

sea watch  
FOUNDATION



## National Whale & Dolphin Watch 2015



25<sup>th</sup> July – 2<sup>nd</sup> August

### Facts and Figures



 **1150** hours of observation

 **946** sightings reported

 **4480** individual animals

 A record **13** different species

 **113** land watch sites

 **27** vessels

 **276** dedicated observers

 More than **1500** participants

**Memorable sightings include...** a humpback whale sighted in the Inner Hebrides, fin whales off the Yorkshire coast, Risso's dolphins all along our western shores, and an arctic beluga whale off Northern Ireland!

# Introduction

The National Whale and Dolphin Watch (NWDW) is organised each year by the Sea Watch Foundation, and the 2015 event marked the thirteenth occasion that members of the public were invited to join organised whale and dolphin watches around the UK. The event aims to raise the profile of British whales, dolphins and porpoises (collectively termed cetaceans) whilst investigating their status and distribution through a large scale snapshot survey.

Sea Watch Foundation pioneered this citizen science approach in the UK, being the first organisation to harness the support of members of the public to record and report their cetacean sightings. Whilst the research organisation encourages such observations and recording throughout the year, the NWDW gives an opportunity to collect a large amount of scientifically valuable data throughout the British Isles over a concentrated period of time.



**Plate 1.** A selection of photographs from this year's event: Top Left - harbour porpoise by AK Wildlife Cruises, Top Centre - leaping bottlenose dolphin by Ecoventures, Top Right - young girl watches from Aberystwyth by Kathy James/SWF, Middle Left - Risso's dolphin at Porthcurno by Marine Discovery Penzance, Middle Centre - dolphin-watching on a boat by Newquay Shark Tours, Middle Right - short-beaked common dolphin and calf by Carl McKay/Shearwater Ullapool (SWT Living Seas), Bottom Left - landwatch at St Agnes Head by Cornwall Wildlife Trust, Bottom Right - minke whale by David Ainsley.



NWDW 2015 was a tremendous success with high levels of public interest and direct engagement, and a high number of sightings around the UK. Sponsored by BG Group, the event is building in popularity year on year, and in 2015 the reach of the campaign was aided by an effective collaboration with various other conservation and recording organisations. The third consecutive year of the Big Watch Weekend (a NWDW event by Northumberland Wildlife Trust and Environmental Records Information Centre North East) at the start of the watch period continued to give an added boost to data collection.



**Plate 2.** A public outreach opportunity during NWDW 2015 in New Quay, West Wales.

Additionally, 2015 saw the first 'Ocean Watch' with observers from ORCA adding to NWDW data by choosing to coincide data collection from ferries with the National Whale and Dolphin Watch run by Sea Watch Foundation. This initiative added valuable 'effort hours' and sightings, particularly in some of the relatively under-studied offshore regions.

Once again, the event has continued to grow with an increased volume of data received compared to previous years.



**Plate 3.** Volunteer observers at the Mull of Galloway RSPB reserve, Dumfries & Galloway



# Results

## Effort

Thanks to the efforts of 276 volunteer cetacean observers all over the UK, 1141.5 hours of effort data were collected during the course of the nine day event. These observers, dedicatedly collecting effort-related data (whereby a timed watch takes place and environmental details are systematically recorded), were stationed at 113 land watch sites and on 27 vessels around Britain (Fig.1). In addition to these, 158 volunteer observers reported casual sightings both from land and at sea. A further 1158 individuals were recorded in attendance at just 25 of the NWDW events. It is estimated that around four times this figure may have been at events where the attendance was not recorded.

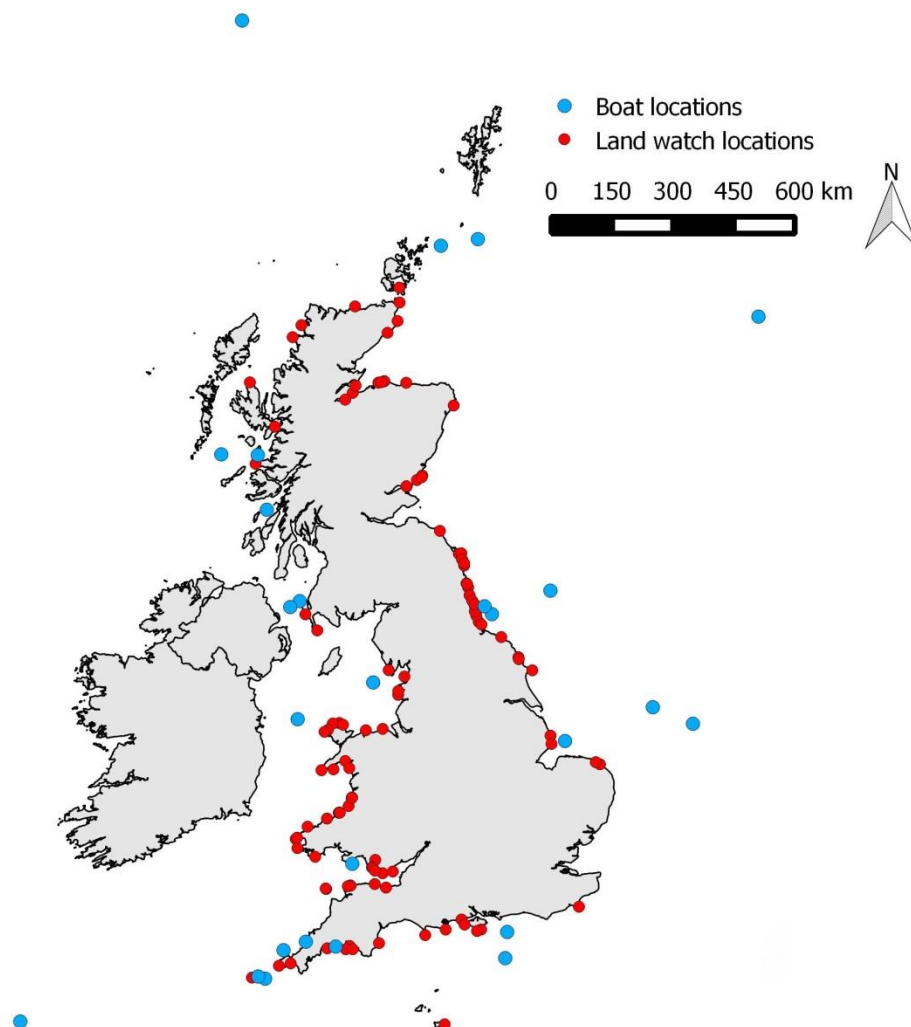


Figure 1. Watch locations for NWDW 2015 (n=140)

Whereas the number of NWDW watch sites had shown an increase year on year from 2011 to 2014 (48 sites in 2011, 72 sites in 2012, 76 in 2013, 116 sites in 2014), the number for 2015 was slightly less at 113. However, if other scheduled watches had not been cancelled due to poor weather conditions, the number would have increased by 13, creating another annual increase in public involvement in watches from different sites. Even with slightly fewer land watch sites in operation, effort data in 2015 saw a great increase to 1141.5 hours of recorded cetacean watches (from 927 in 2014), with much of this achieved by increased offshore coverage during this year's event.

This year, the volume of effort data recorded in each region varied widely and was strongly linked to observer numbers. Areas with strong regional networks and links with other organisations once again produced the highest levels of effort data collection (Fig 2.).

33.9% of effort data was recorded from a vessel during the 2015 event, an increase on the previous year. Despite the majority of effort data still being collected from land, the sightings data continue to show a more balanced picture in terms of platform type. Just under half of all sightings were reported at sea (40%) (Fig.3).



**Plate 4.** Left - Alan Grieve took to the seas off West Sussex on his catamaran to collect effort-based data, top right - A special NWDW watch on Marine Drive in Scarborough, North Yorkshire, where regular observer Stuart Baines watches from most days of the year, bottom right - Land watch at Stoer Head Lighthouse, Sutherland.

