



Veterinærinstituttet
Norwegian Veterinary Institute

Using salmonids mortality and other production data for surveillance in aquaculture

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Photo: Rudolf Svensen



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Seawater phase

> 58,000,000

Dead salmon during production in 2023

16.7 %

Yearly probability of dying

Photo: Rudolf Svensen
Sommerset et al., 2024



Photo: P.A. Sæter, Åkerblå

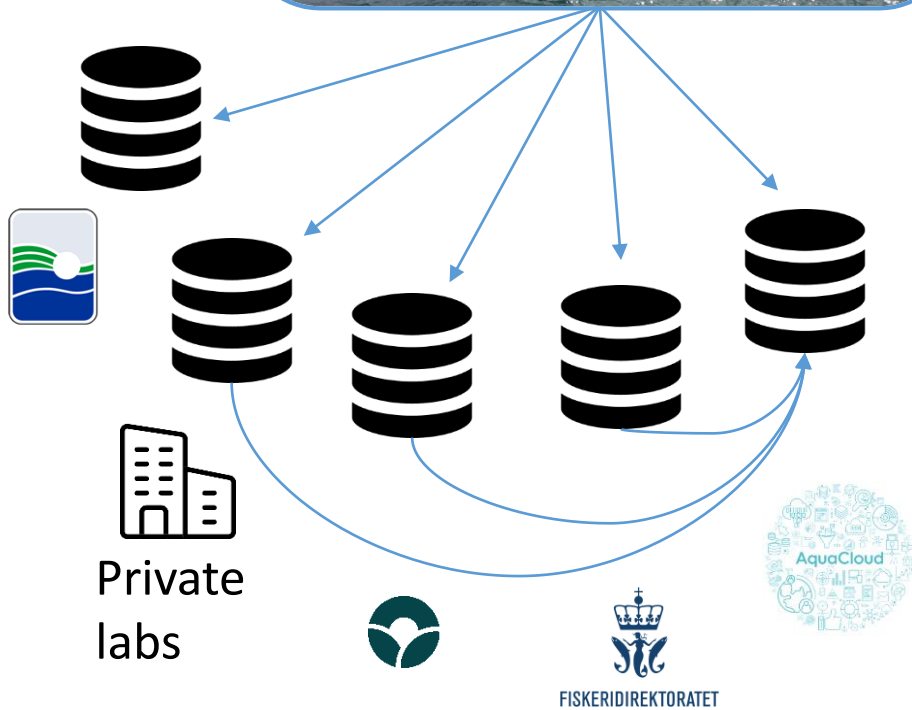


Photo: Erling Svensen

Why mortality?

- Monitored continuously
- Data from every geographical area
- Proxy for incidence of several diseases
- Availability of production data for modeling

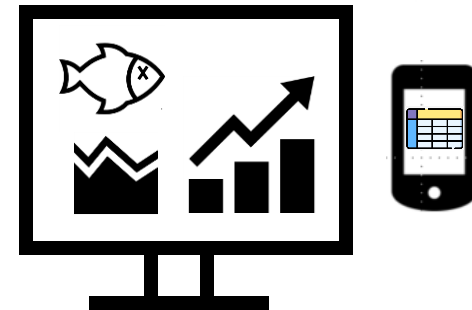
Data sources and streaming



- Data integration
- Data curation
- Data analysis



Data presentation document



Data exploratory tool



Research

How mortality has been used for surveillance?

- Unexplained increased mortality in a site is notifiable in Norway
 - Fish under 0.5 kg > 0.5 ‰ /cage/day
 - Fish over 0.5 kg > 0.25 ‰ /cage/day
- Aggregate mortality reports at national and regional level:
 - Monthly, yearly, production cycle
- Companies participating in an industry initiative for assigned causes of deaths

