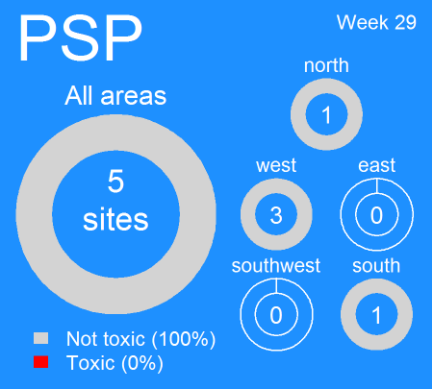
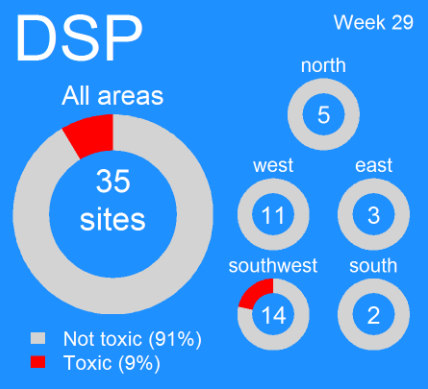
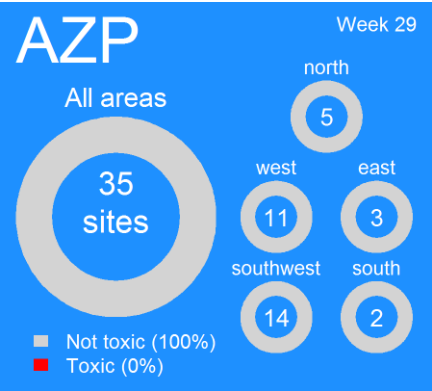
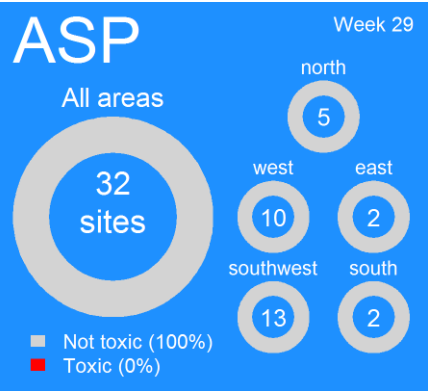


Ireland: Current Conditions

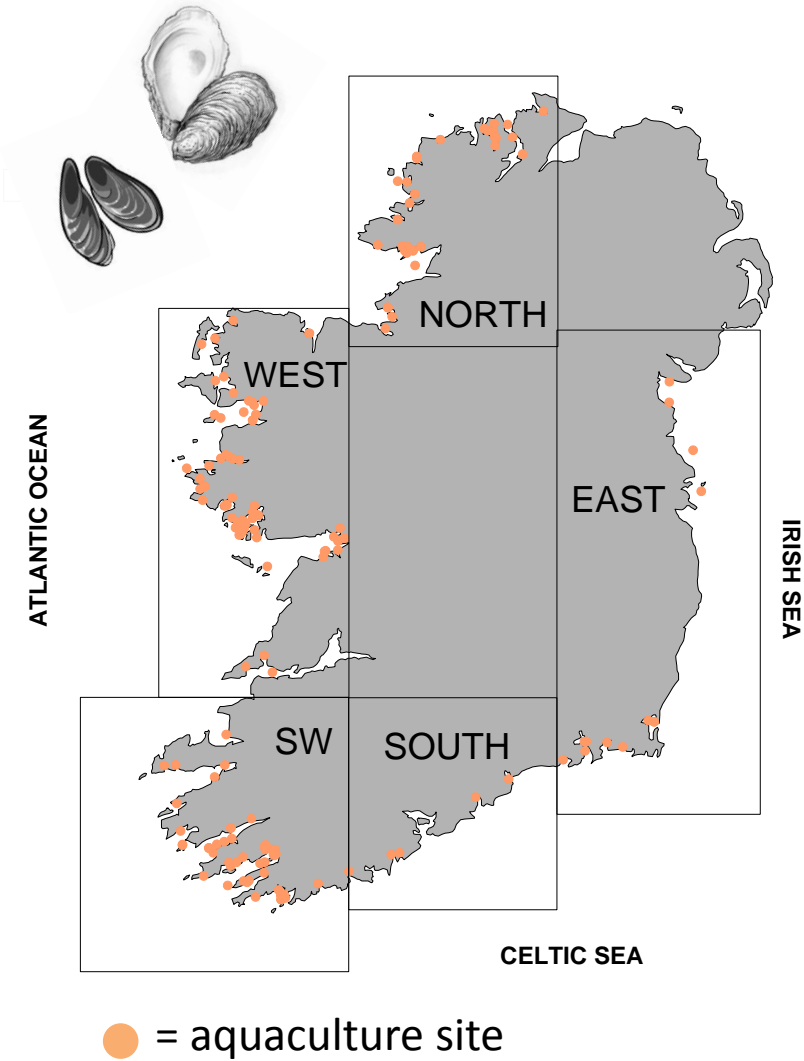
Shellfish biotoxin report (last week)



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 = **AZ**spiracid **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 in all areas

AZP event: Low risk in most sites except for specific areas - see info. below

DSP event: High risk in some areas

PSP event: Decreasing risk in Cork Harbour

Why do we think this?

ASP: Toxins not detected. The “*P. seriata*” group was found in high cell numbers in the north and east coasts. However this phytoplankton group only makes up a small portion of the community composition in the north and east, so there is plenty of safe phytoplankton biomass available to shellfish. Historically this is NOT a high risk week.

AZP: Very low background levels along the western seaboard. *Azadinium*-like species recorded at relatively low levels with maximum in the SW. Historically, this week presents some risk for AZP. The small blips of AZP toxins in shellfish nationwide indicate that AZP is likely to be on the increase. In the case of Killary Harbour, westerly winds predicted for mid-week are favourable for the inshore transport of shelf phytoplankton. If these currents are carrying toxic *Azadinium* then you will see an increase in related toxins.

DSP: Toxin detected in flesh samples in the south and SW sites. Toxin levels in the SW have increased in recent weeks. We are now in a traditionally HIGH risk period and the recent increase in toxins reflect this pattern. NOTE - very high cell levels of *D. acuta* were detected last week in offshore waters in the Celtic Sea. These bloom patches are travelling west in the summer coastal jets and have the potential to cause a very sudden change in toxicity in sites along the coast adjacent to the sea transport pathway. There is an increased risk that DSP events will continue to occur in the SW coast and an increased risk in all other areas. Based on historical weekly trends, this is a moderate risk period in the west coast. However, offshore waters are expected to enter Killary Harbour in the coming days and it is likely that *Dinophysis* cell levels and DSP in Killary shellfish will increase. You may also begin to see an increase in *Dinophysis* in waters to the north.

