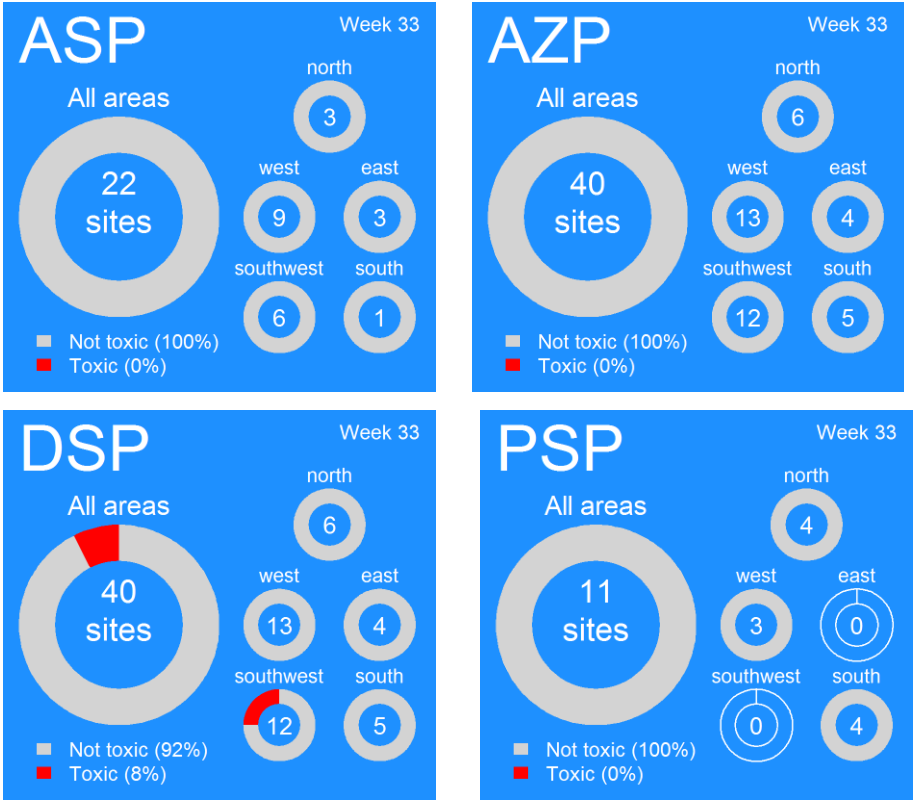


Ireland: Current Conditions

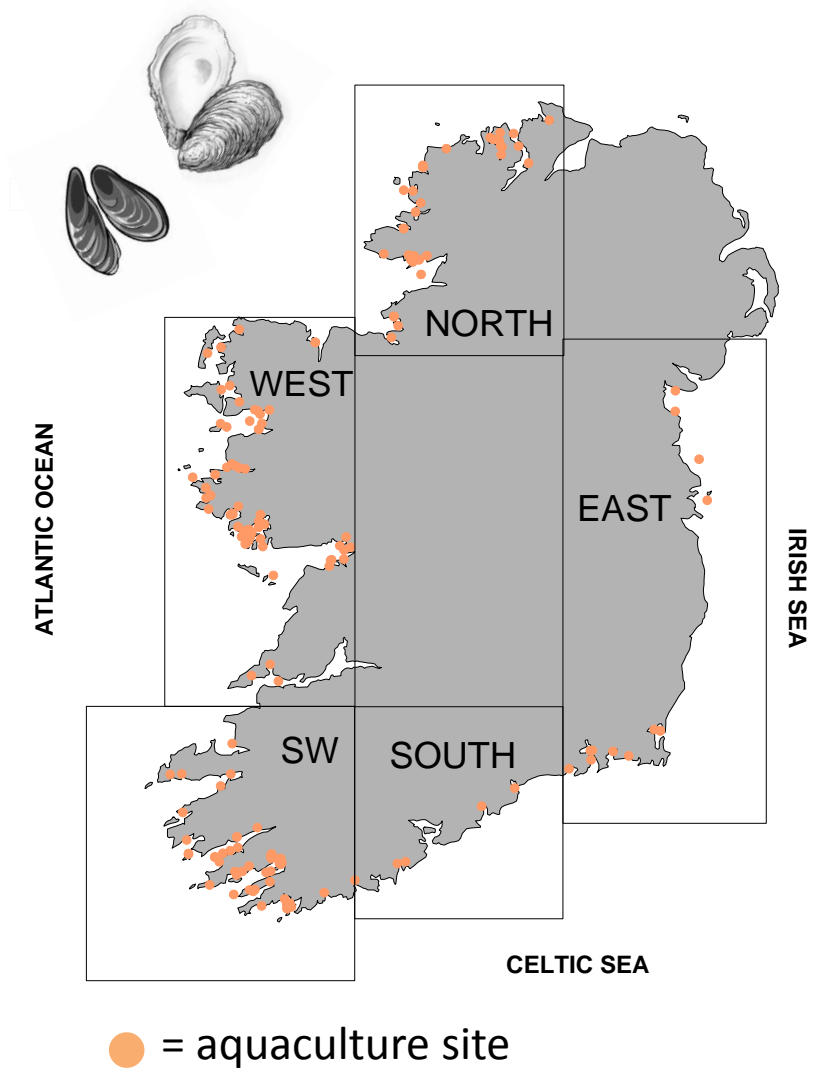
Shellfish biotoxin report (last week)



EU Regulatory Limit:
ASP 20 µg/g; AZP 0.16 µg/g; DSP 0.16 µg/g; PSP 800 µg/kg

Toxin groups
ASP = **A**mnestic **S**hellfish **P**oisoning; AZP = **A**Zaspiracid **P**oisoning;
DSP = **D**iarrhetic **S**hellfish **P**oisoning; PSP = **P**aralytic **S**hellfish **P**oisoning

National Monitoring Programme Designated Sampling Sites



Ireland: Predictions

Prediction for this week:

ASP event: Very low risk

AZP event: Moderate-High risk in some areas

DSP event: Moderate-High risk in some areas

PSP event: Low risk

Why do we think this?

ASP: Toxins not detected. This is a LOW risk time of year. Highest cell levels of “*Pseudo-nitzschia seriata*” group, up to 45,000 cells/L were recorded in the SW and in the east last week. This group makes up 50 % of the flora at one site in the SW – however, we do not know if toxic species are present in this assemblage. Based on the chemistry results and time of year, it is highly unlikely that a toxic event will occur in the next week.

