

The Benefits of Citizen Science for Widespread Cetacean Monitoring

James Waggitt, Noel Bristow





Involving the General Public

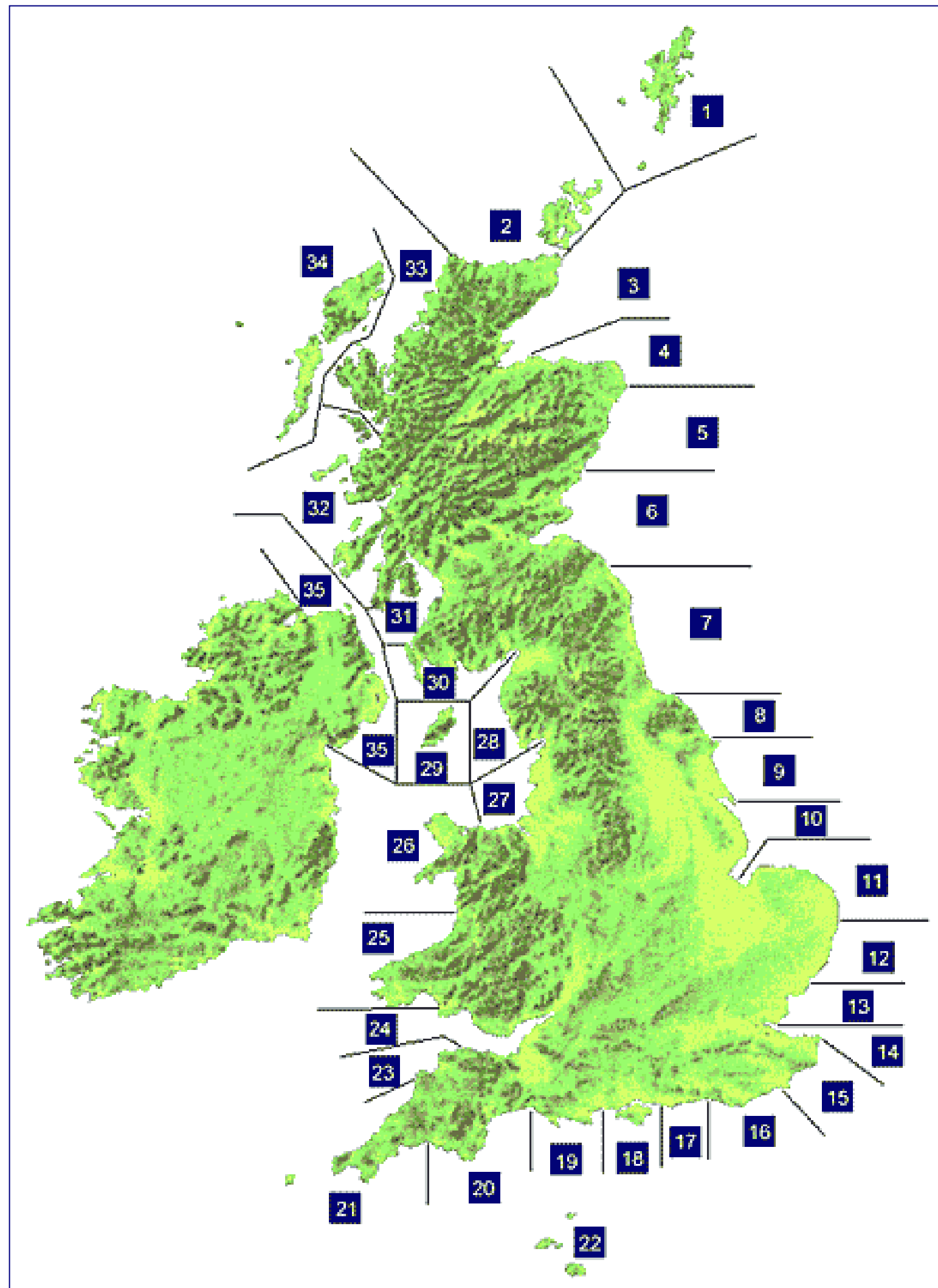


..... and other Marine Users



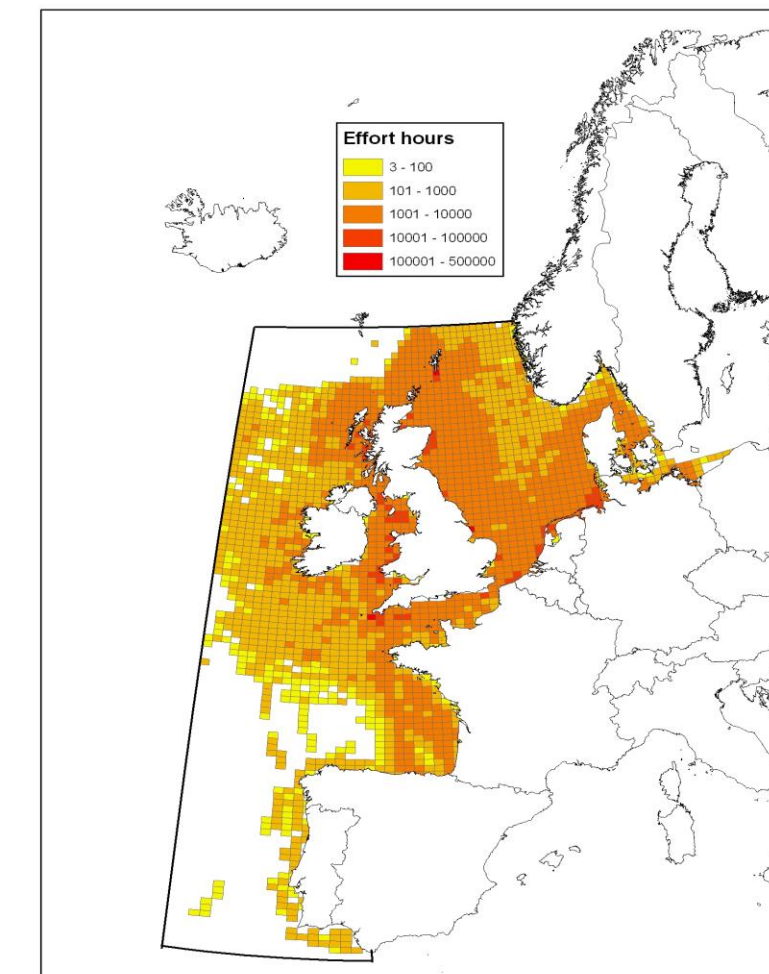
Observer Network around the British Isles

sea watch
FOUNDATION



- **UK split into 35 regional groups**
- **Regional Coordinator (voluntary) for each region, experienced cetacean observer**
 - **Organise watches**
 - **Collate data**
 - **Recruit observers**
 - **Represent SWF**
- **c. 4,000 observers**

- **Sightings from 1960-present**
- **>250,000 effort records**
- **135,000 effort-based sightings**
- **>200,000 casual sightings**





THE INDEPENDENT GUIDE TO UK WHALES AND DOLPHINS



Bottlenose Dolphin *Tursiops truncatus*

Bottlenose dolphins have a worldwide distribution and are probably the most familiar of all dolphin species. They often bow ride and breach, sometimes leaping several metres out of the water. They live in schools that vary in number from just a few to several hundred animals. They mainly eat fish, as well as eel, crustaceans and small squid.

Vital Statistics: They are 0.98-1.30m when newborn, growing to 2.2-4m. Sizes and weights vary greatly. Adults weigh 150-650kg and newborns 15-30kg. Births occur between May and November. Gestation is 12 months. Sexual maturity reached at 5-15 years and life expectancy is up to 50 years.

Atlantic White-sided Dolphin *Lagenorhynchus acutus*

They are usually seen off the UK coast in groups of tens, sometimes even hundreds. They feed mainly on mackerel, herring, blue whiting and several species of squid, and may hunt co-operatively. They commonly breach, and occasionally bow ride boats. In some areas, entanglement in fishing nets is a threat to the species.

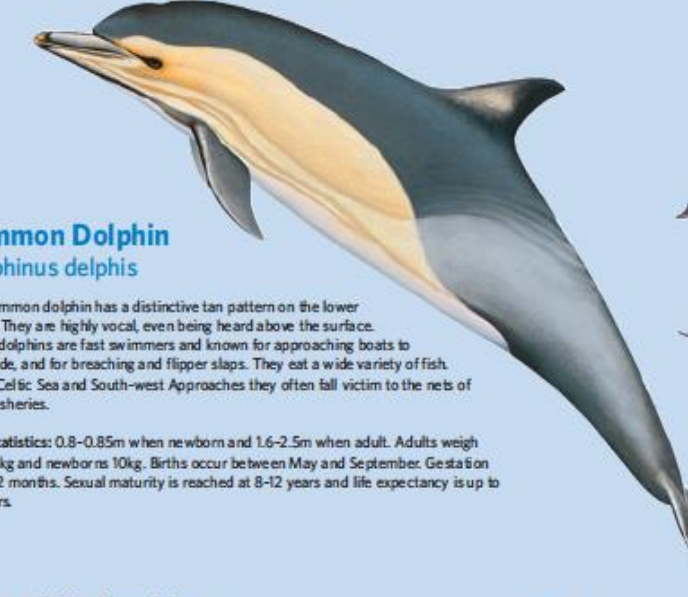
Vital statistics: Atlantic white-sided dolphins are born in spring or summer, weighing 30-35 kg, at a length of 1-1.22m. Adults weigh 150-230kg and are 2.1-2.6m. Gestation is 11 months. Sexual maturity is reached at 6-12 years and life expectancy is at least 27 years.



White-beaked Dolphin *Lagenorhynchus albirostris*

White-beaked dolphins are robust and less agile than common dolphins, but nevertheless they commonly breach and bow ride vessels. They may co-operatively hunt squid and open water fish such as whiting and cod. They are often seen in groups with Atlantic white-sided dolphins, and sometimes associate with fin and humpback whales.

Vital Statistics: Young are born in spring or summer at a length of 1-1.6m, weighing around 40kg. Adults typically grow to 2.4-2.8m and weigh 180-350kg, with females smaller than males. The gestation period is 10-11 months. The age at which sexual maturity is reached is not known. Life span is at least 22-27 years.



Common Dolphin *Delphinus delphis*

The common dolphin has a distinctive tan pattern on the lower flanks. They are highly vocal, even being heard above the surface. These dolphins are fast swimmers and known for approaching boats to bow ride, and for breaching and flipper slaps. They eat a wide variety of fish. In the Celtic Sea and South-west Approaches they often fall victim to the nets of trawl fisheries.

Vital statistics: 0.8-0.85m when newborn and 1.6-2.5m when adult. Adults weigh 70-110kg and newborns 10kg. Births occur between May and September. Gestation is 10-12 months. Sexual maturity is reached at 8-12 years and life expectancy is up to 35 years.



Harbour Porpoise *Phocoena phocoena*

These animals are the smallest, most common and widely distributed marine mammal found in northern European shelf waters and are often confused with dolphins, particularly bottlenose dolphins. They face a number of threats from humans including accidental capture in fishing gear, as well as pollution and disturbance. Measures are being taken by European governments to better protect the species.

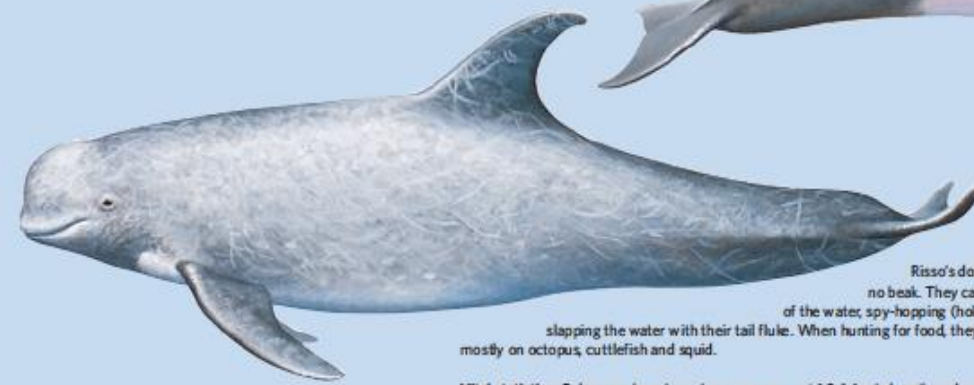
Vital statistics: Adults measure around 1.5m, and weigh 50-60kg. Calves are born between May and August at 65-90cm length and 5kg weight. Gestation period is 10-11 months. Sexual maturity is usually reached at 3-5 years, and few live beyond 12 years.



Northern Bottlenose Whale *Hyperoodon ampullatus*

The northern bottlenose whale came to widespread notice when one individual swam up the River Thames in January 2006. Sadly, attempts to rescue it failed. That whale could not have been further from its natural habitat; the northern bottlenose is an uncommon species, mainly occurring in North Atlantic trenches of 1000m or more depth.

Vital statistics: Calves are born in spring or summer at 3.5m in length. Females grow to 6.9-8.7m and males to 7.5-9.8m, with a weight of 6-8 tonnes. Gestation is at least 12 months. Sexual maturity is reached at 7-11 years. Life span is at least 37 years.



Risso's Dolphin *Grampus griseus*

Risso's dolphins have a distinctive, blunt head with no beak. They can be quite demonstrative, breaching clear of the water, spy-hopping (holding their head above the surface), or slapping the water with their tail fluke. When hunting for food, they sometimes spread out in a line. They feed mostly on octopus, cuttlefish and squid.

Vital statistics: Calves are born in spring or summer, at 1.2-1.6m in length and a weight of 20kg. Adults grow to 2.8-3.8m and weigh 300-500kg. The gestation period is 13-14 months. Sexual maturity is reached at 3-4 years. Life span is at least 30 years.

Long-finned Pilot Whale *Globicephala melas*

These slow-swimming, uniformly dark whales live in pods of 20-100, although much larger herds, numbering thousands, have been reported. They feed co-operatively, mainly on squid, but also hunt fish and crustaceans.

Vital statistics: Calves are born in summer and measure about 1.7m. Adult females typically measure 3.8-5m and weigh around 1.3 tonnes, while adult males measure 5-6m and weigh 2.3 tonnes. Gestation period is 12-16 months. Sexual maturity is reached at 6-14 years. They can live to at least 50-60 years.



Killer Whale or Orca *Orcinus orca*

Despite their name, the killer whale is the largest member of the family of true dolphins. Orcas live in small pods and are very effective predators, taking fish, squid, birds and even seals, porpoises and whales.

Vital statistics: Calves are born between October and January, measure 2-2.5m and weigh up to 180kg. Adult males, at 6-9m, are larger than females, at 4.5-7m. They weigh 4-5.5 tonnes. Gestation period is 15-18 months. Sexual maturity is reached at 8-16 years. Males have a life expectancy of 50-60 years but females can live to around 90 years.



