THE USE OR ABUSE OF "NORMAL" TERRITORIAL SEA BASELINES

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Abstract

One would think that the use of the low water line to define the normal baseline of the territorial sea would be without reproach. Yet the author has seen occasions when, often for technical reasons, the low water line produces unusual situations which can affect the location of the maritime jurisdictional limits and international maritime boundaries. Technical experts assisting government regulation writers, negotiating teams, arbitration pleaders, and the judiciary need to be aware of the origin, significance, and impact of these peculiarities. The author will give examples from Canada, Greenland, Barbados and Suriname based on his experiences.

Disclaimer

The views expressed in this paper are not necessarily those of the Government of Canada or of any of the Tribunals whom the author assisted. The maps should be considered illustrative, not definitive.

1. Introduction

A State's sovereign maritime area extends to the outer limit of its territorial sea, which is defined as being as a maximum of twelve nautical miles from the closest point on that State's territorial sea baseline.[1] Similarly, the sovereign rights that a State enjoys in its contiguous zone and exclusive economic zone extend only as far as certain prescribed maximum distances from the same territorial sea baselines. The limit of the continental shelf rights of a State is more complex, yet it also has connections to the territorial sea baselines.

The territorial sea baseline comes in two fundamental types: the normal baseline and the straight baseline. The latter type is supposed to be applicable only when the coastline is deeply indented or fringed by islands. However, many States have officially defined straight baselines that some hydrographic and legal practitioners, and some States, find rather perplexing. There have been a number of atlases[2], treatises, and books[3]

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[1] *United Nations Convention on the Law of the Sea* (UNCLOS), Article 3.
[2] See Tullio Scovazzi, Giampiero Franalanci et al., *Atlas of the Straight Baselines*, Dott. A. Giuffrè Editore, Milano, 1989.
[3] See J.R.V. Prescott, *The Maritime Political Boundaries of the World*, Methuen, London & New York, 1985.
J.R.V. Prescott & Clive Schofield, *The Maritime Political Boundaries of the World – 2nd Edition*, Martinus

written about the State practice of territorial sea straight baselines. At least one State has tried to quantify the geographic parameters necessary for straight baselines[4], and the United Nations itself held a workshop in 1987 on the subject and published its findings.[5]

One would think that the territorial sea "normal" baseline, which is defined as the low water line along the coast, would be free from any abuse similar to those of straight baselines. This paper addresses this subject.

2. What Does the Law Say?

Article 5 of the United Nations Convention on the Law of the Sea (UNCLOS) says:

> "Except where otherwise provided in this Convention, the normal baseline for measuring the breadth of the territorial sea is the low-water line along the coast as marked on large-scale charts officially recognized by the coastal State."

And Article 13 of UNCLOS says:

> 1. "A low-tide elevation is a naturally formed area of land which is surrounded by and above water at low tide but submerged at high tide. Where a low tide elevation is situated wholly or partly at a distance not exceeding the breadth of the territorial sea from the mainland or an island, the low-water line of that elevation may be used as the baseline for measuring the breadth of the territorial sea.
> 2. "Where a low-tide elevation is wholly situated at a distance exceeding the breadth of the territorial sea from the mainland or an island, it has no territorial sea of its own."

These two Articles talk about technical terms that are not defined elsewhere in the Convention: low-water line, charts, large scale, officially recognized, low tide, high tide and even island.

3. Technical Consideration #1: Geographic Location

In 1975, Nautical Magazine welcomed Rear Admiral D.W. Haslam to his post as the new U.K. hydrographer of the navy with these words: "Hydrography is a never-ending battle of too few resources against too many tasks. The situation has been like that since Alexander Dalrymple became the first Hydrographer in 1795. And it will never be any different in the future. Never."[6] The world's economic well-being depends on commodities being shipped through navigable, but nevertheless shallow, stretches of coastal waters and into major ports. These areas have been repeatedly hydrographically

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Nijhoff, Lieden & Boston, 2005.
W. Michael Reisman & Gayl S. Westerman, 1992. *Straight Baselines in International Maritime Boundary Delimitation.* The MacMillan Press Ltd., United Kingdom.
[4] United States Dept. of State, *Limits in the Sea*, No. 106.
[5] Office for Ocean Affairs and the Law of the Sea, *Baselines: An Examination of the Relevant Provisions of the United Nations Convention on the Law of the Sea*, United Nations, New York, 1989.
[6] *Nautical Magazine*, Glasgow, 214, 6, 323.

surveyed to meet increasing needs and physical changes. But parts of the submerged land mass claimed by States have not been surveyed even once as priorities were put elsewhere. Whereas photogrammetric techniques can be easily used to map great expanses of terrain, hydrography means the laborious profiling of the bottom by a ship or launch. Canada is not alone in having charts which include surveys dating back into the 19th Century.

One such problem caused by old surveys is the geographic location of features. In Figure 1, the eastern coast of Baffin Island (Canada) was cartographically compiled in the 1940s for air navigation from vertical and oblique aerial photographs loosely controlled by astronomic positions determined at infrequent intervals. These aeronautical maps were then used in the preparation of the nautical charts in the 1950s and the hydrography added relative to the coastline.