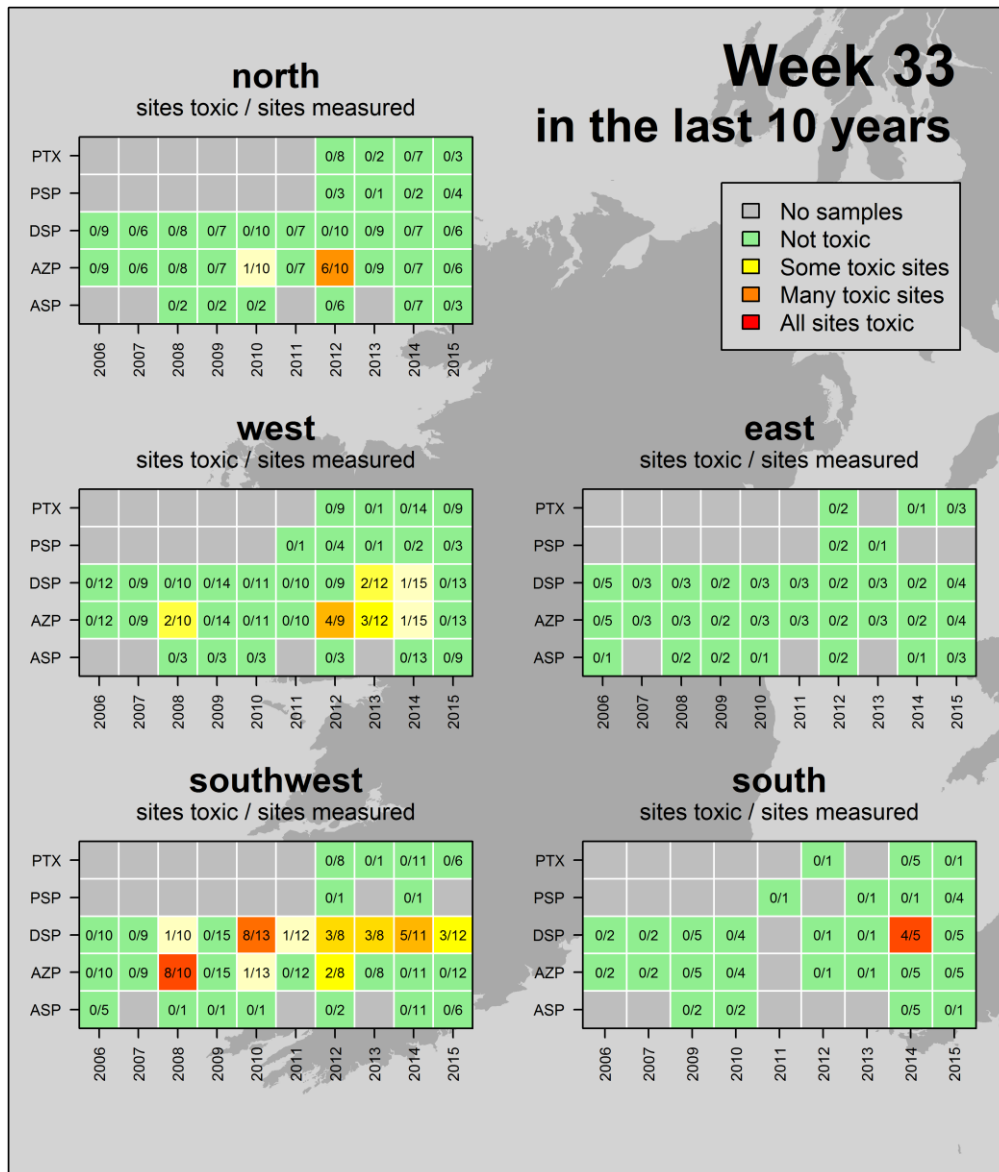
AZP: While relatively low levels of toxins were recorded countrywide in recent weeks, the toxin is increasing slowly. This is most noticeable in the west. Last week, highest cell levels of *Azadinium*-like spp. were in the north and the west. However, we are currently unable to differentiate between toxic and non-toxic species. Based on historical data and the recent chemistry results, it is likely that toxin levels will continue to increase at some sites in the north, west and SW.

DSP: Toxins recorded at or above EC Reg. levels in the SW. *Dinophysis* is still present at relatively high numbers in several south and SW sites - toxins are expected to remain in many of the shellfish sites in these areas for the next week. While only background levels of *Dinophysis* spp. have been observed in western and northern sites in recent weeks, toxins have increased at some sites. Historically, the risk at this time of year in the west and north is MODERATE - caution is therefore advised in these areas.

PSP: Toxin was not recorded above EC Reg. level at any site countrywide in the last week. While low levels of *Alexandrium* spp. have been recorded in many sites, historically PSP events have only occurred in Cork Harbour. Alexandrium was not recorded in Cork harbour last week and toxin levels in Cork Harbour have begun to drop and are well below the EC Reg. level. Therefore, a PSP event is unlikely to occur in the next week.

Ireland: Historic Conditions

A look back at how last weeks biotoxin results compares to other years



Ireland HISTORIC TRENDS

Likely times for Shellfish Toxicity: does not include winter carry over of biotoxins

ASP events: mid-March to early May

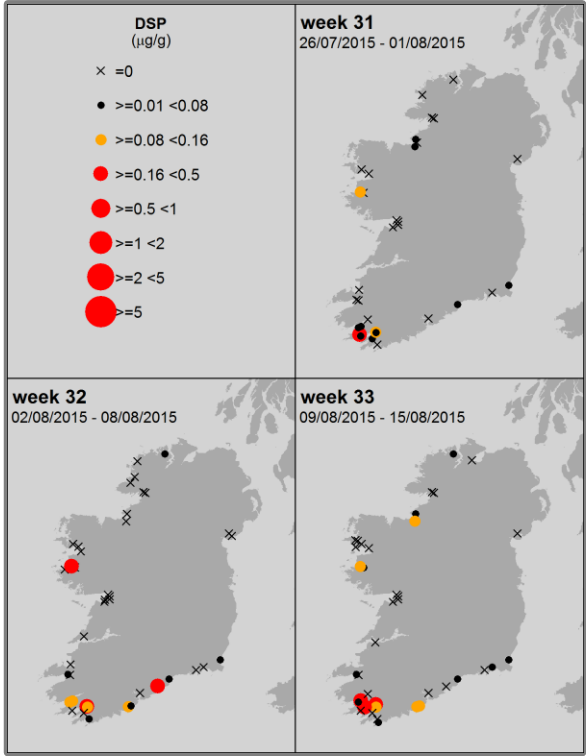
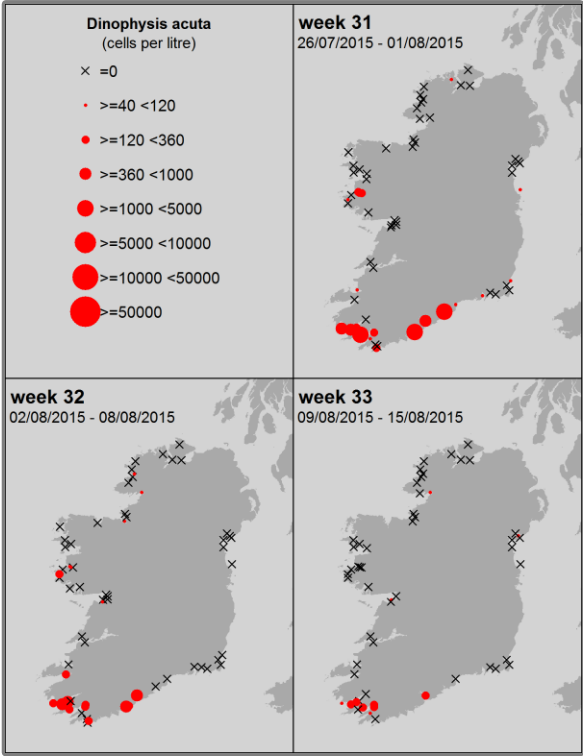
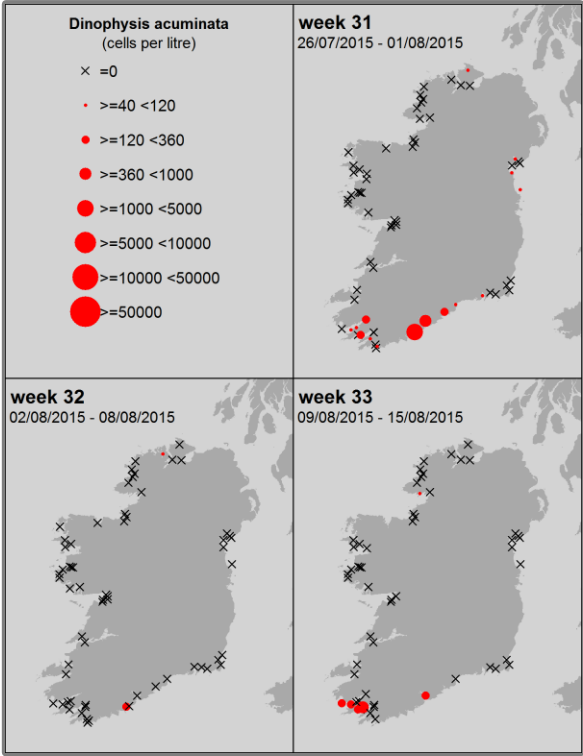
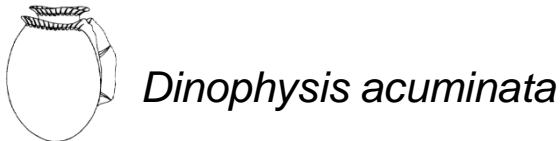
AZP events: April to December

