Puget Sound Imperviousness

Kenneth B. Pierce Jr. PhD
Habitat Science Division
WA Dept. of Fish & Wildlife
The Watershed Concept

Credit:
http://www.brown.edu/Courses/GE0158/web2_revised/dennis/index.html

Credit:
http://web.mst.edu/~rogersda/umrcourses/ge301/evolving%20laws%20for%20flood%20damage%20litigation.html
Effects of impervious surfaces

- Reduce water infiltration
- Speed storm-water flow to streams, rivers and the Sound
- Shorter faster flow paths increase pollution transfer and stream flow variability
- Increasing post storm stream flow reduces groundwater recharge
- Increased short term flow changes in-stream conditions
Change Detection & Data
Two views of the shore

Landsat 30-m pixel
139-ft diagonal

NAIP 1-m pixel
4.6-ft diagonal
WDFW’s High Resolution Change Detection Program

• Land cover change measured from 1m NAIP data
• Focuses on mapping urbanization and forestry
• Completed time-periods
  – 2006-2009, 2009-2011,
• Consistently implemented throughout Puget Sound
• Applications answering basic questions with local partners
From 2006-2011 approximately 250,000 people moved to Puget Sound accompanied by 1,500 ft$^2$ of impervious surface each.
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Change Map Data

• Each mapped change location has up to six analyst assigned attributes:
  – Change type/agent (4 primary classes)
    • Change percentage (all in 25% increments)
    • Decrease in tree cover
    • Increase in impervious surface
    • Increase in semi-pervious surface
  – Starting land cover
Forest to Developed Example

Cover: Tree/shrub
Area: 16.9 acres

Change Type: Development
Changed area: 100%
Tree decrease: 100%
Impervious increase: 50%
Semi-pervious increase: 25%
Mixed to Developed Example

Cover: Mixed Non-built
Area: 0.68 acres

Change Type: Development
Changed area: 50%
Tree decrease: 25%
Impervious increase: 25%
Semi-pervious increase: 25%
2006-2011 Puget Sound Change Map

- 94,477 Change events
- 166,809 Change acres
- 36,047 Acres Canopy removal
- 112,830 Acres Timber harvest
- 9,457 Acres New Impervious

Event size is exaggerated for visibility.

Scale: ~170,000 acres
Acres of Impervious Surface increase
2006-2011 by HUC 10

Legend

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Source: WDFW HRCD 2006-2011
HRCD 2015 and Future

2. 2011-2013 Analysis (Early 2016)
3. SMP monitoring project
4. Experiment with Land cover modeling
5. Next NAIP flight this summer 2015
6. Funding currently depends on final state budget approval.
• For more information

Kenneth B Pierce Jr. PhD
  – 360 902-2564
  – Kenneth.piercejr@dfw.wa.gov

Matt Muller
  Land Use Change Outreach Coordinator
  – 360 902-2554
  – Matt.muller@dfw.wa.gov