



King County, Washington Climate Change Adaptation Efforts

Models for Adapting to Climate Change
New Partners for Smart Growth Conference
Seattle, WA, Feb. 4, 2010

Matt Kuharic

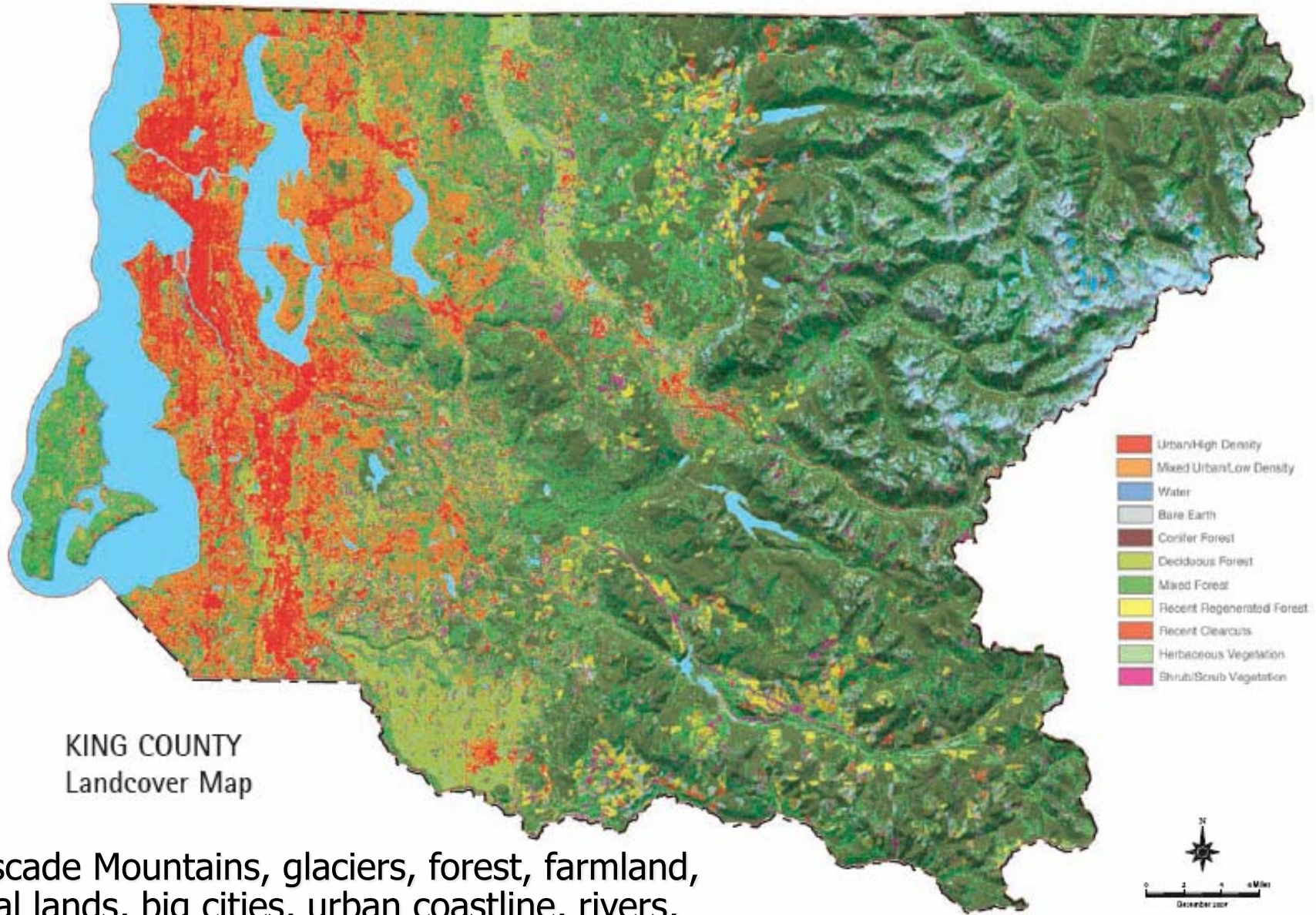
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King County, Washington

Program Manager, Climate Change Initiatives

Department of Natural Resources and Parks Director's Office

Who, Where, What is King County?

