FISKERI- OG KYSTDEPARTEMENTET

Norwegian Ministry of Fisheries and Coastal Affairs

Norwegian Aquaculture Zoning Policy and the Competition for Marine Space in Aquaculture

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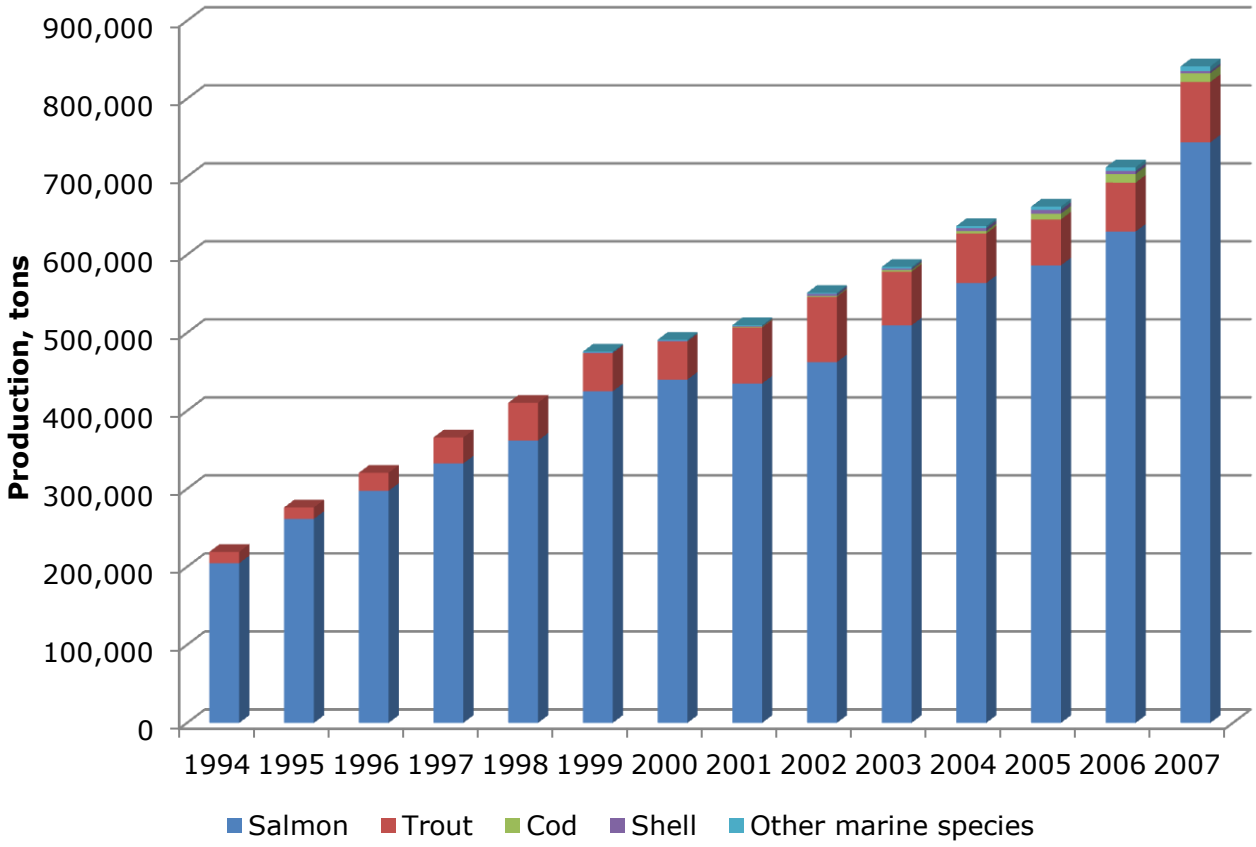
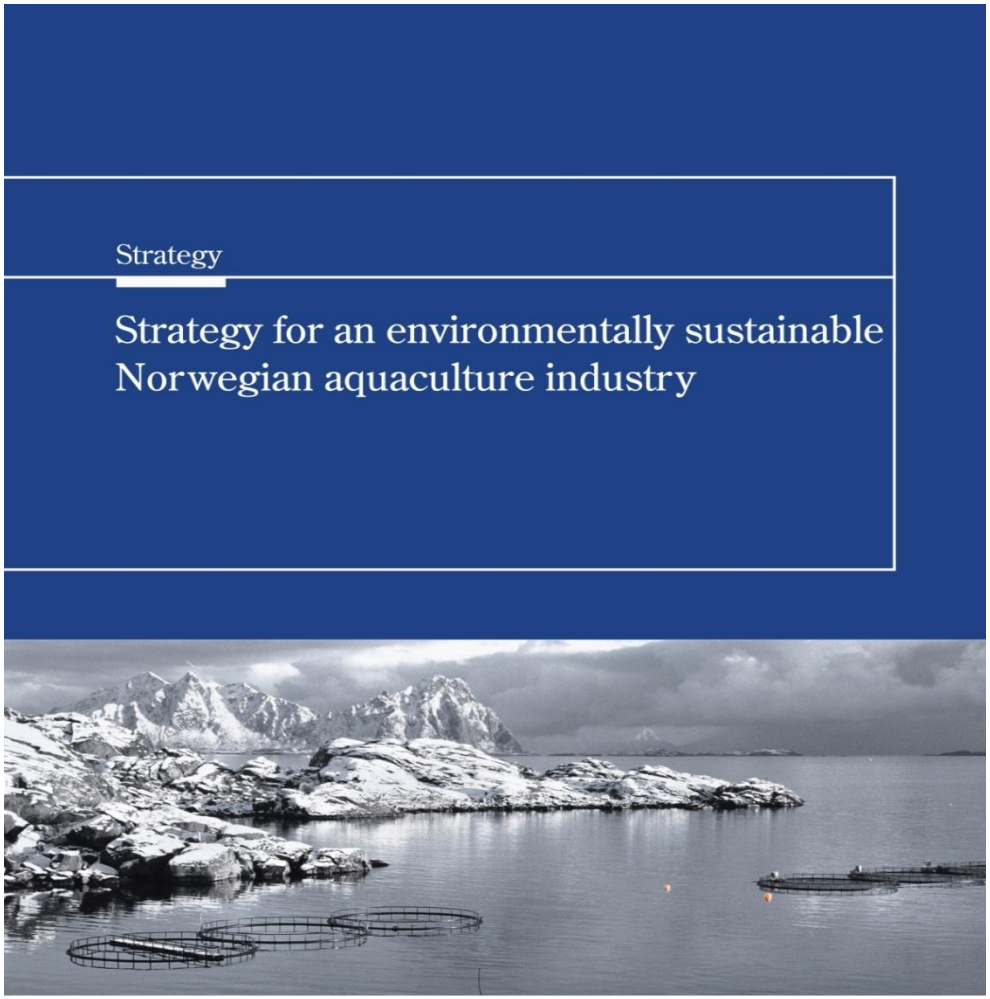
Norwegian Aquaculture Production



