

Maine Pollutant Discharge Elimination System Permit (MEPDES) Application

Nordic Aquafarms, Inc.

Public Information Meeting

October 4, 2018





Introductions & Agenda

- Joanna Tourangeau, Drummond Woodsum
 - Introductions & Agenda
 - Purpose and Format of Public Information Meeting
 - Project Permitting Process
 - MEPDES Application Process
- Erik Heim, President, Nordic Aquafarms, Inc.
 - Overview of Project
 - Treatment System
 - Discharge Quality and Quantity
- Elizabeth Ransom, P.G., Ransom Consulting, Inc.
 - Discharge Permit Parameters
 - Belfast Bay Background
- Nate Dill, P.E., Ransom Consulting, Inc.
 - Modeling Discussion and Simulations

The Public Process



- Overall public application process for project (federal, state and local)
 - Separate applications coming for the project and addressing criteria under:
 - Federal Law- U.S. Army Corps of Engineers
 - State Law- Site Location of Development Act; Natural Resource Protection Act (including Significant Groundwater Wells)
 - DEP Rules require PIMs for these submissions too
 - City Law- Planning Board
 - Public meetings are part of this process too



The Public Process

- This Public Information Meeting is for the MEPDES Permit Application
 - Purpose of PIM: Discuss MEPDES criteria
 - The PIM is required BEFORE submission of the application to the DEP
 - Submission of application on or around October 19

Format for Meeting



- Nordic Presentation of draft MEPDES application:
 - Presentation will take approximately 1 hour
 - Court reporter and ASL interpreter
 - PIM is being broadcast live
 - There are 200 copies of the DEP fact sheet regarding opportunities for public comment in the permitting process available at the entrances. That fact sheet is available on the internet at: <https://www.maine.gov/dep/publications/is-public.html>
 - Sign in sheets by entrances will be provided to DEP



What is this Permit For?

- In 1972, the Clean Water Act (CWA) made it illegal to discharge any pollutant from a point source into navigable waters without a permit.
- In Maine, the state administers the discharge permits, and the Maine DEP reviews the permit applications.

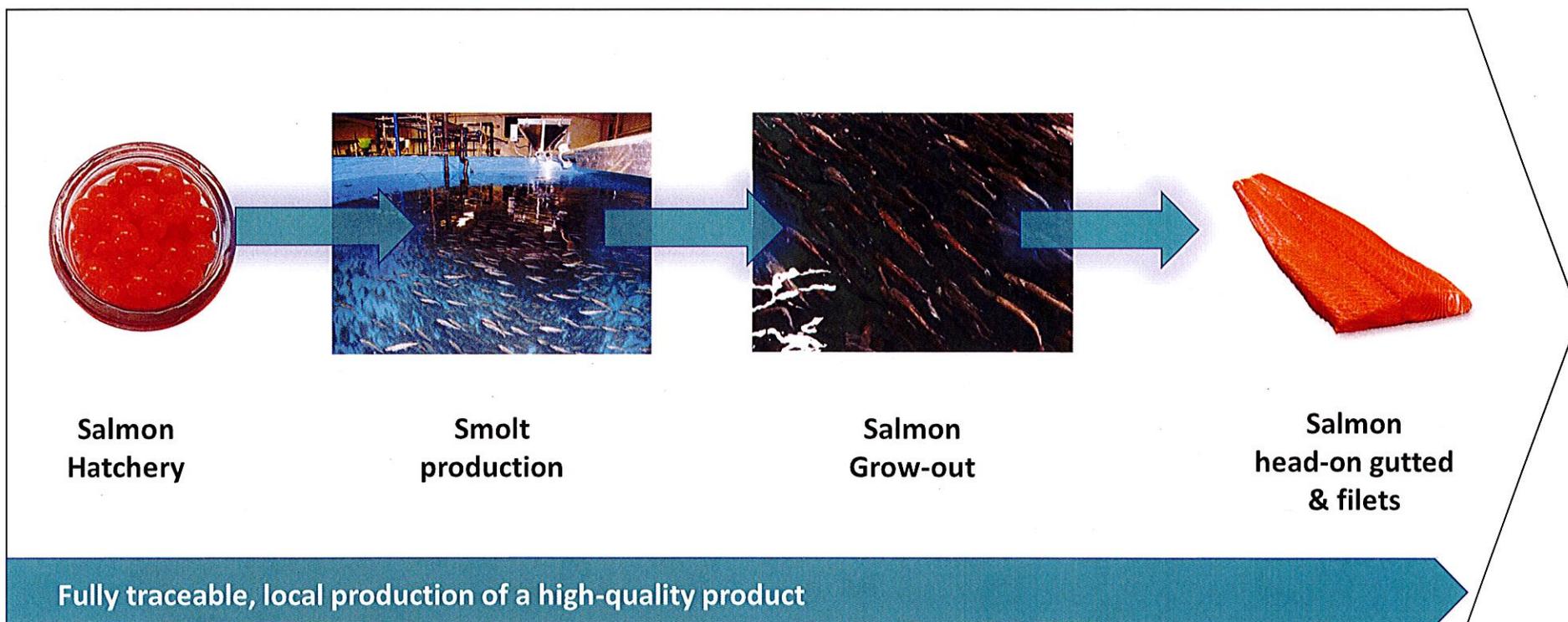
The 1972 CWA revisions meant the end to discharges of the types that existed during the era of the Belfast chicken farms.

General Overview of Nordic Project

*Our production needs clean water
and we intend to keep it that way
.... for everyone's benefit.*



Our Production Process – all happening indoors



Some background on the project



Why Belfast, Maine?

- Access to clean sea and fresh water
- Cold water – less power use
- Suitable site near the ocean
- Attractive community for employees
- Access to power
- Proximity to services and vendors
- Central position to NE USA market
- Academic institutions
- Economic development zone

Benefits for Belfast & Maine

- 100 jobs
- Extensive new business for Maine companies
- Investment and tax revenue
- Another clean Maine seafood product
- Knowledge-based growth industry for Maine
- Large value creation with minimal environmental impact
- Responsible and community oriented company

We are not a sea pen operation
Our vision and capabilities speak to a very different future



We remove and recycle nutrients from our production water. Sea pens do not.

We treat all water coming in and out for bacteria and pathogens. Sea pens do not.

