



Eichner et al 2015

Larvene til **Lakselusa – når og hvor?**
«hvordan utnytte kunnskapen til forebygging»

Frode Oppedal,

Sussie Dalvin, Daniel Wright, Thomas Crosbie, Aylah Szetey, Andrew Coates, Michael Sievers, Ellen Ditria, Samantha Bui, Jonatan Nilsson, Lars Stien, Tina Oldham, Tim Dempster og en rekke teknikere.

Støttet av HI, NFR, FHF, NFD, UniMelb, ...



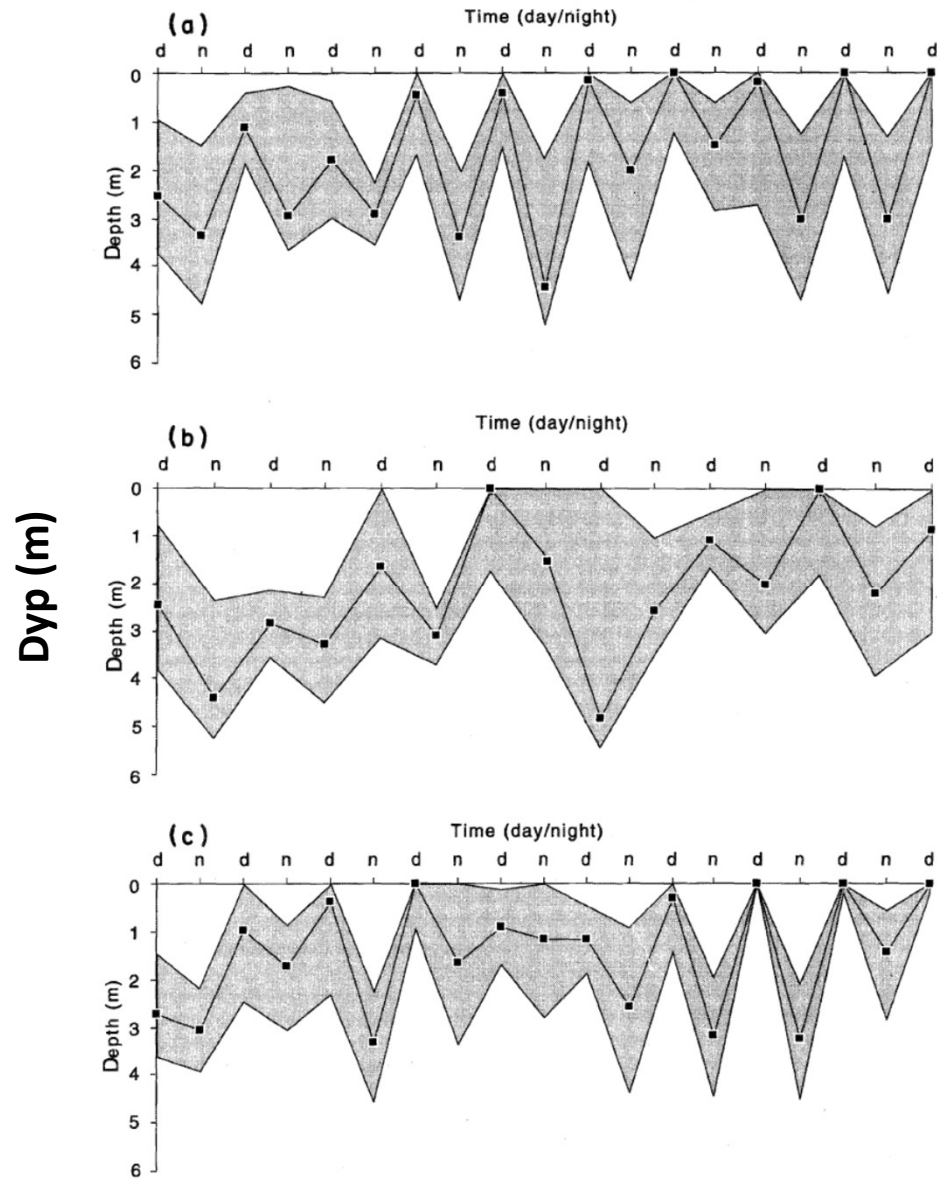
FHF's Lusekonferanse 2019 Trondheim 21.-23.januar

Oversikt

- Hvor finnes luselarvene?
 - Lys
 - Saltholdighet
 - Temperatur
- Hvordan nytte kunnskapen til forebygging?
 - Overflate beskyttelse (snorkel, skjørt, lukket)
 - Dypere svømming (nedsenkning, dype lys og fôring)
 - Brakkvann
- Miljøstyrt luseforebygging

