

Using numerical modelling to regulate a growing aquaculture industry

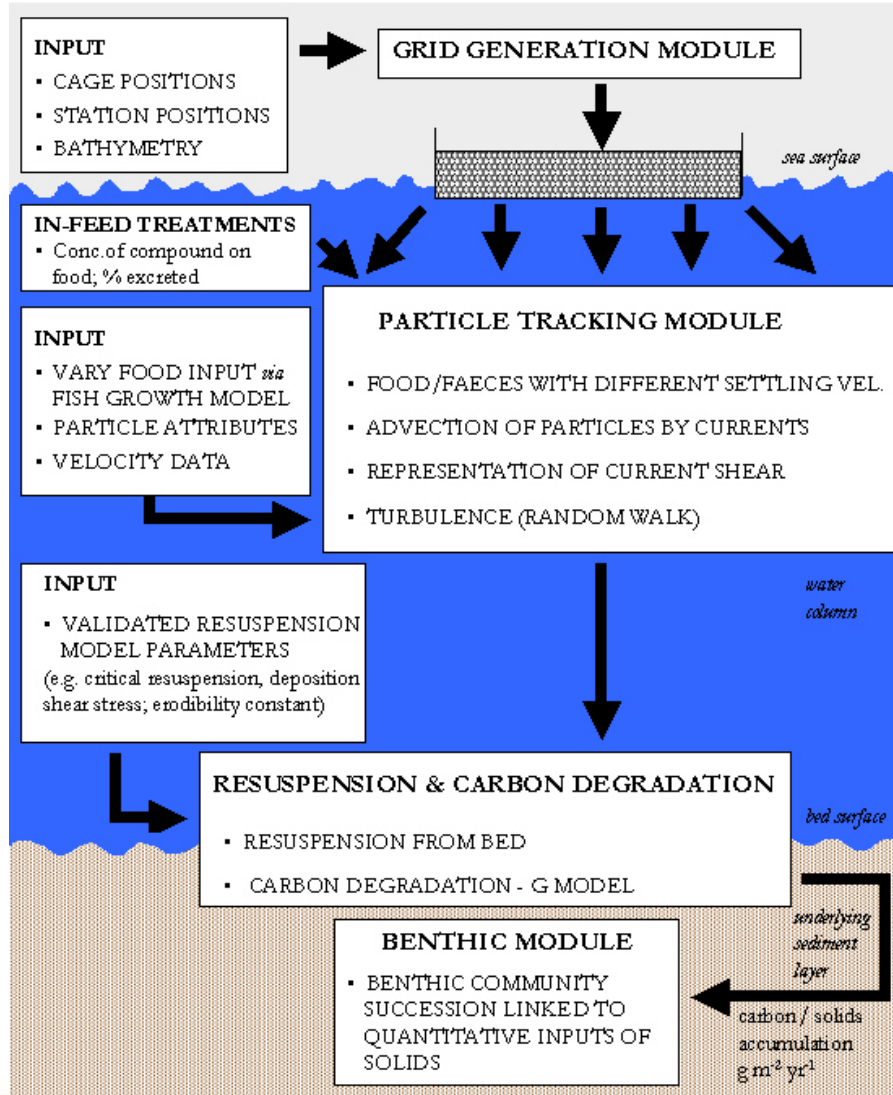