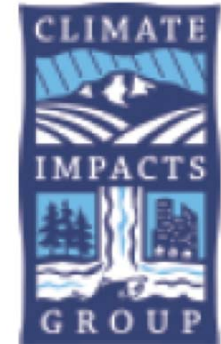


KING COUNTY
Landcover Map

Cascade Mountains, glaciers, forest, farmland,
rural lands, big cities, urban coastline, rivers,
big lakes, small lakes, Puget Sound



Pacific Northwest Impacts of Climate Change



Climate changes in...

- Temperature
- Precipitation
- Storm frequency and intensity



Fire damage in the North
Cascade Mountains

will impact...

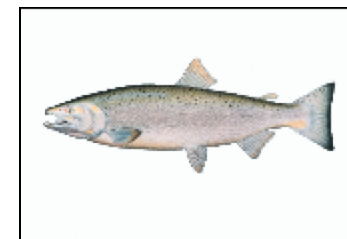
- Snowpack
- Streamflow
- Flooding
- Water supply
- Sea level
- Soil water content

and affect...

- Agriculture
- Stormwater
- Wastewater Treatment
- Wildfire risk
- Roads
- Hydropower
- Forest health
- Salmon and biodiversity

with consequences to...

- Public health
- Economic livelihoods
- Financial sector
- Insurance industry
- Individual comfort
- Recreation



A male
Coho
Salmon

Source: Climate Impacts Group,
University of Washington,
www.cses.washington.edu/cig

What is climate change adaptation?

Planning with the understanding that...

- History may no longer be a guide to the future
- We must prepare for change in built, human and natural systems
- We must be smart about what we build and where





Like Eating and Drinking

Mitigation

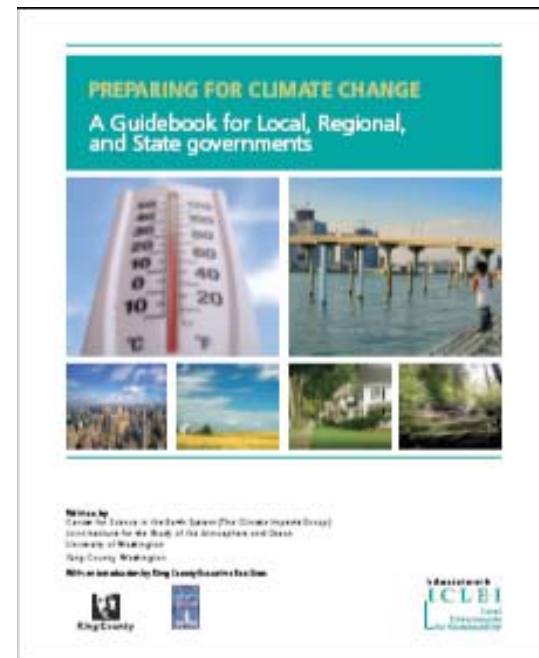
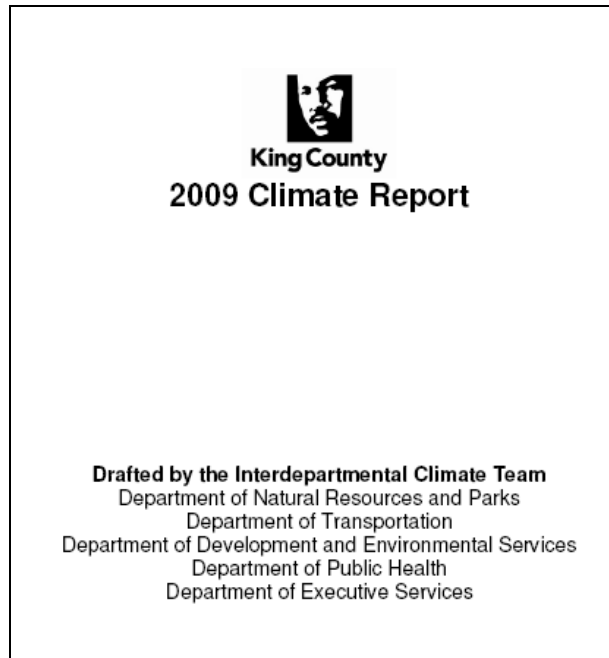
Reducing or sequestering greenhouse gases

