NAVIGATING COASTAL HAZARDS 2 WORKSHOP REPORT

A SUMMARY REPORT OF THE CASCADIA COPES HUB NAVIGATING COASTAL HAZARDS 2 WORKSHOP

FEBRUARY 10-11, 2025

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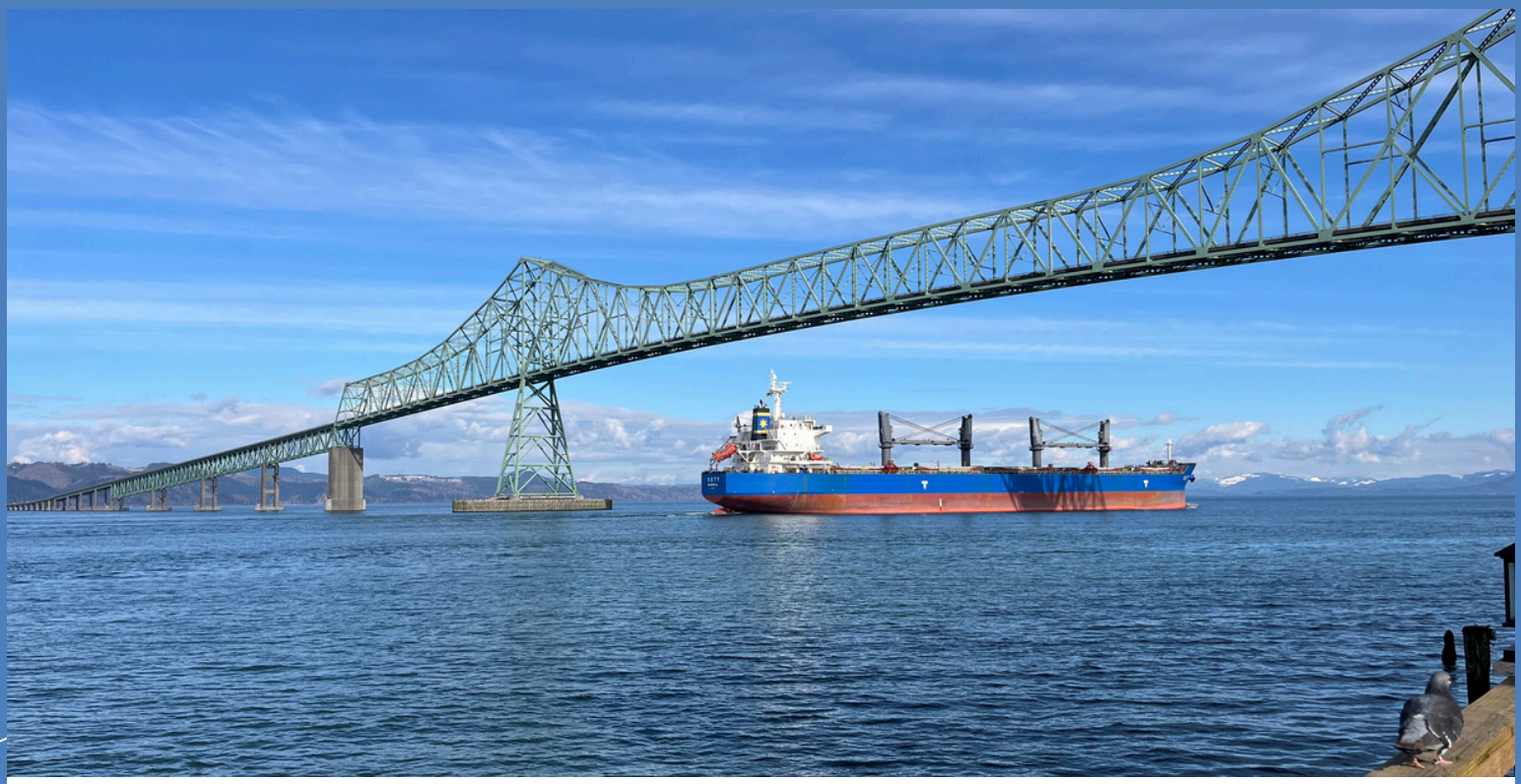
Cascadia CoPes Hub
THE CASCADIA COASTLINES AND PEOPLES HAZARDS RESEARCH HUB



INTRODUCTION

Cascadia has a complex, dynamically evolving landscape, shaped by natural forces that bring both beauty and risk. This dynamic region faces a complex array of coastal hazards, including rising sea levels, flooding, erosion, mega-earthquakes from a Cascadia Subduction zone event, tsunamis, and landslides. These challenges highlight the ongoing need for proactive research, planning, and preparation.

In response to this need, the first Navigating Coastal Hazards workshop convened in 2024 (NCH)[1] brought together voices from across Cascadia coastal communities and sectors to chart a path forward on collaborative research to strengthen resilience across Cascadia. Over the past year, that momentum has grown. Key achievements include new connections and collaborations on coastal inundation modeling, coastal hazard management, improved guidance on implementing nature-based solutions for shoreline protection, and increased awareness of coastal resilience projects in Cascadia. Despite this progress, critical work remains. The second Navigating Coastal Hazards (NCH2) workshop in March 2025 built on the first by identifying remaining gaps, exploring innovative solutions, strengthening partnerships, and developing new partnerships to drive further action.

[1] Bostrom, A., Schmidt, D., Ruggiero, P., Burgos, A., (2024). Cascadia CoPes Hub Navigating Coastal Hazards Workshop Summary Report. Cascadia Coastlines and Peoples Hazards Research Hub. Oregon State University. 104 CEOAS Admin Bldg. Corvallis, OR 97331. https://cascadiacopeshub.org/navigatingcoastalhazardsworkshop/

WORKSHOP GOALS

The primary goals of the workshop were to:

- Build coastal community partnerships, leadership, and adaptive capacity - by
  - developing new and strengthening existing partnerships and expanding regional networks;
  - supporting peer-mentoring and knowledge sharing strategies within and across communities and with researchers; and
  - better aligning interests across researchers and coastal community partners, and across disciplines, agencies, and professions.

- Advance collaborative coastal resilience research - by
  - envisioning forward-thinking, action-oriented, co-created research to strengthen coastal resilience and community preparedness;
  - exploring future coastal scenarios that include natural and nature-based solutions; and
  - strengthening existing mechanisms and creating new ways to collect, share, and enable community use of interdisciplinary data and products, and create synergies across agencies, geographies, and hazard types.

