



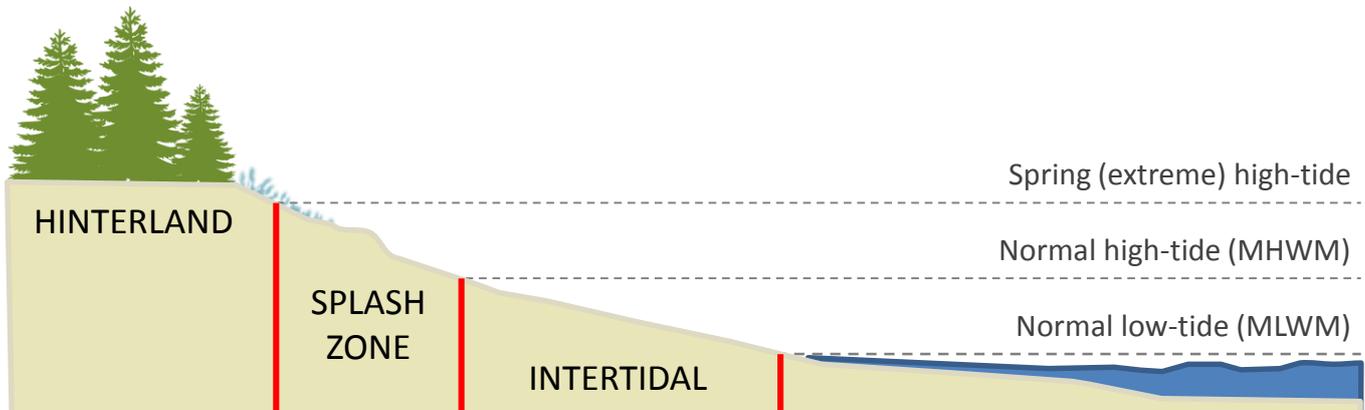
COASTWATCH SURVEY GUIDE NOTES

The Coastwatch Survey 2017 is taking place from the Black sea to the Baltic and the Mediterranean to the Atlantic. This is the 30th anniversary of the survey which was started on the island of Ireland in 1987 and went international in 1988.

It **involves** walking a chosen survey unit of sea shore (500m) once around low tide, eyes peeled for lots of information set out in the survey questionnaire and noting down your observations. Water quality tests may be used. Individual snapshot surveys are combined like a jigsaw of our shore in autumn 2017. Much of this citizen science work can be compared with or used to augment official data to better monitor our shores and seas and take action where needed.



A **survey unit** (s.u. for short) is a stretch of shore approx. **500 m long** as measured along mean high tide mark. On the Coastwatch map online it's any one of the blue or white sections you see along the coast. If you click on one the colour changes to red and the unique survey unit code pops up.



The **width** covers the sea shore from start of hinterland (dry land) down to shallow water when the tide is out. The intertidal may be over a kilometre in tidal estuaries with sand and mudflats, or reduced to a narrow strip along steeply sloping shores. In spring tides on a full and new moon it is widest. On a half-moon the **neap tides** show least difference in low and high tide. In the Black sea and parts of the Mediterranean and Baltic, the width is negligible unless wind blows the shallow water off away to create temporary 'Windwatt'.

We take width into account in our survey by asking about width of the splashzone and intertidal in survey questions C1 and D1. Those in non-tidal areas omit the intertidal section.

If there is a harbour or pier in your survey unit please download the extra of questions on harbour waste management and waste reception facilities. The micro litter app is particularly useful for harbours. EU law on harbour waste management is being reviewed.

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MATERIALS

MUST HAVE'S

1. **Coastwatch survey questionnaire:** Complete 1 questionnaire per 500m survey unit. You'll need a hardcopy.
2. **Guide notes:** print the core bits, or download to your phone to consult in the field.
3. **Detailed map with survey area(s) marked:** photograph the screen if you chose it on a computer, or bring up on your phone, or print a hard copy -see 'Map note' P 3. www.worldmap.harvard.edu/maps/cwsurveyunits
4. **Biro(s):** a spare in different colour allows you to tackle an extra s.u. on the same form.

USEFUL TO HAVE

5. **A phone and/or camera:** fully charged and with enough space.
6. **Micro litter app:** go to www.coastwatch.org/europe/microlitter for instructions. Other apps: www.bit.do/cwapps
7. **A coin** to include in photos for size.
8. **A clipboard**, with plastic cover or bag in case of rain to cover your survey materials.
9. **A container:** like a well washed Greek yogurt container with lid and handle, into which you might also put a plastic zip closure bag.
10. **A shoulder bag or light rucksack** to keep hands free and materials together.

EXTRAS – applicable or not depending on your survey area

1. Fresh water inflow test kits

- Test for nutrients coming from land: **nitrates and nitrites**, available from Coastwatch - please request in advance, posted out to you with instructions and colour chart while stocks last if you are doing more than 1 s.u.).
- **Thermometer** and/or **pH sticks** (stocked in aquarium, some pharmacy and school education shops) please use these if you have access to them.

2. **A small measuring tape** handy if you come across something you want to describe accurately or if photographing, to put the tape into the photo.

3. **ID posters** printed or downloaded – some are drafts.

(i) Biodiversity Tick Sheet (Ulster Wildlife)

(ii) Jellyfish ID with 'stingometer'.

(iii) Seashells The poster contains over 40 Dublin area species, most of which are found elsewhere in Ireland and UK too. We also have seashell teaching materials available on request.

(iv) IAS - Invasive Alien Species poster of river estuary coastal areas in Ireland. Download, any feedback welcome.

4. **Seaweeds select species ID and measurements.** We also have a select Seaweeds species ID and ed module which can be done at any time. During the Coastwatch Survey you may identify a super site to do it.