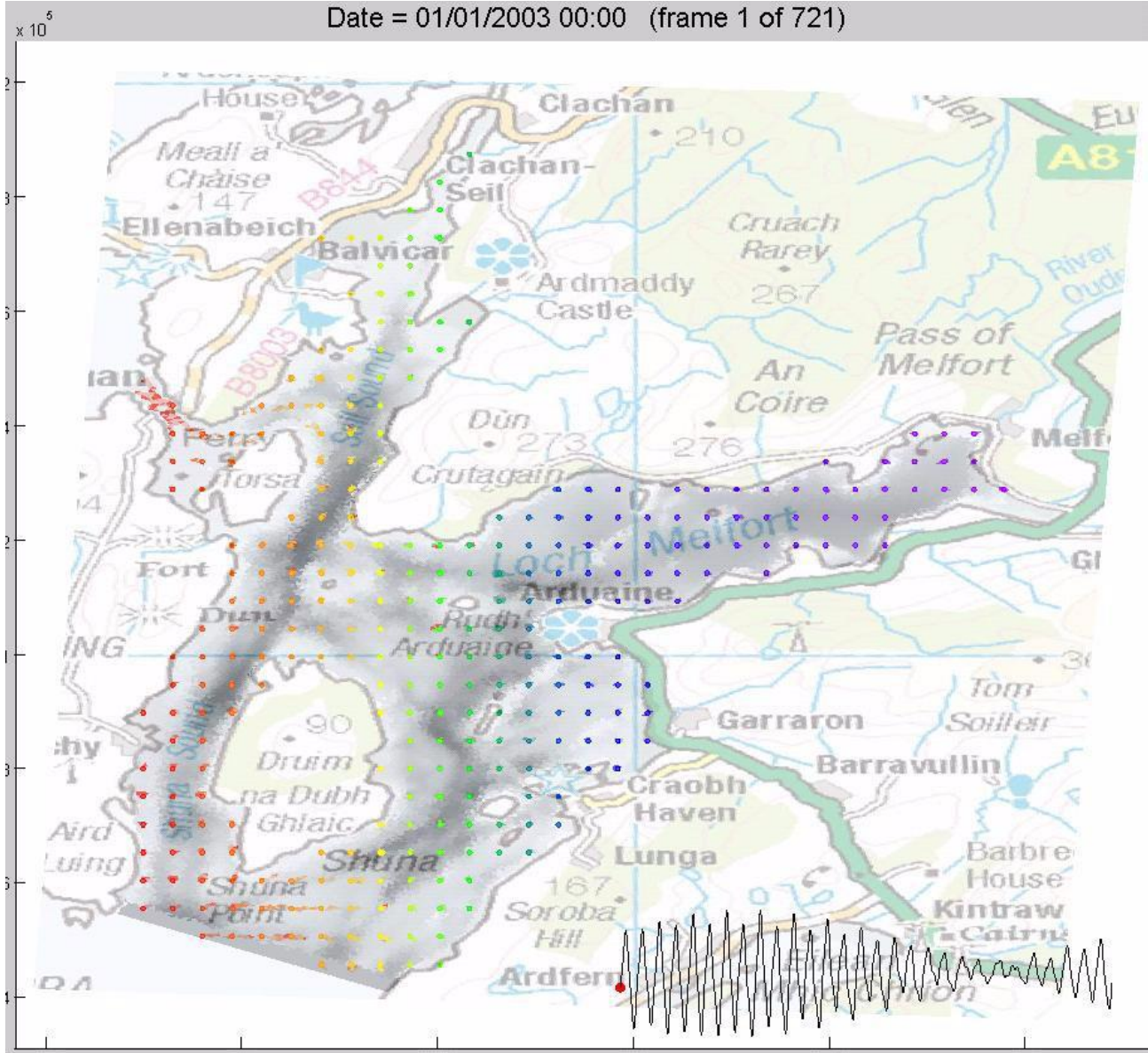
Dr Ted Schlicke
Air & Marine Modelling Unit,
Scottish Environment Protection Agency