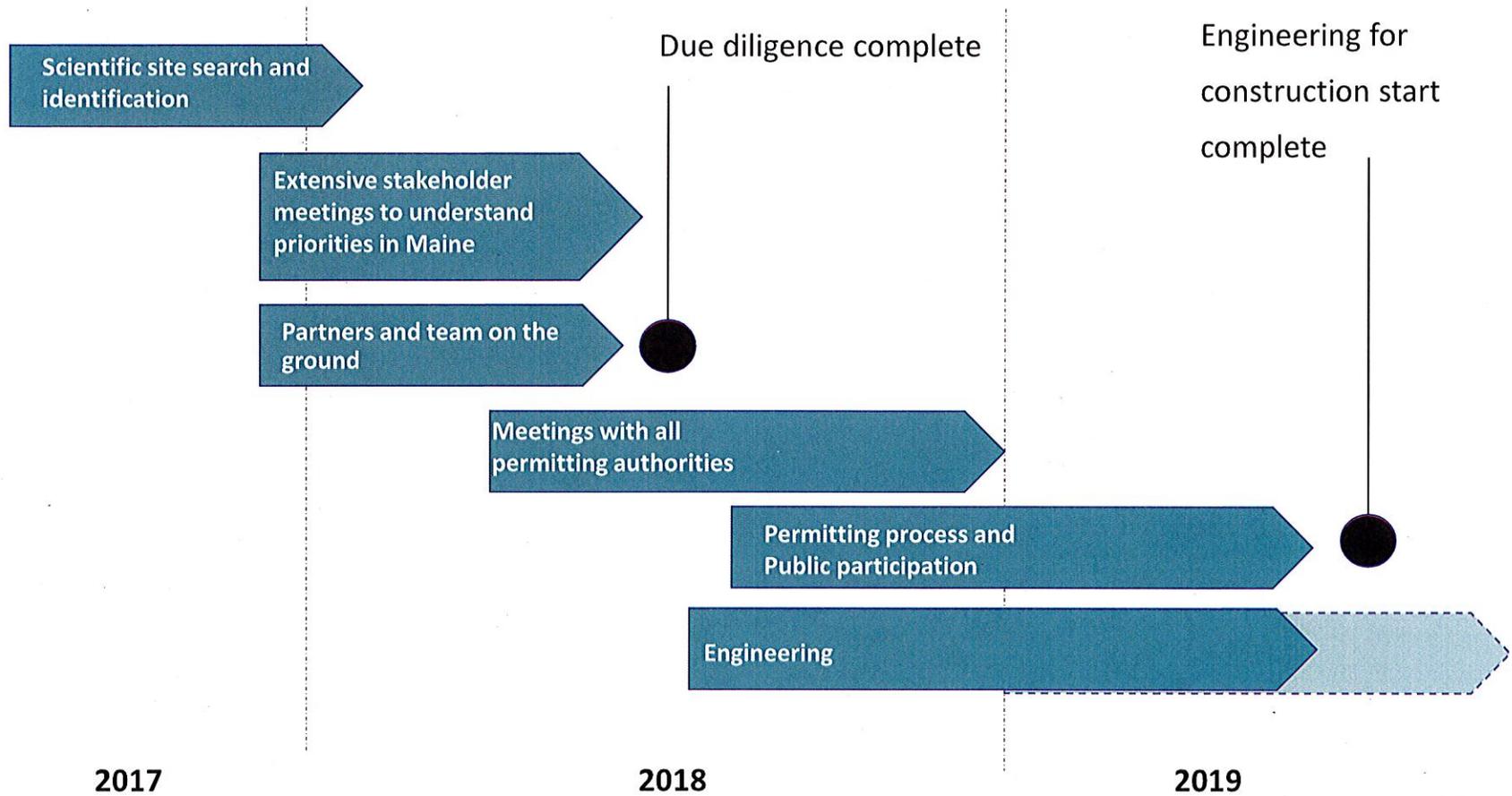
We have extensive barriers to prevent fish escape. Sea pens are vulnerable.

We do not need medication and chemicals to treat for sea lice. Sea pens do.

We develop our operation on private property. Sea pens do not.

We source healthy, non-GMO ingredients for our feed. Industry practice varies greatly.

Timetable for Belfast





What does the permit regulate?

- The permit regulates pollutants, which can consist of toxic substances as listed on the Priority Pollutant List, initially developed by EPA in 1977. Pesticides and heavy metals are considered toxic substances and regulated at low concentrations.
- The permit also regulates non-conventional pollutants such as nutrients. Compounds such as oxygen, nitrogen, and phosphorus are necessary for life, but at too high a concentration, can be harmful.

Nordic Aquafarms' waste stream will discharge low levels of residual nutrients, not toxics.

What are the key discharge components that matter to Belfast Bay?



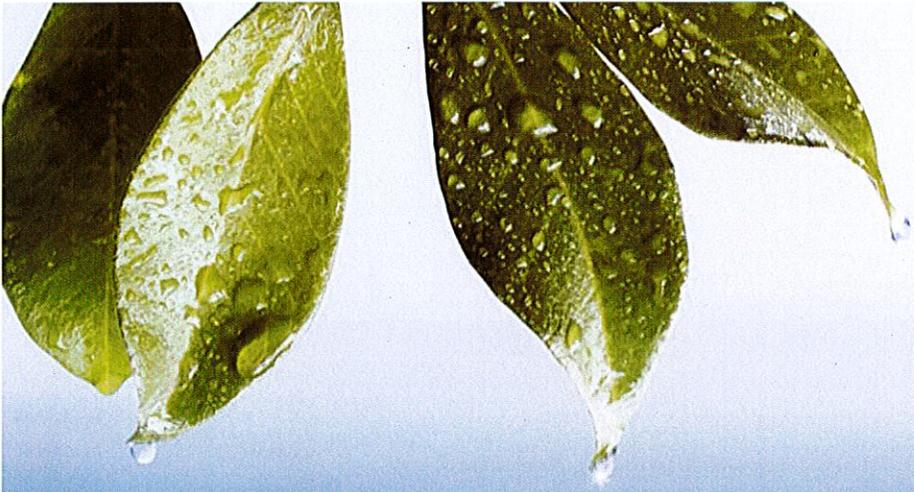
- Total Suspended Solids (“TSS”)
- Biological Oxygen Demand (“BOD”)
- Nitrogen (“N”)
- Phosphorus (“P”)

What are the background levels in the bay?