DSP events: May to December

PSP events: June to mid-July and end September; only in Cork Harbour



Ireland: Last 3 weeks of available National Monitoring Programme data



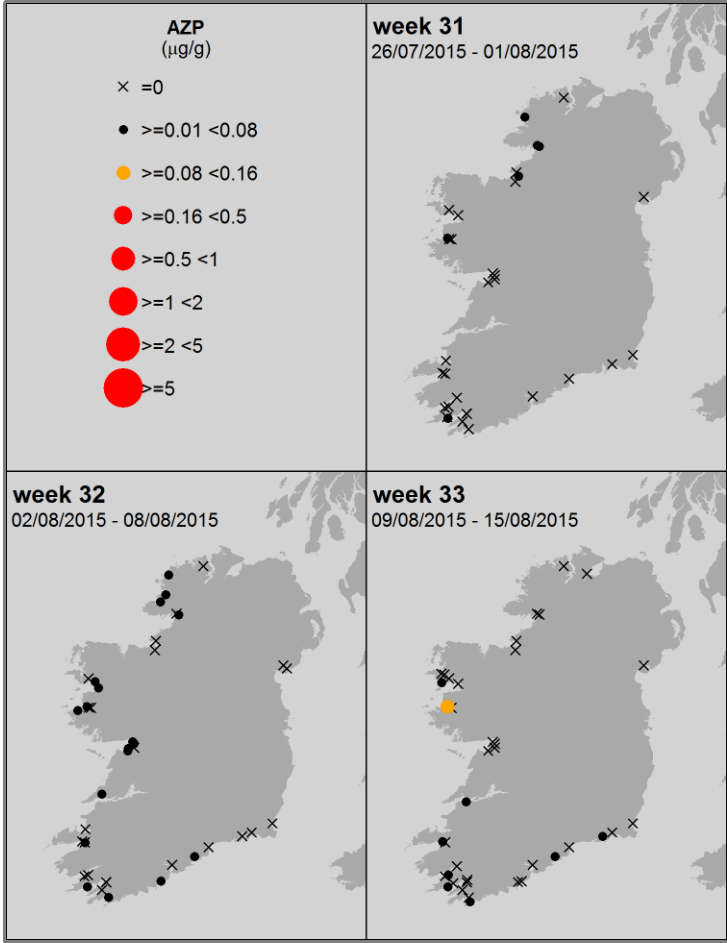
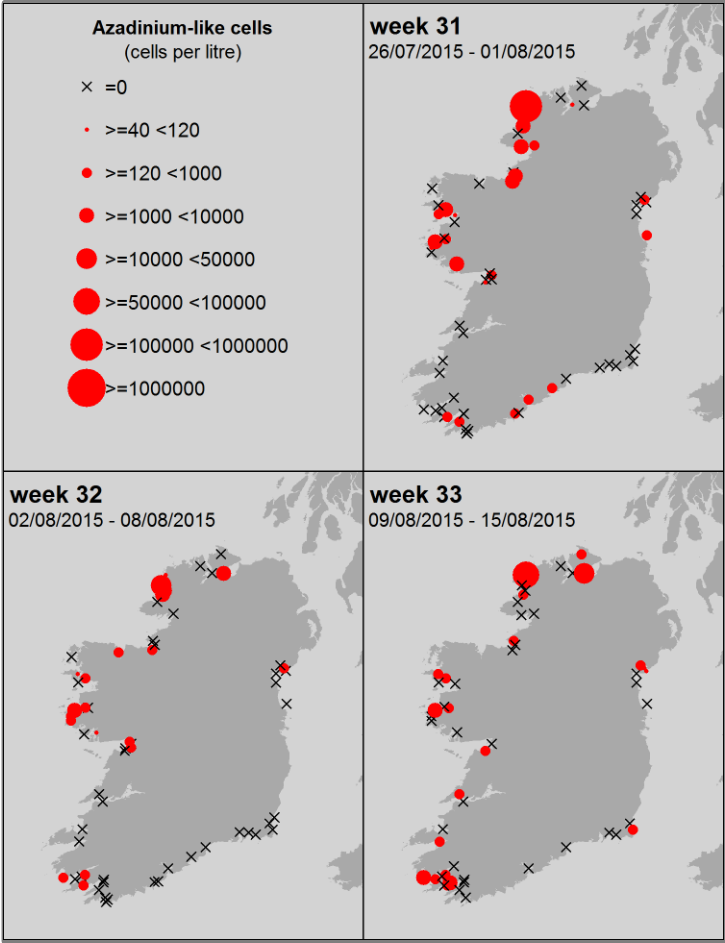
Ireland: Last 3 weeks of available National Monitoring Programme data



Azadinium – like spp.



AZP



Ireland: Last 3 weeks of available National Monitoring Programme data

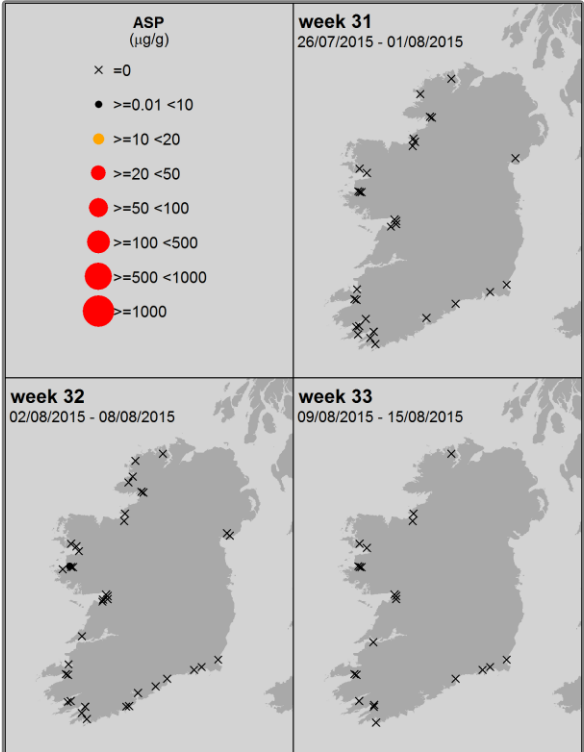
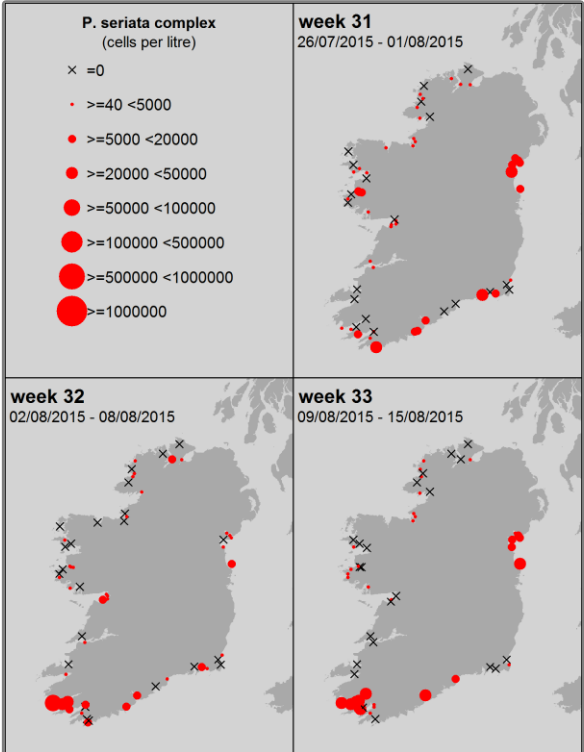
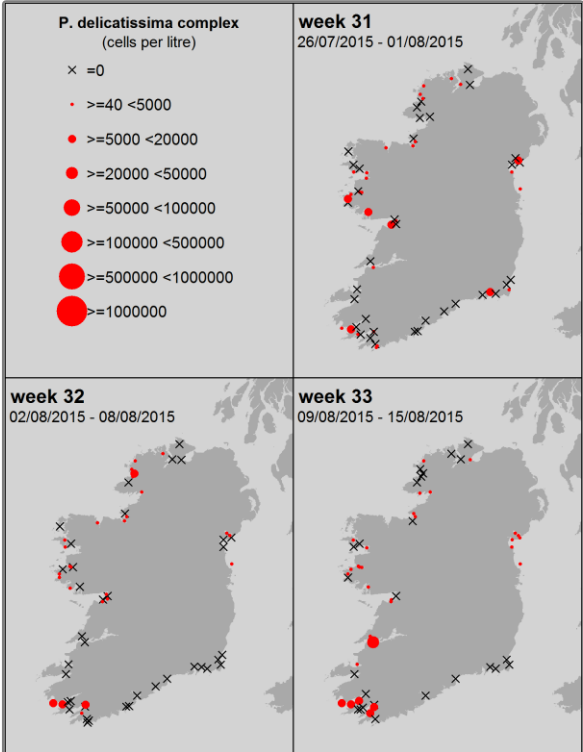
Pseudo-nitzschia spp.