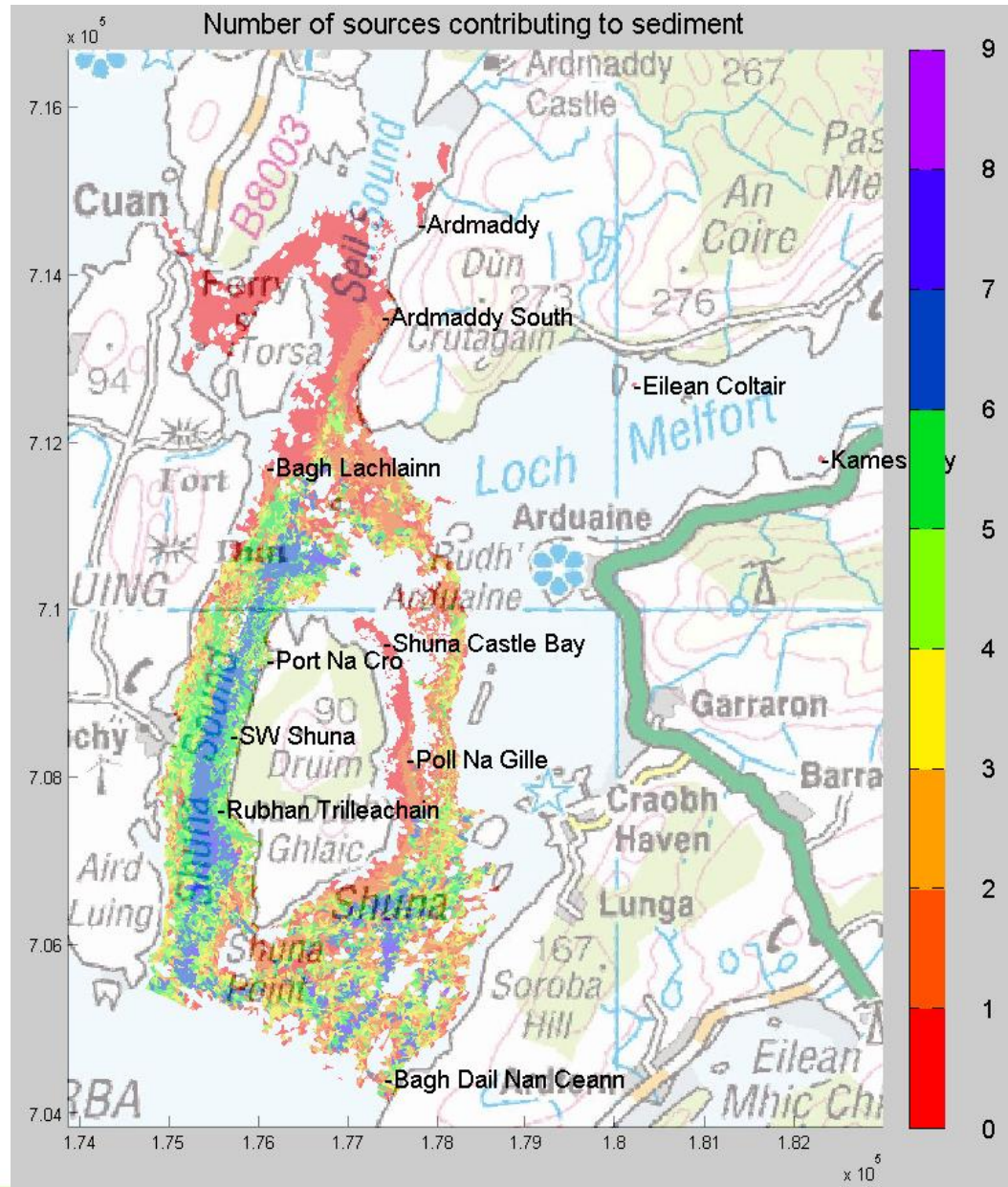
Salmon Fish Farm Locations



DEPOMOD MODULES FOR MODELLING THE EFFECTS OF DEPOSITION FROM MARICULTURE

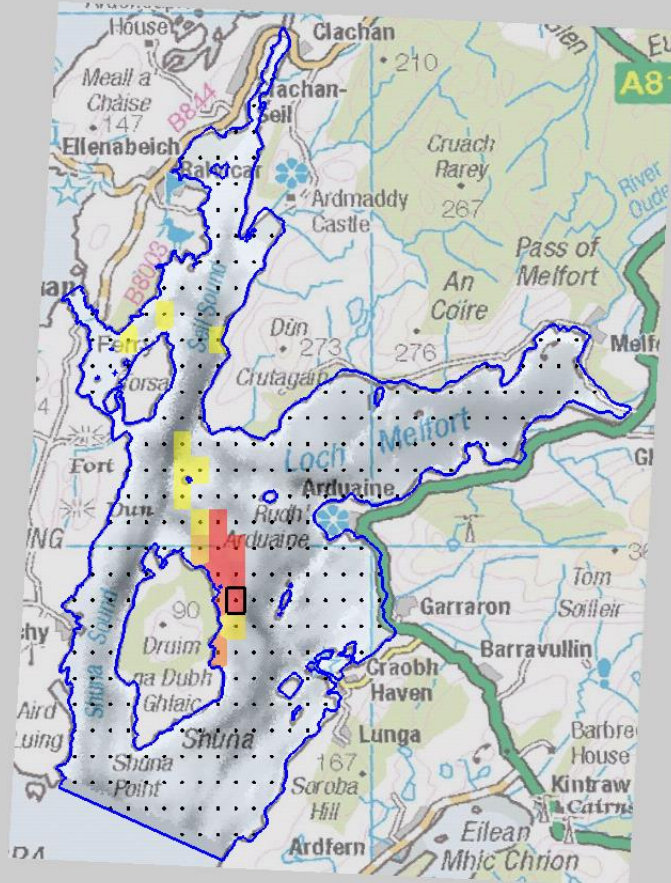




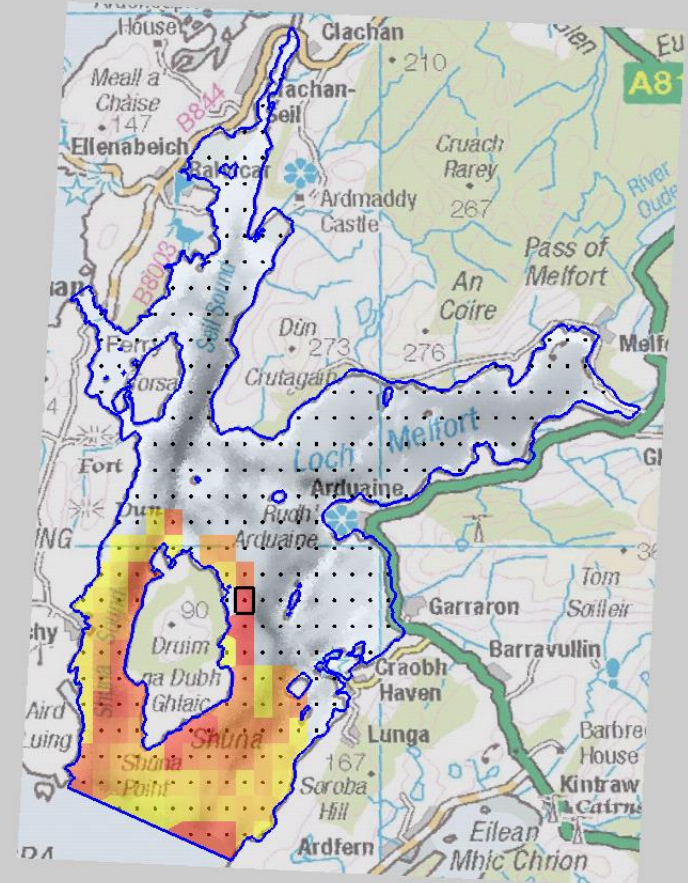


Hydrodynamic Connectivity