PSP: *Alexandrium* species present in many sites nationwide. No toxins detected outside Cork Harbour. Toxins continue to drop in Cork Harbour shellfish. The tidal activity in Cork Harbour no longer favours the growth and development of *Alexandrium* blooms and so PSP levels are expected to continue to fall.

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



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

ASP events: mid-March to early May

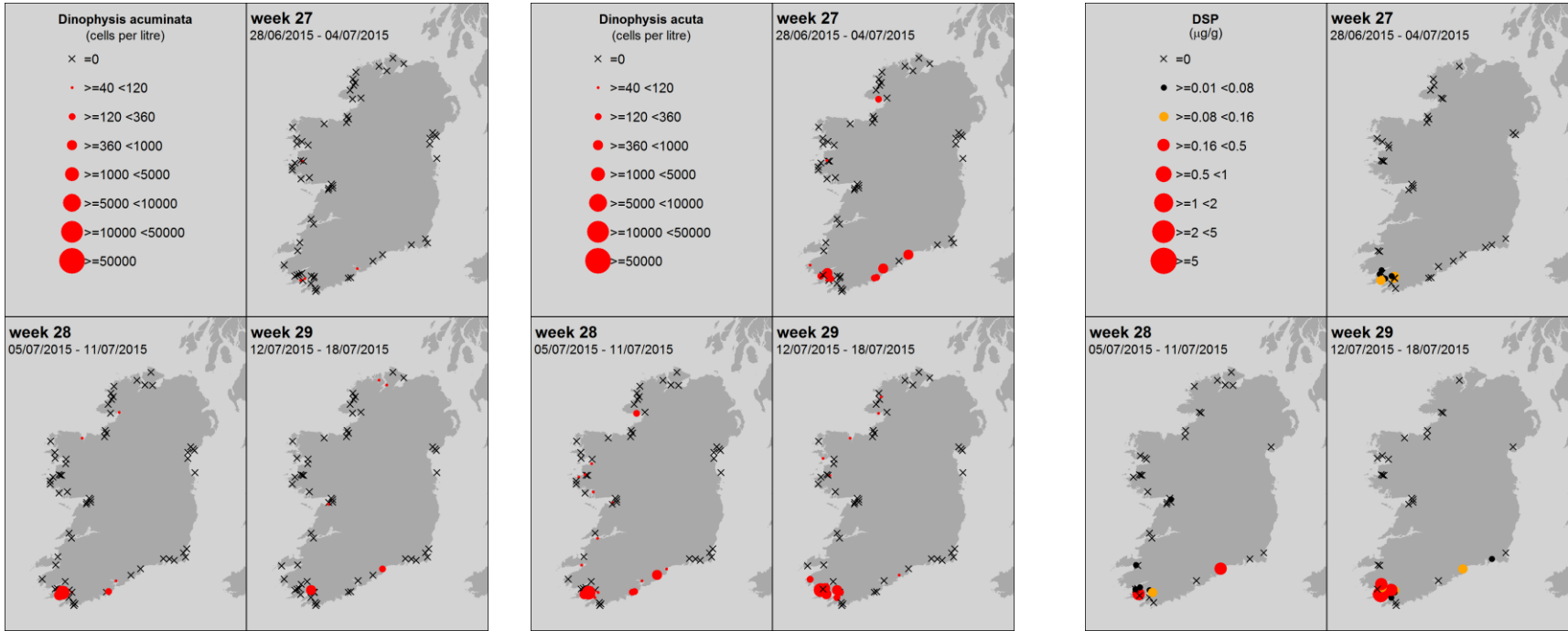
AZP events: April to December

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



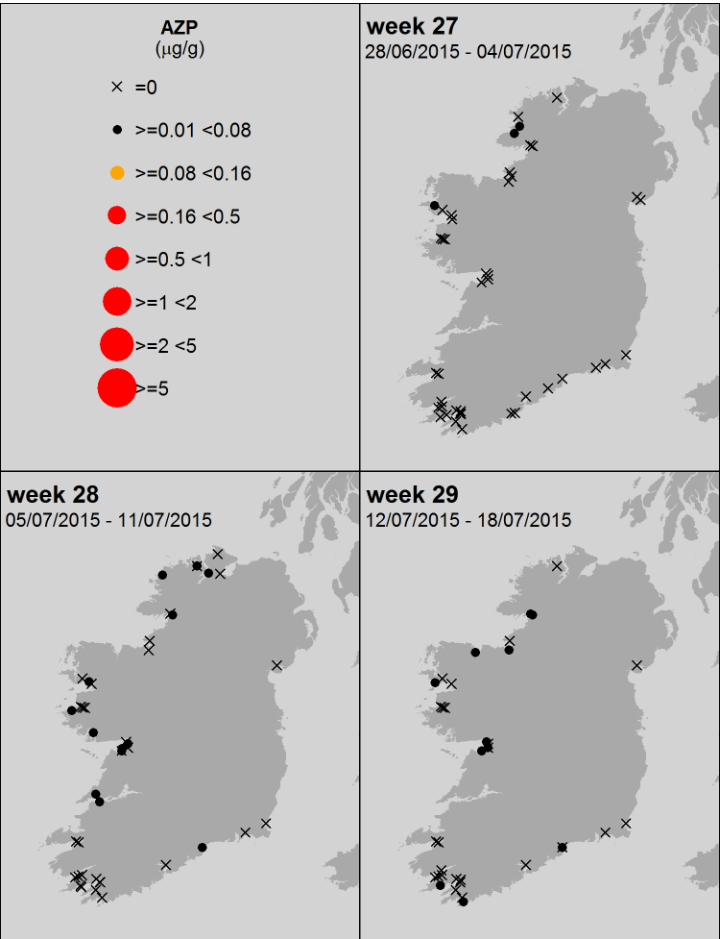
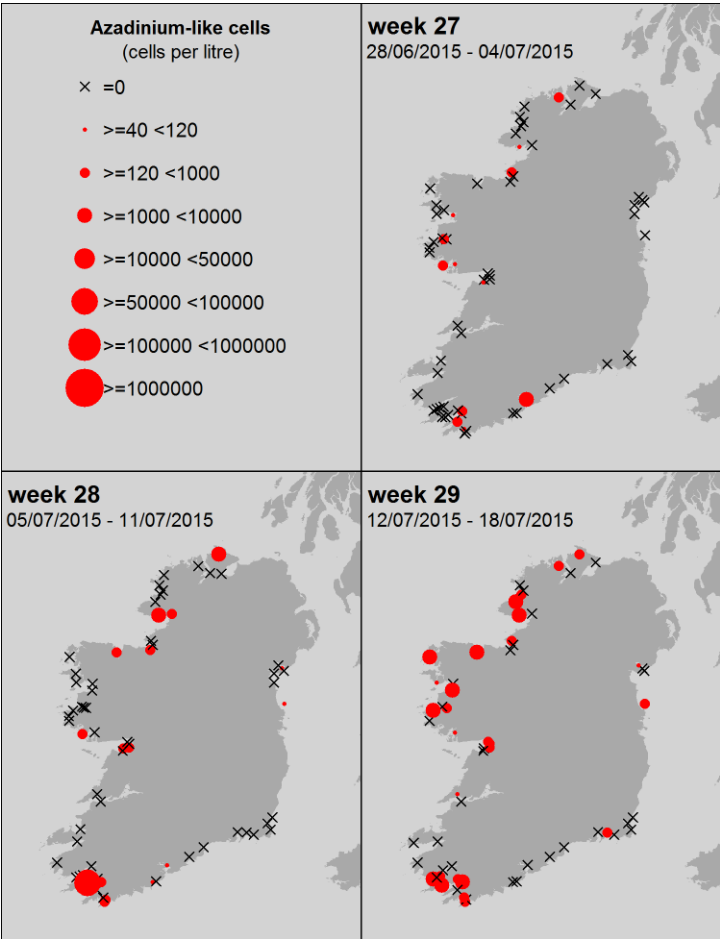
Ireland: Last 3 weeks of available National Monitoring Programme data



