

Climate-resilient future shorelines in Whatcom County

■ Whatcom County is planning for flooding and erosion impacts as climate change accelerates, identifying at-risk communities and infrastructure.

By **LILY SCHREDER**
and **RACHEL JOHNSON**
Herrera

In the face of accelerating climate impacts, Whatcom County advances a first-of-its-kind vulnerability assessment and adaptation strategy — a holistic look at future flood risk that integrates best-available science with forward-looking county-wide planning. This focus on compound flooding (flooding from the ocean and rivers) and collaboration across jurisdictions not only increases the resilience of the region's coastal and riverine landscapes, but also provides specialized tools that communities can directly leverage for their own local resiliency planning efforts.



Schreder



Johnson

The project, titled *Future Shorelines*, builds on previous work to assess compound effects of sea level rise and projected changes in coastal and river flood vulnerability, and will result in a county-wide vulnerability assessment, a suite of adaptation tools and insights, a pilot adaptation plan, and forward-looking policy recommendations. Herrera Environmental Consultants (Herrera) is leading the consultant team, which includes Cascadia Consulting Group, MAKERS Architecture and Urban Design and Northwest Hydraulics Consultants.

FLOODING AND EROSION HAZARDS

Like many Pacific Northwest communities, Whatcom County faces increased challenges with flooding and erosion as climate change accelerates. Dynamic coastal and river shorelines naturally experience these processes, but incidents have become increasingly high-profile in recent years.

Floods in 2021 along the Nooksack River displaced thousands of families and required costly, time-consuming transportation repairs. During 2022 and 2023, high tide flooding partially submerged low-lying coastal buildings and significantly damaged infrastructure. Climate change intensifies these risks through rising sea levels, stronger rainstorms and increased river flows.

Whatcom County is planning for low-probability but high-impact scenarios (1% chance of occurrence) while developing flexible adaptation tools for a range of possible outcomes. While it isn't known exactly when these scenarios will happen, the science is confident that they will occur. Current projections indicate:

- By the 2040s, sea levels could rise by as much as 0.8 feet in Whatcom County (1% probability by 2040; 50% probability by 2060), potentially increasing to 3.3 feet by the 2080s (1% probability by 2080; 50% probability after 2150).
- The Nooksack River's 100-year flood (event with 1% annual probability) is projected to increase in volume by 1.2 times current levels by the 2040s and 1.75 times by the 2080s.

DEVELOPING PLANNING TOOLS FOR PROJECT PARTNERS

The Future Shorelines project integrates collaborative coastal and river planning efforts to address climate-related shoreline risks, fundamentally relying on a multi-jurisdictional planning approach. The county has convened representatives from the Lummi Nation, the Nooksack Indian Tribe, the Port of Bellingham, Blaine, Sumas, Everson, Lynden, Ferndale and Nooksack as well as representatives from the USGS, Department of Ecology, and WA SeaGrant — effectively encompassing its communities along the coast and in the Nooksack River floodplain.

Throughout the development of the Future Shorelines project, these partners will ensure their current local planning efforts are aligned, further informing Whatcom County's final assessment and implementation of resiliency measures.

Through the project's vulnerability assessment, Whatcom County has gained critical insights regarding geographic areas facing the highest risk of flooding and erosion. Thoroughly understanding these vulnerabilities to coastal storms, sea-level rise, and river flooding enables the team to map at-risk communities and infrastructure, and develop a suite of accessible planning tools. The project will deliver several practical tools to share these findings:

- An interactive **StoryMap** — a web-based platform that combines maps with narrative text and visual elements — showing which communities and infrastructure are most vulnerable.
- **Data dashboards** that will provide users with dynamic sum-



Whatcom County's coastline.

Photos courtesy of Herrera

maries of key information displayed in the StoryMap.

- A customizable **data explorer** tool allowing stakeholders to examine the exposure and vulnerability of specific infrastructure types and natural resources based on their particular interests.
- A **workbook of adaptation strategies** that communities can modify to their distinct circumstances and needs.

These Future Shorelines planning tools can then be leveraged by partner jurisdictions, which will tailor the tools to meet their unique adaptation challenges and priorities, including considering how to adjust codes and policies to support resiliency.

