

Appendix D: Resilience Principles for Coastal Hazards Projects

Washington Coast Resilience Action Demonstration Project

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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.

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

Appendix D cover image credit: Jackson Blalock / Washington Sea Grant, 2021

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

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Introduction

Purpose of the resilience principles

This appendix describes guiding principles to help coastal hazards risk reduction projects support resilience. The Resilience Action Demonstration Project (RAD) team developed these principles in order to help local project proponents develop project proposals. Because resilience is a broad term used in many different circumstances, the principles provide descriptions and examples of what “resilience” can mean within the context of coastal hazards projects.

The principles are conditions that, when in place, are likely to support resilience both within a project and within the greater community. The RAD team believes that projects meeting as many principles as possible will produce more resilient results and be more viable candidates for coastal hazards resilience funding programs. The principles are not an exhaustive list, but are rather a group of key suggestions to assist with project planning and scoping. Throughout the course of the RAD, project proponents and other Washington State agencies provided feedback on and made use of these principles.

Use of the principles beyond the RAD

These principles informed the process of developing and scoping locally driven projects throughout the course of the RAD (see Appendix E: Support for Hazards Resilience Projects). Because of the success of these project proposals and positive feedback on the principles from project proponents and partners, the RAD team expects them to continue to be useful to coastal hazards project proponents, state agencies, and other project partners and stakeholders. The resilience principles can be particularly useful for scoping coastal hazards projects to address both short- and long-term priorities, to achieve multiple benefits, to be more competitive for a variety of grant funding programs, and to improve collaboration in support of coast-wide resilience.

The RAD team considers these principles to be a living document to be revised with further use and feedback. To provide comments or other input to improve these principles, please contact the authors of this report.

Methods

The William D. Ruckelshaus Center’s 2017 [*Washington State Coast Resilience Assessment*](#)² states that “a resilient community is able to thrive in the present, adapt to challenges, and even transform as necessary to meet future threats or opportunities.” Additionally, “depending on what kind of system resilience is applied to, it may be defined in different ways.” The principles in this document describe an applied approach to resilience, with the goal of addressing how coastal hazards risk reduction projects can help promote resilience.

The principles were informed by multiple regional efforts to support resilience as well as conversations with stakeholders across the Pacific Coast of Washington throughout the RAD. Key takeaways from these efforts and conversations were grouped into common themes applicable to coastal hazards risk reduction projects. These themes became the four main categories of the resilience principles. The principles were further revised based upon the RAD team’s support for locally driven projects and discussion with project proponents.

Sources that informed the Resilience Action Demonstration Project’s resilience principles for coastal hazards projects include:

- “Community Capitals Framework,” adapted from a presentation by Michael Gaffney (Acting Director of Washington State University Extension) to the Washington State Office of the Insurance Commissioner’s Resilience Work Group. 2020.
- “Community Resilience” presentation to the RAD team and discussion led by Ty Ferrell, Resilience Collaborative Northwest. 2021.
- “How Integrated is our Floodplain Management?” Diagram by the Washington State [*Floodplains by Design*](#)³ program. 2018.
- [*A Guide to Supporting Engagement and Resiliency in Rural Communities*](#).⁴ Federal Emergency Management Agency (FEMA). 2020.
- [*Environmental Justice Task Force Recommendations for Prioritizing Environmental Justice in Washington State Government*](#).⁵ Elise Rasmussen, Esmael Lopez, and Hannah Fernald. 2020.
- Resilience Action Demonstration Project (RAD) outreach and results, particularly Appendix A: Analysis of 2020 Coastal Hazards Resilience Grant Programs, Appendix B: Outreach Analysis, and Appendix E: Support for Hazards Resilience Projects. 2019–2021.
- [*Social Indicators for Washington Coast Integrated Ecosystem Assessment*](#).⁶ Report to Washington Department of Natural Resources in fulfillment of Interagency Agreement

² <https://mrsc.org/getmedia/0498ef44-89e8-46c7-b834-469b992196c6/Washington-Coast-Resilience-Assessment-Report.aspx>

³ <https://www.floodplainsbydesign.org/>

⁴ https://www.fema.gov/sites/default/files/documents/fema_rural-guide_jan-2021.pdf

⁵ [https://healthequity.wa.gov/Portals/9/Doc/Publications/Reports/EJTF%20Report_FINAL\(1\).pdf](https://healthequity.wa.gov/Portals/9/Doc/Publications/Reports/EJTF%20Report_FINAL(1).pdf)

⁶ https://www.msp.wa.gov/wp-content/uploads/2015/03/SeaGrant_SocialIndicatorsReport.pdf

No. IAA 14---204. Melissa Poe, Melissa Watkinson, Bridget Trosin, and Kevin Decker, Washington Sea Grant. 2015.

