

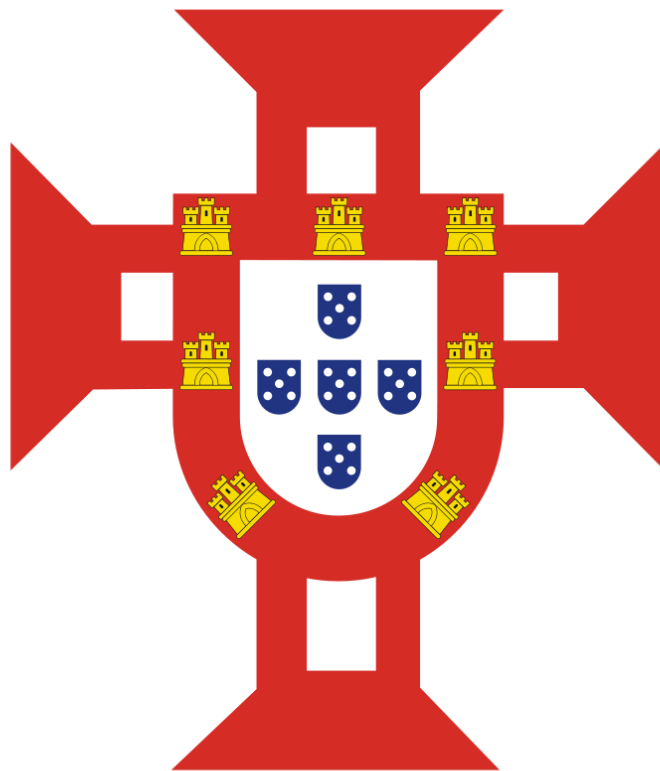


Norfish Dataset 16

Portuguese Newfoundland Cod Fishery 1500-1790

Supporting Documentation

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Flag of Portugal, used at sea around 1500 – symbols denote military and naval victories.

(Tony 2008)



Portuguese Newfoundland Cod Fishery 1520-1790

Summary

Dataset Title:	Portuguese Newfoundland Cod Fishery 1520-1790
Norfish Case Study:	Portuguese Newfoundland Cod Fishery 1520-1790
Large Marine Ecosystem:	9: Labrador-Newfoundland; 8: Scotian Shelf
Subject:	Catches, Newfoundland, Portuguese, Cod, 1520-1790
Author:	Josh Ivinson, Paul Montgomery, John Nicholls Norfish Project Centre for Environmental Humanities Trinity College Dublin
Data Provider:	Josh Ivinson Norfish Project Centre for Environmental History Trinity College Dublin
Data Editor:	John Nicholls Norfish Project Centre for Environmental History Trinity College Dublin
Extent:	271 records
Keywords:	Atlantic cod catches; Norfish, fishing; Portuguese; vessels

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Objectives

This dataset provides a series of annual estimates of the size of the Portuguese Newfoundland fishery (presented in terms of the total live-weight catch of cod) through the period AD1520-1790. The data is presented in a format to allow comparison with other national fishing efforts (e.g. Spanish Newfoundland cod Fishery) and to contribute to an assessment of the total scale of the international Newfoundland fishing industry in this era.

As is the case for the Spanish and Basque Newfoundland Fishery, the Portuguese data for fishing in Newfoundland in this time period are remarkably minimal. While there are some references to Portuguese fishing voyages during the 16th century, these are qualitative rather than quantitative and do not provide details of the actual size of the fishing fleet, the catches they took or the overall scale of the effort; quantitative data are all but non-existent in surviving sources and existing literature. Generating a complete dataset of annual values for the Portuguese cod fishery must comprise of many computed data points in order to provide a reasonable insight into the probable scale of these fishing activities.

Examination of the available materials concluded that missing values could be “filled” by providing informed estimated values. While simple, straight line extrapolations between available data points could provide a rough awareness of the annual values, this does lead to the possibility of huge inaccuracies. To overcome this problem, the Capacity Trend Method was applied to the missing data points; data were trended against an existing fishery (Spanish and Basque Newfoundland Fishery) which provides a continuous value series for the period. The French Newfoundland Cod Fishery, with accurate annual catch data based on actual port and notarial records provides the overarching trend that informs both the Spanish and the Portuguese fisheries.

