Aquaculture Advisory Council

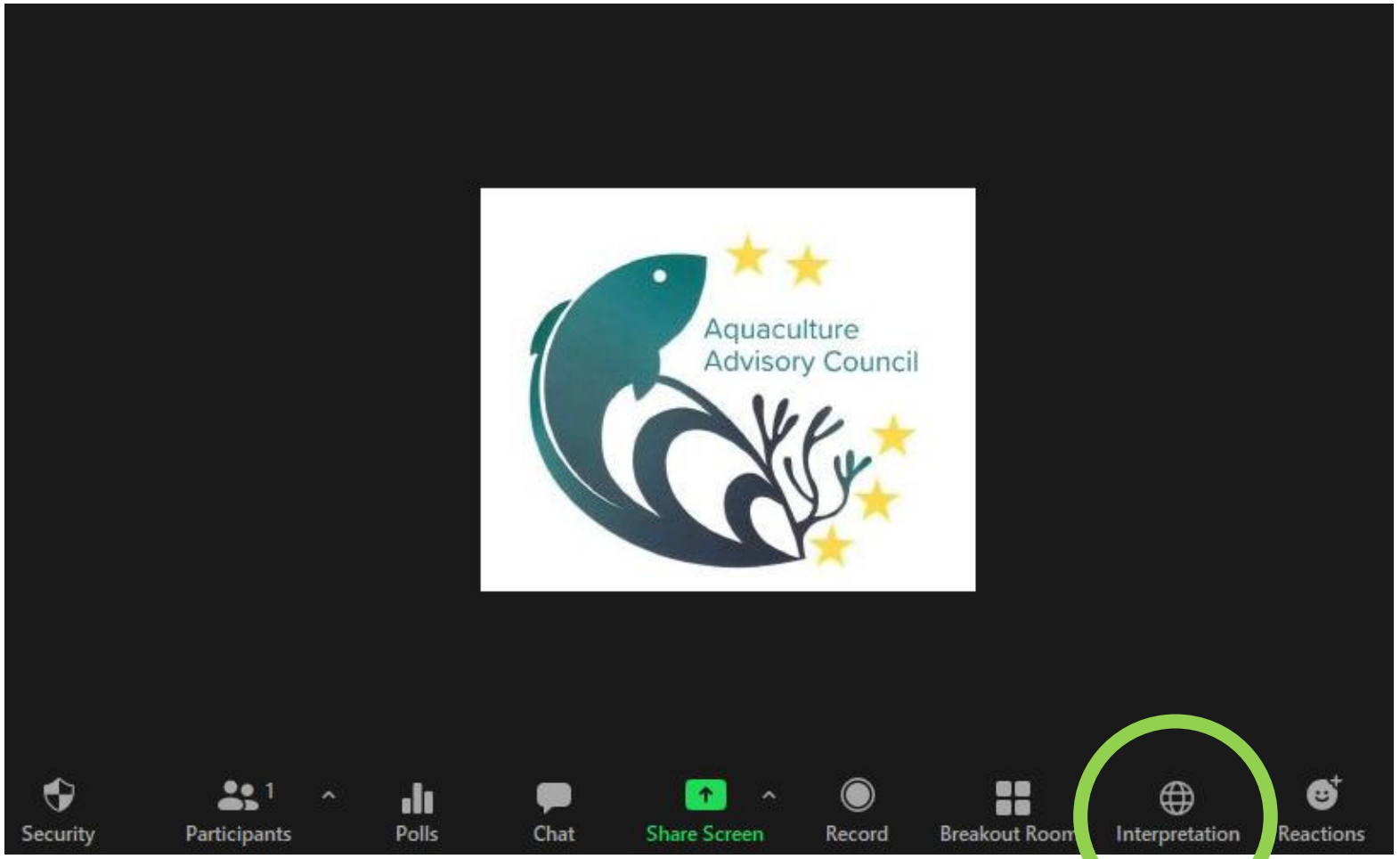
Working Group 2 Shellfish

Meeting

03.02.2026

10:00 – 13:00

How to use interpretation



How to use interpretation

Please make sure that you use the latest updated version of Zoom!

- Interpretation is available in EN, FR, ES and IT
- Please, be aware that when speaking, you'll need to switch to the channel of the language you're speaking in.

  - **For example**:
    Select 'English' when speaking English,
    'French' when speaking French,
    'Spanish' when speaking Spanish and
    'Italian' when speaking Italian.