Azadinium – like spp.



AZP



Ireland: Last 3 weeks of available National Monitoring Programme data

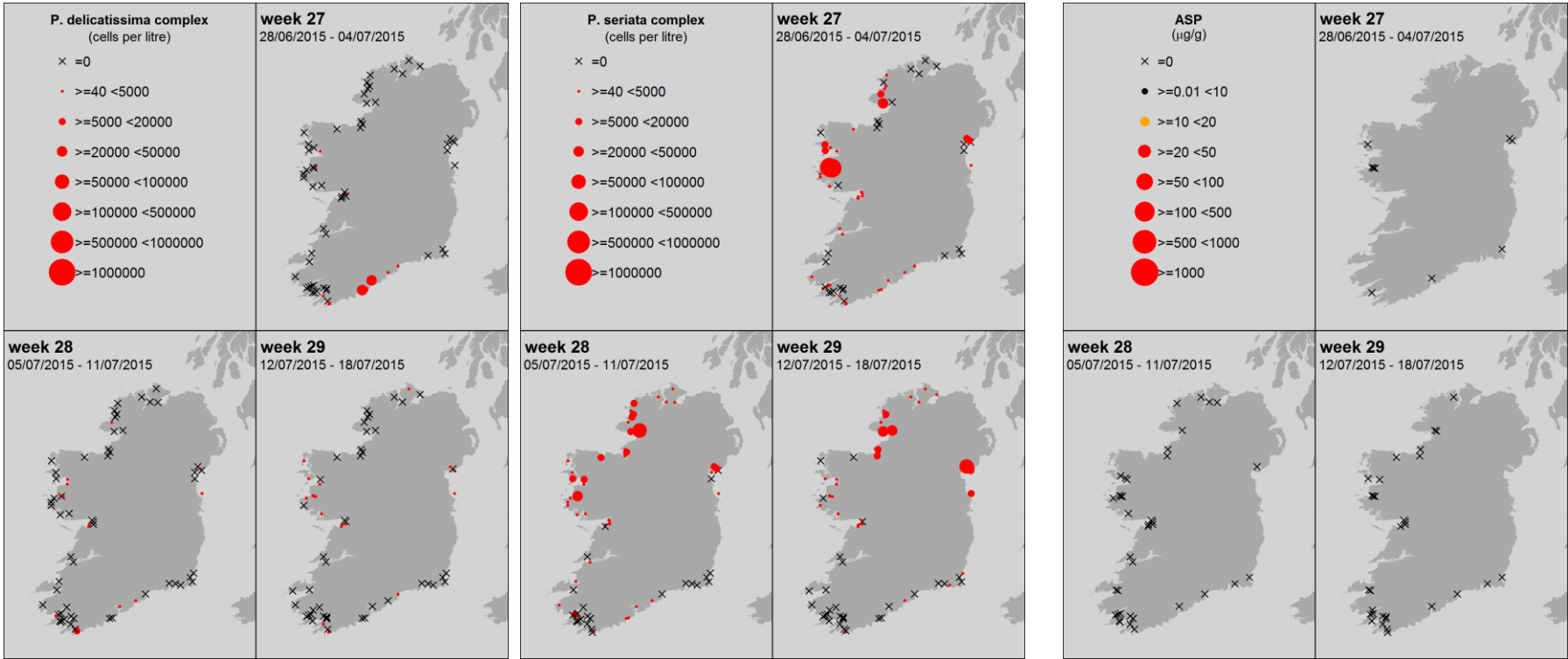
Pseudo-nitzschia spp.



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

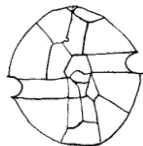


Taken from the literature: Of the 4 species (*P. fraudulenta*, *P. australis*, *P. pungens* and *P. delicatissima*) from Irish waters, tested for ASP toxins in culture work, only one, *P. australis* (from the “*P. seriata*” group) was toxic.