Sources and Chronology

The traditional and mainstream understanding is that the Portuguese held a sizable stake in the New World fisheries in the sixteenth century, which they lost in the 1580s following their annexation by the Spanish crown and prolonged wars with England, France and the United Provinces. Anglophone historians have long trusted Harold Innis’s statement that there was “abundant evidence [of] ... Portuguese fisheries” in the early 16th century, during an era in which English sources offered so little (Innis 1954, p.14). Yet, recent research has highlighted

the total lack of documentary evidence to support the argument that the Portuguese ever had a dominant presence in the early Newfoundland fisheries. (Abreu-Ferreira 1995, 1997, 1998).

As in England, there are no significant repositories of 16th century notarial or insurance records in Portugal, and customs data survives only very sporadically and locally. Consequently, Portuguese historians similarly bemoan a remarkable lack of sources regarding the nation's interests in the Newfoundland fisheries before 1639 (Barros 2015, p.2015; Amorim p.280-1; Abreau-Ferreira, 2005). Notably absent are any Portuguese national regulations regarding these fisheries (despite the sardine and tuna fisheries off the Algarve and Cape Verde being well regulated), and the paucity of references to this trade in contemporary Portuguese histories and economic treatises (Abreu-Ferreira 1998, pp.103-105).

There is little doubt that Portuguese explorers and early fishermen played a crucial role in exploring and charting the region before about 1520, producing the majority of early portolans that depict the east coast of Newfoundland and thereby coining many still-used toponyms. These regions were frequently referred to on these charts as 'pescarias' or 'Terra dos Bacalhaus' (the 'Land of the Cod'), indicating that fish stocks were known to be available there, but without proving that this fishing was continually being pursued by Portuguese crews (Barros 2015, p.9; HARRISSE 1900; Ganong 1964). Records show that tithes on Newfoundland cod were permitted (but not necessarily taken) as early as 1506 (Silva 1892, p.434). But Portuguese activities over the subsequent century are shrouded in mystery due to a lack of sources and research.

Darlene Abreu-Ferreira posits that there is little evidence to support the popular belief that Portuguese merchants developed any significant interest in the fisheries over the 16th century, and that the nation's developing reliance on foreign cod imports is more apparent (Abreu-Ferreira 2005, p.133-4). There is certainly a lack of evidence of regular Portuguese commercial activity in the North West Atlantic before the 1560s and 1570s, when Azorian adventure rekindled their interest in the region and mainland Portuguese ships began to be witnessed by early English West Country fishing crews (Quinn 1973, p.183-187; TNA HCA; Vigneras 1973, pp.61-64). Portuguese historians have often noted the presence of Portuguese fishermen in the international fishery upon Newfoundland's banks in the mid-sixteenth century, but the scale of their involvement has been unclear (Ferreira Neves 1939, pp. 38-51; 213-22; Fernandes Moreira 1987).

Amandio Barros is right that "There are no comprehensive figures with which to evaluate the size and composition of the Portuguese cod fleet", but his assertion that "it is

believed to have numbered some 50 vessels by the second half of the sixteenth century” is completely unverified (Barros 2015, p.12). This number of 50 vessels is derived from a single, uninformed estimate made by the English merchant adventurer Anthony Parkhurst, cited in a letter to Richard Hakluyt (Parkhurst, 1578) in 1578, which is uncorroborated; the figure cannot be any better informed from hitherto available sources. Anglophone and Portuguese historians alike continue to restate this estimate in most general histories as it remains the only historic assessment of the scale of the 16th century Portuguese fishery (Amorim 2009, pp.281-4; Barros 2015, pp.8-14).

In earlier decades, references to Portuguese fishing in Newfoundland also generally come from foreign sources. Two Portuguese ships were reported to be fishing in St John’s harbour by an English expedition in 1527, precisely the same year in which two merchants paid taxes on landings of Newfoundland cod in Vila do Condo (Williamson 1962, p.104-5). Roberval also encountered Portuguese ships in St John’s in 1542, but there is no other evidence of Portuguese fishing for several decades thereafter.¹