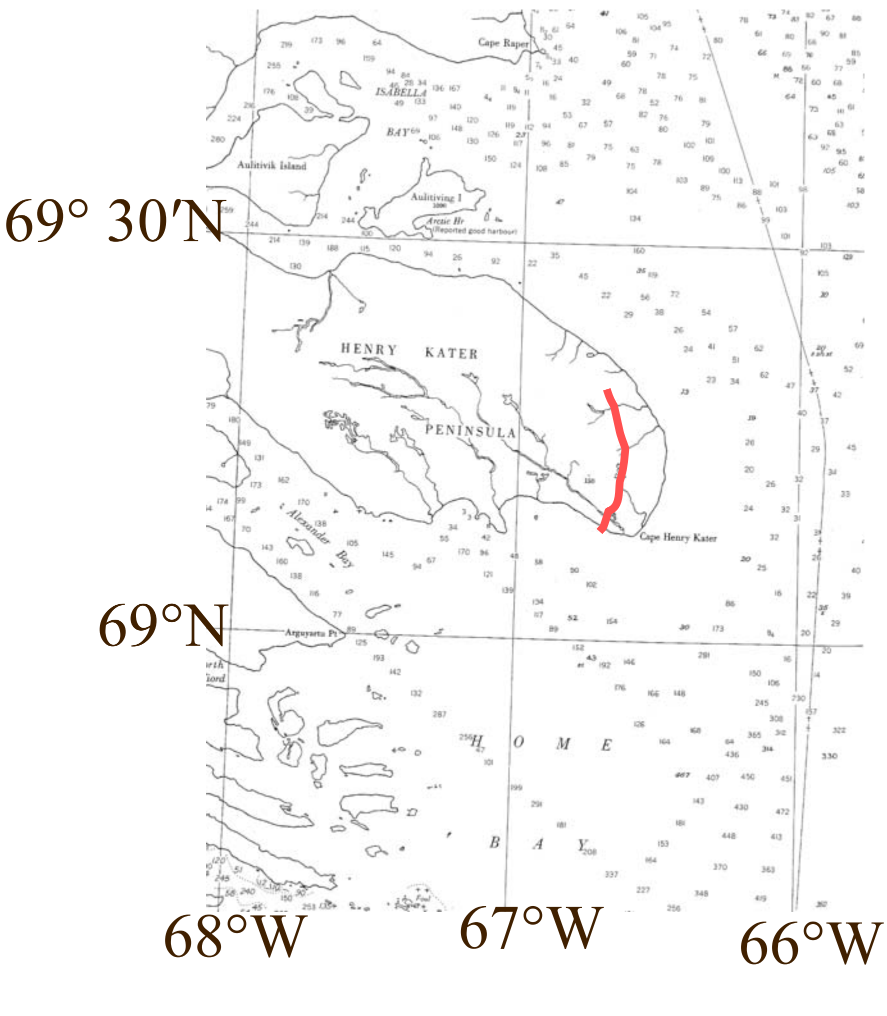

Figure 1. Henry Kater Peninsula, Baffin Island, Canada. Canadian Hydrographic Service chart 7053. The red line is the approximate true location of the coastline.

The actual coastline of Henry Kater Peninsula is approximately 3 nautical miles west of its charted position. The territorial sea limit was added in 1994 using the charted coastline, based on the premise that mariners would likely be using radar as a position fixing method within, or near, the territorial sea. However, the Canada-Greenland continental shelf delimitation line (agreed to in 1972, and recomputed in 2003), which is based on the strict equidistance principle, uses the best known geographic coordinates for each of the basepoints, including those on Henry Kater Peninsula.

4. Technical Consideration #2: Discontinuity between Surveys

The whole world cannot be surveyed at once, and since erosion and accretion caused by water currents are much stronger forces for reshaping topography than wind or gravity, there will be times when the results of one survey do not match with the results of adjacent surveys done at a different epoch. One such situation arose during the Barbados-Trinidad & Tobago maritime boundary arbitration. The then-current edition of British Admiralty chart 502 (Harbours and Anchorages in Barbados) had a discontinuity in the location of the low water line and the depth contours seaward thereof caused by surveys to the east of the discontinuity dating back to 1868-73 and to the west dating from the 1980s. See Figure 2.

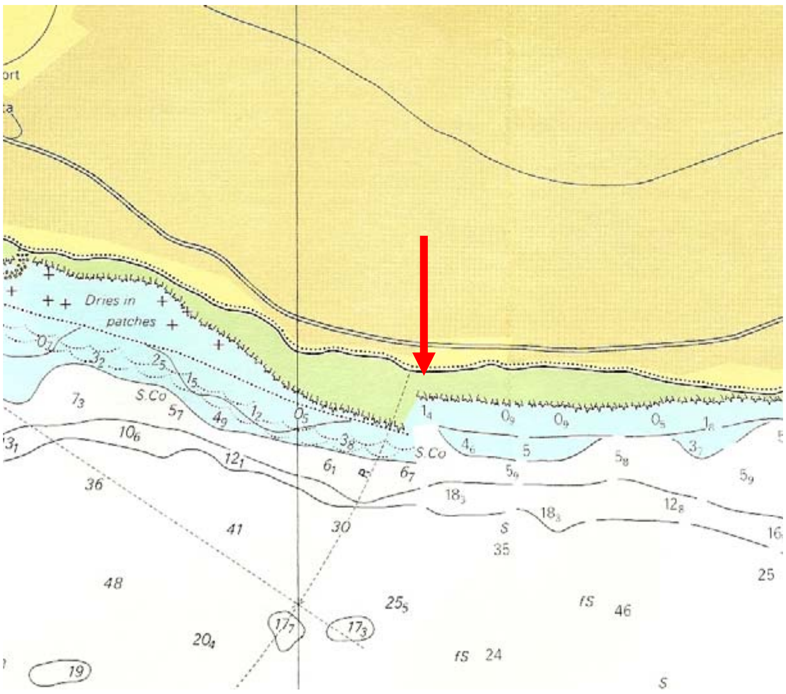

Figure 2. British Admiralty chart 502 (1990 Edition) of the harbours and anchorages in Barbados. The area east of the discontinuity, marked by the red arrow, was surveyed 1868-73, and the area west of the discontinuity was surveyed in 1980. Newer surveys were incorporated throughout the chart in the 2006 edition.

