Advisory Committee Meeting 7 Notes **March 30, 2022**

Attendees: Rebecca Fornaby, Brynné Walker, Jim Parvey, Angela Angove, Brian Alvis, Chuck Hendricksen, David Swindale, Greg Reed, Hans Hunger, Jason Sullivan, Jerome O'Leary, Justin Hall, Katrina Knutson, Krystal Kyer, Lindsey Amtmann, Marie Wellock, Martin Fox, Patrick Reynolds, Paul Bucich, Paul Loveless, Royce Young, Todd Essman, Angela Gallardo, Helmut Schmidt, Greg Reed.

Introductions

- Jim Parvey, City of Tacoma
- Jerome O'Leary, PC Ag Advisory Committee
- Hans Hunger, City of Puyallup
- David Swindale, City of University Place
- Todd, Essman, Pierce County
- Greg Reed, City of Orting
- Chuck Henderson, City of Edgewood
- Paul Bucich, City of Lakewood
- Paul Loveless, Town of Steilacoom
- Martin Fox, Muckleshoot
- Justin Hall, Nisqually River Council
- Royce Young, City of DuPont
- Jason Sullivan, City of Bonney Lake
- Brian Alvis, City of Fife
- Katrina Knutson, City of Gig Harbor
- Patrick Reynolds, Muckleshoot
- Marie Wellock, Town of Wilkeson
- Chris Larson, City of Fife

Updates

- What are you looking for regarding the problem statement?
    - Just summing up your perspective of how it affects your city and residents.

Plan

Flood Risk Assessment and Economic Analysis

- Are the watershed maps set in stone?
- Some of the flooding impacts highways and freeways – will the assessment include these
    - There is a transportation piece in Task 4, which is the transportation corridor section.
- This is a study that is being done by 8 consultants at a high level. This will include ground water, coastal and urban flooding.

River Flood Inundation Mapping

- When is the expected date for the maps?
    - Mid-summer. It's been a huge modeling effort.
- On the yard stick where you have the reach amounts, can you can include the intervals in the USGS.
- Could a companion document be done?

    - We will need to decide how we are going to report the data in order to do it, but it can be done.
- How does it compare Lidar geo res analysis to see why it's better than the FEMA maps as well as the rapid based inundation areas? Based on what has been provided, trying to understand how it works and how it improves our inundation area. The difference of a few inches can cause extensive increase in a floodplain. How does it report on those populations better than FEMA?
    - Our flow from our map will be similar to FEMA. Our map will provide some finer detail than the FEMA map. The idea is as we get more hydrologic data, providing these nominal flows, we will be able to see what that elevation does on stage.
- Will this ultimately be used for capital improvements Upper Puyallup and have input on Emergency Management?
    - Yes. It will provide a better tool to determine where activity will happen and where to send crews.

Advisory Committee Meetings

- April 27 at 10:00
    - Groundwater
- September
    - EIS discussion
- May
    - Meet with the Tribes

Mural

- Anticipate a lot of inundation due to sea level rise. Things for Tacoma have been identified as problems. We should stay in the here and now and not look at future problems.
    - This will help us address the current problems with the mapping. We shouldn't ignore what the future might look like.
- The ferry terminals can be affected by tides. Are they affected in king level tides or sea level rise?
    - Ann-Marie said no, but maybe check with ferries department for the information.
    - Steilacoom, we will be tagging the terminal as an area that would be adversely impacted by flood and high tides. Do they do damage? No, because we have armoring. Sunnyside beach did have some flooding because the armory failed. Will probably lose Sunnyside Beach in the future because of permitting difficulties.
    - They do have some issues loading the ferries at high tide. Low tide is normal for them to have issues.
- Have hatcheries been affected by coastal flooding?
    - Will have to check on that – may be a WDF hatchery.

