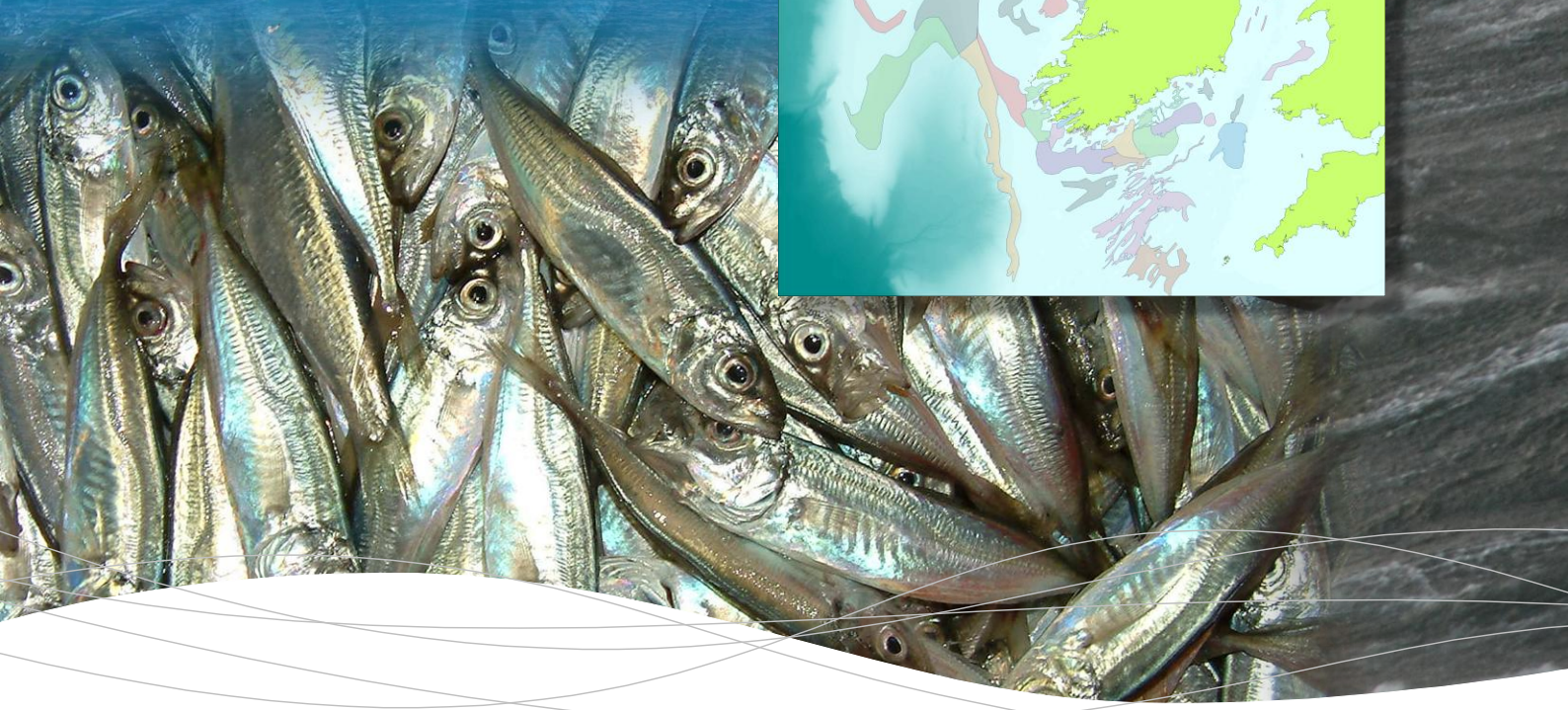
ATLAS OF COMMERCIAL FISHERIES AROUND IRELAND



Second edition

March 2014

Marine Institute
Foras na Mara
Fisheries Ecosystems Advisory Services

Atlas of Commercial Fisheries around Ireland

Second edition

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March 2014

About this atlas

The Atlantic Ocean (named after mythological Greek god Atlas) is the world's second-largest ocean and covers 20% of the earth's surface. The waters around Ireland constitute a small part of that vast ocean but they are very productive; they support a diverse range of international fishing activities and contain important marine habitats and ecosystems. This resource requires careful management to protect vulnerable components whilst ensuring sustainable exploitation. This "Atlas of Commercial Fisheries Around Ireland" uses informatics, the science of processing data into information, to give useful new insights into fishing activities and fisheries resources. Fishing effort is mapped by gear and country. Landings of the key commercial species are mapped individually and by gear. This information is put into context by maps of effort and landings at a broader European scale and by the historical time series of landings that are provided for each species.

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Disclaimer

Acknowledgements

We thank the Irish Naval Service, the Sea-Fisheries Protection Authority and the Department of Agriculture, Food & the Marine for supplying the VMS and Irish logbooks data. Work on this atlas was supported by the European Union ERDF - INTEREG Atlantic Area Programme which funded the GEPETO project (http://gepetoproject.eu).

Please cite this atlas as:

Gerritsen, H.D. and Lordan, C. 2014. Atlas of Commercial Fisheries Around Ireland, Marine Institute, Ireland. ISBN 978-1-902895-56-7. 59 pp.

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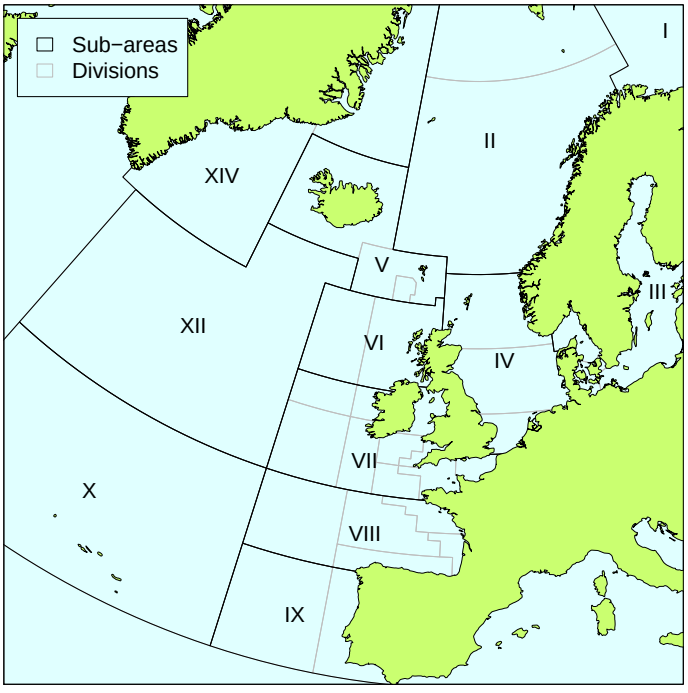
Introduction

On an average day, more than 1000 fishing vessels are active in the waters around Ireland, clocking up more than 8 million fishing hours per year. Most of the seabed near Ireland is trawled at least once per year and some regions are trawled more than 10 times per year [1]. Fishing is clearly one of the most significant ocean uses in the waters around Ireland.

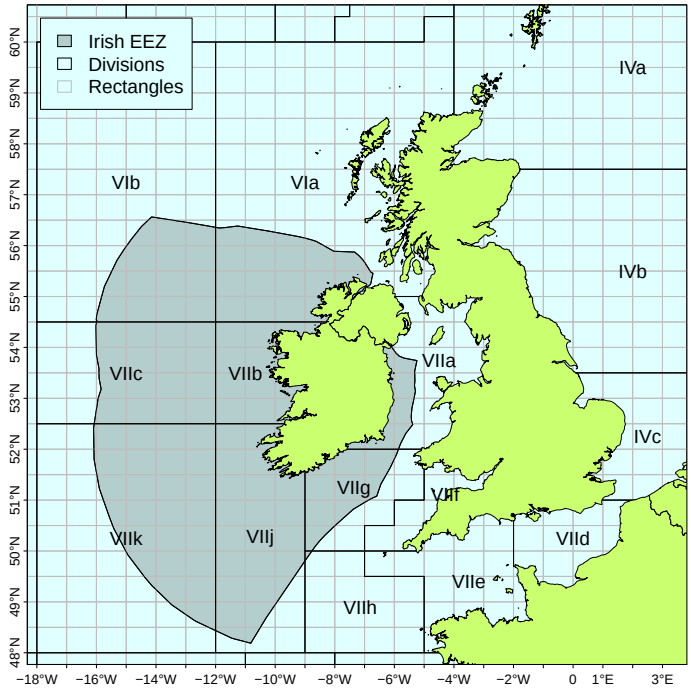
The fisheries in Irish waters are very diverse. The Irish otter trawl fleet alone can be divided into 33 distinct fisheries [2], each using a different fishing technique or targeting different species or groups of species. A large part of this heterogeneity in the fisheries can be explained by spatial patterns in the availability of the target species and in this atlas we aim to give useful insights by providing maps of fishing activities and landings of the most important fish and shellfish species. This atlas is the second of its kind, following the 2009 publication of the Atlas of the Commercial Fisheries Around Ireland [3]; the current version provides updated information as well as new types of maps.



▲ The Northeast Atlantic is divided into 14 Sub-areas (indicated by Roman numerals), which can consist of a number of Divisions.

Management units

The Northeast Atlantic is divided into a range of fishing areas and political zones. For the purpose of catch reporting and fisheries management, ICES divides the area in Sub-areas, Divisions, and statistical rectangles. Additionally, each coastal country claims an Exclusive Economic Zone (EEZ) in which it has special rights over the use of marine resources.



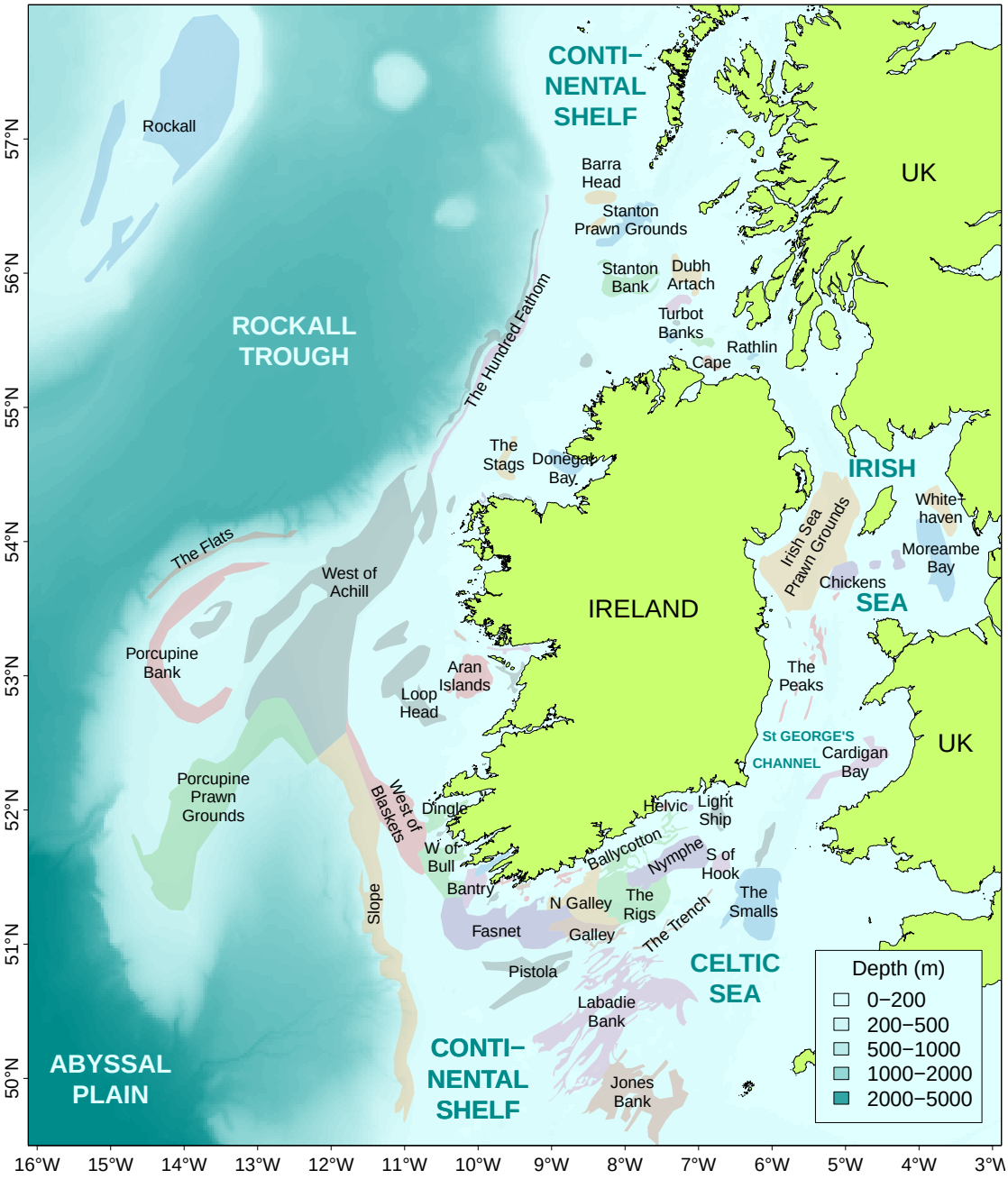
▲ The waters around Ireland consist of ICES Sub-areas VI and VII which contain Divisions VIa,b and VIIa-k. The Divisions are further partitioned into statistical rectangles of 0.5° latitude by 1.0° longitude. The Irish Exclusive Economic Zone (EEZ) is the sea area in which Ireland has special rights over the use of marine resources. It extends up to 200nm offshore.

Fishing grounds

The character of the seabed can vary considerably from one area to the next and fishers distinguish fishing grounds based on the bottom type and on the expected catch composition. Marine Institute fisheries observers record the names used for these grounds and although the names may vary between fishers and some grounds have no clear boundaries, patterns emerge when the observer records are overlaid over fishing effort data from Vessel Monitoring Systems (VMS) and catch composition data from the logbooks. The map below shows the main fishing grounds that were distinguished in this way.

Bathymetry

The seabed around Ireland gently slopes down towards a depth of around 200m (continental shelf) after which it slopes steeply to the abyssal depth of the ocean floor. A large number of species are caught in the waters of the continental shelf, including *Nephrops*, cod, haddock, whiting, megrim, plaice, black sole, herring and boarfish. Along the shelf edge, species like anglerfish and hake are targeted and mackerel and horse mackerel are caught as they migrate to the shelf edge to spawn. Tuna and blue whiting are mainly caught in waters beyond the continental slope.



▶ The main fishing grounds around Ireland. The names of the grounds are based on records from fisheries observers and the outlines of the are derived from VMS data. The colour of the background gives an impression of the water depth with darker colours indicating deeper water.

Data

Data from a number of different sources have been integrated to provide new perspectives on the resource and fishing activities. The data are provided in a visual and non-technical way. Any technical terms and acronyms are defined in the Glossary (page 53.). Some of the data used in this atlas are freely available, others are confidential. All data have been aggregated to a level that does not compromise the confidentiality of individual vessels.

Data sources

The following data sources were used to create the maps and graphs in this atlas:

Official international landings. A time-series of official landings from 1903 to 2011 is available from ICES (http://www.ices.dk/marine-data). Currently the 2012 data are incomplete. The official landings are submitted by the national authorities responsible for fisheries data and are generally reported by ICES Division.

The data have not been corrected for non-reported landings and therefore the data may differ from those presented in ICES fish stock assessment working group reports.

International effort and landings by rectangle. International effort and landings data at a finer spatial scale are available from STECF. (Downloaded on 26 September 2013 from http://stecf.jrc.ec.europa.eu/web/stecf/ewg1306). Data for all relevant EU member states are available for 2012 at the spatial scale of ICES statistical rectangles (0.5° latitude by 1.0° longitude).

The STECF data set includes most, but not all species and fishing gears that are relevant to Ireland. Additionally effort data for Irish vessels <10m are not available and landings data for these vessels are not available at the rectangle level.

The STECF data relate to a number of management plans; the Western Waters, Bay of Biscay and Annex IIa management plans are relevant to the north-east Atlantic area. However there is some spatial overlap between the Western Waters and Annex IIa management plans, therefore data referring to Western Waters were selected only for ICES Divisions VIIb-k and data referring to Annex IIa were selected for Sub-areas IV and VI and Division VIIa to avoid duplicates. Additionally any data referring the BSA regulation area were removed as these data were duplicated in the other regulation areas.

Vessel Monitoring Systems. VMS record and transmit the position and speed of fishing vessels at intervals of two hours or less [4]. VMS data for the most recent five years (2008-2012) were used to create high-resolution maps. VMS data were supplied to the Marine Institute by the Irish Naval Service. VMS data are available for all EU vessels ≥15m inside the Irish EEZ; outside this zone only Irish VMS data are routinely available.

For some gear types, vessels <15m (which are not covered by VMS) account for a significant amount of the total effort. Where this is the case, an indication of the distribution of the effort of these smaller vessels will be given in the text.

VMS do not record whether a vessel is fishing, steaming or inactive. Vessels were assumed to be fishing if their speed fell within a certain range. The following gear-specific criteria were applied (minimum and maxiumum speed in kn):

Gear	Min Speed	Max Speed
Otter trawl	1.5	4.5
Beam trawl	1.5	6.0
Seine	0.5	4.0
Gill net	0.5	5.0
Longline	0.5	5.0
Dredge	1.5	4.0
Pots	0.5	5.0
Pelagic trawl	1.5	6.0

This approach works well for active gears where vessels spend much of their time engaged in fishing operations (e.g. Demersal otter trawls [5]). However vessels using pelagic trawls tend to spend most of their time search-

ing and a relatively short time fishing and it is likely that some fishing operations are missed during the 2-hour time interval between VMS transmissions. For vessels using passive gears (nets, lines, pots), fishing operations may be identified using speed criteria, but this gives no information on the soaking time, the length of gill nets, the number of hooks or the number of pots. Therefore, any maps based on pelagic trawl data or passive gear data are indicative of the general distribution pattern only and cannot be evaluated in a quantitative way.

Logbooks. VMS data of Irish vessels were linked to logbook data to obtain the fishing gear used and the landings for each day the vessel was fishing [5]. Logbook data are collected by the Sea-Fisheries Protection Authority and supplied to the Marine Institute by the Department of Agriculture, Food & the Marine .

Landings data are generally not available for non-Irish vessels, unless the vessels landed in Ireland.

EU fleet register. For non-Irish vessels, gear information was obtained from the EU fleet register (downloaded on 8 March 2013 from http://ec.europa.eu/fisheries/fleet/index.cfm).

For vessels for which the gear was not known from the logbooks, the main gear type listed in the EU fleet register was used. Note that if vessels use more than one gear, it is possible that the main gear type was not the one that was actually used.

Data analysis

VMS data were analysed using the approach described by Gerritsen and Lordan [5]. This approach assigns effort and landings values to each of the VMS data points. The effort of a VMS data point is defined as the time interval since the previous data point, if this interval is larger than 4 hours, a value of 4 hours is used. Next the data are filtered for fishing activity using speed criteria (see table on page 3). Landings of each vessel were assigned to VMS data points on a daily basis. So, for example, there might be 12 VMS positions available for a vessel on a certain date, with 10 of those positions corresponding to fishing activity. If the vessel recorded a retained catch of 120kg of haddock for that day in its logbook, then 12kg of haddock will be assigned to each of the 10 fishing positions. This procedure is performed for all combinations of vessel, date and species. The last step is aggregating the landings or effort data to a grid; a commonly used grid cell size in this atlas is 0.03° longitude x 0.02° latitude. The data were standardised by dividing by the surface area of the grid cell. This way the data can be expressed as fishing hours per km^2 or as landings per km^2

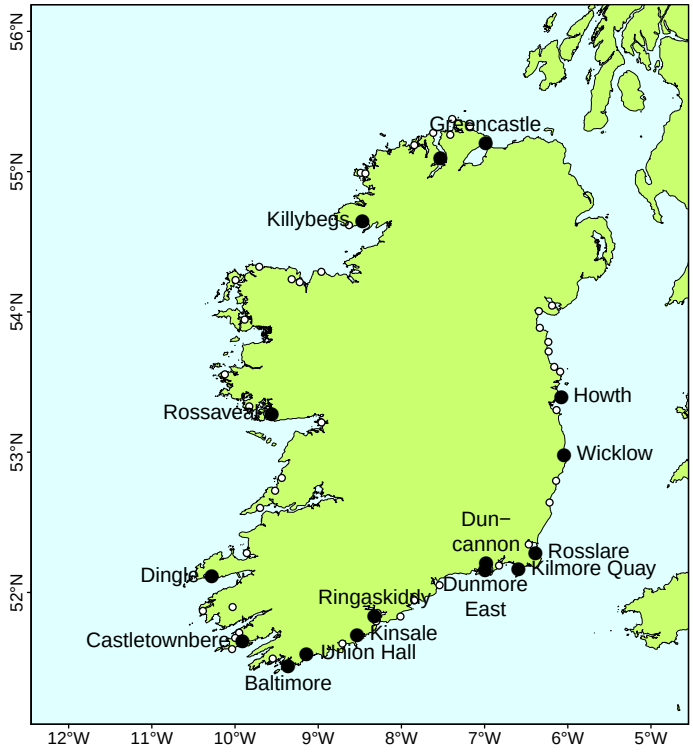
The analysis and mapping of the data was performed in the R environment (R 3.0.1, [6]); specifically the package mapplots (http://cran.r-project.org/web/packages/mapplots).

Irish fishing ports

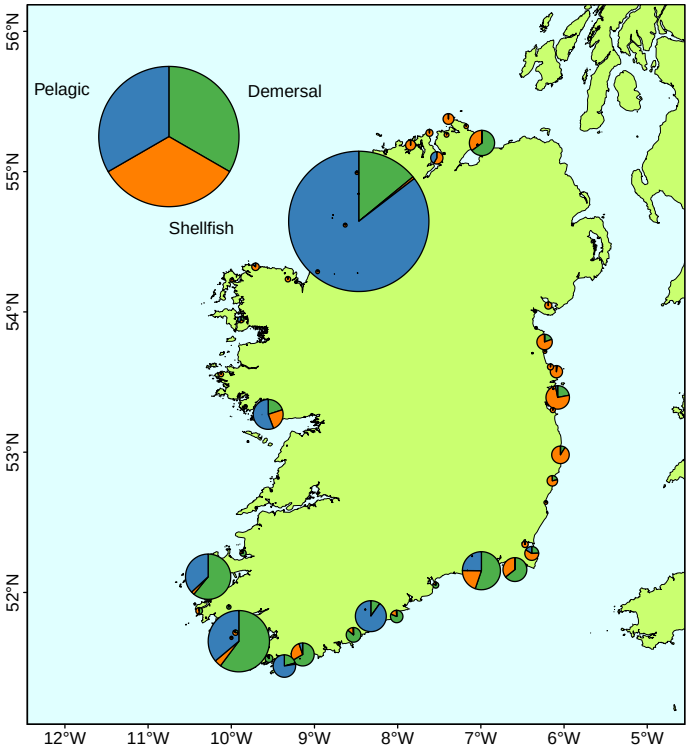
Fish are landed into numerous ports around the Irish coast and although each vessel is registered in a single port, they do not necessarily land their fish there. The main landings port for each vessel was determined by selecting the port where most landings events took place during 2008–12. Only vessels >10m with at least 50 landings events during the period 2008–12 were included.

Landings and vessels

Killybegs is by far the largest port in terms of the weight of fish landed (>100kt per year during 2008–12; including landings from foreign vessels). Pelagic species dominate in Killybegs but it is also the largest port for landings of demersal species. Killybegs is the main port for around 41 vessels. Castletownbere is the second-largest port in terms of landings (around 19kt per year; main port for around 53 vessels), followed by Dingle (10kt per year, 14 vessels). Demersal species dominate in these ports but pelagic species also account for around one third of the landings. Rossaveal is the main port in the west of Ireland (4kt per year, 31 vessels) and receives a mix of pelagic, demersal and shellfish species (The shellfish are nearly exclusively *Nephrops*). There are a large number of medium-sized ports along the south and east coast of Ireland, the largest of which is Dunmore East. The ports along the south coast receive a mix of pelagic, demersal and shellfish species while those on the east coast mainly deal with *Nephrops* landings.



▲ The main Irish fishing ports (black dots). Minor ports are shown as white dots.



▲ Landings by port and species group; the size of the pie plots corresponds to the landings volume.

The fishery in the Irish EEZ

The Irish Exclusive Economic Zone (EEZ) extends up to 200nm off the Irish coast. Ireland has access to VMS data from all EU fishing vessels operating inside the Irish EEZ. Outside this zone, only data from Irish vessels are routinely available. VMS data were used to create detailed maps of the distribution of fishing activity by gear type and vessel nationality and to estimate the proportions of effort by gear and nationality. STECF data were used to estimate the international landings inside the EEZ.

Fishing gear

From the VMS data (see the Data chapter, page 3), it can be estimated that demersal otter trawlers account for the vast majority of fishing effort of vessels ≥15m inside the Irish EEZ (around 62% of the fishing hours in 2008-12). Longliners account for around 15% and Gill and trammel netters for 7%. (Note that the time spent engaged in fishing operations is not necessarily a good measure of effort for passive gears.) Pelagic trawlers only account for 5% of the total effort inside the EEZ but they are responsible for more landings than any other gear type, both in terms of volume and value. Beam trawlers and seiners account for around 5% and 2% respectively and pots and dredges both account for around 1%. Note that there are a considerable number of vessels <15m involved in potting and dredging. Other fishing gears or unknown gears account for the remaining 2%.

The figure on page 9 shows the spatial distribution of fishing gears inside the Irish EEZ.

Vessel nationality

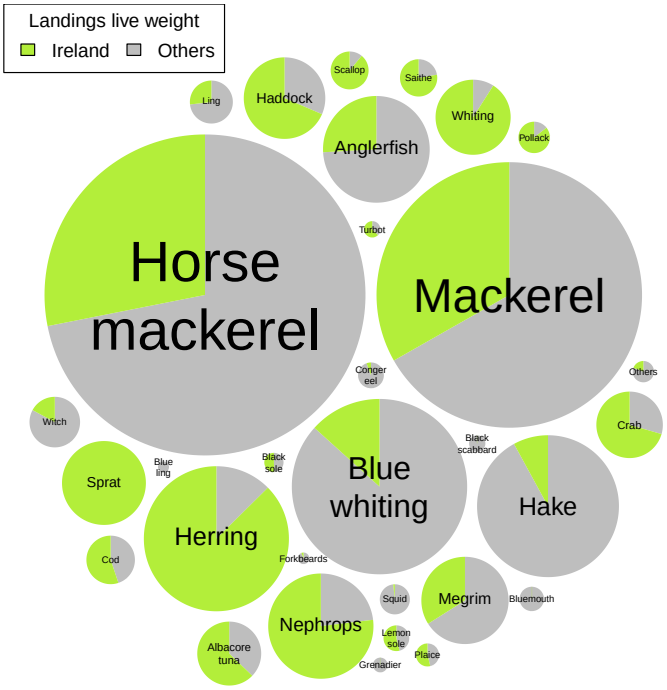
The VMS data also reveal that the vast majority of fishing effort by Irish vessels ≥15m takes places within the Irish EEZ (77%). However, most of the fishing effort inside the Irish EEZ is carried out by foreign vessels; Ireland is responsible for only 36% of the international effort of vessels ≥15m inside the EEZ (but note that the proportion of Irish effort would be considerably higher if smaller vessels were included). The Irish effort consists of mainly of demersal otter trawlers. Spain accounts for 30% of the effort (mainly demersal otter trawlers and longliners). France and the UK account for 20% and 11% of the effort (dominated by demersal otter trawlers for both countries). Belgium accounts for 1% of the effort, (nearly all beam trawlers). The remaining 3% effort of is carried out mainly by the Netherlands, Germany and Denmark and is dominated by pelagic trawlers.

The figure on page 10 shows the spatial distribution of fishing effort by nation inside the Irish EEZ.

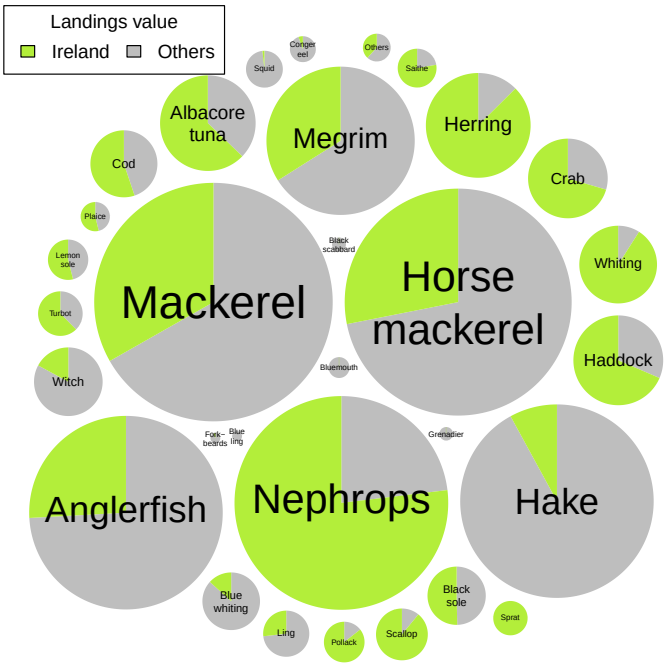
Landings in the Irish EEZ

The STECF dataset (see the Data chapter, page 3) provides an opportunity to examine the landings taken inside the Irish EEZ during 2012. Statistical rectangles were taken to be inside the Irish EEZ if their midpoint falls within the EEZ. Information on fish prices was extracted from the Irish logbooks database; for each species the average price at first sale was estimated. These (Irish) value data were applied to the international landings to estimate the total value of the resource captured inside the Irish EEZ. Note that some important inshore shellfish species like lobster, scallop, whelk etc. are not included in the STECF dataset and that the data on rays and skates are incomplete.

The table and figures on the next page show that the international landings inside the Irish EEZ are dominated by pelagic species like horse mackerel, mackerel, boarfish, blue whiting and herring in terms of bulk. In terms of value, mackerel and horse mackerel are important but *Nephrops*, anglerfish and hake stocks are almost equally valuable. Despite the large bulk of boarfish and blue whiting landings, their value is relatively low. Ireland takes around 30% of mackerel and horse mackerel and nearly all of the boarfish and herring inside the Irish EEZ. Ireland also takes more than 75% of *Nephrops* but only around 25% of anglerfish and less than 10% of hake.



▲ Proportion of the landings inside the EEZ that are taken by Irish vessels, the size of the pie charts corresponds to the live weight of the landings.

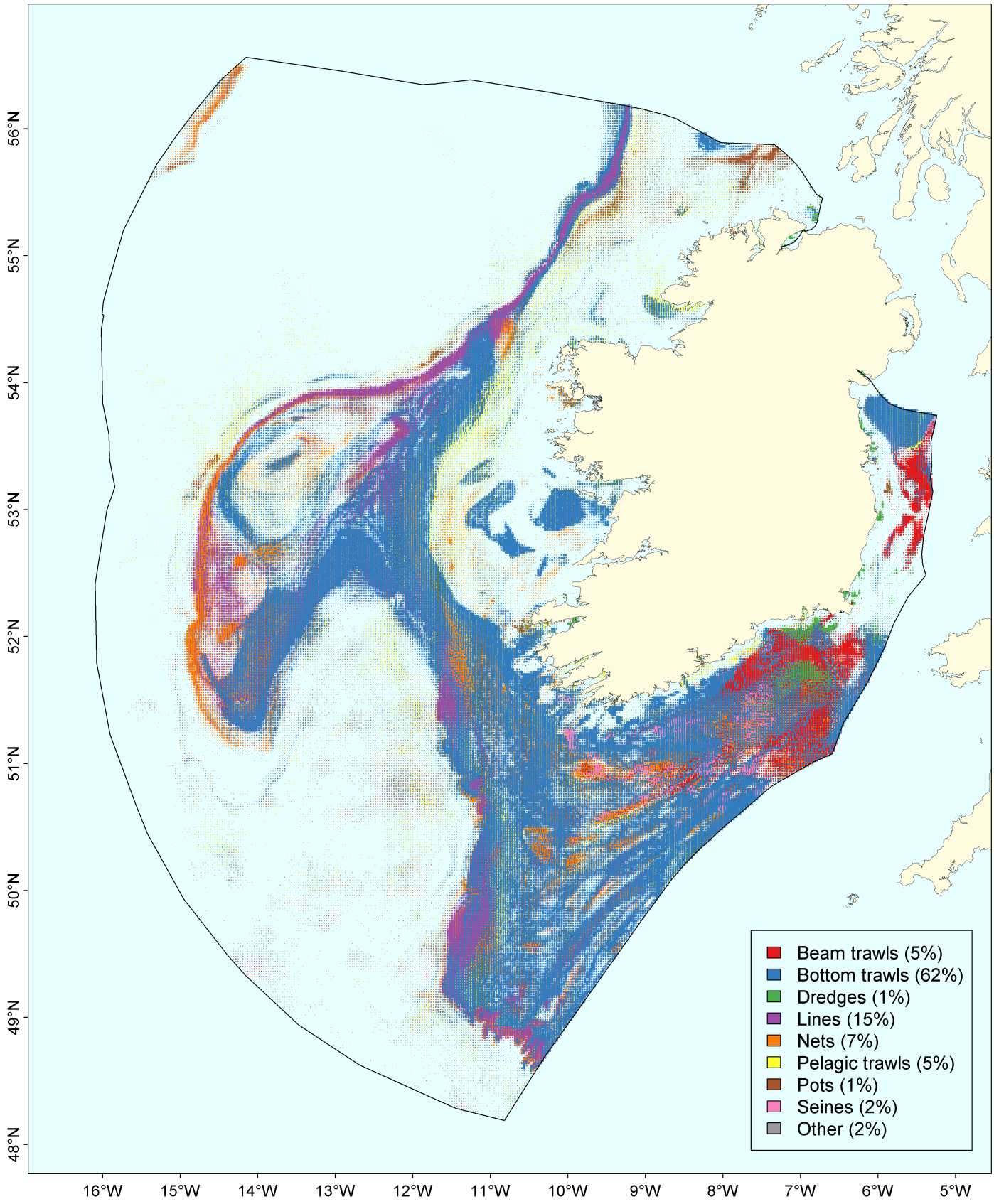


▲ Proportion of the landings inside the EEZ that are taken by Irish vessels, the size of the pie charts corresponds to the estimated monetary value of the landings.

