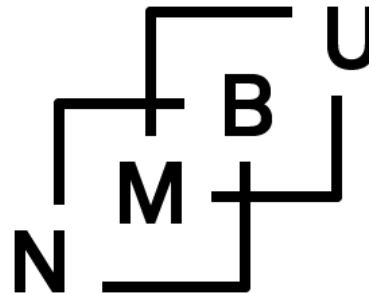


Farmed salmon/Wild salmon

Health interactions and challenges



Norges miljø- og
biovitenskapelige
universitet

Trygve T. Poppe, Norwegian University of Life Sciences NMBU

Reykjavik, March 14 2014

About myself:

**Veterinarian from The Norwegian School of Veterinary Science 1976
Have been working with fish health and fish diseases since 1981.**

This talk:

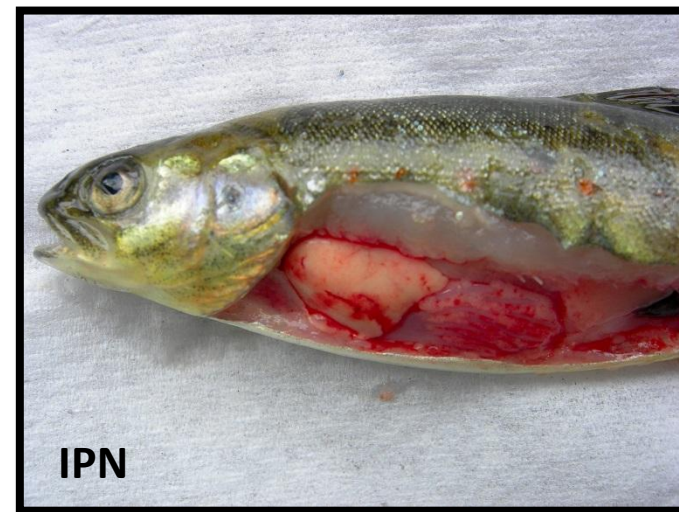
- **Health problems in aquaculture - past and present**
- **Interactions between wild fish and farmed fish**
- **Precautions and what can we learn**

1. HEALTH PROBLEMS IN NORWEGIAN AQUACULTURE (ULTRASHORT VERSION)

PAST	Furunculosis (bacterial) (imported) Cold-water vibriosis (bacterial) <i>Gyrodactylus salaris</i> (parasite) (imported) Sea-lice (parasite) Yersiniosis (bacterial) Infectious salmon anemia (ISA) (virus) IPN
PRESENT	Pancreas disease (PD) (virus) Heart and skeletal muscle inflammation (HSMI) (virus) Cardiomyopathy syndrome (CMS) (virus) Sea-lice (parasite) Unspecific mortality/Production-related diseases



Important virus-associated diseases in Norwegian aquaculture



Virus reservoirs

Infectious salmon anemia (ISA): Marine source is likely

Heart and skeletal muscle inflammation (HSMI): The causative virus is widespread in wild and farmed salmonids in North America and Europe

Cardiomyopathy syndrome (CMS): The virus is widespread in farmed salmon and some other species as well

Infectious pancreatic necrosis (IPN): Widespread in freshwater and saltwater worldwide

In other words: The number of different viruses with a disease-causing potential in the aquatic environment is innumerable.

2. INTERACTIONS BETWEEN FARMED AND WILD FISH

Two-way traffic:

**From wild fish to farmed fish
From farmed fish to wild fish**

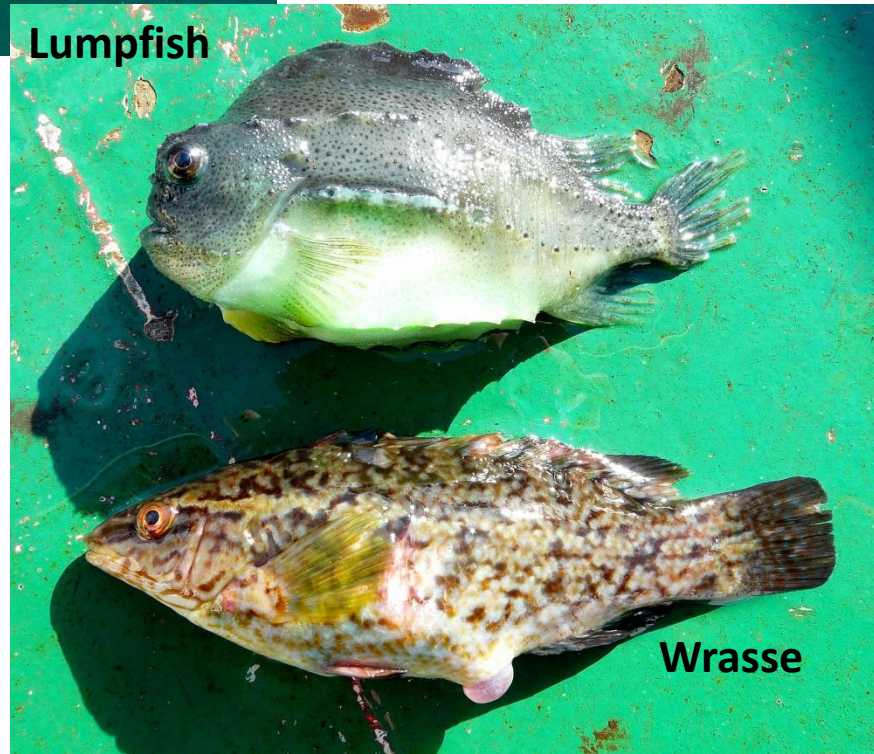
Key words:

**Open systems/open cages
Movement of biomass**





Lumpfish



Wrasse



What is the significance of viral diseases for wild fish?

Answer: ??????????????????????

AN EXAMPLE:

The virus causing heart and skeletal muscle inflammation (HSMI) is called Piscine Reovirus (PRV).

PRV is widespread in both healthy farmed salmonids as well as in wild salmonids in N. Europe and N. America.

Farmed fish can carry the virus without developing disease.

Most known cases of virus-associated mortality in wild populations is associated with spawning migrations and spawning. In other words, in situations where the fish are emaciated, stressed and are congregating in high concentrations.



