



På vei ut i havet

Jon Arne Grøttum

Forsker II, NTNU

Direktør havbruk, Sjømat Norge

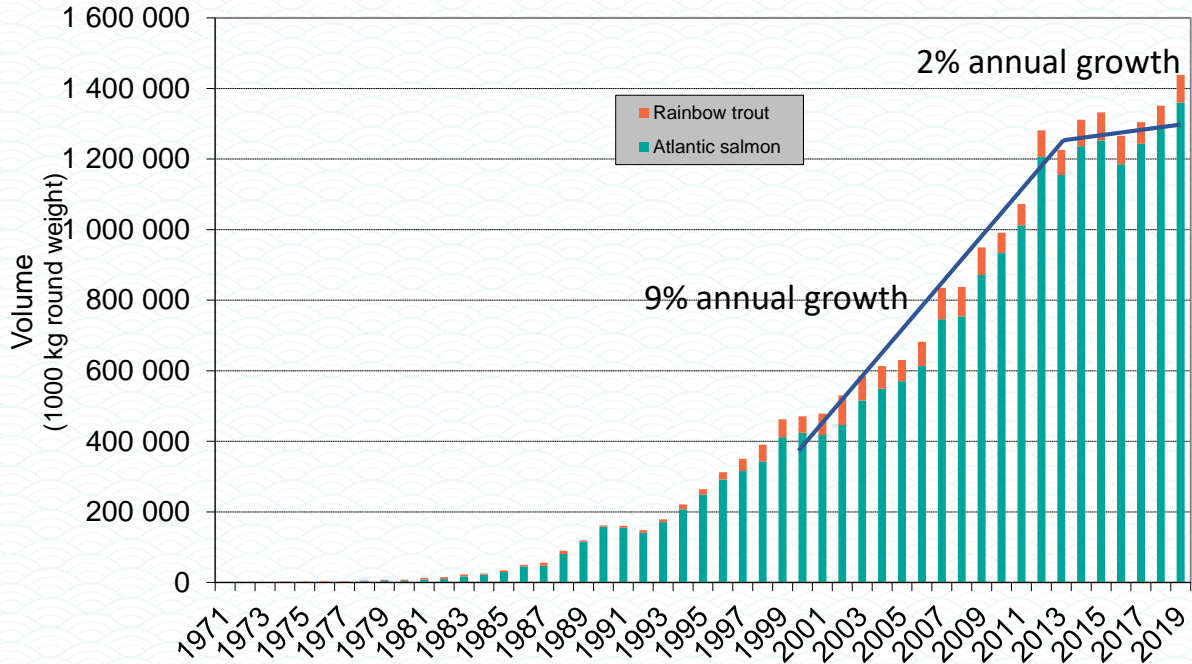
Brohode Havbruk 2050



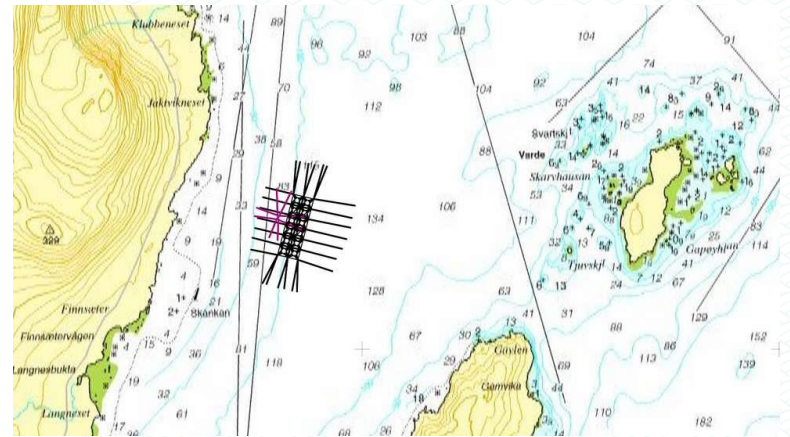
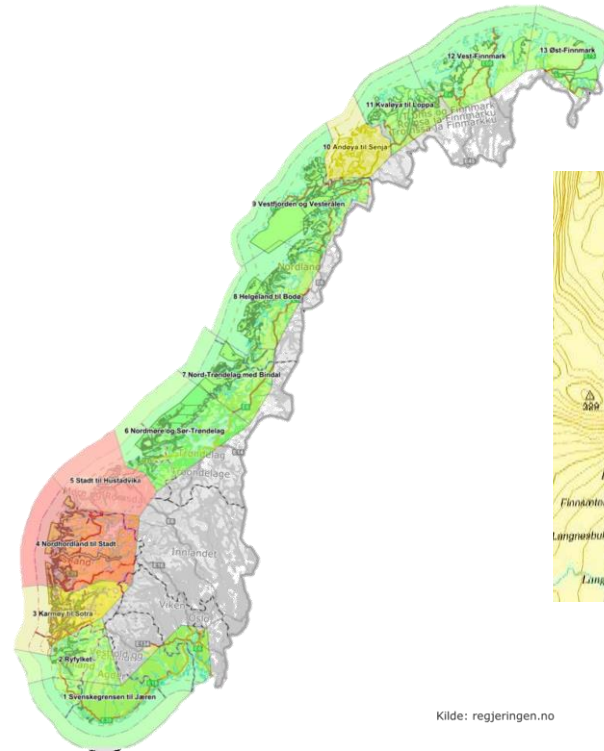


The growth in the Norwegian aquaculture sector have stagnated

Volume salmon and trout
1971 - 2019



Traffic light system – difficult access to new sites



Social acceptance

Two strategies to provide a future growth

- Have the people to accept the advantages and the possibility by producing food in the sea
- Find alternative producing methods which is general accepted, and are economical viable