INSTRUCTIONS

1. CHOOSE YOUR SURVEY AREA. There are 2 ways to do this:

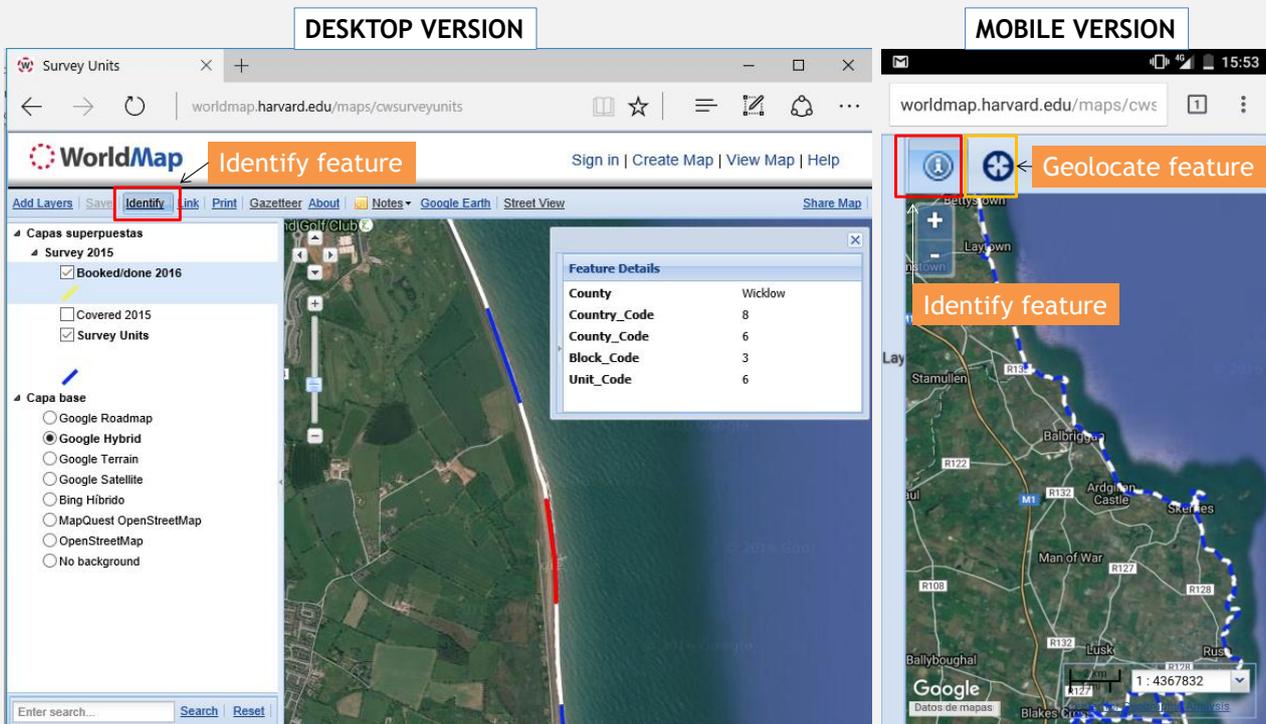
a) Go to the survey map <http://worldmap.harvard.edu/maps/cwsurveyunits>. Zoom in on your chosen area and select a 500m survey unit or more. Note the site code in Question A1 of the survey form.

MAP NOTE

You can access the Coastwatch map with a **smart phone** when you are in the field. The first page of the survey questionnaire carries a QR code. If you scan the QR code with any QR reader app the map will come up (but only if there is internet). So it is wiser to prepare where you know you can get on line.

You will be asked 'Would you like to view the alpha mobile version of this map?' If you say 'yes' you will be able to use the geolocation feature that tracks your location using the GPS on your phone. If you say 'no' you will be redirected to the desktop version of the map.

You have to make sure that the Identify feature (top toolbar) is selected or the code will not pop up.



Helpful map hints

Here three ways to prepare a survey unit map for use while surveying, (e.g. to identify start/finish of your survey unit), while you have internet access: **(1)** select your survey area on the Coastwatch Map, in 'satellite view', then either take a screen shot which you print to take out with you, or **(2)** photograph the map on the computer screen, to zoom in on the photo on your camera or phone while out surveying, or **(3)** If you have a smartphone you can find the map on your phone and take a screenshot, which you can consult later. For all options: include a few s.u., so you can survey the next one, if it's a great day for roaming around the shore.

If you don't have internet access a map of your area can be printed out and sent to you by post. Contact your regional or national coordinator (see option **b** below)

If you experience any problems with the maps please contact angel88dc@gmail.com

b) Contact your Coastwatch (regional) coordinator to have an area allocated or a group of other surveyors to join. They should then provide you with the survey area code and its location. www.coastwatch.org/europe/survey

2. BOOK YOUR SURVEY AREA. There are 2 ways to do this:

- a) Book your survey area using our online booking form: www.coastwatch.org/europe/booking
- b) Contact your regional/national coordinator and let him/her know, or ask them for recommendations (see web)

Booked areas and watching progress

We plan to update the map (<http://worldmap.harvard.edu/maps/cwsurveyunits>) every 2-3 days during the survey, so there is some lag between bookings and those s.u. appearing booked on the map (booked s.u. will be marked in **yellow**, done s.u. will be marked in **green**). Several reports for one s.u. are useful to run validation checks. But as we do want to cover as much coast as possible, make sure you check the most up to date map on line before booking.

You can just go out on the spur of the moment as you happen to be on a shore and can get internet access to identify the survey unit. But ideally you plan, book and if the area includes a stream or pipe discharging water order water quality test kits in time.

3. PLAN AND SURVEY

SURVEY PLANNING HINTS

Try to start about 1.5 hours before low tide. Check a tide table, go to www.bit.do/easytide or google 'low tide and place or nearest harbour'.

