Cartographical Perspectives on the
Evolution of Fisheries in Newfoundland’s
Grand Banks Area and Adjacent North
Atlantic Waters in the Sixteenth and
Seventeenth Centuries

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At the turn of the sixteenth century, John Cabot and his successors discovered abundant fish stocks in the north west Atlantic waters near Newfoundland. This article accounts for how sixteenth- and seventeenth-century mapping provide another strand of evidence that supplement our knowledge of the subsequent Iberian, French, and British fisheries. Such cartography exhibited significant mutations and innovations in rendering fishing locations, and illustrating fishing practices and fish species. Fishermen’s knowledge must have informed such mapping. The innovation of hydrographical indicators in esthetically appealing maps recognized from an early stage the status of the Grand Banks as a globally important feature of submarine topography. More refined and accurate delineations of its submarine plateaus and other adjacent continental shelves closely followed the development of fishing activities, encompassing both Newfoundland’s nearshore and the Grand Banks themselves. Furthermore, such cartography reflected transformative and reciprocal relationships with commerce and inter-state politics across the North Atlantic.

KEYWORDS cartography; fisheries; fishing; Newfoundland; Grand Banks area; North Atlantic

Au début du 16ème siècle, John Cabot et ses successeurs ont découvert des stocks de poissons abondants dans les eaux du nord-ouest de l’océan Atlantique près de Terre Neuve. Cet article explique comment la
A finales del siglo XV y principios del XVI, Juan Caboto y sus sucesores descubrieron abundantes poblaciones de peces en las aguas del noroeste del Atlántico cerca de Terranova. Este artículo explica cómo la cartografía de los siglos XVI y XVII proporciona otra línea de evidencia que complementa nuestro conocimiento de las pesquerías ibéricas, francesas y británicas subsiguientes. Dicha cartografía presenta mutaciones e innovaciones significativas en la forma de representar los lugares de pesca y de ilustrar prácticas de pesca y especies de peces. Estos mapas deben haber hecho uso del conocimiento de los pescadores. La innovación de los indicadores hidrográficos en mapas estéticamente atractivos otorgó pronto a los Grandes Bancos el estatus de accidente topográfico submarino de importancia global. La delimitación más refinada y exacta de sus mesetas submarinas y de otras plataformas continentales adyacentes siguieron muy de cerca el desarrollo de las actividades pesqueras, abarcando tanto la costa cercana a Terranova como los Grandes Bancos propiamente dichos. Además, dicha cartografía reflejó relaciones transformadoras y recíprocas con el comercio y con la política internacional en todo el Atlántico Norte.

PALABRAS CLAVE cartografía, pesquerías, pesca, Terranova, área de los Grandes Bancos, Atlántico norte
Introduction

This article analyzes an overlooked aspect of cartographical history that is key to understanding the development of the Newfoundland and Grand Banks fishery—the largest fishery ever. In doing so, it traces how the Grand Banks and neighboring submarine plateaus evolved from linear to more expansive spatial renderings in maps of various utilitarian and cultural importance over the sixteenth and seventeenth centuries. The value of such cartographical evidence first provides significant insight on the importance of the Newfoundland fisheries, and second, sheds light on how mariners’ and fishermen’s knowledge of the fisheries may have informed high state politics as well as been communicated to a wider readership. The article draws attention to some early examples of hydrographical features in the cartographical record and to visualizations of fisheries and fishing practices in the area that revolutionized the fishing industry which in turn impacted world trade and politics.

The continental shelves of Atlantic Canada are “characterized by a series of banks separated by transverse troughs.” This article centers primarily on the Grand Banks of Newfoundland section of these shelves while including some neighboring banks on what have been termed the Scotian Shelf, the North East Newfoundland Shelf, and the Labrador Shelf (see Figure 1 for a modern physical map of the geographical area). Research into the history of fisheries in the Grand Banks area has concentrated upon two foci for fisheries over the sixteenth and seventeenth centuries—one located within the inshore waters around Newfoundland, the other on the offshore Grand Banks and other neighboring submerged plateaus. It is evident that the Iberian and French fishing fleets dominated the fisheries of the area in the sixteenth century. While the French continued to dominate the fisheries of the area through the seventeenth century, the English had intensified their operations in the inshore waters, before eventually dominating the wider fisheries from the late eighteenth century. Up to this point,

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1. P. Holm, F. Ludlow, C. Scherer, C. Travis, B. Allaire, C. Brito, P. W. Hayes, A. Matthews, K. J. Rankin, R. J. Breen, R. Legg, K. Loughheed, and J. Nicholls, “The North Atlantic Fish Revolution, c. AD 1500. Hypotheses, Methodologies, and Ways Forward,” Quaternary Research (2019), DOI: https://doi.org/10.1017/qua.2018.153.

2. J. Shaw, B. J. Todd, M. Z. Li, D. C. Mosher, and V. E. Kostylev, “Continental shelves of Atlantic Canada,” in Continental Shelves of the World: Their Evolution During the Last Glacio-Eustatic Cycle, eds. F. L. Chiocci and A. R. Chivas (London: Geological Society, 2014), pp. 7–19: 7.

3. An official Canadian source states “The Grand Banks of Newfoundland are located south and east of the island of Newfoundland. They are comprised of a grouping of submerged banks including the Grand Bank, Whale Bank, Green Bank and St. Pierre Bank. Most of the bank areas are found at depths up to 200 meters with the majority of area between 51–100 meters. The continental slope is quite steep along the southern and eastern portions of the banks and depths reach to beyond 1000 meters over a relatively short distance.” Oceans Division, Oceans and Habitat Management Branch, Fisheries and Oceans Canada (Newfoundland and Labrador Region), The Grand Banks of Newfoundland: Atlas of Human Activities, (2007). See https://www.dfo-mpo.gc.ca/oceans/publications/nfld-atlas-tnl/index-eng.html#intro.

4. Aggregated together these continental shelves “range in width from 100 to 480 km. They are comparatively shallow, with a shelf break that averages −210 m but varies from as little as −75 m on parts of the Scotian Shelf to as much as −530 m off NE Newfoundland.” J. Shaw, B. J. Todd, M. Z. Li, D. C. Mosher, and V. E. Kostylev, “Continental shelves of Atlantic Canada,” p. 7.

5. Gillian Cell identifies the year 1577 as significant for English expansion to be followed later in 1610 by the founding of what became known as the Newfoundland Company. See G. T. Cell, English Enterprise in Newfoundland 1577–1660 (Toronto: University of Toronto Press, 1969), pp. 53–7. This has complemented...
the French generally engaged in “green” or “wet” fisheries in offshore areas with their cod catch salted on board and conveyed to home ports, while the English operated a “dry” fishery inshore, whereby, with limited access to salt, the catch was landed and dried in Newfoundland before being sent on to the Iberian market.

Prior scholarship has not analyzed how cartographers depicted the banks of these continental shelves, and here we account for their first inclusion in a c. 1504 map through to the end of the seventeenth century. The volume of primary evidence documenting navigational knowledge for the Newfoundland and Grand Banks area is low for the sixteenth century. Yet, the early sixteenth century expeditions to the “New World” have been credited with helping to shape Newfoundland’s cartographical representation along with its place name nomenclature in the subsequent works of Diogo (also known as Diego) Ribeiro,

other key works that have detailed the evolution of the area’s fisheries such as C. B. Judah, *The North American Fisheries and British Policy to 1713* (Urbana: University of Illinois, 1933); R. G. Lounsbury, *The British Fishery at Newfoundland* 1634–1763 (New Haven: Yale University Press, 1934); and in specific treatment in H. A. Innis, *The Cod Fisheries; The History of an International Economy* (Toronto: University of Toronto Press, 1940), pp. 11–70, 95–111. More latterly, Peter Pope has explored more evidence that greatly emphasizes the difference between the fisheries inshore and those further out on the “Banks.” See P. E. Pope, *Fish into Wine: The Newfoundland Plantation in the Seventeenth Century* (Chapel Hill: University of North Carolina Press, 2004).

