

# Appendix C: Project Inventory Analysis

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## Washington Coast Resilience Action Demonstration Project

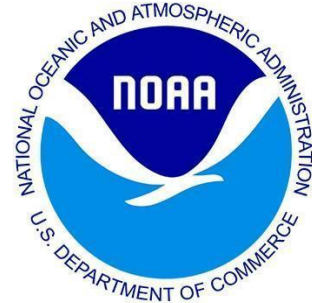
Shorelands and Environmental Assistance Program  
Washington State Department of Ecology  
Olympia, WA

&

Washington Sea Grant  
Seattle, WA

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**The Resilience Action Demonstration Project (RAD)** was a 24-month (2019–2021) pilot program that enhanced local capacity to address coastal hazards issues across Washington’s Pacific Coast. The RAD team tested the logistics of the proposed inter-agency Coastal Hazards Organizational Resilience Team (COHORT) and gathered lessons learned for the implementation of a long-term COHORT initiative. In doing so, the RAD team advanced community-driven hazards resilience projects by connecting communities with scientific and technical expertise, coordinated agency support, and funding. Through research, outreach, and targeted support for locally driven projects, the RAD team identified strategies for improving and better coordinating state hazards assistance to Washington’s coastal communities, in service of long-term pre-disaster risk reduction and resilient communities.

The RAD was conducted as a partnership between Washington’s Coastal Zone Management Program, housed at the Washington State Department of Ecology, and Washington Sea Grant. Many partners and collaborators were instrumental in the success of the RAD. They are listed in the acknowledgments section of the final report.

A Coastal Zone Management Project of Special Merit grant from the NOAA Office for Coastal Management (grant #NA19NOS4190144) provided primary funding for the RAD.

Additional information about the report and its appendices can be found on the [RAD webpage](https://wacoastalnetwork.com/resilience-action-demonstration-project/),<sup>1</sup> which is hosted by the Washington Coastal Hazards Resilience Network.

**Appendix C cover image credit:** Jackson Blalock / Washington Sea Grant, 2018

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<sup>1</sup> <https://wacoastalnetwork.com/resilience-action-demonstration-project/>

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# Introduction

## Purpose of the RAD Project Inventory Analysis

This appendix describes projects inventoried during the RAD team’s initial outreach to local organizations, government agencies, and Tribes from the coastal hazards resilience community of practice across Washington’s Pacific Coast. This initial outreach informed project strategy and ensuing products (see Appendix B: Outreach Analysis for more information) and produced an inventory of coastal hazards risk reduction projects across Washington’s Pacific Coast. This appendix provides a summary analysis of the inventoried projects. The complete project inventory is not included and is not published in order to protect sensitive information.

The goals of the Project Inventory Analysis were to:

- Document the status of coastal hazards-related projects across the Pacific Coast of Washington State.
- Identify specific opportunities to support coastal hazards resilience across the region and, in combination with the Resilience Principles for Coastal Hazards Projects (Appendix C), inform the selection of priority resilience projects for the RAD team to support (Appendix E: Support for Hazards Resilience Projects).

## Use of the project inventory beyond the RAD

The project inventory was used to inform next steps and deliverables for the RAD. However, the RAD team also expects the inventory to be useful for the continued work of coastal resilience practitioners, policy-makers, and community members. State agencies, outreach organizations, or the proposed COHORT (if implemented) may find the inventory particularly useful for connecting projects to available funds, related projects, and other resources. These entities could use the existing inventory as a starting point, updating the inventory as necessary to reflect newly identified coastal hazards resilience projects that are ready to move forward or that will require additional support from state agencies.

In furtherance of this work, the Washington Coastal Hazards Resilience Network (CHRN) website hosts all documents and tools from the RAD on the [RAD webpage](#).<sup>2</sup> Contact the authors of the RAD report to contribute to the project inventory, request project assistance, or discuss this work.

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<sup>2</sup> <https://wacoastalnetwork.com/resilience-action-demonstration-project/>

## Methods

RAD outreach began in fall 2019 and continued through the project's completion in 2021. This appendix describes coastal hazards projects inventoried through RAD's initial 2019–2020 outreach. During this initial outreach phase, coastal community members described projects at various stages of progress, from problem identification to monitoring and assessment. A conversation guide was used in all interviews with coastal hazards project proponents and other community members to produce comparable qualitative data (see Figure C-1). For a full description of outreach methods, see Appendix B: Outreach Analysis.

The RAD team also reached out to grant programs included in the RAD's analysis of funding programs (Appendix A), in order to inventory projects that were not funded.

Tracking code: _____	
Interviewee: _____	
1. Issue:	
coastal flooding / riverine flooding / sea level rise / tsunami / erosion / landslide / earthquake	
2. Specific location:	
beach or tideflat / bluff / impervious / fortified / rocky / wetland /// embayment / coast / riverine	
3. Future conditions:	
4. Parties impacted:	
5. Effort toward a solution:	
6. Parties involved (local, agencies, etc.):	Contact info:
city / county / federal / private / state / tribal	
7. Status (progress and funding):	
risk evaluation / scoping + design / implementation / assessment	
8. Hurdles (permits, timing, coordination, attempted funding, etc.):	
9. Research, reports, maps, etc:	
10. Related projects or issues:	Tracking code:

Figure C-1. The conversation guide used to collect information on coastal hazards projects during initial RAD outreach.

## Analysis of the Project Inventory

The following figures and takeaways describe the location and other characteristics of projects inventoried through the RAD. A total of 177 locally driven coastal hazards projects were inventoried. Because the RAD sought to support local coastal hazards resilience efforts, the project inventory consists of projects developed by local organizations, Tribes, state agencies, and federal agencies that own or manage land along the coast. Projects were defined as actionable efforts to reduce coastal hazards risk and may or may not currently have an active project proponent. During conversations, efforts were made to focus on actionable efforts rather than simply descriptions of risk. Some, but not all, of these projects overlap with actions described in county or Tribal Hazard Mitigation Plans.