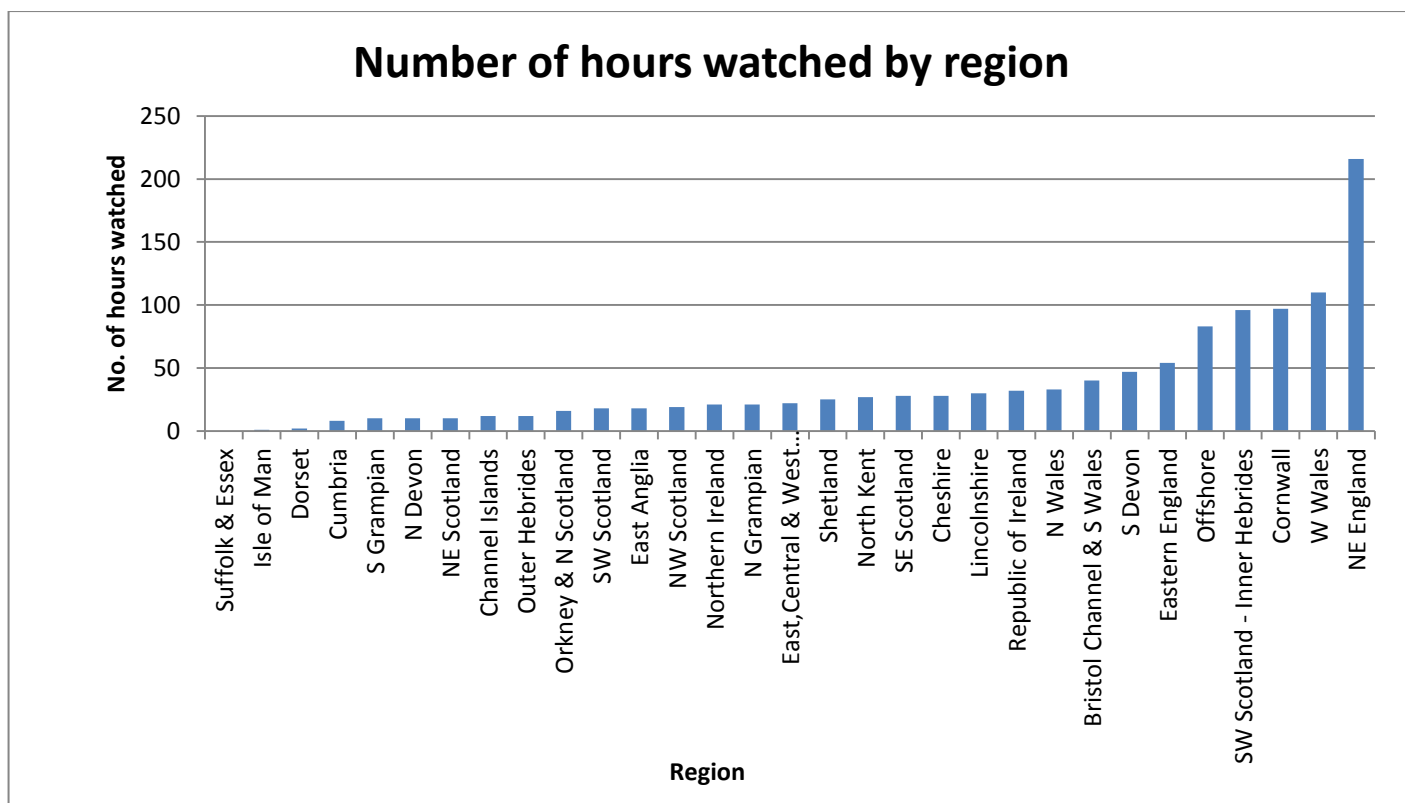


Figure 2. Number of hours of effort-related data collected by region

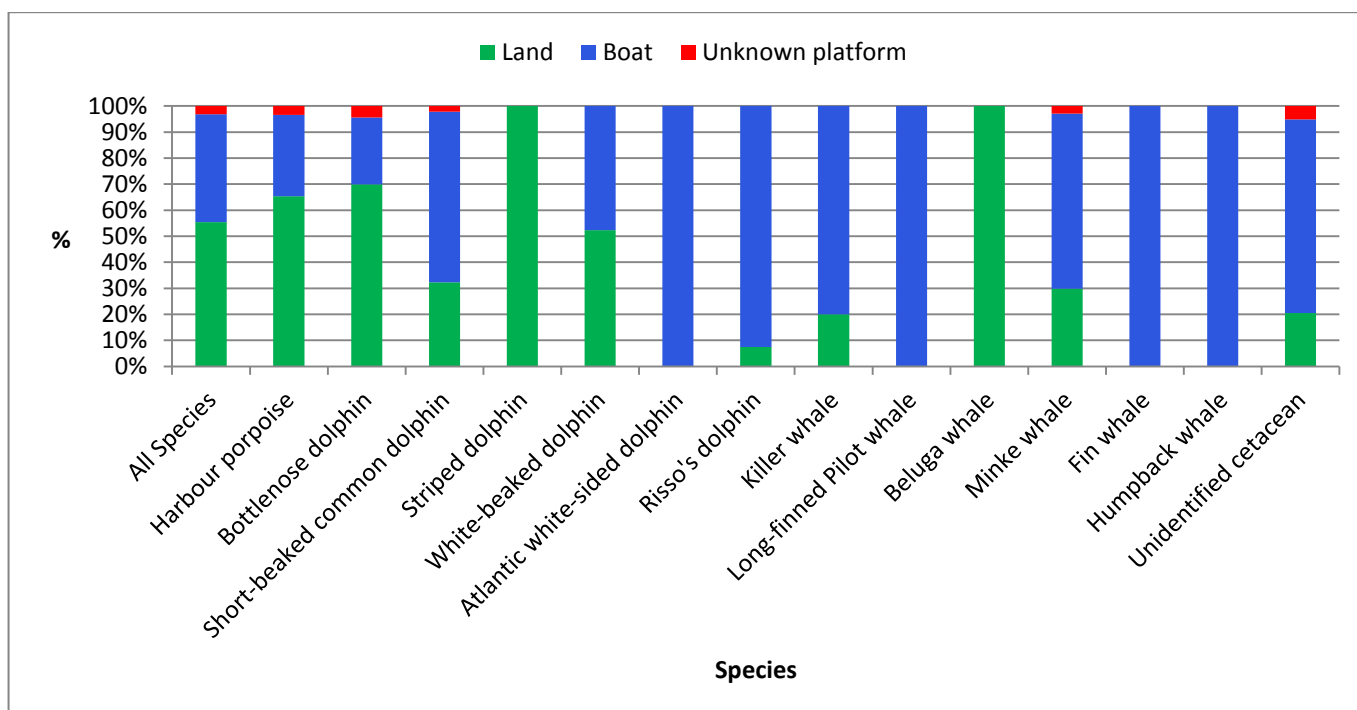


Figure 3. Proportion of sightings per species reported from land, vessels or unknown platforms



## Weather

Cetacean data collection is always strongly weather dependant. Factors such as sea state, swell height and visibility to the horizon affect how easily animals can be detected during a watch. Heavy rain and wind can even cause watches to be cancelled altogether. For these reasons, every year we rely heavily on good weather conditions for the success of NWDW. As in previous years, this year's event was scheduled over nine days in order to increase the chances of coinciding with a favourable weather window. Unfortunately, the event took place during a very changeable weather window, with lower than average temperatures, heavy rain in some areas, and particularly high winds towards the end of the nine day event. A summary of the weather conditions, and sightings by day, is provided in Appendices 1 and 2.



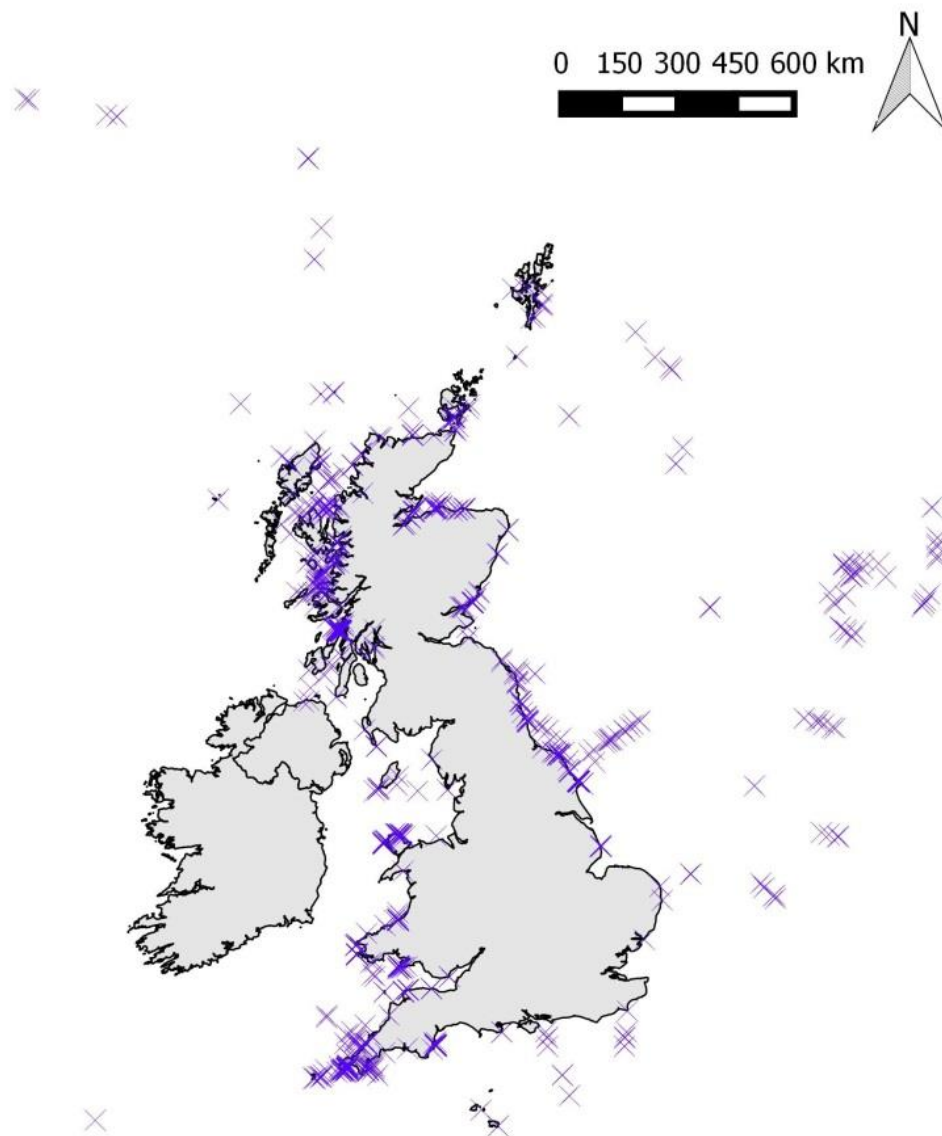
**Plate 5:** Despite rough seas, bottlenose dolphins still made an appearance in New Quay, West Wales.

Photo by Katrin Lohrengel/Sea Watch Foundation

## Sightings

946 sightings of cetaceans totalling 4,480 individual animals were reported during the NWDW 2015 watch period (Fig.4). Whilst total sighting numbers are down by almost 20% on 2014's figures (1,150 sightings), there were more species recorded than ever before! Thirteen different cetacean species were observed around the UK, topping the previous NWDW record of eleven in 2009 and 2014. The list of different species recorded during NWDW has varied between years (cf. NWDW reports: 2011, 2012, 2013, and 2014), and the 2015 event added an entirely new species to this list.

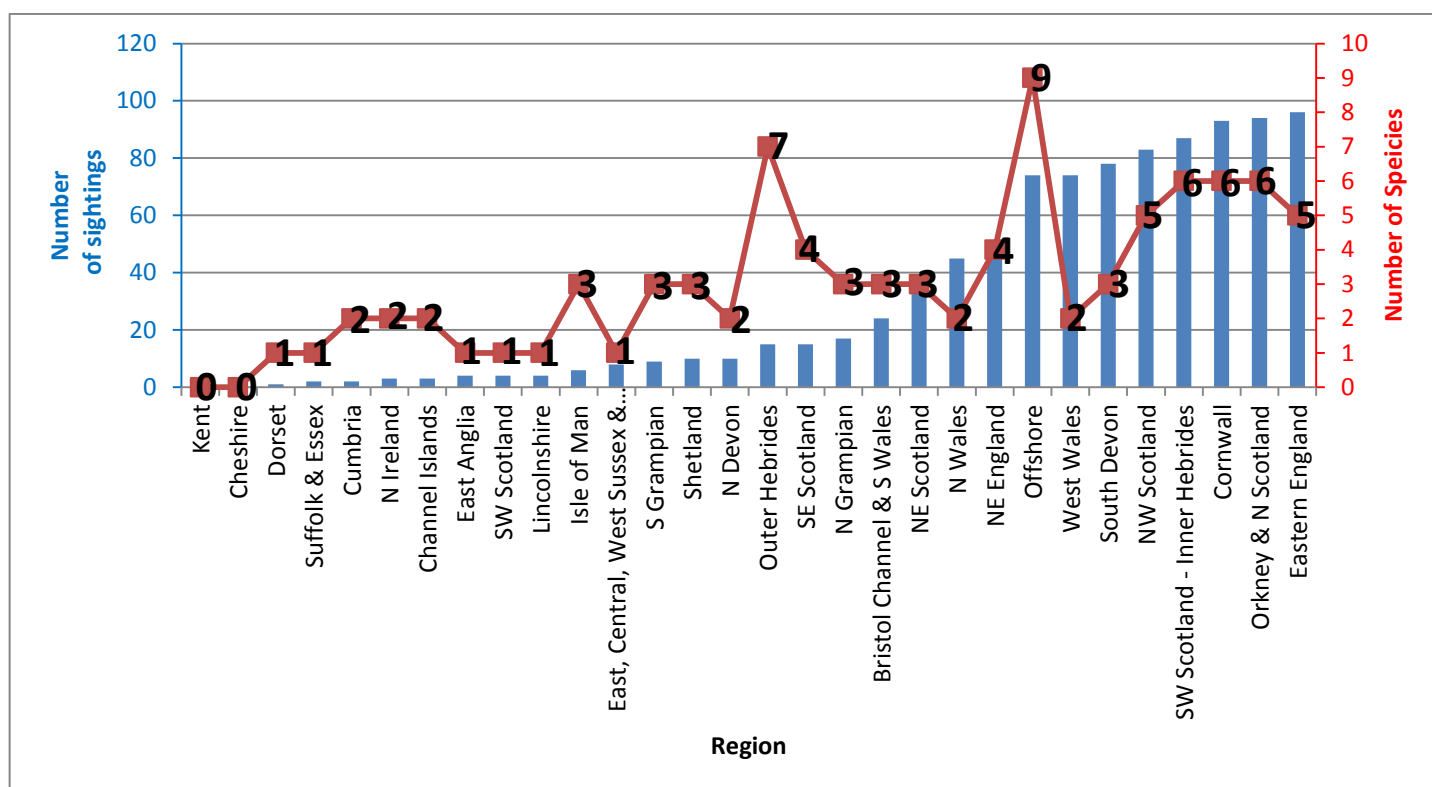
It is thought that poor general weather conditions may have hampered many of our observers' efforts, and we anticipate that with a better window of opportunity for observations, sightings figures would match or surpass that of previous years.



**Figure 4. Sightings of cetaceans during NWDW 2015 (n=946)**

The heterogeneous distribution of sightings around the UK's coasts reflects a combination of factors: observer coverage, species distribution and sightability (how easily the cetaceans can be detected, particularly from the coast). 373 sightings (39.4%) were reported in Scotland; these were closely followed by 349 sightings (36.9%) in England. Observers in Wales recorded 138 sightings (14.59%) whilst 3 sightings (0.3%) were recorded off Northern Ireland. The Isle of Man and the Channel Islands reported 6 sightings (0.6%) and 3 sightings (0.3%) respectively (Figs 4 & 5). Additionally, offshore sightings (which cannot easily be ascribed to one of our observer regions) accounted for 74 sightings (7.8%).





