

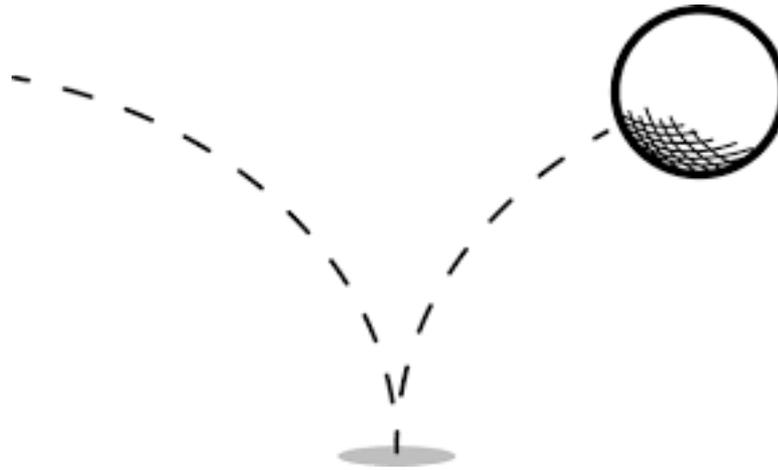
Vulnerability Factors Associated with Local Flood Protection Actions

February 11, 2021

ECONorthwest
ECONOMICS • FINANCE • PLANNING

Purpose of Presentation

- Help expand the OCB's understanding of population vulnerability and resilience, in the context of flood management strategies under development.



Note: This purpose of this presentation is for guidance as a first step in this process.

Questions We Are Answering

1. What are the demographic and socioeconomic characteristics of the people within the Chehalis River Basin?
2. How could these characteristics make people or communities more or less vulnerable to potential adverse outcomes?
3. How could any of the proposed local flood protection actions contribute to or reinforce inequities or discriminate against marginalized populations or communities?
4. What kinds of strategies to proactively avoid or mitigate any potential adverse outcomes for vulnerable populations?

Equity: Both an outcome and process

EQUALITY VERSUS EQUITY



In the first image, it is assumed that everyone will benefit from the same supports. They are being treated equally.



In the second image, individuals are given different supports to make it possible for them to have equal access to the game. They are being treated equitably.



In the third image, all three can see the game without any supports or accommodations because the cause of the inequity was addressed. The systemic barrier has been removed.

Social Justice

Equity:

The absence of systemic disparities that result in unequal outcomes for people with different social identities

Access:

Ensuring that all people have access to goods, services, and opportunities regardless of their social identity

Participation:

Ensuring active involvement by those most marginalized in decisions which affect their lives

Rights:

Protecting the civil, political, economic, cultural, and social rights of individuals and groups

Environmental Justice

- The distribution of environmental benefits (access to green space, clean water, clean air, etc.) as well as the distribution of environmental burdens (risks and hazards of pollution, negative effects of climate change, or the impacts of flooding) is equal across all communities, and not disproportionately impacting the most marginalized communities.

Environmental Justice

- According to the Environmental Protection Agency (EPA):
“Environmental justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.”