18 sources impacting on highlighted cell



91 cells impacted by highlighted source

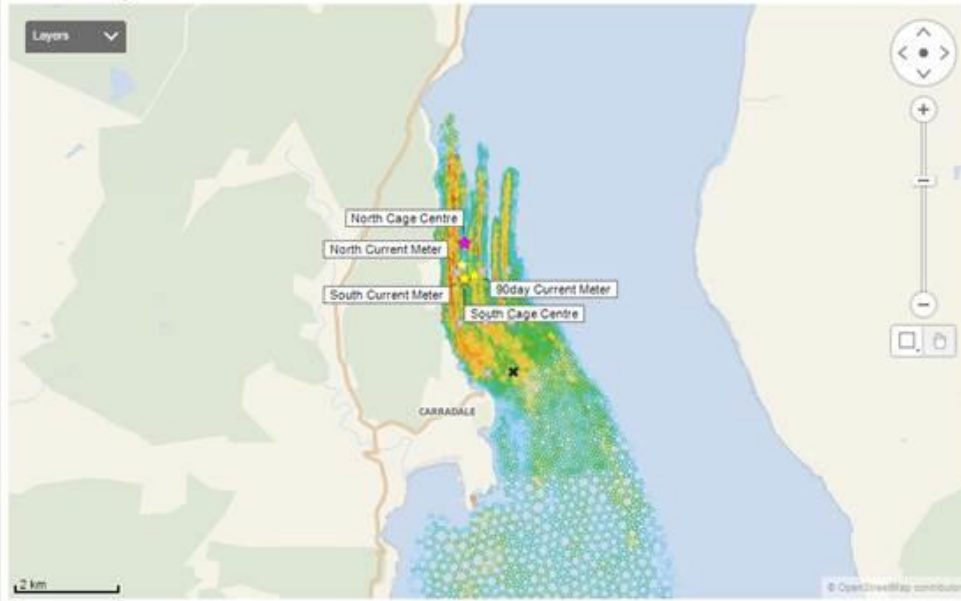


Chemical Impact Scenario Testing

Selected Source Location:
182500 639000

Sedimented Emamectin Benzoate concentration. EmBz release is appropriate