ASP

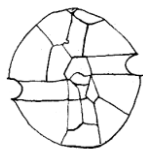
“*P. delicatissima*” complex = small cells
Taken from the literature:
3 species confirmed in Irish waters

“*P. seriata*” complex = large cells
Taken from the literature:
7 species confirmed in Irish waters



Taken from the literature: Of the 4 species (*P. fraudulenta*, *P. australis*, *P. pungens* and *P. delicatissima*) from Irish waters, tested for ASP toxins in culture work, only one, *P. australis* (from the “*P. seriata*” group) was toxic.

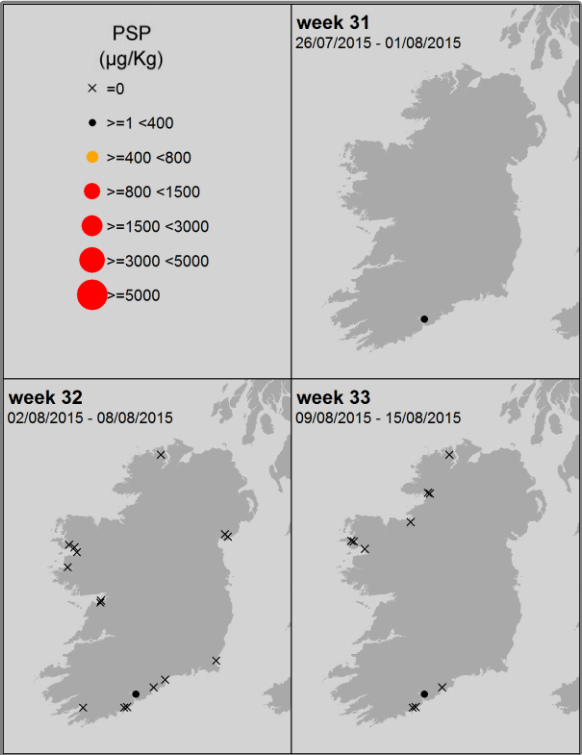
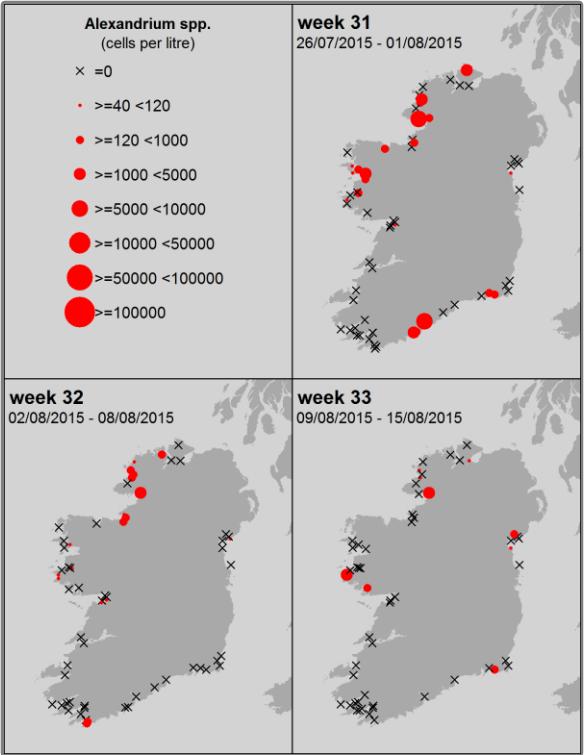
Ireland: Last 3 weeks of available National Monitoring Programme data



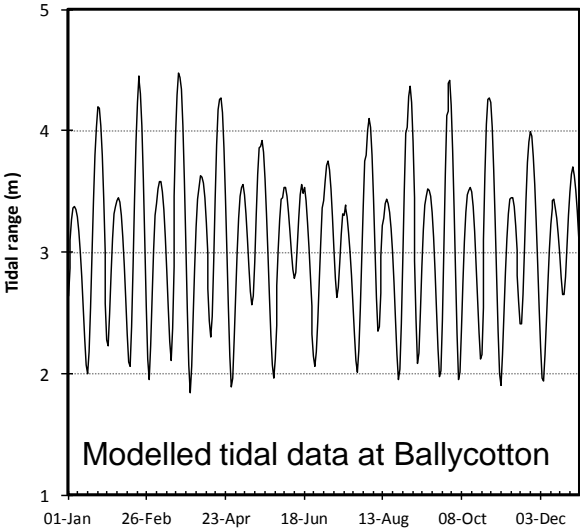
Alexandrium spp.



PSP



Tidal Range Cork 2015 (Predicted)



Usually the *Alexandrium* bloom in Cork Harbour begins on the first spring tide in June (around the time of the summer solstice) as small tidal range is important in bloom initiation (lower tidal dilution rate). Optimum conditions for *Alexandrium* are a water temperature of 15 °C and an irradiance of > 100 µM/m²/sec. Historically, production areas in Cork Harbour are the only sites that have experienced closures due to Paralytic Shellfish Poisoning toxins (one of the most dangerous shellfish toxins).