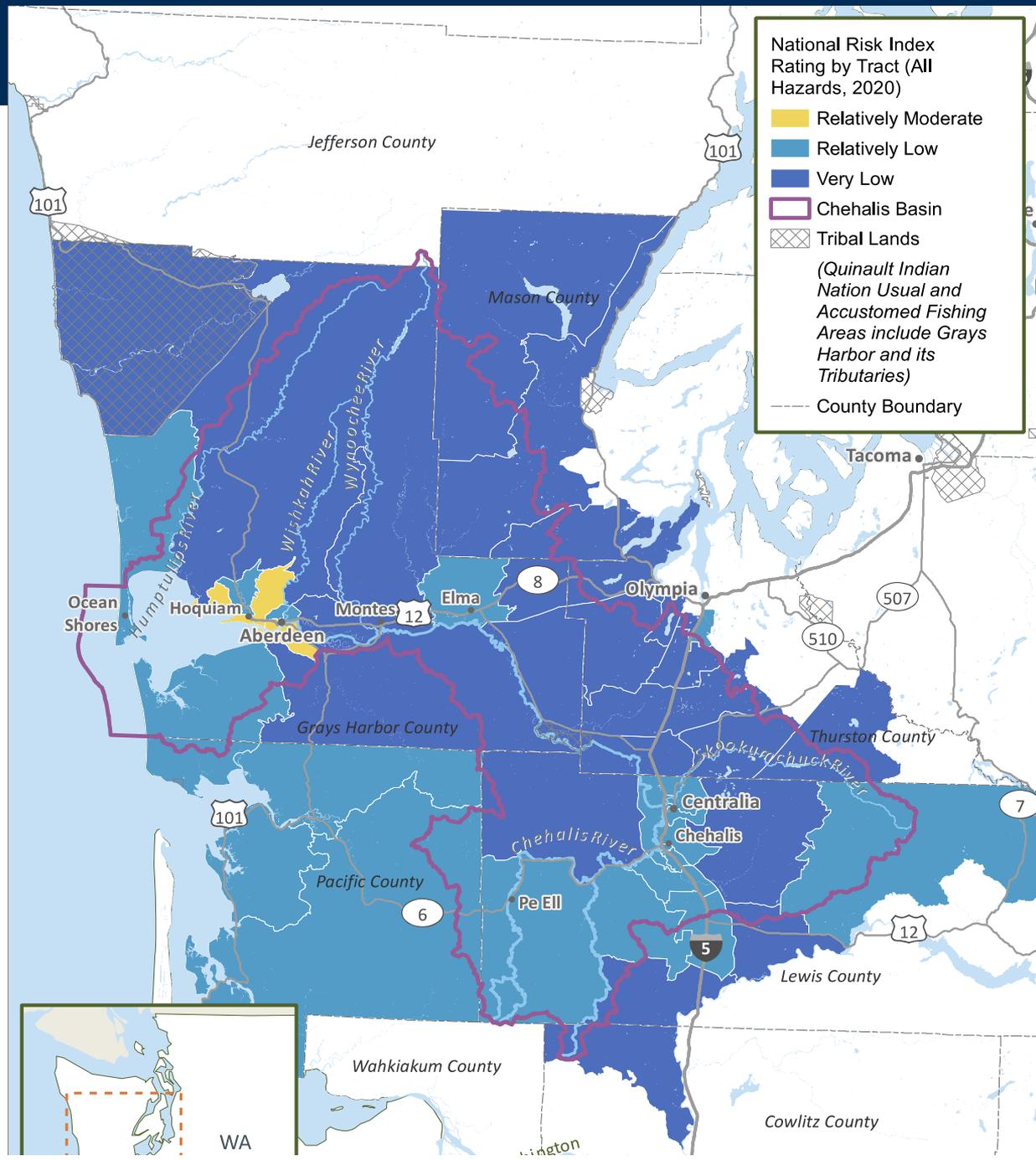


1. What are the demographic and socioeconomic characteristics of the people within the Chehalis River Basin?

Demographics & Vulnerability Indices

- A vulnerability index is a way to spatially represent where people might be at highest risk due to both their socio-economic and demographic attributes as well as their risk to natural disasters.
 - FEMA NRI (released in 2020)
 - CDC SVI
 - Individual demographic attributes (e.g., income, minority status, renter, etc.)

- FEMA National Risk Index for Natural Hazards (NRI) documents risk based on:
 - expected annual losses (18 natural hazards),
 - social vulnerabilities (29 socioeconomic variables), and
 - community resilience (49 indicators of resilience).