ADAPTATION STRATEGIES FOR THE LONG-TERM

In addition to assessing vulnerabilities, Future Shorelines will result in adaptation strategies to strengthen Whatcom County's coastal and river communities. Adaptation strategies often fall into four different approaches: **avoid** (i.e., reduce risk of hazards by not putting development and infrastructure in vulnerable areas), **accommodate** (i.e., decrease the impacts of flooding and erosion through engineering, design, and restoration), **relocate** (i.e., move away from hazards through relocating structures), and **protect** (i.e., delay impacts by preventing flooding and erosion through engineering and design). Adaptation strategies also use different approaches, like policies in land use planning, and building codes, and also structural changes, like habitat restorations or levees.

No matter the strategy, adaptation plans need to be forward-looking, flexible, and realistic. Plans must allow for pairing together different strategies over

time. For instance, in the case of a road that is vulnerable to flooding, a near-term approach could include using sandbags during flood events (protect), a mid-term approach could allow the road to flood and be temporarily closed (accommodate), and a long-term approach could involve permanently moving the road (relocate) and restoring the shoreline. While addressing the near term, planning for the long-term is critical since today's infrastructure investments must withstand climate challenges for the next 50+ years.

As the Future Shorelines project transitions from assessment to planning, Whatcom County will develop a pilot adaptation plan for Birch Bay — a community facing significant coastal flood risk and erosion, and already heavily impacted during high tide events. This strategic pilot will identify the most effective adaptation measures for Birch Bay's specific challenges, and gather community input to inform the development of the plan. Success here will create a valuable template for adaptation planning across vulnerable communities throughout the county.



Coastal bluff erosion in Whatcom County.

RESILIENT FUTURE SHORELINES

Whatcom County is set to conclude its Futures Shorelines project in June 2025, establishing a new standard for climate adaptation planning. By integrating future flood and erosion risk projections with detailed geospatial information, the county and its partners will have a clearer understanding of vulnerabilities spanning from present day through the 2040s, 2080s — and beyond.

Findings from the comprehensive vulnerability assessment and adaptation strategies will

guide crucial decisions about which areas may need additional protection measures, which may need innovative risk-reduction strategies, and which areas may have too high of costs to allow continued growth or development. This project represents Whatcom County's investment in both critical infrastructure and community planning, adapting shoreline areas to be more

resilient and serve residents for generations to come.

Rachel Johnson is a water resources engineer at Herrera who specializes in climate change adaptation planning for watershed, stormwater, and flood management planning projects. Lily Schreder is a marketing specialist at Herrera with a background in marketing and environmental work.

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Revitalizing the waterfront, restoring key transportation infrastructure

■ How the cleanup of the Whatcom Waterway is helping to power Bellingham's economic future.

By **MATT WOLTMAN**
Anchor QEA

A multi-year, two-phase contaminated marine sediments cleanup project is reshaping the Bellingham waterfront, breathing new life into the Port of Bellingham's economic outlook. The Whatcom Waterway remediation project addresses decades of industrial pollution, while also paving the way for commercial and industrial growth, enhanced public access and recreation, and modernization of a deepwater port terminal facility.



Wolman

At the center of this ambitious initiative is the revitalization of a site long burdened by contamination from historical industrial uses. The Whatcom Waterway was once home to Georgia-Pacific's pulp and chemical mill operations, which for decades released mercury, pulp waste and other byproducts into the bay. Today, this legacy is being replaced by clean water, new public parks, upgraded infrastructure and developable waterfront property.

A TWO-PHASE APPROACH TO RECOVERY

The project is structured in two major phases. Phase 1, completed in 2016, removed over 100,000 cubic yards of contaminated sediment, capped remaining materials and implemented habitat improvements designed to make the effort self-mitigating. Phase 2, currently in the design stage and scheduled for construction between 2027 and 2030, significantly expands the scope of the remediation and its associated benefits.

The cleanup has been guided by a consistent team with deep experience in sediment remediation and shoreline redevelopment. From the outset, the project was intended to do more than address contamination. It is designed to support future investment — clearing the way for port-related industry, expanding public shoreline access and generating environmental credits that can help accelerate permitting for future development.

DEVELOPMENT OPPORTUNITIES ON THE HORIZON

As cleanup progresses, new land is becoming available for high-value economic uses. Once the site of wastewater processing, the 26-acre Aerated Stabilization Basin (ASB) is being reimagined to serve existing and future marine trades tenants. Approximately 13 acres of upland property will be created as part of the cleanup, opening the door for maritime operations, manufacturing or other commercial tenants requiring waterfront access for their businesses.

This aligns with the port's broader land-use vision and Bellingham's goals for job creation and economic diversity. The area

is already seeing increased interest from businesses seeking proximity to the deepwater terminal and multimodal shipping routes.