6 The European concept of the “New World” was only just first emerging at the beginning of the sixteenth century in print. Indeed, it may be viewed that the Newfoundland discoveries transitioned from being “a multinational zone treated as the far western edge of Europe’s economic zone before it slowly, and never completely, was integrated into the economic zones of the Americas.” S. Pettigrew and E. Mancke, “European Expansion and the Contested North Atlantic,” *Terrae Incognitae*, 50.1 (2018), pp. 15–34: 34.
Gaspar Vegas, and Pedro Reinel. Maps could conceptually condense a great deal of information, but such information tended to be piecemeal initially and/or subject to embargo if considered commercially or strategically valuable.

The Grand Banks and Newfoundland were among the initial parts of the New World to attract the attention of European mapmakers and their significance to fishing was affirmed by textual legends and toponyms (e.g. the Jean Rotz Atlas, 1542), illustrations of fishing methods (e.g. Giocomo Gastaldi, 1556), and illustrations of fish species (e.g. Samuel de Champlain, 1612). Cartographical mutations of the Grand Banks and other neighboring submarine plateaus evolved from simple elongated dotted bands or lines of uniform width to include more refined triangular delineations or “stylized lips” that were accorded a detail “usually reserved for land masses rather than ocean floor.” While representing high terrain on land had become a convention in cartographical semiotics, the repute of the Grand Banks particularly and its fisheries were such that expansive submarine topography featured prominently alongside examples of toponyms, such as derivatives of “ille de baccalao” [island of codfish]. As such, cartographical knowledge clearly evolved in both technical and political contexts in ways that supplement existing knowledge of Newfoundland’s fisheries from the early sixteenth century through to the period of ratcheted Anglo-French rivalries at the end of the seventeenth.

### Methodology and Sources

This article adopts a thematic empirical approach aimed at highlighting the various conceptions of the Grand Banks (inclusive of neighboring submarine plateaus) and fishing during what has been identified as the “early” and “transitional” periods of the area’s historical cartography. The themes explored include how historical cartography reflected fishing practices of the era (including the identification of fishing grounds and fish species); the transmission of knowledge from the mariner/fisherman into cartography; and the political context of their production and content as the area became a theater of colonial interests and intensifying political rivalries. We have consulted 110 maps (either inspected in person or from high resolution images available from online digital repositories), ranging from early mappamundi type manuscripts, to atlas folios, to regional maps depicting the Grand Banks and Newfoundland area in wider contexts. Those highlighted here have been selected on the basis, first, of rendering innovative stylistic and technical

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7 A. Cortesão, “Study on the evolution of the early cartographic representation of some areas of the world: Terra Nova and Japan,” in *Portugaliae Monumenta Cartographica Volume V* (Lisbon: Coimbra University Press, 1960), pp. 157–78: 158.
8 A. Morantz, *Where Is Here? Canadian Maps and the Stories They Tell* (Toronto: Penguin Canada, 2002), pp. 128–9.
9 W. F. Ganong, *Crucial Maps in the Early Cartography and Place-Nomenclature of the Atlantic Coast of Canada* (Toronto: University of Toronto Press, 1963), p. 3. The “early” period spans the Cabot voyages of the late fifteenth century to the advent of Samuel de Champlain in the early seventeenth while the “transitional” period covers his output of the early seventeenth century to the prelude of the “professional” surveys of the eighteenth century.
One must treat early historical cartography with a good degree of skepticism. Williamson asserted quite rightly that “It is impossible to be dogmatic about the evidence of maps unless we know more than we commonly do about the intention and circumstances of those who drew them … .”  

Also, Skelton warned that early maps can deceptively assert “unqualified statements of geographical fact” and one must be wary of drawing conclusions on foundations which are too narrow to support them. Although the maps presented here can be traced to individual cartographers and places of origin, they invariably reflect influences of wide hinterlands, the cross-pollination of ideas, and the commercial as well as political interests of states. As cartography was produced by different people for different ends, the same individual phenomenon can even be rendered in quite different ways even if they are drawing from the same source. Mindful that these are Eurocentric cartographical perspectives on space and place as “Europeans rendered Indigenous space empty and proceeded to refill it with their own knowledge,” the maritime dimension of this article serves as a corollary to other accounts of indigenous and territorial aspects of contemporaneous cartography of the area, especially regarding nomenclature.

Cartographical Reflections of Fishing Practices (Fishing Grounds and Fish Species)

Establishing the Significance of the Grand Banks area in Cartography: The Pedro Reinel Map of c.1504

The earliest example of the submarine topography of the Grand Banks area originated shortly after Bristol-based mariners had encountered substantial fish resources in the Newfoundland and Grand Banks area, and John Cabot subsequently obtained Italian financing and the support of the English King for his voyages of 1497–8. Expeditions continued during the reign of Henry VII by the Company Adventurers to

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10 J. A. Williamson, The Voyages of the Cabots (London: The Argonaut Press, 1929), p. 279.
11 R. A. Skelton, Looking at an Early Map (Lawrence: University of Kansas Publication, 1965), p. 3.
12 C. Van Duzer and L. Beck, Canada before Confederation: Maps at the Exhibition (Wilmington: Vernon Press, 2017), pp. 4.
13 Prominent among these accounts are: H. Harrisse, Découverte et Évolution Cartographique de Terre-Neuve et des Pays Circumvoisins 1497-1501-1769 (Paris: H. Welter, 1900); T. E. Layng, Sixteenth-Century Maps Relating to Canada: A Check-List and Bibliography (Ottawa: Public Archives of Canada, 1956); and Ganong, Crucial Maps.
14 “[T]hey declare the sea there is full of fish that can be taken not only with nets but with fishing-baskets….” Letter of Raimondo di Soncino, Milanese Minister to England to the Duke of Milan (Dated at London, 18 December 1497) republished in Narratives of the Discovery of America, eds. A. W. Lawrence and J. Young (New York: J. Cape and H. Smith, 1931), p. 274. A Bristol merchant John Day reported on Cabot’s 1497 voyage: “All along the coast they found many fish like those which in Iceland are dried in the open and sold in England and other countries, and these fish are called in English ‘stockfish.’” See L. A. Vigneras, “The Cape Breton landfall: 1494 or 1497. Note on a letter from John Day,” Canadian Historical Review 38 (1957), pp. 219–28. On Cabot’s expeditions see E. T. Jones, “Alwyn Ruddock: ‘John Cabot and the Discovery of America,’” Historical Research 81,212 (2008), pp. 224–54; E. T. Jones, “Henry VII and the Bristol expeditions to North America: the Condon documents,” Historical Research 83,221 (2010), pp. 444–54; F. Guidi-Bruscoli, “John Cabot and his Italian financiers,” Historical Research 85,229.
the New Found Land but royal backing disappeared with the death of the monarch in 1509. English fishermen seem to have concentrated on Iceland while it was left to Iberian and Basque fishermen to develop the banks into an industry and that was complemented by a cartographical record.

The c.1504 manuscript (also known as the “Kunstmann I” map) by Pedro Reinel offered a delineation of the Grand Banks as part of a more extensive rendering of the area’s submarine plateaus (excerpted in Figure 2). The earliest known map to have been actually signed by a Portuguese cartographer, it constitutes a cartographic record of the explorations between 1501 and 1503 of the North Atlantic by the Portuguese brothers Gaspar and Miguel Corte-Real. Moreover, we contend that the map’s depiction of these submarine plateaus that include the Grand Banks is a remarkable detail deserving of attention otherwise overlooked in the literature given a previous claim that Jean Rotz’s Boke of Idrography (1542) (as discussed later) contained the earliest charts to indicate the extent of the area’s fishing banks.