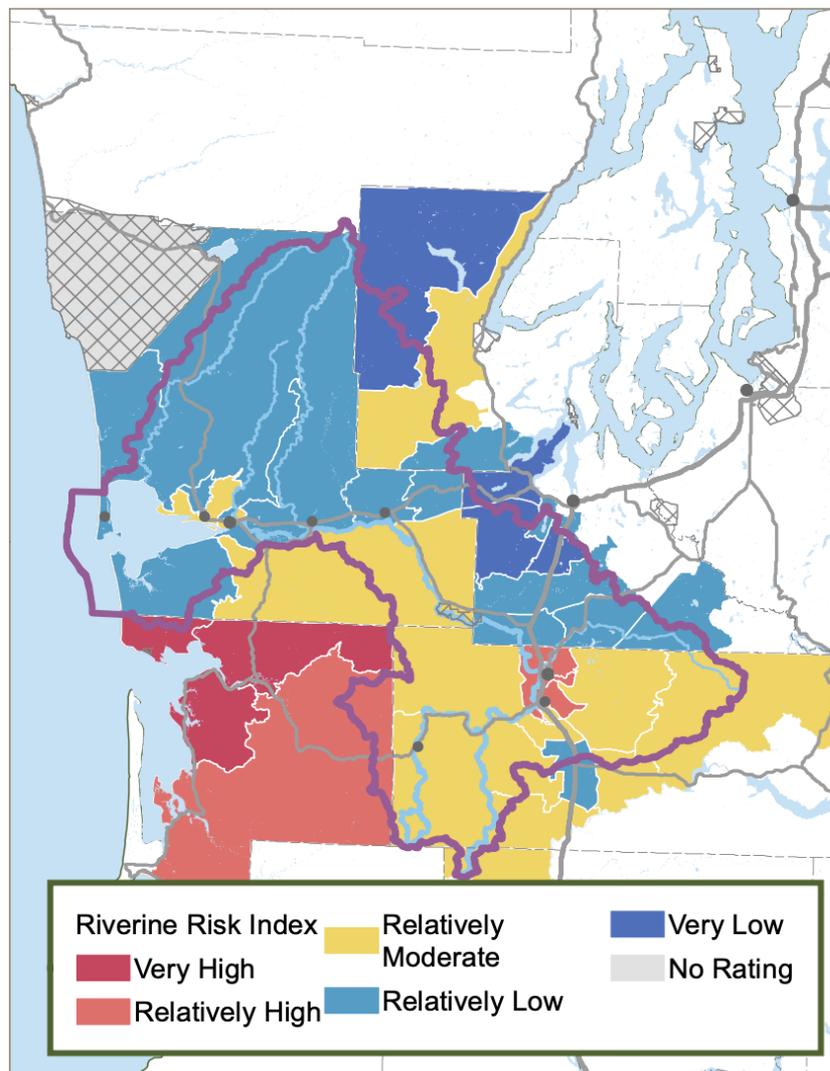
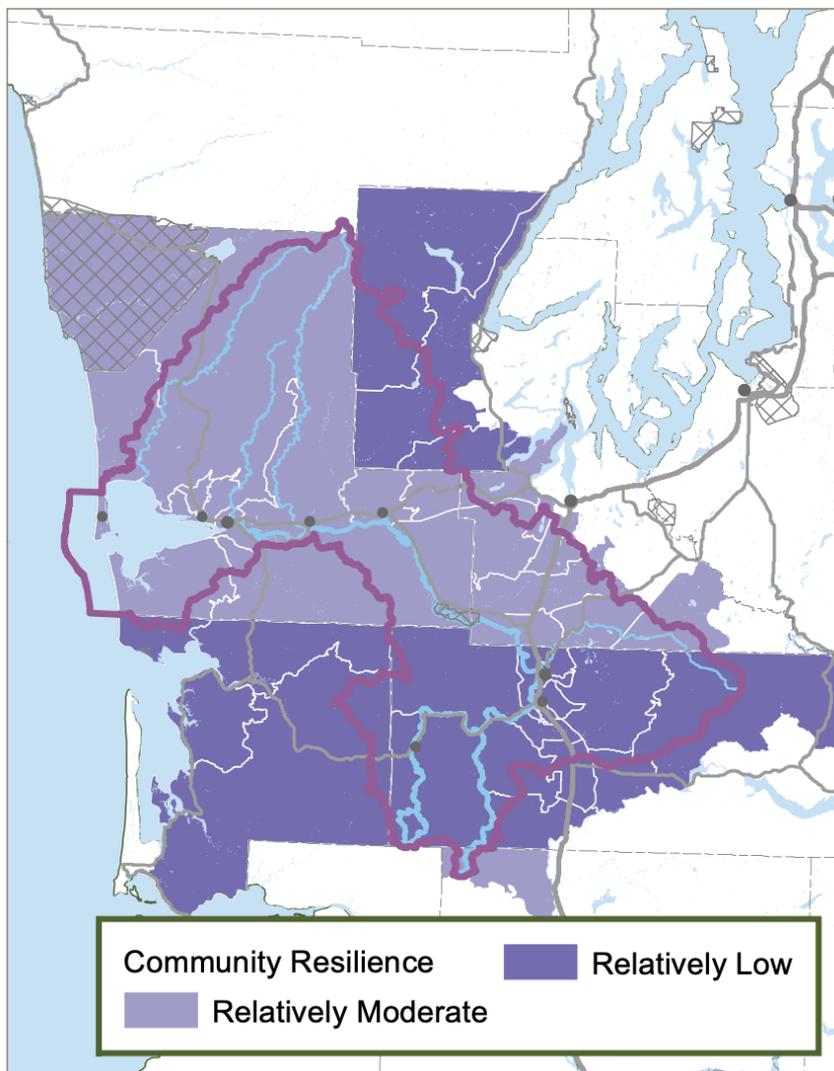