**VHS in wild fish
from
The Great Lakes**

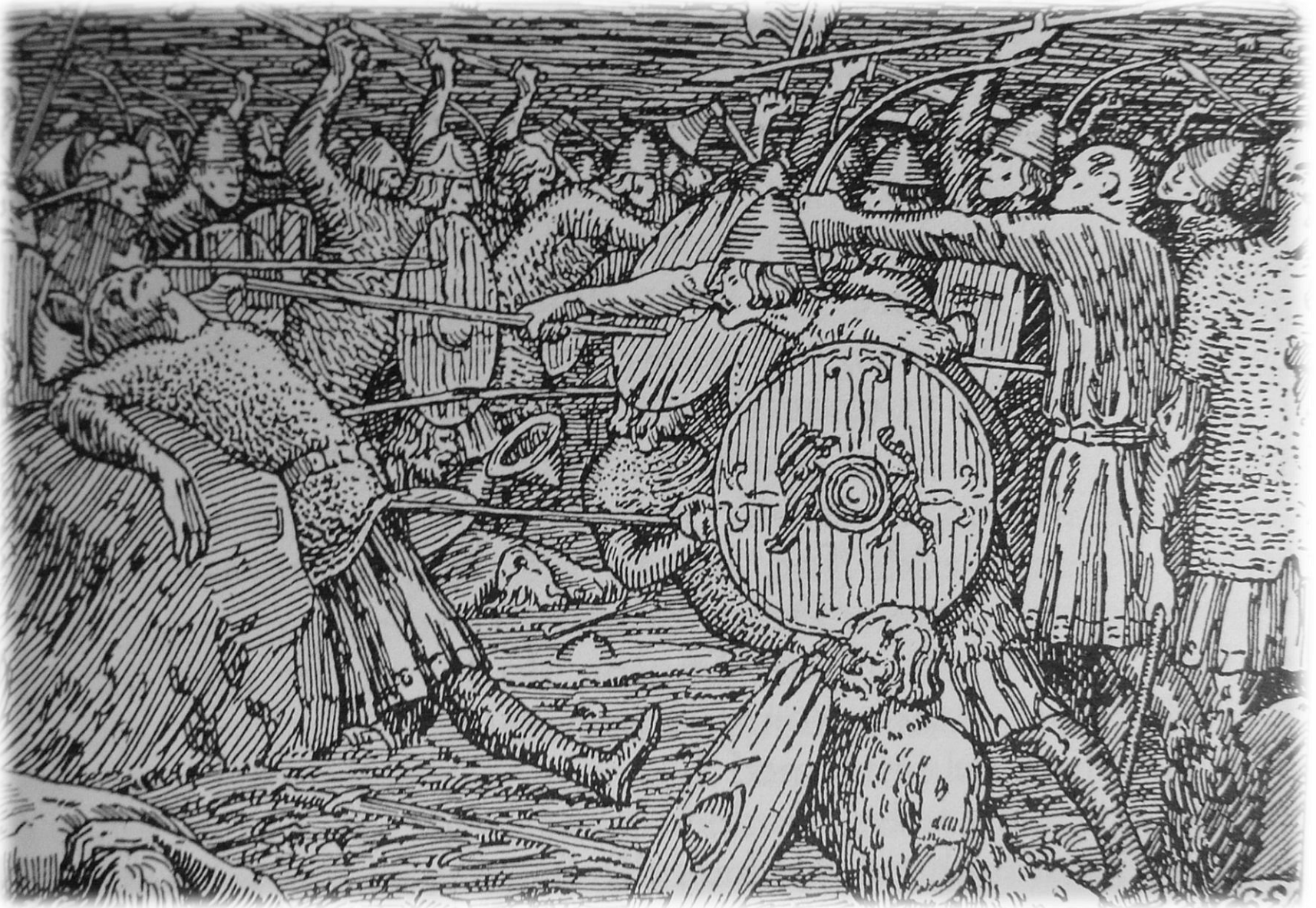


Andy Noyes, NY DEC

3. PRECAUTIONS AND WHAT WE CAN LEARN

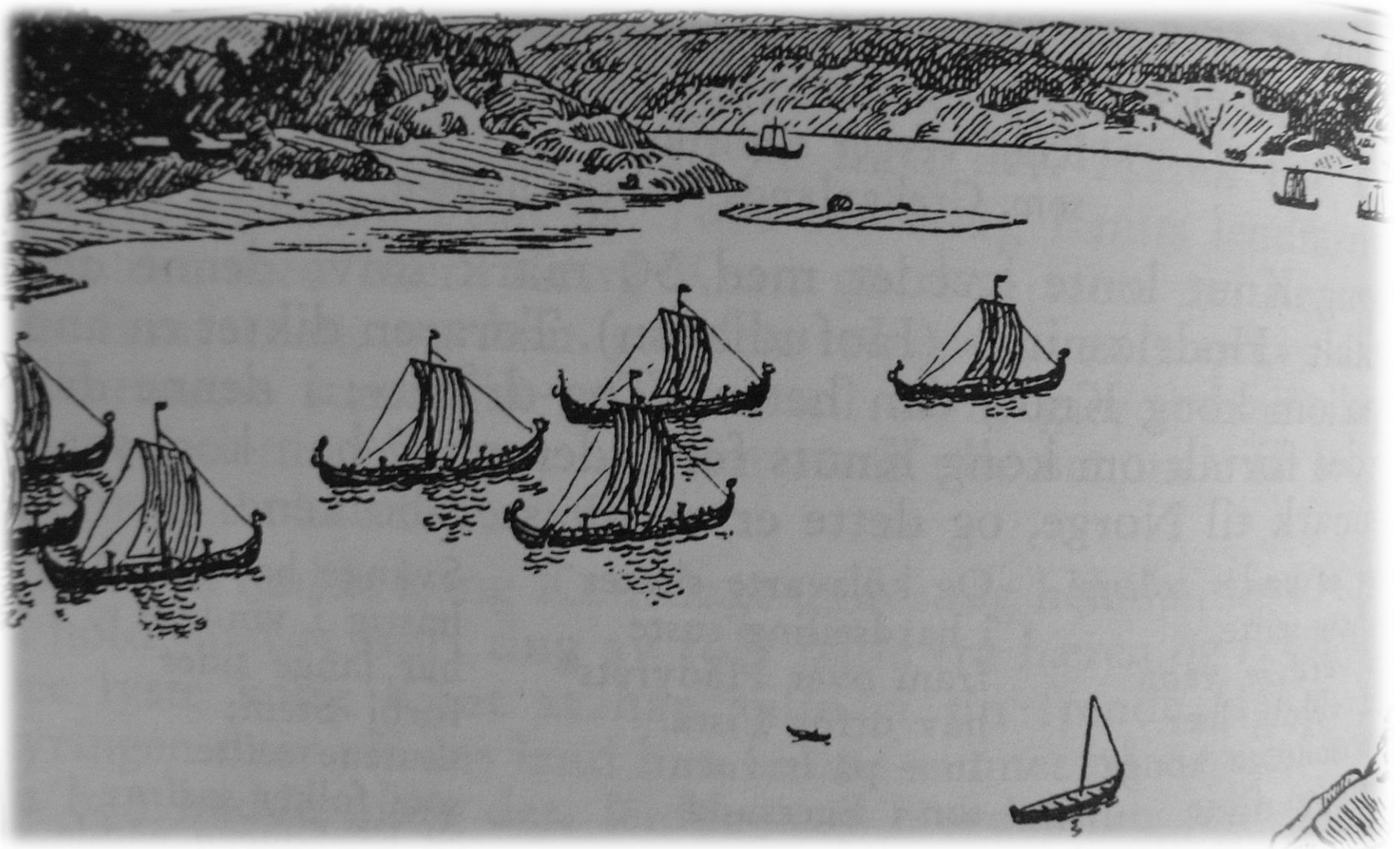
- The only thing we learn from history is that we don't learn from history!



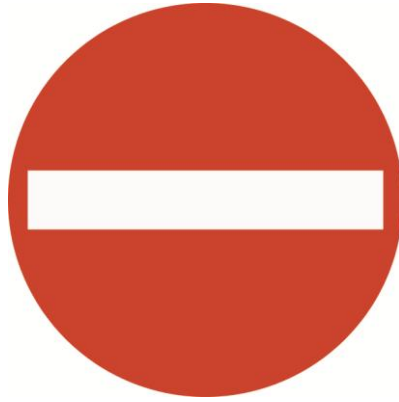


THERE WILL BE CONFLICT!

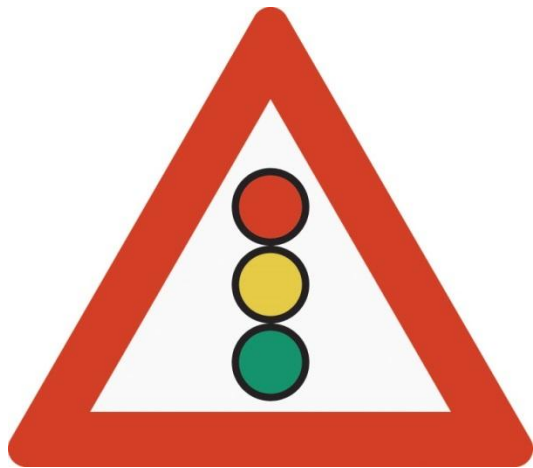
What should we fear?







Laws, rules, regulations and controls are necessary to keep the fish farming industry at a level where it can be handled satisfactory.



Some good advice:

Do not hurry

Restrict farming to certain areas well segregated from important salmon rivers.