Humpback Whale *Megaptera novaeangliae*

This whale has an arched back and very long flippers, which it may wave above the surface or use to slap the water. The humpback is known for its melancholic song, and for making spectacular leaps out of the water or throwing its tail into the air before making a dive. They eat krill, and fish such as herring and capelin.

Vital statistics: Humpback whales are born in winter, weighing about 900kg, at a length of 4-4.5m. Adults grow to around 11.5-15m and weigh about 45 tonnes. Gestation period is 12 months. Longevity is at least 48 years.



Sperm Whale *Physeter macrocephalus*

The sperm whale's head houses a large reservoir of oil, which was much prized by whalers. They routinely dive to depths of 500-1,000m, and have even been known to reach 3,000m. They feed on large squid. Sperm whales use echo location to navigate, and their clicking sounds are referred to as 'creaks'.

Vital statistics: Calves are born in winter or spring, measuring 3.5-4m and weighing one tonne. Adult females measure 8-15m and weigh 15-25 tonnes, while males measure 11-20m and weigh up to 40-60 tonnes. The gestation period is 14-16 months. Life span is at least 60-70 years.



Minke Whale *Balaenoptera acutorostrata*

Minke whales are fast swimmers, capable of reaching speeds of 18-24 knots (16-22mph). They tend to be solitary animals, though when feeding they may form loose aggregations numbering up to 20 animals. They spend relatively little time at the surface and their blow can be hard to spot. After twenty years of protection from hunting, commercial fisheries have recently started in Icelandic and Norwegian waters.

Vital statistics: Calves are born in winter and weigh 320kg. They are 2.4-2.8m in length when newborn, and around 7-8.5m when adult. Adults typically weigh between 5-14 tonnes. Gestation period is 12 months. Longevity is 40-60 years.



Fin Whale *Balaenoptera physalus*

The fin whale is the world's second largest animal (the biggest is the blue whale), and it is the largest visitor to UK continental shelf seas. They feed mainly on crustaceans, but also take fish. Fin whales blow at intervals of 10-20 seconds and typically dive for 3-15 minutes, to depths of almost 500m.

Vital statistics: Males grow to 18.5-22m and females to 20-24m, weighing up to 80 tonnes. Calves are born in autumn or winter weighing around two tonnes, and are 5-6m in length. Gestation period is 11-12 months. Sexual maturity is reached at 6-12 years. They can live to 85-90 years.



Sea Watch is a UK marine conservation charity which relies on the goodwill and financial support from people like you. Please visit our website to adopt a dolphin today, www.seawatchfoundation.org.uk/adoptdolphin or phone 0845 2023892.

Regd. Charity no 1013002

protecting and conserving
whales, dolphins and porpoises

Illustrations by Brett Jarrett from "Whales, Dolphins and Seals: A Field Guide to the Marine Mammals of the World" by Hadoram Shirihai and Brett Jarrett, reproduced with permission of A&C Black Publishers. not to scale

Photos from the Public in the 2020s

sea watch
FOUNDATION



Killer whale tossing Porpoise



© Steve Truluck

© Jo Richardson

Risso's dolphin



© Ian Jones

© Vicki Hall



White-beaked dolphin



Common dolphin



Reporting Sightings: via Sea Watch website

www.seawatchfoundation.org.uk/recent sightings/

Please fill in the form below. **All fields marked with a * are obligatory**; if they are missing, the system will request you fill them in before the form is accepted for submission.

The information will be reviewed by a member of the Sea Watch Foundation and will be added to our main sightings database. Thank you for your collaboration.

Observer who made or reported the sighting

First name* Last Name*
 Your e-mail* Your telephone*

Date and time of the sighting

Day* Month* Year* Time (hh:mm 24 hour clock)

Location of the sighting

Region*

Location type*

Location details*

(e.g. O.S. grid ref or description of location)

Latitude degrees Latitude minutes
 (e.g. 54) (e.g. 4.00)

Longitude degrees Longitude minutes Meridian

(e.g. 4) (e.g. 38.74)

Sightings details

Species* Confidence in ID*

Best estimate of total number* No. of adults No. of juveniles No. of calves

Behaviour Direction of animal heading

Viewing conditions at the time of the sighting

Sea state

Swell height Visibility

Other comments:

Submit the sighting information



Recent sightings

The map below allows you to check the latest sightings in the UK.

Please select an area on the map below or use the drop-down menu.

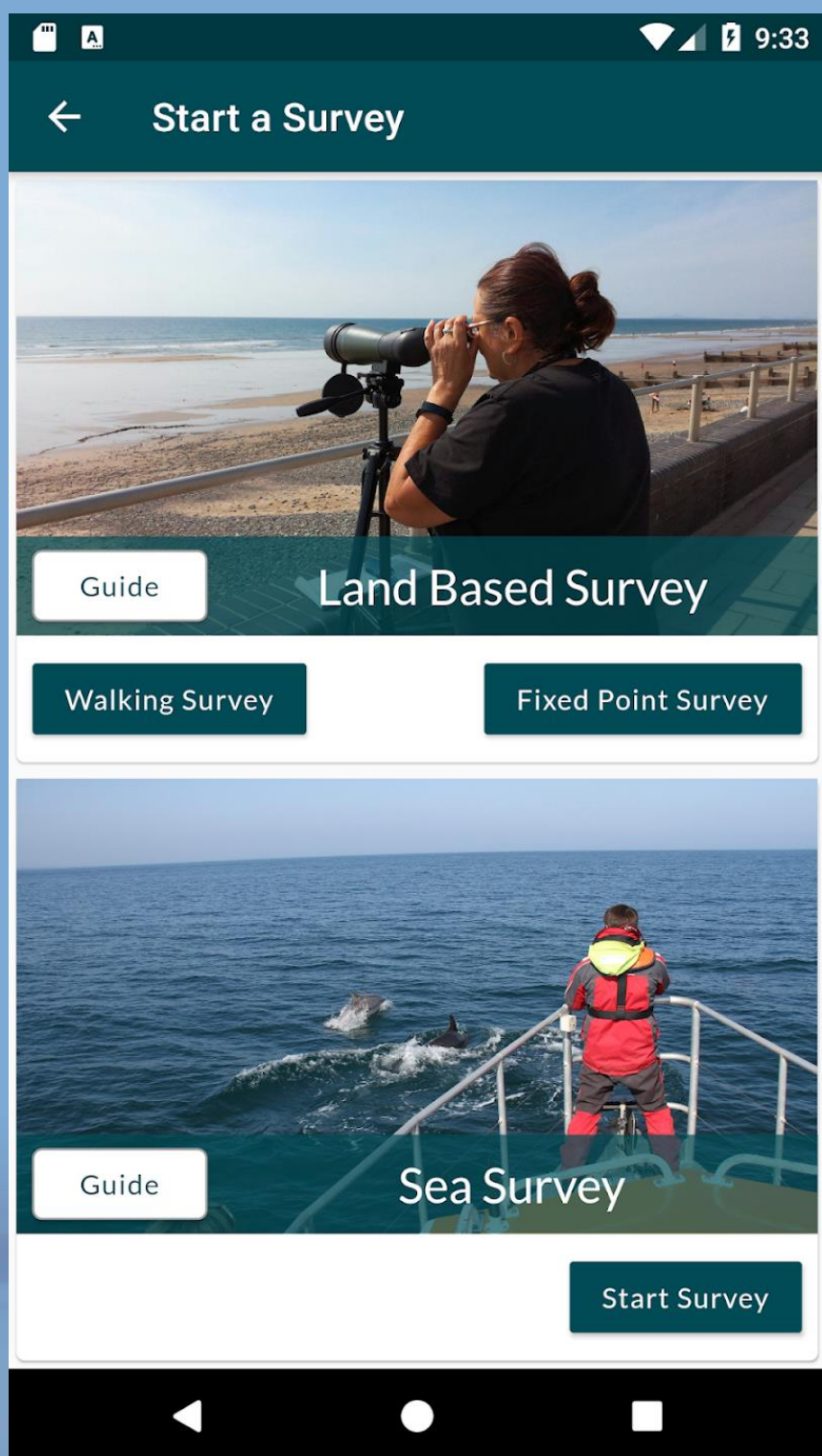


Orkney and North Scotland

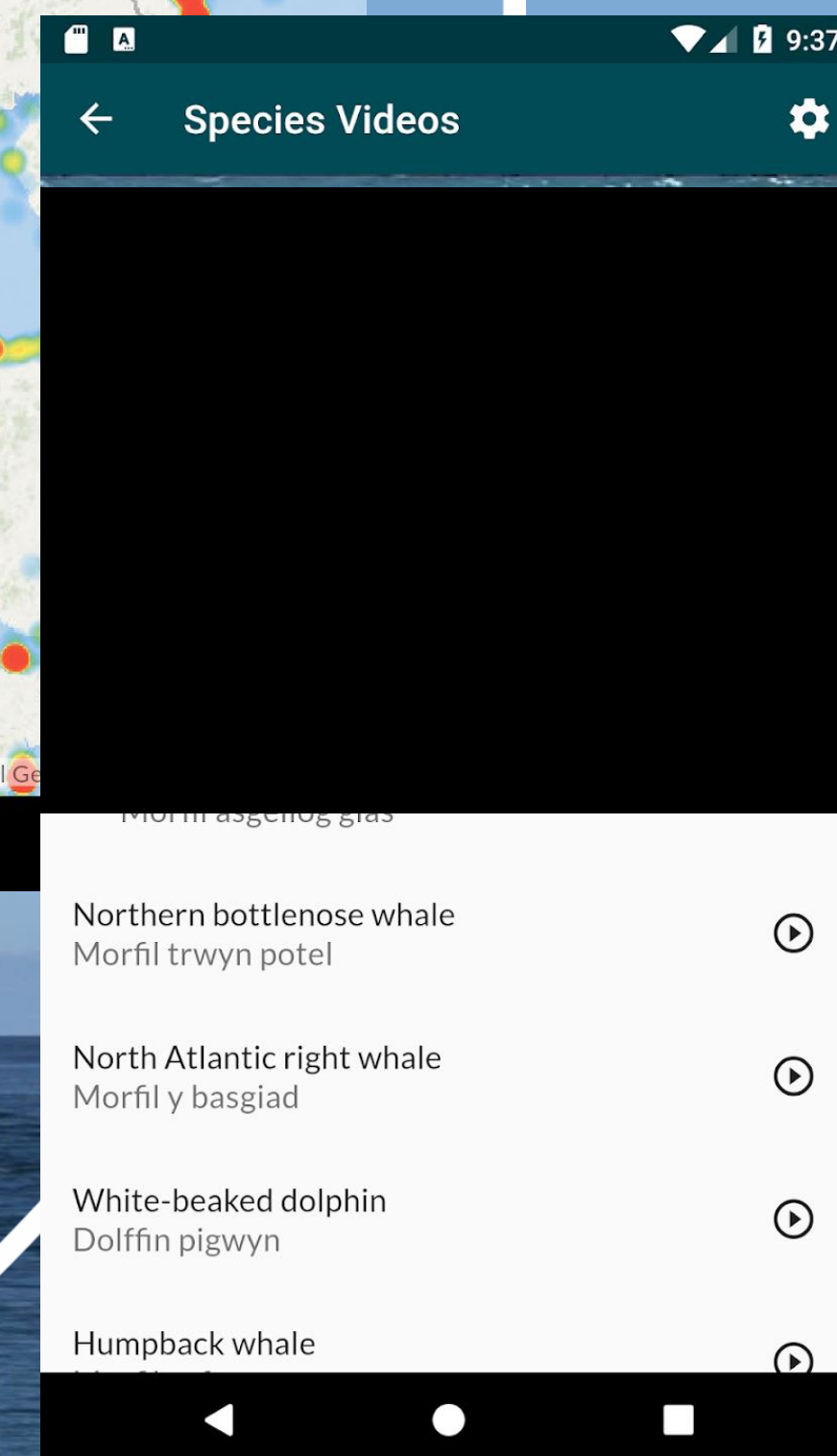
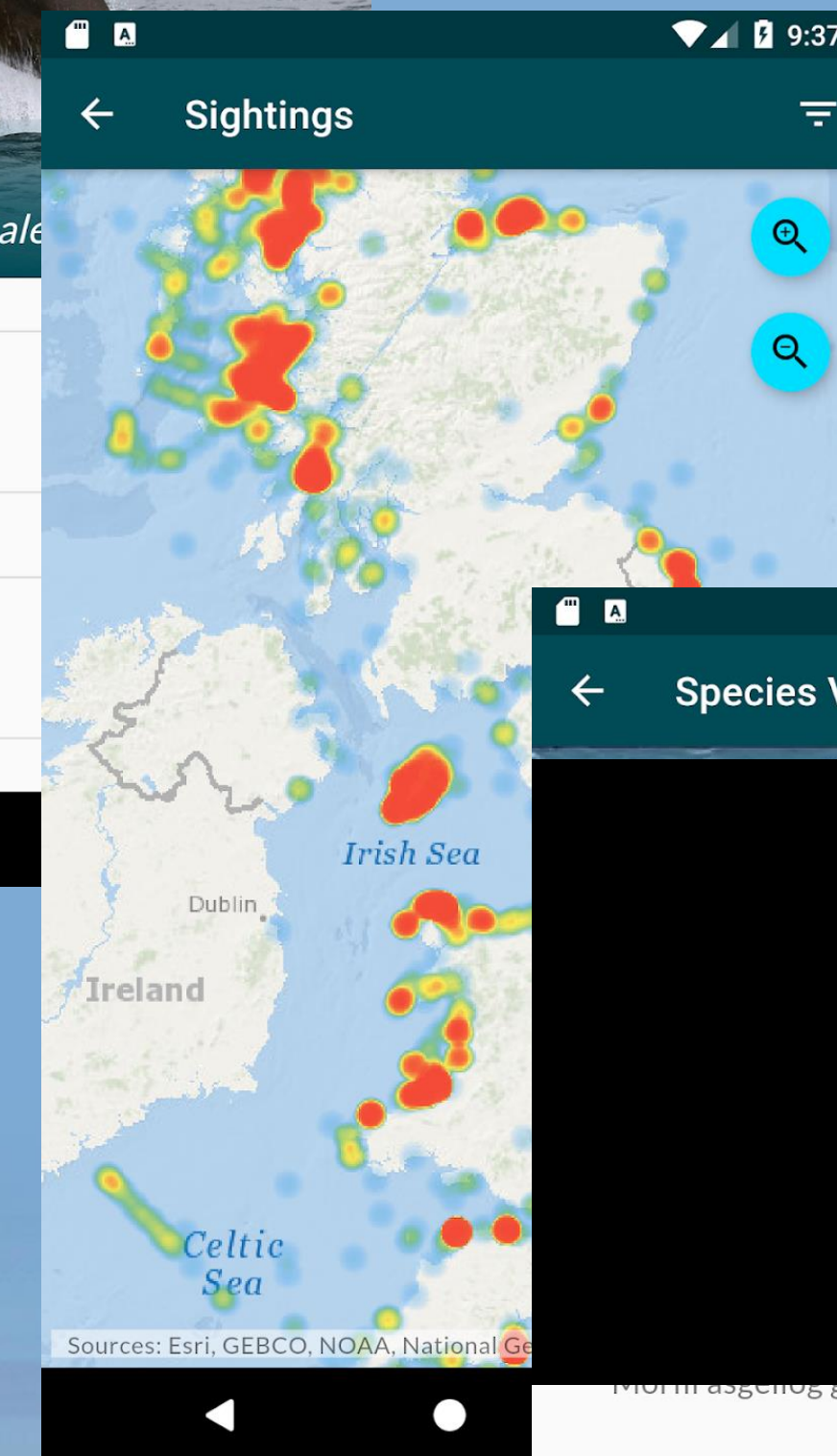
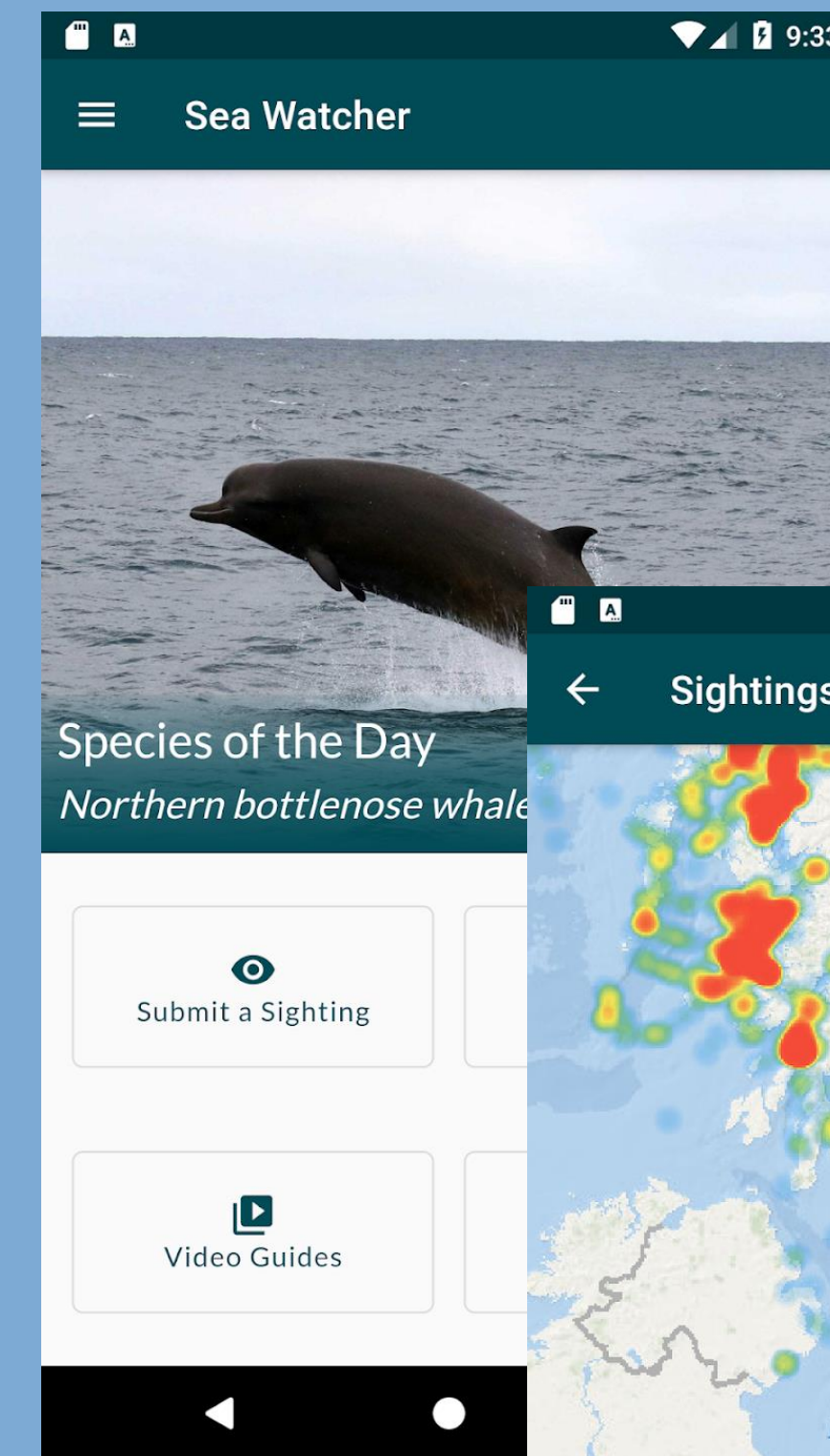
The most recent sightings in this area are:

Risso's dolphin (x2) - Cantick Head Lighthouse, Orkney at 11:00 on 28 Apr 2021 by OCG OCG
Risso's dolphin (x2) - Scapa, Orkney on 27 Apr 2021 by OMMRI OMMRI
Risso's dolphin (x2) - Scapa Flow, Orkney on 27 Apr 2021 by OCG OCG
Risso's dolphin (x2) - Lyness, Orkney on 27 Apr 2021 by OMMRI OMMRI
Risso's dolphin (x8) - Murckle, Caithness at 16:55 on 26 Apr 2021 by CMFCS CMFCS
Risso's dolphin (x6) - Dunnet Head, Caithness at 17:45 on 25 Apr 2021 by CMFCS CMFCS
Dolphin species (x3) - Sandside, Caithness at 14:45 on 25 Apr 2021 by CMFCS CMFCS
Risso's dolphin (x5) - East side of Papay, Orkney at 14:00 on 25 Apr 2021 by OCG OCG
Risso's dolphin (x2) - Portskerra, Sutherland at 12:20 on 25 Apr 2021 by CMFCS CMFCS
Harbour porpoise (x1) - Sanday Sound, Orkney at 16:35 on 24 Apr 2021 by OMMRI OMMRI
Risso's dolphin (x5) - Westness, North Ronaldsay, Orkney at 11:50 on 24 Apr 2021 by OMMRI OMMRI
Killer whale (x8) - Westness, North Ronaldsay, Orkney at 10:25 on 24 Apr 2021 by OMMRI OMMRI
Common dolphin (x8) - Bring Deeps, Orkney at 08:00 on 24 Apr 2021 by OCG OCG
Risso's dolphin (x7) - Stromness, Orkney on 24 Apr 2021 by OCG OCG
Minke whale (x1) - Start Point, Sanday, Orkney on 24 Apr 2021 by OMMRI OMMRI
Harbour porpoise (x1) - The Gloup, Deerness, Orkney at 18:45 on 23 Apr 2021 by OMMRI OMMRI
Dolphin species (x3) - Old Man of Hoy, Orkney on 23 Apr 2021 by CMFCS CMFCS
Risso's dolphin (x5) - Black Craig, Orkney on 23 Apr 2021 by OCG OCG
Risso's dolphin (x3) - Dennishead, North Ronaldsay, Orkney on 23 Apr 2021 by OMMRI OMMRI
Minke whale (x1) - Royal Oak Buoy, Scapa Flow, Orkney at 20:20 on 22 Apr 2021 by OMMRI OMMRI
Risso's dolphin (x2) - Yesnaby, Orkney at 14:00 on 21 Apr 2021 by OMMRI OMMRI
Killer whale (x8) - Calf of Flotta, Orkney at 10:20 on 21 Apr 2021 by OCG OCG
Killer whale (x2) - Mull Head, Orkney on 20 Apr 2021 by OMMRI OMMRI
Large whale (x1) - Hoxa Head, Orkney at 17:45 on 18 Apr 2021 by OMMRI OMMRI
Risso's dolphin (x5) - Holborn Head, Caithness at 11:40 on 17 Apr 2021 by CMFCS CMFCS
Dolphin species (x3) - Skelwick Bay, Westray, Orkney on 17 Apr 2021 by OMMRI OMMRI
Killer whale (x5) - Strathy, Sutherland on 16 Apr 2021 by CMFCS CMFCS
Killer whale (x5) - Portskerra, Sutherland on 16 Apr 2021 by CMFCS CMFCS
Risso's dolphin (x3) - Crosskirk, Caithness on 16 Apr 2021 by CMFCS CMFCS
Dolphin species (x2) - Echnaloch Bay, Orkney on 16 Apr 2021 by OCG OCG
Risso's dolphin (x3) - Stroma Sound, Caithness at 11:15 on 15 Apr 2021 by CMFCS CMFCS
Fin whale (x1) - Hobbister, Orkney at 19:45 on 14 Apr 2021 by OMMRI OMMRI
Minke whale (x1) - Outer Holms, Stromness, Orkney at 17:45 on 14 Apr 2021 by OMMRI OMMRI
Large whale (x1) - Echnaloch Bay, Orkney at 09:15 on 14 Apr 2021 by OMMRI OMMRI
Risso's dolphin (x3) - Skelwick Bay, Westray, Orkney on 14 Apr 2021 by OMMRI OMMRI
Minke whale (x1) - Hobbister, Orkney at 19:25 on 13 Apr 2021 by OMMRI OMMRI
Humpback whale (x2) - Echnaloch Bay, Orkney at 19:00 on 10 Apr 2021 by OCG OCG
Risso's dolphin (x5) - Hoxa Head, Orkney at 17:20 on 10 Apr 2021 by OMMRI OMMRI
Humpback whale (x2) - John O'Groats, Caithness at 15:40 on 10 Apr 2021 by CMFCS CMFCS
Humpback whale (x2) - Switha, Orkney at 15:00 on 10 Apr 2021 by OCG OCG
Dolphin species (x1) - Grimness Head, Orkney at 15:45 on 9 Apr 2021 by OMMRI OMMRI
Large whale (x1) - Orphir, Orkney on 7 Apr 2021 by OCG OCG
Common dolphin (x4) - Hobbister, Orkney at 18:50 on 1 Apr 2021 by OMMRI OMMRI
Harbour porpoise (x1) - Shapinsay, Orkney at 14:50 on 4 Mar 2021 by Emma Naeve-Webb /Orkney Marine Mammal Research
Humpback whale (x2) - Echna Loch Bay, Orkney at 12:04 on 17 Feb 2021 by Sasha Woolham
Bottlenose dolphin (x3) - Stena Spey, Orkney on 4 Feb 2021 by Karen Hetherington
Killer whale (x5) - Scapa Flow, Orkney at 16:21 on 16 Jan 2021 by Robbie Stanger
Killer whale (x2) - Hoxa, Orkney at 14:00 on 16 Jan 2021 by Leonard Bain
Killer whale (x2) - Nevi Skerry, Orkney at 12:35 on 16 Jan 2021 by Andrew Cuddihy
Killer whale (x3) - Switha, Orkney at 09:55 on 15 Jan 2021 by Karen Hetherington
Common dolphin (x15) - Swanbister Bay, Orkney at 09:00 on 5 Jan 2021 by David Leask

Sea Watcher App

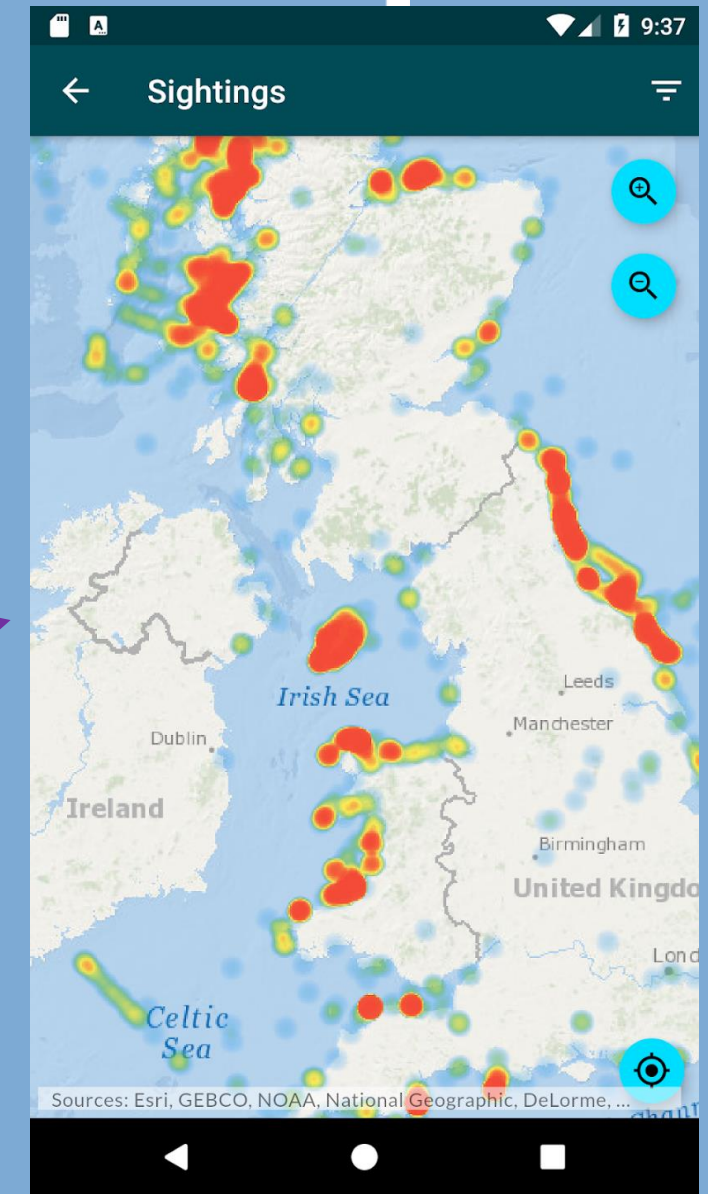
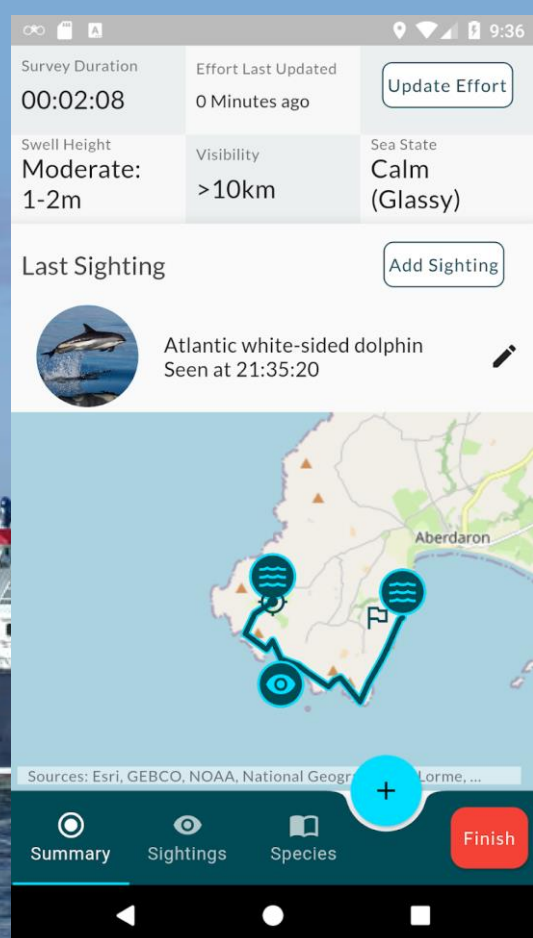
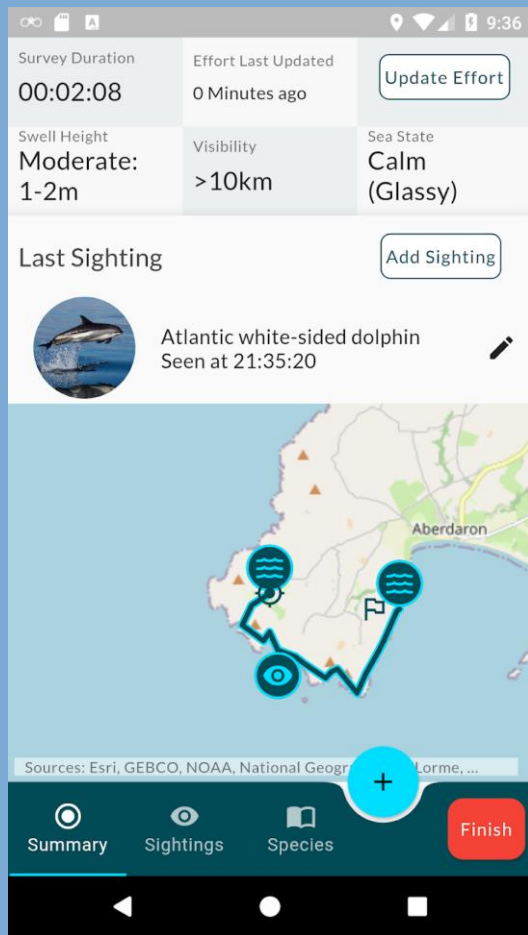