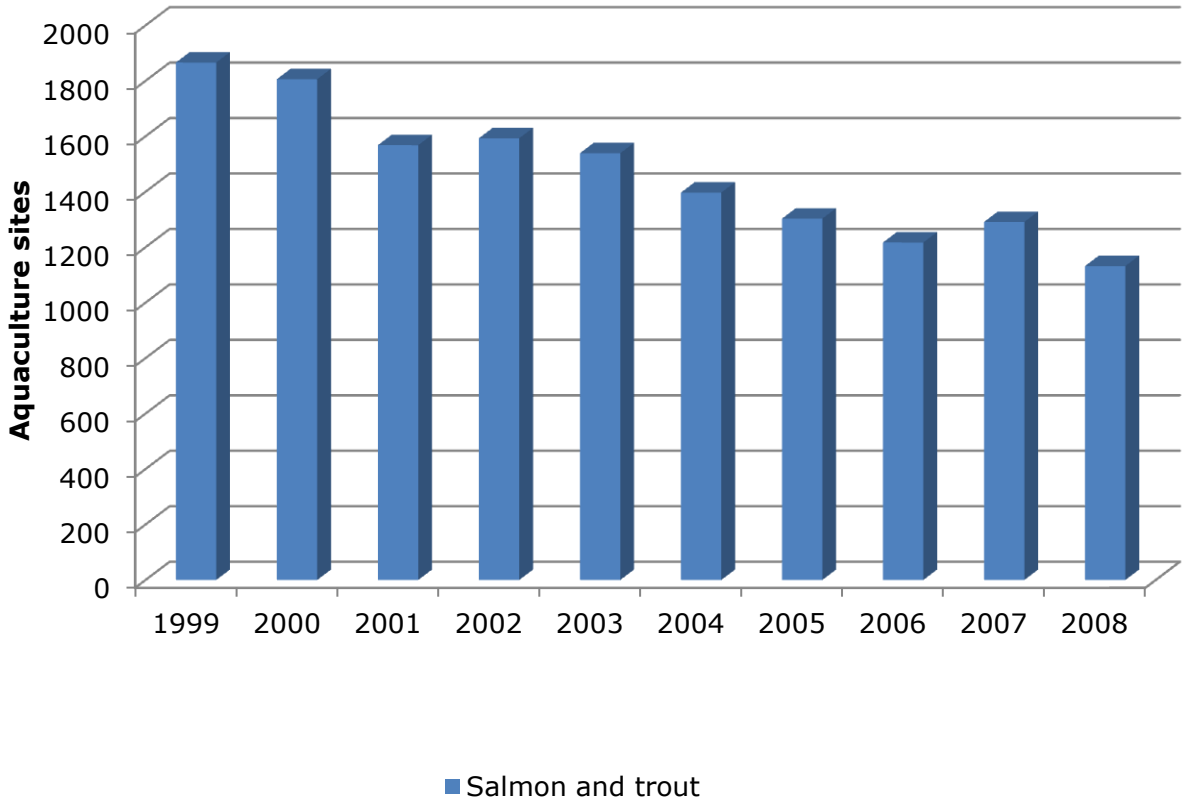


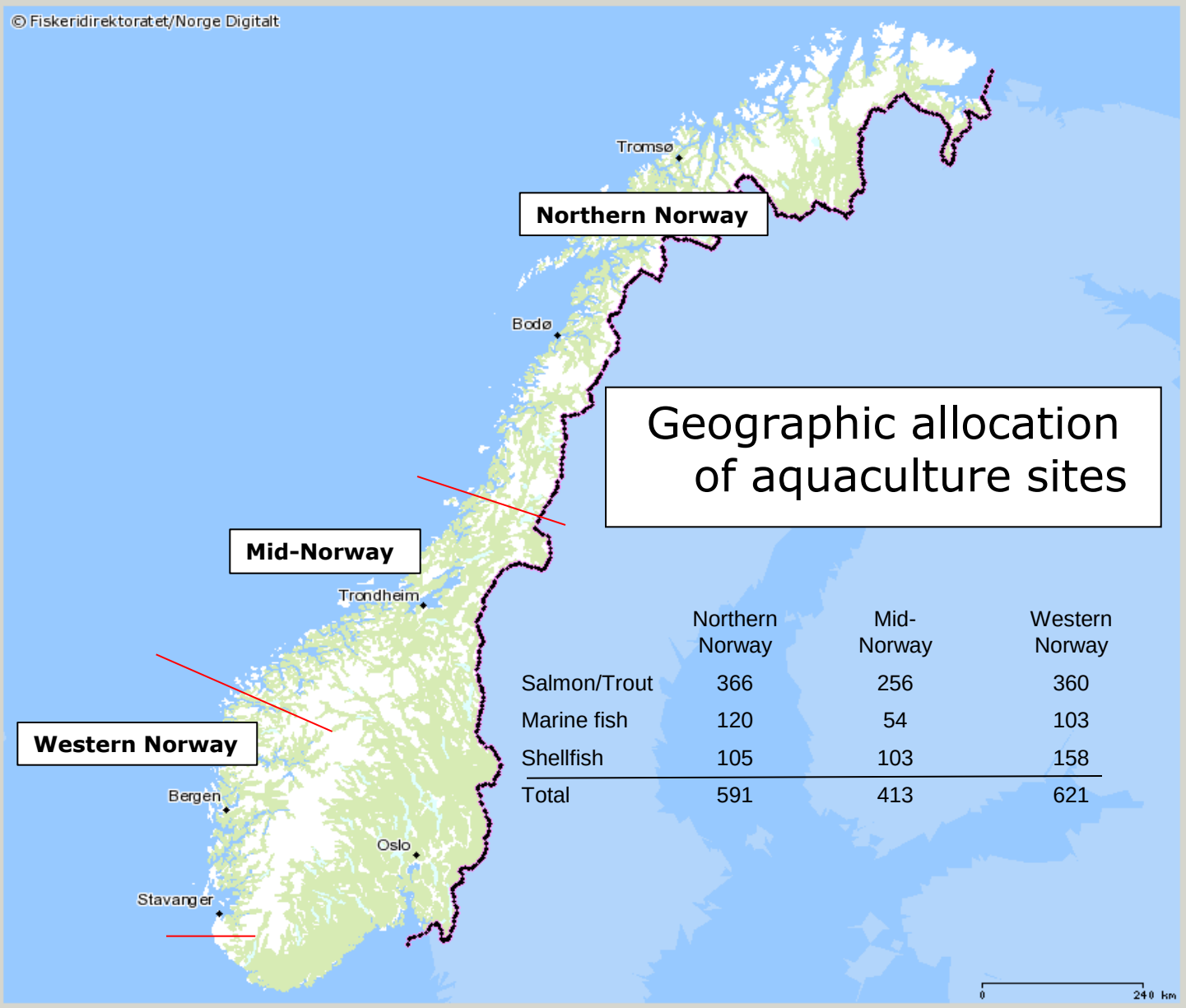
NORWEGIAN MINISTRY OF
FISHERIES AND COASTAL AFFAIRS

Why a strategy for environmental sustainable aquaculture?

- Current siting structure reflects an earlier era in aquaculture production
- Significant growth over the past 20 years
- Experienced challenges
- The strategy identifies 5 focus areas, where aquaculture have impact on the environment
  - Genetic interaction
  - Pollution
  - Diseases
  - Spatial planning
  - Feed resources