The inventory represents project information gathered through the RAD team's outreach work. It does not represent a comprehensive list of all potential or ongoing hazards projects on the Pacific Coast of Washington. Due to the sensitivity of some projects and private information contained within the project inventory, the full list of projects is not included in this appendix; however, the information contained within the inventory is summarized here. Please contact the authors of this report for additional information.

### Location of coastal hazards projects

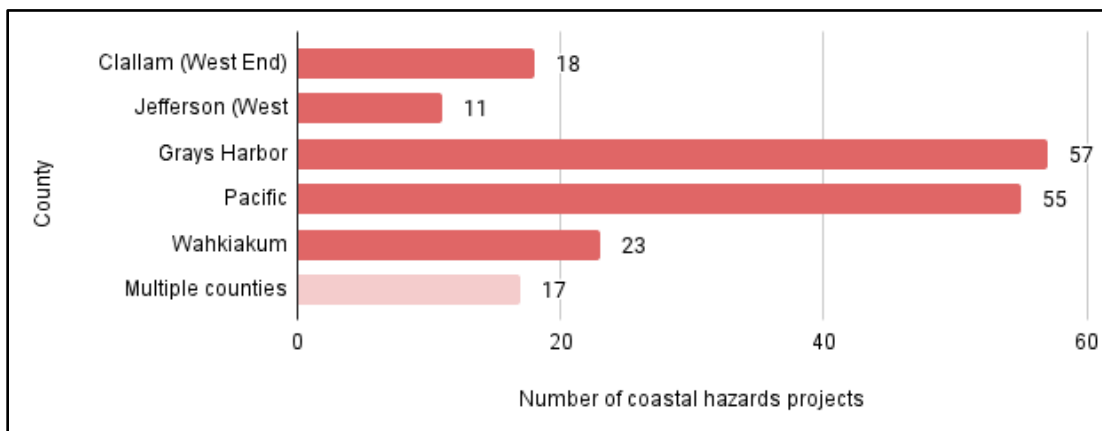


Figure C-2. Location of inventoried coastal hazards projects.

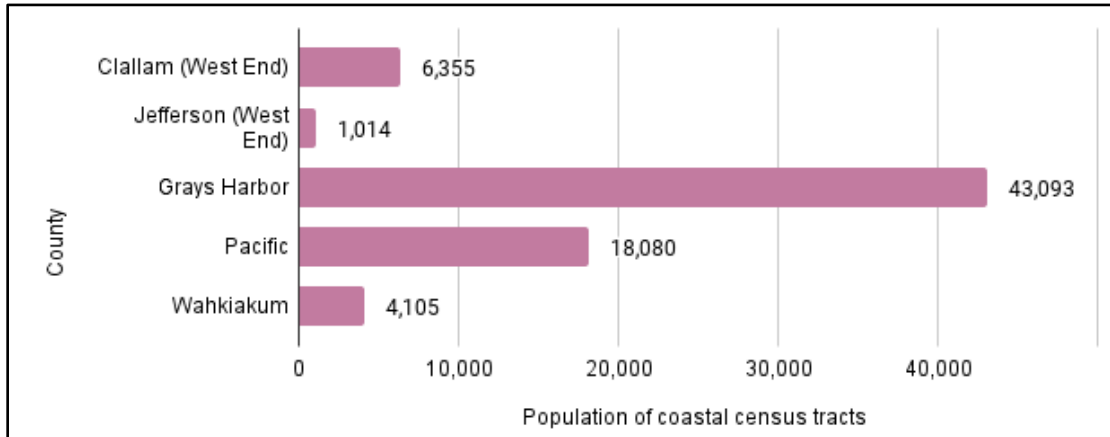


Figure C-3. Population by county on the Pacific Coast of Washington.

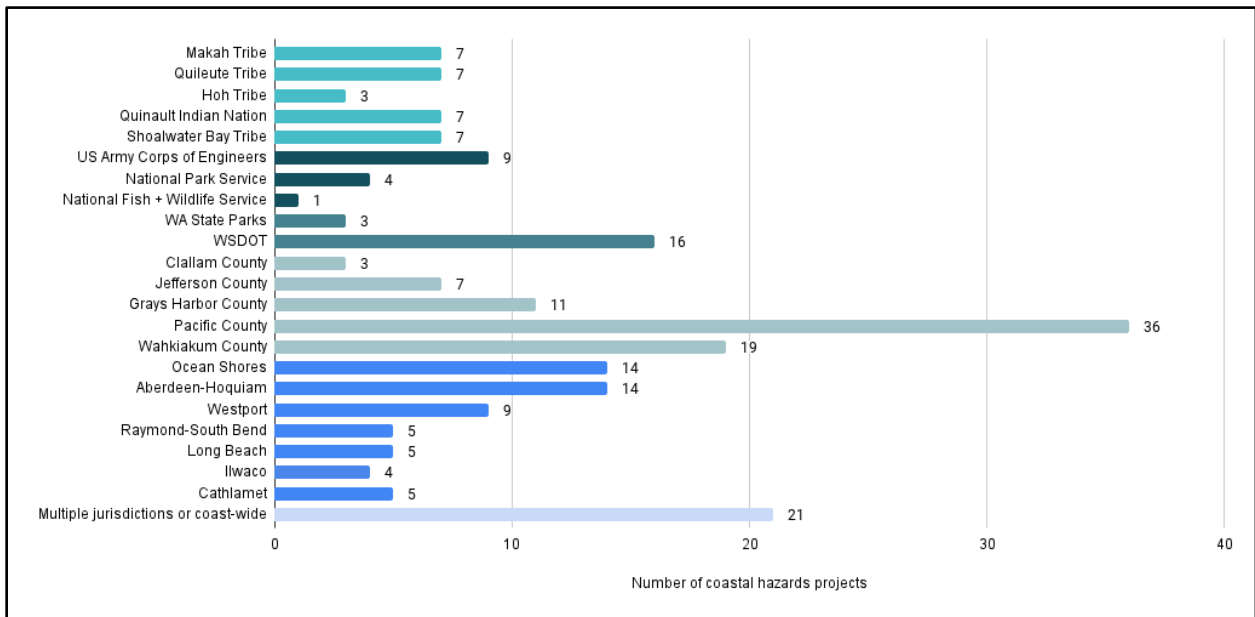


Figure C-4. Project holders of inventoried coastal hazards projects. For the purposes of the assigning “project holders,” the appropriate county was designated as the project holder for projects that are located in unincorporated areas, are led by county emergency managers, or are under jurisdiction of a county special district. Many projects involve multiple jurisdictions, and these overlaps occur particularly when WSDOT and USACE are involved. “Multiple jurisdictions or coast-wide” includes projects that span large areas, outreach projects that do not involve a land-owning jurisdiction, and generalized projects that do not yet have project-holders.