- 🔍 App developed by Imardis group at Bangor University
- 🔍 Written in Dart and Flutter SDK for Android and iOS
- 🔍 First released in 2020
- 🔍 Resources:
 - 🔍 Species fact sheets, Video guides, Codes of conduct, Abundance maps etc
- 🔍 Casual sightings – citizen science
- 🔍 Surveys – effort-based observations



Data Processing

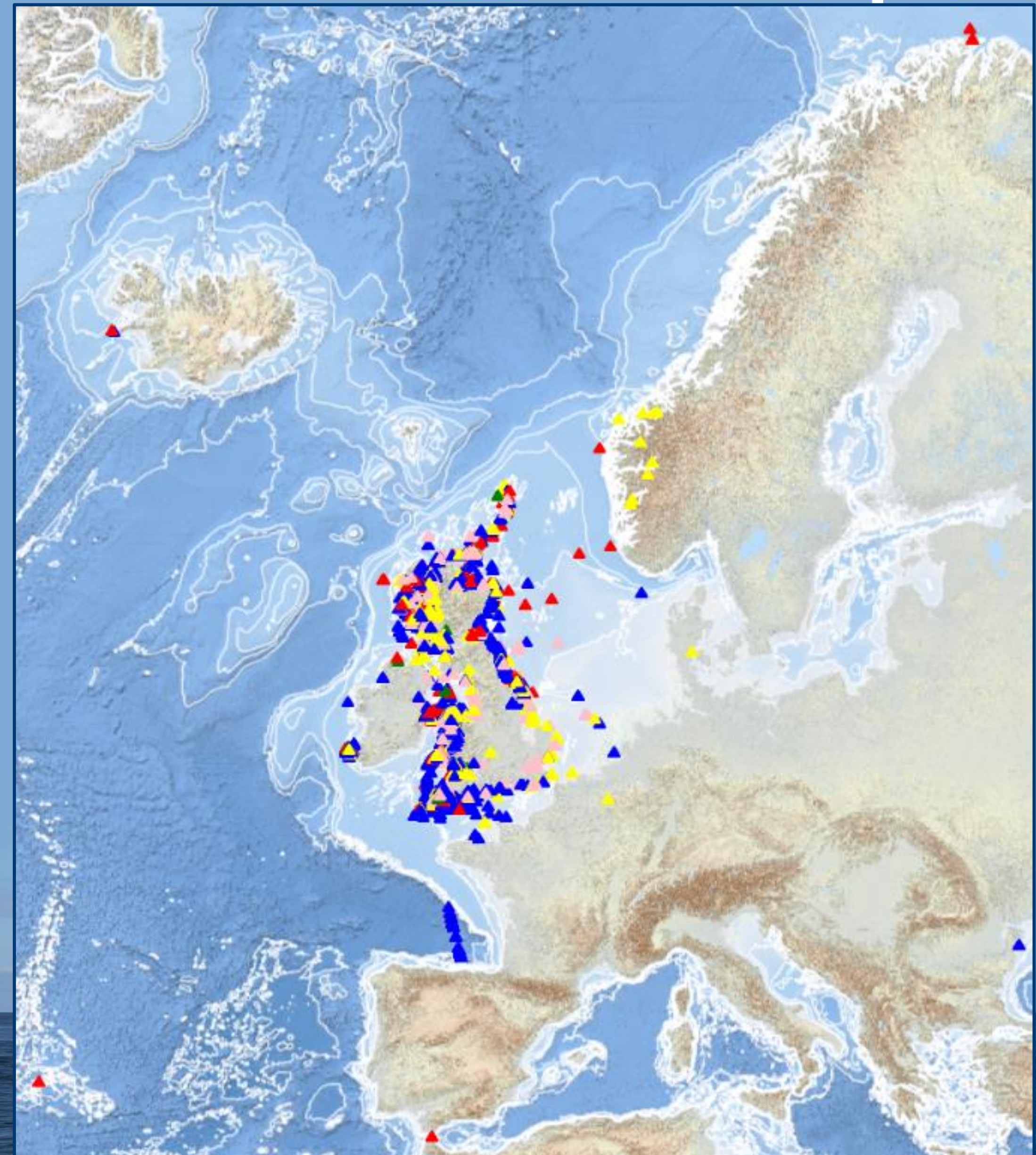
- 🔍 Data is stored on the cloud (AWS)
- 🔍 Monthly reports → Sea Watch Foundation staff



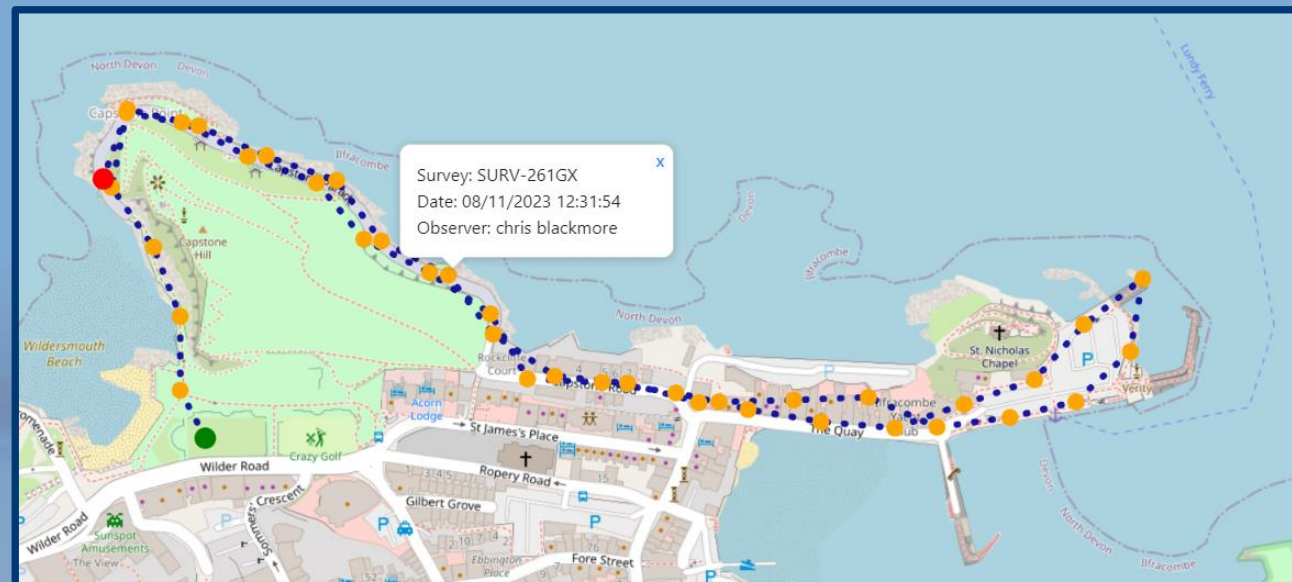
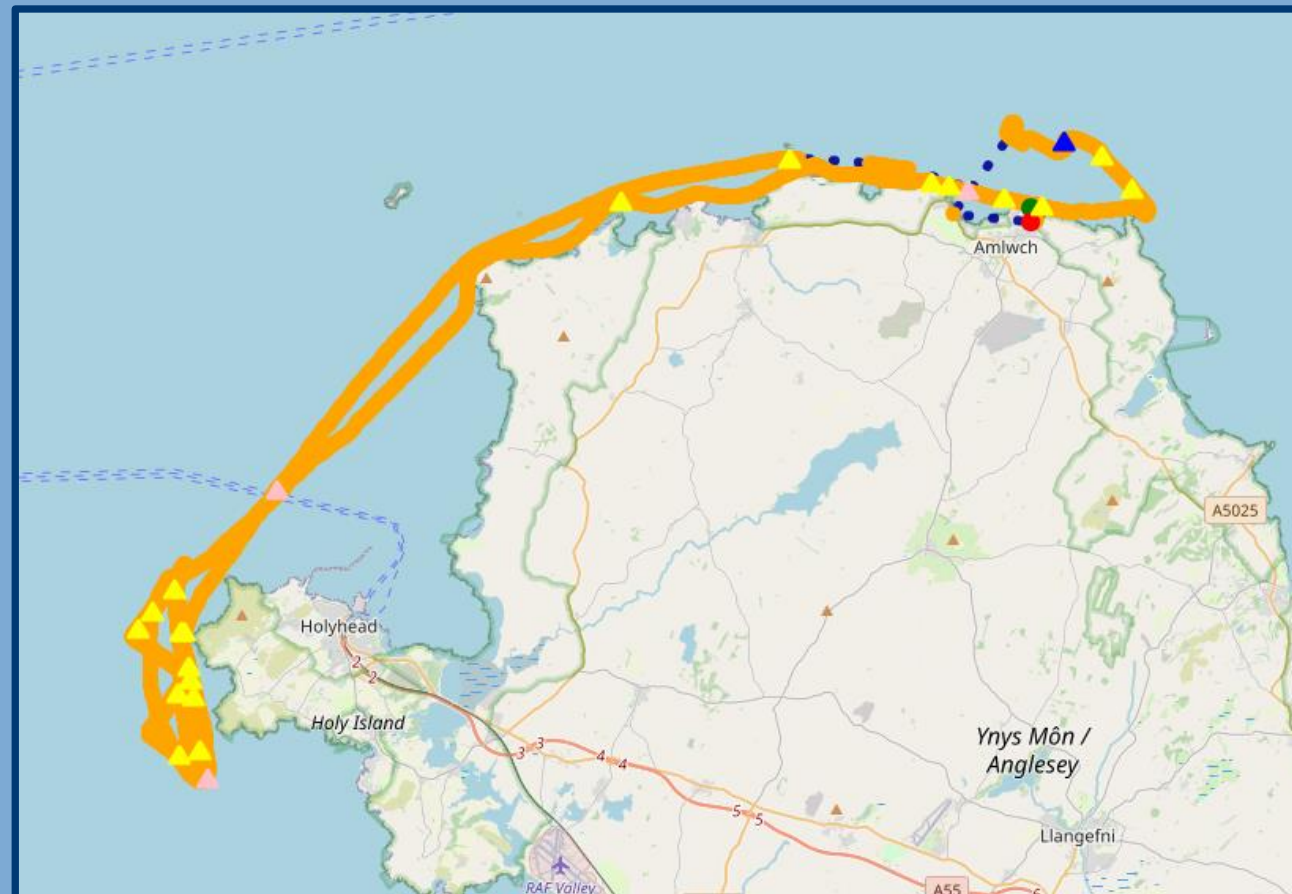
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2	2024-01-01 13:29:47.000000	-0.3837	54.287	BND	20	Definite	Land	SIG-90KX3	FEED, NS	
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4	2024-01-06 10:25:22.000000	-1.7429	57.3414	HP	1	Definite	Land	SIG-4K18W	NS	
5	2024-01-07 14:30:35.000000	-0.3839	54.2878	HP	1	Definite	Land	SIG-L79PW	FEED, NS	
6	2024-01-07 14:31:11.000000	-0.3833	54.2867	HP	1	Definite	Land	SIG-89Y6A	FEED, NS	
7	2024-01-08 10:30:57.000000	-4.6317	53.4362	BND	3	Probable	Land	SIG-69160	SURF	
8	2024-01-09 09:50:00.000000	-0.4164	54.3211	BND	5	Definite	Land	SIG-E0E6K	FEED, NS	
9	2024-01-09 12:00:20.000000	-0.3838	54.2859	HP	1	Definite	Land	SIG-LV14V	FEED, NS	
10	2024-01-10 11:02:33.000000	-0.3838	54.2879	HP	1	Definite	Land	SIG-90N33	FEED, NS	
11	2024-01-11 10:00:33.000000	-0.3834	54.2868	HP	1	Definite	Land	SIG-L7KX8	FEED, NS	
12	2024-01-11 12:00:00.000000	-0.3836	54.2868	BND	20	Definite	Land	SIG-Y8KY7	FEED, NS	
13	2024-01-12 08:50:18.000000	-4.71070051109759	53.333644979226	BND	15	Definite	Land	SURV-Q0KX4-0	SS	
14	2024-01-12 09:30:14.000000	-4.69123080641409	53.2781939302064	BND	8	Definite	Land	SURV-Q0KX3-1	SS	
15	2024-01-12 09:51:59.000000	-4.7082680772445	53.3051888505493	BND	18	Definite	Land	SURV-Q0KX3-2	BORN_LEAP, SS, TA...	
16	2024-01-12 10:19:12.000000	-4.70227693207998	53.296466397017	GRS	6	Definite	Land	SURV-Q0KX3-3	NS	
17	2024-01-12 10:21:04.000000	-4.707301633574246	53.29884058297173	GRS	1	Definite	Land	SURV-Q0KX3-4	nsult	
18	2024-01-12 10:33:04.000000	-4.693827051673731	53.27302329712852	BND	7	Definite	Land	SURV-Q0KX3-5	NS	
19	2024-01-12 10:54:26.000000	-4.673417704184235	53.27369908807172	BND	35	Definite	Land	SURV-Q0KX3-6	BORN_LEAP, SS, SU...	
20	2024-01-12 11:54:01.000000	-4.697970310230458	53.29797071407857	HP	1	Definite	Land	SURV-Q0KX3-7	NS	
21	2024-01-12 13:00:55.000000	-0.3833	54.2869	BND	5	Definite	Land	SIG-E0C0C	FEED, NS	
22	2024-01-12 15:18:21.000000	-0.3837	54.2861	HP	2	Definite	Land	SIG-LV18V	FEED, NS	
23	2024-01-13 09:08:59.000000	-0.3837	54.2867	HP	3	Definite	Land	SIG-8P41V	FEED, NS	
24	2024-01-13 13:41:55.000000	-5.1025	50.8422	CD	4	Probable	Land	SIG-7S103	BORN_LEAP, SURF	
25	2024-01-13 14:30:52.000000	0.4866	50.8442	GRS	1	Definite	Land	SIG-BV0NL	BOT	usual male
26	2024-01-13 15:00:45.000000	-0.3836	54.2866	HP	3	Definite	Land	SIG-8PQ57	FEED, NS	
27	2024-01-14 09:15:26.000000	-6.2727	49.9367	FW	1	Definite	Land	SIG-VVY87	FEED, SS	
28	2024-01-14 11:04:40.000000	-0.3838	54.2862	HP	1	Definite	Land	SIG-PAK26	FEED, NS	
29	2024-01-14 12:26:26.000000	-0.3838	54.2869	BND	10	Definite	Land	SIG-PA1EY	FEED, NS	
30	2024-01-16 11:00:31.000000	-0.1066	54.1473	HP	1	Definite	Land	SIG-Q0KX4	FEED, NS	
31	2024-01-17 10:16:35.000000	-0.3830	54.2873	HP	1	Definite	Land	SIG-XMY05	FEED, NS	
32	2024-01-18 11:00:50.000000	-0.3838	54.2865	HP	1	Definite	Land	SIG-68K5X	FEED, NS	
33	2024-01-19 09:00:05.000000	-0.3837	54.2875	HP	4	Definite	Land	SIG-KQVEY	FEED, NS	
34	2024-01-19 09:30:18.000000	-0.3839	54.2859	HP	7	Definite	Land	SIG-26J1Q	FEED, NS	
35	2024-01-19 09:52:24.000000	-4.3575	52.2158	BND	2	Definite	Land	SIG-JP2X7	FEED, FS	
36	2024-01-19 14:00:23.000000	-0.3834	54.2867	HP	3	Definite	Land	SIG-69160	FEED, NS	

