Appendix B:
Methods

Phase 1: Outreach

a. Overview

Phase 1 “Outreach” began in Spring 2022 and continued through the conclusion of the project in Summer 2024. The primary components of this phase were 1) community outreach, 2) mapping outreach results, and 3) document review. Audiences included local, city, county, state, federal, and Tribal participants.

b. Community outreach

The project team attended existing meetings to better understand local topics of interest, share information about the project, and collect insights on how to better conduct the project. The project team also conducted semi-structured interviews and site visits with local stakeholders regarding SLR and associated impacts (e.g. flooding, erosion, salinity intrusion, and erosion and deposition). These discussions highlighted additional contacts for focused outreach and invitations to workshops.

Local meeting attendance included, by region:

Baker Bay

- Port of Chinook Commissioners
- Port of Ilwaco Commissioners
- Pacific County Marine Resources Committee
- Pacific County Planning Commission
- Pacific County Sea Level Rise Vulnerability Assessment
- Lower Columbia Solutions Group

Grays Bay

- Grays River Flood Control District (formerly Grays River Habitat Enhancement District)
- Grays River Grange
- Wahkiakum County Comprehensive Flood Hazard Management Plan
- Wahkiakum County Marine Resources Committee
- Wahkiakum County Conservation and Restoration Working Group

Additional engagement with groups or activities external to the project area were used to inform overall project methods and regional context. These external events or discussions included:

- Oregon Department of Land Conservation and Development’s sea level rise workshops
- Washington Coastal Hazards Resilience Network’s Annual Meeting[1]
- Cascadia CoPes Hub (Coastlines and Peoples)[2]
- The Nature Conservancy (regarding Floodplains By Design grant program[3])

Focused discussions, interviews, or site visits included:

Baker Bay

- City of Ilwaco mayor

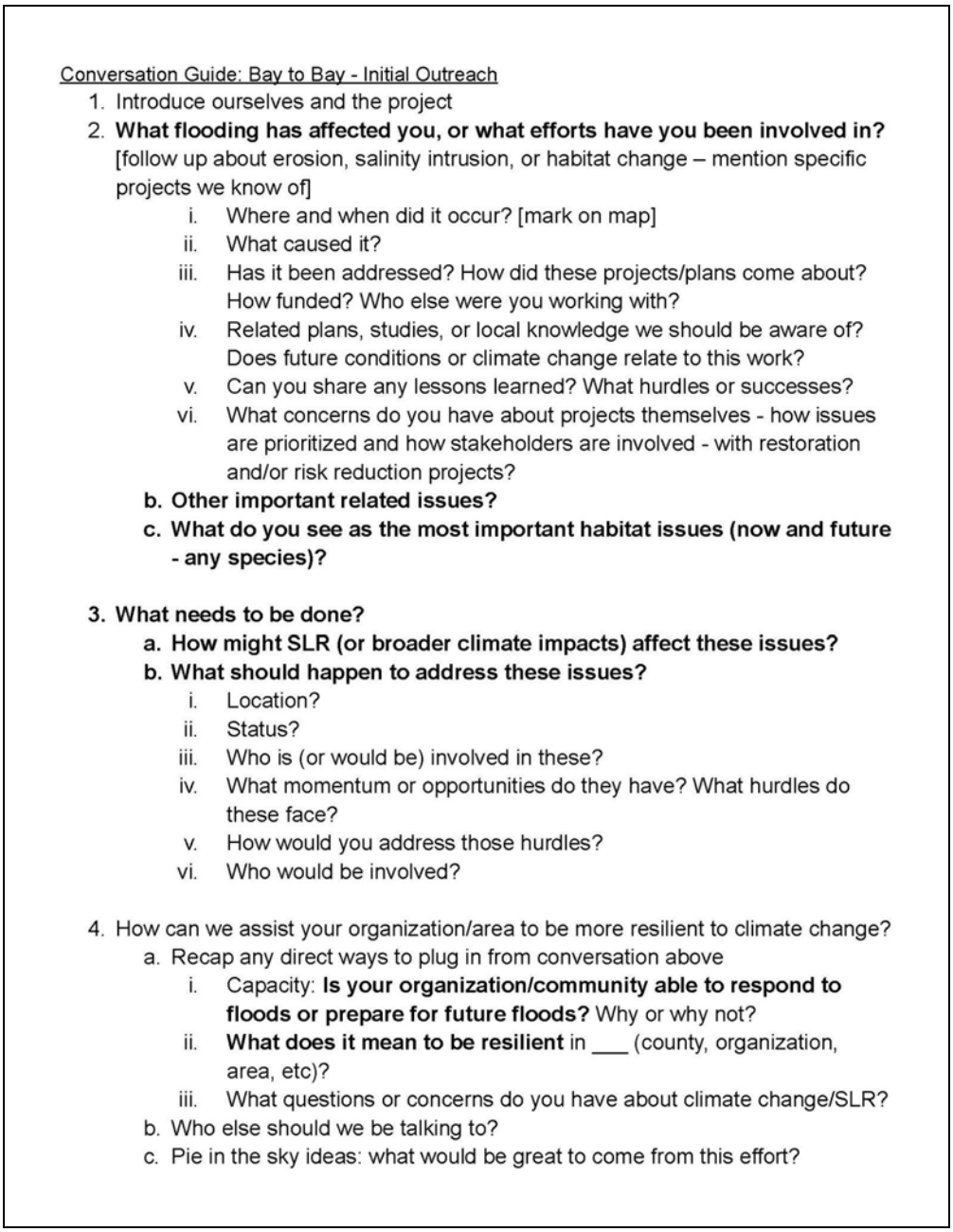
[1] https://wacoastalnetwork.com
[2] https://cascadiacopeshub.org
[3] https://floodplainsbydesign.org

- Columbia Land Trust staff
- Local residents
- Pacific Conservation District staff
- Pacific County Department of Community Development staff
- Pacific County Public Works staff
- Sea Resources, Inc. board members
- The Watershed Company staff (planning consultants for City of Ilwaco and Pacific County)
- United States Army Corps of Engineers staff
- Washington Department of Fish and Wildlife staff
- Washington State Department of Transportation staff

Grays Bay

- Columbia Land Trust staff
- Cowlitz Indian Tribe
- CREST staff (Columbia River Estuary Study Taskforce)
- Current and former board members of the Grays River Flood Control District (formerly Grays River Habitat Enhancement District)
- Local residents
- United States Army Corps of Engineers staff
- Wahkiakum Conservation District staff
- Wahkiakum County Commissioner
- Wahkiakum County Marine Resources Committee members
- Wahkiakum County Port No. 2 Commissioners
- Wahkiakum County Public Works staff
- Wahkiakum Eagle staff
- Washington Department of Fish and Wildlife staff
- Washington State University Extension Wahkiakum County staff
- Washington State Department of Transportation staff

Focused discussions, interviews, or site visits were guided by a conversation guide (Figure 1), though other topics were covered as relevant. Notes and photographs from these conversations informed ensuing outreach, along with planning and materials for Phase 2's workshop series described further in this appendix. Geographic Issues, ideas, and work-to-date from conversations were incorporated into GIS maps used in workshops.



Conversation Guide: Bay to Bay - Initial Outreach

1. Introduce ourselves and the project
2. **What flooding has affected you, or what efforts have you been involved in?** [follow up about erosion, salinity intrusion, or habitat change – mention specific projects we know of]
    i. Where and when did it occur? [mark on map]
    ii. What caused it?
    iii. Has it been addressed? How did these projects/plans come about? How funded? Who else were you working with?
    iv. Related plans, studies, or local knowledge we should be aware of? Does future conditions or climate change relate to this work?
    v. Can you share any lessons learned? What hurdles or successes?
    vi. What concerns do you have about projects themselves - how issues are prioritized and how stakeholders are involved - with restoration and/or risk reduction projects?
    b. **Other important related issues?**
    c. **What do you see as the most important habitat issues (now and future - any species)?**

3. **What needs to be done?**
    a. **How might SLR (or broader climate impacts) affect these issues?**
    b. **What should happen to address these issues?**
        i. Location?
        ii. Status?
        iii. Who is (or would be) involved in these?
        iv. What momentum or opportunities do they have? What hurdles do these face?
        v. How would you address those hurdles?
        vi. Who would be involved?

4. How can we assist your organization/area to be more resilient to climate change?
    a. Recap any direct ways to plug in from conversation above
        i. Capacity: **Is your organization/community able to respond to floods or prepare for future floods?** Why or why not?
        ii. **What does it mean to be resilient** in ___ (county, organization, area, etc)?
        iii. What questions or concerns do you have about climate change/SLR?
    b. Who else should we be talking to?
    c. Pie in the sky ideas: what would be great to come from this effort?

Figure 1. Conversation guide used during initial outreach.

c. Mapping outreach results

Based on responses from community outreach, the project team created a GIS map for use in ongoing project planning Phase 2's workshop series. For example, outreach results mapped via GIS were used to determine preliminary table groupings in Workshop 1. Maps used throughout the workshop series - and shown throughout this report and appendices - were from this GIS map.

d. Document review

To supplement local perspectives with additional insights, the team collected and reviewed available documents related to SLR and associated impacts, other potential changes in water level (e.g. projections for future precipitation change), existing planning and projects, and related topics. Many of these documents are listed in Appendix A, “Background and Context,” section 4. Past and present news articles were also extremely helpful for the team to understand local and regional context.

Phase 2: Adaptation Planning Workshops

1. Overview

Phase 2, “Adaptation Planning Workshops", consisted of four public workshops in each bay, with the goal of further engaging the broad stakeholder group identified through Phase 1. The workshops in each bay occurred between spring 2023 and summer 2024 (see Fig. B.1). This hands-on workshop series engaged attendees in collaborative problem-solving, resilience planning, and relationship-building informed by available science and the Phase 1 outreach results. Workshops were intentionally located in the respective communities at event venues frequently used for community events and meetings. For Baker Bay, workshops were held at the Historic Chinook School and for Grays Bay, the workshops were held in Rosburg Community Hall. Community workshops were advertised using multiple outreach techniques including:

- Paid advertisement in the Chinook Observer;
- Posting to online event calendars in the Chinook Observer and the Wahkiakum County Eagle;
- Press releases to local papers that generated news stories promoting the workshops;
- Multi-phase email campaigns to a curated list of local leaders, interested community members, and workshop attendees;
- Direct mail (addresses for direct mail were generated through GIS mapping of tax lots located in areas affected by sea level rise and flooding in Grays and through USPS every door direct mail service for Baker Bay to get residential addresses and P.O. boxes);
- Social media campaigns; and
- Flyers posted at community gathering spots.

Participant representation in the workshop series included local residents and homeowners, habitat enhancement district representatives, county commissioners, city council members, state agency staff, among others. Each workshop provided dinner to all attendees, a table for kids with arts and crafts supplies, a raffle with gift certificates to local restaurants, and locally canned fish was provided to everyone who attended and completed a workshop at the end of each workshop.

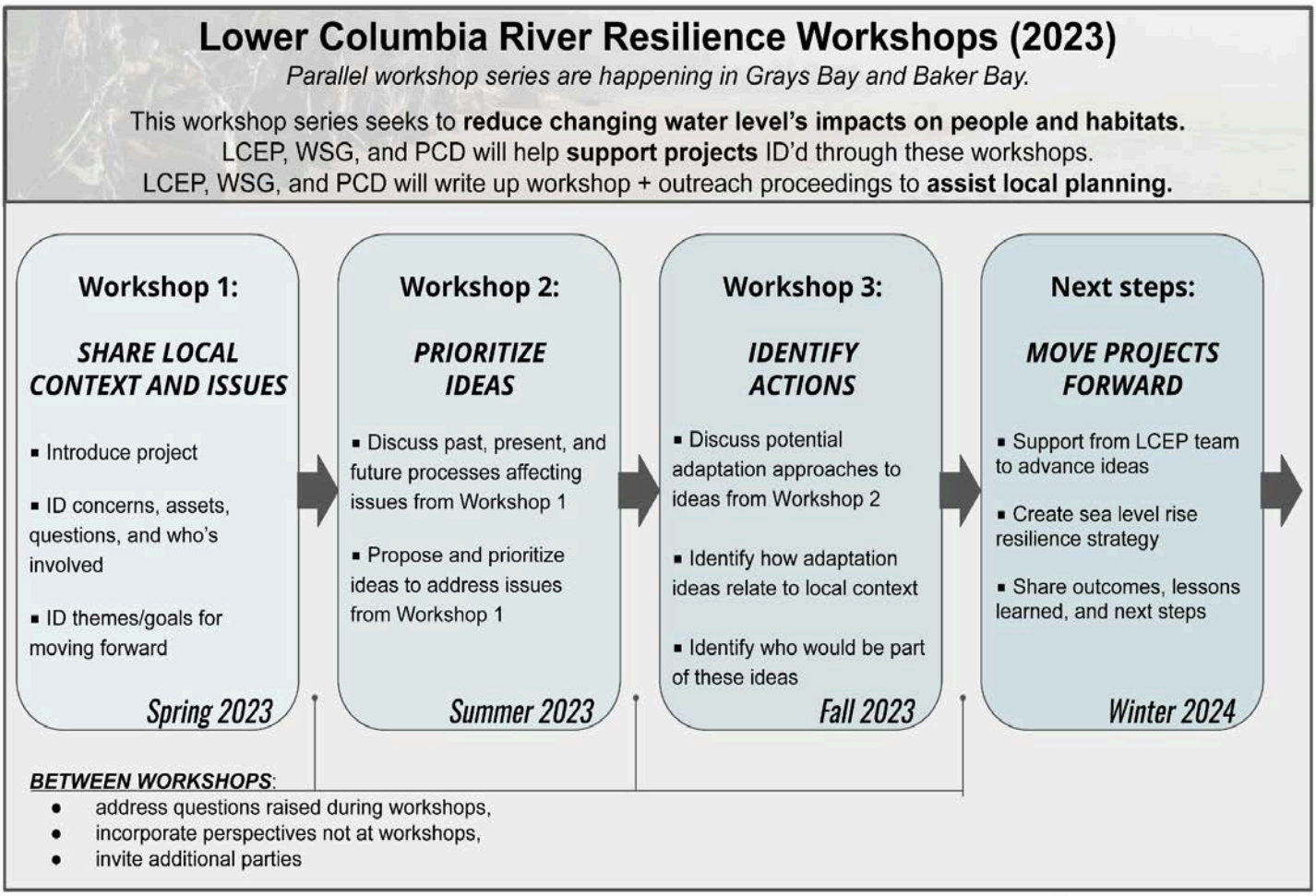


Figure B.1. Outline of workshop series, preceded by community outreach. A fourth workshop occurred for both bays, during which project results were shared for final feedback (not shown).

Workshop outcomes were accomplished through work during workshops with public participants and work between workshops by project leads. As an overview, Workshop 1 engaged participants in discussions about community resilience while identifying community and/or ecological assets and their exposure to climate-related hazards (such as SLR impacts to tidal wetlands which buffer critical public infrastructure from storm surge). Participatory mapping in Workshop 1 aided in identification of assets while ensuring that local lived experiences informed adaptation planning, informed by Phase 1 outreach and data compilation. Workshop 2 assessed the sensitivity of identified assets to coastal hazards. In scenario-based planning exercises, content experts guided Workshop 2 participants in reviewing probabilistic SLR projections and associated flood risks, selecting planning horizons and applying multi-hazards event scenarios to identified assets. Workshop 3 introduced regional resilience case studies and best practices resulting from Phase 1 outreach, identified assets' adaptive capacity, and identified potential conceptual designs for nature-based flood mitigation solutions. Workshop 4 prioritized conceptual hazards and habitat resilience design concepts, based on community resilience criteria developed through Phase 1 outreach and workshops 1-3, with the support of licensed engineers with expertise in lower Columbia habitat restoration. Throughout the workshops, emphasis was placed on applying appropriate nature-based restoration solutions that will achieve maximum ecological benefits and coastal hazards resilience, while furthering local collaborations and adaptive capacity through application of resilience principles identified through Phase 1's outreach and Phase 2's workshops. Detailed methods for each workshop are outlined below. Full maps shared throughout the workshop series can be found in Appendix C and F.

2. Workshop 1

Attendance for Workshop 1 was 36 people for Baker Bay and 41 people for Grays Bay, not including the project team. The agenda for Workshop 1 is shown in Fig B.2. After a brief introduction of the project team, workshop participants were asked to pair up with another participant and share their name, where they are from, and a memory that they associate with that workshop.

AGENDA	
Project goals: ● Identify and support multi-benefit projects ● Develop a strategy for sea level rise across Baker + Grays Bays **Workshop 1 Goals:** ● Introduce project and workshop process ● ID coastal floodplain-related concerns, questions, and who's involved ● ID themes/goals for moving forward	
6:05	Introductions and project overview
6:30	Breakout groups: What are your concerns? Tell your story Pick an topic, dig into it Share-out
7:10	******DINNER*** (and raffle)***
7:30	Discussion of themes: initial goal setting ***(dinner continues)***
7:50-8:00	Next steps and closing

Figure B.2. Agenda for Workshop 1, which occurred from 6:00-8:00 pm local time on March 30, 2023 in Baker Bay, and May 25, 2023 in Grays Bay.

Participant pairs were directed to large tabletop maps (Fig. B.3), where they were encouraged to write down the memory on a sticky note and place the sticky note on the map to denote the location associated with that memory.

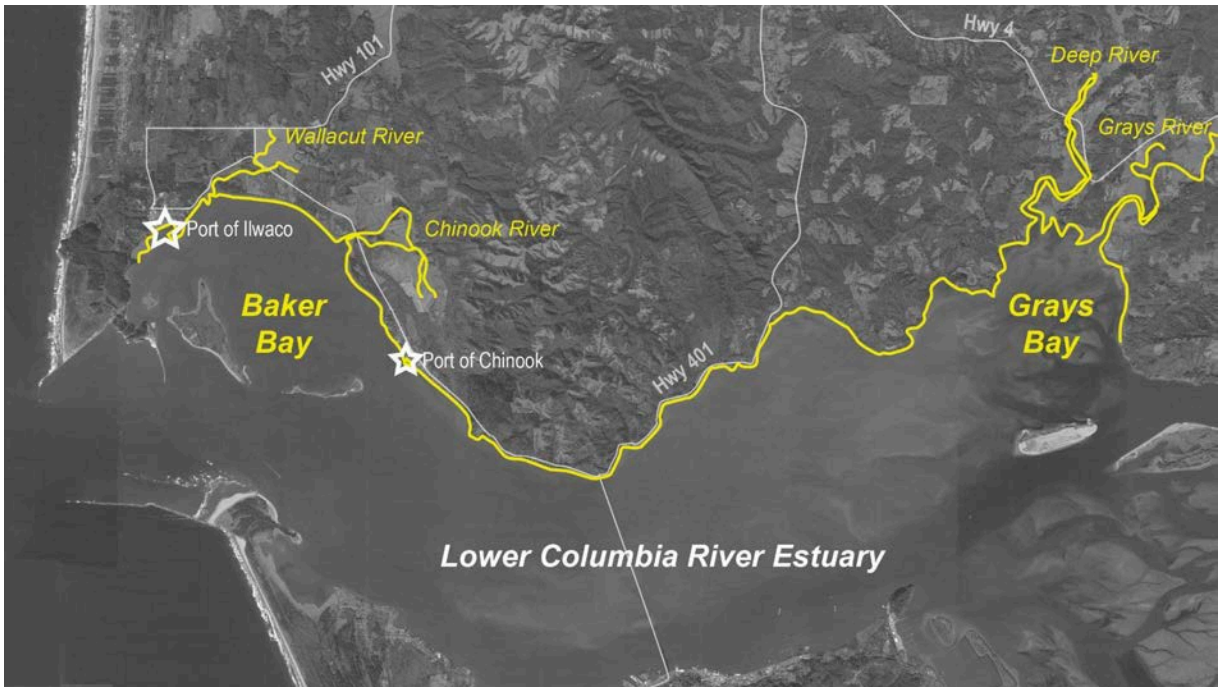
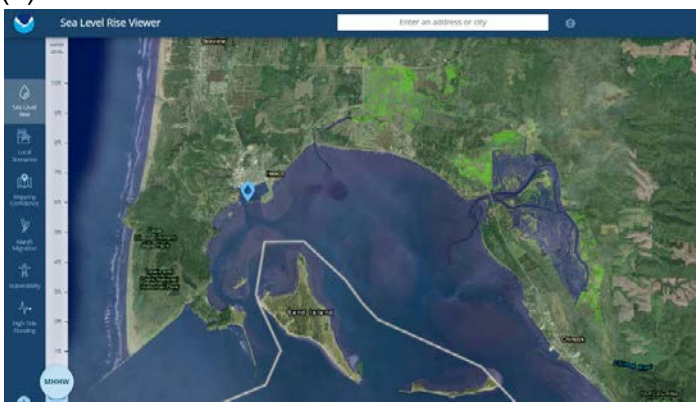


Figure B.3. Tabletop map provided during Workshop 1.