## Project characteristics

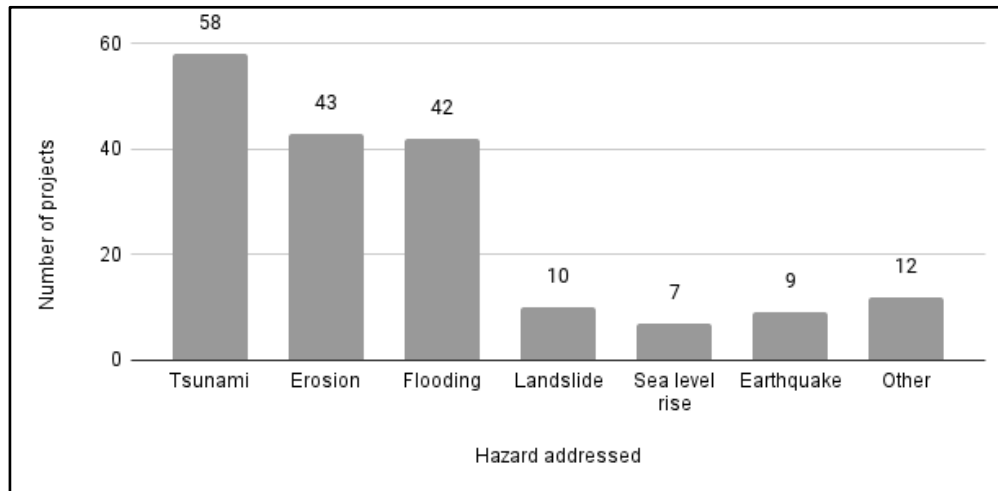


Figure C-5. Hazards addressed by inventoried coastal hazards projects.

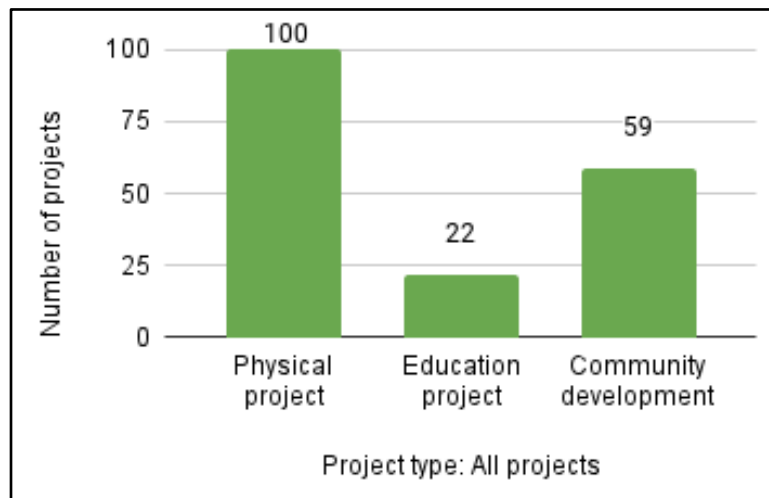


Figure C-6. Inventoried coastal hazards project types.

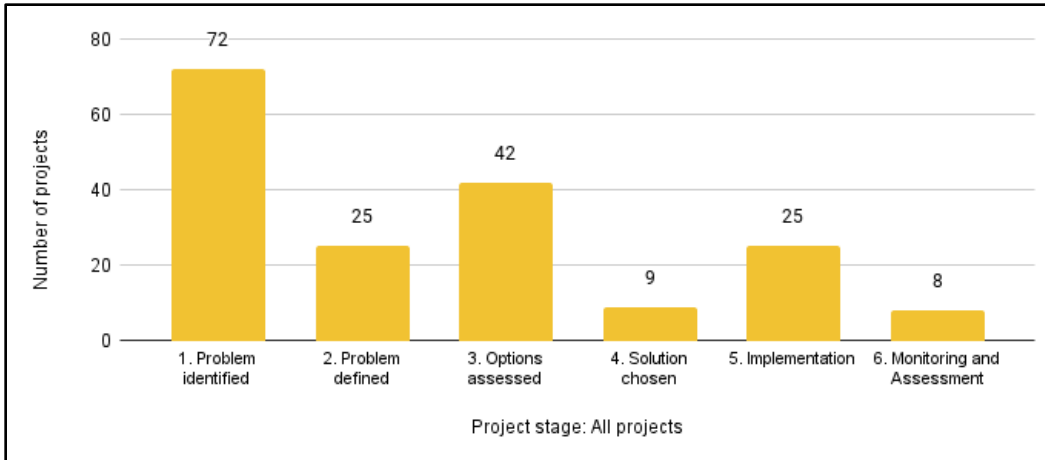


Figure C-7. Current stage of inventoried coastal hazards projects. Stages 1 and 2 constitute the “risk evaluation and characterization” stage, while stages 3 and 4 constitute the “project scoping and design” phase.

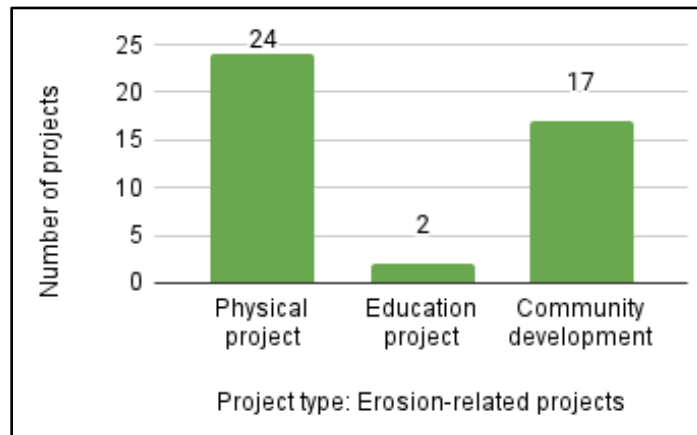


Figure C-8. Types of inventoried erosion-related projects.