The problem was resolved, fortuitously, by the British Admiralty providing the tribunal an advance copy of the next edition of the chart which incorporated new surveys throughout, and which was accepted by both Parties to the arbitration. The new edition of the chart was officially released 11 weeks prior to the decision being handed down.

The tribunal decided that the equidistance line was appropriate for much of the boundary, which meant that the geographic position of points along the low water line were important. Without the new edition of the chart, the tribunal could have used the 1990 edition, since it was the one presented to the tribunal. Or, once the new edition was available, it could have asked the technical expert to recompute the equidistance line based on the coordinates of base-points from the new edition, but then the Parties would not have had a chance to argue the merits of that new edition.

These two examples remind the author of a statement made by a very practical chart compilation supervisor at the Canadian Hydrographic Service who quipped: "The lack of data has never stopped us from making charts." And indeed, it should not – at least from an Admiralty law point of view. It is one thing for a hydrographic office not to know about a danger to navigation, assuming that proper diligence has been observed during the survey, but to withhold information from the mariner crucial to safe navigation might easily lead to the charting agency being found negligent.

5. Technical Consideration #3: Overlooking Charted Information.

If a State issues legislation, a regulation, an order, or a decree specifying what are the endpoints of the straight baselines or sections of low water line that are the baselines for the territorial sea, then it better be sure that it lists all the appropriate data. Canada is one country that has gone this route. United States, on the other hand, specifies that the latest published chart of an area is the definitive source for the low water line. Therefore changes or previous omissions can be corrected without issuing a new regulation/order/decree in the government's gazetteer.

States which issued their territorial sea baseline definition may need to re-visit their charts to see if there are low tide elevations between the old 3 nautical mile territorial sea limit and the newer 12 nautical mile limit. There is at least one example in Canada where this has happened. See Figure 3.

Canada's territorial sea straight baselines, sections of low water line and low tide elevations north of Cape Chidley were promulgated for the first time in 1986. Labrador Reef, being two pinnacles which dry 2.7 and 2.4 metres, were inadvertently overlooked. They are 2.5 nautical miles from the nearest island and should have been included. Canada has the possibility of claiming another 188 square kilometres (55 square nautical miles) if it were to claim these two pinnacles as basepoints of its territorial sea.

One can only rationalize that they were overlooked because the reefs are outside the area covered by the largest scale chart of the Button Islands, and only appear on smaller scale charts of the coast. In 1986, Canada promulgated very quickly its definition of the territorial sea baselines from Cape Chidley northwards to the Arctic Ocean and then southwestwards to the Alaska/Yukon border in response to the 1985 transit of the Northwest Passage by the USCG icebreaker *Polar Sea*. The moral of the story is to be diligent.

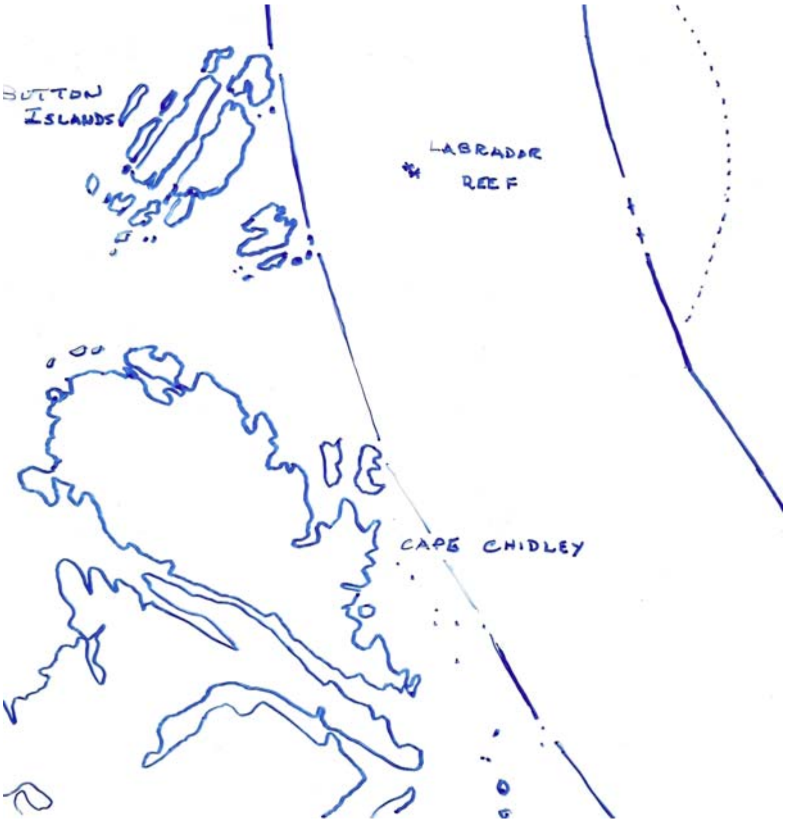

Figure 3. Cape Chidley area (north end of the Labrador Peninsula), Canada.

## 6.	Technical Considerations #4: Chart Symbology

Any part of the sea bottom that is shallower than the draft of the ship at high tide is irrelevant to that ship because it cannot possibly navigate there. Therefore, hydrographic surveyors, if they are rushed in their survey work, may not spend the time to differentiate between a "dangerous underwater rock" (shown by a 4-pointed cross), a "rock awash at chart datum" (shown by a 4-pointed cross with 'dots' at the four corners of the 'box' formed by the cross), a "rock which covers and uncovers" (shown by a six-pointed star, 2 of which are pointing horizontally on the chart), or a "rock which does not cover" (shown by an enclosed polygon or shape).