Participants then received a brief presentation from the project team that covered the background, overview, and goals of the project in addition to the workshop agenda and expectations for the workshop. Background information shared during the presentation component of the workshop included explanations of the work typically done by the partnership team organizations and an overview of the expected layout and format of all 4 workshops. The presentation also directed participants to resources that include case studies of similar coastal resilience efforts around the state of Washington (located on the Washington Coastal Hazards Case Study Mapper[4]) and supplied a brief summary of lessons learned by some of these case studies, including utilizing collaboration, incorporating nature-based designs, considering multiple geographic scales, coordinating across projects, and prioritizing multi-benefit approaches. The second portion of the presentation provided an explanation and maps of current flooding levels experienced in the bay in addition to the flooding that is expected to be experienced by 1ft and 4ft of SLR (for example, maps for Baker Bay are shown in Fig B.4).

[4] https://waecy.maps.arcgis.com/apps/MapSeries/index.html?appid=cb81314d6fb44e0187e7980a1f0cd32b

(a)



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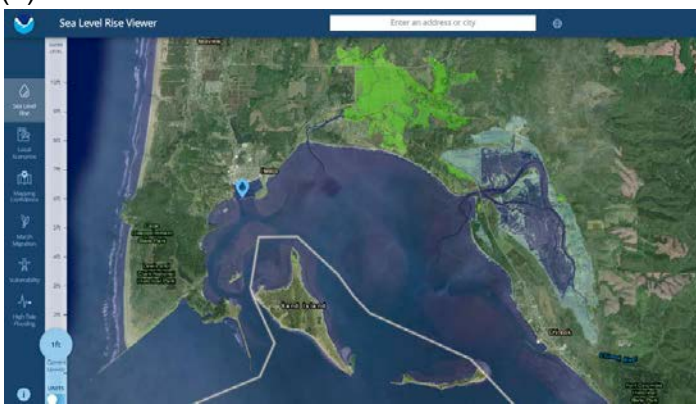

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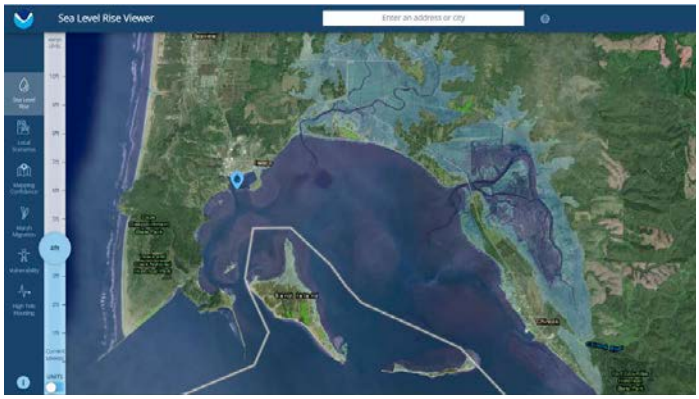


Figure B.4. Maps of (a) current sea level, (b) 1 ft of sea level rise, and (c) 4 ft of sea level rise in Baker Bay, Washington, presented in Workshop 1.

Finally, the presentation introduced four general impacts related to SLR, which included coastal flooding, salinity change, habitat change or loss, and erosion and deposition. These environmental processes served as the basis of small group discussions immediately following the presentation. Participants self-selected into small groups, each representing a subregion of the bay based on relevant geographies identified during Phase 1 outreach (see Fig B.5) and each facilitated by a project team member.

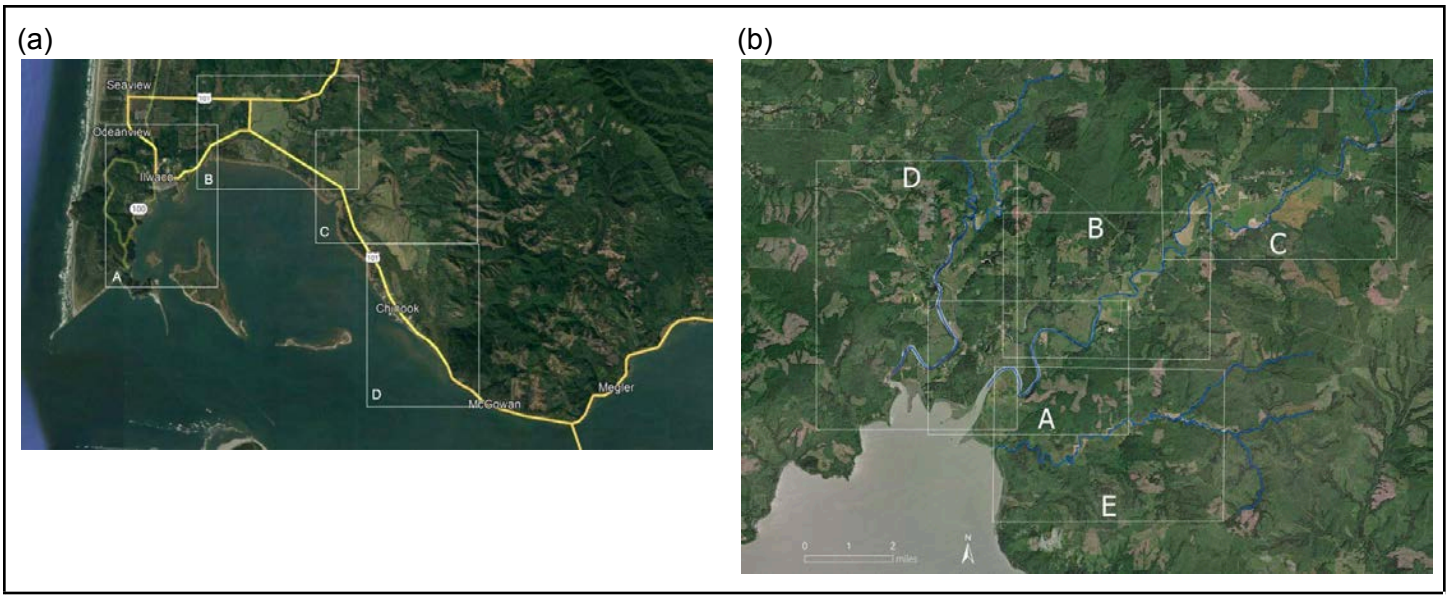


Figure B.5. Subregions associated with small group discussions during Workshop 1 at (a) Baker Bay: City of Ilwaco, Wallacut River, Chinook River, and Chinook shoreline; and (b) Grays Bay: Grays River mouth, lower Grays River, middle Grays River, Deep River, and Crooked Creek.

Small groups were given about 15 minutes to share with others in their group the concerns they had in the assigned subregion pertaining to the four sea level related environmental impacts and identify these concerns using a sticky note on the map. The groups were then tasked with summarizing and categorizing the identified concerns into themes and highlighting any questions that arose. Using this information, the individual participants filled out worksheets, referred to as “Message Box” worksheets, that provided an opportunity to dive deeper into the specific concerns and issues they identified in their small groups. An example of this worksheet is given in Fig B.6.

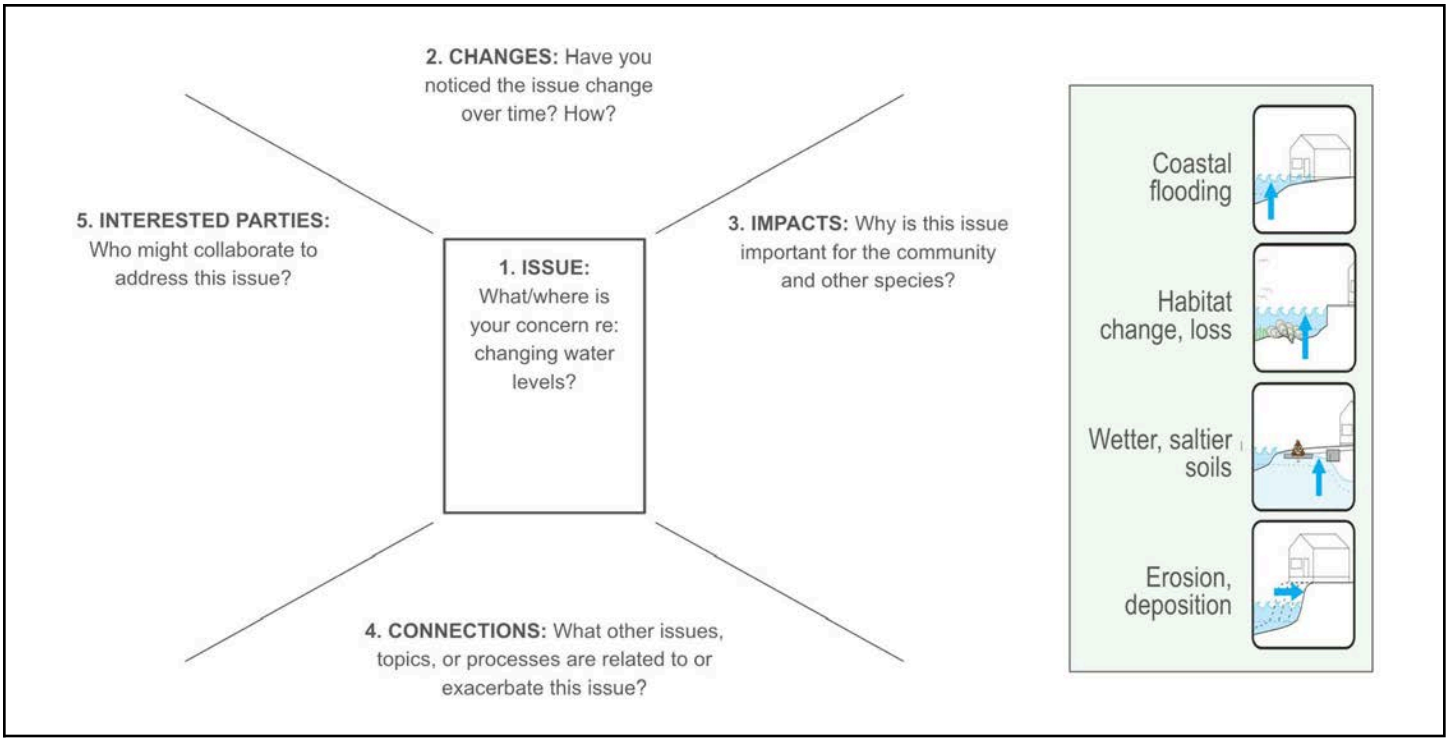
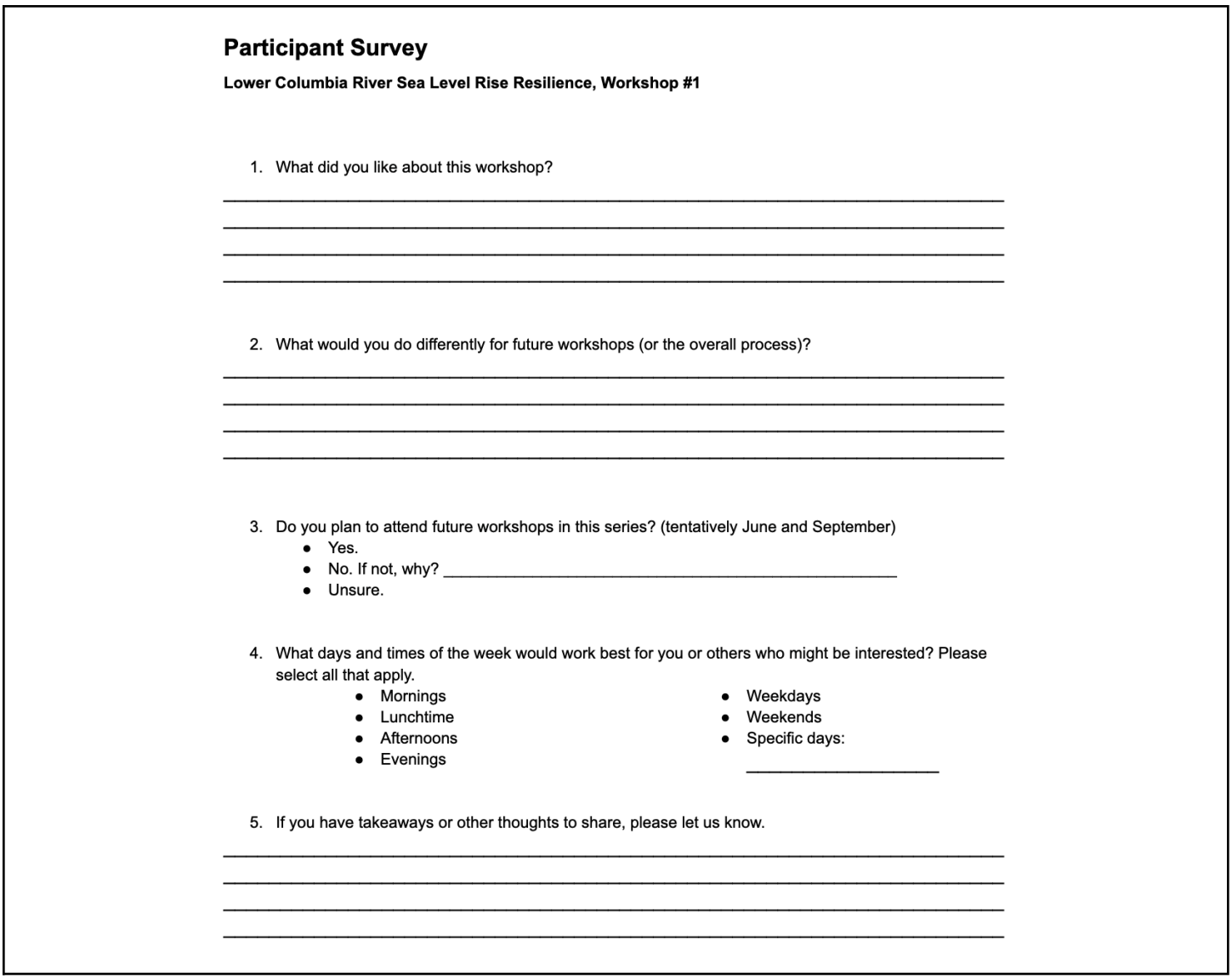


Figure B.6. Message Box Worksheet used to identify details around specific sea level rise related concerns in each bay during Workshop 1.

When all worksheets were filled out, takeaways and insights gleaned from each small group were shared in a full-group discussion. Following this full-group discussion, participants were given a break for dinner and encouraged to walk around and take a look at the discussion materials (maps and worksheets) for the other small groups (representing other subregions) and add sticky notes to identify any important assets or concerns that might have been missed. Results of the Mapping and Message Box activities are summarized in Appendix D Table D.1 for Baker Bay and Appendix G Table G.1 and for Grays Bay.

Finally, the full group was reconvened to hear from the participants, answer any questions, and provide information about next steps from the project team. Participants were also given a survey at the end of the event (see Fig B.7), which allowed them to provide feedback on the workshop design, to better shape future events.



Participant Survey

Lower Columbia River Sea Level Rise Resilience, Workshop #1

1. What did you like about this workshop?

_____
_____
_____
_____

2. What would you do differently for future workshops (or the overall process)?

_____
_____
_____
_____

3. Do you plan to attend future workshops in this series? (tentatively June and September)
   - Yes.
   - No. If not, why? _____
   - Unsure.

4. What days and times of the week would work best for you or others who might be interested? Please select all that apply.
   - Mornings
   - Lunchtime
   - Afternoons
   - Evenings
   - Weekdays
   - Weekends
   - Specific days: _____

5. If you have takeaways or other thoughts to share, please let us know.

_____
_____
_____
_____

Figure B.7. Workshop 1 survey given to all participants.

Following Workshop 1, the project team analyzed the maps, the worksheets and the surveys and used the findings from this analysis to synthesize themes, look further into the identified topics, and connect with additional people/groups that were identified. This information was brought back to Workshop 2. Survey results for Baker Bay suggested that most survey recipients appreciated the pace and format of the first workshop, in addition to appreciating the opportunity to gather with friends and neighbors. Specifically, survey recipients enjoyed that the workshop was interactive, that the facilitators were knowledgeable, and that they were given the opportunity to hear from other workshop participants. Overall, participants felt heard by the project team and they enjoyed the mix of open discussion and directed activities. They also really appreciated the food provided to them and the maps to help orient them to the region and activities. Suggestions for improving future workshops included reaching out to additional community members who were not represented at the first workshop, making adjustments to better display the presentation slides and make the content more readable, and come up with a way for workshop participants to be able to hear the project team and other participants better. For Grays Bay, several survey recipients mentioned that a larger venue and more space would be helpful for future meetings. From this feedback, the project team chose a larger room to meet for the following Grays Bay workshops, invested in a better screen to display the slides more clearly, provided the slides as printed materials for each participant, and used bluetooth microphones.

3. Workshop 2

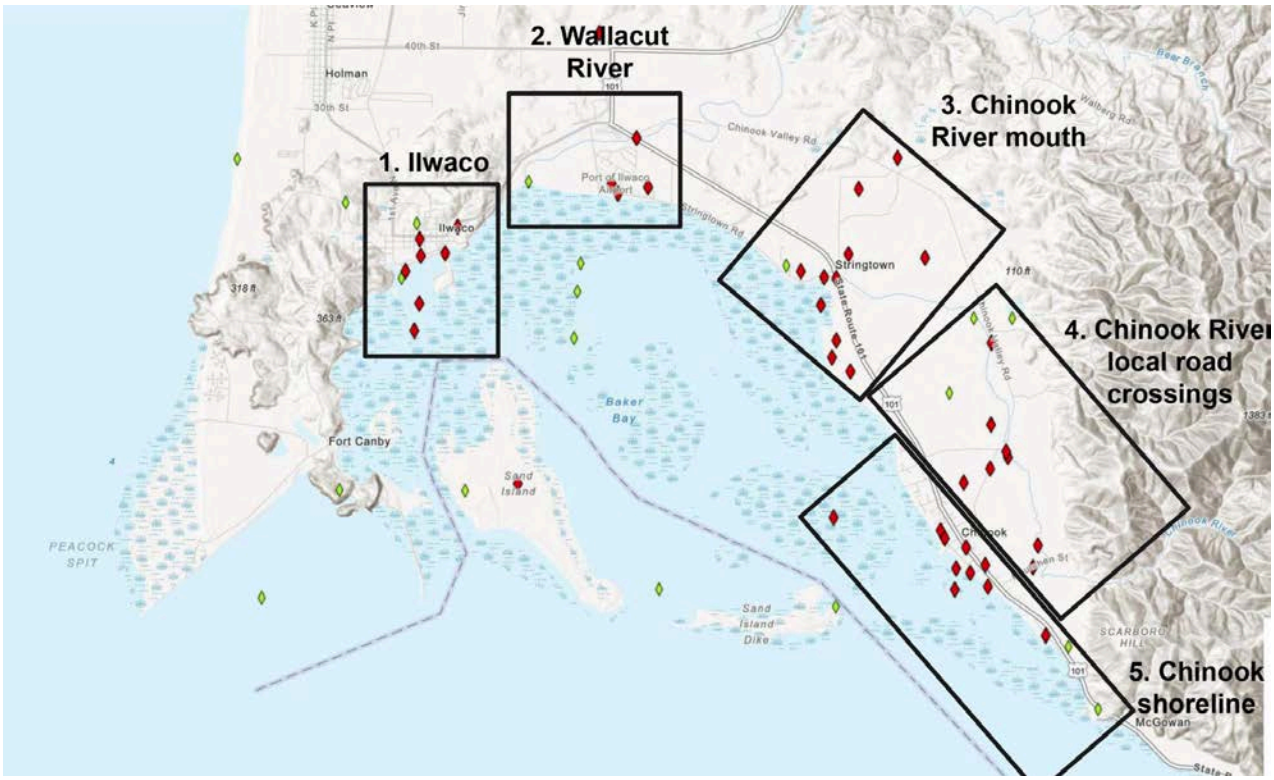
Attendance for Workshop 2 was 27 people for Baker Bay and 34 people for Grays Bay, not including the project team–a decrease in attendance compared to Workshop 1 by approximately 25% and 17%, respectively. The agenda for Workshop 2 is shown in Fig B.8.