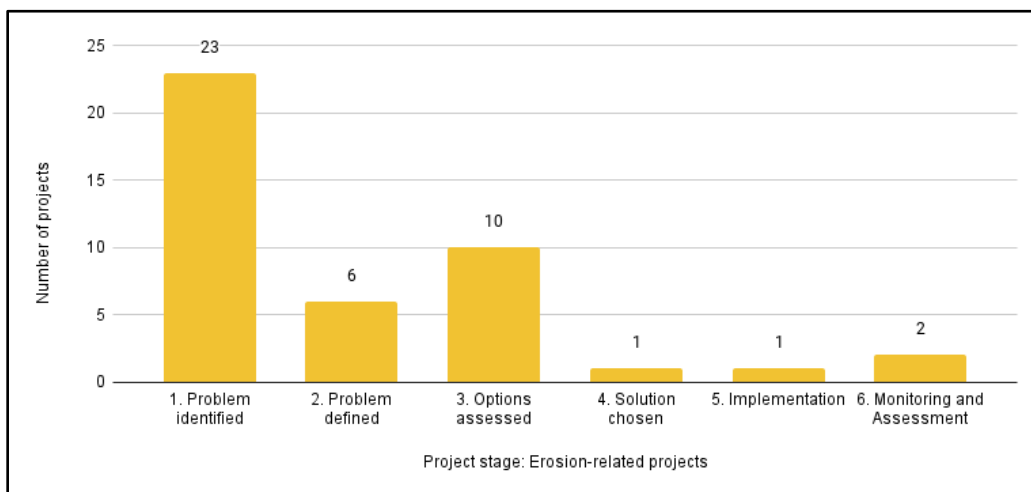


Figure C-9. Current stage of inventoried erosion-related projects.

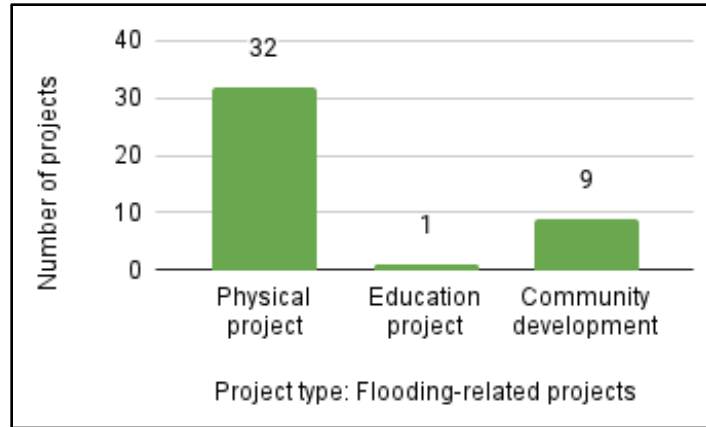


Figure C-10. Types of inventoried flooding-related projects.

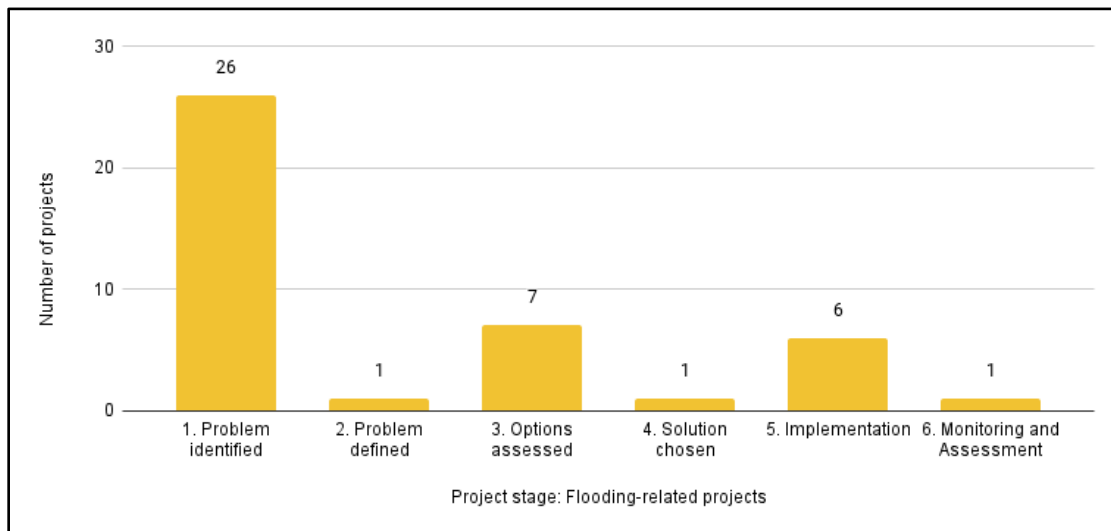


Figure C-11. Current stage of inventoried flooding-related projects.

County	Percent Population in the Floodplain
Grays Harbor	33.91%
Skagit	23.92%
Garfield	22.08%
Pacific	18.11%
Columbia	16.19%
Wahkiakum	14.04%

Figure C-12. Percent of county populations living in floodplains. Out of 39 counties in the state, three counties in southwest Washington (Grays Harbor, Pacific, and Wahkiakum) are ranked in the top six with regard to the highest percentages of the population living in floodplains. In terms of overall population, Grays Harbor County has the state's third highest number of people living in floodplains. Jefferson and Clallam Counties rank significantly lower, as both have 2.67% of their population in floodplains. Image adapted from Washington RiskMAP's 2018 Business Plan.