Alternative technologies



Closed units on land – Fredrikstad seafood
Photo: ilaks.no



Closed units in sea – Akvadesign
Photo: kyst.no



Exposed sites – Ocean farm
Photo: kyst.no

Eksponert havbruk



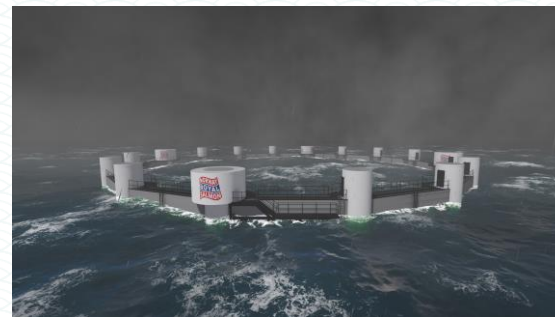
Ocean farm
Photo: kyst.no



Smart fish farm
Photo: MAriculture

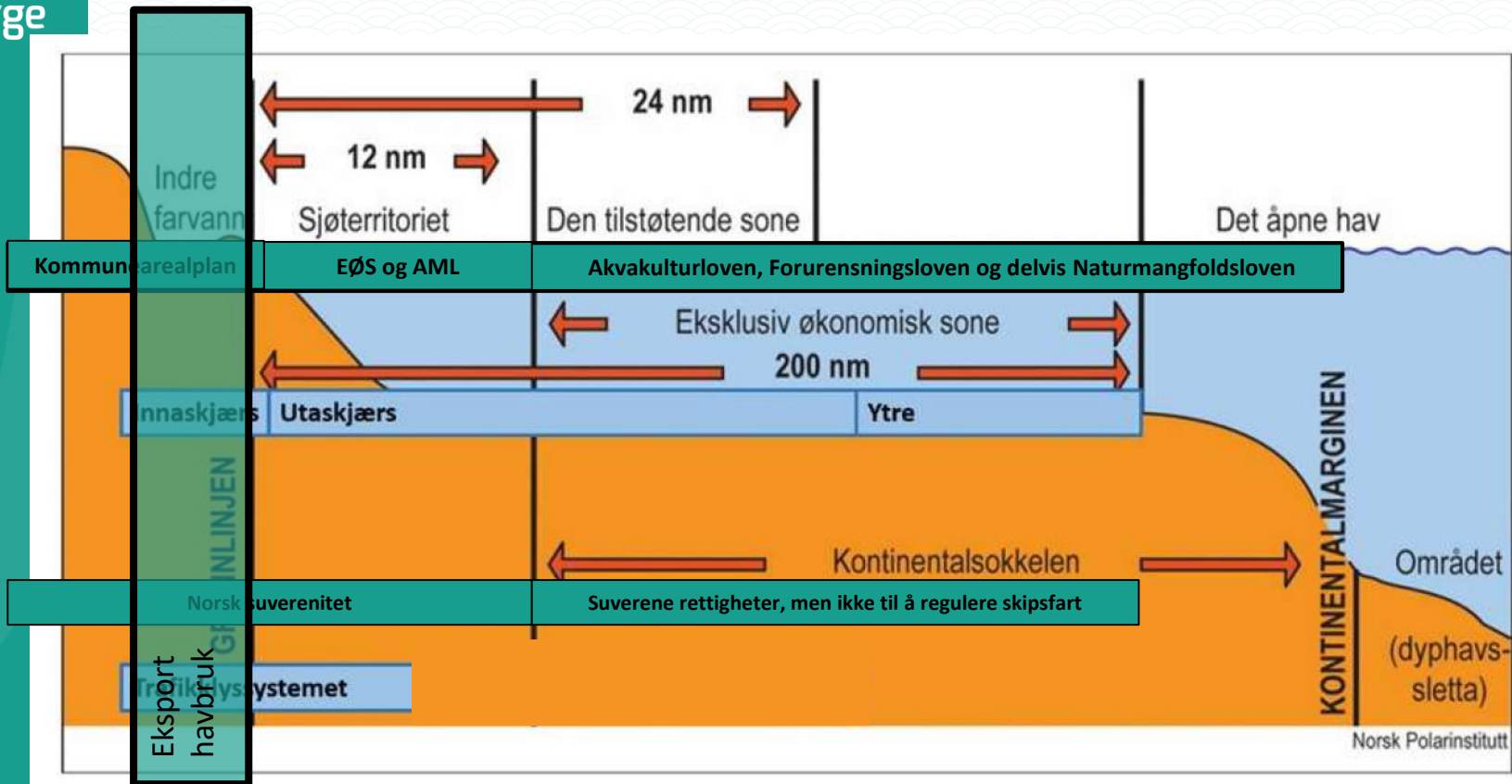


Havfarm
Photo: Nordlaks



Arctic Offshore Farming