Aquaculture sites

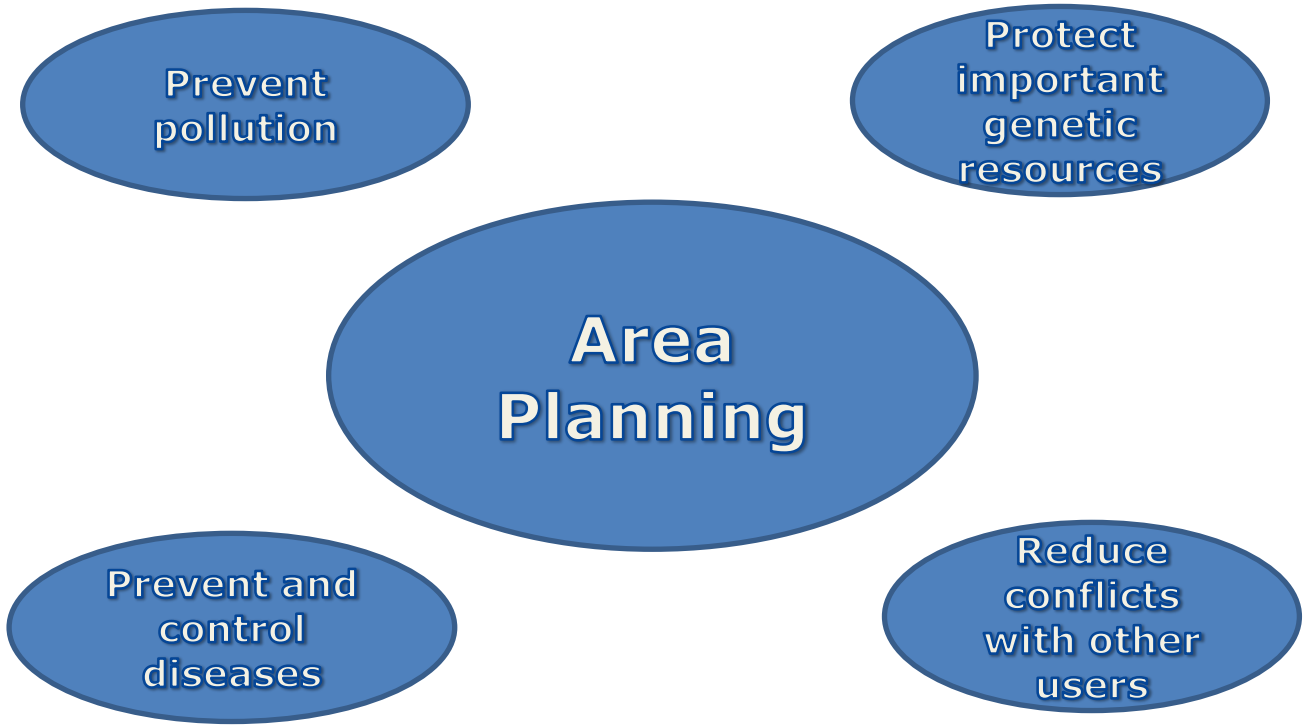




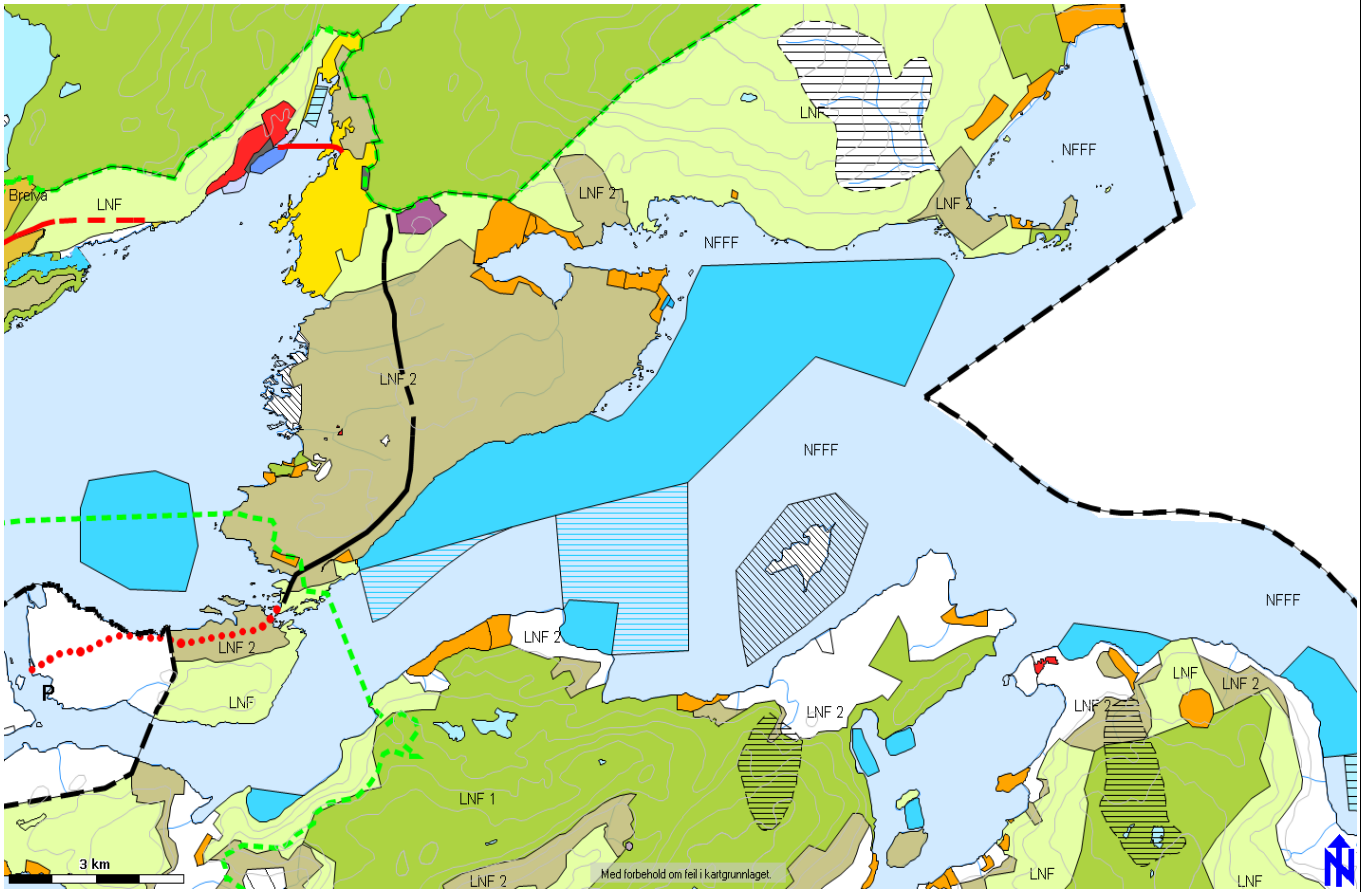
Geographic allocation of aquaculture sites

	Northern Norway	Mid-Norway	Western Norway
Salmon/Trout	366	256	360
Marine fish	120	54	103
Shellfish	105	103	158
Total	591	413	621