KEY OUTCOMES FROM THE NCH2 WORKSHOP

- There is a continued need to bring scientific findings into the community, effectively communicate risk, and build connections amongst researchers, government officials, and community stakeholders. Workshop discussions focused on innovative ways of presenting information (e.g., inundation maps on apps vs. flood-level markers on telephone poles) or bringing together the community in ways that are enjoyable and feasible, such as low-stakes planned events with food and opportunities for socializing.
- It is important to include communities in the scientific process, particularly groups not previously engaged in decision making. As stated by Chandler Countryman of Washington Sea Grant during the workshop, "People don't care what you know until they know that you care."
- The intentionally structured interactive nature of the workshop was received favorably by participants; many called for even more interaction and opportunities for engagement in future workshops.
- Post-meeting survey responses show that the workshop successfully achieved its goals of: (1) building coastal community partnerships, leadership, and adaptive capacity and (2) advancing collaborative coastal resilience research.
- Researchers attending the workshop reiterated their strong commitment to continuing to produce cutting-edge coastal resilience research despite uncertainties around research funding.
- The workshop successfully convened a large, heterogeneous group of researchers and practitioners across domains and career stages and provided opportunities for collaboration not available in their daily professional settings. Nearly all post-meeting survey respondents indicated that they had made a new contact with a potential new collaborator at the workshop.

WORKSHOP STRUCTURE AND DESIGN

Building on insights from the first workshop, NCH2 aimed to strengthen collaboration and dialogue among those engaged in managing and protecting coastal lands in the Cascadia region through research and practice. Feedback from the first event emphasized a desire for more structured networking opportunities and an even stronger focus on actionable outcomes. In response, the 2025 workshop introduced new activities such as networking and science innovation challenges designed to foster cross-sector discussion and networking, and generate new research ideas aligned with coastal resilience needs. Science innovation and community project roundtables also provided further focus on taking action, with two roundtables focused specifically on ‘doing something’ about coastal hazards.

The first day of the workshop began with an informal breakfast and coffee hour along with brief introductions from all attendees. The day proceeded to a poster session where participants mingled and discussed research and community work with poster presenters (Appendix 1). Following this session, the group heard presentations on collaborative research engagements in coastal communities related to coastal resilience from academic and government researchers and practitioners. The session following lunch was an interactive "Networking Challenge Hackathon," for which participants were sorted into different tables based on topics of shared interest, and mixed with regard to field and career stage. At these tables, attendees shared a specific problem encountered in their work and others at the table then shared their thoughts on potential solutions. The final session of the first day involved a 'Community Resilience Projects' roundtable activity. Attendees could move to their choice of 14 different roundtables across three rounds to hear presentations on specific projects aiming to boost coastal resilience in the Cascadia region and discuss ideas and solutions related to these projects. The day wrapped up with a dinner and networking at the restaurant adjoining the workshop venue.

The second day proceeded similarly to the first with a welcome breakfast and recap of the first day's activities, along with another chance to engage with poster presenters. This was followed by a series of research presentations from each of the three Cascadia CoPes Hub research teams, followed by three more talks centered around community resilience engagement efforts. The final event of the day at the workshop venue was the Science Innovation Challenge Activity which built on themes and next steps originally identified in the 2024 NCH workshop. Tables were organized by themes identified as important to convergence science approaches to coastal resilience. Participants were asked to join the table theme that they found most interesting and work together to design a research project to answer the prompt given to their table. A representative from each table then presented the proposed project.

The second day finished with a round of recognition for everyone's participation. Attendees then had the choice to attend one of two field trip activities centered around geophysical research and community engagement in coastal communities: either a trip to Cannon Beach, Oregon where attendees learned how researchers use core samples from coastal marshes to source evidence for tsunami models, or a second trip to Chinook, Washington where attendees learned firsthand about coastal resilience projects along the Baker Bay shoreline from those living and working in the area.

PARTICIPATION AND REPRESENTATION

The workshop included 138 registrants who represented a broad group of organizations, including community groups, local-state-and-federal government agencies, Tribes, research networks, regional non-profits, and local grassroots organizations. Almost all of those registered attended. Participants came from a variety of professional and academic domains and brought diverse perspectives, experiences, and expertise to the workshop (see Table 1).

Half of the workshop attendees self-identified as researchers. Attendees included Hub members from University of Washington, Oregon State University, University of Oregon, Washington State University, Washington and Oregon Sea Grant, the National Oceanic and Atmospheric Administration, and the United States Geological Survey. Also attending were emergency managers, community planners, researchers, and officials from the Coquille Nation Tribe, the Confederated Tribes of Grand Ronde, the Confederated Tribes of Siletz Indians, the Swinomish Indian Tribal Community, the OR Department of Human Services Office of Resilience and Emergency Management, WA Department of Ecology, WA Geological Survey, cities, and counties in the region, and consulting and nonprofit organizations such as Surfrider Foundation, Consejo Hispano, the Moore Wright Group, Parametrix, Aim-4-Access, and Upstream Access. Tribal communities from both Oregon and Washington including the Coquille Nation Tribe, the Confederated Tribes of Grand Ronde, the Confederated Tribes of Siletz Indians, and the Swinomish Indian Tribal Community were represented at the workshop. Attendees at the workshop came from many different career stages and age groups, including senior-level investigators and managers, early- and mid-career professionals, and graduate students.

In response to a question about their level of understanding of Cascadia coastal hazards and resilience prior to the workshop, the majority of participants felt knowledgeable on the topic. Two-thirds rated their understanding as a 4 (47%) or 5 (18%), on a scale of 1 (low) to 5 (high).

Self-identified role (categories are not mutually exclusive)	**Percentage of attendees (based on survey responses, N=68)**
City/county official	4%
Community planner	9%
Emergency manager	10%
Environmental or planning consultant	13%
Researcher	50%
State/federal agency	21%
Tribal government	4%

Table 1. *Self-reported roles of attendees who responded to the post-workshop evaluation survey. Respondents could select more than one option for which reason the total exceeds 100 percent.*

SCIENTIFIC CONTRIBUTION TO THE WORKSHOP

Several workshop sessions featured research presentations from a diverse range of investigators and collaborators across academia, government (federal to local), and community organizations. Poster sessions on both days highlighted contributions from various professional fields, age groups, and career stages. Many graduate students presented posters and engaged with senior researchers and community stakeholders. Government and community researchers also shared coastal resilience projects with practitioners who could apply these insights directly on the ground. The topics of the research presented also reflected the wide variety of domains in which the Hub works: for example, geophysical research related to earthquakes, tsunamis, landslides, and sea-level rise, social science research related to community engagement and planning, and experiences related to translating research into action. A full list of poster presentations can be found in Appendix 1.