AGENDA	
Project goals: ● Identify and support multi-benefit projects ● Develop a strategy for sea level rise across Baker + Grays Bays **Workshop 2 Goals:** ● Identify local places/activities that support resilience ● Understand processes associated with issues from Workshop 1 ● Prioritize which issues to focus on in Workshop 3	
6:00	Project overview
6:05	Local priorities and “resilience principles”
6:20	Places and issues: past, present, future
7:00	******DINNER*** (and raffle)***
7:20	Prioritizing issues ***(dinner continues)***
7:55-8:00	Next steps and closing

Figure B.8. Agenda for Workshop 2, which occurred from 6:00-8:00 pm local time on June 20, 2023 in Baker Bay, and September 19, 2023 in Grays Bay.

At the start of Workshop 2, participants were asked to sit at one of several tables that corresponded to specific subregions identified as key areas by the project team based on results from mapping activities in Workshop 1. These subregions are displayed in Fig B.9.

(a)



(b)

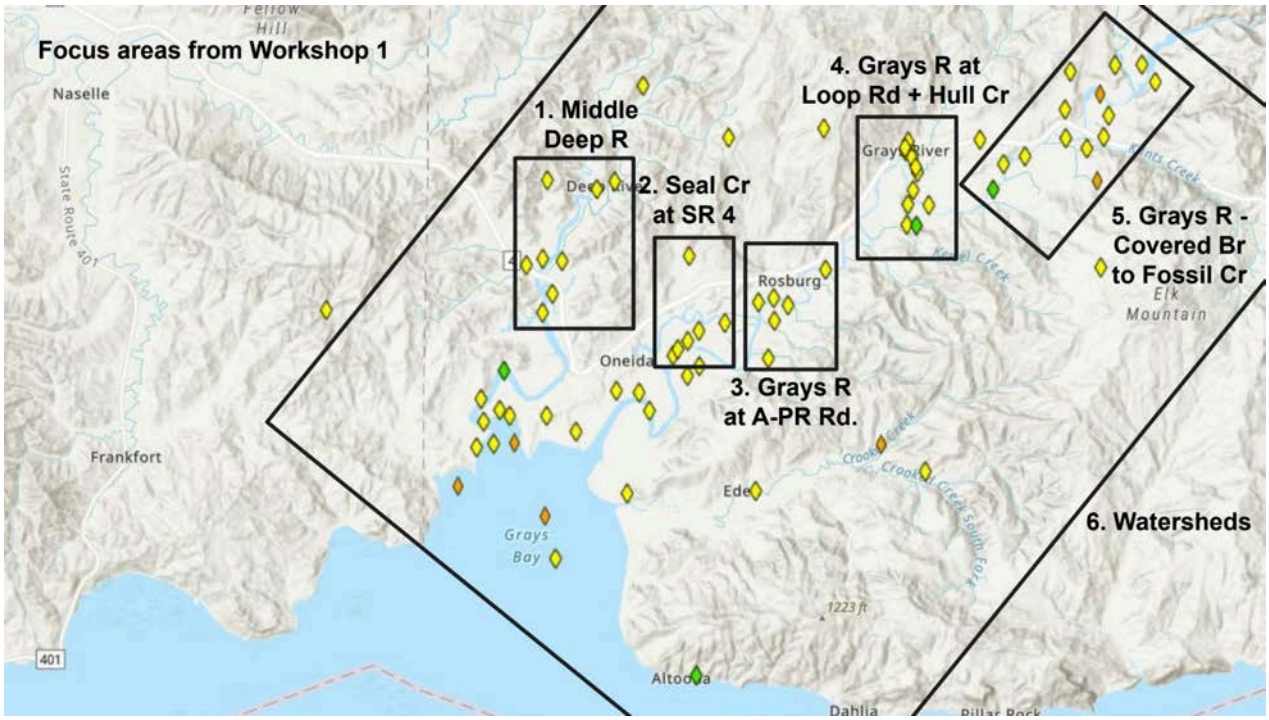


Figure B.9. Focus subregions for Workshop 2 identified from Workshop 1 in (a) Baker bay and (b) Grays Bay.

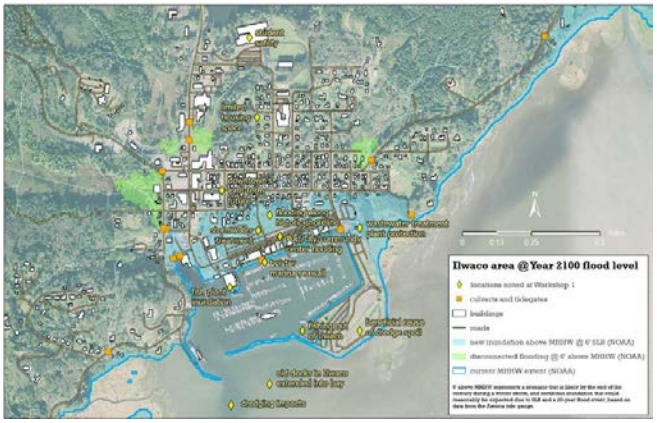
Once participants were split by subregion, Workshop 2 began with a brief presentation from the project team, which included an overview of the project and workshop series and a recap of Workshop 1. From Workshop 1, sticky notes placed on maps to locate memories, concerns, and important assets were summarized along with the information gleaned from the Message Box Worksheets (Fig. B.6) to create an overview of themes related to values and priorities, referred to as “Local Resilience Principles”. These Local Resilience Principles were presented to Workshop 2 participants and participants were given the opportunity to add any values or priorities that might have missed in Workshop 1. Results from this activity are presented for Baker Bay in Appendix D, Table D.1 for Baker Bay and Appendix G, Table G.1. for Grays Bay.

After Workshop, the project team overlaid current and future flooding extents for each subregion (Fig. B.9) on area maps along with other relevant information including infrastructure, hydrology, flow barriers, and the assets and priorities identified by workshop participants. These maps are shown in Figures B.10-B.11, (larger maps can be found in Appendix C and F) and were used as reference in subsequent workshops. Current flood extents shown on the maps include the mean higher high water (MHHW) tidal extent and the FEMA 100-year floodplain extent. We chose a sea level rise value of 6’ above current MHHW as our future flooding extent. This represents a scenario that combines a predicted 20-year extreme flood event (~5’ above current MHHW) plus projected relative SLR (~1’ above current MHHW) that are likely to occur at the end of the century (~2100), based on current climate model estimates (UW Climate Impacts Group). These values are consistent with what is published in the Pacific County 2023 Sea Level Rise Risk Assessment. Table 1 in that document indicates a 50% likelihood of 1’ 2” of SLR and 4’ 7” of additional extreme flood inundation on top of SLR, for a combined increase of 5’ 9” for the year 2100 (DCG/Watershed, 2023[5]).

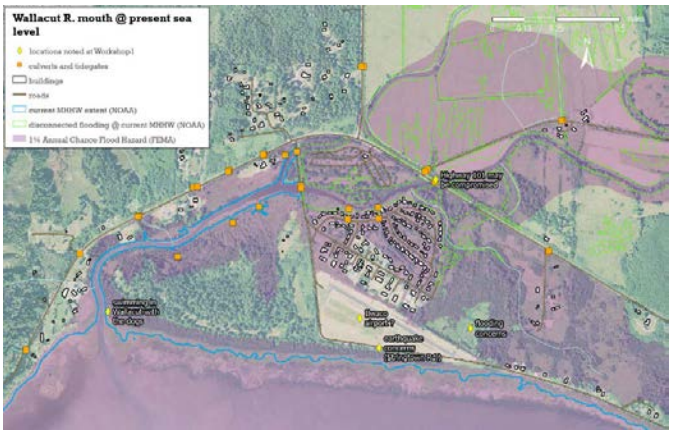
[5]DCG/Watershed Inc. 2023. Sea Level Rise Risk Assessment. Prepared for Pacific County Department of Community Development.

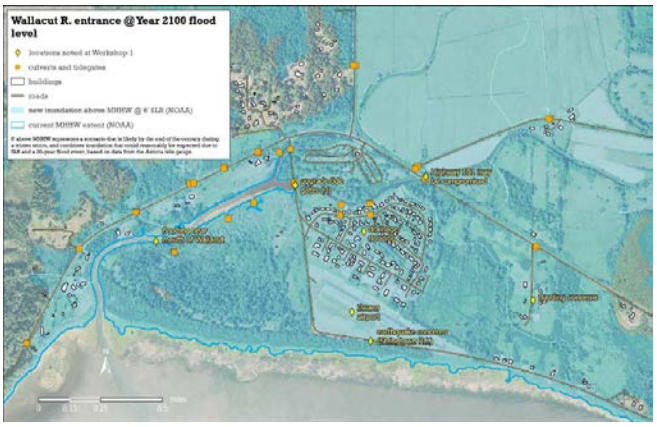
(a)


flooding near mouth of Willapa
limited space for housing
Port/city/community center flooding
protection for wastewater treatment plant
fish plant inundation
Ilwaco area @ present sea level
locations noted at Workshop1
culverts and tidegates
roads
NOAA relative inundation in m @ current MHHW
FEMA Flood Hazard
1% Annual Chance Flood Hazard
0.2% Annual Chance Flood Hazard

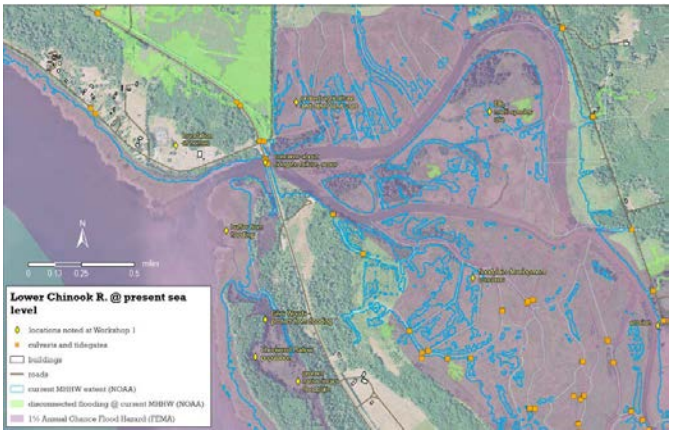

Ilwaco area @ Year 2100 flood level
locations noted at Workshop 1
culverts and tidegates
buildings
roads
new inundation above MHHW @ 6' SLR (NOAA)
disconnected flooding @ 6' above MHHW (NOAA)
current MHHW extent (NOAA)

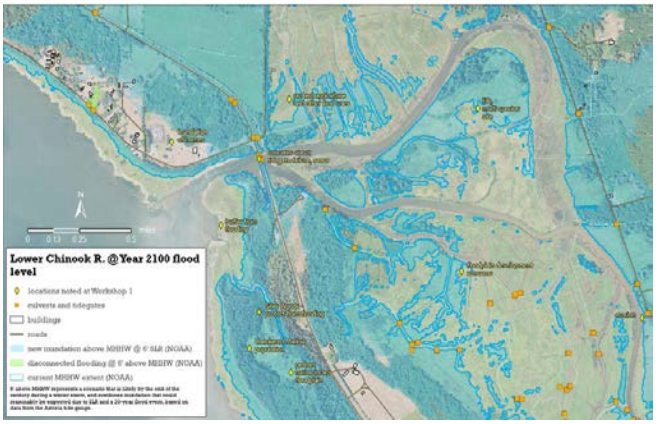
(b)


Wallacut R. mouth @ present sea level
locations noted at Workshop1
culverts and tidegates
buildings
roads
current MHHW extent (NOAA)
disconnected flooding @ current MHHW (NOAA)
1% Annual Chance Flood Hazard (FEMA)

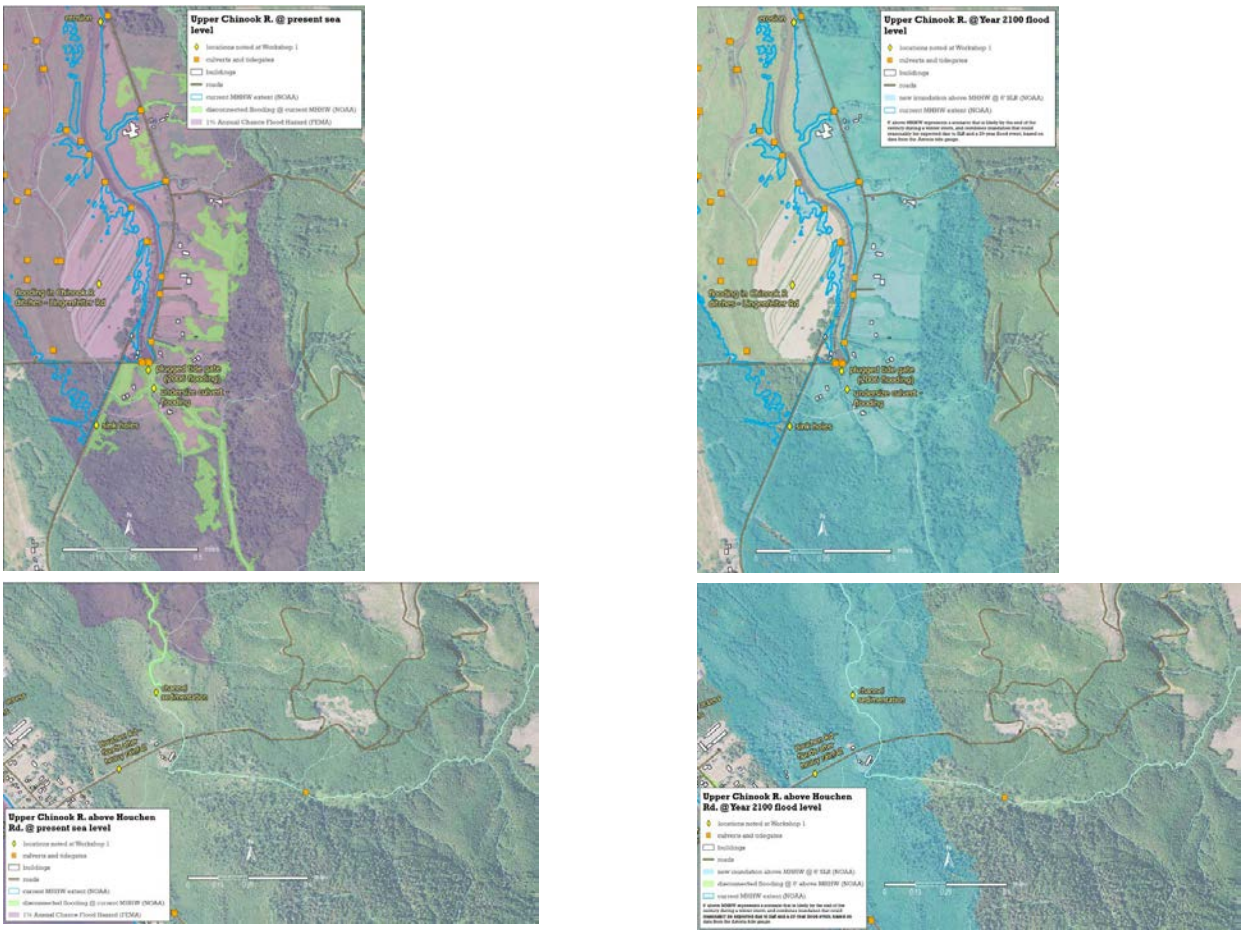

Wallacut R. entrance @ Year 2100 flood level
locations noted at Workshop 1
culverts and tidegates
buildings
roads
new inundation above MHHW @ 6' SLR (NOAA)
current MHHW extent (NOAA)

(c)


Lower Chinook R. @ present sea level
locations noted at Workshop 1
culverts and tidegates
buildings
roads
current MHHW extent (NOAA)
disconnected flooding @ current MHHW (NOAA)
1% Annual Chance Flood Hazard (FEMA)


Lower Chinook R. @ Year 2100 flood level
locations noted at Workshop 1
culverts and tidegates
buildings
roads
new inundation above MHHW @ 6' SLR (NOAA)
disconnected flooding @ 6' above MHHW (NOAA)
current MHHW extent (NOAA)

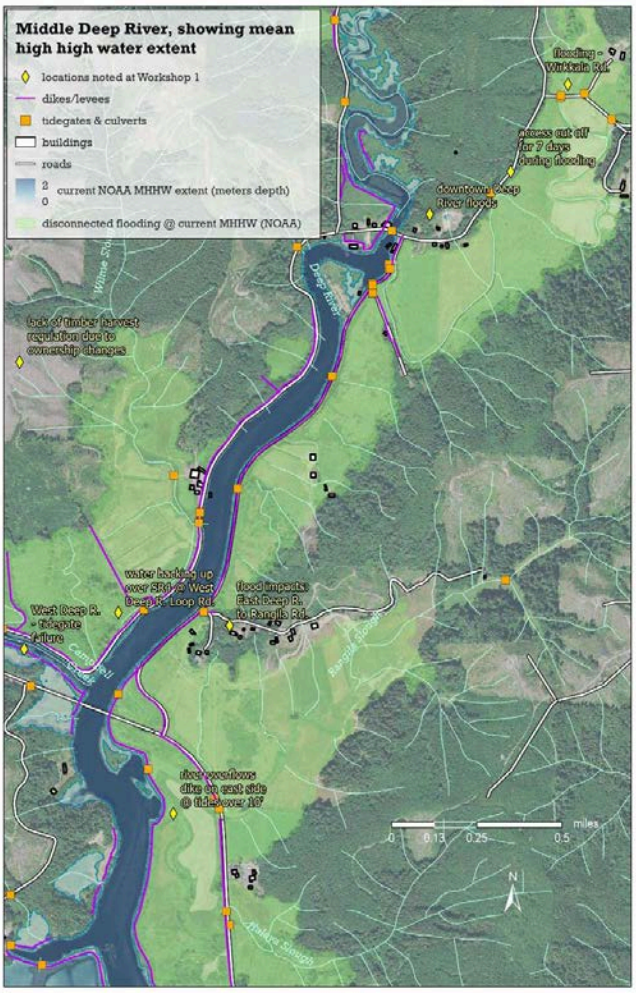
(d)

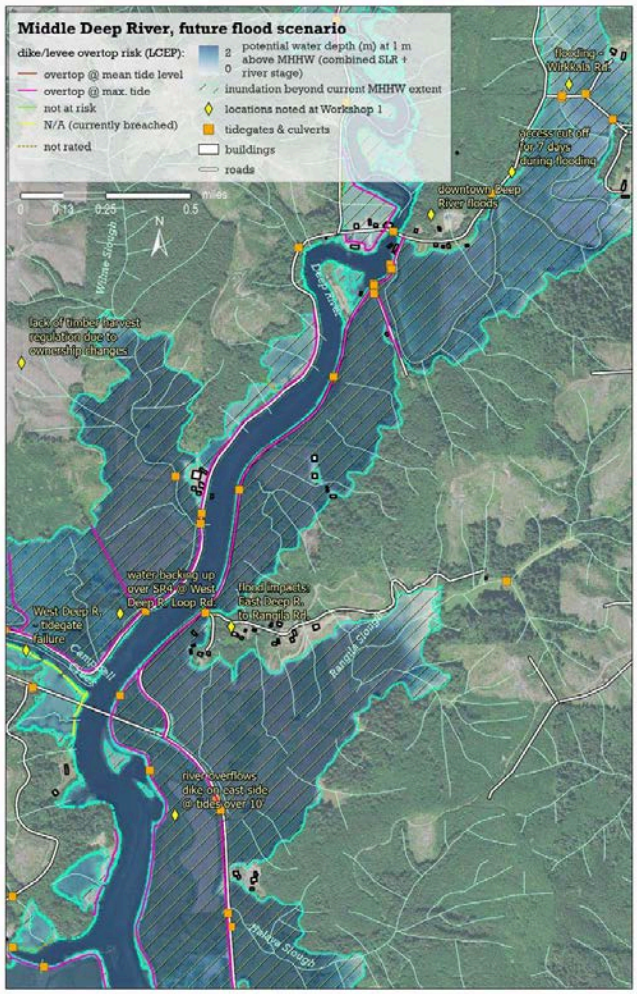


(e)

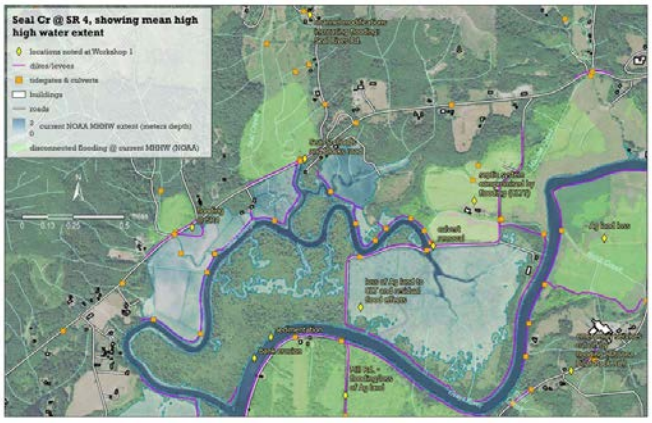
Figure B.10. Maps showing current (left) and future (right) flooding scenarios for subregions (a) Ilwaco, (b) Wallacut River, (c) Lower Chinook River, (d) Upper Chinook River, and (e) Chinook Shoreline. Subregions reflect those in Fig. B.9a. Larger Maps are shown in Appendix C.