Sightings Data

- 🔍 Users: ~2000 downloads, ~600 observers
- 🔍 Sightings: ~7,000
- 🔍 Surveys:
 - 🔍 Sea: 950, Land: 957, Walking: 238
- 🔍 Species (listed in order of abundance):
 - 🔍 Common (>200 sightings):
 - 🔍 Harbour porpoise, Common dolphin, Bottlenose dolphin, Grey seal, Minke whale, Risso's dolphin,
 - 🔍 Less common (20-200 sightings):
 - 🔍 Harbour seal, Killer whale, Basking shark, White-beaked dolphin, Humpback whale, Ocean sunfish, Atlantic white-sided dolphin,
 - 🔍 Uncommon (<20 sightings):
 - 🔍 Fin whale, Sei whale, Long-finned pilot whale, Leatherback turtle, Striped dolphin, Sperm whale, Cuvier's beaked whale, Sowerby's beaked whale, North Atlantic right whale, Northern bottlenose dolphin



Lessons Learned & Future Development



🔍 App Improvements (v2.x)

🔍 Effort-based observations are very important

→ App improved to better capture effort data

🔍 Long-winded input process:

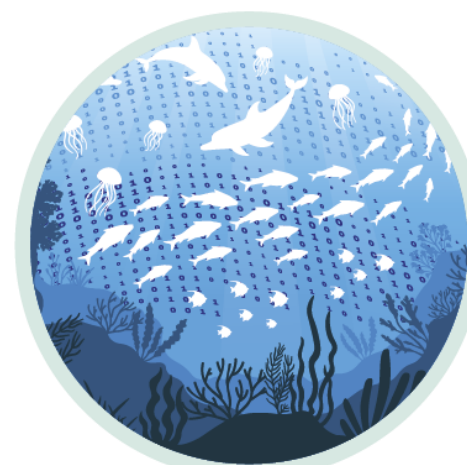
🔍 Good for inexperienced observers 😊

🔍 Not so good for experienced marine observers 😞

→ Survey form improved for experienced users

🔍 Funding: DTO-BioFlow

🔍 Biodiversity Data → European Digital Twin Ocean



DTO-BioFlow

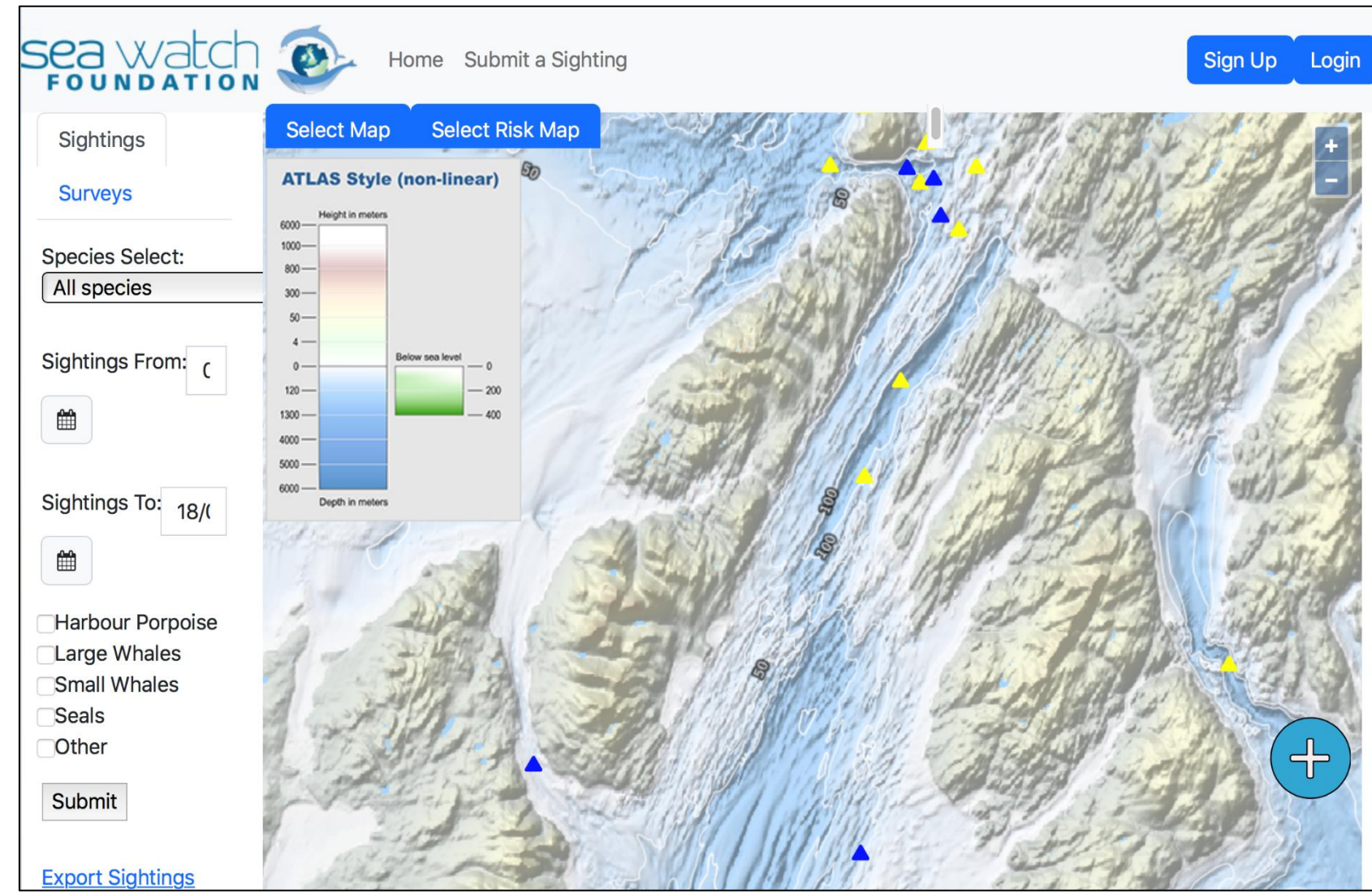
Integration of biodiversity monitoring
data into the Digital Twin Ocean