On both days of the workshop attendees heard scientific presentations from the CoPes Hub Pilot Project awardees and research lightning talks. Pilot project awardees were united in their mission of bringing science out of the lab and into the community. These included investigating the best way to communicate nature-based solutions for complex and dynamic natural systems to local communities, approaches to create inclusive multi-hazard maps along the Oregon coast, and a novel exchange to build STEM Identities through Community-Driven Earthquake Monitoring at the Quileute Tribal School while expanding geoscientists' exposure to Quileute language and culture. A lively question and answer session following each presentation illuminated some interesting take-aways: for example, presenters discussed the advantages of layered drawings in communicating complex coastal change as opposed to photos, the excitement of youth in taking field trips to better understand geophysical science in their localities and even monitoring seismic activities themselves, and the challenges in identifying assets and optimal color codes in community hazard maps.

The lightning talks provided opportunities for early career researchers to present to a large audience interested in their work. Topics also reflected the diversity of Hub work, with three presentations from each of the Hub's three main research areas: tectonic geohazards, inundation and coastal change hazards, and community adaptive capacity. Presentations reflected cutting-edge work from Teams 1 and 2 of the Hub on 3D ground motion simulation from a Cascadia Subduction Zone (CSZ) earthquake, landslide dam susceptibility along the Oregon Coast range, regional infrastructure connectivity modeling in Oregon following a CSZ earthquake, coastal dune ecosystems and flood risk perceptions, and modeling the effects of coastal compound flooding. Team 3 presented novel ways to engage youth with drones and community asset mapping, a survey on community assets from coastal Oregonians, and a co-production of research with the environmentally vulnerable Seattle community of South Park on community hazard adaptation planning. A list of these presentations can be found in Appendix 1 and presentation slides can be made available upon request.

TRANSLATING SCIENCE INTO ACTION

A key focus of Cascadia CoPes Hub researchers and community partners is to communicate high quality and cutting-edge geophysical and social science research with local stakeholders in ways that can be translated into resilience-boosting action in the Cascadia region. A common theme throughout the workshop was how to bring science into the community in a digestible and appropriate manner. Sessions on both days of the workshop highlighted concrete efforts to convert science into action on the ground to boost local resilience. These efforts were implemented by federal, state, and local government agencies.

On day 1, presenters from the state government in Washington noted that collaboration across agencies has been important in coordinating efforts towards engaging communities and maximizing impacts. A presentation from Washington Sea Grant reflected on successful community outreach in communities along the lower Columbia River including through facilitating workshops which encouraged socializing amongst community members and government/academic representatives. Researchers from the Santa Cruz, CA USGS office presented work from their expansion of the CoSMos storm modeling system into the Cascadia region. This work includes interactive dashboards that can be used by planners and community members alike.

The presentations continued on day 2 with findings from DOGAMI on successes/challenges in developing tsunami evacuation structures and routes in Clatsop County, OR. Additional presentations focused on Oregon Sea Grant and DOGAMI researchers making inroads and working with the hospitality industry along the Oregon coast, as well as an interactive discussion on hazard mitigation planning. Some challenges mentioned included effectively communicating hazard risk to private stakeholders and stewards of coastal lands who do not actively engage with the Hub but whose interests nonetheless involve the safety of people during a major coastal hazard. A throughline through the presentations was the desire to make research understandable for a lay audience.

SUMMARY OF FINDINGS FROM COMMUNITY RESILIENCE PROJECTS ROUNDTABLE ACTIVITY

Research roundtables held on the first day of the workshop were organized around providing discussion and feedback surrounding 14 community projects. Table 2 summarizes the problems and solutions identified regarding each project. The discussions took place in three rounds, so that each challenge was discussed by up to a dozen-plus participants.

Table #	Table Lead (Affiliation)	Title	Problem	Discussion Points
1	Charlie Plybon (Surfrider Foundation)	Erosion Threatening Cannon Beach's Ecola Creek and Coastal Resilience	Meandering creek with condos built in dynamic areas, with major site constraints and needing collaboration with multiple land owners including full-time residents and second home owners	-Cannon Beach is not eligible for rip-rap, so nature-based solutions are needed. -Making the case for solutions is difficult when the best solution (i.e. structural vs. non-structural) is not known. -The team seeks consistent engagement with the public from the start but some community members are resistant. -Focus on benefits: how do you want the look and feel of your beach to be? -Need more guidance on non-structural solutions. -Reframe what success looks like, necessity for maintenance in all scenarios. -Experimentation could be a powerful tool for persuasion. -Finding supportive stakeholders is key for a participatory process.
2	Chris Elder (Whatcom County)	Collaborative Adaptation Planning and Regulation Development in Local or Government	Convince local policymakers to adopt regulations, individuals to move or adapt in light of sea level rise projections	-Focus on low-risk, high-risk probabilistic scenarios, think about different timelines -Regulations for adaptations -Economics is key: i.e. insurance -Considering the impact of place attachment makes this more difficult.

Table #	Table Lead (Affiliation)	Title	Problem	Discussion Points
3	Dan Abramson (UW) and Kevin Goodrich (WA Parks)	Overcoming Challenges in Coastal Community-University Collaborations in South Beach, WA	Figure out how to align different paces of funding and availability from both the community and university side	-Maintaining a stream of university students who base their projects in a partner community can work well to support community-engaged research over time. -Advantages of involving local schools through curricular and extracurricular activities related to Hub projects. -Challenge of distance between rural coastal partner communities and city-based universities; possibility of residing locally for a period.
4	Felicia Olmeta Schult (OR Sea Grant/OSU Extension)	Engaging Oregon's Hospitality Industry	Address low response rate to survey asking about coastal hazards preparations, interest in learning more	-Approach county commissioners, emergency managers. -Endorse/certify hotels that are tsunami-aware/prepared for natural disasters. -The ultimate solution may be legislative.
5	Ian Miller (WA Sea Grant) and Ann Bostrom (UW)	Assessing Sea Level Rise Vulnerability	Determine the best practices for assessing vulnerability to inform HB1181 in Washington, which requires considering impact of SLR	-Develop consistent adaptable methods to use across locations. -Address defining what 'considering SLR' in shoreline master plans means. -Identify underutilized datasets. -Discuss challenges: funding constraints, insurance implications, barriers to integrating into policy.