Ireland HAB & Biotoxin Distribution maps

[current status of harmful and toxic algae]

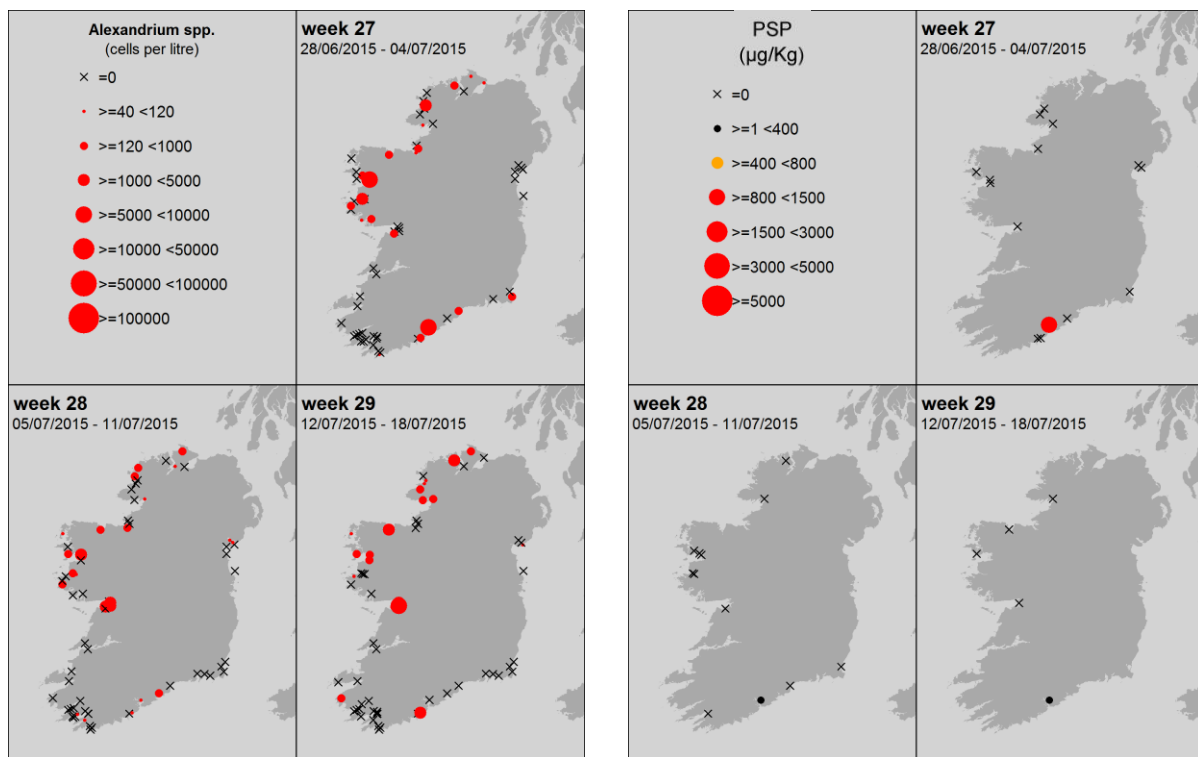
Ireland: Last 3 weeks of available National Monitoring Programme data



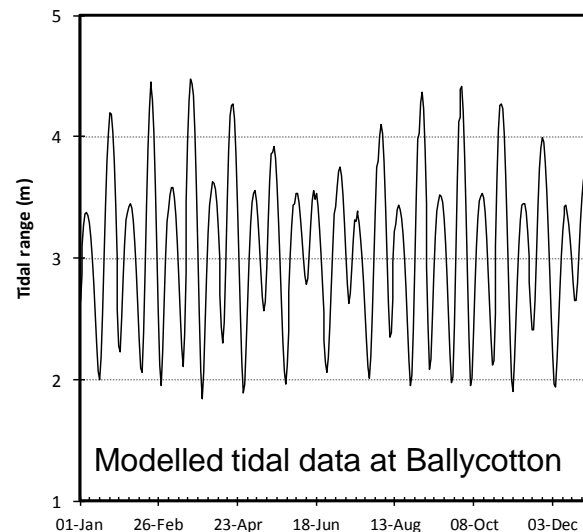
Alexandrium spp.



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).

Cork Harbour:

Shellfish samples tested positive for PSP

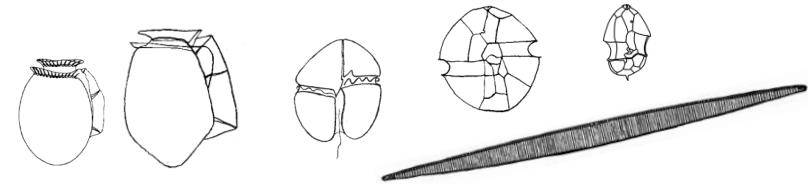
mussels = 71 µg/Kg, oysters 17 µg/Kg

Alexandrium spp. 1,360 cells/L

Ireland HAB & Biotoxin temporal trends

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

Ireland: Biotoxins



Toxin groups

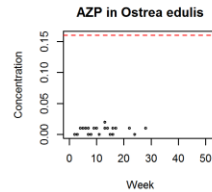
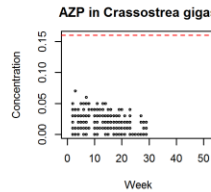
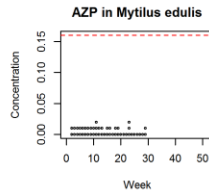
mussels

oysters

oysters

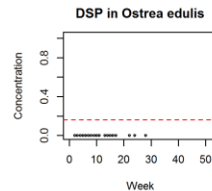
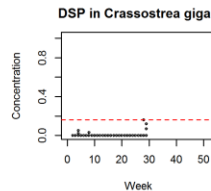
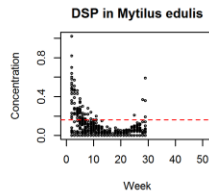
AZP

AZaspiracid
Poisoning



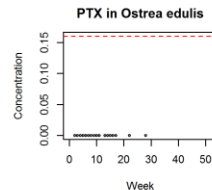
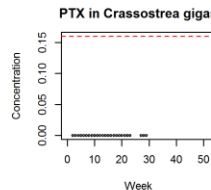
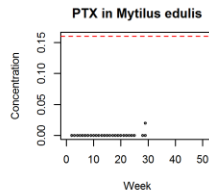
DSP

Diarrhetic
Shellfish
Poisoning



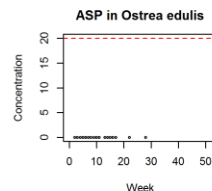
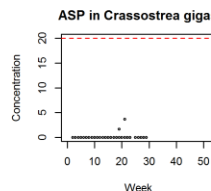
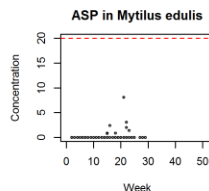
PTX

Pectenotoxin



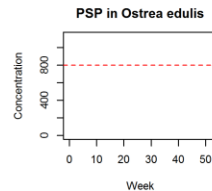
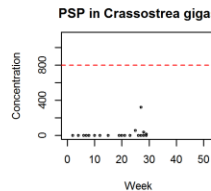
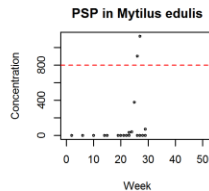
ASP

