OREGON
Department of Land Conservation & Development

TO: Coastal Shoreline Stabilization Rulemaking Advisory Committee Members

FROM: Rhiannon Bezore, Ph.D., Coastal Shores Specialist, Meg Reed, Senior Coastal Policy Specialist, Amanda Macnab, Coastal Rule Coordinator

CC: Brenda Bateman, Ph.D., Commissioner Erin Skaar, Lisa Phipps, Alexis Hammer, Alyssa Bonini, Casaria Taylor, Matthew Hampton

RE: Materials for October 15, 2026 Rulemaking Advisory Committee Meeting

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Thank you for your continued commitment to the rulemaking effort around shoreline stabilization along Oregon's coastal shorelines. Enclosed please find the meeting agenda, last meeting's summary, draft definitions for discussion, and other meeting materials. Please review this packet before our second Rulemaking Advisory Committee (RAC) meeting on **October 15th from 9am to 12pm**.

During RAC Meeting #2, we will hear from fellow RAC members, Dr. Meagan Wengrove and Dr. Jonathan Allan, about different types of shoreline stabilization techniques. Following their presentation, DLCD staff will provide an overview of the role of definitions in rules and review the existing definitions that will not be changing. We will then spend the remainder of the meeting discussing new definitions for the rules. To come prepared for this meeting, we ask that you review all the definitions and packet materials closely.

Packet Contents:

1. Meeting agenda
2. RAC Interview Summary by Kearns & West
3. RAC Meeting #1 Notes
4. Draft Rule Outline
5. Definitions for Discussion
6. Existing Definitions (Glossary)
7. Coastal Snapshots (developed by graduate students and faculty with Oregon State University and University of Washington)

Note about definitions: Some of the definitions that will be included in the rules (Document #6) are definitions that are already defined elsewhere (e.g., statute, rule, or

statewide planning goal) and are not subject to change through this rulemaking. For example, "coastal shoreline" means the boundary line between a body of water and the land, measured on tidal waters at mean higher high water. This definition is within the statewide planning goals and will not be changing during this rulemaking effort. To use our time together efficiently during the meeting, we will only be focusing on the terms that we are creating definitions for through this rulemaking process (Document #5). We have included both sets of definitions in this packet to help guide discussion of the new definitions and for context. Think of the existing definitions (Document #6) like a glossary – they are very important in the context of writing the rules. **We ask you to review both lists prior to RAC Meeting #2, but the focus of the meeting will be on the definitions for discussion (Document #5).**

Keep these questions in mind as you review the draft definitions for discussion. They will help guide our meeting:

- How would having a definition for a given term or concept help you in your work/research/experience? How have you used the term before?
- Does this definition fit with your perception or understanding of the term? Is it specific and/or flexible enough?
- What level of specificity is going to be most helpful in applying this term?
- Do you have any additional concerns or anything else to share around the definition of this term?

Logistics

The meeting will take place virtually on Zoom. Rulemaking Advisory Committee members should join Zoom using the link provided by DLCD – please do not share your Zoom link. Members of the public may watch the meeting live or recorded on the DLCD YouTube channel.

Additional Information

The following resources were provided previously but are listed here again as a reminder:

- Video about the role of the RAC in rulemaking for DLCD
- RAC Meeting #1 recording
- DLCD rulemaking webpage.

Rulemaking Timeline Reminder

- ✓ June 2026: LCDC Initiates Rulemaking

- ✓ July 2026: RAC recruitment
- ✓ September 10, 2026: RAC 1: Introductions, review charge and operating principles, background materials, rulemaking timeline
- ✓ October 5, 2026: Opional RAC Office Hours
- October 15, 2026: RAC 2: Background presentations, review and discuss draft rule definitions
- October 21, 2026: Optional RAC Office Hours
- October 26, 2026: Optional RAC Office Hours
- November 12, 2026: RAC 3: Technical information presentations, review and discuss draft rule language
- November 13, 2026: Field Trip around Newport, OR to view various shoreline stabilization techniques (Optional)
- January 11, 2027: Oregon Legislative Session begins
- January 22, 2027: RAC 4: Review draft rule revisions, review fiscal, housing, and racial equity impact statements
- March 5, 2027: RAC 5: Final draft rules review and discussion before public comment
- April 1, 2027: Secretary of State Notice with Draft Rules and Impact Statements. Start of the public comment period.
- April 2027: Public Hearing with LCDC
- April or May 2027: Geographic Public Hearing on the Coast
- May 14, 2027: RAC 6: Finalize draft rule based on public comments and LCDC directives
- May 17, 2027: Close of public comment period
- June 2027: Adoption with LCDC

If you have any questions about the materials in this packet, please feel free to contact us via phone or email. Our information is listed below.

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Coastal Shoreline Stabilization Rulemaking Advisory Committee Meeting #2 Agenda

October 15, 2026

9:00 a.m.–12:00 p.m. | Online

Meeting Access and Materials

The meeting will be livestreamed on the Department of Land Conservation and Development (DLCD) YouTube page. The recording and meeting materials will be posted on DLCD's Rulemaking webpage.

Accessibility and Accommodations

To ensure the meeting is accessible, the department will make reasonable accommodation upon request. Please contact us at least 48 hours before the meeting. Contact the DLCD front desk by phone at 503-373-0050, by email at dlcd.info@dlcd.oregon.gov, or by TTY through Oregon Relay Services (800) 735-2900.

Topic 1: Welcome, Opening Remarks, and Agenda Review | 9:00–9:15 a.m.

- *Jamie Damon, Kearns & West Facilitation Team*
- *Commissioner Erin Skaar, Tillamook County Commissioner and Land Conservation and Development Commissioner*

Topic 2: Nature-Based Solutions Presentation and Q&A | 9:15–9:45 a.m.

- *Dr. Jonathan Allan, DOGAMI*
- *Dr. Meagan Wengrove, Oregon State University*
- *All RAC members*

Topic 3: Definitions, Part 1 - Intro to Definitions and Q&A | 9:45–10:00 a.m.

- *Rhiannon Bezore, DLCD Coastal Shores Specialist*
- *Meg Reed, DLCD Senior Coastal Policy Specialist*
- *All RAC members*

Break | 10:00–10:15 a.m.

Topic 4: Definitions, Part 2 - New Definitions Overview, Q&A, and Discussion | 10:15–11:45 a.m.

- *Rhiannon Bezore, DLCD Coastal Shores Specialist*
- *Meg Reed, DLCD Senior Coastal Policy Specialist*
- *All RAC members*

Topic 5: Field Trip, Rulemaking Schedule, Office Hours, and Next Steps | 11:45–11:55 a.m.

- *Jamie Damon, Kearns & West Facilitation Team*
- *Ruby Gonzales, Kearns & West Facilitation Team*

Topic 6: Closing Comments and Adjournment | 11:55 a.m.–12:00 p.m.

- *RAC members*
- *Commissioner Erin Skaar, Tillamook County Commissioner and Land Conservation and Development Commissioner*

DLCD Coastal Shoreline Stabilization RAC K&W Convening Interview Summary

September 2026 - Prepared for DLCD by Kearns & West

Introduction & Background

The Oregon Department of Land Conservation and Development (DLCD) convened the Coastal Shoreline Stabilization Rulemaking Advisory Committee (RAC) to advise on draft rule amendments for consideration by the Land Conservation and Development Commission (LCDC). The RAC is scheduled to meet six times between September 2026 and May 2027, with optional coastal field trips between meetings.

Committee membership spans local government, state agencies, Tribal government, coastal property owners and businesses, academic and technical researchers, private engineering and geotechnical practice, and conservation, recreation, and watershed organizations. DLCD engaged Kearns & West (K&W), a neutral collaboration and public engagement firm, to serve as the third-party facilitation team. In advance of the first meeting, K&W conducted convening interviews with RAC members to understand the range of perspectives, interests, and expectations members bring to the process, and to inform the design of meetings that support meaningful participation and informed deliberation.

K&W conducted 26 virtual 30-minute convening interviews throughout August and September 2026. This summary presents a high-level synthesis of themes and does not attribute comments to individuals or organizations.

Key Priorities and Interests

RAC members described a wide range of professional and personal connections to Oregon's shoreline, from regulatory and permitting responsibility to engineering and geologic practice, land use planning, wildlife and habitat management, cultural resource protection, emergency management, transportation infrastructure, coastal research, property ownership, and community and business leadership. The following priorities emerged across conversations.

Clear, Durable, and Applicable Definitions

RAC members' most widely shared priority is the need for clear definitions of structural, nonstructural, and hybrid approaches. RAC members described how permit applicants cannot tell what will be approved; regulators interpret the same facts differently, and that there is no shared vocabulary in which to compare alternatives. RAC members also emphasized that definitions should be written to accommodate learning, as the understanding of nonstructural performance is actively evolving, and several cautioned that definitions written too narrowly around today's techniques could constrain the state's options within a few years. Others cautioned in the opposite direction, expressing concern that

definitions written too loosely could allow conventional armoring to be repackaged as nature-based solutions. The following are examples shared by participants of tools and solutions that are not currently clearly defined:

- Dynamic revetments and cobble or gravel berms, including where the boundary sits between cobble, gravel, and boulder-scale material
- Soil-filled geotextile units, sandbags, and similar temporary or semi-permanent measures
- Placement of large natural boulders in settings where they visually and geologically match the surrounding shoreline
- Textured or ecologically engineered concrete marketed as habitat-supporting
- Vegetative approaches, including which species are appropriate and how to address non-native species that provide stabilization while degrading habitat
- Log-and-cobble structures explicitly designed to move, deflect, and absorb wave energy

Permitting Clarity and Navigability

RAC Members repeatedly described a jurisdictional landscape that is difficult for applicants and regulators to navigate. Several noted that a single project can require multiple permits from entities that are not required to coordinate with one another, and that responsibility for each step is often unclear to the applicant. A few noted that this limits opportunities to those who can afford sustained professional representation and expressed concern about long-term residents and fixed income retirees who cannot afford these services. Others spoke to the difficulty of obtaining permits for maintenance of existing structures and described the consequences of deferred maintenance. RAC Members suggested the RAC could contribute by:

- Clarifying ownership, regulators, and at which step each authority applies
- Establishing tiers or categories of approaches with proportionate review, drawing on existing general authorizations and exemptions for techniques already shown to have minimal individual and cumulative impact
- Identifying at what stage in a project different professional disciplines should be engaged
- Providing a clearer and timelier pathway for situations involving active or imminent erosion
- Addressing the gap between permitted design and construction practice, including how contractors are brought into and held to an approved plan

Expanding the Practical Availability of Nonstructural Approaches

Many RAC Members expressed support for the direction set by SB 504 and an interest in seeing nonstructural nature-based approaches become a genuine and accessible option. Several shared that the professional services market has developed around conventional armoring, that few practicing consultants are trained in nonstructural design, and that property owners are often presented with a single development option. RAC Members suggested that clear rules could open pathways for engineers and consultants to develop and offer nonstructural designs.

Several RAC Members also raised the question of who nonstructural approaches are available to. A recurring observation was that current rule framing centers on eligibility for shoreline protection under Goal 18, and that nonstructural approaches may be appropriate and desirable for a much broader set of properties than that eligibility category captures. A few noted that nonstructural approaches require physical space to function and had questions about property boundaries and work conducted on land the applicant does not own.

Protecting Coastal Resources, Processes, and Public Access

RAC Members identified a set of resource priorities they want reflected in the rules. These include ensuring that new rules do not cause harm, that shorelines retain the ability to evolve in response to changing conditions, and that ecological processes (at creek mouths and in areas important to salmonids and other sensitive species) are not disrupted. Several shared concerns about cumulative impacts and that the effect of a single project may be modest while the effect of many along a stretch of shoreline is not. Decisions about projects should be evaluated at the scale of the shoreline reach rather than the individual parcel.

Public access was raised as a distinct and significant interest. RAC Members noted that hardened shorelines reduce beach width and that Oregon's public beach access consequences are borne by the public at large. A few framed this in terms of public trust and future generations, noting that those who will live with these decisions in the future are not represented at the table.

Protecting People, Infrastructure, and Community Viability

Many RAC Members emphasized that the rules will govern decisions about homes, businesses, public facilities, and transportation infrastructure that communities depend on. RAC Members discussed how local revenue is tied to visitors and property values, the difficulty of retaining working-age residents, and a concern that rules written without attention to community viability will have effects that are felt locally and unevenly.

Protecting Cultural and Archeological Resources

RAC Members identified the protection of cultural and archaeological resources as a priority. A RAC member shared that the Oregon coast contains some of the oldest known archaeological sites in North America, several of them in actively eroding bluffs, dunes, and shoreline settings, and that sites are being lost to erosion, and storm events accelerate that loss.

RAC members identified that the relationship between nonstructural approaches and cultural resource protection is not straightforward. Several nonstructural techniques (dune rebuilding, cobble berm construction, beach nourishment, and other approaches involving excavation or imported fill) disturb more ground than placement of material on an already-modified face. RAC Members noted that this can place cultural resource protection and nonstructural preference in tension, and that mitigation obligations can be costly for Tribes and property owners.

Ability to Experiment and Learn

Several RAC Members identified the absence of any mechanism for experimental or first-of-its-kind approaches as a specific gap. RAC Members expressed strong interest in the rules providing an approval pathway for approaches that carry monitoring and performance conditions.

Key Issues and Concerns

RAC Members were asked to identify topics they anticipate will be difficult for the committee to discuss and several key issues, concerns, and tensions were highlighted.

Performance, Longevity, and Extreme Events

A significant concern raised across interviews is whether nonstructural approaches will perform under Oregon's dynamic wave climate. Several emphasized that any approach the rules encourage must be evaluated against harsh conditions, and that longevity and life-cycle performance are important. A related concern is how nonstructural approaches can be labor and cost intensive to maintain, and that site access for maintenance is constrained in many locations.

RAC Members also expressed communication concerns around discussing non-structural solutions: approaches designed to be dynamic, shed material, and move are functioning as intended when they do so, but this can be read by property owners, the public, and regulators as failure.

Vegetation

Vegetative approaches drew mixed responses. RAC Members described introduced species (European beachgrass and gorse) that hold sediment and slope material in place while substantially altering habitat and, in some settings, creating safety hazards. RAC Members noted that these species now perform a stabilization function that removal would eliminate, producing erosion and site-damage risk, and that no native replacement performs comparably. RAC members described some public agencies planting a species in one location while other public agencies fund its removal nearby. RAC Members suggested discussing how a technique can be nonstructural and still be ecologically harmful and how to balance those elements.