Next Meeting

April 27, 2022 at 10:00 AM

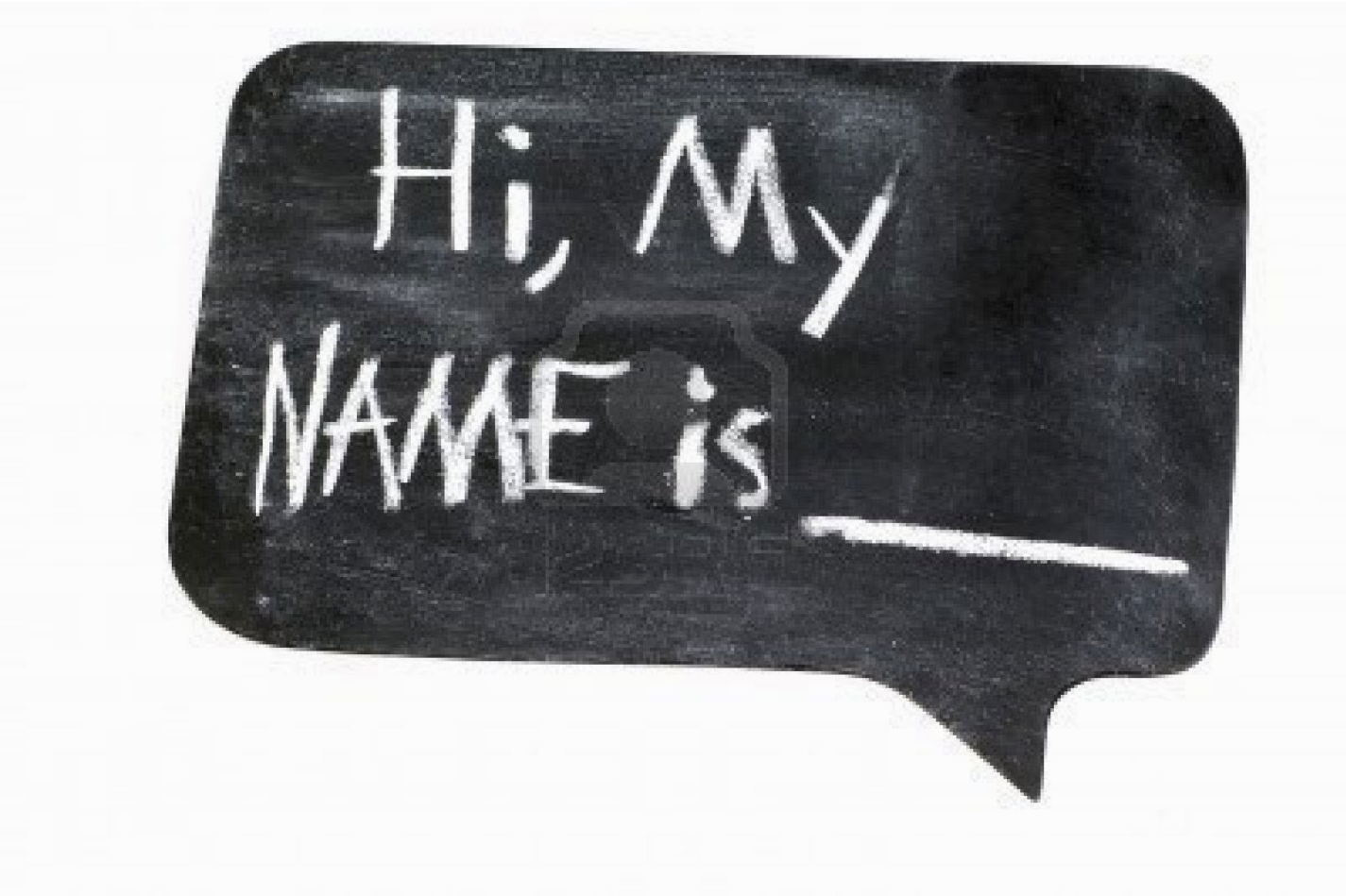
2023 Comprehensive Flood Hazard Management Plan Advisory Committee Mtg #7