Table #	Table Lead (Affiliation)	Title	Problem	Discussion Points
6	Jenna Tilt (OSU), Georgia Smith (Samaritan Health), and Diana Niño (Consejo Hispano)	Community Engaged Research in a New Political Climate	Determine how researchers need to adapt work and relationships with coastal community partners, in response to current fears	-Be creative with research approaches and prioritize the safety of the community. -Simplify the messaging researchers use and be direct and to the point with research questions and methods. -Continue to translate academic language into more digestible forms. -More time should also be given to relationships and community-building. -In communication with community members and with recruitment there is a need to change practices and be mindful, for example using secure communication strategies and holding events in private places.
7	Kelly Zupich (Island County, WA)	Unpermitted Shoreline Armoring: Adaptive Response to SLR	Address 95% unpermitted shoreline armoring	-Prioritize already unpermitted. -Remove licenses, increase enforcement. -More education. -Utilize HOAs, neighborhood-scale incentives. -Positive peer pressure through success stories.
8	Lauren van Vliet (UO)	Preserving Cultural Heritage in the Face of Disasters	Determine what heritage resources are and plan for how to protect them in Astoria, OR	-Determine whether to expand from traditional focus on buildings. -The team looked at a map of Astoria and thought through important resources to different groups of people. -Much of Astoria is at high tsunami and landslide risk. -Tribes consider certain natural resources as important cultural heritage. -Get help from Americorps VISTA, military interns, Indian health board. -Consider moving things out of the inundation zone but landslide risk is hard to mitigate.

Table #	Table Lead (Affiliation)	Title	Problem	Discussion Points
9	Madeleine Lucas (UW) and Julia Grossman (UW)	Effective Collaboration on Geohazards Sciences and Education with Tribes	Determine how to sustain the CCASE program long-term and expand tribal, governmental, and academic partnerships	-Many possible groups to connect with: coastal management programs, conservation districts, counties, WWU, Elwha and other tribes, the arts. -Publish curricula so it can be used elsewhere. -Keep continuity of students teaching students.
10	Meagan Wengrove (OSU), Jackson Blalock (Pacific Conservation District)	Visualizing Nature-Based Strategies in Willapa Bay	Assess communication coastal dynamics through drawings of nature-based erosion and beach restoration options like dynamic revetments, importance for grant focused on North Cove shoreline	-Suggestions for clearer communication in the drawings, such as showing why the revetment project is needed in the particular location. -Communicate how this issue will develop over time, but seasonality is not a significant concern. -Acknowledge benefits and tradeoffs of different approaches.
11	Michael Howard (UO) and Amanda Ferguson (UO)	Multi-hazard Evacuation Mapping	Determine how to make better multihazard evacuation maps for coastal communities	-Visitors rely on landmarks and orient by the coast which could cause confusion. -Decline in map reading skills→consider Google Maps layers, technology options-Suggested improvements to symbology and word choice. -Identify priority and more accessible routes. -Could consider combining for multi-hazard maps.

Table #	Table Lead (Affiliation)	Title	Problem	Discussion Points
12	Michael Tomlinson (University of Hawaii, retired)	Beyond Ham Radio- Getting Information to Residents	Determine how to accurately and efficiently disseminate information to residents in an emergency	-Hand-crank air raid sirens placed throughout area to tell people to pick up their radios. -Jurisdiction-wide cell alerts. -Education through schools, game based on real-life scenarios, radio club. -Build community around weekly check-ins
13	Mike Lindell (UW) and Haizhong Wang (OSU)	Tsunami Preparedness Lesson from the Nehalem Bay Drill	Strengthen partnerships with coastal communities when researching and modeling tsunami evacuation	-Tsunami evacuation preparation drills are important for coastal tsunami preparedness. -Self-selection of participants biases the sample (many had previous training). -Consider trying to recruit younger, lower income, and ethnic minority participants in future. -Oregon Department of Health Services could assist in diversifying the sample
14	Sanpisa Sritrairat (UW Sea Grant), Carrie Shofner (WSU Extension), Andrea Mah (OSU)	Integrating Economic Sustainability with Restoration and Mitigation in Wahkiakum County	Assess how to prioritize and plan for economic sustainability as a part of restoration plans	-Highlight costs of not taking action, look for case studies of instances of economic benefits. -Acknowledge the history and individual values. -Reframe barriers as challenges. -Help people navigate the bidding process, incorporate local workforce and local youth.

Table 2. *Summary Notes from Community Resilience Projects Roundtable Activity*

NETWORKING ACTIVITY

A networking activity on the Monday afternoon of the workshop was added based on feedback from the NCH calling for more structured networking opportunities. This activity allowed for organic dialogue between attendees at the workshop. Participants were sorted into tables based on the topics they hoped to discuss at the workshop, as noted in their registration forms, as well as an effort to ensure diverse representation across sectors at each table. At each table, participants were asked to jot down a description of a particular challenge they had encountered in their work, and place the note in a hat. The table was then given five minutes to discuss a specific challenge, which was selected randomly from the hat. This was repeated for several 5-minute rounds.

Examples of challenges discussed included: getting scientific models out into the community; finding integrating economic resiliency into coastal planning; motivating people to address the full suite of hazards related to groundwater, including pollution, septic tank problems, risks to habitat, flooding; and road infrastructure; communicating about chronic vs acute hazards; visualizing probabilistic hazard information; and making research outputs useful.

The activity allowed for attendees who might not have otherwise interacted to get to know each other and allowed fresh perspectives to enter into the problem-solving process. In the lively discussions of challenges, table members offered diverse approaches to tackling challenges, from examples of how other communities had tackled or solved such problems, resources from organizations dedicated to addressing specific problems (e.g., Hub-partners at the Ruckelshaus Center, and WSU and OSU extension for making research outputs useful), to ways of breaking down challenges to make them more manageable.