Only in the late sixteenth century are limited Portuguese sources available (Amorim 2009, p.281; Barros 2015, p.8). Of the very few Portuguese port books to have survived from this era, the books for Porto record 3 Newfoundland voyages in 1558 and another 3 the subsequent year (Abreu-Ferreira 1998, p.107; Barros 2015, p.22 Appendix). A single Newfoundland voyage was found by Barros in Porto’s ‘Livro do despacho’ for ships that were required to carry munitions, departing in March 1558 (Barros 2015, p.18). This voyage was only mentioned incidentally under the ship’s subsequent entry, indicating that voyages to the fisheries were not registered in these accounts. Indeed, an annexed note stated that other unregistered ships were sailing to Terra Nova, but it is impossible to tell how many (Abreu-Ferreira 1998, p.104 fn13). Interestingly, Gallician merchants were seen setting out on a Newfoundland fishing venture of their own in 1559 with Portuguese assistance (Ménard 2006, pp.71-4, 254-5, 421-3 Appendix 4). A second cluster of evidence of a modest fishing effort exists for in 1566/7, when Newfoundland cod made up 13% of the *sisá* (import tax) for Viana do Castelo and 5 Portuguese ships unloaded a total of 400,000 fish at the port (Amorim 2009, p.263).

However, the loss of notarial and economic records in many Portuguese towns means that “nothing has been uncovered showing a systematic, large-scale, and long-term Portuguese involvement in Newfoundland’s cod fishery”, thereby indicating that their

¹ John Rut’s voyage (in Hakluyt, reprinted in Williamson 1962)

involvement in Newfoundland fisheries before 1580 union with Spain was “sporadic at best.” (Abreu-Ferreira 1997, p.32-3; 1995). Newfoundland ventures from the Portuguese towns of Porto, Lisbon, Vianna, and Aveiro appear only intermittently in archival material, and in the entire literature there are never any references to more than a dozen ships in a single year.

Some scholars continue to state that up to 100 Portuguese ships fished in Newfoundland each year (Godinho 1991, p.134-5). Others even continue to suggest that 150 vessels were sailing to Newfoundland from Aveiro and Porto each year around 1550 (Andrieux 2008, p.62; Cole 1990, p.2 citing Portuguese literature). However, these numbers are completely infeasible given the size of that port’s merchant marine. Of the 35 ships and 33 carvels registered by the Aveiro Corpo Cronológico in the mid-sixteenth century, only two were said to be engaged in the Newfoundland trade (Fernandes Moreira 1984, p.109; 1987, p.86; Amorim 2009, p.281).

Due to a paucity of Portuguese sources, English Admiralty Records appear to offer the fullest accounts of Portuguese fishing in the late 16th century. For example, English pirates and privateers took 3 Portuguese Newfoundland ships in one case in 1583, 8 ships in 1584, and 16 in 1585 (HCA 1583, 3/25, f.40v-51v; 1584 13/25 f92; Quinn 1973, p.47-50). Portuguese sources discuss ten ships sailing to the New World fisheries in 1580, and a fleet of eleven ships from four ports (Viana, Leça, Aveiro and Peniche) being attacked by English privateers in 1587 (Barros 2015, p.14) ². However, it is entirely unclear what fraction of the fishery is captured in these reports.

Although Barros offers intermittent evidence that the Portuguese fishing fleet was present in some minor measure in the 16th century, Portuguese maritime historians are in general agreement that an irreconcilable lack of sources will prevent further work (Barros, 2015). Importantly, there is as yet no definitive evidence that this industry comprised more than a few dozen ships at most, let alone the hundred or so that some historians had postulated.

The Portuguese fisheries had already entered their decline in the 1570s, when the booming South Atlantic trades increasingly occupied the attention of Portuguese shipowners, before being decimated during war with the English (Barros 2015, p.13-4; Quinn 1973, 4 p.47). Revisionists like Darlene Abreu-Ferreira and Ines Amorim agree that the Portuguese Newfoundland fisheries had ceased for good by the 1590s as a result of warfare, the

² Barros cites Torre do Tombo (National Archive), Corpo Cronológico, parte I, maço 112, documento 5.

Portuguese annexation by Spain, English competitive advantage, piracy (as stated before) and a myriad of other economic factors (such as the monopolisation of the fishery by France and England) (Amorim 2009, p.265; Abreu-Ferreira 1995, p.108). However, although no Portuguese historians appear to have expressed the fact, foreign sources indicate that the Portuguese fishery continued well into the 17th century.