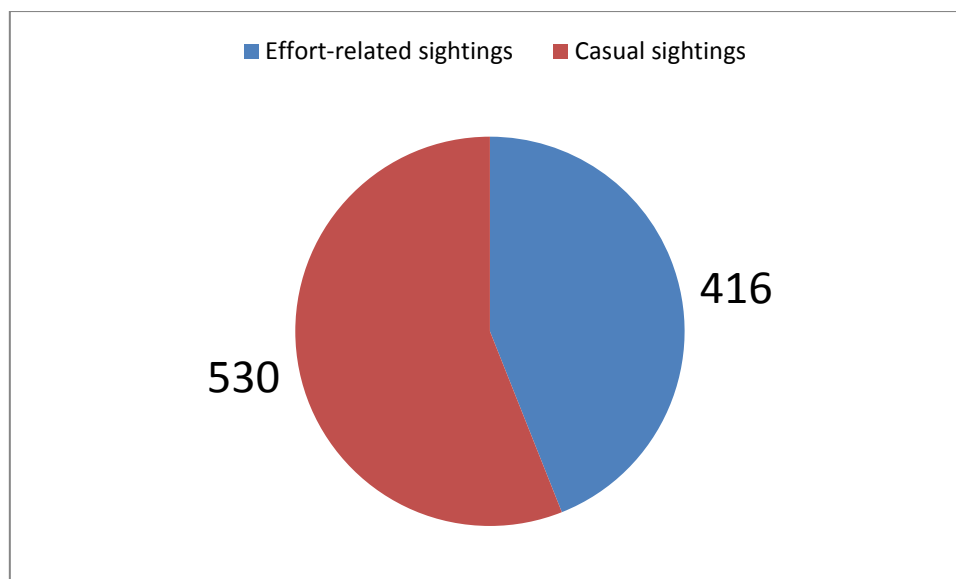
**Figure 5. Number of sightings (casual and effort-related) and species per region during NWDW 2015**

Eastern England (96 sightings), Orkney & North Scotland (94 sightings), Cornwall (93 sightings), South-west Scotland & Inner Hebrides (87 sightings), North-west Scotland (83 sightings), South Devon (78 sightings) and West Wales (74 sightings) were the most successful regions in terms of the absolute number of sightings reported.

Offshore waters saw the highest species diversity (nine species reported), closely followed by the Outer Hebrides (seven species recorded) and South-west Scotland & Inner Hebrides, Orkney & North Scotland, and Cornwall (six species recorded).

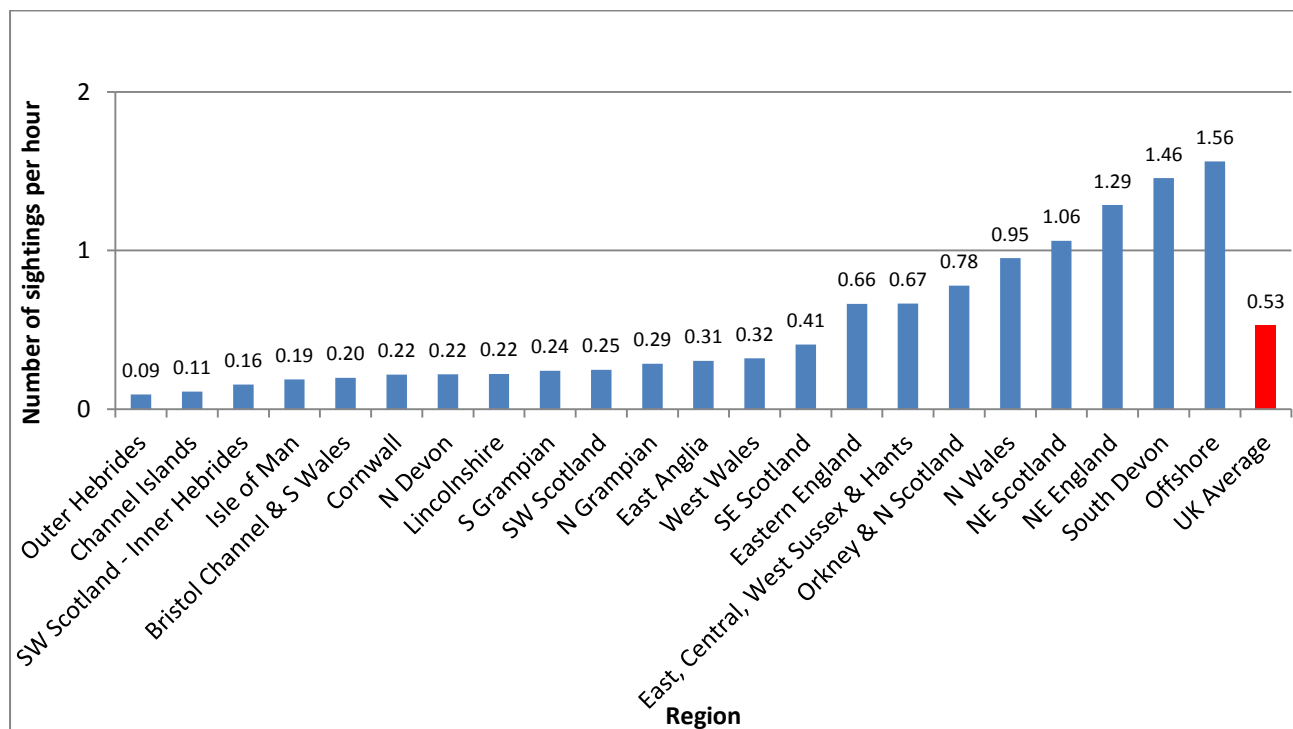
The South-eastern and North-western coasts of England recorded low numbers of sightings. These regions also demonstrated the lowest levels of species diversity (one species where sightings were made). Interestingly, as in 2014, the Isle of Man reported three different species of cetaceans despite only six sightings reports in total.

The ratio of “casual” sightings (without associated effort data) to “effort-related” sightings is similar to that of 2013’s event (Fig. 6). Casual sightings account for 56% of all sightings recorded during the event. The effort-related sightings percentage is 44% for 2015, up from 31% in 2014 and more closely aligned with 46% in 2013. 2015 represents both an increase in effort-related watches and an improvement in the number of effort-related sightings as a proportion of the total.

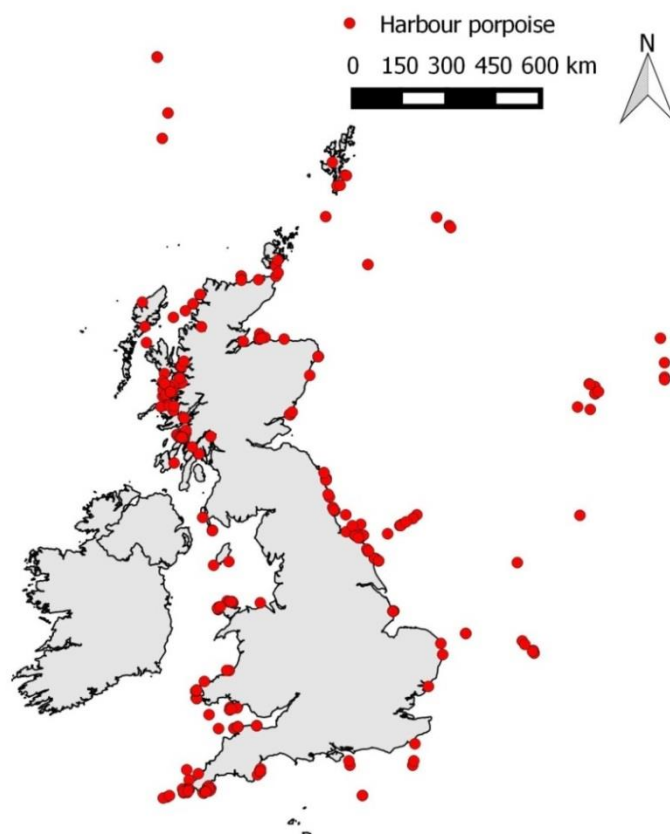


**Figure 6. Proportion of effort related sightings (n=416; 44%) and casual sightings (n=530; 56%) recorded during NWDW 2015**

Figure 7 places Offshore waters as well as South Devon, North-east England and North-east Scotland at the top of the list, with mean sighting rates of at least 1 per hour of watching. Based on this year's results, the UK's national average is a sighting rate of 0.53 or one cetacean seen every two hours of watching.



**Figure 7. Sighting rate per region during NWDW 2015**



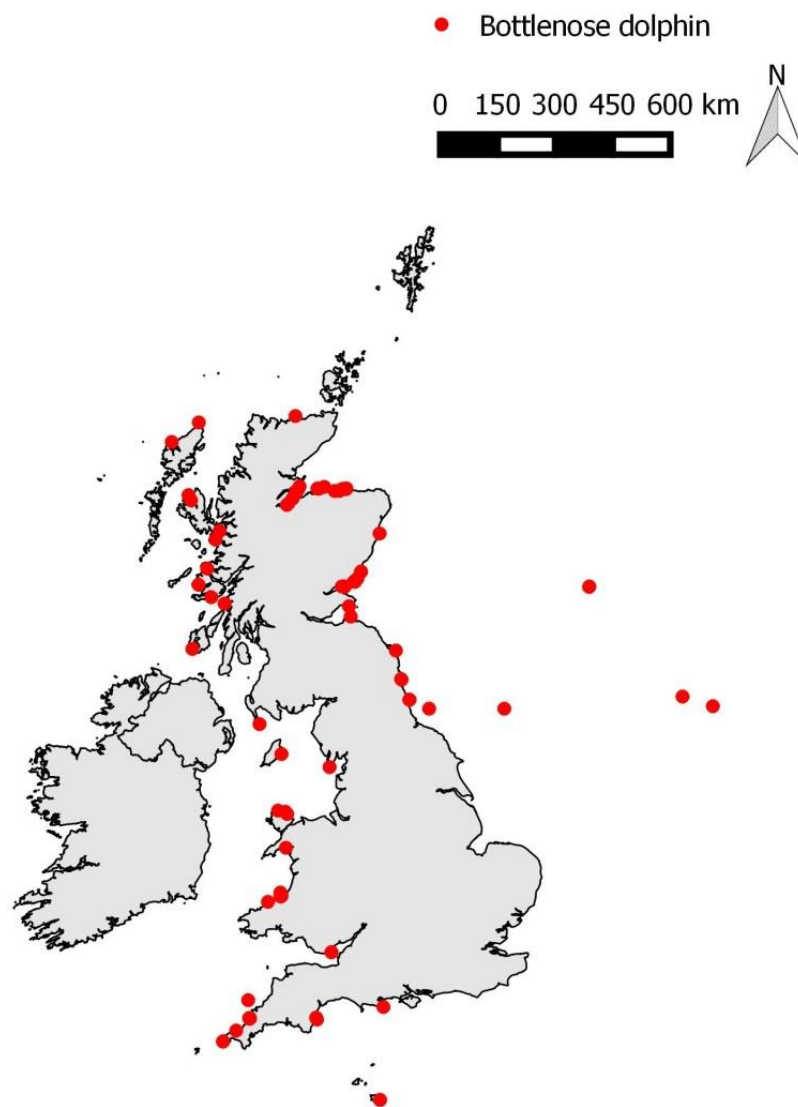
**Figure 8. Sightings of harbour porpoise during NWDW 2015 (n=565; 59.73%)**

Harbour porpoises are common in most parts of the UK, and this was once again reflected by this year's NWDW results. The species was recorded 565 times and made up the greater part of the records for the event (59.7%). As illustrated by Figure 8, sightings were distributed around the whole of the UK coastline, and concentrated in areas of high effort such as North-East England, the Inner Hebrides, North and West Wales, and Cornwall (Fig. 2). The size of groups of this species varied widely from a single individual to the largest group of 20 animals which was seen off Flamborough Head, Yorkshire (Table 1).