▼ The estimated international landings inside the Irish EEZ in 2012, the approximate value of the international landings and the percentage of the landings that were taken by Irish Vessels.

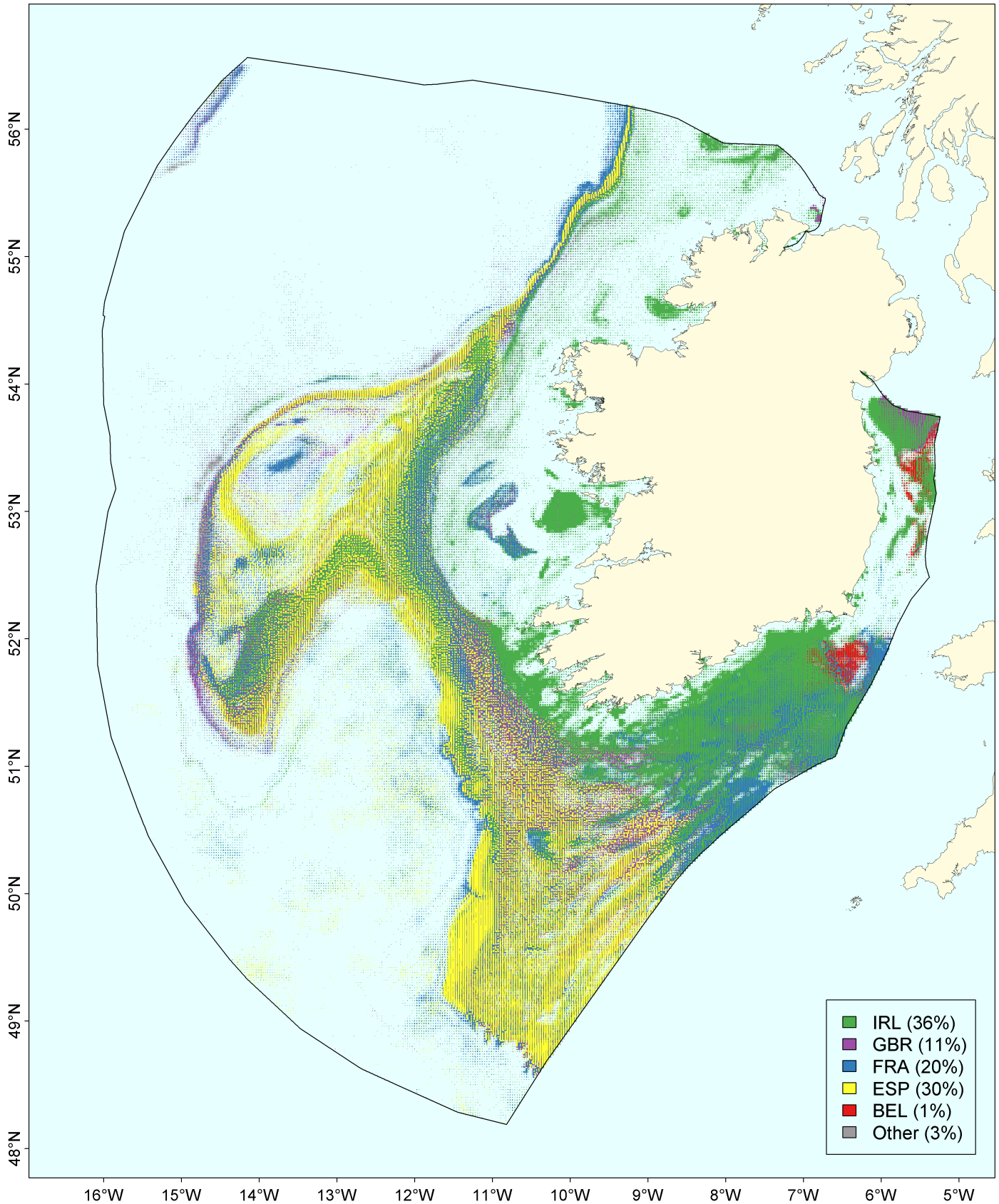
Species	Landings (tonnes)	Value (million €)	Irish share (percentage)
Albacore tuna	4 471	10.6	63%
Anglerfish	12 452	43.7	26%
Black scabbard	289	0.2	0%
Black sole	403	4.0	50%
Blue ling	133	0.1	0%
Blue whiting	33 633	3.9	13%
Bluemouth	648	0.5	0%
Boarfish	45 081	6.7	98%
Cod	2 573	5.2	55%
Conger eel	727	0.8	5%
Crab	4 836	7.4	71%
Forkbeards	144	0.1	6%
Grenadier	237	0.2	0%
Haddock	7 271	9.4	69%
Hake	22 019	43.6	8%
Herring	23 017	12.8	87%
Horse mackerel	112 691	60.0	28%
Lemon sole	722	1.9	54%
Ling	2 020	2.5	27%
Mackerel	77 126	66.3	33%
Megrim	8 326	25.6	34%
Nephrops	12 116	53.2	77%
Plaice	577	1.0	54%
Pollack	1 078	1.9	86%
Saithe	1 518	1.8	78%
Scallop	1 568	3.1	89%
Sprat	7 694	1.4	100%
Squid	990	1.6	2%
Turbot	290	2.3	62%
Whiting	6 170	7.0	91%
Witch	2 795	5.5	17%
Other species	497	0.9	19%

Fishing gear



▲ The fishing gears used by vessels ≥15m fishing in the Irish EEZ (all nationalities combined). The percentages in the legend refer to the share of the total effort inside the EEZ for each gear.

Vessel nationality



▲ The nationality of vessels ≥15m fishing in the Irish EEZ (all gears combined). IRL = Ireland; GBR = United Kingdom; FRA = France; ESP = Spain; BEL = Belgium. The percentages in the legend refer to the share of the total effort inside the EEZ for each country.

Fishing effort and species composition

This chapter provides an overview of the fishing effort in the waters around Ireland. The spatial distribution of fishing effort results from complex interactions between species distributions, regulations, market forces, vessel characteristics and skippers' preferences. This chapter is intended to illustrate where the fishing effort of different gear types is carried out how the species composition of the landings varies across the fishing grounds.

Interpretation

Fishing effort is the time spent engaged in fishing operations or time spent at sea. It is usually expressed in fishing hours or days but because more powerful vessels can catch more fish, the fishing time is sometimes multiplied by the engine power of the vessel and expressed in kilowatt hours or kilowatt days. Fishing effort can also be expressed in terms of the amount of fishing gear that is deployed, e.g. length of gillnets, number of hooks on longlines or the number of pots and the soak time (the length of time the gear is left in the water).

For the purpose of this atlas effort is always expressed in hours engaged in fishing operations. Therefore, any maps based on passive gear data are indicative of the general distribution pattern only and cannot be evaluated in a quantitative way. Similarly, effort maps of pelagic trawlers should be interpreted with care, as vessels targeting pelagic species tend to spend most of their time searching and a relatively short time fishing. Additionally, it should be noted that the engine power of a pelagic trawlers is on average around three times as large as that of a demersal trawler, so a small number of pelagic trawlers have much greater capacity for catching large amounts of fish than a large number of (smaller) demersal trawlers.

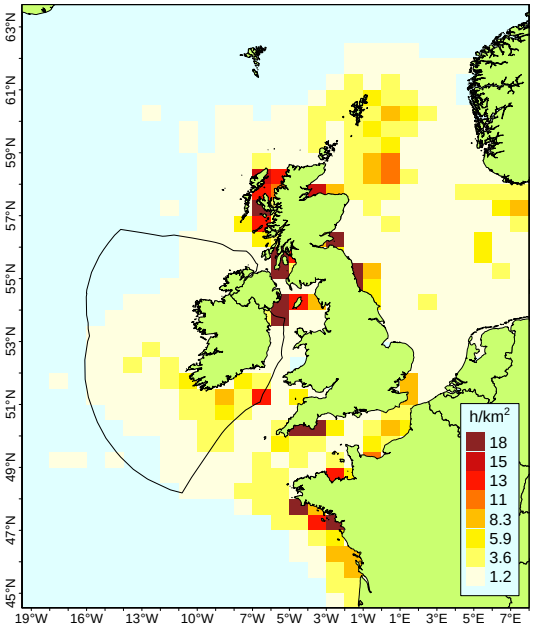
Fishing gears have been classified into eight main groups: demersal otter trawls; beam trawls; demersal seines; gill and trammelnets; longlines; dredges; pots and pelagic trawls. For each fishing gear, five maps are presented:

- Two small maps show the distribution of the international effort in the north-east Atlantic and the contribution of each nation to this effort in 2012. These maps are intended to provide a wider spatial context to the fishing effort data and are based on data from STECF (see the Data chapter, page 3 for details).

- Two larger maps show the fine-scale distribution of Irish effort and the trend in this effort over the period 2008-12. In the trend map, grid cells are coloured red if the effort has increased over time and blue if the effort has decreased. The rate of change in effort was determined for each grid cell by fitting a trend line through the effort data for the last 5 years. These maps are based on Irish VMS and logbook data (see the Data chapter, page 3 for details).

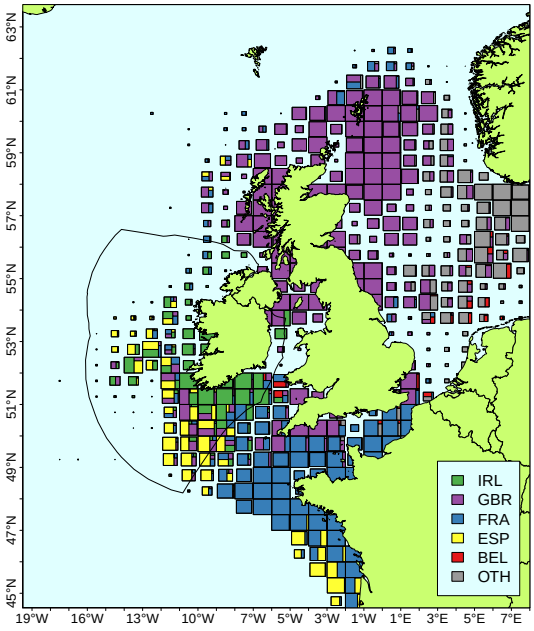
- The last, and largest, map is based on VMS and logbooks data of Irish vessels and foreign vessels landing into Ireland. It shows the spatial distribution of the species composition of the landings. The proportion of colour in each of the grid cells corresponds to the proportion of the species caught (and retained) in that grid cell.

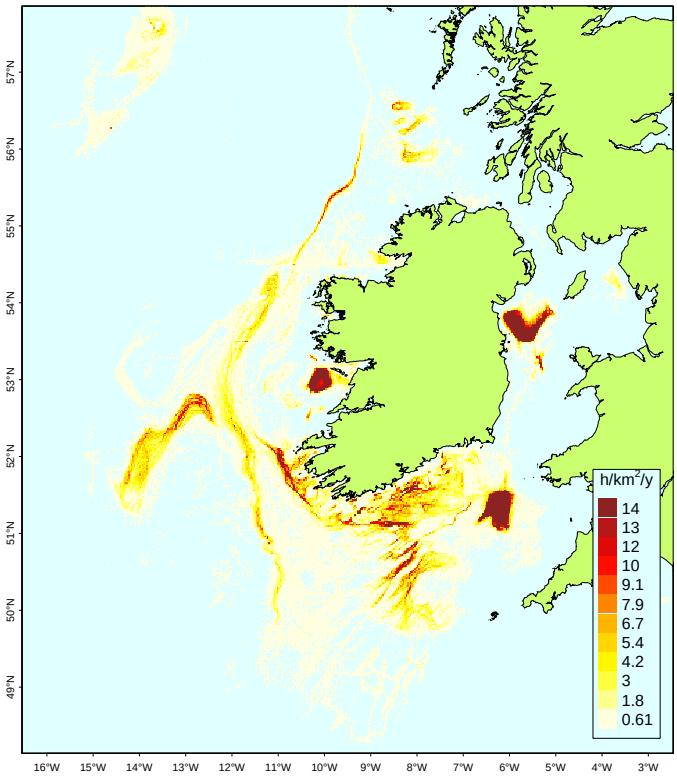
Demersal otter trawl effort



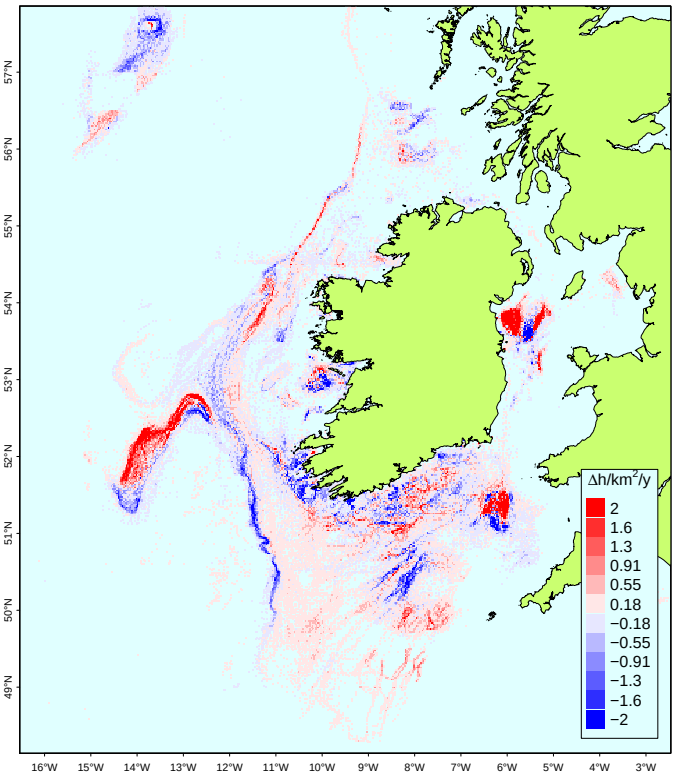
◀ The distribution of international demersal otter trawl effort in the north-east Atlantic during 2012. Much of the effort is concentrated around the UK and French coasts.

▶ The demersal otter trawl effort by country in 2012. Ireland accounted for approximately 50% of the effort inside the Irish EEZ; the UK accounted for 26%.

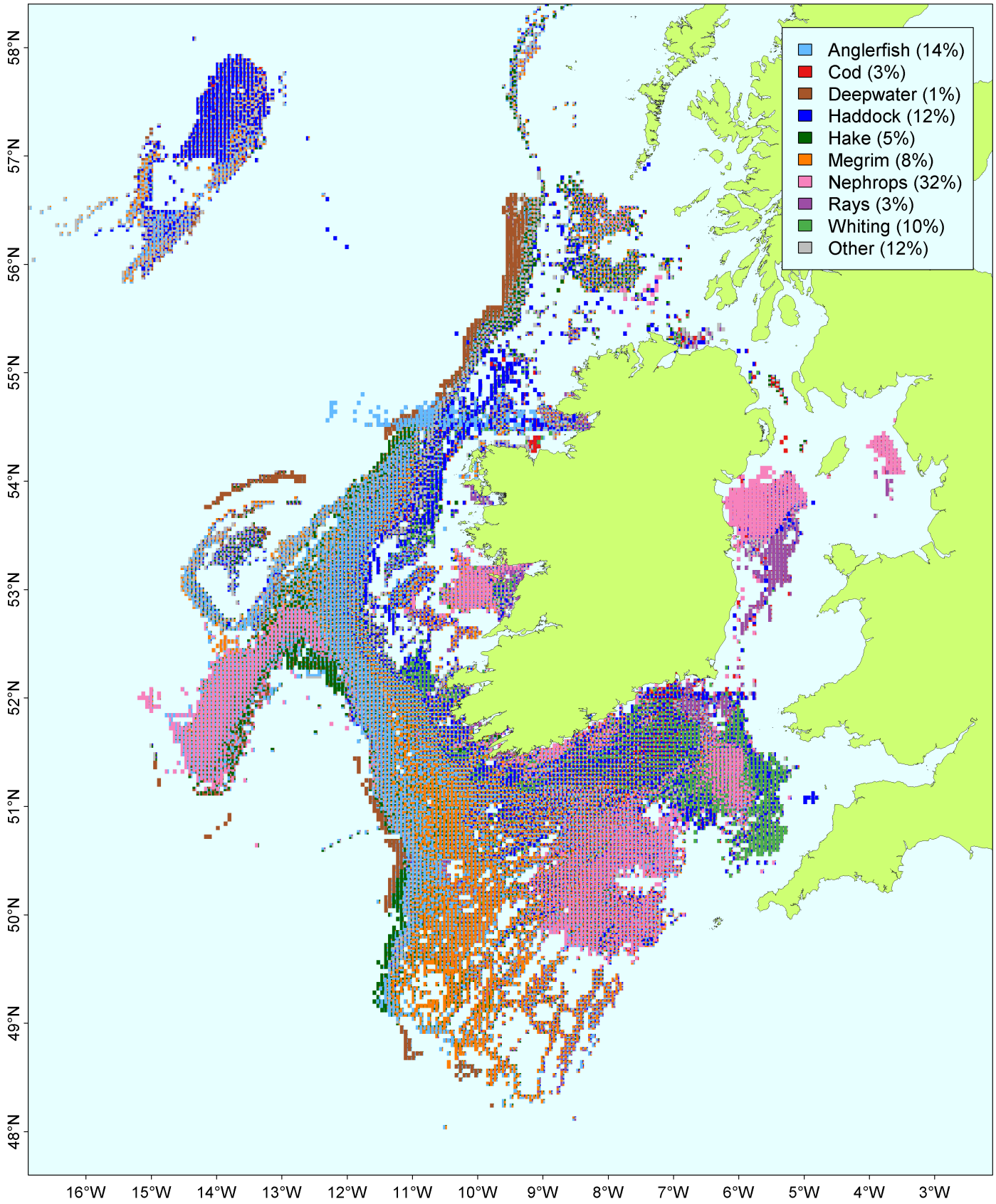




▲ The distribution of demersal otter trawl effort by Irish vessels ≥15m during 2008-12. Smaller vessels (between 10 and 15m) account for 16% of the total effort; this effort is mainly distributed inshore off the south coast of Ireland and on the Irish Sea *Nephrops* grounds.

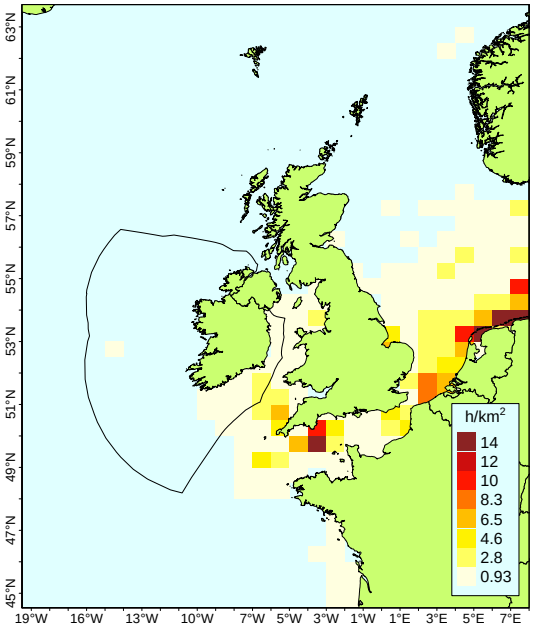


▲ The trend in demersal otter trawl effort by Irish vessels ≥15m during 2008-12 (change in effort per km^2 per year). Effort increased on most of the *Nephrops* grounds. Effort decreased along most of the continental slope and around Rockall.



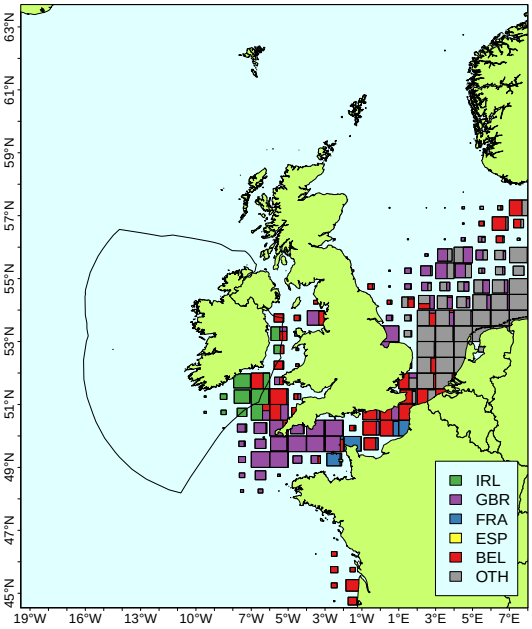
▲ The species composition of the demersal otter trawl vessels ≥15m landing into Ireland. The *Nephrops* grounds can be clearly distinguished, anglerfish dominate along the shelf edge, megrim dominate in the south-western Celtic Sea and whiting dominate in areas of the eastern Celtic Sea. The percentages in the legend refer to the share of the total landings for each species.

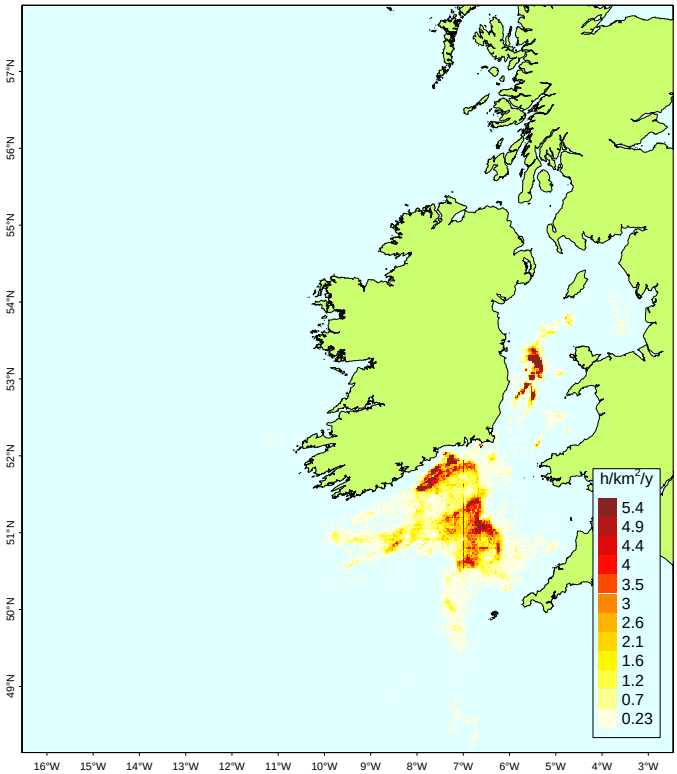
Beam trawl effort



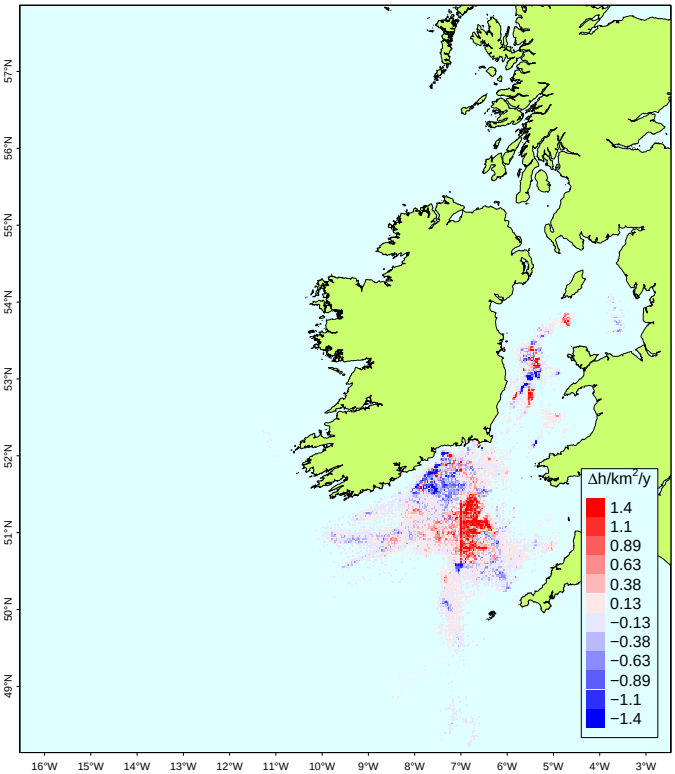
◀ The distribution of international beam trawl effort in the north-east Atlantic during 2012. Most of the effort takes place in the North Sea and English Channel

▶ The beam trawl effort by country in 2012. Ireland accounted for approximately 73% of the effort inside the Irish EEZ.

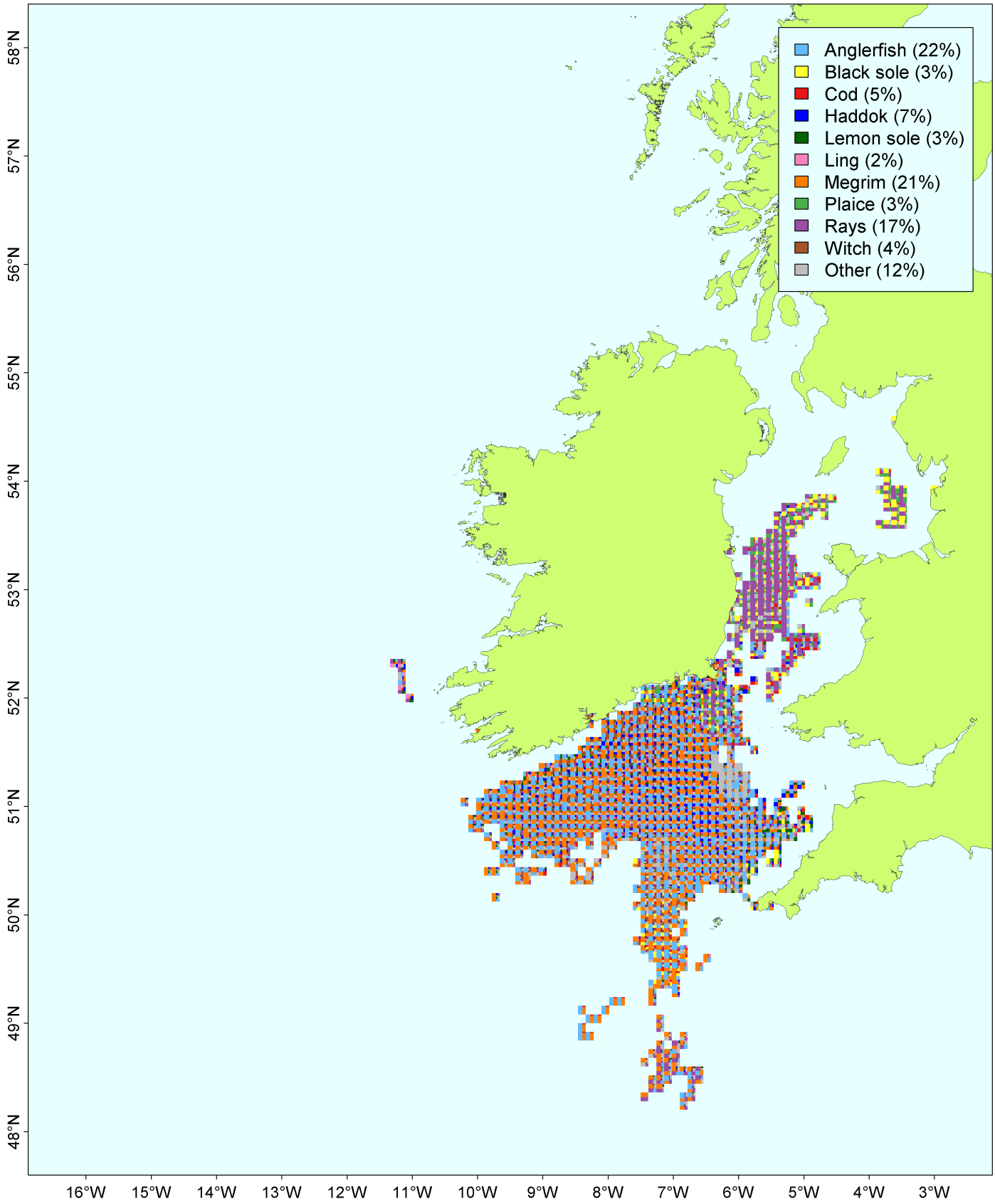




▲ The distribution of beam trawl effort by Irish vessels ≥15m during 2008-12. Smaller vessels account for a negligible proportion of the total effort.

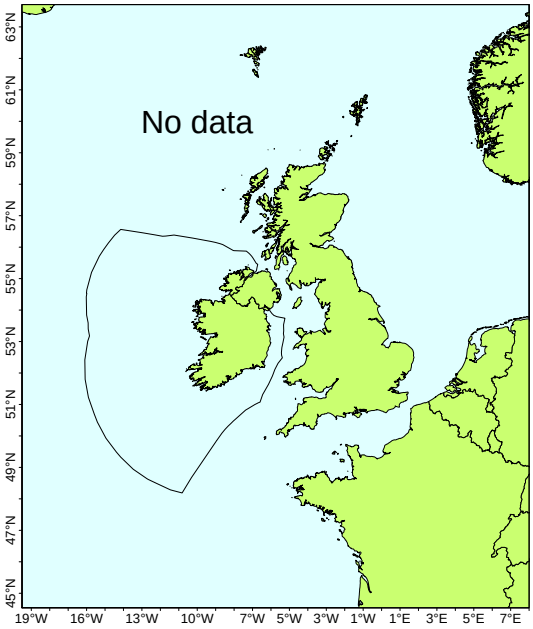


▲ The trend in beam trawl effort by Irish vessels ≥15m during 2008-12 (change in effort per km^2 per year). Effort increased in the main offshore areas of the Celtic Sea while it generally decreased in the inshore areas.



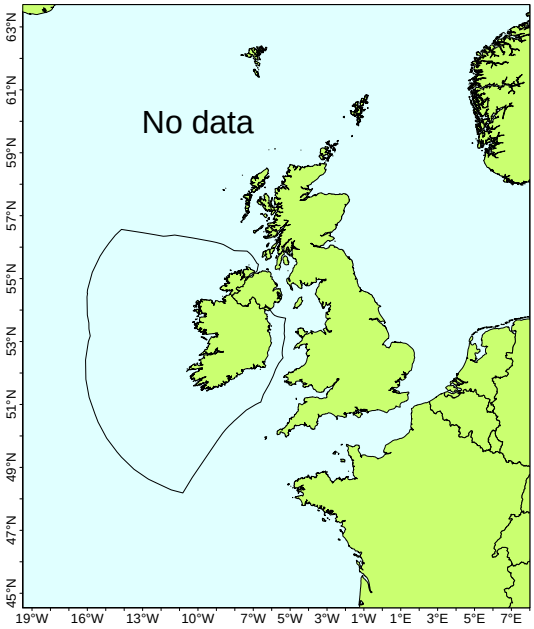
▲ The species composition of the beam trawl vessels ≥15m landing into Ireland. The species composition is highly mixed in all areas but black sole dominate in the Irish Sea, rays dominate in the St. George's Channel and megrim and anglerfish dominate in the Celtic Sea. The percentages in the legend refer to the share of the total landings for each species.

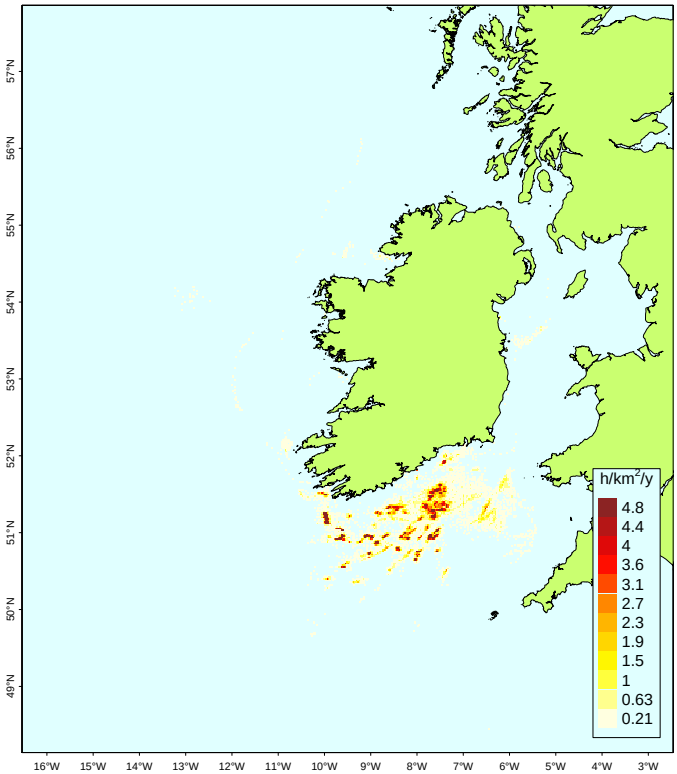
Demersal seine effort



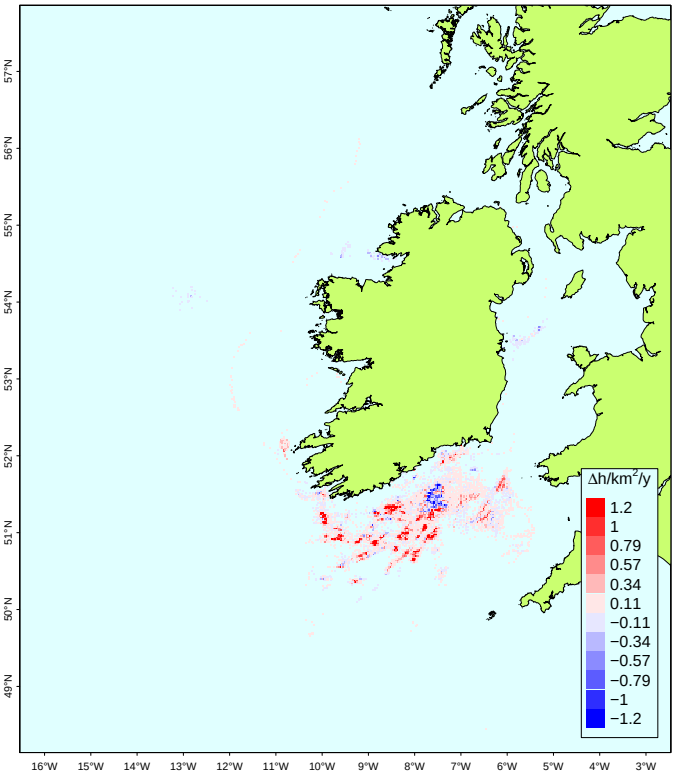
◀ No data were available from STECF on the distribution of international demersal seine effort during 2012.

