



1.3 Sustainable Management of SPAs Through Delineation of Buffer Zones

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Final Meeting - 15 April 2021

Ambitions

- Better understanding of the interaction between factors that lead to closures
- Improved modelling tools to predict impacts from norovirus and algal biotoxins
- Better predictions to inform industry and regulators to reduce impact and maintain public health protection



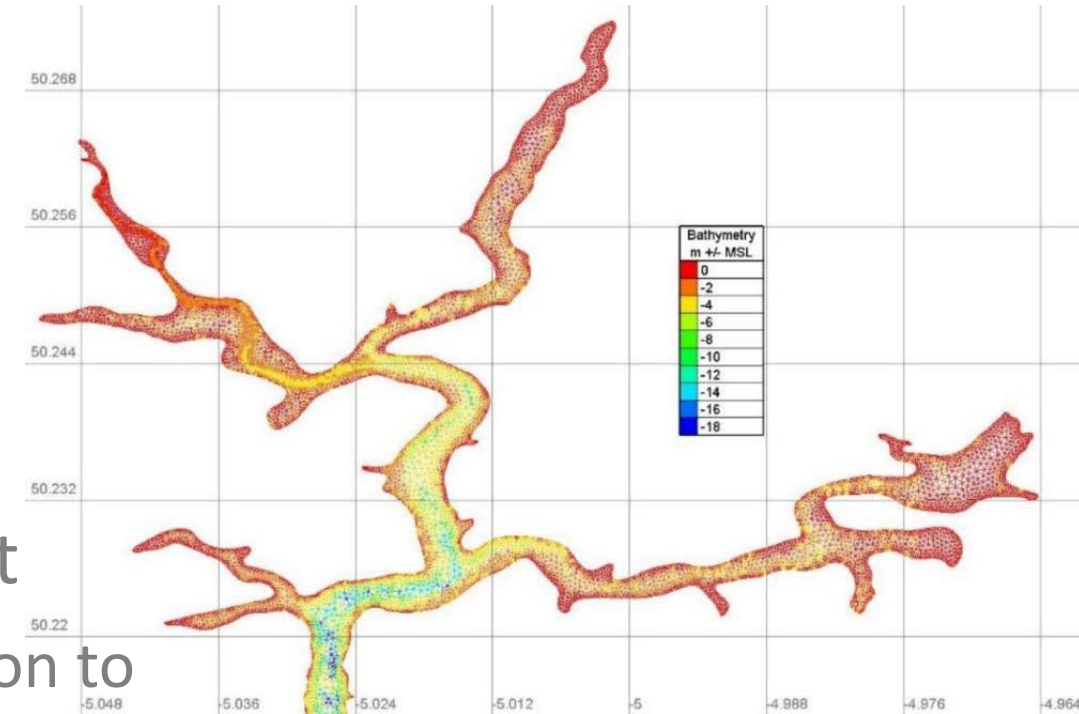
Outcomes

- Investigation of the suitability of a buffer zone approach to management of bivalve shellfisheries
- Modelling of norovirus and toxins to predict impacts based on specific areas in England and Spain
- Description of how to apply this information



Buffer Zone Modelling Protocol

- Characterisation of area
 - Sanitary Survey
 - Bathymetric data
 - Environmental data
 - Knowledge of sources
- Modelling can be applied by a specialist
 - Tidal cycles, dilution, die off and depuration to be considered in developing a dynamic buffer zone based on area and sources



Toxic Phytoplankton Model

- Alfacs Bay – rich dataset
- Five taxa studied
- Neural network models developed
 - 1-2 weeks forecast
 - Abundances above/below alert threshold values for Alfacs Bay

Taxon	Threshold alert concentration (cells L-1)
<i>Alexandrium minutum</i>	1,000
<i>Pseudo-nitzschia</i> spp	2,000,000
<i>Dinophysis</i> spp	500
<i>Dinophysis caudata</i>	500
<i>Dinophysis sacculus</i>	500

Harvest prediction tool

- Modelling based on depuration rate from McMenemy, et al 2018
- Requires knowledge of *E. coli* in both seawater and shellfish on start date

Measured
in shellfish
on day 1

Measured
in water on
day 1

Parameter	Value
Start date (dd/mm/yyyy)	01/01/2021
Species (mussel, oyster, cockle)	oyster
Season (cold, warm)	cold
NoV Threshold (copies/g)	600
Initial <i>E. coli</i> Concentration (MPN/100g)	1000
Initial <i>E. coli</i> uptake (MPN/100mL)	500
Depuration rate (d ⁻¹)	7.89456
Possible harvest date	27/01/2021

Some scenarios give very long closure times

Next Steps and Future Work



- Develop projects for further validation work in different locations
- Further work toward development of modelling for toxin prediction in wider areas
 - Refine to allow lower detection limits
 - Identify data rich areas that could support further development of approaches
 - Advocate for improved data gathering in areas that have toxin issues
- Real-world testing and applicability





Thank You

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