Oriented on an approximate northeast-southwest axis and spanning 13 degrees of latitude as indicated by an oblique meridian, the submarine plateaus are rendered on Reinel’s map by an elongated dotted band to indicate their extent and location as well as the hazard of rocks (assumed to be the Virgin Rocks – symbolized by two crosses and edged by a radial semi-circular spur – see Figure 3). There is no inscription to describe what we find to be indicative of both an extensive geographical phenomenon and an innovation in representing submarine topography. Accompanying an orthodox perpendicular meridian more easterly positioned, the

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(2012), pp. 372–93; and M. M. Condon and E. T. Jones, “William Weston: early voyager to the New World,” Historical Research 91:254 (2018), pp. 628–46.

15 E. T. Jones and M. M. Condon, Cabot and Bristol’s Age of Discovery: The Bristol Discovery Voyages 1480–1508, (Bristol: Cabot Project Publications, 2016).

16 An authority on Portuguese historical cartography has maintained that the map “records information undoubtedly brought back by the expedition [of Miguel Corte Real] of 1503,” A. Cortesão, “Pedro Reinel, Chart of c.1504,” in Portugaliae Monumenta Cartographica Volume I, (Lisbon: Coimbra University Press, 1966), pp. 25–7: 27. Of other authorities to date the map: To 1504 – see O. Peschel, Geschichte des Zeitalters der Entdeckungen (Stuttgart: J. G. Cotta, 1858), p. 332; also to 1504 – G. R. F. Prowse, Cartographical Material: Vol.1 Maps (Winnipeg: G. R. F. Prowse, 1936), p. 137; to 1505 – J. G. Kohl, A History of the Discovery of Maine, Vol. 1 (Portland: Bailey and Noyes, 1869), p. 178; and also to 1505 – H. Harrisse, The Discovery of North America: A Critical, Documentary, and Historical Investigation (London: H. Stevens and Son, 1892), pp. 434–6. However, Ganong believes it “belongs much later” – see Ganong, Crucial Maps, 48. Ganong’s opinion would certainly accord with a view that the map was based on more available sources since the Corte Real voyages.

17 F. Fernández-Armesto, “Maps and Exploration in the Sixteenth and Early Seventeenth Centuries” in The History of Cartography, Volume Three (Part 1) Cartography in the European Renaissance, ed. D. Woodward (Chicago and London: The University of Chicago Press, 2007), pp. 738–59: 755.

18 D. B. Quinn, “The Americas,” in The Maps and Text of the Boke of Idrography presented by Jean Rotz to Henry VIII, ed. H. Wallis (Oxford: Roxburghe Club, 1981), pp. 47–57: 48. We have been able to trace only one secondary source that mentions the term “Grand Bank” in relation to Reinel’s map – see Prowse, Cartographical Material Vol.1, p. 137. However, Prowse signals reservation on this by suggesting it may also relate to the Labrador Current. This would mean that Reinel’s map suggests it has a direct north easterly course from Cape Race in Newfoundland. We would suggest that the dotted rendition is not the Labrador Current as its direction would not diverge so strongly well beyond continental shelf margins so north easterly from its close actual flow along the Labrador coast. For a contemporary map of the Labrador Current in the North Atlantic context see M. A. Sicrea, K. Weckström, M. S. Seidenkrantz, A. Kuipers, M. Benetti, G. Masse, U. Ezat, S. Schmidt, I. Bouloubassi, J. Olsen, M. Khodri, and J. Mignot, “Labrador current variability over the last 2000 years,” Earth and Planetary Science Letters 400 (2014), pp. 24–32: 27.
superimposed oblique meridian was another cartographical innovation of a calibrated latitudinal scale that helped account for local magnetic variation for compass bearings in northern latitudes.

However, mindful of the warnings of Williamson and Skelton cited earlier, it is quite plausible that the map’s latitudinal meridians were not drawn by Reinel himself and were added some time later (with 1504 being notably early for latitude indications). Indeed, the oblique meridian awkwardly intersects and partially obscures the dotted rendition. Deducing distances is further complicated by the relative accuracy of the oblique meridian to Newfoundland’s latitudes on one hand (Newfoundland’s Cape Race lying at approximately 47 degrees North), and the relative accuracy of the perpendicular meridian to Greenland’s Cape Farewell (approximately 60 degrees North) on the other where the opposite end of the dotted rendition closely terminates. So there is reasonable doubt over

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19 See footnotes 10 and 11.
20 We thank Tony Campbell for pointing this possibility out to us. It happens that this possibility of the oblique meridian being the work of another hand is shared in Kohl, A History, p. 178.
21 For a technical discussion of the early use of the oblique meridian in this region see both H. Winter, “The Pseudo-Labrador and the Oblique Meridian,” Imago Mundi 2 (1937), pp. 61–73; and E. G. R. Taylor, “Hudson’s Strait and the Oblique Meridian,” Imago Mundi 3 (1939), pp. 48–52. The coast of the northern...
precise and interpretation when extrapolating from the apparent scales and distances the map purports here.

Overall, the appearance of submarine plateaus that include the Grand Banks in this map is extremely noteworthy not only for appearing so relatively soon after the reports of Cabot’s findings but also for representing a level of detail to even show the local maritime hazard (i.e. the Virgin Rocks near Cape Race), as well as indicating the Portuguese heritage of local nomenclature that proved to be regular features in subsequent maps of the area in the late sixteenth and seventeenth centuries. One of Newfoundland’s offshore islands is colored blue and inscribed in red as “Y. dos Bocalhas” – which we take to mean “island of codfish,” plus there is also “C. de Boaventura” which would correspond to Newfoundland’s Cape Bonavista.  

Figure 3 Pedro Reinel [Portulan (Atlantik)] – (Portugal, c.1504: 62.0 × 89.3 cm (detail)). (Digital copy is licensed under: CC BY-NC-SA 4.0) Bayerische Staatsbibliothek München; Shelfmark-BSB Cod.icon. 132, urn:nbn:de:bvb:12-bsb00002580-2)
Fishing Grounds: Text and Delineations

Johann Ruysch’s 1507 and 1508 editions of Ptolemy’s *Geographia* labeled Newfoundland as “Terra Nova,” depicted as a jutting eastern peninsula of a purported Asian landmass. The map contains an early inscription that suggested the significance of codfish in the cartography of the Newfoundland area as the Latin “IN.[SULA] BACCALAURAS” – island(s) of codfish – is labeled off its shore. Clear textual reference to fish in the area is contained in Diogo Ribeiro’s renowned world map of 1529 that bears the inscription “TIERA NOVA:- DE CORTEREAL en la cual no ay otro provecho que pescaria de bacallaos y mucha madera de pinos.” Similarly, on the “Wolfenbüttel-Spanish” map dated variably between 1529 and 1533, beneath the legend “TIERA NVEVA DE LOS BACALLAOS,” is inscribed “Esta tierra fue descubierta por los portogeses no ayen ello cosa de provecho mas/los bacallaos/es pescado muy bueno. Aquí seper diero los corte reales.” The origin of the actual term “bacallao” is unknown but came into wide use by the sixteenth century in Portuguese, Spanish, and Basque as well in the form of kabeljauw also in Flemish and Danish.

The coverage of Newfoundland’s Grand Banks area (including the waters off Labrador and Nova Scotia) in Jean Rotz’s *Boke of Idrography* (1542) can be discerned from two separate folios. One folio (f.22) (see Figure 4), with south oriented to the top, illustrates the eastern shores of the Newfoundland archipelago and the Labrador landmass. The atlas contains nomenclature and legends in English, as well as coastal toponyms reflecting French and Portuguese influence. Amidst the lattice of rhumb lines, one can clearly discern the course of narrow twin dotted lines linking an island “Ille dorbellanda” (the veracity of which is uncertain) that with a gentle arc (from approximately 58 to 44 degrees north in
latitude) loops around the legend of “New fonde londe” before being obscured by a peripheral compass rose on the folio edge. One interpretation suggests this is “the marking of the fishing banks by a boundary line”\(^{29}\) or another possible interpretation could be that it approximates an extended outer delimitation of the Labrador, NE Newfoundland, Grand Banks, and Scotian Shelves combined. However, if one accepts that the map represents the submarine plateaus of the Grand Banks area it does so in a significantly narrower and more sinuous manner than Pedro Reinel’s c.1504 map, while it similarly distinguishes a small island “Ille des bacolhaos” (colored gold) at the easternmost point of the Newfoundland archipelago.