For Groups or school classes sharing a survey unit or a longer stretch of coast

- Agree a marker, or a line across the shore as start/end points of survey units to avoid overlaps where the end of 500 m isn't clear such as a long beach. A pedometer app as used in sports is useful to mark out the 500 m on the ground.
- If several people are doing the same survey unit, suggest dividing the survey between them at the planning stage. Some may concentrate on the Land and Inflows page (B) while others do waste/litter (E). Or all do litter but divide up counts (page 11)
- Ensure each surveyor (group) has (i) the required survey form, (ii) at least the basic biodiversity ID poster and a master set of all posters is downloaded or in hard copy with group coordinator (iii) survey area map, (iv) downloaded the micro litter app if doing the waste page and has (v) contact details of another surveyor. (vi) If distributing water test kits make sure everyone also has the colour chart to compare nitrate test strip colour with the chart. (ID Posters can be laminated to be used again).
- Organise member pickups or a meeting point to share findings and immediate follow up if needed.

NB - You might have devised lots of other clever ways of planning a group survey. We'd be delighted if you were to share this. Take photos! We are planning to do a special school workshop as several countries have integrated the CW Survey in class work.

SITES TO SURVEY

The more continuous the Coastwatch survey returns in an area – e.g. for a whole 5 km block, or even 2 adjacent survey units - the more reliable our conclusions from results. If we selectively pick beaches, we will get a bias in litter and in other categories. If it's possible, choose or include a 500m survey unit you know, as that provides extra background information. There are some 80 priority sites which have been surveyed most years. Old surveyors in those areas are notified by email. If they cannot repeat survey they are begged to help us find someone else so we keep long time lines.

Accessibility: If a whole survey block is booked, part may be inaccessible. No problem. Please just complete the first page and make any comments and return that form. No access is also important.

TIMING

15th Sept to 15th Oct. survey period. (an overrun is possible in case of bad weather or to avail of a good spring tide)

22nd October: Deadline for your survey results to be submitted **online**. If posting forms please do so as soon as possible to allow others to input your data on time. Post to **Coastwatch, Civil Eng. TCD, Dublin 2 by Friday 21st Oct.**

Tue 28th Nov (tbc): First result highlight and follow up planning event. All surveyors are invited to the results highlight launch and conference gratis.

Mid-January 2018 onwards – International results and follow up plans final results book.

NOTES ON QUESTIONS

A Background information

- A1** The unique code for each 500m survey unit needs to be filled in as provided on the survey map <http://worldmap.harvard.edu/maps/cwsurveyunits> and follow instructions. Please alert Ángel Duarte angel88dc@gmail.com if you notice any map or code problems. Some islands and countries are not coded using this online system yet but can be done.
- A6** Please answer whether you think the area here is designated from previous or present knowledge or from posters/signs seen near the shore. This question is to gauge present knowledge and public information not research. Research is welcome in A7.
- A7** The first column lists most common international and national nature designations. Find EU designations with maps on www.natura2000.eea.europa.eu/ for all EU countries. For Ireland see www.npws.ie/protectedsites.

'Other' Nature designations includes regional ones like the OSPAR MPAs <https://www.npws.ie/sites/default/files/general/OSPAR%20MPAs.pdf>. In the Rep of Ireland case the coastal ones are all Natura 2000 sites with an extra MPA designation label. Designation of further MPAs under the MSFD is in progress and some new sites were identified with citizen participation in Northern Ireland. This MPA designation legislation is being drafted in the Rep. of Ireland. Surveyors who know an area well which is biodiversity rich and special (e.g. a rich seaweed area and fish nursery not yet protected under other legislation) could consider collecting data for proposing such sites as soon as the legislation to do so is in place. Coastwatch is hoping to work on this internationally.

The 2nd column is a mix of human uses and human use designations. If the area is officially designated, there are requirements to be met and quality standards apply. For some you need to dig if you want to find out more, for others like the bathing water designation there is real effort to provide public information and open up participation. See ec.europa.eu/environment/water/index_en.htm for the EU. In Ireland the EPA and local authority have a really informative new website www.beaches.ie.

Shellfish Areas (Used to be called Shellfish Waters when first designated under the Shellfish Water Directive) are designated and monitored to ensure the quality of commercial farmed or wild collected edible shellfish is OK for human consumption. That Directive has now been brought into the Water framework Directive. To see which areas are designated still google 'designated shellfish water and your country. For Rep of Ireland areas see <https://data.gov.ie/dataset/register-of-protected-areas-shellfish-areas>, for designated sites in NI see <http://bit.ly/nishellfish>.

'Other' includes shore uses and permits to use, not just designations. So include areas used traditionally for **seaweed harvesting whether or not licensed**, as well as permits e.g. **aquaculture license, seaweed harvest license**. Evidence of popular **bathing** and evidence of **aquaculture** being practised where not designated or licensed are also included here. Add notes as needed.

- A8** **Direct access** from hinterland can influence how the shore is used and how a pollution incident may be addressed. Think of 'accessible' questions as by car, or average wheelchair, or family/group walking with minor climbs, not mountain goats!

If the survey unit is inaccessible directly but can be accessed via other survey units, still put inaccessible but then go ahead and survey 'from next door'

If your survey unit cannot be surveyed even from other sites, please still send in the page. If you have extra notes on access – eg there used to be a road or path but it has eroded, or could be accessed by boat - please add in F6.

NB – when you return the form, the area will be marked as surveyed on the master map; we don't have a different colour for 'inaccessible to survey'. But later in result presentations we plan to map these areas as 'inaccessible and therefore not surveyed' or 'no direct access, but surveyors accessed and surveyed via other units or by boat'.