In selecting possible territorial sea baseline points, it is perhaps appropriate to identify rocks awash. If the rocks awash were just a little higher, they could be low tide elevation. Thus, it might be advantageous to resurvey them. One such instance, again in Canada, is Blonde Rock off the most southern tip of Nova Scotia. Blonde Rock was shown on the 1992 edition of CHS chart 4242 (Cape Sable Island to/à Tusket Island) as a "rock awash"; however, the previous chart, a British Admiralty chart surveyed in the late 19^{th} century for which CHS assumed responsibility in the 1950s, showed it as drying. A survey was requested and in due time performed. The rock was indeed found to be drying by 0.4 metres. See Figure 4.

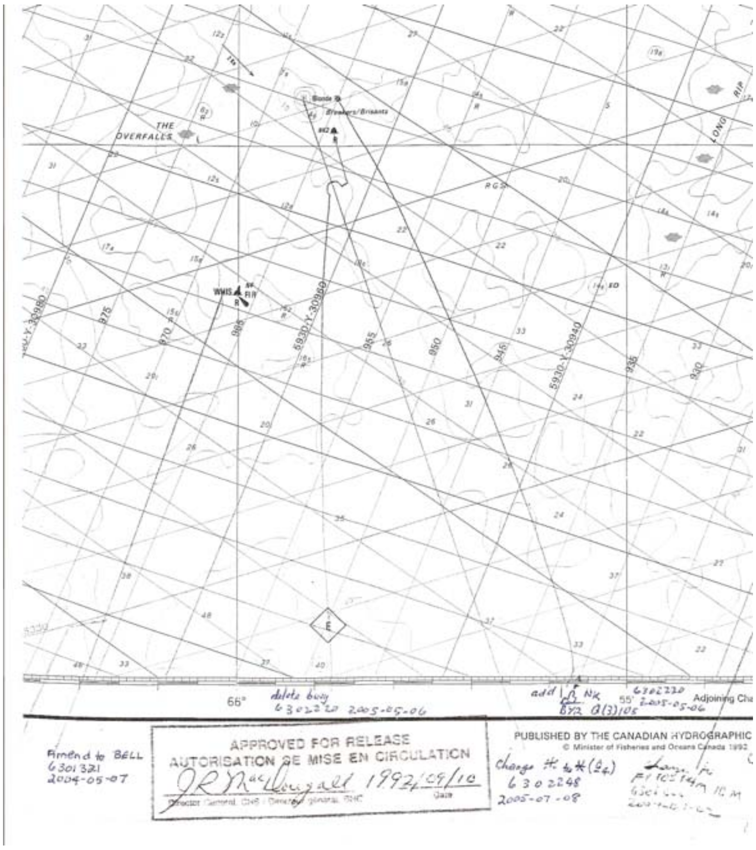

Figure 4. CHS chart 4242 (Cape Sable Island to/à Tusket Island). This is a copy of the chart on file in the Notices to Mariners office at CHS, which records all the Notices issued against the chart. The Notice changing the symbology for Blonde Rock is to the right of the "Approved for Release" stamp.

The effect of having Blonde Rock as a possible basepoint could be to add 136 square kilometres (39 square nautical miles) to Canada's territorial sea. See Figure 5.

7. Technical consideration #5: Need for Dedicated Surveys

The coast of Labrador (Canada) is a beautiful but harsh environment. Cliffs rise from the ocean to 500 metres (1500 feet) or more throughout its 1000 kilometre (500 nautical miles) length. The ocean floor near the coast can be as precipitous. I personally have seen the sounder go from 100 metres to zero in a split second. Unexpected collisions with the solid-rock bottom causing major damage to our five launches, occurring at the rate of one per week during the whole survey season. HMS *Challenger*, when surveying off Nain, Labrador in 1932, was holed by a pinnacle rock in a freshly surveyed area.[7] It was a major feat of seamanship to get her off.

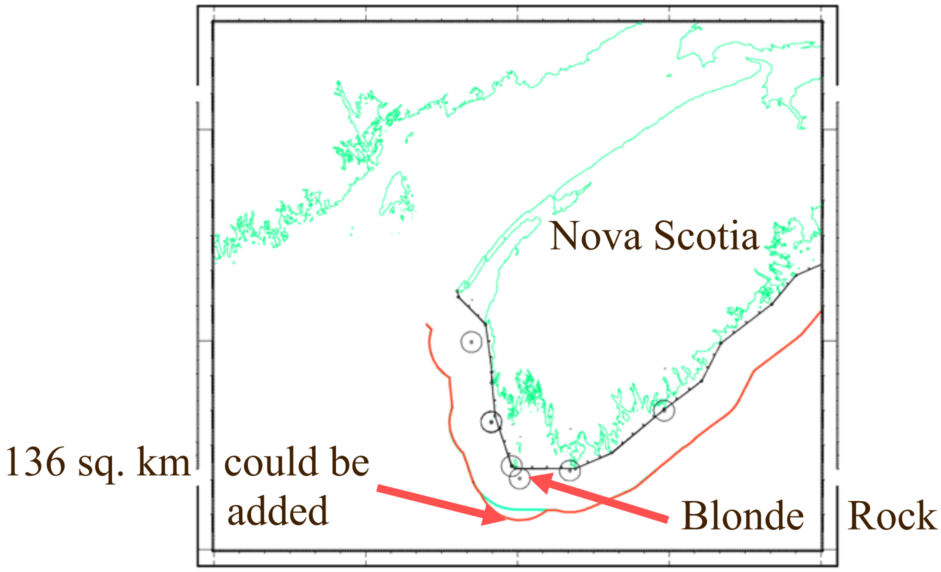

Figure 5. The possible effect of Blonde Rock on Canada's territorial sea.