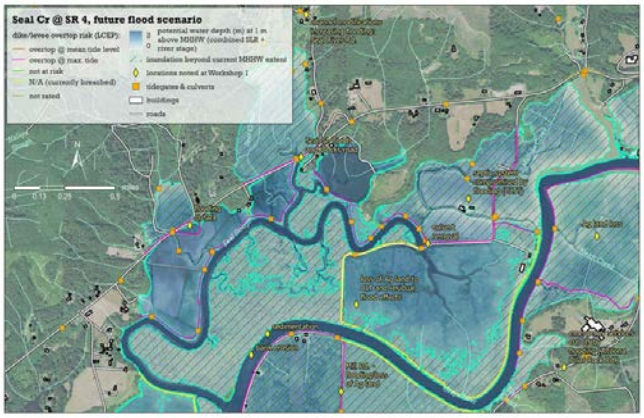
(a)


Middle Deep River, showing mean high high water extent
locations noted at Workshop 1
dikes/levees
tidegates & culverts
buildings
roads
2
0
current NOAA MHHW extent (meters depth)
disconnected flooding @ current MHHW (NOAA)
flooding - Wirkkala Rd
access cut off for 7 days during flooding
downtown Deep River floods
White Slough
Deep River
lack of timber harvest regulation due to ownership changes
water backing up over SR4 @ West Deep R. Loop Rd.
flood impacts East Deep R. to Rangila Rd.
West Deep R. - tidegate failure
Rangila Slough
river overflows dike on east side @ tides over 10'
Mishaw Slough
0 0.13 0.25 0.5 miles
N

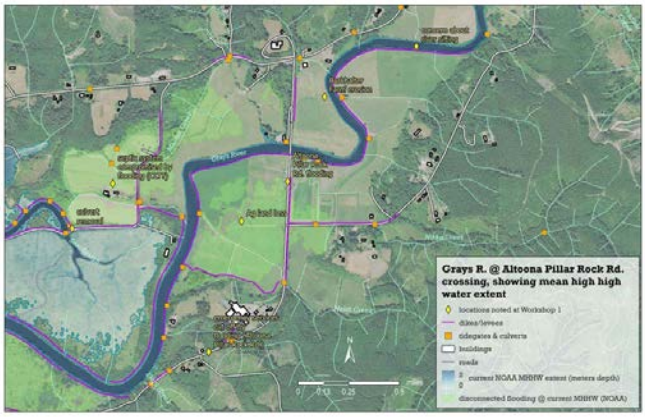

Middle Deep River, future flood scenario
dike/levee overtop risk (LCEP):
overtop @ mean tide level
overtop @ max. tide
not at risk
N/A (currently breached)
not rated
2
0
potential water depth (m) at 1 m above MHHW (combined SLR + river stage)
inundation beyond current MHHW extent
locations noted at Workshop 1
tidegates & culverts
buildings
roads
flooding - Wirkkala Rd
access cut off for 7 days during flooding
downtown Deep River floods
White Slough
Deep River
lack of timber harvest regulation due to ownership changes
water backing up over SR4 @ West Deep R. Loop Rd.
flood impacts East Deep R. to Rangila Rd.
West Deep R. - tidegate failure
Rangila Slough
river overflows dike on east side @ tides over 10'
Mishaw Slough
0 0.13 0.25 0.5 miles
N

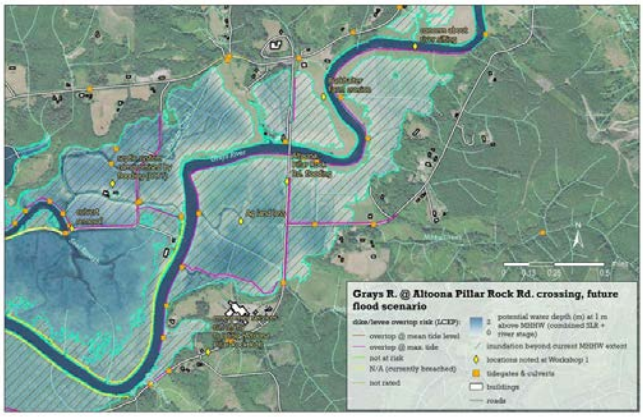
(b)


Seal Cr @ SR 4, showing mean high high water extent

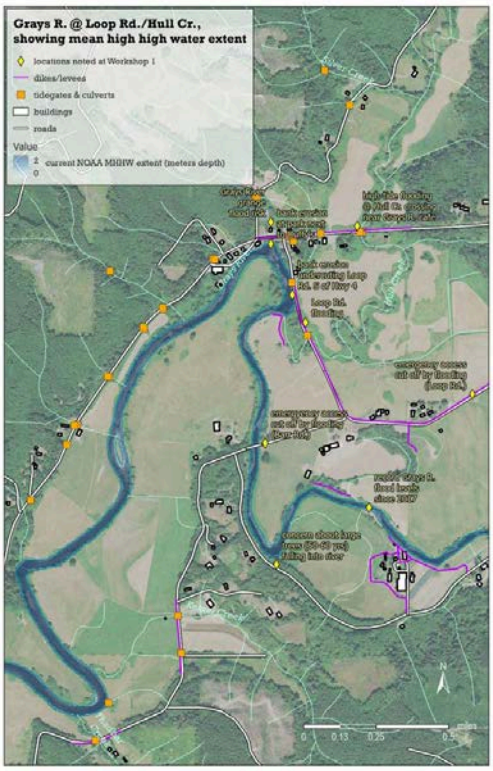

Seal Cr @ SR 4, future flood scenario

(c)


Grays R. @ Altoona Pillar Rock Rd. crossing, showing mean high high water extent
locations noted at Workshop 1
dikes/levees
tidegates & culverts
buildings
roads
current NOAA MHHW extent (meters depth)
disconnected flooding @ current MHHW (NOAA)


Grays R. @ Altoona Pillar Rock Rd. crossing, future flood scenario
dike/levee overtop risk (LCEP):
overtop @ mean tide level
overtop @ max. tide
not at risk
N/A (currently breached)
not rated
potential water depth (m) at 1 m above MHHW (combined SLR + river stage)
inundation beyond current MHHW extent
locations noted at Workshop 1
tidegates & culverts
buildings
roads

(d)


Grays R. @ Loop Rd./Hull Cr., showing mean high high water extent
locations noted at Workshop 1
dikes/levees
tidegates & culverts
buildings
roads
Value
current NOAA MHHW extent (meters depth)

(N/A)

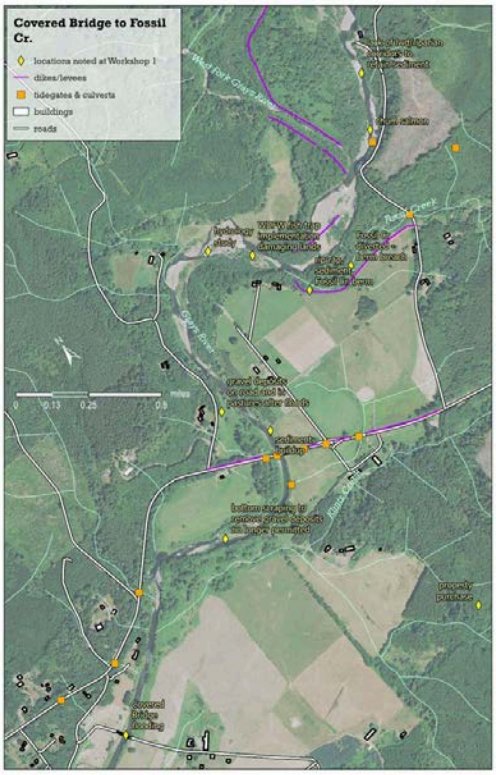
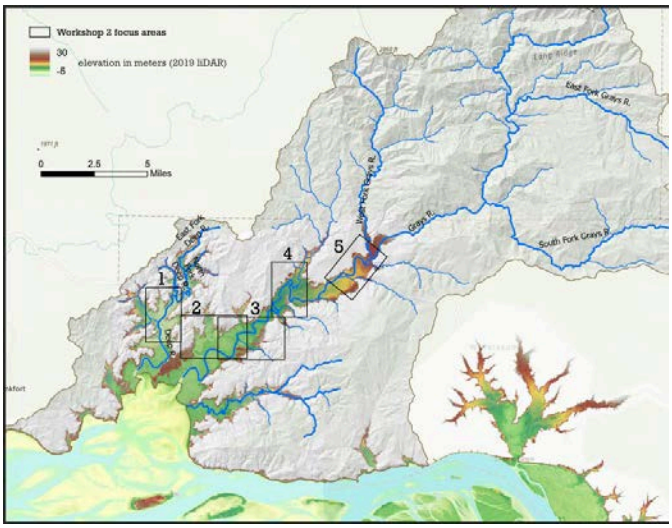
(e)		(N/A)
(f)		(N/A)

Figure B.11. Maps showing current (left) and future (right) flooding scenarios for subregions (a) Middle Deep River, (b) Seal Creek, (c) Grays River at Altoona Pillar Rock Rd., (d) Grays River at Loop Rd., (e) Covered Bridge to Fossil Creek, and (f) the entire watershed. Subregions d, e, and f do not have future flooding projections provided due to lack of notable change in the map with a few feet of added sea level rise or stormwater. Subregions reflect those in Fig. B.9b. Larger maps are shown in Appendix F.

With the subregion maps, Workshop 2 participants at each table were given about 15 minutes to discuss the following four questions regarding their specific subregion:

4. What is providing protection here, or has in the past?
5. What changes are happening in this area?
6. Where would actions have the most community benefit?
7. What questions do you have, or what information is needed?

During this time, designated table facilitators (part of the project team) helped facilitate the discussion and documented answers. Answers from each table were then re-framed into an “And-But-So” Worksheet, which is a facilitation tool that allows topics to be tied together with both larger issues and suggested next steps. An example of the And-But-So worksheet is provided in Fig. B.12. Groups were encouraged to write 2-3 And-But-So worksheets for their subregion.

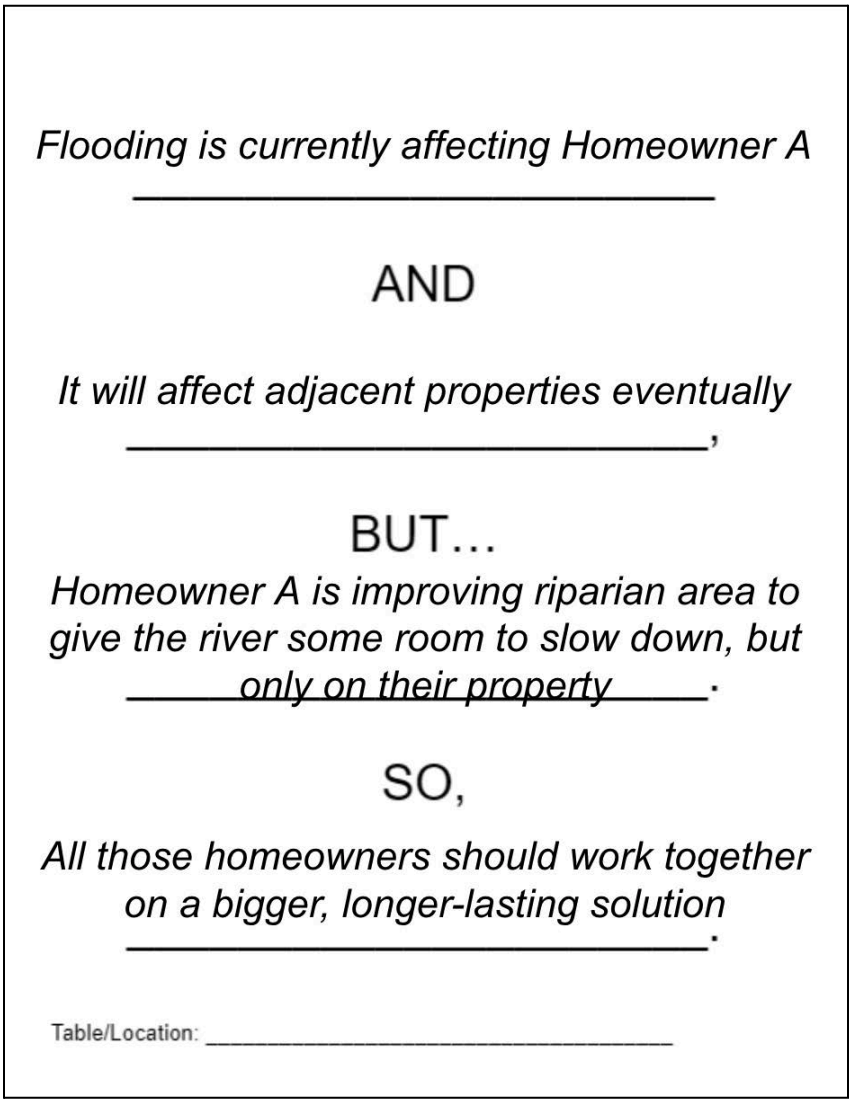


Figure B.12. Example for And-But-So worksheet used during Workshop 2 to connect past, present, and future flooding concerns for each subregion at each bay.

Following this activity, workshop participants were brought back together for a full-group discussion to share their And-But-So worksheets before breaking for a brief dinner break. Food was provided to all participants.

After dinner, each participant was given three stickers. All And-But-So worksheets were displayed on tables around the edge of the room and participants were encouraged to walk around, read each worksheet and use the stickers to vote on the top three worksheets they felt represented the most relevant and sustainable topics for the project. The goal of this activity was to gain insights of the workshop participant priorities regarding flood-related concerns. Results from the worksheets are shown in Appendix D (Table D.2) and Appendix G (Table G.2) for Baker Bay and Grays Bay, respectively, and prioritization of these were used by the project team after Workshop 2 to outline initial potential project ideas presented in Workshop 3.

Finally, the full group was reconvened to hear from the participants, answer any questions, and provide information about next steps from the project team. Participants were also given a survey at the end of the event, which was the same format as the survey given at Workshop 1 (see Fig B.7), which allowed them to provide feedback on the workshop design, to better shape future events. Survey results from Baker Bay indicates that participants appreciated the opportunity to network and bring the community together, learning more about the issues they face, hearing from other locals, the new/larger location for the workshop, the pace of the workshop, the information shared, productive discussions, project facilitators, the action-focused and solution-oriented approach to flooding concerns, hearing from diverse perspectives, and that the results from workshop were community-driven. Suggestions from participants on how to do workshops differently in the future included having a better projector and screen, a longer workshop, a faster paced workshop, more attendance from locals and agency folks, offering food first, more information about the future water level projections, having table facilitators that had more knowledge of the subject, and providing a microphone to better hear people. Survey results from Grays Bay indicated that participants appreciated the opportunity to talk with others in their community, the amount of things discussed, that the workshop moved at a good pace, being able to choose to sit at a table for a region that they were most interested in, being able to hear multiple perspectives, that the event was in person, that the project facilitators were concerned about the local flooding, the format of the activities, the focus on solving problems, getting to see the maps, being provided good food, resources shared by project facilitators, and appreciated the project facilitators themselves. Suggestions from participants on how to do workshops differently in the future included giving more time for people to chat, sending out summaries from previous workshops, providing beer, offering a different start time, more discussion around specific hazards, helping people along the Grays River not shown on the maps provided, providing a microphone and speakers so people can hear better, suggestions on different ways to allow for votes, and more guidance and explanation around the And-But-So worksheets.

d. Workshop 3

Attendance for Workshop 3 was 20 people for Baker Bay and 52 people for Grays Bay, not including the project team–a decrease in attendance compared to Workshop 2 by approximately 26% and an increase of approximately 53% for Baker Bay and Grays Bay, respectively. The agenda for Workshop 2 is shown in Fig B.13.

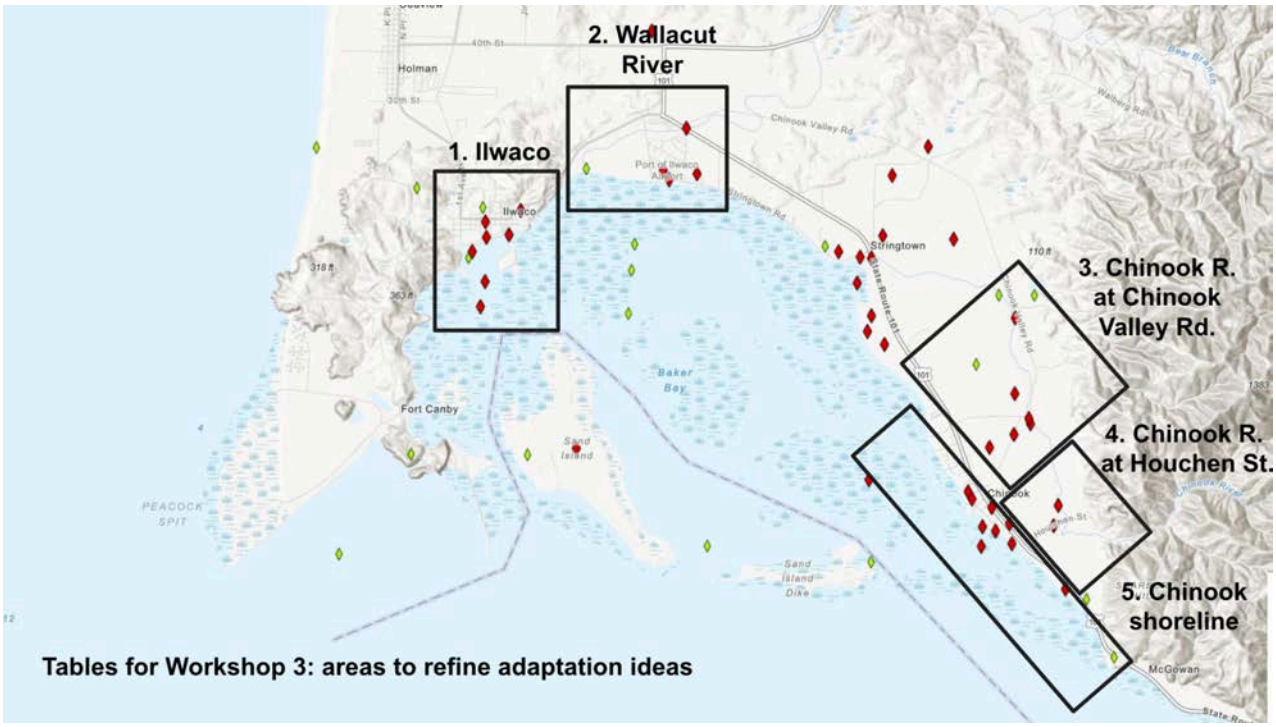
AGENDA	
Project goals: ● Identify and support multi-benefit projects ● Document opportunities and constraints for reducing the impacts of sea level rise and related issues across Baker + Grays Bays **Workshop 3 Goals:** ● Discuss potential approaches to issues/ideas from Workshops 1-2 ● Identify how these ideas relate to local context ● Identify who would need to be part of these ideas	
6:00	Workshops series recap
6:05	Revise draft resilience ideas
6:45	How can these ideas move forward?
7:00	******DINNER*** (and raffle)***
7:15	Group review of revised ideas ***(dinner continues)***
7:45-8:00	Discussion and closing

Figure B.13. Agenda for Workshop 3, which occurred from 6:00-8:00 pm local time on October 25, 2023 in Baker Bay, and January 30, 2024 in Grays Bay.