B Land and inflows

- B1** The hinterland and shore are linked, one affects the other. Look out for immediate land use for the first 500 m or so above your shore. A good photo can be added. Sea banks which aren't grazed should be marked as 'other' and noted in the space provided.
- B2** Describe each **inflow** at time of survey as you encounter them walking along your shore. There is space for 4 inflows to be described (4 columns) If you don't have enough time concentrate on the biggest one or one which needs attention. There is a special focus on the fresh water inflows which enter the shore, especially small streams this year as our second river basin management plan is to be adopted. **Look up catchments.ie if you want to see whether the inflow you see: (1) Officially exists and as what (2) Whether it is monitored officially yet (if not your data may be of special value) (3) Whether there are any licensed discharges upstream which might effect quality.** If you are not sure how to find your way around this EPA website, or want to do more on a stream, recent experience from a FLAG project and Irish EPA support allows us to provide extra training. Look out for training opportunity in your area or ask us to provide it.

Inflow type

Inflow types are sometimes difficult to differentiate. Write the first letter of what you think the inflow is in the survey form column:

P - A **pipe** can be small like a drain from a wall, medium like the one in the picture or a sewage storm water overflow which may be dry on day of your survey but should still be recorded as present and the shore below it checked for recent sanitary litter indicators.

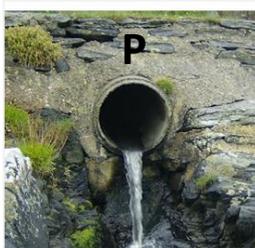
S - **Seepage** is where the water comes out of the ground or bank or wall without a clear source. A pipe could be hidden under sand but water emerges as seepage. Also look out for seepage appearing half way down a shore in the intertidal.

D - A **drain** is usually a small man made field drain or cut to take water from land. It is active after rain or watering but may dry up.

R - **Rivers** and **streams** are more natural and larger. Most are carrying water year round in N. Europe but may be dry for part of the year in southern countries.

If a drain or river passes under a sea road, it will require a bridge or a very large pipe culvert. Record the inflow as an **R** or **D** rather than a Pipe. then photograph its mouth, or by use the [river obstacles app](#).

NEW: PLEASE ADD RIVER or STREAM NAME IF KNOWN IN THE TYPE box.



Size

Small (S) – medium (M) – large (L) size indication. Think of letting someone know what to look out for if they were to find that inflow.

Quality Indicators

Animal life: look for both fresh water and sea life. Juvenile fish move up and down. Spend a few minutes on searching if it's a promising stream. A pond dip net can be great. Are there lots of shrimp? If you have a spoon or similar implement you might dig into the bank where small eels or lampreys may be hiding. If you lift stones put them back. We are not asking for detail in the survey form but.

Smell: A bad smell might be natural – if seaweeds are decaying in the stream mouth, after a storm. Or you might pick up a distinct sewage, slurry, chemical, or oil smell. Add comment.

Colour/froth: Tick all discoloration –whether natural brown humic acid rich water from a bog which is natural, or discoloration after heavy rain. Iron bacteria may also stain the base of a drain or pipe. That isn't a health hazard but can look alarming with rust coloured slime. Occasionally you might get industrial source of discoloration. Try using the 'Eyeonwater' app or just photograph if the colour is strange www.coastwatch.org/europe/citclops-project. Scum froth – please photograph.

Dead fish: are quite rare and if you see one please do photograph. If you see several add a count in F6 and contact relevant authority & Coastwatch. In Ireland report to IFI [Phone: \(01\) 884 2600](tel:018842600)

Dumped waste and waste washed down an inflow but not sewage related: Bridges are favourite places for rogue waste disposal, so look out for waste dumped on the seaward or landward side of a stream entering. Photo and report.

Sewage and sewage related litter: is now a separate category. Note that sewage litter from storm water overflows may contain long strings of baby wipes or wet wipes which have become increasingly popular in recent years. Some are described as flushable on packaging. Please don't touch but **photograph**. This litter leads to sewerage system blockages and treatment plant breakdowns and hence shore pollution. So it's on our priority list to tackle.

Grey/brown filamentous algae and sewage fungus are in one category, as these have been too difficult to tell apart. Neither of these are found in a healthy stream. A blanket of these covering the stream bed flags a problem. So add 'B' if that is the case and take a photo. NB – if you see tufts of **green** filamentous algae this should not be ticked in your survey form. **Sewage fungus** is a soft brownish grey filamentous covering of the inflow floor, or it can float like long dirty grey hair. Occasionally other colours are mixed in with it. It is usually slimy and smells of sewage. Sewage fungus is never green and never has roots like a plant. Please add in comments (bottom of page) if you see other issues, especially:

- a **mass of decaying brown seaweeds** lodged in the stream channel or lagoon at its mouth. (As that rots, it uses up the oxygen and becomes a problem for stream life. The water may turn grey white).
- a **layer of peat** which may cover the inflow floor in areas with peat cutting and inadequate silt traps. Peat 'chokes' the river bed and is harmful to fish which lay their eggs in the stream bed. In this case could you take a sample as evidence, note it in comments and contact us. In Co Meath one Coastwatcher did just that and the source was identified by the EPA and addressed.

Oil and look-a-likes: A fine oily film on still fresh water, pooling as it gets into the sea, may be innocent as caused by iron bacteria. To check, dip a stick into the film and watch what happens: if its iron bacteria, the film breaks like thin glass, while if its oil, the typical swirls will be seen. **Oil pollution is a serious threat!** If found please take photos and contact the relevant body to find the source and stop it. Note the location within the su. and report immediately to local authority and Coastwatch.

Invasive Alien Species: may be seen on the bank of the inflow, at the water's edge or in the water such as stream bed. Please check our poster to help with ID (www.coastwatch.org/europe/survey)

Water Quality Tests:

Test Kits are valuable, but expensive and work to fundraise. So if you have some, please use them correctly and ensure you return results!