National Risk Index Rating by Tract (All Hazards, 2020)

- Relatively Moderate
- Relatively Low
- Very Low
- Chehalis Basin
- Tribal Lands
(Quinault Indian Nation Usual and Accustomed Fishing Areas include Grays Harbor and its Tributaries)
- County Boundary

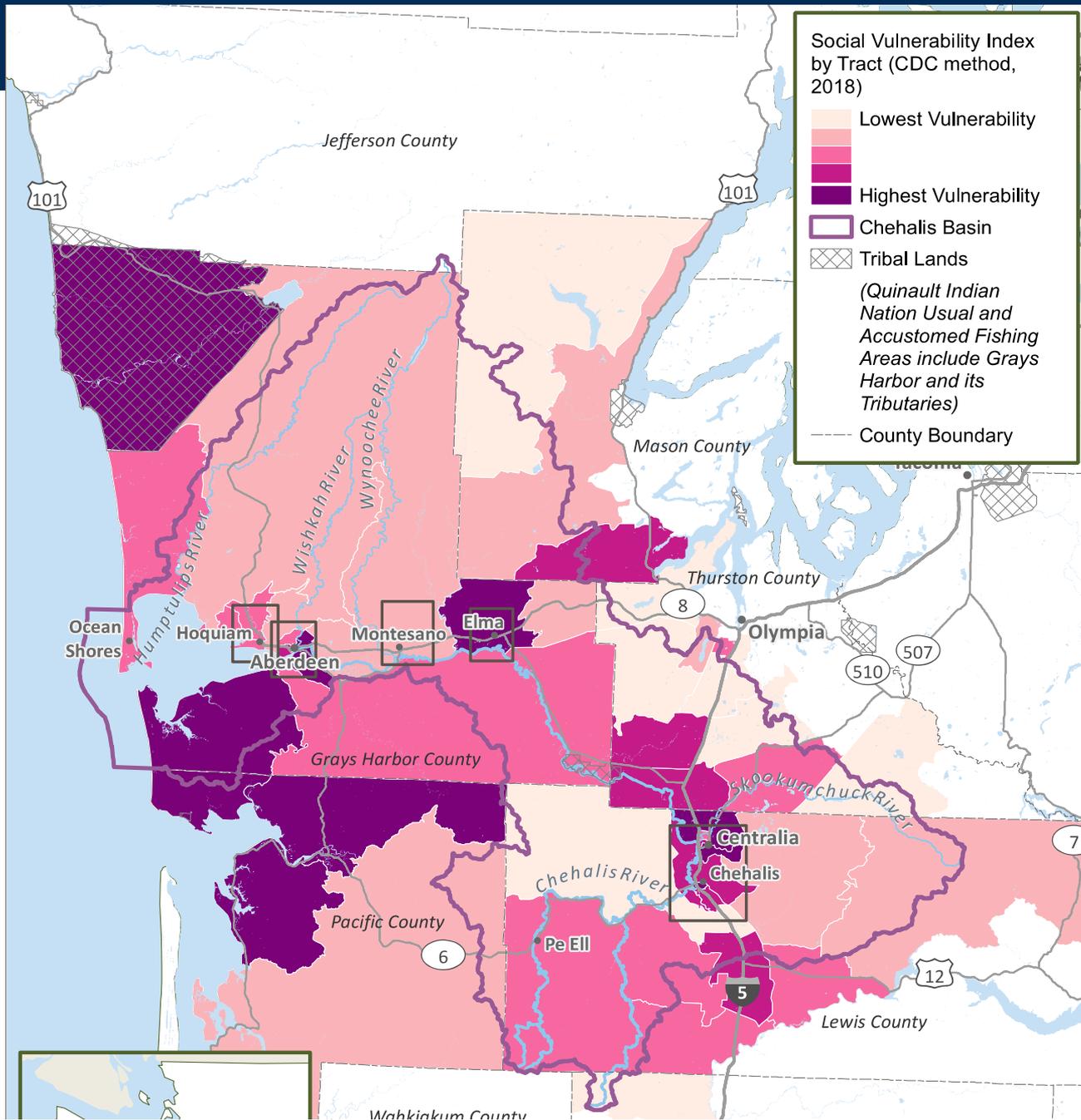
Riverine Risk Index by Component (NRI)