European Digital Twin Ocean

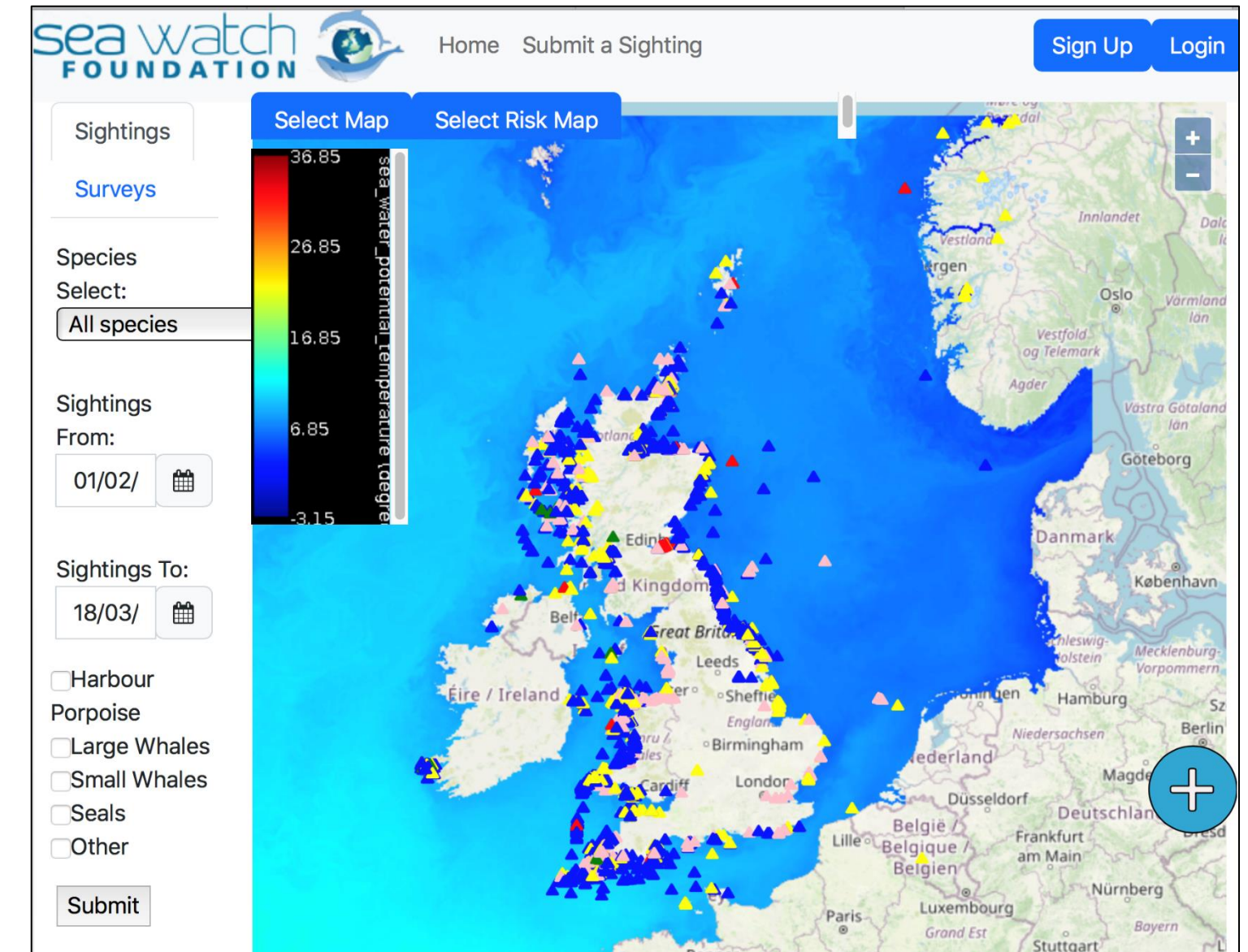
EDITO
Model Lab

Sea Watcher App Sightings Data in relation to Physical & Oceanographic Features

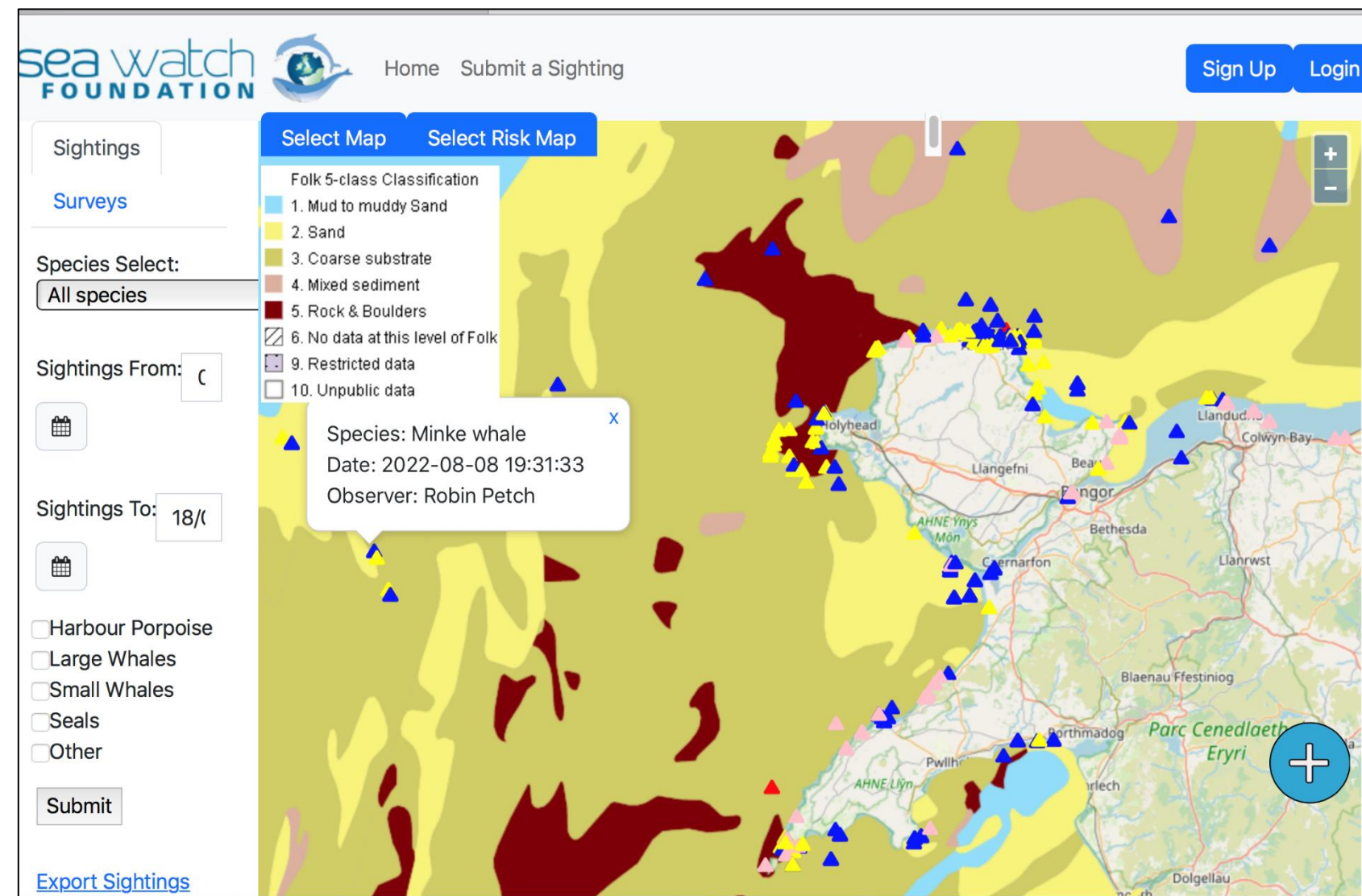
a) Bathymetry



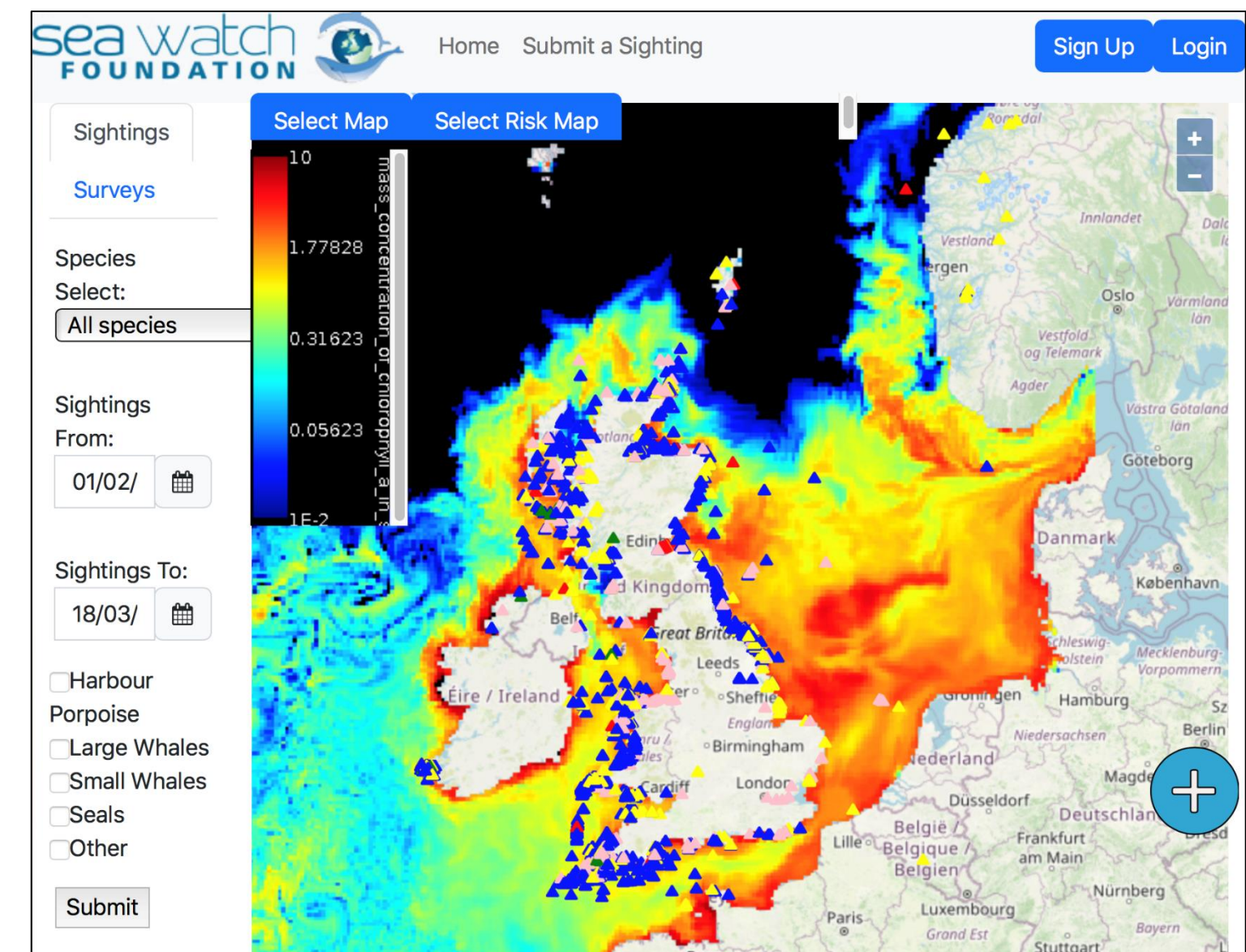
c) Sea Surface Temperature



b) Seabed Substrate Type

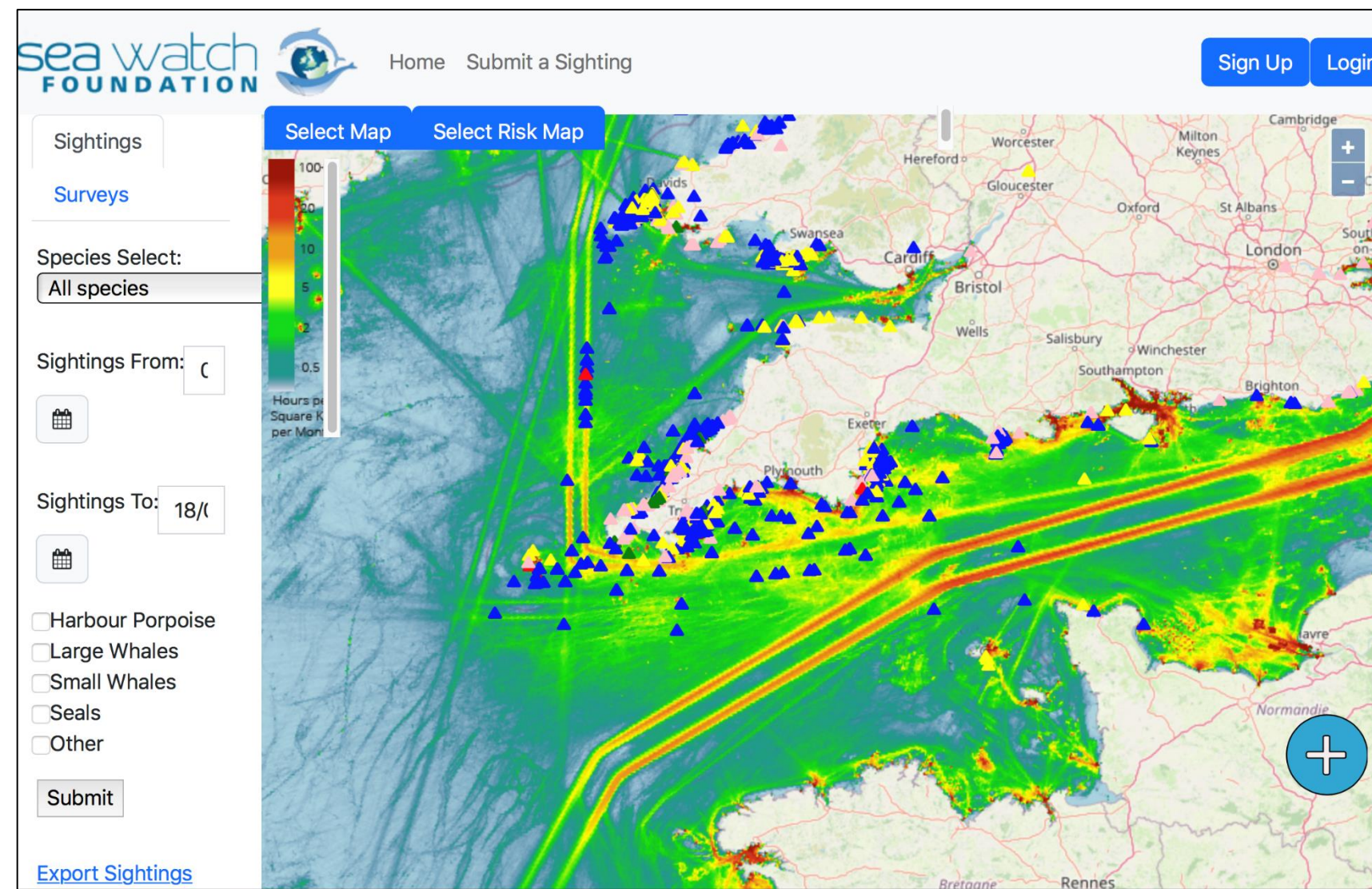


d) Primary Productivity

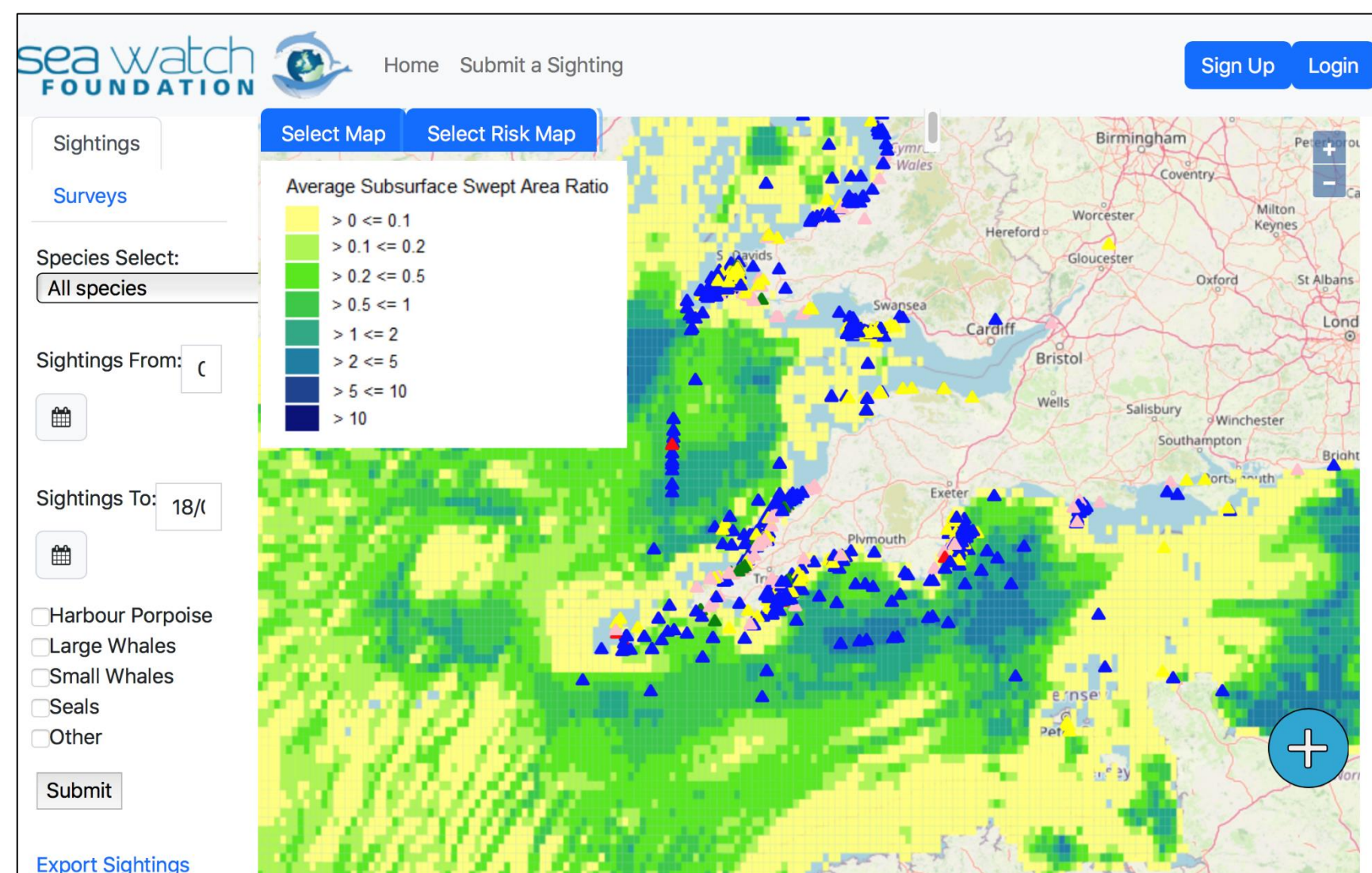


Sea Watcher App Sightings Data Overlays with Data on Human Activities

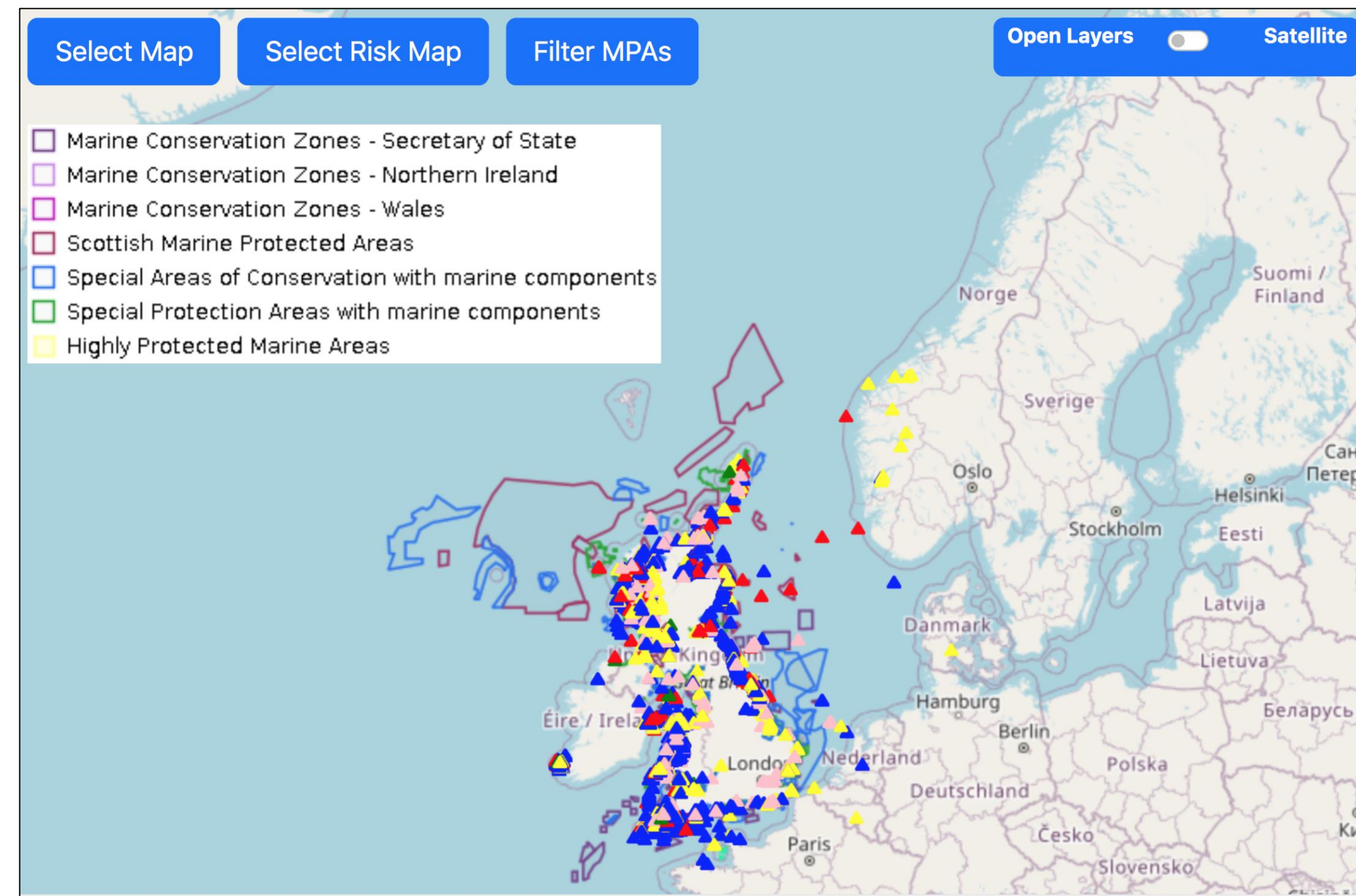
a) Vessel Traffic



b) Subsurface Area swept by Fishing Vessels



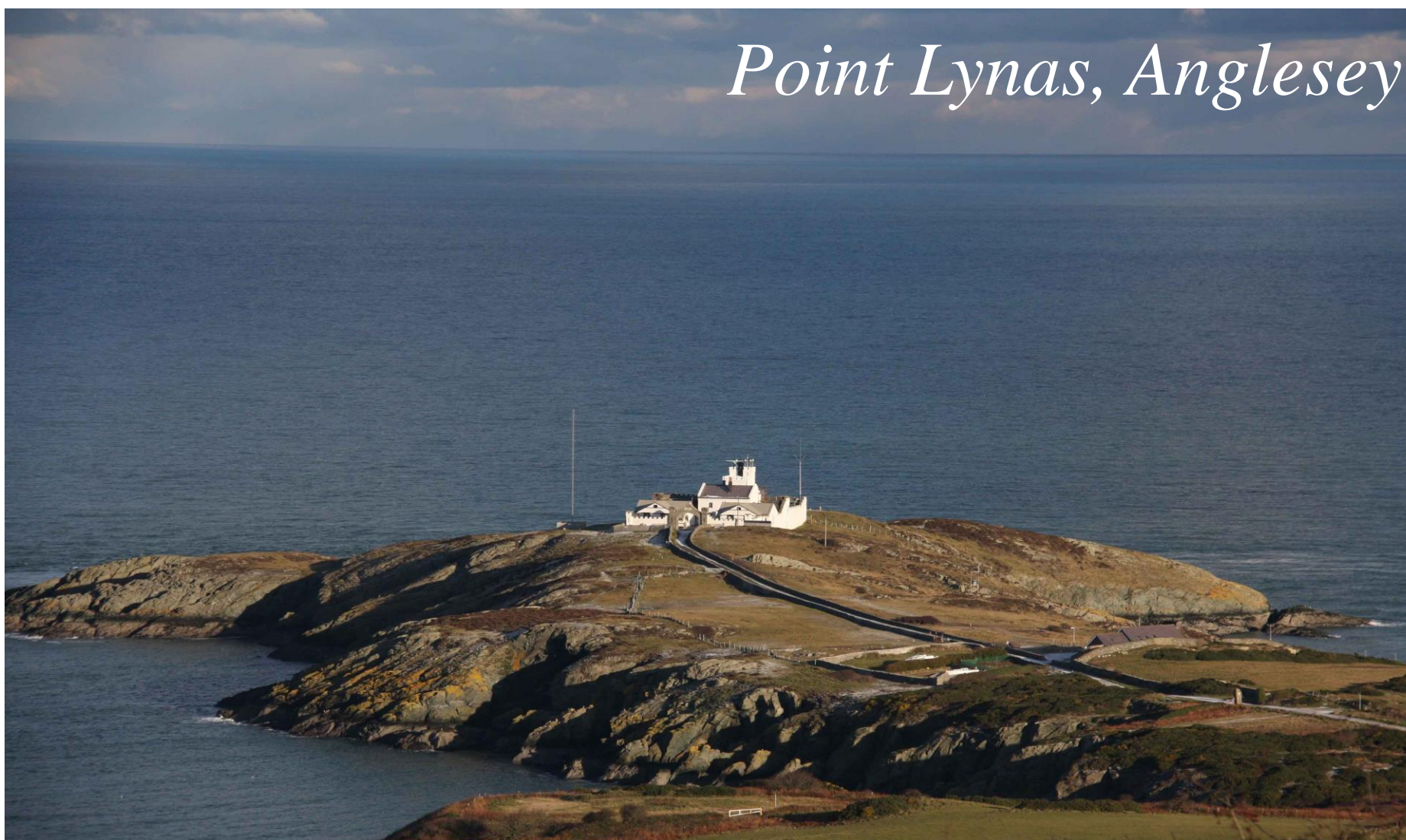