Aquaculture Advisory Council

WG2 – Shellfish 03.02.26

Coming up next:

1. Approval of the agenda (10:05)

WELCOME WORDS BY THE CHAIR

WG2 – Shellfish 03.02.26

Coming up next:

Adoption of the agenda (2/2)

1. Adoption of the Agenda (1/2)

Welcome words by Chair Lorenzo Gennari (10:00)

1. **Approval of the agenda** (10:05)
2. **Norovirus** (10:10)
3. **Potentials and constraints in the implementation of restorative aquaculture** (10:35)
4. **Indicators on environmental performances (including animal welfare) of shellfish aquaculture** (11:00)

//COFFEE BREAK (11:25 – 11:35) //

5. **Indicators on economic and social performances (including animal welfare) of shellfish aquaculture** (11:35)
6. **Molluscan Welfare** (12:00)
7. **Follow up of previous recommendations** (12:20)
8. **Bivalve challenges – Exchange in view of an AAC contribution** (12:40)
9. **AOB & conclusions** (13:00)

End of the meeting: 13:05

WG2 – Shellfish 03.02.26

Coming up next:

2. Norovirus (10:10)

1. Adoption of the Agenda (2/2)

AOB

- Any other business?

WG2 – Shellfish 03.02.26

Coming up next:

Exchange of views with the Working Group members and decision on next steps

2. Norovirus

Exchange of information on the latest news

OXYVIR experimental observatory : season 2025-2026

AAC WG2 – 03/02/26

COMITÉ NATIONAL DE LA CONCHYLICULTURE

Objectives

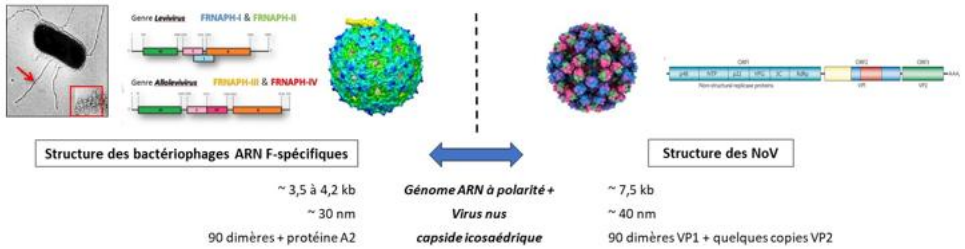
Dual objective: **scientific** and **operational**

Monitoring norovirus pollution in 74 shellfish farming areas (influenced and non-influenced) between Nov. 2025 and Apr. 2026 (68 areas in 2025-2026).

1. To validate in the field the reliability of the OXYVIR indicator (infectious F-specific RNA bacteriophages/infectious FRNAPH) after 10 years of experimental research
2. Define and apply appropriate control measures for each zone monitored (depuration, relaying, etc.)
3. Monitor oyster depuration performance

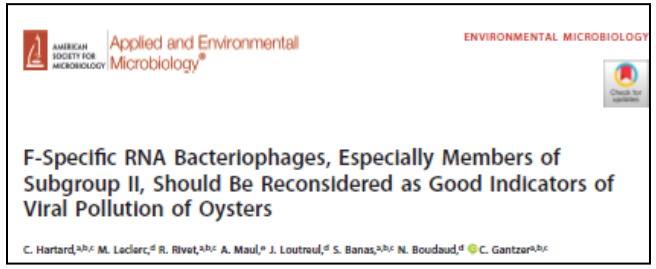
OXYVIR concept

For more than 10 years, almost absolute **scientific demonstration** of the usefulness of a viral indicator (**infectious F-specific RNA bacteriophages** (FRNAPH)) for estimating the presence of **infectious noroviruses** in oysters.



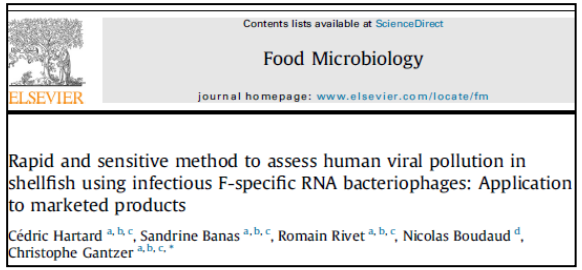
OXYVIR

4 of the 7 major scientific references on the concept:


Applied and Environmental Microbiology
ENVIRONMENTAL MICROBIOLOGY

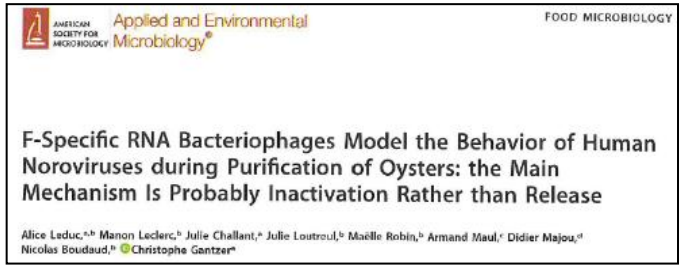
F-Specific RNA Bacteriophages, Especially Members of Subgroup II, Should Be Reconsidered as Good Indicators of Viral Pollution of Oysters