Managing Flooding from Mount Rainier to Puget Sound

Today's Agenda

- Introductions
- Plan update
  - Cities Appendices
- Studies update
  - Economic Analysis/Flood Risk Assessment
  - Flood Inundation study
- Coastal Flood Hazards
- Upcoming meetings

Introductions



Plan Update

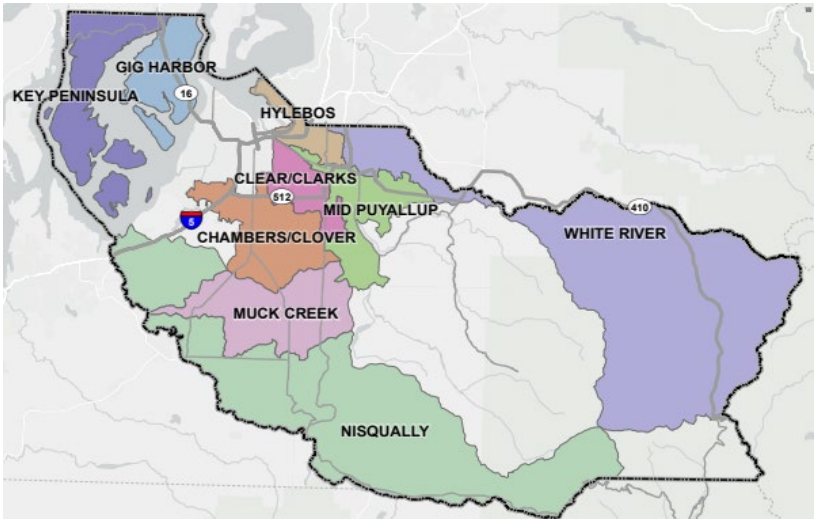
CFHMP Cities Appendices

- **Problem Statement:**
- **Municipalities Name:**
- **Cities Floodplain Regulations (link)**
- **Flooding Problems to project scoring**
- **Pathways (if applicable)**
- **Programmatic Recommendations**
- **Additional Flood Problems**

City of Lakewood, WA 1996
DuPont · Washington — Welcoming for 5,000 Years
City of Puyallup, State of Washington
City of Sumner, Washington
Town of South Prairie, Incorporated 1908
Steilacoom — Town of Firsts — Washington
Edgewood, Washington
City of Pacific
Gig Harbor — The Maritime City
Bonney Lake
Town of Eatonville
University Place, Washington
City of Tacoma, Washington
Orting, Washington
Town of Wilkeson
The City of Fircrest
Fife, Washington — Industrious by Nature

Studies Update: Flood Risk Assessment and Economic Analysis

The results will be organized by watershed as show in the graphic below



The Flood Risk assessment includes:

- A flood hazard profile
- Vulnerability analysis
- Description of impact of flooding and channel migration
- Coastal Transportation Analysis

The Economic Analysis include (not an all-inclusive list):

