Chehalis Basin Strategy Local Actions Program Implementation Advisory Group Meeting #1

November 16, 2020

Meeting Agenda and Purpose

- Review Implementation Advisory Group work plan and schedule
- Review Board approved Local Actions Program outcomes
- Review Chehalis Basin sub-area flood damage map
- Highlight extent of changes in mainstem Chehalis River floodplain in a 100-year 2080 future
- Discuss past floodplain land use recommendations and potential additions

Introductions

- Breakout rooms of three members
- Introduce yourself (one minute each)
- Name and affiliation
- If you have been involved in basin flood issues
- Fun fact about yourself

Implementation Group Schedule

- Schedule for meetings and issues
- How your work will be used

Implementation Advisory Group Schedule

Meeting #2: December 16, 2020

- Highlight areas of significant flood damage and discuss where existing environmental justice populations and communities are located
- Panel discussion on regional/national programs using structure relocation, acquisition, and retrofits for flood damage reduction

Implementation Advisory Group Schedule

Meeting #3: January 11, 2021

- Future floodplain (i.e., 100-year flood in 2080), including structures at risk
- Implications and feasibility of land use management actions (e.g., relocation, acquisition, floodproofing, and land use regulations)
- Priority areas/projects
- Bank protection strategies/approaches and implications to communities

Implementation Advisory Group Schedule

Meeting #4: January 13, 2021

- Implications and feasibility for potential structural (e.g., levees, floodwalls, etc.) or non-structural projects and actions
- Continue discussion and follow-up from meetings #1-3

Implementation Advisory Group Schedule

Meeting #5: January 21, 2021

- Discussion and follow-up from meetings #1-4

Meeting #6: February 11, 2021

- Discussion and follow-up from meetings #1-5

Meeting #7: February 22, 2021

- Discussion and follow-up from meetings #1-6

Technical Advisory Group Issues

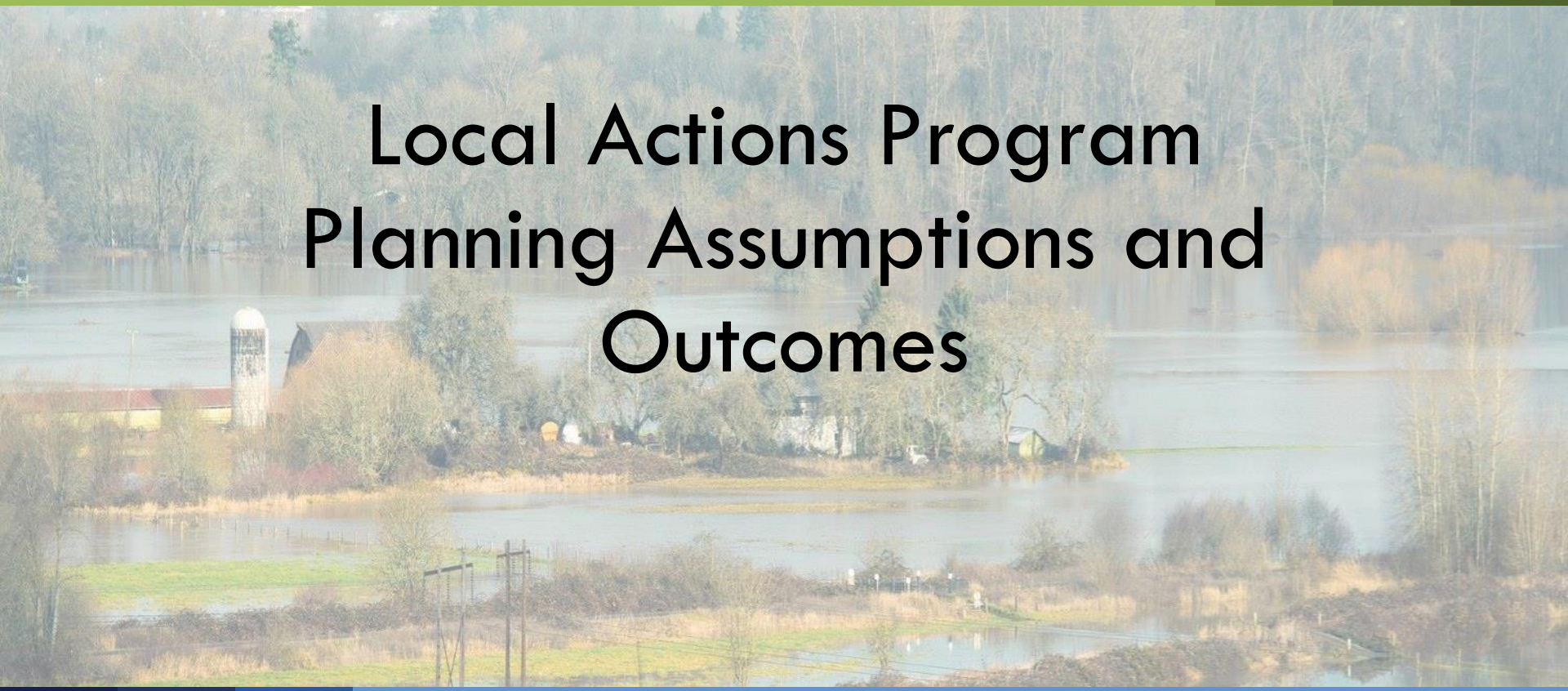
- Use of existing models and other information used to predict the cause and extent of flooding
- Climate change predictions have been used to predict future flood conditions
- Additional locations to increase flood storage either through restoration of natural conditions or removal of infrastructure
- Additional approaches to protect high value structures and critical infrastructure such as improving or building new levees, floodwalls, or pump stations.
- Ways to address damage from accelerated bank erosion
- Additional technical issues may be added as the Board deliberates during the six-month process

