

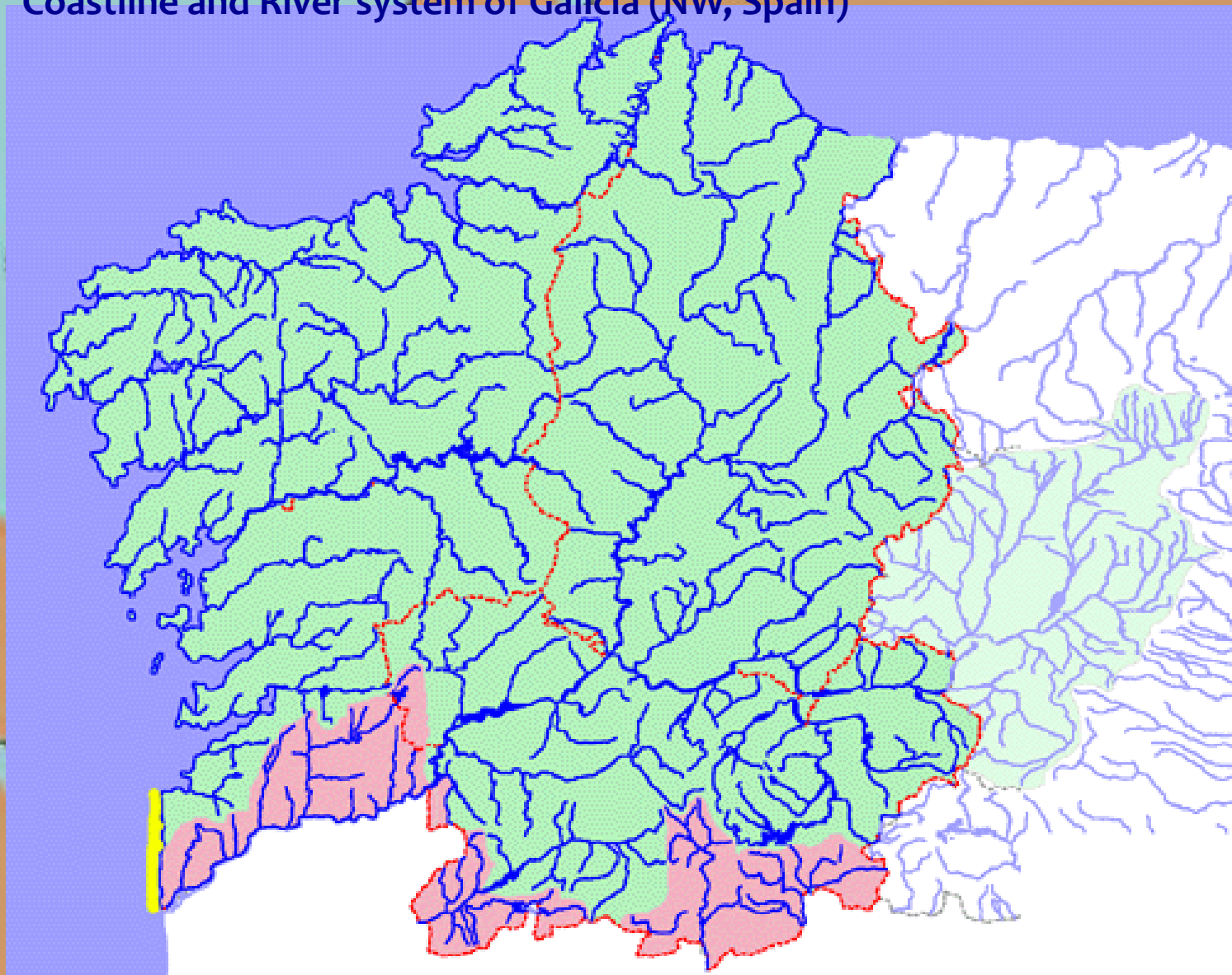
Gill Diseases in Salmon and Turbot in Spain

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Coastline and River system of Galicia (NW, Spain)



North/NorthWest Atlantic Spain is the southern limit for the wild salmon populations in Europe

Salmon Culture in Galicia (NW SPAIN)