**Plate 6.** Harbour porpoise spotted off Falmouth during NWDW 2015. Photo by AK Wildlife Cruises





**Figure 9. Sightings of bottlenose dolphins during NWDW 2015 (n=113; 11.95%)**

Once again, bottlenose dolphins were the second most frequently reported species during NWDW, with 113 sightings (11.9%). Two large semi-resident populations of bottlenose dolphins can be found in UK waters: one in Cardigan Bay, West Wales; the other in the Moray Firth, North-East Scotland. Animals from both these populations were well recorded during the event, as illustrated in Figure 9. In addition, bottlenose dolphins were also recorded widely around many parts of the UK during the 2015 event, the exception being South-East and East England.

622 individual bottlenose dolphins were recorded during the event. However, we cannot assume that all of these sightings represented different individuals; many animals will likely have been spotted more than once. The largest groups were recorded off the Farne Islands, Northumberland and off North Berwick in South-East Scotland, each consisting of 20 animals (Table 1).

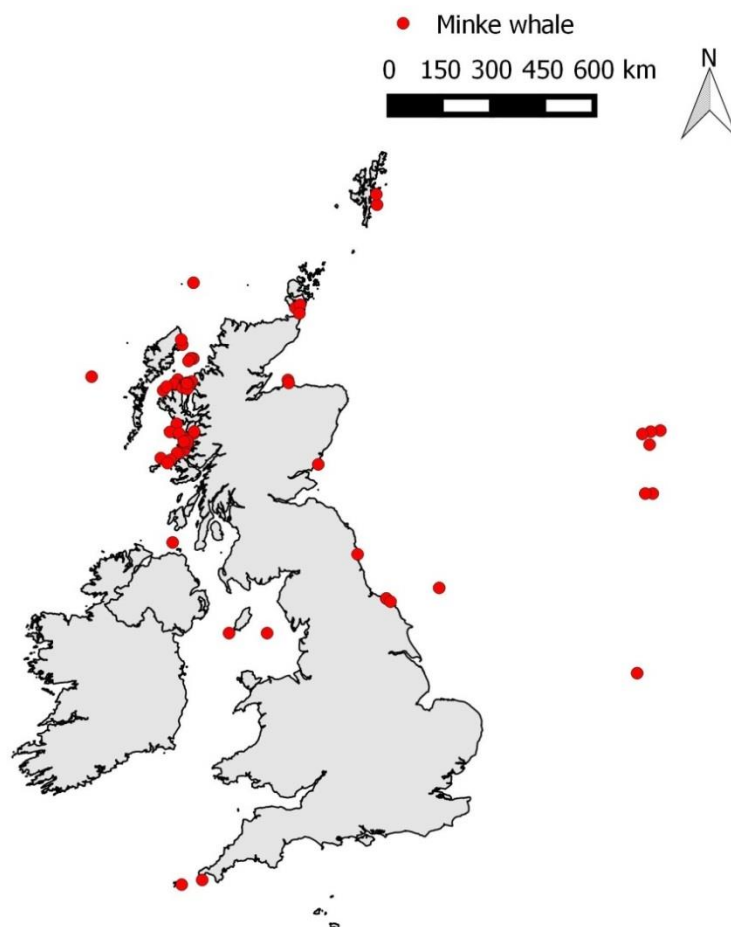


**Plate 7.** A 'beaky' bottlenose dolphin is visible amongst a pod of 'blunt-headed' Risso's dolphins off Northern Scotland during the 2015 NWDW. Photo by Karen Munro



**Plate 8.** A bottlenose dolphin leaps high out of the Moray Firth, Scotland for NWDW 2015.

Photo by EcoVentures



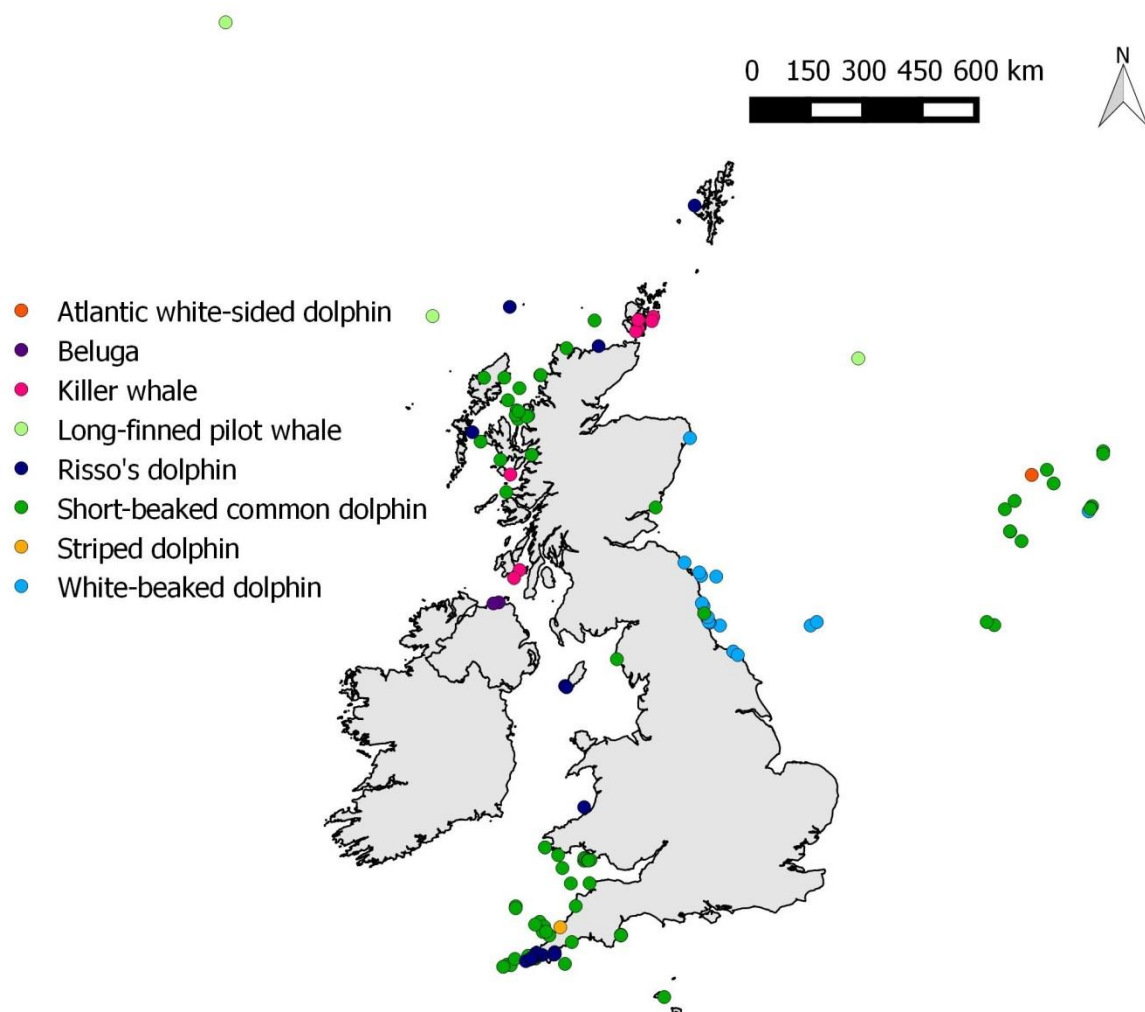
**Figure 10. Sightings of minke whales during NWDW 2015 (n=67; 7.08%)**

The most frequently reported whale species was the minke whale, accounting for 7.1% of the entire sightings total. The species was mainly seen in the northern half of the British Isles, but with further sightings reported off Cornwall, in the northern Irish Sea and the South-western North Sea (Fig. 10). The largest group of minke whales was five, seen in The Minch, North-west Scotland (Table 1).



**Plate 9.** A minke whale makes an appearance during NWDW2015. Photo by David Ainsley





**Figure 11. Sightings of Atlantic white-sided dolphin (n=1; 0.11%), beluga whale (n=2; 0.21), killer whale (n=10; 1.06%), long-finned pilot whale (n=3; 0.32%), Risso's dolphin (n=27; 2.85%), short-beaked common dolphin (n=93; 9.83%), striped dolphin (n=1; 0.11%), white-beaked dolphin (n=21; 2.22%) during NWDW 2015**

Common dolphins were the third most abundant species recorded during the 2015 NWDW event, with 93 sightings, accounting for 9.8% of all records. The species showed a predominantly western distribution, with further reports from the central and northern North Sea. The largest group (150) was recorded between Falmouth and Lizard Point in Cornwall (Fig.11, Table 1).

Other species of dolphins were less frequently recorded but nevertheless presented very distinct distributions. Killer whales were reported ten times during the event, in the waters surrounding the Orkney Isles as well as those surrounding the islands off West Scotland. The largest group consisted of 5 animals seen off Mull Head, Orkney (Fig. 11; Table 1).

Risso's dolphins demonstrated a distribution along the west coasts of the UK and the Isle of Man. 27 sightings were made in total (2.9% of all sightings). Group size varied from one animal to twelve being seen off Sula Sgeir, in North-west Scotland (Fig. 11; Table 1).

White-beaked dolphins made 21 appearances (2.22% of total sighting reports) and were concentrated off the North-east coast of England and the East coast of Scotland. The largest observed group size for this species was 30 animals seen off Berwick-Upon-Tweed, Northumberland. Other sightings were of group sizes of 20 animals or less (Fig. 11, Table 1).

There was one definite striped dolphin, which was an unfortunate case of a fatal stranding up a tributary of the Camel Estuary in Cornwall which was attended to by British Divers Marine Life Rescue. The species was recorded a further five times, but could not be verified.

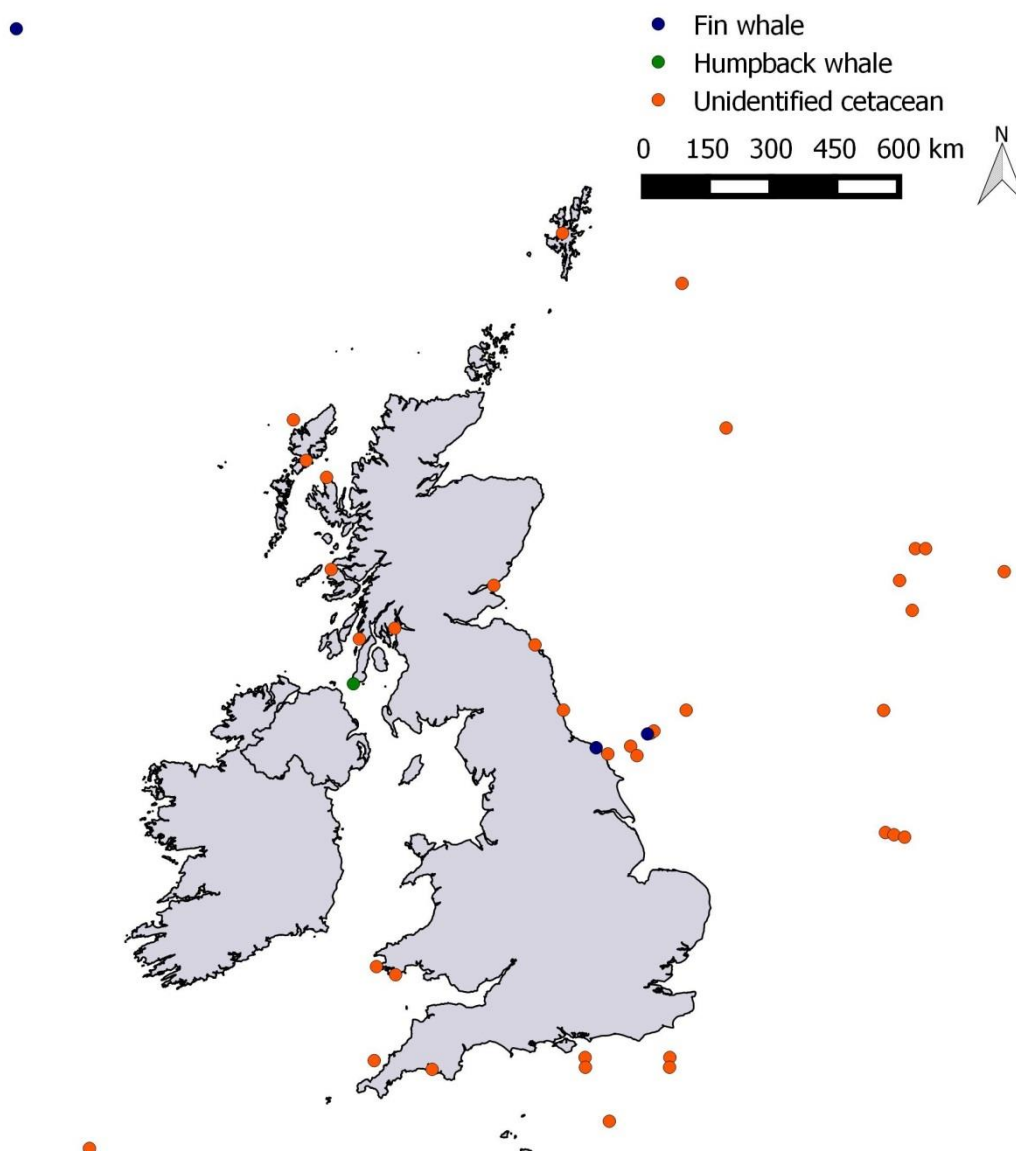
There were three sightings of pilot whales during the NWDW, accounting for 0.3% of the total number of sightings. It is assumed that these were all long-finned pilot whales rather than their tropical counterpart, the short-finned pilot whale (Fig. 11; Table 1).