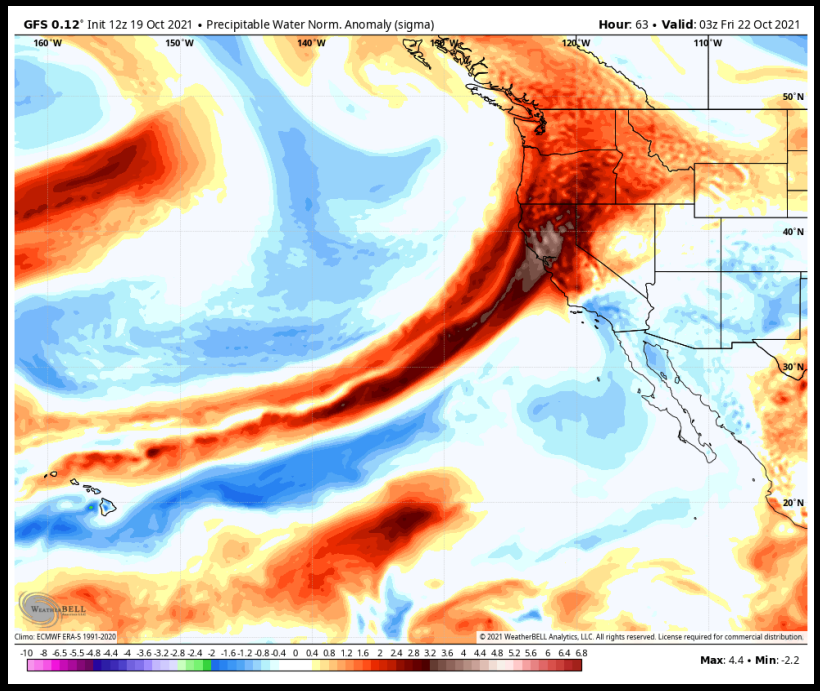
- Loss of output and personal (worker) income from disruptions to commercial and industrial businesses
- Loss on farm revenue
- Potential impact (including lost employment income) to businesses located outside the floodplain
- Critical infrastructure in flood prone areas
- Affordable housing located in flood prone areas