▶ No data were available from STECF on the demersal seine effort by country in 2012.

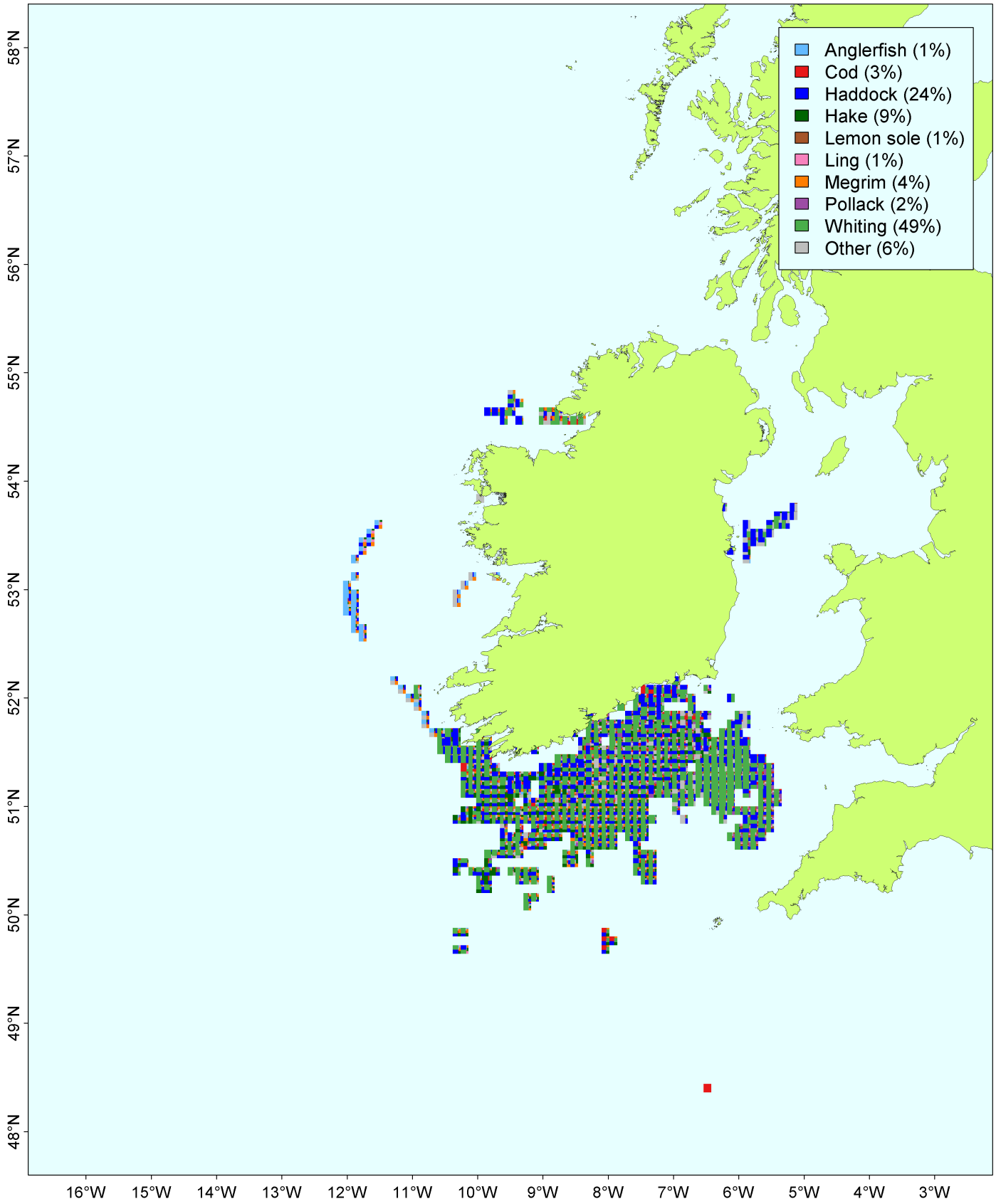




▲ The distribution of demersal seine effort by Irish vessels ≥15m during 2008-12. Smaller vessels account for a negligible proportion of the total effort.

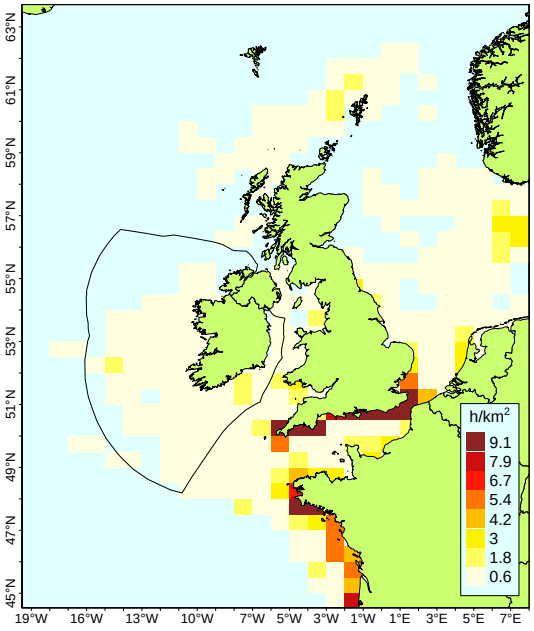


▲ The trend in demersal seine effort by Irish vessels ≥15m during 2008-12 (change in effort per km^2 per year). Effort increased moderately in most areas in the Celtic Sea.



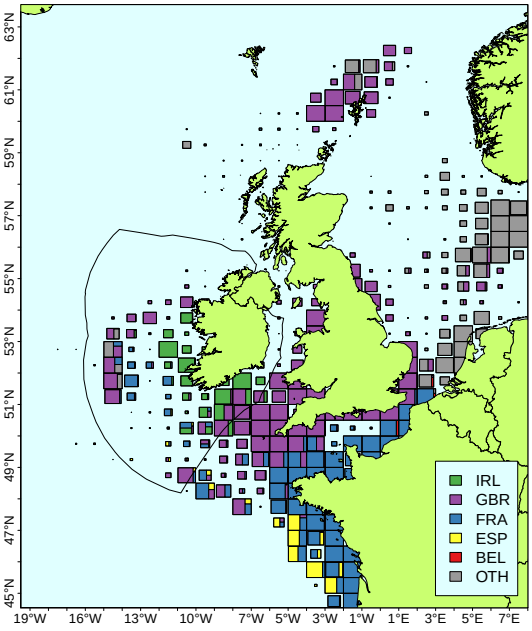
▲ The species composition of the demersal seine vessels ≥15m landing into Ireland. Whiting dominate the landings in most areas. The percentages in the legend refer to the share of the total landings for each species.

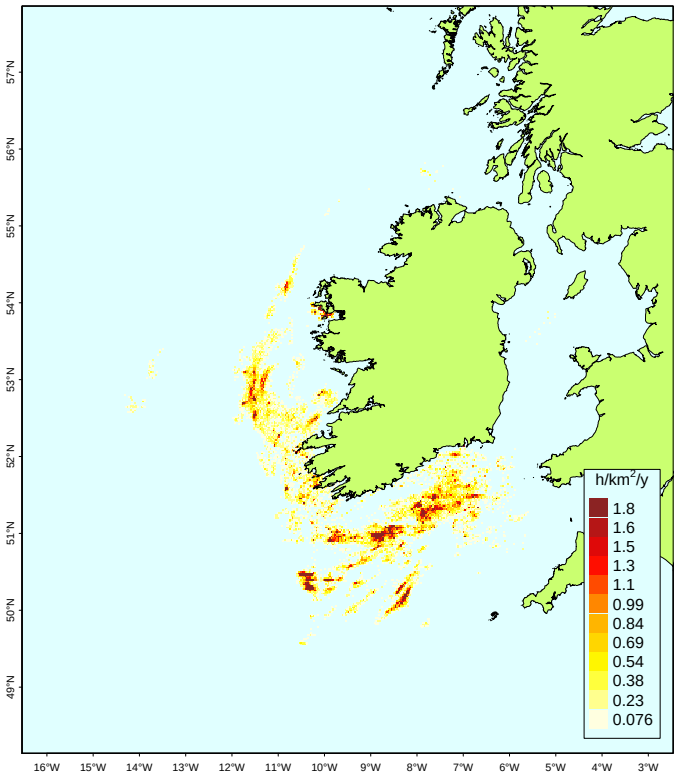
Gill and trammel net effort



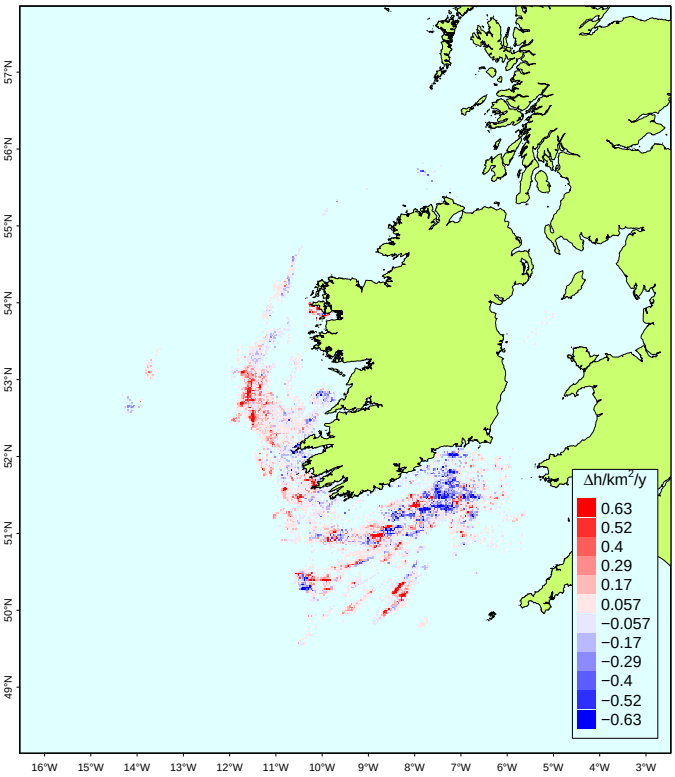
◀ The distribution of international gill and trammel net effort in the north-east Atlantic during 2012. Most of the effort takes place off the south coast of England and in Biscay.

▶ The gill and trammel net effort by country in 2012. Ireland accounted for approximately 41% of the effort inside the Irish EEZ; the UK accounted for 40%.

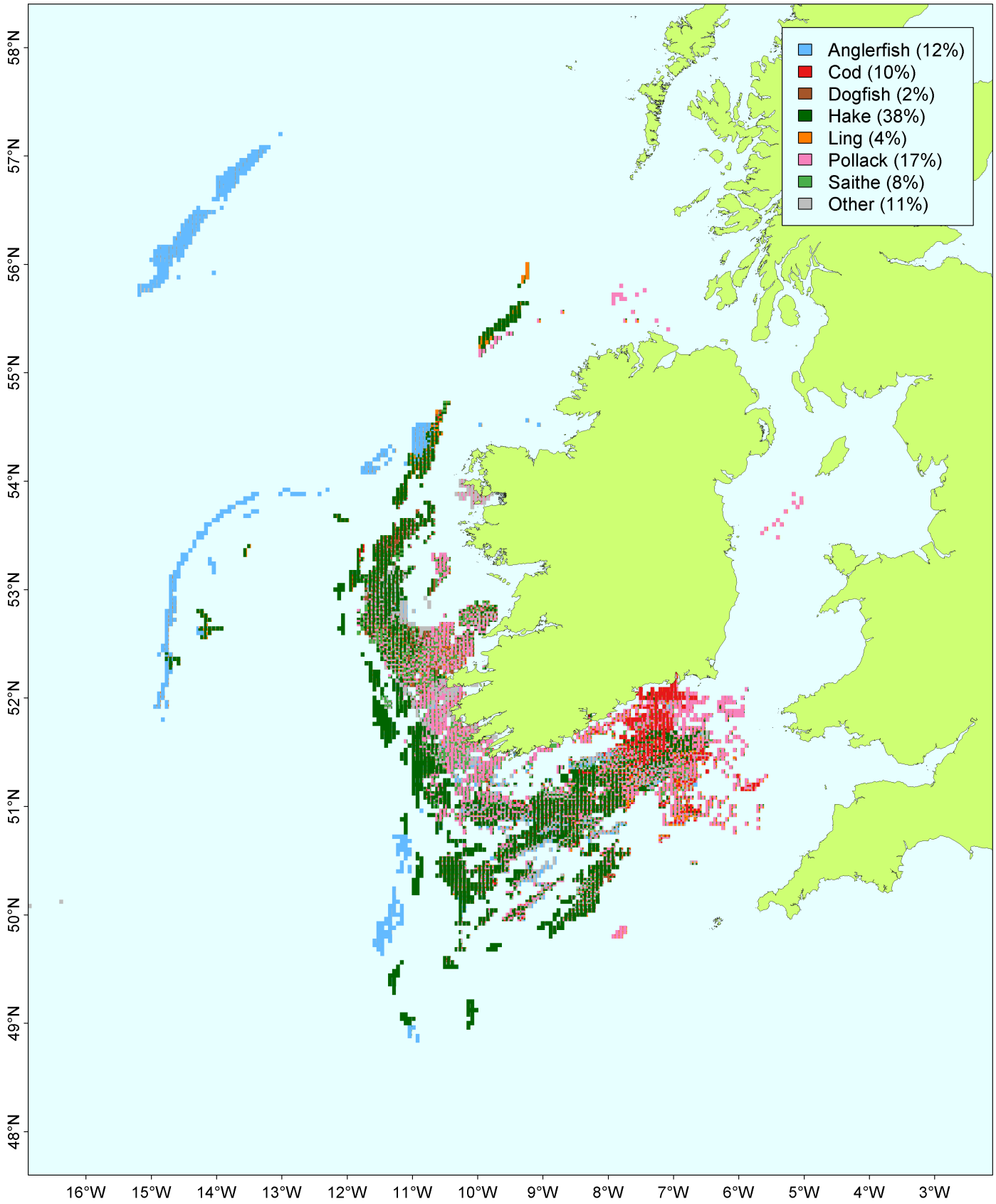




▲ The distribution of gill and trammel net effort by Irish vessels ≥15m during 2008-12. Smaller vessels (between 10 and 15m) account for 46% of the total recorded effort; this effort is mainly distributed inshore off the south and south-west coast of Ireland. Vessels under 10m might also account for a significant amount of effort but the extent of this effort is not recorded.

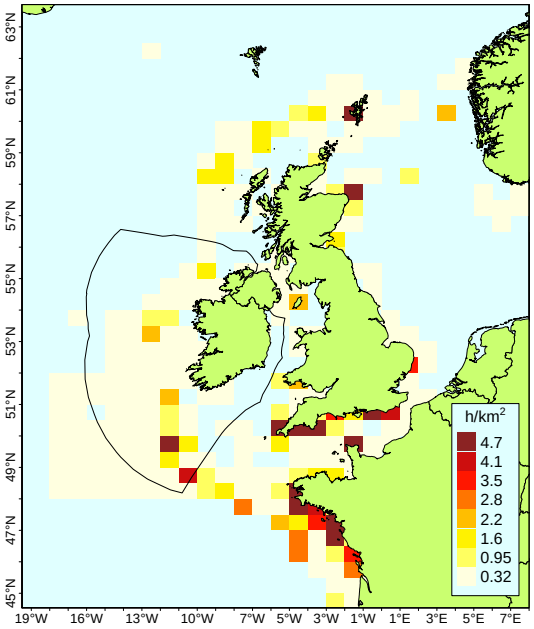


▲ The trend in gill and trammel net effort by Irish vessels ≥15m during 2008-12 (change in effort per km^2 per year). Effort off the west coast of Ireland has increased in recent years while effort in much of the Celtic Sea has decreased.



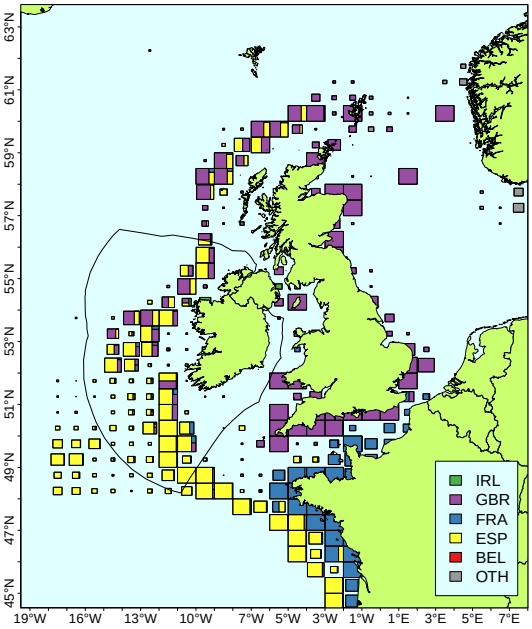
▲ The species composition of the gill and trammel net vessels ≥15m landing into Ireland. Anglerfish dominate in deepest areas in the west, hake dominate on most the continental shelf while pollack and cod dominate closer to shore. The percentages in the legend refer to the share of the total landings for each species.

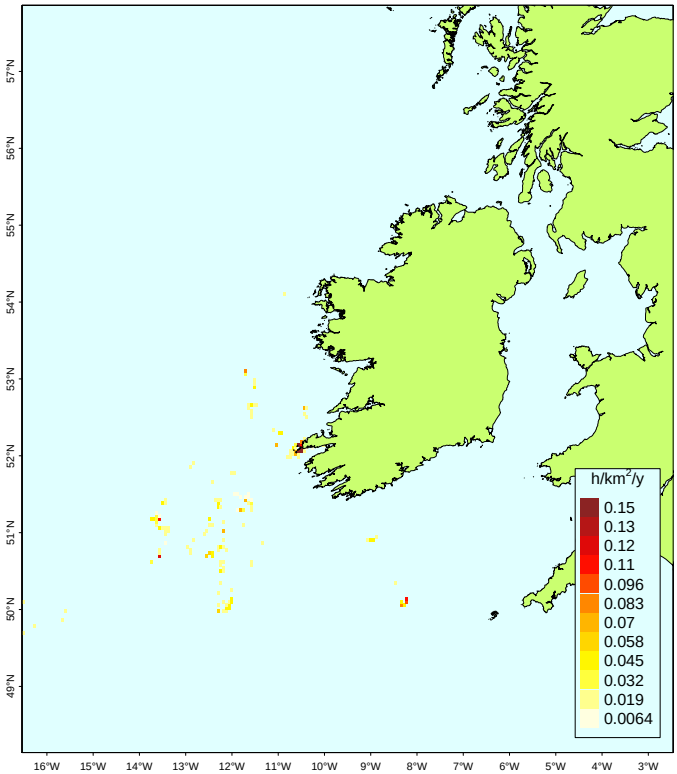
Longline effort



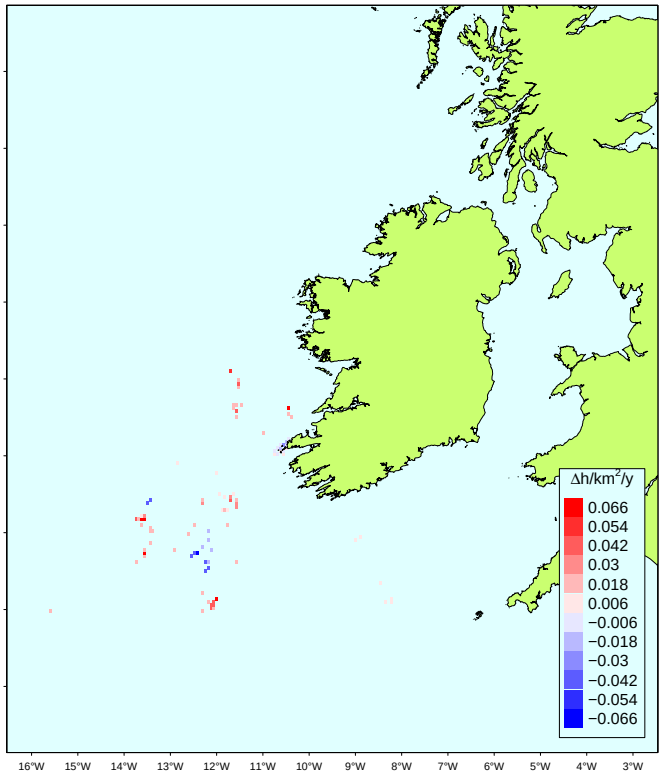
◀ The distribution of international longline effort in the north-east Atlantic during 2012. Effort takes place in coastal areas as well as along the edge of the continental shelf.

▶ The longline effort by country in 2012. Ireland accounted for approximately 2% of the effort inside the Irish EEZ; Spain accounted for 78%.

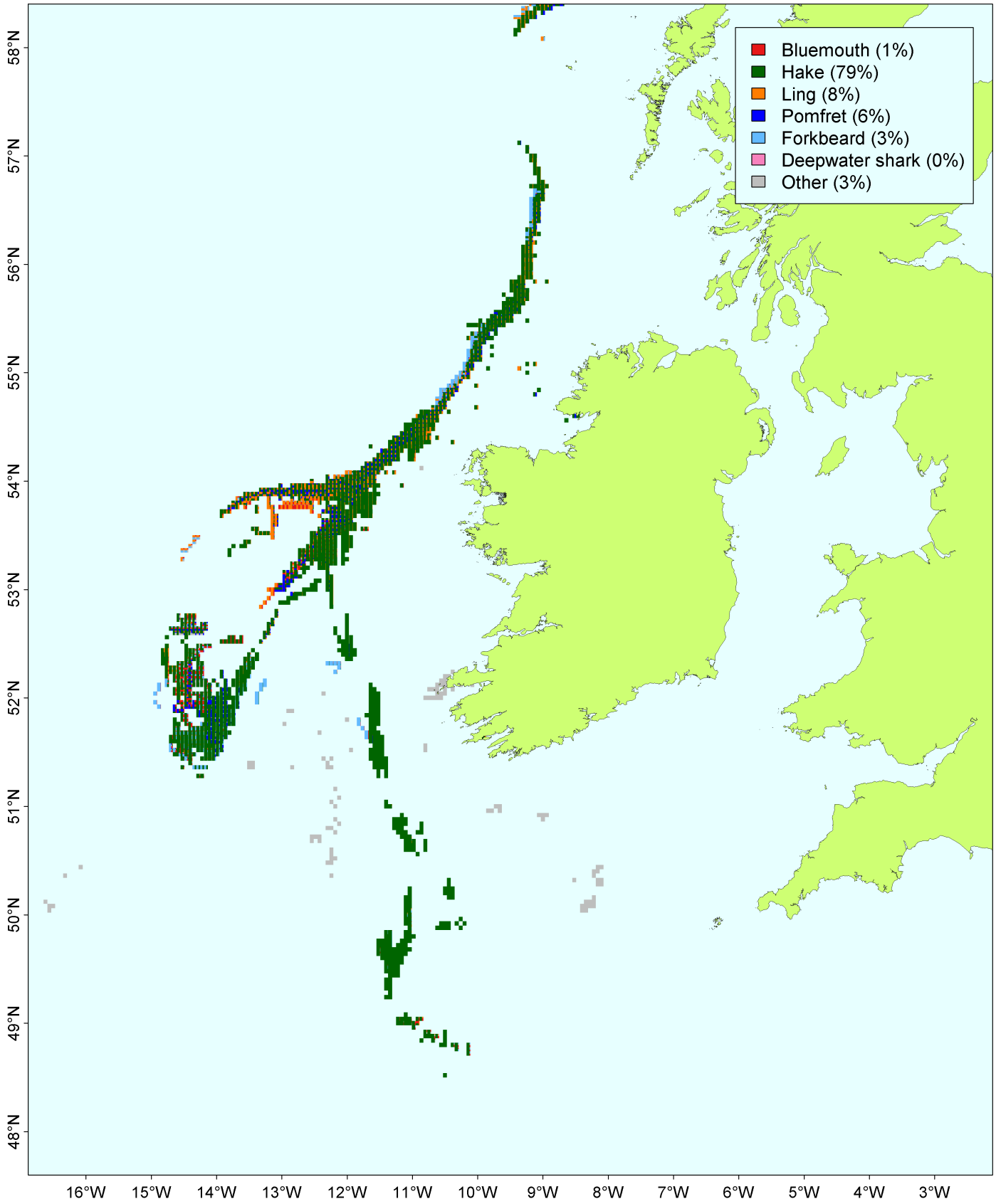




▲ The distribution of longline effort by Irish vessels ≥15m during 2008-12. Irish longline activity is very minor.

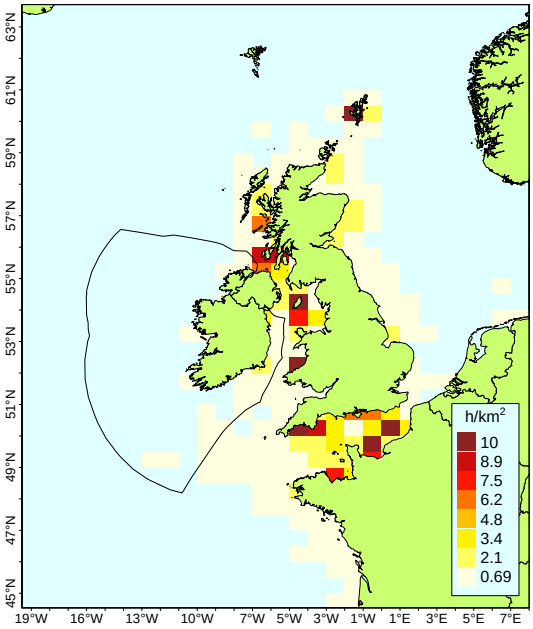


▲ The trend in longline effort by Irish vessels ≥15m during 2008-12 (change in effort per km^2 per year). No obvious pattern is apparent.



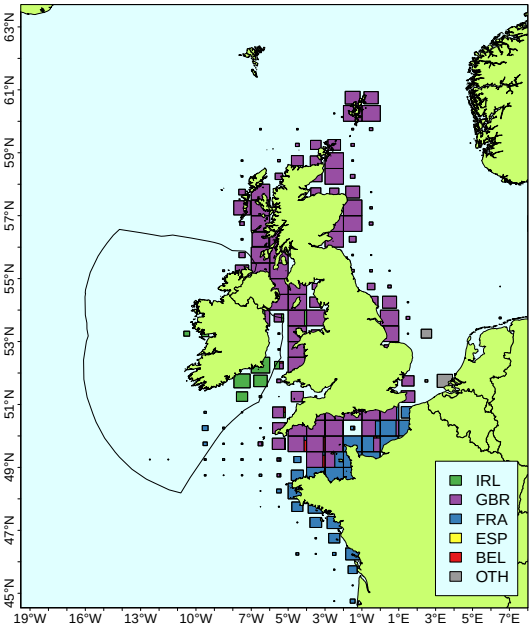
▲ The species composition of the longline vessels ≥15m (these are mainly Spanish vessels landing into Ireland). The landings are dominated by hake in nearly all areas. The percentages in the legend refer to the share of the total landings for each species.

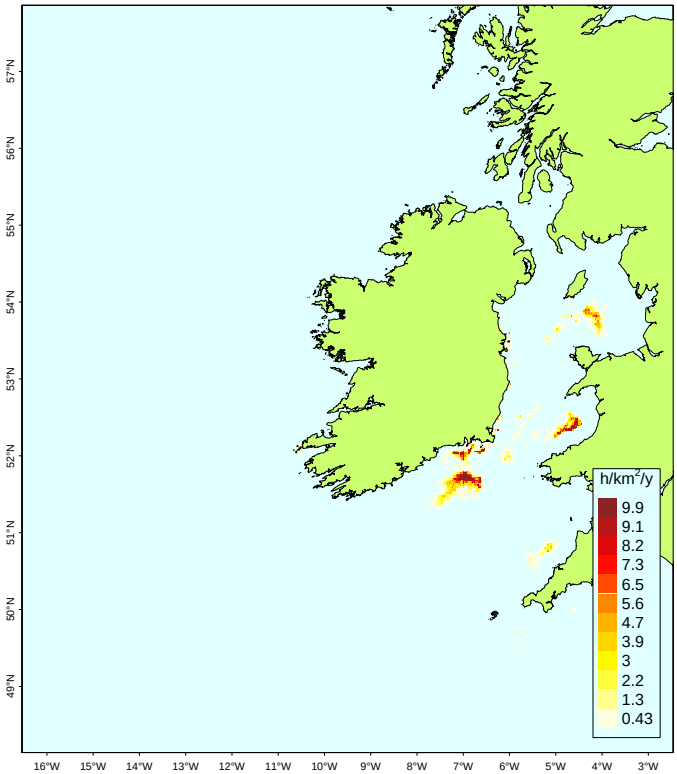
Dredge effort



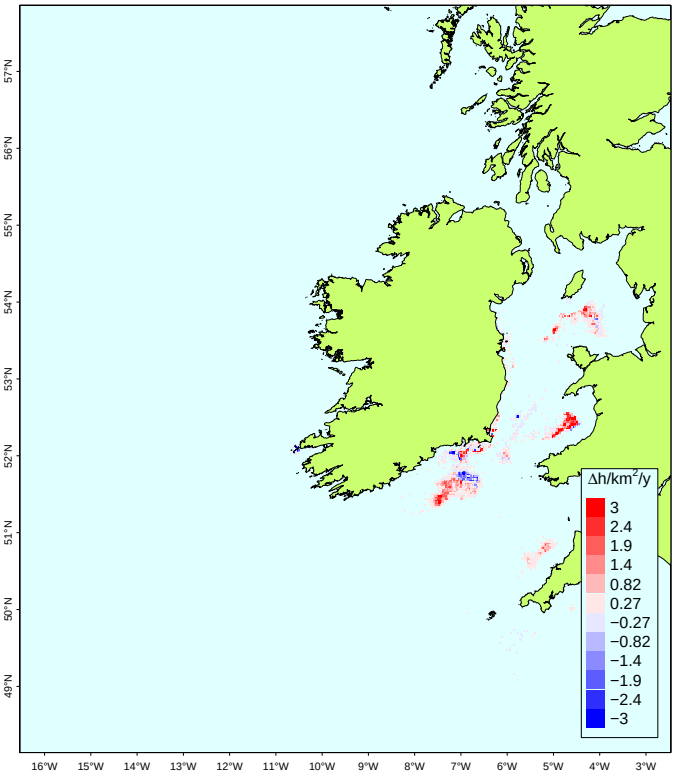
◀ The distribution of international dredge effort in the north-east Atlantic during 2012. Most of the effort takes place off the west coast of the UK and in the English Channel.

▶ The dredge effort by country in 2012. Ireland accounted for approximately 71% of the effort inside the Irish EEZ.

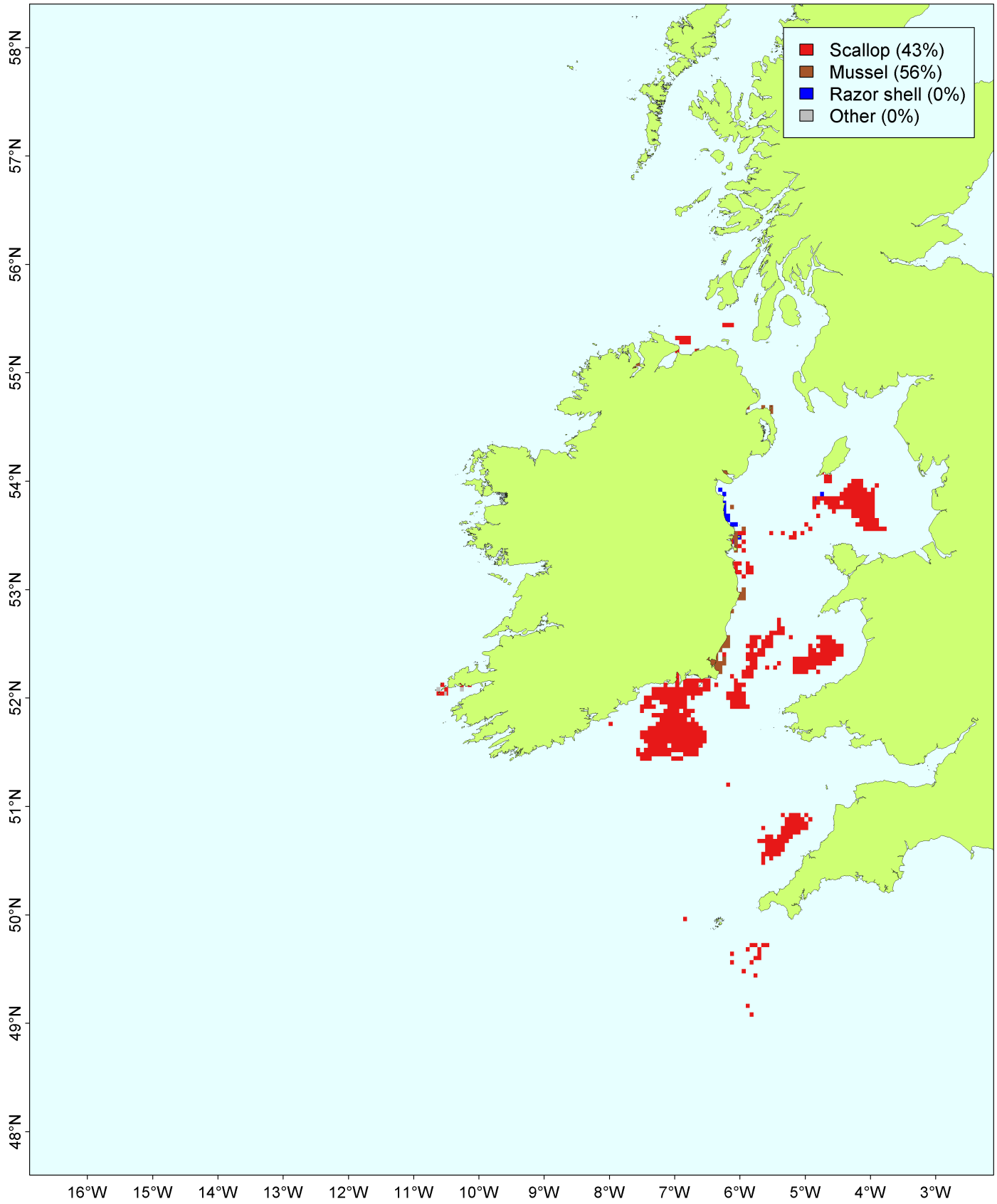




▲ The distribution of dredge effort by Irish vessels ≥15m during 2008-12. Smaller vessels (between 10 and 15m) account for 46% of the total recorded effort; this effort is mainly distributed inshore off the east and south-east coast of Ireland. Vessels under 10m might also account for a significant amount of effort but the extent of this effort is not recorded.