A second folio (f.23) (see Figure 5) depicts the eastern shoreline of the American continent from Newfoundland to the northern reaches of South America including the West Indies. It is of smaller scale but depicts the entire Newfoundland archipelago, modern day Nova Scotia, and the eastern flank of North America. The twin dotted lines continue westerly before it turns toward Nova Scotia’s shore where it closely terminates (thus detracting from the continental shelf delimitation hypothesis). It is punctuated briefly by a rectangular shape “Illa dassa,” consisting of dots

\(^{29}\) D. B. Quinn, “Artists and illustrators in the early mapping of North America,” *The Mariner’s Mirror* 72.3 (August 1986), pp. 244–73: 254. Emphasis added. Other shallows rendered elsewhere within the Atlas such as the Bahamas are indicated with wider definition, thereby begging the question why a similarly widened expanse of the Grand Banks was not rendered likewise.
and crosses that in one opinion shows a “group of isles or shoals,” and accords with the position of today’s Sable Island. Further from the shore a legend reads “The new fonde londe quhar men goeth a fisching,” which must be among the earliest cartographical evidence directly testifying to the exact location of the fishery south of Newfoundland and Nova Scotia. The very inclusion of north west Atlantic and Newfoundland mapping in an atlas of “I[H]ydrography” was indicative of the growing significance European mapmakers were devoting to understanding aspects of seabeds and continental shelves throughout the world as much as the land.

In 1556, a regional woodcut map titled “Nuova Francia” [New France] (see Figure 6) attributed to Giocomo Gastaldi contained another linear and distinctive rendition of the submarine plateaus of the Grand Banks area and adjacent waters. Similarly to Rotz, the map represents them as an elongated arcing band (but comprised of irregularly sketched dashes and minute circles to convey a sand-like texture) and includes a quadrilateral rendering of “Isola della rena” – Island of Sand – known as Sable Island today. The band extends to below the peninsula labeled “Angoulesme” (which has been identified as relating to the Upper Bay of New York), making the band an inclusive rendering of

30 Quinn, “The Americas,” p. 49.
31 Sable is a French word for sand.
32 P. D. Burden, The Mapping of North America: A List of Printed Maps 1511–1670 (Rickmansworth: Raleigh Publications, 1996), p. 31.
submarine plateaus beyond Nova Scotia as far as New England and Long Island as well. Additionally, the fragmented group of islands south of Labrador confirmed the prevailing concept of Newfoundland as an archipelago, but the actual island named “Baccalaos” is noticeably elongated compared to both Reinel’s and Rotz’s versions.

Informed by direct experience, Samuel de Champlain’s detailed “Carte géographique de la Novelle Francia” of 1612 (excerpted in Figure 7) has an explicit navigational purpose as attested by the presence of a compass rose and rhumb lines. Indeed, the inscriptions in the upper corners of the map describe how the map was made for sailors who used French compasses uncorrected for magnetic deviation. Notably, the map adopts the new convention of consolidating Newfoundland (but still heavily indented) into a single triangular form. One of the key focal points, the Grand Bank itself, labeled as “le Grand ban,” is rendered in

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**Figure 6** Giacomo Gastaldi, “La Nova Francia,” (1556, Venice), 26.9 × 37.4 cm (Digital copy is licensed under: CC BY-NC-ND 2.5 CA) Memorial University of Newfoundland. (Digital Archives Initiative Callmark G 3435 1556 R3 c.2 MAP –http://collections.mun.ca/maps/G_3435_1556_R32.tif)

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33 “I have made this map for the greater convenience of the majority of those who navigate these coasts, since they sail to that country according to the compasses arranged for the hemisphere of Asia.” Translation in Burden, *The Mapping of North America: A List of Printed Maps 1511–1670*, 197. Samuel de Champlain’s rationale was explained by the sailing times that could be lost by ignoring such potential errors with further advice that ships’ compasses should be adjusted once the Grand Banks were reached. See C. E. Heidenreich, *Explorations and Mapping of Samuel de Champlain, 1603–1632* (Toronto: University of Toronto Press, 1976), pp. 79–80.
a fine stipple with localized spraying waters indicating the navigational hazard of the Virgin Rocks – “les miqueles rochers” – off Newfoundland’s southern tip. The map significantly broke from previous conventions that represented the submarine plateaus lying off Newfoundland and Nova Scotia as uniform in shape. Indeed, individual banks of the continental shelves are delimited and distinguished (“banguereaux,” “ban au vert,” and “le Grand ban[c]” with other small circular areas stippled near “banguereaux.” In addition, there is the accurately crescent-shaped “Ille de sable” (illustrated with a single storied building and flagged tower)

34 Gleaning from Prowse’s most detailed historical cartobibliography of Atlantic Canada, inscriptions of “Grand Bank” or “le grand ban[c]” and close derivatives became more common from approximately 1610 onwards. See G. R. F. Prowse, Cartological Material: Vol. 3 Names (Winnipeg: G. R. F. Prowse, 1942), pp. 46–9. However, “le banc” is inscribed alongside a small red-colored oval island off Newfoundland in Pierre Desceliers 1550 world map (British Library Add MS 24065). See http://www.bl.uk/manuscripts/Viewer.aspx?ref=add_ms_24065_f001r. As a point of comparison, no Mediterranean portolan charts noted shelves but black (or usually red) dots were reserved for sandbanks. We thank Tony Campbell for this information.

35 In modern English nomenclature “banguereaux” and “ban au vert” are known as “Banquereau Bank” and “Green Bank” respectively.
that would mark it as a potential hazard not only for local fishermen but also for voyagers on direct routes between Europe and North America. Champlain’s map provides no indicator of settlement on Newfoundland (contrary to Nova Scotia and the rest of the North American coastline), but permanent English settlement would have been at a very embryonic stage at this time even if Champlain was aware of it. Greater clarity and scale are provided throughout than in earlier maps, as exemplified in its depiction of “ille de bacallos” near Newfoundland’s westernmost point.

A specialized utilitarian map of the Newfoundland’s waters (excerpted in Figure 8) was produced by Robert Dudley in Florence as part of his 1647 marine chart atlas – Dell’Arcano del Mare [Secrets of the Sea] – a title acknowledging that cartographical details were regarded as trade secrets. The entire atlas heralded an advance on previous work. It contained more coverage of the world and adhered to Mercator’s ground breaking projection with an intersecting graticule indicating latitude and longitude, thereby allowing the shortest distance between two points to be indicated. Its technical utility extended to denote information (with resort to the ornate baroque italic calligraphy supplied by the engraver Antonio Francesco Lucini) as to currents, prevailing winds, and magnetic deviation, as well as the crucial innovation of quantified soundings.

Several banks and sand bars are rendered on the map, each delimited by double dotted lines. The Grand Bank itself is a large winged expanse tapered by northern and southern flanks indented by semi-circular arcs, one of which contains crosses that accord with the Virgin Rocks hazard and is perforated by smaller doubled dotted lines indicating an uneven seabed. It is inscribed with the legend “La Gran Banca o Seccagna di Terra Nuova dove si pescano li merluzi” [The Grand Bank of Newfoundland where cod is caught]. In contrast to Champlain’s rendering, the Grand Bank curves in a gentle arc eastward from Newfoundland. There are numeric fathom soundings, which are liberally shown elsewhere on what amount to a submerged chain of plateaus. Although known for heavily inscribing the coasts with nomenclature, Dudley was liable to fill otherwise empty space with different versions of the same name (e.g. “G. di Bacalao” and “B. di Bacalao” in addition to “I. Bacalao”) with the suspicion that they were inserted to balance the map’s appearance. This example, however, uses more nomenclature than his other maps, especially on Newfoundland’s western flank. The nomenclature frequently compounds

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36 A French attempt to colonize Sable Island had failed by 1603. B. Barbiche, “Henri IV and the World Overseas: A Decisive Time in the History of New France,” in Champlain: The Birth of French America, eds. R. Litalien and D. Vaugeois (Montréal: McGill-Queen’s University Press, 2004), pp. 24–32: 27.