Major Interaction Between Advisory Groups

- Floodplain increase from climate change
- Potential structural actions
- Potential non-structural actions

Techniques for Meeting Engagement

- Zoom chat
- Jamboard
- Survey
- Discussion



Local Actions Program Planning Assumptions and Outcomes

Approved Planning Assumptions for Local Actions Program

The Board will:

1. Consider a timeframe of up to 30 years to implement the actions necessary to achieve outcomes.

2. Utilize future flood conditions that are predicted for the 100-year flood in 2080 (26% and 50% increase).

3. Require projects funded through the Local Actions Program to be designed, implemented, and mitigated to avoid making flood damage worse in other areas.

Approved Measurable Flood Damage Reduction Outcomes

1. Valuable structures protected from mainstem, catastrophic flooding
2. Homes & businesses protected from seasonal urban flooding
3. Lower basin properties & businesses protected from coastal storm surges
4. Farmland and rural structures protected
5. Critical facilities protected
6. Transportation routes protected
7. Environmental justice advanced
8. Prevent new at-risk development

Local Action Analyses & Actions

Identify erosion and channel migration hazards

Evaluate appropriate bank protection options

Identify opportunities to increase floodplain storage

Evaluate potential for structural solutions in high priority areas

Identify opportunities to protect structures through floodproofing, elevation and/or relocation.

Identify opportunities for floodplain agriculture ‘stay-in-place' assistance tailored to address site-specific flood and erosion risks.

