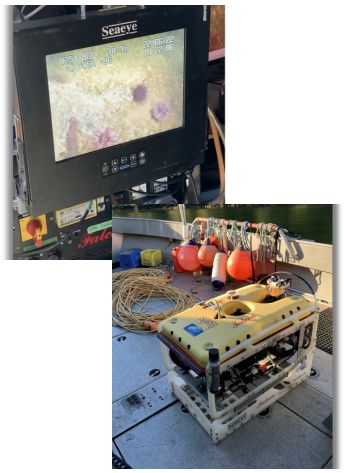
BC SALMON FARMERS

Under The Farm

Q: What is underneath salmon farms?

A: The area underneath a salmon farm is referred to as the 'benthic environment,' meaning the seafloor. There are two types of seafloor:
Hard Bottom - areas of the ocean floor that are made up of solid substrates, such as bedrock, rock, or gravel. These surfaces are typically more stable and can provide a habitat for different types of marine life, such as algae, sponges, and organisms that attach themselves to the hard surfaces.
Soft Bottom - areas of the ocean floor that are composed mainly of loose sediments, such as sand, silt, or mud. These soft, fine-grained materials can shift easily and often support a variety of benthic organisms, like worms, clams, and other creatures that burrow into the sediment.

Did you know?
Remotely Operated Vehicles (ROV) are used to routinely monitor under salmon farms!



Q: How could salmon farms impact the benthic environment?

A: Salmon farms can have an effect on the ocean floor directly underneath a pen. Here's how it happens:

Fish Waste:
As salmon are fed, they produce waste that contains organic material, including carbon.

Uneaten Feed:
A small percentage of salmon feed is not consumed. The uneaten feed, which is rich in carbon, sinks to the seafloor.

Decomposition:
As fish waste and uneaten feed settle on the seafloor, they begin to decompose, releasing carbon.

Deposition:
If this carbon builds up too much, it can affect the benthic (seafloor) environment by altering oxygen levels and impacting the organisms.

The benthic environment is consistently monitored to ensure that impacts do not exceed certain thresholds.

Q: How do salmon farmers monitor the benthic environment?

A: Salmon farmers monitor the benthic environment in two main ways, depending on whether the seafloor underneath is soft or hard.

Micromolar (µM) is a unit of concentration of the number of moles of a substance (sulfide in this case) in one liter of solution.

Soft Bottom
Monitoring thresholds are set at 30 meters and 125 meters from the cages. Sediment samples are collected at these distances to test for sulfide levels. The farm cannot be restocked unless sulfide levels are below 1,300 µM at 30 meters and below 700 µM at 125 meters.

Hard Bottom
Farmers use a remotely operated underwater vehicle (ROV) to capture video footage of the ocean floor from the edge of the pen system out to 140 meters. Biologists analyze this footage to identify organisms, substrate types and to estimate indicators, like worm complexes and bacteria. The farm can only be restocked if the amount of these indicators is less than 10% in at least three of six video segments between 100 and 124 meters from the cages.

Monitoring thresholds are set by the Department of Fisheries and Oceans and farmers are required to submit detailed reporting on these thresholds.

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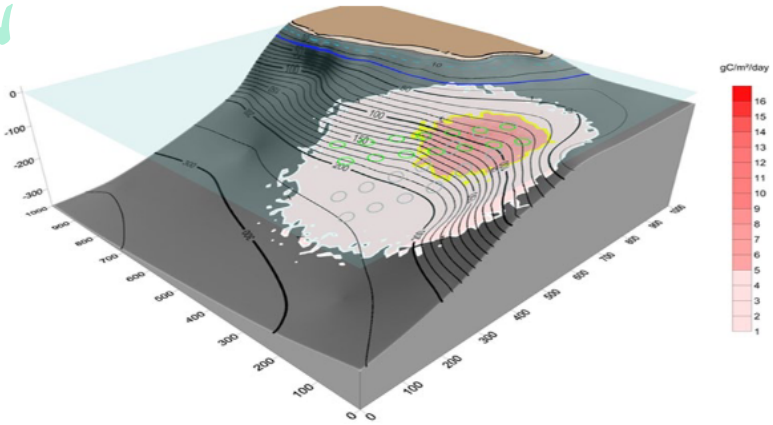
Q: What does DFO do to manage the nutrient footprint of farms?

A: DFO has set limits on the size and intensity of the nutrient footprint that farms can have. Since 2004, they've required farmers to use a simulation model called DEPOMOD to help predict where particulate matter will settle on the seafloor, especially when the farm is using the most feed, usually just before harvest. The model also helps biologists predict the average footprint for the entire production cycle.

Q: How does the DEPOMOD model work?

A: The DEPOMOD model uses information about the farm's size, location, the amount of feed used, and environmental data like water currents and the shape of the seafloor. It tracks particles and predicts where particulate matter will settle on the seafloor and how this will impact the environment, identifying probable areas of high, medium and low deposition.



Q: What happens if a farm doesn't meet the thresholds set by DFO?

A: If a farm doesn't meet the thresholds for either soft or hard bottom, it must be left fallow, meaning no fish can be added until a new survey shows that the thresholds are met. These thresholds are designed to limit the farm's environmental impact and ensure the seafloor recovers between crops.

Want to learn more?

Scan the QR code to check out
"Modern Salmon Farming: A Review" for info on:

- Indigenous Stewardship in Aquaculture
- Feed Sustainability
- Protecting Biodiversity
- Sea Lice Management

and more!

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