The most common issue in our freshwater inflows is nutrient enrichment: **nitrates and phosphates** are nutrients, which plants need to grow. But too much creates problems and water bodies become **eutrophic**. Apart from tests which give the nutrient concentration that second, look out for stream eutrophication indicators (i) brown-grey filamentous blanket on the stream bed and (ii) super green lush water cress in the water and lush nettles on the banks.

A typical shore eutrophication indicator is abundant sea lettuce and other **green algae** on the shore in summer (it dies off in winter).

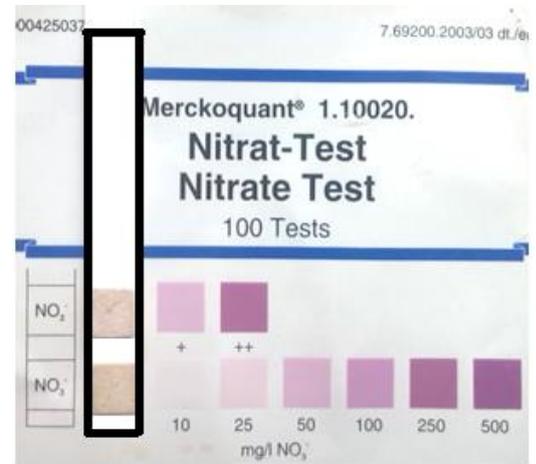
As field Nitrate tests are cheaper than phosphate tests and nitrates tend to be the main problem in coastal waters, we are testing for these in the CW survey.

Key nutrient sources are sewage, fertiliser and slurry. Our survey takes place when the slurry spreading season is still open in most areas. Slurry is spread to get nutrients back onto land, not into water courses. Agricultural pollution controls are in the EU Nitrate directive <http://bit.ly/nitratedir> and national laws to implement that EU law. e.g. the Irish nitrate regulations on <http://bit.ly/ienitrate>.

Nitrate/nitrite Test kits

Each metal strip contains just one test which can only be used once. Make sure you **keep strips cool 4-10 C⁰** and dry until you use them and please report back your findings. The colour chart can be reused assuming you don't get colour from the test strip all over it. When ready to test:

1. Open the metallic wrapper at the fine line and pull the test strip out, with the reactive pads area like a lolly pop.
2. Wet the pads by **briefly** (1 sec) dipping them into the water you are testing. Shake off any excess liquid and wait.
3. After 1 minute (in very cold weather 2 min), compare the colour of the pads with the colour scale (see picture) and read off the nitrate concentration. You cannot wait more than 5 min to read, so if you don't have a colour chart with you, take a water sample instead and test later. Photograph the result.
4. Write down the results in the Question B2 table against the right inflow. If very high you might look for a possible source?
5. The second pad closer to your hand is to pick up Nitrite. This is highly unusual as it quickly degrades to nitrate. If you do get a positive nitrite please photograph.



← Surveyor tests seepage which is running beside an old defunct pipe across the shore. Warren Point.

The pH is a measure how acidic or basic your inflow water is. Most of our run off and stream inflows are about neutral (pH of 7) with animals and plants adapted to this. Water is acid - down to pH 4.5 in peat bog areas; often with natural brown humic acid discoloration - or alkaline around pH 8 in limestone areas. Seawater is around 8 pH units.

The pH scale is logarithmic, so each whole pH value below 7 is ten times more acidic than the next whole value. E.g - pH 5 is ten times as acidic as pH 6. For industrial discharges, pH limits may be stipulated in the license. Look up catchments.ie and see whether there is a license and get detail.

Temperature: It must be taken while at the site. Dip the thermometer into the inflow wearing a glove and wait long enough for type of thermometer.

- B3 Sewage pollution** may be coming from outside your survey unit, or from a source within it. Sometime a very small source can cause nasty localised pollution. It might be raw, or part treated. If 'seasonal' it is usually summer and it may not be active when you arrive to do the Coastwatch survey. But there may be signs of recent activity. If sewage pollution is associated with heavy rain storm water overflows, you might see what you think came from a toilet on the base or sides of the inflow. Photograph such sanitary litter. **SAMPLES:** We **do not** want water samples!!!! as they 'go off' quickly and need special storage in cool conditions.

You can add notes on B2 and B3 in the comments at the bottom of that page, or leave it for F6.

C Splash Zone

- C1** The **splash zone**, also known as supra-tidal, is the extreme upper limit the sea reaches in highest spring tides and storms. It receives the splash of waves (and debris) on rocky shores and is a really specialised habitat.
- C2** **Saltmarsh** and **reed beds** are valuable wetland soft coast **splash zone** types, while **drift line vegetation** or eroding **dune** might mark the splash zone of a sandy beach. These are habitats, protected under the EU Habitats Directive and national law. **Building** can be a bridge, or harbour wall. **'Hard erosion control'** is varied from **groynes** (poles or rocks built at an angle from the shore to catch sand drifting past, to wire mesh gabions filled with stones, hugging the edge. If this is an old **sea wall**, you might check is it being undermined or has stones missing which isn't obvious from the landward side. If so a photograph with location is very useful for authorities who are trying to protect the land behind the sea wall. Get onto your local authority as first port of call. If not responsible they may know who is. Cc Coastwatch in to your notification. **Builder's rubble** and **construction waste** are illegal hard erosion controls and also ways to reclaim land. Tick here and in E1 large waste. Please take photos and notes.

D Intertidal

The **D section only applies to tidal areas**. So omit in the Baltic and Black Sea. If not familiar with the plants or the names used (locally these may differ) look at a plant guide, or on the web. A good NW Atlantic seashore guide is www.marlin.ac.uk/wwf

D1 HIGHER PLANTS

Spartina is a knee high hard grass, likely to have seed heads now in autumn. It favours sand/mudflats, or saltmarsh channels where it can stand like a growing island. One variety introduced to Europe to reclaim land over 100 years ago, unexpectedly hybridised with a local species. This hybrid spread around the coast of Ireland and the UK.