Participants received a brief presentation from the project team that covered the background, overview, and goals of the project in addition to the workshop agenda and expectations for the workshop. Background information shared during the presentation component of the workshop included overviews of the previous two workshops and efforts made by the project team outside of the workshops.

Based on results from Workshop 2 (particularly that of the And-But-So Worksheets, Fig. B.12, Fig. D.2, and Fig G.2) , Workshop 3 discussions were split into several focus areas, shown in Fig. B.14.

(a)



(b)

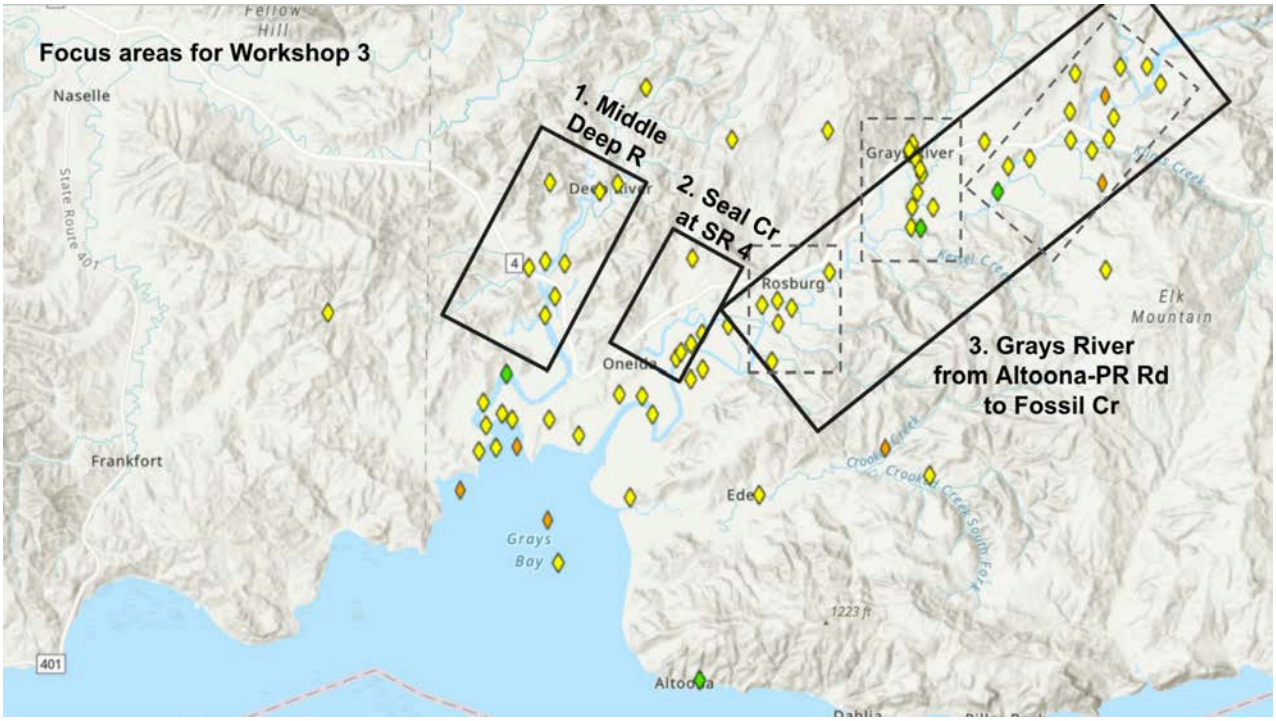
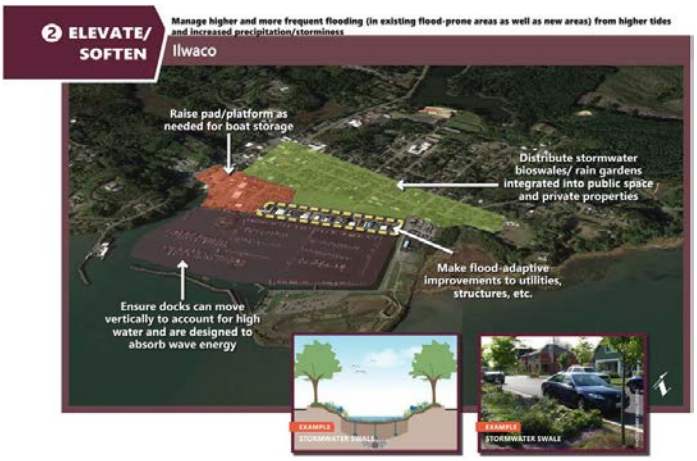


Figure B.14. Focus areas Workshop 3 discussions and activities for (a) Baker Bay and (b) Grays Bay.

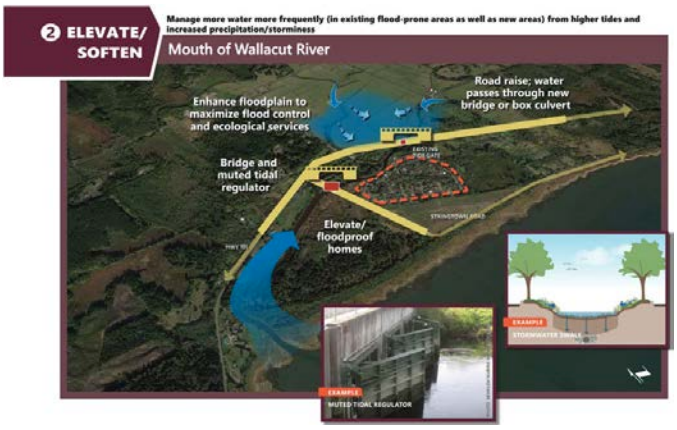
For both bays, the project team gave a short presentation that covered some background information on general adaptation scenarios that are typically used for coastal flooding planning. Adaptation scenarios were presented as four main categories, which included a ‘harden’ approach, a ‘move’ approach, a ‘soften/elevate’ approach, and an ‘other/combination’ approach. Explanations and Washington-specific examples of each of these categories were shared by the project team.

Next, examples of the four adaptation planning approaches for each location were presented to workshop participants. Thes examples, referred to as ‘resilience scenarios’, were draft concepts based on results from the And-But-So Worksheet activity in Workshop 2, which prioritized adaptation concerns identified by workshop participants (see Appendix B, Phase 2 (Workshop 2) for an explanation of these methods). These resilience scenarios are shown in Fig. B.15 for Baker Bay and Fig. B.16 for Grays Bay.

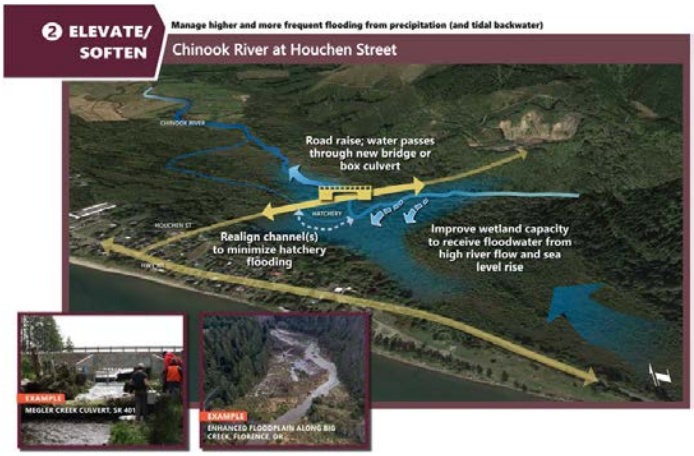
(a) Ilwaco



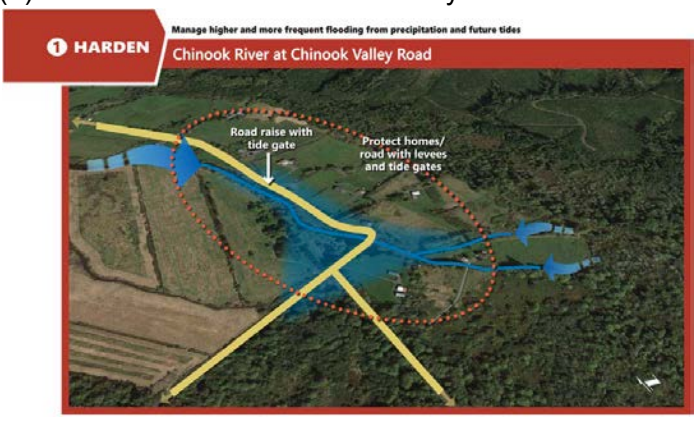
(b) Wallacut River

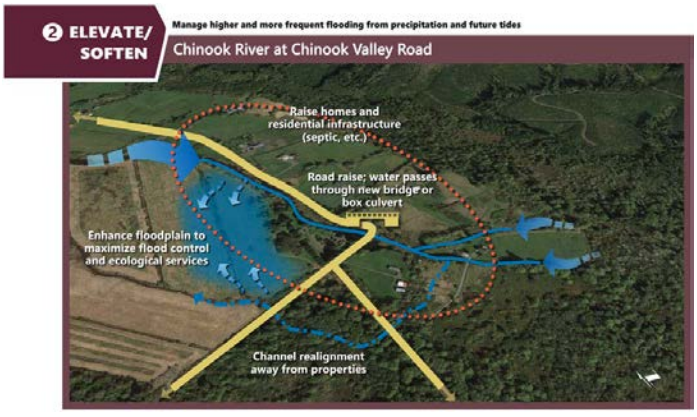


(c) Chinook River at Houtchen St



(d) Chinook River at Chibook Valley Rd.





(e) Chinook Shoreline

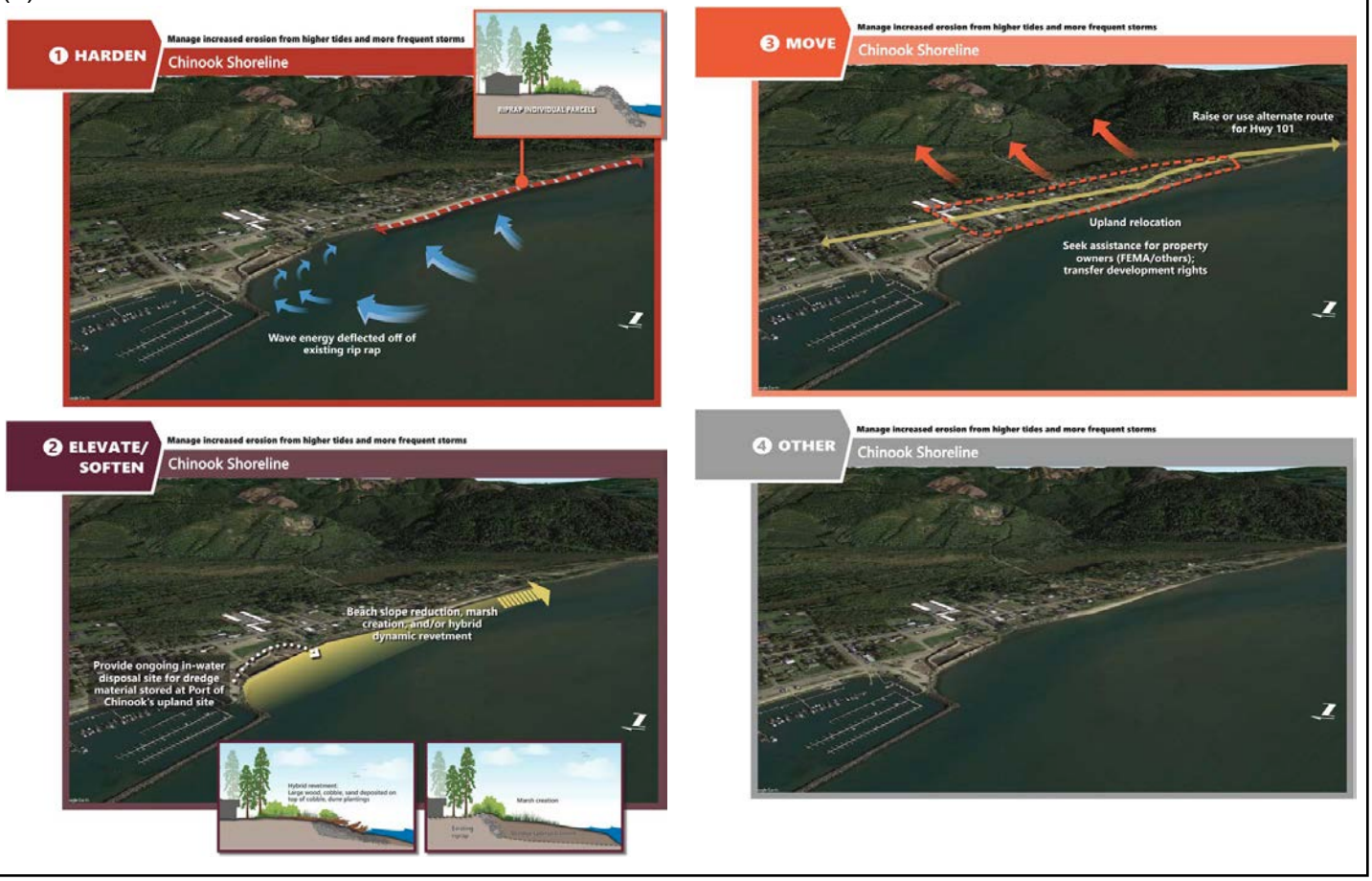


Figure B.15. Resilience scenarios presented at Baker Bay Workshop 3 for (a) Ilwaco, (b) Wallacut River, (c) Chinook River at Houtchen St., (d) Chinook River at Chinook Valley Rd., and (e) Chinook Shoreline. Graphic elements and annotations do not represent proposed design or engineering plans, and may not represent feasible solutions.

(a) Middle Deep River

(b) Seal Creek at SR 4

(c) Grays River from Altoona-Pillar Rock Rd to Fossil Creek

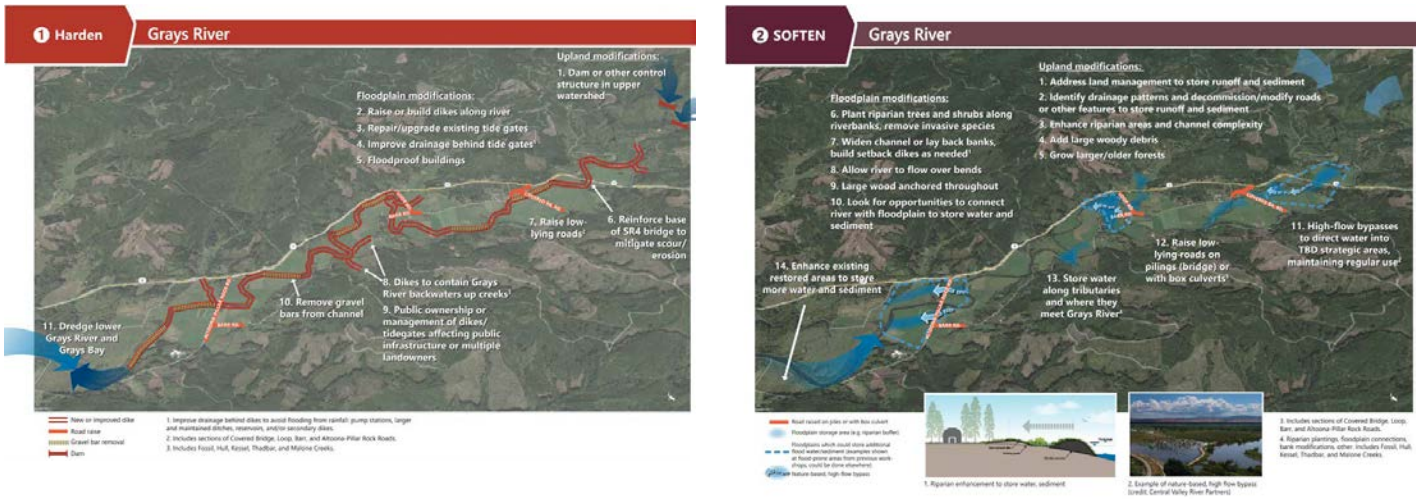


Figure B.16. Resilience scenarios presented at Grays Bay Workshop 3 for (a) Middle Deep River, (b) Seal Creek at SR 4, and (c) Grays River from Altoona-Pillar Rock Rd to Fossil Creek. Graphic elements and annotations do not represent proposed design or engineering plans, and may not represent feasible solutions.

With project team guidance, participants were given an opportunity to weigh in their opinion for each of the resilience scenarios. This was done slightly differently for each bay. For Baker Bay, resilience scenarios were more location-specific and therefore workshop participants there were split into five groups (one group for each subregion depicted in Fig B.14a). Each group was then tasked with reviewing and analyzing the resilience scenarios, using a worksheet. An example of the worksheet used for the 'harden' resilience scenarios in Workshop 3 is shown in Fig. B.17. Participants were given about 20 min to complete this activity.

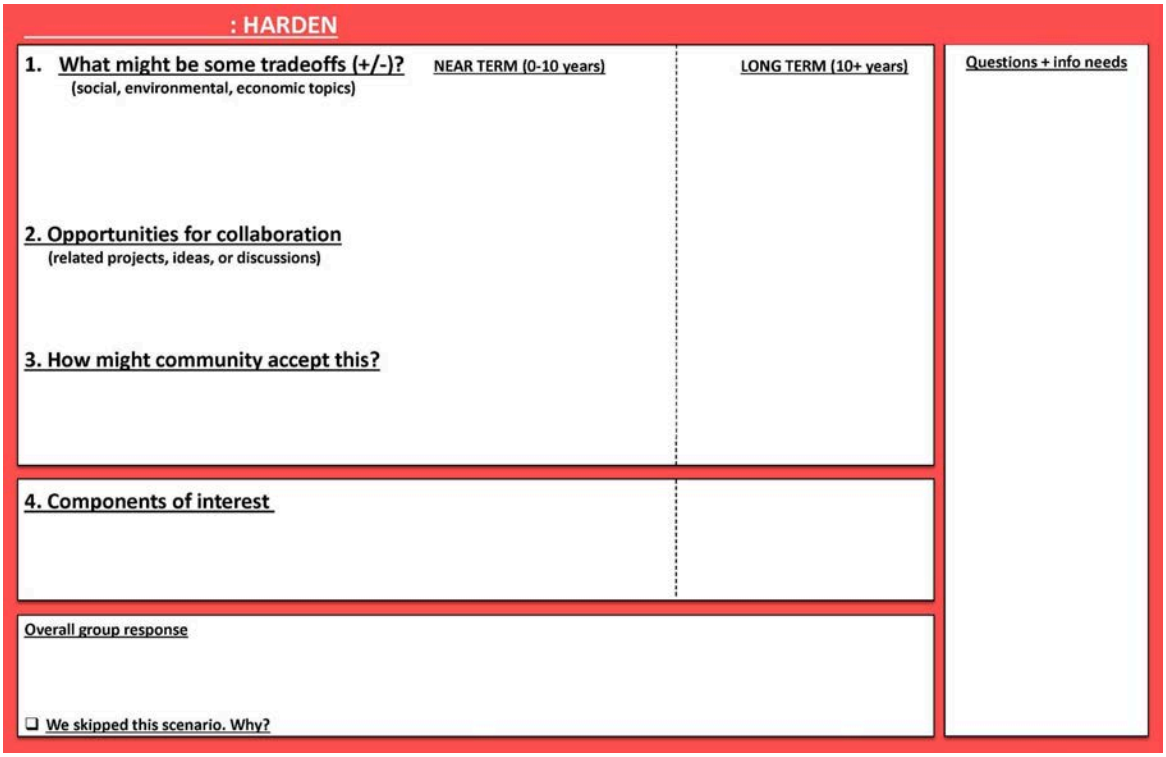


Figure B.17. Worksheet used in Workshop 3 to get participant feedback on the resilience scenarios.