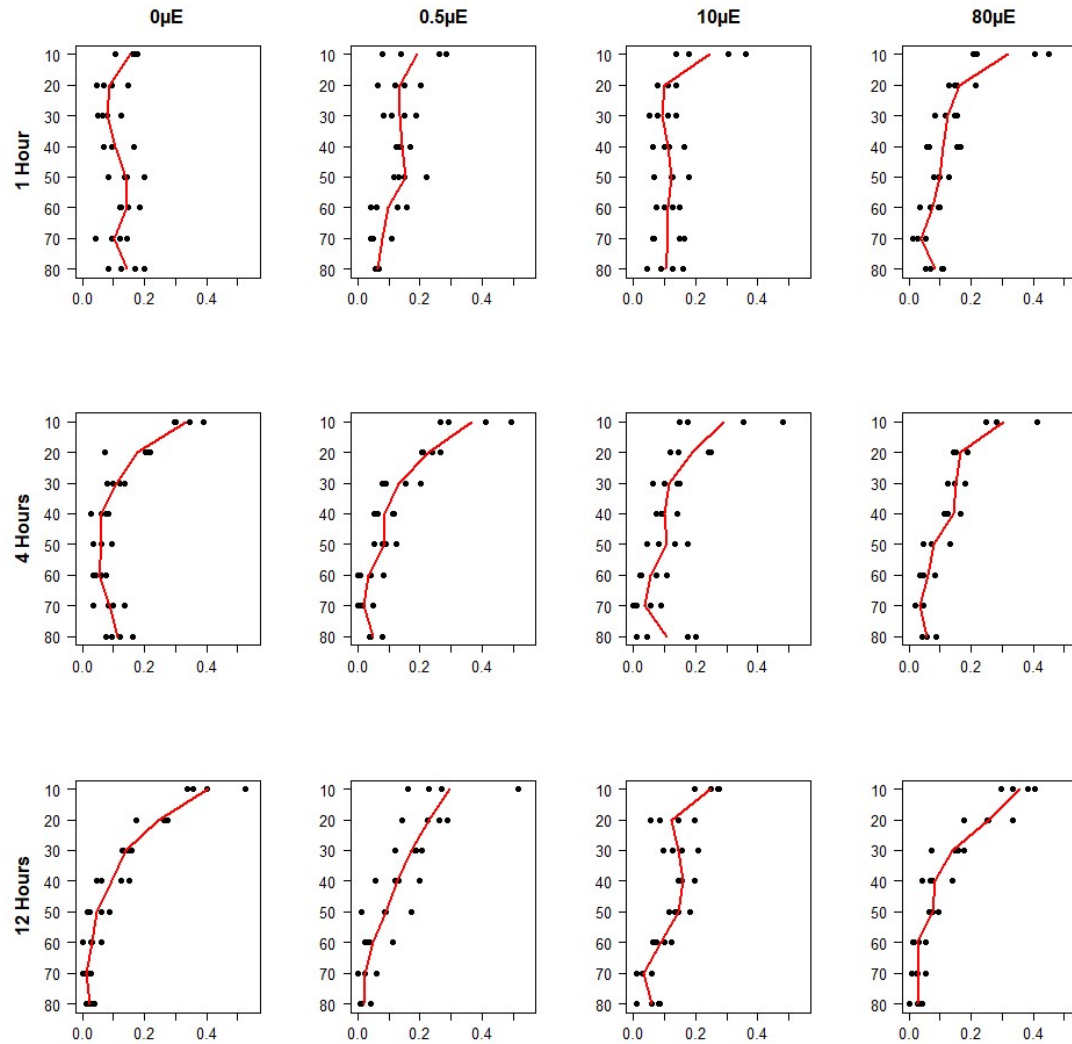


Lys



Lys

Lysintensitet

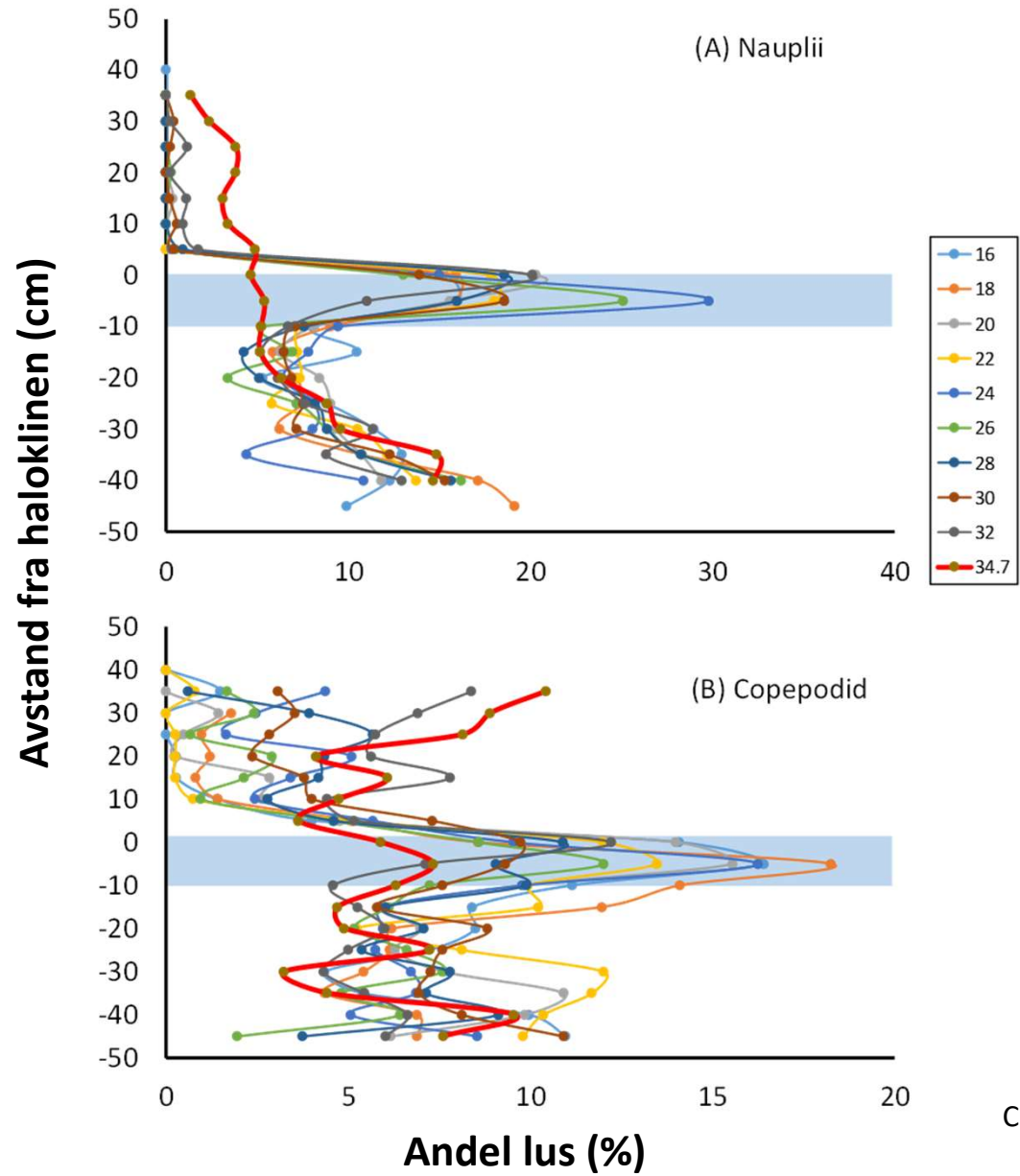
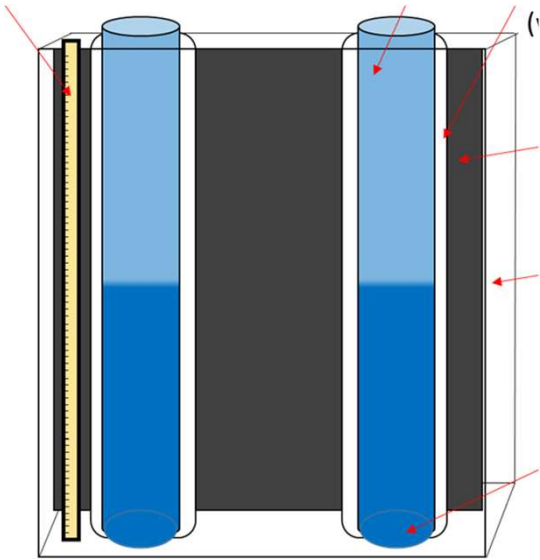


Relativ andel lusekøpepoditter

Szetey, Wright, Oppedal,
Dempster, in prep.



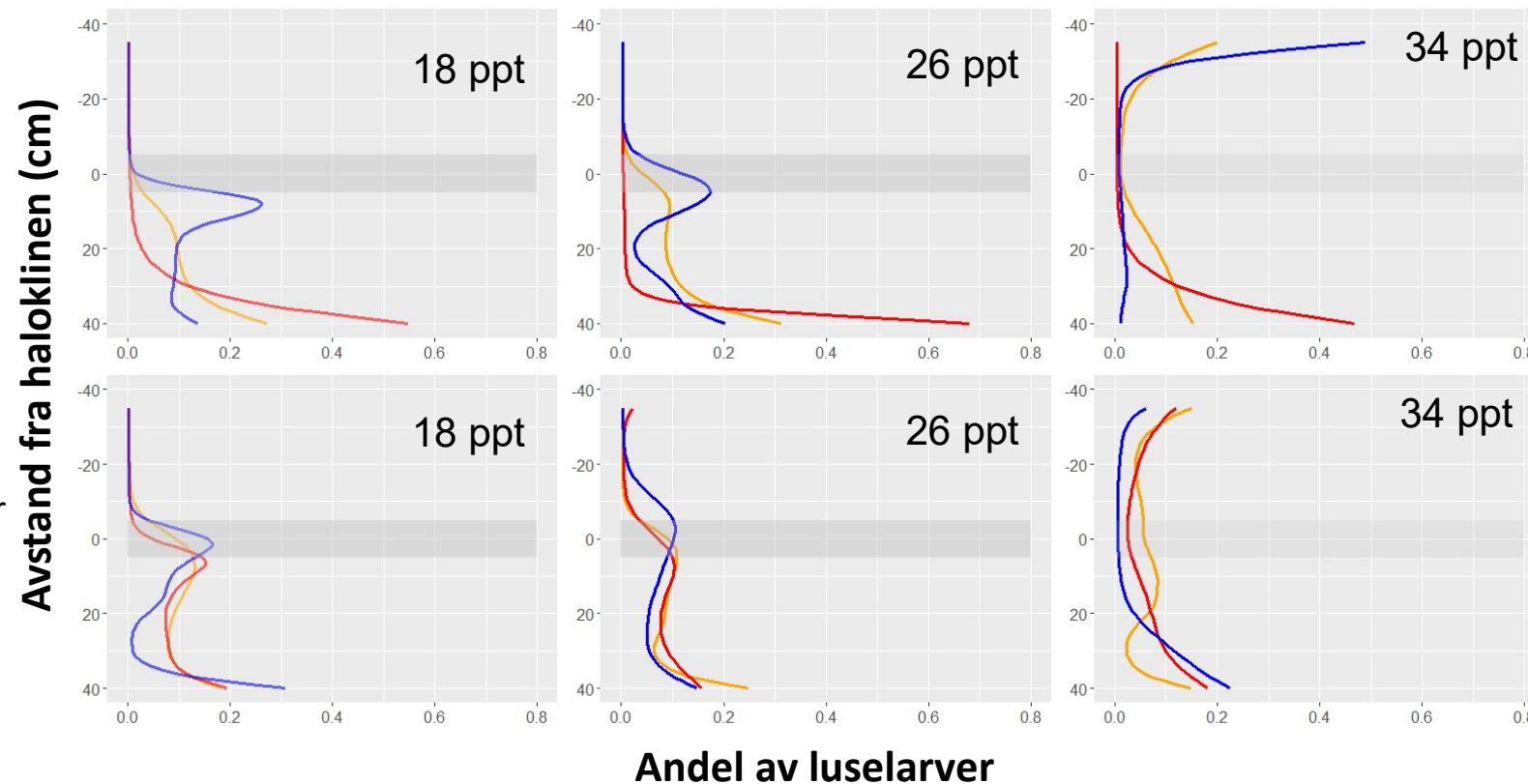
Saltholdighet



Crosbie, Wright, Oppedal, Dempster, submitted.