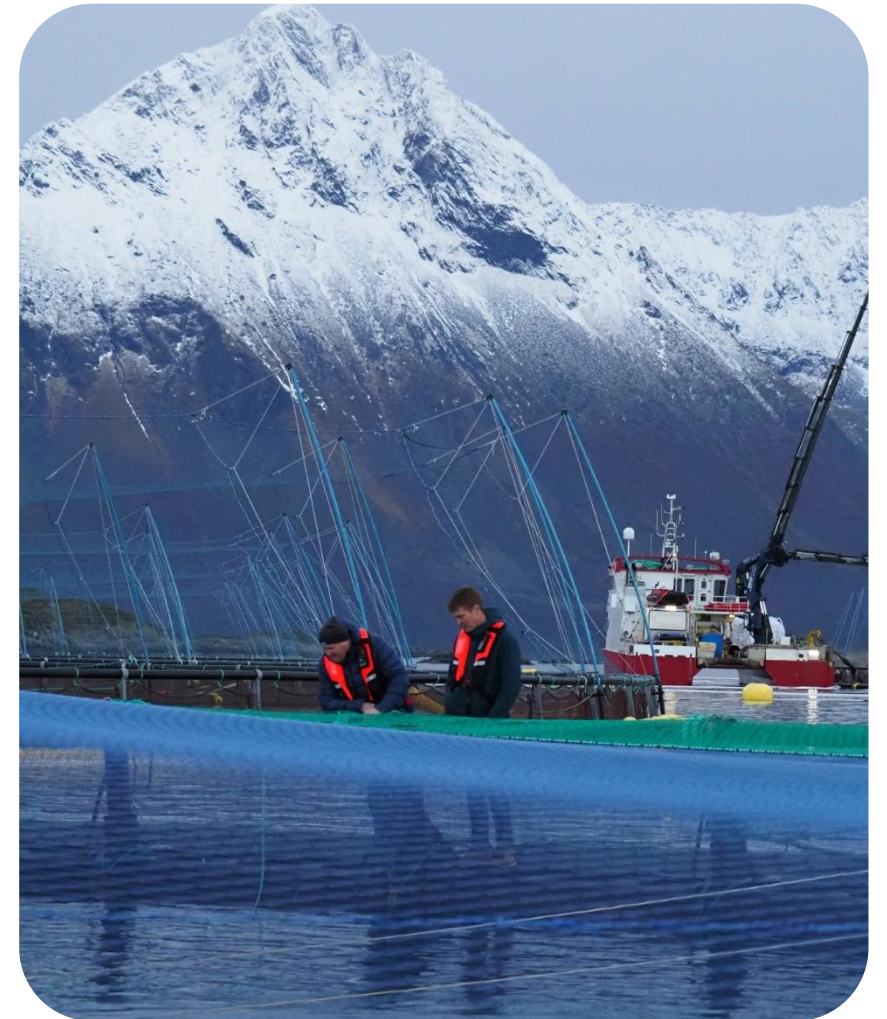


Photo: Harrieth Lundberg

Statistikk over tap og dødelighet av laks og regnbueørret

Velg art:

Laks

Velg geografisk område:

Produksjonssone

Tallene er hentet fra månedlige rapporter sendt til Fiskeridirektoratet. For mer informasjon om hvordan disse statistikkene er sammensatt, vennligst se «Om statistikken»-fanen. Brukere kan velge om de ønsker å se totale tap (under «Tap»-fanene) eller kun tap som skyldes dødelighet (under «Dødelighet»-fanene). I tillegg kan dataene vises for forskjellige produksjonssykluser. Det er også mulig å beregne dødelighet med egne data (under 'Kalkulator'-fanene).