English reports stated that Portuguese ships were barred from sailing to Newfoundland in 1607 so the Luso-Spanish Crown could fulfil its naval levy. But English colonial tracts noted that Portuguese ships were again voyaging to the Avalon peninsula of Newfoundland in the 1610s and 1620s, often arriving a month later than English and French ships did, and occasionally buying fish from English fishermen as well as fishing for themselves. Letters from the first English colonists also referred to Portuguese ships which continued to fish in and around Conception Bay. Significantly, a note on local piracies made by the governor of the English colony at Harbour Grace recorded 12 Portuguese fishing ships being captured in Newfoundland in 1612, several more again in 1614, and two ships of Aveiro and one of Peniche being taken in 1619. In the latter year Portuguese crews were also recorded as having had disputes with English fishermen in St John's harbour and nearby Petit Harbour. Additionally, Dutch notarial records similarly reveal a continued Portuguese presence in that region: a Dutch freighting ship had encountered (and pirated) one Spanish and one Portuguese ship near Plaisance in Southern Newfoundland in 1606, while another Dutch ship sailed to Newfoundland via Aveiro in 1609 in order to take onboard fishing equipment and skilled Portuguese fishermen.

Magnitude of the fishing fleet

Certainly, Abreu-Ferreira is correct in that after 1600 Portugal had become more reliant on foreign cod imports, especially Newfoundland cod brought by Englishmen, which reduced the demand for Portuguese crews to pursue their own New World fisheries (Amorim 2009, p.265-9; Abreu-Ferreira 2005; 2012). But the unrecognised continuation of this Portuguese fishery for several decades longer than has been previously acknowledged indicates that a significant proportion of the sixteenth century Portuguese fishery in Newfoundland may similarly have been neglected in the sources, and by historians.

Therefore, it is recommended here that the Portuguese Newfoundland fishing fleet totalled around 20 ships annually in the late 16th century (1550-1600). This is significantly less than the speculative guesses of some historians and less than half the number proposed

by Anthony Parkhurst in 1578. His estimate, the only contemporary estimate of the entire nation's fishing effort, is deemed to be uninformed and not verifiable. However, a fishery of 20 ships is also more than any Portuguese (or English) source ever references at any one time. It is assumed that the several recorded observations of fleets of around 10 Portuguese ships (often in relation to piracy) did not represent the entirety of the Portuguese fisheries. This is based on our knowledge of the scarcity and incompleteness of these sources (both in the early and late 16th century, but especially over the next few decades) and an acceptance of a smaller fleet would be too dissimilar to Parkhurst's estimate. The total fleet would have varied significantly year-to-year, especially during the war years between 1580-1600. Thus an average of 20 ships per year is neither too conservative nor too ambitious.

The size of the Portuguese fleet in earlier and later periods is harder to ascertain. While there was certainly some Portuguese fishing taking place in the periods 1500-1550 and 1600-1650, the average size of these fleets is presumed to be of a negligible amount of less than 5 ships per year, and probably often fewer. Only during the Anglo-Spanish peace of 1604 and 1625 does it appear that Portuguese ships returned to Newfoundland in significant numbers, however it would be excessive to presume that these fleets were as significant or regular as in earlier years, due largely to our lack of informative data.

Processing and methods

Regarding the type of fish being produced and shipped by Portuguese crews, it is widely stated that the fish was originally returned to Portugal either fresh or wet salted and then dried (and made into Bacalhau) at drying facilities in home ports. Evidence of this is scarce, and there are also suggestions that the fish was indeed dried on shore in Newfoundland as was more common in the international fisheries. Without access to definitive evidence, we will presume that half the fish was shipped to Portugal wet salted or fresh, and the rest was shipped in bulk-reduced dried form.

Hand lining with metal hooks was almost certainly the catch method deployed by fishers and has been documented as the traditional method of fishing in the later 18th and 19th century (Cole 1990).

Tonnage and catch data

Records of the size of Portuguese fishing ships are exceedingly rare in the surviving sources, except for a few references to ships of between 70 and 100 tons being involved in these fisheries in the mid-16th century (Moreira 1987, p. 86; 1984, p.109; Amorim 2009, p.281). However, Anthony Parkhurst suggests that Portuguese fishing ships were 60 tons on average based on Hakluyt's 1600 account (1979, iii, p.132-134). These are notably smaller than his figures for Spanish ships, but comparable to the average size of English and French ships in this era. Thus, because no ships smaller than 70 tons are found in our limited primary source data, an average ship size of 80 tons is proposed (Amorim 2009, p.281).