Measurements have been conducted historically by others and by Nordic in the past few months:

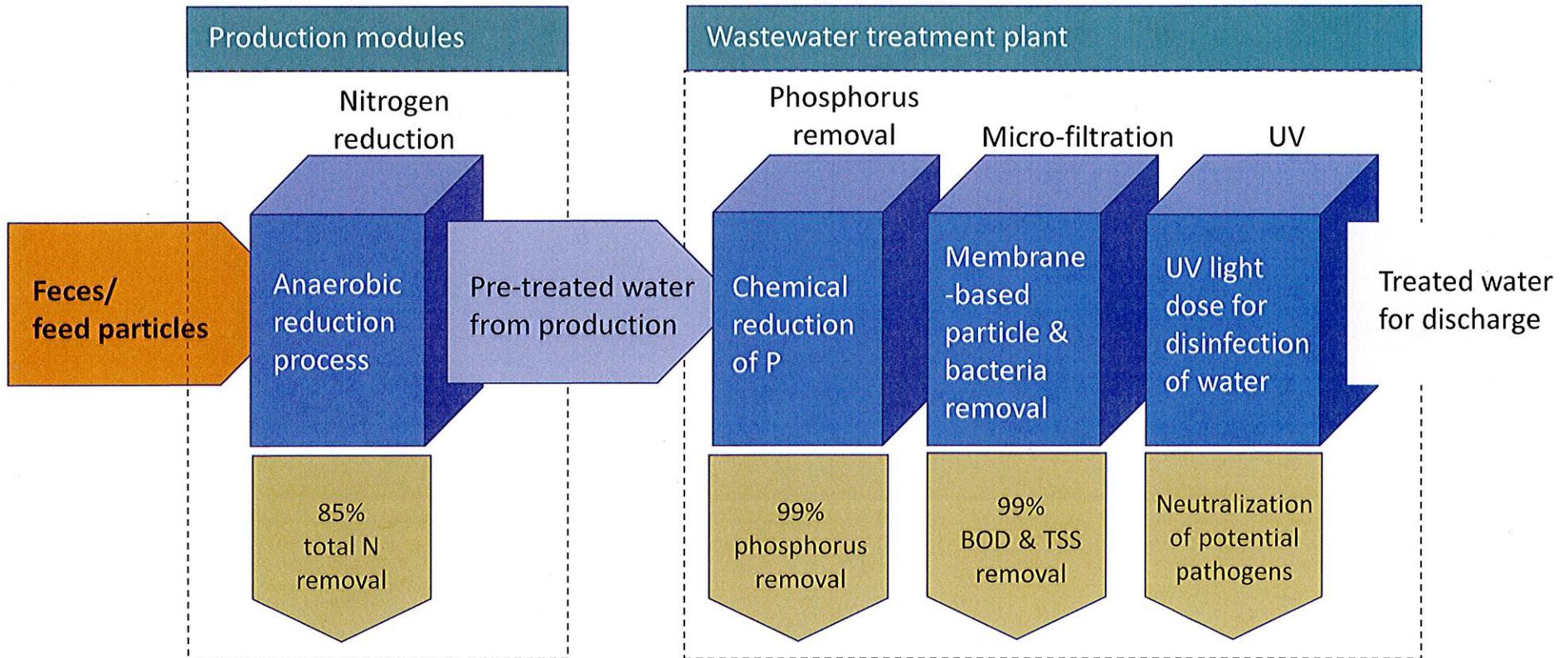
- **TSS** : 6.9 to 11 mg/l.
- **BOD** : currently low- at or below the laboratory detection limit of 2.0 mg/l.
- **Phosphorus** : 0.012 mg/l and 0.024 mg/l.
- **Nitrogen** : 0.17 to 0.48 mg/l (0.48 up to 0.78 mg/l at Little River)



Creating a cleaner future

World class wastewater treatment

Established and well-tested technologies

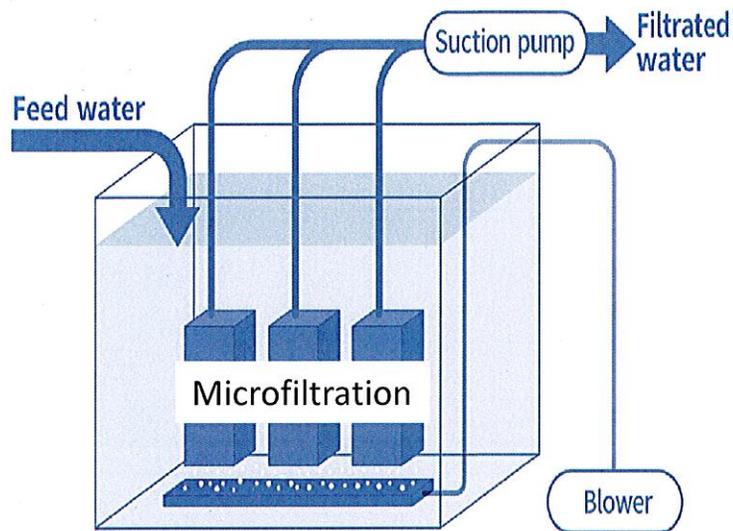


System has back-up power to continue treatment in case of outages.

Microfiltration Membrane Technology followed by UV sterilization for discharge treatment: drinking water treatment standard