Adaptation

Preparing for known impacts of climate change

Many projects and can concurrently mitigate GHG emissions and be good adaptation strategies.

Assessment; Mitigation; Adaptation; Collaboration



- *King County Climate Plan*
- *Preparing for Climate Change Guidebook*
- *King County Comprehensive Plan*



How is King County Adaptation Preparation and Planning Going?

- Comprehensive Planning
- Flood Planning
- Reclaimed Water Efforts
- Sea level rise assessment by the Wastewater Treatment Division
- Transportation Infrastructure
- Carbon Sequestration and Ecosystem Resiliency on Public and Private Lands



Brightwater Treatment Plant construction



West Point Treatment Plant
Seattle, Washington

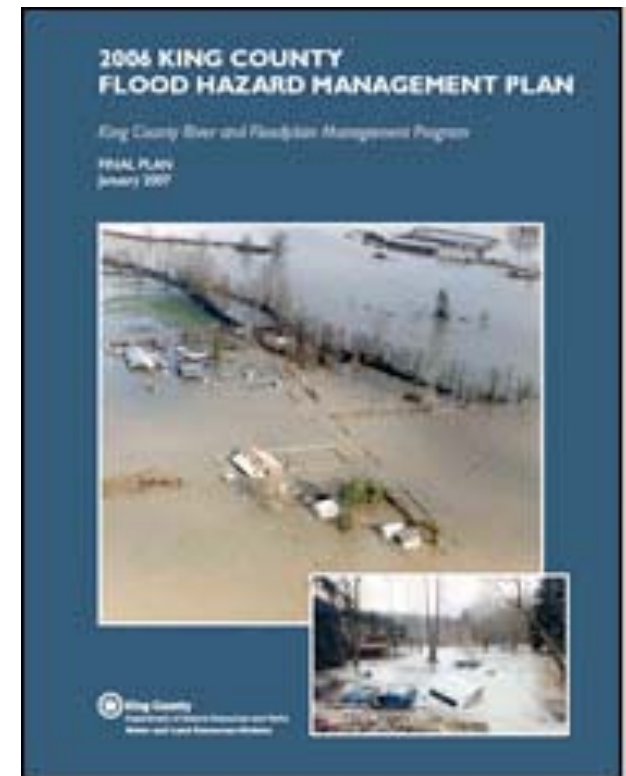


Flood Planning and Control

“Floods continue to plague our region with devastating effects for people, property, fish and livestock,” said Councilmember Larry Phillips. “With the advent of the climate crisis, we have to look at controlling flooding on more than an area-by-area basis.

“This legislation replaces our former piecemeal approach to flood protection with a unified, regional system and guides our future investments in repairs and upgrades to flood control facilities across King County.” (Executive Dow Constantine)

<http://your.kingcounty.gov/mkcc/news/2007/0407/fczd.htm>





Flood Planning and Control

- Up to \$335 million to improve King County's system of 500 levees
- Program does roughly 10X the work it used to do
- Increase river capacity, purchase the most susceptible lands





Reclaimed Water from Wastewater Treatment

- Creating resources from wastewater
 - Continue and improve WTD's existing reclaimed water programs
 - Develop markets for reclaimed water
 - Reclaimed Water Comprehensive Plan Completed
- New Brightwater Treatment Plant has an extensive "reclaimed water backbone"