As we see from the contemporary Basque whaling fleet, ships were often up to 800 tonnes in size, such as the 200-250 tonnes wreck of the San Juan found at Red Bay, but cod fishing ships were smaller, generally between 50 and 200 toneles (Barkham 2009; Loewen 1999; Grafe 2006, pp.92-4). The Spanish toneles was between 10% and 20% larger than an English ton burthen (Castro 2013, pp.1137-8). Therefore, an average ship size of 100 tons is proposed. This figure may appear conservative, especially in the context of more general Spanish maritime historical literature, which often focuses on the large Spanish naos and gallions of over 500 tons. Nevertheless, this figure of 100 tons is still far larger than the average size of the French and English ships in the 16th and early 17th centuries fisheries.

With an average burthen of 100 tons a 30-ship cod fishing fleet would catch around 10,200 metric tons liveweight of fish, and a 50-ship fleet around 17,000 mt. This matches Peter Pope's estimates used for the later French fishery: "That cargo of fish comprised 75% of the stated tonnage of a ship (very conservative), and that the average cargo was 50% wet cod and 50% salted cod. The ratio between tons burthen and metric tonnes liveweight caught was calculated to be 3.4" (Pope 1995, pp.13-4; Pope 2004, p.20, fn 11).

For the Portuguese fleet the effect is that an 80-ton vessel carried a cargo of 60 tonnes. Of this 60-tonne load, 50% was dried and a ratio of 3.4:1 may be applied to represent liveweight. With the adjusted weights, each vessel produced about 130 tonnes of liveweight cod.

Archaeological evidence

As is the case for the lack of archaeological evidence for Spain's Cod fishery off the coast of Newfoundland, there is extraordinarily little archaeological evidence of this industry for the Portuguese cod fishery. As shown from the historical sources above, there is at least qualitative information to indicate the presence of Portuguese cod fishing activity, but this has not thus far translated into archaeological traces. Some maps and charts provide the suggestion of Portuguese presence and a Portuguese familiarity with the physical geography of the region; other Iberian (Spanish and Pasque place names and locations) are representative of activities that could have ranged from fishing to trade but there is nothing to specifically suggest long term settlement or colonisation; had this been the case, archaeological evidence would be far more likely.

The clearly identified small scale of the Portuguese fishery contributes hugely to the lack of evidence, but the fact that the soil deposits in the Newfoundland region are poor due to a lack of the soil the formation process caused by thin glacial soil, inhibits the preservation of organic archaeological deposits (Pope 2004, p.45).

Past archaeological investigations of the earliest fishing settlements in Newfoundland conducted by Peter Pope qualify typical Spanish landing sites as temporary fishing camps and they are characterised as being archaeological ephemera and hard to define or identify. This would have been very similar for any possible Portuguese sites. (Pope 2013).

By contrast, on a small number of Newfoundland fishing sites from the later 17th and the 18th centuries, there are significant archaeological organic deposits which formed in locations of long-term settlements which indicate human activity, such as Ferryland which was settled by the English (Betts et al. 2014).

The lack of known archaeological sites of Portuguese fishing in Newfoundland supports the notion that cod were often lightly salted for transport and were landed at Iberian ports to be processed there on-site. In the Spanish case, major coastal ports such as San Sebastian were known to have large shore areas called arenas which were used for processing fish (Azpiazu 1990, pp.85-110). Fish were taken to cabanas or "tents" on the sea-shore to be cured for transportation inland to the major terrestrial markets of the region. It appears that there was a relatively short fishing season based on the north Atlantic weather coupled with the high cost of salt which would encourage fishers to return swiftly to port with semi-cured fish. Lacking any major archaeological deposits in Newfoundland itself from this early period that form a link to the Iberian fisheries, we must rely on the zooarchaeological evidence that sites in Portugal and Spain can provide us with.