INFRASTRUCTURE AND INDUSTRIAL ACCESS

The Whatcom Waterway cleanup is also helping to restore key transportation infrastructure. In 2023, the port began early dredging at the Bellingham Shipping Terminal to ensure continued navigational access and prevent the redistribution of contaminated sediment from vessel activity. Additional dredging will follow during Phase 2 of the cleanup project, resulting in deepening of the navigational channel.

The project is further coordinating efforts to return rail service to the Bellingham Shipping Terminal. A federal grant secured through congressional support is funding upgrades to the BNSF mainline spur and a switchback track system. These improvements will strengthen Bellingham's role as a flexible and competitive port along the Seattle-to-Vancouver corridor.

CREATIVE SOLUTIONS, LONG-TERM VALUE

A defining feature of the Phase 2 cleanup project is the plan to manage contaminated sediments onsite, saving both time and resources. Rather than transporting over 500,000 cubic yards of contaminated sediments offsite, the cleanup strategy involves building a containment wall within the ASB to create a nearshore confined disposal facility. This secure structure will isolate the material and allow the remaining acreage to be used for future development.

This revised approach required amending the site's consent decree and cleanup action plan with the Washington State Department of Ecology, which originally called for a full marina conversion. By adjusting the plan to current community and economic needs, the port is achieving both environmental protection and long-term usability. The result is reduced cleanup costs, added flexibility for redevelopment and the generation of valuable habitat mitigation credits.

ENHANCING THE PUBLIC REALM

While economic development remains central, the project also contributes significantly to the quality of life along Bellingham Bay. Partnerships between the port and the city of Bellingham have already produced parks and trails, with more improvements on the horizon. Waypoint Park, for example, transformed portions of the former mill site into one of the community's most popular shoreline destinations, with further expansion planned.

The Whatcom Waterway project is part of a comprehensive port-wide remediation and redevelopment effort that weaves together environmental restoration, infrastructure upgrades and land-use



Proposed post-cleanup shoreline conditions including filling the 26-acre Aerated Stabilization Basin to create a nearshore confined disposal facility, isolating contaminated material. Renderings by Anchor QEA



The Aerated Stabilization Basin, including the nearshore Confined Disposal Facility(CDF), with potential opportunities for land use on about 13 acres of upland property being created as part of the cleanup.

planning. The cleanup project is supported in part by Department of Ecology grants. Additional Ecology funding for habitat improvement also includes enhancing the intertidal habitat between the Roeder Avenue and Holly Street bridges — and highlights the value of a holistic approach that integrates cleanup with long-term civic investment.

A MODEL FOR INTEGRATED PORT REDEVELOPMENT

The Whatcom Waterway cleanup offers a compelling model for

See **WATERFRONT** — page 5

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What it means to be a community architecture firm in Bellingham

■ A focus on community means staying flexible, agile and accountable to your clients, because they're usually your friends and neighbors, too.

By **BRAD CORNWELL** and **JASON WILLIARD**
RMC Architects

The first thing visitors to the RMC Architects (RMC) website see on our home page is our mission: We believe architecture should be a celebration of its unique setting — reflecting the values, culture, history, geography, and diversity of people and place. In this way, architecture strengthens community. Since we opened our doors in Bellingham in 1986, our focus has been to provide work that is integrated into our community.



Cornwell



Williard

This gives our designs a strong context. We understand more than sun angles and the direction of the wind on a site. We know our community and therefore bring a different sensibility to the work than a firm outside our city would.

As a 20-person firm led by four principals and two associates, we appreciate the diversity of working in multiple markets so that we can maintain stability for our staff in Bellingham. That also has the benefit of touching many different people in our community. In a city of this size, people live, work and play in our buildings.

STAYING FLEXIBLE WITH A VARIETY OF PROJECT TYPES

Our market sectors include single-family and multifamily housing, healthcare, civic and cultural, commercial, sacred spaces and master planning. We also consider mass timber part of our primary market and have a number of projects that use cross-laminated timber (CLT). Within these markets we've designed municipal buildings like the new Public Works Operations Center for the city of Bellingham, institutional buildings like the new administrative offices for Bellingham Public Schools, and healthcare buildings like The Way Station for Whatcom County Public Works. We've worked with ports locally and regionally on projects that include waterfront master plans and feasibility studies for adaptive reuse of historic buildings such as the former Northern State Hospital campus.