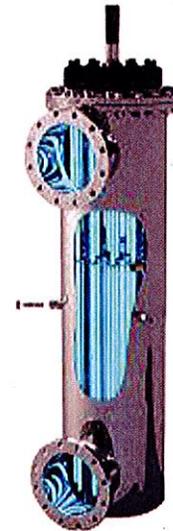


 MITSUBISHI CHEMICAL AQUA SOLUTIONS



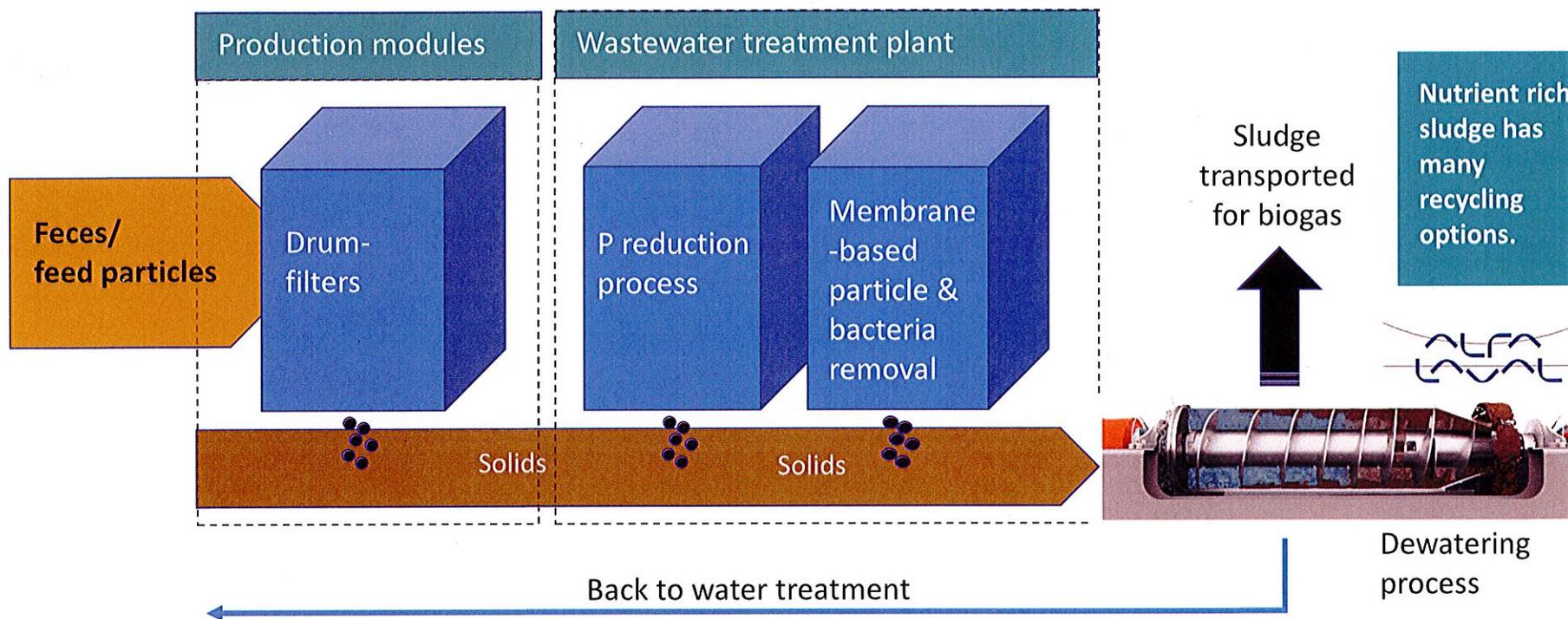
0.4 microns mesh size to take out particles down to bacteria size

ULTRAQUA
UV DISINFECTION SYSTEMS



300 mJ/cm³ dose of UV light
as final biosecurity step

Solids are dewatered into a sludge with multiple beneficial reuses, including biogas.



Feed profile is a part of the consideration when calculating discharge



- A wide variety of ingredients are available and new ones being added by the industry.
- Producers can tailor their feed to achieve the product they want.
- Our discharge figures are based on content profile of range of relevant feeds.
- Nordic Aquafarms will be composing a feed to achieve a high-quality product.
- Feed suppliers we will use will be fully CFIA, USDA, FDA and ISO compliant.
- Final feed selection to be decided in 2020 based on closer assessments of US options.



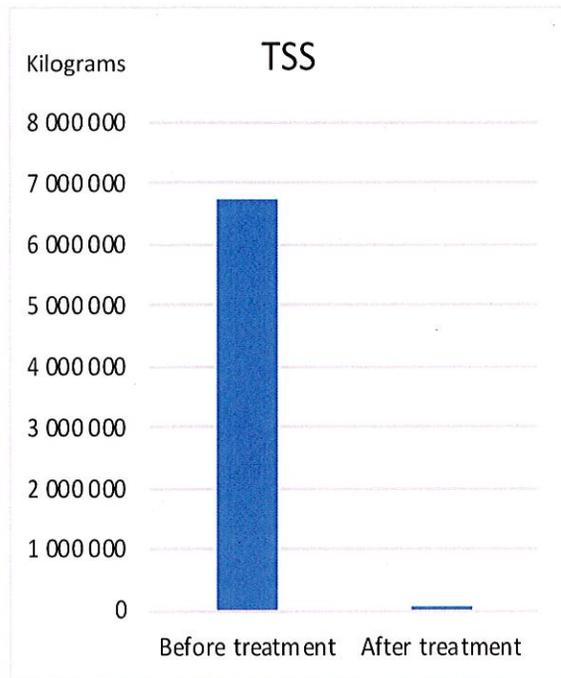
What about medications and other chemicals?

- MEPDES permit application must list all chemicals, cleaning substances and fish health medications that conceivably could be used at the facility.
- Many of the substances listed will be back-up or contingency options- i.e. used only in case of emergency for fish welfare purposes.
- For example, antibiotics are no longer in regular use in the industry, but could conceivably be used in rare circumstances as a contingency measure. Thus, we must list it.
- Emergency use of medications will be handled using US-approved medications under US veterinary direction.

Residual discharge figures in the application are the cleanest in the industry - Total suspended solids (TSS)



99 percent removal



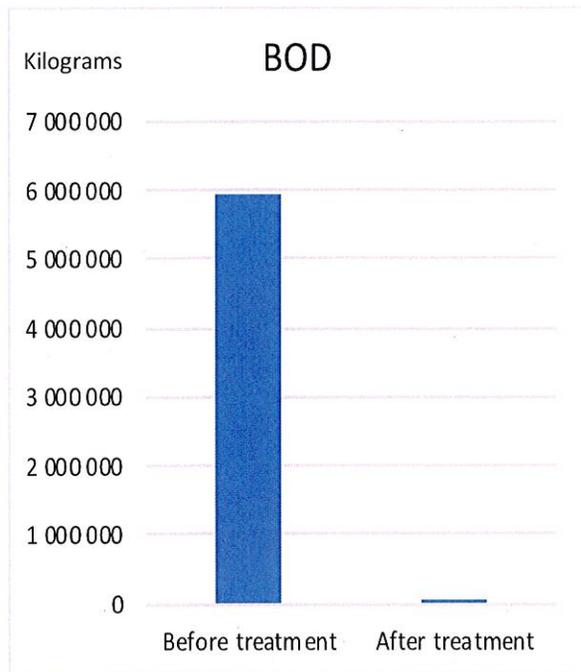
33,000 metric tons production

- TSS discharge is 185 kg per day / **concentration of 6.33 mg/l.**
- Background measured near the proposed discharge ranges from **6.9 to 11 mg/l.**
- **Residual discharge is lower than background values in the bay.**