Differing Views on Conventional Armoring

RAC Members expressed divergent views about riprap and similar approaches, and several identified this as the most likely point of contention. Some described riprap as a necessary and proven tool and expressed frustration at difficulty obtaining approval for new installation or maintenance of existing structures. Others described a policy interest in reducing its proliferation, noting the cumulative effect on beach width and public access, and observing that emergency authorizations for riprap that were intended to be temporary have in practice become permanent. A specific

concern raised by several RAC Members is that terminology from other jurisdictions could be interpreted in a way that permits conventional armoring under a nature-based label.

Existing Rules and Programs

Several RAC Members anticipated conflicts between what this rulemaking may produce and requirements already in place. Areas identified include federal flood insurance program requirements and floodplain development standards, revised flood mapping and elevation requirements affecting reconstruction, Goal 18 eligibility categories, endangered species compliance, and existing marine and wetland protections. RAC Members also noted the concurrent OPRD rulemaking and asked how the two efforts will be sequenced and reconciled. A few raised questions about how the rules will handle reconstruction after loss (from storms, fire, or a subduction zone event) and where the line is drawn on rebuilding in place.

Group Dynamics

RAC Members were direct about interpersonal dynamics. Several noted that shoreline issues on the Oregon coast are more than fifty years in the making, remain emotionally charged, and involve members who have previously been on opposite sides of specific permit applications or appeals.

Concerns raised included:

- Disagreement about whose technical expertise is authoritative, including distinctions between geotechnical, geologic, and coastal engineering credentials
- Concern that technical information will be mischaracterized or dismissed, and uncertainty about whether and how to respond in the moment
- A small number of participants dominating discussion, and members who are less comfortable speaking in a large group not being heard
- Framing that positions state interests against local interests, or environmental interests against property interests, in ways that foreclose middle ground
- Local political dynamics being carried into a statewide policy conversation

Perspectives, Interests, and/or Community Considerations

RAC Members were asked which perspectives should be carefully considered during the process and whether any voices may be underrepresented. RAC Members generally observed that DLCD made a visible effort to seat a wide range of perspectives, while identifying the following as needing additional attention.

Governmental and Sovereign Interests

- Tribal governments, including consideration of the nine federally recognized Tribes in Oregon and of Indigenous communities that do not currently hold federal recognition, and clarity about how consultation and engagement will occur alongside the RAC process

- County and city jurisdictions, including planning commissions, whose regulatory approaches to shoreline protection vary substantially from one jurisdiction to the next
- Special service districts operating below the municipal level, whose challenges and resources are less visible in statewide processes
- State agencies with water quality, fish and wildlife, submerged lands, floodplain, and emergency management responsibilities

Community and Resident Interests

- Coastal residents who do not own property, including renters, whose interests are distinct from those of property owners
- Migrant and seasonal workers and residents for whom English is a second or learned language, and for whom regulatory changes may not be communicated in an accessible form
- Long-term residents whose observational knowledge of what has and has not worked over decades is not captured in any dataset
- Inland property owners, whose interests can diverge from those of shorefront owners within the same community
- The recreating public and visitors, who are affected by access and safety conditions but are not organized as a constituency
- Emergency services, including access and response considerations shaped by shoreline and dune conditions

Technical, Professional, and Economic Interests

- Coastal engineering and coastal geomorphology expertise, distinguished from geotechnical practice
- Ecologists, wildlife biologists, and those able to assess habitat and species consequences of specific techniques
- Contractors and builders, who RAC Members noted are frequently absent from permitting discussions despite executing the work
- Real estate professionals and land developers, including owners of land held for future development
- Coastal businesses and the visitor economy, including lodging, events, and tourism-dependent local revenue
- Commercial and recreational fishing interests with sustained observational knowledge of local conditions
- Insurance considerations affecting ocean-fronting property

Geographic Considerations

RAC Members consistently emphasized that the Oregon coast is not one place. RAC members spoke to how conditions and pressures differ substantially between the north, central, and south coast; between open ocean shore, estuaries, rivers, and coastal lakes; and between accreting and eroding littoral cells. RAC members noted that microclimates and long-term weather patterns vary along the coast, that erosion hot spots are concentrated in identifiable areas, and that some communities are gaining beach while others are losing it. A recurring recommendation was that the rules provide for place-specific application rather than a uniform standard, and that the committee guard against generalizing from any single community's experience.

Information, Data, and Knowledge Needs

RAC members identified information the RAC should consider and named specific reports, datasets, workshops, projects, and areas of expertise that could support that work.

Information and Data

- **Coastal change and storm history.** Long-term shoreline change monitoring, the historical wave and storm record, and the conditions any approach must be designed to withstand, noting that recent decades have been comparatively mild.
- **Case studies, including non-viable solutions.** Documented nonstructural, hybrid, and structural projects with design intent, performance over time, cost, and maintenance history. RAC members emphasized that examples of what has not worked are as instructive as successes.
- **Design criteria and parameters.** Practical direction engineers can apply, including wave exposure conditions, site access constraints, and construction-phase impacts. RAC members noted that engineers need parameters.
- **Cost and life cycle comparison.** Comparative installation, maintenance, and service-life costs across approaches.
- **Sediment dynamics and mapping.** Littoral cell boundaries, accretion and erosion patterns, the effects of existing jetties and large structures, and mapping of the statutory vegetation line, modeled estuary extents, and revised flood mapping.
- **Ecological and cultural resource information.** Effects of specific techniques on habitat, listed species, and native plant communities, including cumulative effects along a shoreline reach; and where archaeologically sensitive areas are concentrated and what ground disturbance triggers.
- **Existing permitting record and program interactions.** Inventory of general authorizations, exemptions, and permit categories that may already cover low-impact techniques, and how

flood insurance requirements, floodplain standards, endangered species compliance, and Goal 18 eligibility will interact with new rules.

- **Experience from other jurisdictions and local knowledge.** Lessons from states with more established nonstructural programs, with attention to which transfer to Oregon's conditions and policy framework; and structured ways to capture the observational knowledge of long-term residents and local practitioners.

Potential Resources and Presenters

RAC members named the following as potential briefings, materials, and field visits.

- State coastal geomorphology and hazards monitoring, including coastal change data, established monitoring sites, and the historical wave record.
- University coastal engineering and dune geomorphology research, including wave laboratory capability and recent published work on Oregon dune evolution.
- Materials, reports, and recordings from recent Oregon beach and dune and nature-based solutions workshops, strategy catalogues, and a global literature review of nonstructural approaches.
- Agency staff and consultants from Washington with more established experience in dynamic revetments and nonstructural design.
- State permitting staff from each agency with jurisdiction, presenting the pathway from the applicant's perspective, and Tribal cultural resource staff on compliance obligations.
- Federal coastal engineering manuals, flood study documentation, and recently issued state guidance on coastal infrastructure design and siting.
- Field visits: an in-progress nonstructural demonstration project in Cannon Beach; existing dynamic revetment installations at Ecola state park, Hatfield research facility, and different jetty locations; south coast settings illustrating invasive vegetation, eroding bluffs, and cultural resources; central coast bluffs where natural material placement has been permitted near Seal Rock; and communities including Seaside with differing dune management practices

Several RAC members volunteered to host or guide field visits and to share photographs, permit records, and project documentation with the committee.

General RAC Experience

RAC members bring markedly different levels of experience with rulemaking advisory committees: several have served on multiple RACs across natural resource, transportation, and land use agencies, while a substantial number have never served on a state advisory body of any kind and were candid that they will need support to participate on equal footing. Across that range, interviewees described success as rules that are clear, internally consistent, faithful to legislative intent, and usable by the regulators, applicants, and designers who will apply them, arrived at through a process

in which every member has a real opportunity to be heard and disagreement is surfaced and worked through rather than avoided. Several drew on recent related rulemaking experience sharing concerns about late materials, limited communication between meetings, and an unexplained pause and advised DLCD to share materials in advance and clearly communicate issues and challenges that may impact the work of the RAC. RAC members expressed appreciation for scheduling meetings well in advance and for the individual interview opportunity.

Key Questions on the RAC Process

RAC members raised the following questions:

- How large is the committee, and who is serving on it?
- Will the committee have access to member applications or background information to understand the expertise around the table?
- How will the rulemaking work in practice? What is the committee's role in producing rule language, and how are recommendations carried forward?
- How does this rulemaking relate to the concurrent state parks rulemaking and to other agency rulemaking underway on related subjects? What is the sequencing?
- Will definitions apply uniformly across settings (open ocean shore, estuaries, rivers, and coastal lakes) or will they differentiate by exposure and setting?
- How will conflicts with existing requirements, including flood insurance program standards and Goal 18 eligibility, be identified and resolved?
- Will the committee define what success looks like at the outset?
- Will meetings be recorded, and will summaries be provided to members who cannot attend?
- What is expected of members between meetings, and what is the anticipated time commitment?

Conclusion

Across these conversations, RAC members were open, generous with their time, and direct about both their interests and their concerns. RAC members across the full range of perspectives agree that the absence of clear definitions is the central problem this rulemaking exists to solve, and that the permitting pathway is difficult to navigate for applicants and regulators alike. They agree that the Oregon coast is highly variable and that rules should accommodate place-specific conditions, be flexible and allow experimentation to learn what works and what doesn’t. They agree that whatever the committee recommends must be durable, usable, and capable of withstanding the conditions this coast produces.

RAC members also hold differing perspectives, specifically about the role of conventional armoring, about what should qualify as nature-based, about how to weigh protection of property and infrastructure against protection of shoreline processes and public access, and about how much the rules should constrain versus enable. RAC members asked for a process in which the

differences are surfaced early, discussed with good information, and worked through with structure and mutual respect.

Kearns & West appreciates the candor and thoughtfulness members brought to these conversations and looks forward to supporting the committee's work.

Appendix A: Convening Interview Questions

The following questions guided the convening interviews. Conversations were semi-structured; not every question was asked of every RAC member, and follow-up questions were tailored to each member's background and role.

1. Please tell us about your background and your interest in shoreline stabilization issues in Oregon. How do you see your role on the RAC? What is your personal experience or expertise with shoreline stabilization in Oregon? What is your familiarity with Oregon land use and coastal management?
2. What interests, concerns, or priorities led you or your organization to participate? From your perspective, what are the most important issues, opportunities, or challenges this rulemaking should address along Oregon's coast, estuaries, or lakes?
3. What perspectives, interests, or stakeholder groups should be carefully considered during this process? Are there any voices that may be underrepresented?
4. What information, data, technical expertise, or local knowledge will be important for the RAC to consider when evaluating potential rule changes?
5. What is your experience working with other RACs? Have you served on a RAC before? What does a successful RAC process look like from your perspective? What outcomes would indicate that the committee has done its work effectively?
6. Are there particular topics, issues, or areas of disagreement that you anticipate may be challenging for the committee to discuss? If so, what would help those conversations be productive?
7. How should the RAC approach situations where members have differing values, priorities, or interpretations of scientific, technical, or policy information?
8. What process considerations would help you participate effectively in the RAC (for example, meeting format, technology support, accessibility needs)?
9. Do you have any questions for us? Is there anything else you would like to share that would help us support the committee's work?

Department of Land Conservation and Development (DLCD) Coastal Shoreline Stabilization Rulemaking Advisory Committee (RAC) Meeting Summary

Thursday, September 10, 2026, RAC Meeting #1

Location: Virtual (Zoom)

This meeting was livestreamed, recorded, and available for viewing at https://www.youtube.com/Oregondlcd. The following is a high-level summary and meeting overview. Please review the recording and archived meeting packet for details and presentation slides.

MEETING ATTENDEES

RAC Member Attendees:

- Councilor Tita Montero, City of Seaside
- Anthony Pagano, City of Gold Beach
- Brendan Lynch, Emergency Management Professional
- Brock Nation, Oregon Realtors
- David Lauten, Institute for Natural Resources
- Denise Lofman, Columbia Estuary Study Taskforce
- Dianna Turner, Friends of the Dunes at Cannon Beach
- Guy Sievert, Coastal Property Owner, Watershed Council
- Jacqui Boyer, Certerra Northwest, LLC
- John O'Leary, Lincoln County
- Mark Hopman, Coastal Business Manager
- Mary Redfield, Coastal Property Owner
- Max Bordal, HG Schlicker and Associates
- Max Derenoncourt, Youth Representative
- Meagan Wengrove, Oregon State University
- Ralph Dunham, North Bend
- Sara Palmer, Coquille Indian Tribe
- Weston Fritz, City of Lincoln City

State Agency Representative Attendees:

- Charles Redon, Oregon Dept. of State Lands
- Jonathan Allan, Oregon Dept. of Geology and Mineral Industries
- Kevin Herkamp, Oregon Parks and Recreation Dept.
- Scott Marion, Oregon Dept. of Fish and Wildlife
- Stacey Goldstein, Oregon Dept. of Transportation
- Tom Jenkins, Oregon Dept. of Emergency Management

DLCD Staff Attendees:

- Dr. Brenda Ortigoza Bateman, DLCD Director
- Lisa Phipps, Ocean and Coastal Services Division Manager
- Dr. Rhiannon Bezore, Coastal Shores Specialist
- Meg Reed, Senior Coastal Policy Specialist
- Amanda Macnab, Costal Rulemaking Coordinator
- Alyssa Bonini, Legislative and Policy Coordinator
- Casaria Taylor, Senior Rules Coordinator
- Deanna Wright, Oregon National Flood Insurance Program Coordinator
- Hui Rodomsky, South Coast Regional Representative
- Brett Estes, North Coast Regional Representative

Facilitation Team:

- Jamie Damon, Kearns & West
- Ruby Gonzales, Kearns & West Facilitation Team

WELCOME, OPENING REMARKS, AND AGENDA REVIEW

Jamie Damon, Kearns & West, introduced herself as the neutral-third-party facilitator for the RAC. She provided an overview of the hybrid meeting format, meeting logistics, and reviewed the agenda.

Dr. Brenda Bateman, DLCD Director, introduced herself and provided brief opening remarks. She explained that this rulemaking originated in legislative direction passed in the 2025 session, and that the Land Conservation and Development Commission (LCDC) provided a charge for the rulemaking that expands its scope beyond the bill to allow DLCD to define additional related terms. Dr. Bateman noted the rulemaking will not amend the coastal goals and described three intended outcomes: decrease barriers to using nonstructural nature-based shoreline stabilization solutions, expand their use wherever appropriate, and increase education about their uses and benefits for permitting agencies, property owners, and coastal contractors. She asked members to keep the practical constraints and capacity challenges of implementing partners in mind so that the rules are meaningful, productive, and implementable.

Lisa Phipps, DLCD Ocean and Coastal Services Division Manager, introduced herself and provided brief opening remarks. She shared that drafting rules is the main focus of the committee's work between now and spring 2027. Lisa noted that the new rule has a narrow focus, so some members' concerns may not be fully addressed by this rulemaking. However, sharing those concerns is still useful for other discussions. She encouraged all members to speak up regardless of their experience with rulemaking advisory committees.