Ireland HAB & Biotoxin temporal trends

Ireland: **HABs and biotoxins** Levels from week 1 to present

Ireland: Biotoxins



Toxin groups

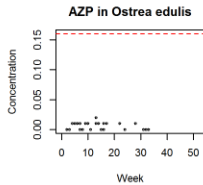
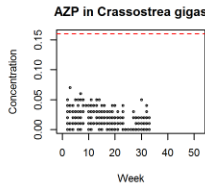
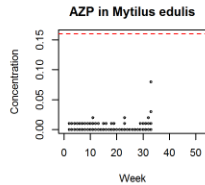
mussels

oysters

oysters

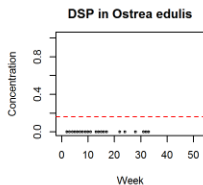
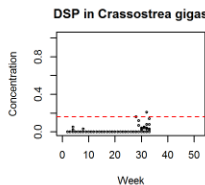
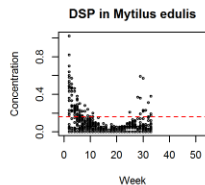
AZP

AZaspiracid
Poisoning



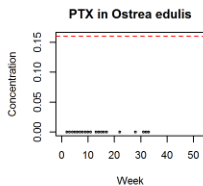
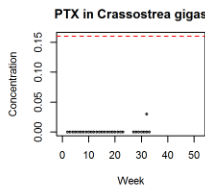
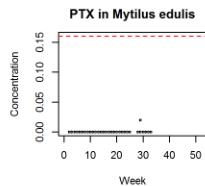
DSP

Diarrhetic
Shellfish
Poisoning



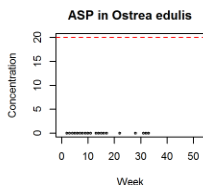
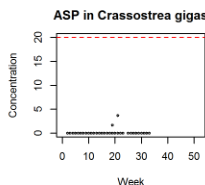
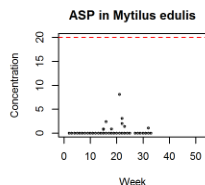
PTX

Pectenotoxin



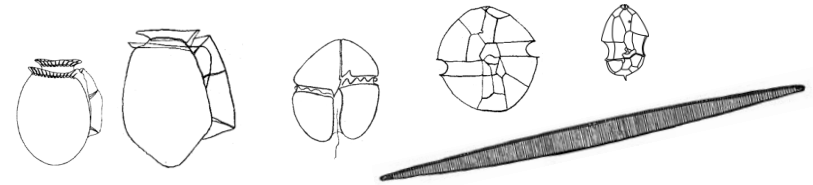
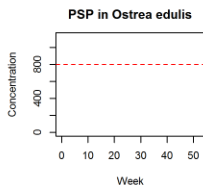
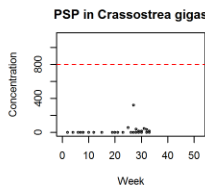
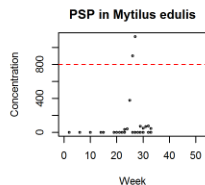
ASP

Amnesic
Shellfish
Poisoning



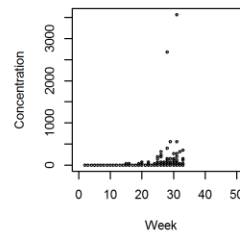
PSP

Paralytic
Shellfish
Poisoning

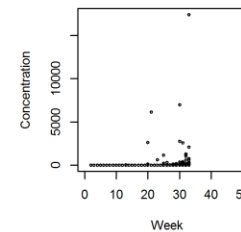


Ireland: HABs

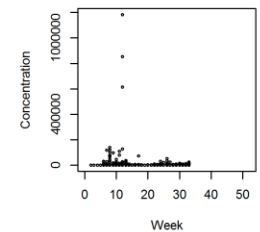
Dinophysis acuminata



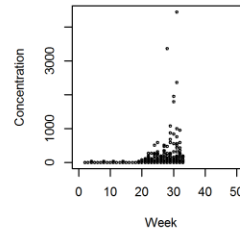
Karenia mikimotoi



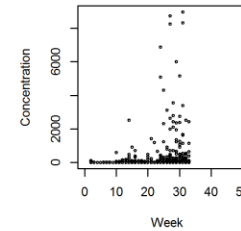
P. delicatissima complex



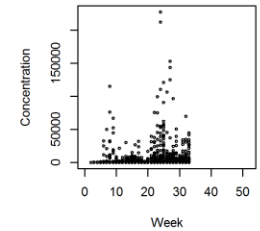
Dinophysis acuta



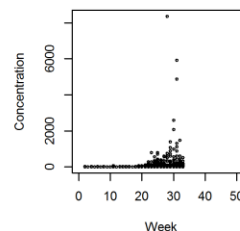
Alexandrium spp.



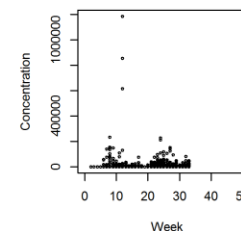
P. seriata complex



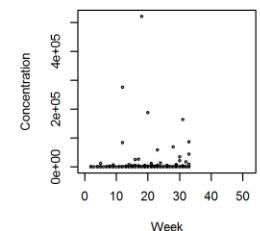
All *Dinophysis* spp.



All *Pseudo-nitzschia* spp.



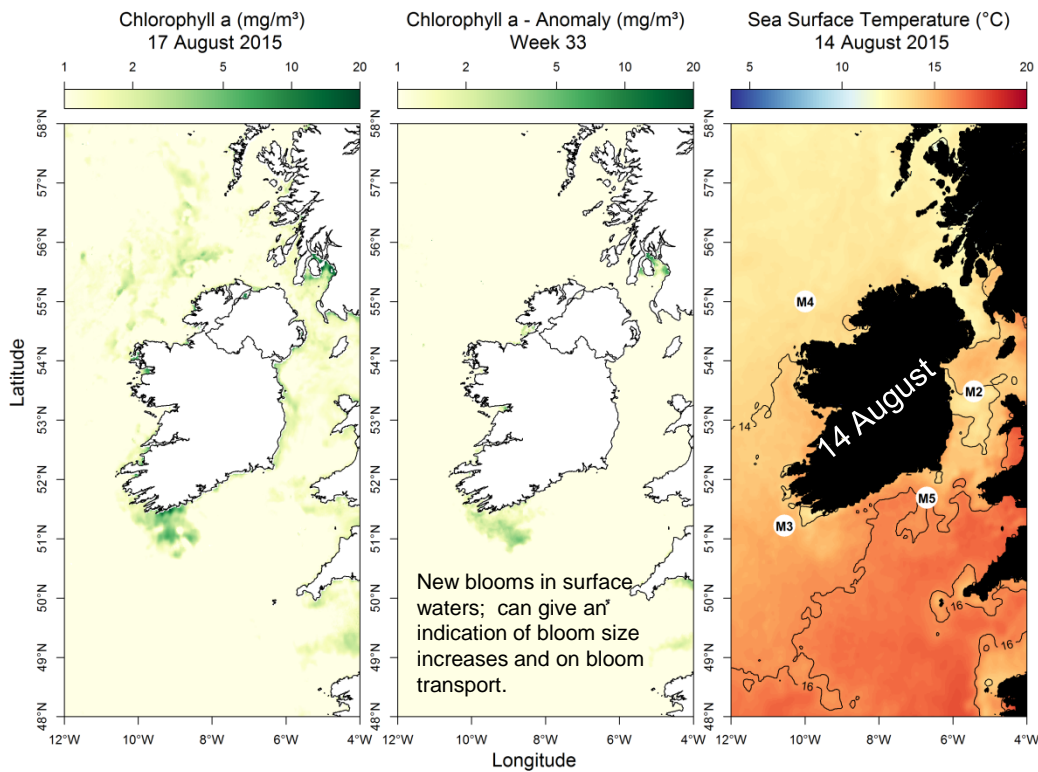
Azadinium-like cells



EU Regulatory Limit: ASP 20 µg/g; AZP 0.16 µg/g; DSP 0.16 µg/g; PSP 800 µg/kg

Regulatory limit = ■■■■■

Most up to date available satellite data



SST (°C) anomaly for last week:
Data taken from the Irish data buoy network where the anomaly is the weekly difference in SST compared to the long term mean (~ 10 yrs)

- NW coast (M4) below average by 2.08 °C
- SW coast (M3) Offline
- SE coast (M5) above average by 0.12 °C

What phytoplankton were blooming at inshore coastal sites last week?

