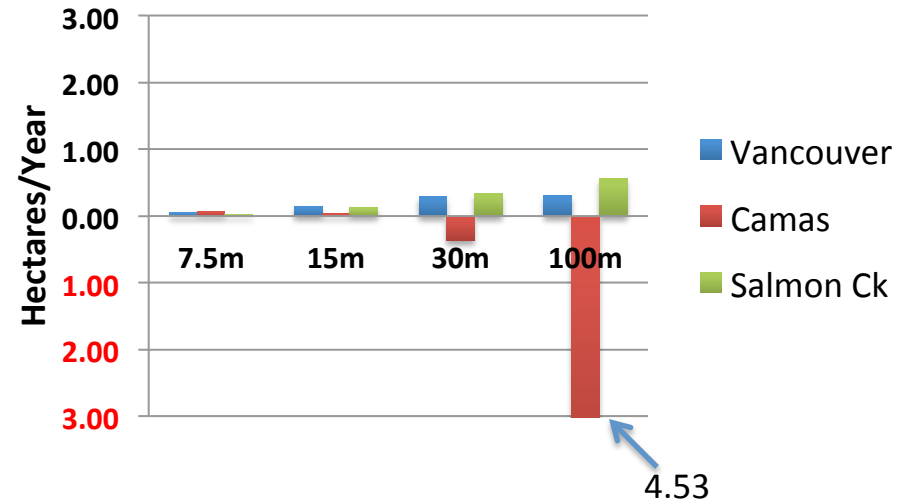


Adjacent Woody Vegetation Change (Washington urban areas)

1990-2002

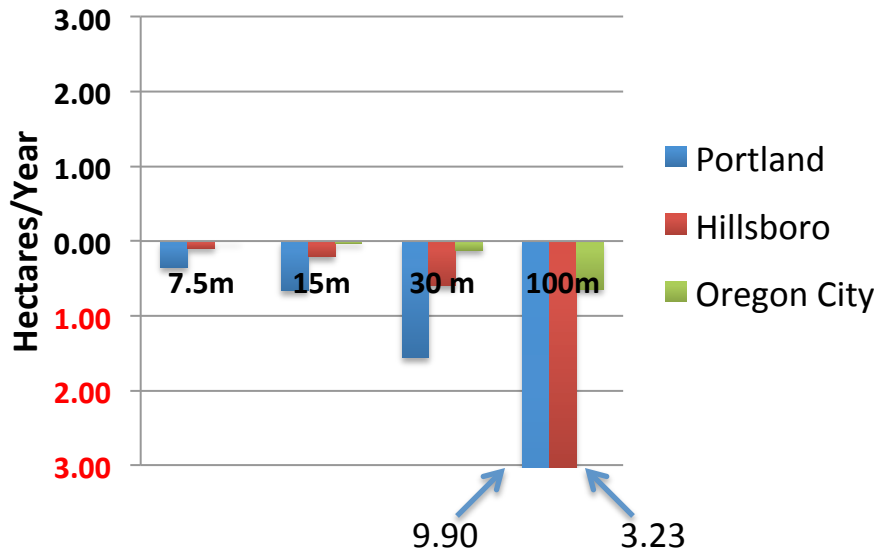


2002-2007

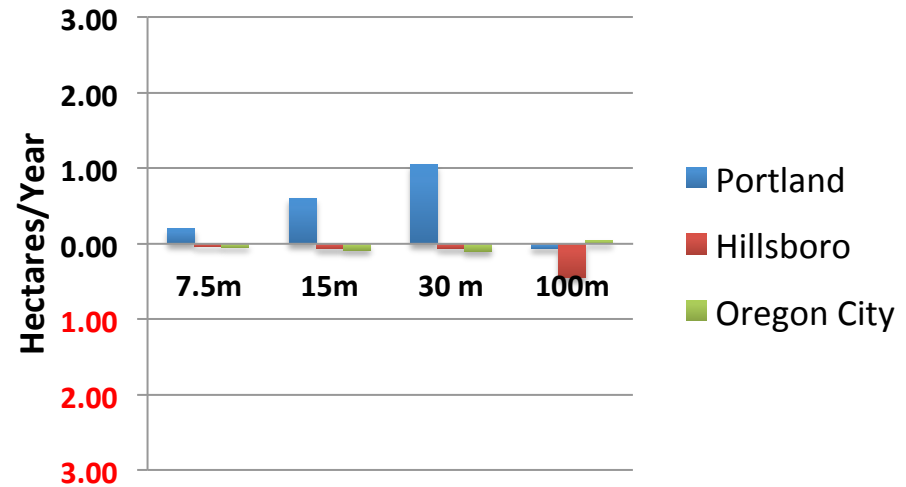


Adjacent Woody Vegetation Change (Oregon urban areas)

1990-2002



2002-2008



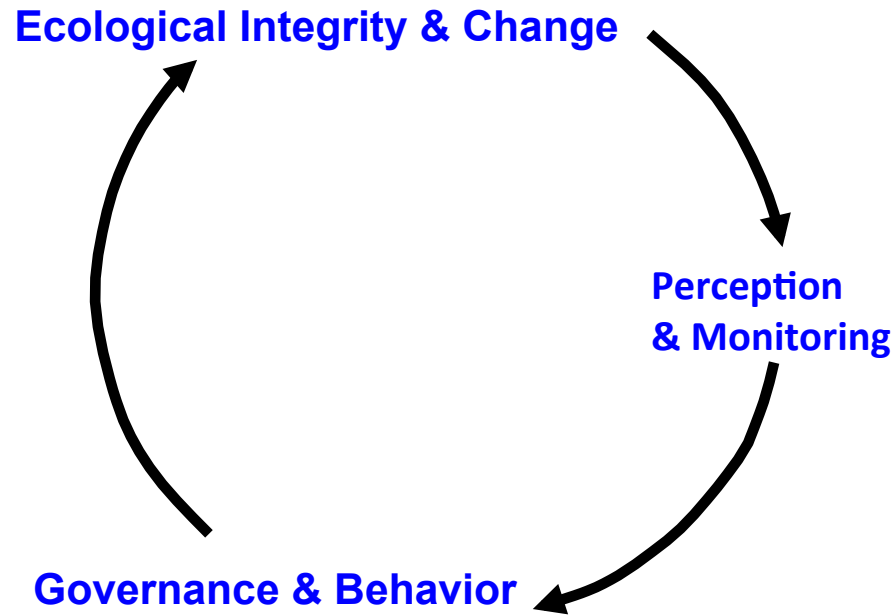
Riparian loss rate, evident in the 1990s, slowed down in the 2000's for 5 of the 6 urban areas studied

The rate of riparian vegetation gains increased in the 2000's

Some cities began to see **net gains in riparian areas** due to both governance activities at both the local and state level

Natural areas conservation policies in Oregon and Washington, while quite different, **both show promising progress** for maintaining and restoring urban riparian areas

Portland Vancouver ULTRA-Ex questions – Does governance matter?



For riparian ecosystems in urbanizing areas:

Do differences in levels of **governance** affect the **resilience** of urban ecosystems?

A tentative yes, but more analysis is needed

Do alternative **land use planning** strategies affect **urban ecosystem integrity** & **services**?

Yes, but there are multiple pathways available to affect positive change

Does **monitoring** ecosystem services provide a **feedback loop** in urban socio-ecological systems?

Results in both states with urban floodplain restoration suggest yes ... but more study needed