Jamie noted that Commissioner Erin Skaar, the LCDC liaison to this RAC, was unable to attend this first meeting and will join future meetings.

INTRODUCTIONS

Jamie facilitated introductions among the group. DLCD staff, RAC members, and state agency representatives each shared their name, title, organization or interest represented, and their connection to the Oregon coast. Many RAC members described long-standing personal, generational, or professional ties to the coast. Jamie noted that a brief roll call will be conducted at the top of each future meeting.

RAC ROLE, CHARGE, AND OPERATING PRINCIPLES

Jamie provided an overview of Oregon public meeting laws. She encouraged RAC members to email department staff with questions and not conduct RAC business offline with other RAC member outside of meetings. She shared that meetings are open to all to view on DLCD's YouTube channel, are recorded, and all materials are posted to the DLCD's RAC website. As part of the meeting packets, meeting summaries will be provided in advance of each RAC meeting and DLCD aims to distribute packets one week ahead of each meeting.

Jamie reviewed the role of the RAC, noting that this committee is advisory rather than consensus based. She shared that RAC members advise staff, help brainstorm ideas, and recommend policies, language, and direction. RAC members are considered volunteers by the state and must comply with open meeting, public record, and ethics laws.

Jamie reviewed the operating principles and guidelines included in the meeting packet: act in good faith; stay on topic; balance speaking time; address issues and questions, not people or organizations; listen with respect and speak one at a time; discuss topics together; communicate on behalf of your interest group; and attend all meetings. She noted that members who cannot attend should notify staff in advance, review the packet and meeting recording, and follow up with DLCD or the facilitation team to get up to speed.

Meg Reed, DLCD, reviewed the rulemaking charge. She shared that the RAC will define terms used in coastal planning related to shoreline stabilization, including but not limited to nonstructural nature-based solutions, structural and hybrid stabilization techniques, and hazard avoidance measures; require that nonstructural nature-based solutions conform with statewide land use planning goals and are prioritized over structural solutions to address erosion and flooding, including through consideration of incentives; consider mitigation for structural shoreline stabilization methods; and consider local government and state agency capacity constraints to achieve rule requirements. She noted the rulemaking will not change rules allowing ODOT to use structural shoreline stabilization methods, as those are already allowed by the statewide planning goals and associated rules. The group had the following questions.

- **RAC Member Question:** Several RAC members work with one another on other business and community matters outside of this committee. If a member needs to email other RAC members as part of that separate work, do they need to step away from the RAC?
    - **KW Response:** No. Many RAC members work with one another on other matters. We ask that RAC business not be conducted with other RAC members outside of these meetings.
- **RAC Member Question:** Is the RAC developing a set of definitions as part of this rule process?
    - **DLCD Response:** Yes. Definitions are part of the charge, and the majority of the next RAC meeting will focus on definitions.

BACKGROUND SETTING

Rhiannon Bezore, DLCD, presented an overview of the Oregon Coastal Management Program (OCMP) and the statewide land use planning system. The OCMP was approved by the National Oceanic and Atmospheric Administration (NOAA) in 1977 under the Coastal Zone Management Act of 1972, making Oregon one of the first approved programs in the country. She shared that Oregon's coastal zone is watershed-based, extending from the territorial sea eastward to the Coast Range, which is wider than the coastal zones of other states. The OCMP is housed within DLCD and holds authority to review federal activities for consistency with state and local enforceable policies. The OCMP network is made up of all coastal counties and cities and ten other state agencies in addition to DLCD. The network also works with tribes, university partners, and other communities and organizations.

Rhiannon provided a high-level overview of Oregon's land use planning system, established in 1973 with the passage of Senate Bill 100 and built on 19 statewide planning goals grouped into process, resource, urban, and coastal goals. The state's role is to set and enforce the goals and advise local governments, through a variety of means, including guidance documents, data and tools, model policies and codes, network meetings and training, and identification of local planning grants and funding opportunities. She shared that three coastal goals are the focus of this rulemaking: Goal 16 (estuarine resources), Goal 17 (coastal shorelands), and Goal 18 (beaches and dunes). Goal 19 (ocean resources) is not part of this effort.

Rhiannon described Oregon's dynamic coast and acute hazards, such as the Cascadia Subduction Zone and the potential for earthquake and resulting tsunami impacts. Chronic hazards include a large tidal range, king tides, extreme winter waves, atmospheric rivers, tidal and storm surge flooding, and erosion. She described the coastline as geologically diverse, with sandy, mixed sediment, and cobble beaches on the outer coast and varied estuarine environments, clarifying that there is no one-size-fits-all erosion control solution. Rhiannon shared that the purpose of all shoreline stabilization is to reduce erosion, wave attack, and flooding, with reduction and minimization rather than elimination as the goal.

Rhiannon reviewed the impacts of structural shoreline stabilization, including end effects or flanking on adjoining properties, toe erosion at the base of the structure, loss of sediment to the beach system and beach narrowing, loss of north-south beach access, habitat loss, and the pattern described as "riprap begets riprap." She noted that structural methods also carry benefits and that seawalls and riprap are the most common methods in Oregon and have a long history of use. There is a general wariness toward nonstructural solutions in Oregon because there are fewer cases where they have been implemented. Goals 16, 17, and 18 all contain provisions limiting structural solutions, but provide few definitions and limited guidance, which is the gap this rulemaking is intended to fill. She shared that terms will be defined along a continuum from nonstructural to structural, including hybrid solutions.

Meg Reed, DLCD, reviewed the current policies in the three statewide planning goals relevant to shoreline stabilization.

- Goal 16 (Estuarine Resources) covers the waters of the estuary. Oregon zones its estuaries through three management units: natural, conservation, and development, with boundaries defined by the resources present or the uses taking place. Alterations to the estuary require an impact assessment; dredge, fill, or other alteration must meet minimum criteria; and certain uses in natural and conservation management units are subject to a resource capability test. In natural management units, the most restrictive unit, riprap is the only structural method allowed and only under certain conditions, such as for the protection of development existing as of October 7, 1977, or for the protection of public facilities. Nonstructural methods are allowable subject to the requirements above.
- Goal 17 (Coastal Shorelands) covers the areas adjacent to estuaries, coastal lakes, and the ocean shore, and is the main policy framework for this rulemaking. Implementation Requirement 5 provides that land use management practices and nonstructural solutions to problems of erosion and flooding shall be preferred to structural solutions. Structural solutions are the least prioritized, and all shoreline stabilization must minimize adverse impacts.
- Goal 18 (Beaches and Dunes) applies on the outer coast and limits beachfront protective structures to development that existed as of January 1, 1977. Development is defined specifically for this requirement and does not include roads. Use of a beachfront protective structure must minimize visual impacts, maintain access to the beach, minimize negative impacts on adjacent property, and avoid long-term or recurring costs to the public.

Meg described the spatial relationship among the goals. Goal 17 (coastal shorelands) and Goal 18 (beaches and dunes) overlap, with each jurisdiction defining its own coastal shoreland and beach and dune boundaries based on minimum information required by the goals. Goal 16 (estuaries) and Goal 17 adjoin but do not overlap, meeting at mean higher high water. She shared that shoreline stabilization frequently occurs directly at these lines, and projects may need to comply with the requirements of multiple goals.

Meg then reviewed the legislative direction. Senate Bill 504 (2025) directs LCDC to adopt rules by January 1, 2028, that at a minimum define "nonstructural nature-based solutions," guide the use of those solutions, and conform with the statewide planning goals. The bill also includes direction on the composition of the rulemaking advisory committee and a requirement for conforming rulemaking by the Department of State Lands and the Oregon Parks and Recreation Department, if needed, by January 2029.

Meg reviewed what will not be addressed through this rulemaking: alterations that are not shoreline stabilization techniques, such as outfalls or public accessways, and anything that would require an amendment to Goals 16, 17, or 18. She shared that the guiding policy framework is that nonstructural shoreline stabilization and hazard avoidance measures are the first choice to address shoreline erosion and flooding impacts. Meg noted that the rules will likely require cities and counties to update comprehensive plans and development codes, revise permitting processes, and require coordination with state agencies and education for applicants and consultants. DLCD will offer training and support on implementation. The group had the following questions and comments.

- **RAC Member Question:** Could you go over how tidal influence is defined under Goals 17 and 18? Does it include the open ocean, or only waters that can be measured with a gauge height?
    - **DLCD Response:** It is dependent on geography and jurisdiction. In estuaries, the legal regulatory boundary for the application of Goal 16 is the head of tide, and then Mean Higher High Water or the line of actual vegetation, whichever is further landward. Anything waterward of that line is considered estuary while anything landward of that line is considered coastal shoreland. The same definition of coastal shoreline applies on the outer coast (Mean Higher High Water). This boundary is often derived by survey in the field but is otherwise derived using NOAA tidal gauge data, which uses a 20-year average to calculate the mean tidal lines.
- **RAC Member Question:** For estuaries, will the rule only address nature-based solutions within the water portion and not the adjacent lands?
    - **DLCD Response:** The rule will address both, covering the whole landscape. The rules may be parsed to some extent by the geography of where the coastal goals apply. Regulatory boundaries differ by agency. The boundaries described here are for the implementation of the statewide planning goals.
- **RAC Member Question:** As estuaries are fed by rivers, where does the coastal shoreline stop as you go upriver from an estuary? For example, the Necanicum River rises and falls with the tide.
    - **DLCD Response:** It stops at the head of tide where tidal influence ends. The Department of State Lands maintains a map (linked here) of the heads of tide for each estuary, which is used for regulatory purposes.
- **RAC Member Question:** Where an estuary flows out to the ocean, there is an area where it crosses the beach. The RAC should discuss jurisdictions and which rules apply where.

    - **DLCD Response:** This is a point to address in a future meeting and could be a focused topic for OPRD, DSL, and local jurisdictions.
- **RAC Member Question:** If the rules are not adopted until January 2028, when will a city need to have its comprehensive plan and development code adjusted?
    - **DLCD Response:** The rules only have to be adopted by that date, and the effective date can be different. The RAC can discuss how long local governments would need to update their plans and what an appropriate timeline would be.
- **RAC Member Question:** Where do hybrid solutions fit within the rulemaking? Will definitions be developed for those?
    - **DLCD Response:** Yes, hybrid shoreline stabilization techniques will be part of the discussion, and the next RAC meeting will focus on definitions.
- **Oregon Emergency Management (OEM) Comment:** County and tribal jurisdictions may also need time to review potential changes and how they align with, or create tension with, their Natural Hazard Mitigation Plans, which often include municipalities and special districts. Those plans require state and federal coordination and approval and have five-year lifespans before being renewed. There may be a nested series of documentation and programmatic timelines to be better understood.
    - **DLCD Response:** Natural Hazard Mitigation Plans are not local regulatory documents unless the local government adopts them into its comprehensive plan and development code. For land use, cities and counties have distinct jurisdictions, with some overlap in the urban growth boundary, which is usually addressed through a memorandum of understanding or agreement about who processes land use approvals.

COASTAL SHORELINE STABILIZATION PERMITTING

Meg reviewed the local permitting framework, illustrating how the pieces fit together. Oregon Revised Statutes and the statewide planning goals sit at the top and carry the same legal weight; Oregon Administrative Rules help implement the laws, and this rulemaking will add a new division to the administrative rules; comprehensive plans are the overarching local policy documents, implemented through local ordinances; and individual permits and local decisions sit at the bottom. For land use, permits typically fall into permitted uses, conditional uses, and prohibited uses. Floodplain development permits are generally required whenever development occurs in a regulated floodplain.

Deanna Wright, DLCD's Oregon National Flood Insurance Program (NFIP) Coordinator, presented on floodplain development and local planning. The NFIP was created in 1968 and applies nationwide; participation provides access to federal grants and disaster assistance and flood insurance for structures and contents, and FEMA identifies and maps flood risk on an ongoing basis. Approximately 98 percent of Oregon communities participate. DLCD has hosted the state technical assistance grant since 1998 and assists 260 communities statewide. Floodplain management is delegated to local jurisdictions in Oregon, which issue permits and enforce their own floodplain regulations; continued eligibility depends on maintaining compliance with minimum NFIP regulations.

Deanna reviewed example coastal flood maps from Seaside, Lincoln City, Florence, and Bandon, noting that all flood maps along the Oregon coast have been updated over roughly the last decade. She described how coastal flood maps are prepared, including offshore analysis using Pacific Ocean wave data, buoy data, and storm data, and nearshore analysis applying different shoreline types and cross-sections based on topography, wave exposure, shoreline characteristics, and land use.

She reviewed the coastal flood map zones. She explained base flood elevation and the 1% annual chance flood, and noted mapping limitations that FEMA does not account for, including changing conditions, fire impacts, blocked bridges and culverts, sediment flow and channel erosion, and extreme rain events. Deanna then reviewed coastal floodplain regulations derived from federal regulation and reflected in section 5.3 of Oregon's model floodplain ordinance.

Deanna closed with the status of the Biological Opinion (BiOp) in Oregon. She shared that FEMA was sued in 2009 over whether federal floodplain regulations did enough to protect species listed under the Endangered Species Act. NOAA then issued a Biological Opinion in 2016. Two processes are now running simultaneously. FEMA's short-term Pre-Implementation Compliance Measures (PICM) offered communities three pathways: adopt the FEMA model ordinance, place a moratorium in the floodplain, or proceed permit-by-permit with habitat assessment and mitigation. FEMA's full implementation requires selecting among three options: no action, no net loss with exceptions, or no net loss without exceptions. There is a September 1, 2027, deadline for FEMA to fully implement. Deanna emphasized that DLCD's role has been technical assistance and coordination, not tracking, documenting, or enforcing FEMA's plan.

The group had the following questions and comments.

- **RAC Member Question:** Since the NFIP is currently set to sunset September 30, 2026, is reauthorization anticipated?
    - **DLCD Response:** The NFIP was reauthorized through December in a continuing resolution.
- **RAC Member Question:** How does PICM work alongside FEMA's rules?
    - **DCLD Response:** DLCD cannot answer on FEMA's behalf, but PICM is still in effect, and communities should have selected one of the pathways to comply with the short-term measures. Members are encouraged to follow up directly with FEMA Region 10.
- **RAC Member Question:** In Tillamook County, because of new FEMA regulations and mapping, a structure destroyed by natural causes and being rebuilt on the shoreline had to be elevated on stilts, which violated the height limit along the shoreline in the county's land use ordinance. When one set of rules runs into another, is that something DLCD would look at?
    - **DLCD Response:** Anything substantially damaged or substantially improved must meet the current floodplain regulations of the local jurisdiction, which is why it was elevated on posts and pilings in the VE zone. Height limitations are the county's code. DLCD has no requirements about height limitations and would not get involved.
    - **RAC Member Response:** Lincoln County would consider a height variance to accommodate a constraint created by the flood hazard.