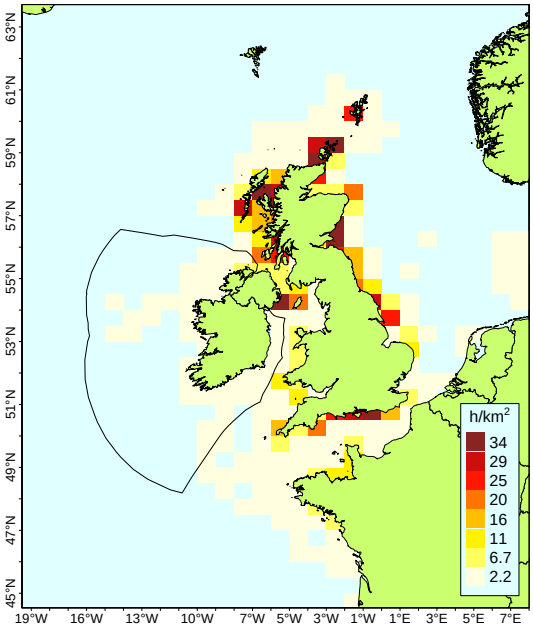


▲ The trend in dredge effort by Irish vessels ≥15m during 2008-12 (change in effort per km^2 per year). Effort has increased in most areas.



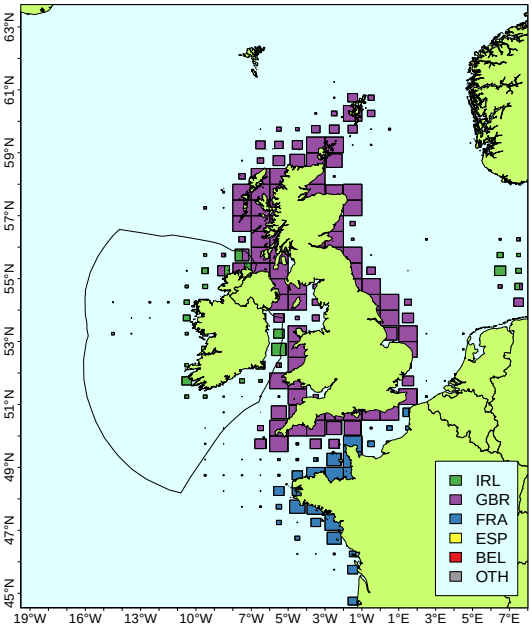
▲ The species composition of the dredge vessels ≥15m landing into Ireland. Scallop dominate the landings but mussels and razor shells are also caught along the east coast of Ireland. The percentages in the legend refer to the share of the total landings for each species.

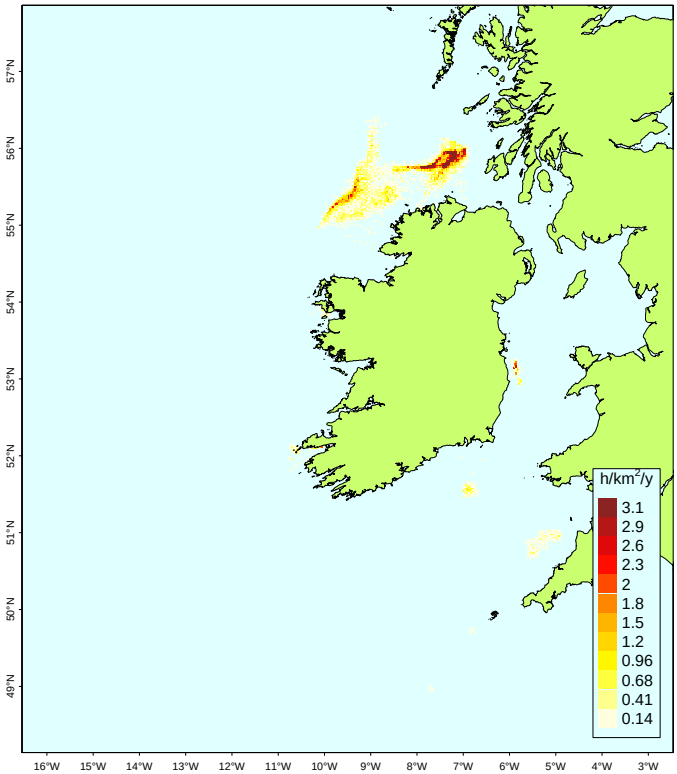
Potting effort



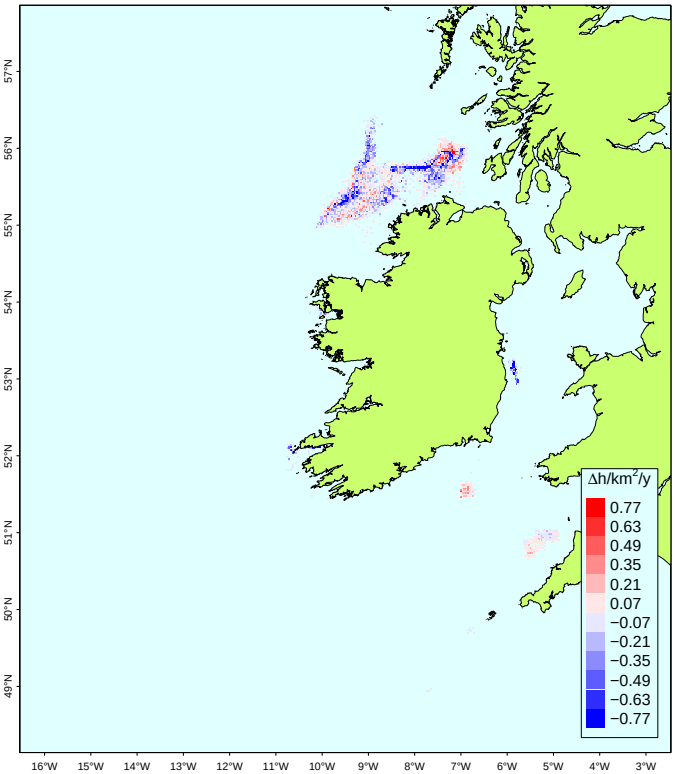
◀ The distribution of international potting effort in the north-east Atlantic during 2012. Most of the effort is concentrated along the UK coast.

▶ The potting effort by country in 2012. Ireland accounted for approximately 64% of the effort inside the Irish EEZ.

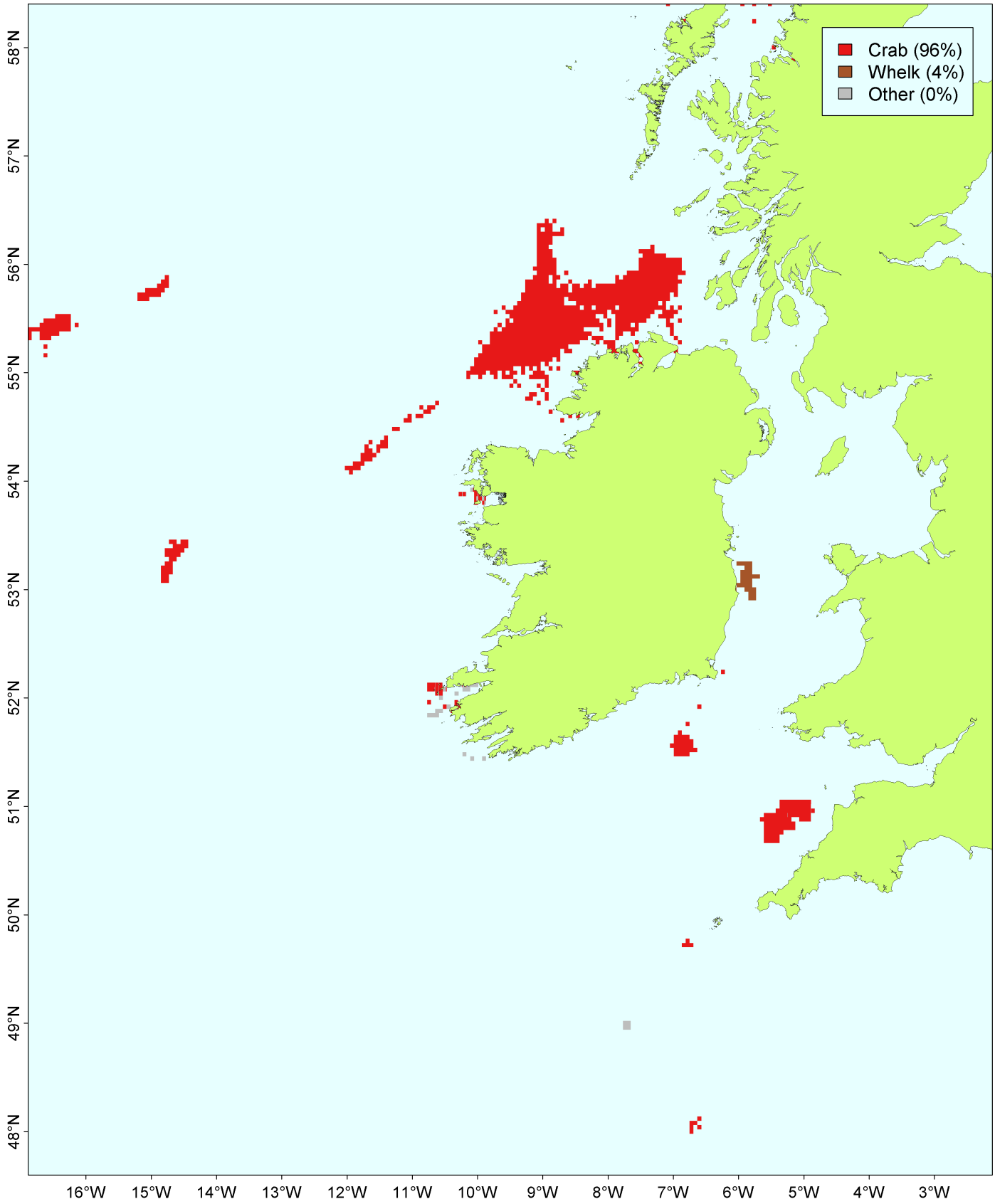




▲ The distribution of potting effort by Irish vessels ≥15m during 2008-12. Smaller vessels (between 10 and 15m) account for 84% of the total recorded effort; this effort is distributed inshore off all coasts around Ireland. Vessels under 10m might also account for a significant amount of effort but the extent of this effort is not recorded.

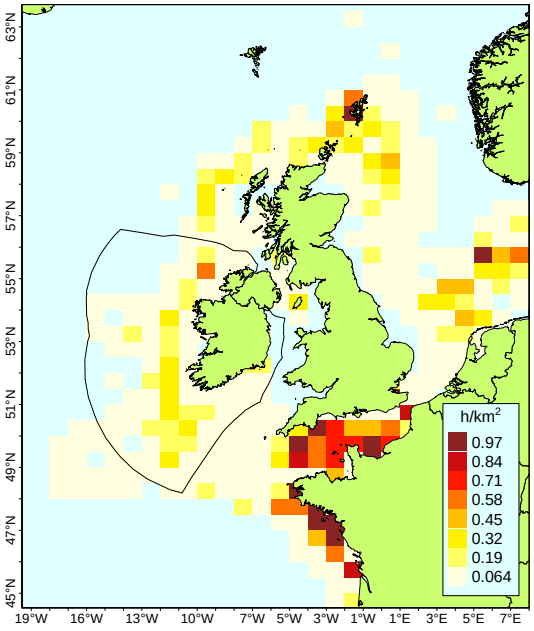


▲ The trend in potting effort by Irish vessels ≥15m during 2008-12 (change in effort per km^2 per year). Effort has decreased in almost all areas.



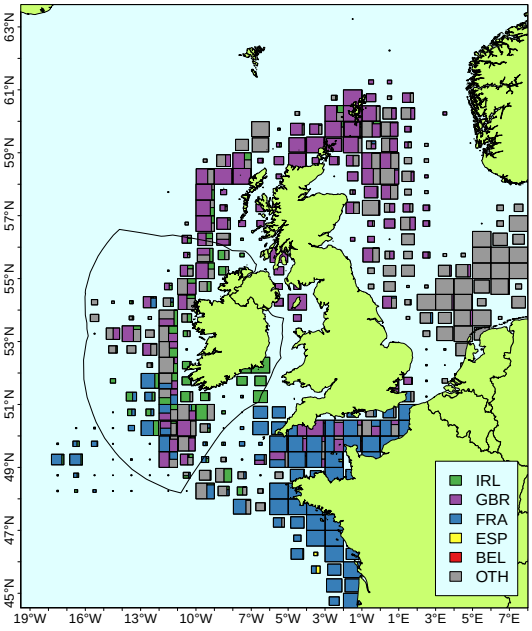
▲ The species composition of the potting vessels ≥15m landing into Ireland. Crab dominate the landings but whelk are also landed from an area off the Wicklow coast. The percentages in the legend refer to the share of the total landings for each species.

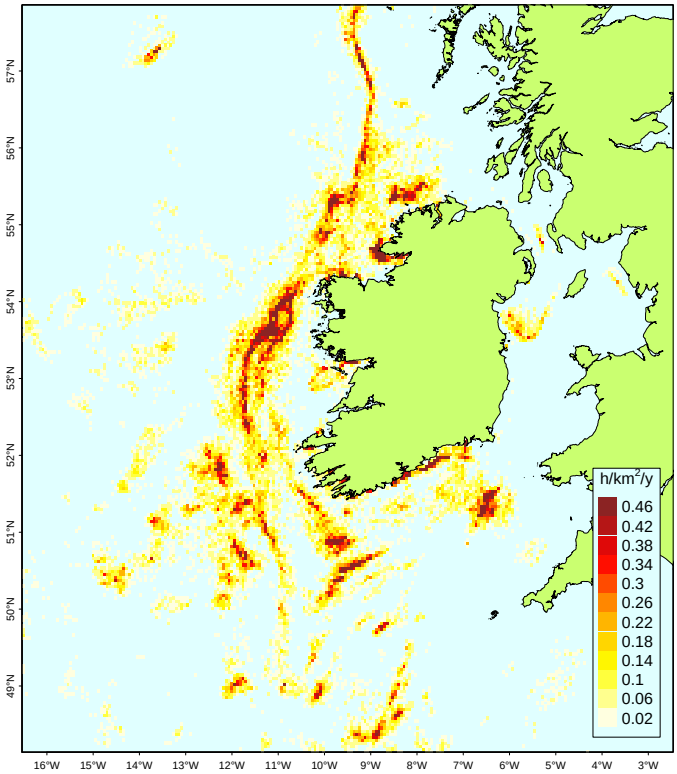
Pelagic trawl effort



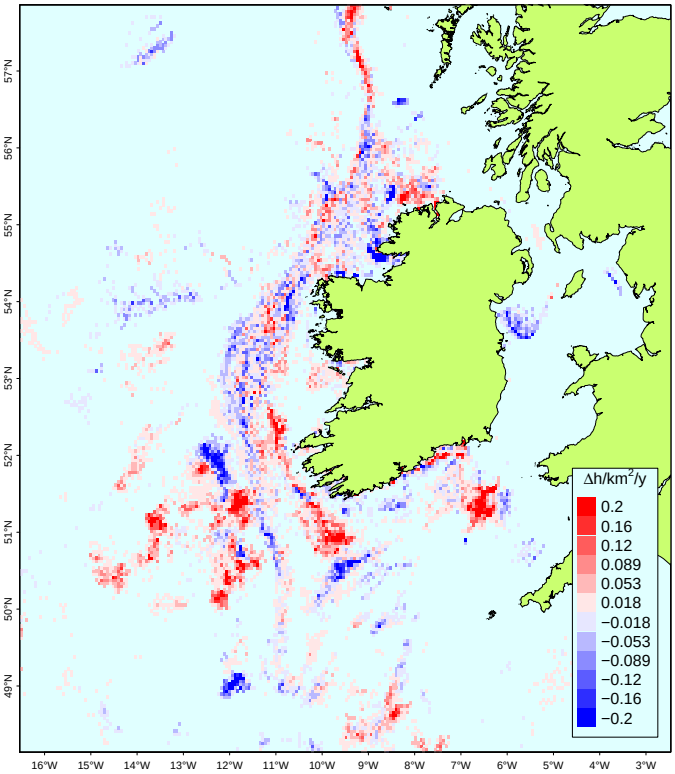
◀ The distribution of international pelagic trawl effort in the north-east Atlantic during 2012. Most effort takes place in the English Channel and northern Biscay.

▶ The pelagic trawl effort by country in 2012. Ireland accounted for approximately 27% of the effort inside the Irish EEZ; the UK and the Netherlands accounted for 27% and 21% respectively.

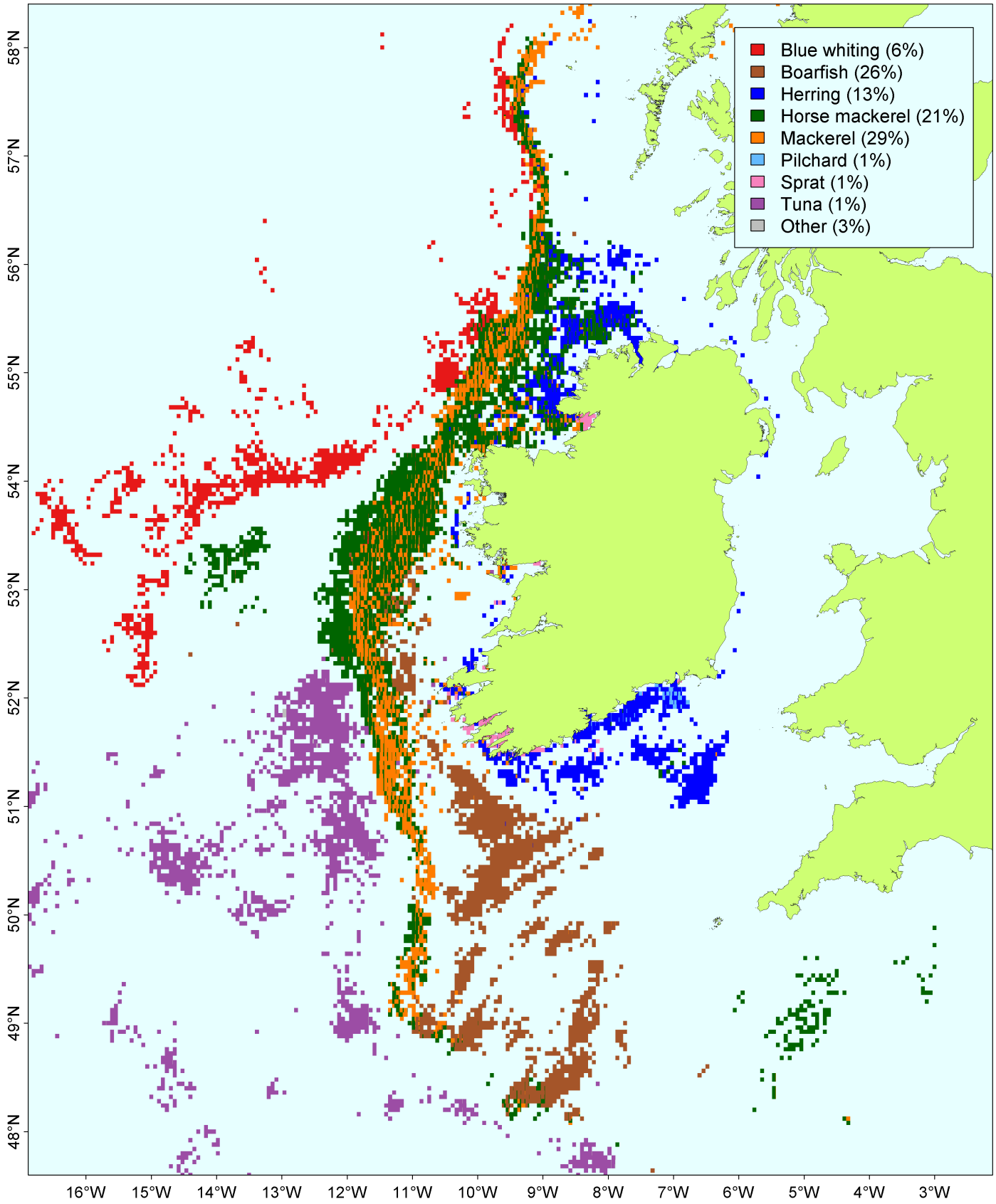




▲ The distribution of pelagic trawl effort by Irish vessels ≥15m during 2008-12. Smaller vessels (between 10 and 15m) account for 18% of the total effort; this effort is mainly distributed inshore off the south-east coast of Ireland.



▲ The trend in pelagic trawl effort by Irish vessels ≥15m during 2008-12 (change in effort per km^2 per year). The distribution in effort has changed in complex ways, reflecting changes in targeting of species or stock components and changes in species distribution.



▲ The species composition of the pelagic trawl vessels ≥15m landing into Ireland. Blue whiting dominate the offshore landings north of 52°N, tuna dominate offshore south of 52°N, mackerel and horse mackerel are both caught along the continental shelf edge, boarfish dominate the landings in the western Celtic Sea and herring dominate inshore. The percentages in the legend refer to the share of the total landings for each species.

Landings of key commercial species

This chapter provides an overview of the landings of the key commercial species from the waters around Ireland. Landings are the result of a complex interaction between the spatial distribution, abundance and catchability of each species and the regulations and market forces that drive the distribution of fishing effort, the types fishing gear used and the patterns in discarding. This chapter is intended to illustrate where the landings are taken and by which countries.

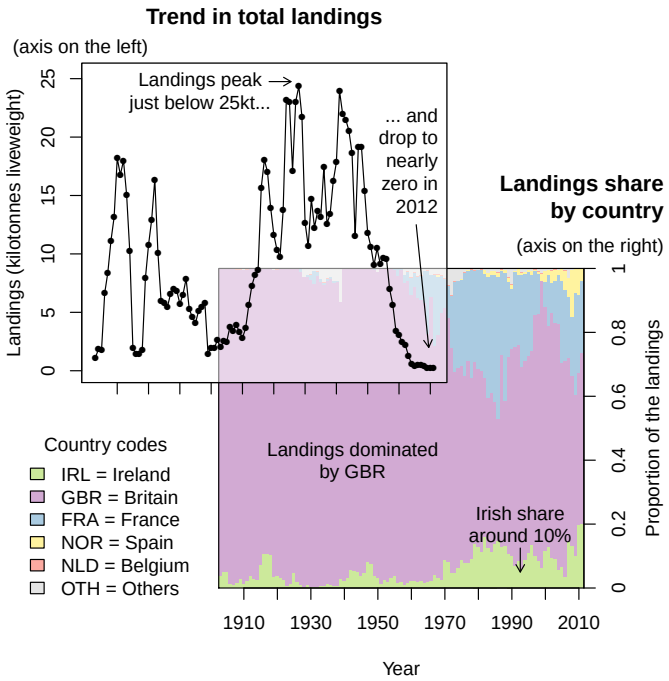
Interpretation

It is important to note that the maps in this chapter cannot be interpreted as species distribution maps. For example, species may occur in areas where they are not caught (or caught but not landed). On the other hand, species may be caught in large bulk in certain areas without being particularly abundant, simply because the fishing effort is very high in those areas.

Note that discard data are not included in the maps and plots in this chapter because discard data are only available for a relatively small number of fishing trips.

For each species, one graph and three maps are presented:

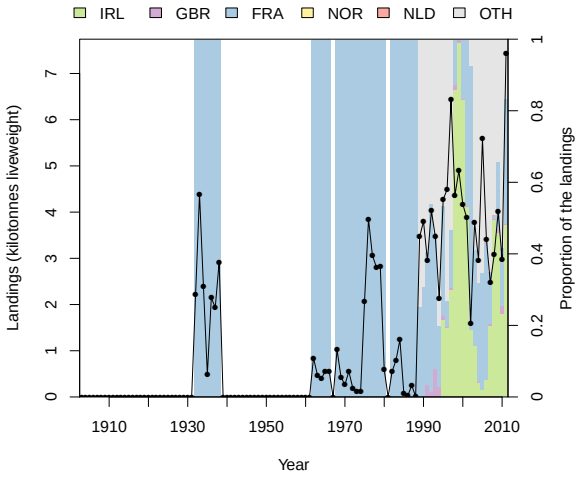
- The graph shows the long-term trends in the landings in Sub-areas VI and VII; the total landings of all countries are shown as well as the proportion of the landings that each country has taken. See example graph on the right and the Data chapter, page 3 for details on the landings data.
- The small map on the top-right of each page shows the distribution of the international landings in the north-east Atlantic in 2012. This map is intended to provide a wider spatial context to the landings data and is based data from STECF (see the Data chapter, page 3 for details).
- The two larger maps at the bottom of each page show the fine-scale distribution of Irish landings and the trend in these landings over the period 2008-12. These two maps are based on Irish VMS and logbooks data, (see the Data chapter, page 3 for details). In the trend map, grid cells are coloured red if the landings have increased over time and blue if the landings have decreased. The rate of change in landings was determined for each grid cell by fitting a trend line through the landings data for the last 5 years. Any changes in landings can be the result of changes in stock abundance or changes in fishing effort or targeting practices therefore the interpretation is not always straightforward.



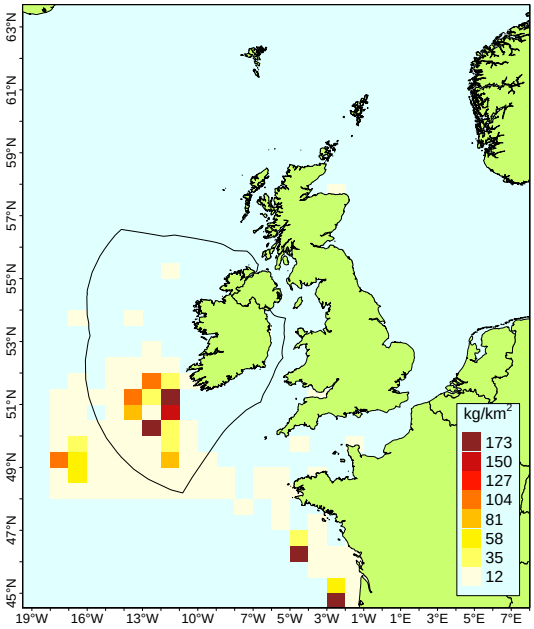
▲ The landings graphs consist of a line plot giving the total landings in Sub-areas VI and VII. This is overlaid over a colour plot showing the proportion of the landings taken by each country.

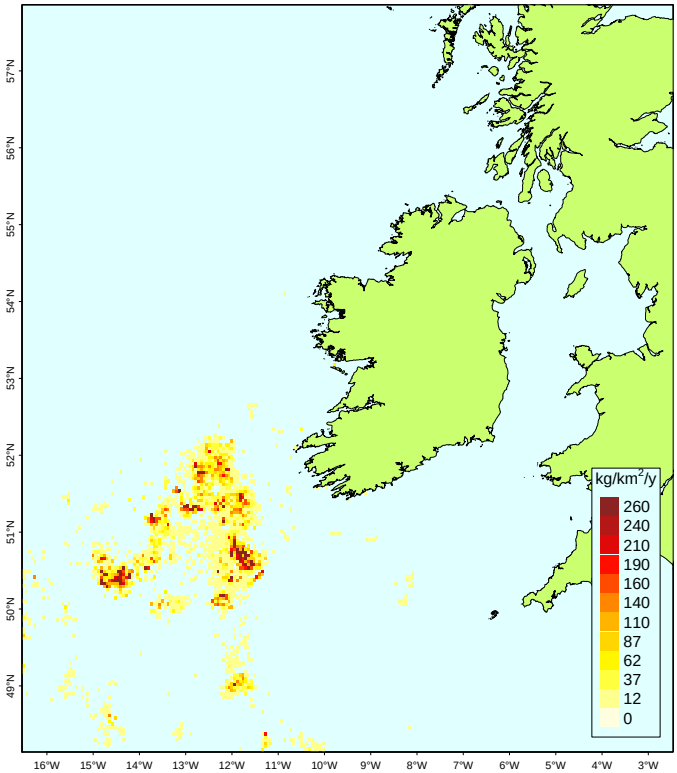
Albacore tuna landings

▼ International landings of albacore tuna in Sub-areas VI and VII and the share taken by each country. The fishery has been somewhat erratic in the past and was historically dominated by France. Ireland has taken a variable share in the fishery since 1995.

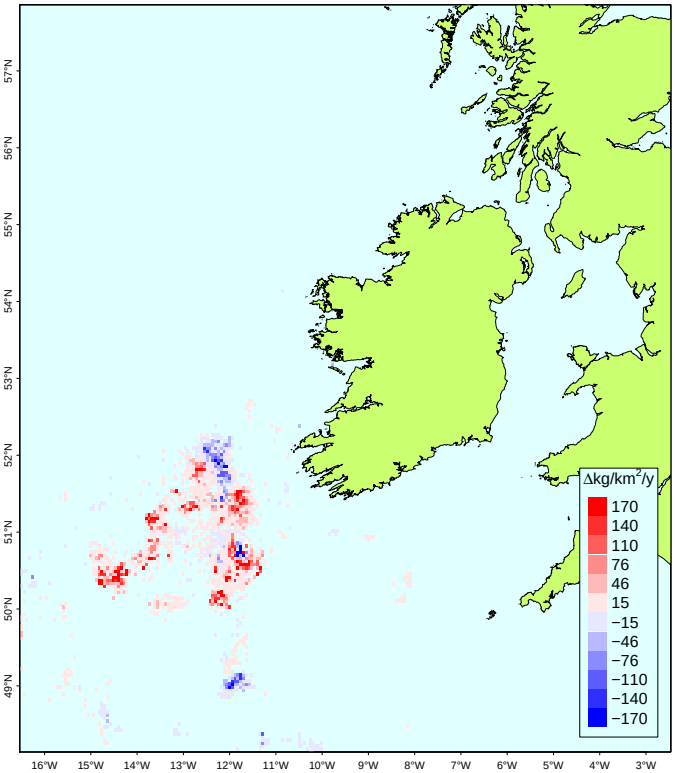


▶ The distribution of international landings of albacore tuna during 2012. Most albacore tuna landings were taken off the south-west coast of Ireland and in Biscay.





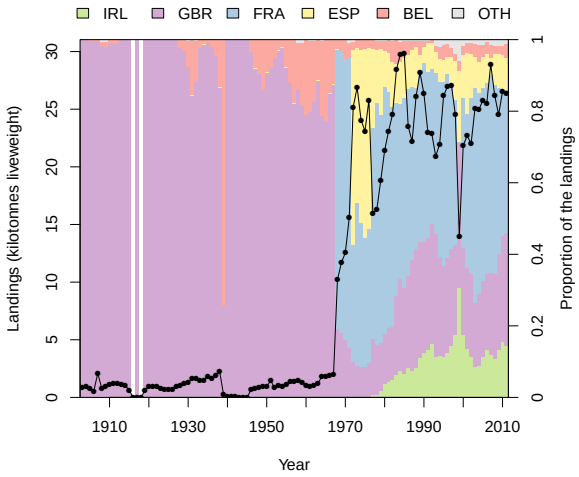
▲ The distribution of albacore tuna landings by Irish vessels ≥15m during 2008-12 (all gears). Vessels <15m did not land albacore. Most of the fishery takes place during August and September.



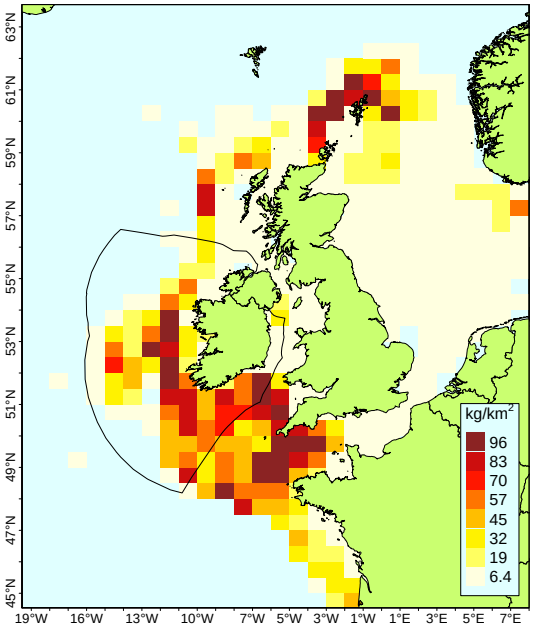
▲ The trend in albacore tuna landings by Irish vessels ≥15m during 2008-12 (change in landings per km² per year). Landings increased in most areas.