After completing the resilience scenario worksheets, Baker Bay Workshop 3 participants were given a second worksheet similar to the Message Box worksheets used in Workshop 1. An example of this worksheet is provided in Fig. B.18. Information from these two worksheets were used by the project team after the workshop to support potential projects, more information about these methods are given in Appendix B, Phase 3.

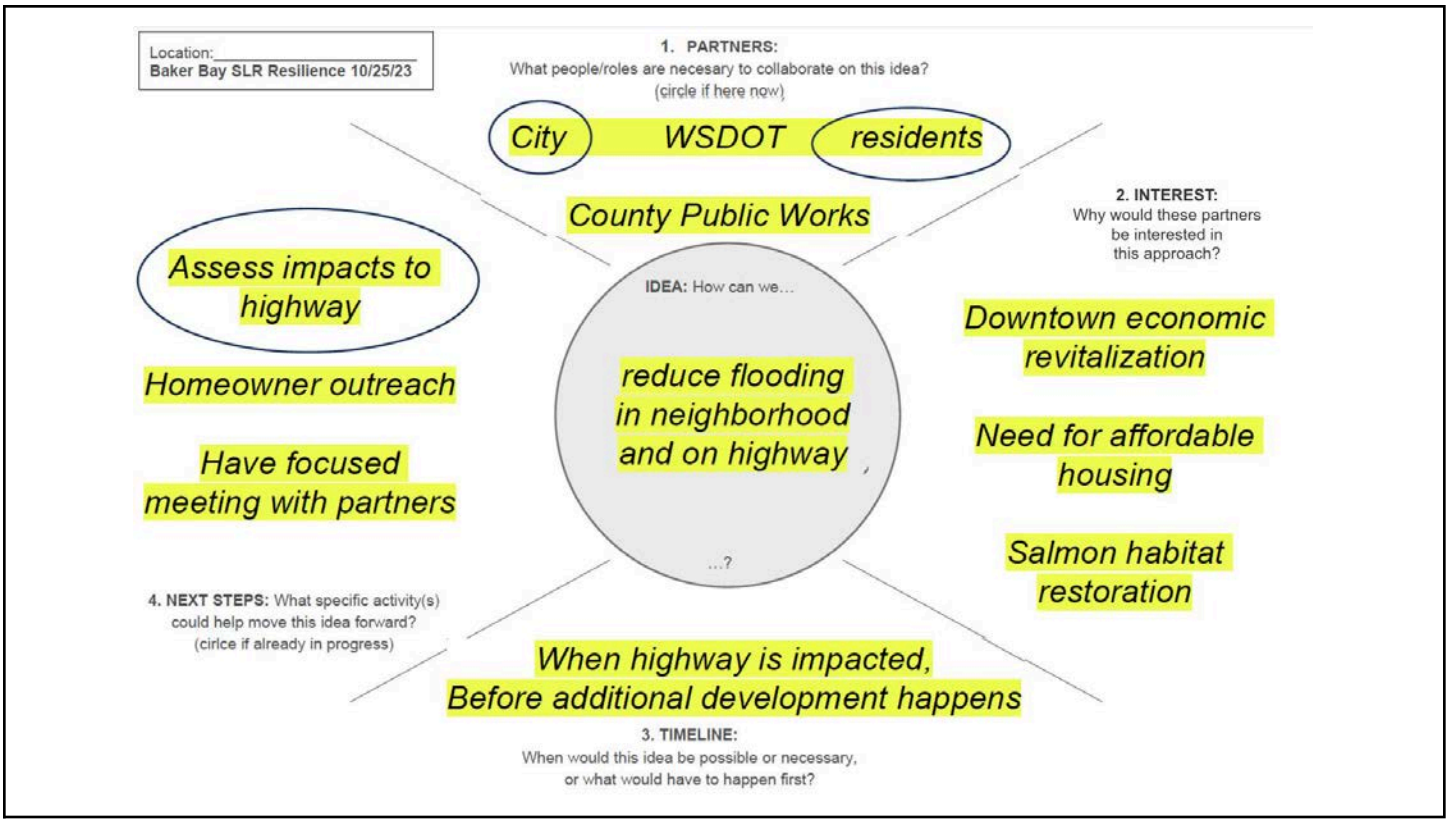


Figure B.18. Message Box worksheet used in Workshop 3 with example responses highlighted in yellow.

Results from Workshop 2 for Grays Bay were less location-specific, and instead tended to focus on larger watershed scale concerns. For this reason, Grays Bay Workshop 3 participants were kept as one large group for discussions and activities related to the presented resilience scenarios. As a large group, the project team and workshop participants discussed each resilience scenario together and the project team recorded pros and cons identified for each by the participants. At the end of the discussion, participants filled out a poll individually to share which resilience scenario components they liked, disliked, or needed more information for. Poll results were analyzed by the team after the workshop to help develop a resilience strategy and identify potential projects.

For both bays, workshop participants were given a short dinner break with food provided by the project team. After dinner, the project team held full-group discussions with workshop participants to hear reflections and thoughts from participants about the resilience scenarios and moving forward. Participants were given the following prompt questions for this discussion:

1. Do any of the participants want to be an “owner” of a discussed/proposed project?
2. Consider what could help people act long-term (to benefit future generations)?
3. What could help people act at larger scales (beyond their own property lines)?
4. How to engage people who were not at the workshops?
5. How can local planners, government staff, and elected officials support these efforts?
6. What else could help preferred actions move forward?

Finally, the project team presented and discussed next steps for the project.

Participants were given a survey at the end of the event, which was the same format as the survey given at Workshop 1 (see Fig B.7), which allowed them to provide feedback on the workshop design, to better shape future events. Survey results indicated that participants from Baker Bay appreciated the visuals and the maps of the potential projects, they enjoyed the discussion among attendees, enjoyed learning about SLR and ways they can plan for it, appreciated the breakout groups by smaller area, the strong leadership and direction from the project team, the workshop preparation and organization, the provided food, and getting to hear all the input from various groups and perspectives. While most participants mentioned that they liked the workshop series as it, some suggestions from participants on how to do workshops differently in the future included holding a longer workshop to allow more time for discussion and questions or having fewer question prompts for the options, more presentation on sea level rise projections, more light and heat in the event space, sending out information before the workshop so attendees have an opportunity to digest the information beforehand and come ready with questions, more clear slides in the presentation, clearer directions about public input, and more outreach to Tribal groups. When asked what the participants liked about the three workshops as a whole, participants shared that they appreciated how the workshops built off one another, that they had time to digest between workshops, that they were informative overall, the opportunity to participate even if an attendee cannot make all the workshops, bringing the scientific community to residents, the diversity of discussion topics, and the collaboration efforts of everyone involved. Some suggestions from participants on how to do the 3 workshop series differently in the future included offering more time for discussion, getting more attendance from local residents, sending information out ahead of time, providing more notice of the workshops, having more business owners, local politicians, and journalists involved so that news gets out about the workshops, and possibly holding the workshops closer together without as much time in between. Participants suggested that future topics to consider could include opportunities for funding, capacity building and coalition building, a focus on tourist influx to the area in the summertime, the inclusion of tsunami planning, more engagement from US Fish and Wildlife, the US Army Corps, and WA transportation folks, and more discussion of land-use planning. Participants also provided general feedback that the food was good and that they appreciated the workshop series and the project team. Participants from Baker Bay mentioned that they heard about the workshop series via email announcements, direct outreach from a member of the project team, announcements in the local newspaper, follow-up from attending prior workshops, invitations from other workshop participants, announcements at other community events, and facebook.

Survey results indicated that participants from Grays Bay enjoyed hearing from other participants and the issues they are dealing with, hearing from the diverse perspectives in the room, the leadership and information presented by the project team, the opportunity to connect with others in the community, feeling like participant input would be incorporated into possible solutions, the information presented was easy to follow, the expert facilitation by the project team, and the food provided. While most participants mentioned that they liked the workshop series as it, some suggestions from participants on how to do workshops differently in the future included having more small group discussion opportunities to hear from people that are less likely to speak up in a large group and avoid the overrepresentation by a couple louder individuals, having more engagement and larger attendance from state agencies and local utilities, having more guest speakers to help inform some of the topics, providing an executive summary of the workshop series overview for those attendees who might have missed previous workshops, and receiving more advance notification of the workshops. Participants suggested that future topics to consider could include logging impacts on flooding and erosion, having more local and state representatives attend the workshops, offering experienced speakers to cover some of the legal issues in the area, offering more conversation on assistance to residence around current flossing issues, more discussion around climate change, and the potential for opening logging roads during flood events to allow for alternate routes for residents. Other general feedback included a consideration of how potential solutions

would impact fish and an overall appreciation for the workshop series to date. Participants from Grays Bay mentioned that they heard about the workshop series via email announcements, direct outreach from a member of the project team, a newsletter, postcards in the mail, flyers hung up at local businesses, follow-up from attending prior workshops, invitations from other workshop participants, and announcements at other community events.

e. Workshop 4

Attendance for Workshop 4 was 32 people for Baker Bay and 37 people for Grays Bay, not including the project team–an increase in attendance compared to Workshop 2 by approximately 60% and an decrease of approximately 29% for Baker Bay and Grays Bay, respectively. The agenda for Workshop 4 is shown in Fig B.19.

AGENDA	
Project goals: ● Identify and support multi-benefit projects ● Document opportunities and constraints for reducing the impacts of sea level rise and related issues across Baker + Grays Bays **Workshop 3 Goals:** ● Review suggested approaches to issues/ideas from Workshops 1-3 ● Identify next steps for projects and stakeholder coordination	
6:00	Workshops series recap, event overview
6:15	Activity: Review Resilience Strategy and project suggestions
7:15	******DINNER*** (and raffle)***
7:30	Discussion: Activity results and next steps ***(dinner continues)***
7:50-8:00	Closing and survey

Figure B.19. Agenda for Workshop 4, which occurred from 6:00-8:00 pm local time on June 6, 2024 in Grays Bay, and June 7, 2024 in Baker Bay.

Participants received a brief presentation from the project team that covered the background, overview, and goals of the project in addition to the workshop agenda and expectations for the workshop. Background information shared during the presentation component of the workshop included a recap of the previous three workshops and efforts made by the project team outside of the workshops so far (see Project Support Methods, Appendix B Phase 3 below). The only agenda item that differed between the two workshops was a brief additional presentation at the Grays Bay workshop by a representative from Pacific Northwest National Laboratory (PNNL), which provided initial results of their modeling efforts of flood reduction approaches for the Grays River. This model focused on dredging scenarios for the bay and river, which produced initial results

showing very limited effectiveness of dredging on local flooding. The presenter discussed their work, asked for participant feedback, and responded to questions. No such presentation occurred at the Baker Bay workshop.

The participants then participated in an activity to review and provide feedback on potential adaptation projects. These projects were based on conceptual hazards and habitat resilience design concepts, reflecting community resilience criteria developed through Phase 1 outreach and workshops 1-3, with the support of licensed engineers with expertise in lower Columbia habitat restoration. Six projects were presented each for Baker Bay and Grays Bay. The locations for each of these projects are shown in Fig. B.20. The potential projects spanned different spatial scales that cover most of the original area of interest and covered several big issues, including projects that are ready for grants and just need a bit of coordination, projects that need longer stakeholder coordination and analysis, and projects that are larger planning and capital-intensive projects.

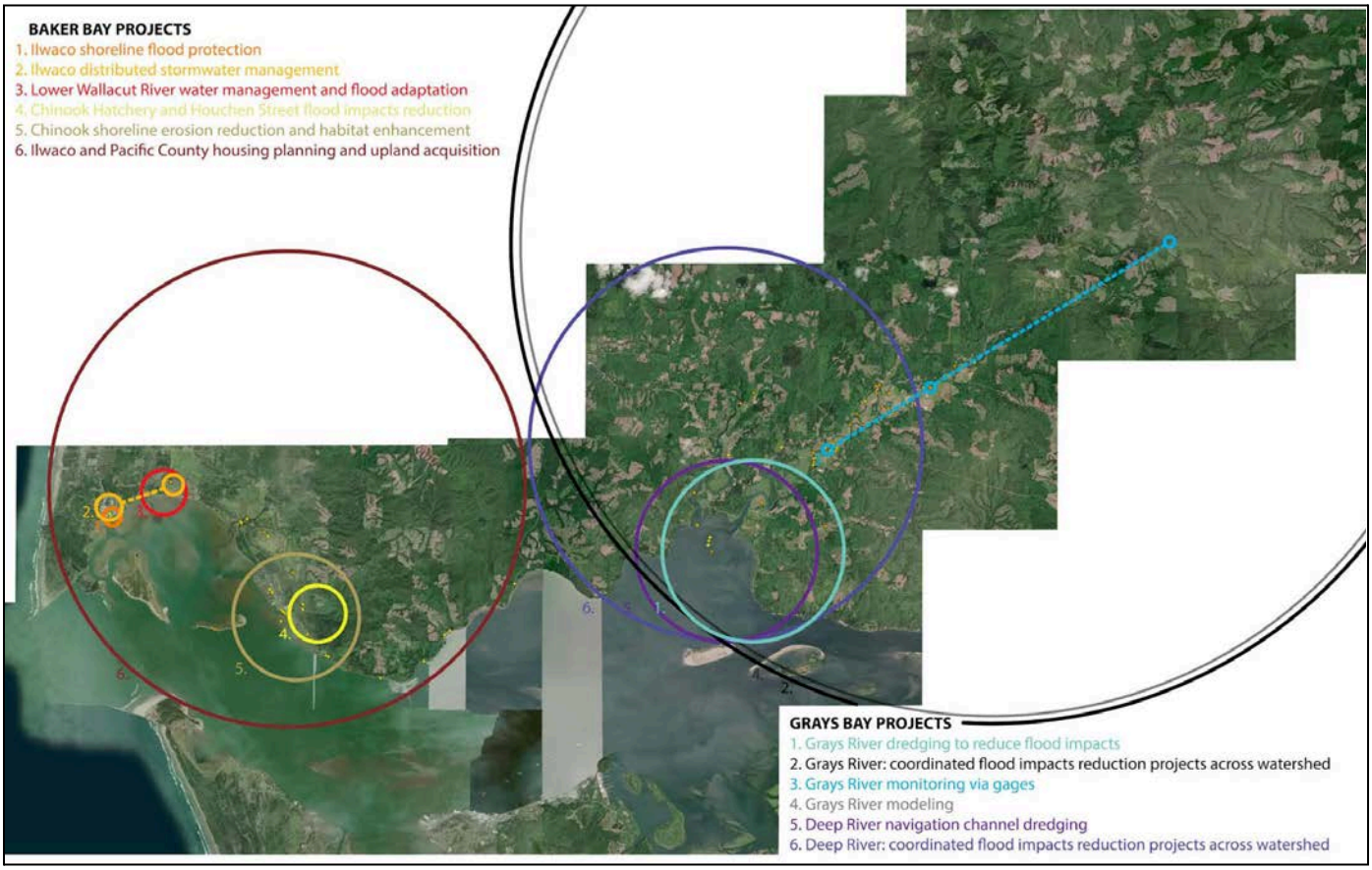


Figure B.20. Map of potential projects for Baker Bay and Grays Bay presented in Workshop 4.

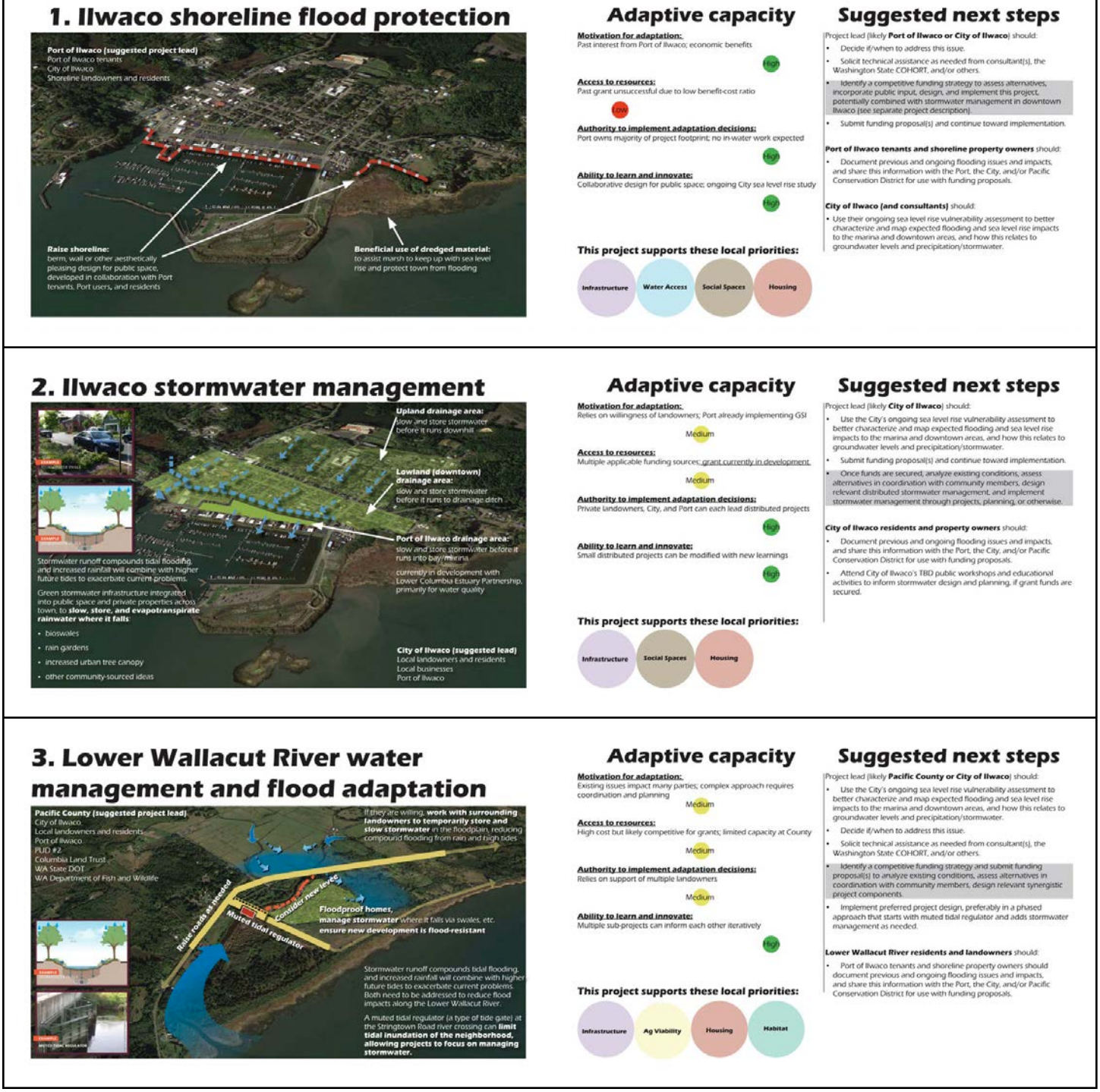
Each participant was given a printed handout with a diagram for each of the six projects in their respective Bay along with a description of the project and the related community-identified adaptation priorities for that project that was identified in Workshops 1 and 2. The handout also displayed an analysis done by the project team of the adaptive capacity (defined as the ability of the "system" to adapt in the way described). The analysis considered 4 criteria to better understand the adaptive capacity for each potential project, including:

1. Motivation for adaptation: are the affected/involved parties likely to support this work?
2. Access to resources: what resources would help advance this work, and how accessible are they?
3. Authority to implement adaptation decisions: do project partners have the authority to take action?
4. Ability to learn and innovate: Are project partners able to address information gaps, adjust the project as new learning are acquired, and take advantage of emerging opportunities/ideas that were not originally planned for?