C. Hartard, M. Leclerc, R. Rivet, A. Maul, J. Loutreul, S. Banas, N. Boudaud, C. Gantzer


Contents lists available at ScienceDirect
Food Microbiology
journal homepage: www.elsevier.com/locate/fm

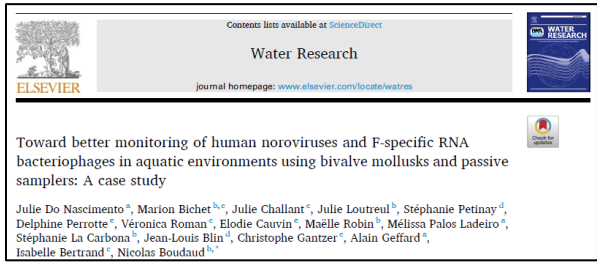
Rapid and sensitive method to assess human viral pollution in shellfish using infectious F-specific RNA bacteriophages: Application to marketed products

Cédric Hartard, Sandrine Banas, Romain Rivet, Nicolas Boudaud, Christophe Gantzer


Applied and Environmental Microbiology
FOOD MICROBIOLOGY

F-Specific RNA Bacteriophages Model the Behavior of Human Noroviruses during Purification of Oysters: the Main Mechanism Is Probably Inactivation Rather than Release

Alice Leduc, Manon Leclerc, Julie Challant, Julie Loutreul, Maëlle Robin, Armand Maul, Didier Majou, Nicolas Boudaud, Christophe Gantzer


Contents lists available at ScienceDirect
Water Research
journal homepage: www.elsevier.com/locate/watres

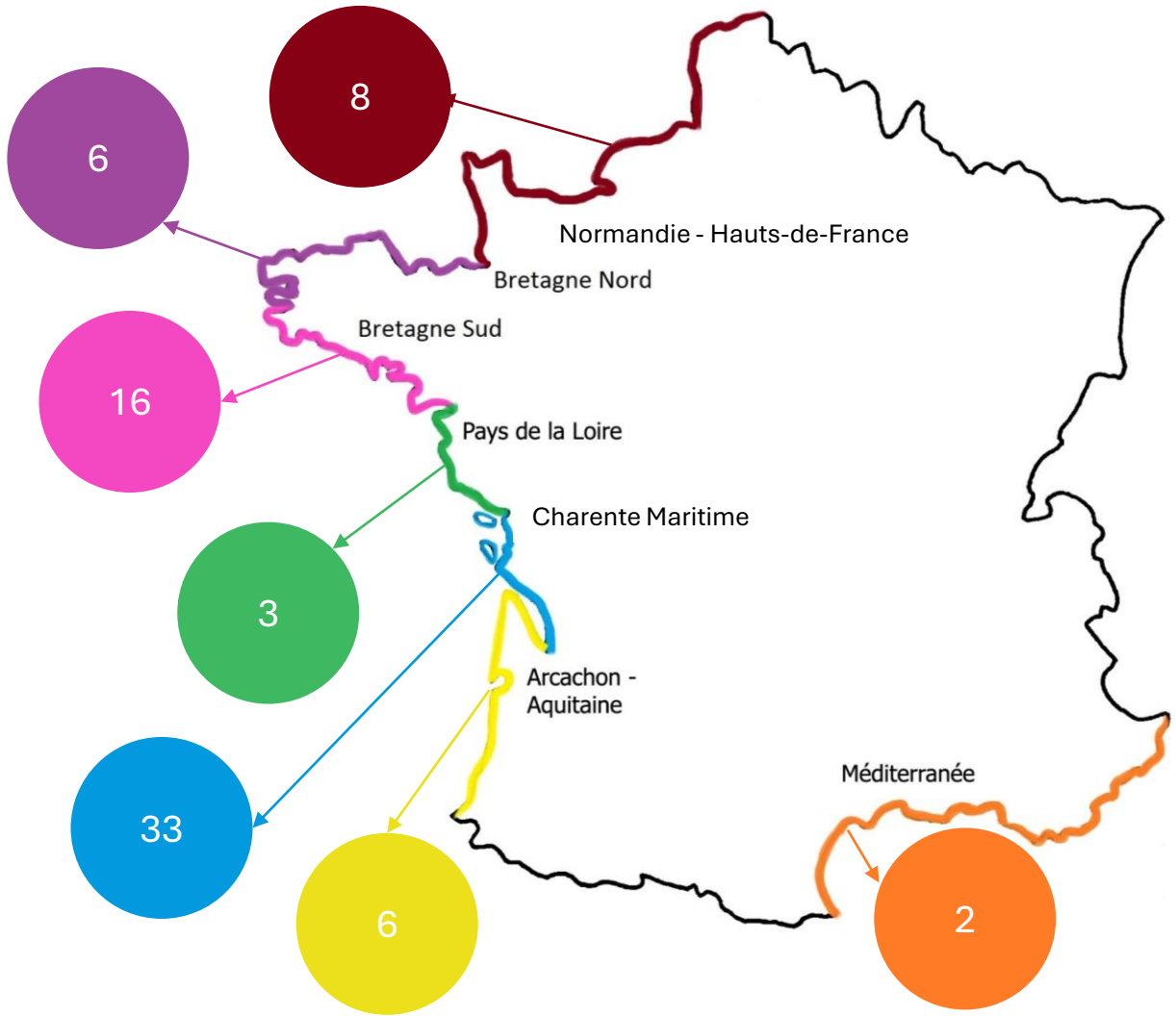
Toward better monitoring of human noroviruses and F-specific RNA bacteriophages in aquatic environments using bivalve mollusks and passive samplers: A case study