- **RAC Member Question:** Does the Oregon Department of Justice have a role in the RAC process, or does it come in at the end and provide redlines? How do these administrative rules align with the Oregon Constitution and other frameworks?
    - **DLCD Response:** There are usually multiple touchpoints. DLCD has a Department of Justice representative, shared with the Oregon Parks and Recreation Department, who reviews rules at draft stages and conducts a deeper review before the rules go out for public comment, currently estimated for April 1, 2027.
- **RAC Member Question:** Will the rule direct local government or just set nature-based solution standards?
    - **DLCD Response:** It is likely the rule will direct local government, but that is hard to say at this point.

STATE AGENCY ROLES

Rhiannon introduced the six state agencies represented on the RAC and their roles in this rulemaking. Agencies that grant permits are the Oregon Parks and Recreation Department (OPRD) and the Oregon Department of State Lands (DSL). The Oregon Department of Transportation (ODOT) receives permits and maintains jurisdiction over the state highway right-of-way. The Oregon Department of Emergency Management (OEM) contributes hazard planning and mitigation expertise. The Oregon Department of Fish and Wildlife (ODFW) and the Oregon Department of Geology and Mineral Industries (DOGAMI) provide technical expertise and guidance. State agency representatives are participating RAC members as well as technical resources.

Rhiannon noted that DLCD will provide office hours or drop-in meeting times for non-agency RAC members on an as-needed basis, depending on interest, and will meet separately with state agency RAC members as needed. The group had the following questions and comments.

- **RAC Member Question:** Is there any requirement for citizen involvement in the OPRD's permitting process? Public safety and public access to the beach are among the considerations for a shoreline protection application, and it would be useful to know whether the community is involved.
    - **OPRD Response:** For full permits there is a 30-day review. For waivers there is no public review.
    - **DSL Response:** For DSL individual permits and general permits there is a public and agency review period. For notice-based exemptions there is no public review requirement.
    - **OEM Response:** On coastal hazards, OEM is heavily involved with local outreach to community members. Discussions of administrative rulemaking and updates to existing procedures are often where most people interact with the agency.
    - **RAC Member Comment:** Tribal staff regularly review OPRD actions within the ocean shore jurisdiction, though broader comment requirements are less clear.

- **RAC Member Question:** The ocean shore rules include permitting requirements for any type of modification. Does that apply only to public or state property, or to any property, including private property?
    - **OPRD Response:** It applies to any property. The ocean shore jurisdiction extends along the entire coastline within that boundary line and includes both public and private ownership.
- **RAC Member Question:** Does OPRD's jurisdiction include federal lands?
    - **OPRD Response:** Somewhat yes. There is no exclusion for the federal government.
    - **DSL Response:** DSL's removal-fill permitting jurisdiction also covers federal lands.

REVIEW OF RULEMAKING PURPOSE AND TIMELINE

Jamie revisited the rulemaking charge, which is to: define terms; work within the existing coastal goals; require prioritization of nonstructural shoreline stabilization; consider incentives for nonstructural shoreline stabilization methods; consider mitigation for structural shoreline stabilization methods; and consider local government and state agency capacity constraints. She noted that clarity around definitions was a consistent theme in the one-on-one member interviews. The group had the following questions and comments.

- **RAC Member Question:** If the rules establish a preference for flexible nature-based stabilization solutions, will DSL and the U.S. Army Corps of Engineers give any consideration to permit authorization for projects with a shorter-life span? For example, if a solution is expected to last 10 years, would it require the full permit process to re-establish, or a semi-automatic reauthorization? Under a nationwide permit the process may take three to five months, but an individual permit can take two to three years, which is a concern when the resulting structure has a 10-year life expectancy.
    - **DLCD Response:** We can discuss this further and consider how these rules work in relation to DSL rules and coordinated permit processes. DSL can conduct conforming rulemaking. How to incentivize nature-based solutions should be part of the RAC discussion, though DLCD does not have an answer yet on what that looks like. DLCD anticipates including a section in the new rules on coordination and guidance.
    - **DSL Response:** The U.S. Army Corps of Engineers is not represented on this RAC. Corps permits are entirely separate from DSL permits; the two share an application form only, with no cross-link in the permitting process. At DSL, timing is handled on the front end and depends on the method being used. A new hard structure such as riprap requires an individual permit, which takes a minimum of 120 days from receipt of a complete application and can take longer if additional analysis or mitigation is needed. DSL has notice-based exemptions, called general authorizations, for bioengineering and similar approaches; those applications are less expensive, require substantially less analysis, and are approved within 30 days of a complete application. Once issued, a removal-fill permit functions like a construction permit and is only active for the period the work is being done in the wetland or waterway, rather than being maintained in perpetuity.

- **RAC Member Question:** Are those DSL provisions in rule, or are they agency processes?
    - **DCLD Response:** One possibility is that a more streamlined permit type could be added to DSL's general authorization list as an outcome of this rulemaking. Similarly, if this rulemaking develops a definition that does not align with DSL or OPRD definitions, those agencies may need to update theirs. Conforming rulemaking refers to the provision in SB 504 allowing DSL and OPRD to adopt rules to resolve conflicts or misalignment between their existing rules and the new rules. We coordinate with the Army Corps and can potentially schedule technical presentations from partner agencies during future RAC Meetings.

Rhiannon noted that OPRD is running a concurrent rulemaking to update its Division 20 rules. She shared that a number of people serve on both RACs, and DLCD is working to ensure alignment between the two efforts. OPRD's process has been on a brief hiatus, allowing the two rulemakings to run more concurrently.

Jamie reviewed the rulemaking timeline:

- June through August 2026: rulemaking initiation and RAC recruitment
- September 2026 through March 2027: RAC meetings, drafting of rule language, and impact statements
- April through May 2027: local government webinars, public comment and hearings, and the final RAC meeting
- June 2027: LCDC deliberation and potential adoption
- June through December 2027: outreach and technical assistance
- January 2028: rules need to be adopted by January 1

Rhiannon noted that DLCD plans to hold at least one optional field trip, most likely in the Newport area, so members can see different types of shoreline stabilization solutions in the field. DLCD has been working with the DOGAMI and Oregon State University RAC members to plan it and will share details once they are set.

- **RAC Member Question:** Will the RAC receive one complete draft with everything in it, or will it address sections or goals separately? How should members expect the language to come to them?
    - **DLCD Response:** The next meeting will focus primarily on definitions, and each meeting after that will likely focus on various sections of the rules instead of reviewing all the rules at once to help with conversations . DLCD will likely also provide an outline of the entire rules so members can see the overall direction. Definitions will greatly shape how the rest of the rules are parsed, particularly with respect to geography and whether definitions are specialized for estuaries versus the ocean shore.
    - **KW Response:** As the RAC works section by section, the facilitation team will watch for conflicts between earlier and later sections so that the rules function as a whole.

- **RAC Member Question:** Will DLCD present on this rulemaking at the October LCDC meeting?
    - **DLCD Response:** Probably not a formal presentation. Updates will likely be included in the director's report, which is a standing agenda item.

CLOSING REMARKS AND NEXT STEPS

Jamie invited RAC members to share reflections on the first meeting.

- **RAC Member Comment:** I am disappointed that the definition of non-structural solutions excludes rocks, and that some of the nature-based approaches appear to use fewer effective materials. I am interested in whether larger rocks in keeping with the natural setting could be considered nature-based, and in learning more about cobble berms and how effective they can be. I have concerns about the visual impact of some nonstructural examples relative to maintaining the beauty of the natural environment.
    - **DLCD Response:** There is no one-size-fits-all solution. Oregon's coastline is highly erosive with high wave energy, and certain situations will call for different solutions, some of which may be structural. Nothing has been decided, and we encourage the RAC to stay open-minded and thoughtful.
- **RAC Member Comment:** Many people react the same way when first introduced to nature-based solutions, particularly around how long they last and how much erosion protection to expect. It is a significant paradigm shift from the expectation that riprap provides decades of protection. A nature-based project in Cannon Beach has been reshaped by the ocean into what a coastal engineer described as the proper slope, has come through a winter storm, and now has grass becoming established. Monitoring and learning are ongoing as the community works to balance protecting the public beach with providing protection for oceanfront property owners.
- **RAC Member Comment:** Stabilization has two sides. While much of the coast is concerned with erosion, some communities contend with sand accumulation moving into town and building high dunes, so stabilization is also a maintenance question. Both erosion and increases in sand can be caused by natural and human-made factors, including jetties, with unintended consequences in other areas. I hope the RAC can discuss this.
    - **DLCD Comment:** While dune grading will not be addressed in this rulemaking, vegetative stabilization as an erosion and accretion control measure is a relevant consideration.
- **RAC Member Comment:** The volume of acronyms used throughout the meeting was difficult to follow.
    - **DLCD Response:** We can include a list of commonly used acronyms in the next meeting packet.

Lisa provided closing remarks. She encouraged members to prepare for the definitions discussion at the next meeting, noting that the questions raised during this meeting demonstrated why definitions

are so critical and foundational to the rest of the rule. She reminded members not to hesitate to reach out to DLCD with questions, including questions intended for other agencies, which DLCD can route on their behalf.

Jamie reviewed the upcoming RAC meetings:

- RAC #2: October 15, 2026, 9:00 a.m. to 12:00 p.m. Discussion of definitions of key rule terms. Packet will be sent October 8.
- RAC #3: November 12, 2026, 9:00 a.m. to 12:00 p.m. Technical presentations and discussion of draft rules.
- RAC #4: January 22, 2027, 9:00 a.m. to 12:00 p.m.
- RAC #5: March 5, 2027, 9:00 a.m. to 12:00 p.m.
- RAC #6: May 14, 2027, 9:00 a.m. to 12:00 p.m.

MEETING ADJOURN

The meeting adjourned at 4:02 p.m. PT.

Chapter 660

Division 49

Coastal Shoreline Stabilization

Draft Rule Outline

As of 10/07/2026

Purpose

The purpose of this division is to establish definitions and requirements for managing the impacts of erosion and flooding along Oregon's coastal shorelines through hazard avoidance measures and shoreline stabilization methods. This division carries out the requirements of Goal 16 Estuarine Resources (OAR 660-015-0010(1)), Goal 17 Coastal Shorelands (OAR 660-015-0010(2)), and Goal 18: Beaches and Dunes (OAR 660-015-0010(3)) regarding coastal shoreline stabilization.

Policy

(1) The Land Conservation and Development Commission (LCDC) recognizes that coastal shoreline stabilization methods are used throughout Oregon's estuaries, coastal shorelands, and beach and dune environments to mitigate the impacts of erosion and flooding to coastal shoreline development, infrastructure, and coastal resources. Therefore, it is important to provide for and direct the use of shoreline stabilization methods within coastal resource areas.

(2) Hazard avoidance measures and nature-based solutions shall be prioritized over structural shoreline stabilization methods within estuaries, coastal shorelands, and beaches and dunes. In addition to providing shoreline stabilization, nature-based solutions provide habitat for wildlife, improve water quality, protect cultural resources, and provide public access, as appropriate.

(4) Coastal shoreline stabilization methods shall be designed to minimize adverse impacts to the natural and built environments.

Definitions

For purposes of Division 049, the definitions contained in ORS 197.015 and the Statewide Planning Goals (OAR chapter 660, division 015) apply. In addition, the following definitions apply:
See "Definitions for RAC Consideration" document.

Applicability

(1) The requirements of this division apply to areas subject to Goals 16, 17, and 18, which include estuaries, coastal shorelands, and beaches and dunes.
(2) For coastal shoreland areas immediately adjacent to coastal lakes, the requirements of OAR 660-049-XYZ (Shoreline Stabilization General Requirements) apply.
(3) OAR 660-049-ABC etc. apply to estuaries and coastal shorelands immediately adjacent to estuaries.
(4) OAR 660-049-DEF etc.* apply to:
    a. Beach and dune areas covered by Goal 18;
    b. Coastal shoreland areas covered by Goal 17 that border the ocean shore; and
    c. Any combination thereof.
(5) This division does not negate the need for entities to obtain any applicable local, state, or federal permits related to the construction, repair, or modification of new or existing shoreline stabilization projects.

**Highlighted text will be filled in later in the rule drafting process.*

Hazard Avoidance Measures

The purpose of this section is to manage and direct new development and redevelopment in high hazard areas that are prone to impacts from waves, erosion, flooding, landslide, tsunamis, and sea level rise, amongst other hazards. Under Goal 17, "Land-use management practices and non-structural solutions to problems of erosion and flooding shall be preferred to structural solutions." DLCD is drafting this section of the rules under that existing goal framework by detailing strategies that:

- Mitigate the need for future shoreline stabilization,
- Provide space for non-structural nature-based solutions to work effectively; and
- Decrease risk for those coastal shoreline properties where the rules apply.

Shoreline Stabilization

General Requirements

This section is meant to provide general requirements for shoreline stabilization techniques across all coastal landscapes. This will include any commonalities in requirements or processes. Such approaches may include what is required in a local government permit for shoreline stabilization, coordination across permitting entities, and monitoring and maintenance of techniques. An expedited review pathway for nonstructural nature-based solutions and emergency permitting of shoreline stabilization may also be addressed.

Waivers

This section addresses certain hazard avoidance measures and nature-based solutions that can occur without a permit or with the approval of a waiver to incentivize their use. This section may cover exempted activities and standards to qualify for a waiver. Such activities and standards may include providing a beneficial use to the ecosystem or public, not surpassing a size limit, having minimal impact on the landscape, or infilling nature-based solutions on adjacent properties.

Estuaries

General Requirements for Shoreline Stabilization in Estuaries:

This section will only apply to coastal shorelines within estuaries and subject to Goals 16 and 17. It will require that any shoreline stabilization project be consistent with the purposes of the estuary management unit and adjacent coastal shorelands zoning as adopted in the jurisdiction's estuary management plan.

Natural Estuaries and Natural Management Units:

This section is applicable to the types of shoreline stabilization methods allowable and prohibited within estuaries classified as natural or within designated natural management units and their adjacent coastal shoreland areas. Riprap under certain conditions is the only structural shoreline stabilization method allowable in natural estuaries and natural management units (as already stated in Statewide Planning Goal 16).

Conservation Estuaries and Conservation Management Units:

This section is applicable to the types of shoreline stabilization methods allowable and prohibited within estuaries classified as conservation or within designated conservation management units and their adjacent coastal shoreland areas.