37 O. A. W. Dilke and M. S. Dilke, “Sir Robert Dudley’s Contributions to Cartography,” The Map Collector 19 (June 1982), pp. 10–14: 10.

38 Burden, The Mapping of North America, p. 339.

39 Prevailing physical conditions in the region are also affirmed by stylized inscriptions such as “Corrente Verso Maestrale” [Current to the [northwest] mistral [wind]] – (probably indicative of the Labrador current); “L’Venti Sono spesso verso Ponente” [The winds are often westerly]; “aria fredda e asciutta” [Cold and dry air]; and “Seccangna Lunga” [Long Bank].

40 F. O’Dea, The 17th Century Cartography of Newfoundland (Toronto: University of Toronto Press, 1971), p. 25.

41 Burden, The Mapping of North America, p. 353.
Italianized English and French names. However, given the maritime emphasis, this is at the expense of showing much in the way of settlements.

A large and heavily detailed manuscript chart of the coasts of Newfoundland, with the fishing districts marked, was produced in London in 1693 (see Figures 9, 10, and 11). Not a great deal is known about its maker, Augustine Fitzhugh, but it has been noted that he had served as an apprentice to John Thornton, who was renowned for The English Pilot series of maps that functioned as seminal guides to the world’s important

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42 An apprentice tree diagram of the Thames School of cartography is contained in T. Campbell, “The Drapers’ Company and its School of Seventeenth Century Chart-Makers,” in My Head is a Map: Essays & Memoirs in honour of R.V. Tooley, eds. H. Wallis and S. Tyacke (London: Francis Edwards and Carta Press, 1973), pp. 81–106: 100. Another North American map by Fitzhugh is “A draught of Boston Harbor by Capt. Cyprian Southake. Made by Augustine Fitzhugh anno 1694.” An original is held at the British Library, Add 5414.17. A later 1884 copy of this map may be viewed at https://collections.leventhalmap.org/search/commonwealth:1257bb808n. We have been unable to establish further evidence of professional dealings between Fitzhugh and Southake/Southack.
harbors. Fitzhugh would have been well skilled in distinguishing technical features, such as anchorages, soundings, and navigational hazards. Indeed, the utility and stylistics of the map accord with what has been identified as the Thames School of cartography. 43 Adorned by two elaborate compass-roses, it adapts some portolan style features: more important place-names of towns, or hazards (the “Virgins” rocks inscription off Cape Race is denoted by three hash-like symbols), are written in red, and more minor place-names are written in black. All of the banks depicted are shown in a dark yellow hue, and the sections further from shore are differentiated with a lighter texture. Only “The Maine Banck” and “The False Banck” (a possible rendering of today’s Flemish Cap) are actually named, with the former containing “Dry” areas to indicate shallower sections. Most of the banks are linked together to give a pincer appearance around the southern and eastern shores of Newfoundland and include textual reference to fishing, affirmed

43 See T. R. Smith, “Manuscript and printed sea charts in seventeenth-century London: The case of the Thames School,” in The Complete Plattmaker: Essays on Chart, Map and Globe Making in England in the Seventeenth and Eighteenth Centuries, ed. N. J. W. Thrower (Berkeley: University of California Press, 1978), pp. 45–100.
by a large vertically inscribed legend stating “English Fishing Boats” and two others stating “French Fishing Boats.”

**Illustration and Vignettes: Fishing and Fish Species**

In the maps selected for this article, only those by Giocomo Gastaldi, Samuel de Champlain, and Augustine Fitzhugh illustrate fishing activity and fish species. Gastaldi’s 1556 map of “Nuova Francia” was originally published as part of a series of complementary mapping in the third volume of Giovanni Battista Ramusio’s *Navigationi et Viaggi* [Navigations and Travels]. The map is replete with vivid illustrations that depict a landscape and seascape of dynamism and vitality, in which fishing features very heavily. Among the fish-related vignettes
(see Figure 6) are a fish hooked on a line (handlining) from an unmasted two man crewed boat with another two man crewed boat using a rod; a pair of fish hanging to dry from a bar suspended between two trees; examples of gill-netting and sail-assisted drift netting; and, various individual depictions of fish, marine life, and mythical creatures surfacing the water. A number of vessels are illustrated that are variably sized, crewed, and masted, with sails either furled or unfurled. Other esthetics include vivid vignettes of inhabitants dancing and hunting. The map would have served as an enticing prospectus for enterprise, as well as invoking a frontier spirit. It depicts bountiful fish resources while also finding recourse for imaginative creativity to include winged mythical beings occupying the northern fringe of Newfoundland labeled the “Island of Demons” [Isola de Demoni], as well as the unknown in the form of a large blank tract inscribed as “Parte Incognita.” Owing to wide dissemination (which contrasted with the limited readership of the
Jean Rotz Atlas manuscript), the vignettes of fishing (each positioned inshore from the map’s representation of the submerged topography) reinforced the reputation of the Grand Banks’s rich fishing grounds.

Champlain’s map similarly serves to depict a range of flora and fauna, as well as illustrate indigenous peoples. Of the various marine life distinguished in accurate detail (only some of which are present in the excerpted Figure 7 reproduction) are a cod (a “molue” placed beyond the southern reaches of “le Grand ban”), dogfish, bullfish, bass, garpike, sturgeon, horseshoe crab, and salmon (positioned by Newfoundland’s south-western inshore fisheries), as well as marine mammals, such as the sea-lion and the whale. The sea is implied to be as much as bounteous an asset as the land (although the act of fishing is absent), and with individual ships (rendered differently in size, orientation, and even shown firing artillery) also punctuating the map, there is little by way of empty space.

There are few depictions of marine biota in Fitzhugh’s manuscript map, and even those present are difficult to identify with precision. The only clear illustration of fish are a pair of flatfish stylized to flank the scale cartouche. However, the clear emphasis of the map is on the extensive formations of English and French fishing fleets. The vast majority of French boats are proportionally larger and asymmetrical in construction than their “English” counterparts, as well as more frequently indicated to be single crowded or not crewed at all. Further, the map supplies large scale insets of the harbors Ferryland, St John’s, Harbour Grace, and the Bay of Bulls, that variably illustrate anchorage points and fortifications flying the British flag. In the case of Ferryland, renderings of built settlement can also be observed.44

**Cartography, Fishing, and the Transmission of Knowledge**

Another dimension to interpreting cartographical evidence of fishing in the Newfoundland and Grand Banks area and adjacent waters relates to the extent that mariners’ and fishermen’s knowledge informed mapmakers and then became transmitted onto maps. As European fishing fleets began to visit the area regularly from the turn of the sixteenth century, T.E. Layng has opined a “reasonable supposition” that the shores of southern Newfoundland were known and roughly sketched shortly after the Corte Real expeditions and that also some of the regular fishermen probably had knowledge of the Gulf of St. Lawrence and the Nova Scotia coast, years before Cartier’s voyages in the French interest.45 While fishermen and traders would have aggregated information and data of variable quantity and quality of their long experiences of routes, destinations, and other

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44 See Pope, *Fish*, p. 328.
45 Layng, *Sixteenth-Century Maps*, p. xiv. In John Rastell’s play *The Four Elements* ([London, ca.1518]), pp. 864–65, one stanza relates “Fyshe they have so great plente,/That in havyns take and slayne they be/With stavys withouten fayle./Nowe Frenchemen and other have founde the trade,/That yerely of fyshe there they lade/Above an hundred sayl.” We thank Lydia Towns for drawing our attention to this reference. Axton’s modern commentary refers to Rastell’s abortive entrepreneurial fishing plans for the New World and the growing competition over fishing that had emerged. See *Three Rastell Plays: Four Elements, Calisto and Mélebea, Gentleness and Nobility*, ed. R. Axton (Cambridge: D. S. Brewer, 1979), pp. 5–6, 133–4.
features of interest, it is also likely that explorers and navigators were at least privy to such information despite the lack of surviving record or formal acknowledgment.\textsuperscript{46} However, it appears that fishermen left little direct cartographical evidence of their experiences, and many of the surviving maps thought to date from the early sixteenth century are estimates at best. Nevertheless, what survives of other mariners’ surveys indicates that they were based on “eye sketches, magnetic compass bearings, estimated distances, crudely observed latitudes, and dead-reckoning longitudes.”\textsuperscript{47} With the margin of error each of these can entail, inconsistencies and unintelligible elements are to be expected by those having to interpret them, but the surviving cartographical record augments our perspective alongside other documentary material relating to that period.