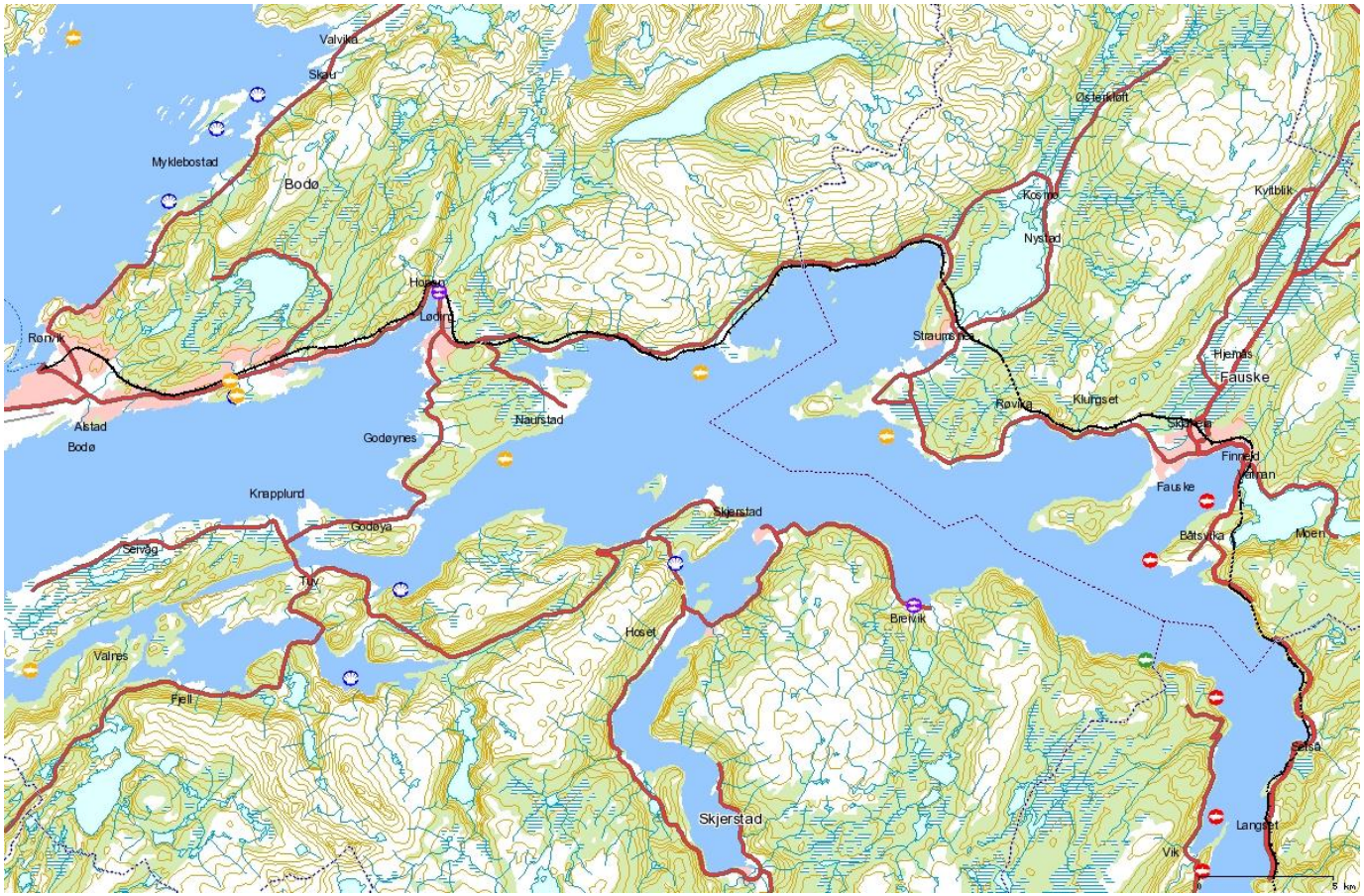
Good area planning is a precondition for environmental sustainable aquaculture