The Atlantic white-sided dolphin was recorded just once during the event, in the North Sea in the same region as several of the common dolphin sightings.

A real surprise for the 2015 event was two beluga whale sightings recorded off Dunseverick in Northern Ireland. It is assumed that the same animal was observed on two separate days.



**Plate 10.** Left - leaping white-beaked dolphin off Northumberland, photo by Alan Leatham/ Ocean Explorer; top right - beluga whale off Northern Ireland, photo by Gordon Watson; bottom right - short-beaked common dolphins in Mounts Bay, Cornwall, photo by Marine Discovery. All were taken during NWDW 2015.



**Figure 12. Distribution of fin whales (n=3, 0.32%), humpback whales (n=1; 0.11%) and unidentified cetaceans (n=39; 4.12%) during NWDW 2015**

Two fin whales were recorded off Whitby, North Yorkshire, and a third individual was seen in the offshore region off North-west Scotland. A single humpback whale was observed in the Mull of Kintyre, South-west Scotland. Finally, there were 39 reports of unidentified cetaceans, accounting for 131 animals. These unidentified sightings reports were spread around the UK (Fig. 12, Table 1). It should be noted that five of these were submitted as striped dolphin records which could not satisfactorily be verified by Sea Watch and have been downgraded to 'patterned dolphin species'.



**Table 1. Quantitative description of sightings per species during NWDW 2015**

Species	No. of sightings	%	No. of individuals	%	Av Group Size
Harbour porpoise	565	59.73	1630	35.89	2.88
Bottlenose dolphin	113	11.95	622	14.02	5.50
Short-beaked common dolphin	93	9.83	1663	37.47	17.88
Striped dolphin	1	0.11	1	1.04	7.67
White-beaked dolphin	21	2.22	152	3.42	7.24
Atlantic white-sided dolphin	1	0.11	2	0.05	2.00
Risso's dolphin	27	2.85	123	2.77	4.56
Killer whale	10	1.06	28	0.63	2.80
Long-finned pilot whale	3	0.32	37	0.83	12.33
Beluga whale	2	0.21	2	0.05	1.00
Minke whale	67	7.08	85	1.80	1.29
Fin whale	3	0.32	3	0.07	1.00
Humpback whale	1	0.11	1	0.02	1.00
Unidentified cetacean	39	4.12	131	1.94	2.53
Totals	946	100	4480	100	4.78

**Plate 11.** A sea-watching team from the Wildlife Trusts Living Seas – Irish Sea project

## Acknowledgements

Sea Watch would like to thank both established and new volunteers and regional coordinators who contributed to making this year's event such a success. Thanks also go particularly to the BG Group for their continued support of NWDW. Without it, we would have great difficulty in organising this important national event. Additional thanks go to Nicola Maxey of the Met Office for her provision of satellite maps for the report, and to Anna Pääkkönen, Helen Fearnley, Jess Grimbley, and Lana Turnbull for their assistance with data entry. Lastly, thanks go to Alice Ormiston and Megan Evans for their invaluable assistance in the run up to, during and after the event with regards to recording and advertising watches, organising NWDW themed educational events, speaking with observers, and data entry.

**APPENDIX 1.**

*General overview of the weather by country for the period of NWDW 2015 (Met Office – [metoffice.gov.uk](http://metoffice.gov.uk))*

After [the start of July], the month was typified by a westerly Atlantic weather type, bringing cool and rather changeable weather generally, with rain or showers for much of the time, and only a few dry and warm days. There were some cold nights, especially in the last few days, and overall it was rather a cool month despite the hot start.

The provisional UK mean temperature was 14.4 °C, which is 0.7 °C below the 1981-2010 long-term average. It was coldest relative to average in the west and north. Rainfall was above average over most of the country, with parts of Scotland, East Anglia and elsewhere approaching double the normal rainfall amount; near-normal totals were restricted to parts of the Midlands and south-east England. The overall UK rainfall total was 140% of average. Sunshine amounts were unremarkable generally, with a UK total amounting to 96% of average.

A low pressure system passing southern England on the 24th [July] brought strong winds and heavy rain for south-east England with 20 to 40 mm falling quite widely. There was further rain and strong winds affecting south Wales and south-west England on the 26th to 27th, with reported road closures due to fallen trees.

The weather during August was mostly unsettled and fairly cool, with the UK often under the influence of nearby areas of low pressure.

The provisional UK mean temperature was 14.7 °C, which is 0.2 °C below the 1981-2010 long-term average. It was coldest relative to average across south-west England, south Wales and Northern Ireland. This was a very wet month across southern coastal counties of England which received double the normal rainfall amount; some locations approached three times the monthly average rainfall and it was provisionally the wettest August across south-east England since 1977. It was a fairly wet month for many other areas too, except Scotland where rainfall overall was near average. August was a dull month across central and southern England but it was sunnier across north-east England and eastern Scotland.

**England**

A vigorous area of low pressure for the time of year swept in from the west during the 26th, bringing rain to all areas and gusts to 40 mph to exposed western and southern coastal areas. Further rain affected northern areas for much of the day on the 27th, making slow progress south during the afternoon. It was mainly dull on the 28th with rain in the north and showers in the east, the best of any bright weather in the west and feeling cooler. A day of sunshine and scattered showers followed on the 29th, feeling cool in a northerly breeze. The 30th was mainly dry and bright in the west but scattered showers developed during the day in some eastern and central areas. A small number of stations saw record low July minima early on the 31st; after a dry and bright start it felt warmer for most, but showers edged into the north-west in the afternoon.

The far north and south were mainly dry with sunny spells on the 1st [August] but an area of showers plagued some central and eastern areas for much of the day. It was dull with outbreaks of rain in the north on the 2nd but most other areas enjoyed a bright and warm day with temperatures reaching the mid 20s in the south-east.

## **Wales**

The 25th was generally dry with long spells of sunshine. Another band of rain moved through in the morning of the 26th. Showers followed in behind accompanied by moderate to strong winds. The 27th was cloudy with showers or longer spells of rain in the south, and heavier showers developed in the evening further north. There was a mix of sunshine and showers on the 28th with some heavier bursts in the late afternoon and evening. The 29th had showers continuing with sunny spells. Early isolated showers on the 30th died out, with sunny spells appearing by late morning and through the afternoon. It was dry with some sunshine on the 31st apart from the odd isolated shower in the north-west.

The 1<sup>st</sup> [August] was generally cloudy, cool and breezy with outbreaks of rain, mainly in the north. It was much sunnier and warmer on the 2nd with 24.7 °C at Hawarden Airport (Flintshire), but with some rain over northern areas and it was breezy over the west coast.

## **Scotland**

Scattered showers in the west on the morning of the 24th spread to the east during the afternoon, and there were scattered blustery showers for most areas again on the 25th. It was generally dry at first on the 26th, but rain spread into the west and then across the rest of the country later in the day with the exception of the far north. Most areas had rain on the 27th except the north-east, Caithness and the Northern Isles. The rain was heavy at times with 42.6 mm recorded at Cassley (Sutherland). There was rain again for most areas on the 28th but it was lighter and patchier in the far north. After a dry start for most areas on the 29th, showers became more widespread and heavier through the day. Most areas were dry on the 30th with only a few light showers in the north and some rain in the north-west later. Rain in the west on the morning of the 31st spread across the rest of the country through the afternoon and evening.

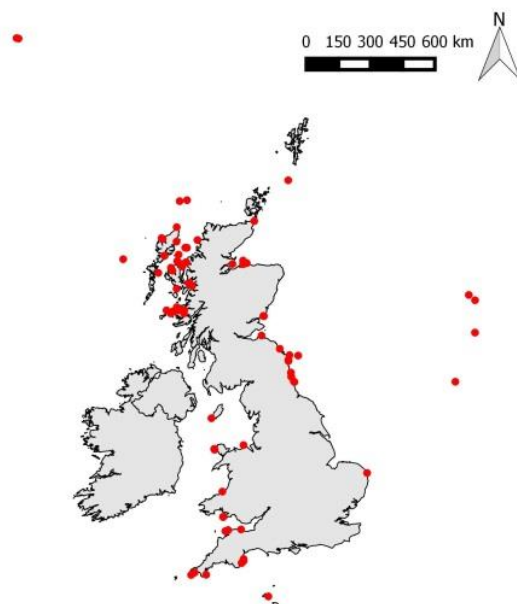
There was a dry start on the 1<sup>st</sup> [August] for most areas but a band of rain in the west spread east across the country through the day with blustery showers building up behind it. There was a dry start in the north on the 2nd with rain in the south but another weather system brought rain to most areas through the afternoon and evening.



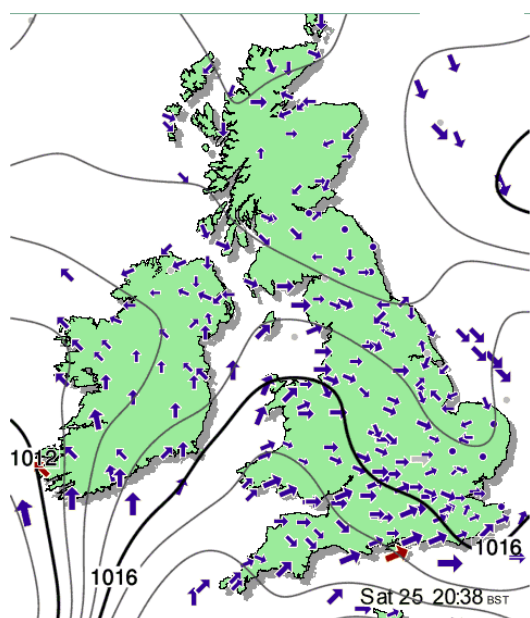
## APPENDIX 2 – Weather

General overview of the weather by day during the period of NWDW 2015 using pressure maps from XC Weather ([xcweather.co.uk](http://xcweather.co.uk)) and satellite maps from the Met Office.