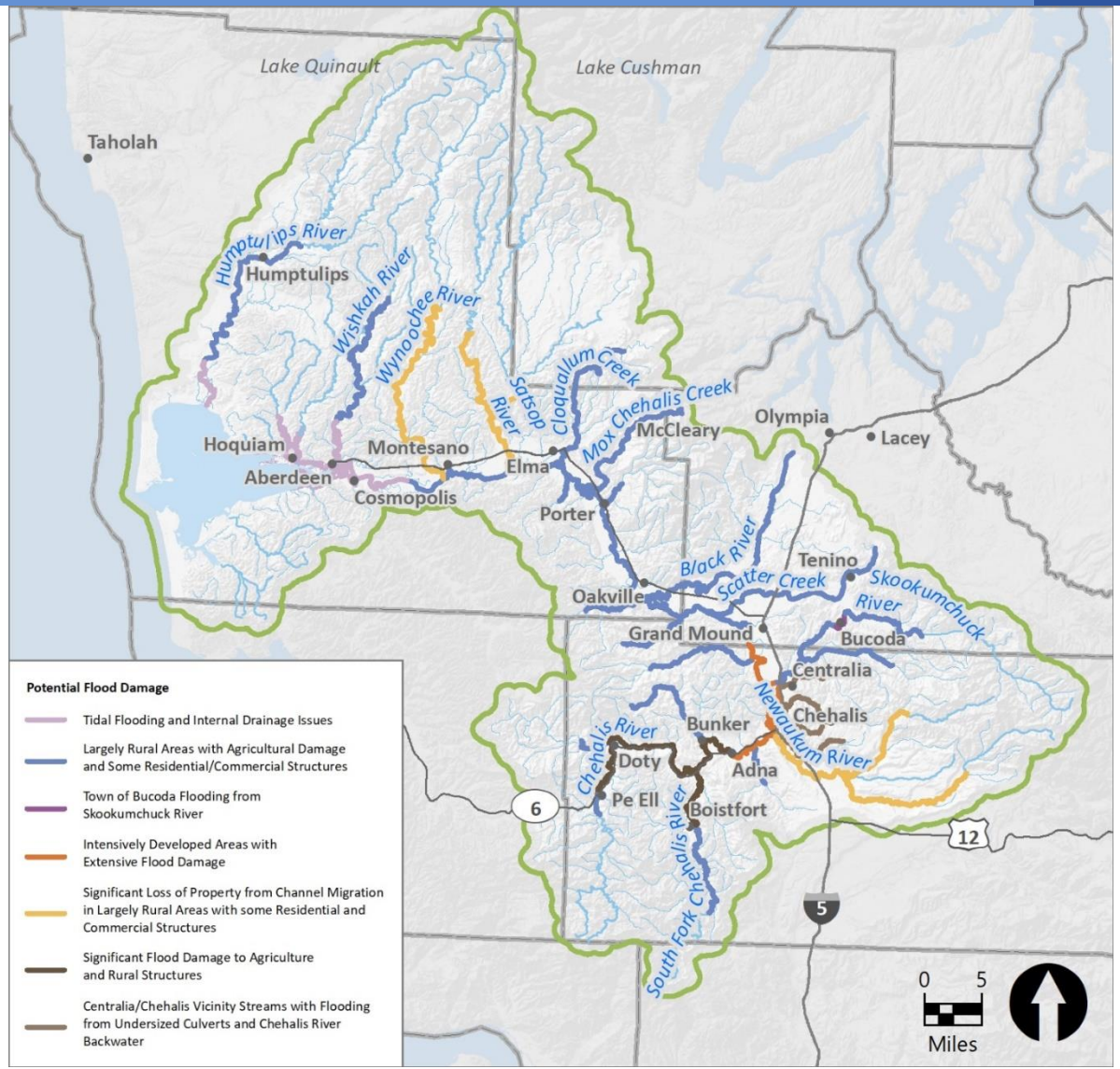
Identify opportunities to improve flood emergency response actions.

Prevent new at-risk development.

Current and Projected Future Chehalis Basin Flood Damage Areas

Basinwide Look at Flood Damage

Targeting Local Actions



LOCATION	DESCRIPTION AND NUMBER OF STRUCTURES IN MODELED 2080 FLOODPLAIN	POSSIBLE SOLUTIONS AND TECHNICAL CONSIDERATIONS
1. Adna	Concentration of residences and high school **Structures = 83**	Drainage solution implemented in 2013; potential levee or road raise to further protect Adna
2. Lower Newaukum	Moderate number of residences near Stan Hedwall Park **Structures = 20**	May be too few structures for levee
3. Airport Levee and Chehalis	Airport levee and I-5, commercial district of Chehalis. **Structures = 215**	Possible raise of levee, I-5, or floodwalls; combine with other actions such as raising local roads
4. Centralia	Majority of Centralia east of I-5, flooding from Skookumchuck in north half; from Salzer/Chehalis in south half **Structures = 3,484**	Possible new, raised, or setback Skookumchuck levees; possible extension of Long Road levee to protect South Centralia; possible road raises to protect downtown
5. West Centralia	Centralia west of I-5 **Structures = 508**	Potential new levee similar to segment proposed by Corps studies; combine with other actions such as removing fill, raising roads, or widening bridges
6. Military Road	Residential **Structures = 34**	Potential road raise
7. Galvin	Concentration of residences **Structures = 87**	Possible road raise; could also consider flood storage
8. Independence Road and north floodplain	Right bank floodplain of Chehalis River, nearly 40% of river flow goes north towards Black River; numerous residences, Chehalis Reservation **Structures = 306**	Possible causeway or road raises
9. Oakville	South part of town **Structures = 172**	Possible levee and pump station
10. Elma	South Elma along north side of Highway 12; water flows over Highway 12 to low spot **Structures = 148 structures**	Possible raise of Highway 12, levee and pump station
11. South Aberdeen Levee Area	Area protected by levee still experiences tidal, local, and tributary flooding **Structures = 1,203**	Possible pump station and raise of levee; removal of fill on riverward side of levee for flood storage
12. East Aberdeen	Tidal flooding near Wishkah River in commercial area; not protected by North Shore Levee	Possible pump station and fill removal to increase flood storage; floodproofing