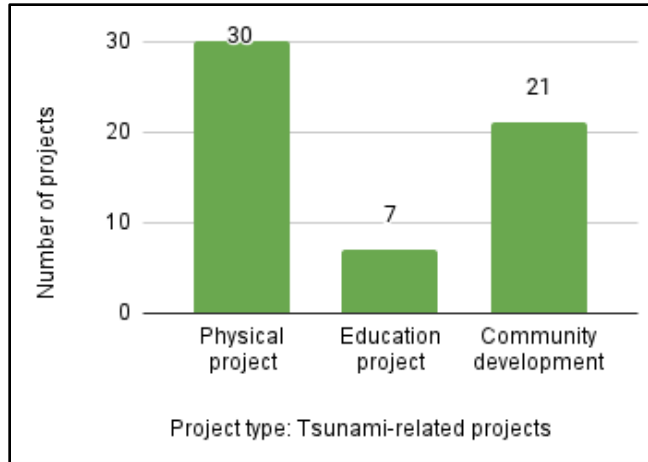


Figure C-13. Types of inventoried tsunami-related projects.

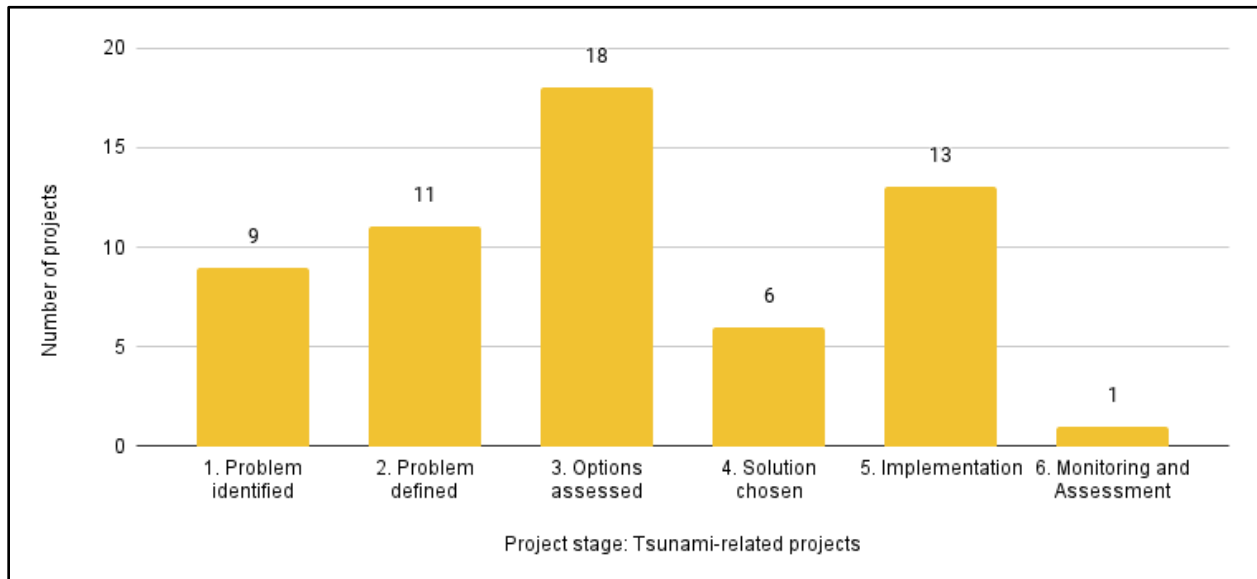


Figure C-14. Current stage of inventoried tsunami-related projects.

## Takeaways

- The number of coastal hazards projects identified in each county (Figure C-2) roughly reflects each county's population size (Figure C-3). However, Pacific and Wahkiakum Counties have a disproportionately high number of coastal hazards projects for their populations. This may be due to a higher exposure to coastal hazards, a more proactive approach to addressing coastal hazards risk, a higher rate of response to the RAD team's inquiries, or a combination of these factors when compared to other counties.
- Projects most frequently lie in the jurisdiction of Tribes, counties, incorporated cities, and WSDOT. WSDOT is often mentioned as a potential state agency partner for projects (16 projects, approximately 10% of the entire project list), but is not listed as a potential COHORT state agency by the 2017 Washington State Coast Resilience Assessment. Other state and federal agencies have roles within a smaller number of projects. These are generally cited with more frequency in areas with higher population density and resulting infrastructure density. Pacific County is the project holder for the highest number of projects. This may be a result of the area's rural nature and the multiple organizations that fall under county jurisdiction (special districts, emergency management, and many unincorporated areas).
- A large number of projects span multiple jurisdictions. The proposed COHORT could provide vital cross-jurisdictional coordination to support these projects.
- Interviewees often described multiple projects that were adjacent to each other and/or addressed related issues. This highlights a piecemeal approach, which can result from conducting emergency response or repair projects, rather than developing plans that address issues across a geography in a holistic and coordinated manner. Developing overarching plans and coordinating adjacent projects could leverage the expertise and perspectives of a variety of partners, improve cost-effectiveness, and promote proactive adaptation efforts that provide long-term, multi-benefit solutions.
- There were many more inventoried physical projects and community development projects than education projects. However, previous outreach across the same geography through the [Washington Coastal Resilience Project](#)<sup>3</sup> highlighted education and multi-generational collaboration as a priority in order to address hazards in a more resilient fashion. This contrast may be due to the priorities of the interview subjects that were interviewed through the RAD team's outreach efforts or limited capacity to connect educational programs to local coastal hazards issues. The COHORT may be more effective in supporting resilience by supporting and facilitating local educational programs and building partnerships with organizations and agencies that focus on education and youth development.