Photo: NRS

Eksponert havbruk

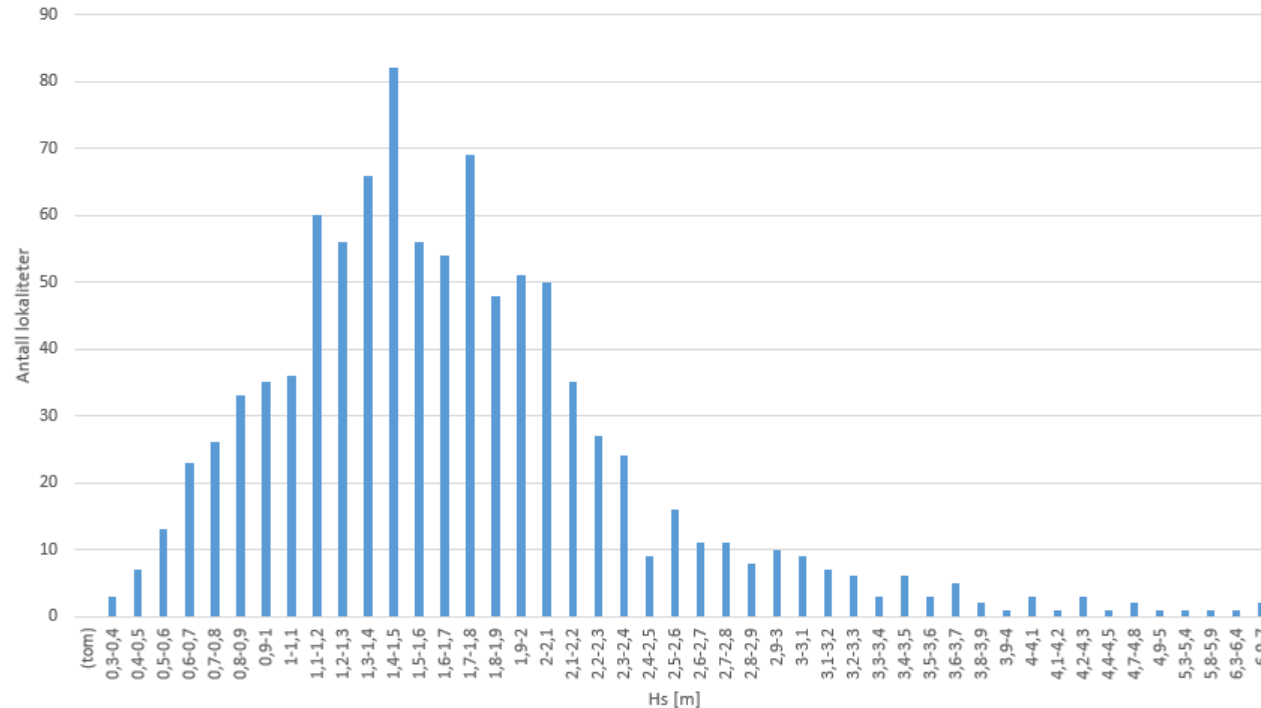


Bølgehøyde



FISKERIDIREKTORATET

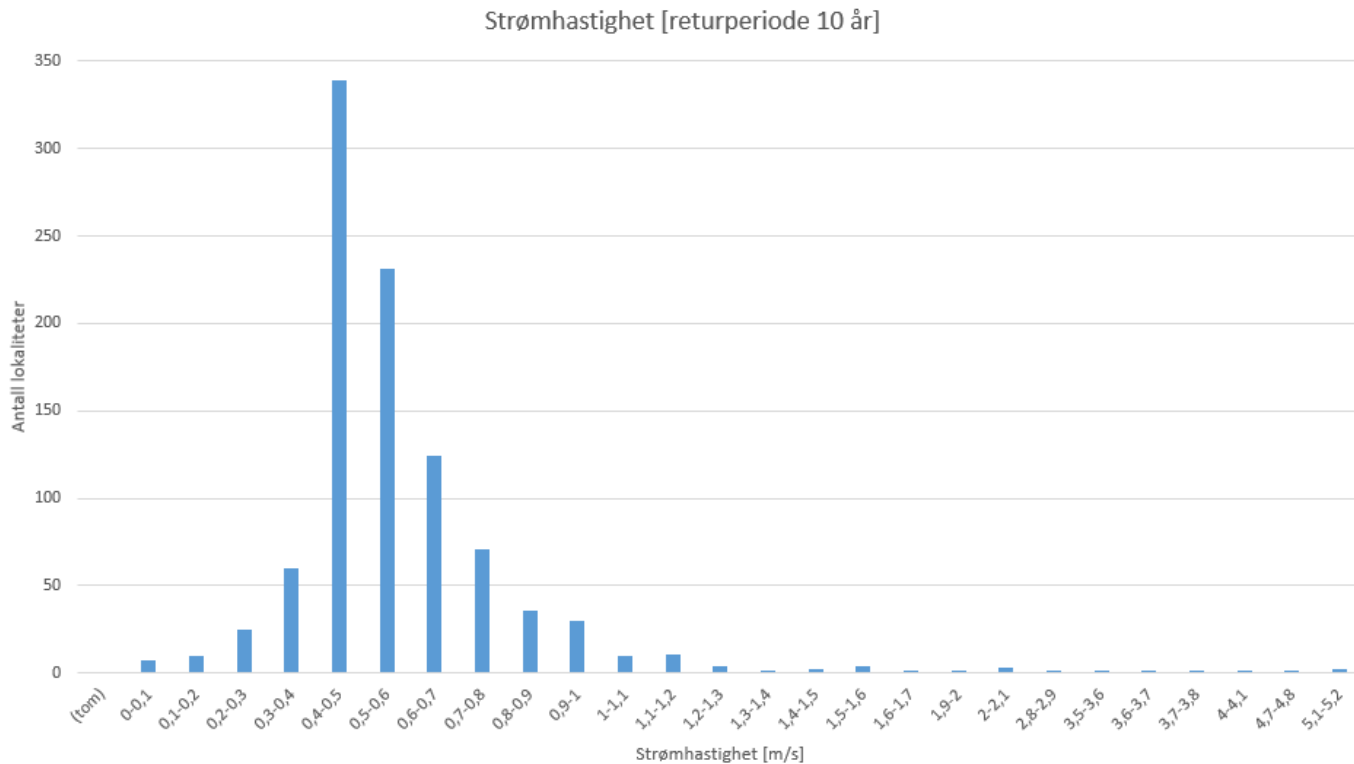
Fordeling av Hs [returperiode 10 år]