- *Washington Coast Restoration Initiative: Socio-Economic Benefits to Coastal Restoration*. Melissa Watkinson, The Nature Conservancy. 2016.
- [Washington Coastal Resilience Project](https://wacoastalnetwork.com/washington-coastal-resilience-project/)⁷ outreach and results. 2016–2020.
- [Washington Disaster Resiliency Work Group Final Report](https://www.insurance.wa.gov/sites/default/files/documents/washington-disaster-resiliency-work-group-final-report-november-2020.pdf).⁸ Mike Kreidler, Washington State Insurance Commissioner. 2020.
- [Washington State Coast Resilience Assessment](#). The William D. Ruckelshaus Center. 2017.

⁷ <https://wacoastalnetwork.com/washington-coastal-resilience-project/>

⁸ <https://www.insurance.wa.gov/sites/default/files/documents/washington-disaster-resiliency-work-group-final-report-november-2020.pdf>

Resilience Principles for Coastal Hazards Projects

What is a coastal hazards resilience project? (See Table D-1 for more information).

1. It is a **physical** project, **community development** effort (capacity building, strategy development, planning, etc.), and/or **educational** activity.
2. The project **reduces a community's vulnerability** to coastal hazards and environmental change.
3. Project proponents and the greater community work together to **include resilience characteristics**. See “What makes a project more resilient?” below.

What makes a project more resilient? (See Table D-2 for more information).

4. It addresses **immediate concerns, aligned with a long-term vision**.
5. It incorporates **place- and process-based design** by considering past, present and future conditions and engaging with adjacent areas and interconnected systems.
6. It supports **additional community benefits**, such as economic development, food sovereignty, and access to housing.
7. It provides **system-wide benefits**. See “How can a project provide system-wide benefits?” below.

How can a project provide system-wide benefits? (See Table D-3 for more information).

8. It explores **creative or new options for funding** and coordinating investments in community resilience (including matching funds), such as local improvement districts, public–private partnerships, and grant support beyond existing resilience-focused programs.
9. It uses **innovative approaches**, such as nature-based solutions and adaptive management techniques, and **shares lessons learned**.
10. It supports or **builds local capacity**.
11. It spans **multiple jurisdictions, management regimes, and land uses**, with an emphasis on collaboration between Tribes, counties, cities, and private landowners.

Who is involved in the project? (See Table D-4 for more information).

12. A **strong local advocate or champion** is involved in leading the project.
13. Collaboration, consultation, and/or partnership takes place with **local, state, and federal agencies, Tribes, and relevant committees and institutions** that have technical expertise related to the project.
14. At the outset of the project, specific consideration is given to ensure that **all people affected by the activity can substantively participate** through collaboration, including multiple generations and underrepresented groups.
15. Throughout the project, strong outreach, engagement, and project communications **connect project partners, affected parties, the general public, and other interested audiences**.

Additional details and examples

Tables D-1 through D-4 contain additional information on the resilience principles for coastal hazards projects. The examples indicate potential ways in which each principle could be incorporated within a typical coastal hazards project.

Table D-1. What is a coastal hazards project?

Principle	What does this mean?	Examples
1. It is a physical project, community development effort (capacity building, strategy development, planning, etc.), and/or educational activity.	<ul style="list-style-type: none"> • A physical project leads to a specific “dirt-turning” activity. • A community development effort focuses on capacity-building, strategy development, planning, etc. • An educational activity increases understanding of hazards for students, the general public, or specific groups • These activities may be stand-alone projects, occur sequentially as separate phases of a project, occur simultaneously, or operate otherwise. 	<p><i>Physical: elevating infrastructure to mitigate sea level rise, installing woody debris to mitigate erosion, building a vertical evacuation structure</i></p> <p><i>Community development: scoping a project, coordinating multiple related projects through a single plan, planning an upland relocation</i></p> <p><i>Education: conducting coastal hazards workshops with educators and applying these lessons in the classroom, public awareness of tsunami evacuation routes.</i></p>
2. The project reduces a community’s vulnerability to coastal hazards and environmental change.	<ul style="list-style-type: none"> • It reduces coastal hazards risk in a technically sound and feasible way that ultimately reduces community members’ vulnerability. • It addresses coastal hazards, which can include: coastal and riverine flooding, sea level rise, erosion, earthquakes, tsunamis, and landslides. • It may address other forms of environmental change, such as climate change, ocean acidification, landform change, and changes to an ecosystem. 	<p><i>Conducting risk and vulnerability assessments to identify and prioritize specific actions to reduce hazards vulnerability.</i></p> <p><i>Hazards-focused projects, such as reducing earthquake and tsunami risk through outreach, upland relocation, vertical evacuation tower(s), mitigating hazard risk along evacuation routes, and seismic retrofit of reservoirs.</i></p>
3. Project proponents and the greater community work together to include resilience characteristics .	<ul style="list-style-type: none"> • See Table D-2, below, for project characteristics that can support resilience, based on focused outreach and analysis. • For a more in-depth description of resilience, see the <i>Washington State Coast Resilience Assessment</i> (2017). 	See Table D-2.