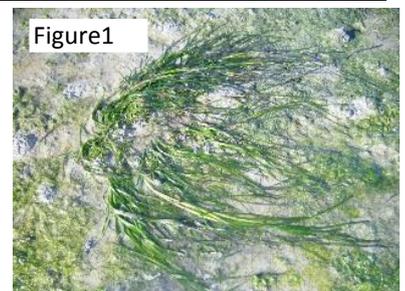
While *Spartina* swards can form rich habitats, the hybrid is invasive taking over valuable open mudflat habitats and seagrass (*Zostera*) beds. Reports from new areas, where it was not seen before and noticeable change in area previously occupied on the shore are of particular interest.



Zostera are silky grasses which live in the sea.

The little *Z. noltii* looks like a wet thin grass lawn which is ready for a cut, lying on the sand/mudflats when the tide is out. It may be patchy as in fig 1. It's the most favoured Brent geese food, so watch out where you see geese grazing.

The rarer *Zostera marina*, has two forms: one (phenotype) grows in wet areas of the intertidal and pools fig (2) and is easy to identify as strong up to knee high grass. If the water is fully out it also lies down. The second phenotype grows from low water down depending on water transparency and other factors. It can be a meter or 2 long and is an important feeding, shelter and shore protection habitat for fish, molluscs, shrimps, sea horses etc. *Zostera* beds are threatened and if you find one it's a real treasure! You might find **Zostera plants floating on the water or dislodged blades** that indicates its growing in the area. The blades turn shiny black like old tape on the tideline as it dries. Along the Mediterranean coast *Posidonia* is the dominant seagrass species.



Glasswort or Golden Samphire Salicornia is listed in the EU habitat directive as 'Salicornia sward'. Several similar looking fleshy hand high species, grow from seed in spring on the lower saltmarsh, or upper mud flats. There is also a very rare perennial one. *Salicornia* turns red-orange-yellow (hence Golden Samphire) before shedding seeds in autumn. Some are edible. Snails and flounders nibble on them too.



SEAWEEDS:

The same areas as *Spartina* and *Zostera* can be occupied by seaweeds.

'**Green algae**' i.e. seaweeds can look similar to *Zostera*. On closer examination though they do not have the typical grass blades with veins, but have bubbly or homogeneous bright green tissue like strands. The other big difference is that grass has proper roots which go into the mud or sand, while green seaweeds only have small holdfasts to cling to something. NB - Many greens die off in autumn while sea grasses don't.

Brown and red algae are what many traditionally call 'seaweeds'. Most brown seaweeds in the intertidal, are leathery and need to hold onto something firm like a stone with their 'holdfast'. Seaweeds don't have roots. Kelps are like forests of the sea, exposed only at spring tides in the lowest intertidal. See www.seaweed.ie to be amazed by the diversity and help you identify a few seaweeds. A new Coastwatch seaweed ID, information on measuring and where the growth points are is in preparation and will be uploaded on our [website](#).

D4 Look out for new native and non-native species which may be becoming established due to change of climate or introductions.

Invasive Alien Species are animals and plants that are introduced accidentally or deliberately into a natural environment where they are not normally found, with serious negative consequences for their new environment. They represent a major threat to native plants and animals in Europe, causing damage worth billions of euros to the European economy every year. EC Brochure on [Invasive Alien Species](#) For work All Ireland see <http://invasives.biodiversityireland.ie>. The [Regulation 1143/2014 on invasive alien species](#) entered into force on 1 January 2015. This Regulation seeks to address the problem of invasive alien species in a comprehensive manner so as to protect native biodiversity and ecosystem services, as well as to minimize and mitigate the human health or economic impacts that these species can have. The Regulation foresees three types of interventions; prevention, early detection and rapid eradication, and management. A list of invasive alien species of Union concern has been adopted. [Commission Implementing Regulation 2016/1141 adopting a list of invasive alien species of Union concern](#) The list was drawn up and managed together with the Member States using risk assessments and scientific evidence. The underlying risk assessments are available [here](#).

Meanwhile we have more species which we need to:  **an eye out for,**  **an eye on and/or actively control!**

Coastwatchers we prepared a draft poster with select IAS which surveyors reported seeing in the last 3 surveys on immediate hinterland, on the shore or in shallow water. Download the poster from our website from September 15th. We also have a 5 min. **video on one of the species** New Zealand flax. *Phormium tenax*. for family or school use this puts a different view to the glowing term descriptions for use of this IAS in coastal gardens— see this gardening website consulted on Aug 31st 2016:

<https://www.gardenia.net/plant/Phormium-Tenax-New-Zealand-Flax>

D5 Discover the biodiversity of your shore! Species groups which most should find if present on the shore are in question D5. More detailed information is sought in extra questions – for Ireland and the UK on back page of the questionnaire. The biodiversity poster has photos of both D 5 species and extra page to quickly check in the field (page 2 of the Irish and UK hard copy forms). **When you move seaweed or turn a rock to find animals or their eggs, ALWAYS put them back, and do so gently. Sometimes a little wedge helps.**

Some common queries and a sting warning:

- **Black shiny blobs stuck on rocks:** Likely to be **sea anemone** with tentacle retracted waiting for the sea to cover them again so they can take tentacles out and start feeding.
- **Limpets and Barnacles** have the same Irish name but are totally different animals. The limpet is a vegetarian mollusc which moves around like your garden snail once the tide comes in to graze on the seaweed film on rocks. Barnacles are generally the tiny volcanoes which cannot move once they are attached to rocks or other surfaces. They feed by opening trap doors at the top of their shell.
- **Some jellyfish** like the lion's mane sting badly even when swept up and dead. See Coastwatch jellyfish poster in survey materials.
- If you find one dead or an **oiled bird**, look around to see if there are more. Can you identify it/them? Is a foot ringing? If yes, please take off and note down number and contact BirdWatch/RSPB. Or contact Coastwatch and we pass the information on. **Please note any dead or injured animals especially if any were entangled in nets or litter. Take photos and note location in s.u.**

E E's are the litter, waste and pollution questions, which link to the MARPOL Convention for ships and the Marine Directive (MSFD) which uses litter in our seas as one of eleven sea quality 'Descriptors'.