Week 33

Region	Predominant Phytoplankton (most abundant taxa)	Cells/L (rounded)
north:	Diatoms:	
	<i>Leptocylindrus minimus</i>	8,208,000
	<i>Chaetoceros</i> (Hyalochaete) spp.	6,533,000
	<i>Guinardia delicatula</i>	426,000
	Dinoflagellates:	
west:	<i>Glenodinium foliaceum</i>	773,000
	Diatoms:	
	<i>Skeletonema</i> spp.	319,000
	<i>Chaetoceros</i> (Hyalochaete) spp.	243,000
	<i>Leptocylindrus danicus</i>	133,000
SW:	<i>Navicula</i> spp. (20-50 µm)	78,000
	<i>Lauderia</i> / <i>Detonula</i> spp.	52,000
	" <i>Pseudo-nitzschia delicatissima</i> " complex	27,000
	<i>Leptocylindrus minimus</i>	18,000
	Pennate diatom	17,000
	<i>Striatella</i> spp.	13,000
	Dinoflagellates:	
	<i>Azadinium</i> / <i>Heterocapsa</i> spp.	10,000
	Diatoms:	
	<i>Skeletonema</i> spp.	572,000
south:	<i>Leptocylindrus minimus</i>	486,000
	<i>Asterionellopsis glacialis</i>	215,000
	Diatoms:	
	<i>Thalassiosira nordenskiöldii</i>	192,000
	<i>Thalassiosira</i> spp. (20-50 µm)	135,000
east:	<i>Thalassiosira</i> spp. (< 20 µm)	134,000
	<i>Chaetoceros</i> (Hyalochaete) spp.	79,000
	Diatoms:	
	<i>Bacteriastrum</i> spp.	645,000
	<i>Chaetoceros</i> (Hyalochaete) spp.	425,000
	<i>Rhizosolenia</i> spp.	300,000
	<i>Asterionellopsis glacialis</i>	210,000



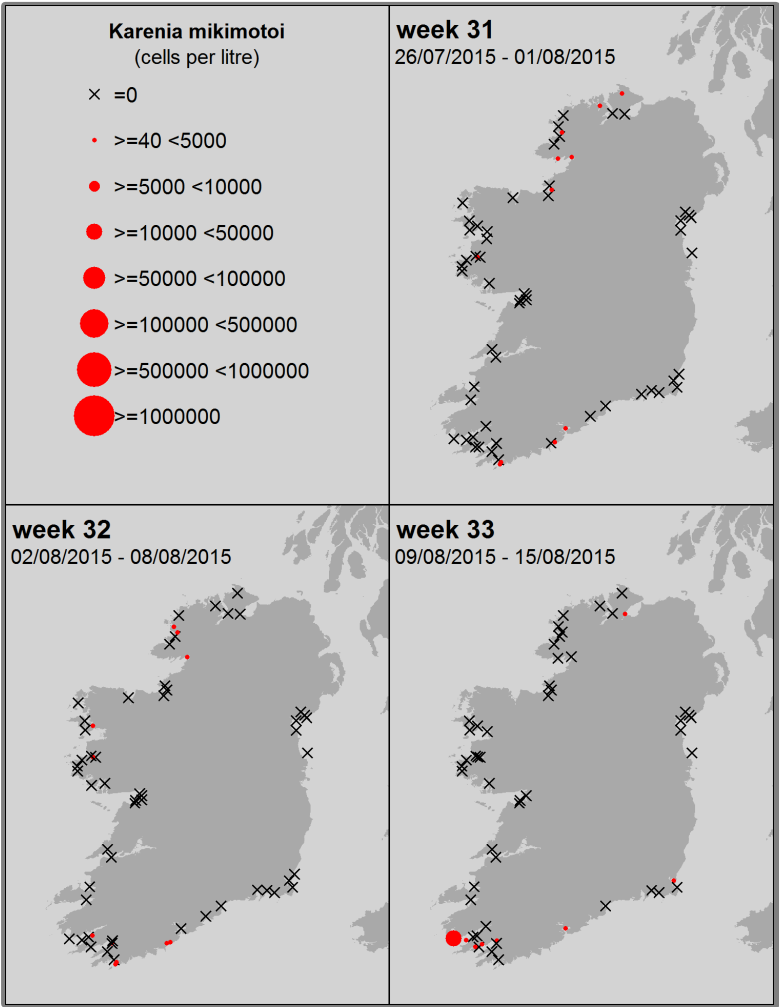
Karenia mikimotoi
(old name: *Gyrodinium aureolum*)

Increased *Karenia mikimotoi* cell counts have been recorded in the southwest

maximum densities
@ 20,000 cells/L

Blooms tend to cause problems when cell denisties are in the millions of cells per litre.

We will continue to monitor the intensity and distribution *Karenia* in the coming weeks