Poll

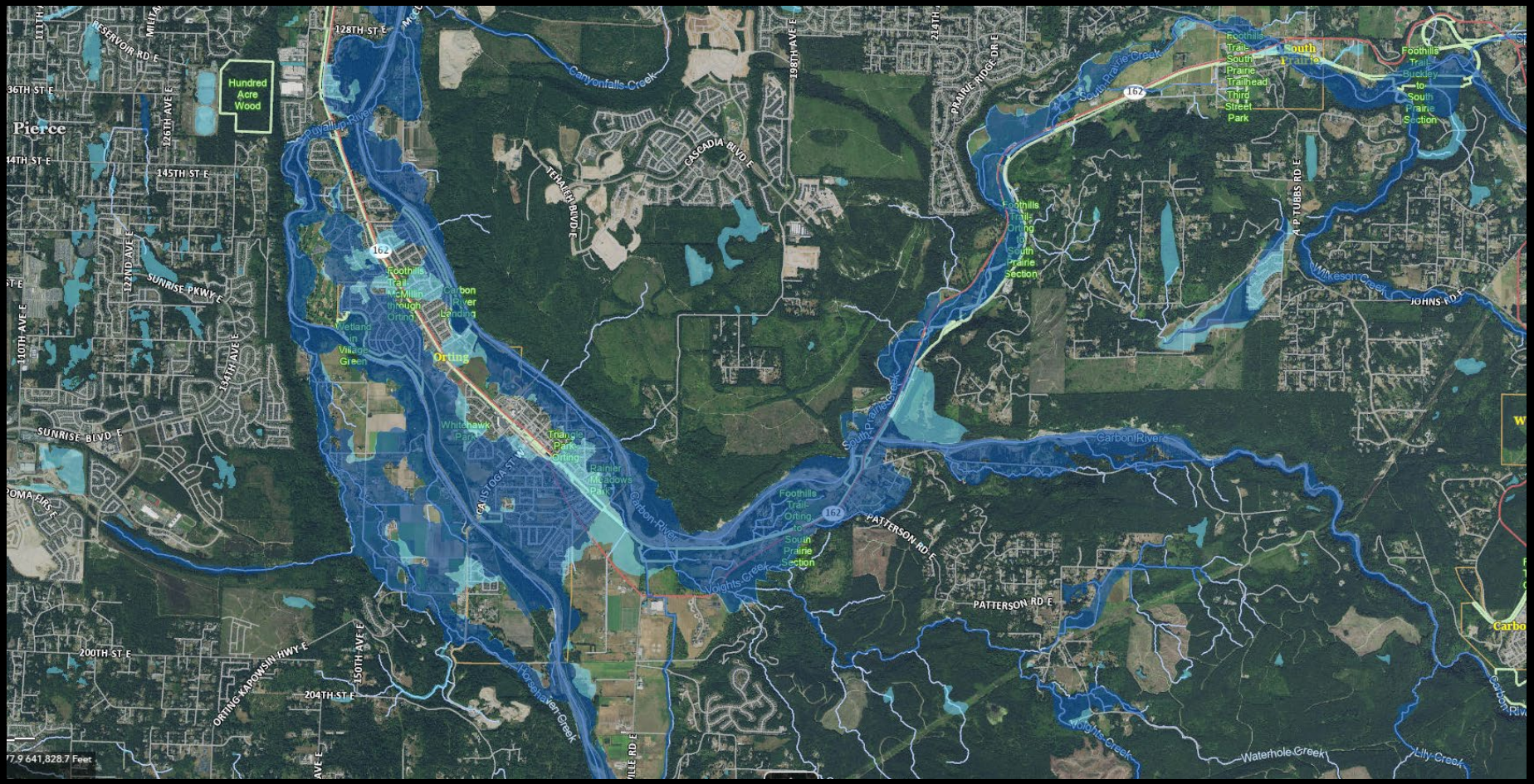
Rivers Flood Inundation Mapping

Scenario

- It’s a nasty stormy day here in Pierce County
- It’s raining pigs & chickens
- An atmospheric river is heading our way
- NWS is predicting some flooding on local rivers
- We check the NWS website for river gauge data
  - White at “R” St. 5,000CFS
  - Puyallup at Puyallup 36,000CFS
  - Carbon at Fairfax 12,500CFS
  - Puyallup at Orting 18,000CFS



FEMA Flood Insurance Rate Map (FIRM)



Rivers Flood Inundation Mapping

- FEMA FIRMs are a regulatory tool
- Developed to display inundation predicted for 100yr (1% chance) and 500yr (0.2% chance) events
- They are focused on flood insurance to set premiums
  - Identify structures in the associated floodplain
  - They are a predictive tool

- Not very helpful for the more frequent events
- Not very helpful from an operational standpoint
- Not very helpful for first responders
- Not a great planning tool

- We need a better predictive tool.

Rivers Flood Inundation Mapping

- What problem are we trying to solve?
- What are we doing?
- Why is it important?
- When will it be ready?

Flow Table Example

Unsorted

Reach: Upper Puyallup RM 17.4 - 29.2		Orting gauge
Flow	Description	Relates to:
6970	50% annual chance	2 year Return Period
10581	20% annual chance	5 year Return Period
13082	10% annual chance	10 year Return Period
16340	5% annual chance	25 year Return Period
18816	2% annual chance	50 year Return Period
21319	1% annual chance	100 year Return Period
23886	0.5% annual chance	200 year Return Period
6700	Action Flow	NWS AHPS warning threshold
10000	Flood Flow	NWS AHPS warning threshold
13500	Moderate Flood Flow	NWS AHPS warning threshold
16000	Major Flood Flow	NWS AHPS warning threshold
22385	5% increase in 1% Annual Chance	Climate change 20 yr. low range
23451	10% increase in 1% Annual Chance	Climate change 20 yr. high range
24517	15% increase in 1% Annual Chance	Climate change 40 yr. low range
25583	20% increase in 1% Annual Chance	Climate change 40 yr. high range
27715	30% increase in 1% Annual Chance	Climate change 60 yr. low range
29847	40% increase in 1% Annual Chance	Climate change 60 yr. high range
21500	2006 Nov flood peak	NWS AHPS Historic Crests
18300	1996 Feb flood peak	NWS AHPS Historic Crests
17200	2015 Dec flood peak	NWS AHPS Historic Crests
16900	2009 Jan flood peak	NWS AHPS Historic Crests
16500	2014 Nov flood peak	NWS AHPS Historic Crests
12,200	*10% annual chance*	*10 year Return Period*
16,800	*2% annual chance*	*50 year Return Period*
18,600	*1% annual chance*	*100 year Return Period*
22,600	*0.2% annual chance*	*500 year Return Period*
5000	**Nominal model run flow**	
10000	**Nominal model run flow**	
15000	**Nominal model run flow**	
20000	**Nominal model run flow**	
25000	**Nominal model run flow**	
30000	**Nominal model run flow**	