Summary and Ranking of Flood Damage Potential

- Using the FEMA Floodplain Three Overlays were Made and Ranked (from 1 to 36):
  - Number of Structures in the FEMA 100-year floodplain
  - Acreage of Higher Density Zoning in the FEMA 100-year floodplain
  - Acreage of Agricultural Zoning in the FEMA 100-year floodplain
- These were then weighted and an overall ranking was determined

Example Ranking of Flood Damage Potential

FLOODING SOURCE	AGRICULTURAL ZONING IN SFHA (ACRES)		DEVELOPABLE ZONING IN SFHA (ACRES)		STRUCTURES IN SFHA (COUNT)		OVERALL RANK
TOTAL	55,755	RANK	54,213	RANK	14,548	RANK	
Chehalis Mainstem	31,387	1	14,094	1	3,860	1	1
Coastal Flood Zone	651	10	8,391	2	3,094	2	2
Skookumchuck River	1,655	6	3,812	5	1,863	4	3
Satsop River	4,378	3	1,675	9	589	5	4
Humptulips River	5,898	2	6,564	3	183	11	5
Wynoochee River	4,280	4	2,537	7	241	8	6

Summary and Ranking of Flood Damage Potential

- Structures, Developable Acreage, Agricultural Acreage ranked

Highest Ranked Systems

FLOODING SOURCE	AGRICULTURAL ZONING IN SFHA (ACRES)		DEVELOPABLE ZONING IN SFHA (ACRES)		STRUCTURES IN SFHA (COUNT)		
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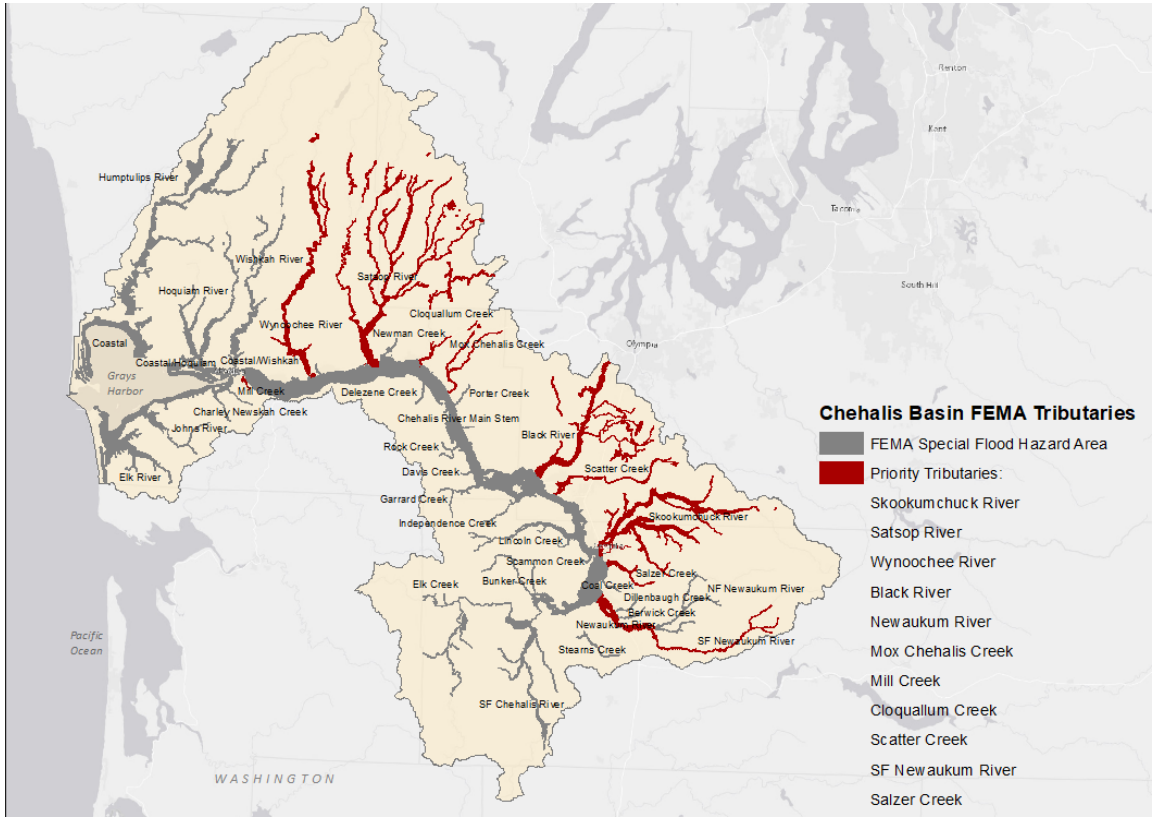
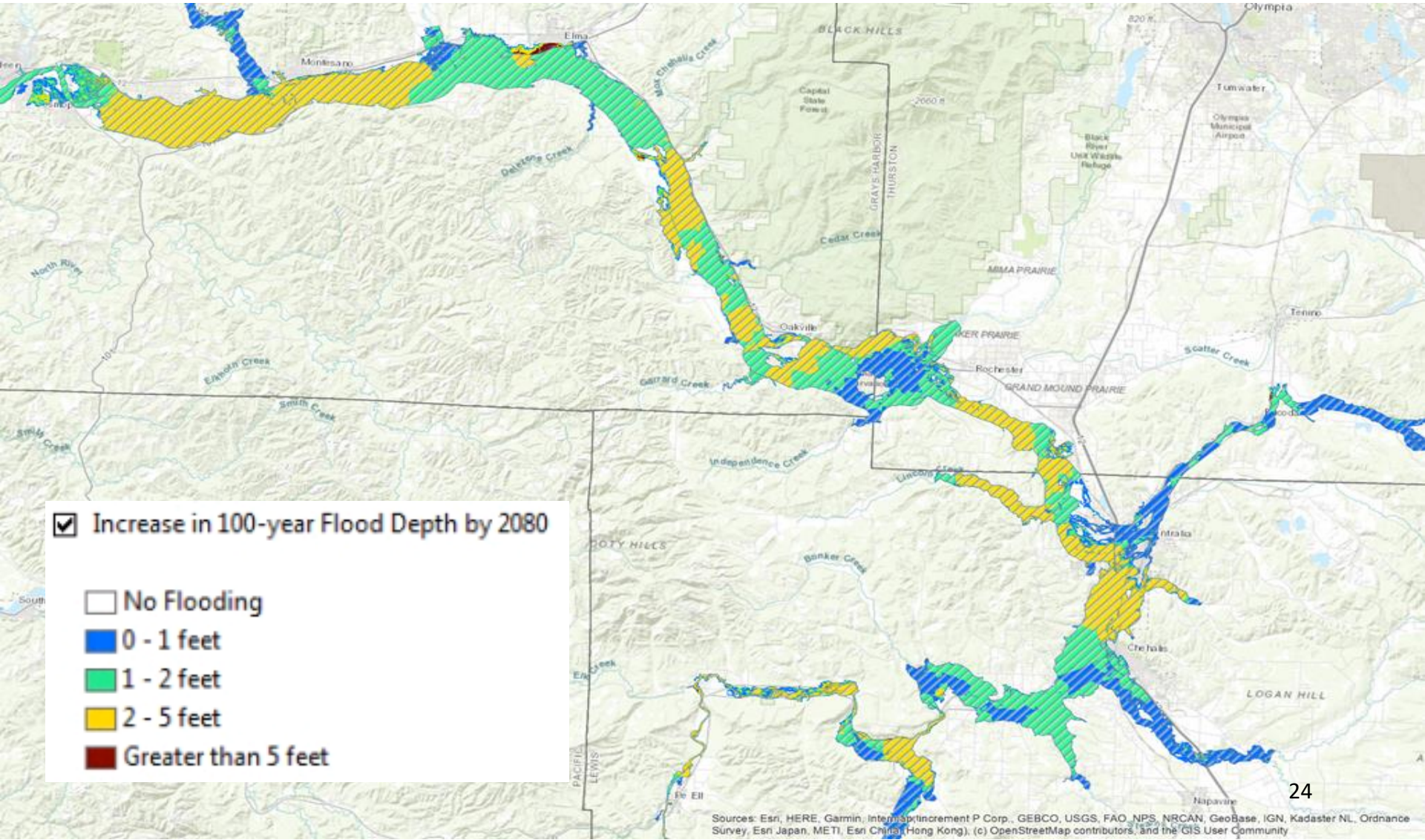
Humptulips River	5,898	2	6,564	3	183	11	5
Wynoochee River	4,280	4	2,537	7	241	8	6
Black River	53	20	2,740	6	234	9	7
Newaukum River	758	9	539	16	295	6	7
Coastal/Hoquiam	0	28	1,147	12	2,193	3	9
Hoquiam River	0	28	3,928	4	205	10	10
Wishkah River	1,538	7	2,053	8	83	20	11
Coastal/Wishkah	0	28	341	17	251	7	11
Mox Chehalis Creek	213	13	697	15	96	18	13
Charley and Newskah Creeks	0	28	801	14	141	14	14
Cloquallum Creek	59	19	334	18	125	15	15
Scatter Creek	15	25	912	13	108	17	16
South Fork Newaukum River	322	12	25	29	144	13	17
Salzer Creek	15	26	88	25	163	12	18