Månedlige tap

Månedlige dødsrater

Årlige tap

Årlig dødelighet

Produksjonssykluser dødelighet

Dødelighetskalkulator

Dødelighetskalkulator for utvidet periode

Om statistikken

Diagram

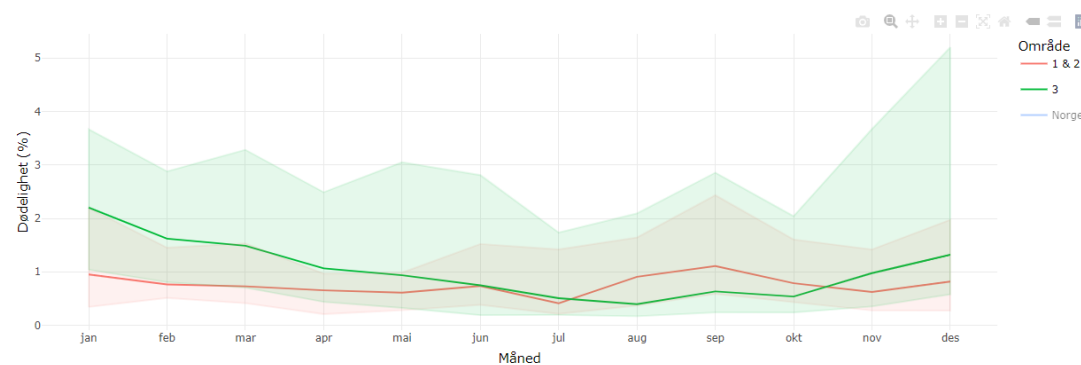
Tabell

Velg år:

2023

Velg zone:

1 & 2 3



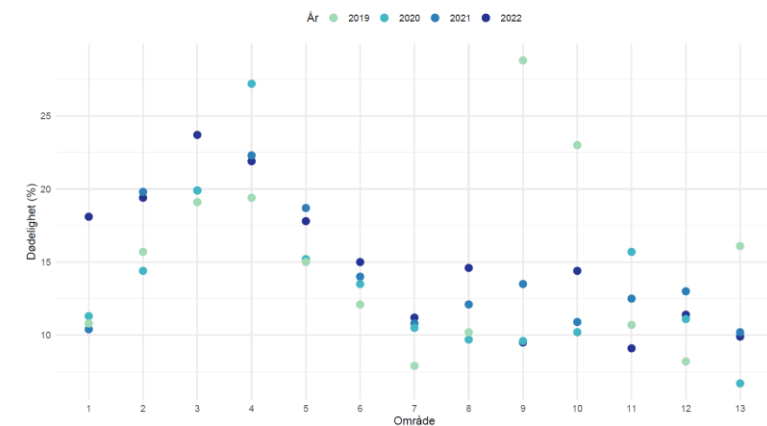
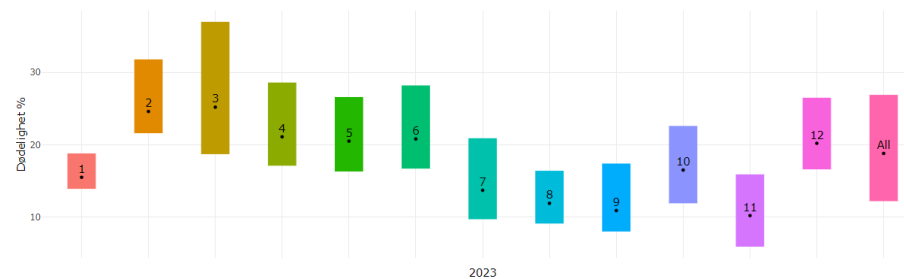
Diagram

Tabell

Velg år:

2023

Fullførte produksjonssykluser (>= 12 måneder)



Statistikk over tap og dødelighet av laks og regnbueørret

Månedlige tap

Månedlige dødsrater

Årlige tap

Årlig dødelighet

Produksjonssykluser dødelighet

Dødelighetskalkulator

Dødelighetskalkulator for utvidet periode

Om statistikken

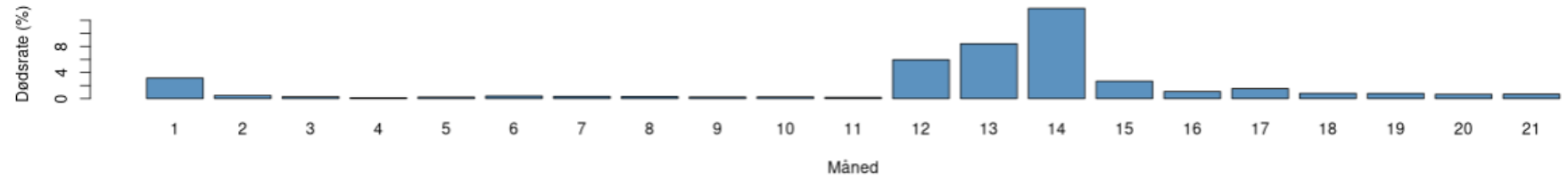
Velg periode:

Måned

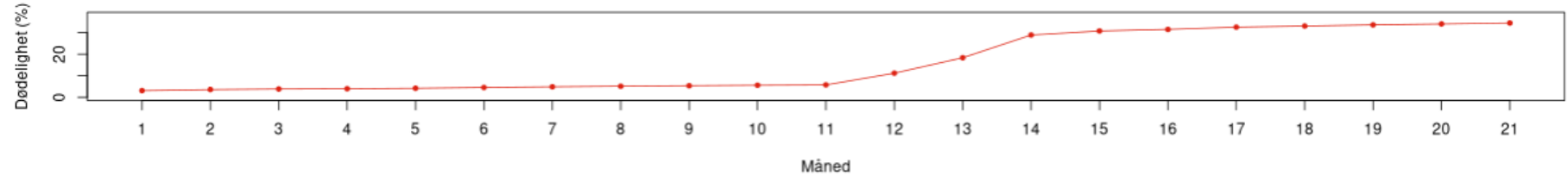
Fyll inn dødsrate for flere perioder
(separer perioder ved å bruke komma, og
bruk et punktum i stedet for et komma
for desimaltall, f.eks. 0.5, 1, 1.5, 2):

Kalkuler

Månedlige dødsrater

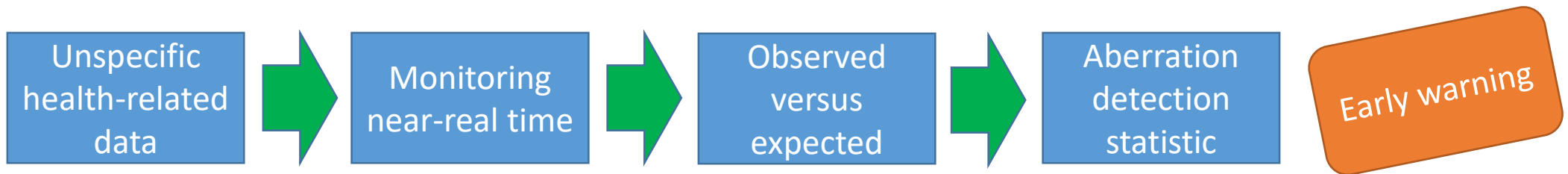
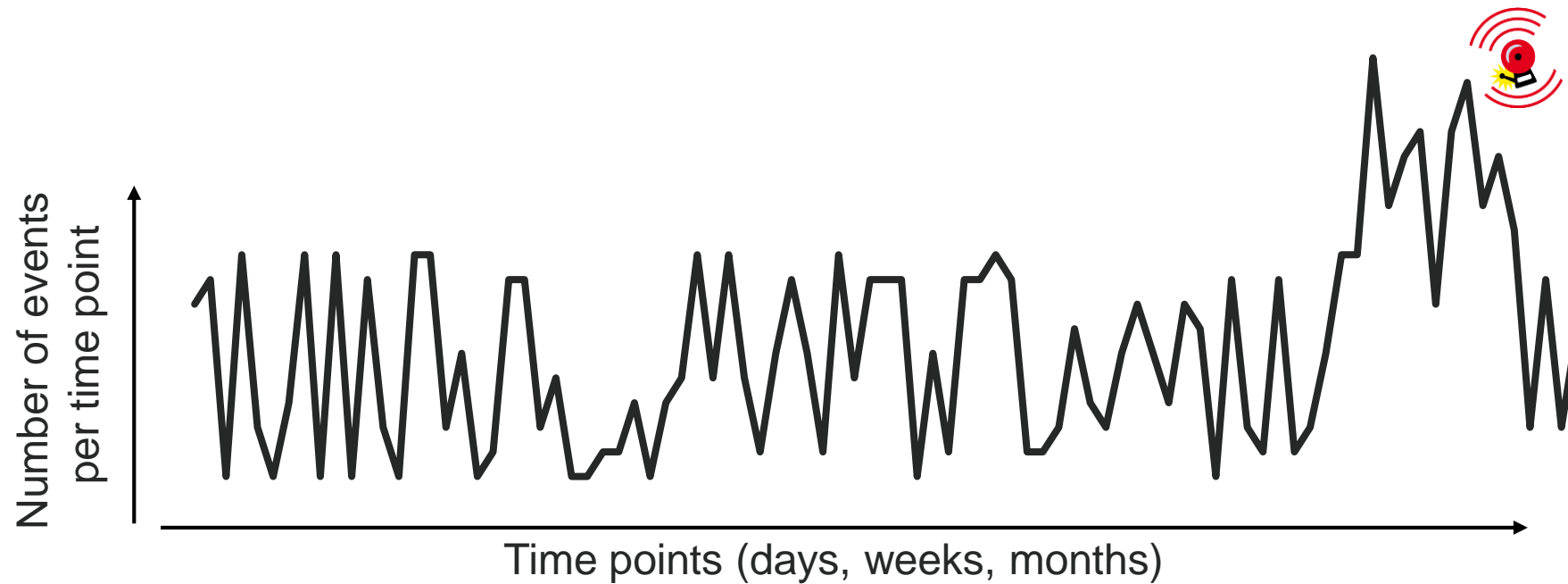


