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# Southern Flow Corridor



from **Engineering With Nature: An Atlas, Volume 2.**

by US Army Engineer Research and Development Center



## Tillamook, Oregon, United States

### **Converting catastrophic flood recovery into widespread flood reduction.**

The Southern Flow Corridor project is a landscape-scale effort to relieve more than 1,214 hectares of community from regular flooding and reconnect more than 65 hectares of Tillamook Bay's most productive salmon-bearing habitat to neighboring streams. Over the past 150 years, settlers have drained close to 90% of the Tillamook Estuary's historical tidal wetlands to support other land uses. Levees and dikes constricted and disconnected the natural river channels, causing frequent seasonal flooding that often catastrophically affected landowners in Tillamook County. This habitat loss contributed to winter flooding events, created by a combination of storm surge, heavy rainfall, and snowmelt, and led directly to the decline of the area's salmonid species, including chum (*Oncorhynchus keta*), Chinook (*O. tshawytscha*), and the threatened Oregon Coast coho salmon (*O. kisutch*). To resolve this, Tillamook County acquired 155 hectares of land where the Wilson and Trask Rivers meet and converted retired dairy land into wetlands by removing an extensive system of levees. In addition to restoring 179 hectares of habitat, the

project opened 21.2 kilometers of new tidal channels for migratory fish while reducing flooding and protecting private property.

Article cover: A slough in the wetlands after levee removal. (Photo by Tillamook County)

## **Producing Efficiencies**

First the team developed a hydraulic model to design the project. After removing the levees, the team reused the existing tide gate infrastructure for the new setback levees, installed to protect and drain adjacent agricultural land. When the project was complete, they were also able to reuse the original hydraulic model to validate whether the solution achieved the site's flood reduction goal. Simply by removing these levees, the project team reduced flooding on 1200 hectares of land, saving \$9.2 million on flood recovery costs over the restoration's expected 50-year lifespan.

## **Using Natural Processes**

Restoring tidal inundation to the marsh habitats opened up 180 additional hectares for Oregon Coast coho salmon and other fish and wildlife species. Over time, the inundation of tidal waters will naturally improve the marsh by adding sediment and reducing invasive plant species. This process will create, enrich, and expand a network of habitats, such as mud flats, aquatic beds, emergent marsh, forested wetlands, and sloughs. By reopening the land and allowing tidal forces to change the landscape, this project will restore the area without further human intervention.







The completed spillway across the middle setback levee.

(Photo by Tillamook County)

## Broadening Benefits

One of the objectives of the Tillamook restoration was to engineer ecological benefits without negatively affecting local agricultural productivity. Reducing the seasonal flooding events by restoring the floodplain achieves both of these as lowered flood risk raises local property values and ensures crops are not destroyed by floodwaters. It also mitigates the recovery expenses associated with flooding. Recovering salmon populations further contributes to the region's ecological and economic profile, and as in other Pacific Northwest restoration projects, preserves their social and cultural importance.





The flow corridor before the levee setback.

(Photo by Tillamook Estuary Partnership)



The flow corridor with restored tidal marsh habitat after the levee setback.

(Photo by Tillamook Estuary Partnership)

## Promoting Collaboration

The project team included Tillamook County, the Port of Tillamook Bay, the Tillamook Estuary Partnership, and the Tillamook Bay Habitat Estuary Improvement District. For the main project, the team used the Oregon Solutions process, in which the governor designates an impartial convener to help community leaders join together and resolve a challenging issue. Then, the team received funding from the Federal Emergency Management Agency's disaster assistance fund, allowing them to convert catastrophic flood recovery into future flood prevention. To complete the project, these funds were combined with funding from the National Oceanic and Atmospheric Administration Office of Habitat Conservation Restoration Center, the U.S. Fish and Wildlife Service, and the Oregon Watershed Enhancement Board.



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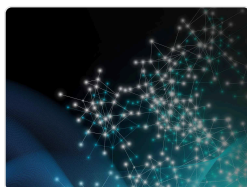
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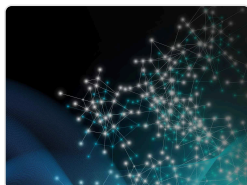
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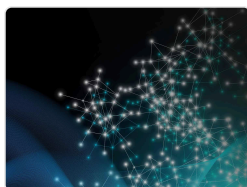
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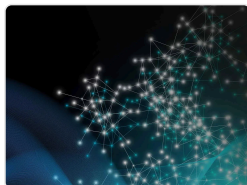
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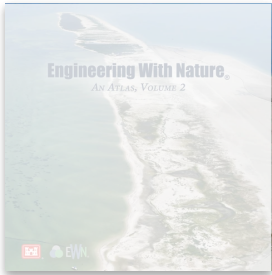


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