SUMMARY OF FINDINGS FROM SCIENCE INNOVATION CHALLENGE ACTIVITY

Research agenda brainstorming roundtables held on the second day of the workshop were organized around a subset of themes identified from last year's workshop. Table 3 summarizes the projects identified for each theme.

Theme		Goal	Method
Hazard Communi-cations	**Table 1**	Compare the effectiveness of two communication methods in improving comprehension of temporal and spatial hazard scale.	-Compare in an experiment: a control group, a community group with a map app, and a group from a community where colored bands on poles are placed to show inundation heights and frequencies for different inundation hazards (tsunamis, atmospheric river flooding). -Conduct pre- and post-intervention surveys
	Table 2	Foster a culture of preparedness by highlighting existing community strengths and linking preparedness efforts to both chronic and acute hazards	-Create a co-production workshop bringing together emergency managers, planners, and community members. -Create community inventory of assets and strategies, with timeline-based communications about different hazards, focusing on a positive framing.
Legal/ Policy Landscape of Hazards Resilience	**Table 1**	Develop a framework to evaluate shoreline permitting practices.	-Use evaluation criteria that include economic, social, and environmental impacts, community health and resilience, effects on individuals, businesses, and infrastructure, and the risk of maladaptation. -Incorporate community engagement on framework components
	Table 2	Update and expand on the 1993 study on coastal armoring practices in Oregon to assess alignment with state policies and regulatory goals	-Comparative analysis of regulatory approaches and impacts, assessing effectiveness of past practices and exploring alternatives. -Creating a science-based checklist of design criteria, best practices, and alternatives.

Theme		Goal	Method
Do Something	**Table 1**	Develop a dynamic hazard-adaptation matrix and cost-benefit analysis to help communities adapt to changing risks	-Incorporate three approaches, depending on the stage: 1) Pre-Event: secure funding, outreach, test strategies 2) Post-Flooding: leasing programs with tax incentives 3) Permanent Inundation: plan for relocation, buyouts, and raising homes
	Table 2	Improve livability into the future through education, hazard mitigation, and community engagement	-Use a community learning center for education and development of local leaders. -Focus on nature-based solutions, preventing construction in hazard zones, and ongoing monitoring and education. -In the future: conduct holistic hazard assessment, create a hazard viewer
Community Engagement		Support Clatsop County and other emergency management groups in conducting effective needs assessments to improve resilience	-Conduct meta-analysis and case studies in 4 communities evaluating existing practices. -Convene a practitioner summit to incorporate feedback and refine strategies. -Create a handbook on conducting needs assessments in Cascadia.
Community Capacity Building		Develop and test a conceptual model for adaptive capacity that focuses on individual community identities and strengths	-Identify existing efforts and engage communities to discuss assets. -Analyze case studies to develop model. -Train communities to apply the model.
Community Relevant and Informed Modeling Scenarios		Determine optimal locations for 9 additional Evacuation Assembly Points on the Oregon coast	-Incorporate existing mapping, probability modeling, accessibility, and land use factors into decisions. -Ensure community integration and communication about the process.

Theme	Goal	Method
Societal Factors that Impact Resilience	Analyze structures and preparedness in coastal communities to improve resilience and community-driven recovery efforts	-Evaluate preparedness in select pilot communities, identifying investment priorities and local partners. -Create simple training materials and staff training programs for key sectors.
Infrastructure and Land Management	Examine how different groups define and prioritize critical assets for disaster resilience	-Case study comparing inland and outer coastal communities. -Analyze GIS data to assess assets under threat, reviewing infrastructure work, and engage diverse stakeholders through conversations about asset priorities.

POST-WORKSHOP SURVEY AND OUTCOMES

SURVEY

The workshop feedback survey yielded overwhelmingly positive responses. When asked about their overall workshop experience, 85.3% of respondents said that it was either “The best workshop ever” (38.2%) or that it “exceeded expectations” (47.1%). Across all five questions related to the workshop’s main goals, over 85% of respondents indicated that the workshop either “Met all expectations”, “exceeded expectations”, or was the “best workshop ever” (Figure 1), with no one indicating that the workshop met none of their expectations. Over 80% of responses to the workshop goal of Building Adaptive Capacity were either “Met all expectations” or “Exceeded expectations,” and 1.5% said that it was the “Best Workshop Ever,” while 14.7% of respondents indicated that the workshop “Met most” of their expectations.

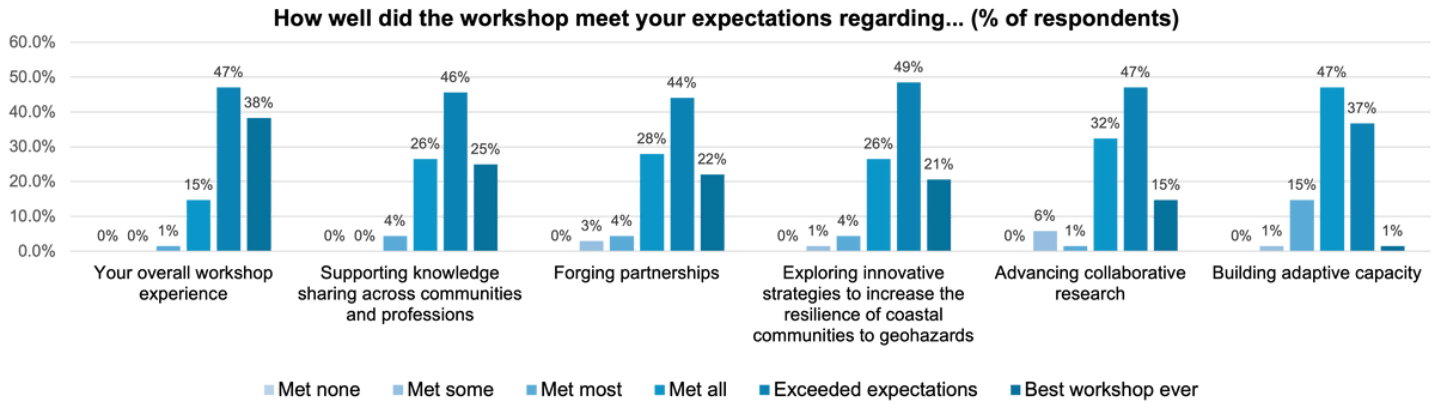


Figure 1. *Assessment of workshop sessions meeting participants’ expectations. Response options for each of these questions were (select one): Met none, Met some, Met all, Exceeded expectations, Best workshop ever.*

As Figure 2 shows, participants in aggregate found all of the workshop sessions useful to some extent. The most common response to the question "Which session at the workshop did you find most useful?" was the Community Resilience Roundtable Activity (71%), while the poster sessions (65%), Monday presentations on local resilience efforts (60%) and the Networking-Challenge Hackathon (57%) were rated among the most useful sessions by over half of attendees. Both presentations and interactive activities received high marks from attendees.