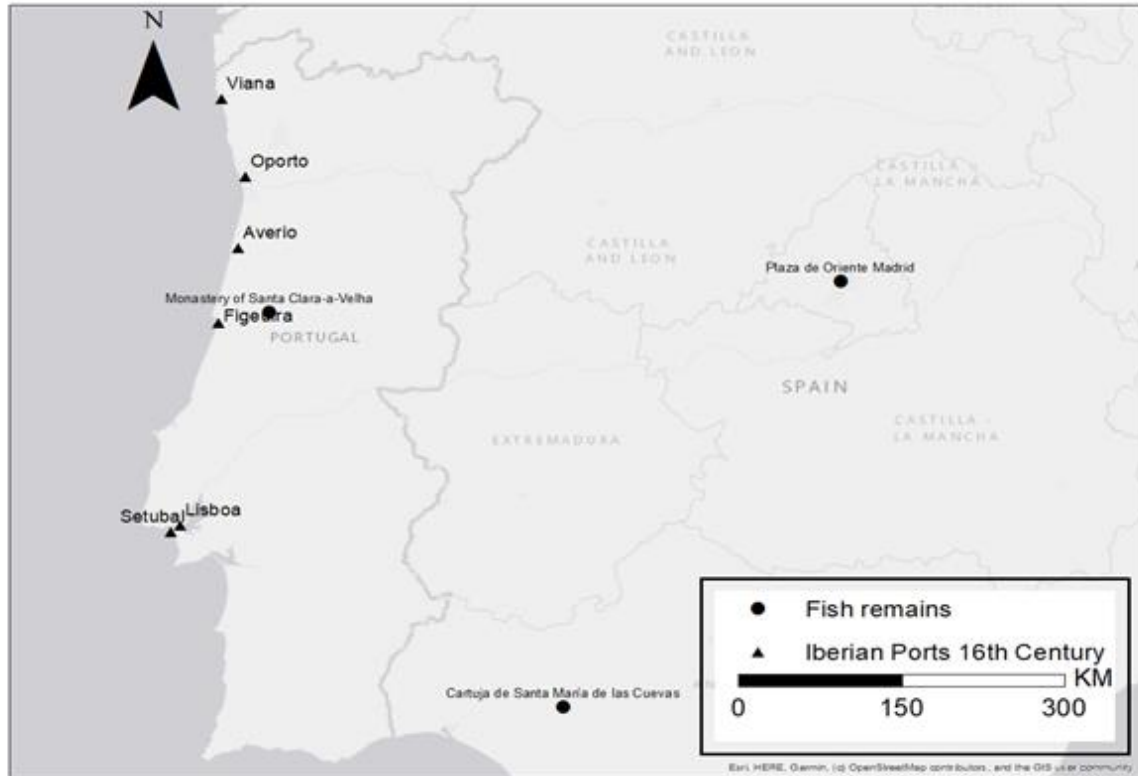


Figure 1. Ports of Portugal identified as participating in the cod fisheries in the 16th century

Due to the small number of historical sources from this period there were forced to rely on scattered information that can give us some insights into the volume and nature of their catch being landed in Iberia during the 16th century. We have several isolated reports of catches such as 150,000 cod for one sea in 1627 and this catch was considered a below average cargo (Apiazu Elorza 1988). Portugal's northern ports, such as Aveiro, Oporto and Viana were home to cod vessels that crossed the Atlantic to the Grand Banks and Newfoundland during the 16th century. The major ports for both the importation of cod (as well as salt used in the curing of cod) were Porto and Aveiro, as well as Lisbon in Spain; re-exportation to the wider Iberian market as well as Brazil emanate from these ports in many cases (Kurlansky, 2002). Porto and Viana emerged as the most important cod landing and exporting centres in Portugal (Mountinho, 1985).

A zooarchaeological study, especially that of fish, is developing in Portugal and Spain, and has only started to gain traction in the past two decades. This has resulted in many new and existing sites being excavated; this is increasingly giving more than the previously observed cursory glance at materials such as fish bones in archaeological reports.