Area planning Bodø municipality



Aquaculture sites in Bodø municipality



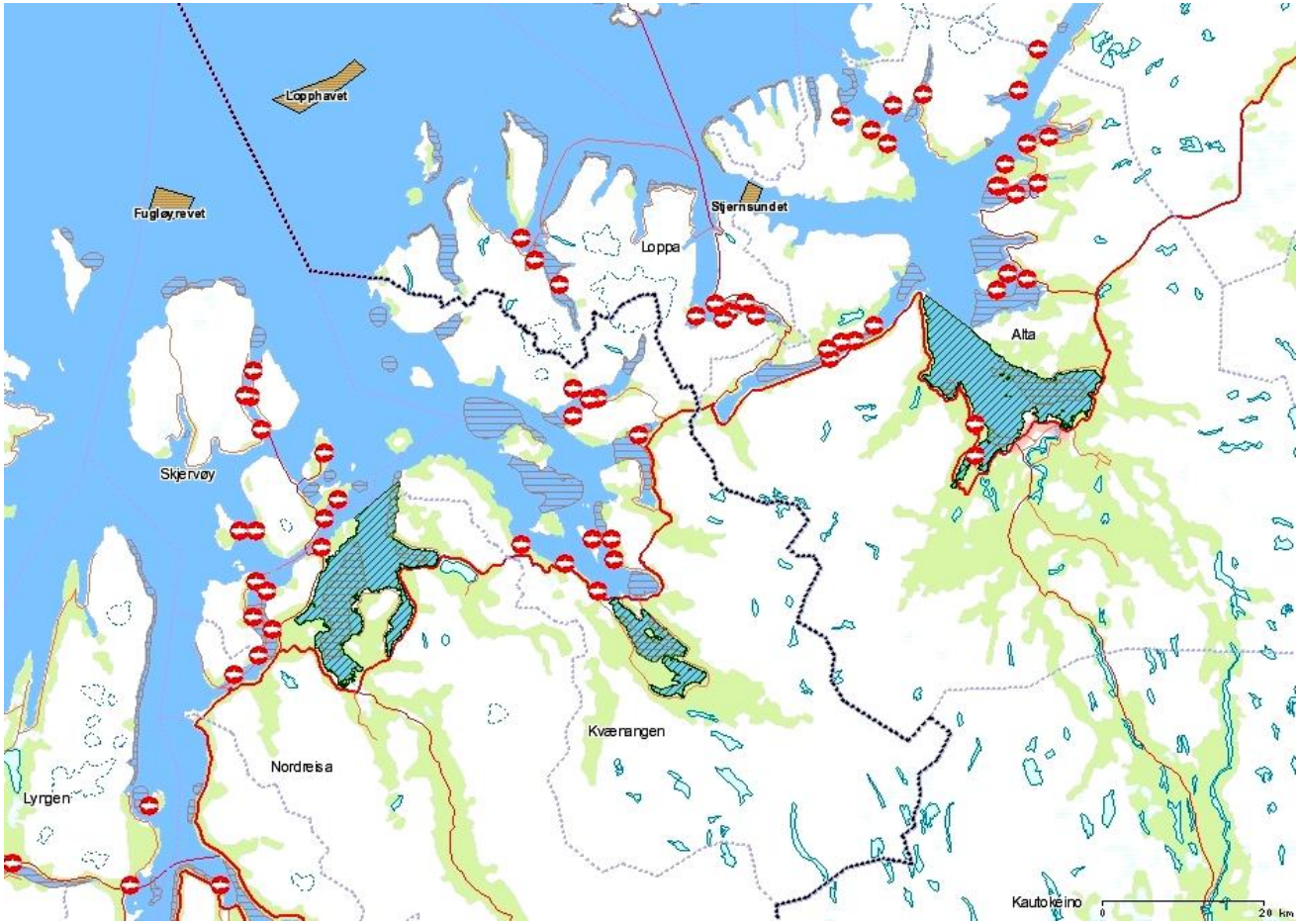
Protecting genetic resources

- *Aquaculture does not contribute to permanent changes in the genetic characteristics of wild fish stocks*

- Protecting important stocks of wild atlantic salmon
  - Designated water catchment areas and fjord-systems given special protection

- Protecting breeding grounds of cod
  - Ban on siting of cod farms in known breeding areas of local stocks of codfish