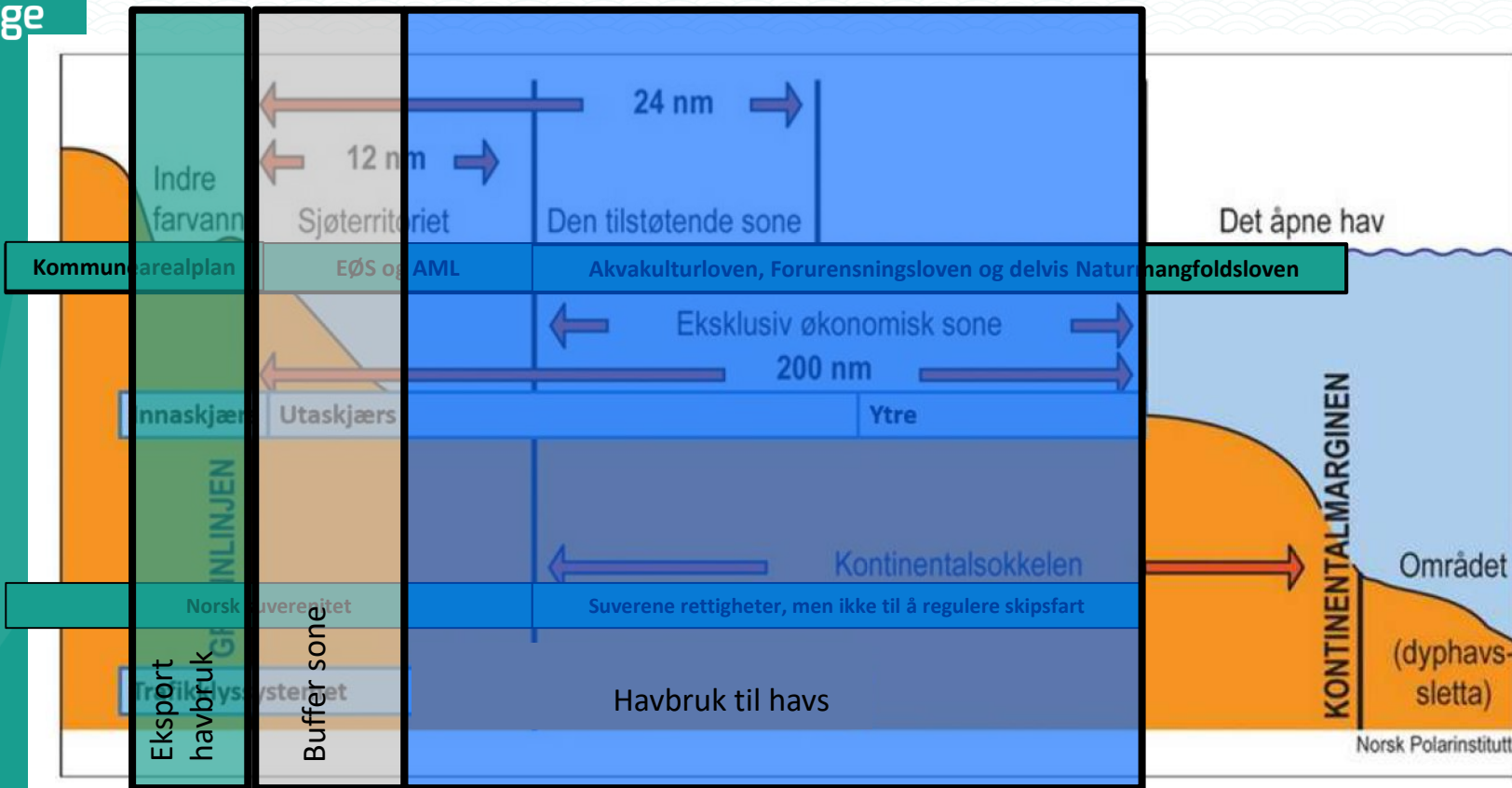
Strøm



FISKERIDIREKTORATET



Havbruk til havs



Off shore aquaculture - independent of the traffic light system