Do not let the industry spread to every suitable fjord

Do not let the industry grow too fast

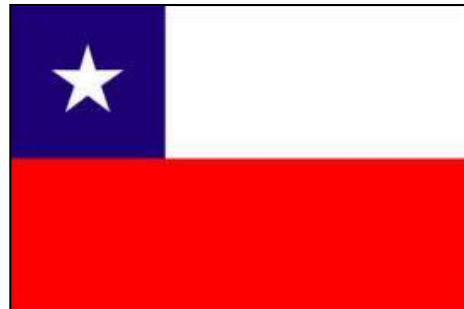
Put strong restrictions on the industry and make sure you have good legal framework.



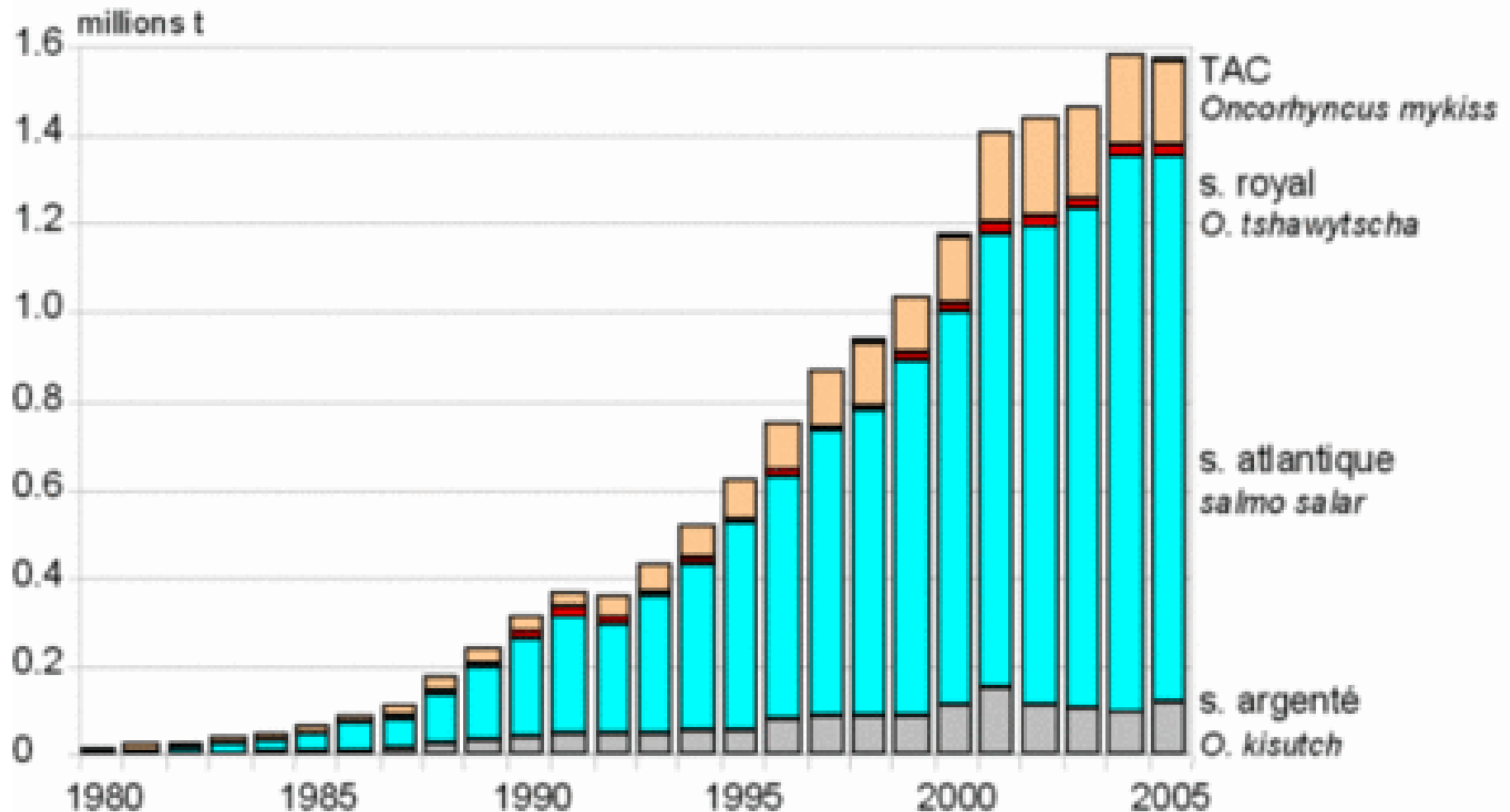


Chile

- Salmonids are NOT native to South America!
- Trout and salmon introduced to Argentina and Chile in the 1880-ies
- World-class angling for salmonids in these two countries today
- Fish farming from ca. 1980
- Collapse in the industry
2007-2008



Production of salmonids in Chile



Farming sites in Chile

Region X



Region XI





Chile:
An accident waiting to happen!

Lice; *Caligus rogercresseyi*



Foto: S. Bravo