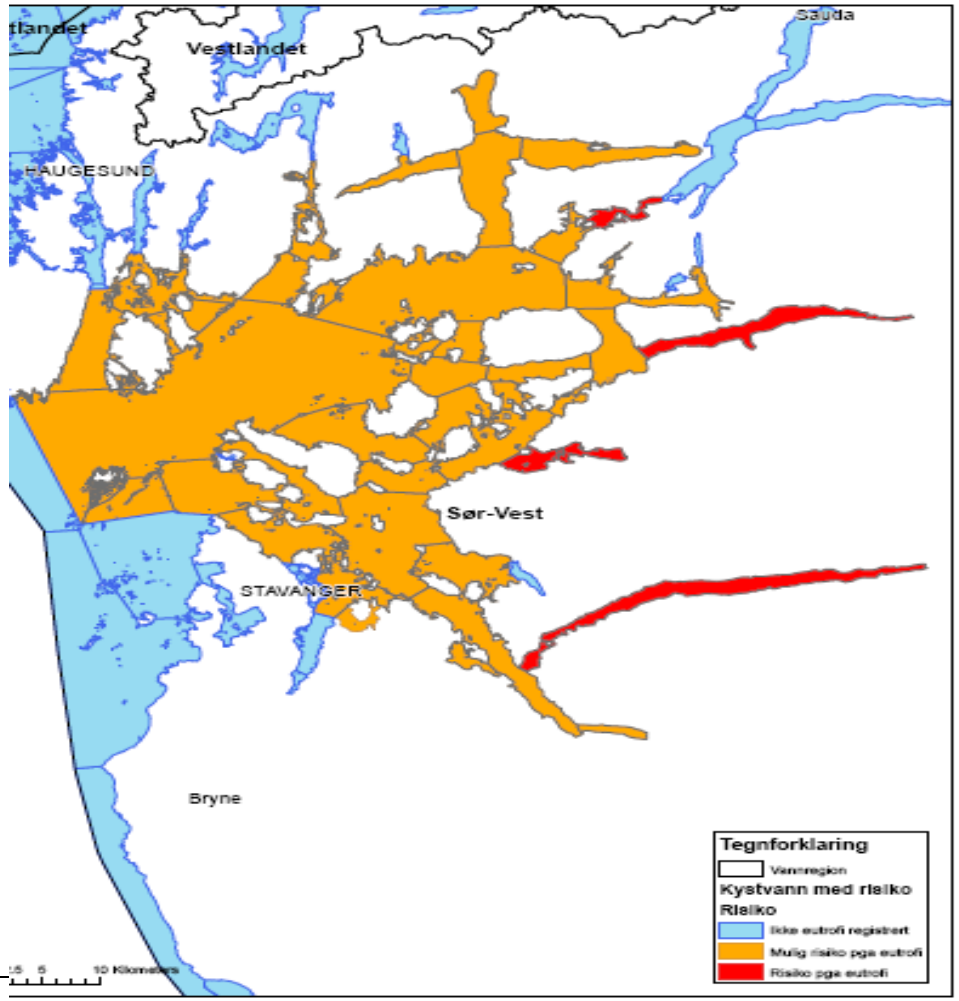
Protecting genetic resources



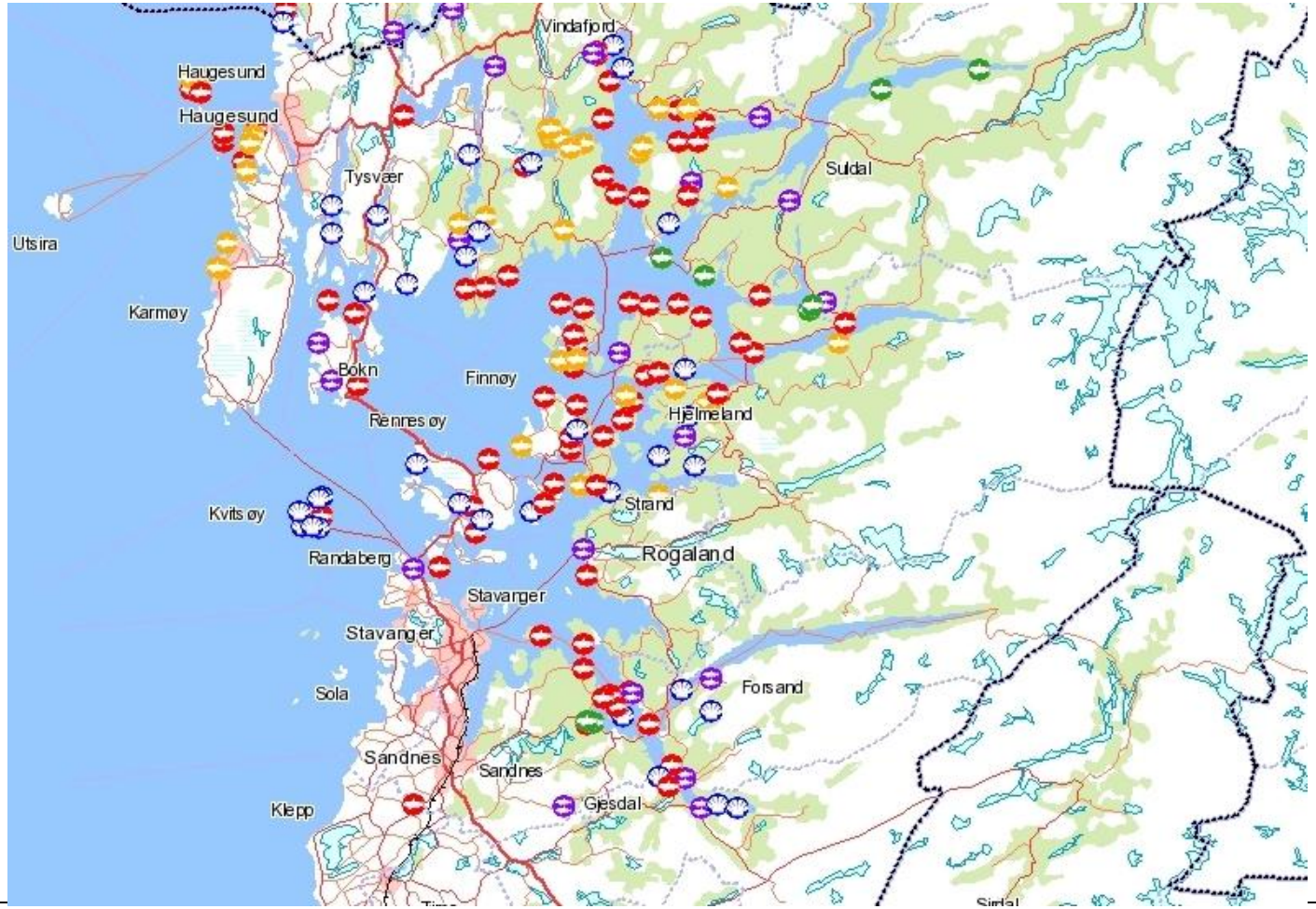
Pollution

- *All aquaculture sites operate within acceptable environmental conditions, and do not have higher effluence of nutrient salts and organic material than the carrying capacity of the recipient*
- Benthic monitoring before and during aquaculture operation (NS 9410)