No impact on the sites within the areas
of traffic light:

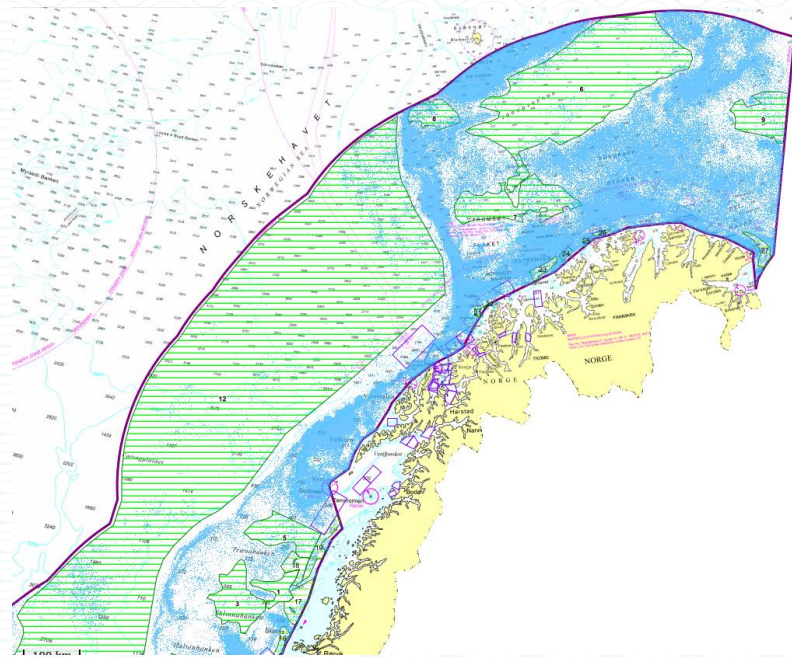
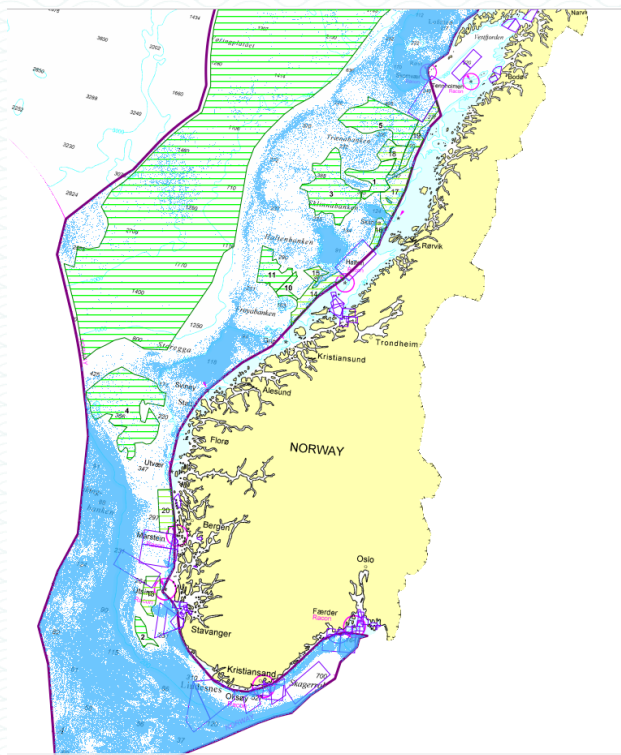
-> regulation of growth