Table D-2. What makes a project more resilient?

Principle	What does this mean?	Examples
4. It addresses immediate concerns, aligned with a long-term vision.	<ul style="list-style-type: none"> • In addition to addressing an identified current need, it considers the effects of future conditions and prioritizes long-term sustainability and durability (see Principle 2b, below). • It ties into plans and plan updates that are underway or scheduled for the future, as well as adjacent projects or management strategies. • Use long-term planning horizons to design projects that address immediate needs such as emergency repairs. 	<p><i>Developing longer-term strategic plans.</i></p> <p><i>Incorporating sea level rise projections or other relevant climate change science⁹ into project design.</i></p> <p><i>Framing future planning as an opportunity; using scenarios or story telling that connects to present issues. See Principles 2c and 3c.</i></p>
5. It incorporates place- and process-based design by considering past, present and future conditions and engaging with adjacent areas and interconnected systems.	<ul style="list-style-type: none"> • Consider the long-range history and future trajectory of the communities, ecosystems, and landforms. Consider how the project may be received by future generations. Consider compounding, enduring, and emerging issues such as sea level rise and population change. • Incorporate traditional and local knowledge (see Principles 3c, 4c-d). • Start with the local context: understand, honor, and support the unique ecology, culture, social dynamics, and history of each place. Enhance or amplify parts of the existing ecosystem or culture when possible. • Ensure that actions are coordinated at a reach, watershed, or network scale. 	<p><i>Removing dikes to reconnect floodplains and mitigate combined coastal/riverine flooding.</i></p> <p><i>Coordinating erosion control efforts across an entire shoreline, rather than working parcel-by-parcel.</i></p>

⁹ Visit the UW Climate Impacts Group (<https://cig.uw.edu/>) and the Washington Coastal Hazards Resilience Network (<https://wacoastalnetwork.com>) for Washington-specific resources and information on climate change and sea level rise.

<p>6. It supports additional community benefits, such as economic development, food sovereignty, or access to housing.</p>	<ul style="list-style-type: none"> • Scope projects to address issues beyond the hazard impact being mitigated • Map and focus on community assets. Integrate with other projects that aren't primarily hazards-focused • Provide or support¹⁰: <ul style="list-style-type: none"> ○ Living standards - increased access to affordable and stable housing ○ Health - restored health of habitats for nature and people; food and water access ○ Education - access; local knowledge of ecosystems, change, interventions ○ Work and leisure - jobs and recreation access ○ Governance - planning; community-based management of resources ○ Social cohesion - enhanced natural public meeting spaces and opportunity to manage local resources; access to social services ○ Economic security - income and revenues; diversified local economies 	<p><i>Developing new economic initiatives and supporting existing economies as a key element in planning and project design.</i></p> <p><i>Improving fish passage, forage habitat, or other restoration-focused dynamics through hazard mitigation. See Principle 2b.</i></p> <p><i>Improving food security by designing edible landscapes along walking trails which also serve as evacuation routes.</i></p> <p><i>Leveraging emergency response funds to expedite efforts to provide coast-wide broadband, improved cell phone coverage, and satellite communications.</i></p> <p><i>Integrating project activities and learnings into local education programs and curricula. See principles 1a and 4c.</i></p>
<p>7. It provides system-wide benefits.</p>	<p>Resilience can occur at multiple scales. Projects can support resilience at the local/project scale while contributing to a larger network of resilience efforts. This, in turn, can support additional local and regional resilience projects.</p>	<p><i>See Table D-3 for information on system-wide benefits.</i></p>

¹⁰ Adapted from Watkinson, 2016 and Poe et al., 2015 (see Appendix D Methods section).