Temperatur og saltholdighet

- Foreløpig analyse



Blå = 6°C
Oransje = 12°C
Rød = 18°C.



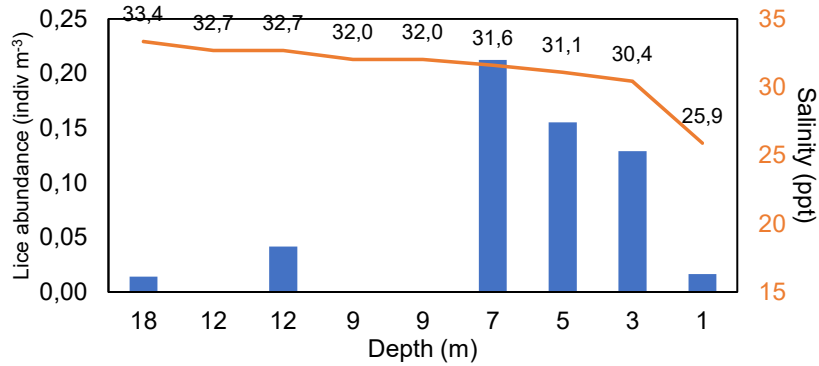
Coates, Wright, Oppedal, Dempster, in prep.

Plankton tråling

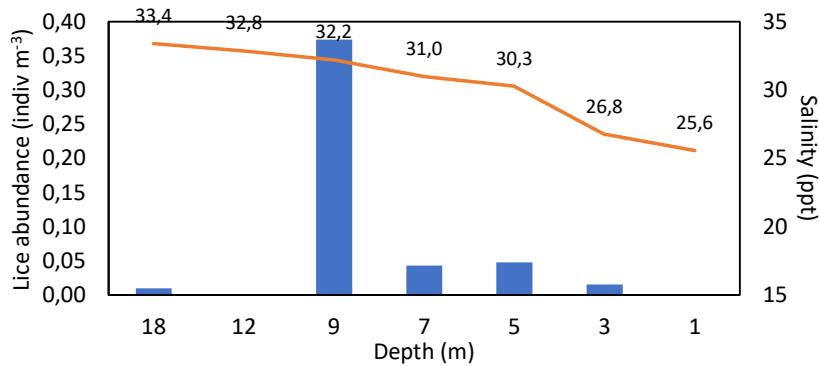
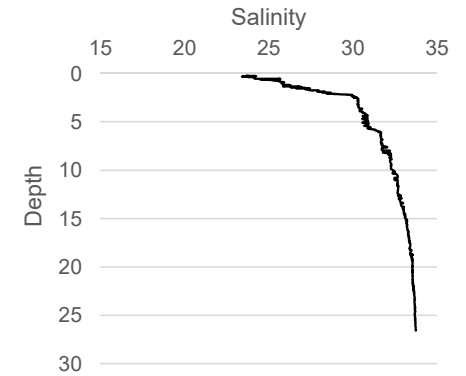


Plankton tråling

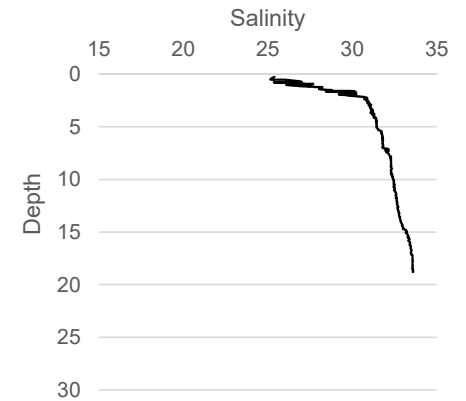
Nov. 2017



- Fjord/ brakkvann (Stasjon C)
- Trålvolum (snitt) = 42.000L

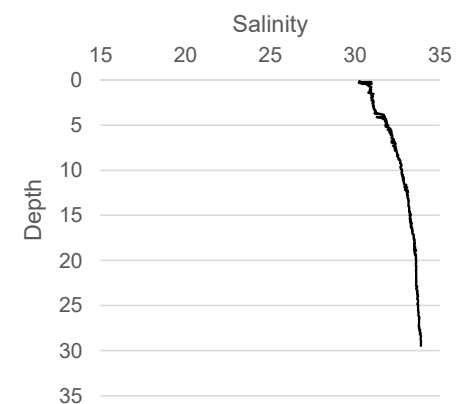
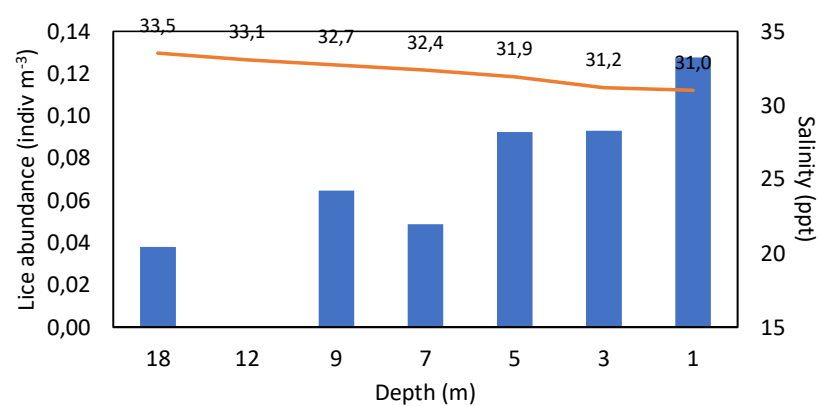


- Fjord/ brakkvann (Stasjon C)
- Trålvolum (snitt) = 84.000L



Plankton tråling

Nov. 2017



- Homogent kystmiljø (Stasjon G)
- Trålvolum (snitt) = 39.000L



Hvor er så lusen?

- Går mot lyset og overflaten - lusebelte
 - Over tid, også i mørke...
 - Raskere og mer ved høyere intensitet
- Unngår brakkvann (nauplier mer enn kopepoditter)
- Samler seg i/ under haloklinen
- Nauplier velger lavest temperatur