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<sup>3</sup> The 2016–2020 Washington Coastal Resilience Project (WCRP) increased the state's capacity to prepare for natural hazards that threaten the coast: <https://wacoastalnetwork.com/washington-coastal-resilience-project/>

- Erosion, flooding, and tsunami projects are by far the most common projects inventoried (Figure C-5). These projects often encompass earthquake, landslide, and sea level rise issues as well. By supporting erosion, flooding, and tsunami projects, state agencies may also assist in addressing earthquake, landslide, and sea level rise issues—and provide lessons learned for addressing all of these hazards via the COHORT. Environmental education and local educational capacity were regularly mentioned as local priorities during RAD outreach.
- Grays Harbor, Pacific, and Wahkiakum have disproportionately high percentages of residents living in floodplains when compared to all other counties in Washington, providing opportunities for engagement and project development. However, these counties are under-represented in [Floodplains by Design](#),<sup>4</sup> Washington State’s grant program that funds collaborative multi-benefit floodplain management; only one Floodplains by Design project was located in this region between 2013–2015, out of approximately 40 total projects funded by the program. Further outreach and project development in these southwest Washington counties may highlight ways to connect to Floodplains by Design and other funding programs.
- Tsunami-related projects are largely further along in the project development process than erosion- and flooding-related projects. This indicates that tsunami-related project assistance should be primarily focused on project design and implementation and that erosion- and flooding-related project assistance should be primarily focused on problem identification and project scoping. This may reflect limited local capacity for scoping flooding and erosion projects, which do not have dedicated state support, and greater (but still limited) capacity for scoping tsunami projects, which does have dedicated state support through Washington State Emergency Management Division. Not all hazards projects inventoried were in these project phases, however, and specific strategies for assistance should be catered to each community and context.
- Coast-wide, project proponents are overburdened. However, certain geographic areas may be more limited in their ability to build hazards resilience than others. The [United States Environmental Protection Agency’s environmental justice screening and mapping tool \(EJSCREEN\)](#)<sup>5</sup> can help link potential hazards projects with environmental justice considerations. For example, many census tracts with high percentiles of low-income populations (above 70th percentile) held potential projects. In several of these areas, however, the RAD team was unable to forge relationships in support of project development. This may be due to limited local capacity to collaborate on project scoping efforts. Coordinated assistance efforts (such as the COHORT) could use existing data and additional outreach to examine the environmental justice implications of hazards risks and impacts on the Pacific Coast. This could inform targeted assistance to communities and Tribes that are most disadvantaged in their ability to address hazards resilience issues.

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<sup>4</sup> <http://www.floodplainsbydesign.org/>

<sup>5</sup> <https://www.epa.gov/ejscreen>

## Maps of Coastal Hazards Projects

The following figures display the mapped location of coastal hazards projects inventoried by the RAD team. Figure C-15 provides a legend for the map symbols. Figure C-16 displays all inventoried hazards projects, while Figures C-17 through C-19 display inventoried projects for specific hazards addressed.

Coast-wide projects and other projects that do not have a specific geographic location (such as some emergency management efforts) are omitted from these maps.








Icon used on map	Primary hazard addressed by project at this location
	Flooding
	Sea level rise
	Erosion
	Landslide
	Earthquake
	Tsunami
	Other

Figure C-15. Map legend for Figures C-16 through C-19.



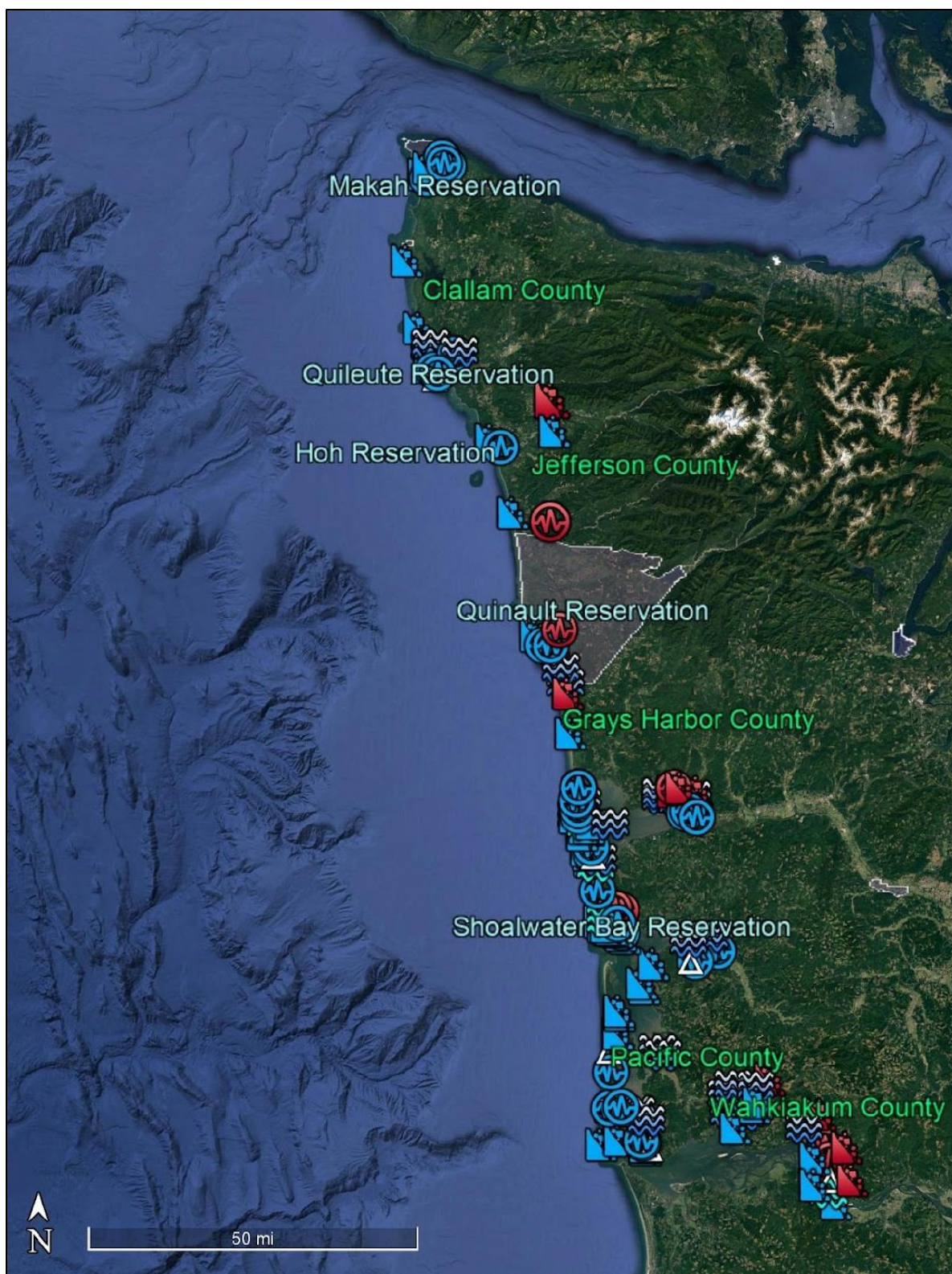


Figure C-16. Coast-wide distribution of coastal hazards projects inventoried through the RAD. Background image adapted from Google Earth.