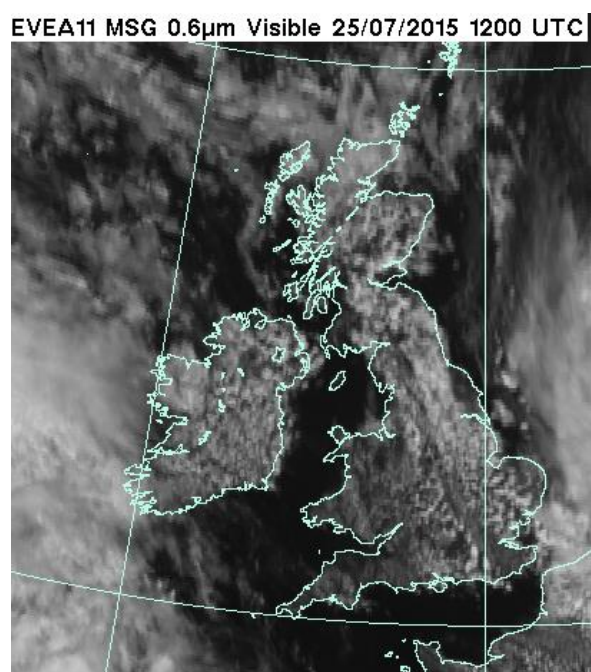
Saturday, 25<sup>th</sup> July



Cetacean sightings on day 1 of NWDW 2015 (25<sup>th</sup> July)

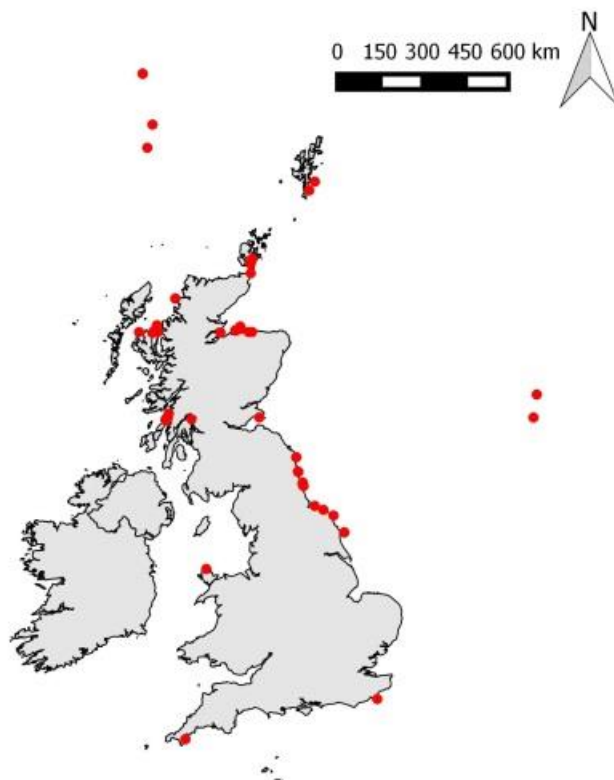


Pressure map on day 1 of NWDW 2015 (25<sup>th</sup> July)

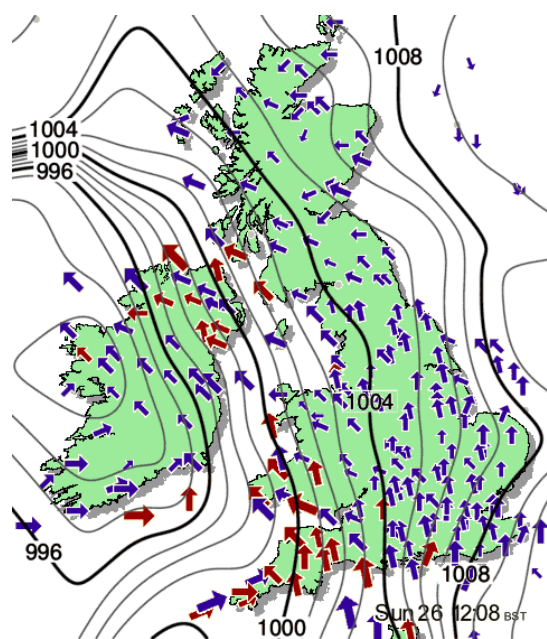


Satellite map on day 1 of NWDW 2015 (25<sup>th</sup> July)

*Sunday, 26<sup>th</sup> July*

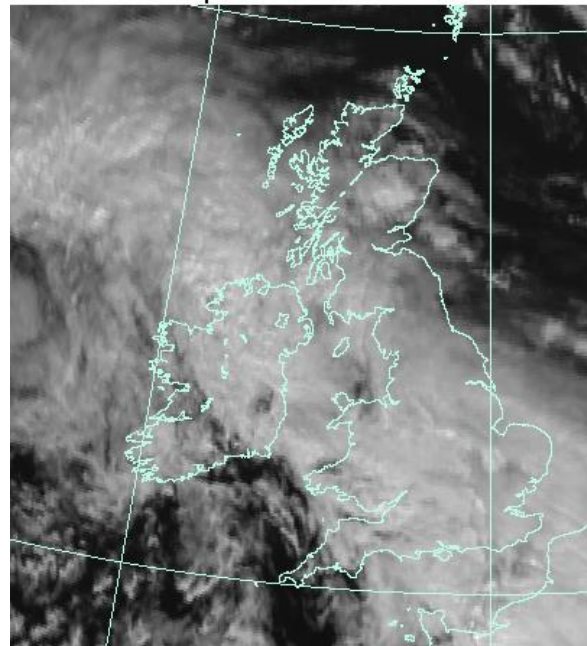


Cetacean sightings on day 2 of NWDW 2015 (26<sup>th</sup> July)



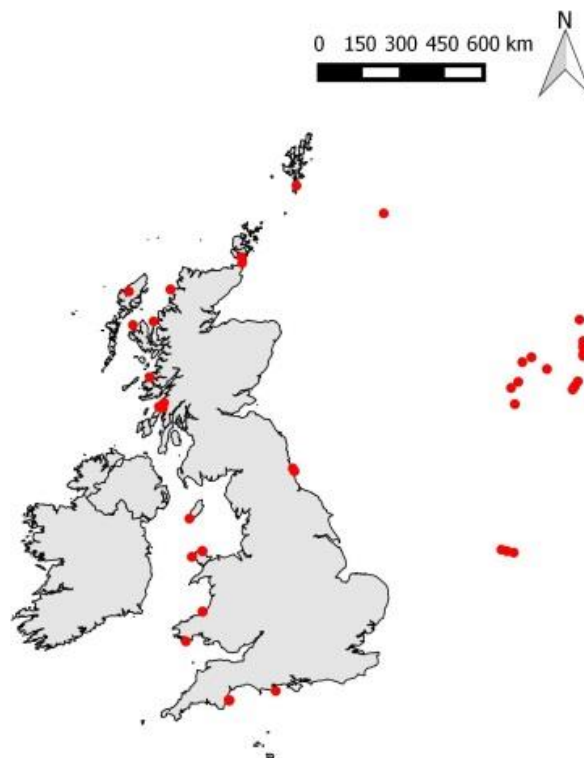
Pressure map on day 2 of NWDW 2015 (26<sup>th</sup> July)

EVEA11 MSG 0.6µm Visible 26/07/2015 1200 UTC

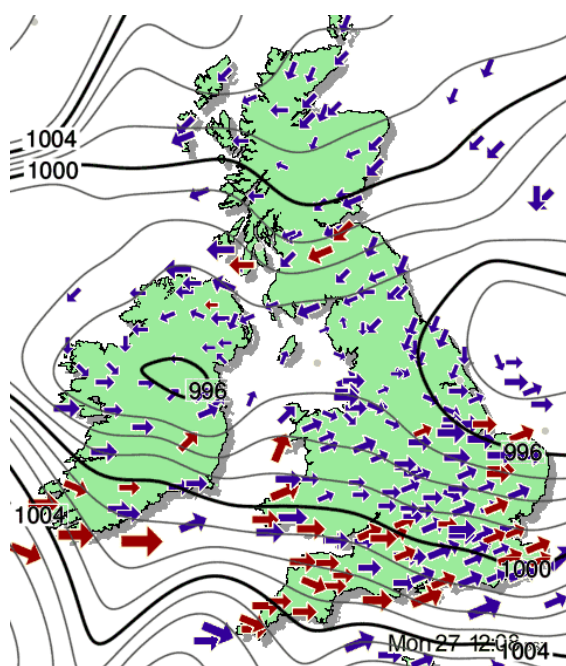


Satellite map on day 2 of NWDW 2015 (26<sup>th</sup> July)

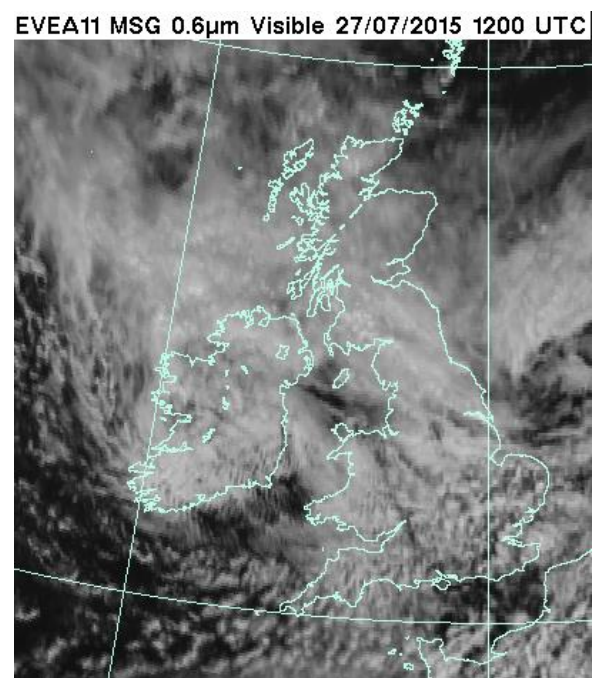
Monday, 27<sup>th</sup> July



Cetacean sightings on day 3 of NWDW 2015 (27<sup>th</sup> July)



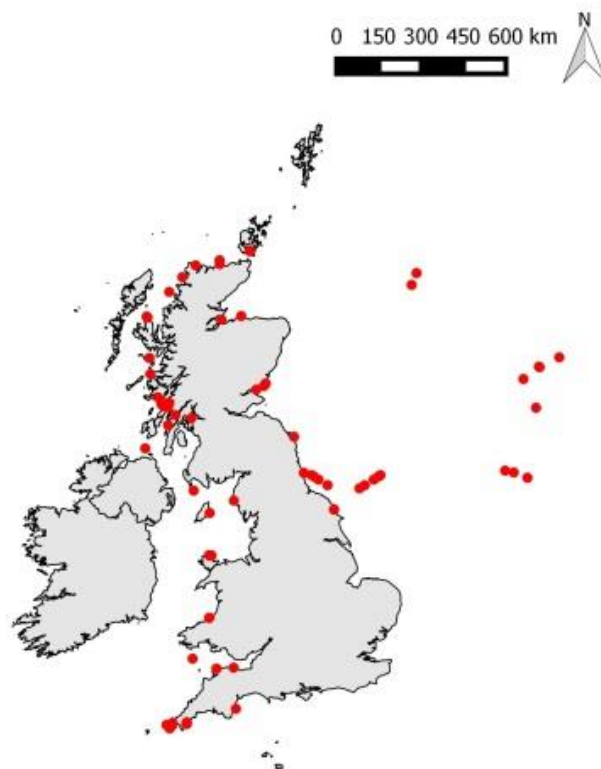
Pressure map on day 3 of NWDW 2015 (27<sup>th</sup> July)



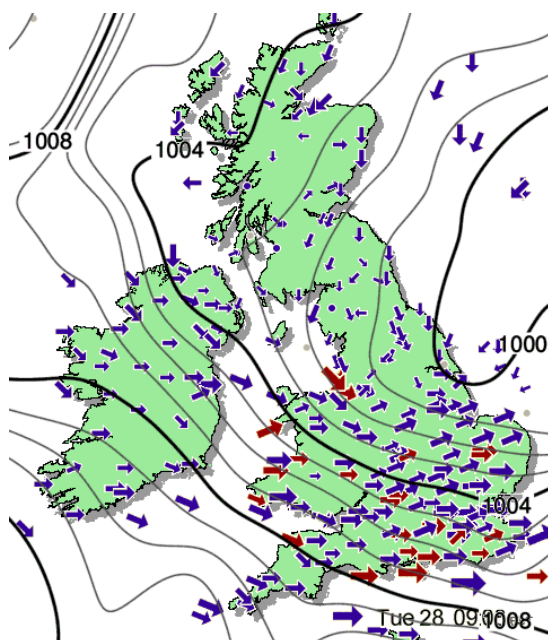
Satellite map on day 3 of NWDW 2015 (27<sup>th</sup> July)