E1 This section is to record large litter items, or piles of smaller ones. For household rubbish, make sure you include only dumped bins, bags, or boxes. Enter individual items of such litter in **E2 and 3**, not here. The same goes for dumped crops. A lonely onion does not qualify! We have reintroduced a tyre count as there appears to be an increase of used tyres appearing (illegally) on the shore to help catch peeler crabs. These tyres may not be obvious. But if your eye catches a long line of seaweed in round shapes mid shore it is probably tyres. There is both EU and national law that used tyres must be disposed of in an approved manner. You pay an eco-tax to the garage on each tyre to ensure this is done.

E2 **Drinks container counts** are listed as material on the survey form to cover all forms of containers. Most plastic drinks containers are bottles, metal ones are cans, glass are bottles. '**Paper outer**' covers tetra-packs etc. with (waxed) paper outer and other materials inside. Keep count by making notches on the line in groups of 5 **||||** which you later add up.

NB -If several of you are surveying together divide counts of most frequent items between you (cans, bottles..)

Bag counts - plastic shopping bags only not the bigger animal feed or coal bags.

Other counts: Chose what you see as either most common or damaging. Some types of litter are known to be threats to wildlife - here are a few: Balloons have been found to suffocate sea turtles, packing straps, nets, Chinese lanterns and other tangle gear have been found to trap or strangle variety of animals, tiny polystyrene and hard plastic beads are ingested by birds. And larger polystyrene pieces are very likely to disintegrate into beads. If picking up litter, prioritise these for removal.

E3 In **E3** no count is required, just tick if present, leave blank if not seen. If walking your shore up and back, it might be easiest to check one shore level on the way out and another on your way return. Often you can tick almost everything by going to a corner where waste accumulates. Then that's done. If litter is more spread out, it's useful to refresh your mind on the menu of what to tick. Most on the first column is some sort of plastic, while the second column tends to be other materials – except for **GEOTEXTLIE** added in the 2nd column category, to separate this building material, used in rock armour, road and other construction. This is becoming increasingly common on our shores and after review in 2016 is now separated out from the wearable textile category.

The 'hard plastic containers' include buckets, oil, shampoo, and other bottles, but excludes plastic drinks bottles, as these are already covered in your count of E2. The 'other plastics' is only for plastic not covered in any other category e.g. twine, fertiliser sacks, lids and polyurethane (previous surveys had that listed with polystyrene). **Extra notes are welcome.**

E4 **Microlitter:** Our pilot research on micro litter for the new Marine Directive has now moved on from taking samples to using our **NEW MICRO LITTER APP** with questions informed by our earlier sample analyses and your comments. The app was tested as a pilot last year and we now have a final version of the app; go to www.coastwatch.org/europe/microlitter and follow the instructions. Micro litter is now recognised as a major problem. Please look out for it on the tide mark, in deposition areas and in shallow water.

If you see something unusual you want to have identified do take a sample. Make sure you add your s.u. code and your name and hand in or post these well wrapped back to us. Results will be analysed for you and also used in the results exhibition.

E5 Give an impression of where the waste and litter is settling on the shore (also relevant to planning a clean-up)

F

F1 This is to record shore and immediate hinterland changes you have noticed, or know are planned, no matter whether you think these are good or bad. Look out for gradual change too – like deepening of trampling paths on dunes. Larger changes may include a new building, erosion control or wind turbines...

F4 This question seeks to pick up threats to your coastal zone. That might be related to the change you already noted in F3 above, or something which is proposed – such as planning application for something you feel would threaten the present quality or integrity of your coast. It can also be an on-going pressure or problem. We are including the threat of Invasive Alien Species (IAS) as an option. For a list of more common IAS please check the Invasive Species Ireland website (www.invasivespeciesireland.com) or our IAS poster.

Loss of biodiversity can be caused by many subtle changes like over harvesting, or change in the way something is harvested. Also consider cumulative effects.

- F5** After all that critic and counts of waste, we hope you can refocus back on the special and beautiful elements of your shore. Hence this question on what you like. If you have surveyed this shore last year and made a full comment which still applies now, you can just record that.
- F6** Comments can be extended if submitting survey forms on line or on an extra page.

NOTES ON EXTRA BIODIVERSITY AND HARVESTING QUESTIONS

Coastwatchers in different seas and countries have developed blocks of extra questions. Those available for download this year in Ireland and the UK are included as final page in that survey form. We would be really keen for some surveyors to try these. Here an overview of these extras: The ID pictures in the biodiversity questions can be downloaded from the web as poster page 2 of the survey form, or requested as hard copy leaflet.

Code	Extra Questions on:	Complete if:
G	Biodiversity	You are interested in taking a closer look at the animals on your shore. Ideally you are already reasonably knowledgeable or can get help to find and report on some select worms, molluscs and fish. The biodiversity poster is a quick reminder of what the species look like.
H	Harvesting from the wild and aquaculture	You see or know of aquaculture or harvesting of seaweed or other resources from the shore, or inshore waters in front of your survey unit.