	Year	Location	Specie	Company	Culture
1	1976/1977	Ria de Arosa (A Pobra do Caramiñal)	<i>S. salar</i>		Net pens
2	1983/1985	Ría Ortigueira	<i>O. kisuch</i> <i>S. salar</i>	Xanquei	Net pens
3	1990/2000	Ferrol	<i>S. salar</i>	Norafish	Inland tanks
4		Camariñas	<i>S. salar</i>	SAGAL	Inland tanks
5		Ría de Muros "A Creba"	<i>S. salar</i>	S. Roo	Net pens
6		Ría de Sada	<i>S. salar</i>	Isidro de la Cal	Net pens
7		Estaca de Bares	<i>S. salar</i>	Isidro de la Cal	Net pens
8	2008/2010	Ría de Arousa, Riveira	<i>S. salar</i>	Northwest Food	Net pens
9	2011/2015	Ría de Muros, "San Francisco"	<i>S. salar</i>	Northwest Food	Net pens

Fig. 2: Historic summary of the salmon culture in Spain. Origin of *S. salar* smolts: Scotland or Ireland

Locations of Salmon culture

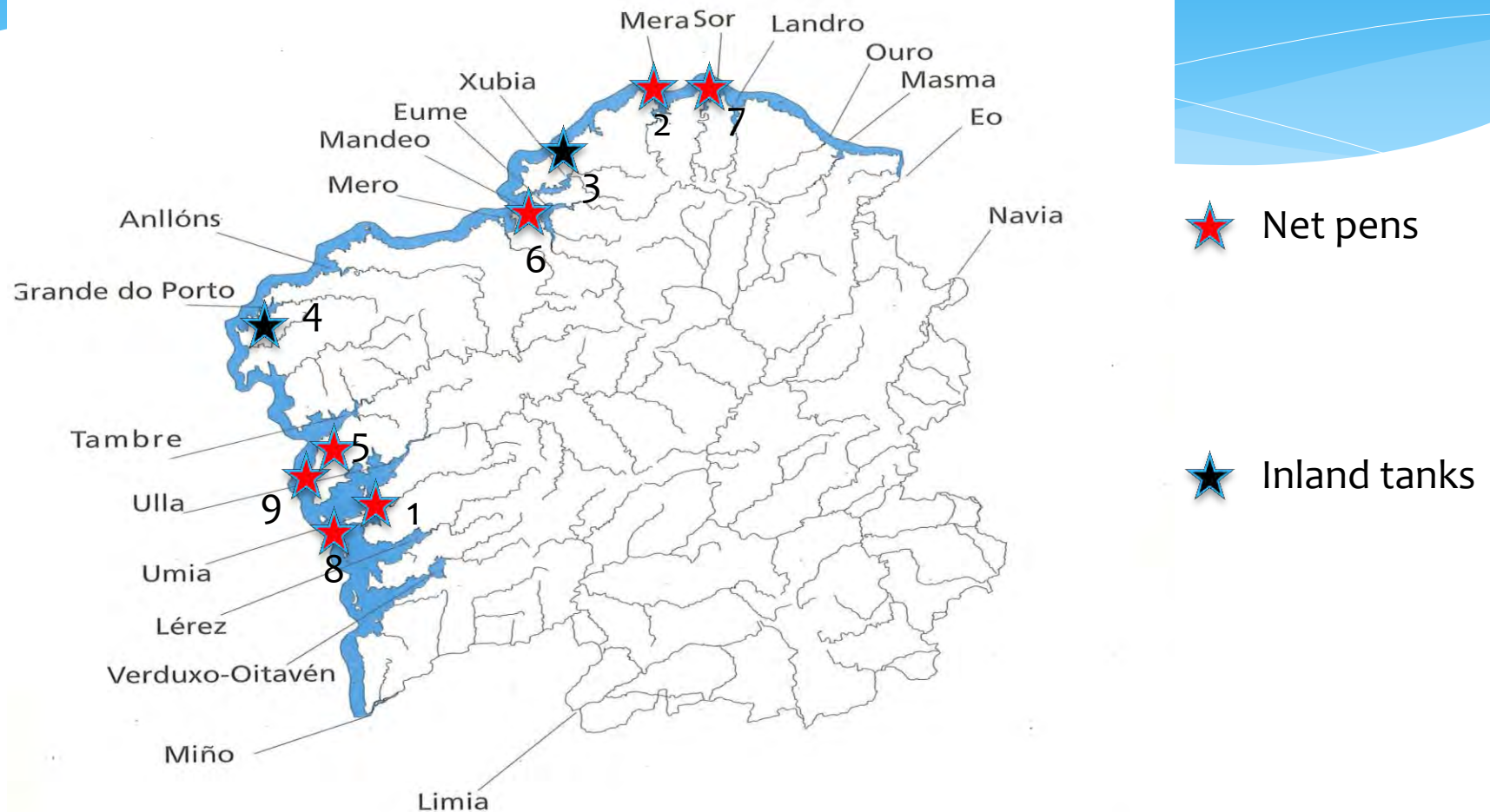
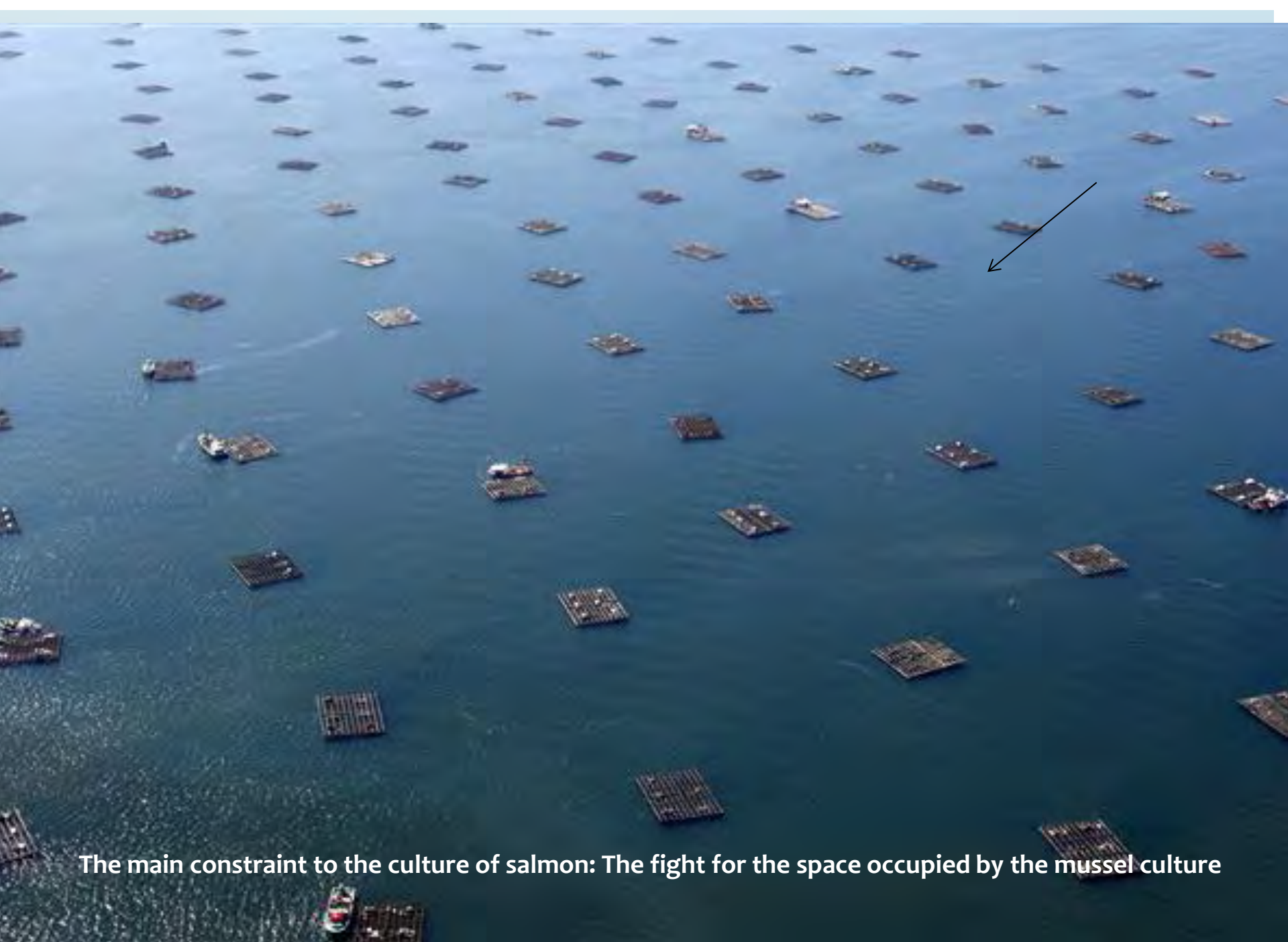