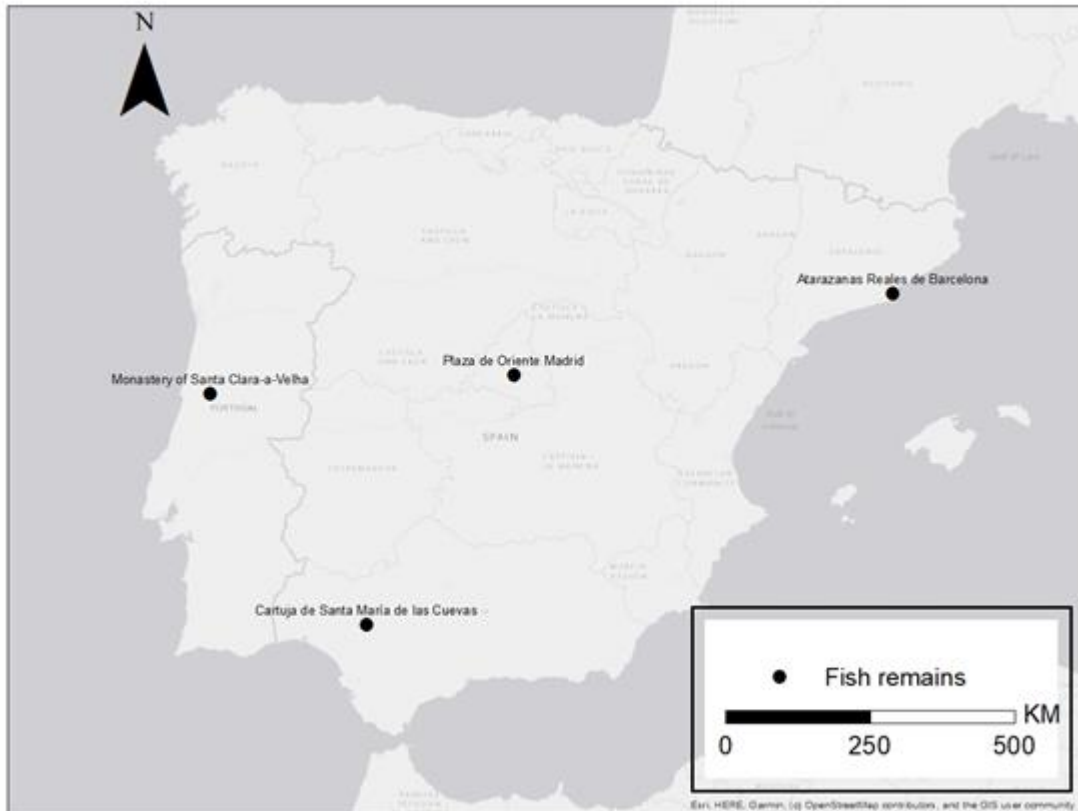


Figure 2. Site of known cod remains from 16th century records and archaeological excavations in the Iberian peninsula.

Overall, the archaeological evidence is sparse and severely limited, but current, ongoing work in the field may reveal further insights into Newfoundland cod being consumed in Portugal and Iberia as a whole. The presence and suggestion of imported cod in Spain, corroborated by finds in Portugal at the Monastery of Santa Clara (see figure 2) indicates that cod from Newfoundland was both present and that it was arguably minimal when compared with other fish species consumed. These factors serve to underpin the limited and relatively small Portuguese fishery that was prevalent in Newfoundland and the Grand Banks, and which by the early to mid-17th century had virtually dried up, if not completely ended altogether.



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Other Processes

The Capacity Trend Method was used to calculate values for years where no data was available. This process entails a trending process where a trend of annual data is applied between available points in order to determine a series that reflects general trends rather than a simple straight line. (Nicholls, Allaire, Holm 2020)

The marine species information that informs the dataset is obtained from the World Register of Marine Species (WoRMS 2020) which validates common species names, scientific names and sources.

The Metadata system underpinning the dataset is based on Darwin Core (OBIS 2017; 2020) which provides static formulations of all data fields as outlined in the Data Fields section of this document.

Data Fields

Darwin Core Field Name	Description
occurrenceID	A globally unique “per record” identifier based upon the concatenated institutionCode, collectionCode, catlogNumber and ID fields (TCD_Norfish_PorIviNicMonCod_1)
type	Description of data series type. e.g. Dataset
modified	Most recent date the data was modified; ISO 8601 metric date/time standards apply. (2020-12-12)
license	Data licensing conditions that apply. (http://creativecommons.org/licenses/by/4.0/legalcode)
bibliographicCitation	Author citation for the dataset: (Ivinson, J, Montgomery, P and Nicholls, J. 2020. Norfish Supporting Documentation: Portuguese Newfoundland Cod Fishery 1520-1790. Dublin: TCD)
references	Denotes the actual source literature, document or archival material used to determine the underlying data.
institutionCode	Identifies the institution which owns the data - Trinity College Dublin (TCD)
collectionCode	Code of the project or research group (Norfish)
datasetName	Name of the dataset (Portuguese Newfoundland Cod Fishery 1520-1790)
basisOfRecord	Specifies the nature of the observed or researched specimens or data (HumanObservation)
catalogNumber	Identifier of the data within the institution and project – “Por” refers to Portuguese, “Ivi” refers to Ivinson, “Mon” refers to Montgomery, “Nic” refers to Nicholls (PorIviMonNicCod)
occurrenceRemarks	Comments about the occurrence record (Catch is determined from number of vessels; extrapolated value based on French Newfoundland trend)