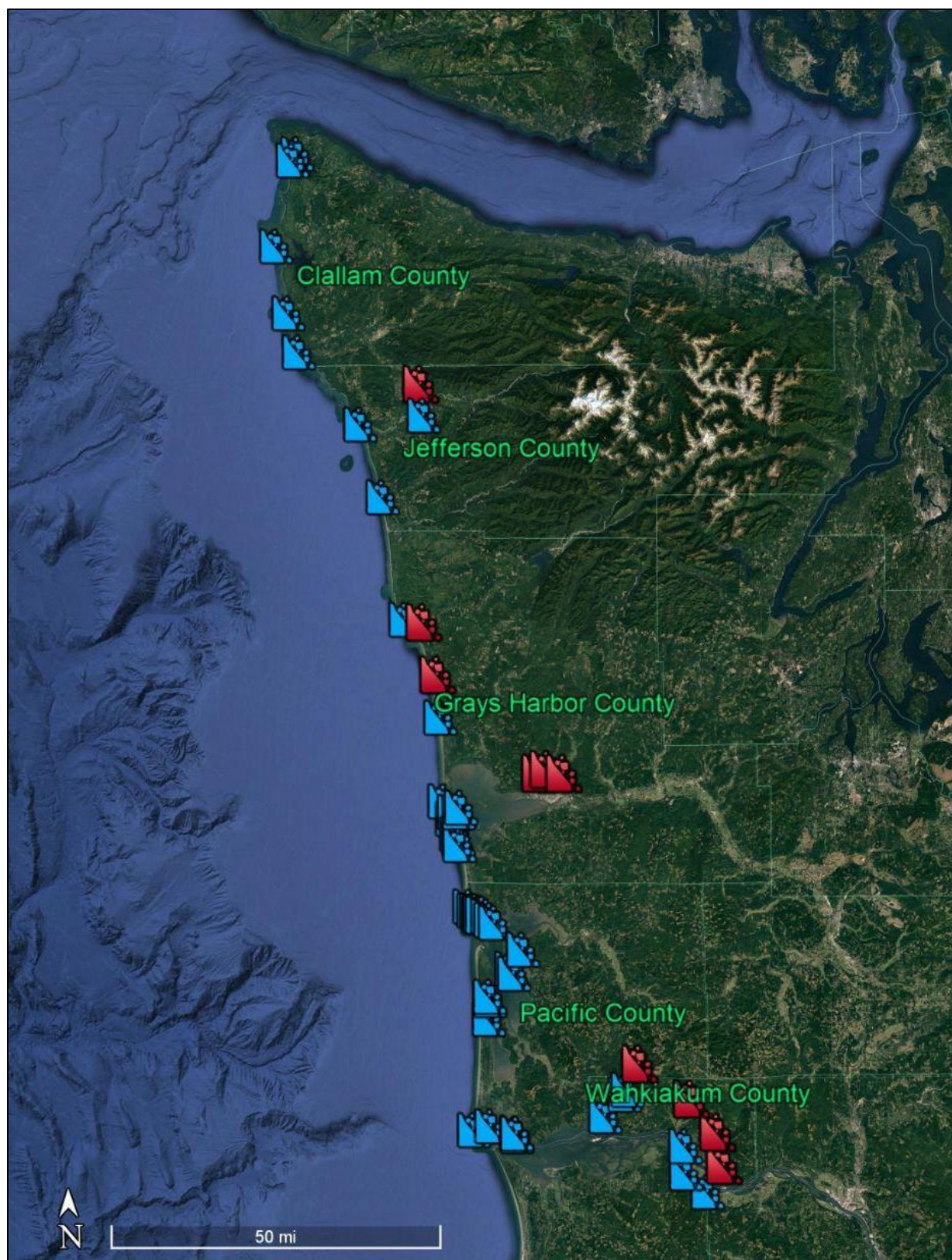


Figure C-17. Coast-wide distribution of erosion and landslide projects inventoried through the RAD. Background image adapted from Google Earth.