Amnesic
Shellfish
Poisoning

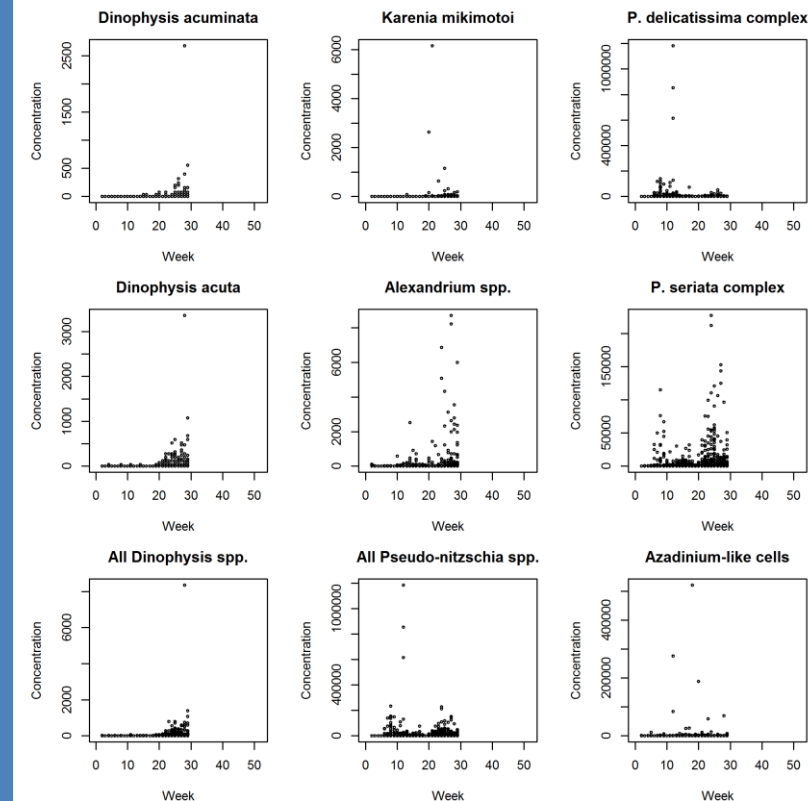


PSP

Paralytic
Shellfish
Poisoning



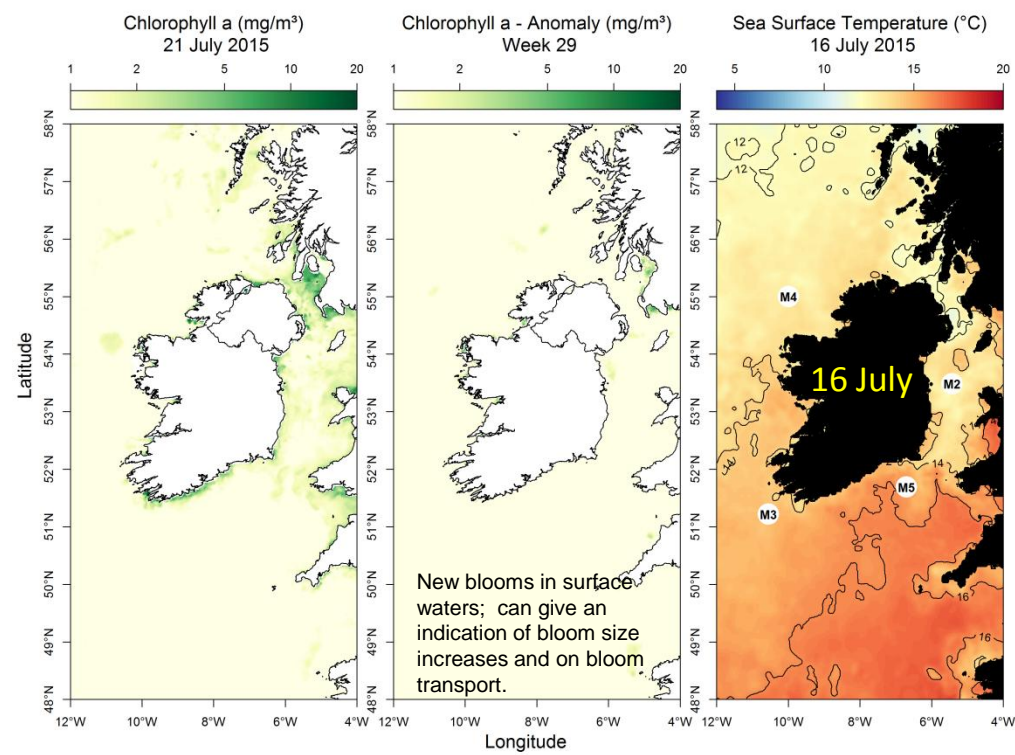
Ireland: HABs



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 1.50 °C
SW coast (M3) Offline
SE coast (M5) above average by 0.10 °C

What phytoplankton were blooming at inshore coastal sites last week?