Dødelighet over tid

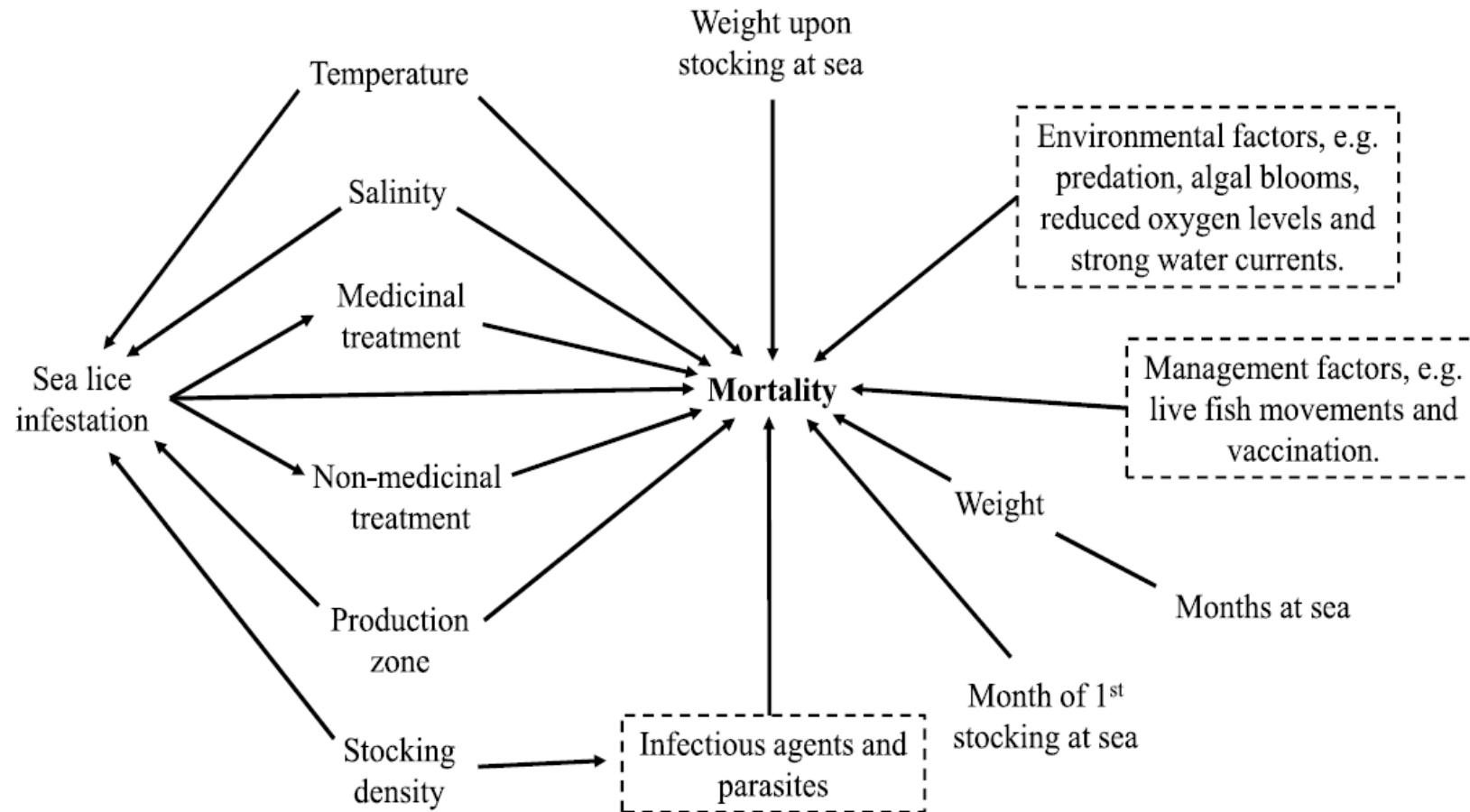


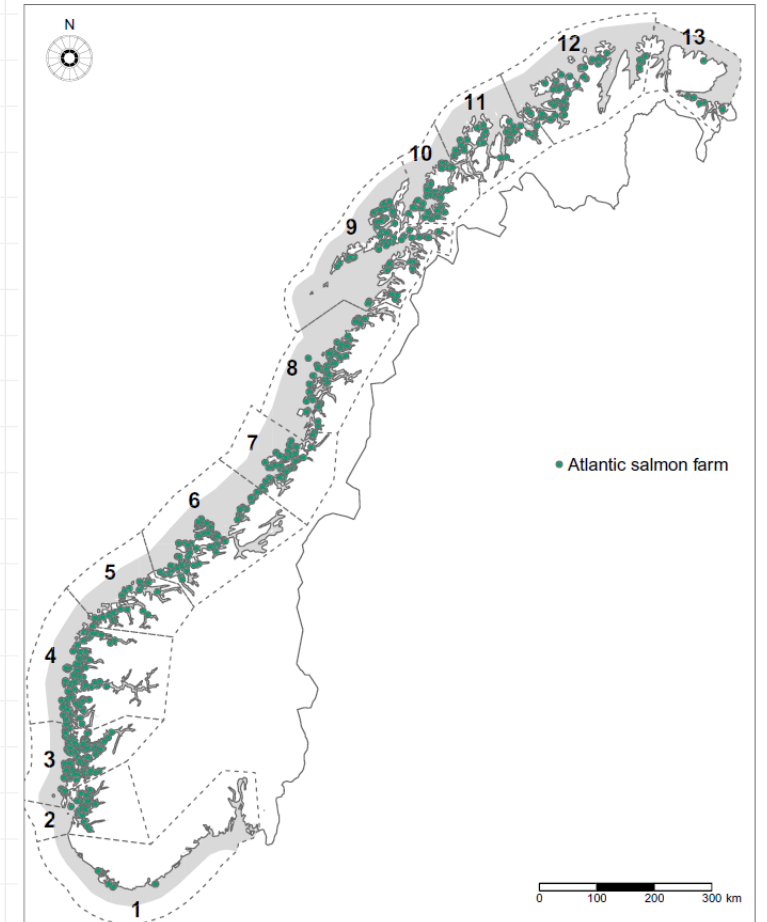
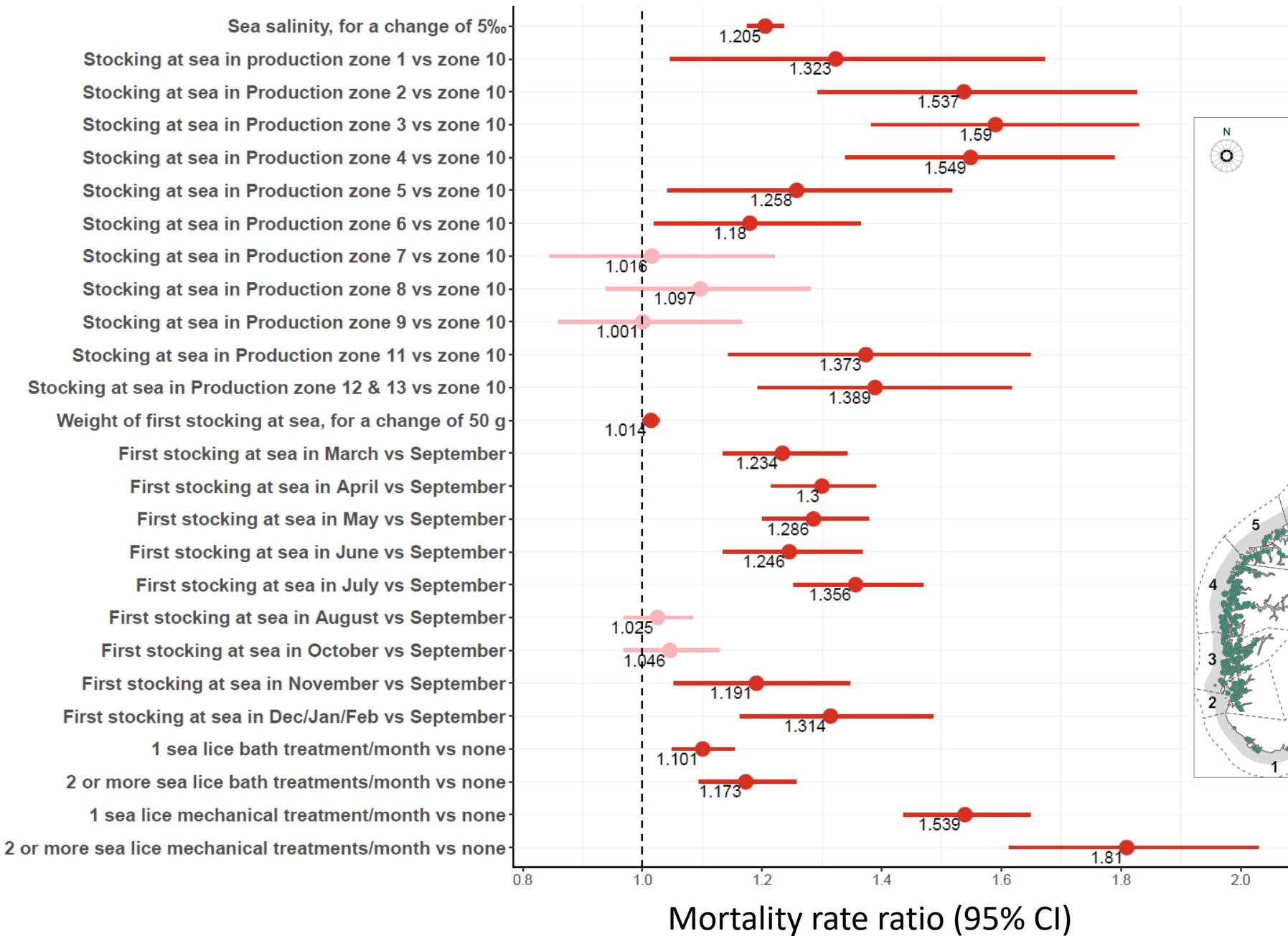
Dødelighet for den siste registrerte perioden 34.48%

Improving mortality surveillance...



Mortality model – seawater phase





Syndromic surveillance performance - Early warning system

- Commercial Atlantic salmon farms for food consumption, **PO 3**
- Screening of salmon pancreas disease (PD): current **PD** surveillance (clinical and lab results)



		2688 production months/ 235 fish groups	
SyS mortality		Positive	Negative
Screening PD	Positive	500	993
Negative	72	1123	

Se = **87.4%**

Sp = **53%**

Timeliness = **1 month (-3 - 3)**

NPV = **94%**

References

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Thank you for your attention!
Questions and comments

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