There is a frustrating lack of contextual detail regarding the production of Pedro Reinel’s c.1504 manuscript.\textsuperscript{48} In the early sixteenth century, Portugal and Spain had established hydrographic survey bureaus whereby the masters of vessels that had voyaged overseas submitted ships’ logs, which would inform amendments to a Padrão Real/Padrón Real master chart.\textsuperscript{49} However, we cannot definitively account for how Pedro Reinel sourced his material much beyond the claim that it was based on the Corte Real brothers’ voyages between 1501 and 1503.\textsuperscript{50} Brown has remarked generally of the period that there

“was doubtless an illicit traffic in them [i.e., charts] at all important seaports; not in standard, out of date products, but the latest thing compiled last month by a friend of a friend, that could be bought (only by a friend of course) for a price. Charts went underground.”\textsuperscript{51}

The 1542 Jean Rotz Atlas comprises part of the influential Dieppe school of cartography in the mid-sixteenth century.\textsuperscript{52} This period had overseen the extension of French interests in North America as typified by Jacques Cartier’s North American explorations of the 1530s. It is likely that local navigational knowledge would have informed map-makers as Norman fishermen had already undertaken multiple ventures to Newfoundland, and added to the expertise of Portuguese mariners and map makers in their employ (as well as accumulated charts and directions on Newfoundland voyages acquired by purchase or capture).\textsuperscript{53}

\textsuperscript{46} K. A. Seaver, “‘A Very Common and Usuall Trade:’ The Relationship between Cartographic Perceptions and ‘Fishing’ in the Davis Strait \textit{circa} 1500–1550,” \textit{The British Library Journal} XXII (Spring 1996), pp.1–26: 5.

\textsuperscript{47} Ganong, \textit{Crucial Maps}, p. 3.

\textsuperscript{48} A brief treatment of the map is Cortesão, “Pedro Reinel, Chart of c.1504,” pp. 25–7. See footnote 16 for dates ascribed to the map.

\textsuperscript{49} R. W. Unger, \textit{Ships on Maps: Pictures of Power in Renaissance Europe} (New York: Palgrave Macmillan, 2010), p. 99. For a discussion on possible early examples of a Padrón Real see also J. A. Gaspar (2017), “The Planisphere of Juan de la Cosa (1500): The First Padrón Real or the Last of Its Kind?” \textit{Terrae Incognitae} 49:1, pp. 68–88.

\textsuperscript{50} A. Cortesão, “Pedro Reinel, Chart of c.1504,” p. 27.

\textsuperscript{51} L. A. Brown, \textit{The Story of Maps} (New York: Dover Publications, 1979), p. 142.

\textsuperscript{52} A concise account of this cartographical school is provided in G. K. Brunelle, “Dieppe School,” in \textit{The Oxford Companion to World Exploration, Volume 1}, ed. D. Buisseret (Oxford: Oxford University Press, 2007), pp. 237–8.

\textsuperscript{53} H. Wallis, “Dating and Sources,” in \textit{The Maps and Text of the Boke of Idrography}, ed. H. Wallis (Oxford: Roxburgh Club, 1981), pp. 39–45: 40.
atlas folios are edged by a latitude scale further flanked by an ornate margin containing a scale calibrated by leagues, a characteristic common in Portuguese nautical atlases, thereby corroborating the likely cross-pollination of Portuguese and French influences.\(^{54}\) Rotz’s regional North America mapping has been identified as indicative of Cartier’s first expedition of 1534 but not of the subsequent one of 1535. The reason for the lag between these voyages and the 1542 publication is not definitively known.\(^{55}\) Nevertheless, the maps appear to support Peter Pope’s observation that “Breton, Norman, and French Basque crews dominated the nascent transatlantic cod fishery, and their activities grew dramatically in the 1540s.”\(^{56}\)

Giocomo Gastaldi’s Venice base was a significant hub in cartographical production in the mid-sixteenth century. His map reflects the discoveries of Jacques Cartier’s voyages to the Gulf of St Lawrence and those of Giovanni di Verrazano, who was seeking a passage to Asia on behalf of Francis I of France. It has been suggested that by integrating information from both Cartier and Verrazano, the map compounds distortions and errors.\(^{57}\) Gastaldi continually added to a wealth of aggregated knowledge to assist in adapting original data in his own productions, which in turn became the models that successors emulated.\(^{58}\) The popular impact of the publication receptive to a readership interested in travel literature was such that it was translated into other languages and necessitated reprints. Indeed, maps such as these became associated with texts that “turned places into political spaces defined by their subjection to the rule of European powers.”\(^{59}\)

The authority of Samuel de Champlain’s map derives from the first-hand accounts of his experiences that place his cartography of the Grand Banks area in further perspective.\(^{60}\) He explains how submarine delineations came to be drawn from the “innumerable soundings” of “all former seamen,”\(^{61}\) whereby a sounding lead was prepared at timed intervals to ascertain that “when he is on the [Grand] Bank he will find 45, 40, 35 and 30 fathoms, a little more or less according to latitude … .” Further corroboration was taken from accounts of an “infinite number of birds” following fishing vessels to scavenge fish entrails returned to the sea.\(^{62}\) The very knowledge of the Grand Banks area not only transcended its utility as a fisheries

\(^{54}\) A. T. da Mota, “Three Luso-French Atlases,” in Portugaliae Monumenta Cartographica, Volume V (Lisbon: Coimbra University Press, 1960), pp. 132–40: 139.

\(^{55}\) Quinn, “The Americas,” p. 51.

\(^{56}\) See Pope, Fish, p. 16. Pope also notes that “French and Iberian records of the middle decades of the sixteenth century suggest a scale of effort by Bretons, Normans, and Basques unmatched, until the 1570s.” Pope, Fish, p. 15.

\(^{57}\) T. Suarez, Shedding the Veil: Mapping the European Discovery of America and the World (Singapore: World Scientific, 1992), p. 88.

\(^{58}\) Layng, Sixteenth-Century Maps, pp. xvii–xx.

\(^{59}\) F. Lejosne, “Les lieux du compilateur: les Navigationi et viaggi di G. B. Ramusio (1550–1559),” Belgeo 2 (2014) URL: http://belgeo.revues.org/12909; DOI: 10.4000/belgeo.12909 (See English abstract).

\(^{60}\) Samuel de Champlain, “Tratté de la marine et du devoir d’un bon marinier” (“Treatise on seamanship and the duty of a good seaman”), The Works of Samuel de Champlain, Volume VI, 1629–1632, trans. H. H. Langton and ed. H. P. Biggar (Toronto: The Chaplain Society, 1936), pp. 253–348.

\(^{61}\) Samuel de Champlain, “Tratté de la marine et du devoir d’un bon marinier,” p. 302.

