

Fish farm waste can drift to distant shores

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Concentrated waste plumes from fish farms could travel significant distances to reach coastlines, according to a study to be published in an upcoming issue of the journal *Environmental Fluid Mechanics*, available online now. Roz Naylor, Oliver Fringer and Jeffrey Koseff of the Woods Institute for the Environment at Stanford University found that relatively high concentrations of dissolved waste from fish pens do not consistently dilute immediately.

The paper is the first detailed look at how 'real world' variables, such as tides, currents, the earth's rotation and the physical structure of the pens themselves, influence the flow of waste from fish farms. The research, which was funded by the Lenfest Ocean Program, can serve as an important tool for determining the impacts of [aquaculture](#) discharge on waterways and surrounding shorelines.

"This study suggests that we should not simply assume 'dilution is the solution' for aquaculture pollution," said Koseff. "We discovered that the natural environment around fish pens can dramatically affect how far waste plumes travel from the source."

Dissolved substances from feces, undigested food and other forms of discharge amass near fish pens. In multiple modeling scenarios in which these factors were varied to study how each one affected the behavior of such pollution, effluent was characterized by "plumes" of highly concentrated waste that held together for great distances from the source.

The findings suggest that regulators need to consider the full range of possible influences on the movement of pollution plumes—and accurately identify the dominant factors—when designing water quality regulations for and monitoring waste from aquaculture.

"Our approach to aquaculture is at an important juncture right now," said Naylor, referring to the fact that the National Oceanic and Atmospheric Administration is inviting public comments through April 11 on its draft national aquaculture policy, and the state of California is implementing new aquaculture regulations.

"As the aquaculture industry grows, so will the number of pens that create pollution," she added. "The models that we developed for this study can help regulators determine how waste from proposed fish farms might impact the waterways and coastlines both near and far from the pens."

More information: *Environmental Fluid Mechanics* paper:
www.springerlink.com/content/d1528228x7122x67/

Provided by Stanford University

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