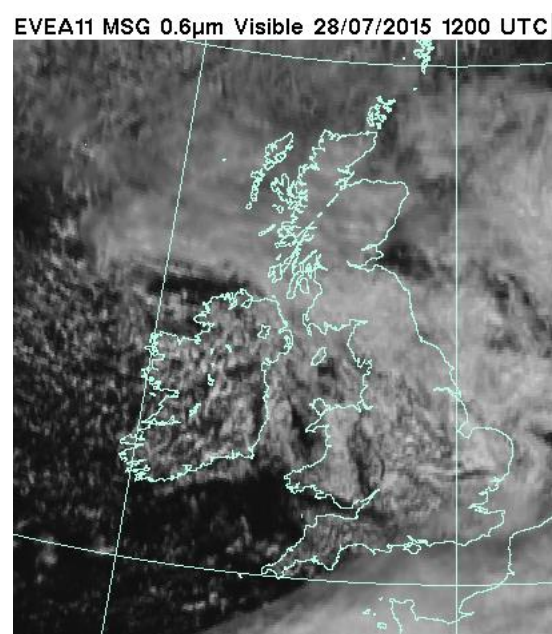
*Tuesday, 28<sup>th</sup> July*



Cetacean sightings on day 4 of NWDW 2015 (28<sup>th</sup> July)



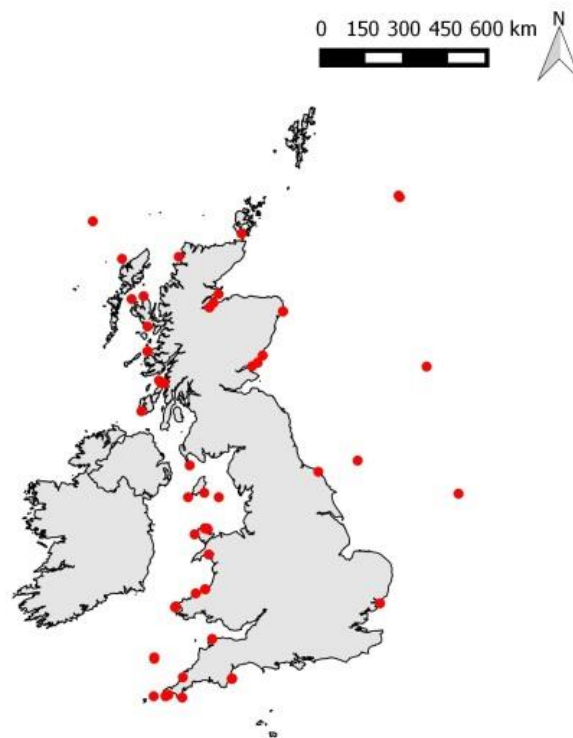
Pressure map on day 4 of NWDW 2015 (28<sup>th</sup> July)



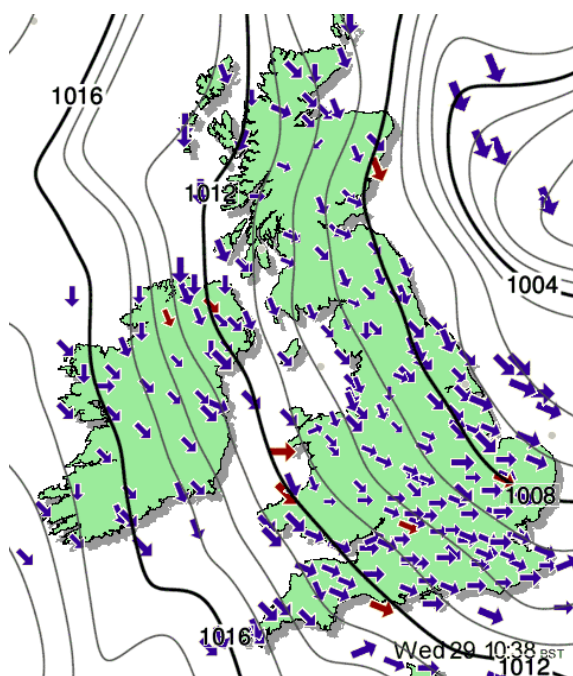
Satellite map on day 4 of NWDW 2015 (28<sup>th</sup> July)



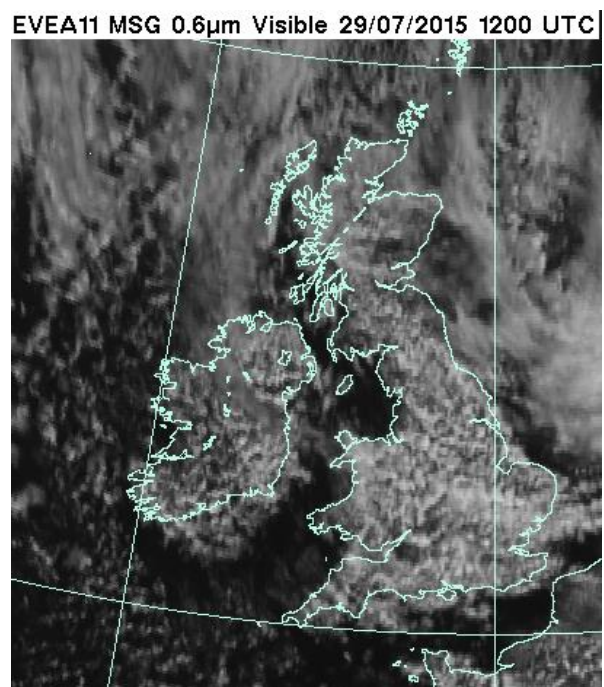
Wednesday, 29<sup>th</sup> July



Cetacean sightings on day 5 of NWDW 2015 (29<sup>th</sup> July)

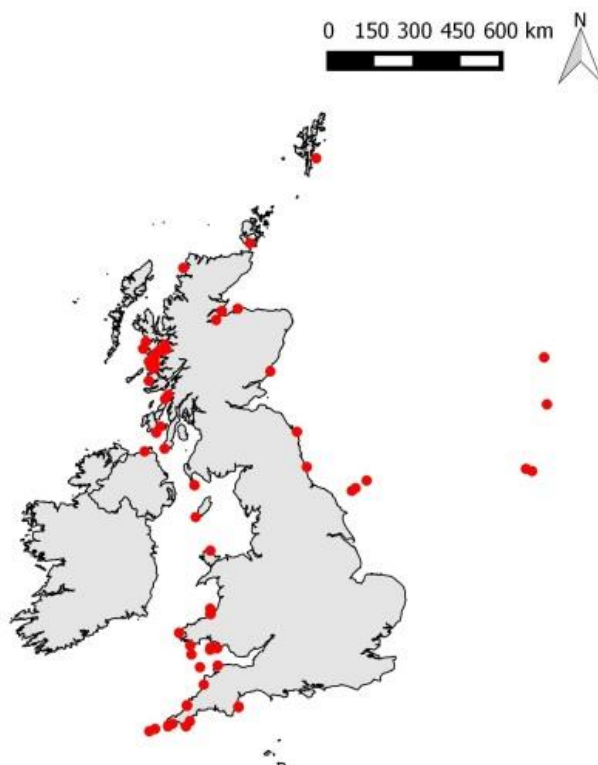


Pressure map on day 5 of NWDW 2015 (29<sup>th</sup> July)

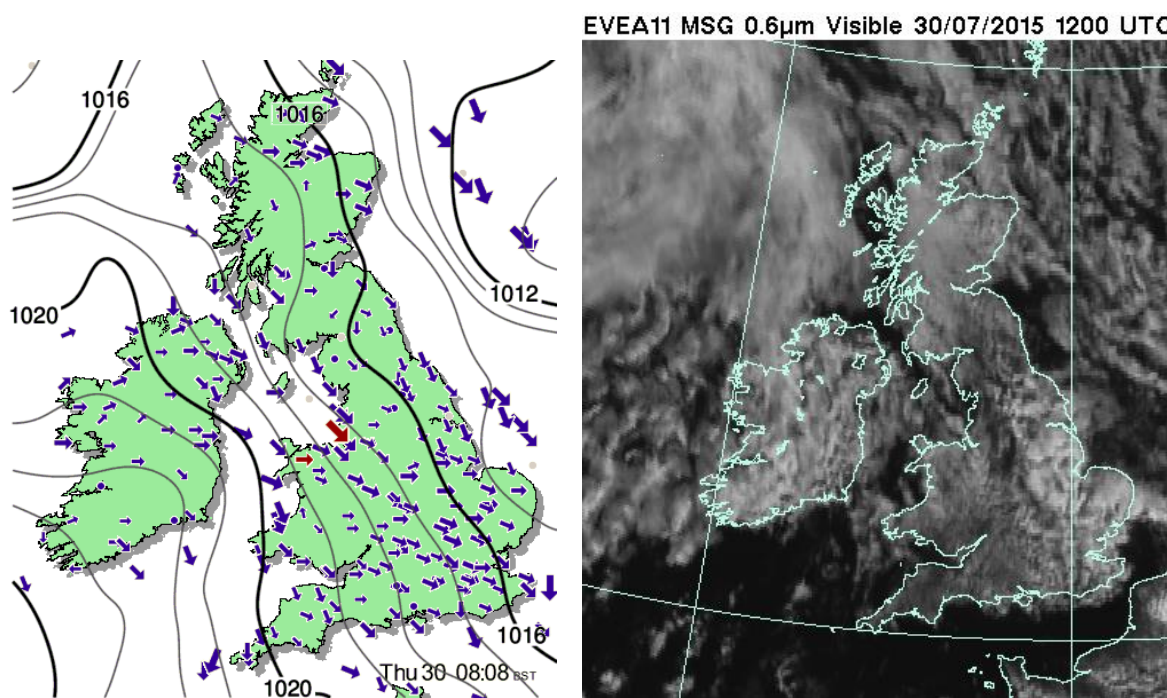


Satellite map on day 5 of NWDW 2015 (29<sup>th</sup> July)

Thursday, 30<sup>th</sup> July



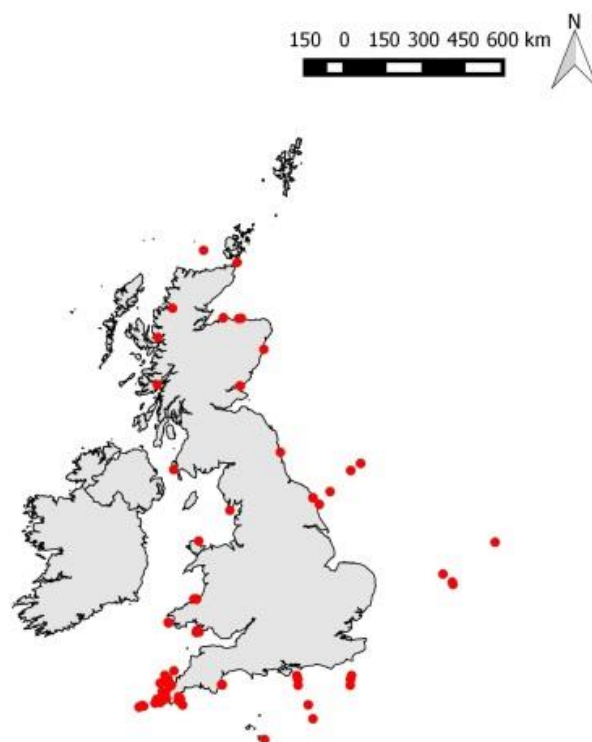
Cetacean sightings on day 6 of NWDW 2015 (30<sup>th</sup> July)