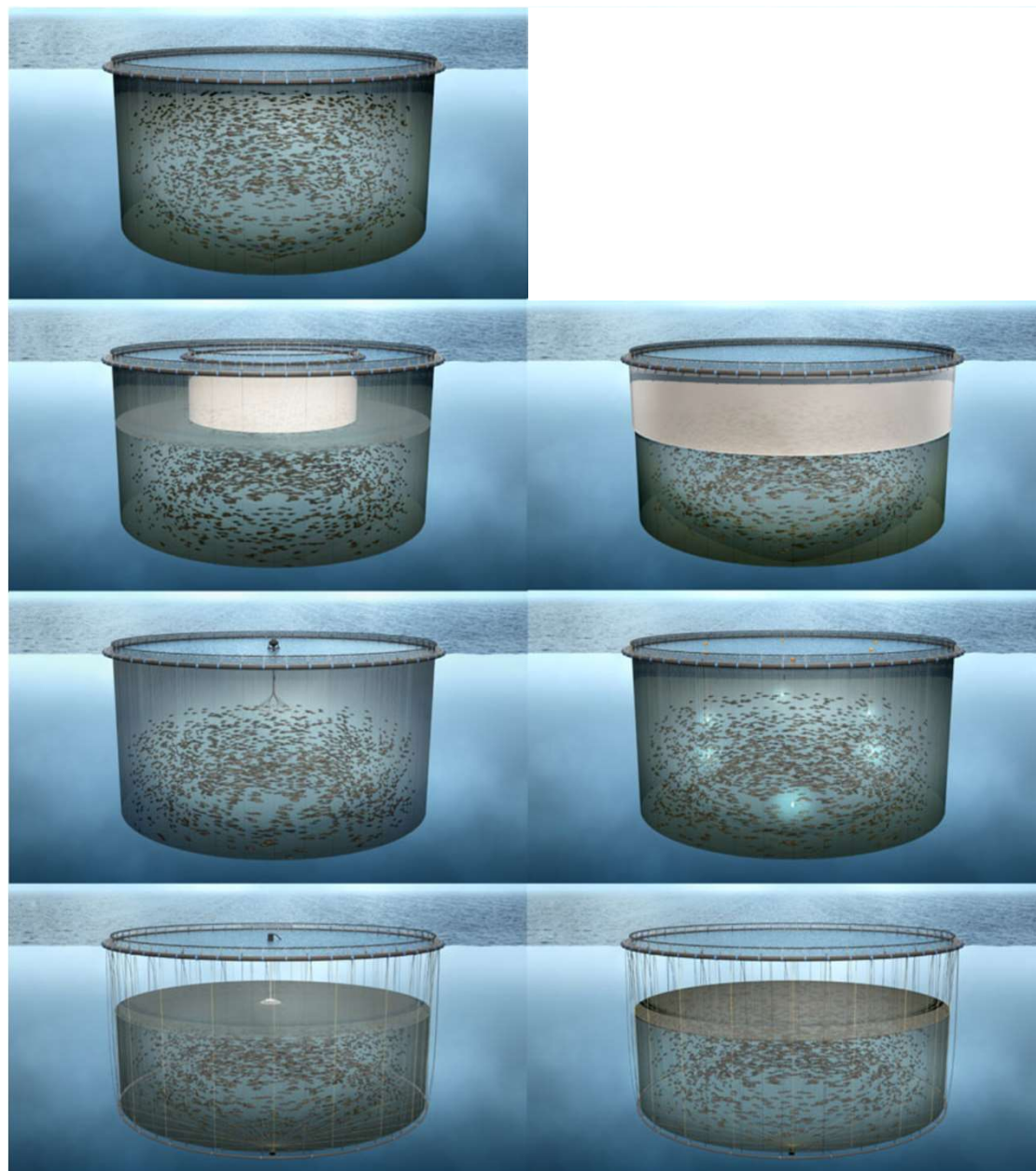
- Vannstrøm
 - Bølger, vertikal sirkulasjon, pålandsvind/ fralandsvind



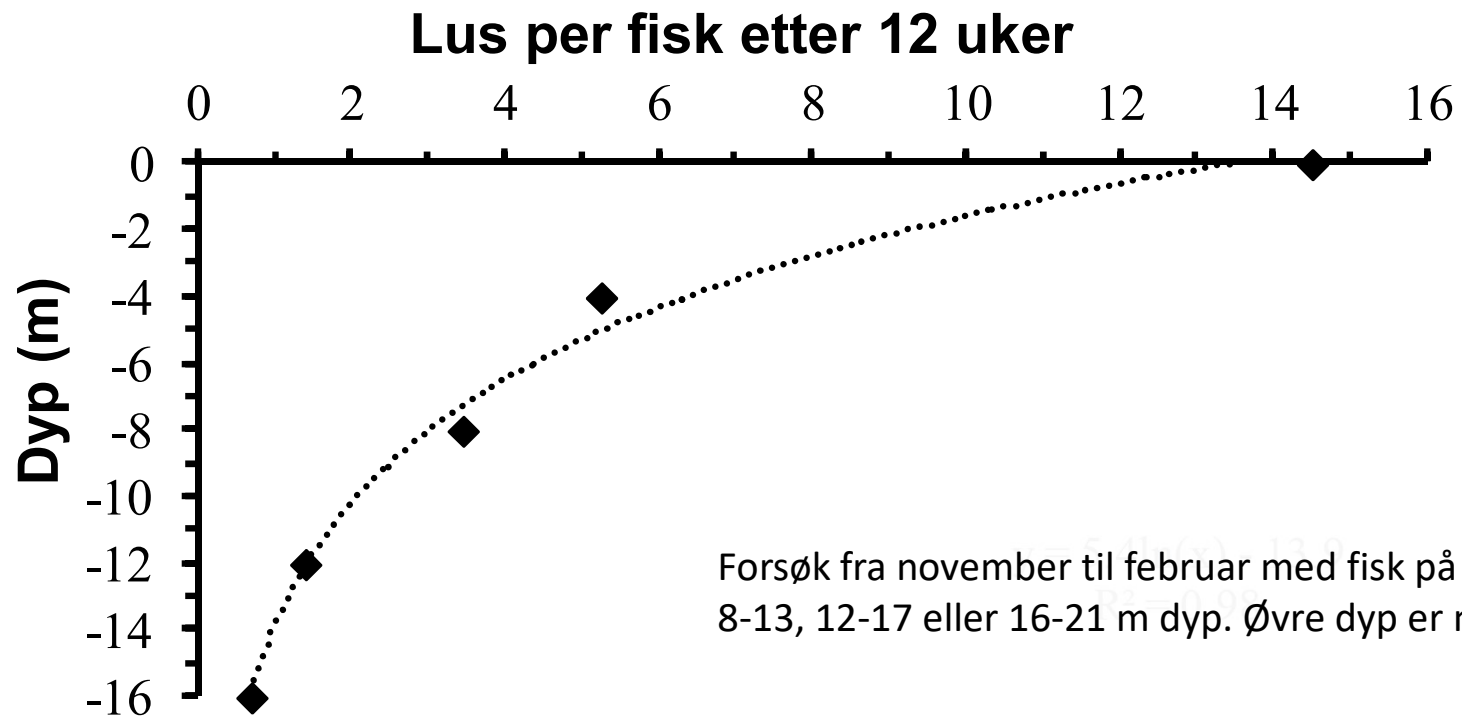
Normal merd

Forebyggende tiltak

- Snorkelmerd
- Skjørt
- Dyp fôring
- Dype lys
- Nedsenkning
- (lukket merd)