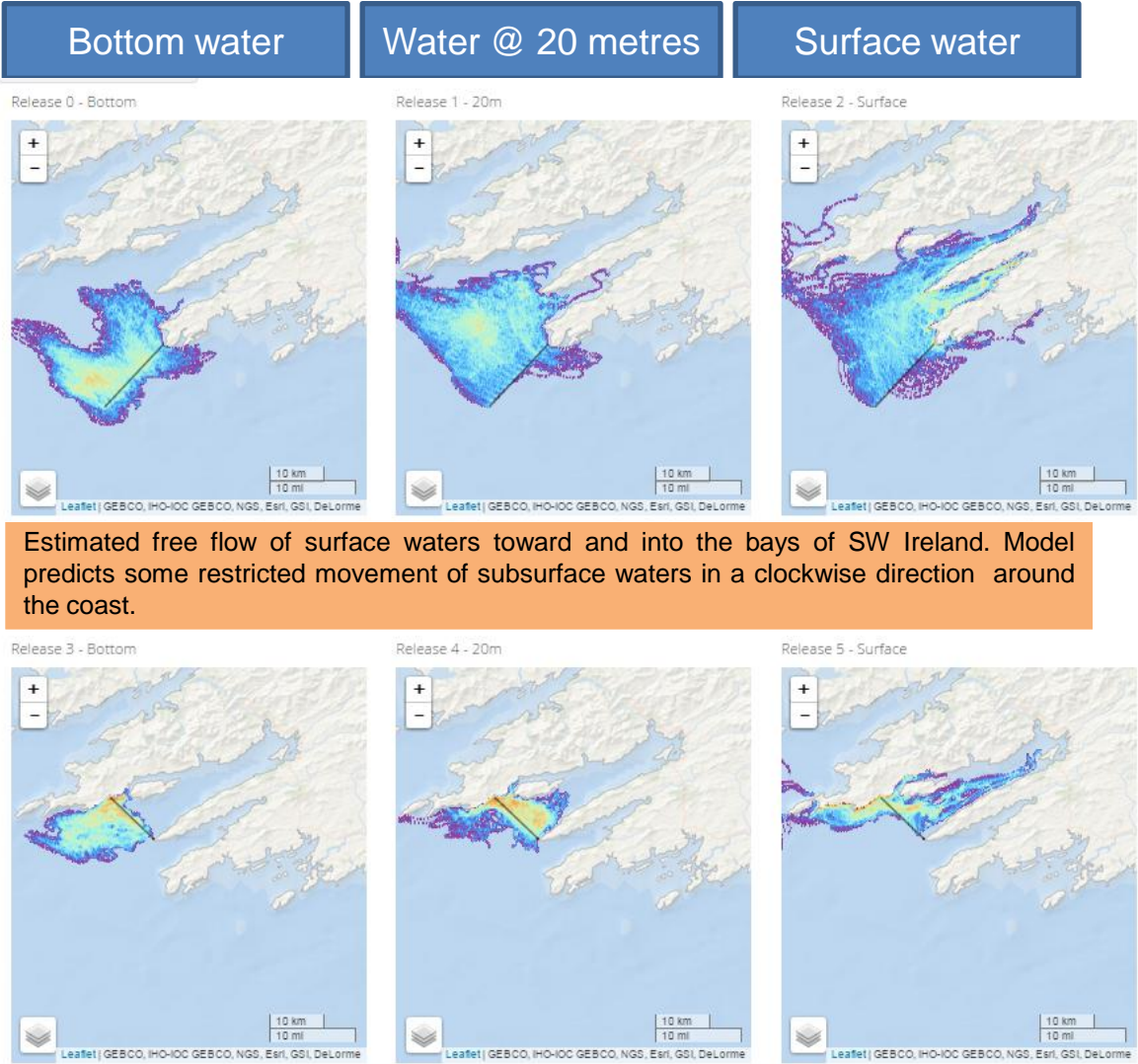
SOUTHWEST: Bantry Bay

The maps show the **most likely transport pathways for the next 3 days of phytoplankton** found along the **presented transects** (black lines off Mizen Head and the Mouth of Bantry Bay) and **water depths** (bottom, 20 metres and surface)

Reddish colours represent areas where phytoplankton remain longest
Cooler colours represent areas where phytoplankton remain for shorter periods

particle transport probability (hours)
Bantry Bay model particle track analysis
(2015-03-10T00:00:00Z, release_location=0.0 count)
Data courtesy of Irish Marine Institute

Forecast for the next 3 days



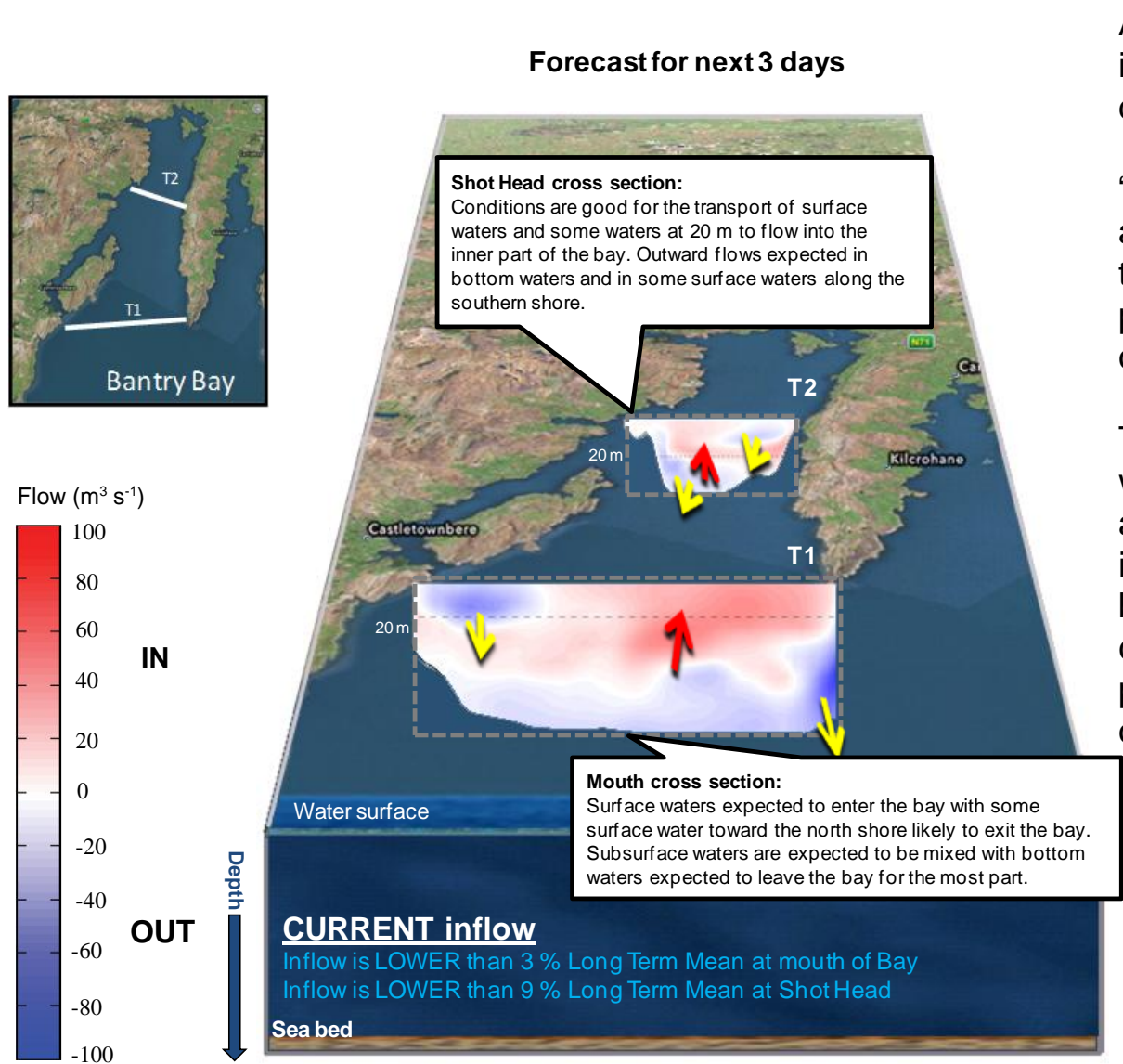
Estimated free flow of surface waters toward and into the bays of SW Ireland. Model predicts some restricted movement of subsurface waters in a clockwise direction around the coast.

Predicted water circulation patterns at the mouth of Bantry Bay show that surface waters will enter and travel quite a distance into the bay. Surface waters will also likely exit the bay toward the north. Subsurface waters will likely be more restricted with bottom water expected to exit the bay in the coming days.

Go to <http://vis.marine.ie/particles/> to view daily forecasts

Bantry Bay

3 day estimated water flows at the mouth and mid-bay sections of Bantry Bay



A weak downwelling event is predicted in the coming days.

“downwelling” is associated with the transport of *Dinophysis* populations from outside of the bay.

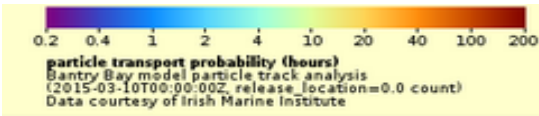
This type of shelf-bay water exchange could also potentially cause an increase in AZP toxins in bay shellfish, if the causative organisms are present outside the mouth of the bay.

