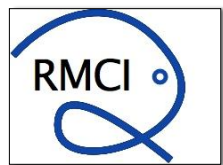


Fabrice Richez



# Review of the massive oyster mortality in France since 2008 and the implication for the oyster industry in Northern Ireland





# Research investigations about the massive oyster mortality



The background of the slide features a dark, underwater scene. On the right side, there are several yellowish-brown oysters. In the center, a translucent jellyfish with a purple, glowing, cross-like pattern on its bell is visible. The title text is overlaid on this background.

# Oyster mortality before 2008

- Massive oyster mortalities were getting more intense since the 1990's in France.
- This happen when the French production reached its production peak (150,000 tonnes).
- These mortalities were referred as summer mortalities and may have affected seed, juveniles and adults. Studies demonstrated a causal link between the presence of pathogens such as the herpes virus.
- Oyster summer mortalities were linked to multifactorial interactions between the state of the oyster, the pathogens, and the environment.

# Oyster mortality after 2008

- At difference to previous reports of mortalities, from 2008 these mortalities were affecting more:
  - **Seed, at unseen levels (80% mortality rates), recurrently every year, and almost everywhere around the French coast.**
- These mortalities also occurred in the summer, but at a lower sea temperature (from 16°C).
- Typically mortalities appear, from spring in successive wave during the summer, following a south North increase of temperature.
- French oyster production fall from 128,000 tonnes in 2008 to 80,000 tonnes in 2011.



# Oyster mortality in the Island of Ireland

- The Island of Ireland and the UK have been less affected by mortalities.
- Up to date, OsHV-1 $\mu$ Var has not yet been detected in 19 oyster production sites in the Island of Ireland and no abnormal increase of mortalities have been reported on these sites.
- **Possible explanations:** the lower degree of intensification of oyster farming, lower summer temperatures, limited shellfish movements between production sites and appropriate sanitary measures to stop the spread of the disease.

# Factors inducing mortalities

## **PATHOGEN**

- OsHV-1  $\mu$ Var.
- Co-infection possible with other pathogens (*Vibrio species*).

## **HOST**

- Spat and juveniles.
- Trophic conditions (fast growing oyster more susceptible).
- Genetic: certain families have higher survival rates.

## **ENVIRONMENTAL PARAMETERS**

- Mortality start when sea temperature increase, but not below 16-18°C.
- Mortality rate decrease above 24°C in investigation in the Mediterranean sea.
- Water quality and pollution affect the immune response of the oyster.
- Isolated sites are less or no affected by mortalities.

# Factors affecting the spread and dissemination of the disease

- The variant is highly contagious and horizontal transmission has been demonstrated during its replication phase.
- There is a constant migratory flux of the oysters with their diseases between France -UK- Ireland (spread of the disease between oyster productions regions)
- Dissemination of the disease within production sites: Cultural practices, hydrodynamic factors, sites proximity

A horizontal banner image showing an underwater scene. In the center, a translucent jellyfish with a purpleish-pink bell is visible. To its right, there are yellowish-green seaweed or kelp fronds. The background is dark blue, suggesting deep water. The title text is overlaid on this image.

# Impacts of the massive mortalities

- Impacts are huge, the production fell from 128,000 tonnes in 2008 to 80,000 tonnes in 2010.
- It has some benefit in Ireland because it has increased the price for bulk by 50%.
- For French producers the increase of the retail price didn't compensate the losses in production.



Response from the  
industry to reduce  
the impact of  
mortalities





# FACTORS CONTRIBUTING TO REDUCE OR AVOID MORTALITIES

- The sea temperature: Farming at deep sea, below 16°C
- Isolation: oyster farming away from main production sites, off shore, ponds, nurseries, tanks. during critical period or for the full production cycle.
- The degree of intensification of aquaculture, oyster farming overall biomass, hydrodynamics factors.
- Culture practices: period of seed transfer, exposure time (hardening the seed) or oyster densities in bags.



# PRODUCTION STRATEGIES PUT IN PLACE BY OYSTER FARMERS

- **I - Avoiding mortalities:**
- Use of ponds or tanks for remote setting technics.
- deep water site where temperatures are below 16 °C.
- Late transfer of seed.