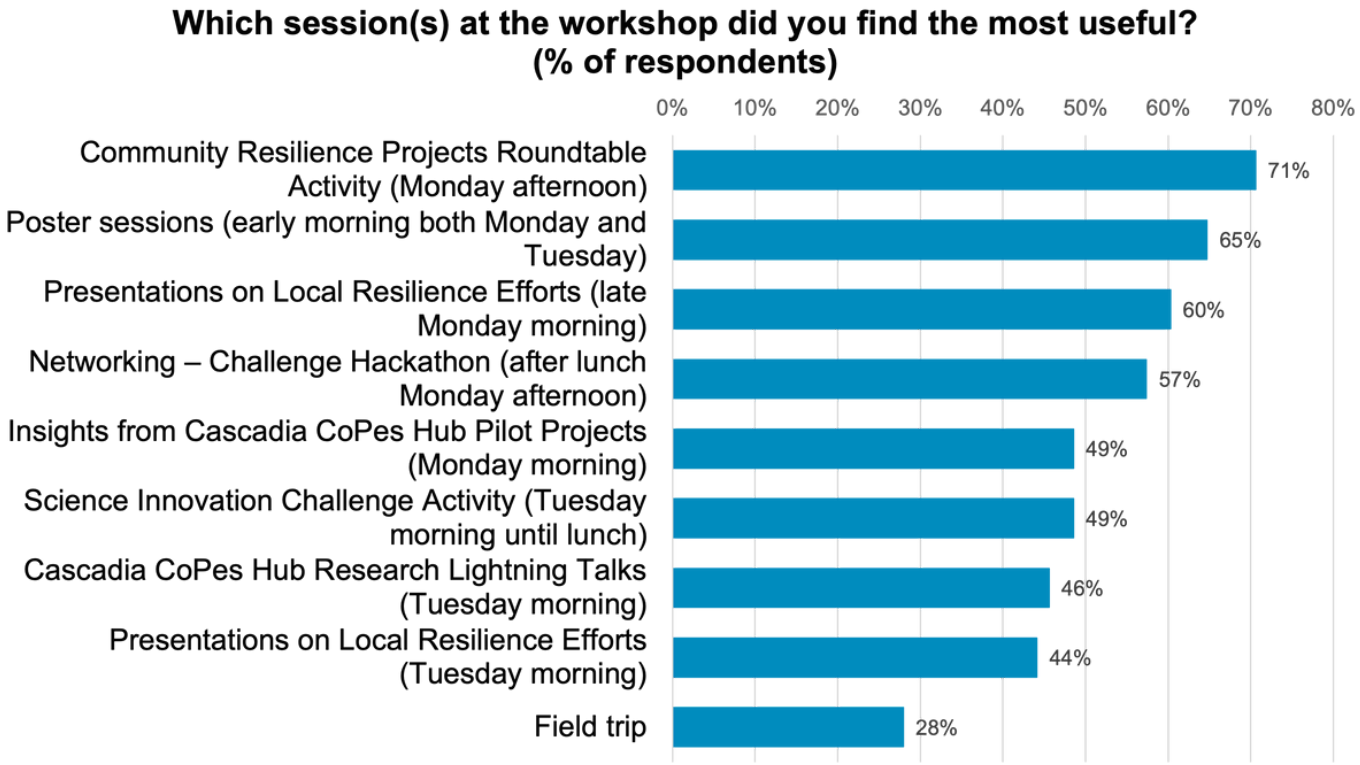


Figure 2. *Percentage of attendees identifying sessions as the most useful at the workshop (select-all-that-apply). Respondents could choose more than one option and thus percentages will not add up to 100. About half (67) of the participants registered for a field trip.*

A number of respondents (13% of recorded responses) to the workshop feedback survey indicated that they felt they represented a group or coastal community who could use additional assistance from the Cascadia CoPes Hub. Examples of calls for further assistance and collaboration included more funding for Hub programs including the Cascadia Culture & geoScience Exchange (CCASE) Program (a Cascadia Earthquake Research Science Center designation for a program that was initiated with Hub pilot project funding) and a request for a Traveling Researcher Road Show, as well as more collaboration with government research groups and community planning efforts.

Open-ended responses on the survey provided valuable contextualization and nuance to the tabulated results. A common thread was appreciation for the emphasis on interactive activities and networking opportunities. Many participants offered suggestions as to how these sessions could be improved to better facilitate connections, such as focusing objectives more to ensure that the short time frame is well utilized or better managing sound in the venue so that people can communicate more clearly with each other. Another common request was to emphasize even more the work of practitioners and projects on the ground that bring research into practice. Suggestions included seeking more representation from people engaged in work in the field, including Tribal nations, and making more time for presentation from these perspectives.

Although most open-ended comments praised the diversity of participation and views at the meeting, there were a few comments to the effect that it felt like academic voices dominated the posters and talks, and a few desiring more diverse perspectives, despite the fact that a minority of participants (and about a third of survey respondents) were from academia. Additionally, despite mixed feedback regarding sound quality and noise from adjacent tables during breakout discussions, the workshop venue received high praise from nearly all respondents.

TAKEAWAYS

Several common themes emerged in both presentations and discussions throughout the workshop. One important takeaway was that there is a continued need to bring scientific findings into the community, effectively communicate risk, and build connections amongst researchers, government officials, and community stakeholders. Discussions focused on innovative ways of presenting information (i.e. inundation maps on apps vs. flood-level markers on telephone poles) or bringing together the community in ways that are enjoyable and feasible (i.e. planned events with food and opportunities for socializing).

In addition, engaging communities not often incorporated in the scientific process, including youth or those who have been left out historically, as well as those who do not seek out connection with the scientific community or government, such as private homeowners and business owners, can be challenging but is important and should remain a priority in the future. As stated by Chandler Countryman of Washington Sea Grant during the workshop, "People don't care what you know until they know that you care". Finally, the researchers attending reiterated their strong commitment to continuing to produce cutting-edge coastal resilience research despite uncertainties around research funding.