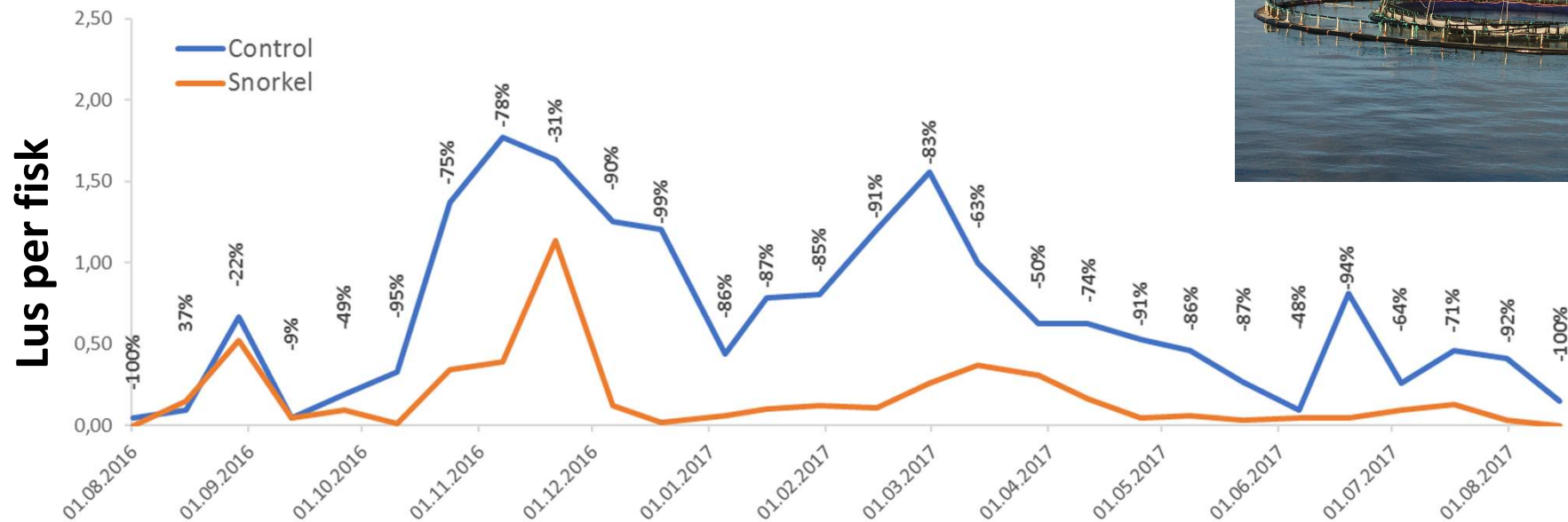


Snorkelmerd - forsøksskala



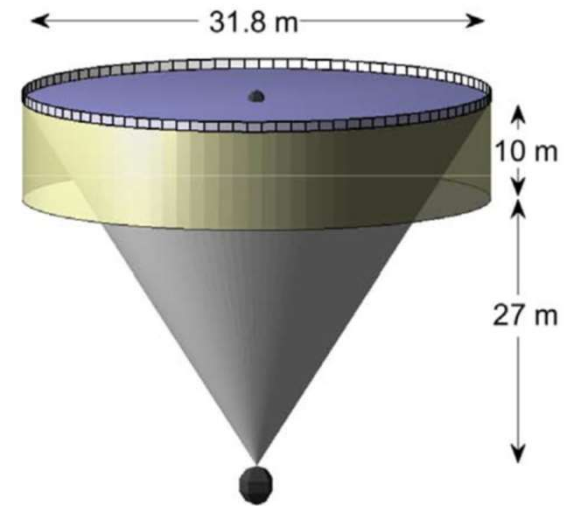
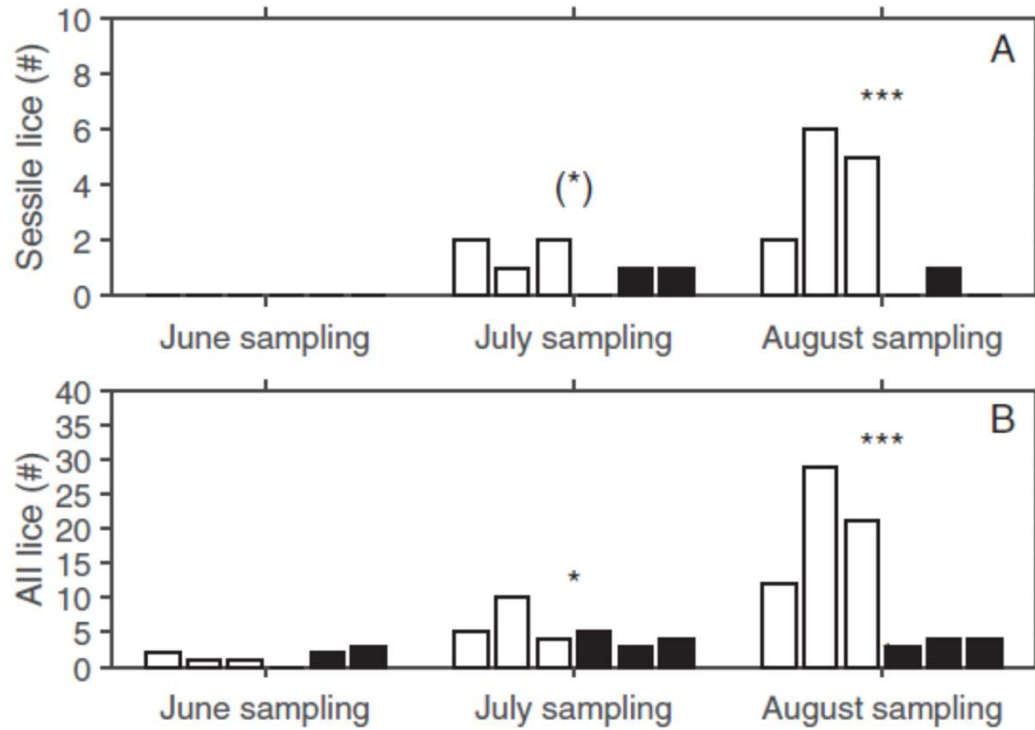
Snorkelmerd/ tubenot – kommersiell skala