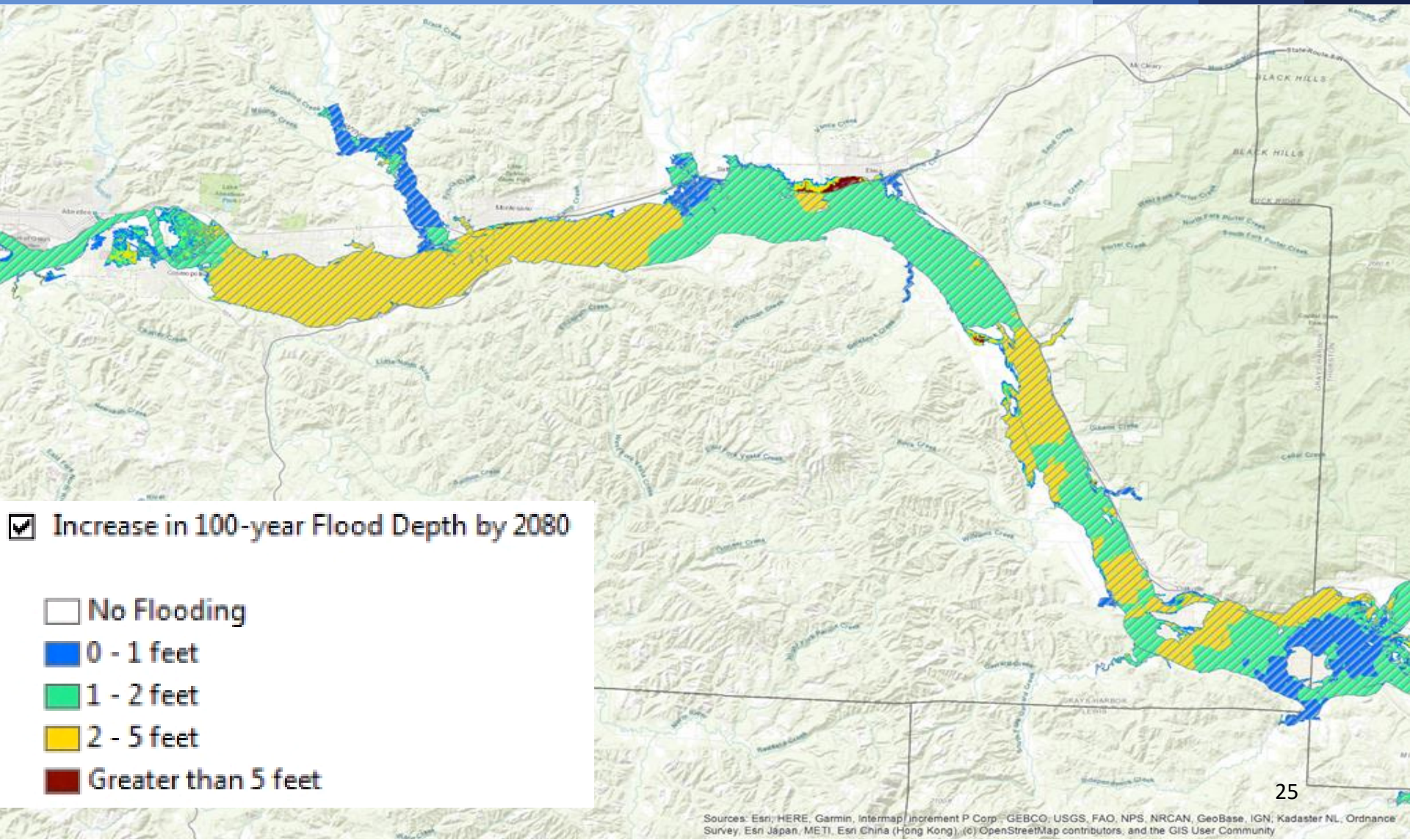
H&H Modeling Options for Long-term



