

Jetty: 'Our intent is to not come back out here for 50 years'

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Project managers estimate the repairs to Jetty A will be completed in June 2017. Ilwaco residents and state park visitors will notice some construction traffic due to the project, but barging the rocks in has reduced that traffic significantly compared to past projects that relied on trucks to move all the rock. The barge is also more cost-effective, project officials said.

Scope of the repairs

From above, it's easy to spot several dips, gaps and holes in the jetty's exterior that show how the elements have battered it over the years.

What's not as easy to see is the almost 900 feet of rock that is now mostly submerged. In fact, boats that try to cut the corner outside the navigation buoy, risk striking the rocks.

According to Jerry Otto, a Corps civil engineer and the Jetty A project manager, not all of that will be rebuilt. He said scientific modeling now gives engineers "a more precise muscle," so that less material can be used to make jetties more efficient structures.

That modeling shows workers will need to add just an additional 200 feet to bring the jetty up to full functional capacity. A massive fortification of rocks at the tip of the jetty should prevent any future loss of length.

Currently, workers are focusing repairs to the most degraded sections of the jetty.

Arming the jetty

Crews were working around the clock to unload the shipments of basalt, a type of volcanic rock that is known for its durability and strength. Each boulder weighs somewhere between 6 and 28 tons, and each barge carries about 13,000 to 14,000 tons of stone, project officials said. In all, work crews will add about 82,000 tons of rock to the jetty.

A "spotter," perched below the crane, examined the shape of each stone, and looked for a spot in the jetty where it would fit neatly. Using a radio, the spotter relayed his suggestions to the crane operator, who gently lowered each one into place. The procedure resembled a large-scale version of the video game Tetris.

"The key is to have as much interlock between the stones as possible," said Otto.

The boulders that didn't go straight into the jetty were loaded into what resemble gigantic versions of the classic yellow toy Tonka trucks. The crews hauled them to a staging yard, where they dumped them, sending up plumes of dust. Later, the rocks would be organized by size, weight and shape.

What the jetties do

"It's all for navigation. We really want to make it a safe navigation coming in and out of the river," Otto said.

According to the Corps, the jetty system provides a safe and reliable entrance for a \$24 billion trade economy that depends on the Columbia and Snake river systems. More than 40,000 local jobs rely on that trade.

Positioned east of the North Jetty, the rocky expanse of Jetty A lurches due south from Coast Guard station, parallel to the Ilwaco channel. Before it was built, the "thalweg," or deepest, fastest part of the river, slammed against North Jetty with full-force, damaging the jetty and degrading the effectiveness of the whole jetty system, that includes South Jetty on the south side of the Columbia River. Now,



Photos by David Plech/EO Media Group

Kiewit construction workers offloaded nearly 14,000 tons of stone from a barge at the tip of Jetty A as part of a construction and rebuilding effort that will last through next summer. The jetty system supports safe ship travel through the mouth Columbia River and neighboring navigation channels.



Engineers and project managers are working alongside Kiewit Corporation construction crews on the rebuilding of Jetty A. Together with the North and South jetties, Jetty A supports safe ship travel and even healthy salmon habitat.

the thalweg deflects southward and into the main shipping channel, Otto said.

The mouth of the Columbia River is about five miles wide, but the 9.7 mile, three-jetty system, reduces that width to approximately two miles. That narrowing makes the river act like a hose, flushing sediment to sea. A properly functioning jetty system greatly reduces the frequency and need for expensive dredging. And a clearer, deeper channel means safer ship travel.

Dredging Ilwaco Channel

Locally, the Ilwaco channel also benefits from a properly functioning jetty system. In 1950, a complete breach of Jetty A caused 200,000 cubic yards of sediment to flood into Ilwaco channel making it virtually impassable. More recently, a 10-year storm surge breached degraded parts of the jetty, and that shifted a lot more sediment than usual into the channel, said Otto.

As the rocks dropped on land, Corps crews in the river were back dredging the Ilwaco channel again. Guy Glenn, manager of the Port of Ilwaco, said repairs to Jetty A will definitely help keep silt and sediment out of Ilwaco channel, but he thinks additional infrastructure projects are needed.

"I'm sure there some effects from the jetty deterioration, but we think there's a larger problem than that," Glenn said.

Glenn said dynamic movements of water and sand around nearby islands are also increasing the need for dredging in Ilwaco channel, because pile dikes along Sand Island and at the main stem of the river have decayed to the point where they are either under water or completely detached from land. When that happens, instead of funneling water into the channel to scour out sediment, water flows in behind the pile dikes.

"With that flow splitting, it slows the veloc-

ity of water, and that's when everything starts filling in," Glenn said.

Otto confirmed that pile dikes work in conjunction with the jetty so that "sediment gets dropped where you want it, and pushed out where you don't want it."

"If we took out Jetty A, there would probably be an island created where Ilwaco channel is now," Otto said.

Glenn said Port of Ilwaco is working closely with the Corps of Engineers, the Pacific Northwest Waterways Association, and congressional delegates to come up with an engineering plan and funding to repair the aging pile dikes.

Glenn said dredging is currently the port's highest priority. The channel wasn't dredged in 2013, Glenn said, and as a result, a Coast Guard boat hit bottom coming into port, and the Corps had to seek emergency funding. That "was a real challenging year," Glenn said.

Glenn says he has lobbied in Washington, D.C., for funding for a more long-term solution to the silt problem. It's going to take time, he said, but he's hopeful that local leaders will be able to fully resolve the pile-dike issue within the next three to five years.

Regular dredging since 2013 has kept the depth and condition of the Ilwaco channel at a very high standard, said Glenn, who reported bigger boats are coming in carrying more tonnage. When that happens, local economies benefit, he said.

"It's a real thing for us," Glenn said. "We just want to help the Corps be able to do the job. They know it needs to be done. There's just so many different priorities and funding limitations. It's just a matter of keeping after it."

Ancillary benefits

In addition to providing safe passage for mariners who are headed out to sea, the jetty system also helps ocean-bound salmon.

The narrowing effect of the jetties increases the velocity of the water as it passes through the channel. Scientists have discovered that this increase in speed dramatically improves the condition of the Columbia River plume; the zone where fresh water exiting the river meets and rises above the denser saltwater of the Pacific Ocean.

According to an environmental assessment provided by the Corps, this multi-layered zone provides key habitat in the life cycle of juvenile salmonids, who often spend the first few weeks of their ocean life in the plume. Food concentrates in its fronts and eddies, and the high turbidity in the plume also provides cover from predators while the young fish gain strength. Eventually, the quickly moving plume helps the salmon move farther away from shore. The plume also provides important spawning habitat for northern anchovy, an important food source for salmon and humpback whales.

Big project, big money

Work on Jetty A should be completed by next summer. After that, the Corps will start a roughly year-long effort to rehabilitate North Jetty. In 2019, the Corps will start a more ambitious, four-year restoration of South Jetty. According to estimates provided by the Corps in its 2012 "Major Rehabilitation Evaluation report," the total cost of work on all three jetties is estimated to cost \$257.2 million.

Corps officials hope the work will help the jetty system perform well for a long time to come.

"Our intent is to not come back out here for 50 years," Otto said.

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