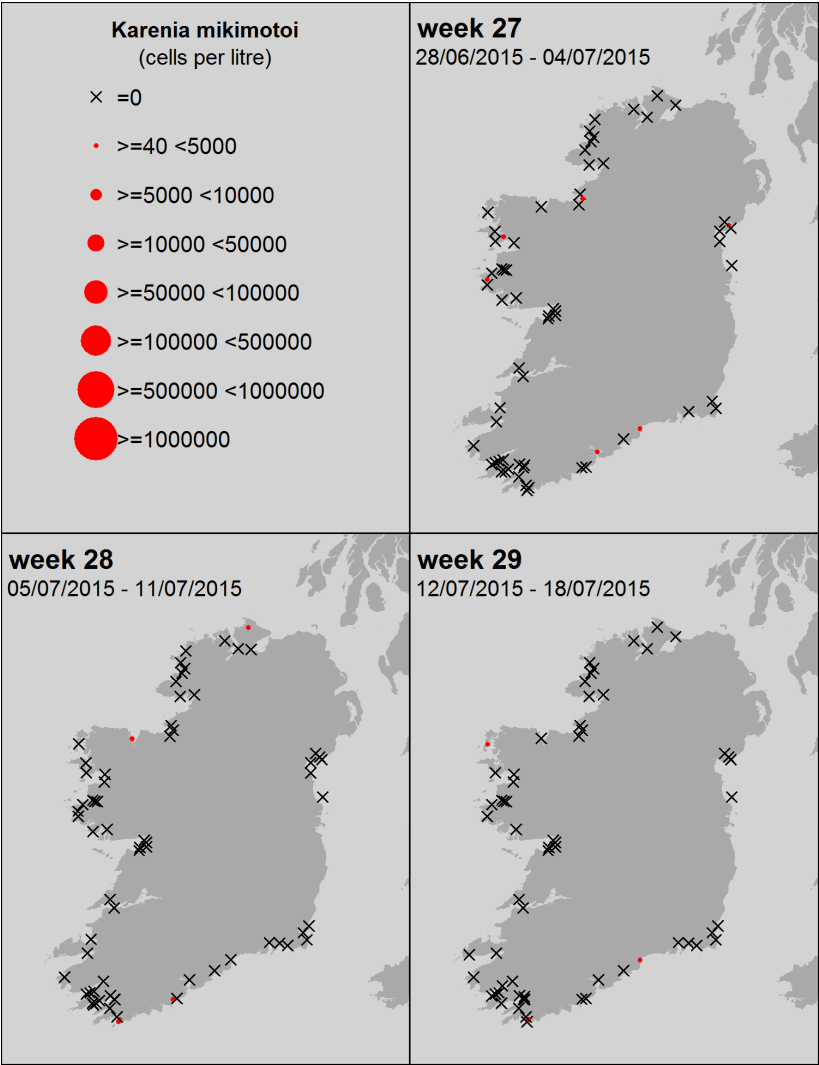
Region	Predominant Phytoplankton (most abundant taxa)	Cells/L (rounded)
north:	Diatoms: <i>Chaetoceros</i> (Hyalochaete) spp. <i>Skeletonema</i> spp. <i>Guinardia delicatula</i> <i>Leptocylindrus minimus</i>	6,612,000 99,000 84,000 57,000
west:	Other: microflagellates Diatoms: <i>Chaetoceros</i> (Hyalochaete) spp. <i>Navicula</i> spp. Pennate diatoms Dinoflagellates: <i>Scippsiella</i> spp.	758,000 231,000 107,000 76,000 167,000
SW:	Diatoms: <i>Bacteriastrum</i> spp. <i>Leptocylindrus minimus</i> <i>Detonula confervacea</i>	580,000 476,000 288,000
south:	Diatoms: <i>C. Closterium</i> / <i>N. Longissima</i> Centric diatoms (< 20 µm) <i>Thalassiosira</i> spp. (< 20 µm) <i>Navicula</i> spp. <i>Lauderia</i> / <i>Detonula</i> spp. Other: <i>Mesodinium rubrum</i>	34,800,000 656,000 599,000 78,000 22,000 1,275,000
east:	Diatoms: <i>Chaetoceros</i> (Hyalochaete) spp. <i>Leptocylindrus danicus</i> Other: microflagellates <i>Asterionellopsis glacialis</i> <i>Thalassiosira</i> spp. (< 20 µm)	377,000 263,000 175,000 104,000 101,000



Karenia mikimotoi
(old name: *Gyrodinium aureolum*)

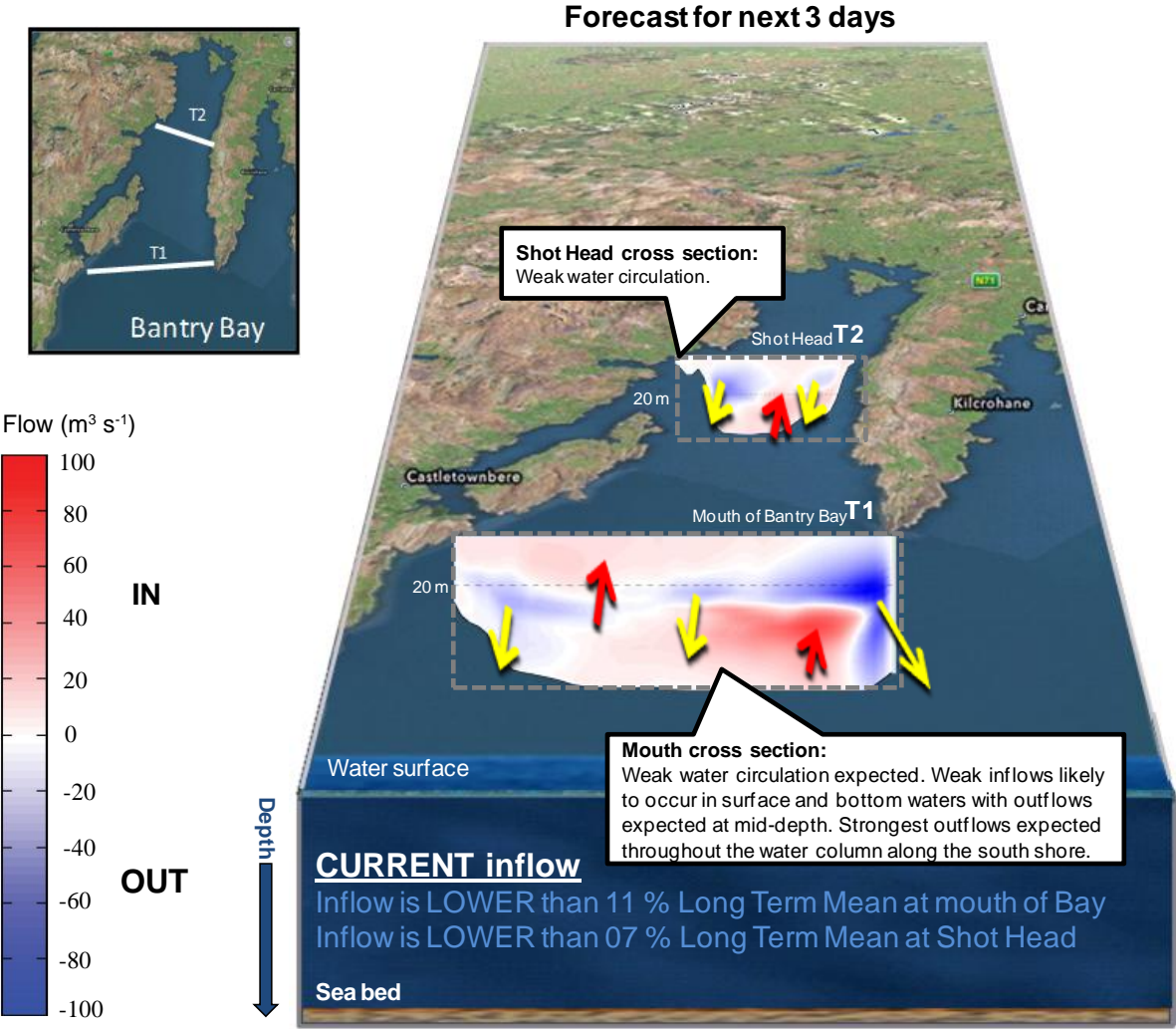
A *Karenia mikimotoi* bloom is NOT expected this week

Cell concentrations remain at background levels at 3 sites nationwide
max = 200 cells/L



Bantry Bay

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



Mixed conditions expected in the days ahead.

