

Ancient clam gardens nurture food security

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Tagged clams

A three-year study of ancient clam gardens in the Pacific Northwest has led researchers, including three from Simon Fraser University, to make a discovery that could benefit coastal communities' food production. *PLOS ONE*, a peer-reviewed science journal, has just published their study.

Amy Groesbeck, an SFU alumna, SFU professors Anne Salomon, an

ecologist, and Dana Lepofsky, an archaeologist, and Kirsten Rowell, a University of Washington biologist are the authors.

The researchers discovered that ancient clam gardens made by Aboriginal people produced quadruple the number of butter clams and twice the number of littleneck clams as unmodified clam beaches. This is the first study to provide empirical evidence of ancient clam gardens' superior productivity.

In the past, as indigenous [coastal communities](#) from Alaska to Washington State grew in numbers, people needed to devise sustainable ways of feeding themselves. One of the ways they did this was by cultivating clams in human-made, rock-walled beach terraces known as clam gardens.

When the researchers transplanted more than 800 baby clams into six ancient clam gardens and five non-walled natural beaches to compare their growth rates they made a groundbreaking discovery.

The clams in the ancient gardens grew almost twice as fast and were more likely to survive than baby clams transplanted into unmodified beaches in the same area.

"We discovered that by flattening the slope of the beach ancient clam gardens expanded the real-estate for clams at the intertidal height at which they grow and survive best," explains Salomon. The School of Resource and Environmental Management assistant professor adds: "Traditional knowledge by coastal First Nations members further revealed that their ancestors boosted these gardens' productivity by adding ground clam shell and pebbles to them."

The researchers began their clam garden investigations in 2008. From 2009 to 2011 they focused their efforts on Quadra Island due to the

sheer number of clam gardens available to survey and use as experimental replicates. They surveyed 11 ancient clam gardens and 10 un-walled clam beaches and compared their number, size and weight of clams. They collaborated with indigenous knowledge holders from the Tla'amin First Nation and Laich-kwil-tach Treaty Society.

This study was the basis of Groesbeck's master's research, which was conducted under the supervision of the study's other authors. Groesbeck, a 2013 Faculty of Environment graduate and this study's lead author, is now a University of Washington research assistant.

"Our discovery provides practical insights into sustainable ancient marine management techniques that can inform local food security strategies today," says Groesbeck.

This study notes that some of today's benthic shellfish aquaculture practices have been shown to undermine near shore ecosystem resilience. They "alter the community composition of near shore systems, change sediment characteristics, and facilitate the introduction of invasive species," says the study.

Lepofsky says, "On the Northwest Coast we are fortunate to have both the tangible record of clam gardens and the culture-based knowledge of local indigenous people to educate us. The lessons learned here have global implications for food security and about the way indigenous people interact with their land and seascapes."

Provided by Simon Fraser University

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