Yard Stick

Sorted

Reach: Upper Puyallup RM 17.4 - 29.2		Orting gauge
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20000	**Nominal model run flow**	
21319	1% annual chance	100 year Return Period
21500	2006 Nov flood peak	NWS AHPS Historic Crests
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24517	15% increase in 1% Annual Chance	Climate change 40 yr. low range
25000	**Nominal model run flow**	
25583	20% increase in 1% Annual Chance	Climate change 40 yr. high range
27715	30% increase in 1% Annual Chance	Climate change 60 yr. low range
29847	40% increase in 1% Annual Chance	Climate change 60 yr. high range
30000	**Nominal model run flow**	

18,000 falls into this bracket

Rivers Flood Inundation Mapping

Primary Benefits

Inundation maps can be used for:

- Timely and focused flood response
- Planning aid for resource allocation
- Recovery & damage assessments
- Emergency preparedness - “What-if” scenarios
- Assessment of level of service for flood risk reduction infrastructure
- Mitigation and planning - flood risk analyses
- Environmental and ecological assessments
- Communication tool to help communities understand flood risks and consequences
- Floodplain management

Rivers Flood Inundation Mapping

Other Benefits

The completion of flood inundation mapping supports multiple County Plans:

- Pierce County Comprehensive Emergency Management Plan
- Pierce County All Hazards Management Plan
- Pierce County System Wide Improvement Framework Plan
- Pierce County Rivers Flood Hazard Management Plan
- SWM Emergency Response Management Plan

Flood Inundation Mapping will also benefit and inform:

- US Army Corps of Engineers PL 84-99 Continuing Eligibility Inspection program
- Provides a useful planning and operational tool for M&O and PCDEM
- 2023 Comprehensive Flood Plan update
- Capital Facilities Program project planning and design

Questions?

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todd.essman@piercecountywa.gov

Advisory Committee

Who is on the Advisory Committee?

Members representing cities, counties, tribes, state and federal agencies, business, environmental and agricultural interests, floodplain residents and citizens outside of the planning area.

Meeting topics

- Problem/ Project Ranking Criteria
- Alternatives sections of the EIS
- Discussing each hazard in detail (One meeting per hazard)
- Pathways Approach
- Programmatic Recommendations
- Level of Design
- EIS Impacts

	TOPIC	EST. DATE
Mtg 7	Coastal Flooding Discussion	March 30th, 2022 @ 10am
Mtg 8	Groundwater Flooding Discussion	April 27th, 2022 @10am
Mtg 9	Programmatic Recommendations	June 15th, 2022 @1pm
Mtg 10	Level of Design/ EIS Impacts	September 28th, 2022 @ 10am

Disappearing Task Group (DTG)

Who is on the DTGs?:

Anyone who is interested in the specific topics listed below

Meeting topics:

- Coordination with Cities/Counties/ Tribes
- Coastal Flooding
- Groundwater Flooding
- Urban Flooding
- Plan implementation