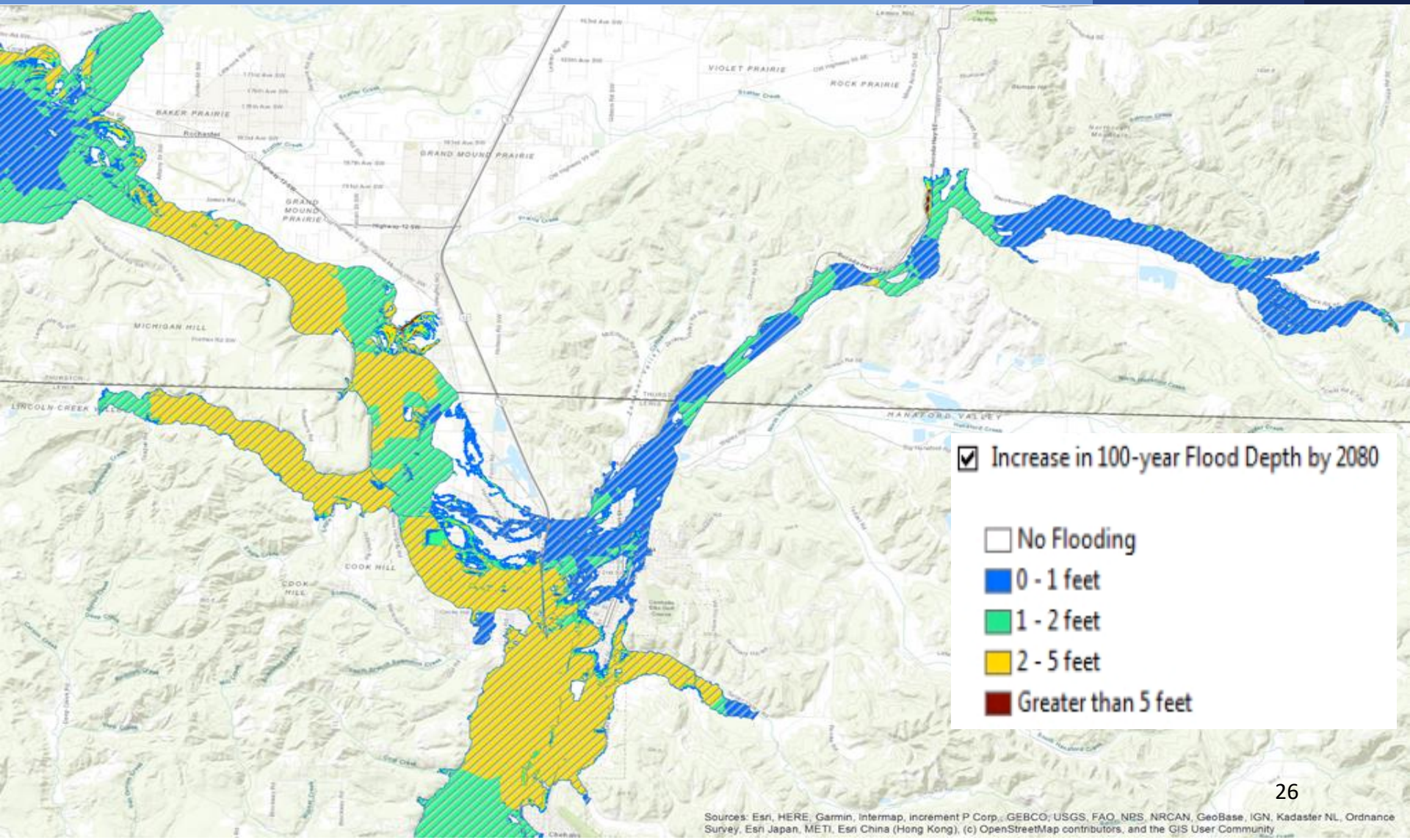
Future Floodplain (2080)