WORKSHOP OUTCOMES

The positive responses from the workshop feedback survey indicated that the workshop successfully achieved its goals of: (1) building coastal community partnerships, leadership, and adaptive capacity and (2) advancing collaborative coastal resilience research. The intentionally structured interactive nature of the workshop was received favorably by participants; many called for even more interaction and opportunities for engagement in future workshops. The workshop successfully convened a large, heterogeneous group of researchers and practitioners across domains and career stages, and provided opportunities for collaboration not available in their daily professional settings. Indeed, nearly all respondents indicated that they had made a new contact and potential new collaborator at the workshop.

The annual gathering of the Cascadia CoPes Hub in April 2025 included follow-up activities that built on the findings reported here to achieve further progress toward the goals of building coastal community partnerships, leadership, and adaptive capacity, and advancing collaborative coastal resilience research.

SUMMARY AND NEXT STEPS

This workshop highlighted the importance of hazard communications and turning interdisciplinary science into actionable, community-centered solutions. Ideas ranged from using flood markers on telephone poles to integrating hazard data into user-friendly dashboards and apps. Participants emphasized the need to better engage historically excluded groups—including youth, Tribal communities, and private landowners—and reiterated the value of meeting people where they are, both physically and culturally. Survey feedback confirmed the workshop's success, with over 85% of attendees stating it met or exceeded their expectations, citing strong networking opportunities, interdisciplinary collaboration, and actionable takeaways.

Looking ahead, the Cascadia CoPes Hub will integrate lessons and opportunities identified at NCH2 into its ongoing work, including public seminars and efforts to broaden participation. The Hub is exploring plans for a third Navigating Coastal Hazards workshop in 2026, with guidance from its Community Advisory Council. Additional efforts—such as a proposed Traveling Researcher Road Show and expanded support for programs like the Cascadia Culture & geoScience Exchange—will continue building bridges between research and practice, with a focus on inclusive, community-driven resilience solutions.

ACKNOWLEDGEMENTS

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SUGGESTED CITATION

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**authors listed in reverse-alphabetical order*

July 9, 2025

APPENDIX I

WORKSHOP AGENDA

NAVIGATING COASTAL HAZARDS 2 WORKSHOP AGENDA

FEBRUARY 10-11, 2025

THE LOFT AT THE RED BUILDING 20 BASIN ST. ASTORIA, OR

Time	Agenda
Day 1	**February 10th, 2025**
8:00 - 9:00 AM	Registration Open - Entrance to The Loft Breakfast (eggs, potatoes, + pastries) coffee, and tea served
9:00 - 9:30 AM	Welcome and Introductions
9:30 - 10:15 AM	**Poster Session Part I** Poster titles and authors pgs. 5-7.

10:15 - 11:05 AM	**Insights from Cascadia CoPes Hub Pilot Projects** "Visualizing dynamic processes and social-ecological systems to advance coastal resilience action" - Jackson Blalock (WA Pacific Conservation District) + Meagan Wengrove (OSU) "Building STEM Identities and Resilience: Community-Driven Earthquake Monitoring at the Quileute Tribal School" - Maddy Lucas (UW) "Building Multi-hazard Evacuation Map Prototypes for Coastal Communities" - Jenna Tilt (OSU) and Michael Howard (UO)
11:05 - 11:25 AM	Break
11:25 - 12:10 PM	**Presentations on Local Resilience Efforts** "Increasing Community Resilience through Washington State Inter- agency Coastal Hazard Organizational Resilience Team (COHORT)" - Sanpisa Sritrairat (WASG), Ellen Chappelka (WA EMD), and Sam Giannakos (WA ECY) "Community-Based Coastal Resilience Action along the Lower Columbia River" - Chandler Countryman (WASG) "Expansion of the Coastal Storm Modeling System (CoSMoS) into Cascadia" - Patrick Barnard (USGS)
12:10 - 1:00 PM	Lunch
1:00 - 2:00 PM	**Networking Activity - Challenge Hackathon** Network with your peers while providing advice and feedback to each other's challenges
2:15 - 2:45 PM	Round 1- Roundtable Activity

2:45 - 3:00 PM	Break
3:00 - 3:30 PM	Round 2- Roundtable Activity
3:30 - 4:00 PM	Round 3 - Roundtable Activity
4:00 - 4:30 PM	Wrap up and close
4:30 - 8:00 PM	**Happy Hour and Dinner** Please join us for happy hour and appetizers followed by a buffet dinner at The Bridgewater Bistro restaurant below The Loft venue. Happy hour will be a no-host cash / card bar.
Day 2	**February 11th, 2025**
8:00 - 8:30 AM	Registration Open - Entrance to The Loft Breakfast (eggs, potatoes, + pastries) coffee, and tea served
8:30 - 8:45 AM	Welcome and Day 1 Recap
8:45 - 9:15 AM	**Poster Session Part II** Poster titles and authors pgs. 5-7.

9:15 - 10:00 AM	**Cascadia CoPes Hub Research Lightning Talks**
9:15 - 9:30 AM	**Team 1** "Improving estimates of cascading hazards in the Cascadia Subduction Zone through 3D ground motion simulations" - Audrey Dunham (USGS) "Landslide Dam Susceptibility" - Paul Morgan (UW) "Connectivity and Coastal Infrastructure Performance Following the Big One" - Amina Meselhe (OSU)
9:30 - 9:45 AM	**Team 2** "Overview of the Cascadia CoPes Hub Team 2 (Inundation and Coastal Change Hazards) research and engagement" - Ian Miller (WASG) "Beachgrasses, sand, and coastal dunescapes: From shifting sands to flood risk protection" - Sally Hacker (OSU) "Modeling the effects of combined river and coastal flooding" - Wuming Ni (UW)
9:45 - 10:00 AM	**Team 3** "Living With Water: Co-Creating Flood Adaptation Strategies in Seattle's Duwamish Valley" - Maja Jeranko (UW) "Identification of Community Assets: A Survey of Coastal Oregonians' Priorities for Natural Hazard Preparedness" - Andrea Mah (OSU) "Using Drones as a Tool for Community Asset Mapping and Youth Engagement" - Matias Korfmacher (UW)