Fig. 3: Sequential picture. No all sites occupied at the same time. A number of the rivers marked, still harbours will salmon



The main constraint to the culture of salmon: The fight for the space occupied by the mussel culture

Problems/Incidences

- Vibriosis
 - Vibriosis/Tenacibaculosis
 - Forunculosis/Tenacibaculosis
 - Photobacteriosis (Formerly Pasteurellosis)
 - **AGD (Amoebic Gill Disease)**
 - Pancreas disease (PD)
 - IPNV
-
- Early maturation in *O. kisutch*
 - Pump cloggin with algae (Inland culture)
 - Oil spill (Aegean Sea tanker)

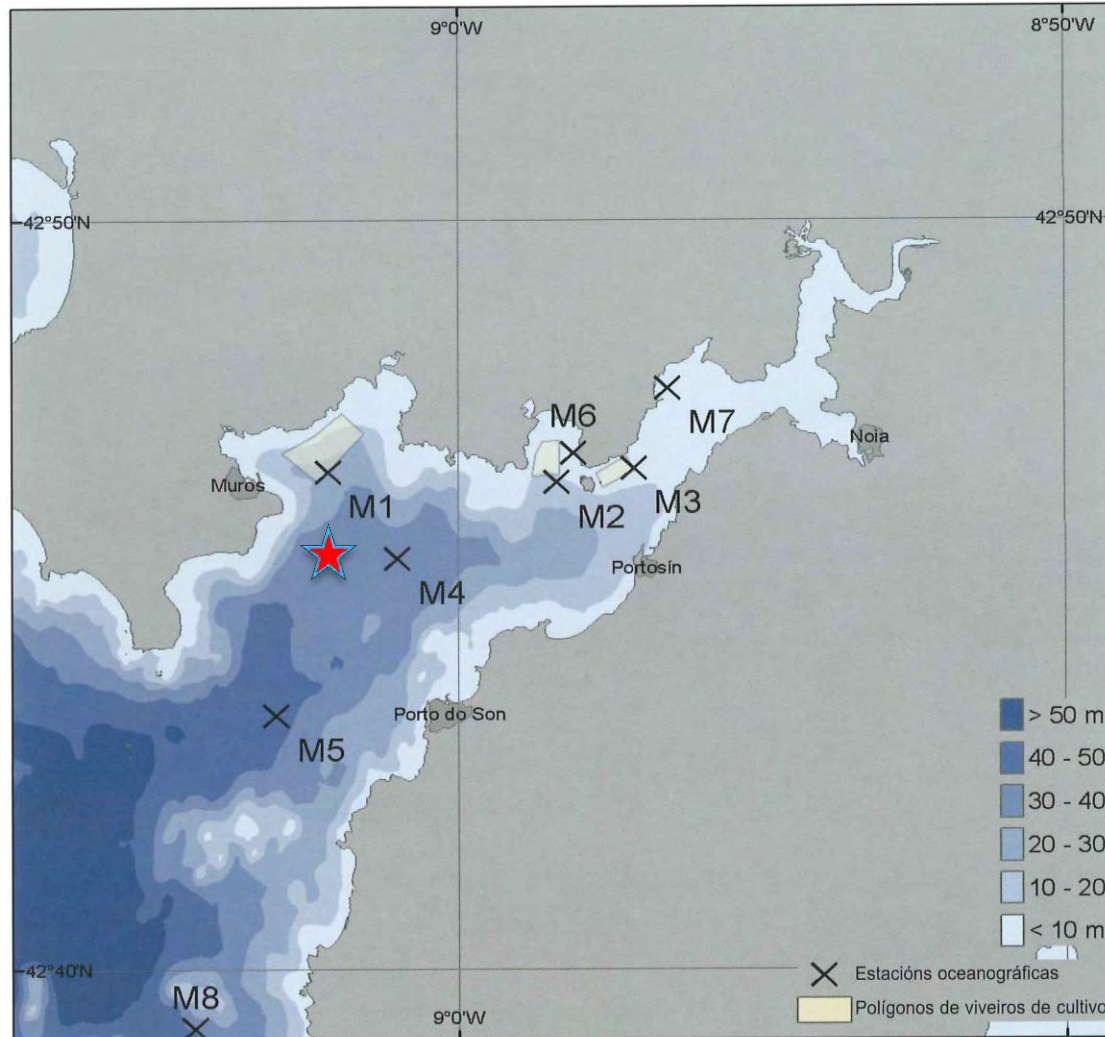


Vibriosis and Forunculosis occurred until the 80's before the starting of vaccination programs. PD and Pasteurellosis occurred only once. IPNV present occasionally with no mortalities associated.

The stress derived from AGD treatments seems to be the origin to the Tenacibaculosis.

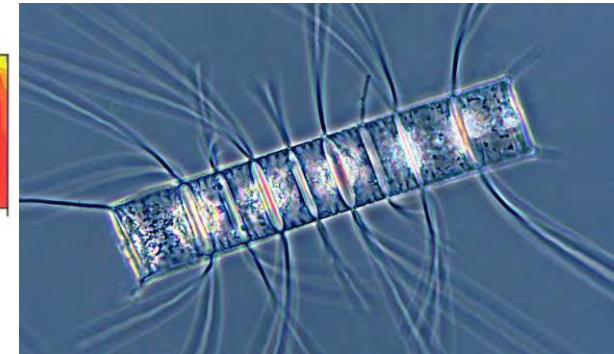
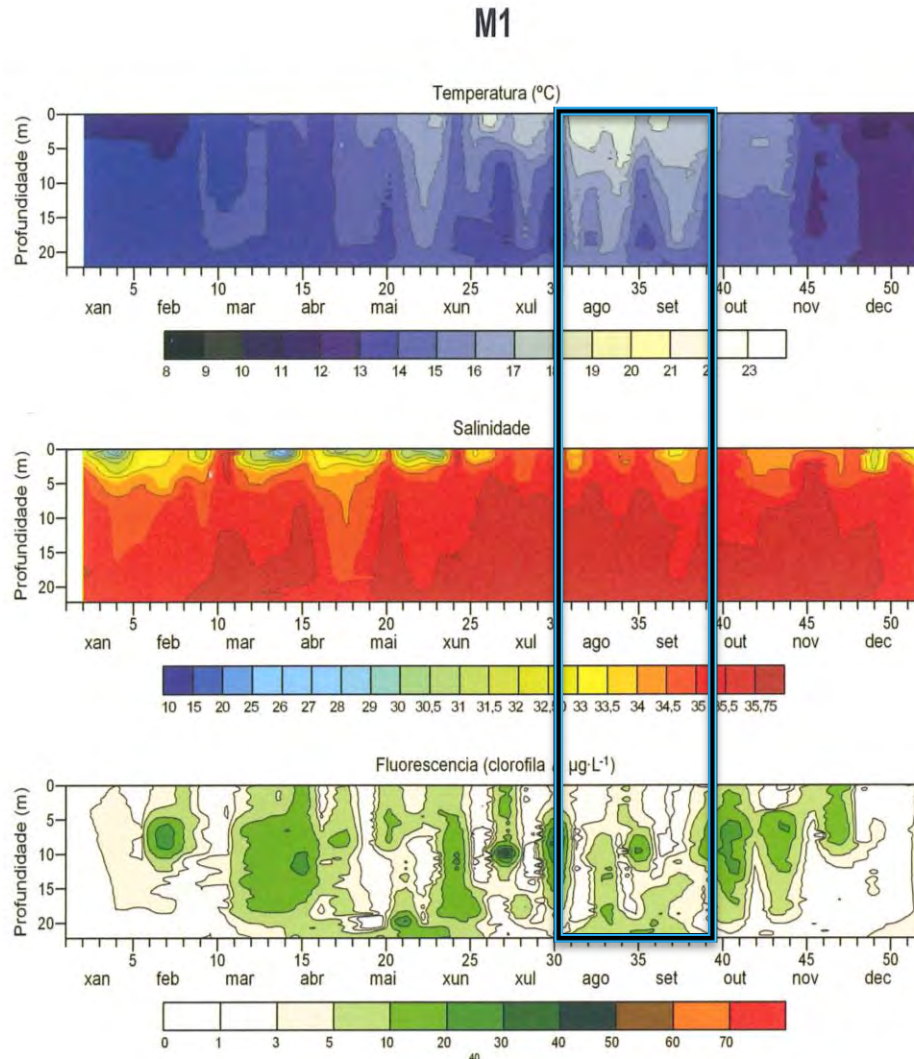
RÍA DE MUROS - NOIA