Development Estuaries and Development Management Units:

This section is applicable to the types of shoreline stabilization methods that are allowable and prohibited within estuaries classified as deep-draft development, shallow-draft development or within designated development management units and their adjacent coastal shoreland areas.

Outer Coast

Requirements for Shoreline Stabilization in Coastal Shorelands adjacent to the Ocean Shore:

This section is applicable to the types of shoreline stabilization methods that are allowable and prohibited on the outer coast (adjacent to the ocean shore) and subject to Goals 17, 18, or both.

Mitigation

This section will address the requirements of mitigation for the impacts of structural shoreline stabilization methods related to wildlife habitat, water quality, cultural and recreational resources, and public access.

Regional and Multi-Property Planning Incentives for Nature-Based Solutions

This section addresses incentives to encourage collaborative, regional planning efforts between neighboring property owners to design, permit, and implement nonstructural nature-based shoreline stabilization projects across multiple contiguous or hydrologically connected properties. Adjacent or functionally connected properties can be any mix of private, city, county, state, Tribal, or federally owned lands.

Monitoring, Maintenance, Repair, and Removal

This section addresses the requirements and responsibilities of the landowner(s) for monitoring, maintaining, repairing, and in some cases removing shoreline stabilization on their land. Projects may require regular monitoring reports be submitted to the applicable permitting authorities.

Definitions for RAC Consideration

Terms for the Coastal Shoreline Stabilization Rules that are new and not already set in statute, rule, or statewide planning goal.

1) "Hazard Avoidance Measure" means a land use practice or requirement designed to prevent, reduce, or eliminate exposure of development and infrastructure to coastal hazards such as erosion and flooding. Examples of Hazard Avoidance Measures include construction setbacks, zoning, easements, development limitations, stormwater and groundwater management, and vegetation protection.

2) "Geologic Hazards Report" means an analysis conducted by a qualified professional that includes a site description, hazard analysis, evaluation of alternatives, mitigation, design specifications, and recommendations for development on the applicable site. Geologic hazards reports are prepared by qualified professional engineers or geologists who have professional expertise in the regional and local shoreline geology and processes.

3) "Shoreline Construction Setback Line" means the minimum required horizontal distance that buildings and structures be constructed from a body of water or coastal feature such as Mean Higher High Water or line of established upland vegetation.

4) "Shoreline Stabilization" means a project or practice that seeks to address impacts from coastal erosion and flooding. Shoreline stabilization includes nonstructural nature-based solutions, hybrid nature-based solutions, and structural shoreline stabilization, including beachfront protective structures.

5) "Nonstructural Nature-Based Solution" means a project or practice that uses, restores, or mimics natural coastal processes to address impacts from erosion or flooding. Nonstructural Nature-Based Solutions use dynamic natural elements designed to absorb wave energy and mimic, enhance, or integrate with natural functions and processes for long-term resilience.
    i) Nonstructural nature-based shoreline stabilization methods include the use of natural materials, vegetation, and natural processes to absorb wave energy, stabilize soil, slow water, manage stormwater and reduce runoff, build up dunes, restore or enhance natural ecology and functions, or otherwise reduce erosion and flooding.
    ii) Examples of nonstructural nature-based shoreline stabilization methods include but are not limited to bank recontouring, vegetative stabilization, cobble berms, sand nourishment, dune enhancement, wetland restoration, floodplain reconnection, oyster shell, logs, and similar non-structural or non-fixed erosion or flooding mitigation measures.

6) “Hybrid Nature-Based Solution” means practices that combine vegetation, biodegradable materials, and rock to absorb wave energy or otherwise reduce erosion and flooding. For a practice to be considered hybrid nature-based solution, rock may only be used for toe-of-slope protection where the stabilization solution meets the substrate or to create an intertidal sill for salt marsh creation. Hybrid nature-based solutions are usually constructed of a mix of rock, logs, and vegetation. Biodegradable sandbags or burritos are considered hybrid nature-based solutions.

7) “Toe protection” or “toe stabilization” means the use of shoreline stabilization solutions at the toe of slope to minimize erosion, scouring and undermining and to provide additional upland stabilization.

8) “Living Shoreline” means a nature-based solution, most commonly used in low-energy environments such as estuaries and coastal lakes, that provides erosion control and water quality benefits; protects, restores, or enhances natural shoreline habitat; and maintains coastal processes through the strategic placement of plants, stone, sand fill, and other organic materials, such as rock, concrete, wood fiber, oyster shells, and geotextiles. A living shoreline must meet the definition of either a nonstructural or hybrid nature-based solution depending on its specific design and cannot be a structural shoreline stabilization method.

9) “Cobble berm” means an engineered mound of cobble-sized rocks placed at the back of a beach or at the toe of a dune or bluff designed to absorb, dissipate, and shift with incoming wave energy, protecting shorelines from storms and erosion. Cobble berms imitate naturally occurring shorelines, are dynamic, and consist of stones between 2.5 to 10.1 inches in diameter.

10) “Structural Shoreline Stabilization” means methods placed within coastal shorelands or coastal waters that are intended to remain in a fixed position with the purpose of resisting or redirecting wave energy and minimizing coastal erosion impacts. Structural shoreline stabilization methods are designed to incorporate non-deformable, static, or other hardened elements composed of wood, metal, rock, concrete or other materials that are intended to maintain a specific form over time. Structural shoreline stabilization includes shore parallel and shore perpendicular methods. Examples of structural shoreline stabilization methods include but are not limited to beachfront protective structures, riprap revetments, seawalls, bulkheads, gabions, jetties, groins, and breakwaters.

11) “Beachfront Protective Structure” means a static shore parallel structure constructed on the ocean shore and is intended to remain in a fixed position to minimize or eliminate coastal erosion risk to development as defined by Goal 18. Beachfront Protective Structures are designed to resist or redirect wave energy. This includes, but

is not limited to, riprap revetments, seawalls, bulkheads, concrete or mortar reinforcement such as shotcrete that extend onto the ocean shore, and gabions.

12) “Riprap revetment” means a structural shoreline stabilization method located within coastal shorelands or coastal waters, constructed of boulders placed on a slope to mitigate the impacts of coastal erosion. Riprap revetments are typically constructed on a sloped embankment with a layer of large, angular boulders placed over a filter or bedding layer. Riprap revetments are designed to redirect or resist wave energy.

13) “Seawall” means a structural shoreline stabilization method located within coastal shorelands or coastal waters, constructed to address impacts from coastal erosion or flooding, composed of a vertical or near vertical structure. Seawalls are built from non-deformable materials including stone, brick, wood, gabions, concrete, or steel sheet pile. Seawalls are designed to reflect or resist wave energy.

Existing Definitions

Terms for the Coastal Shoreline Stabilization Rules that are set by statute, rule, statewide planning goal, or broad scientific understanding.

(1) “Accessory Dwelling Unit” or “ADU” means an interior, attached, or detached residential structure that is used in connection with, or that is accessory to, a primary dwelling.

(2) “Accessory structure” means a building or structure that:
   a. Serves a function incidental and subordinate to the primary building or principal use on the same lot or parcel;
   b. Does not include accessory dwelling units.
   c. Is non-habitable (i.e., not designed for regular living activities such as sleeping, cooking, or dining);
   d. May be detached or connected by a breezeway and shares the same parcel with the main use or structure; and
   e. Includes, but is not limited to, awnings, carports, decks, steps, storage sheds, and ramps (and similar improvements).

(3) “Beach” means gently sloping areas of loose material (e.g., sand, gravel, and cobbles) that extend landward from the low-water line to a point where there is a definite change in the material type or landform, or to the line of vegetation.

(4) “Coastal Lakes” mean lakes in the coastal zone that are bordered by a dune formation or that have a direct hydrologic surface or subsurface connection with saltwater.

(5) “Coastal Resources” mean the diverse natural, biological, and physical assets, as well as the emotional, cultural, spiritual, and recreational values found within the land-sea interface. Examples include estuaries, beaches, dunes, headlands, and wetlands, as well as fish and wildlife and their respective habitats within these areas.

(6) “Coastal Shorelands” means those areas immediately adjacent to the ocean, all estuaries and associated wetlands, and all coastal lakes. In accordance with Goal 17, coastal cities and counties have a designated coastal shorelands boundary.

(7) “Coastal Shoreline” means the boundary line between a body of water and the land, measured on tidal waters at mean higher high water.

(8) “Coastal Waters” mean the territorial ocean waters of the continental shelf; estuaries; and coastal lakes.

(9) “Cultural Areas” mean archaeological sites, landscape features of cultural interest, and sites where both are present. Also referred to as "cultural resource sites."

(10) “Dune” means a hill or ridge of sand built up by the wind along sandy coasts.

(11) “Emergency” means an unanticipated and imminent threat or peril of being destroyed or damaged by action of the Pacific Ocean or other coastal waters to public health, safety, or the environment.

(12) “Estuary” means a body of water semi-enclosed by land, connected with the open ocean, and within which salt water is usually diluted by freshwater derived from the land. The estuary includes: (a) estuarine water; (b) tidelands; (c) tidal marshes; and (d) submerged lands. Estuaries extend upstream to the head of tidewater, except for the Columbia River Estuary, which by definition is considered to extend to the western edge of Puget Island.

(13) “Ocean Shore” has the meaning provided in ORS 390.605(2).

(14) “Primary dwelling” means a permanent structure designed and used for human habitation. It is not a temporary or recreational structure. Primary dwellings include, but are not limited to, principal residences, vacation dwellings, and second homes.

(15) “Substantial improvement” means any repair, reconstruction, or improvement of an existing structure, the total cost of which exceeds 50 percent of the real market value of the structure. When applying this definition, the cumulative impact of all development work completed within the previous five-year period shall be considered. Maintenance, repair, or alterations to existing structures that do not alter the building footprint or foundation do not constitute substantial improvement.

(16) “Toe of slope” or “toe” means the lowermost base or bottom boundary where the downward-sloping bank, bluff, dune, or shoreline stabilization solution transitions to beach, lakebed, riverbed, estuarine beach, or other substrate.

INTRODUCTION TO THE

COASTAL EROSION CONTROL SNAPSHOTS

This group of Coastal Erosion Control Snapshots were designed to provide information to landowners and land use managers on coastal erosion mitigation strategies that could be implemented on the outer coast of Oregon, USA. The Snapshots provide easy to understand visualizations of the various strategies and important information on the environmental setting, advantages/disadvantages, metrics of success, design life, cost considerations, permitting, and maintenance cycles associated with their implementation. Many of the strategies presented here are considered non-structural, nature-based solutions, designed to function similarly to natural beaches, dunes, and backshore habitats and can be combined to make more resilient hybrid alternatives. We also feature structural solutions such as riprap and sea walls to serve as comparison. The Snapshots are focused on the outer coast of Oregon, but many of the strategies could be transferred to estuarine coastlines as well. Accompanying these Snapshots is an online guide that provides a simple overview of the coastal processes that result in the erosion and flooding hazards typical of the region. Additionally, the online guide includes a set of definitions for policy and permitting and contextual information meant to help with the interpretation of the Snapshots.

Suggested citation:
Wengrove, M., Clifford, I., Hacker, S., Heminway, S., Keen, M., Ringer, C., Ruggiero, P., Schuldt, A., Whalen, D., Wise, L., Arnowil, C., Balderas Guzmán, C., Bond, H., Hamilton, J., Ostrow, K., Rotolo, M., 2026. The Coastal Erosion Control Snapshots. Access through: The Cascadia Coastlines and Peoples Hub, link: https://cascadiacopeshub.org/coastal-erosion-control-snapshots/

NOTES ABOUT THE SNAPSHOTS:

- The Snapshot series is meant to be an overview of various coastal erosion control alternatives for landowners and land use managers. Not all possible erosion control strategies are presented, nor is the information exhaustive.
- Coastal engineers and informed contractors should be consulted for the design and implementation of various erosion control alternatives.
- Non-structural, nature-based solutions will be easier to permit than structural solutions. Permitting requirements should be confirmed with each permitting agency and are subject to change with updated local planning rules and regulations or state rule and law changes.
- Multiple erosion control alternatives may be combined into hybrid strategies that may impact the permitting process.
- Many of the erosion control strategies outlined in the Snapshots will require the use of heavy equipment on the beach, dune, or backshore that may impact beach access and habitat for coastal species.

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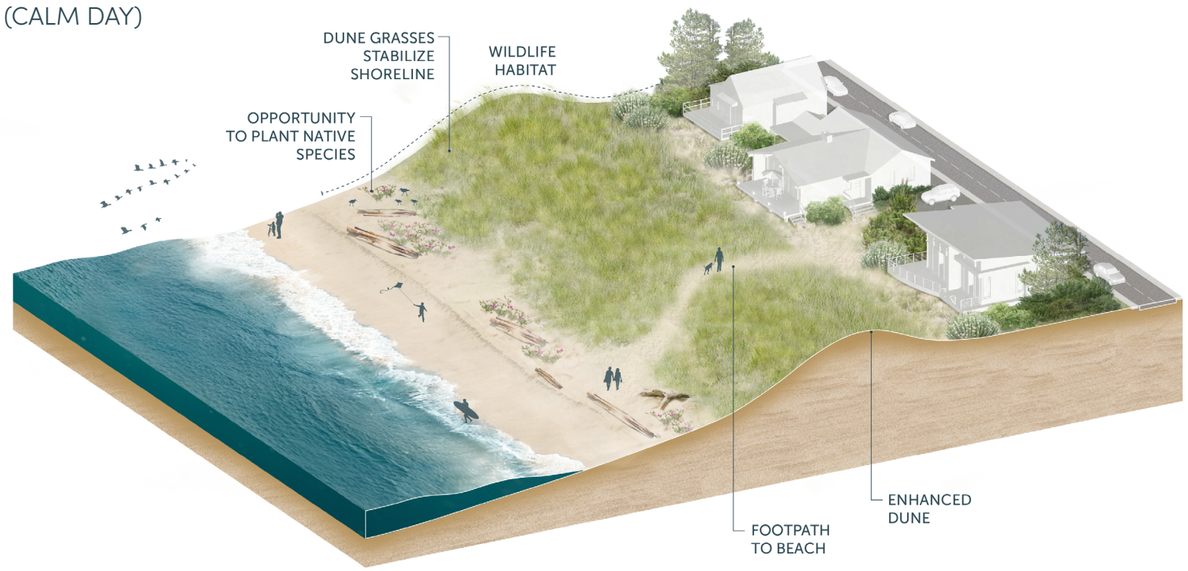
The Coastal Erosion Control Snapshot series was created in 2025/2026 by a group of graduate students and faculty at Oregon State University and the University of Washington as part of a pilot project funded by the Cascadia Coastlines and Peoples Hazards Research Hub. The information in the Snapshots was co-developed and reviewed by a working group comprised of state agency professionals, state planners, and non-governmental organizations who work on the Oregon coast. A full creators list and list of the working group participants are provided in the online guide.