# PRODUCTION STRATEGIES PUT IN PLACE BY OYSTER FARMERS

- **II - Development of specific aquaculture practices to reduce mortalities**
- Alternating fast growth (hardening seed) in the summer and fast growth (deep water cultures) in the winter.
- The late transfer of seed and the use of deep water sites.
- Seed selection at early stage, farming at high densities.

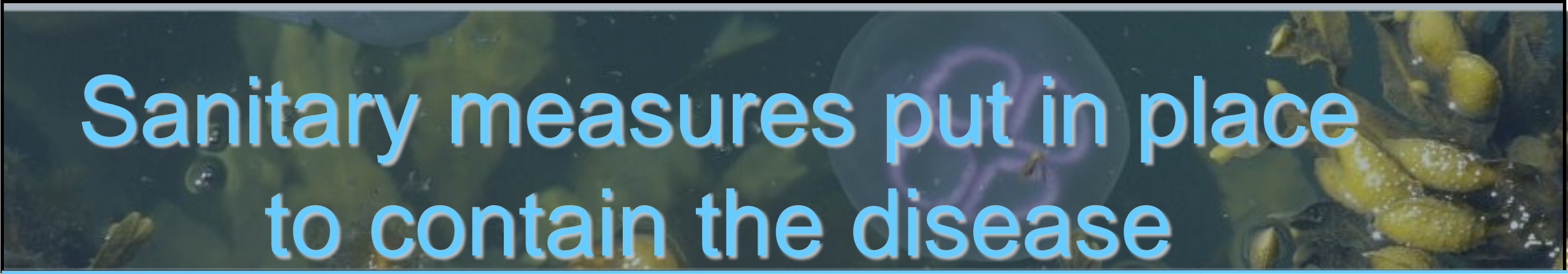


A horizontal banner image showing an underwater scene. In the center, a translucent jellyfish with a purpleish glow is visible. To its right, there are yellowish-green seaweed or kelp fronds. The background is dark blue, suggesting deep water. The text 'OTHER RESPONSES' is overlaid in a light blue, sans-serif font.

## OTHER RESPONSES

- The use of mussels as biological curtain to reduce viral concentrations in the sea.
- The production of selected seed by private commercial hatcheries and the national safeguard plan.
- The introduction of oysters from Japan and Brazil.
- The use of magneto-therapy in bags





# Sanitary measures put in place to contain the disease

- There is a constant migratory flux of the oysters with their diseases between France -UK- Ireland
- French, Irish, British authorities have engaged with the European commission to produce safeguard measures to limit the further spread of the disease.
- Commission decision 2011/187/EU: transfer of seed within bays of similar or superior sanitary status only.



# Transfer of knowledges, development for Northern Ireland





# OUTLOOK TO THE OYSTER FARMING INDUSTRY

- On the French side, it is hoped that progress will be made for the production of selected oyster seed with higher survival rates.
- The BIVALIFE (European consortium) should lead to better understanding about the OsHV-1  $\mu$ Var disease and how to control it.
- Some farming practices may reduce the mortality rates
- The market for bulk oyster is strong, as a result to the shortage of French stock.



# OPPORTUNITIES OF DEVELOPMENT FOR NORTHERN IRELAND

- Northern Ireland is less affected by massive mortality rate, so oysters can be produced at very competitive rates.
- There is a good market opportunity for the supply of seed and juveniles oysters to the French, British and Irish producers.
- Remote setting technics could be developed as a response to the shortage of disease free seed and to produce a locally grown seed.
- Effective sanitary measures have helped for the containment of OsHV-1  $\mu$ Var.



# OPPORTUNITIES OF DEVELOPMENT FOR NORTHERN IRELAND

- Such as in France, professional in Northern Ireland should be encouraged to develop their own production strategy (specialisation for the production of seed/ juveniles, commercial bulk).
- Also, the best approach to develop oyster farming is the carry out trial about best aquaculture techniques to adopted in a context of massive mortality.
- The monitoring of temperatures, the pathogen and mortality rates should help to understand the incidence of the disease.



THANKS