- Påslag (fastsittende lus) redusert med 78%



Skjørt

Lus per fisk

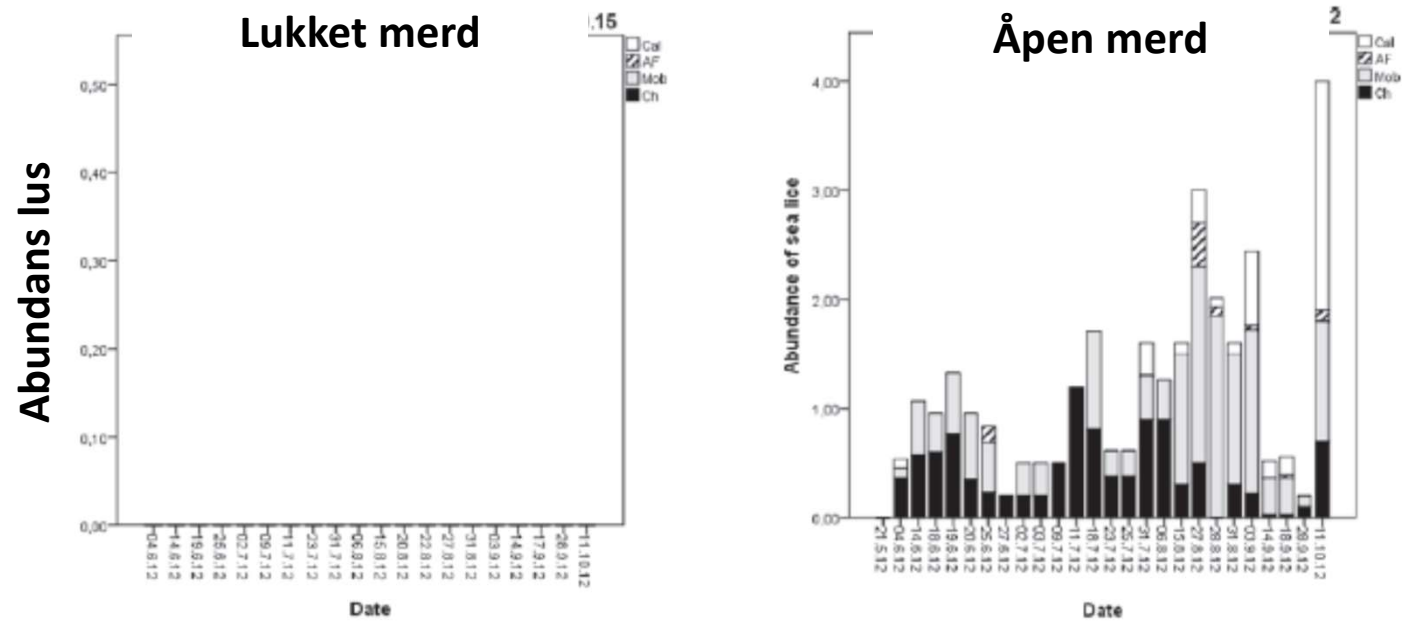


Lukket merd

- Innløp på 25 m dyp

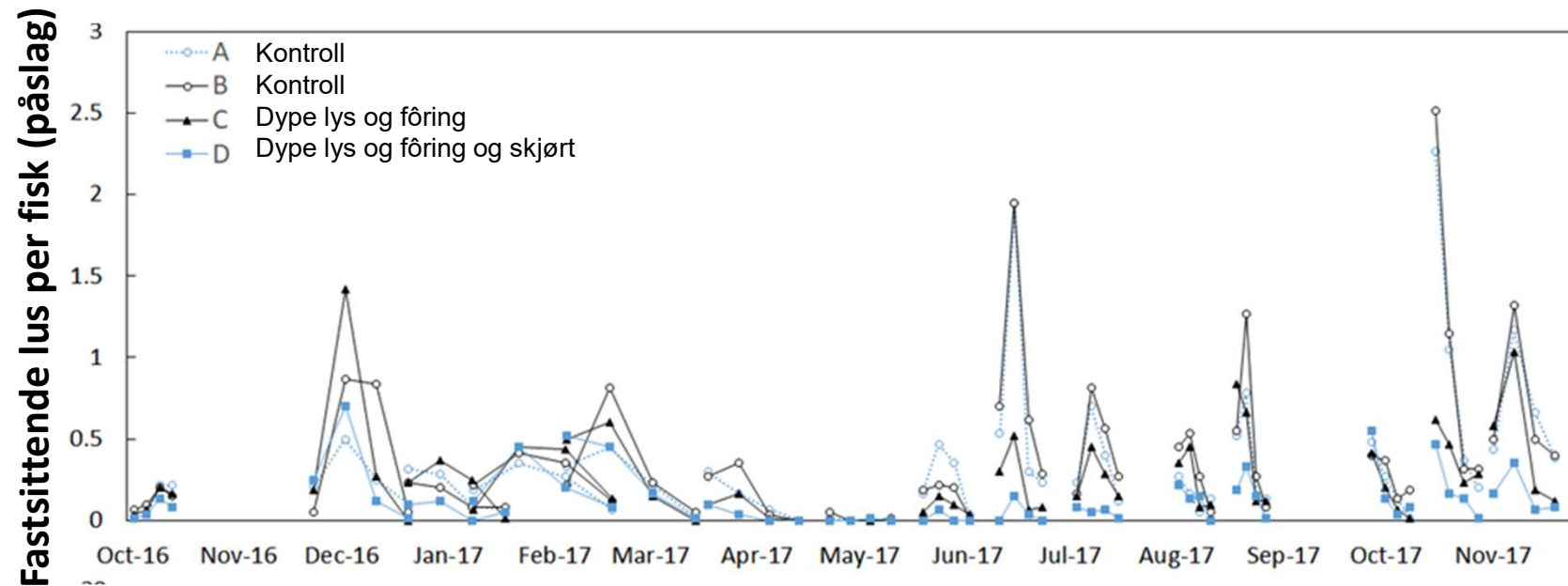
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A. Nilsen et al / Aquaculture 466 (2017) 41–50



Dype lys/fôring (C) + skjørt (D)

Lusepåslag. Data fra CAC

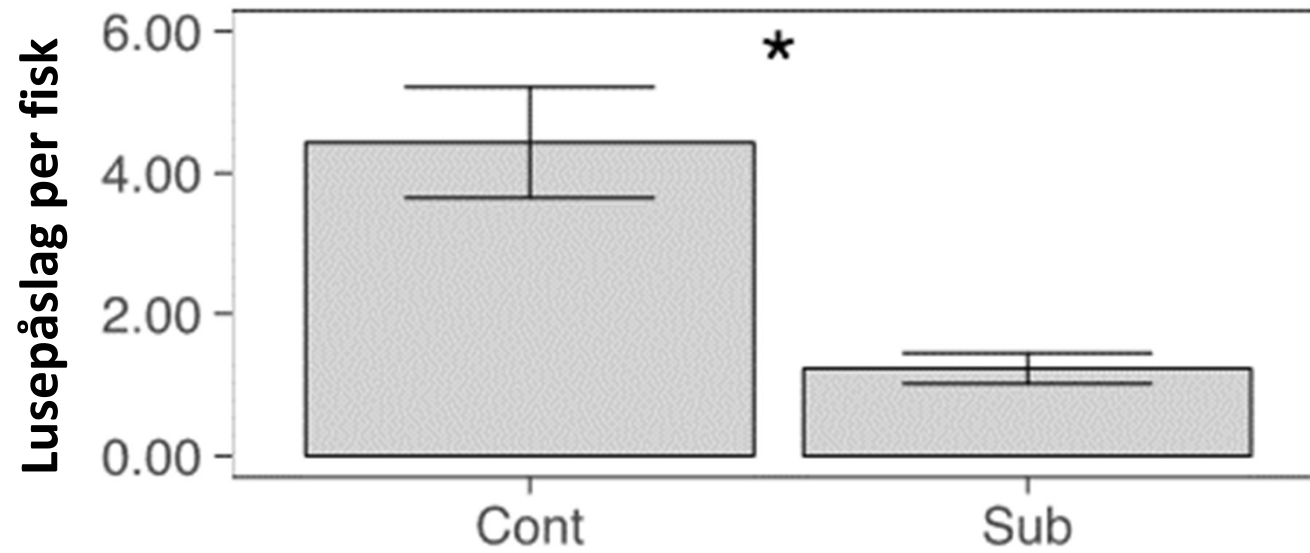


Dype lys/fôring og skjørt reduserte lusepåslag med 55%
Dype lys/fôring viste en tidvis trend i redusert påslag

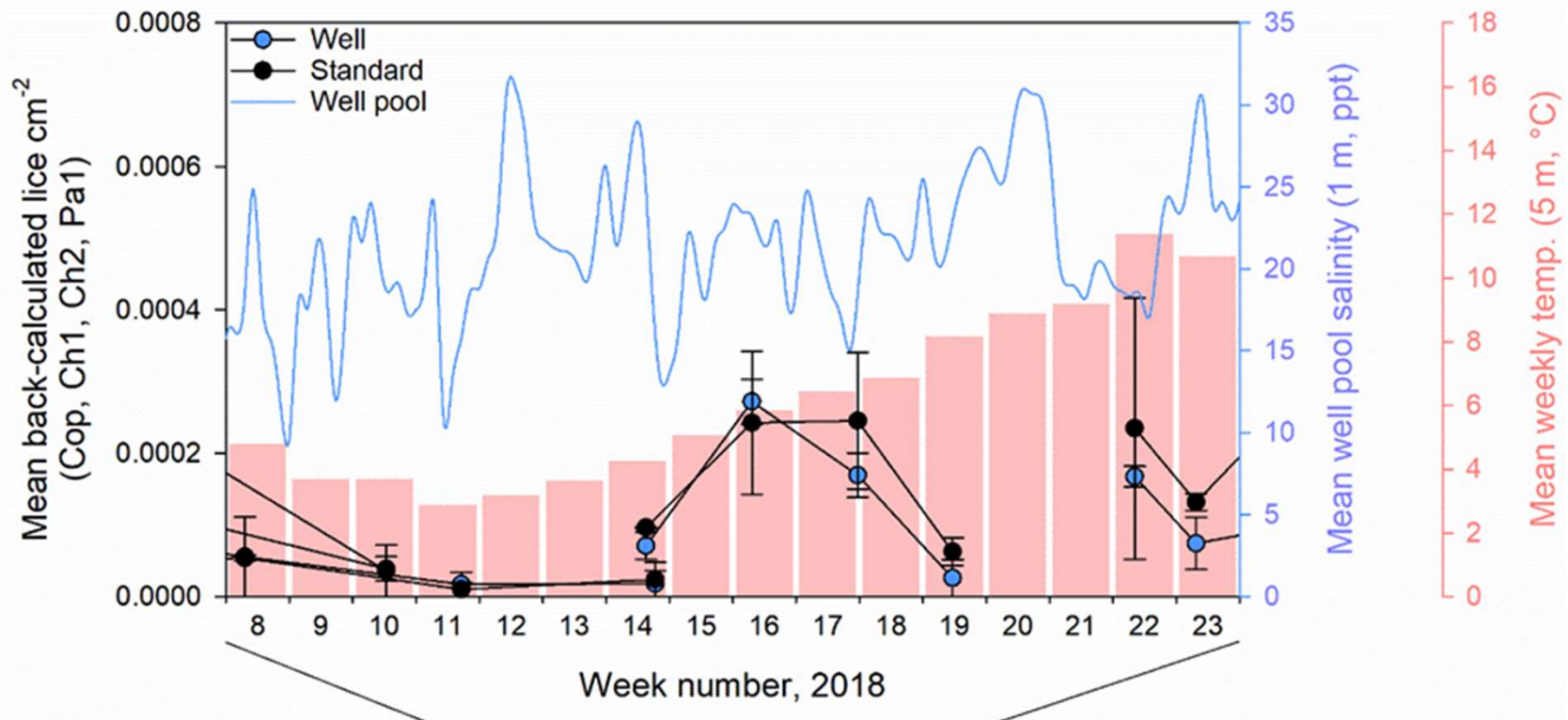
Haloklinen har sannsynligvis en maskerende effekt