Julie Do Nascimento, Marion Bichet, Julie Challant, Julie Loutreul, Stéphanie Petinay, Delphine Perrotte, Véronica Roman, Elodie Cauvin, Maëlle Robin, Mélissa Palos Ladeiro, Stéphanie La Carbona, Jean-Louis Blin, Christophe Gantzer, Alain Geffard, Isabelle Bertrand, Nicolas Boudaud

Deployment

Sources of funding (09/12/25)

+ self-funding



General methodology

Day 0: samples sent

Sampling points

Shipped cold within 24 hours

Traceability sheet

D+1: receipt of samples

5 laboratories involved

J+1 - J+4 : analyses

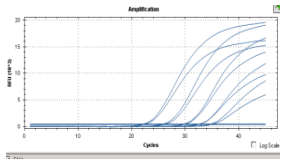
E. coli *(ISO 16649-3, NF V08-106)*

Total infectious FRNAPH
(Hartard and al., 2018)

GI and GII norovirus genome
(ISO 15216-1, 2017)

FRNAPH-II genome
(Wolf and al., 2010)

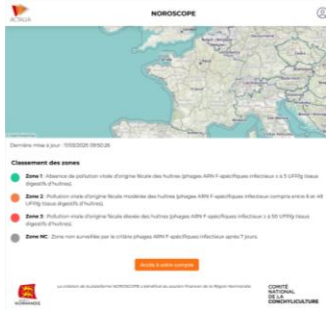


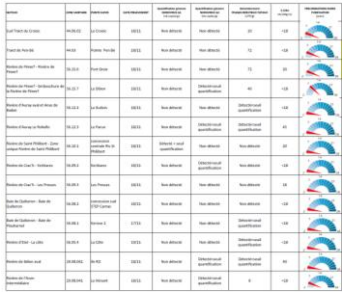




D+4 - D+5: dissemination of results

CRC: consolidated data via Noroscope platform

Professionnels: information by e-mail and/or SMS





2025-2026 winter season

Expected number of samples analysed between **01/11/2025 and 30/04/2026**

	Areas monitored(including control areas)	FRNAPH infectious	GI norovirus genome	GII norovirus genome	FRNAPH-II genome	*E. coli*
CRC NHDF	8	90 to 100				
CRC BN	6	100 to 110				
CRC BS	16	270 to 280				
CRC PDL	3	65 to 75				
CRC CM	33	25 to 35				
CRC AA	6	140 to 150				
CRC MED	2	55 to 65				
Total	**74**	**745 to 815**				

Distribution of a guide to controlling the norovirus

- GUIDE D'AIDE -

MAÎTRISE DU RISQUE NOROVIRUS

DANS LES ENTREPRISES CONCHYLICOLES

Conchylicultrices et conchyliculteurs, ce guide est pour vous (usage interne) !

Vous y trouverez des informations sur le norovirus et des mesures de maîtrise pour vous aider à gérer au mieux le risque norovirus dans vos coquillages et votre entreprise.

COMITÉ NATIONAL DE LA CONCHYLICULTURE

Décembre 2024

Agir et réduire le risque norovirus au sein de votre entreprise (2/4)

👉 Bien **connaître la traçabilité et l'origine de ses coquillages** : se renseigner sur le statut et les alertes sanitaires de chaque zone de production

Présence de gastro-entérites sur le territoire ?
Fortes pluies ?
Dysfonctionnement connu des réseaux d'eaux usées ?
Suspicion de TIAC à norovirus ?