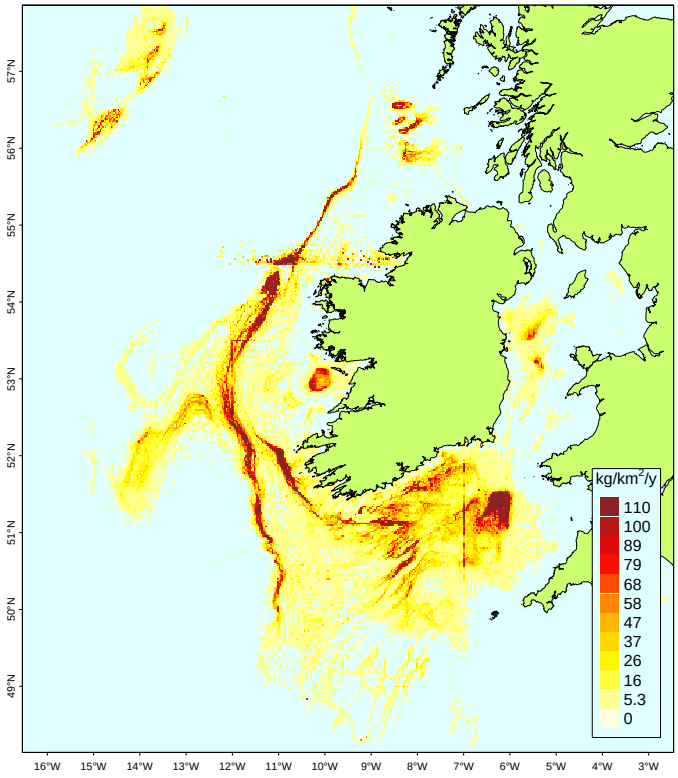
Anglerfish landings

▼ International landings of anglerfish in Sub-areas VI and VII and the share taken by each country. A directed fishery for anglerfish began around 1970 and landings have been fairly stable around 25kt since. France takes the largest share of the landings and Irish landings have been around 15% since the 1990s.

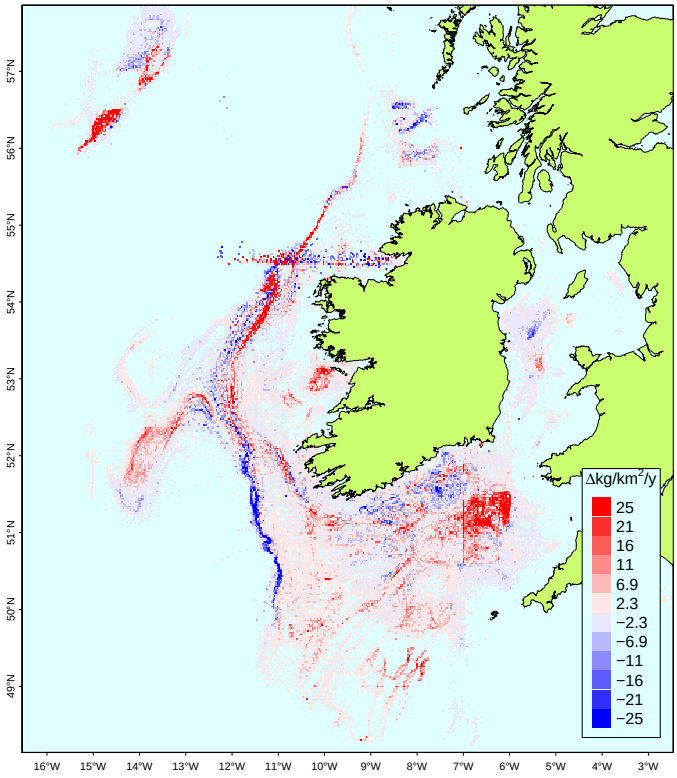


▶ The distribution of international landings of anglerfish during 2012. Anglerfish were landed from most areas along the continental shelf from northern North sea to the western Channel.





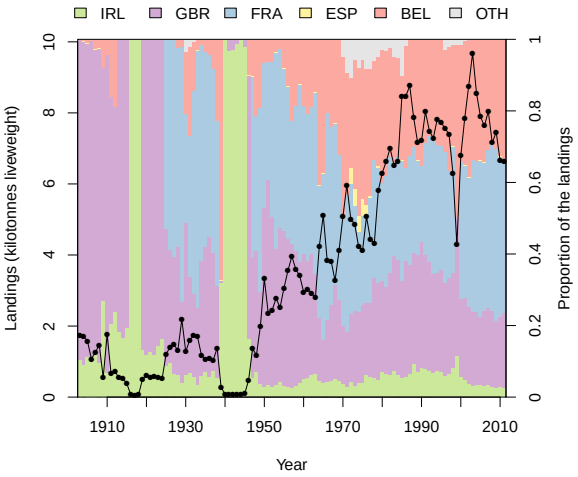
▲ The distribution of anglerfish landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute less than 4% of the total landings. Most catches are taken from depths between 50 and 200m but the highest catch rates occur along the shelf edge at depths between 200 and 350m.



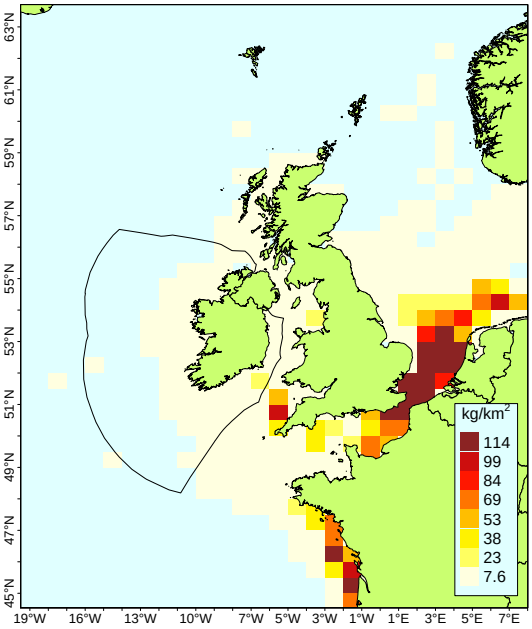
▲ The trend in anglerfish landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings along the slope decreased due to a reduction in effort, landings in most other areas increased.

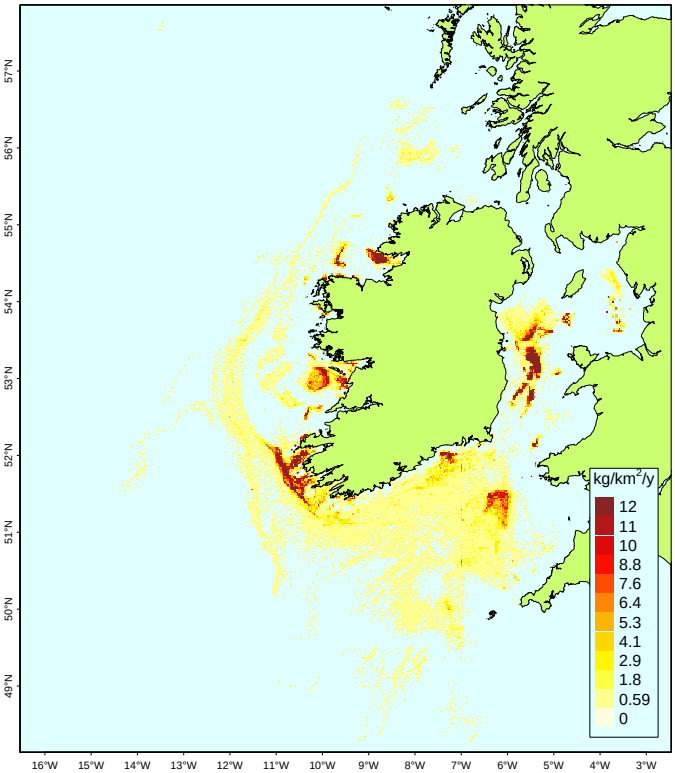
Black sole landings

▼ International landings of black sole in Sub-areas VI and VII and the share taken by each country. Landings increased from the end of WWII until the late 1980s, after which they were relatively stable around 8kt per year. France and Belgium dominate the landings, with Ireland taking less than 5% in recent years.

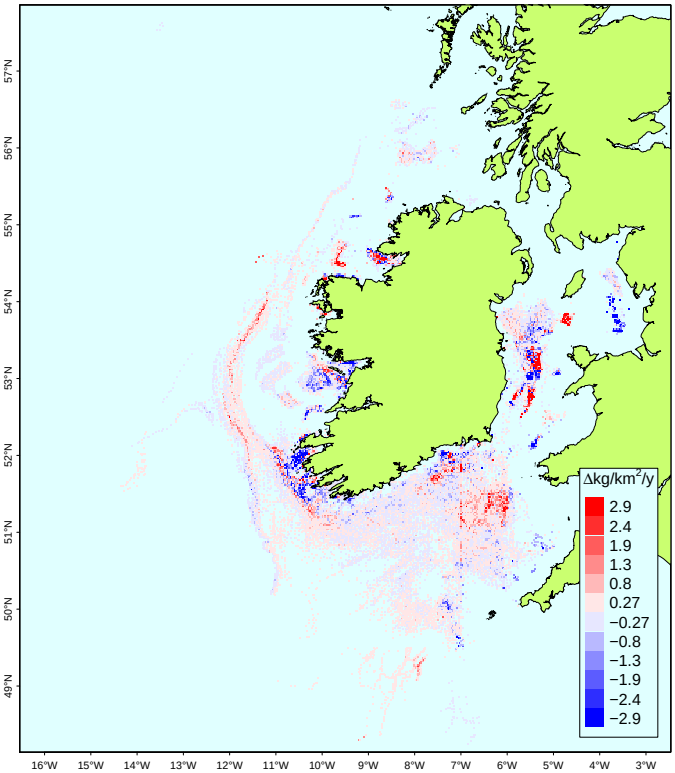


▶ The distribution of international landings of black sole during 2012. The vast majority of black sole landings were taken in the southern North Sea; landings from Irish waters are relatively minor but quite valuable.





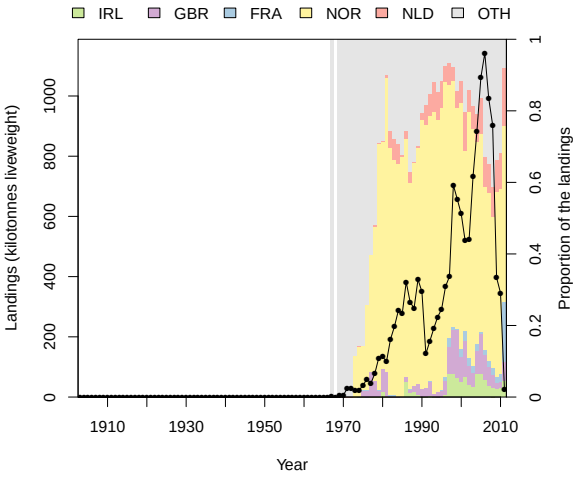
▲ The distribution of black sole landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute 23% of the total landings and are mainly distributed inshore off the west and south-west coast of Ireland.



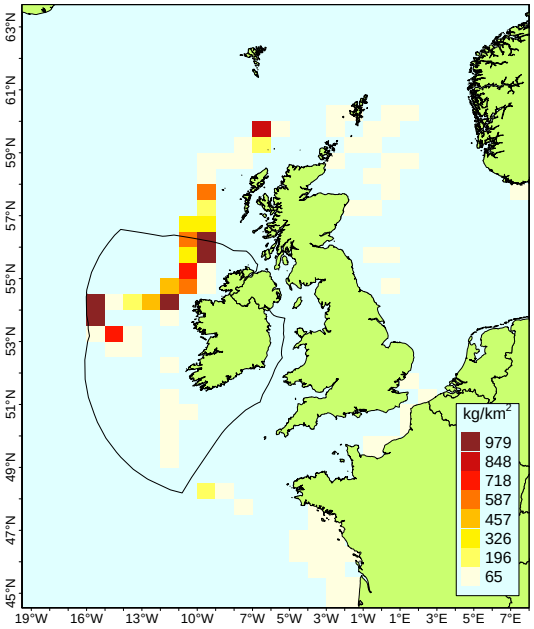
▲ The trend in black sole landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings increased in some areas and decreased in others. This is partially due to a change in availability of the stock and partly due to a change in the distribution of fishing effort.

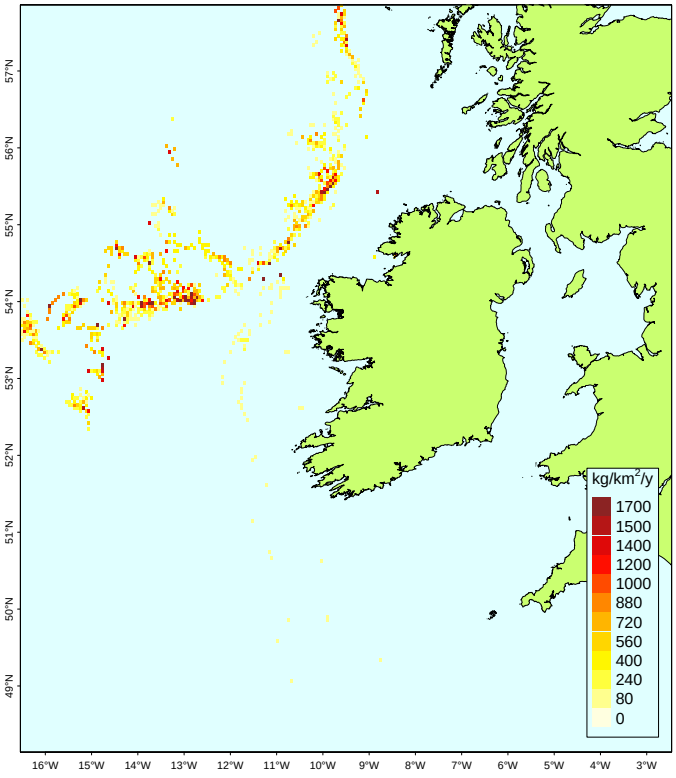
Blue whiting landings

▼ International landings of blue whiting in Sub-areas VI and VII and the share taken by each country. Landings increased since the early 1970s and peaked in 2006 at more than 1100kt. Landings have decreased sharply since, under a management plan agreed in 2008. Norway takes the largest share of the landings, Ireland takes less than 5%.

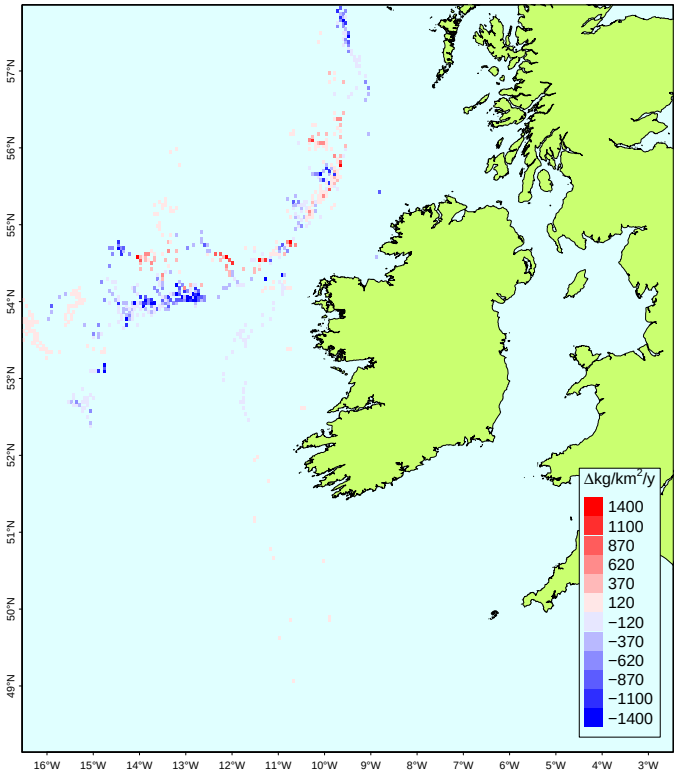


▶ The distribution of international landings of blue whiting during 2012. Note that Norway takes a large share of the landings but these are not included in the STECF dataset.





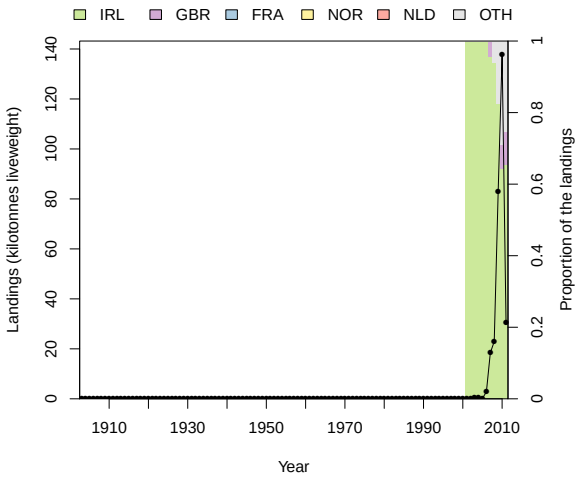
▲ The distribution of blue whiting landings by Irish vessels ≥15m during 2008-12 (all gears). Vessels <15m did not land blue whiting. The main fishery takes place during February and March.



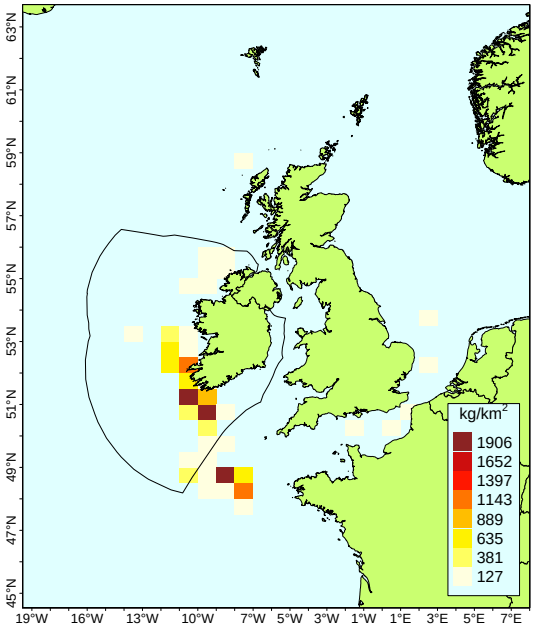
▲ The trend in blue whiting landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). There appear to be more landings close to the north-west coast of Ireland and fewer landings north of the Porcupine bank and west of Scotland.

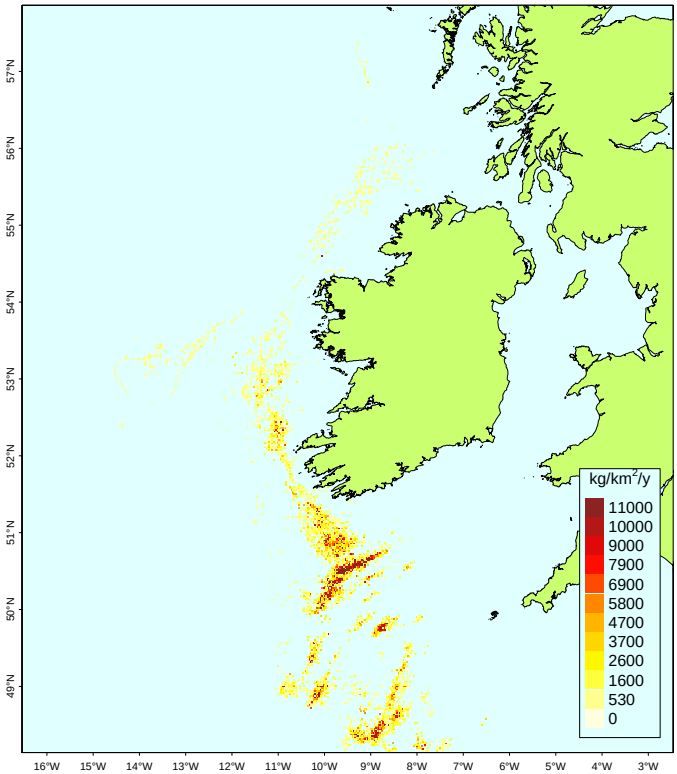
Boarfish landings

▼ International landings of boarfish in Sub-areas VI and VII and the share taken by each country. This fishery has recently developed and is dominated by Ireland.

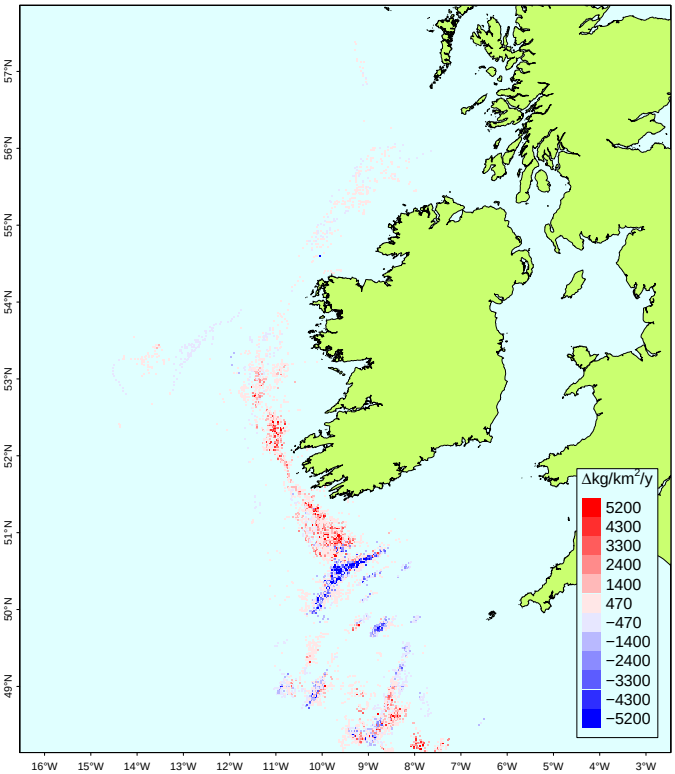


▶ The distribution of international landings of boarfish during 2012. Nearly all landings were taken off the south-west of Ireland and west of Brittany.





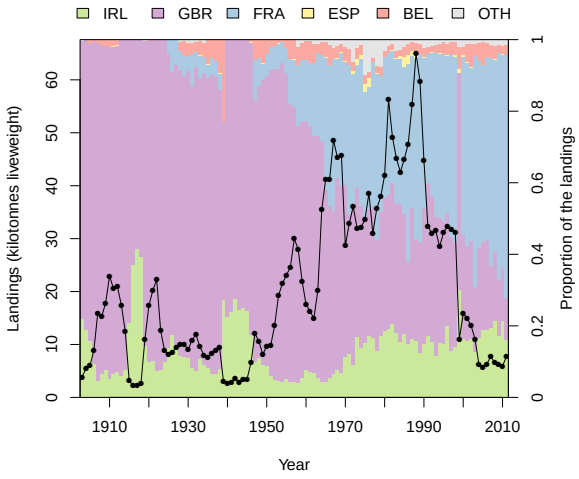
▲ The distribution of boarfish landings by Irish vessels ≥15m during 2008-12 (all gears). Vessels <15m did not land boarfish. Most landings are taken in the Celtic Sea at depths between 100 and 200m. Boarfish form dense aggregations above banks and ridges.



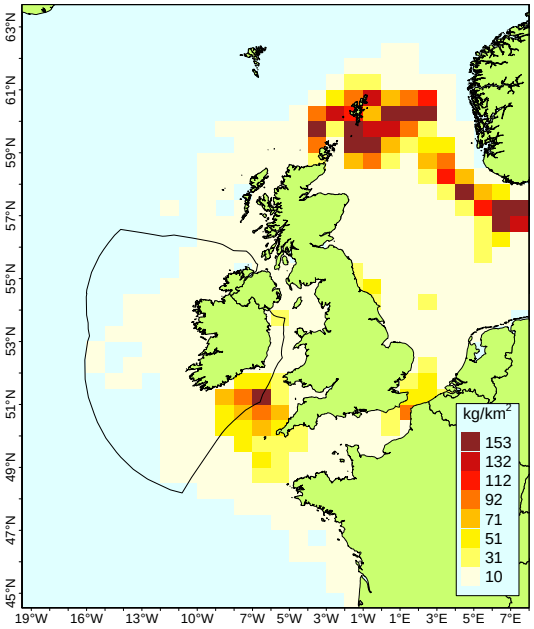
▲ The trend in boarfish landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). The main focus of the landings has moved north from the southern Celtic Sea as the fishery started targeting larger fish and avoiding juveniles.

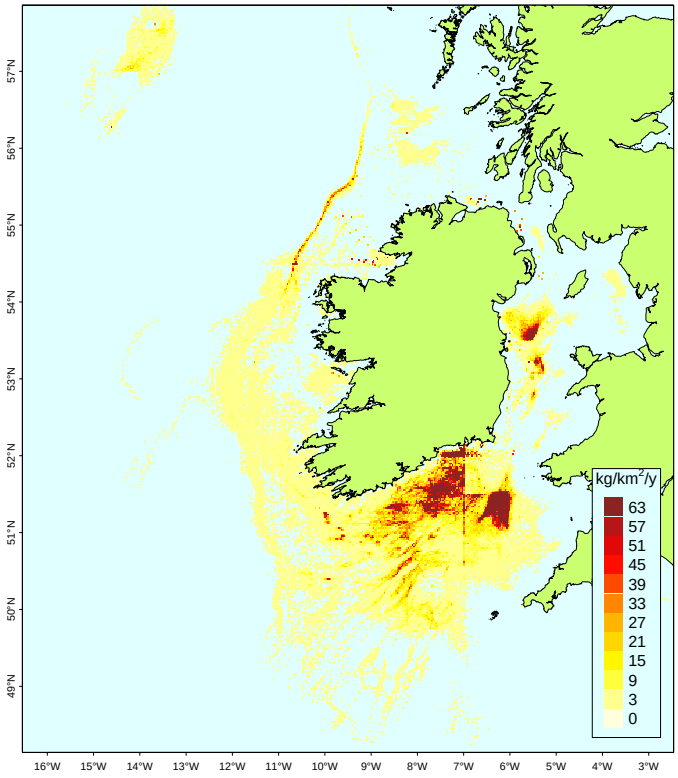
Cod landings

▼ International landings of cod in Sub-areas VI and VII and the share taken by each country. Landings increased from the end of WWII until the late 1980s, after which TACs started restricting the landings. In recent years France has taken most of the landings while Ireland has taken around 15%.

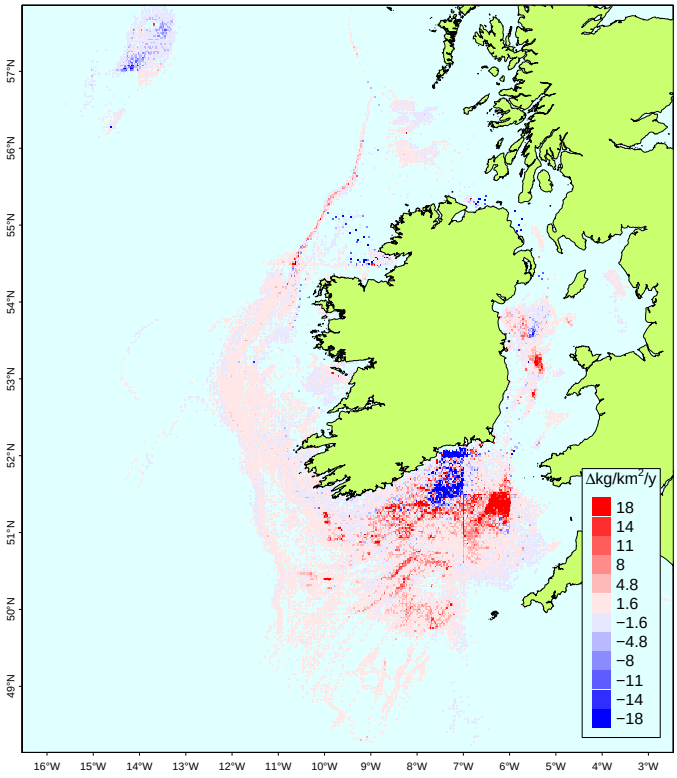


▶ The distribution of international landings of cod during 2012. The vast majority of cod landings in the area were taken from the northern North Sea, however landings from the Celtic Sea were also substantial.





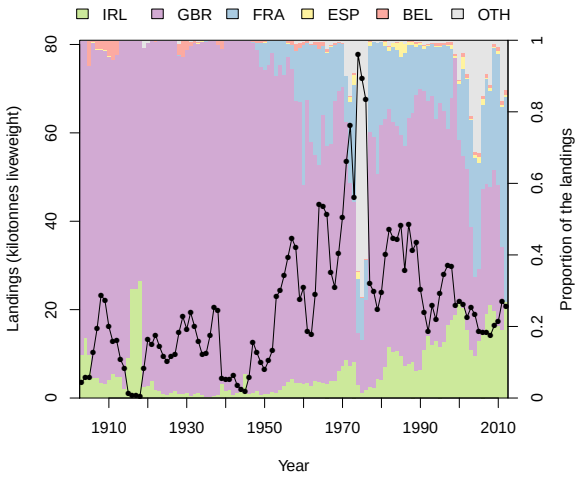
▲ The distribution of cod landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute around 20% of the total landings, these vessels operate mainly near south coast of Ireland where catch rates of cod are highest.



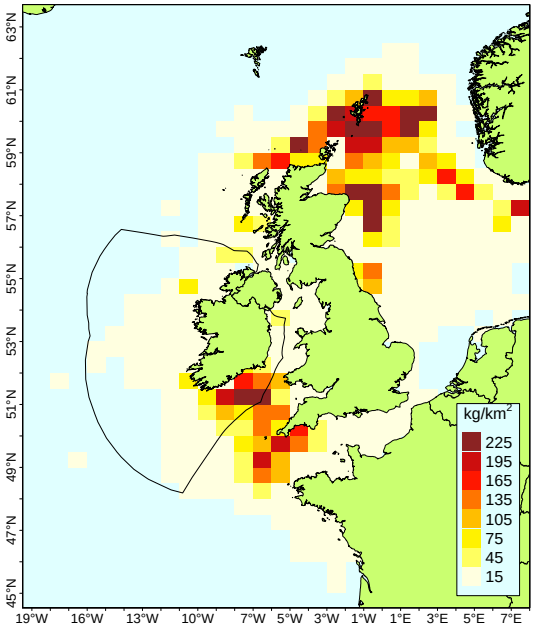
▲ The trend in cod landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings increased in most areas except in the Northern Celtic Sea. The general increase in landings is due to an increase in the stock size following exceptionally good recruitment in the Celtic Sea 2009.

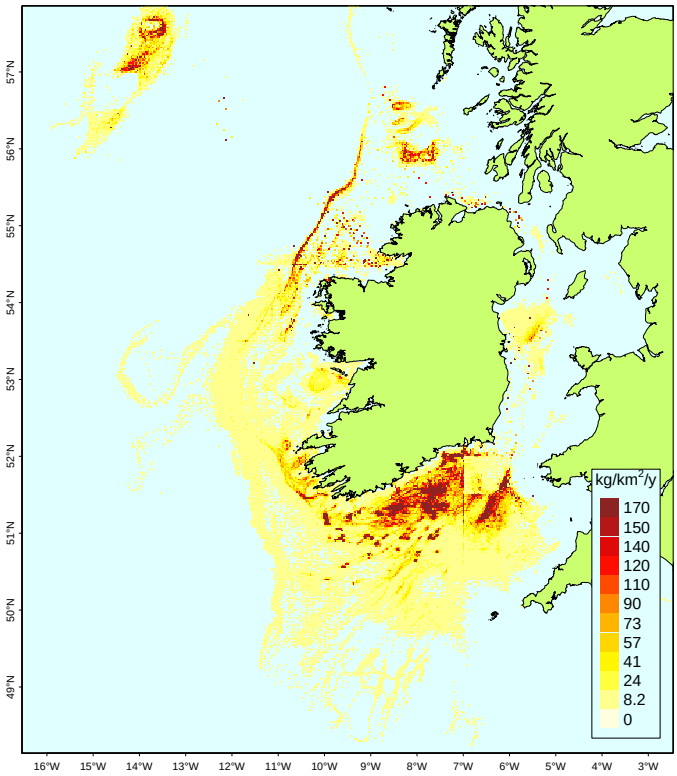
Haddock landings

▼ International landings of haddock in Sub-areas VI and VII and the share taken by each country. Landings peaked in 1975. Haddock landings tend to show strong fluctuations reflecting sudden increases in the stock following sporadic events of exceptional recruitment. In recent years the landings have been shared more or less equally between France, the UK and Ireland.

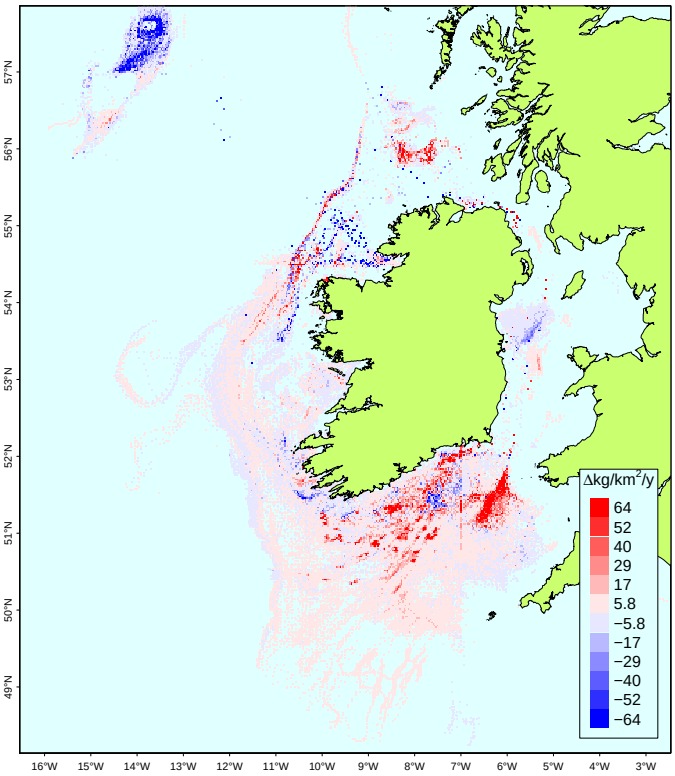


▶ The distribution of international landings of haddock during 2012. Most haddock landings were taken from the northern North Sea and from the Celtic Sea.