Cascadia CoPes Hub
THE CASCADIA COASTLINES AND PEOPLES HAZARDS RESEARCH HUB

DUNE ENHANCEMENT

NON-STRUCTURAL SOLUTION **COST: $$$–$$$**

TYPICAL SUMMER CONDITION
(CALM DAY)



DEFINITION:

A method used to increase dune size for better erosion and flood protection through sand nourishment and/or promotion of sand accretion and dune building using dune vegetation and/or sand fences.



Pacific City, OR



Cape Disappointment, WA

ENVIRONMENTAL SETTING:

- Suitable for existing sandy beaches and dunes with mild to moderate erosion and flooding
- More effective where dune vegetation receives windblown sand from the beach to maintain dune building
- More effective on multiple parcel scales but suitable for individual parcels, if needed

ADVANTAGES:

- Preserves eroding dune and reduces beach and backshore erosion and flooding risk
- Provides habitat for plants and wildlife and increases carbon storage
- Allows for easily maintained beach access and scenic views
- Minimal and short-term modification of original backshore ecosystem and recreational activities
- Provides a flexible approach that may be combined with other non-structural solutions

DISADVANTAGES:

- Sand instability, erosion, and flooding risk before vegetation has established or sand fences are installed
- Reduced beach access if tall dunes form and/or sharp slopes are created from wave induced scarping
- Limited ocean views with tall dunes and vegetation
- Potentially less habitat for some native dune plants and animals if non-native dune grasses are planted or sand fences are installed

METRICS OF SUCCESS:

- Reduces beach and backshore erosion and flooding risk by increasing dune size
- Reduces damage to backshore coastal infrastructure
- Withstands storm conditions without significant damage
- Maintains ecosystem functions and services of dunes

DESIGN LIFE:

- Up to decades with proper sand supply, vegetation cover, and fence installation
- Depends on ability to withstand large storms and resist backshore retreat
- Given natural cycles of shoreline change, dunes may erode or build as sand supply varies
- Extended by regularly scheduled maintenance

COST CONSIDERATIONS:

- Design: Enhancement plans, permitting, structural dimensions, planting scheme, sand fence placement
- Materials and construction: Source materials and transport, site work including sand enhancement method, planting, fence installation
- Maintenance: Monitoring, sand nourishment, plant care, fence adjustments

PERMITTING:

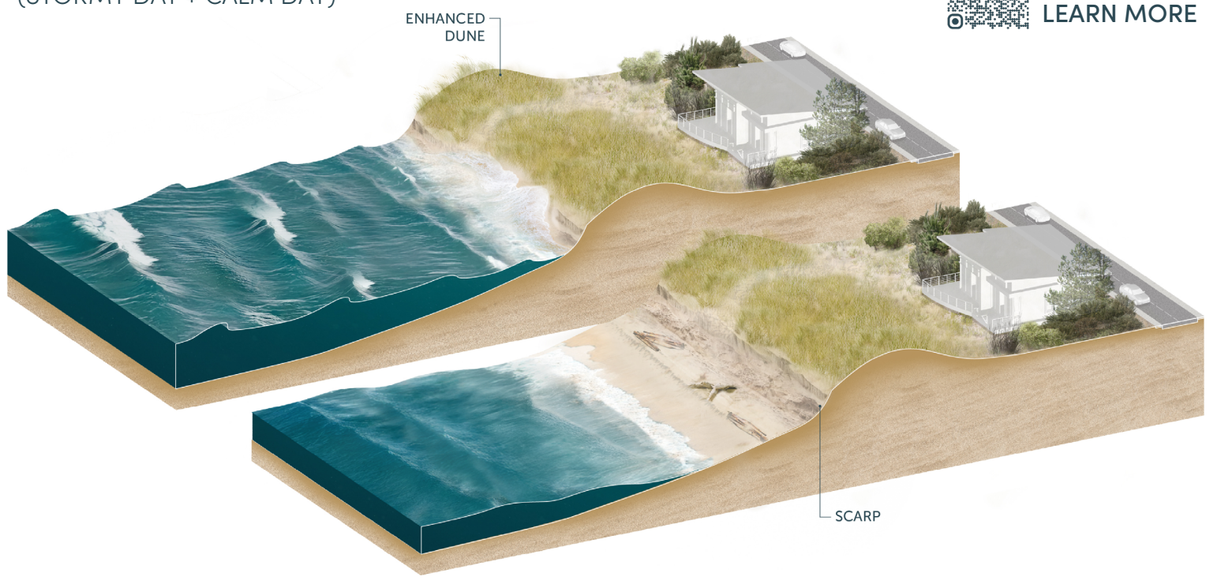
- Non-structural, nature-based solutions are preferred over structural solutions under state law, potentially simplifying permitting
- Requires an Ocean Shore Alteration Permit from the Oregon Parks and Recreation Department (OPRD) if placed on the outer coast and other permits from the city and/or county
- Additional permits may be required from other federal, state, and local agencies depending on location and potential impacts
- Locally approved dune management plans may have certain restrictions on dune enhancement methods

MAINTENANCE CYCLE:

- Maintenance may be necessary at regular time periods, after storm events, or when dune erodes, plants die, or fences are buried
- Maintenance may be initially higher as plants establish or fences are installed, but self-sustaining over time
- Monitoring is key for informing maintenance schedules and is the responsibility of the permittee

TYPICAL WINTER CONDITION
(STORMY DAY + CALM DAY)

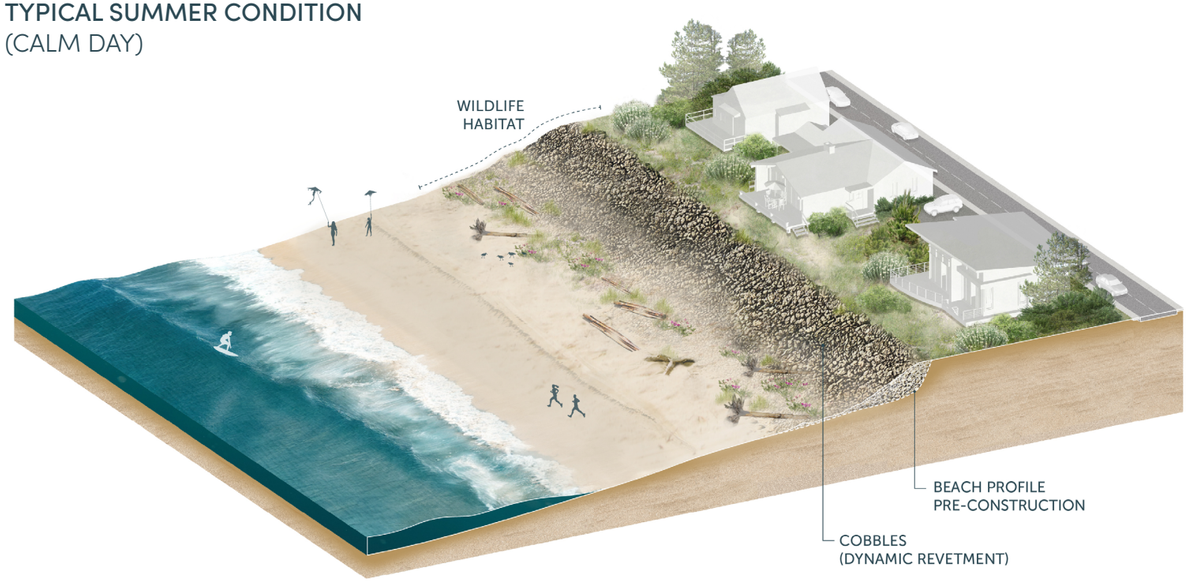
SCAN OR CLICK TO LEARN MORE



DYNAMIC REVETMENT

NON-STRUCTURAL SOLUTION **COST: $$$–$$$**

TYPICAL SUMMER CONDITION
(CALM DAY)



DEFINITION:

An engineered berm of mobile cobbles placed in the backshore to replicate the function of a natural cobble beach by dissipating wave energy and reducing erosion and flooding risk.



Westport, WA



North Cove, WA

ENVIRONMENTAL SETTING:

- Suitable for both exposed and sheltered beaches, ideally those with existing cobble rock, sand, or fine sediments
- Less suitable for beaches with substantial alongshore currents and high waves that transport cobbles
- More effective on multiple parcel scales but suitable for individual parcels, if needed

ADVANTAGES:

- Cobbles adjust to wave action and reduce beach and backshore erosion and flooding
- Provides habitat for beach plants, shorebirds, shellfish, and other wildlife
- Allows for easily maintained beach access and scenic views
- Effective on small scale projects using locally sourced cobbles without negatively affecting adjacent backshore
- Provides a flexible approach that may be combined with other non-structural solutions

DISADVANTAGES:

- Limited information on dynamic revetment performance over decadal time periods
- Movement of cobbles by waves and currents may pose safety concerns and require continued maintenance
- Original beach and backshore ecosystem may be modified, affecting recreational activities and plants, shorebirds, shellfish, and other wildlife

METRICS OF SUCCESS:

- Reduces beach and backshore erosion and flooding risk through wave attenuation
- Reduces damage to backshore coastal infrastructure
- Withstands storm conditions without significant damage
- Maintains ecosystem functions and services of cobble beaches

DESIGN LIFE:

- Ranges from 5-20 years based on existing projects
- Depends on ability to withstand large storms and still resist erosion and flooding
- Depends on size with smaller berms typically having shorter lifespans
- Depends on natural cycles of shoreline change; may experience sand burial and vegetation establishment, decreasing cobble movement and wave attenuation
- Extended by regularly scheduled maintenance

COST CONSIDERATIONS:

- Design: Construction plans, permitting, structural dimensions, cobble type
- Materials and construction: Source materials and transport, site work including excavation, staging, cobble placement
- Maintenance: Monitoring, cobble replacement

PERMITTING:

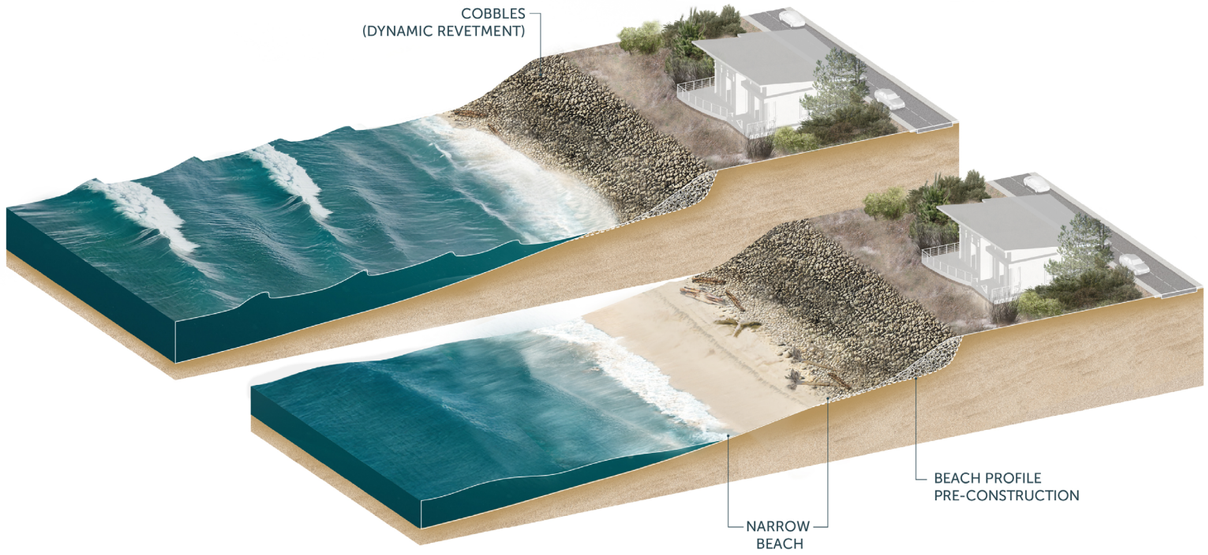
- Non-structural, nature-based solutions are preferred over structural solutions under state law, potentially simplifying permitting
- Requires an Ocean Shore Alteration Permit from the Oregon Parks and Recreation Department (OPRD) if placed on the outer coast and other permits from the city and/or county
- Additional permits may be required from other federal, state, and local agencies depending on location and potential impacts

MAINTENANCE CYCLE:

- Maintenance may be necessary at regular time periods, after storm events, or when cobbles are lost or berm is buried
- Large storms that move cobble onto infrastructure will require additional maintenance
- Monitoring is key for informing maintenance schedules and is the responsibility of the permittee

TYPICAL WINTER CONDITION
(STORMY DAY + CALM DAY)

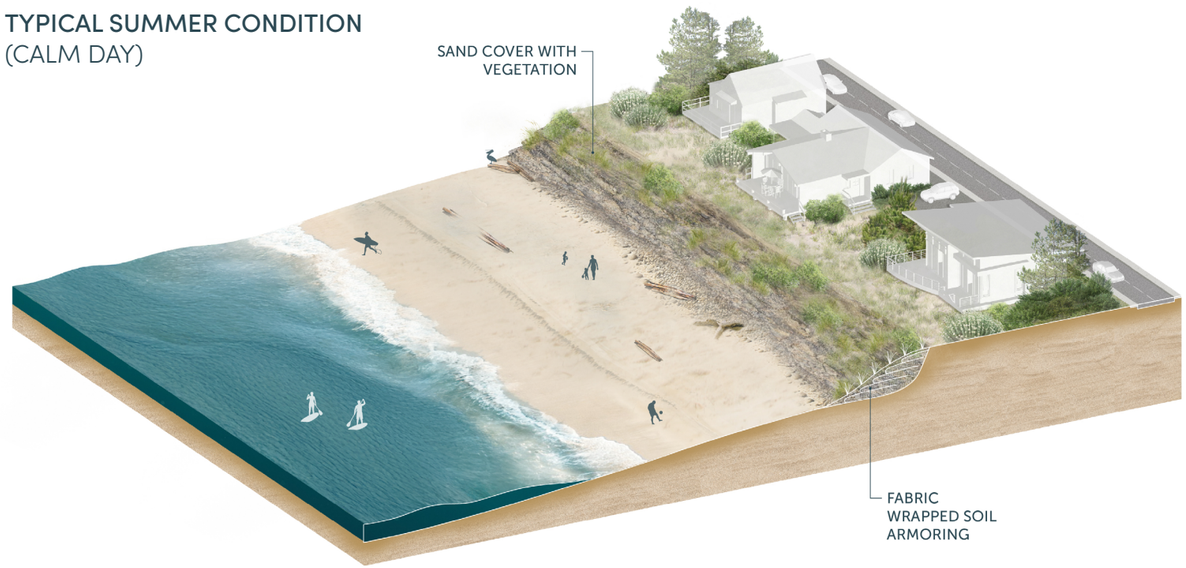
SCAN OR CLICK TO LEARN MORE



VEGETATED SLOPE STABILIZATION

NON-STRUCTURAL OR STRUCTURAL SOLUTION* **COST: $$$–$$$**

TYPICAL SUMMER CONDITION
(CALM DAY)



DEFINITION:

An engineered method used in the backshore in which vegetation is planted on top of biodegradable or synthetic geotextile fabric or tubes that are layered or filled with soil or sand and serve to reduce beach and upland erosion and flooding risk.