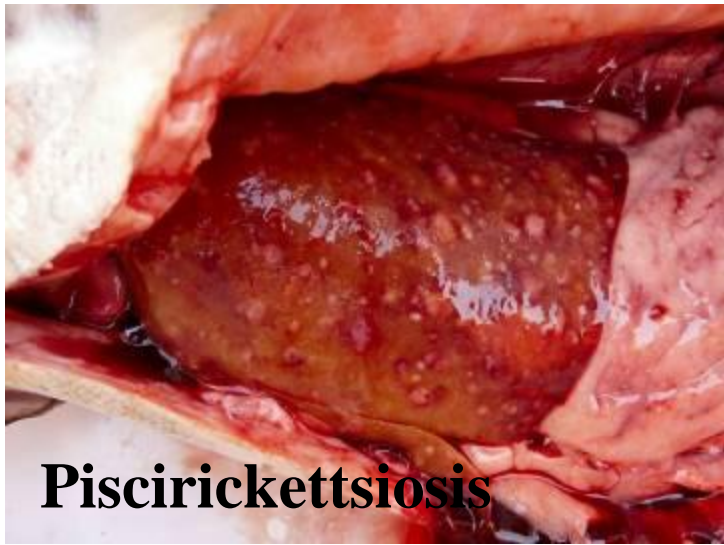
ISA

What went wrong in Chile?

Everything!



- **Sea-lice situation out of control (multiresistence)**
- **Liberal use of antibiotics and disinfection compounds**
- **High density of farms**
- **Extensive moving of fish between areas**
- **Strong belief in technical solutions instead of structural measures**
- **Inadequate legislation and powerful farming companies**
- **Many production-related diseases**
- **Very high mortality during the freshwater phase**



Piscirickettsiosis



Malformations



ISA

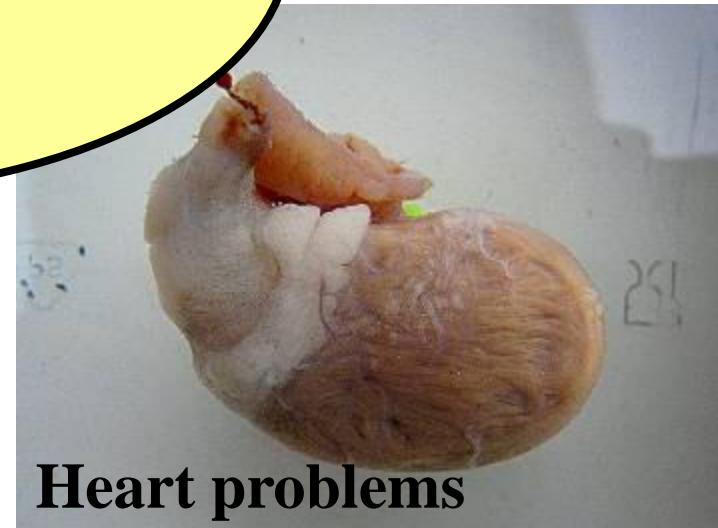
Structure

**Laws,
regulations**

COLLAPSE!



Caligus rogercresseyi



Heart problems