Residual discharge figures in the application are the cleanest in the industry - biological oxygen demand (BOD)

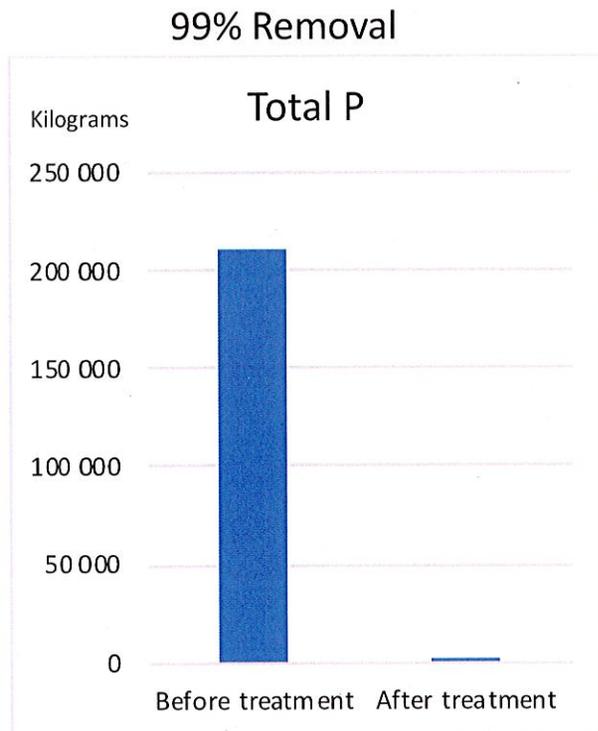
99% Removal



33,000 metric tons production

- BOD discharge is 162 kg per day / **concentration of 5.55 mg/l.**
- Background measured near the proposed discharge is at or near the detection limit of **2.0 mg/l.**
- **Dilution will quickly bring BOD to background level.**

Residual discharge figures in the application are the cleanest in the industry - Phosphorous (P)



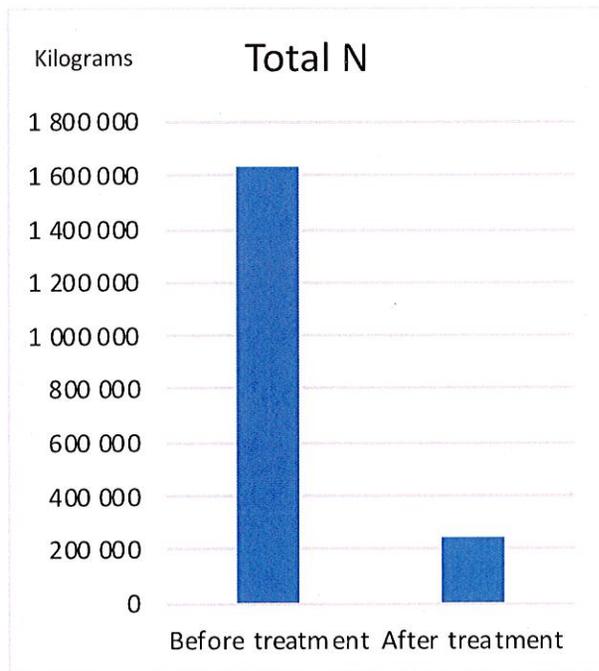
33,000 metric tons production

- P Discharge is 5.8 kg per day / **concentration of 0.20 mg/l.**
- Background measured near the proposed discharge ranges from **0.012 mg/l** to **0.024 mg/l.**
- **Dilution will quickly bring P to background level.**

Residual discharge figures in the application are the cleanest in the industry - Total Nitrogen (N)



85% Removal



33,000 metric tons production

- N Discharge is 673 kg per day / **concentration of 23 mg/l.**
- Background measured near the proposed discharge ranges from **0.17 to 0.48 mg/l.**
- **Dilution will quickly bring N to background level.**

- Ammonia is 0.07 kg per day / **concentration of 0.003 mg/l.**
- Background measured near the proposed discharge ranges from below **0.024 to 0.045 mg/l.**
- **Ammonia discharge is lower than background level.**



Wastewater Treatment Plant Testing

- Protocols for discharge measurement are a key part of overall operations and quality systems
- Method is a combination of data collection from sensors, and manual testing
- Discharge log will be continuously maintained and reviewed as a part of the management of the facility
- Results will be used to document the environmental profile of the operation
- Sampling data and discharge logs will be available for regulators to audit at any time
- Nordic Aquafarms is developing a data set for background values of key parameters in the vicinity of the discharge pipeline, so that background can be monitored for long-term trends.

Two-phased development:

- Phase 1 will account for 50% of the discharge volume in the application.
- Discharge in Phase 1 will be monitored and documented before Phase 2 expansion.
- Thus, a step-by-step approach is used to ensure that we comply with our permit requirements.