-> sale of licenses

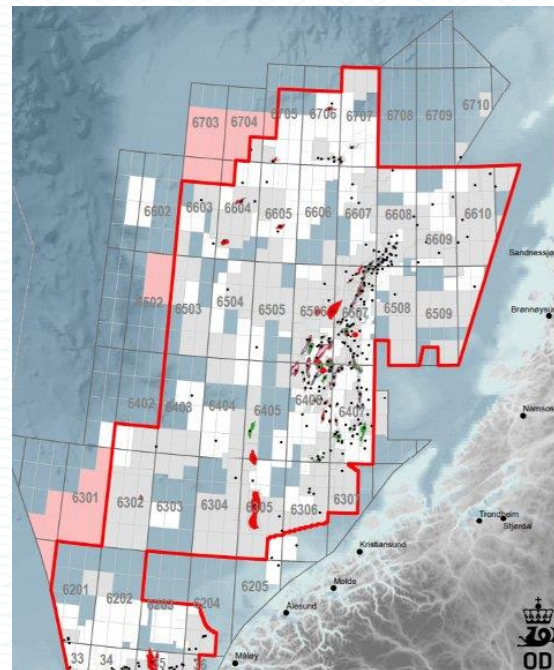
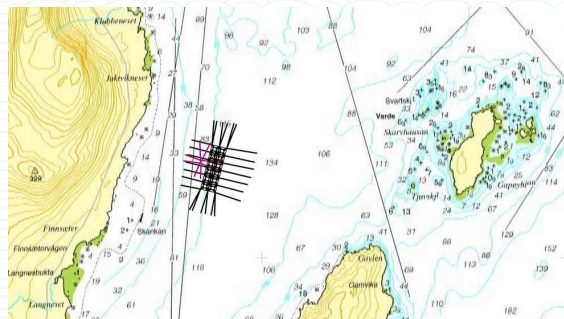


Smart fish farm
Photo: Mariculture

Allocation of sea areas



Lokaliteter eller blokker?