EXTRA QUESTION NOTES

BIODIVERSITY

These extra questions are just picking up a tiny bit of our enormous shore biodiversity. We focus here on 3 worms, 6 native seashells and 2 invasive molluscs. Select a mixed shore with bits of mud, sand, boulders, or rock outcrop to maximise your chances of finding all. If you are in a rocky shore area and are in a group or school class, you might do a whole shore project with transect or plan a shore treasure hunt including much more. Use or adapt the **Ulster Wildlife tick posters to do that**. You learn a lot about your shore, it's fun and you can share that information with others. Your results may highlight special fragile life which needs to be taken into account next time an activity is planned for this area.

HARVESTING FROM THE WILD

Lug worms live in U shaped burrows under the sandy mud flats. Their presence is given away by the squiggles on the shore. The larger the squiggle, the larger the worm. You might find a nursery area dotted with tiny squiggles high on the shore, while the old guys live lower down.

Honeycomb worms create s c reefs are only found in a few areas. In one survey, a Wexford county council surveyor found the longest known intertidal honeycomb reef in Ireland. With our ~7000 km of coast and very few scientists working on it, your information is really valuable.

Sand masons live buried in the sandy mud sediment but their little tentacle tops stick out and look like tiny dead forests with whitish branches.

Find more information about Ireland's biological diversity at <http://maps.biodiversityireland.ie/#/Map>

SEASHELLS: Species to find are on Poster page 2. See separate seashell posters to download or ask for hard copy if you have a great diversity on your shore.

INVASIVE ALIEN SPECIES: Please report Gigas Oysters stuck to rocks and slipper limpets right away.

FISH AND FISH EGG CASES: Many marine fish have juvenile stages which might be picked up in stream mouth. These can be very difficult to identify. But the general shape does tell us something. If you do have more knowledge please share. A second place to look is under intertidal rocks where only a few fish live and similar for rock pools. A fish poster is in preparation. Egg cases (empty mermaids purposes) can be collected and kept for years. You might collect some to ID at home after soaking in water. Put any notes as to where you looked or sps into notes bottom of page.

HARVESTING FROM THE WILD: It is surprising how little we know about who harvests what and when on our shores. The same goes for aquaculture. These results will not be published by location, in case some areas might attract extra harvesters, but will be of value for environmental groups when trying to protect areas or help in the protection of traditional sustainable uses of a shore or shallow waters. Re fishing and landing animals in Ireland, look at the new SFPA website and booklet with information on minimum sizes and other rules at <http://www.sfpa.ie/>

If you know of use intensity or method changes e.g. increase/decrease in aquaculture area or bait digging. Is there a new fishing method – e.g. razor shell dredging then do put this into comments at the bottom of the page.

Data Return (back at home)

INPUT FORM

Input your results using our online input form(s) <http://coastwatch.org/europe/input-form/>

If you can't send your results online you can post your survey forms for volunteers in HQ to input your data.

NOTE

- You must complete 1 form per 500m survey unit (it should take 5 to 8 min. to input each form)
- If you are submitting data for several survey sites you don't have to fill in your personal details every time, only the first time (address, telephone, email), for the following submissions just give your full name.
- If you haven't completed the mandatory fields (*) you will not be allowed to submit (survey codes, name, date..)

PICTURES AND VIDEOS

This year we have a new feature for sending photos from the website. Following this link you'll be able to upload files directly from your computer, phone or tablet. <http://coastwatch.org/europe/send-your-pictures/>

INSTRUCTIONS

Click the green button  to find the photos on your computer. You can also drag and drop your photos in the area coloured grey **DRAG 'N DROP**. Once you do this your files will be queued (you should see them listed). You can repeat the operation to add more files.

Complete the sort form entering your email, first name, last name and the code of the survey units where the pictures were taken.

If you don't wish to be named in publications and/or if you wish your name to remain private, please indicate so right after your name (e.g. Jane Doe - **please withhold name**).

When you are finished click the blue button  to upload and send your photos.

Tips

- File size: There is a limitation of 25mb per file, but you can upload as many pictures as you like (within reason). Try not to upload pictures larger than 5mb each. You can also upload short videos as well.
- Before you upload the photos you can edit the file names of your pictures to add a short description (e.g. instead IMG_012345.jpg you can change the name to fish_in_stream.jpg)

You can also email pictures, video clips or any other extra to survey@coastwatch.org

Or, if you prefer it, you can post hardcopies or CD to **Civil & Environmental Engineering, Trinity College Dublin, College Green, Dublin 2**

Categories of video or photo are particularly useful for our Coastwatch survey:

1. **Special:** fish in a stream, otter footprint, a honeycomb worm reef, sea grass, an amazing patchwork of habitats etc. Catch these with photos or short video(s), upload and add any extra information. Purpose: 1. Celebrate the richness of our shores 2. Inform shore users to prevent damage.
2. **Action:** structural damage to a sea wall, a raw sewage discharge, oil pollution, a dump or infill, defunct materials in the intertidal, a spot where the sea has pooled litter... Your images assist planning the logistics of action.
3. **ID:** not sure what you found? Carefully video or photograph the animal, plant, feature or object and a marker to locate it again. Use for strange containers & ammunition.
4. **Litter and waste:** the large, common and strange and the micro-litter little pieces and pellets you might find. A picture for our exhibition & for feedback on the marine directive (Add object to help gauge scale for small items).
5. **You the Surveyors:** One nice surveyor shot, with names would be great for exhibition and use in credits collage.
6. **Baseline:** e.g. - stand on a vantage point and photograph down the splashzone and shore to low water. Then repeat in the opposite direction, standing at low water and taking a shot back to show the shore up as far as the vantage point or higher. A third may cover shore users and signs of use like tracks of humans and of wildlife. Future surveyors can repeat the exercise and view changes in land and shore use.