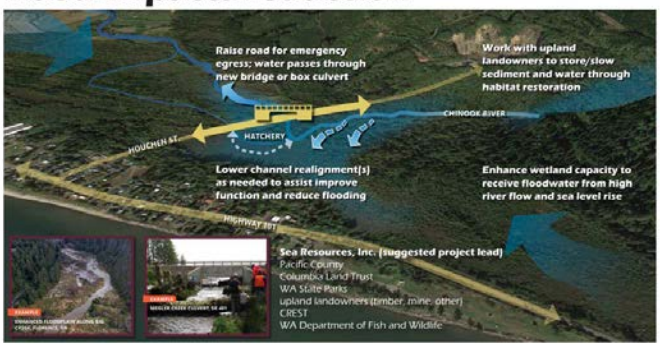
On the handout, adaptive capacity considerations were color coded as follows:

- Green = high likelihood of happening
- Yellow = somewhat likely to happen
- Red = unlikely to happen or requires a lot of effort

The contents for the potential project handouts are shown in Fig. B.21 for Baker Bay and Fig. B.22 for Grays Bay. Larger, higher-quality maps can also be found in Appendix E and H.



4. Chinook Hatchery and Houchen St. flood impacts reduction



Adaptive capacity

Motivation for adaptation:
Sea Resources actively looking for solution(s); historic community asset

High

Access to resources:
Small volunteer-based organization; likely competitive for grants

Medium

Authority to implement adaptation decisions:
Relies on multiple large landowners; collaborative solution possible

Medium

Ability to learn and innovate:
Hydrological/ecological assessments needed; group can learn together

High

This project supports these local priorities:

Habitat | Infrastructure | Social Spaces

Suggested next steps

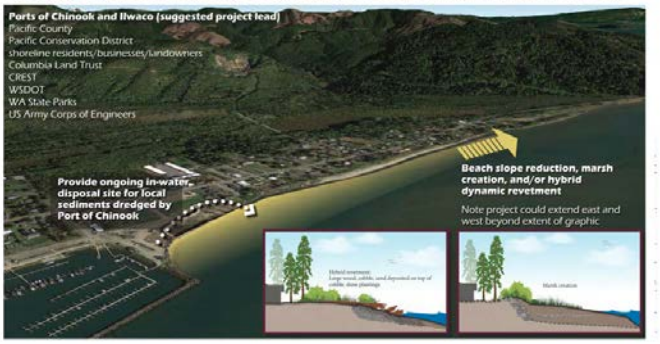
Project lead (likely **Sea Resources, Inc.**) should:

- Use the County's ongoing sea level rise vulnerability assessment to better characterize and map expected flooding and sea level rise impacts to the area, and how this relates to groundwater levels and precipitation/stormwater.
- Coordinate with adjacent landowners and technical assistance provider(s) to identify a competitive funding strategy
- Submit funding proposal(s) to analyze existing conditions, assess alternatives in coordination with adjacent landowners and regulators, and develop a project design.
- Implement preferred project design.

Adjacent landowners and land managers (e.g. **Columbia Land Trust, WA State Parks, Pacific County Public Works**) should:

- Consider their long-term goals for land/water management, what habitat restoration and flood reduction projects they would support, and how this relates to collaborative land management across multiple properties.

5. Chinook shoreline erosion reduction and habitat enhancement



Adaptive capacity

Motivation for adaptation:
Ongoing issues; previous project success; multi-organizational interest

High

Access to resources:
Limited local capacity for coordination; two grant proposals in review

Medium

Authority to implement adaptation decisions:
Requires landowner support ; significant permitting hurdles

Low

Ability to learn and innovate:
Existing project = prototype to learn from; adaptive management likely

High

This project supports these local priorities:

Habitat | Water Access | Social Spaces | Infrastructure

Suggested next steps

Project lead (likely **Port of Chinook**) should:

- Submit funding proposal(s) [COMPLETE]
- Once funding is secured, analyze existing conditions, coordinate with community members and landowners to identify goals and concerns, assess potential alternatives, and develop initial design to inform permitting discussions.
- Conduct engineering and modeling to understand long-term costs, effectiveness, and maintenance requirements.
- Identify which sources of dredged material are clean enough for in-water or shoreline placement.
- Continue regular coordination with shoreline stakeholders throughout project design, implementation, and lifecycle.

Chinook shoreline residents and property owners should:

- Document previous and ongoing erosion and/or accretion, impacts, and various species's presence along the shoreline (such as shorebirds, fish, or otherwise).
- Share this information with the Ports and/or Pacific Conservation District for use with funding proposals.

6. Ilwaco and Chinook (Pacific County) upland housing development

Adaptive capacity

Motivation for adaptation:
Widespread interest; low expectations; supports tsunami safety

Medium

Access to resources:
Limited capacity for leadership; significant cost barrier to implement

Low

Authority to implement adaptation decisions:
Success depends on private landowners and real estate market

Low

Ability to learn and innovate:
Can learn from coastal Tribes moving upland and share with others

High

This project supports these local priorities:

Infrastructure | Habitat | Housing | Social Spaces

Suggested next steps

Pacific County and/or City of Ilwaco should:

- Build upon University of Washington's recent housing studies for Pacific County, with focus on development safe from coastal hazards
- Develop a working group to - among other tasks - conduct local, state, and federal outreach to gage public interest and potential pathways to acquiring and developing uplands for housing. This could inform a work plan and feasibility assessment so the City and/or County can better understand opportunities and constraints for this work. This could also identify a dedicated lead organization.
- In the near term, develop codes and incentives for increased density in non-hazard prone areas, low-impact development (LIDs), and upland development, with a focus on affordable or workforce housing.
- In the near-term, focus on small-scale pilot projects to acquire uplands for housing that is affordable/accessible and resilient. Relevant updates to codes and planning documents can assist this. Pilot projects could focus on potentially relocating Chinook Hatchery facilities upstream and/or providing upland housing for City of Ilwaco.

Private developers, landowners, or investors should:

- Consider if they are interested in this project, contact the City/County.

Local newspapers and interested organizations should:

- Include ongoing inquiries into this topic, to raise awareness, gage public interest, and inform multi-benefit approaches. This could start by sharing results of this workshop series.

Figure B.21. Diagrams (left) and associated community-identified adaptation priorities (right) of the 6 potential resilience projects in Baker Bay presented in Workshop 4.

1. Grays River dredging to reduce flood impacts

Wahkiakum County (suggested project lead),
Port District No. 2,
WA Department of Fish and Wildlife,
State of Washington,
US Army Corps of Engineers

Adaptive capacity

Motivation for adaptation:
Strong community priority, with some objections

High

Access to resources:
Expensive; requires studies and likely maintenance; proposal to US Army Corps in review

Low

Authority to implement adaptation decisions:
Tough permitting; reliance on US Army Corps to conduct all work

Low

Ability to learn and innovate:
Necessary study of hydrology and habitats can inform other efforts

Medium

This project supports these local priorities:

Infrastructure | Historic character | Social Spaces | Land use

Suggested next steps

Wahkiakum County should:

- Submit funding/assistance proposal to US Army Corps [COMPLETE]
- Work with US Army Corps and others to conduct relevant studies and economic assessments to determine feasibility of dredging
- Conduct State and Federal advocacy and fundraising for next steps
- Pursue additional approaches to reduce flood impacts and their underlying causes across Grays River watershed, in case dredging does not prove successful on its own.

WA Department of Fish and Wildlife should:

- Conduct studies about potential impacts to species/habitats of concern (or aggregate existing studies), and communicate results to interested parties.
- Communicate permitting requirements and concerns to interested parties.

US Army Corps of Engineers should:

- Lead a focused conversation with state agencies and elected officials from Wahkiakum County and Grays River Flood Control District. This would outline the steps required for dredging and relevant hurdles/opportunities.

2. Grays River: watershed-wide coordination

Flood impacts reduction is tied to factors across the watershed. A regular action-oriented community forum can ensure that actions are synergistic with related efforts and communicated to interest parties (see Willapa Erosion Control Action Now - WECAN).

Studies, prototype projects, and information/insight-sharing will be critical to affecting large-scale change through smaller projects.

All key organizations would be regularly involved in outreach, fundraising, project developments, and group coordination. Participation by agencies will ensure permittable work that builds relationships.

***As the only key organization in all subregions, Wahkiakum County is the logical lead coordinator. Subregion-specific leads may be different than the County.

Key organizations by subregion:
(does not include all partners, or regulators)

Grays Bay:
Wahkiakum County***
Port District No. 2
US Army Corps
WA State
OR State

Lower Grays River:
Private landowners
Columbia Land Trust
Grays River Grange
Grays River Flood Control District
Wahkiakum Conservation District
Wahkiakum County***
Washington State DOT

Upper Grays River:
Timber landowners
Columbia Land Trust
Pacific County
Wahkiakum Conservation District
Wahkiakum County***
WA Dept. of Natural Resources
Cowlitz Tribe

Adaptive capacity

Motivation for adaptation:
Many efforts already occurring; addresses priority issues

High

Access to resources:
Costly but competitive for grants; leadership needed; studies exist

Medium

Authority to implement adaptation decisions:
TBD distributed projects can focus on interested landowners

Medium

Ability to learn and innovate:
Can learn from existing studies and examples elsewhere; potential for prototypes + revision

High

This project supports these local priorities:

Infrastructure | Habitats + ecological processes | Historic character | Information | Land use | Social Spaces

Suggested next steps

Wahkiakum County should:

- Create a webpage with existing documents and project updates
- Conduct educational events to better understand watershed processes, and how other communities have dealt with similar issues. In the near-term, this could be supported by Wahkiakum County Marine Resource Committee's coastal resilience outreach activities.
- Designate a paid individual and/or department as a point of contact for Grays River flood-related issues. Host a regular action-oriented watershed-wide forum for project participants and interested parties to develop projects + learn together

Columbia Land Trust, WA Department of Natural Resources, Cowlitz Tribe, and Wahkiakum County could:

- Create project briefs about their planned and/or ongoing work in the upper watershed to include on the County's TBD webpage.
- Continue to attend local events and Flood Control District meetings.

Grays River Flood Control District should:

- Continue to address localized flood issues (e.g. tide gates, culverts).
- Consider multiple approaches to address flood issues at larger scales that involve coordination across multiple partners.

3. Grays River monitoring via stream gages

Build on existing collaborative conversations and efforts to update Grays River data collection (such as 2024's Covered Bridge gage elevation calibration) to assist emergency management and modeling to reduce watershed-wide flood impacts.

A community outreach effort will assist use of gage data and emergency preparedness, whether with existing gage or for future gaging updates.

Columbia Land Trust (suggested project lead)
Grays River Flood Control District
WA Department of Ecology
Wahkiakum County
Pacific Northwest National Lab (PNNL)

Adaptive capacity

Motivation for adaptation:
Supports local priorities; uncertain which gage(s) to prioritize

Medium

Access to resources:
Limited funding sources for ongoing operations/maintenance

Low

Authority to implement adaptation decisions:
Gage(s) installation, operations/maintenance, and website are possible

High

Ability to learn and innovate:
Assists emergency preparedness; informs watershed-wide coordination and modeling to reduce flood impacts

High

This project supports these local priorities:

Habitats + ecological processes | Information

Suggested next steps

Columbia Land Trust should:

- Update vertical elevation info for Covered Bridge gage [COMPLETE]
- Collaborate with Grays River Flood Control District on public outreach in support of emergency preparedness.
- Based on existing conversations, prioritize gages/locations within a phased funding strategy. Continue to lead conversation and update interested parties about funding opportunities and other gage-related developments/needs.
- Once funding is secured, collaborate with PNNL to develop new ratings for sediment and flow. Ensure gages are used for local benefit.

Grays River Flood Control District should:

- Conduct outreach to ensure that locals know how to access and read gage data (including 2024 recalibration of the Covered Bridge gage's elevation datum), in service of emergency preparedness and in collaboration with Columbia Land Trust.
- Communicate to the public how new gages can improve understandings of watershed processes and inform enduring flood impacts reduction projects.

WA Department of Ecology should:

- Continue to host gage data online and advise on gage strategy

Wahkiakum County should:

- Continue to fund the Covered Bridge gage, and explore additional funding opportunities for expanding gaging to reduce flood impacts.

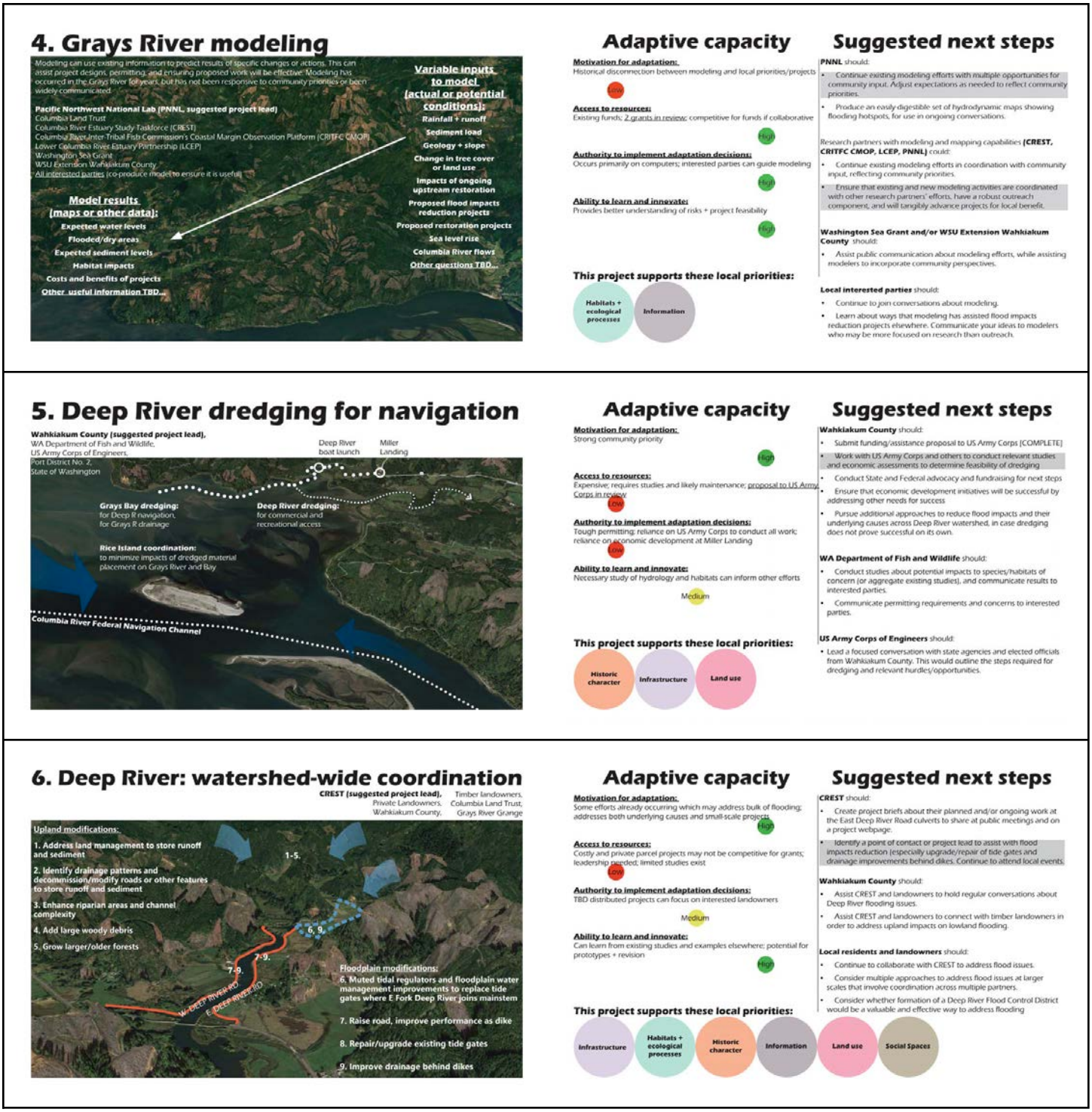


Figure B.22. Diagrams (left) and associated community-identified adaptation priorities (right) of the six potential resilience projects in Grays Bay presented in Workshop 4.

Large maps of the potential projects were displayed around the room and participants were encouraged to walk around, view the maps and provide feedback for each project and attempt to prioritize the projects. Using sticky notes, the participants were asked to consider what they liked about the proposed projects, what they would change about the projects, and document any questions they had about the projects. Additionally, participants were given 10 raffle tickets eachand instructed to use the tickets as a voting mechanism to denote the projects they would like to see prioritized (similar to allocating funding to a project with money). Participants could put all of their tickets towards 'funding' one project or they could spread their 'funding' among multiple

projects. The intent behind this activity was to gain an idea of what the community sees as priorities in the area and was not intended for making any final decisions on these projects by the project team. Participants were given about an hour to complete this activity before breaking for a brief dinner break. Food was provided to all participants.

During the dinner break, the project team synthesized the feedback from the participant's sticky notes and tallied the number of tickets allocated to each potential project. A brief summary of the feedback and the results of the ticket allocation were shared with participants after dinner. Ticket allocation breakdown is shown in Table B.1 for each Bay.

Table B.1. Results of ticket ('funding') allocation activity for potential adaptation/resilience projects in Baker Bay and Grays Bay.

Baker Bay		**Grays Bay**	
Project	**# Tickets (% of total tickets)**	**Project**	**# Tickets (ranking of total tickets)**
Project 2. Ilwaco Stormwater Management	72 (26%)	Project 1. Grays River dredging to reduce flood impacts	84 (ranked 1 of 6)
Project 3. Lower Wallacut River water management and flood adaptation	51 (18%)	Project 3. Grays River monitoring via stream gages	58 (ranked 2 of 6)
Project 5. Chinook Shoreline erosion reduction and habitat enhancement	47 (17%)	Project 2. Grays River: watershed-wide coordination	54 (ranked 3 of 6)
Project 6. Ilwaco and Chinook (Pacific County) upland housing development	40 (14%)	Project 6. Deep River: watershed-wide coordination	? (ranked 4 of 6)
Project 4. Chinook Hatchery and Houchen Street flood impacts reduction	37 (13%)	Project 5. Deep River dredging for navigation	? (ranked 5 of 6)
Project 1. Ilwaco shoreline flood protection	34 (12%)	Project 4. Grays River Modeling	31 (ranked 6 of 6)

Following the share-out of these results, the project team led a full-group discussion about the potential projects aimed at identifying next steps. For each Bay, the adaptive capacity for all projects were compared. This was broken down among the various components of adaptive capacity (motivation, resources, authority, and innovation, as described above). A visual of this comparison was presented to the participants and is shown in Fig. B.23 for each Bay. The participants were asked to share any themes they see and any questions they have regarding this comparison.

	Motivation	Resources	Authority	Innovation
Baker Bay projects				
1. Ilwaco shoreline flood protection				
2. Ilwaco distributed stormwater management				
3. Lower Wallacut River water management and flood adaptation				
4. Chinook Hatchery and Houchen Street flood impacts reduction				
5. Chinook shoreline erosion reduction and habitat enhancement				
6. Ilwaco and Chinook (Pacific County) upland housing planning and development				
Grays Bay projects				
1. Grays River dredging to reduce flood impacts				
2. Grays River: coordinated flood impacts reduction projects across watershed				
3. Grays River gages				
4. Grays River modeling				
5. Deep River navigation channel dredging				
6. Deep River: coordinated flood impacts reduction projects across watershed				

likely to happen
somewhat likely
low likelihood or requires significant effort

Figure B.23. Adaptive capacity for potential projects at Baker Bay (top) and Grays Bay (bottom) from project team analysis presented in Workshop 4.