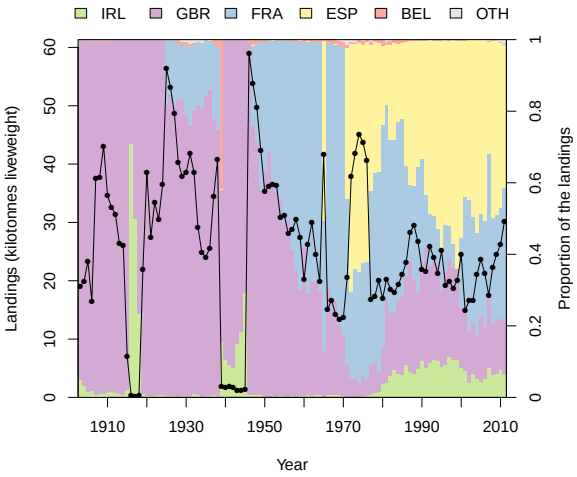
▲ The distribution of haddock landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute around 8% of the total landings, these vessels mainly operate near the south and south-west coast of Ireland. Haddock are caught in most areas between 50 and 200 depth.



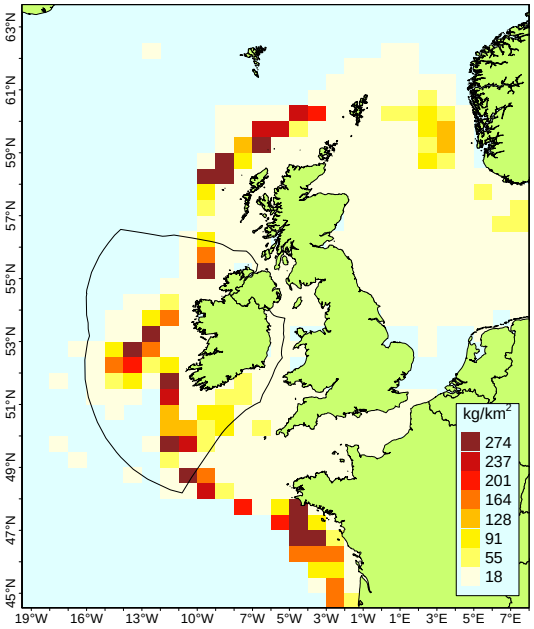
▲ The trend in haddock landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings increased in most areas except off Rockall. The general increase in landings is due to an increase in stock size following exceptionally good recruitment in the Celtic Sea in 2009.

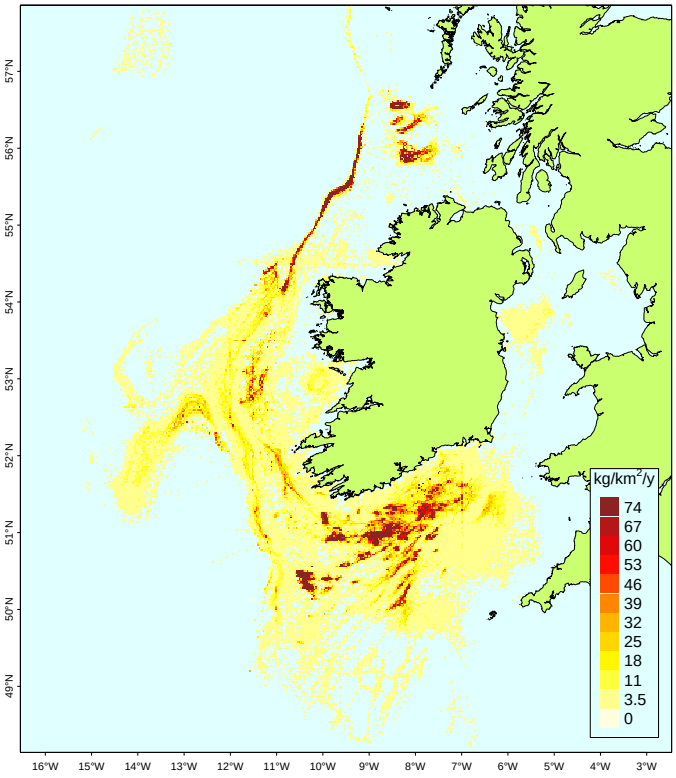
Hake landings

▼ International landings of hake in Sub-areas VI and VII and the share taken by each country. Landings have fluctuated between around 20 and 50kt per year. Since the early 1970s, Spain has generally taken the largest share of the landings while the Irish share in recent years has been around 10%.

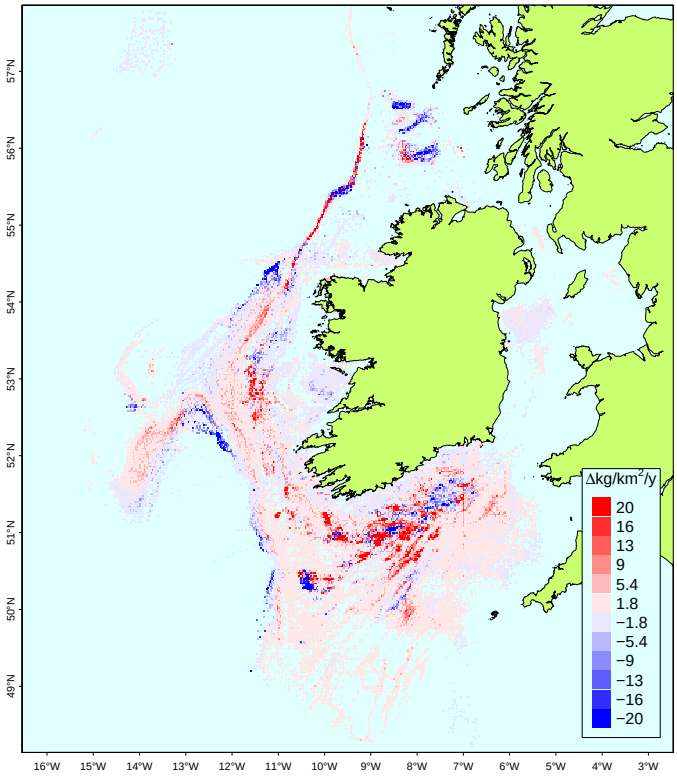


▶ The distribution of international landings of hake during 2012. Most hake landings were taken along the edge of the continental shelf.





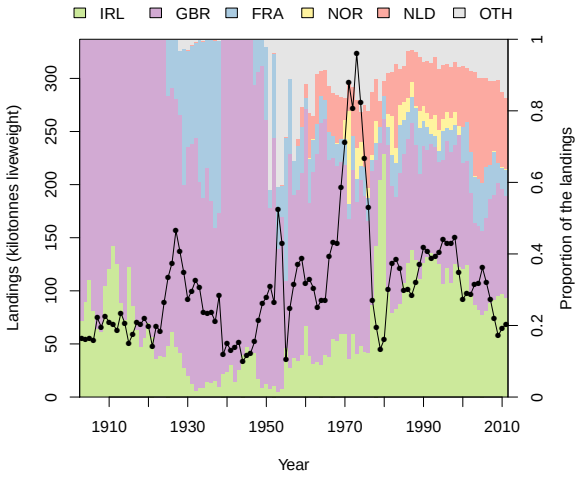
▲ The distribution of hake landings by Irish vessels ≥15m during 2008-12 (all gears). Vessels <15m landed virtually no hake. Hake are widely distributed along the continental shelf, most catches are taken at dephts of less than 200m but the highest catch rates are at depths between 600 and 800m, particularly in Sub-area VI.



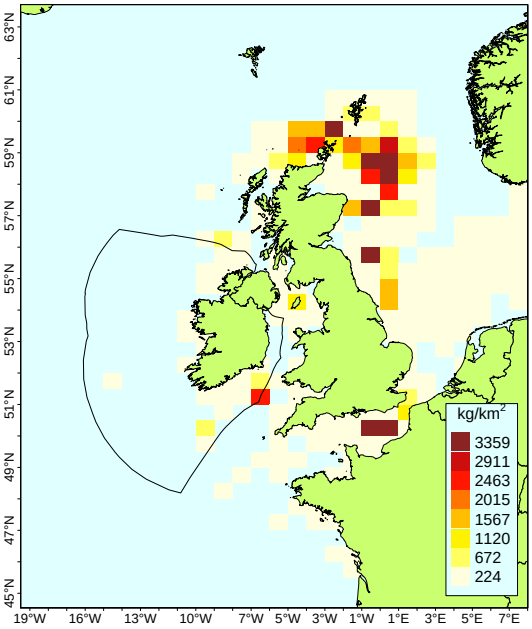
▲ The trend in hake landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings have increased in some areas while they have decreased in others. This is partially due to a change in availability of the stock and partly due to a change in the distribution of fishing effort.

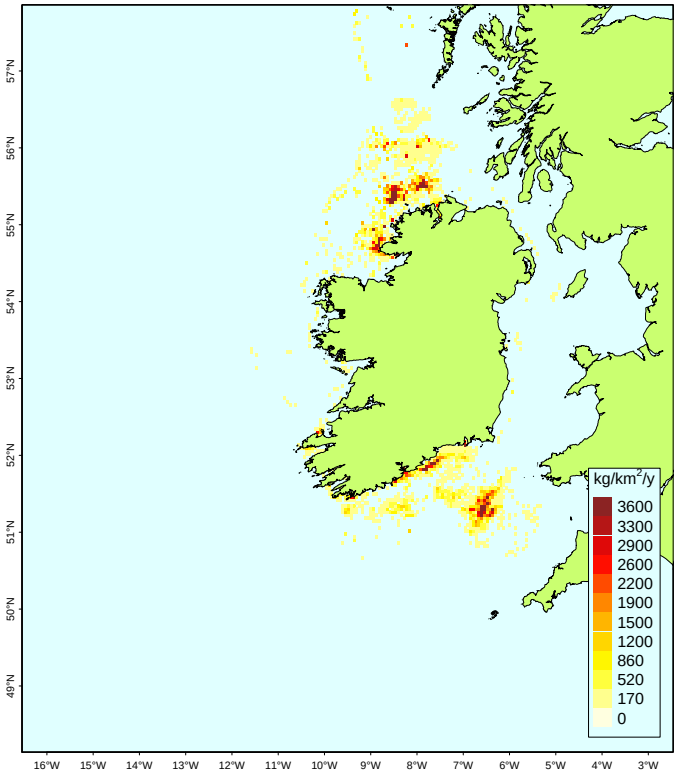
Herring landings

▼ International landings of herring in Sub-areas VI and VII and the share taken by each country. Herring landings peaked in the 1970s at more than 300kt after which the stocks in VII collapsed. Landings increased again in the early 1980s but remained below 150kt. Ireland takes around 30% of the landings in VI and VII.

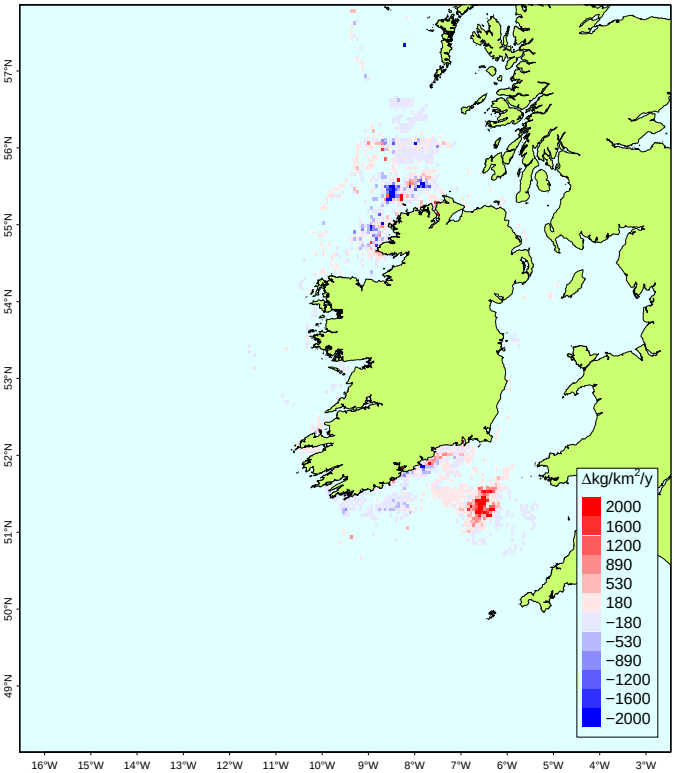


▶ The distribution of international landings of herring during 2012. Most herring landings in the area were taken from the northern North Sea and the English Channel.





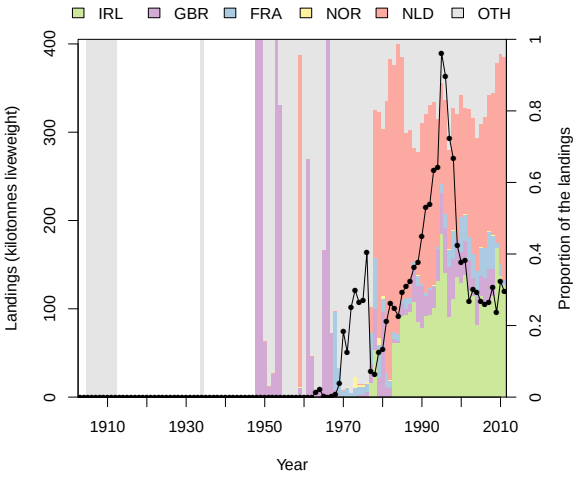
▲ The distribution of herring landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute 5% of the total landings, these vessels mainly operate inshore in the northern Celtic Sea. Spawning aggregations of herring are targeted over gravelly grounds, but they are also caught outside the spawning season over other bottom types.



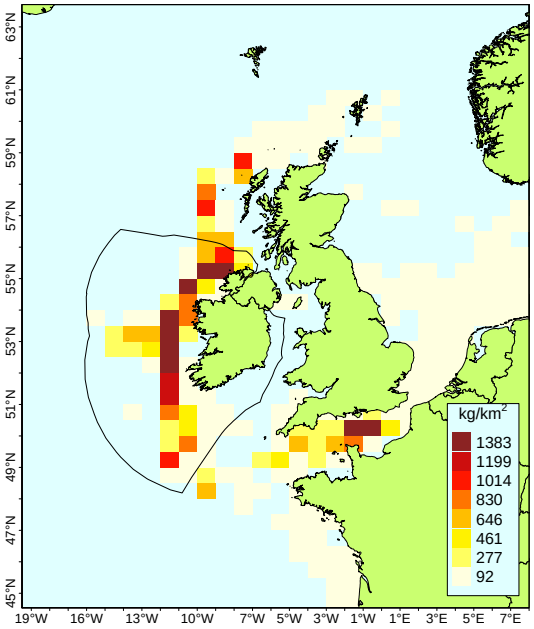
▲ The trend in herring landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings increased on the Smalls grounds following a change in the distribution of the stock. Landings to the North of Ireland have generally decreased.

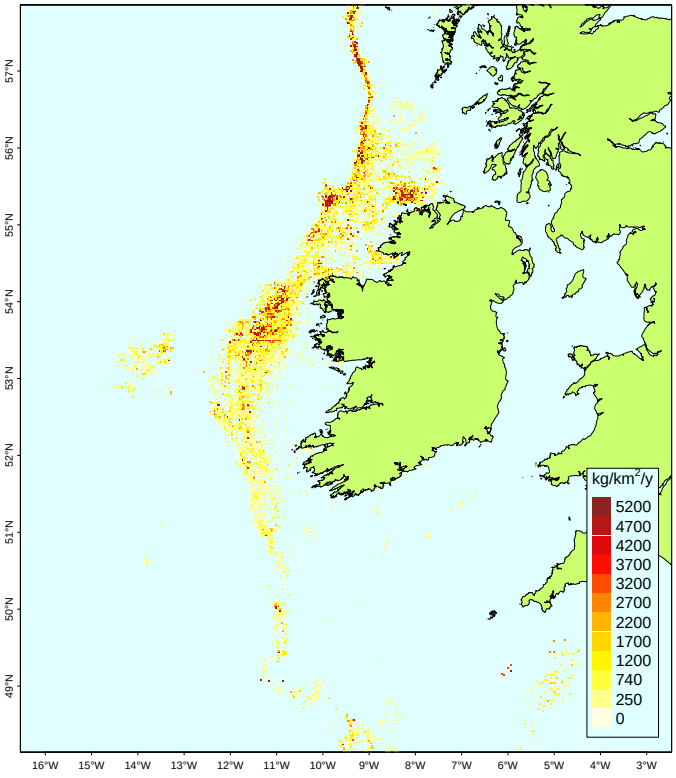
Horse mackerel landings

▼ International landings of horse mackerel in Sub-areas VI and VII and the share taken by each country. Landings increased sharply from the late 1970s and peaked just under 400kt in 1995. The landings have been dominated by the Netherlands (around 50%) and Ireland (around 25%). Many of the Irish landings are taken outside the Irish EEZ.

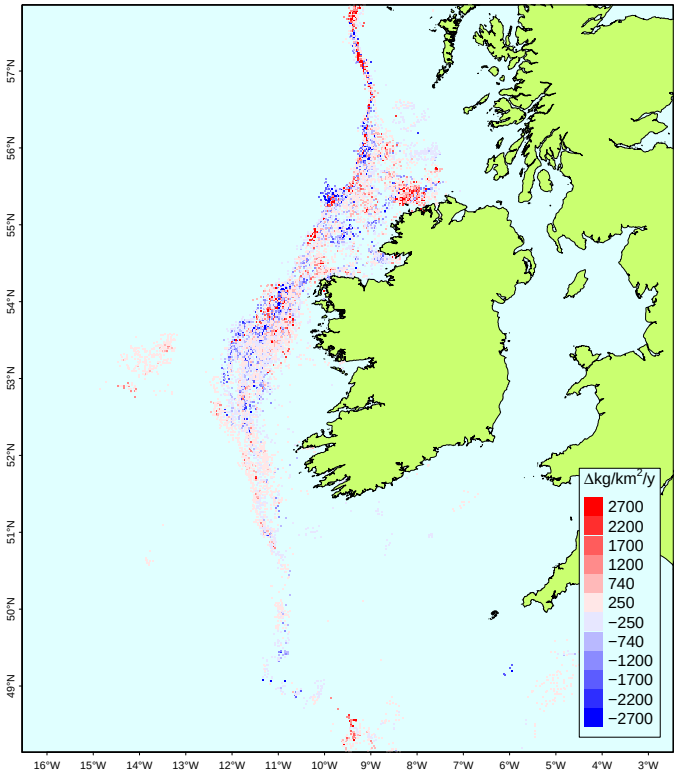


▶ The distribution of international landings of horse mackerel during 2012. Most horse mackerel landings were taken along the edge of the continental shelf to the west of the UK and Ireland.





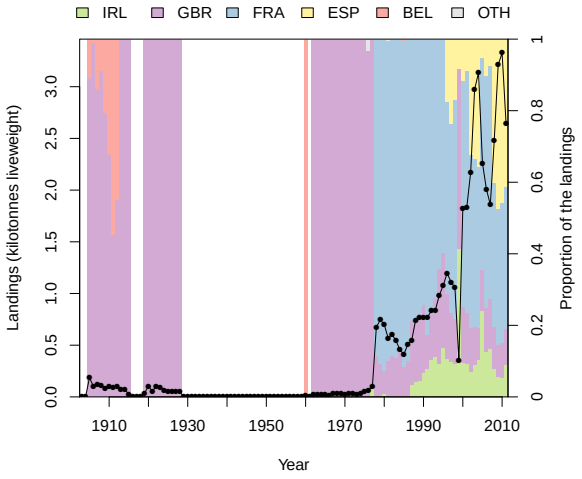
▲ The distribution of horse mackerel landings by Irish vessels ≥15m during 2008-12 (all gears). Vessels <15m did not land horse mackerel. The main catches are taken around the 200m depth contour.



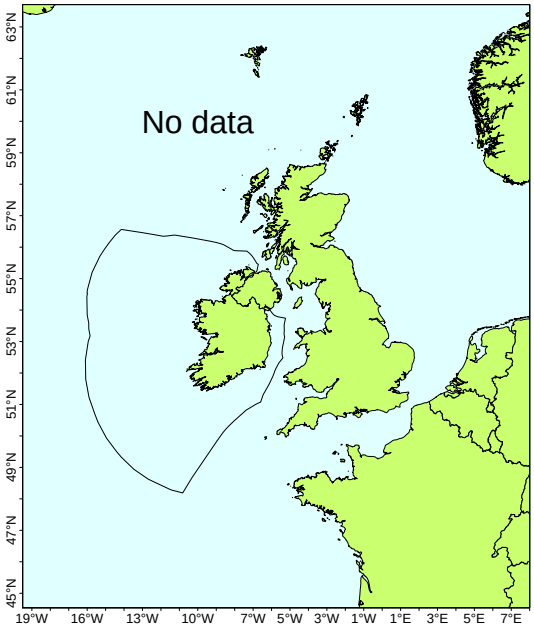
▲ The trend in horse mackerel landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). There is no obvious pattern in these trends.

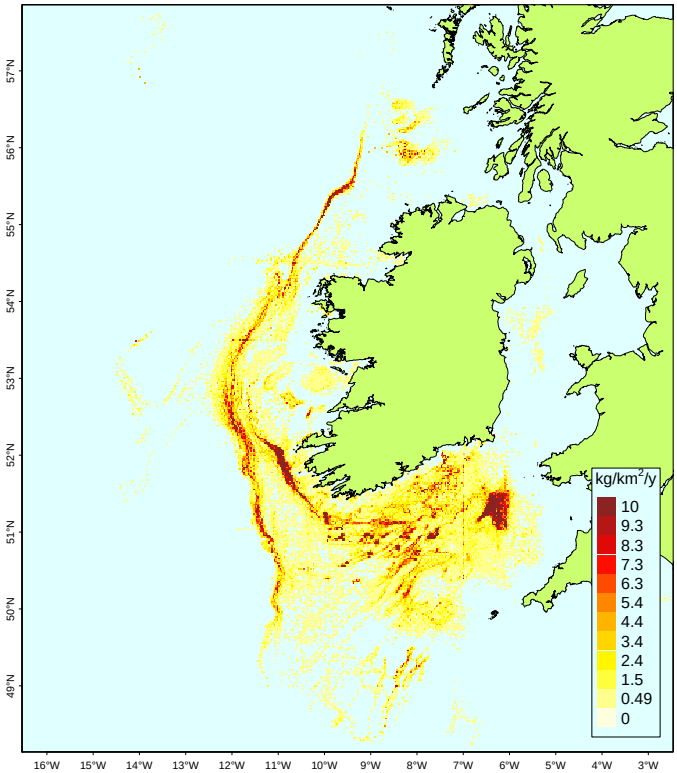
John dory landings

▼ International landings of john dory in Sub-areas VI and VII and the share taken by each country. Landings have increased since the late 1970s and are dominated by France and Spain. Ireland takes around 10% of the landings.

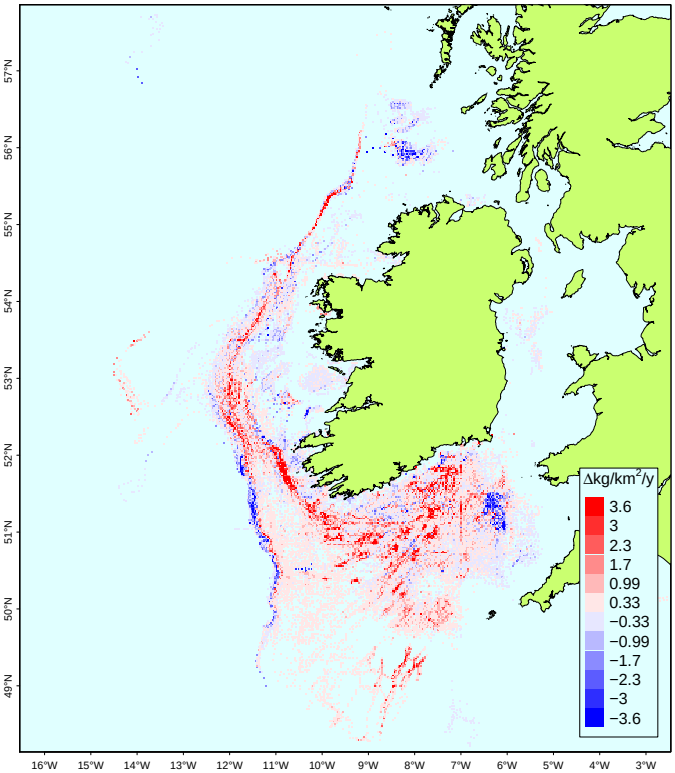


▶ No data on the distribution of international landings of john dory during 2012 were available from STECF.





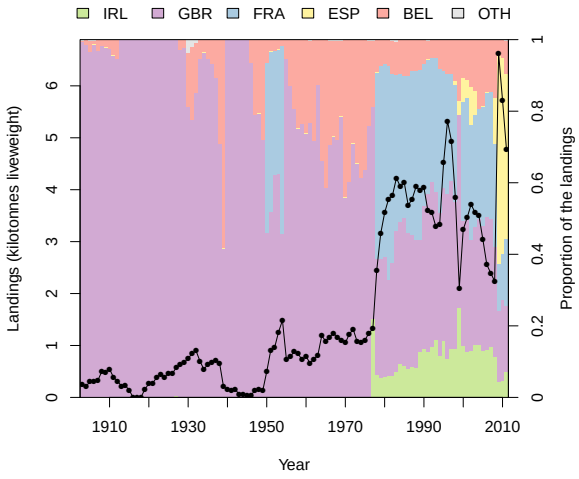
▲ The distribution of john dory landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute less than 4% of the total landings. John dory landings are widely distributed in the Celtic Sea and along the continental shelf.



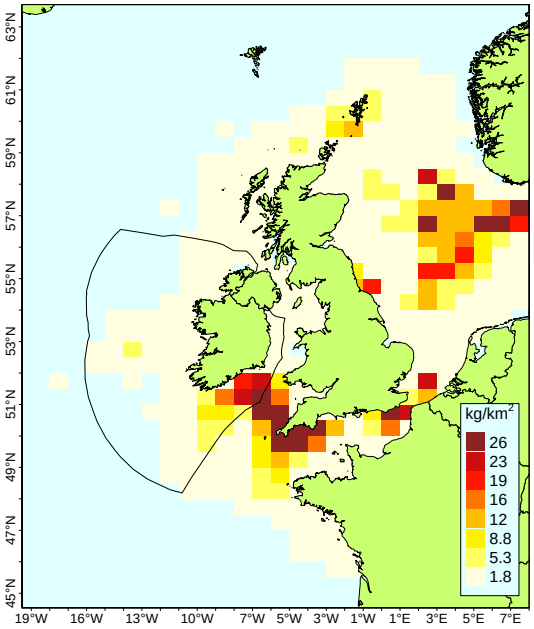
▲ The trend in john dory landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings increased in most areas.

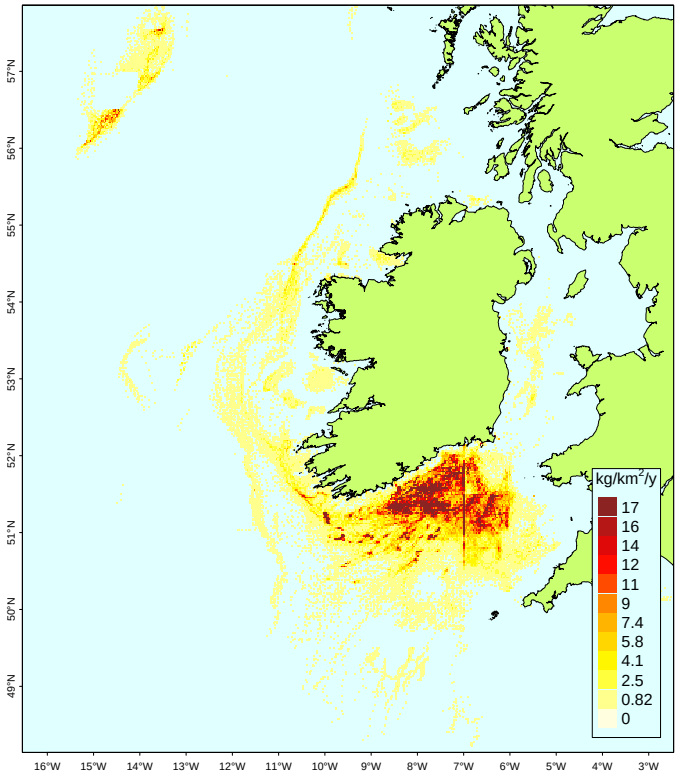
Lemon sole landings

▼ International landings of lemon sole in Sub-areas VI and VII and the share taken by each country. Landings rapidly increased in the early 1980s and have been relatively stable around 4kt per year since. In recent years Spain has started to dominate the landings while the Irish share has decreased to less than 10%.

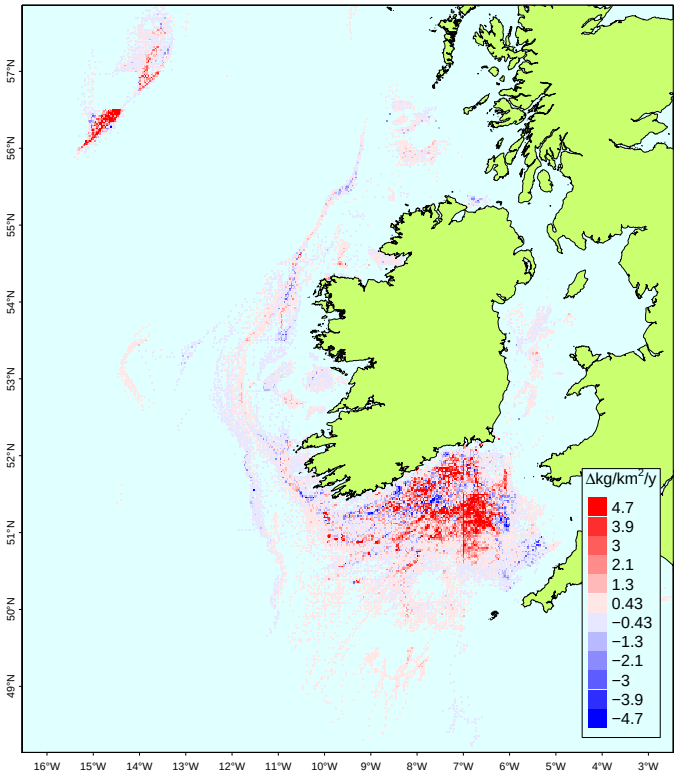


▶ The distribution of international landings of lemon sole during 2012. Lemon sole landings were taken mostly from the Celtic Sea, the English Channel and the eastern North Sea.





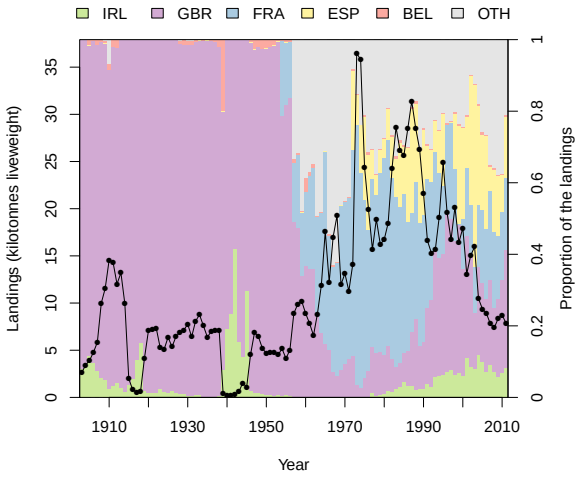
▲ The distribution of lemon sole landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute 9% of the total landings, these vessels mainly operate off the south cost of Ireland. Lemon sole are mainly caught in the Celtic Sea.



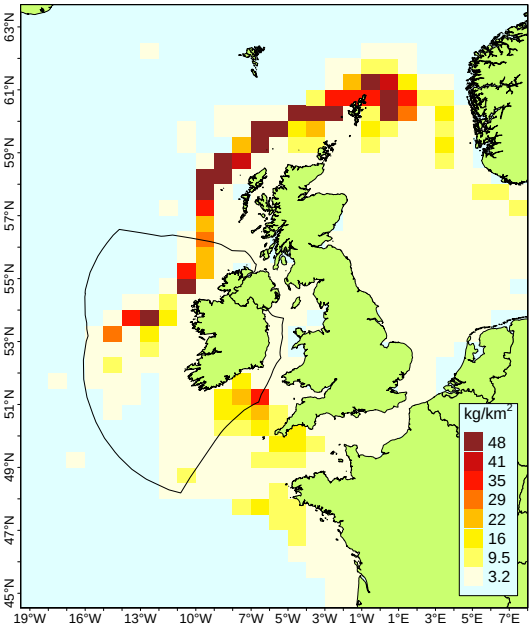
▲ The trend in lemon sole landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings increased in most areas.

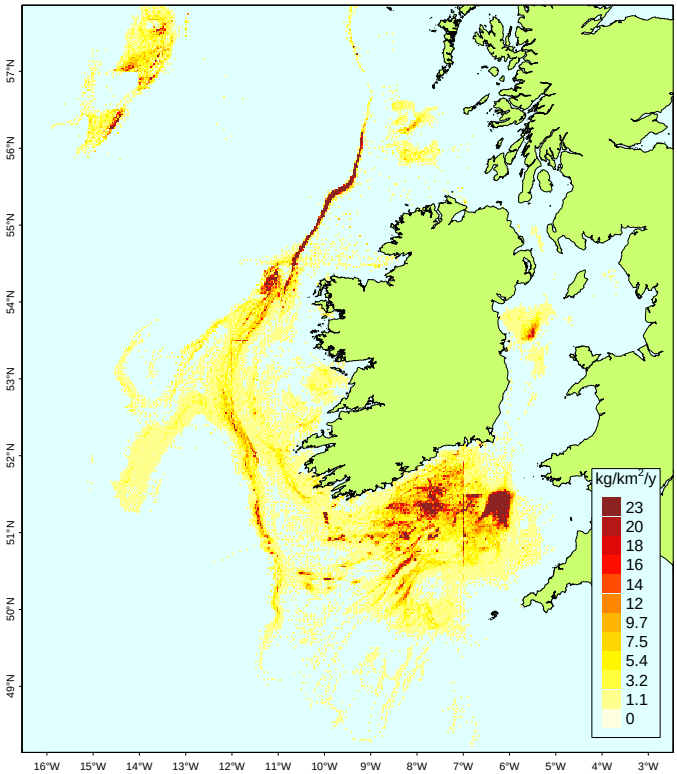
Ling landings

▼ International landings of ling in Sub-areas VI and VII and the share taken by each country. Landings increased from the end of WWII until mid 1970s when they peaked at more than 35kt. The landings have shown a general declining trend since. The UK dominate the landings and Ireland takes less than 10%.