Bui et al 2018b

Nedsenkning

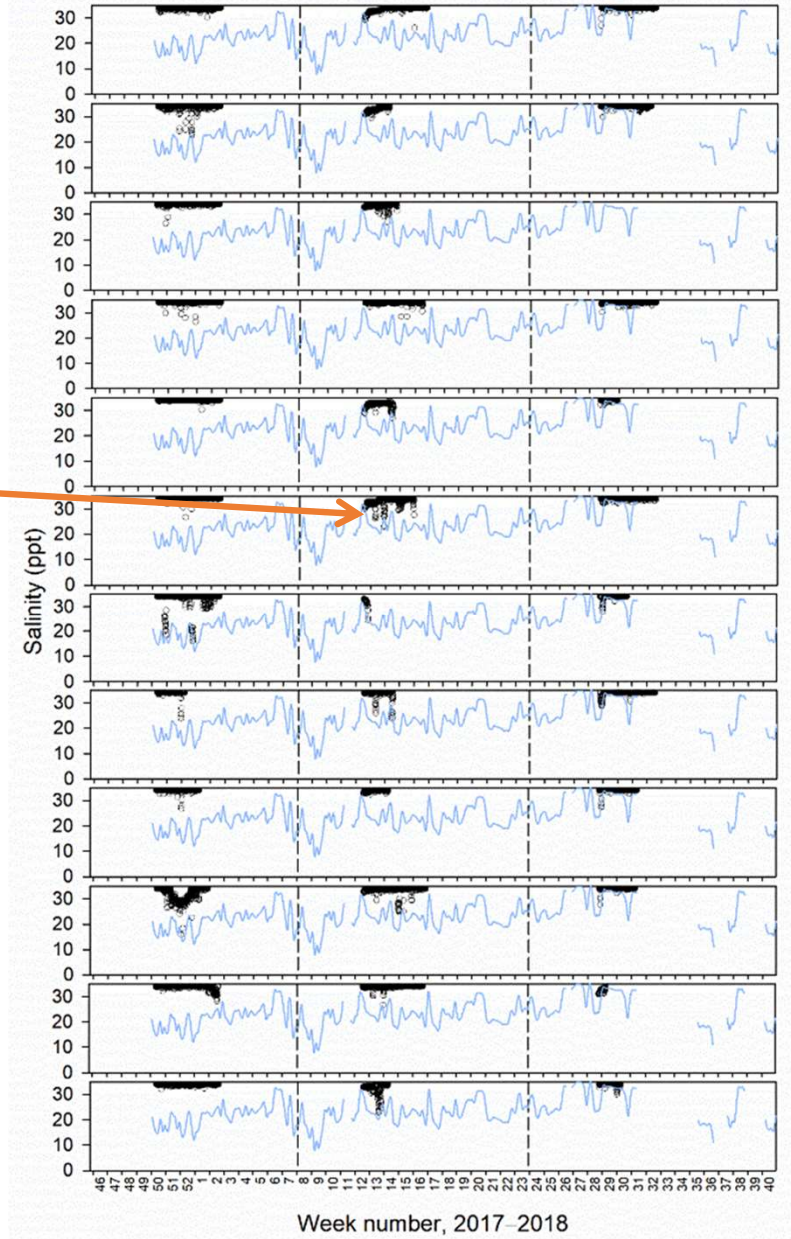


Brakkvannslag

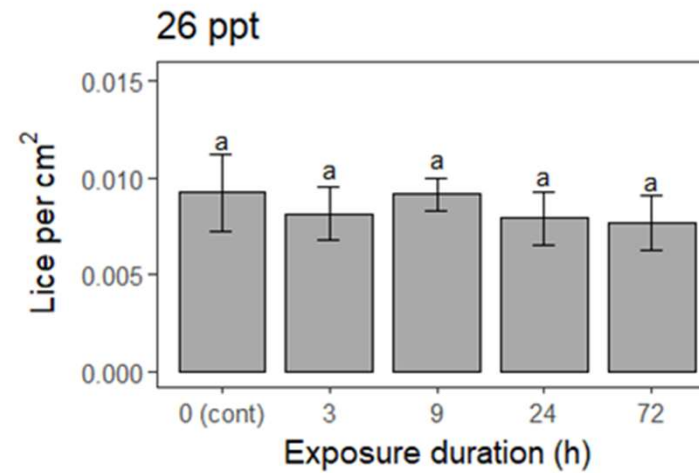
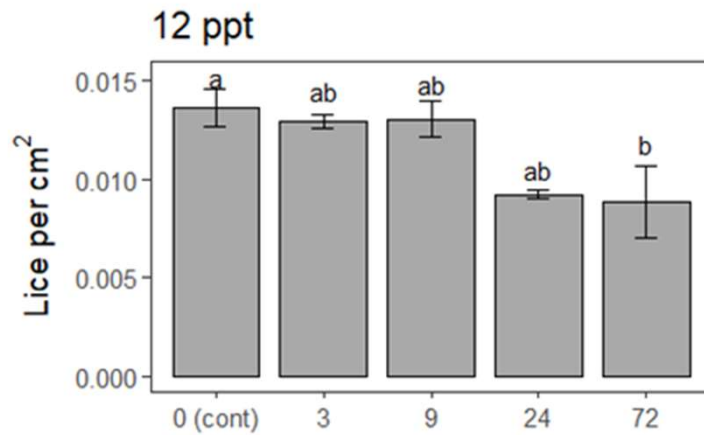
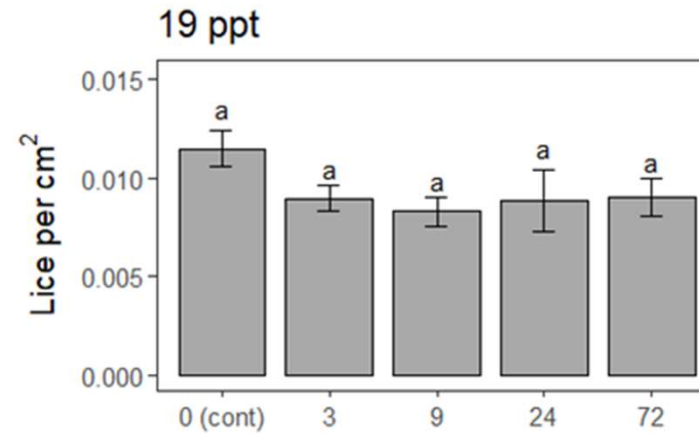
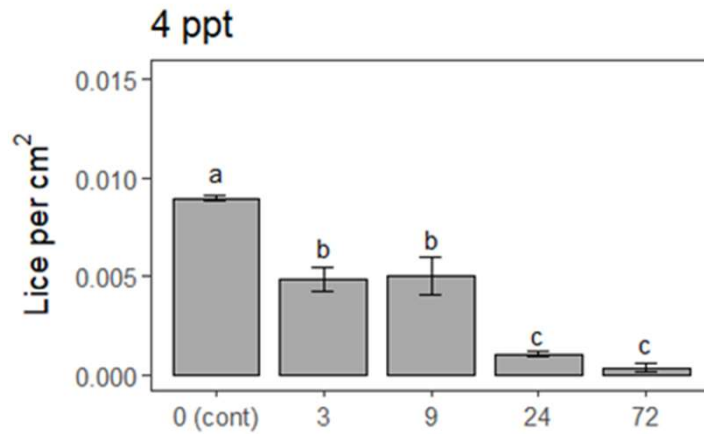