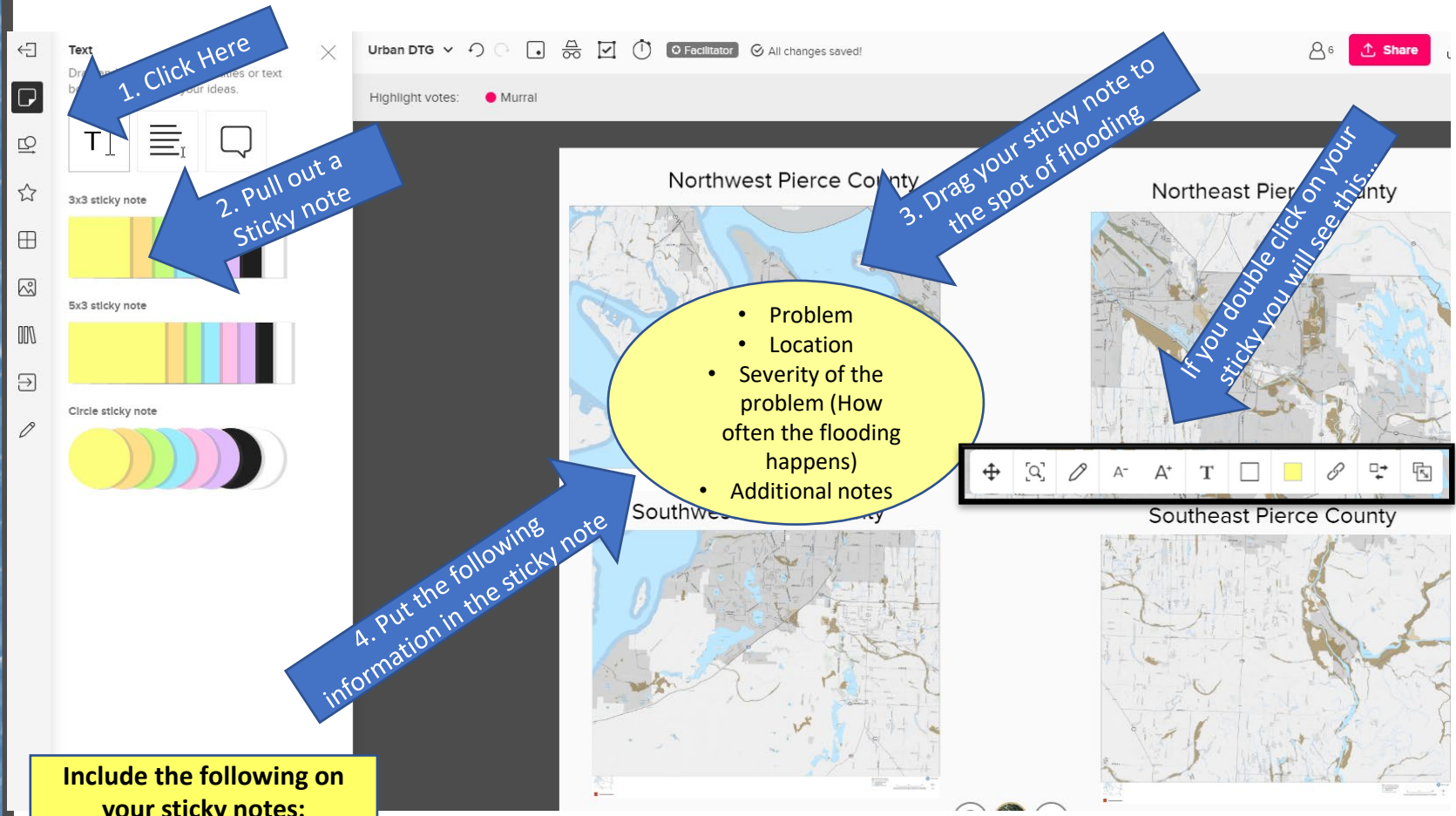
Date	Topic
March 31st 2022	Groundwater flooding
April 13th, 2022	Groundwater Flooding
May 2022	Cities meeting to create programmatic recommendations
May 2022	Coordination with the Tribes section development

What is Coastal Flooding?

Coastal flooding is defined as damaging highwater impacts associated with marine waters.

In Pierce County, that means Puget Sound shorelines. Pierce County has 225 miles of marine shoreline. The effects of high water can be seen during high tide events and during storm events. High tide events are predictable and occur over a three- to five-day period, usually twice a year. Each event can last from two to four hours. However, sea level rise predictions indicate that these events are expected to become more severe over time. Tidal events can aggravate stream, river, and upland flooding by backing up water into those channels and into nearshore drainage pipes. Likewise, wind events can increase wave action and exacerbate damage from high tide events, that is often referred to as “storm surge”.