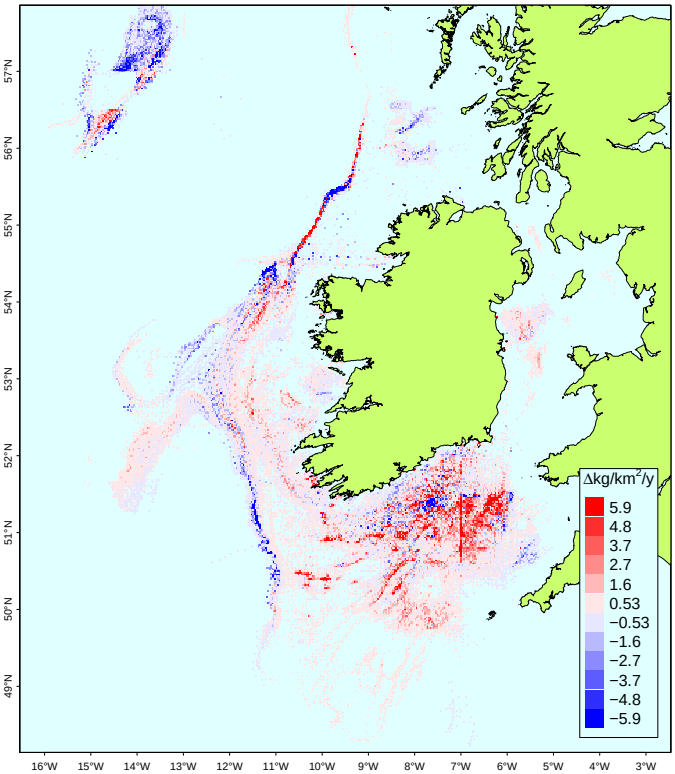


▶ The distribution of international landings of ling during 2012. Most of the landings were taken along the edge of the continental shelf from the Shetlands to the west of Ireland.





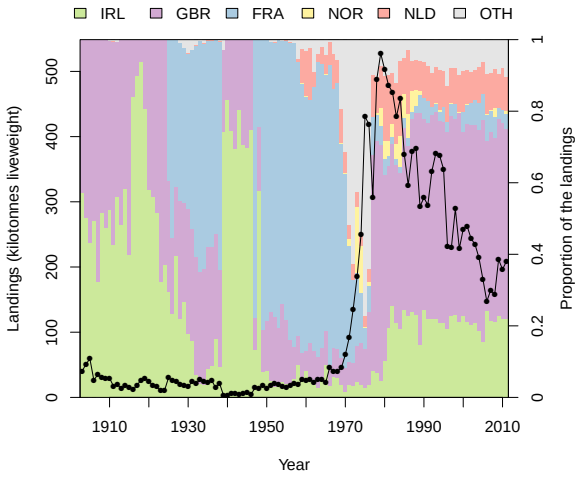
▲ The distribution of ling landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute 7% of the total landings, these vessels mainly operate in-shore in the Celtic Sea. The highest catch rates of ling are along the continental shelf edge between 200 and 300m but they are also widely distributed along the rest of the continental shelf.



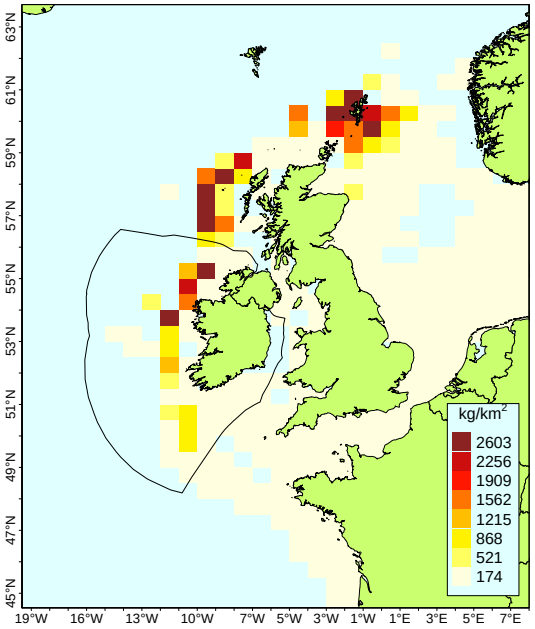
▲ The trend in ling landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings increased in most areas in the Celtic Sea and decreased along the slope and off Rockall following a reduction of fishing effort in these areas.

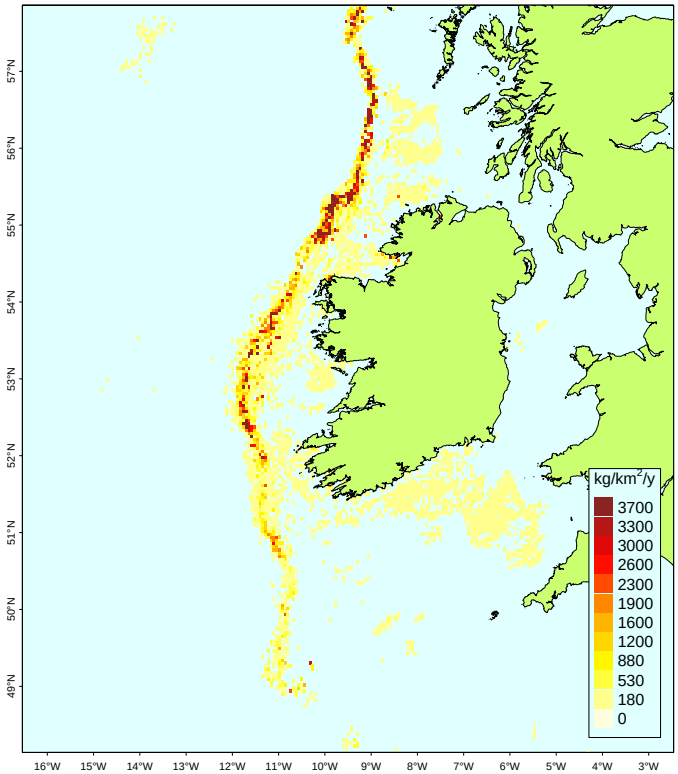
Mackerel landings

▼ International landings of mackerel in Sub-areas VI and VII and the share taken by each country. Landings increased sharply during the 1970s and peaked at more than 500kt in 1979 after which they showed a declining trend. The landings have been dominated by the UK, Ireland takes around 20%.

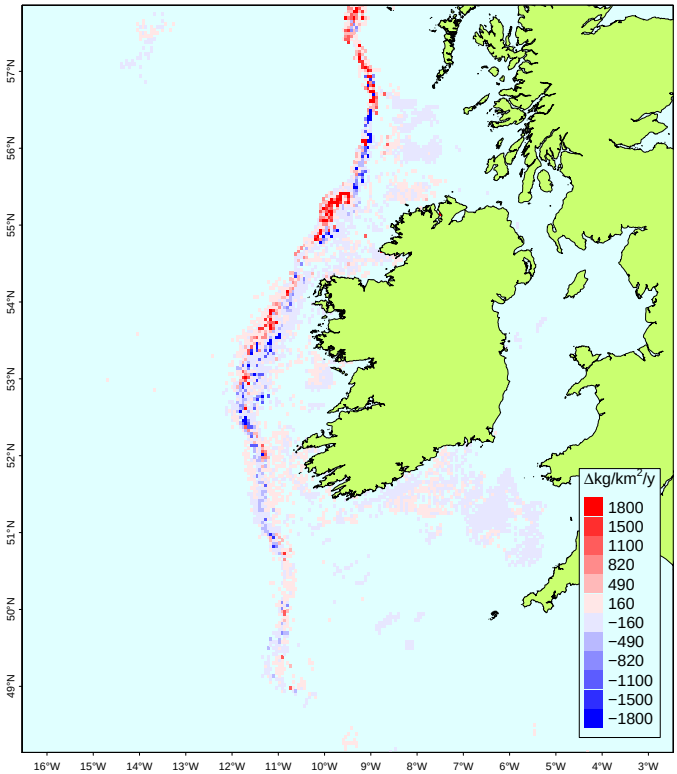


▶ The distribution of international landings of mackerel during 2012. Most of the landings were taken along the edge of the continental shelf from the Shetlands to the west of Ireland.





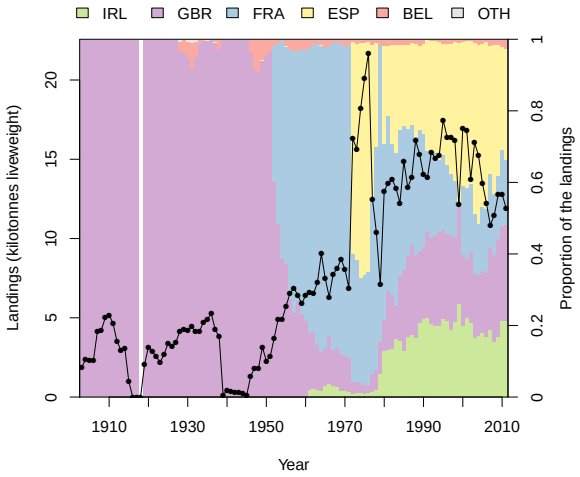
▲ The distribution of mackerel landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute less than 1% of the total landings. The main catches of mackerel are around the 200m depth contour.



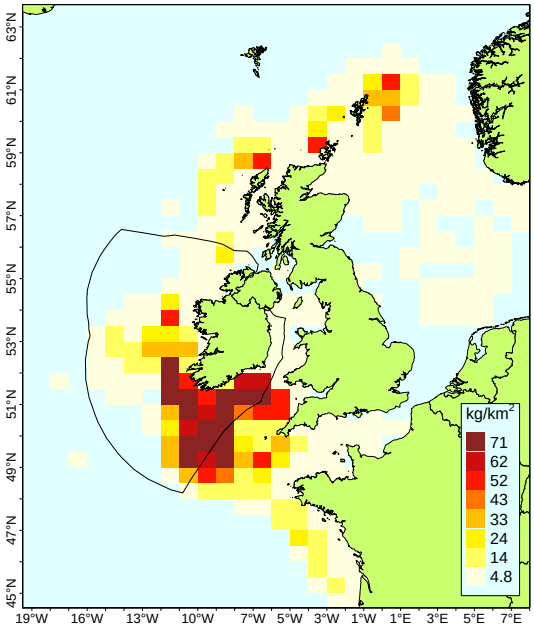
▲ The trend in mackerel landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). There is no obvious pattern in these trends.

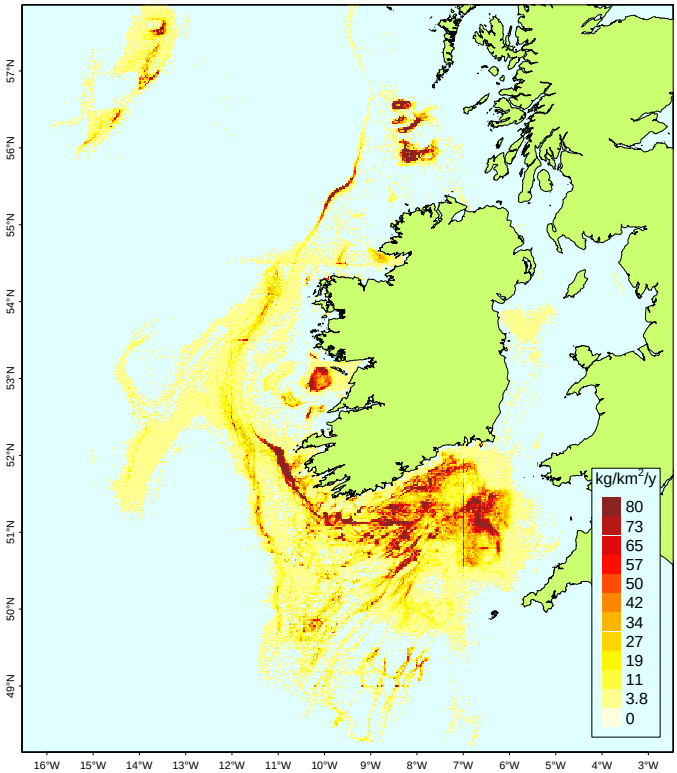
Megrim landings

▼ International landings of megrim in Sub-areas VI and VII and the share taken by each country. Landings increased from the end of WWII and peaked in 1977 at more than 20kt. Since the 1980s the landings have been relatively stable around 15kt per year. Spain dominates the landings and Ireland takes around 20%.

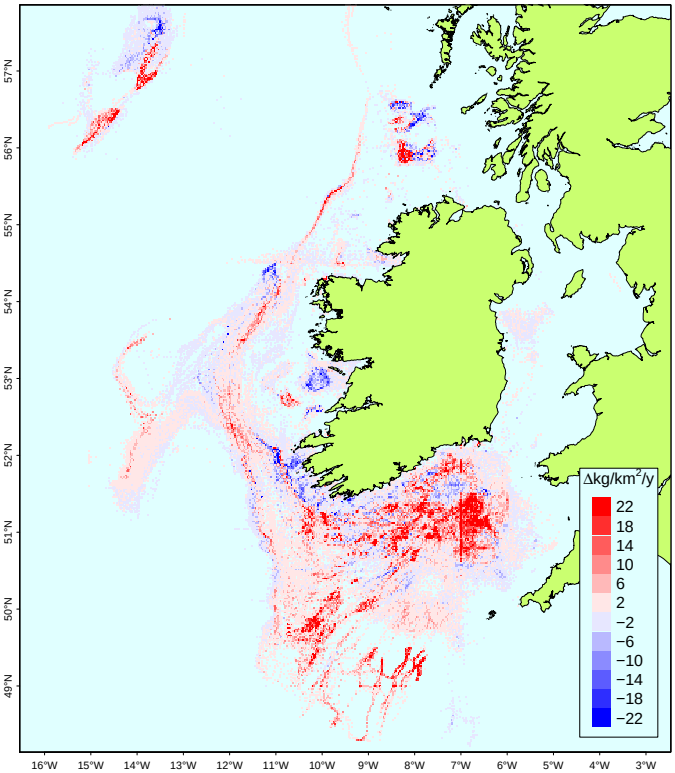


▶ The distribution of international landings of megrim during 2012. Most megrim landings were taken in the western Celtic Sea, but they were caught as far north as Shetland.





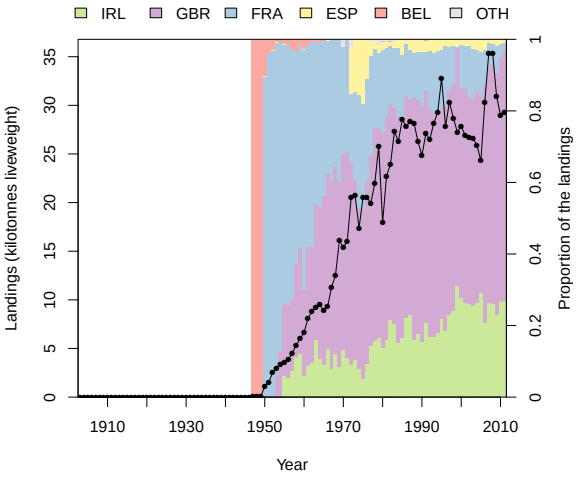
▲ The distribution of megrim landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute 7% of the total landings, these vessels mainly operate inshore in the Celtic Sea. Megrim are widely distributed along the continental shelf but the highest catch rates are in the south-western Celtic sea where there is very little Irish fishing effort.



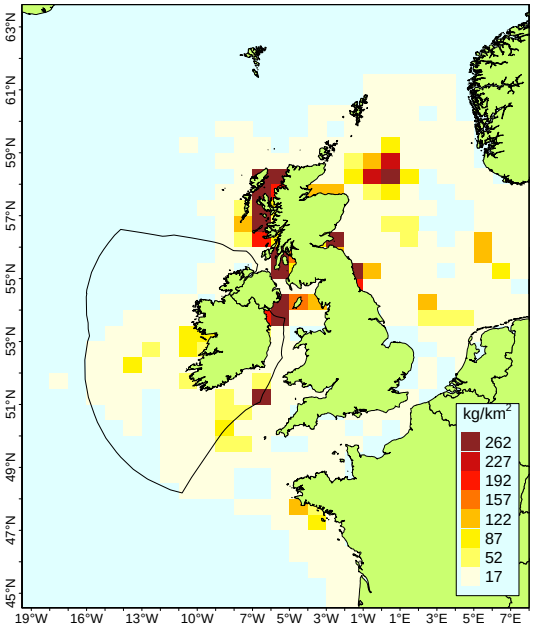
▲ The trend in megrim landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings increased in most areas although the stock has been relatively stable.

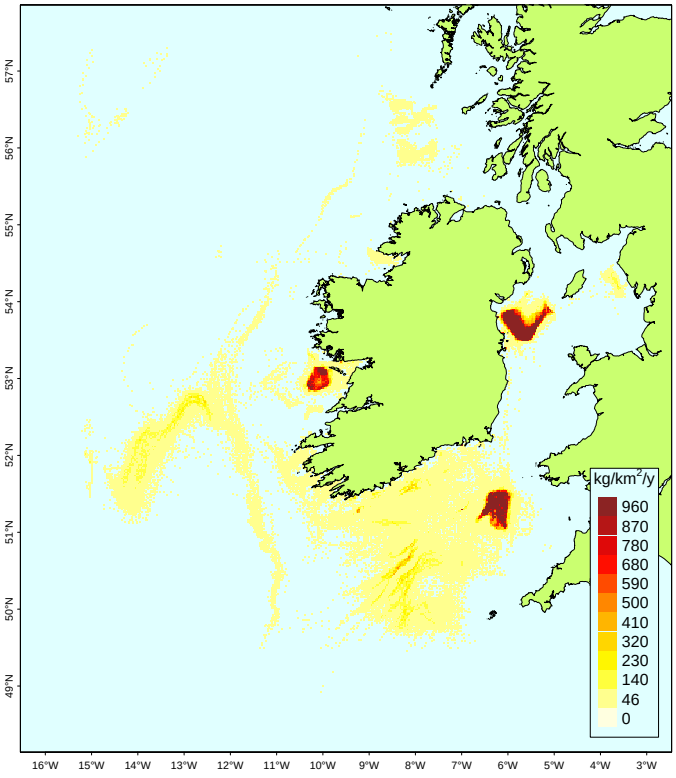
Nephrops landings

▼ International landings of *Nephrops* in Sub-areas VI and VII and the share taken by each country. Landings increased from the 1950s until around 1980 after which they were relatively stable around 30kt per year. The UK dominates the landings with Ireland taking around 25% in recent years.

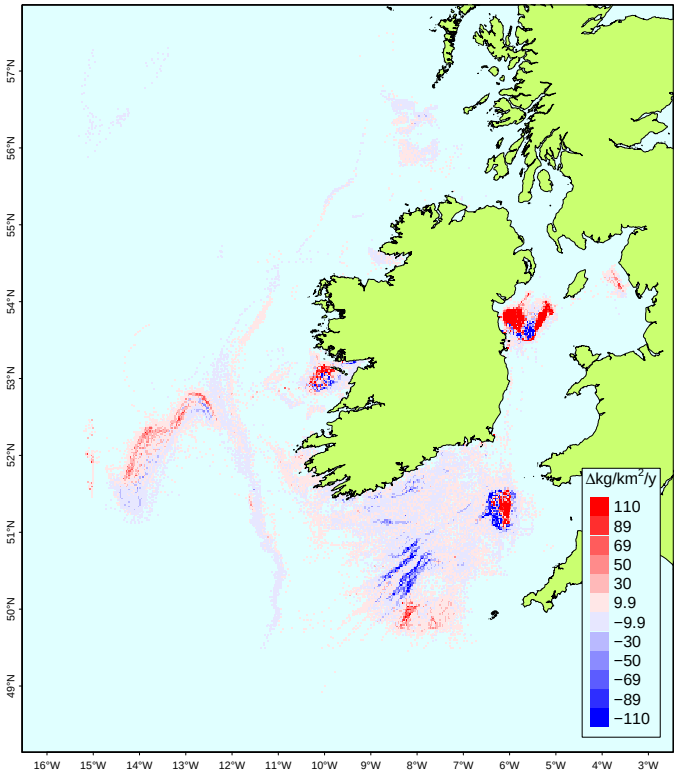


▶ The distribution of international landings of *Nephrops* during 2012. Most *Nephrops* landings were taken off the northern UK coast, but also in the western Irish sea and eastern Celtic Sea.





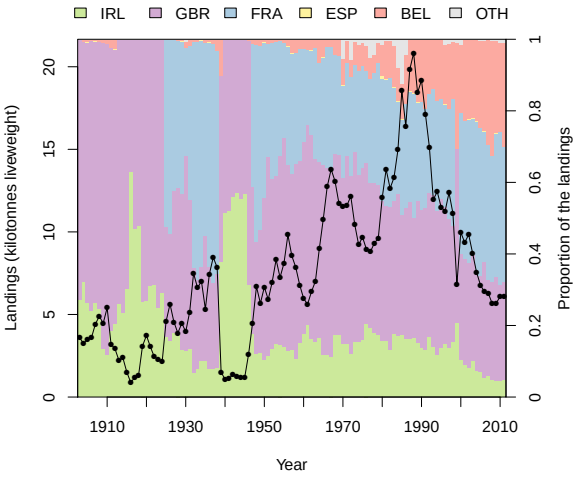
▲ The distribution of *Nephrops* landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute 10% of the total landings, these vessels mainly operate on the inshore *Nephrops* grounds in the Celtic Sea and on the Irish Sea *Nephrops* grounds.



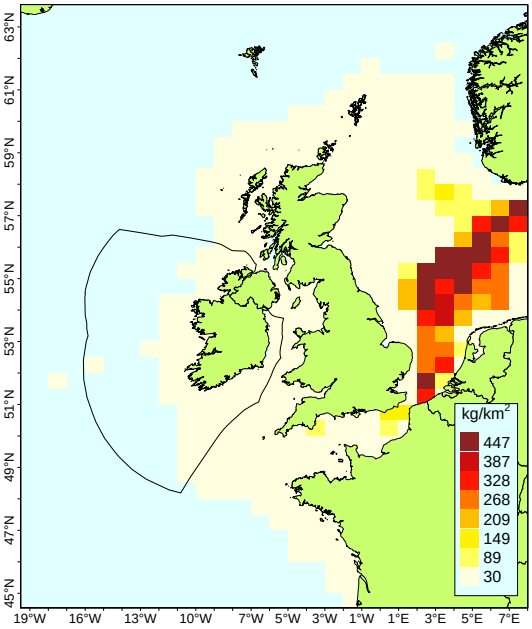
▲ The trend in *Nephrops* landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings increased on the main *Nephrops* grounds but decreased on the Labadie bank. These changes seem to be mainly a result of a change in fishing effort.

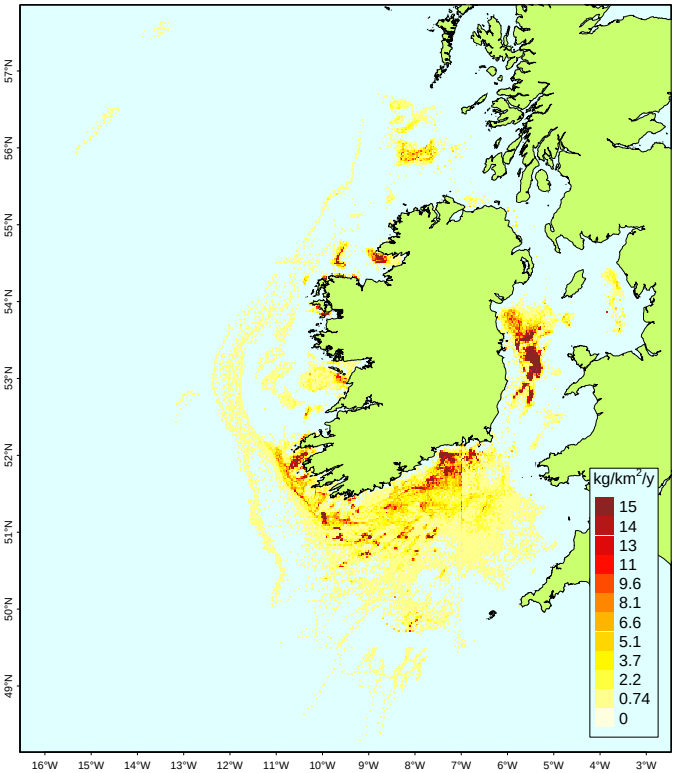
Plaice landings

▼ International landings of plaice in Sub-areas VI and VII and the share taken by each country. Landings peaked in the late 1980s at more than 20kt. Landings have now declined to around 7kt per year. The UK, France and Belgium each take around 30% of the landings, Ireland takes the remaining 5-10%.

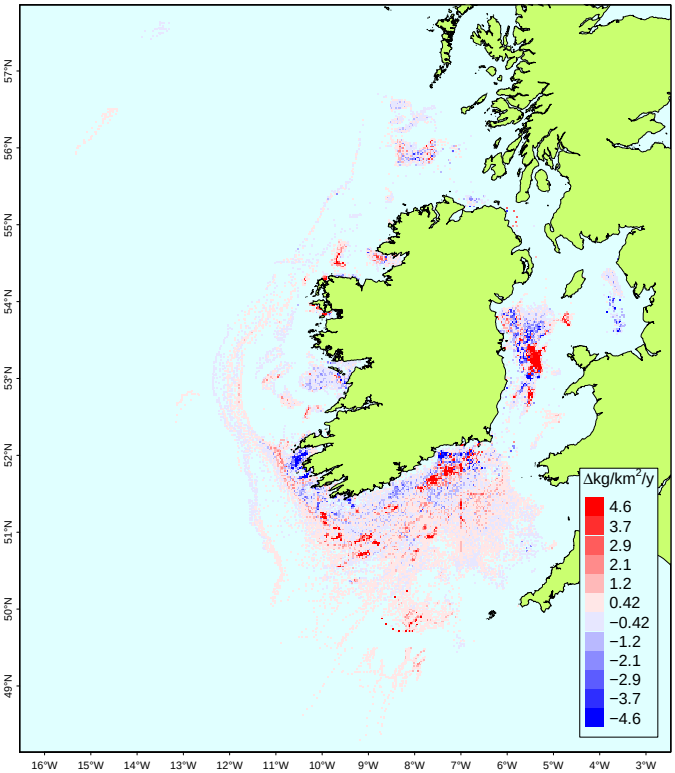


▶ The distribution of international landings of plaice during 2012. The vast majority of plaice landings were taken in the North Sea; landings from Irish waters were relatively minor.





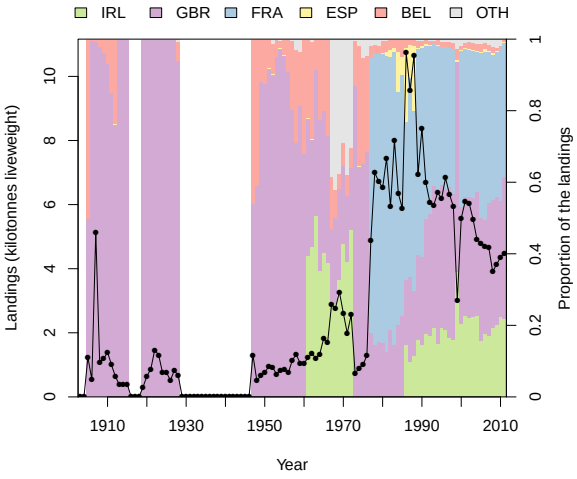
▲ The distribution of plaice landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute 23% of the total landings, these vessels mainly operate inshore along the south and west coast of Ireland. Plaice are caught on localised sandy patches in relatively shallow areas.



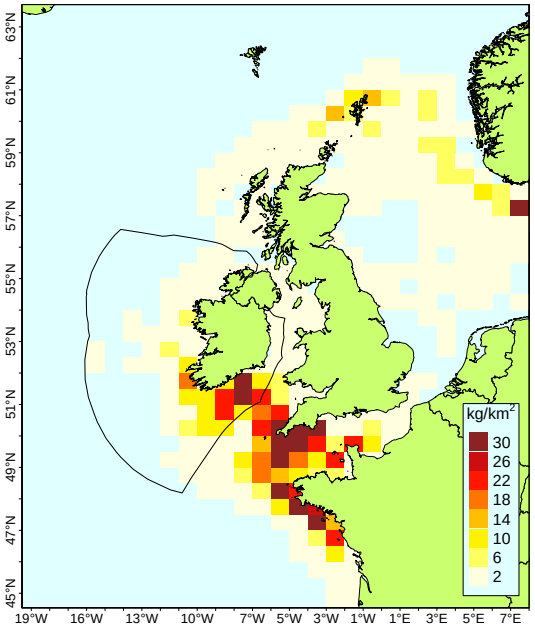
▲ The trend in plaice landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings decreased in many of the inshore grounds while they increased further offshore.

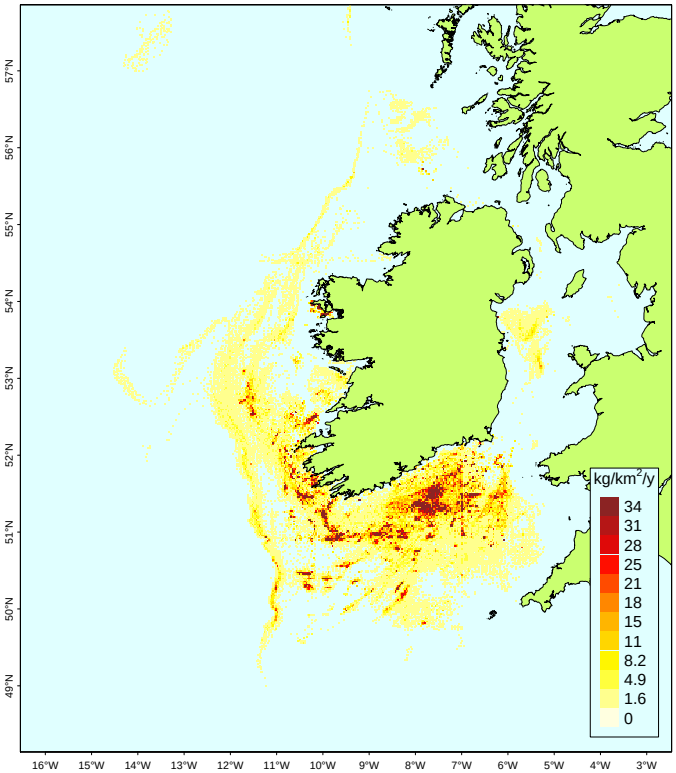
Pollack landings

▼ International landings of pollack in Sub-areas VI and VII and the share taken by each country. Landings peaked in the late 1980s around 10t per year and have shown a declining trend since. France and the UK dominate the landings and Ireland takes around 20%.

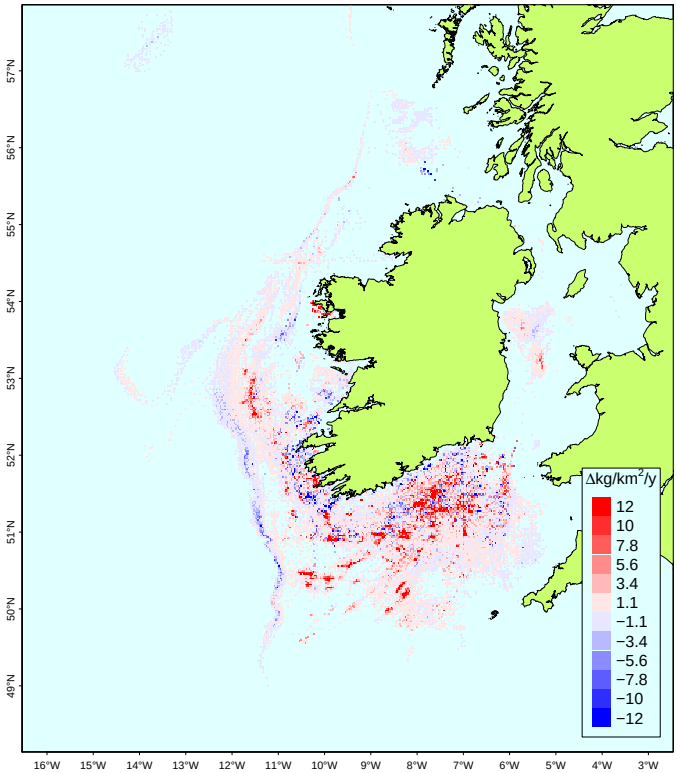


▶ The distribution of international landings of pollack during 2012. Most pollack landings were taken in the Celtic Sea, the western Channel and northern Biscay.





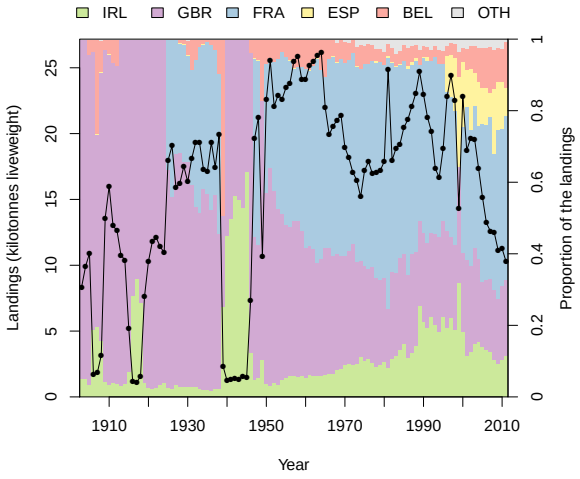
▲ The distribution of pollack landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute 46% of the total landings, these vessels mainly operate inshore off the south and south-west coast of Ireland. Pollack are caught on hard ground, often around wrecks.