\(^{62}\) Samuel de Champlain, “Tratté de la marine et du devoir d’un bon marinier,” pp. 303, 304–5.
resource but also in Champlain’s opinion was “the cause of so many vessels not being lost, as they would be if it were not there, since it enables the seaman to correct his reckoning.”\textsuperscript{63} Champlain’s cartographical portrait hinted at how the Newfoundland fisheries were more expansive (to the south and further offshore) and could be more precisely delimited than predecessors had suggested. It has been noted that the depiction of the Newfoundland coast and its place names appear to derive from an unknown earlier map (possibly French if suggested by the place names), with Champlain having noted himself that many navigators would have possessed their own Newfoundland maps.\textsuperscript{64} Identified as marking the beginning of the “transitional” period of the historical cartography of the period, Champlain’s work was initially based on “ampler knowledge, better facilities, and improved technique” that heralded a better quality of map “systematically complete and recognizable for the regions.”\textsuperscript{65}

By the mid-seventeenth century, Robert Dudley’s utilitarian work echoed Gastaldi’s methodology in synthesizing the best available information. The series of illustrations, working diagrams, and other explanations of the work drew upon his experiences as a navigator and shipwright, as well as expert contacts to discuss navigation, latitude and longitude, winds, tides, naval warfare, and instrumentation.\textsuperscript{66} The aggregation of quantified soundings data from lead lines as well as observations on currents and winds greatly aided safe navigation (plus specifying where cod is caught) with the Newfoundland and Grand Banks folio being deemed “one of the most important maps of the region ever produced.”\textsuperscript{67} There are a few geographical curiosities on the map such as the pronounced exaggeration of Avalon peninsula compared with the rest of Newfoundland which appears to derive from charts of the Atlantic which Dudley probably accessed at his Florence base.\textsuperscript{68} The entire work’s status is more remarkable given the established hegemony of the Dutch sea atlases, the quality of its production (over 12 years in preparation as claimed in the atlas preface), and that it pioneered detailed non-European coverage.

Counter-intuitively, given that it is the last chronologically of the mapping examples in this article, there is not a great deal of evidence to contextualize Augustine Fitzhugh’s manuscript map of 1693. Indeed, only nine of his charts survive in the records spanning the years 1683 to 1697 that included Arabia and West Africa.\textsuperscript{69} However, his map of the Newfoundland and Grand Banks area exhibited far more detail than the folios contained within The English Pilot series by John Thornton to whom Fitzhugh had been apprenticed.\textsuperscript{70} So to glean possible further understanding

\textsuperscript{63} Samuel de Champlain, “Tratté de la marine et dv devoir d’en bon marinier,” pp. 303, 309.
\textsuperscript{64} Heidenreich, Explorations, p. 81.
\textsuperscript{65} Ganong, Crucial Maps, p. 3.
\textsuperscript{66} Dilke and Dilke, “Sir Robert Dudley’s Contributions to Cartography,” p. 11.
\textsuperscript{67} Burden, The Mapping of North America, p. 353.
\textsuperscript{68} O’Dea, The 17\textsuperscript{th} Century, p. 25.
\textsuperscript{69} T. Campbell, “The Drapers’ Company and its School of Seventeenth Century Chart-Makers,” p. 101.
\textsuperscript{70} See footnote 42.
of the map we must examine its empirical detail and the political context of its production when it was produced (see next section).

While allowing for error, W.F. Ganong summarizes that the “transitional” period of the cartographical record of the area experienced the “introduction of the local place-nomenclature, originating with the pilots and fishermen, in replacement of the older formalized, corrupted, and locally unknown map names.” Yet, one may conjecture that fishermen’s knowledge could have been regarded as a trade secret invested with years of professional and personal experience that affected the content and volume of historical cartography in the “early” period spanning the sixteenth century. Nevertheless, what can be established about the flow and transmission of knowledge via fishermen and mariners from the cartographical examples outlined here is understandably hindered and restricted to the circumstantial evidence of their production at best, which has been conditioned by the relative lack of cartographical material that has survived.

**Cartographical Reflections of Political Contexts in Production and Content**

The remaining dimension of the cartographical representations of fishing we consider concerns the political context of their production, as well as their content. The map of Pedro Reinel – “a Portuguese pilot of eminence, who afterward entered the Spanish service” – testifies to the significant Portuguese maritime knowledge of the Newfoundland area at that time. With two Portuguese standards adorning Newfoundland, the map suggests that Portuguese explorers were claiming significant discoveries in the region and systematically recording latitudes and compass variation. However, we cannot deduce a commensurate degree of Portuguese involvement in fisheries there since there is limited evidence. Jean Rotz’s 1542 *Boke of Idrography* is thought to have been “inspired, to a great degree” by an unknown individual Portuguese cartographer. This manuscript atlas was dedicated to the English monarch Henry VIII as Rotz, a Frenchman of Scottish

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71 Ganong, *Crucial Maps*, p. 3.
72 G. Dexter, “Cortereal, Verrazano, Gomez, Thevet,” in *Narrative and Critical History of America, Volume IV*, ed. J. Winsor (Boston and New York: Houghton, Mifflin, and Company, 1884), pp. 1–32: 16.
73 Of course, the Corte Real family was closely linked with the Azores, the Portuguese archipelago in the North Atlantic which is well-positioned for North Atlantic seafaring.
74 *New American World: A Documentary History of North America to 1612, Volume I: America from Concept to Discovery. Early Exploration of North America*, ed. D. B. Quinn (London: Arno Press, 1979), p. 481.
75 Citing a general lack of documentary evidence, Abreu-Ferriera has critiqued what she describes as “the legend that the Portuguese were major players in the 16th century cod fishery.” See D. Abreu-Ferriera, “Portugal’s Cod Fishery in the 16th Century: Myths and Misconceptions,” in *How Deep is the Ocean?: Historical Essays on Canada’s Atlantic Fishery*, eds. J. E. Cantlow and C. Corbin (Sydney: Cape Breton University Press, 1997), p. 31. However, it has been argued that significant Portuguese fishing interests continued well into the late sixteenth century. See A. J. M. Barros, “Cod Fishery and Global Trade: Porto’s Ships in Newfoundland in the Sixteenth Century,” in *Human and Environmental Interactions in the Development of the North Atlantic Fisheries*, eds. R. Robinson, M. Wilcox, and M. McCarthy (Hull: North Atlantic Fisheries History Association, 2015), pp. 7–22.
76 da Mota, “Three Luso-French Atlases,” p. 140.
heritage, had recently transferred into English service with fellow Huguenots from his native France. Norman commerce had already underwritten several ventures to the Grand Banks that supported the growing trade in North Atlantic fish. Yet, with no direct cartographical documentation of Jacques Cartier’s travels extant, any knowledge that was disseminated did not manifest itself in the cartographical discourse for some time.\footnote{Layng, *Sixteenth-Century Maps*, p. xvi.}

Giocomo Gastaldi was linked to Giovanni Battista Ramusio, secretary to the senate of the Venetian Republic (by then a formidable trading power and hub where geographical science was flourishing), and he served as official cosmographer.\footnote{R. W. Karrow, *Mapmakers of the Sixteenth Century and Their Maps* (Chicago: The Newberry Library by Speculum Orbis Press, 1993), p. 216.} The preface to *Navigations et Viaggi* contains hints as to the origins of the map in that Ramusio recorded how he was “exhorted” to include mapping of the New World in the Ptolomaic style “but including whatever has become known up to the present, namely the coasts added in navigator’s charts by Spanish pilots and captains.”\footnote{See Karrow, *Mapmakers*, p. 229.} Such mapping was also indicative of Italian influence in exploration (Verrazano was an Italian serving the French monarch), as well as cartographical expertise blending with French enterprise. In terms of content, the political dimension is inferred from the Portuguese quinas escutcheon in the upper right corner of the map with it also appearing on an unfurled sail nearby as well as a pair of ships in both lower corners of the map having sails adorned with the French fleur-de-lys.

Samuel de Champlain’s 1612 map was produced at a time when France was intensifying its commercial interests (having pursued mineral wealth since Cartier’s voyages in the 1530s), as well as seeking the North West Passage to Asia. Champlain was deputed to explore and chart in the French interest and is credited as being the catalyst “in the initial success of French attempts at gaining a foothold in America.”\footnote{Burden, *The Mapping of North America*, p. 197.} His directly informed map projected a sense of French power over the area that illustrated the array of fish species as well as distinguishing individual banks while also hinting that these waters were contested theaters of intensifying political rivalries (with large galley vessels shown to be discharging artillery).