for a 2500tonne farm at the selected source (x).

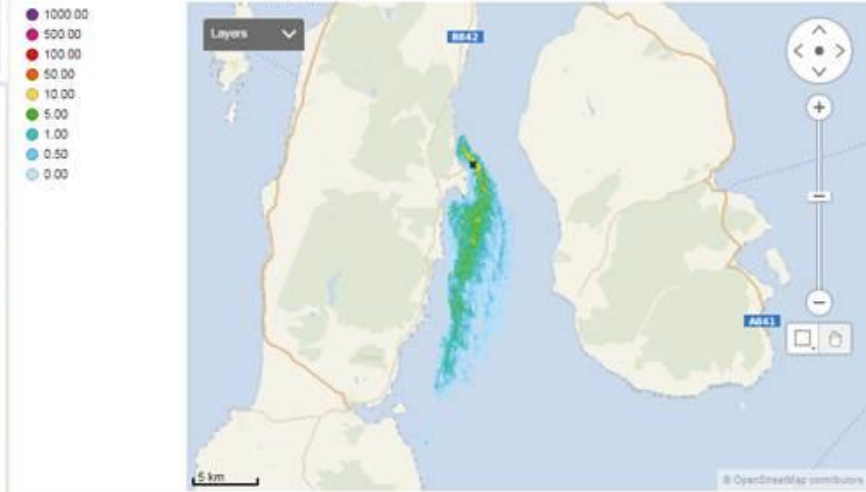
Particle Tracking - SELECT SOURCE



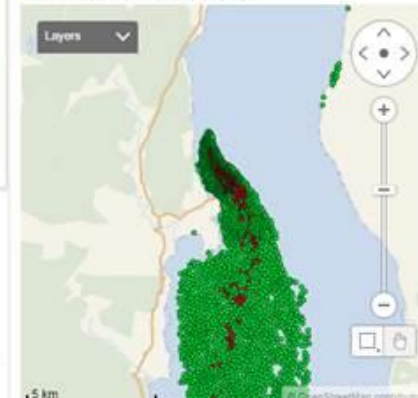
Total sedimented EmBz concentration (ng/kg) over time



Sedimented EmBz Concentration (ng/kg)