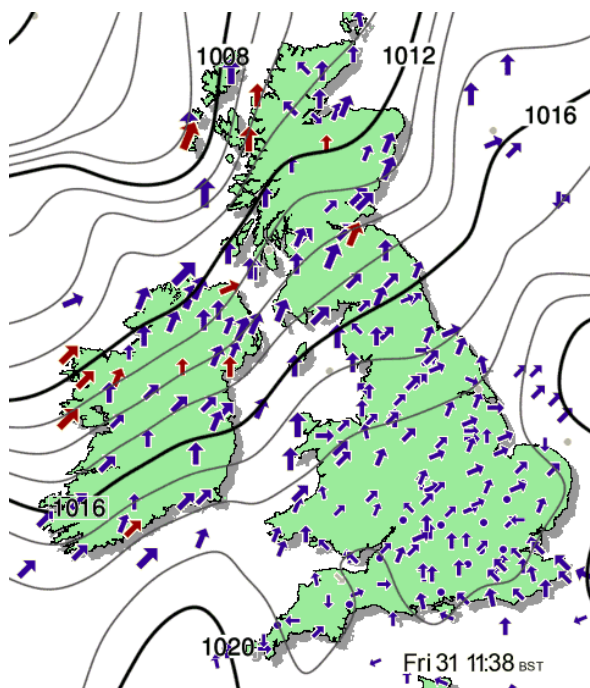
Pressure map on day 6 of NWDW 2015 (30<sup>th</sup> July)

Satellite map on day 6 of NWDW 2015 (30<sup>th</sup> July)

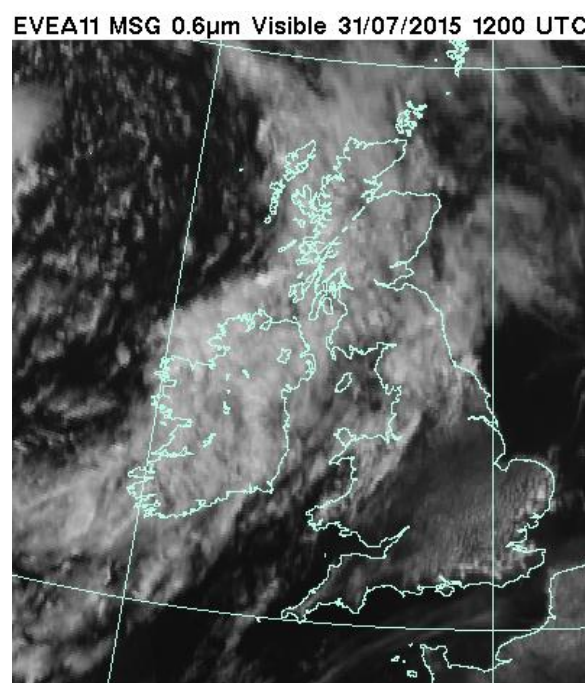
Friday, 31<sup>st</sup> August



Cetacean sightings on day 7 of NWDW 2015 (31<sup>st</sup> July)



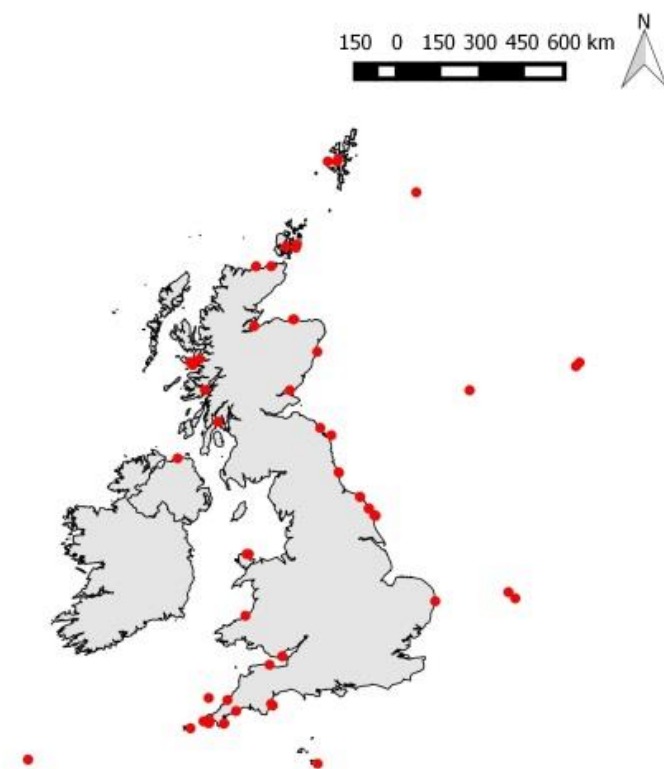
Pressure map on day 7 of NWDW 2015 (31<sup>st</sup> July)



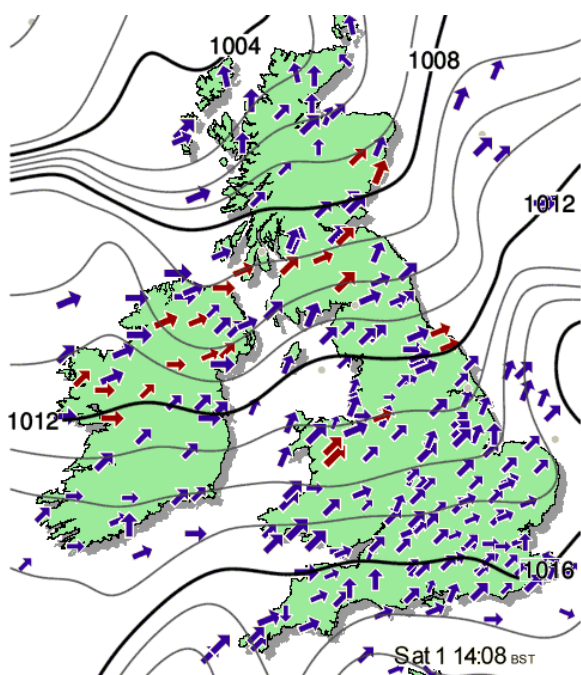
Satellite map on day 7 of NWDW 2015 (31<sup>st</sup> July)



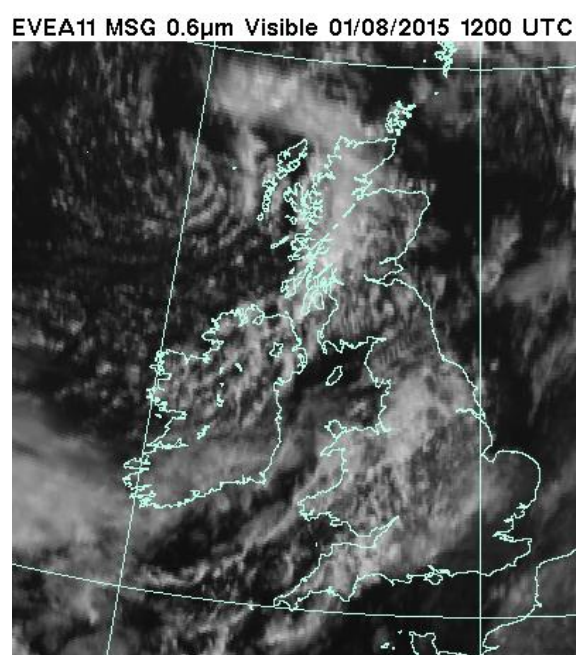
*Saturday, 1<sup>st</sup> August*



Cetacean sightings on day 8 of NWDW 2015 (1<sup>st</sup> August)



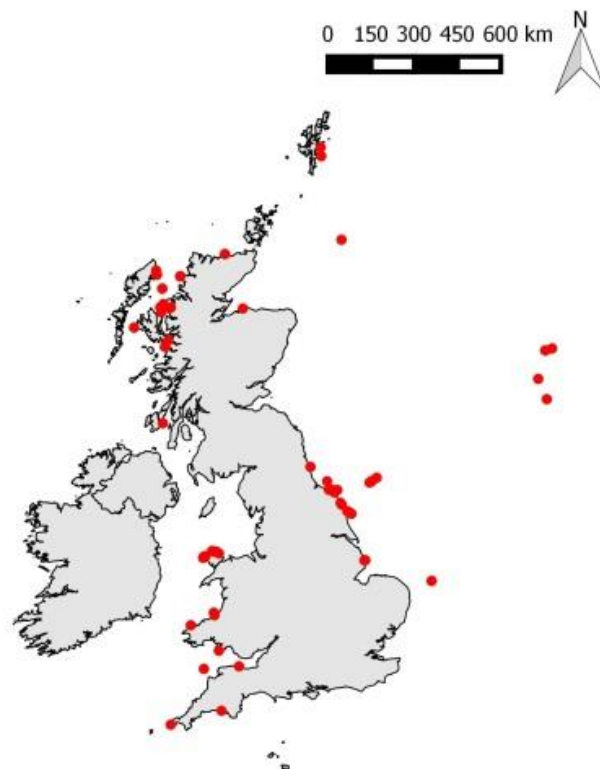
Pressure map on day 8 of NWDW 2015 (1<sup>st</sup> August)



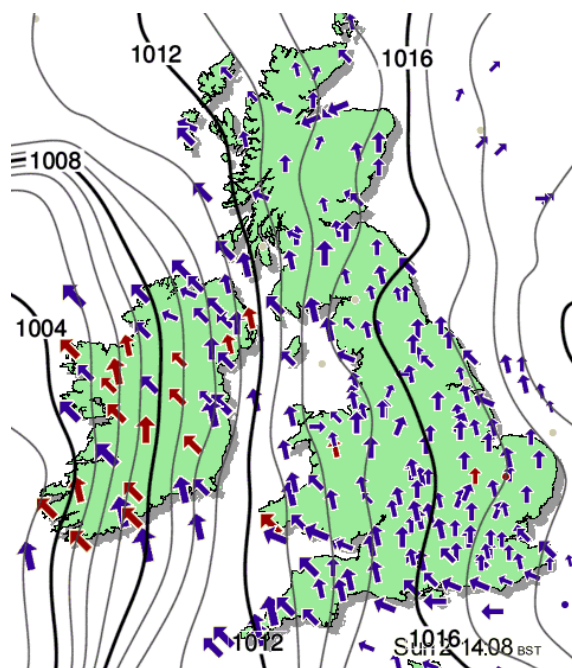
Satellite map on day 8 of NWDW 2015 (1<sup>st</sup> August)



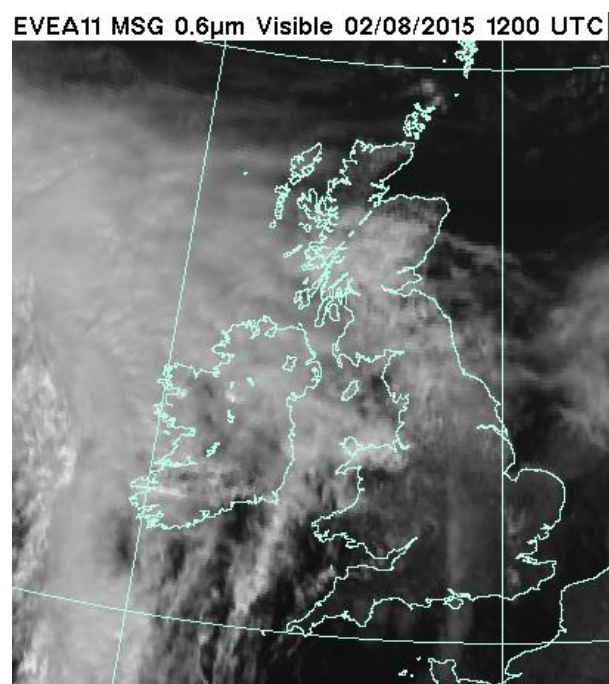
Sunday, 2<sup>nd</sup> August



Cetacean sightings on day 9 of NWDW 2015 (2<sup>nd</sup> August)



Pressure map on day 9 of NWDW 2015 (2<sup>nd</sup> August)



Satellite map on day 9 of NWDW 2015 (2<sup>nd</sup> August)