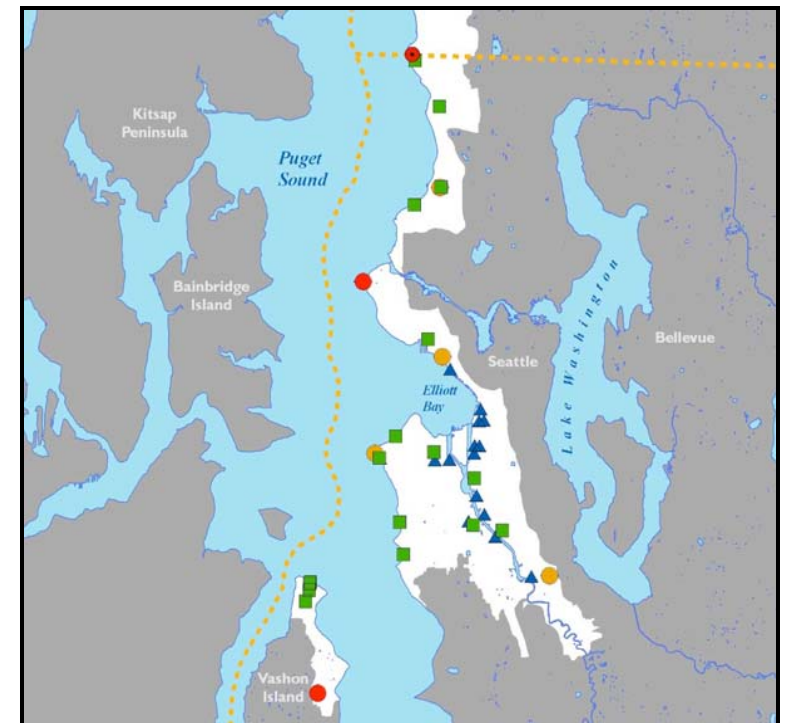
Vulnerability of Wastewater Facilities to Flooding from Sea-Level Rise

Develop and conduct GIS based methodology combining sea level rise projections + storm surge, compared to facility elevations



Recommendations include:

- Raise elevation of Brightwater sampling facility and flow monitor vault sites.
- Raise weir height and install outfall flap gate for Barton Pump Station improvements.
- Conduct terrain analysis of five lowest sites and West Point Treatment Plant.



King County

Transportation Infrastructure



- New \$24 million Tolt Bridge spanning the Snoqualmie River has been built with longer spans than the previous bridge, increasing its capacity to withstand high flows and major flooding events
- More than 57 smaller "short span" bridges are planned to be replaced with wider span structures, allowing debris and floodwater to pass underneath without backing up river levels
- Culverts that will increasingly be at risk of chronic flooding and road failure, and would cause destruction of fish habitat during storm events – will be replaced with larger systems not only to prevent roads from failing, but also to improve fish passage

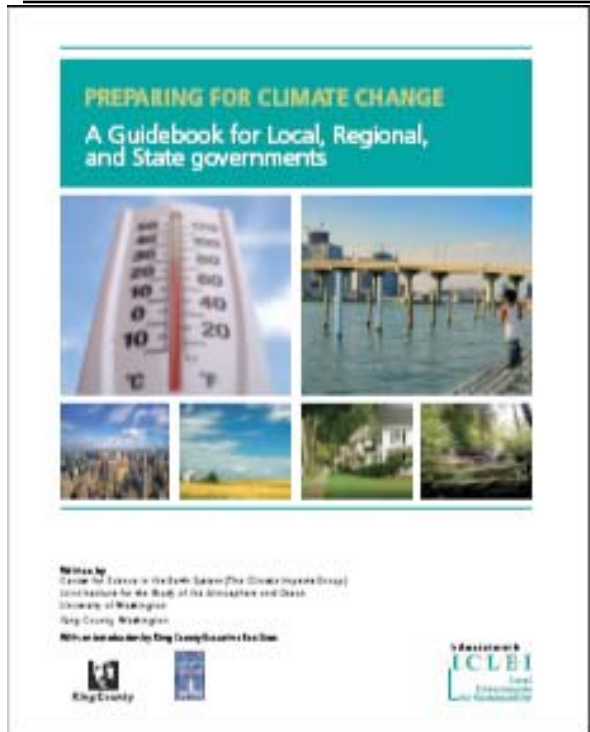


Forest Restoration and Health



- Opportunities on public and private lands to increase carbon sequestration and improve ecosystem resiliency
- USFS – NWF – King County Urban and Community Forestry Climate Preparedness and Response