c) Marine Protected Areas



SUMMARY OF UK LAND WATCH DATA & ANALYSIS



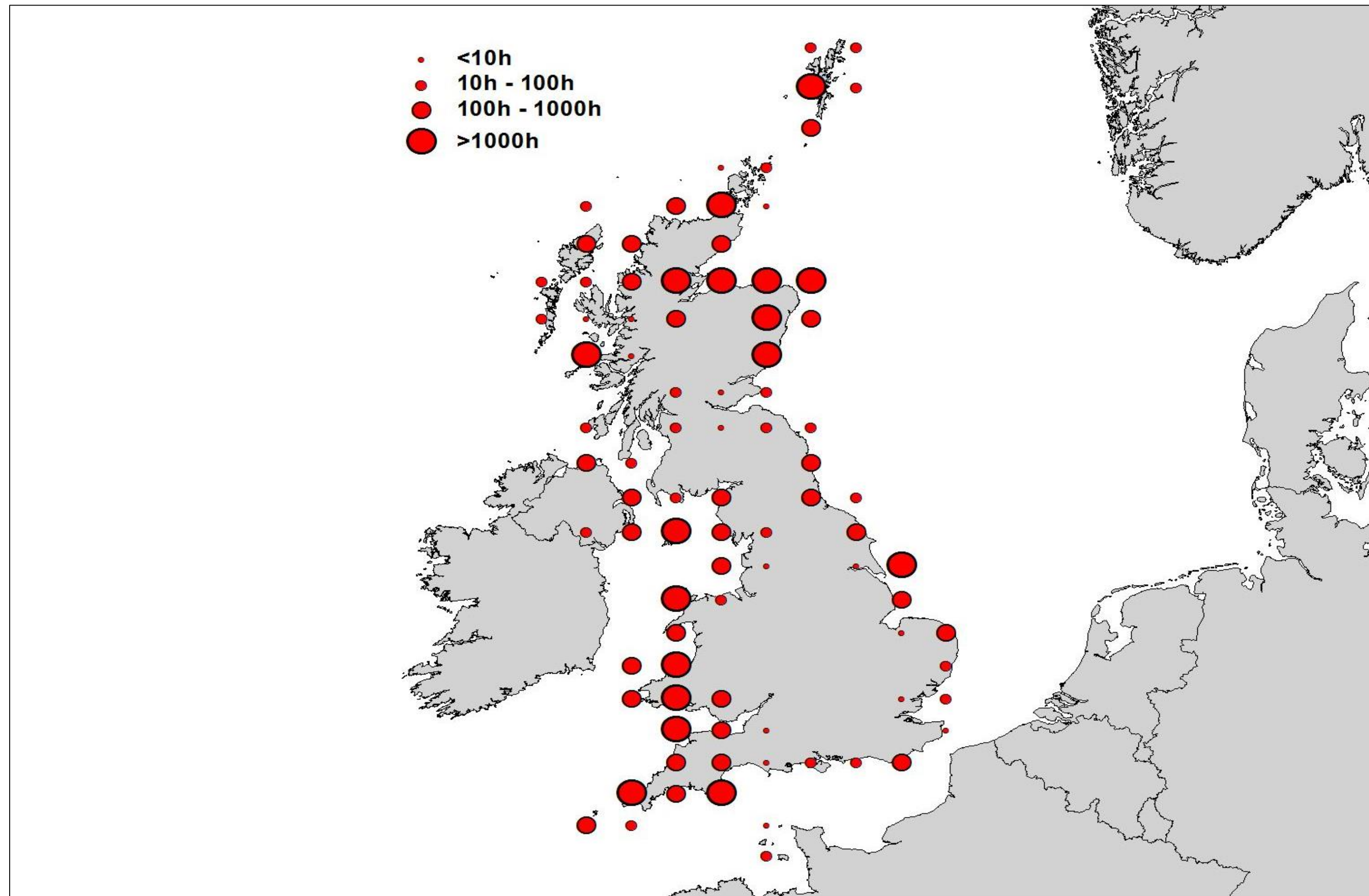
- >145,000 effort records
- c. 84,000 hours of effort
- 50-year time period: 1965-2014
- Number of sites: 732
- c. 20,000 harbour porpoise records
- c. 27,000 bottlenose dolphin records



- Presence, sighting and count rates calculated for each site, for both species
- Results summarised by site and by day (to eliminate within-day autocorrelation)
- GAMs & GAMMs run (the latter to quantify any effect of autocorrelation between consecutive days of observation)
- GAMs with a site \times year interaction to reveal interannual changes in distribution