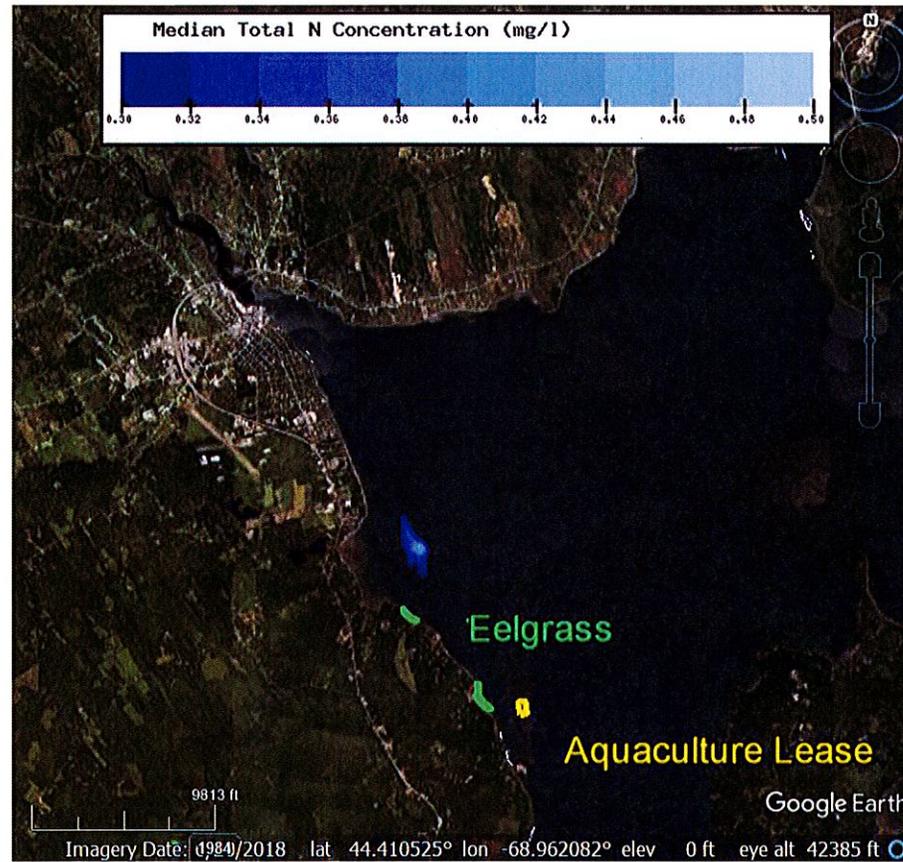


How much N is that, really?

- According to a 2011 study by R. Moore and others to look at nutrient sources and transport mechanisms in Penobscot Bay, approximately 11.6% of the Nitrogen in the bay comes from agricultural runoff,
- 17.7% comes from other development,
- 4.3% comes from point source discharges, and the remainder comes from atmospheric deposition.
- Nordic's discharge is anticipated to add about 0.75% (less than 1%) to the point source discharge figure.

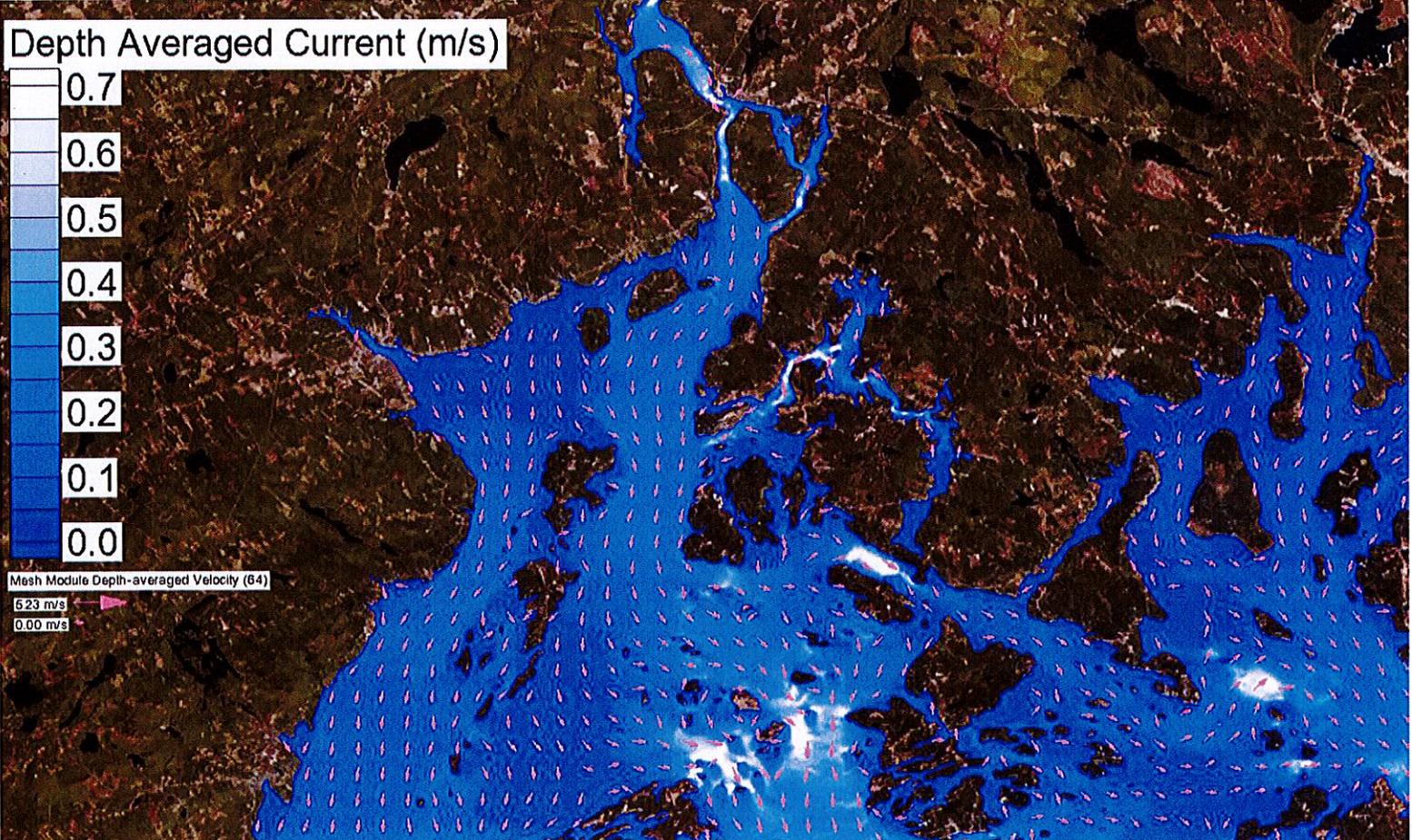


What are the populations of concern in Belfast Bay?