Source:
INTECMAR
(Galicia
Spain,2009)



Example of Oceanographic stations established to monitor pollution and red tides.
Red star = Salmon site

Oceanographic parameters (M1)

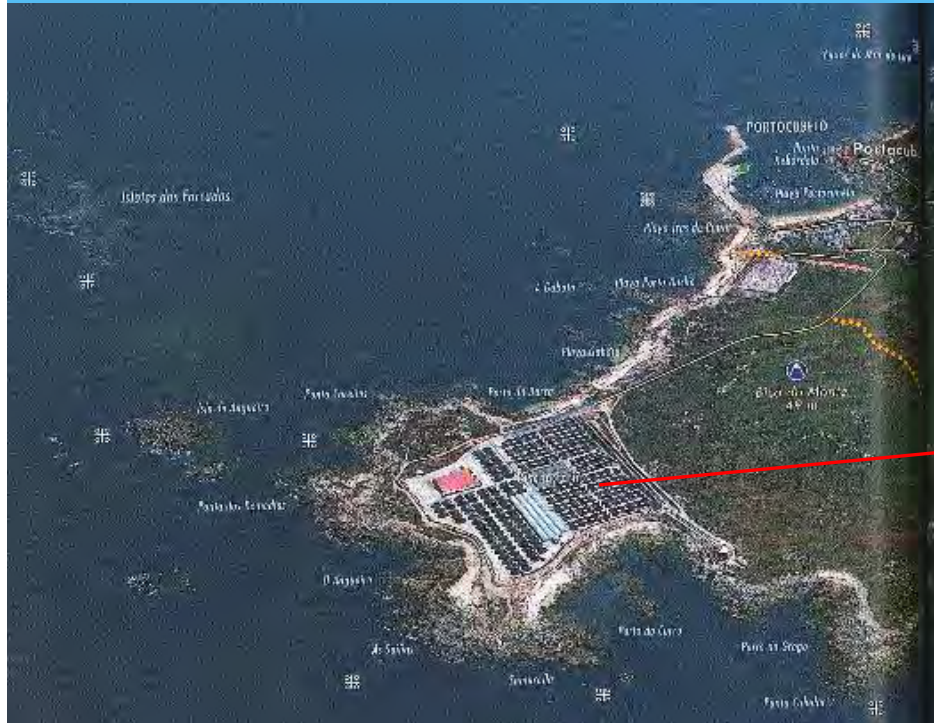


Chaetoceros

Source:
INTECMAR
(Galicia Spain,
2009)

High temperature and salinity--Plancton abundance (Chaetoceros, Skeletonema....)--Gill discomfort--Mucus overproduction, give rise to AGD

