

Senator Reny, Representative Hepler, and distinguished members of the Committee on Marine Resources, my name is Kathleen Rybarz, I am President of Friends of Frenchman Bay. My organization exists to help support a sound and healthy bay, to provide a forum for discussions on how to keep our bay thriving and to try and find a way to look at the cumulative effects on the bay. Thank you for the opportunity to share why I am supportive of LD 586, An Act to Protect Maine Fisheries from the Effects of Industrial Aquaculture Operations.

I specifically support the bills effort to regulate the discharge from the so-called RAS form of aquaculture. Current regulations of the Maine DEP utilize the CORMIX model of estimating discharges from these systems. This is not the correct model to use. I will explain that on page two and three.

First to set the scene for you.

The State of Maine has 3 permitted finfish RAS commercial/industrial size systems approved by the Maine DEP. **None have been built yet.** Two of these have been tied up in the state court system for various reasons, the third, well, no one knows exactly why, has not been started.

So we have zero experience with the discharges, and only “models” and best guesses as to what their effect on our coastal waters will be.

1. Nordic Aquafarms, Belfast Maine.
Salmon 66 Million Pounds/year.
71 Million Gallons discharge per day.
Note: Discharge calculations were done with two methods, neither of which are applicable for a tidal bay like Penobscot Bay.
2. Whole Oceans, Bucksport Maine.
Salmon 44 Million Pounds/year
86 Million Gallons discharge daily to tidal part of Penobscot River.
3. Kingfish, Jonesport Maine.
Kingfish 16 Million Pounds/year.
28.7 Million Gallons per day discharge into Chandler Bay
Note: higher nitrogen exception for economic reasons. Including an okay to discharge up to 96 pounds of Fish Oil and Grease into the water of the bay as a maximum amount daily or 39 pounds on average each day.
4. 2023 Proposal for Salmon aquaculture in Millinocket, Maine. Unknown details at this time, but this too will discharge into the upper Penobscot River.

The last RAS system just proposed last month for Millinocket Maine, which would be the third facility discharging into Penobscot Bay. Not a single system has been built yet or has ever operated in anywhere near full capacity in Maine.

So all their approvals are for “theoretical discharges” and best estimates of discharges. We don’t yet know what will happen when they begin to operate or what will happen to our native fisheries that will exist in conjunction with these systems. They all have a “condition” to do a dye study when they start operating. To see where the pollution will go.

The only system that raises any fish in a recirculating system are the hatcheries in and around the state, the eel facility in Waldoboro which discharges 95,000 gallons per day (not millions of gallons)) and the startup facilities of Kingfish in Franklin Maine. The facility in Franklin Maine, discharges into Frenchman Bay eventually through Taunton Bay. These are microscopic discharges in comparison.

We also have the American Aquafarms proposal - what is effectively an in-water RAS system proposed for Frenchman Bay, where the fish aren't in tanks on land, but in the sea itself, and with no treatment besides containing the solid waste from the fish and letting the liquid waste and water from the solid waste squeezed out, back into the ocean without any treatment.

In educating myself about the American Aquafarms proposal I learned a lot about the Cormix Model of discharge evaluation that the Maine DEP utilizes. It is a model made for rivers, and discharges into rivers. The model maker specifically says that this model doesn't work for tidal bays. Yet that's exactly what we have the RAS farms discharging into, tidal bays. And the tidal portion of the Penobscot River in Bucksport.

Here is a portion of our groups' comments to the Maine DEP about American Aquafarms, a tidal bay proposed finfish farm in Frenchman Bay. The same situation applies to Nordic and Kingfish as well as Whole Oceans' discharge into tidal Penobscot River.

1) **The use and applicability of Cormix.**

Near and far field dilutions are calculated with a software package called Cormix. Cormix is specifically not intended for regions of dynamic tidal flux where re-entrainment of earlier discharges occur as they do at both proposed lease sites. The literature is replete with notices of these limitations, for example this one from the [Cormix website](#) FAQs section **Q.13. How does CORMIX simulate TIDAL re-entrainment?**

CORMIX is a STEADY-STATE model, whereas tidal environments are inherently UNSTEADY. Because most REGULATORY MIXING ZONE analysis requires "worst-case" dilution analysis, analysts sometimes consider conditions at slack tide (often zero ambient velocity) as representative of the "worst-case". However, minimum initial dilution generally will not occur at slack tide, but shortly after slack tide when the plume re-entrains material remaining from the previous TIDAL CYCLE. In tidal mode, CORMIX considers the reduction in initial dilution due to the re-entrainment of material remaining from the previous cycle. It does not consider UNSTEADY build-up of material over several TIDAL CYCLES, it assumes complete flushing of the historic plume in the NEAR-FIELD, will occur within a tidal cycle.

If unsteady build-up in the NEAR-FIELD or FAR-FIELD over multiple TIDAL CYCLES is likely at your site, additional methods of analysis may be necessary.

For another description of the limitations of Cormix, this time from American Aquafarms' "**Summary of Q&A from May 6 PIM - Pages from FB01 Long Porcupine General Application for Waste Discharge Permit with Attachments.pdf**":

This model is a steady-state model, which means it does not account for changes in the current direction or current speed over time. That means that in tidal environments the results are only valid if you consider them as a brief snapshot of the mixing, generally less than 15 minutes.

But of course, if permitted, the lease sites would discharge waste into tidal zones for a 20-year lease term; it's therefore appropriate to use tools capable of modelling known phenomena like the re-entrainment that can occur when the dynamic tidal flux occurring at both lease sites is present.

Next, Cormix modeled the configuration of the discharge port as a 15-port, 300m diffuser that has little or nothing to do with the actual grid-like configuration of the discharge ports. Further, Cormix requires that the

modeled discharge port be in the bottom third of the water column. Unfortunately, it's in the middle third of the water column. Therefore, additional permutations are applied to an already inappropriate model.

Taken together, these flaws make the Cormix projections extremely questionable.”

Indeed, Friends of Frenchman Bay joined with Frenchman Bay United to **fund our own study of the circulation of Frenchman Bay, and is in process of documenting** that indeed, this bay does not have a major river type of circulation, and that indeed nitrogen will accumulate in the shallower regions of Frenchman Bay. We have hired a university based researcher to extend his Bay of Maine Research into Frenchman Bay. We collected data in 2022 and are now working on entering it into an appropriate modeling software. A report should come out sometime in 2023. Dr. Chris Kincaid of the Graduate School of Oceanography of Rhode Island is our funded researcher. He has been and is in concurrent discussions with the Maine DEP modeler.

Penobscot Bay and Chandler Bays have NOT BEEN STUDIED and their circulation has not been characterized in any way by these companies, as they were not asked to do such work. Yet we need that information to have a full picture of where the waste from these discharges is going.

We need rules that will be appropriate for discharges that are well beyond what our largest cities discharge into our oceans. We need the rules to keep our water clean, and our native fisheries thriving, not declining. I will be present at the study session if you have questions about my comments or about our studies about bay circulation in progress.

Thank you for your time and attention. Please vote out to pass on LD 586.

Make all the changes you want. Likely the discharge evaluations changes should be sent over to the Maine DEP and not the DMR. Give us a chance to get appropriate discharge evaluation to keep Maine's coastal waters as clean as we can.