For over half the length of the coast, coastal navigation has traditionally been by visual navigation in daylight following lines of track soundings through the coastal islands. Now with the advent of GPS as a navigation tool, Canada has only recently completed a 2-mile wide swath outside the coastal islands with swaths leading into the areas amongst the islands. These surveys have not addressed the rocks and small islands that form a veritable *skjærgård* along the coast. To overcome that, the Canadian Hydrographic Service hired specialists to look at the airphotos and satellite imagery of the coast and to find possible rocks for inclusion in the definition of its territorial sea baselines. One must realize that either variety of imagery may not be taken at low tide, and that there is almost certainly be floating ice in the water as well. It meant verifying each possibility individually by going to those locations.[8]

Perhaps the most noted one was a small islet, now known as Landsat Island, since it was first spotted in Landsat imagery in 1973, verified and positioned by resection angles between coastal features in 1976, then the island was found in the airphotos. On a second search for other possible rocks in 1997, a low tide elevation was spotted nearby which had been missed in the imagery and even during the 1976 on-site visit. The 1997

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[7] See G.S. Ritchie, *HMS Challenger, the Life of a Survey Ship*, Hollis & Carter, London, 1957.
[8] See David H. Gray, *Discovering Rocks off Labrador: A Photo Essay*, Boundary and Security Bulletin; 8, (2): 2000.

GPS position of the island is 60° 10′ 37″N, 64° 02′ 30″W, and is 6.6 m above high water. The GPS position is 70 m east of the resection position. The low-tide elevation's GPS position is 60° 10′ 47″N, 64° 02′ 36″W, and its height is 0.8 m above low water. See Figure 6.

Figure 6. Landsat Island. The island was spotted in satellite imagery in 1973, positioned in 1976 by sextant resection angles between distant hill tops. The drying rock, 320 metres to the north was not seen in the 1973 imagery, the 1976 field work, nor the 1996 airphoto analysis but only during the 1997 survey.

Not all airphoto and satellite imagery searches find new rocks and islands – sometimes the search proves that charted islands do not exist at all. The net effect of new rocks and lost islands along the Labrador coast could result in a territorial sea, as shown in Figure 7.

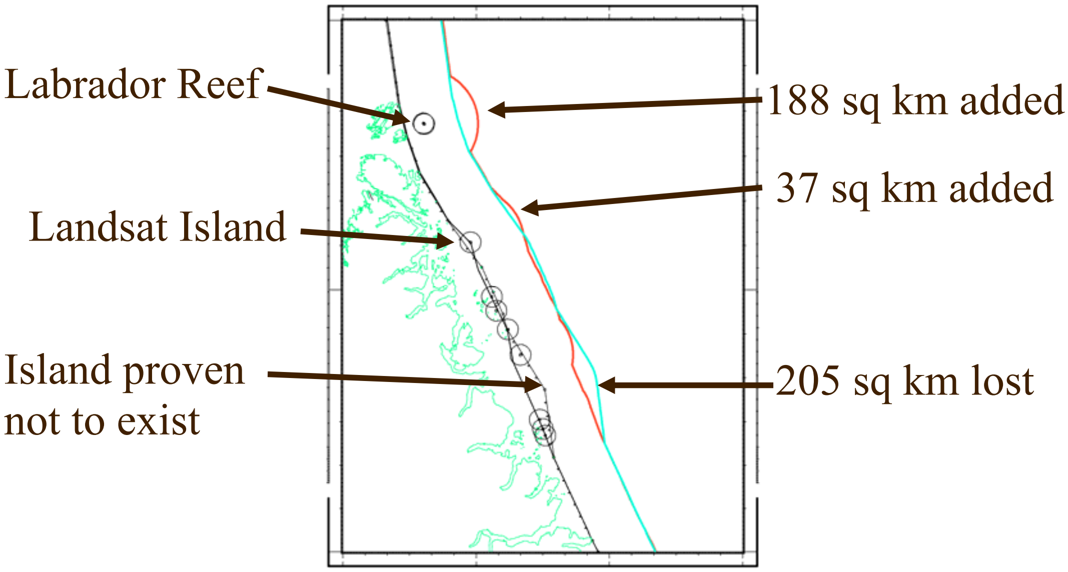

Figure 7. Possible changes to the territorial sea in northern Labrador, Canada.

8. Technical Consideration #6: The Right to Question

During the period 1982-1992, Canada and Denmark investigated the possibility of computing the equidistance line between Canada and Greenland south of 75°N using the best known geographic coordinates of basepoints, the mathematical relationship between the geodetic datums, and the results of any new surveys. Denmark submitted a list of its basepoints which included many rocks which were identified with a four-pointed cross – a dangerous underwater rock. Canada objected to these rocks because they were charted as being below the low water line; and Denmark offered to survey the ones which affected the equidistance line computation. Some of the rocks were found to be below the low water line, some had drying heights, and one – Simiutarssiūt Ikardlue – was found to be exposed at all stages of the tide. It is so far seaward that if it had proved to be a low tide elevation, it could not be a basepoint for the territorial sea. See Figure 8.

If Simiutarssiūt Ikardlue does become a "full-effect" basepoint in the computation of the equidistance line between Canada and Greenland it could add a wedged-shaped area 34 nautical miles long and 2 nautical miles wide for a total area of 152 square kilometres (44 square nautical miles) in favour of Greenland.