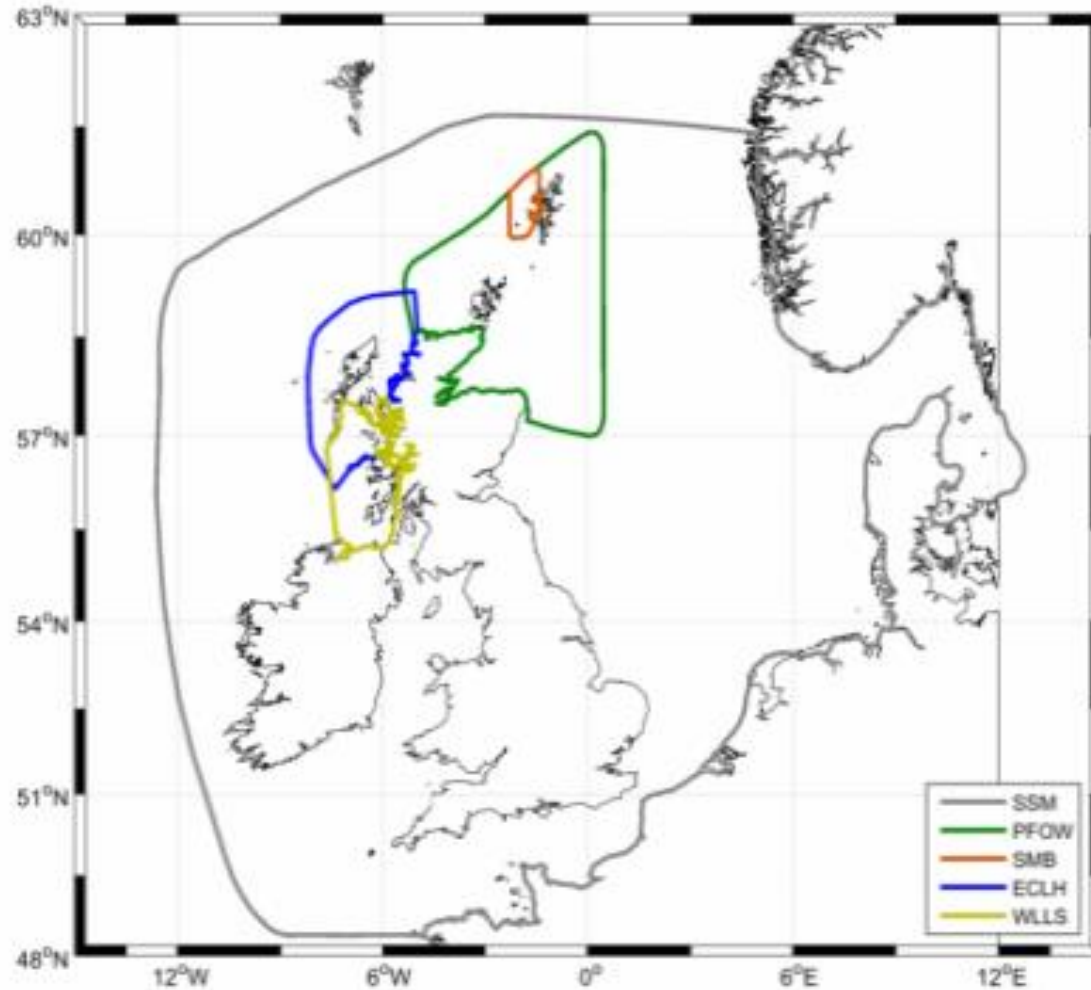
Interim EQ standard (6.04 ng/kg)