Adaptation Outreach and Leadership



Preparing for Climate Change Guidebook

- University of Washington Climate Impacts Group
 - King County
 - Published by ICLEI - USA
- Padilla Bay National Estuarine Research Reserve
- Washington State Ecology's Coastal Management Office
- National Oceanic and Atmospheric Administration (NOAA)
 - King County



More King County Adaptation Projects

2010 efforts:

Built Environment:

- sea level rise impacts to wastewater *conveyance* system
- determining assets to be included in broader adaptation planning

Natural Environment:

- Ecosystem site assessment and restoration plans for 20 largest holdings
- Expanding restoration and reforestation efforts on public lands
- USFS Urban and Community Forestry Climate Preparedness and Response Project

Future Potential Projects:

- assessment of impacts to waste transportation system
- incorporation of projected changes in flooding into floodplain mapping
- incorporation of the temperature and hydrology impacts to the Salmon Recovery Program
- planning for drought, climate induced insect infestations and invasive species and other impacts on the Forestry Program

Recent Storm Events

January 2009



Snoqualmie Valley Farmland



Hyak Ski Area



Snoqualmie Falls



Downtown Snoqualmie



Recommendations

- Inclusion of local governments in federal climate change legislation and programs
- Funding for projects such as King County's efforts
- A National Climate Service and regional climate centers to provide science that is actionable for public policy and infrastructure decisions
- More preparedness trainings for local governments, according to local climate change impact areas



Contact:

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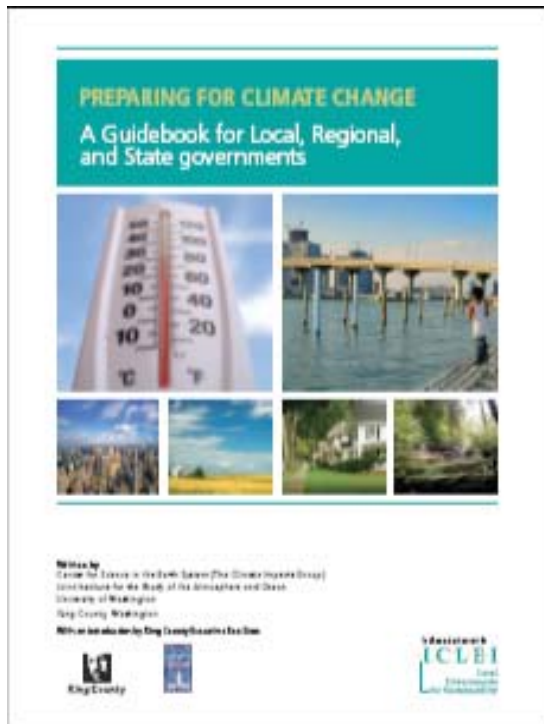
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Extra slides follow this slide:

Preparing for Climate Change

Suggested Steps



1. Initiate a climate planning effort
 - **Listen to the science**
 - **Scope the impacts to your sectors**
 - **Build support – and build a team**
 - **Identify planning areas most affected by climate change**
2. Conduct a climate resiliency study
3. Set goals and develop your plan
4. Implement your plan
5. Measure progress

Drawn from *Preparing for Climate Change: A Guidebook for Local, Regional and State Governments*, by the Climate Impacts Group and King County, and published by ICLEI – September 2007



References

- King County Comprehensive Plan
<http://www.kingcounty.gov/property/permits/codes/growth/CompPlan/2008.aspx>
- King County Climate Change Site
(Including Vulnerable Facilities Assessment and Associated GIS Tool)
<http://www.kingcounty.gov/exec/globalwarming/2005-climate-change-conference.aspx>
- UW Climate Impacts Group - <http://cses.washington.edu/cig/>