- Monitoring underneath and in close vicinity of site
- More comprehensive monitoring also further away from site (overlap between sites giving more regional information)

Pollution


Vestlandet
HAUGESUND
Sør-Vest
STAVANGER
Bryne
Tegnforklaring
Kystvann med risiko
Risiko
Ikke eutrofi registrert
Mulig risiko pga eutrofi
Risiko pga eutrofi

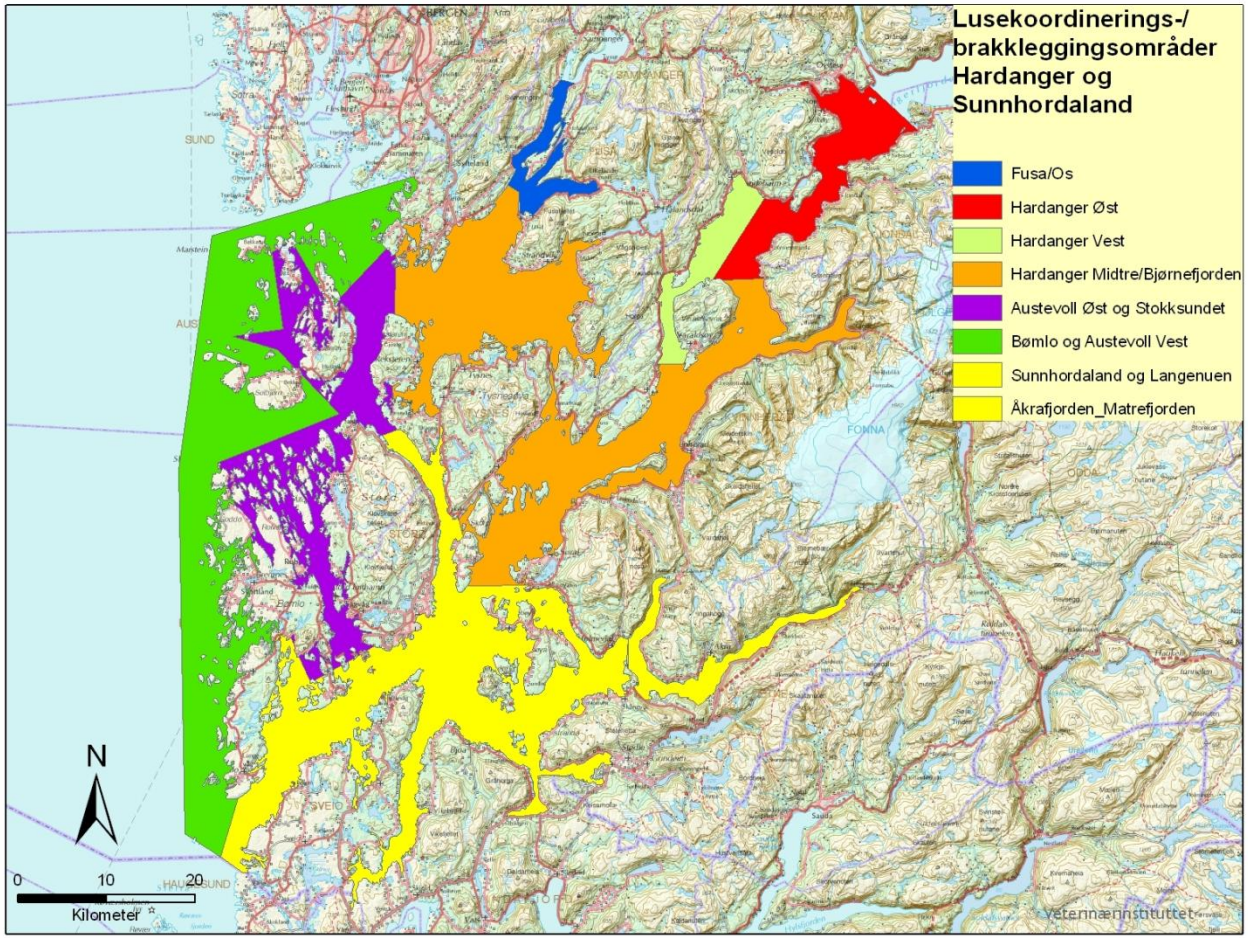
Pollution: Aquaculture sites in the Ryfylke area