Source: Evans *et al.*, 2015

LAND WATCH EFFORT BY ICES GRID CELL

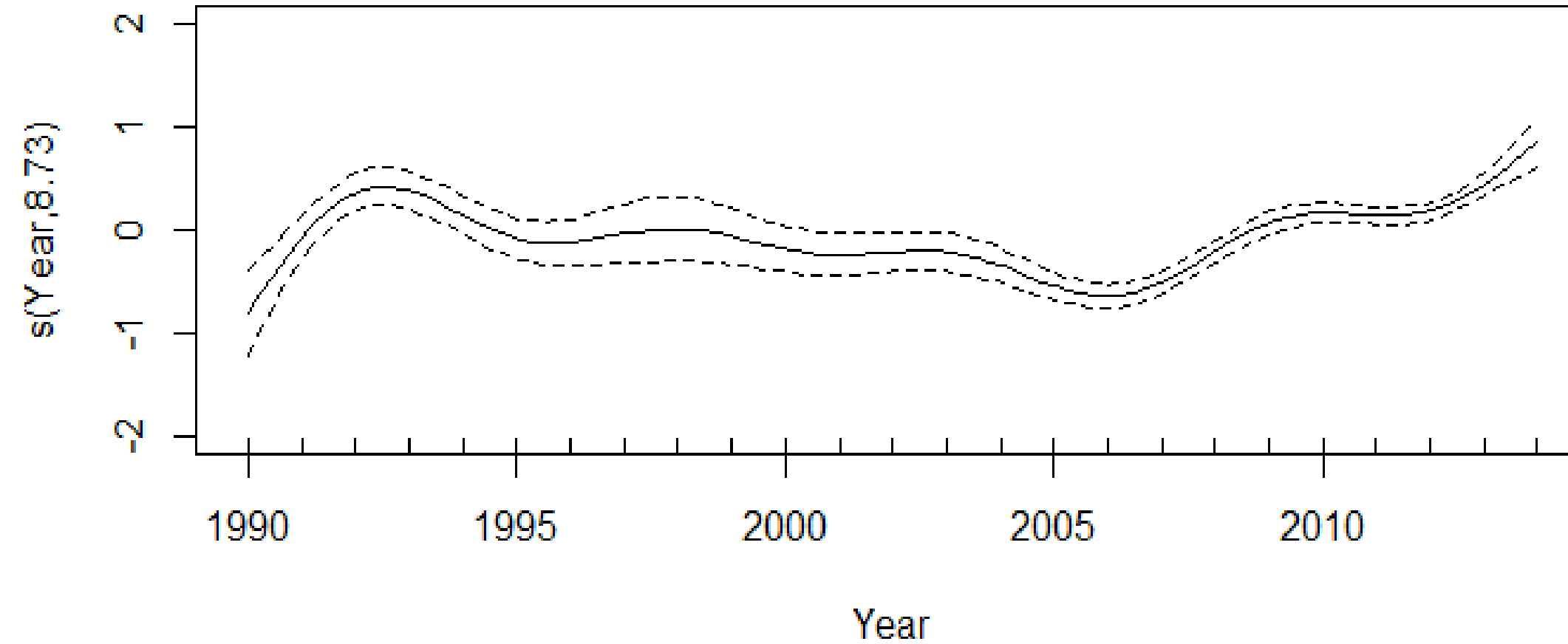


- good overall coverage except SE England, W Scotland & Borders

Source: *Evans et al., 2015*

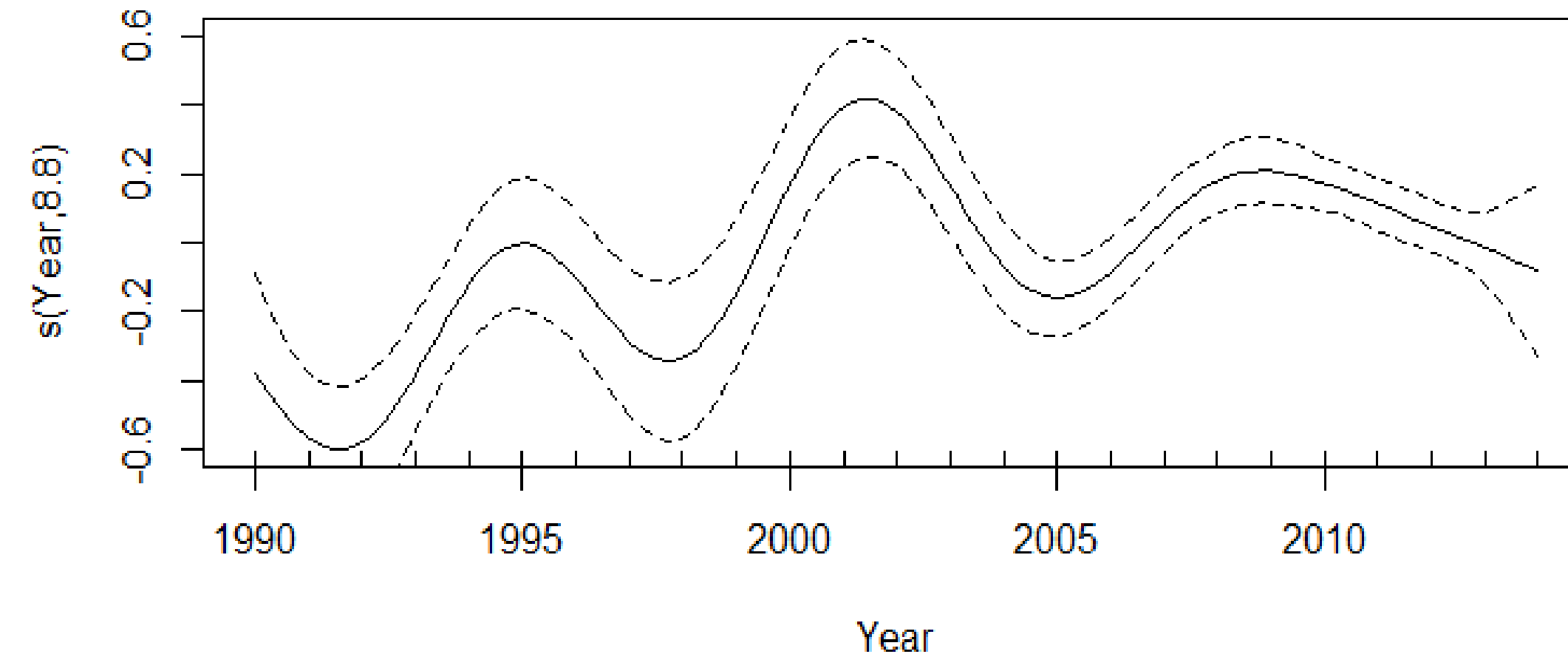
LONG-TERM TRENDS IN OVERALL PRESENCE OF BOTTLENOSE DOLPHIN & HARBOUR PORPOISE

a) Bottlenose Dolphin



- Little change between 1995 and 2005
- General increase between 2006 and 2014

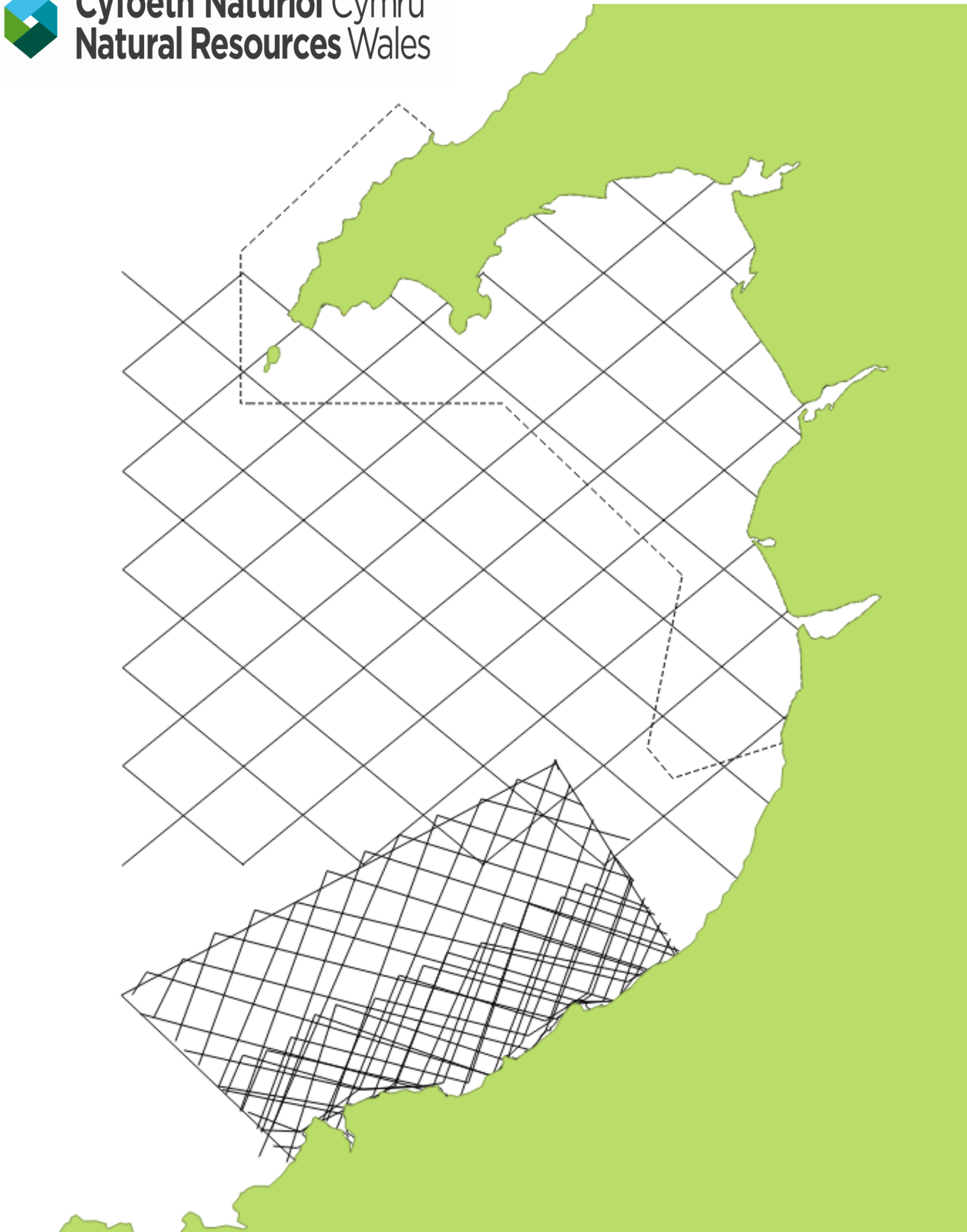
b) Harbour Porpoise



- General increase between early 1990s and 2010
- Peaks around 2001-02 and 2008-09
- Lows around 1992 & 2005

Line transect surveys in Cardigan Bay and Anglesey

 Cyfoeth Naturiol Cymru
Natural Resources Wales



Movements of individual bottlenose dolphins through photo ID



Voldemort

Adult Male

First seen June 2003

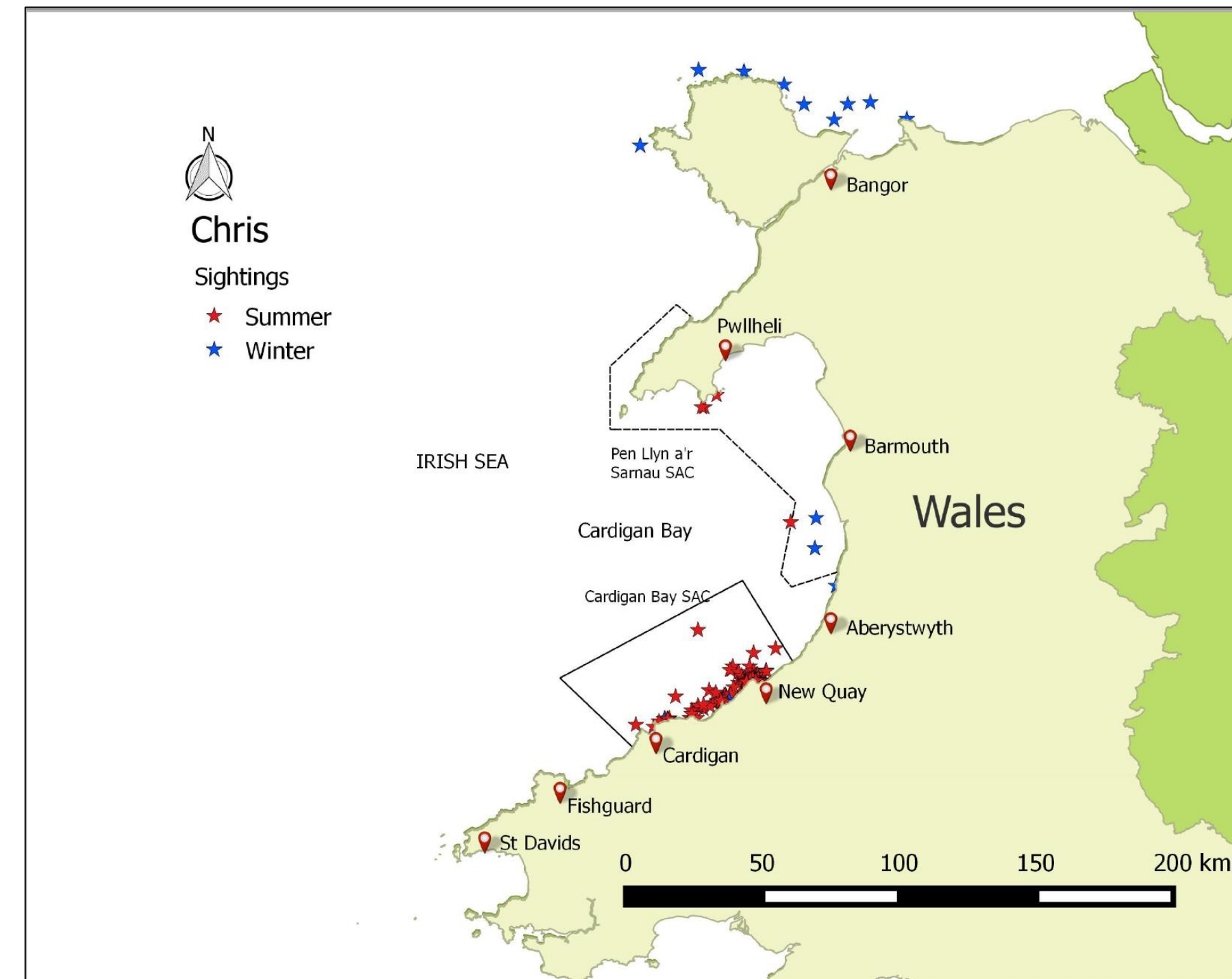
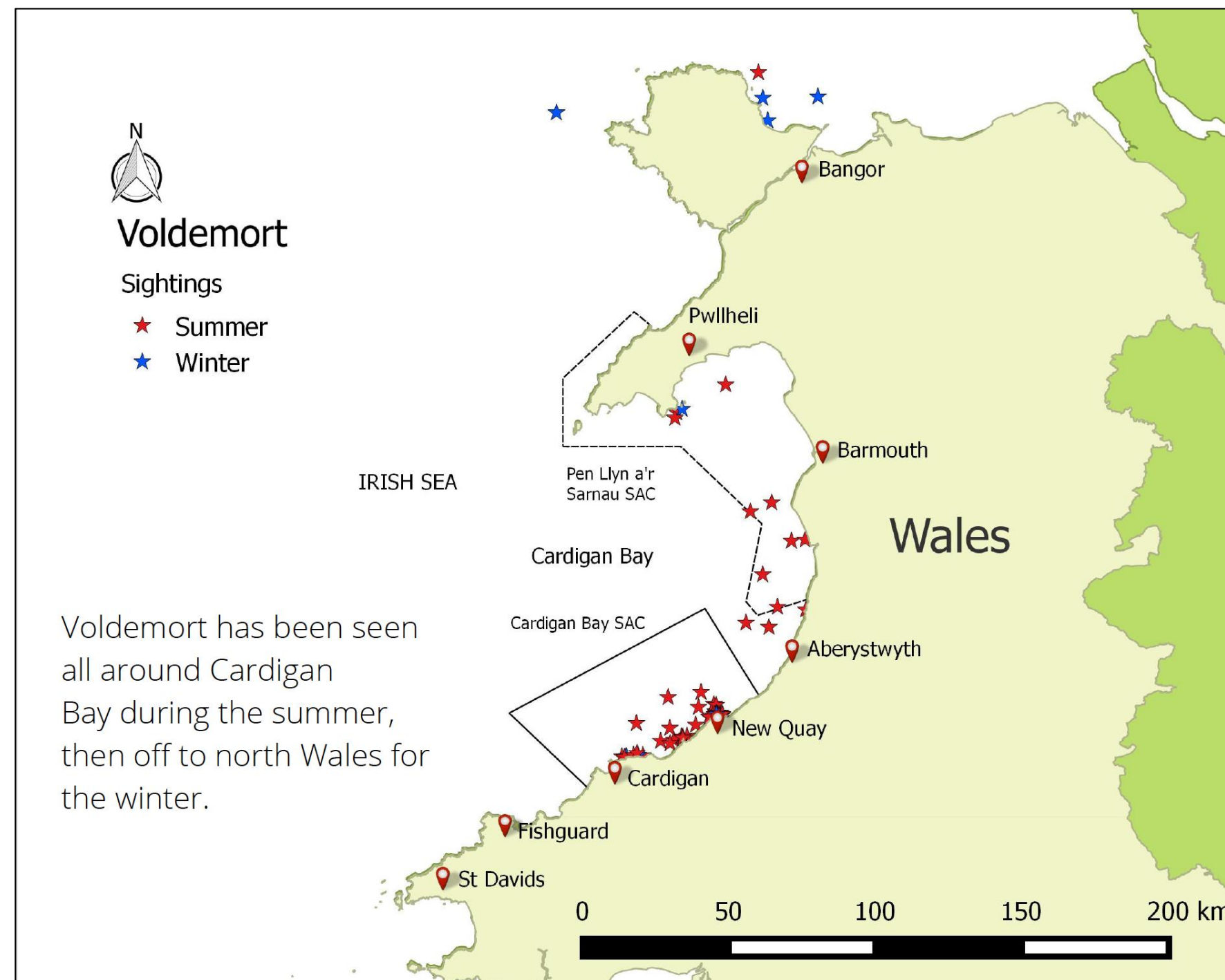


Chris

Adult Female

Seen Oct 1990 – July 2015

3 calves (2001, 2004, 2010)



Thank you