👉 En cas d'**achat de coquillages**, se poser les **mêmes questions** et se renseigner auprès de son **fournisseur** : traçabilité et origine des coquillages, statut et alertes sanitaires de la zone de production

👉 Pour limiter le risque de contamination, plusieurs actions s'offrent à vous :

- La **mise à l'abri de mes coquillages** dans un bassin insubmersible et le travail **en circuit fermé** sans ajout ou renouvellement de l'eau
- La **récolte de mes coquillages** dans des zones conchylicoles non soumises aux pollutions virales

Agir et réduire le risque norovirus au sein de votre entreprise (3/4)

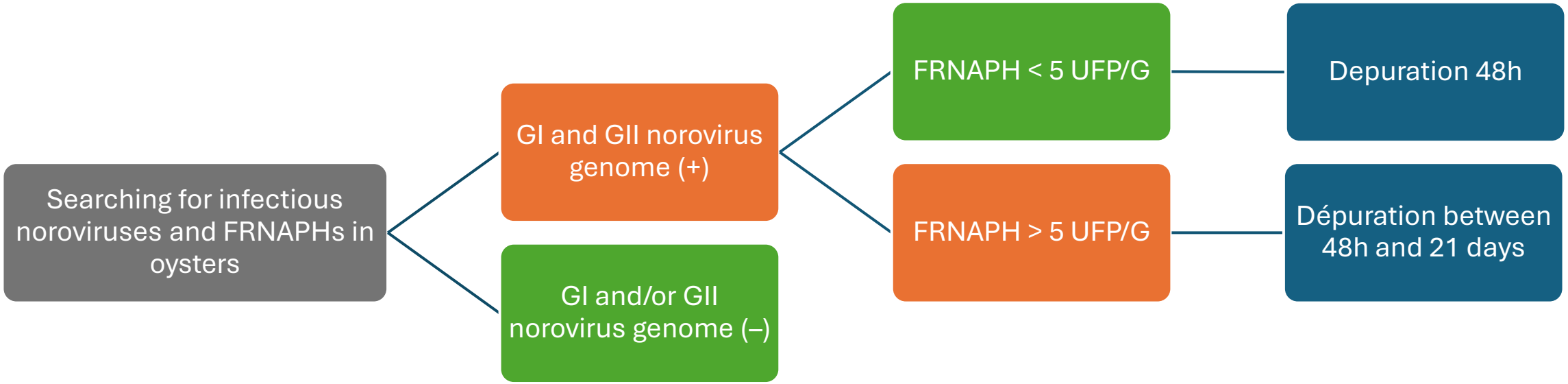
👉 **Suivre les informations transmises par votre CRC** notamment pour les zones suivies dans le cadre de l'observatoire OXYVIR* :

Niveau d'alerte	Probabilité de présence de norovirus infectieux	Mesures de maîtrise conseillées
Niveau 1	**Faible** => absence de pollution fécale	Dépuration de **48h** des coquillages en eau de mer propre
Niveau 2	**Faible** => pollution fécale ancienne	Dépuration de **48h** des coquillages en eau de mer propre
Niveau 3	**Faible** => pollution fécale récente sans présence de norovirus infectieux	Dépuration de **quelques jours** des coquillages en eau de mer propre (selon concentration en bactériophages infectieux)
Niveau 4	**Modérée** => pollution fécale récente faible avec norovirus infectieux	Dépuration de **5 jours** des coquillages en eau de mer propre
Niveau 5	**Elevée** => pollution fécale récente avec norovirus infectieux	Dépuration de **10 jours** des coquillages en eau de mer propre
Niveau 6	**Forte** => pollution fécale récente avec norovirus infectieux	Dépuration d'**au moins 15 jours** des coquillages en eau de mer propre
Niveau 7	**Significative** => pollution fécale récente avec norovirus infectieux	Dépuration d'**au moins 21 jours** des coquillages en eau de mer propre ou reparcage

*Quelques mots sur l'observatoire OXYVIR : suivi expérimental des niveaux de contamination des huîtres par le norovirus infectieux grâce à l'indicateur "bactériophages ARN F-spécifiques infectieux" sur plusieurs zones conchylicoles

Infectious norovirus risk assessment in oysters

Infectious F-specific RNA bacteriophages: management of the norovirus hazard via the OXYVIR indicator during winter season (november – march-april)



- **<u>Last season : only 24% of batches</u>** monitored were affected by a control measure between Nov. 2024 and Apr. 2025
- Vulnerability profiles: some areas more affected than others
- Viral pollution peaks clearly visible in areas monitored every week

Perspectives

- **1 shellfish production area closure at Thau Lagoon** (since December 29) : Heavy rainfall and multiple untreated wastewater discharges → harvesting and marketing prohibited

