NTNU – Trondheim
Norwegian University of
Science and Technology

OCEANS

Strategic Research Area 2014–2023

NTNU OCEANS

NTNU Oceans Pilot on Aquaculture - environmental interactions

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ENERGY HEALTH OCEANS SUSTAINABILITY

Enrolled as PhD candidate in a joint degree project between the Department of Biology, NTNU and DTU Aqua, Danish Technical University (august 2016).

Title PhD thesis:

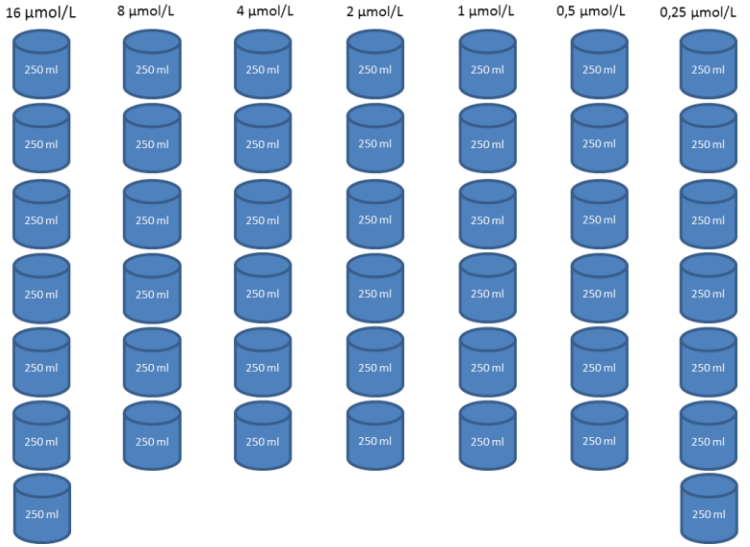
Cultivation potential of brown and red macroalgae species integrated with open salmon fish aquaculture.

Supervisors

- Kjell Inge Reitan, Prof. NTNU
- Yngvar Olsen, Prof. NTNU
- Jens Kjerulf Petersen, Prof. DTU
- Aleksander Handå, research leader, SINTEF

Nutrient uptake study with NO_3 and NH_4
Experimental Setup:

- 7 concentrations (16, 8, 4, 2, 1, 0.5 and 0.25 µmol)
- 6 parallels for each concentration
- Samples taken at 5,10,20,30,50,90,180 and 300 minutes
- 2 controls without plants
  (16 and 0.25 µmol)
- 10 degrees C
- 30 µmol light intensity
- Placed on orbital shakers
- 250 ml incubation volume
- Incubated in f/2 without Nitrate and Silicate
- 5 plants in each conical flask



Nutrient uptake study with NO_3 and NH_4 Experimental Setup:

- 1400 plants with size range 8-13 cm selected
  - 700 plants placed in tank with running deepwater (saturated)
  - 700 plants placed in tank with artificial seawater added f/2 medium without nitrate and silicate for 7-9 days (starved)

Nutrient uptake study with NO_3 and NH_4
Experimental Setup:

Executed 3 times for saturated and starved plants:

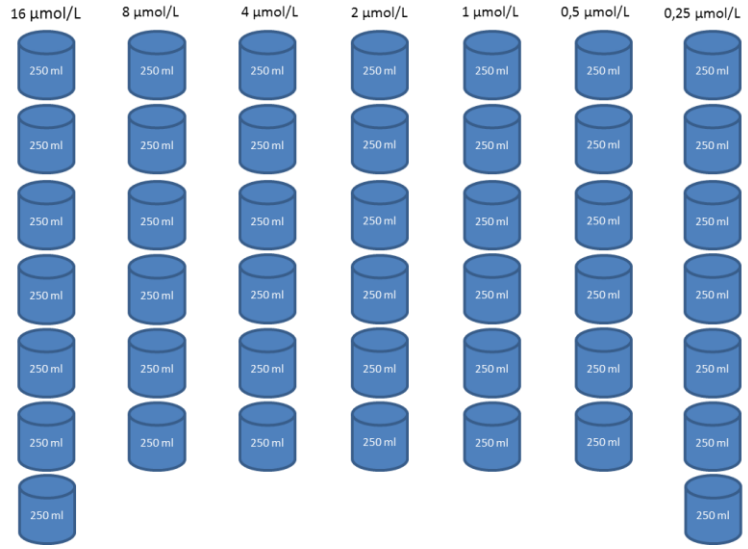
- **Ammonium,**
- **Nitrate,**
- **Preference study**