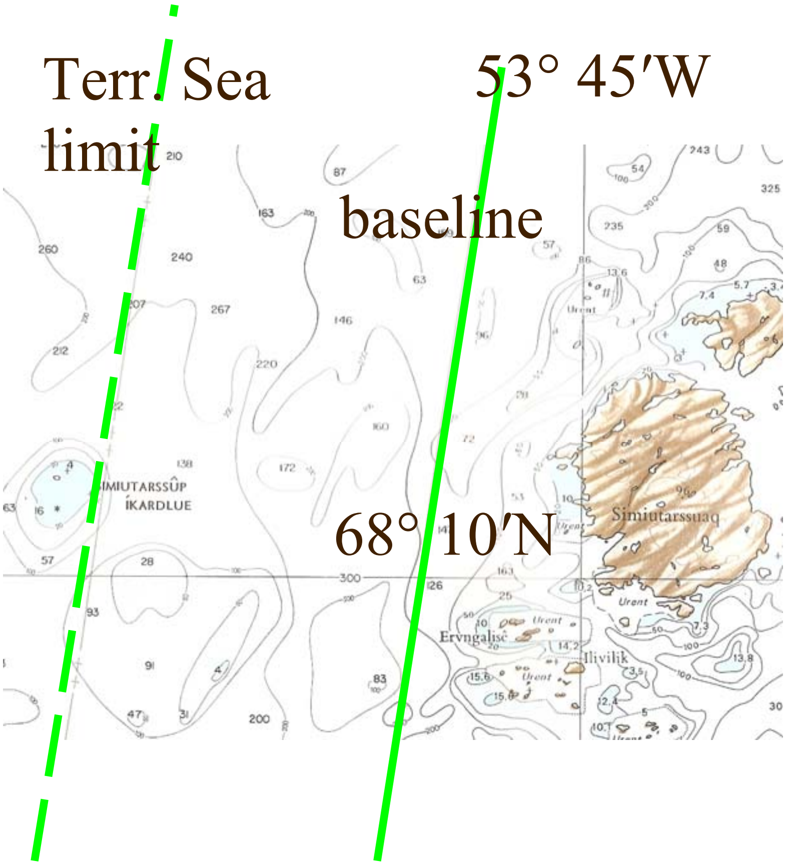

Figure 8. Danish chart 1416 (1999 Edition). Simiutarssiūt Ikardlue is now portrayed as a rock above high tide but the territorial sea has not yet been adjusted.

9. Technical Consideration #7: Redefinition of Low & High Tide

There are plenty of people that are concerned about the effects of global warming, one of those effects being the rise of sea-level. Whole islands will be inundated, and coastal areas flooded. But there are other man-made causes for changes in sea-level. In 1955, Canada completed a causeway across the Strait of Canso, the body of water that had separated Cape Breton Island from the Nova Scotia mainland. The causeway had a number of effects that might not have been foreseen. Firstly it created an ice-free harbour on the Atlantic side of the causeway, one in which the waters were exceptionally deep and suitable for Very Large Crude Oil Carriers. Secondly, it changed the tidal regime on the Atlantic side of the causeway enough that Bass Rock, a low tide elevation, no longer is exposed at even the largest of Low Water Spring Tides. See Figure 9.

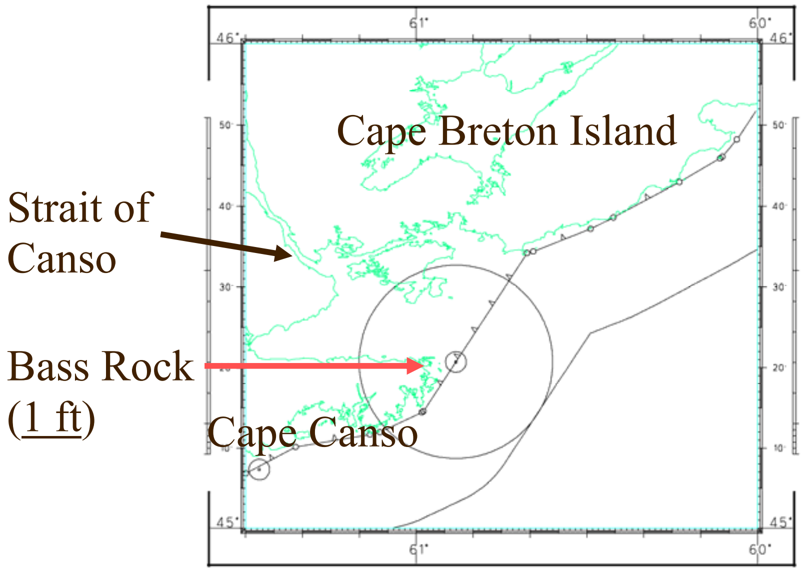

Figure 9. Bass Rock off Cape Canso, Nova Scotia, Canada.

The Canadian Hydrographic Service has yet to change the vertical chart datum on some of the charts of the area, but does provide in an auxiliary note on the affected charts: "Owing to a recent adjustment of the elevation of Chart Datum … 0.4 metres [1.3 feet] must be added to all depths." Bass Rock is charted as drying 1 foot; thus by this adjustment, it no longer uncovers when the tide is at chart datum, i.e., at low tide.

The consequences of the deletion of the basepoint is minor, in that the area involved is 0.4 square kilometres, and Bass Rock pushed the territorial sea outer limit seaward by a maximum of 121 metres.