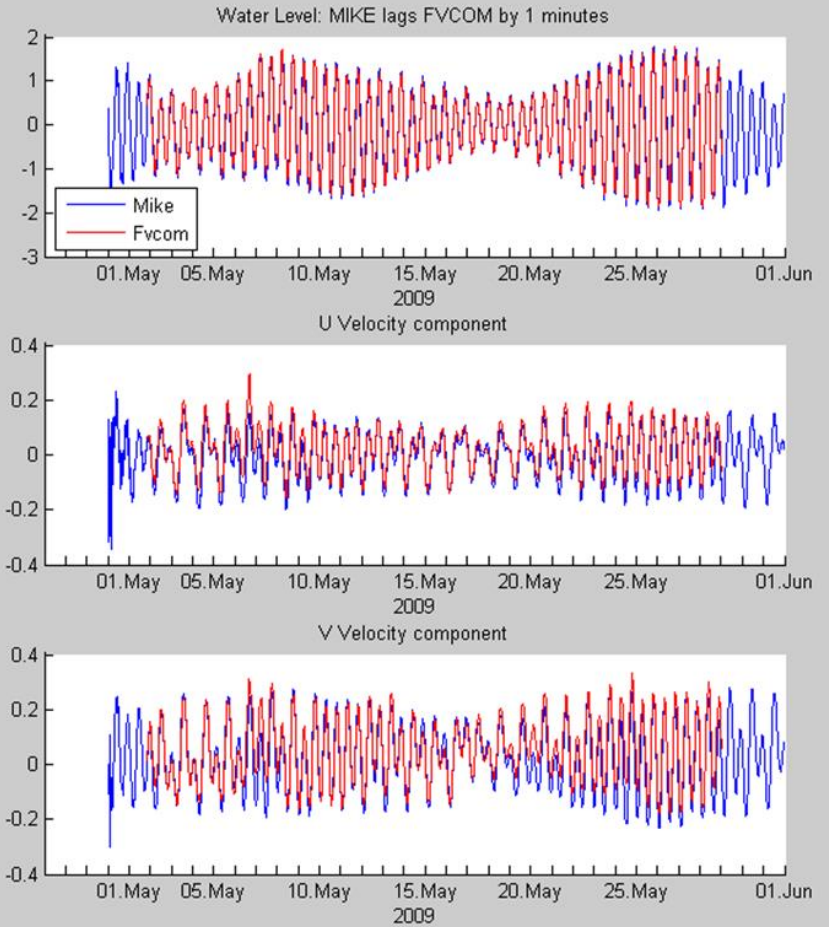
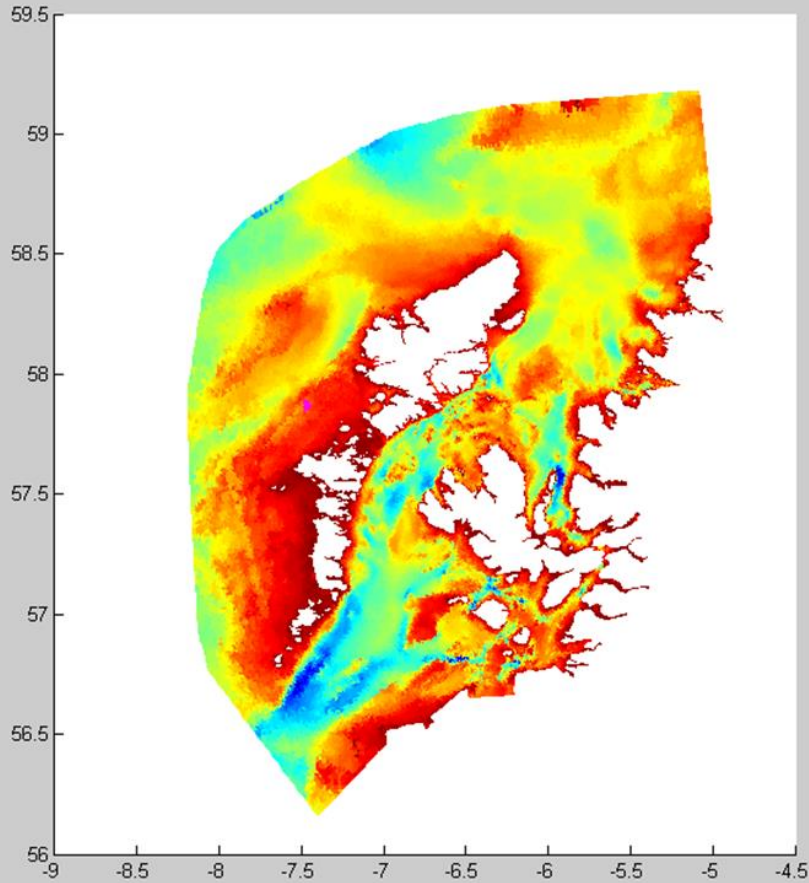
Old EQ standard (763 ng/kg)