Next the project team asked workshop participants their opinions on key partners that should be involved in these potential projects. To facilitate this discussion, the project team presented a list of partners that have been shared in previous workshops–including the Message Box activity from Workshop 3 (see Fig. B.18) and other conversations–and ranked this list based on how many times individual partners were mentioned. This list is presented in Fig. B.24 for each Bay.

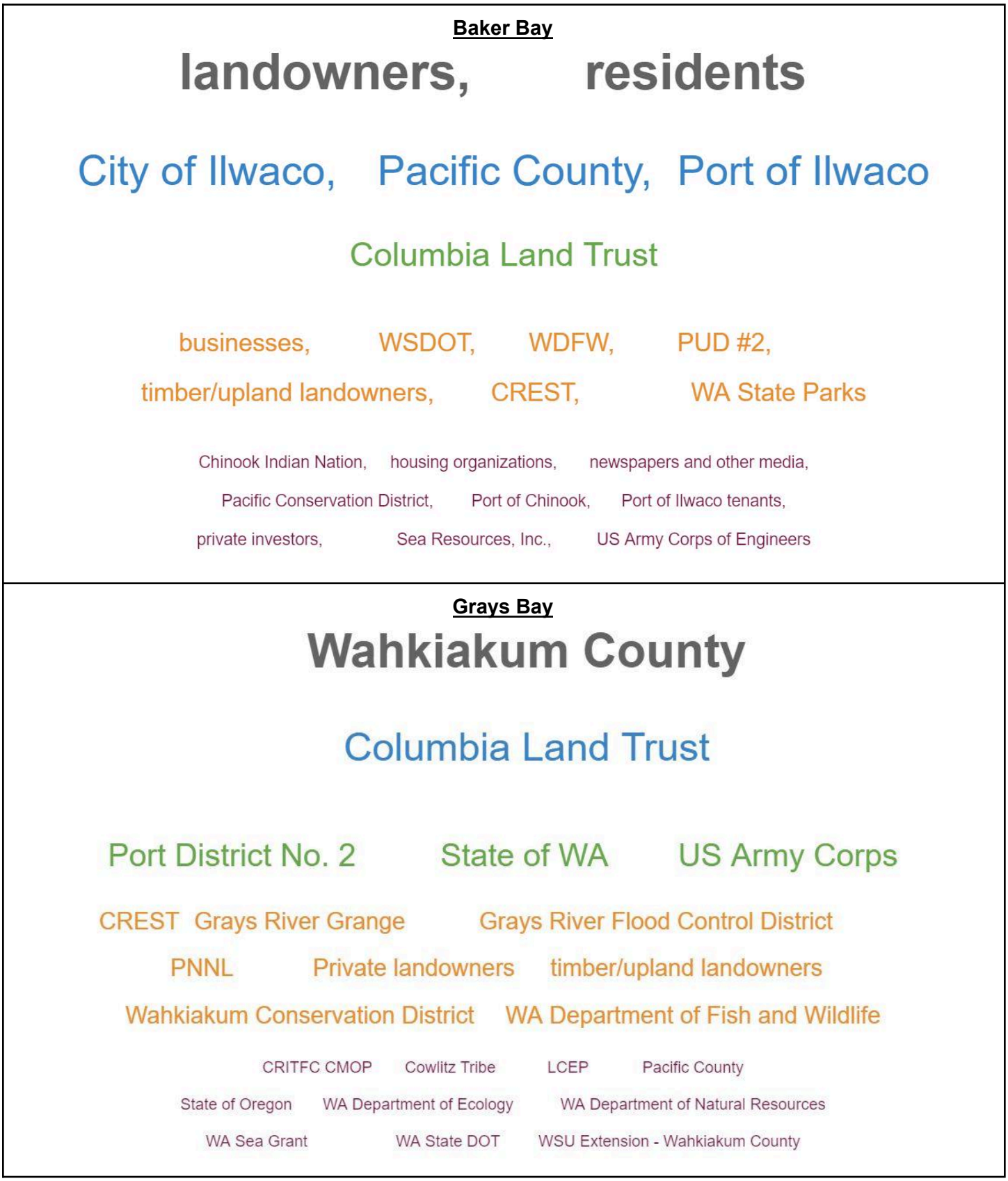


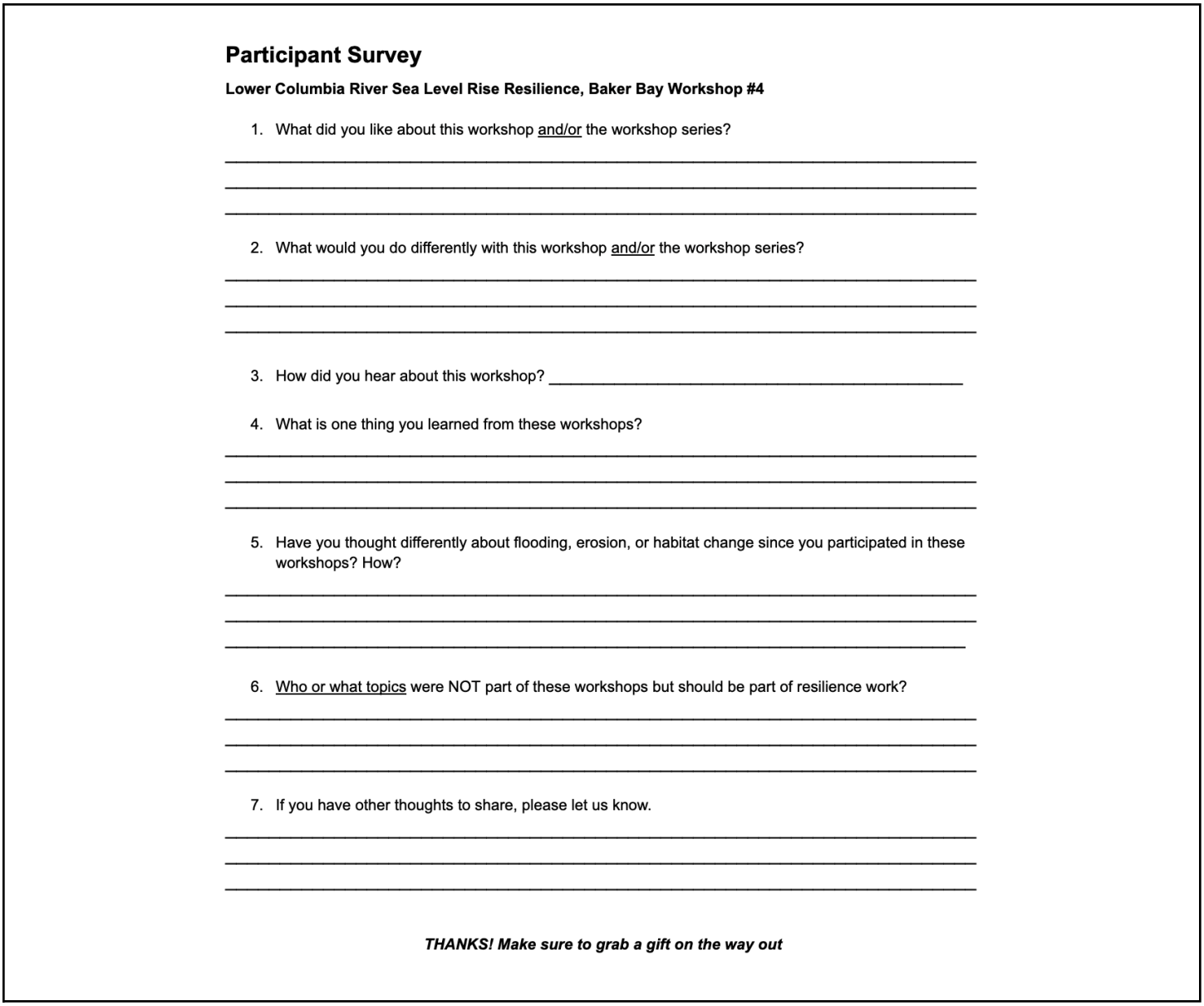
Figure B.24. List of suggested main/active partners for potential resilience/adaptation projects for Baker Bay (top) and Grays Bay (bottom). Larger font denotes that an organization/partner has been suggested more than that with a smaller font.

The project team then asked participants about any existing strong partner relationships in the area, and if any, how they could be improved. Participants were also asked to give any additional feedback of which partners might be missing from the list or should be less involved. This activity was meant to connect the work done in the workshops to the theory of change (see report Introduction for details on this), particularly getting local communities collaborating with county, state, and tribal organizations to help make impactful steps forward for resilience work.

Following this discussion, the project team shared several resilience projects they helped scope so far and areas of active coordination, driven by participants feedback in the workshop series (see Fig.B.21. B.22 and Appendix E and H). Efforts happening outside of the workshop series and this project team were also shared to give a holistic view of what is happening in each Bay. Finally, the project team shared which organization/partners were working on the six potential projects shared in the earlier activity for each Bay, so that the workshop participants knew who they could contact regarding each project and be aware of which projects are not yet being led by anyone. At the time of the workshop, 3 projects in each Bay were being led by partners (including the City of Ilwaco, the Port of Ilwaco, Pacific County, Wahkiakum County, and Pacific Northwest National Laboratories), and the project team shared contact information for these leading organizations. Finding local champions for these efforts was an initial objective for the project. For the remaining 3 projects in each Bay without a lead partner, the project team asked the workshop participants if any of them would be interested in leading the efforts moving forward. Workshop participants stepped forward and expressed interest in leading projects. These names were recorded by the workshop team for future coordination.

Finally, Workshop 4 was closed by announcing the Resilience Strategy efforts underway by the Project Team to be shared via email to all workshop participants upon completion. The project team wrapped up the workshop series with a call to action for continued conversations and projects by community members and local champions to increase the resilience of each Bay into the future.

Similar to the first 3 workshops, Workshop 4 participants were also given a survey at the end of the event, with a slightly different format than that of Workshops 1-3. This survey is shown in Fig. B.25.



Participant Survey

Lower Columbia River Sea Level Rise Resilience, Baker Bay Workshop #4

1. What did you like about this workshop and/or the workshop series?

_____
_____
_____

2. What would you do differently with this workshop and/or the workshop series?

_____
_____
_____

3. How did you hear about this workshop? _____

4. What is one thing you learned from these workshops?

_____
_____
_____

5. Have you thought differently about flooding, erosion, or habitat change since you participated in these workshops? How?

_____
_____
_____

6. Who or what topics were NOT part of these workshops but should be part of resilience work?

_____
_____
_____

7. If you have other thoughts to share, please let us know.

_____
_____
_____

THANKS! Make sure to grab a gift on the way out

Figure B.25. Workshop 4 survey given to all participants.

This survey allowed workshop participants to provide feedback on the workshop series as a whole, to help the project team better shape future workshop series in other communities. Survey results from Baker Bay indicated that participants enjoyed the information that was presented in the workshops, the opportunity to network, the supportive atmosphere and constructive participation from attendees, the pace of the workshops, the opportunity to hear from multiple perspectives, learning how flood protection can align with habitat restoration, receiving points of contact for different parents and efforts going on in the area, receiving the printed handouts with the slides, the location chosen for holding the workshops, the leadership from the Pacific Conservation District, getting to see how other participants voted on projects, the food offered, and the casual atmosphere. While survey results indicate that most participants liked the workshop series as it, some suggestions from participants on how to do workshops differently in the future included having a larger presentation screen, a plan for additional meetings after the workshop to continue conversations and advance resilience efforts, having more directly impacted residents attend the workshops, offering updates on how efforts are progressing, incorporating an ice breaker to get attendees to speak up more, and allowing time for participant introductions. Participants shared that they learned several things from the workshop series, including information about SLR in the future, information about different strategies to help with erosion, an

overview of all the different projects being done in the area, how complex the issues are in the area related to flooding and erosion, how interested it can be to have many different perspectives in the room, how much flooding will impact Ilwaco's core area, information on moving homes and infrastructure out of flood prone areas, zoning and planning possibilities to aid in keeping new building out of flood zones, the importance of documentation of plans to secure funding sources, learning about which areas are most vulnerable to flooding, and a perceived lack of interest from stakeholders–such as the Port of Ilwaco. When asked whether thoughts have changed regarding flooding/erosion/habitat change throughout the workshop series, participants shared that they noticed that people seem interested and that more public education around the historic, current, and future flooding risks could be helpful, some attendees now pay more attention to flooding along creeks when it is happening, a deeper understanding of future flooding with help from the future sea level rise maps shared in the workshops, the need to be proactive in this area, and increased curiosity when seeing flooding in real time about which approaches (hard or soft for example) could help those areas. Participants suggested that future topics to consider could include more information on what type of plants should be planted along rivers for erosion control, a larger participant representation from local residents, and more habitat restoration opportunities and beaver management alternatives. Survey results also indicate that participants enjoyed the food provided and expressed their appreciation for the workshop series as a whole. Participants mentioned that they heard about the workshop series via facebook, postcards in the mail, contacted directly by a member of the project team, project team announcements at other local events, invitations by other participants, flyers hung in local businesses, email advertisements, and announcements from the City of Ilwaco.

Survey results from Grays Bay indicated that participants appreciated that the project team listened to the community, balanced opportunities, prioritized work, and offered an agenda for conversation while allowing for flexibility and new ideas. They also enjoyed that multiple stakeholders were brought together, and particularly enjoyed the opportunity to network and converse with their neighbors. Several participants enjoyed the informative nature of the workshops and mentioned their appreciation for the additional presentation from PNNL about modeling work in the area. While most participants mentioned that they liked the workshop series as it, some suggestions from participants on how to do workshops differently in the future included providing more informational handouts, holding more frequent meetings throughout the year, having a hub for resources to access digitally, omitting language that can be perceived as climate alarmism, having additional experts to help answer questions about the modeling presentation, having more roundtable discussions, and holding the workshops at a different time. Participants shared that they learned several things from the workshop series, including how dredging would impact the local flooding, what their neighbors' concerns were, how complex the flooding issue is, how opinions on flooding solutions differ among different stakeholders, increased awareness of local agencies and partners, and an increased awareness of ongoing work. When asked whether thoughts have changed regarding flooding/erosion/habitat change throughout the workshop series, participants shared that the workshop series brought these issues to the front of their mind, new considerations of watershed approaches vs. one-time or piecemeal solutions to flooding, insights into how close people should be living to bodies of water that experience natural change, how to run workshops well, and the importance of having community conversations. Participants suggested that future topics to consider could include replacing undersized culverts, how fish would be impacted by dredging, installation of Beaver Dam Analogs (BDAs) in the upper reaches of the river to reduce flooding in the lower reaches of the river, inclusion the Army Corps in conversations, a desire for a stronger focus on actionable items, flooding impacts for some specific areas within the watershed, engagement of Timber companies, hearing from the Cowlitz Tribe about their work in the upper watershed, information on gravel bar removals, impacts of wetland and floodplain restoration on flooding, and some more information about the Columbia River. Survey results also indicate that some participants felt that voting on potential projects should be limited only to residents of that bay. Participants mentioned that they heard about the workshop series via an announcement in the local newspaper, direct

outreach by a member of the project team, announcement by the project team at other local/community events, postcards in the mail, and follow-up emails from previous workshops.

Phase 3: Project Support

Phase 3, “Project Support” occurred throughout the project (Fig. B.26). During the initial outreach with stakeholders and literature reviews during Phase 1, the team identified existing projects, prior attempts, existing partners, gaps, and needs to move projects forward in the study area. As the team developed workshop designs throughout Workshops 1 - 2 at Baker Bay and Grays Bay, the team analyzed the communities’ input to identify issues, principle resilient components, and gaps and came up with potential project designs as outlined in Appendix B Phase 2. The discussions during workshop 3 were analyzed to provide the communities’

- preferred designs and/or design components
- feasibility and barriers about each design
- cooperative iteration of participant’s ideal project designs
- Discussion about preferred next steps
- Discussion about a short-term plan and long-term plan.
- identification of potential project leads
- identification of agencies or stakeholders that need to be involved

Based on the discussion points above, the team identified feasible projects or next steps based on all the discussions and prior information throughout the study, which can be found in Appendix E and H. Through interviews and literature reviews, on-going projects and local champions were identified and used in conjunction with the information from the workshops to identify feasible projects and suitable funding sources to address the community's needs. Additionally, literature reviews (Appendix A) also identified existing mitigation or restoration projects elsewhere with similar components to create a list of model projects that can be shared with local communities (see Appendix I).

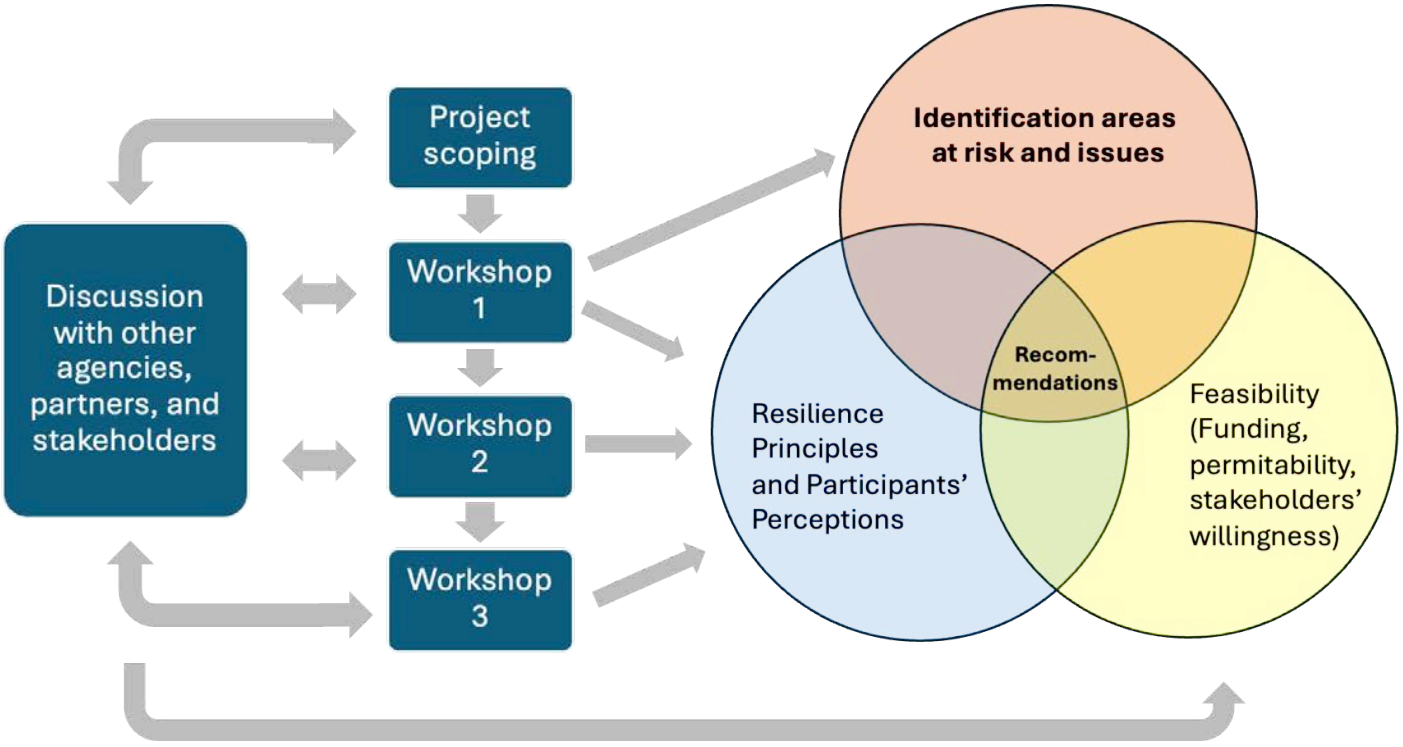


Figure B.26. Methods to derive recommendations and the next steps.