(Master project: 1 µmol Nitrate in addition to Ammonium

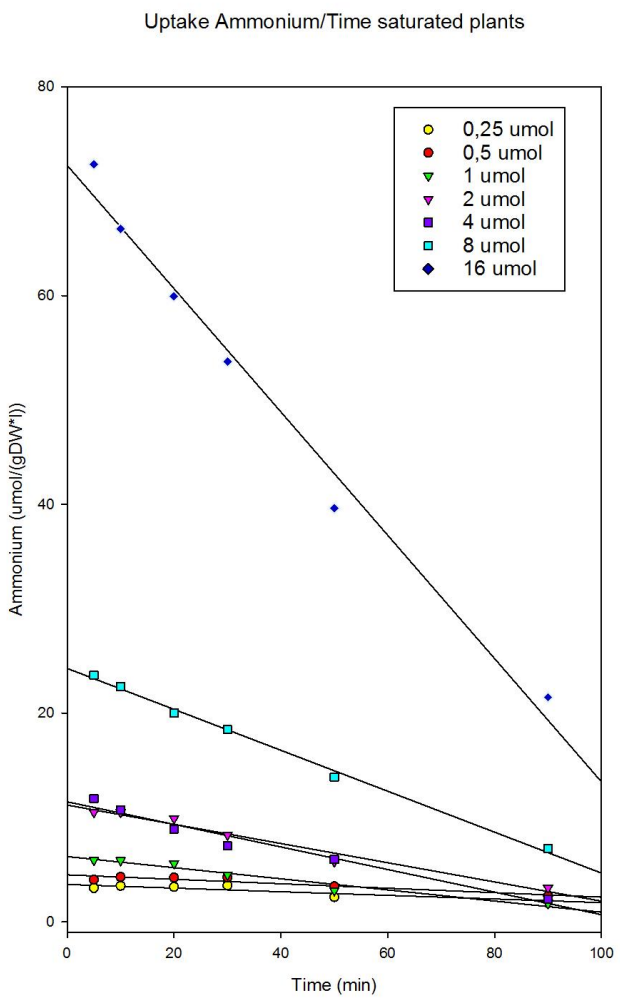
One run: **340** samples
Total samples for nutrient analysis: **2720**

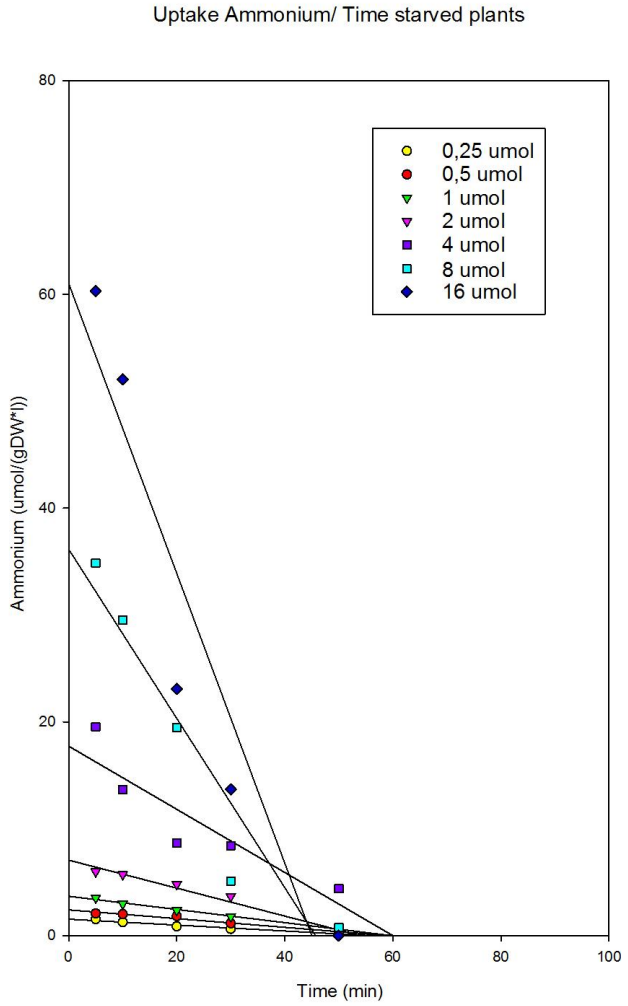
Nutrient uptake study with NO_3 and NH_4 Additional Data:

- Wet weight of all 5 plants from each flask
- Dry weight of 12 plants from each concentration
- Internal nitrate concentration analyzed from 18 plants for each concentration



Nutrient uptake study with NO_3 and NH_4 Preliminary results for NH_4 :





Nutrient uptake study with NO_3 and NH_4
Preliminary results NO_3 :