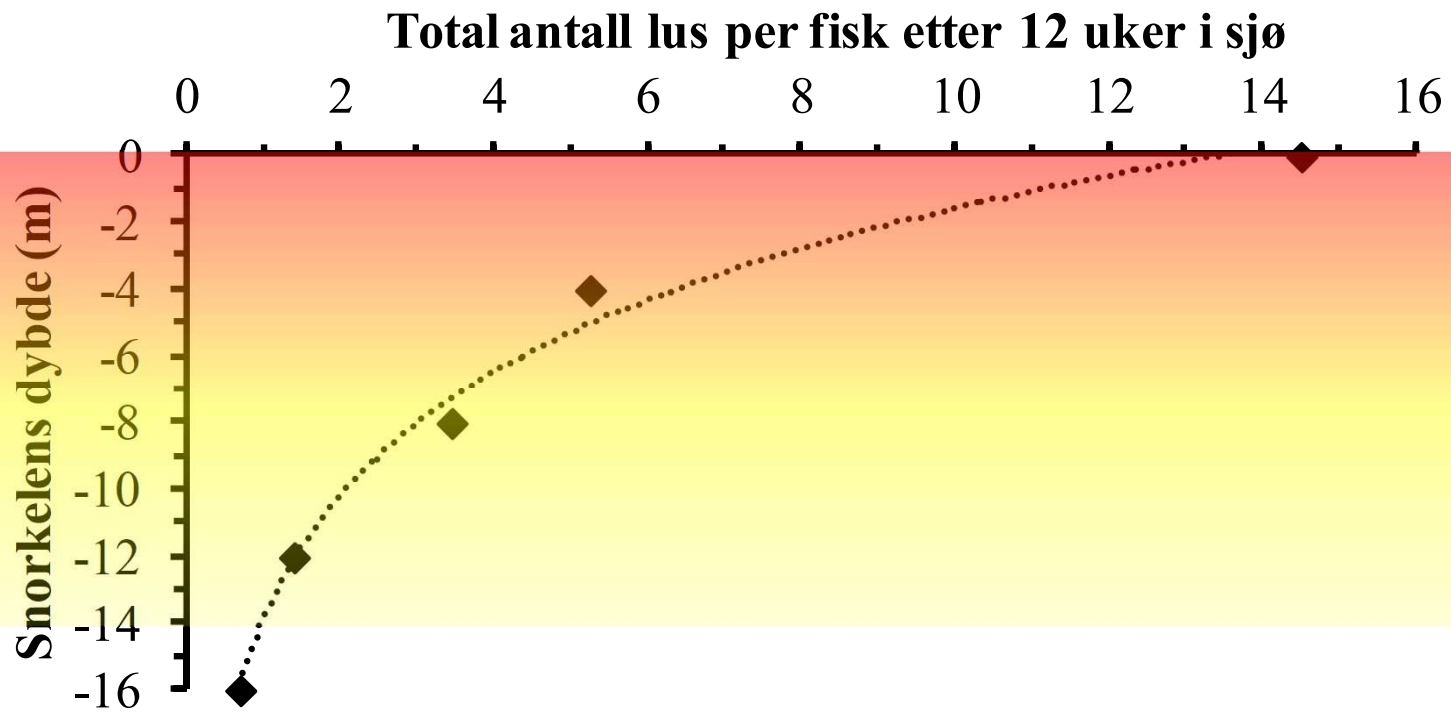
Wright et al 2019



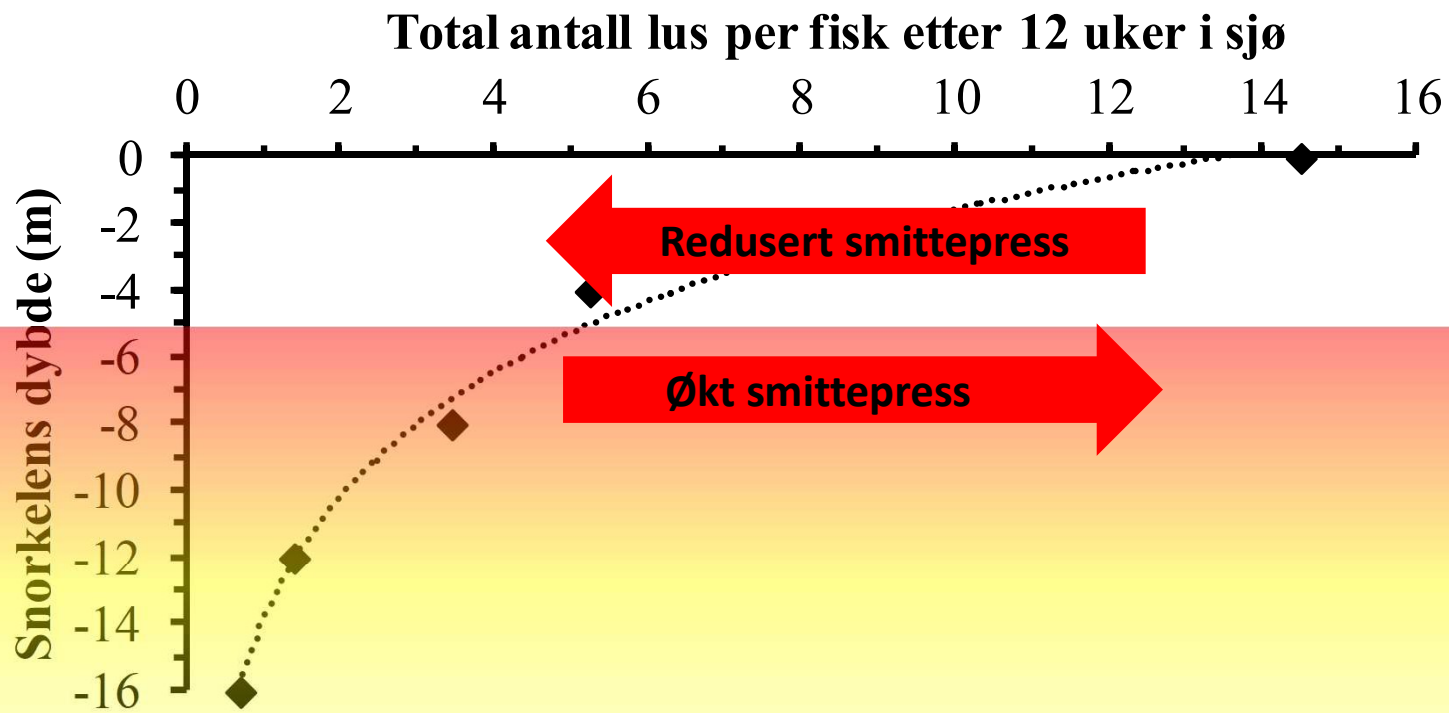
Brakkvann som dreper påslåtte kopepoditter?



Lusebelte

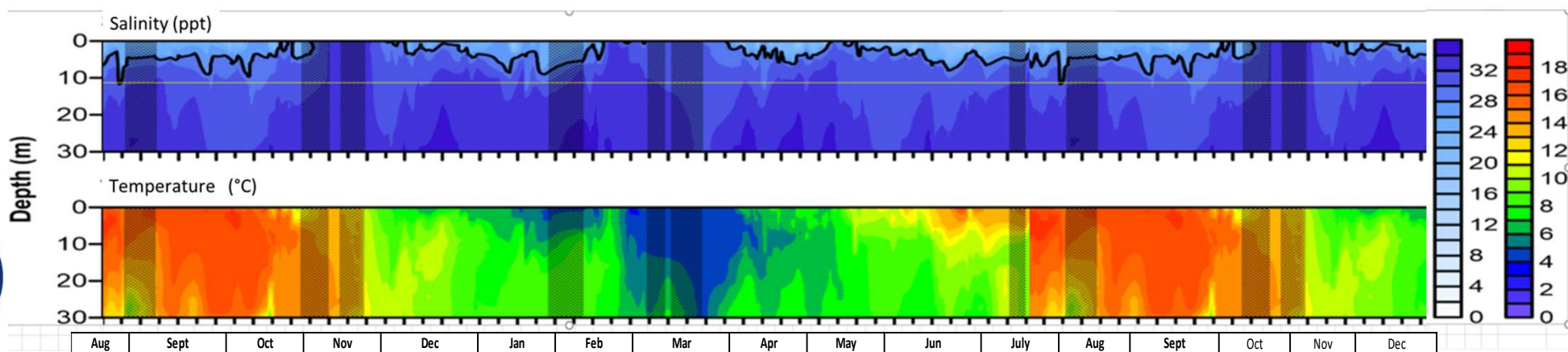


Brakkvann flytter lusebelte ned



Miljøstyrt og atferdsbasert luseforebygging?

- Atferd
 - Hvor er lusen?
 - Hvor vil fisken svømme?
- Miljø – mål!
- Effektive tiltak når, hvor og hvor dypt?





Takk for oppmerksomheten

Foto: Frode Oppedal, HI