10:00 - 10:45 AM	**Presentations on Local Resilience Efforts** "Vertical Structures and Other Tsunami Evacuation Improvement Options in Seaside and Cannon Beach, Clatsop County, OR" - Laura Gabel (DOGAMI) "Outreach Efforts to the Hospitality Industry on the Oregon Coast: Survey & Custom Tsunami Evacuation Maps" - Felicia Olmeta Schult (ORSG) "A conversation on Hazard Mitigation Planning in Cascadia"- Evan Mix (UW), Jenna Tilt (OSU), Viven Coop (Swinomish Tribe)
10:45 - 11:00 AM	Break
11:00 - 12:30 PM	**Science Innovation Challenge Activity**
12:30 - 12:45 PM	**Wrap Up** Boxed lunches provided to-go including VG/V options
1:15 PM	**Field Trips Start** "Exploring Tsunami History: Core Sampling and Insights at Cannon Beach" Leads: Laura Gabel, Coastal Field Geologist, DOGAMI and Carrie Garrison-Laney, Coastal Hazards specialist, WA SeaGrant "Shoreline Resilience: Exploring Baker Bay's Coastal Challenges and Strategies" Lead: Jackson Blalock, Marine & Estuarine Resilience Program Manager, Pacific Conservation District

FIELD TRIP DETAILS

Field Trip 1: Exploring Tsunami History: Core Sampling and Insights at Cannon Beach

Abstract: Join us for an exciting hands-on experience as we collect a tsunami core sample from Cannon Beach, Oregon. You'll have the chance to see buried soils and tsunami sand layers firsthand, while learning about DOGAMI's tsunami modeling efforts that began in this very area. Afterward, we'll gather by the marsh to discuss the core and the science behind it, offering a unique perspective on the region's natural history.

Leaders: Laura Gabel, Coastal Field Geologist, DOGAMI and Carrie Garrison-Laney, Coastal Hazards specialist, WA SeaGrant

Field Trip 2: Shoreline Resilience: Exploring Baker Bay's Coastal Challenges and Strategies

Leader: Jackson Blalock, Marine & Estuarine Resilience Program Manager, Pacific Conservation District

Abstract: Join us for a dynamic field trip along the Baker Bay shoreline, where we'll explore coastal resilience efforts firsthand. Stops include sites around the town of Chinook: large wood installations by Pacific Conservation District, discussions on sedimentation issues at the Port of Chinook, erosion impacts at Chinook County Park, and climate planning at Fort Columbia State Park. We'll hear perspectives from the Pacific Conservation District, Port of Chinook, Washington State Parks, and the Chinook Indian Nation.

POSTER DETAILS

Posters can be viewed online here

Poster Number	Author	Title
1	Abigail Gertz	Adaptation Planning for Sea Level Rise in Grays Harbor County
2	Carson Williams	Probabilistic Compound Flood Modeling on the Oregon Coast
3	Avery Maverick	Puget Sound Sea Level Rise Vulnerability
4	Ian Clifford	Exploring a novel invasive hybrid beachgrass in Pacific Northwest dunes: from genes to dunescapes
5	Greg Curtiss	Nature Based Coastal Design to Reduce Coastal Erosion and Flooding in Washington
6	Ryan Chiu	Remotely sensed inundation maps to support community planning and flood modeling
7	Meagan Wengrove	Coastal Engineering with Nature at the Interface Between Best Available Science, Engineering, Management, and Community Need
8	Paul Morgan	Estimating landslide dam susceptibility for Oregon Coast Range rivers
9	Cait Goodwin	Tsunami Quests: Self-guided outdoor hunts designed to increase situational awareness

10	Audrey Dunham	The cascading impacts of megathrust earthquakes: linking ground shaking and tsunami modeling in the Cascadia Subduction Zone
11	Daniel Eungard	Washington Geological Survey: Tsunami hazard modeling & real-world applications
12	Amina Meselhe	Connectivity and Coastal Infrastructure Performance Following a Cascadia Subduction Zone Multi-Hazard Event
13	Haizhong Wang	Evacuation Time Estimates for Life Safety in Tsunami Hazards
14	Chenqiang Liu	Assessment of Tsunami Evacuation Preparation Time for Coastal Communities
15	Laura Hanson	Statewide seismic islands development with Oregon Department of Human Services
16	Julia Grossman	Linked Earthquake and Tsunami Hazard Modeling on Puget Sound's Crustal Faults
17	Benjamin Newman	Building a Coastal Resilience Program Across Southwest Washington
18	Andrea Mah	Cascadia Community Participatory Resilience to Coastal Hazards

19	John Downes	Shake It Off? Understanding Psychosocial Determinants of Household Earthquake Adjustment on the US West Coast Through a Place-Conscious Perspective
20	Joshua Blockstein	“Todos Preparados” Culturally Responsive Emergency Preparedness for Coastal Communities
21	Madeleine Lucas	Cascadia Culture and geoScience Exchange Program
22	Najiba Rashid	Impacts of post-disaster debris management in coastal communities
23	Michael Tomlinson	Beyond ham radio - Getting the information to residents
24	Zhenqiang Wang	Assessing alternative adaptation pathways to multi-hazard coastal resiliency under climate change
25	Roxanne Carini	Beach Change Art Show: Partnering with Local Artists to Communicate Research Results

APPENDIX II

ORGANIZING COMMITTEE

Alessandra (Ali) Burgos - Project Manager, Cascadia CoPes Hub - alessandra.burgos@oregonstate.edu

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Anna Pearson - PhD Student, University of Washington

Amina Meselhe - PhD Student, Oregon State University

Felicia Olmeta Schult - Coastal Hazards Specialist, Oregon Sea Grant

Haizhong Wang - Professor, Oregon State University

Audrey Dunham - Research Geophysicist, United States Geological Survey

Meagan Wengrove - Professor, Oregon State University

Ian Miller - Coastal Hazards Specialist, Washington Sea Grant

Laura Gabel - Coastal Geologist, Oregon Department of Geology and Mineral Industries

Chandler Countryman - Resilience and Adaptation Specialist, Washington Sea Grant

Jackson Blalock - Marine and Estuarine Resilience Program Manager, Pacific Conservation District

Andy Clifford - Partnerships and Applications Program Manager (CRESCENT)

Ian Keene - Research Planner/GIS Analyst, Confederated Tribes of Siletz Indians