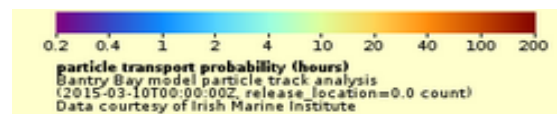
The estimated water movements off the SW indicate that there will not be a big exchange event in the bays of SW Ireland. However, populations of *Dinophysis* and *Azadinium* present in the bays may continue to grow and so you might see increased levels of DSP and AZP in the shellfish.

SOUTHWEST: Bantry Bay

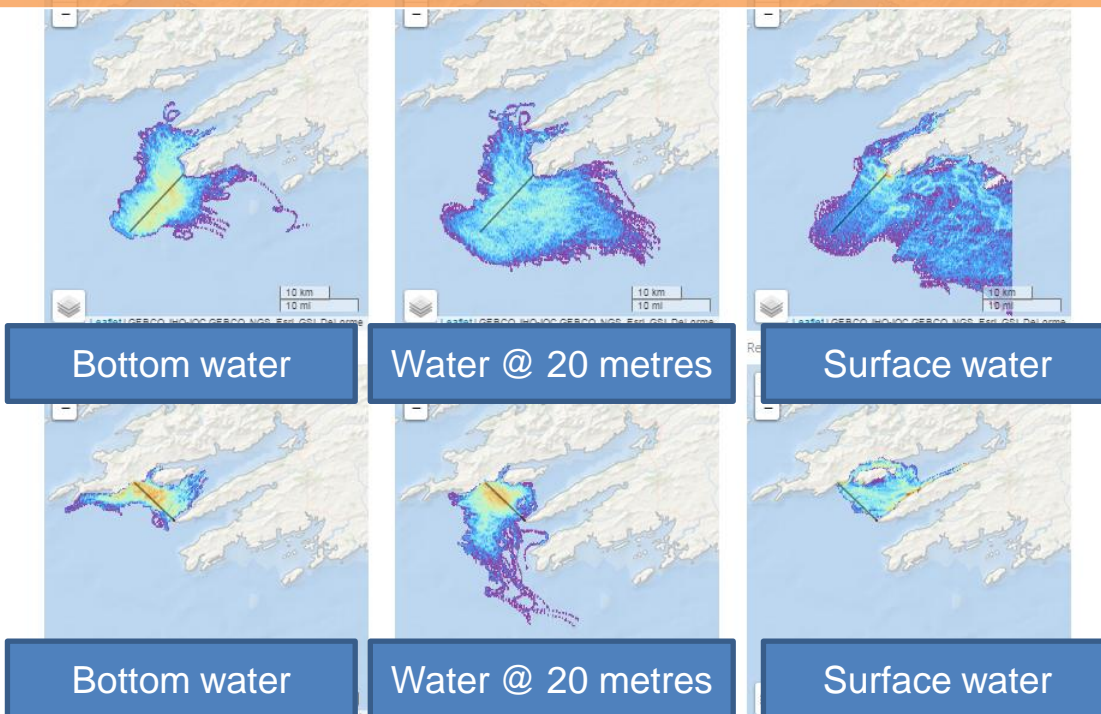
The maps show the **most likely transport pathways** for the next 3 days of **phytoplankton** found along the **presented transects** (black lines off Mizen Head and the Mouth of Bantry Bay) and **water depths** (bottom, 20 metres and surface)

Reddish colours represent areas where phytoplankton remain longest

Cooler colours represent areas where phytoplankton remain for shorter periods



Restricted water flow from Celtic Sea to SW bays. Particles released at 20 m and surface waters along the transect show the majority of particles headed in a SE direction.