**Vegetated slope stabilization is considered a non-structural solution if materials are biodegradable and a structural solution if materials are synthetic.*



Cannon Beach, OR



Nantucket, MA

ENVIRONMENTAL SETTING:

- Suitable for existing sandy or cobble beaches with eroded dunes or bluffs with mild to moderate erosion and flooding from the beach and the upland
- Works best on stable, gradual slopes or those graded to make them less steep
- More effective where vegetation receives windblown sand from the beach to maintain backshore slope
- More effective on multiple parcel scales but suitable for individual parcels, if needed

ADVANTAGES:

- Preserves eroding backshore and upland areas, reducing erosion and flooding risk
- Provides habitat for plants and wildlife and increases carbon storage
- Allows for easily maintained beach access and scenic views
- Minimal and short-term modification of original backshore ecosystem and associated recreational activities
- Effective on small scale projects without negatively affecting adjacent backshore
- Provides a flexible approach that may be combined with other non-structural solutions

DISADVANTAGES:

- Slope instability, erosion, and flooding risk before vegetation has established
- Original backshore ecosystem modification with geotextile materials that may be exposed over time or become visually unappealing
- Potentially less habitat for some native dune plants and animals if non-native dune grasses are planted or if they are entangled by geotextile materials

METRICS OF SUCCESS:

- Reduces backshore and upland erosion and flooding risk through sustained sand burial and vegetation growth
- Reduces damage to backshore coastal infrastructure
- Withstands storm conditions without significant damage
- Maintains ecosystem functions and services of backshore

DESIGN LIFE:

- Ranges from 5-10 years, possibly longer, with proper sand burial and vegetation establishment
- Depends on ability to withstand large storms and resist backshore retreat or upland flooding events
- Given natural cycles of shoreline change, fabric, tubes, or vegetation may erode or be buried as sand supply varies
- Extended by regularly scheduled maintenance

COST CONSIDERATIONS:

- Design: Construction plans, permitting, structural dimensions, planting scheme, biodegradable or geotextile fabric or tubes
- Materials and construction: Source materials and transport, site work including grading, fabric or tube installation, soil or sand nourishment, planting
- Maintenance: Monitoring, soil or sand nourishment, plant care, fabric repair as needed

PERMITTING:

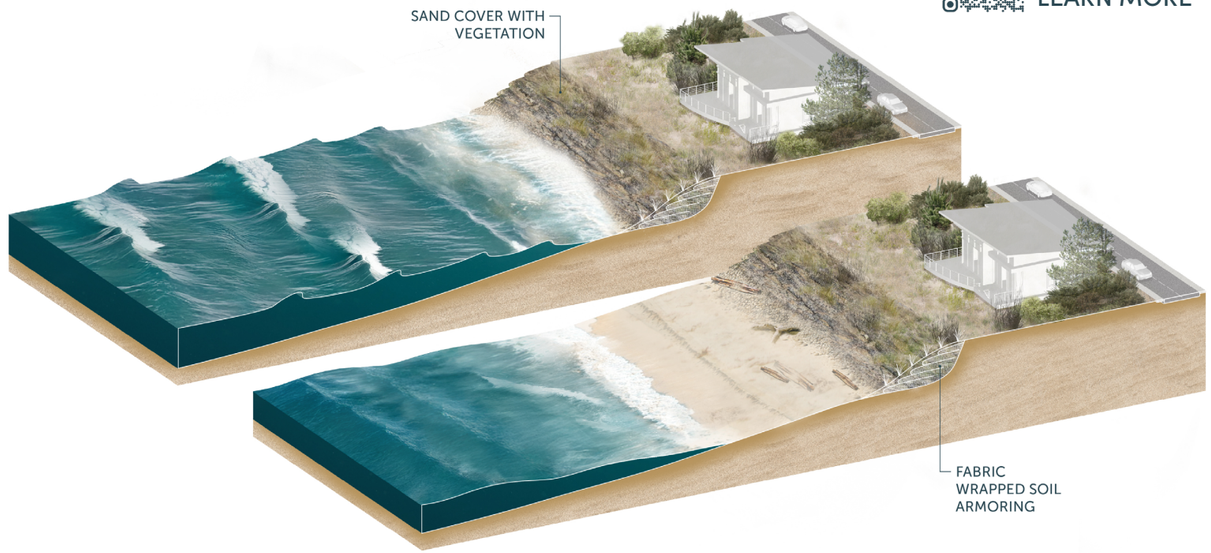
- Non-structural, nature-based solutions are preferred over structural solutions under state law, potentially simplifying permitting
- Non-structural, nature-based solutions must be considered first, or proven infeasible, before permitting applications can proceed
- Additionally, under Oregon's Statewide Planning Goal 18, structural solutions can only be considered for permitting on parcels platted prior to January 1, 1977, unless an exception is granted and, in estuaries, permitting is subject to Goal 16 and 17
- Whether non-structural or structural, requires an Ocean Shore Alteration Permit from the Oregon Parks and Recreation Department (OPRD) if placed on the outer coast and other permits from the city and/or county
- Additional permits may be required from other federal, state, and local agencies depending on location and potential impacts

MAINTENANCE CYCLE:

- Maintenance may be necessary at regular time periods, after storm events, or when soil or sand erodes, plants die, or materials are exposed
- Maintenance may be initially higher as plants establish, but self-sustaining over time
- Monitoring is key for informing maintenance schedules and is the responsibility of the permittee

TYPICAL WINTER CONDITION
(STORMY DAY + CALM DAY)

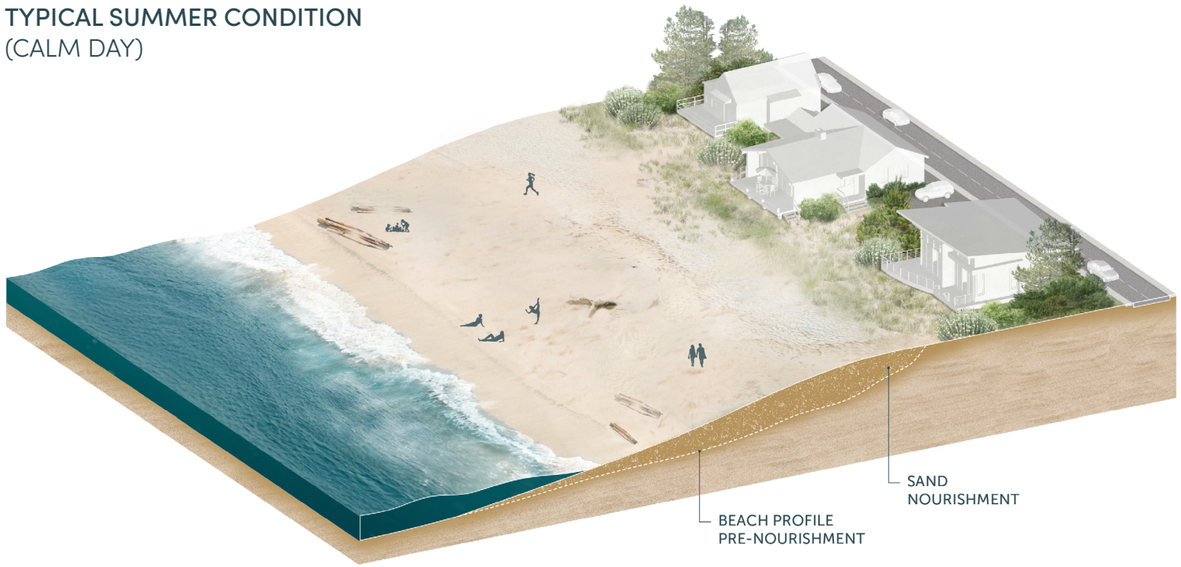
SCAN OR CLICK TO LEARN MORE



BEACH NOURISHMENT

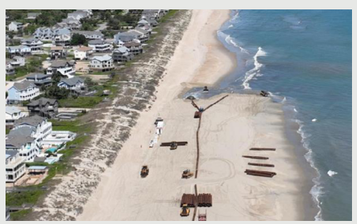
NON-STRUCTURAL SOLUTION **COST: $$$–$$$**

TYPICAL SUMMER CONDITION
(CALM DAY)

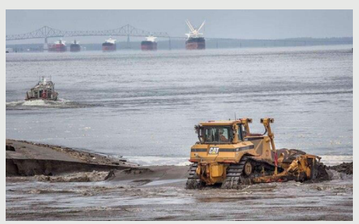


DEFINITION:

An engineered method in which a large volume of sand is added to an eroding beach by pumping dredged sediments onshore or trucking in and dumping sediment from inland sources to increase or sustain beach width, reducing backshore erosion and overtopping.



Outer Banks, NC



Columbia River, Astoria, OR

ENVIRONMENTAL SETTING:

- Suitable for existing sandy beaches with mild to moderate erosion and flooding, ideally with nearby sand sources for nourishment
- Less suitable for beaches with substantial alongshore currents and/or high wave environments that transport sand
- More effective at multiple parcel scales; not suitable for individual parcels

ADVANTAGES:

- Preserves eroding beach and reduces backshore erosion and flood risk
- Maintains or increases recreation through beach preservation or expansion
- Provides habitat for beach plants, shorebirds, shellfish, and other wildlife
- Minimal and short-term modification of the original beach ecosystem
- Provides a flexible approach that may be combined with other non-structural solutions

DISADVANTAGES:

- Requires sand renourishment, especially after large storms
- May alter regional sediment transport and offshore wave characteristics
- May result in sand burial of vegetation and shorebird and shellfish habitat
- Reduced sand supply for dune growth if beach sand is courser grained and unable to be blown to the backshore
- May produce a pungent odor for a period if dredged sand originates in harbors or estuaries

METRICS OF SUCCESS:

- Reduces beach and backshore erosion and flooding risk by increasing beach width or elevation
- Reduces damage to backshore coastal infrastructure
- Withstands storm conditions without significant damage
- Maintains ecosystem functions and services of beaches

DESIGN LIFE:

- Ranges from 3-5 years in regions where nourishment is currently practiced but up to > 10 years with proper nourishment and use of waves and currents to redistribute sand
- Depends on ability to withstand large storms and still resist erosion, flooding, or movement
- Depends on nourishment sand grain size and its mobility on the beach
- Given natural cycles of shoreline change, nourished beaches may erode or build as sand supply varies
- Extended by regularly scheduled maintenance

COST CONSIDERATIONS:

- Design: Nourishment plans, permitting, dimensions of beach, distance to sand source location
- Materials and construction: Source materials (inland versus dredged) and transport, site work including sand nourishment method
- Maintenance: Sand replenishment as designed

PERMITTING:

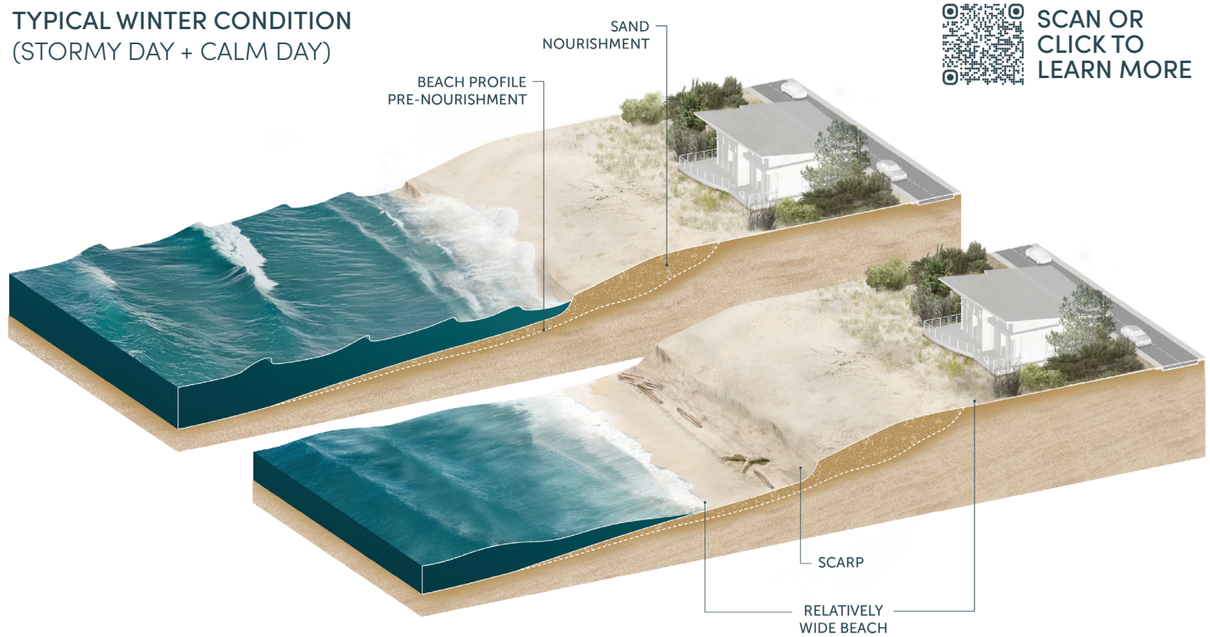
- Non-structural, nature-based solutions are preferred over structural solutions under state law, potentially simplifying permitting
- Requires an Ocean Shore Alteration Permit from the Oregon Parks and Recreation Department (OPRD) if placed on the outer coast and other permits from the city and/or county
- Requires a US Army Corps permit if nourishment will be placed below the high tide line
- Requires a Oregon Department of State Lands removal/fill permit if affecting wetlands
- Additional permits may be required from other federal, state, and local agencies depending on location and potential impacts
- Locally approved dune management plans may have certain restrictions on beach nourishment methods given placement of sand below the high-water line

MAINTENANCE CYCLE:

- Maintenance may be necessary at regular time periods, after storm events, or when beach erodes or becomes too narrow
- Erosion can be faster with nourishment sand than natural sand, requiring more frequent maintenance
- Monitoring is key for informing maintenance schedules and is the responsibility of the permittee

TYPICAL WINTER CONDITION
(STORMY DAY + CALM DAY)

SCAN OR CLICK TO LEARN MORE



LARGE WOOD

NON-STRUCTURAL OR STRUCTURAL SOLUTION*

COST: $$$–$$$

TYPICAL SUMMER CONDITION
(CALM DAY)



DEFINITION:

An engineered method in which large wood is placed, buried, or anchored on a beach and/or backshore area to reduce erosion and flooding risk.

