Building Climate Resiliency in the Lower Willamette Region of Western Oregon

Climate Leadership Initiative
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Climate Change is Happening

- Temperatures are increasing globally and regionally
  - 1.5° F increase in Pacific Northwest
- Human Caused
CO₂ concentration, temperature, and sea level continue to rise long after emissions are reduced.

**Magnitude**

- **CO₂ emissions peak**
  - 0 to 100 years

**Time to Equilibrium**

- Sea-level rise due to ice melting: SEVERAL MILLENNIA
- Sea-level rise due to thermal expansion: CENTURIES TO MILLENNIA
- Temperature Stabilization: A FEW CENTURIES
- CO₂ Stabilization: 100 to 300 YEARS
Climate Futures Forums:

a framework for integrating climate adaptation strategies across natural, built, economic, cultural and human systems
Lower Willamette Climate Futures Forums
Modeling

• Data provided by Oregon Climate Change Research Institute (OCCRI) and Portland State University (PSU)
• Models used: HadCM, PCM1, CSIRO (MIROC used for fire and vegetation)
• Emissions Scenarios: A1b (“Business as Usual”) and B1 ( “Green”)
Observed Temperature and Two Simulations: Natural vs. Anthropogenic + Natural

(Figure courtesy of Dr. Gerald Meehl, National Center for Atmospheric Research.)
Projections for Change in the Lower Willamette

- Increase of 10-15° F in summer; 3-5° F in winter
- Changes in precipitation patterns
- Warmer vegetation types favored
- Higher intensity and increased distribution of fires
- Significant loss of snowpack in the Cascades of about 80%
- Higher stream runoff in winter and early spring and decreased flows in summer for some locations
Sample Temperature Projections
Examples of Streamflow: Willamette River at Oregon City and Salem (HadCM)
April 1 Ensemble Mean Changes in Snow Water Equivalent
Projections for Area Burned

% area burned
- 0
- 0 - 1
- 1 - 2
- 2 - 6
- 6 - 13
Sample Impacts to Natural Systems

- Shifts in stream flow
- Reduced air and water quality
- Loss of genetic diversity and shift in species gender balance
- Shifts in quality of habitat and refugia
- Reduction in ecosystem services
- Increased intensity of urban heat island effect
- Loss of specialist and low mobility species
- Increase in invasive and generalist species
Sample Recommendations for Natural Systems

- Protect and restore floodplains & reconnect to their rivers
- Increase complexity of streams
- Protect, expand, and connect high quality habitat
- Use a landscape scale approach to conservation
- Revise species management
- Reassess allocation of water rights
- Increase riparian vegetation
- Restore natural fire regime
- Reduce impervious surfaces
- Increase and refocus monitoring efforts

CLIMATE LEADERSHIP INITIATIVE
Sample Impacts to Built Systems

- Damage to water and sewer infrastructure
- Strain on public transportation, road conditions
- Bridge failure
- Air and rail disruptions
- Impacts to utility transmission and meeting demand
- Interruptions in communication infrastructure
- Impacts to buildings
Sample Recommendations for Built Systems

- Update and improve water and sewer infrastructure
- Identify critical infrastructure
- Improve and safeguard transportation and building infrastructure
- Improve energy efficiency, promote renewables
- Identify back-up communication sources
- Update land use codes
- Promote compact housing; protect Urban Growth Boundary
Sample Impacts to Economic Systems

- Vulnerability of small businesses
- Shifts in food prices and crops (including wine grapes & timber)
- Shifts in tourism and recreation
- Interruptions to freight transportation
- Increasing insurance rates
- Impacts to health care
Sample Recommendations for Economic Systems

- Diversify and promote risk management for businesses
- Research and invest in climate tolerant crops
- Plan for shifts in transportation of freight
- Meet insurance requirements
- Prepare health care
Sample Impacts to Human Systems

• Amplified risk to vulnerable populations
• Overwhelmed emergency response
• Inadequate individual capacity
• Food and water scarcity
• Stressed social services
• Public safety concerns
• Outdated education
• Public health concerns
Sample Recommendations for Human Systems

- Identify and build resiliency of vulnerable populations
- Strengthen local social networks and improve community outreach
- Increase capacity of emergency & social service response systems
- Enhance local food security
- Increase water conservation and decentralize water storage
- Revise job codes
- Prepare public health
Sample Impacts to Cultural Systems

- Loss of traditional resources
- Deterioration/destruction of historical architecture
- Conflicts with climate refugees
- Environmental justice concerns
Sample Recommendations for Cultural Systems

• Protect key resources for tribal communities
• Encourage resource conservation and energy independence in tribal areas
• Prepare for increase IN human populations
• Proactively address current cultural tensions and prepare for new cultures
Suggestions for Implementation

• Identify who is responsible for implementation
• Identify co-benefits/conflicts
• Identify costs and urgency
• Prioritize recommendations
• Develop partnerships and consider regional collaborations
• Communication strategies

To participate in the presentation training webinar Feb. 28th 9:30-11am PST, please register here: www3.gotomeeting.com/register/929457894.

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