We've been fortunate that our expertise in the much-needed multifamily housing market has been a focus in and around Bellingham. Our range includes market rate, workforce, senior and houseless projects and allows us to work with clients like the Bellingham Housing Authority (BHA), Mercy Housing, Catholic

Housing Services (CHS) and the Opportunity Council. Samish Commons, our recent project with BHA, combines affordable housing with the agency's new offices and revitalized a condemned motel site on the fringe of downtown. We currently have affordable housing projects underway in downtown Bellingham, at the Bellingham waterfront, and in the nearby city of Lynden.

STAYING AGILE THROUGH SMALLER PROJECTS

There are times when being a community architect means taking on projects that are smaller or perhaps not as high profile as some of our work. That kind of flexibility can keep our firm afloat in a wavering economy and we also enjoy those projects. We appreciate being associated with some of our city's parks like the master plan for Cordata Park where we ultimately designed their new pavilion. Or the design of one of our favorite older projects, Taylor Dock, where locals and tourists stroll over Bellingham Bay. Or our current work on the master plan for the Civic Athletic Complex, that will include the Arne Hanna Aquatic Center.

For projects outside of our expertise, we will strategically partner with other architects. Our size allows us to compete with larger firms for interesting projects, while still taking on smaller-scale work and providing a high level of sophistication to those projects. This strategy has helped us attract staff from the UK, Canada, California, Massachusetts and New York.

ONE OFFICE, ONE COMMUNITY

The ability to provide staff with interesting and fulfilling work combined with Bellingham's superior quality of life equates to low turnover. As a firm, we value working together in one space to reinforce the community architect ethos. We have a five-minute commute (if you can call having views of Mount Baker and the Salish Sea on your way to work a commute), and by extension, we prioritize the studio culture.

Being community architects means our work is both relationship and reputation based. That influences the way we practice. Partners are involved in projects from beginning to end. Most of our work continues to come from word of mouth or repeat clients. We also prioritize serving on boards and volunteering. This trickles down to our staff and empowers them to take an active role in our community. When we interview people and ask why they want to work here, the community theme always comes up. They appreciate how embedded we are in Bellingham's culture.

There's an accountability factor to any profession but in a community of our size the degree of separation from your clients can be zero. They may go to the same coffee shop, hike on the same trails, have kids



Bellingham Public Schools Administrative Offices were designed to promote a collaborative, mobile work environment and include community spaces and an early learning center. Photo by Benjamin Benschneider

who play with your kids, shop at the same grocery stores...consequently we feel an acute level of responsibility when working on their projects.

Occasionally, we find ourselves battling the presumption that working in a small city equates to less quality and sophistication. Regardless of being in a smaller market, RMC has adopted the same trends and technologies that larger market firms implement. In fact, we've been at the forefront of some building industry trends because of Bellingham's size. Our strong relationship with the local contracting community allows for meaningful collaboration on GC/CM and design-build delivery methods.

As Bellingham locals, we're inclined to contribute a portion of our work when we can for projects that uplift our community. Lydia Place, which provides services to end the cycle of homelessness; a boathouse for the Whatcom Rowing Association, a nonprofit, community-based rowing club; and work on the Domestic Violence and Sexual Assault Center are some examples of our pro bono work. We believe these projects benefit everyone by making our city more livable for all.

The ability to provide staff with this kind of interesting and fulfilling work, combined with Bellingham's superior quality of life equates to low turnover at RMC. Our third employee has been with us for 36 years and we have several others who've been around since the 1990s. We've also consciously avoided staffing up and down based on economic conditions. That sometimes means we all pitch in and work more during deadlines, but we balance that with breaks when things calm down. And if you



The Pacific Street Operations Center for the city of Bellingham houses both the Public Works Operation's Natural Resources division and the Parks Department's Operations division. Photo by Benjamin Benschneider

ask us, here in Bellingham, those breaks can be taken in some of the most beautiful places on earth.

RMC principal Brad Cornwell's designs focus on placemaking and context for many of the firm's public, library and higher education projects.

RMC principal Jason Williard focuses on the firm's institutional and commercial projects.



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Waterfront

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port cities seeking to balance environmental restoration with economic renewal and public priorities. By tightly integrating cleanup planning with long-term land use, infrastructure goals and habitat enhancement, the project is creating lasting value for the community and for future users of the working waterfront.

When complete, the project will have transformed more than 70 acres of contaminated land and water into a productive, accessible and sustainable shoreline — demonstrating what's possible when environmental responsibility and economic vision align.

Matt Woltman is a principal engineer with Anchor QEA and project manager and lead design engineer on the Whatcom Waterway Phase 2 cleanup project.