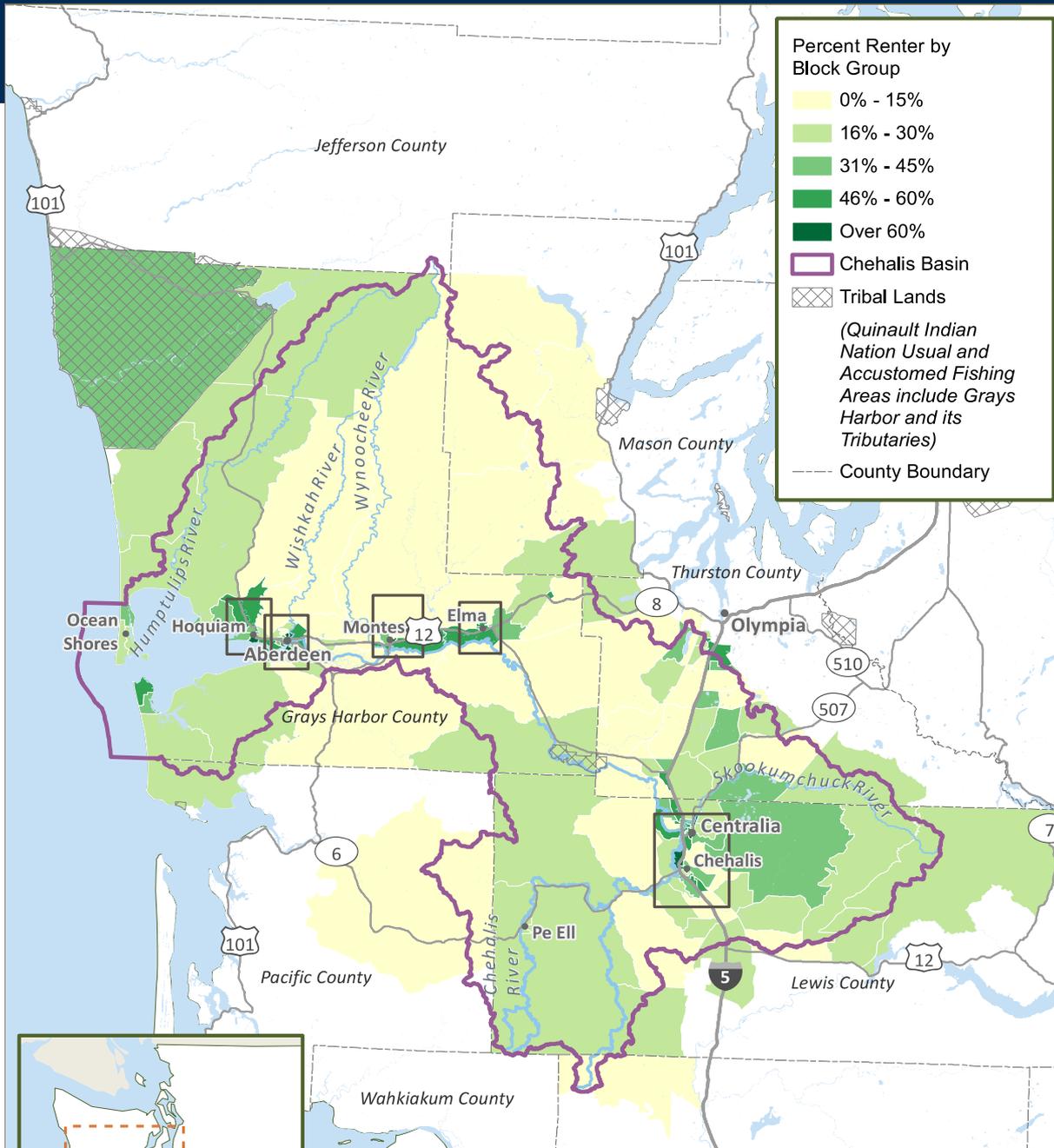


- The Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) uses 15 socio-demographic variables from the U.S. Census to help local officials identify communities that may need support before, during, or after disasters