- **Increased gastroenteritis prevalence since early January :** Professionals on alert; control measures implemented as communicated by regional committees

- **OXYVIR observatory – upcoming scientific publication** : Data from winters 2024–2025 and 2025–2026 => No infectious FRNAPH threshold can currently be defined; risk levels under development

- **Ongoing and forthcoming scientific projects** :
  - Norotrack (FEAMPA, 2024–2027): viral pollution modeling in shellfish-farming areas
  - Initiative (FEAMPA, under review): viral inactivation modeling in oysters according to farming practices
  - OXYVIR – Europe: expansion of the OXYVIR observatory at European level

Thank you for your attention

Contacts :
Audrey LAINE – CNC, a.laine@cnc-france.com
Nicolas Boudaud – ACTALIA, n.boudaud@actalia.eu

COMITÉ NATIONAL DE LA CONCHYLICULTURE

WG2 – Shellfish 03.02.26

2. Norovirus

Exchange of views with the Working Group members and decision on next steps

Coming up next:

3. Potentials and constraints in the implementation of restorative aquaculture (10:35)

WG2 – Shellfish 03.02.26

Coming up next:

Exchange of views with the members and decision on next steps

3. Potentials and constraints in the implementation of restorative aquaculture

Presentation on the draft recommendation by **Hein SAS** (NORA)

Towards a recommendation on the “Potentials and constraints in the implementation of restorative aquaculture”

Hein Sas for AAC WG2

January 29, 2026

Potential (1)

AAC vision for 2040, 2025:

Some aquaculture systems contribute to biodiversity in wetlands and aquatic habitats and provide ecosystem services in addition to healthy aquatic food products.

FAO, Guidelines for sustainable aquaculture, 2025:

Promote aquaculture systems that provide habitat and refuge for both terrestrial and aquatic biodiversity, where appropriate.

Potential (2)

The AAC & FAO visions are applicable to shellfish aquaculture, since:

- Shellfish are the cornerstone of key (marine) habitats.
- Particularly: epibenthic species, such as mussels and oysters

Synergies shellfish aquaculture-nature:

- Enhancing larval concentration in the water, potentially supporting habitat development
- Fulfilling ecosystem functions (water filtration, nutrient extraction), or resembling these (biodiversity enhancement)

NB: While overall environmental impacts are relatively low

Opportunity (1): Nature Restoration Regulation

- EU Nature Restoration Regulation (NRR), Article 5 - Restoration of marine ecosystems:

  Member States shall put in place the restoration measures that are necessary to improve to good condition areas of habitat types listed in Annex II which are not in good condition.

- Annex II includes Shellfish beds (‘Group 3’) as relevant habitats

Opportunity (2): NRR implementation

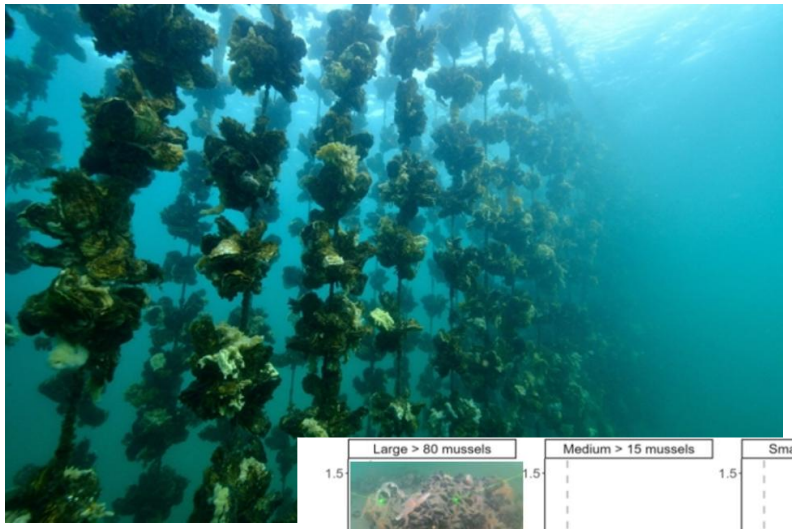
- National governments must submit draft implementation plans to EC by September 2026, with habitat restoration as priority over species restoration
- Observations from international Dublin (Nov 2025) and Bologna (Dec 2025) meetings: national governments are struggling with marine implementation plans and looking for guidance/support