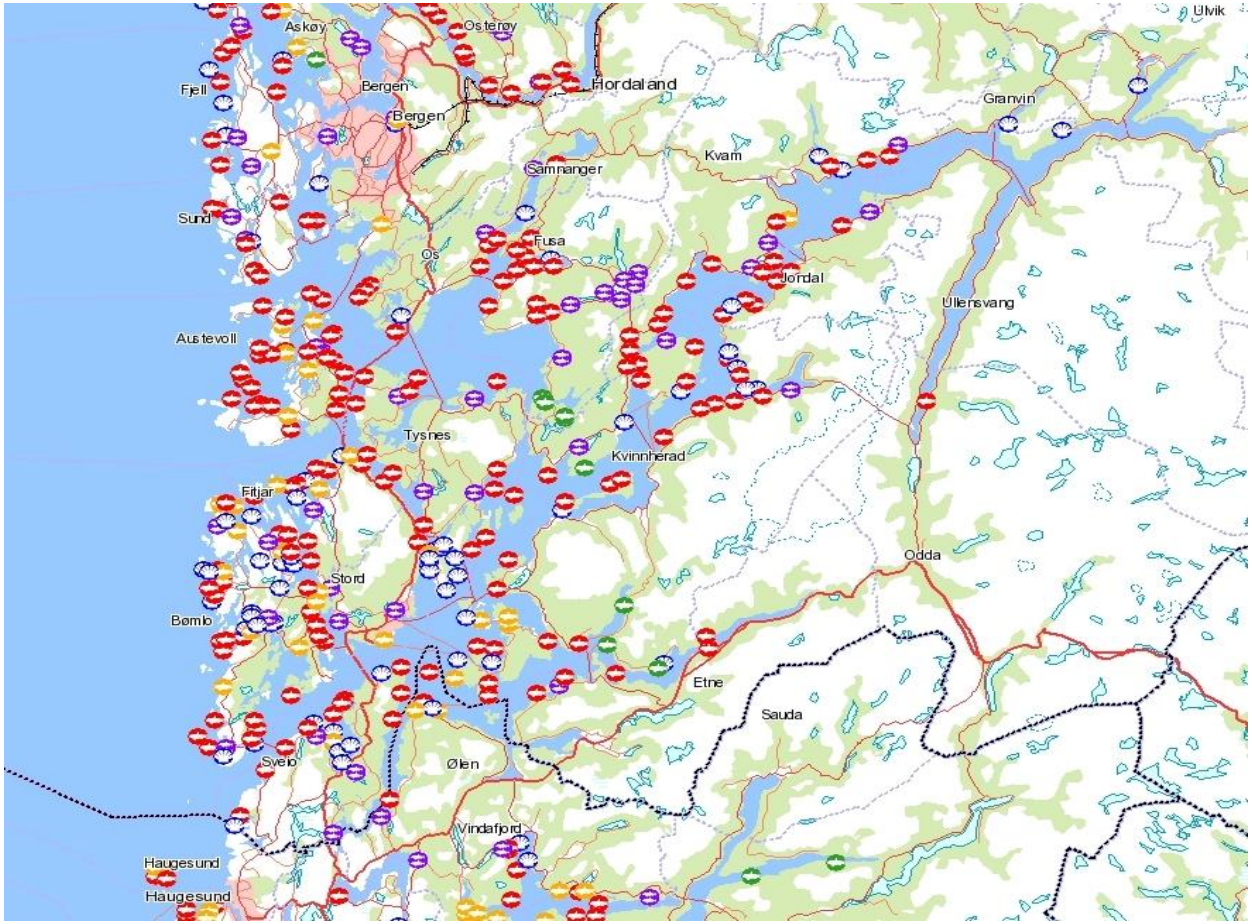
Fish disease

- *Disease in fish farming does not have a regulating effect on stocks of wild fish, and as many farmed fish as possible grow to slaughter age with minimal use of medicines*
- Optimal siting structure important for controlling horizontal disease transmission
- Sea-lice creates new challenges

Fish disease: Proposed zoning structure in Hardanger Sealice – Wild fish



Fish disease: Aquaculture sites in the Hardanger area



Summary – Lessons learnt

- Spatial planning in coastal areas is a prerequisite for a long-term development and growth in an environmental sustainable manner.
  - The carrying capacity of the sea areas
  - Competition with other users
  - Public interest
  - Prevention and control of diseases in aquaculture

Siting structure needs to be revisited