Table D-3. How can a project have system-wide benefits?

Principle	What does this mean?	Examples
8. It explores creative or new options for funding and coordinating investments in community resilience (including matching funds), such as local improvement districts, public-private partnerships, and grant support beyond existing resilience-focused grant programs.	<ul style="list-style-type: none"> Engage with funding opportunities beyond federal grants alone, such as public-private partnerships or local improvement districts.¹¹ Prioritize the project's cost effectiveness, or consider how the project may be able to generate revenue through its life cycle Examine and identify alternative ways to obtain matching funds requirements or reduce local match requirements Examine and identify alternative ways to fund planning, outreach, and vulnerability assessment processes 	<p><i>Designing projects to take advantage of smaller funding programs that can then serve as matching funds for additional, larger funding programs.</i></p> <p><i>Funding projects through a voter-supported levy.</i></p> <p><i>Developing public-private partnerships or incentives to include vertical evacuation structures or nature-based erosion control in private development projects.</i></p> <p><i>Seeking out funds that can be used for operational expenses (e.g. new staff positions). See Principle 3c.</i></p>
9. It uses innovative approaches , such as nature-based solutions and adaptive management techniques, and shares lessons learned .	<ul style="list-style-type: none"> Seriously consider multiple project alternatives, and avoid being bound by past approaches or prescriptive solutions Use natural processes as a design guide: aim to reestablish normative rates and magnitudes of physical, chemical and biological processes that sustain an ecosystem. If the project is situated primarily within a built environment, consider how to re-establish desirable processes. Identify and implement modest or incremental goals to create momentum and build a sense of collective self-efficacy. Encourage locally sourced innovations, along with external innovations. Share project results and lessons learned in city/county/Tribal planning meetings, at Marine Resources Committee meetings or events, and through presentations and webinars. 	<p><i>Implementing incremental upland relocation/ realignment by encouraging development and alternate infrastructure away from hazard zones.</i></p> <p><i>Piloting projects to explore and test new ideas, which may require increased flexibility of regulatory approaches and support voluntary and collaborative efforts.</i></p> <p><i>Learning from existing case studies, and contributing to databases such as the Washington Coastal Hazards Resilience Network's Risk Reduction Project Mapper¹²</i></p>

¹¹ For a summary of existing resilience-focused grant programs, see Appendix A: Analysis of 2020 Coastal Hazards Resilience Grant Programs.

¹² <https://waecy.maps.arcgis.com/apps/MapSeries/index.html?appid=cb81314d6fb44e0187e7980a1f0cd32b>

<p>10. It supports or builds local capacity.</p>	<ul style="list-style-type: none"> ● Support the abilities of local organizations, leaders, and communities to do their work and grow their capacity, with attention to:¹³ <ul style="list-style-type: none"> ○ coastal Tribes, ○ Marine Resources Committees ○ Conservation Districts ○ Emergency Managers ○ City and County governments ● Recognize the time and resource constraints of small communities, local governments, and Tribes. Use funds and other forms of support to build local capacity ● Encourage participation from youth and young adults, exposing future community leaders to hazards resilience work 	<p><i>Providing technical support and assistance for scopes of work that may be outside of a local staffing capabilities or usual purview (e.g. vulnerability/risk assessments, project management, or long-range planning)</i></p> <p><i>Creating new local staff positions through partnerships or scoping projects to fund new staff.</i></p> <p><i>Supporting dedicated community participants through stipends, other payment, technical support (including assistance with unrelated needs), and/or coaching (see Principle 4c).</i></p> <p><i>Incorporating local hires, contracts, job training, and/or educational activities into the project, along with fair pay and labor practices.</i></p>
<p>11. It spans multiple jurisdictions, management regimes, and/or land uses, with an emphasis on collaboration between Tribes, counties, cities, and/or private landowners.</p>	<ul style="list-style-type: none"> ● When possible, design projects that span across multiple jurisdictions, management regimes, and/or land uses. ● During project scoping, examine how similar issues may be affecting adjacent areas; explore collaborative approaches and partnerships. 	<p><i>Starting new conversations with adjacent or overlapping land managers, residents, property owners, industries, agencies, and Tribes about shared goals and how hazards may affect each group.</i></p>

¹³ These entities were initially identified through the *Washington State Coast Resilience Assessment* (2017) “10 Recommendations and Key Leveraging Actions” and “Guiding Principles.”