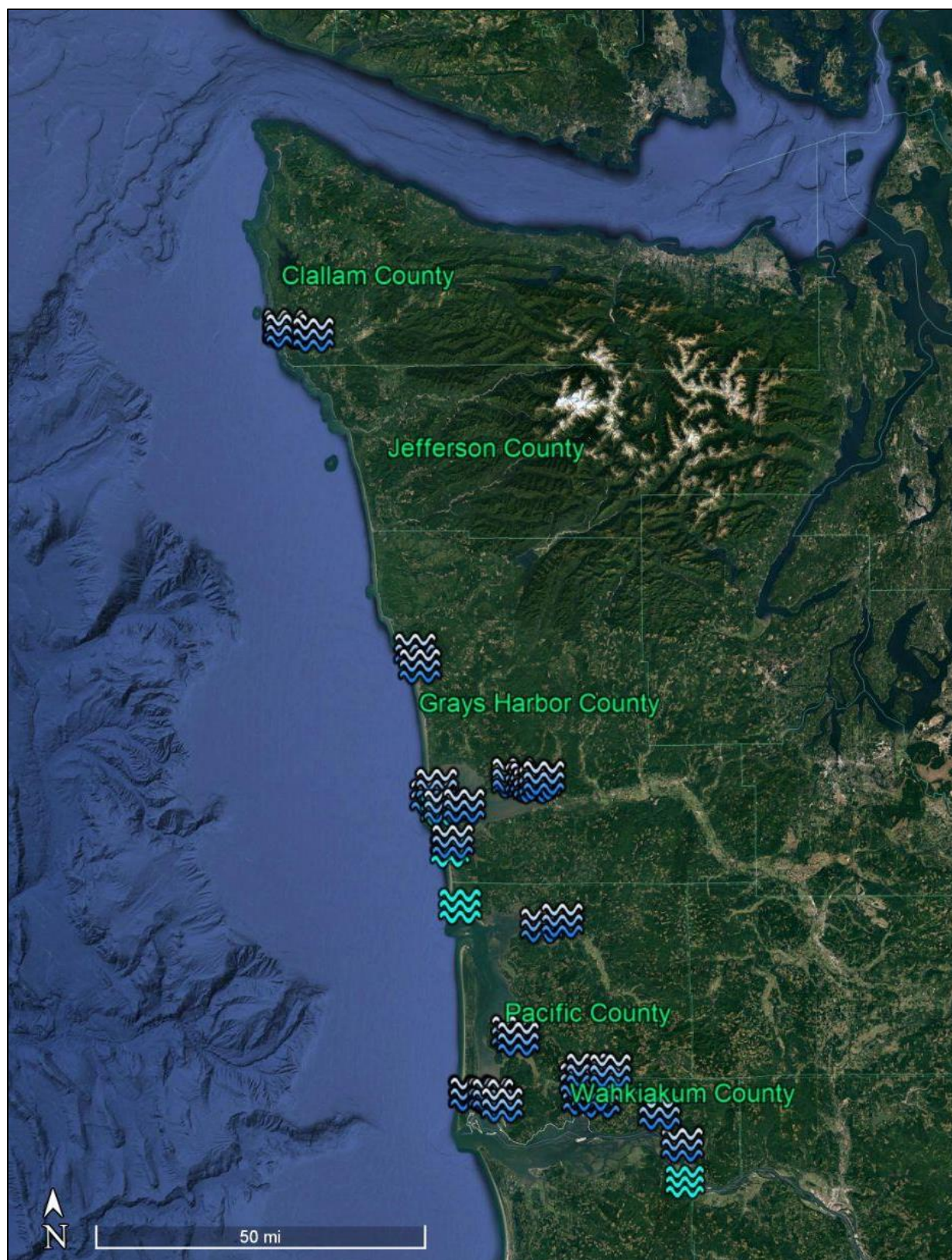


Figure C-18. Coast-wide distribution of flooding and sea level rise projects inventoried through the RAD. Background image adapted from Google Earth.



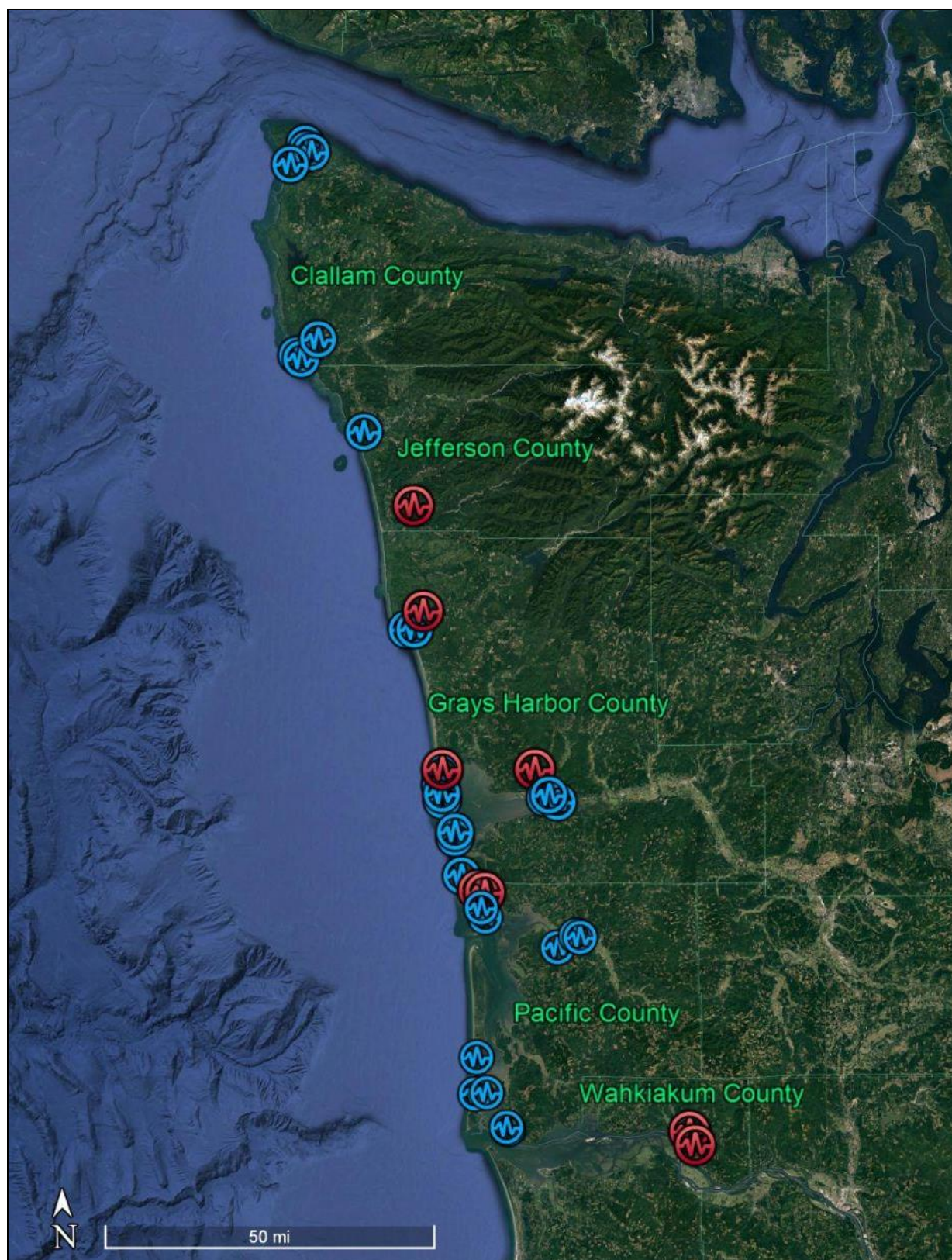


Figure C-19. Coast-wide distribution of tsunami and earthquake projects inventoried through the RAD. Background image adapted from Google Earth.