Mural 101

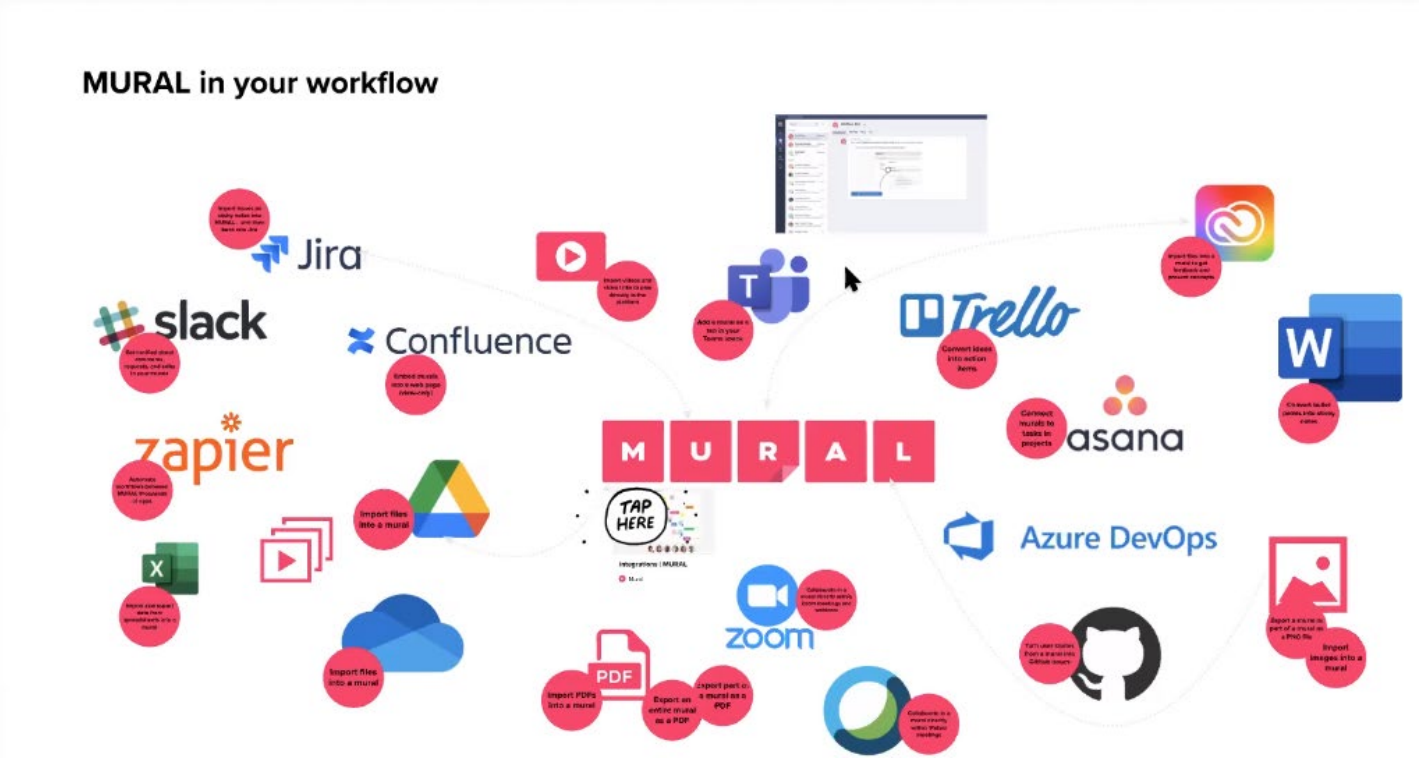


Include the following on your sticky notes:

- Problem
- Location
- Severity of the problem (How often the flooding happens)
- Additional notes

Please use Orange sticky notes

Let's Go into Mural



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