Socioeconomic Status	Below Poverty
	Unemployed
	Low Income
	No High School Diploma
Household Composition and Disability	Aged 65 or Older
	Aged 17 or Younger
	Civilian with Disability
	Single-Parent Household
Minority Status and Language	Racial/Ethnic Minority
	Speaks English "Less than Well"
Housing and Transportation	Multi-Unit Structures
	Mobile Homes
	Crowding
	No Vehicles
	Group Quarters



Renters



2. How could these characteristics make people or communities more or less vulnerable to potential adverse outcomes from flooding?

Underlying Conditions

- Hydrodynamics (risk factors):
 - Who is at risk of flooding and who is protected?
- Resilience (response factors):
 - Different demographic characteristics can influence ability to respond and recover.

3. How could any of the proposed local flood protection actions contribute to or reinforce inequities or discriminate against marginalized populations or communities?

Local Flood Protection Actions

Protection Categories	Protection Actions
Flood protection through localized infrastructure	<ul style="list-style-type: none">• Levee construction• Levee raises
Flood protection by elevating/floodproofing structures and infrastructure	<ul style="list-style-type: none">• Raising or relocating buildings• Raising or relocating road segments• Bridge lengthening
Relocating people and/or property at risk of flooding	<ul style="list-style-type: none">• Buyout programs (willing seller and eminent domain)• Restrictions on construction of new facilities or structures in floodplain areas• Livestock evacuation and sanctuary areas
Redirecting flood waters through increased storage and floodplain restoration	<ul style="list-style-type: none">• Levee setbacks• Repairing incised channels (regrading or excavation)• Restoration of buyout sites• Reforestation/revegetation
Flood warning and preparedness systems	<ul style="list-style-type: none">• Installing flood warning systems• Installing flood preparedness systems

Action Considerations

- Who is affected and are they better off?
 - Project Selection Considerations
 - Potential biases in decision factors?*
 - Who benefits? Who bears the cost?
 - Historical inequities?
 - Implementation Considerations
 - How funded? Rate increases?
 - Are materials and information accessible?
 - Action-specific implementation considerations?

Action Specific Considerations

	Will reduced flood risk be equitable?	Will the action increase utility costs, potentially creating financial burden?	Will people only be able to participate if they can afford to implement the action?	Will the action adversely impact the environment?	Could the action impact housing supply and/or prices (increase or decrease)?	Could the action change the character of the community?	Are there accessibility concerns that could limit participation in the action?
Flood protection through localized infrastructure	Red	Red	Grey	Red	Red	Yellow	Grey
Flood protection by elevating/floodproofing structures and infrastructure	Red	Red	Red	Yellow	Red	Yellow	Red
Relocating people and/or property at risk of flooding	Red	Yellow	Yellow	Grey	Red	Red	Red
Redirecting flood waters through increased storage and floodplain restoration	Red	Yellow	Grey	Grey	Red	Red	Grey
Flood warning and preparedness systems	Yellow	Yellow	Grey	Grey	Grey	Grey	Red



Likely to be a consideration



Could be a consideration



Not likely to be a consideration

4. What kinds of strategies to proactively avoid or mitigate any potential adverse outcomes for vulnerable populations?

Planning, Avoidance, and Mitigation Strategies

Priority Action #1:

Use data to identify risks, assets, and community vulnerabilities.

Priority Action #2:

Commit to ongoing and meaningful community engagement.

Priority Action #3:

Set a proactive vision and build strategic alignment.

Priority Action #4:

Fully incorporate equity into resilience planning processes.

Priority Action #5:

Target investments in vulnerable communities.