Inland Turbot farm



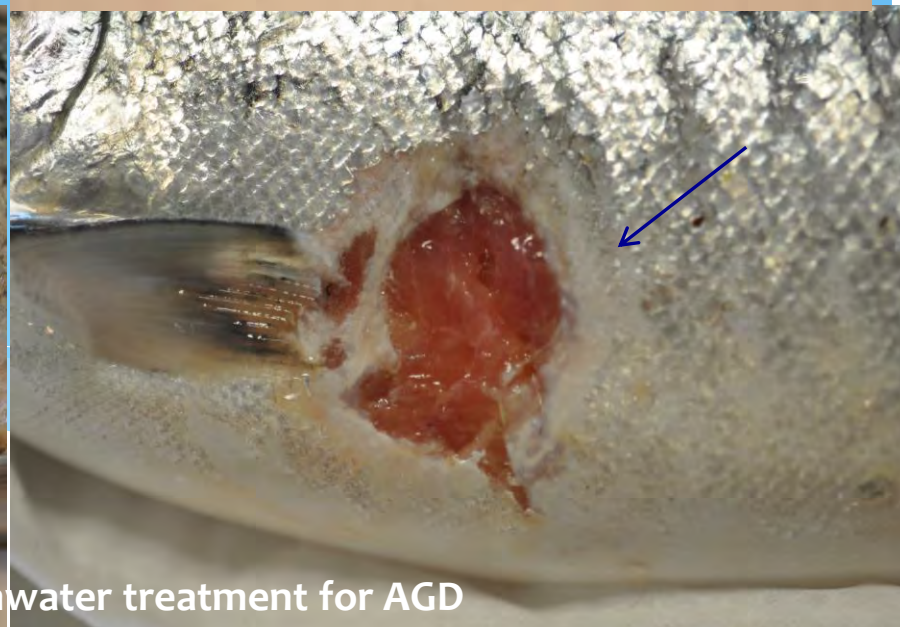
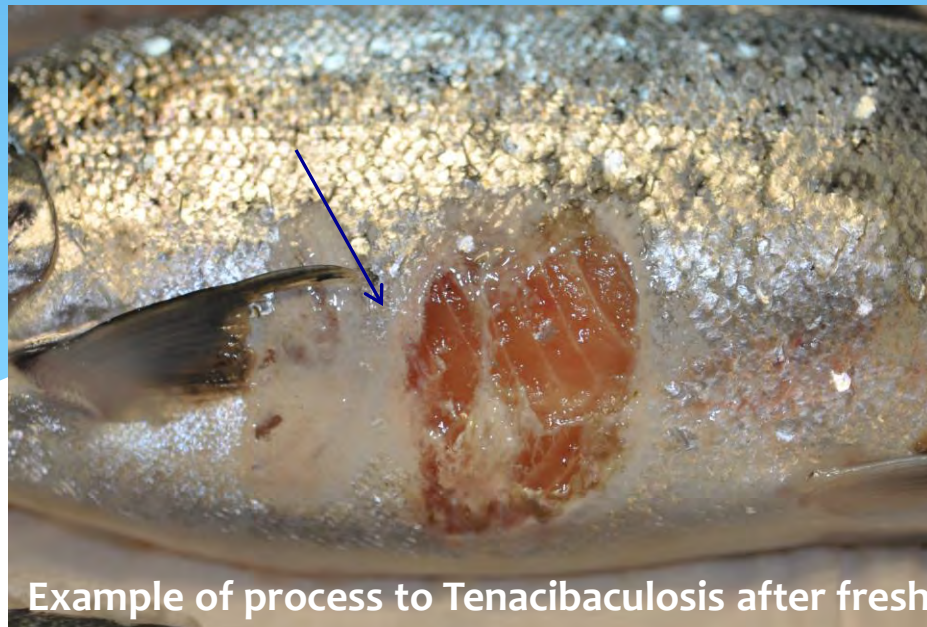
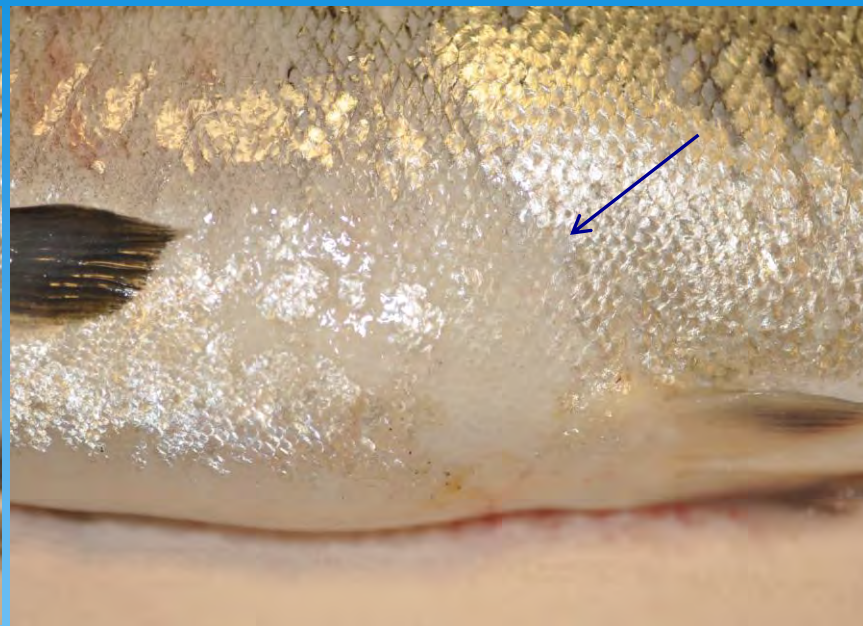
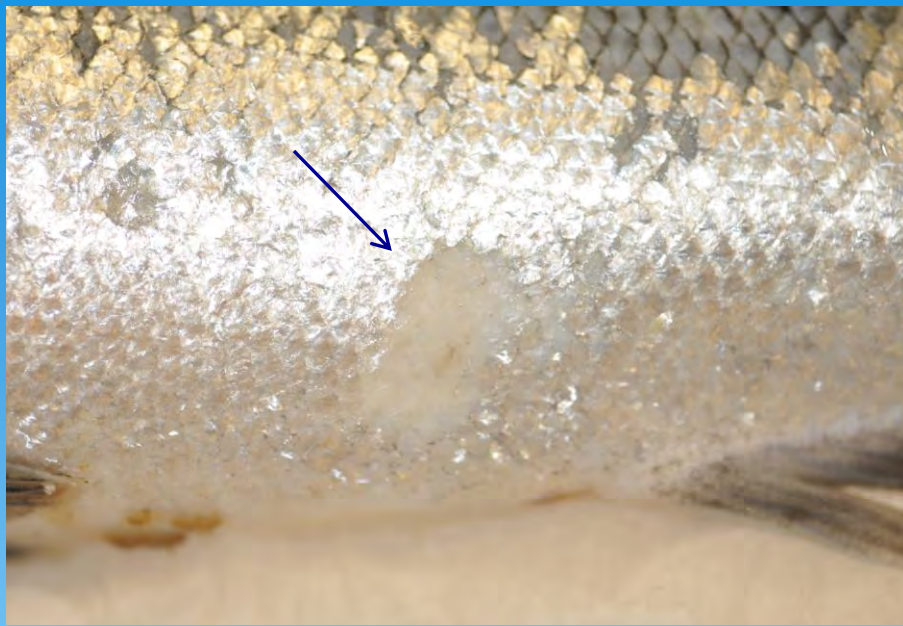
Atlantic Salmon in Northwest, Spain



In some cases, mixed infections of *T. maritimum* and *Aeromonas salmonicida*



Evolution of skin lesion diseased Atlantic salmon by *T. maritimum* in NW, Spain (2014-2015)



Example of process to Tenacibaculosis after freshwater treatment for AGD

Prophylatic treatments

(AGD, *Philasterides*, *Tenacibaculum*)

- * **Hydrogen peroxide (H_2O_2):**
 - ✓ Experiments in turbot demonstrated that 240 ppm/30 min of H_2O_2 is necessary to kill *T. maritimum* when it is colonizing the skin mucus of flat fishes.
 - ✓ However this high concentration increase dangerously the level of stress of fish

Prophylatic treatments

(AGD, *Philasterides*, *Tenacibaculum*)

- * **Freshwater baths:**

Preliminary experiments indicated that a decrease of salinity until **5ppt during at least 24 h** can be an useful strategy to reduce their prevalence in farmed flat fish.

- * **Formaldehyde:** Treatment in turbot.

Baths: 250 ppm during 1 hour



Aquaculture Institute (IA)



Biological Research Center (CIBUS)





Go raibh maith agat.
Slán

