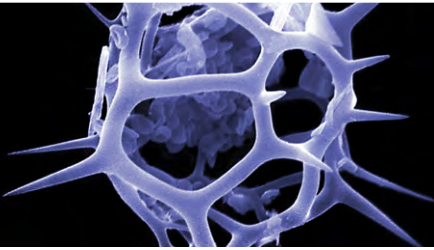
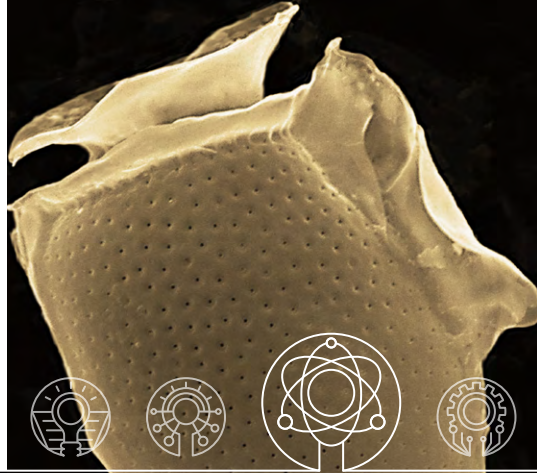




University of the  
Highlands and Islands  
Oilthigh na Gàidhealtachd  
agus nan Eilean

# HAB Modelling



**A mathematical model based early warning tool for advective harmful algal blooms in Scotland.**

Harmful algal blooms in Scottish water are often transported significant distances around the coast through the action of oceanographic currents. Hence, knowing the location of a bloom event allows mathematical model based forecast of its future development and location, offering the potential to provide early warning and risk assessment to other aquaculture businesses in the region.

Within the SAMS harmful algal bloom early warning web-portal ([www.HABreports.org](http://www.HABreports.org)) we have implemented an operational model based forecast tool that uses SAMS' operational forecasting modeling system WeStCOMS to predict the subsequent anticipated size and trajectory of HABs identified at or near aquaculture sites.

The model consists of coupled atmospheric (weather-research forecasts WRF, 2km) and unstructured-grid finite volume community ocean modeling (FVCOM) components with up to 100 meters nearshore resolution.

Microscope counts of algal cells undertaken at aquaculture sites by finfish producers and though the Scottish regulatory shellfish safety monitoring programme are used to initiate the model. If cell counts exceed predefined threshold levels, virtual particles 'seeded' for advection into the flow fields, derived from an ensemble of suitable hydrodynamic forecasting models.



Reports   Show on map  <Select to download>

Forecasts   Show on map  [10/1/2020-10/7/2020]

Sources:  FSS-Toxin  FSS-Phyto

Sites within current map extent:  indicates not on map for selected week/parameter

\*  
**Karenia-d01**  
Thu Oct 1st 2020 11am to Wed Oct 7th 2020 2am  
Total steps: 136 @ 1.0 hr(s) each

Run Forecast Animation Speed: Fast

Wed Oct 7th 2020 2am [135 hrs]

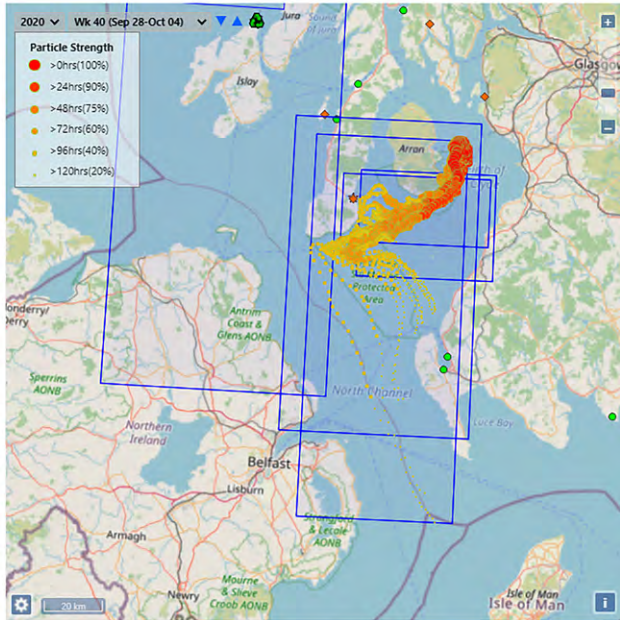
Zoom to Model

Test mode only:  
 Show model trail (will slow down animation)  
 Do NOT ignore points after hitting land  
 Display ALL points (if on land or not)

Close

Prorocentrum lima

Sampled:	2020-08-18	2020-09-01
Pseudo-nitzschia	06:55:00+00	06:50:00+00
delicatissima group	value: -40 cells/l	value: -20 cells/l



The figure above depicts a screenshot from [www.HABreports.org](http://www.HABreports.org) highlighting modelled development identified in the Firth of Clyde on the 28th September, 2020. Colored particles shows the modelled HAB spreading pattern prediction from our WeStCOMS-FVCOM model up to the 4th October 2020.

The alert system is being further developed with support from a SAIC research grant to SAMS, Scottish Sea Farms and MOWI.

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