Scottish Shelf Model

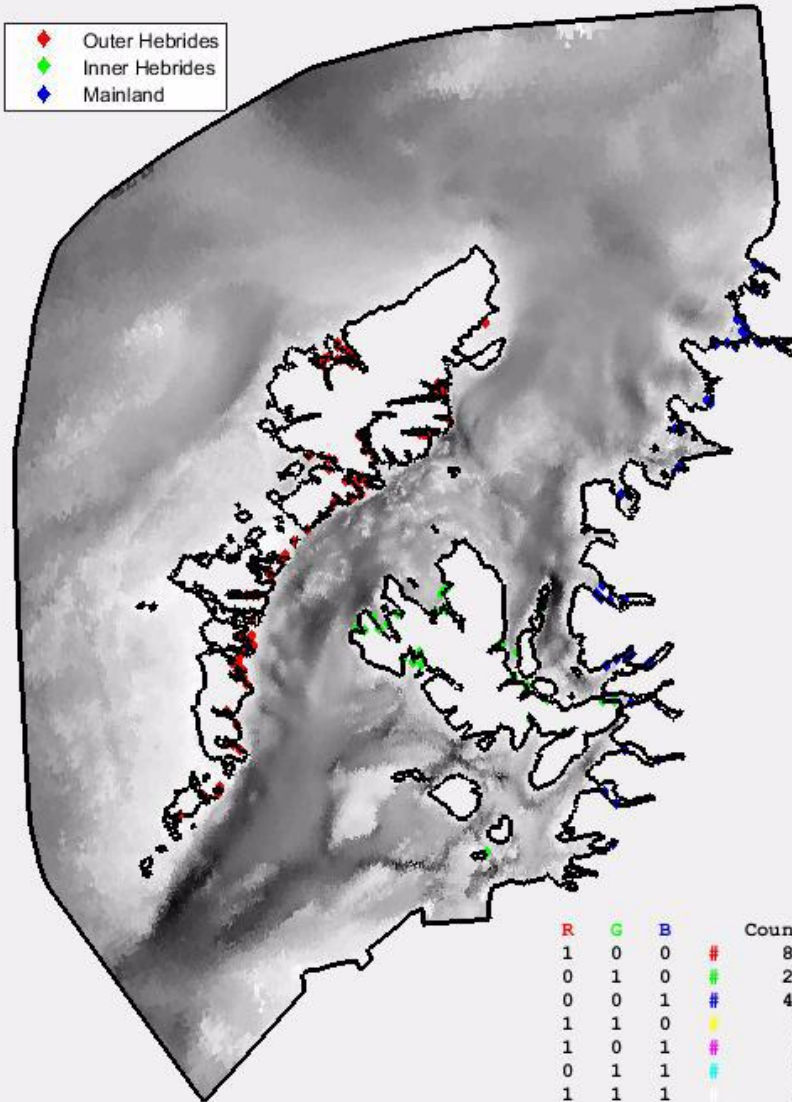


Mike21 / FVCOM Comparison



30/04/2009 00:00

- ◆ Outer Hebrides
- ◆ Inner Hebrides
- ◆ Mainland



R	G	B	Count
1	0	0	87
0	1	0	26
0	0	1	46
1	1	0	0
1	0	1	0
0	1	1	0
1	1	1	0

Summary

- SEPA is using Mike21 to investigate larger scale impacts of fish-farming
- Specific applications include:
 - cumulative effect of multiple farms
 - suitable areas for expansion
 - hydrodynamic connectivity
 - identification of management zones
- Also working to develop screening tools from FVCOM model to help identify riskier sites