Table D-4. Who is involved in the project?

Principle	What does this mean?	Examples
12. A strong local advocate or champion is involved in leading the project.	<ul style="list-style-type: none"> • A strong local advocate for the project can help drive engagement within the affected community, bring stakeholders together, and support facilitation and coordination of project activities. • Specific technical expertise in the project area is generally not required for this role, however, local champions should be interested in a sustained leadership role. Agencies and other organizations can help support local champions in order to ensure successful projects and maximize the ability of local people to carry out, lead, and sustain efforts. • This person should be trusted by diverse parties affected by the project and may represent specific community groups involved. See Principles 3c and 4c. 	<p><i>Ensuring that a trusted individual - who is willing to further the project locally and with agencies, and has a direct connection to the issue(s) at hand - is a project partner.</i></p> <p><i>Dedicating time to working with the project's local champion through informal check-ins, working sessions, or other capacity support to ensure sustained participation.</i></p>
13. Collaboration, consultation, and/or partnership takes place with local, state, and federal agencies, Tribes, and relevant committees and institutions that have technical expertise related to the project.	<ul style="list-style-type: none"> • Benefits to working with these groups throughout the project process include: <ul style="list-style-type: none"> ○ Enhancing the collective experience and expertise of project partners ○ Increasing awareness of funding opportunities, innovative practices, potential hurdles, and technical insights ○ Reducing miscommunication and ensuring smooth permitting and consultation processes. ○ Minimizing unforeseen roadblocks and maximizing potential opportunities by engaging early and often • Where applicable, develop partnerships with:¹⁴ <ul style="list-style-type: none"> ○ Coastal Tribes ○ Marine Resource Committees ○ Conservation districts ○ Emergency managers ○ Washington Sea Grant ○ WSU Extension ○ WA State Department of Ecology ○ WA Emergency Management Division ○ WA State Department of Transportation 	<p><i>Forming a group of agencies, Tribes, community members and other organizations to meet regularly for sharing information, updates, and project strategy.</i></p> <p><i>Forming a multidisciplinary technical assistance "advisory team" to work on specific issues, e.g. permitting multiple related projects.</i></p> <p><i>Enhancing and implementing Hazard Mitigation Plans through partnerships involving local emergency management agencies and community members.</i></p>

¹⁴ Many of these entities were initially identified through the *Washington State Coast Resilience Assessment's* (2017) "10 Recommendations and Key Leveraging Actions" and "Guiding Principles."

<p>14. At the outset of the project, specific consideration is given to ensure that all people affected by the activity can substantively participate through collaboration, including multiple generations and underrepresented groups.</p>	<ul style="list-style-type: none"> ● Provide inclusive and accessible spaces and events, where diverse perspectives and contributions are not only welcome but encouraged. Participation from historically underrepresented groups is sought out and their input is incorporated into the project scope and planning process. In particular: <ul style="list-style-type: none"> ○ Multiple/future generations ○ Low-income and minority populations ○ Tribes and Tribal entities ● Incorporate environmental justice considerations into project scoping and design. 	<p><i>Collaborating with existing stakeholder groups as opposed to only creating new forums for engagement.</i></p> <p><i>Identifying who may not be represented within existing stakeholder groups and proactively reaching out to engage them.</i></p> <p><i>Producing, with all affected parties, a shared vision for project development that incorporates participation at all desired stages.</i></p> <p><i>Reducing barriers to participation, such as offsetting travel or time costs, providing meals or childcare, or arranging for transportation; supporting dedicated community participants through stipends or other payment.</i></p>
<p>15. Throughout the project, strong outreach, engagement and project communications connect project partners, affected parties, the general public, and other interested audiences.</p>	<ul style="list-style-type: none"> ● As the project evolves, make special efforts to reach out to and involve key groups or demographics whose input has not yet been heard or incorporated (see Principles 4b-c). ● Look for opportunities to build trust between groups and actively demonstrate how input is valued and incorporated to support more equitable outcomes. ● Utilize existing efforts to share stories and information about the work that communities and their partners are undertaking. ● Highlight interdisciplinary and cross-sector collaboration (see Principles 3d-4c) 	<p><i>Creating transparent, reasonable, clear, and mutually-agreed-upon expectations for participants, partners and other audiences.</i></p> <p><i>Communicating project updates and communities' compelling stories through video, print, social media, and news media outlets; supporting equal access to relevant information.</i></p> <p><i>Attending local meetings to introduce yourself, share project updates, solicit input, and invite participation.</i></p>