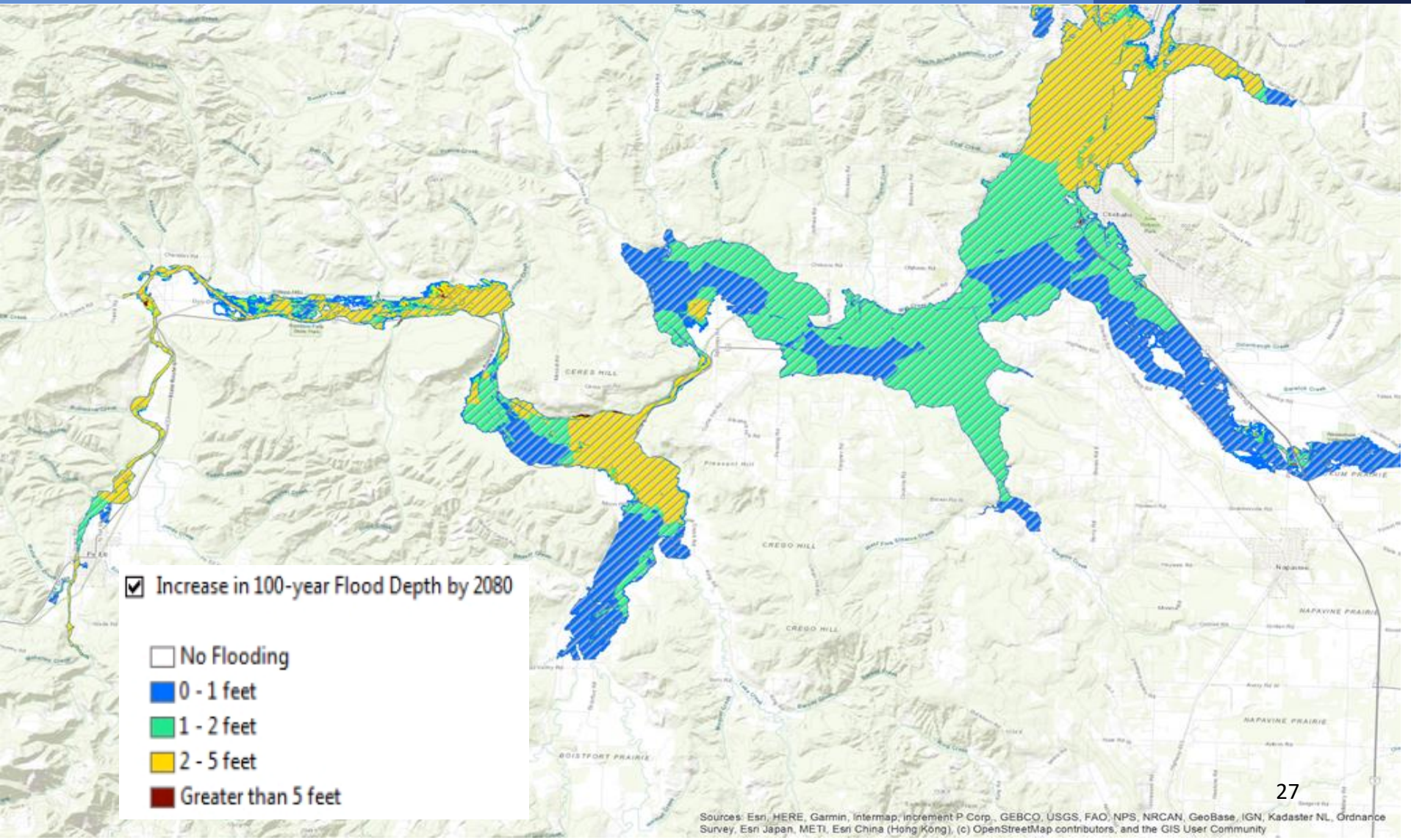
Future Floodplain (Lower Basin)



Future Floodplain (Mid-basin)



Future Floodplain (Upper basin)



Floodplain Management Recommendations

Survey of Local Jurisdictions

- Survey of local governments and Chehalis Tribe - implementation status of floodplain management recommendations from:
  - 2010 Chehalis River Basin Comp Flood Plan
  - Chehalis River Basin Flood Authority in 2016
- A total of 10 of 15 jurisdictions responded to-date
- OCB staff will follow-up with local staff to better understand responses before next Advisory Group meeting
- Survey will be sent to Advisory Group after meeting to identify most important recommendations

Floodplain Management Recommendations

Data, Planning & General

- Flood of record adopted
- Best available data required when no FIRM base flood elevation (BFE)
- Determination of BFE required when no available flood data
- Community Rating System (CRS) participation

Floodplain Management Recommendations

Building/Development Requirements

- Commercial/industrial freeboard requirement
- Foundation requirement
- Non-conversion agreements (limits on enclosures below BFE)
- Lower threshold for substantial improvements
- Substantial improvement tracking over time
- Compensatory storage for fill
- Zero rise policy
- Street elevation

Floodplain Management Recommendations

Zoning / Permitting

- Critical facilities
- Subdivision/large development regulations
- Low density zoning
- Floodplain development restrictions (e.g., require special use permit)

Floodplain Management Recommendations

Water Quality / Critical Areas

- Stormwater manual adoption
- Floodplain protection in Critical Areas Ordinance
- Wetland and stream buffers
- Impervious surface limits
- Shoreline Master Program updates
- Associated wetlands in shoreline management zone
- Hazardous materials

Jamboard / Questions

- What questions/comments do you have about the existing floodplain management recommendations?

- What suggestions do you have for other floodplain management recommendations?


Thank you!