**Large wood is considered a non-structural solution if it uses natural driftwood, root wads, or trees and is not anchored or attached only with biodegradable materials and a structural solution if it is chemically treated and/or anchored with hardware.*



Columbia River, WA



Newport, OR

ENVIRONMENTAL SETTING:

- Primarily used in river inlets or in estuaries but recently adapted for outer coast applications
- Suitable for existing sandy or cobble beaches with eroded dunes or bluffs and mild to moderate erosion and flooding
- Most effective when wood is buried or anchored in place to avoid movement in high water events
- More effective is wood is placed so that it will capture sand during pickup in prevailing wind
- More effective on multiple parcel scales but suitable for individual parcels, if needed

ADVANTAGES:

- Reduces wave and wind energy, trapping sand, encouraging shoreline accretion and reducing erosion and flood risk
- Provides habitat for shorebirds and other wildlife and, when buried, increases carbon storage
- Allows for easily maintained beach access and scenic views
- Effective on small scale projects using locally sourced wood without negatively affecting adjacent backshore
- Provides a flexible approach that may be combined with other non-structural solutions

DISADVANTAGES:

- Limited information on design and function over time
- Movement of wood by waves and currents may pose safety concerns and require continued maintenance
- Modification of original beach ecosystem, affecting shorebirds, shellfish, and other wildlife
- Modification of recreational activities from those traditionally associated with sandy beaches

METRICS OF SUCCESS:

- Reduces beach and backshore erosion and flooding risk by increasing beach width or elevation
- Reduces damage to coastal infrastructure
- Withstands storm conditions without significant damage
- Maintains ecosystem functions and services of beaches

DESIGN LIFE:

- Ranges from 1-10 years, but shorter with high waves or water levels, or longer if wood is anchored
- Depends on ability to withstand large storms and still resist erosion, flooding, or movement
- Depends on natural cycles of shoreline change; may experience sand burial, decreasing wood movement
- Extended by regularly scheduled maintenance

COST CONSIDERATIONS:

- Design: Construction plans, permitting, beach dimensions, wood type (biodegradable or chemically treated), anchoring type
- Materials and construction: Source materials and transport, site work including excavation, staging, wood placement, anchoring
- Maintenance: Monitoring, wood replacement, anchor repair

PERMITTING:

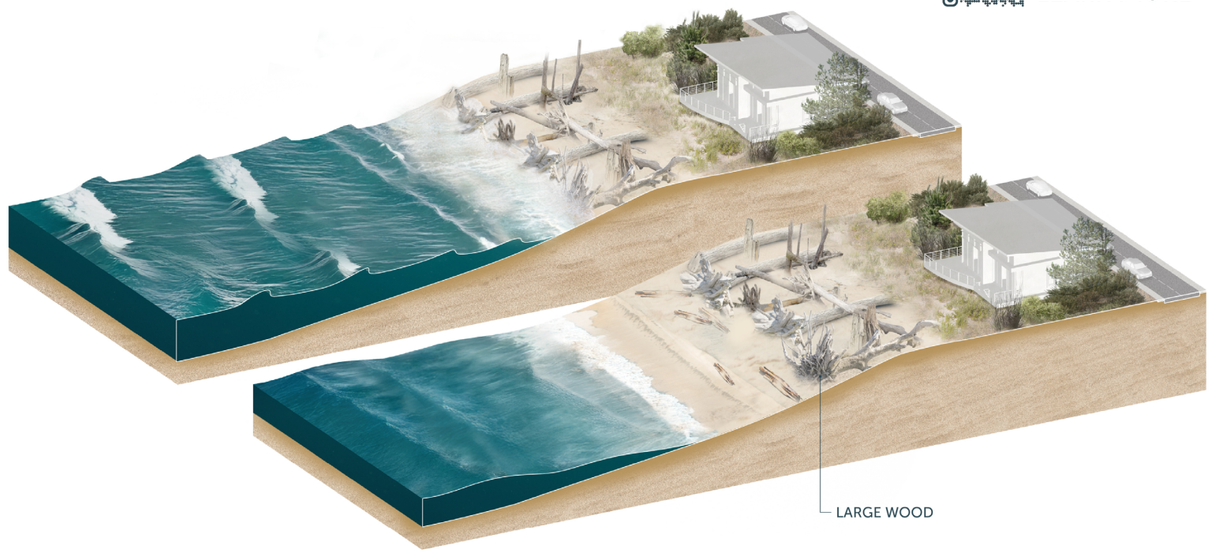
- Non-structural, nature-based solutions are preferred over structural solutions under state law, potentially simplifying permitting
- Non-structural, nature-based solutions must be considered first, or proven infeasible, before permitting applications can proceed
- Additionally, under Oregon's Statewide Planning Goal 18, structural solutions can only be considered for permitting on parcels platted prior to January 1, 1977, unless an exception is granted and, in estuaries, permitting is subject to Goal 16 and 17
- Whether non-structural or structural, requires an Ocean Shore Alteration Permit from the Oregon Parks and Recreation Department (OPRD) if placed on the outer coast and other permits from the city and/or county
- Additional permits may be required from other federal, state, and local agencies depending on location and potential impacts

MAINTENANCE CYCLE:

- Maintenance may be necessary at regular time periods, after storm events, or when wood needs to be replaced or re-anchored
- Large storms that move wood onto infrastructure will require additional maintenance
- Monitoring is key for informing maintenance schedules and is the responsibility of the permittee

TYPICAL WINTER CONDITION
(STORMY DAY + CALM DAY)

SCAN OR CLICK TO LEARN MORE



RIPRAP

STRUCTURAL SOLUTION

COST: $$$–$$$

TYPICAL SUMMER CONDITION
(CALM DAY)

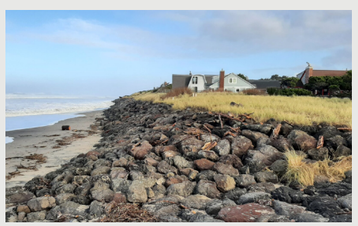


DEFINITION:

An engineered structure constructed from large boulders placed in the backshore and designed to be immobile, reflecting wave energy and reducing backshore retreat and flooding risk.



Lincoln City, OR



Neskowin, OR

ENVIRONMENTAL SETTING:

- Common where development is severely threatened by erosion and overtopping from waves and high water
- Restricted to Goal 18 eligible coastal properties (see permitting section) and in estuaries, where allowed by the jurisdiction's Estuary Management Plan
- More effective on multiple parcel scales but suitable for individual parcels, if needed

ADVANTAGES:

- Technical expertise and long history of use make it a well-known solution in Oregon
- May provide years to decades of protection before maintenance is necessary
- Effective on small scale projects although can negatively impact adjacent backshore

DISADVANTAGES:

- Potential to exacerbate erosion of adjacent backshore, increasing vulnerability and decreasing property values
- Reduces safe beach access given steep slope, large rocks, and associated beach narrowing from erosion
- Original backshore ecosystem modified, affecting plants, shorebirds, and other wildlife
- May be viewed as infallible creating an inflated sense of safety

METRICS OF SUCCESS:

- Reduces beach and backshore erosion and flooding risk
- Reduces damage to backshore coastal infrastructure
- Withstands storm conditions without significant damage
- Minimal beach narrowing and erosion of adjacent backshore

DESIGN LIFE:

- Up to 30 years with proper design and construction
- Depends on ability to withstand large storms and resist backshore retreat
- Depends on natural cycles of shoreline change; base may be undercut from erosion or covered in sand from progradation
- Extended by regularly scheduled maintenance

COST CONSIDERATIONS:

- Design: Construction plans, permitting, structural dimensions, boulder type (composition and shape)
- Materials and construction: Source materials and transport, site work including excavation, staging, boulder placement, compensatory mitigation, if required
- Maintenance: Monitoring, boulder replacement and base repair

PERMITTING:

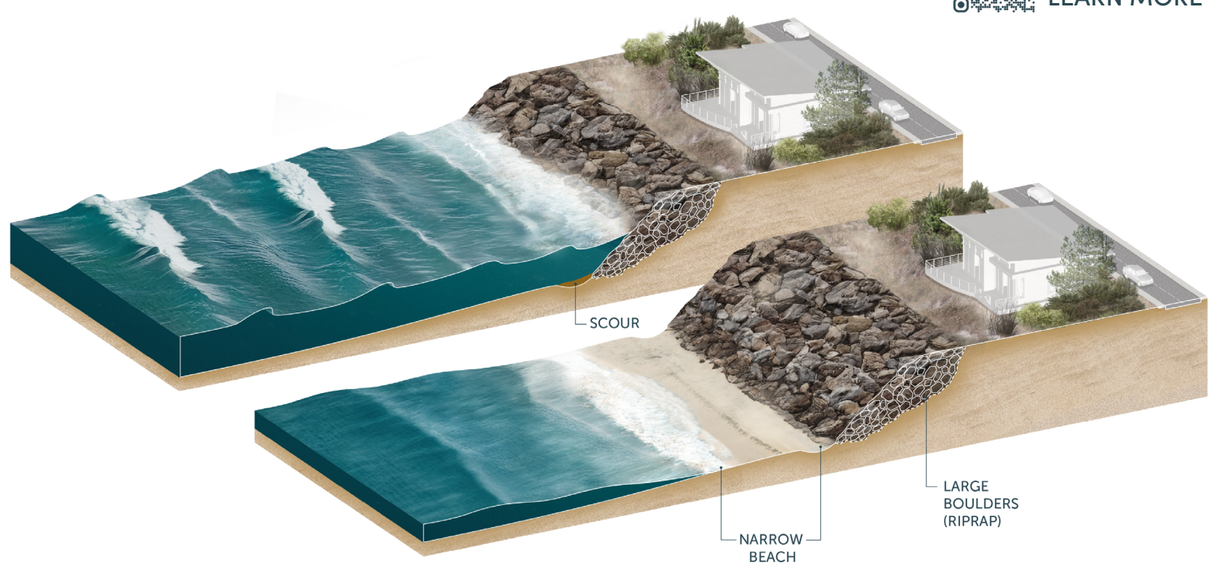
- Non-structural, nature-based solutions must be considered first, or proven infeasible, before permitting applications can proceed
- Additionally, under Oregon's Statewide Planning Goal 18, structural solutions can only be considered for permitting on parcels platted prior to January 1, 1977, unless an exception is granted and, in estuaries, permitting is subject to Goal 16 and 17
- Requires an Ocean Shore Alteration Permit from the Oregon Parks and Recreation Department (OPRD) if placed on the outer coast and other permits from the city and/or county
- Additional permits may be required from other federal, state, and local agencies depending on location and potential impacts
- Projects must be designed to preserve the recreation, scenic, and natural resource uses and values of the Ocean Shore State Recreation Area and compensatory mitigation or other obligations may be required

MAINTENANCE CYCLE:

- Maintenance may be necessary at regular time periods, after storm events, or when structural damage has occurred
- Maintenance or repair requires a permit and must begin within 3 years after the damage occurs
- Monitoring is key for informing maintenance schedules and is the responsibility of the permittee

TYPICAL WINTER CONDITION
(STORMY DAY + CALM DAY)

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SEAWALL

STRUCTURAL SOLUTION **COST: $$$**

TYPICAL SUMMER CONDITION
(CALM DAY)



DEFINITION:

An engineered wall built in the backshore and designed to be immobile, reflect wave energy, and reduce backshore retreat and flooding risk.



Santa Barbara, CA



Cannon Beach, OR

ENVIRONMENTAL SETTING:

- Common where development is severely threatened by erosion and overtopping from waves and high water
- Ideally high enough on backshore to only interact with waves during severe storm events
- Restricted to Goal 18 eligible coastal properties (see permitting section) and in estuaries, where allowed by the jurisdiction's Estuary Management Plan
- More effective on multiple parcel scales but suitable for individual parcels, if needed

ADVANTAGES:

- Relatively small backshore footprint and ideal for seafront walkways
- Effective on small scale projects although can negatively impact adjacent backshore

DISADVANTAGES:

- Potential to exacerbate erosion of adjacent backshore, increasing vulnerability and decreasing property values
- Reduces safe beach access given steep slope, concrete, and associated beach narrowing from erosion
- Original backshore ecosystem modified, affecting plants, shorebirds, and other wildlife
- May be viewed as infallible creating an inflated sense of safety

METRICS OF SUCCESS:

- Reduces beach and backshore erosion and flooding risk
- Reduces damage to backshore coastal infrastructure
- Withstands storm conditions without significant damage
- Minimal beach narrowing and erosion of adjacent backshore

DESIGN LIFE:

- Up to 30 years with proper design and construction
- Depends on ability to withstand large storms and resist backshore retreat
- Depends on natural cycles of shoreline change; base may be undercut from erosion or covered in sand from progradation
- Extended by regularly scheduled maintenance

COST CONSIDERATIONS:

- Design: Construction plans, permitting, structural dimensions, drainage, wall materials
- Materials and construction: Source materials and transport, site work including excavation, staging, wall construction, compensatory mitigation, if required
- Maintenance: Monitoring, crack and base repair

PERMITTING:

- Non-structural, nature-based solutions must be considered first, or proven infeasible, before permitting applications can proceed
- Additionally, under Oregon's Statewide Planning Goal 18, structural solutions can only be considered for permitting on parcels platted prior to January 1, 1977, unless an exception is granted and, in estuaries, permitting is subject to Goal 16 and 17
- Requires an Ocean Shore Alteration Permit from the Oregon Parks and Recreation Department (OPRD) if placed on the outer coast and other permits from the city and/or county
- Additional permits may be required from other federal, state, and local agencies depending on location and potential impacts
- Projects must be designed to preserve the recreation, scenic, and natural resource uses and values of the Ocean Shore State Recreation Area and compensatory mitigation or other obligations may be required

MAINTENANCE CYCLE:

- Maintenance may be necessary at regular time periods, after storm events, or when structural damage has occurred
- Maintenance or repair requires a permit and must begin within 3 years after the damage occurs
- Maintenance involves crack or base repair and may be more expensive than initial construction
- Monitoring is key for informing maintenance schedules and is the responsibility of the permittee

TYPICAL WINTER CONDITION
(STORMY DAY + CALM DAY)

SCAN OR CLICK TO LEARN MORE