10. Technical Consideration #8: An Unsurveyed Coastline

The coasts of Guyana and Suriname are, typically, mud-flats which dry at low tide leaving an inter-tidal area that is a mile or more in width in places. Also, the rivers which empty into the Atlantic Ocean carry vast amounts of sediment which is suspended in the salt water for several miles offshore. So any attempt to survey the near-shore area is almost a fruitless task. Yet, the tribunal in the Guyana-Suriname maritime boundary arbitration evaluated the appropriateness of the equidistance line and later decided that it was the appropriate method for delimiting the maritime boundary from the outer limit of the territorial sea to the outer limit of the Exclusive Economic Zone.

In their submissions to the tribunal, both Parties had submitted their versions of an equidistance line, although they could not agree on all of the basepoints used to construct the line, in part because they could not agree as to which charts to use. The tribunal accepted all submitted basepoints which affect the equidistance line in the delimitation area (12 to 200 nautical miles), including one on the Suriname coast that had been particularly criticized by Guyana.

Point S14 controlled the outermost 2 nautical miles of the equidistance line, but had major ramifications in the proportionality models as presented by the Parties. Its location came from a chart which had been published by the Netherlands Hydrographic Office in 2005, after the start of proceedings. S14 was a point along an unsurveyed low water line and was also more than a mile farther seaward than the location of the low water line on the previous edition of the chart.

British Admiralty chart 99 (Entrances to Rivers in Guyana and Suriname) was of no use since it did not cover the area in question and was a reduction of the Dutch chart anyway. The American chart was at a particularly small scale and was no help. The Netherlands chart 2218 (Suriname Rivier) (1969 edition) said that the area had been sounded in 1967-68, but the area between the Suriname River and Point S14 on Vissers Bank had at least one discontinuous bottom contour suggesting that the area had only been partially sounded and at different times. See Figure 10.

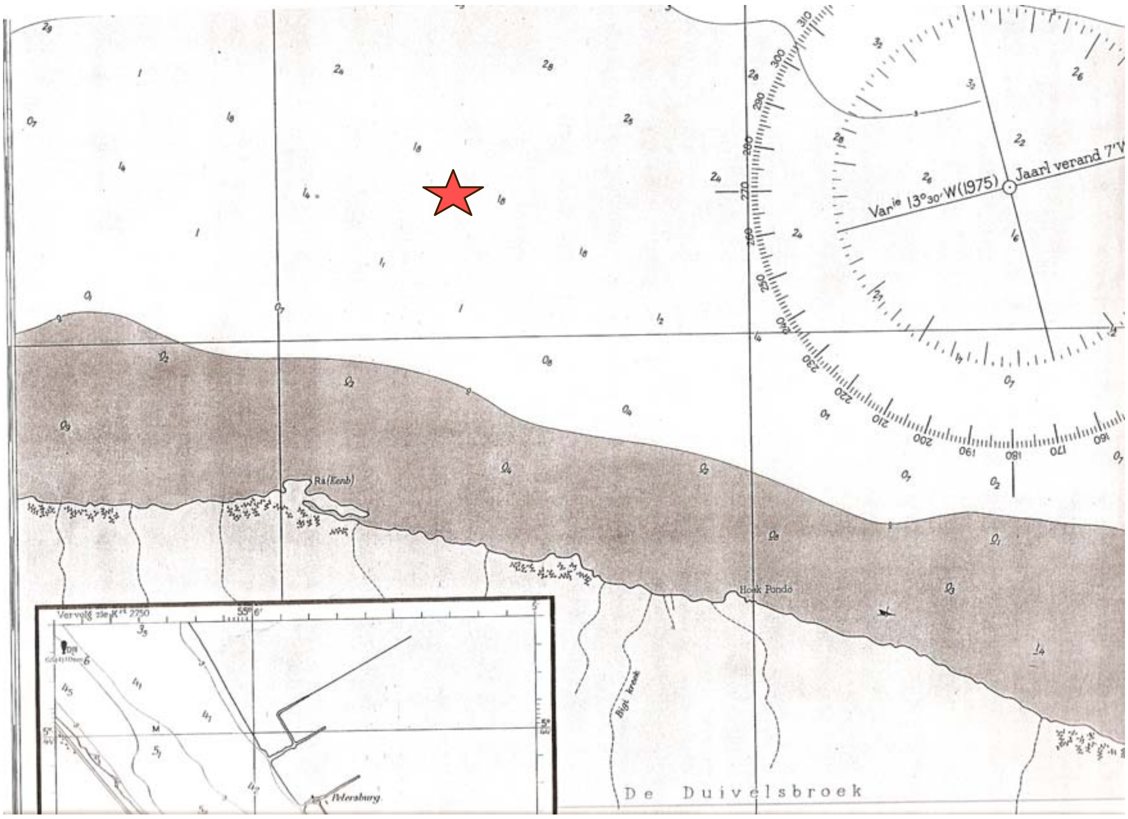

Figure 10. Netherlands chart 2218 (Suriname Rivier) (1969 edition). The red star is the approximate location of point S14. The western limit of the chart is 55° 27′ 48″W and the most northerly point on the low water line is 6° 00′ 21″N.