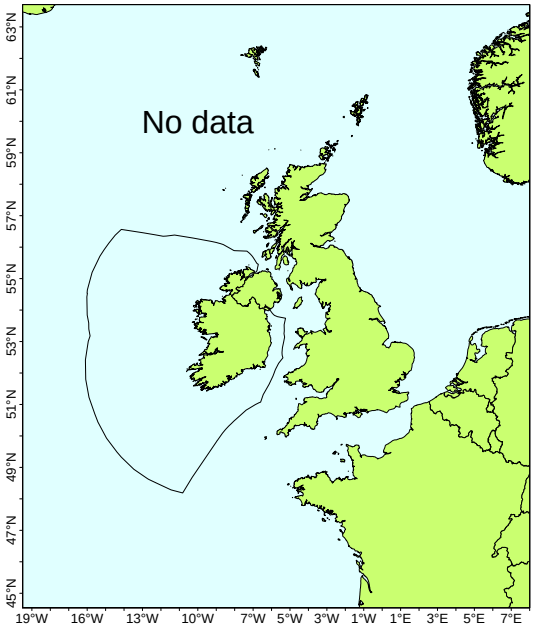
▲ The trend in pollack landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings increased in most areas except along the slope and on some inshore grounds off the south-west coast of Ireland.

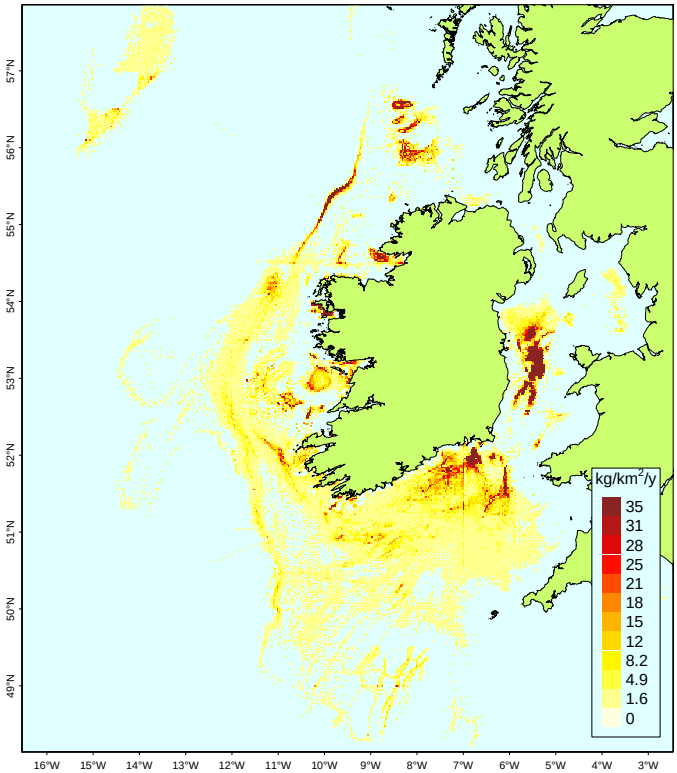
Rays and skates landings

▼ International landings of rays and skates in Sub-areas VI and VII and the share taken by each country. Landings have been relatively stable from 1950 to 2000 but have been declining since. France takes most of the landings and Ireland takes around 10%.

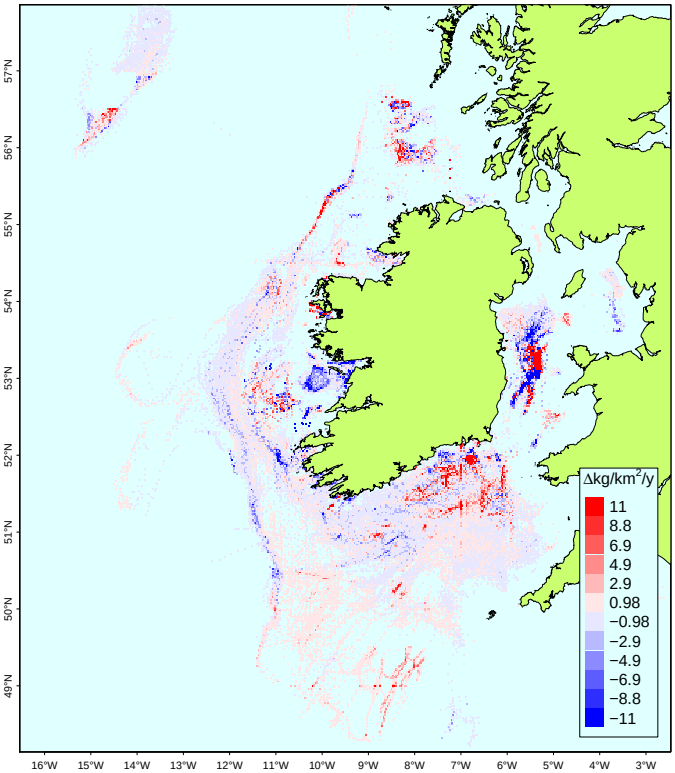


▶ Data from STECF on the distribution of international landings of rays and skates during 2012 are incomplete and therefore not shown here.





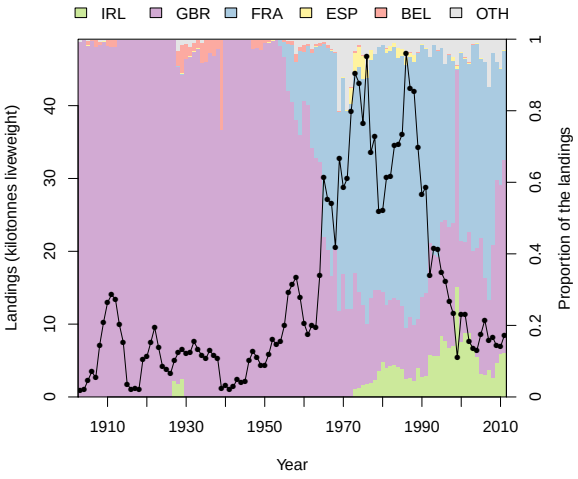
▲ The distribution of rays and skates landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute 21% of the total landings, these vessels mainly operate inshore off the south and west coast of Ireland. The highest catch rates of rays and skates are on sandy grounds in the southern Irish Sea and St George's Channel.



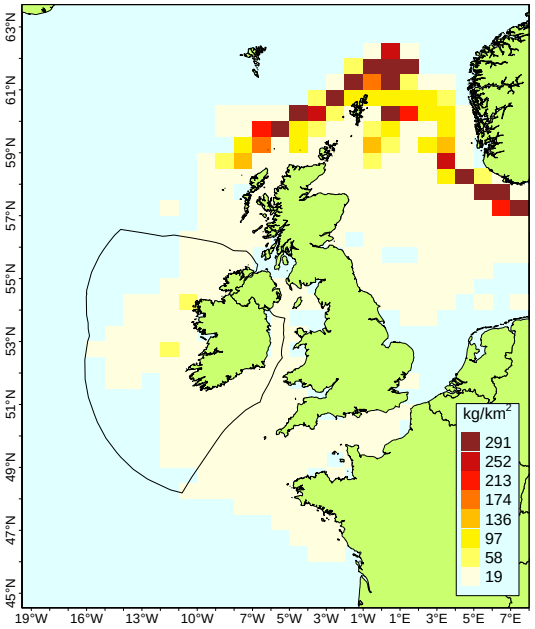
▲ The trend in rays and skates landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings increased in some areas and decreased in others. This is partially due to a change in availability of the stocks and partly due to a change in the distribution of fishing effort.

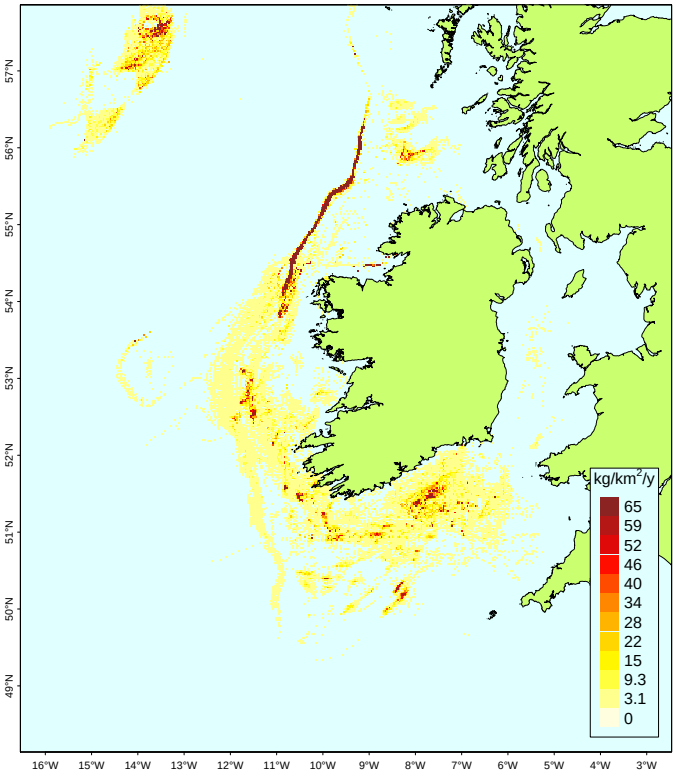
Saithe landings

▼ International landings of saithe in Sub-areas VI and VII and the share taken by each country. Landings peaked in the 1970s and again in the late 1980s at more than 40kt per year. France takes the majority of landings and Ireland has taken around 10% in recent years.

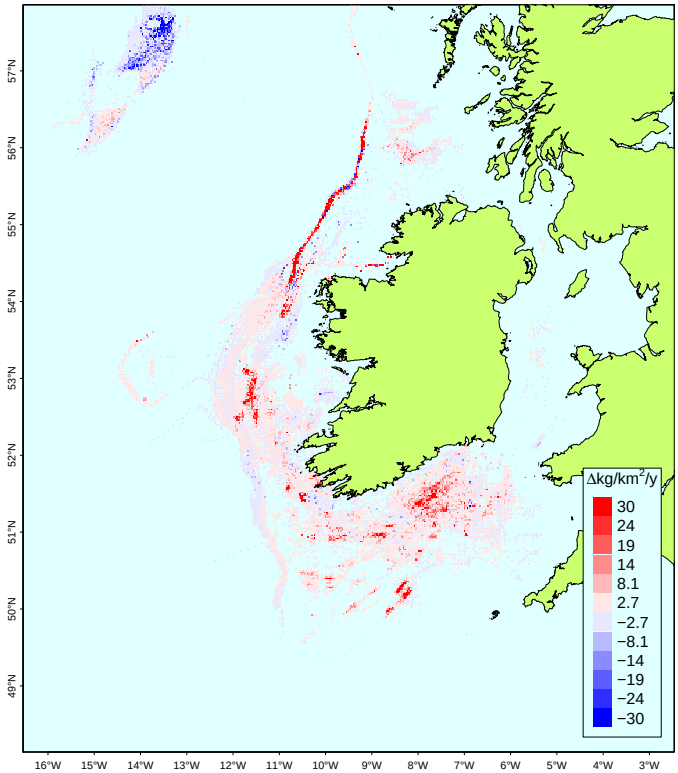


▶ The distribution of international landings of saithe during 2012. Most saithe landings were taken along the edge of the continental shelf and in the Norwegian trench.





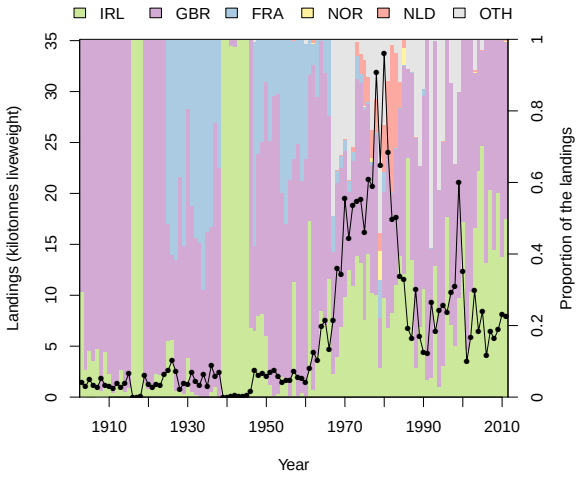
▲ The distribution of saithe landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute 16% of the total landings, these vessels mainly operate inshore off the south and south-west coast of Ireland. Saithe are mainly caught along the continental shelf edge between 100 and 350m depth in Sub-area VI.



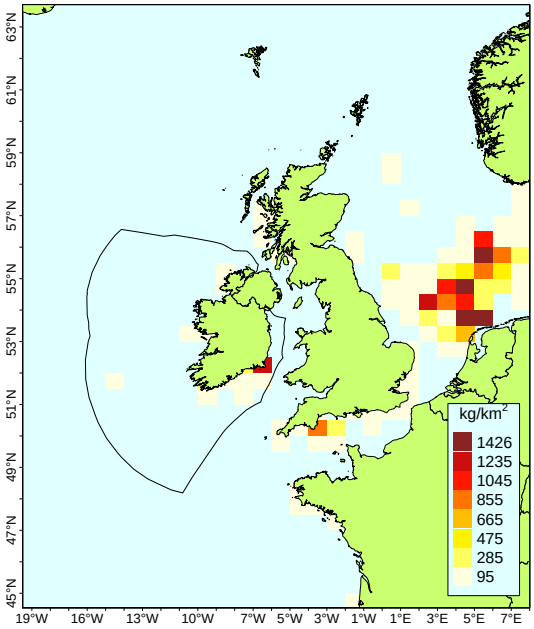
▲ The trend in saithe landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings increased in most areas except off Rockall where fishing effort has decreased.

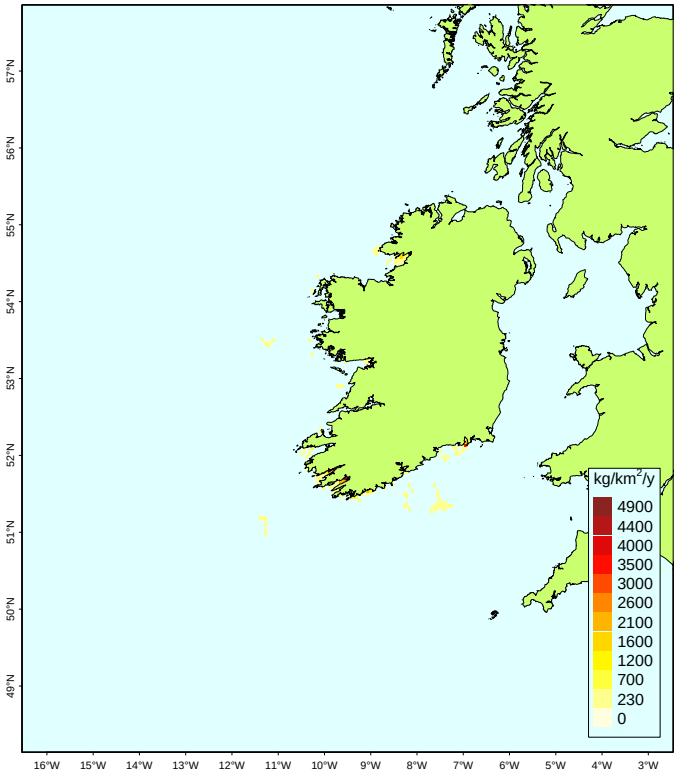
Sprat landings

▼ International landings of sprat in Sub-areas VI and VII and the share taken by each country. Landings increased since 1960 and peaked just under 35kt in 1980. Landings sharply declined since and have been around 5-10kt per year in recent years. Ireland and the UK have taken about half of the landings each in recent years.

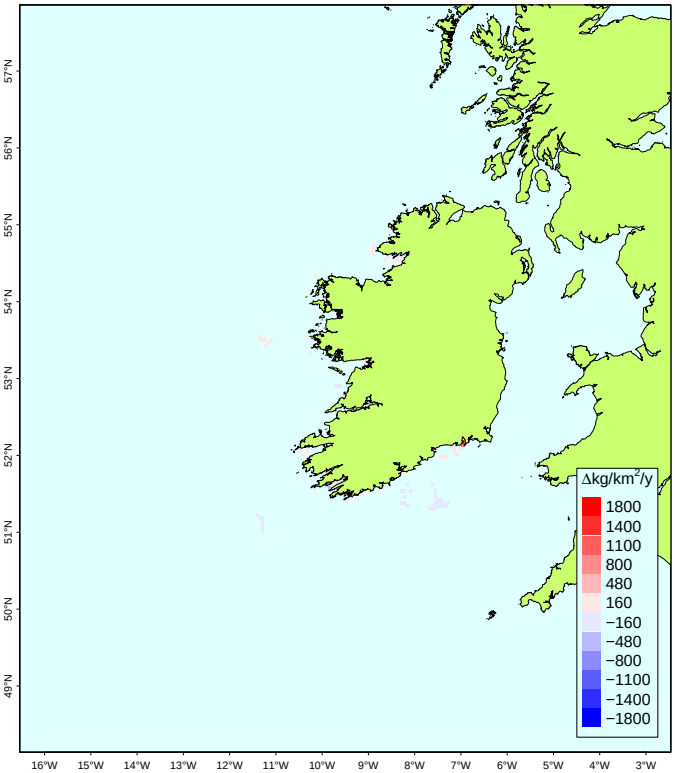


▶ The distribution of international landings of sprat during 2012. Most sprat landings were taken from the North Sea.





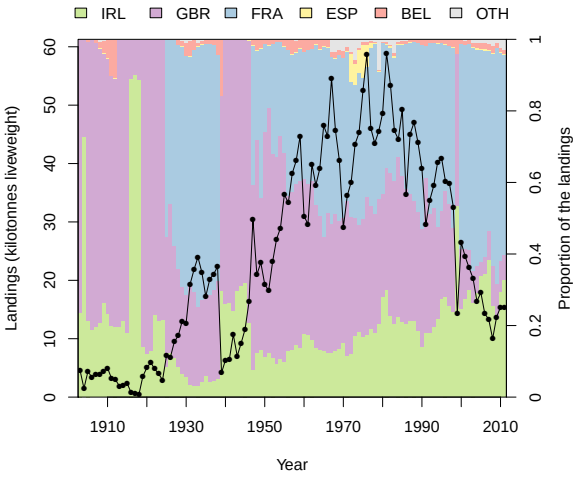
▲ The distribution of sprat landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute 51% of the total landings. The catches are highly localised and mainly take place inside bays and are therefore difficult to distinguish in this map. Sprat are targeted during the winter months.



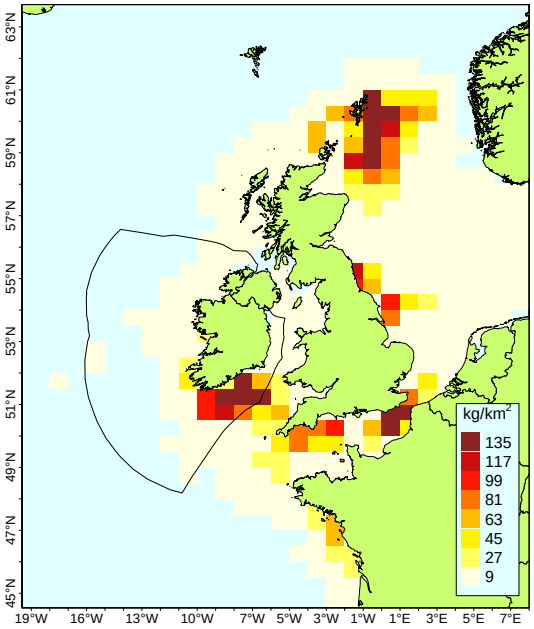
▲ The trend in sprat landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings increased in most areas.

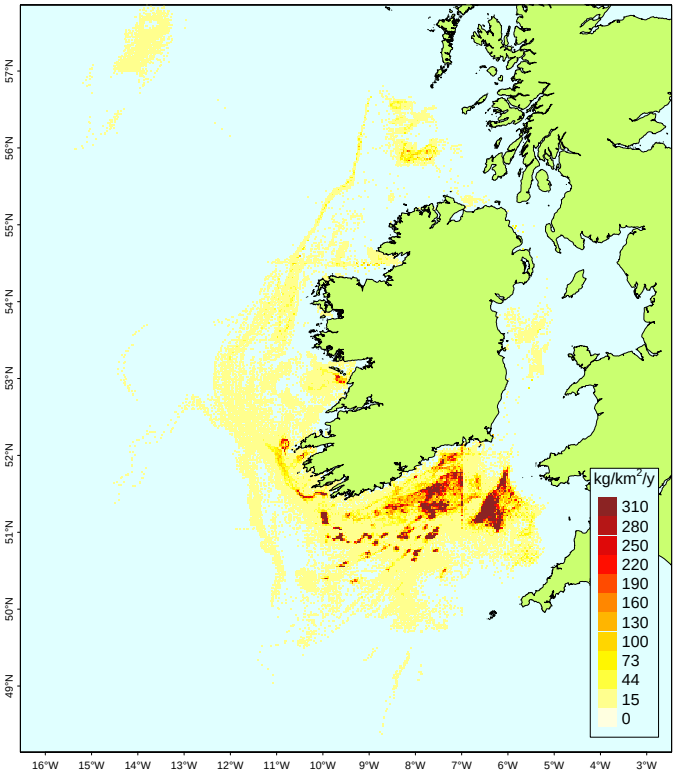
Whiting landings

▼ International landings of whiting in Sub-areas VI and VII and the share taken by each country. Landings increased from the 1920s to the early 1980s when they peaked just below 60kt. Landings have shown a declining trend since. France dominates the landings and Ireland has taken around 30% of the landings in recent years.

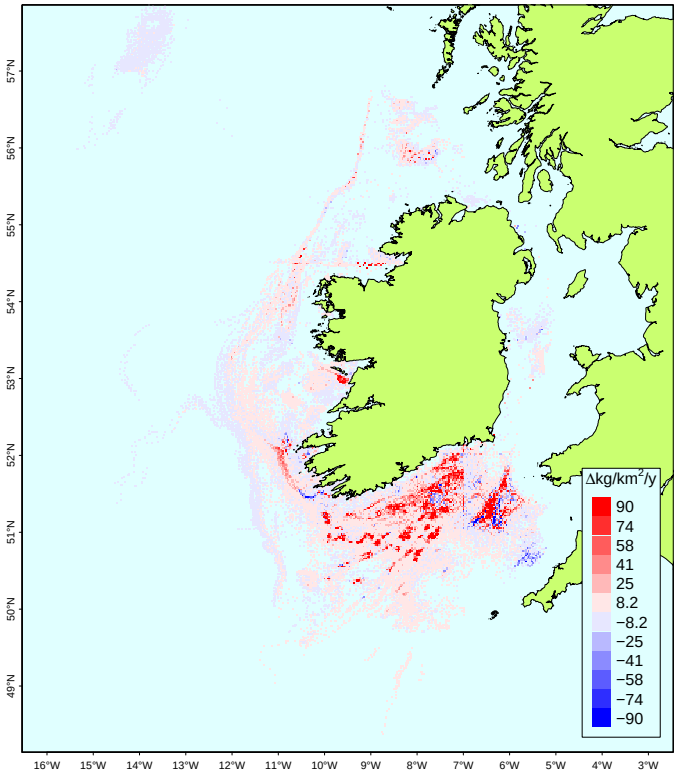


▶ The distribution of international landings of whiting during 2012. Most whiting landings were taken from the northern and western North Sea, the English Channel and the Celtic Sea.





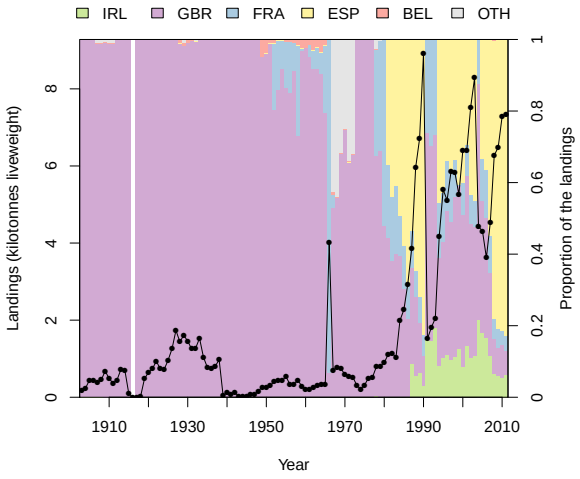
▲ The distribution of whiting landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute 6% of the total landings, these vessels mainly operate inshore off the south and south-west coast.



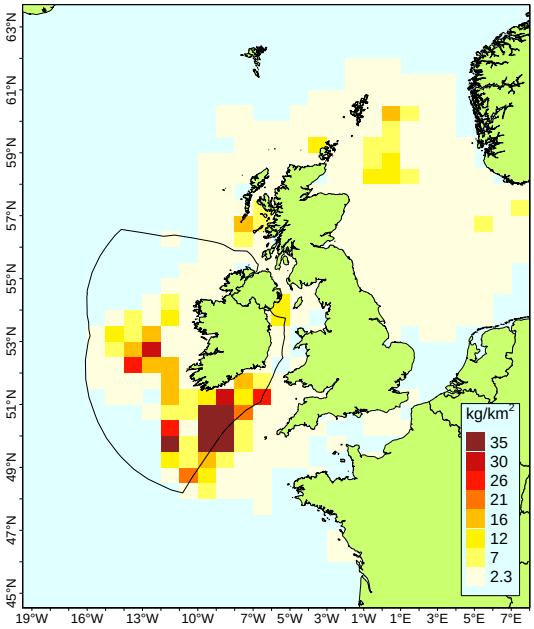
▲ The trend in whiting landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings increased in most areas except in the Northern Celtic Sea. The general increase in landings is due to an increase in the stock size following good recruitment in the Celtic Sea 2008 and 2009.

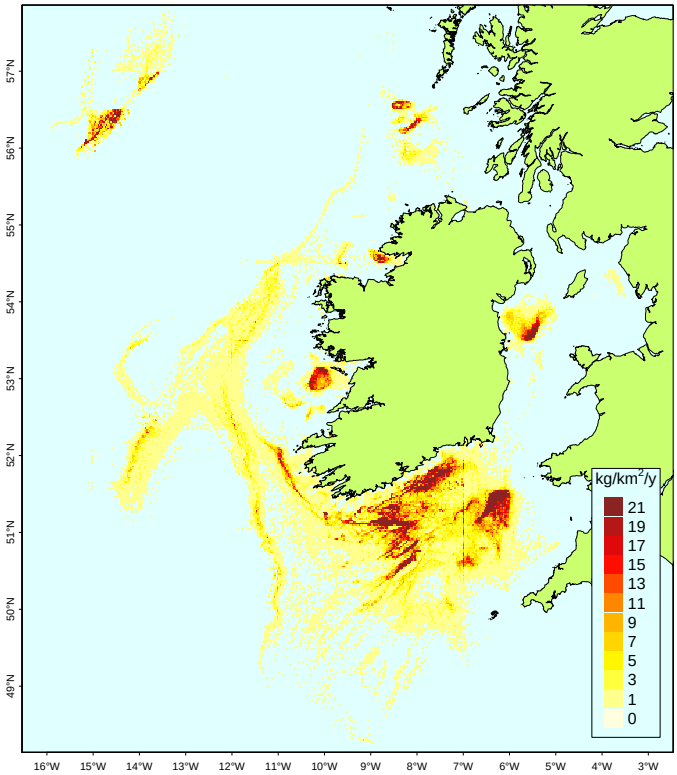
Witch landings

▼ International landings of witch in Sub-areas VI and VII and the share taken by each country. Landings suddenly increased in the 1980s and peaked in 1990 just over 8kt. Landings have fluctuated between 2 and 8 kt per year since. Spain takes the vast majority of the landings and Ireland's share of the landings has decreased to less than 10% in recent years.

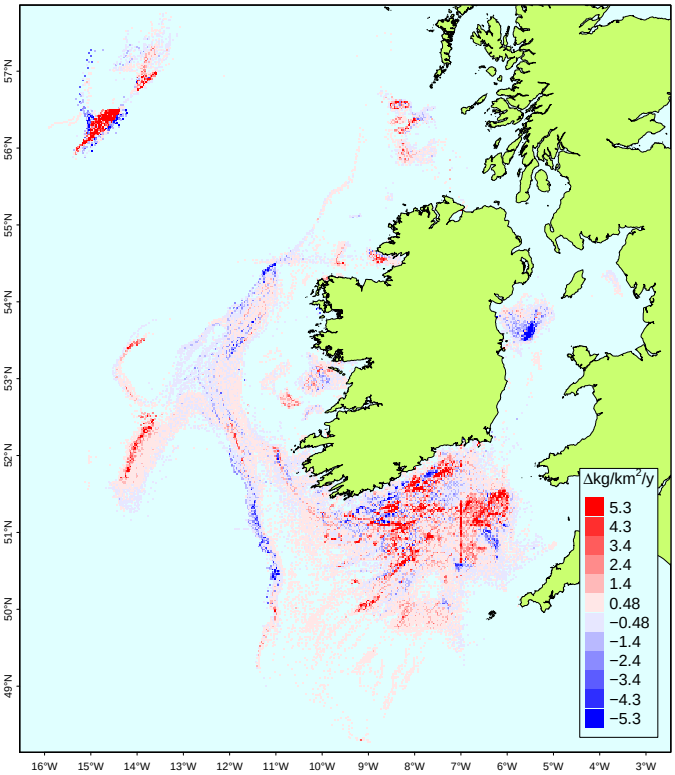


▶ The distribution of international landings of witch during 2012. Most witch landings were taken from the Celtic Sea and the waters to the west of Ireland.





▲ The distribution of witch landings by Irish vessels ≥15m during 2008-12 (all gears). Smaller vessels contribute 5% of the total landings, these vessels mainly operate inshore. Witch landings are widely distributed along the continental shelf.



▲ The trend in witch landings by Irish vessels ≥15m during 2008-12 (change in landings per km^2 per year). Landings increased in most areas in the Celtic Sea and south of Rockall. Landings decreased in the Irish Sea and along the slope.

Glossary

Bathymetry The depth profile of the seabed

Beam trawl A net which is held open by a horizontal beam and dragged along the bottom. Often used to target flatfish.

Catchability The extent to which fish are susceptible to being caught by a certain fishing gear. E.g.: "The catchability of young fish is reduced by increasing the mesh size".

Celtic Sea The sea area between southern Ireland and south-western England. See map on page 2.

Continental Shelf The part of the seabed that gently slopes down from the shore, typically ending around 200m depth (the **shelf edge**) after which the seabed forms a steep slope down to the ocean floor. See map on page 2.

Demersal Associated with the seabed. Demersal fish live near the bottom of the sea and demersal fishing gear is deployed on or near the seabed.

Demersal otter trawl A net which is held open by otter boards or trawl doors and dragged along the bottom. Mainly used to target demersal fish species and *Nephrops*.

Demersal seine A net which surrounds fish, it is usually set from a vessel. Long lines on either side of the net are used to herd the fish and haul the net. Mainly used to target demersal fish species.

Discards The part of the catch that is discarded (thrown back to sea).

Division See: **ICES Sub-area, Division and Rectangle**

Dredge A frame with a holding bag which is dragged along the bottom. Mainly used to target shellfish.

EEZ Exclusive Economic Zone. The sea area around a nation in which it has special rights over the use of marine resources. It extends up to 200nm offshore.

Effort See: **Fishing effort**

Fishing effort The time spent engaged in fishing operations or time spent at sea, this time may be multiplied by a measure of fishing capacity, e.g. engine power. In this atlas, fishing effort is always expressed in fishing hours.

Gill net A single wall of netting hung vertically. Fish generally get trapped by their gills. Mainly used to target demersal fish species.

ICES International Council for the Exploration of the Sea. One of the major roles of ICES is to perform stock assessment and provide fisheries advice (`www.ices.dk`).

ICES Sub-area, Division and Rectangle For the purpose of catch reporting and fisheries management, ICES divides the north-east Atlantic into Sub-areas, which can be subdivided into Divisions, these can be further partitioned into statistical rectangles. Sub-areas are indicated by roman numerals (e.g. VII); Divisions are indicated by roman numerals followed by lowercase letters (e.g. VIIa); rectangles are indicated by two numbers, one uppercase letter and another number (e.g. 36E5). See maps in the section Management units (page 1.)

kn Knot: 1 nautical mile per hour.

kt Kilotonne: 1 000 tonnes, or 1 000 000 kg.

Landings The part of the catch that is retained (not discarded) and landed.

Logbook Records of fishing activity and landings. The master of each fishing vessel ≥10m is required to record its fishing effort and landings [7]. The Sea Fisheries Protection Agency has access to the logbook data from all Irish vessels and from EU vessels landing into Ireland.

Longline A mainline with hooked and baited branch lines. Very few Irish vessels use longlines, Spanish and UK vessels use longlines in the waters around Ireland, mainly to target hake.

Marine Institute The Marine Institute is the Irish national agency responsible for Marine Research, Technology Development and Innovation (www.marine.ie).

nm Nautical mile: 1.852km.

Otter trawl See: **Demersal otter trawl**

Pelagic Associated with open water. Pelagic species live in the water column and pelagic fishing gear is deployed in midwater.

Pelagic trawl A net which is held open by otter boards or trawl doors and deployed in midwater.

Pot A trap, usually baited. Mainly used to target crab, lobster and whelk.

Seine See: **Demersal seine**

Shelf edge The beginning of a steep slope from the continental shelf towards oceanic depths, typically around 200m depth. See map on page 2.

Statistical Rectangle See: **ICES Sub-area, Division and Rectangle**

STECF Scientific, Technical and Economic Committee for Fisheries. STECF advices the European Commission on the conservation and management of living aquatic resources (stecf.jrc.ec.europa.eu).

Sub-area See: **ICES Sub-area, Division and Rectangle**

T Tonne: 1 000 kg.

Trammel net A wall of a number of layers of netting hung vertically. Fish get entangled between the layers of netting. Mainly used to target demersal species.

VMS Vessel Monitoring Systems. EU vessels ≥15m are obliged to transmit their position and speed at least every two hours [4]. VMS transmit these data via satellite to the competent authorities. The Irish Naval Service has access to all VMS data from Irish Vessels and VMS data from international vessels inside the Irish EEZ.

Waters around Ireland For the purpose of this atlas: ICES Sub-areas VI and VII, roughly extending between 48°N and 60°N and between 4°W and 18°W.

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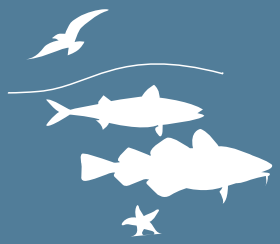

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