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recordedBy	Researchers who recorded the data (Josh Ivinson John Nicholls)
organismQuantity	Quantity of fish represented in the record shown in Kg live weight (8285162)
organismQuantityType	organismQuantity unit of measurement (biomass in kilograms (kg))
occurrenceStatus	Stipulates the physical presence or absence of animals relating to the record (present)
eventDate	Actual date and time at which an occurrence was recorded. ISO 8601 metric date/time standards apply. (1520)
year	Year taken from the eventDate field (1520)
locationID	Marine Region unique identifier (http://marineregions.org/mrgid/ 8544)
locality	Local name for the overall location or region (Newfoundland coast and Grand Banks)
locationAccordingTo	MRGID location identifier based on the marineregions.org/mrgid system (MRGID)
locationRemarks	Description of location identifier (Newfoundland coast and Grand Banks, may extend into Scotian Shelf area. NOAA LME (Large Marine Ecosystem) ID 9: Labrador-Newfoundland)
decimalLatitude	Latitude shown in decimal notation based on the WGS 84 (EPSG:4326) geodetic datum standard (46)
decimalLongitude	Latitude shown in decimal notation based on the WGS 84 (EPSG:4326) geodetic datum standard (-20)
coordinateUncertaintyInMeters	The smallest circle (radius) in metres from the ground zero point depicted by the decimalLatitude and decimalLongitude fields. In this instance, "1351881" depicts a radius of c. 1,351.881 Km.
georeferenceRemarks	Remarks indicating the geographic area identified – Large Marine Ecosystems are used (9: Labrador-Newfoundland)



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scientificNameID	The WoRMS LSID associated with the scientificName, based on the Marine Species database: urn:lsid:marinespecies.org:taxname:126435
scientificName	Scientific name of the animal based upon the vernacularName (Gadus morhua)
kingdom	Together with taxonRank assists in determining broader animal characteristics for darwinCore search engines (animalia)
taxonRank	Together with kingdom assists in determining broader animal characteristics for darwinCore search engines (species)
scientificNameAuthorship	Based on the scientificNameID field and discoverable through the WoRMS database (Linnaeus, 1758)
vernacularName	Literal common name applied to the animal involved. In this case, all values are “bacalhau atlântico” – the Portuguese common name for Atlantic cod
identificationRemarks	Comments about identification of the species (Portuguese name for Atlantic Cod)
conversion	List of conversion factors used (1 ton = 1 metric tonne; 1 vessel (burthen) = 100 tons = 75 metric tonnes load; 1 vessel carries 50% dried cod (3.4:1 ratio to fresh) and 50% liveweight fresh cod; 1 vessel load = 165 metric tonnes liveweight equivalent.)
numberOfVessels	Number of vessels used in the overall fishing effort based on extrapolations of the 1578 given value (30)
catchMT	Derived metric tonnes value based on the calculated fields as shown in the conversion field, or as shown in the codes field.
effort	Number of vessels deployed calculated from population statistics and given vessel numbers for select years; 50% of vessels regarded as being deployed for fishing.
cPUE	Catch per Unit of Effort value derived from <i>catchMT</i> divided by <i>effort</i> ,



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trafficLight Traffic Light coding system denotes level of certainty, and/or level of accuracy that can be described for each record; see Appendix 1 for details.

codes Explanation codes that highlight the process for each record; see Appendix 2 for details.

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Appendix 1

Traffic Light System

Traffic Light	Explanation
green	Original values derived from sources is given.
amber	Calculated values based on two or more given values from sources.
red	Calculated or estimated values based on trends, qualitative reports or simple extrapolations. Specific method is stated per record based on the accompanying codes.

Appendix 2

Codes

Codes	Explanation
a	catchMT calculated based on given number of vessels
b	Zero values assumed based on reported nil or negligible activity
c	Capacity Trend Method applied: values calculated based on trend of French Annual catch values for Newfoundland and extrapolated between nearest available given values.