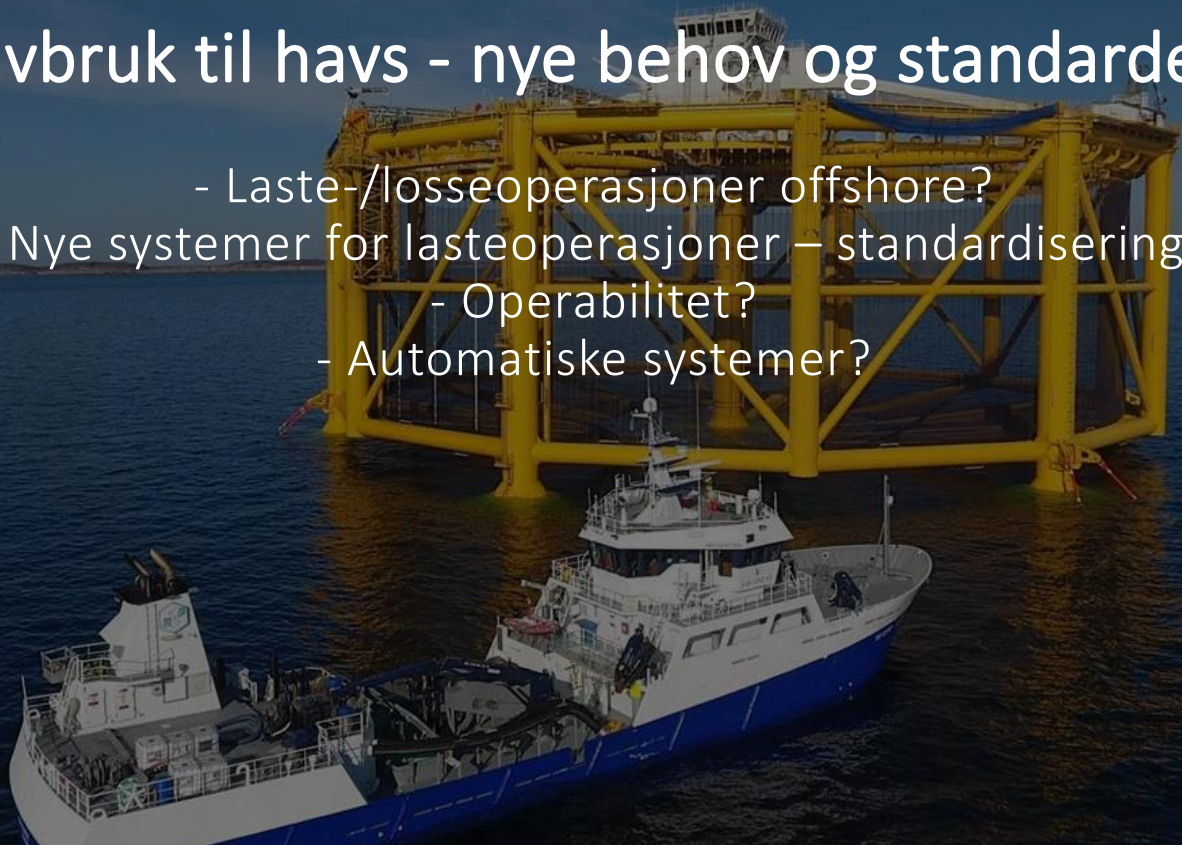


Fokusområder

1. Arealforvaltning
 - a. Kriterier for avsetting av areal
2. Organisering
 - a. Forvaltning av havrommet
 - b. Tildelingsregime
 - c. Tilsyn
3. Vekstregulering
 - a. Utenfor kommunens areal
 - b. Innenfor/utenfor PO
4. HMS
5. Bemanning og kompetanse

Havbruk til havs - nye behov og standarder?

- Laste-/losseoperasjoner offshore?
- Nye systemer for lasteoperasjoner – standardisering?
 - Operabilitet?
 - Automatiske systemer?



På vei ut i havet

- De ulike teknologiene har hver sine fordeler og ulemper
- Merd oppdrett er den foretrukne teknologien
- Stort potensial for Havbruk til havs
- Industrien og myndighetene må utvikle
 - ✓ en tilpasset teknologi på biologiens premisser
 - ✓ infrastruktur
 - ✓ et tilpasset regulering og regelverk