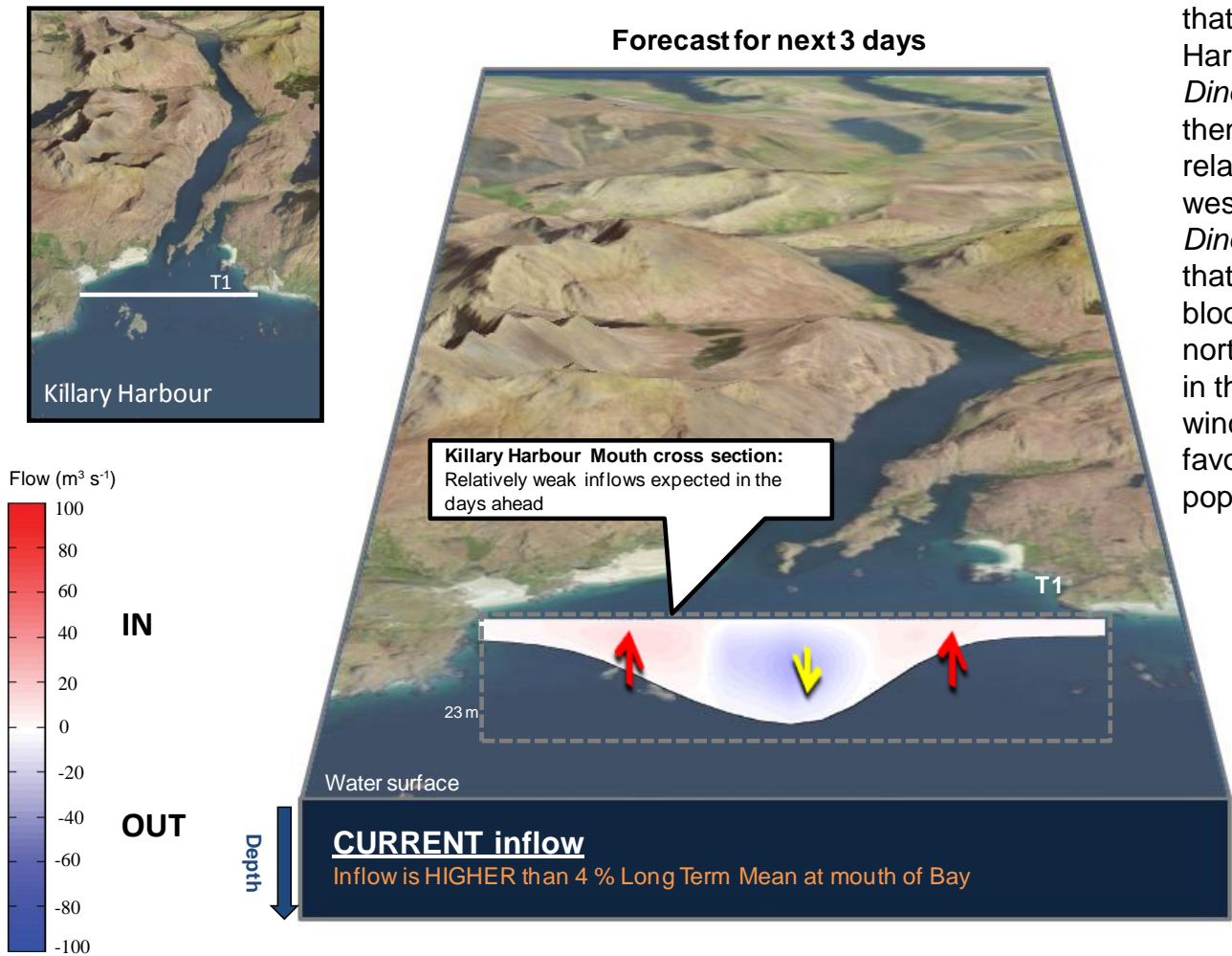


Predicted water circulation patterns at the entrance to Bantry Bay over the next few days show an influx of surface waters. Mid-surface waters expected to be retained at the mouth or will exit the bay. Bottom water movements are expected to be mixed.

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

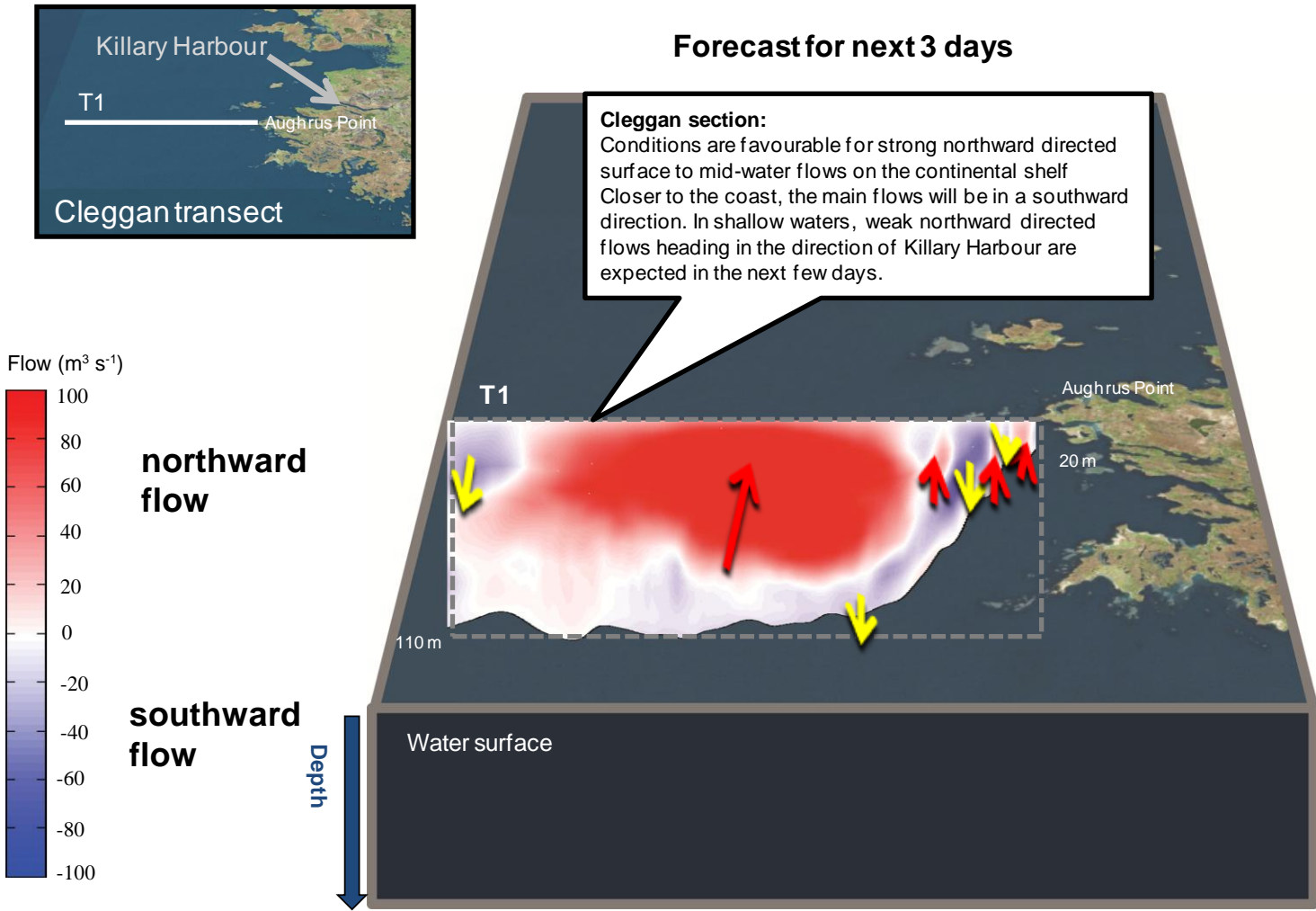
Killary Harbour

3 day estimated water flows at the mouth of Killary Harbour



The offshore simulated currents for the days to come indicate strong northward transport of surface waters that will reach the mouth of Killary Harbour. If these currents are carrying *Dinophysis* and toxic *Azadinium* spp. then you may see an increase in related toxins at some sites along the west coast. Given the high levels of *Dinophysis* in the SW, it is more likely that *Dinophysis* levels will increase if bloom patches have been transported northward in the summer coastal jets in the last couple of weeks. Westerly winds predicted for mid-week are favourable for the transport of offshore populations into Killary Harbour.

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




20 July – 23 July, 2015 (forecast ends at 00:00 hrs)

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