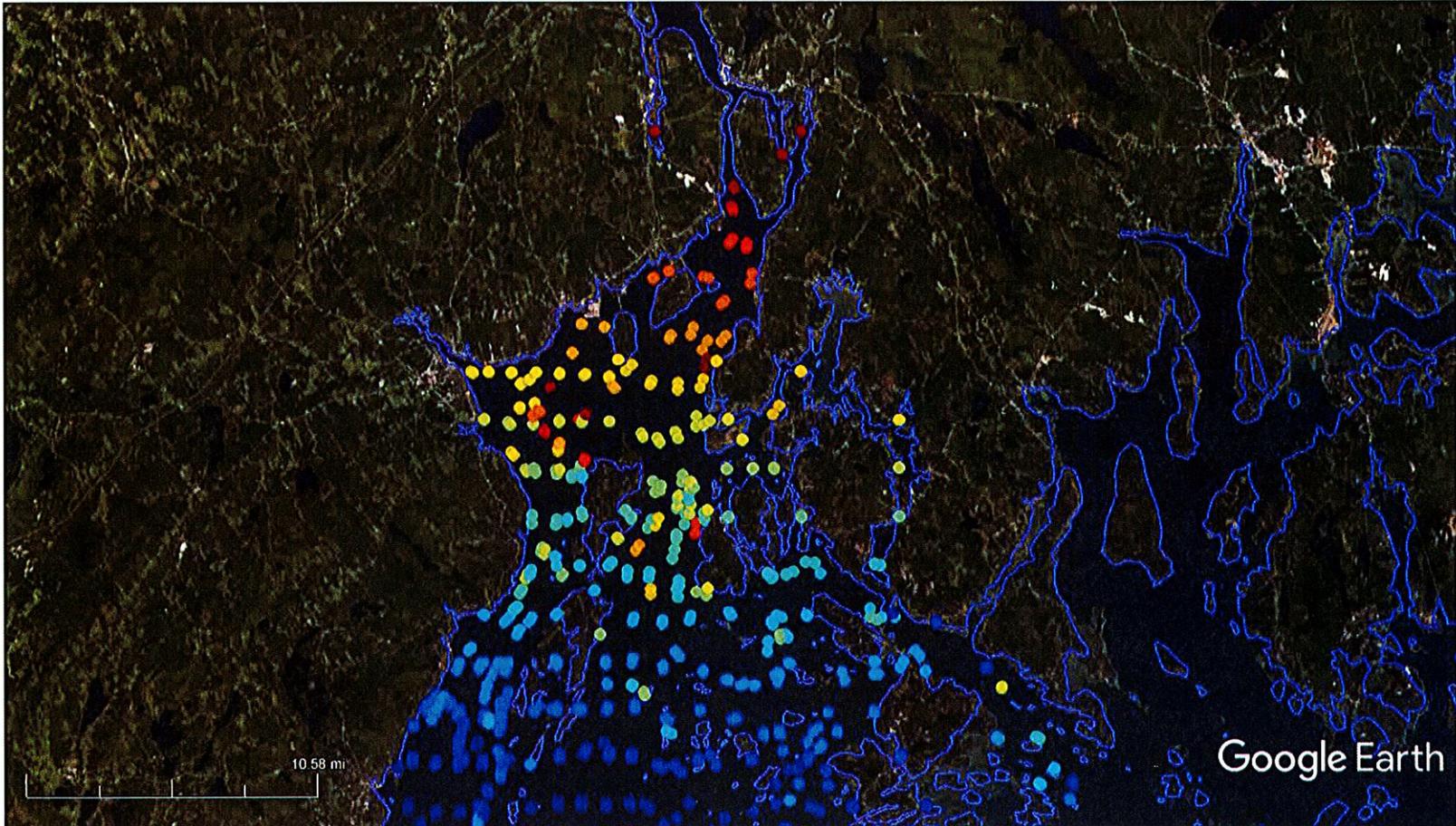




How does water in the bay circulate?