While Robert Dudley’s map suggests accessible waters with unprecedented technical detail, there is little indication given in its content to the interplay of political state interests. Yet, despite its undoubted utilitarian purpose, it has been opined that the promotion of the atlas by its dedicatee, Grand Duke Ferdinand II of Tuscany, was politically motivated so as to award it as a gift to foreign dignitaries.\footnote{Dilke and Dilke, “Sir Robert Dudley’s Contributions to Cartography,” p. 11.} Indeed, the survival of such cartography has been attributed in part to their very “artistic and decorative value” and were more likely to be “exchanged as gifts by princes and nobles.”\footnote{See D. B. Quinn, “Artists and illustrators in the early mapping of North America,” *The Mariner’s Mirror* 72.3 (August 1986), pp. 244–73: 245.}
Augustine Fitzhugh’s map, by epitomizing the growing intensity of political rivalry concerning fisheries (see Figures 9, 10, and 11), places the fishing regime of the Newfoundland and Grand Banks area in a more clearly contested political context than that implied by Gastaldi and Champlain. Colonial expansion in America gathered pace in the mid-seventeenth century, and after the Dutch were eclipsed by the English following conflict over colonies and trading routes, further demand for maps was generated. The period between 1670 and 1700, after English hegemony on eastern American shores was attained, witnessed as prolific a cartographical output as had been produced of the Americas hitherto.83 While depicting navigational information and explicitly indicative of the economic significance of the Grand Banks fisheries, Fitzhugh’s map “outwardly politicizes the fishery by differentiating the French and English fishing fleets” (with flags dotting the map) “and revealing how a smaller English fishing fleet is being surrounded” to convey the image of French domination and encroachment on English fishing grounds.84 According to Peter Pope, shore-based crews had to row as much as three or four miles out and back daily, mooring their vessels as much as a half-mile offshore in water to 40 fathoms deep.85 The map appears to support the contention that the English fishery was more of an inshore industry than one based on the actual banks, while at the same time implying a perceived imminent threat posed by French interests to England’s fisheries.86

The legend “The English Fishing Boats” stretches between two flags (“The King’s Colours” or Great Union Flag) that extends from Cape Race to the Bay of Foggs. This has the effect of enclosing a tightly compacted fleet of boats, mostly comprised of small fishing craft, variably double or treble crewed and with nets cast. Smaller British flags punctuate the eastern shore alongside established harbors that are also separately shown in insets at the top and bottom of the entire map. In close attendance are two large naval vessels with red ensigns. The stretch from the Avalon peninsula to Trinity Bay is rendered fairly accurately and tightly inscribed with place names, reflecting the coast with which the English would have been most familiar.

The map provides a fascinating juxtaposition of the English and French fishing fleets during the time of King William's War (the North American theater of the Nine Years’ War (1688–97)), the first of a series of conflicts England and France waged into the eighteenth century and beyond. The foreboding impression of the map was indeed realized in 1696 when the French sacked the English settlements of Newfoundland’s Avalon peninsula. By the time of the 1713 Treaty of Utrecht, Newfoundland had acquired an elevated status as a geopolitical and economic asset, which had already contributed to England and France coming into direct conflict. The political dimension to both Fitzhugh’s and Champlain’s maps is even

83 See P. D. Burden, *The Mapping of North America II: A List of Printed Maps 1671–1700* (Rickmansworth: Raleigh Publications, 2007). The first significant English map of Newfoundland was only produced in 1625 by John Mason.
84 A. S. Maeer, *The Cartography of Commerce: The Thames School of Nautical Cartography and England's Seventeenth Century Overseas Expansion*, Unpublished PhD thesis (University of Texas at Arlington, 2006), p. 192.
85 Pope, *Fish*, p. 22.
86 Pope, *Fish*, p. 22 n.13.
more clear when one considers them part of the “cartographic discourses of domination and submission during a period in which English and French map-makers attempted to render their sovereigns’ territories larger, more consequential, and occupied either textually or physically by Britain or France.”

Conclusion

We contend that the cartographical record of Newfoundland and the Grand Banks area over the sixteenth and seventeenth centuries exhibited significant mutations and innovations in how fishing locations were delineated and labeled as well as in how fishing practices and fish species were illustrated. The knowledge accrued by and from fishermen would have underwritten such mapping and proceeded to buttress the evolution of hydrographical indicators (mostly by use of stippling) on maps of notable esthetic appeal. This was a crucial innovation at an early stage that recognized the repute of the area and that of the Grand Banks as one of world’s most important submarine topographical features. Indeed, as more refined and accurate delineations of the Grand Banks shadowed the development of fishing activities, encompassing both Newfoundland’s nearshore as well as the Grand Banks and neighboring waters, a symbiotic relationship can be discerned between such cartography and the commercial, as well as the strategic, interests of North Atlantic powers.

The cartographical evidence shows how delineations of the submarine plateaus of the Grand Banks and other neighboring continental shelves evolved from simplistic linear renderings (e.g. Pedro Reinel’s c.1504 map) to more expansive spatial representations in which the Grand Banks themselves explicitly eclipse the territorial coverage of Newfoundland itself (e.g. Augustine Fitzhugh’s map of 1693). Textual inscriptions, too, were deployed to affirm the area’s close links with fishing as well as examples of detailed illustrations of fishermen, fishing practices/methods, fishing vessels, plus generic and individual fish species that significantly augmented the cartographical esthetic. While the extant evidence does capture specific historical moments, the maps had difficulties in expressing temporal nuance such as the seasonality and migratory character of the fisheries, and even representations of ice and fogs are very rare.

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87 Duzer and Beck, Canada, p. 6.
88 Detailed bathymetry in cartography (e.g. isobaths etc.) were initially limited to occasional large scale charts of harbors, coasts, and rivers until Luigi de Marsigli’s Histoire Physique de la Mer of 1725. See E. Imhof, Cartographic Relief Presentation (Berlin and New York: ESRI Press, 1982), pp. 11–2.
89 Why this appears to be the case merits further inquiry and highlights yet another tantalizing dimension with regard to the fragmentary cartographical record. One may speculate at a general reluctance to represent what may have been considered transient rather than prevailing or indefinite conditions. An apparent exception though is the 1550 Pierre Desceliers map which depicts a brown bear (eating a fish) and a polar bear placed on ice flows off northern Labrador. See http://www.bl.uk/manuscripts/Viewer.aspx?ref=add_ms_24065_f001r.
As such, these maps served as effective portraits in a communication process. Initially, as far as the transmission of source information to the final map is concerned, there remains a great deal that is unknown and probably permanently lost. However, circumstantial evidence suggests that fishermen as well as explorers were key witnesses in providing information and data of variable quantity and quality that in some cases permeated the exclusive sphere of high state politics and/or was disseminated to a wider readership. The crucial role of the cartographer was to transform and interpret such information according to their individual perspective as well as to be beholden to commercial and/or political objectives. These would interact with the cartographer’s extant knowledge of other cartography and technical acumen into transforming data onto the map.

Overall, the “early” and “transitional” cartographical record of Newfoundland’s Grand Banks area and its neighboring waters offer valuable insights into what was a transformative period of North Atlantic history based on a confluence of emerging historical developments that underpinned a period of geographical discovery, cartographical innovation, and the pivotal importance of the entire Grand Banks area to fishing. Once its repute for rich fishing grounds began to be established, its rendering in cartography conveyed that it, “on the one hand, had the physical properties of the ocean, but, on the other hand, had the social properties of land as it could be bounded and developed.” The cartographical record proceeded not only to mark new chapters in fishing and in the growing significance of the Grand Banks area as a resource, but also to articulate new and refined information, as well as recognize the area’s strategic significance as a colonial theater for intensifying political rivalries.

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For some insight into the surviving cartographical record see Quinn, “Artists and illustrators in the early mapping of North America,” pp. 244–73.

P. E. Steinberg, “Sovereignty, Territory, and the Mapping of Mobility: A View from the Outside,” Annals of the Association of American Geographers 99. 3 (July 2009), pp. 467–95: 485.
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