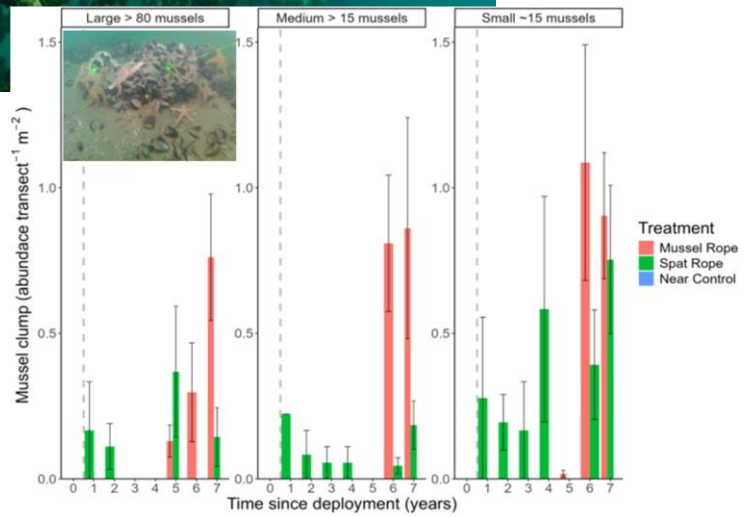
➢Expectation: Need for guidance/support to identify effective NRR-measures in the marine environment will continue the coming years

➢Hypothesis: Restorative shellfish aquaculture has potential as NRR-habitat restoration measure

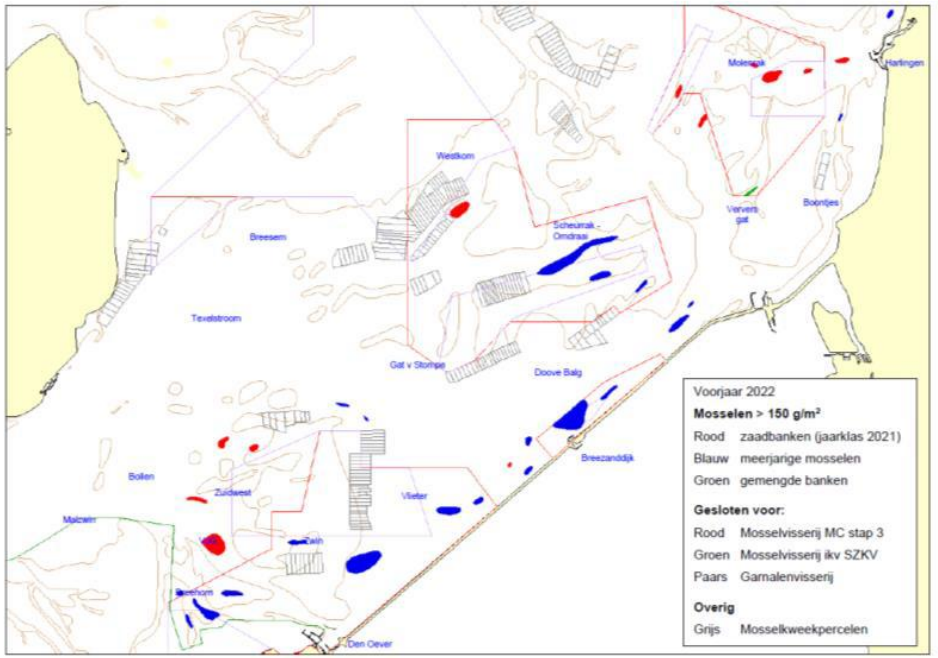
Restoration examples: mussels

Lyme Bay (UK): ropes to reefs





Wadden Sea (MPA-NL): selective seed fishing + catchment in water column

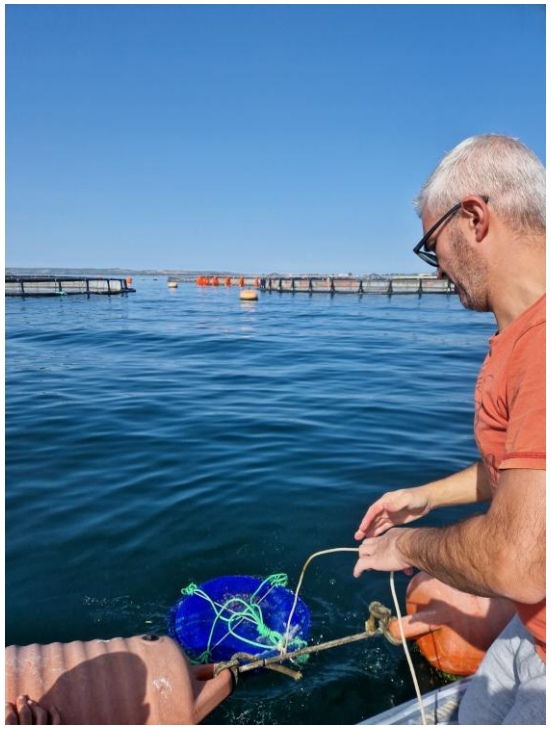


Other examples: Ireland

Restoration examples: flat oysters

Loch Ryan (Sc): 30 years limited harvesting. Result: 1M → 20 M oysters + reef development