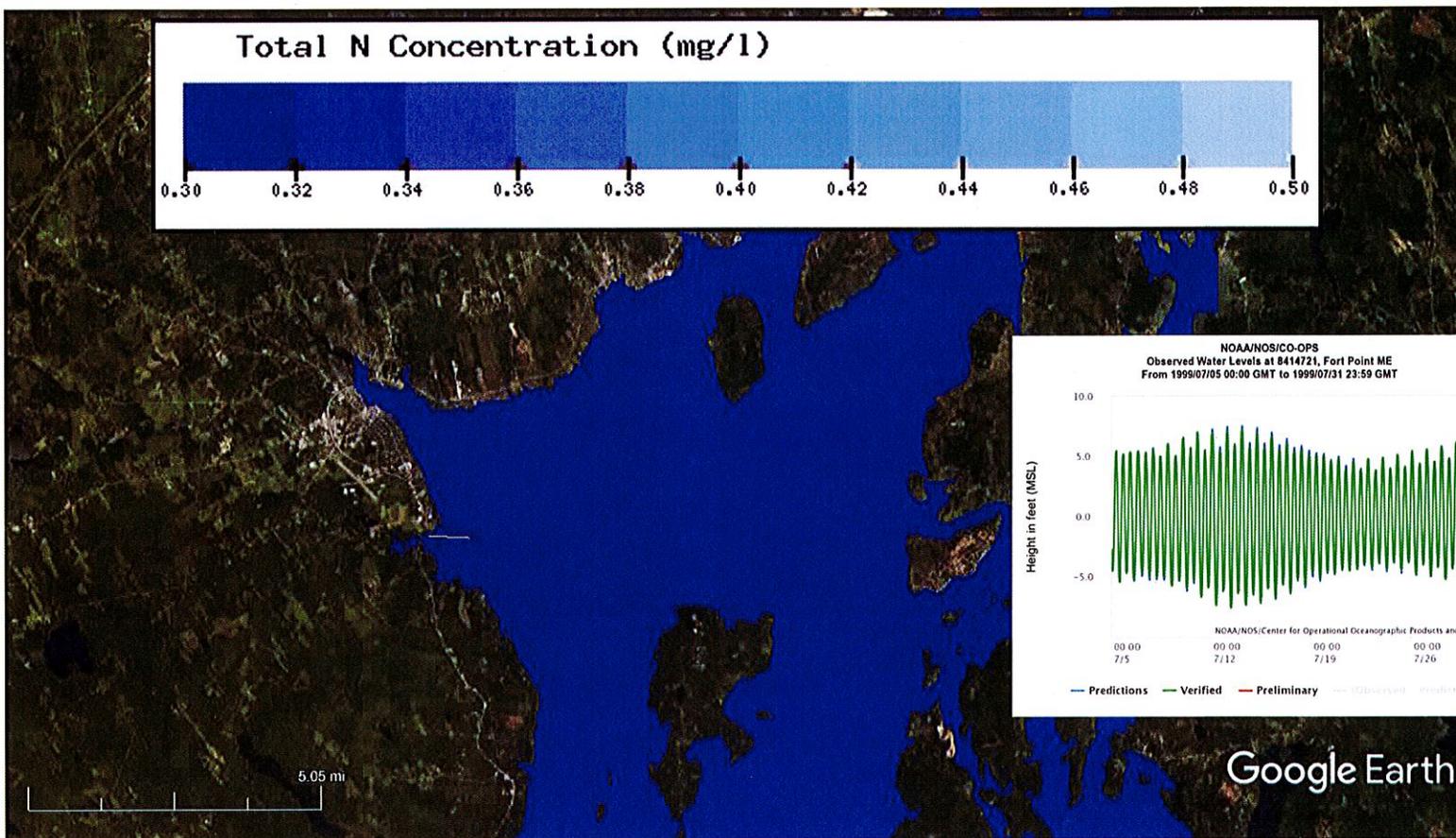


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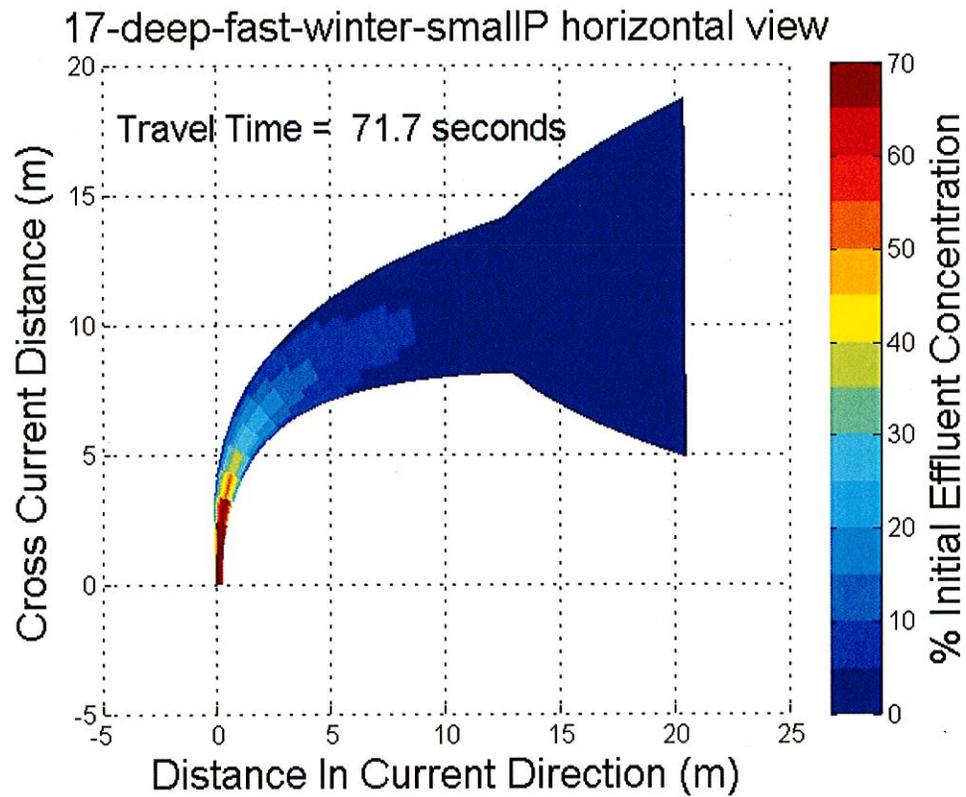


Where Does Nordic's Discharge go?



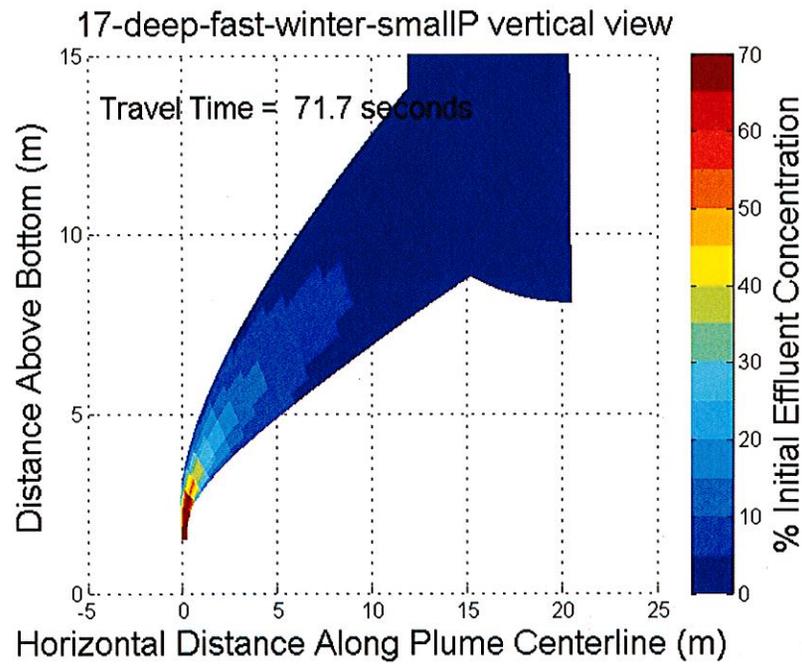


How Quickly Does the Discharge Dilute?





How Quickly Does the Discharge Dilute?





What does it mean?

- Proven wastewater treatment technologies used are state of the art.
- Discharge meets or exceeds all applicable water quality standards.
- Discharge meets DEP's recommended N parameter for eelgrass beds, the most sensitive population in the bay.



Questions?

- Space is available until 9:00.
- Please identify yourself by name and use the microphone.
- Please line up in the center aisle so that we can get to the next speaker without pauses.
- Please come to the microphone and ask your question quickly, as time is limited.
- Questions should be related to the discharge to Belfast Bay that is the subject of this PIM.
- Insulting or aggressive behavior or refusal to adhere to the meeting purpose for speaking will result in removal from the meeting.
- There WILL BE additional PIMs for other state permit applications AND public meetings when we begin the City permit application process.