Strategies to Avoid and Mitigate

- Understand the spatial distribution of who is living and working in the region and who depends on resources affected by project actions.
- Understand the historical inequities related to flood risk and response in this region through documentation and outreach.
- Conduct ongoing and meaningful community engagement.
- Proactively plan before implementing the local flood protection actions.

Equitable Development Plans

Equitable Development Implementation Plan

April 2016



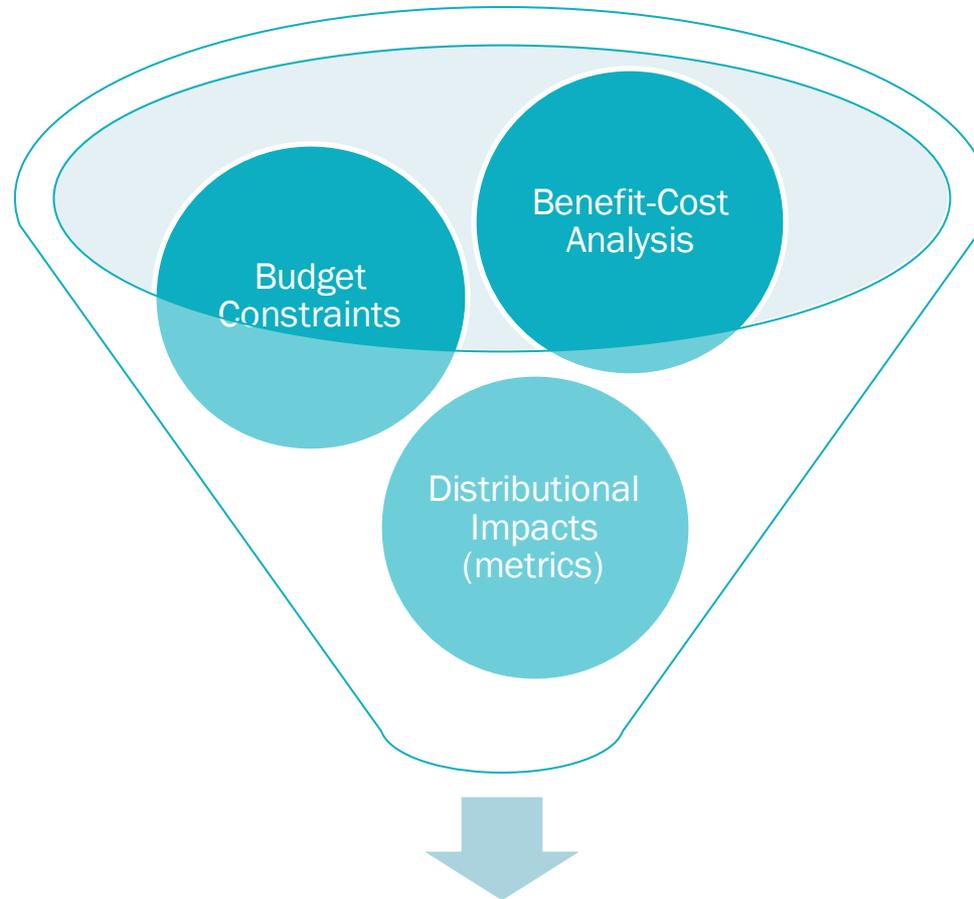
- Risk identification and data gathering,
- Assessments and planning,
- Funding and implementation,
- Monitoring and adjustments

*Stand alone or embedded process

Metric Examples

- The project corrects historic inequities in this region.
- Flood reduction benefits and costs distributed equitably based on scarcity and need.
- If rates increase, low-income households do not experience a burdensome rate increase.
- Actions increase access to services and/or remove barriers to service for vulnerable populations.
- The environmental value of natural resources is appropriately valued through ecosystem service estimates.
- All actions seek to incorporate multiple benefits in addition to flood control (e.g., recreational amenities, educational opportunities, aesthetic values, etc.)

How to Select Program Elements



Selecting Local Flood Protection
Actions and Locations

DISCLAIMER

- This presentation WAS NOT developed through a collaborative process.
- It was developed by ECONorthwest alone based on available resources, and is therefore only a first step.

ECONorthwest

ECONOMICS • FINANCE • PLANNING



Eugene



Portland



Seattle



Boise

Renters Inset