NORA Lagune (MPA-It): cultivation + reef development since 2021



Develop Recommendation to EC

Undertake process to define ‘restorative aquaculture’ as an activity which supports implementation of NRR:

1. Define NRR-relevant indicators to determine effects by aquaculture
2. Define minimum score on indicators to accept aquaculture as NRR-implementation measure
3. Define adequate monitoring to measure 1 and 2
4. Describe aquaculture practices (dependent on various environments) leading to minimum score under 2
5. Develop procedure for these aquaculture practices to be eligible for NRR–implementation in MPAs and related financial support

Scope: blue mussel (*Mytilus edulis*) and flat oyster (*Ostrea edulis*) aquaculture

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3. Potentials and constraints in the implementation of restorative aquaculture

Exchange of views with the Working Group members and decision on next steps

Coming up next:

4. Indicators on environmental performances (including animal welfare) of shellfish aquaculture (11:00)

WG2 – Shellfish 03.02.26

Coming up next:

Exchange of views with the members and decision on next steps

4. Indicators on environmental performances (including animal welfare) of shellfish aquaculture

Presentation of the draft recommendation by **Lorenzo Gennari** (AMA)

WG2 – Shellfish 03.02.26

Coming up next:

Group photo & Coffee break (11:25)

4. Indicators on environmental performances (including animal welfare) of shellfish aquaculture

Exchange of views with the members and decision on next steps

WG2 – Shellfish 03.02.26

Coming up next:

Coffee Break (11:25)

GROUP PHOTO!

If you want to join the photo, please make sure your camera is on and….smile ☺

WG2 – Shellfish 03.02.26

Coming up next:

5. Indicators on economic and social performances (including animal welfare) of shellfish aquaculture (11:35)

COFFEE BREAK

11:25 – 11:35

WG2 – Shellfish 03.02.26

Coming up next:

Exchange of views with the members and decision on next steps

5. Indicators on economic and social performances (including animal welfare) of shellfish aquaculture

Presentation of the draft recommendation by **Thibaut Pivetta** (EMPA)

WG2 – Shellfish 03.02.26

5. Indicators on economic and social performances (including animal welfare) of shellfish aquaculture

Exchange of views with the members and decision on next steps

Coming up next:

6. Molluscan Welfare (12:00)

WG2 – Shellfish 03.02.26

Coming up next:

Exchange of views with the members and decision on next steps

6. Molluscan Welfare

Update on FG activities by the FG leader **Paul Denekamp** (Vissenbescherming)

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Coming up next:

7. Follow up of previous recommendations (12:20)

6. Molluscan Welfare

Exchange of views with the members and decision on next steps

WG2 – Shellfish 03.02.26

Coming up next:

Exchange of views with the members and decision on next steps

7. Follow up of previous recommendations

Update by the **Secretariat**

Recommandation	Follow up	EC reply	WG analysis of EC's reply
Shellfish farming as nitrogen sink	New follow-up recommendation	Yes	Yes
Good husbandry practises in shellfish farming	New follow-up recommendation	Yes	Yes
Norovirus crises	Execute follow-up analysis	Yes	Yes
Biosecurity of shellfish hatcheries and nurseries	Execute follow-up analysis	Yes	Yes
Molluscan welfare	Analyse EC answer	Yes	No
Framing new EU financial tools to support good husbandry practices in shellfish farming	Analyse EC answer	Yes	No
Concerning Impact of Climate Change on EU Mussel Production	Analyse EC answer	Yes	No
Blue Crab Emergency in Italy	Await EC answer	No	NA

Aquaculture Advisory Council

WG2 – Shellfish 03.02.26

Coming up next:

8. Bivalve challenges – Exchange in view of an AAC contribution (12:40)

7. Follow up of previous recommendations

Exchange of views with the members and decision on next steps

WG2 – Shellfish 03.02.26

Coming up next:

Exchange of views with the members and decision on next steps

8. Bivalve challenges – Exchange in view of an AAC contribution

Update by the **Chair**

WG2 – Shellfish 03.02.26

Coming up next:

9. AOB & conclusions (13:00)

8. Bivalve challenges – Exchange in view of an AAC contribution

Exchange of views with the members and decision on next steps

WG2 – Shellfish 03.02.26

Coming up next:

End of the meeting

9. AOB & conclusions

Aquaculture Advisory Council

Date & Place of the next WG2 meeting

Date and place of the next WG2 meeting

Brussels – 10 June morning 2026

THANK YOU!

Your contacts:

AAC Secretariat

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Aquaculture Advisory Council