WEST: Killary Harbour

The maps show the **most likely transport pathways for the next 3 days of phytoplankton** found along the **presented transects** i.e. white lines off Aughrus Point and the Mouth of Killary Harbour, and **water depths** (bottom, 20 metres and surface)

Reddish colours represent areas where phytoplankton remain longest

Cooler colours represent areas where phytoplankton remain for shorter periods

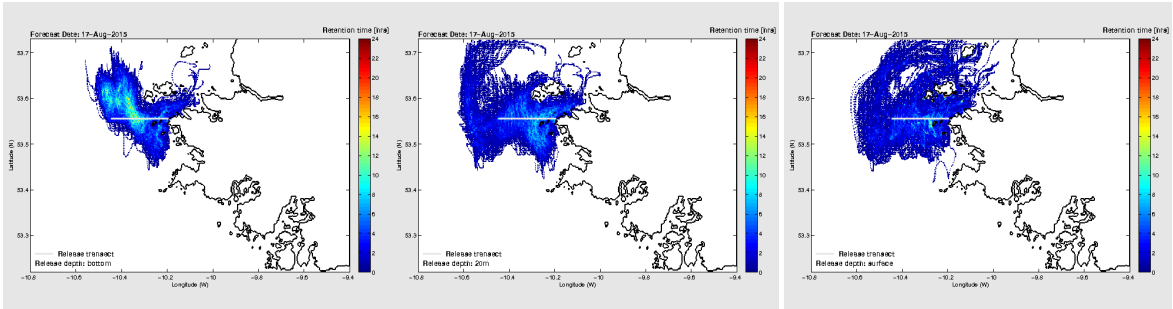


0.2 0.4 1 2 4 10 20 40 100 200

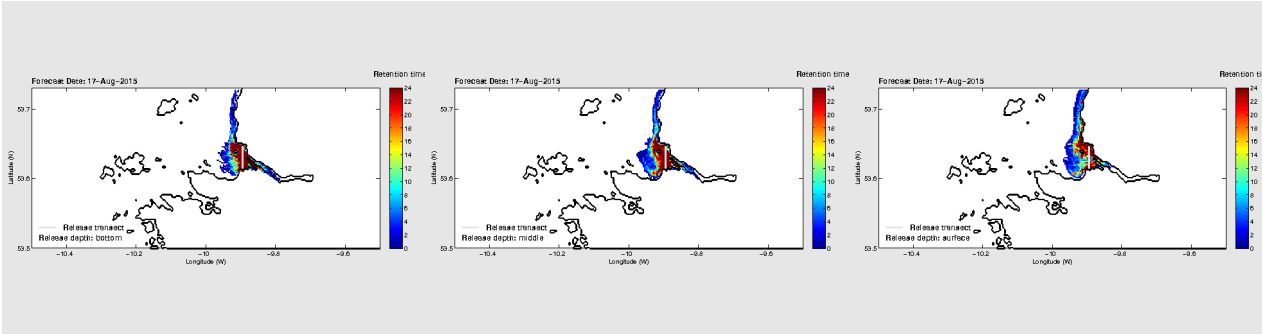
particle transport probability (hours)
Bantry Bay model particle track analysis
(2015-03-10T00:00:00Z, release_location=0.0 count)
Data courtesy of Irish Marine Institute

Forecast for the next 3 days

- Bottom water
- Water @ 20 metres
- Surface water



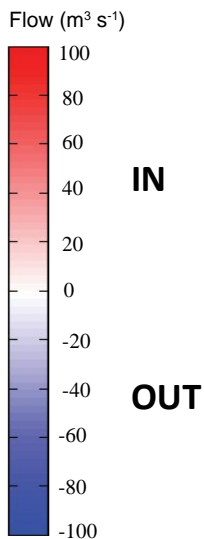
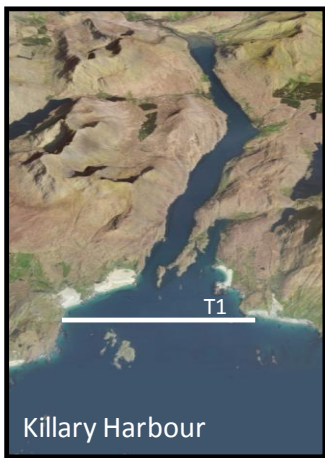
Estimated water flows off Aughrus Point, along the Cleggan transect, show strong northward flows in surface and subsurface waters – expected flows become weaker with depth. It is likely that surface waters will reach the mouth of Killary Harbour.



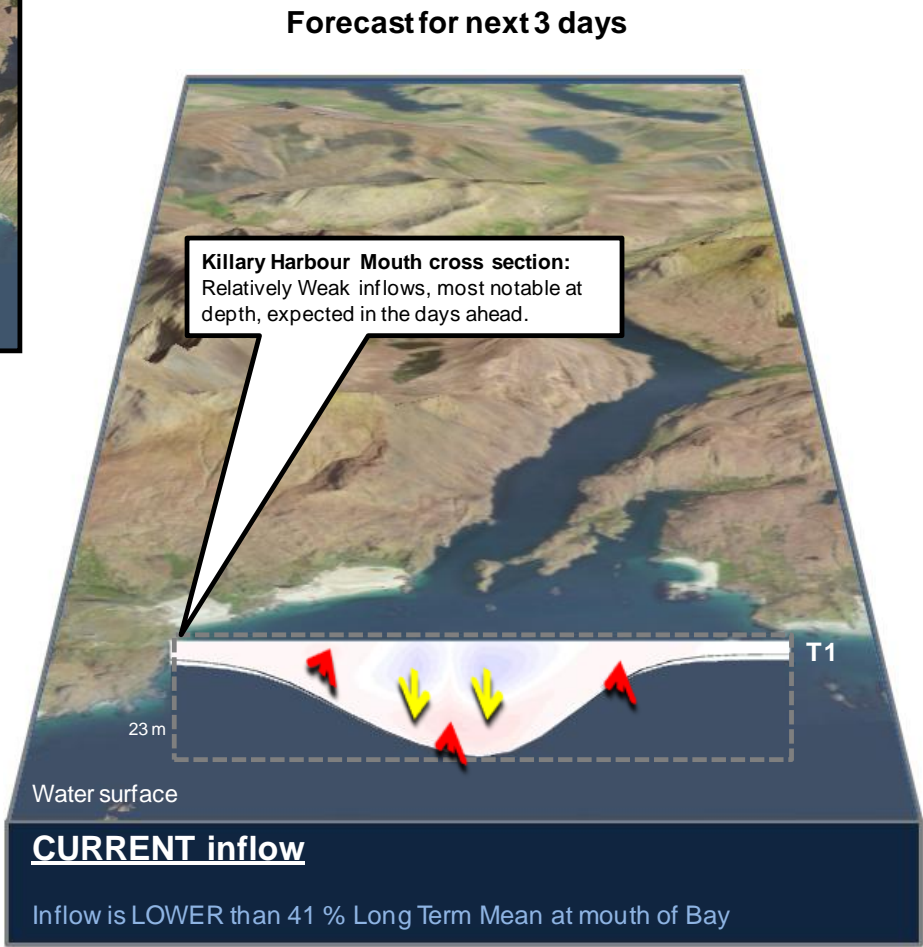
Water circulation patterns at the mouth of Killary Harbour show a similar pattern at all depths examined. There will be some retention at the mouth, however some water is likely to flow out of the bay toward the north at all depths. Inward movement of water into Killary is also expected at all depths with subsurface waters expected to reach Killary middle in the next couple of days.

Killary Harbour

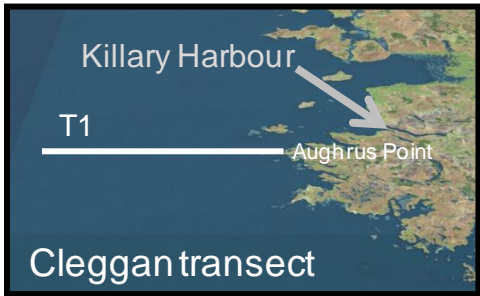
3 day estimated water flows at the mouth of Killary Harbour



Depth



West Coast - 3 day estimated water flows along a transect off Aughrus Point

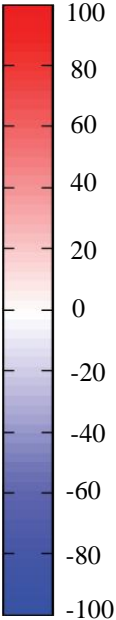


Forecast for next 3 days

Cleggan section:

Shelf water currents are expected to have strong flows in a northward direction in the coming days. Closer to the coast, the main flows are expected to be in a southward direction. In shallow waters relatively strong northward directed currents are expected.

Flow ($\text{m}^3 \text{s}^{-1}$)



**northward
flow**

**southward
flow**

Depth