Netherlands chart 2218 (2005 edition) has new hydrography throughout the chart suggesting that the surveys have been completed. Guyana objected to this chart because it had been published after the start of proceedings. See Figure 11. Guyana, in its Reply, provided annexes which analyzed the field sheets used to construct the chart showing that there was still over a metre of water at chart datum near the charted low water line, albeit using the "unsurveyed" symbology. Guyana pointed out that the depths of the water off that part of the coast appeared to be getting deeper, suggesting that the low water line ought to be moving landward. Guyana also provided a 2004 SPOT satellite image of the coast taken at close to low water refuting the 2005 low water line and supporting the 1969 low water line.[9]

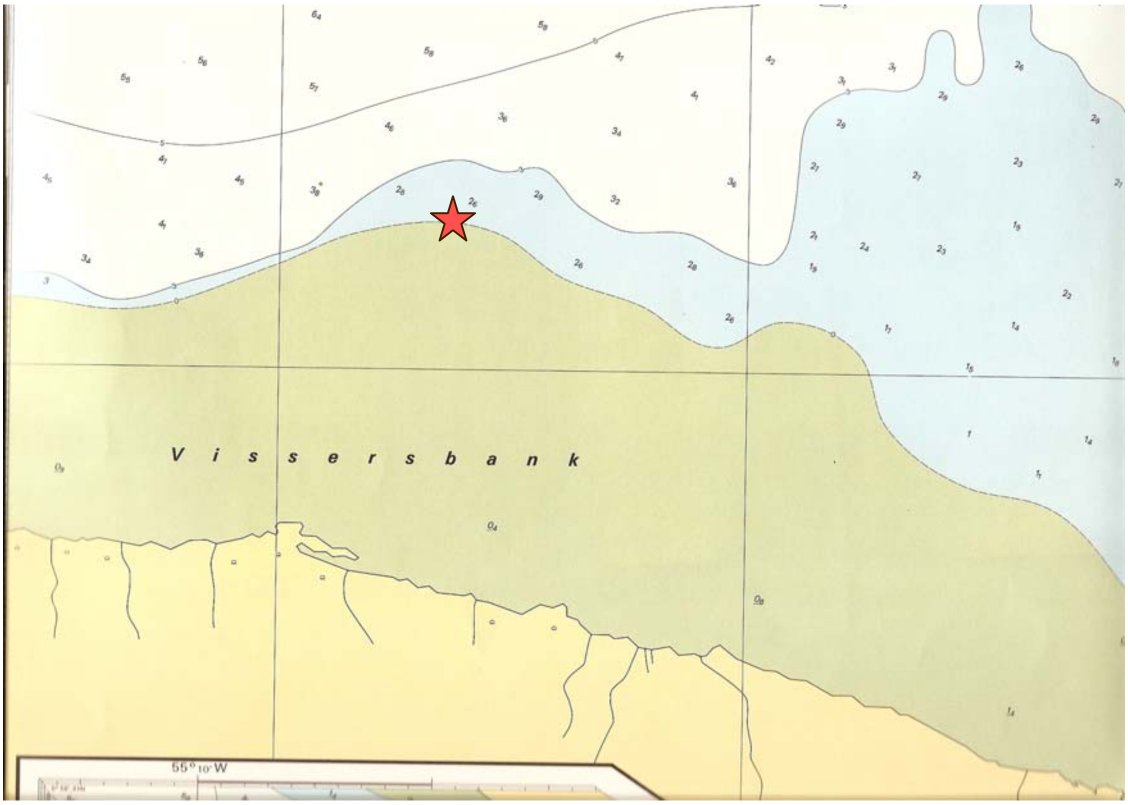

Figure 11. Netherlands chart 2218 (2005 edition). The red star is the approximate location of S14. The western limit of the chart is 55° 27′ 53″W and the most northerly point on the low water line is 6° 01′ 35″N.

I suspect that the hydrographic surveyors probably did not want to damage their boat or the sounder, which is mounted externally to the bottom of the boat, by venturing into shoal water. Besides, not many mariners are willing to go into water that shallow, particularly since there constantly is surf caused by the Northeast Trades.

[9] The written pleadings and Annexes are available on the Permanent Court of Arbitration website at http://www.pca-cpa.org/showpage.asp?pag_id=1147 .

Nautical charts are prepared for safe navigation and thus, if the Hydrographic Office does not know something or has contradictory information, it errs on the side of safety. Thus by those standards, the prudent and correct thing; namely, drew the low water line tangent to the end of the sounding lines and then classified that low water line as "unsurveyed" by pecking the line rather than showing it as a solid line.

The tribunal concluded:

> "The Tribunal is not convinced that the depiction of the low-water line on chart NL 2218, a chart recognised as official by Suriname, is inaccurate. As a result, the Tribunal accepts the basepoint on Vissers Bank, Suriname's basepoint S14."[10]

11. Conclusions

Hydrographic surveys are the product of very dedicated people often using the best technology at the time of the survey, but nevertheless are subject to imperfections: geographic positioning, incomplete data collection, scale of the survey manuscript, subsequent erosion and accretion. Nautical charts are the compilations of the survey manuscripts and can introduce their own imperfections: scale of the chart, generalization, discontinuity between data sets, chart symbology, and the need to err on the side of safe navigation. The chart user who has to ascertain the baselines for the territorial sea needs to be aware of these imperfections and temper the legal description of the baselines accordingly.

12. References

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[10] *Award of the Guyana-Surimane Maritime Boundary Arbitration,* para. 396. Available on the Permanent Court of Arbitration website at http://www.pca-cpa.org/showpage.asp?pag_id=1147 .

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13. Biography

David H. Gray started Definitive Hydrographic & Geodetic Consulting in 2005 after leaving the Canadian Hydrographic Service where he spent 34 years as a specialist in geodesy, radio positioning, and maritime boundaries. Since leaving CHS, he has been the technical expert for the tribunals in the Barbados-Trinidad & Tobago and Guyana-Suriname maritime boundary arbitrations at the Permanent Court of Arbitration. The latter arbitration required an on-site examination of survey markers and GPS positioning. He was also the technical expert assisting the Nova Scotia-Newfoundland & Labrador offshore resource boundary tribunal. With his Danish counterpart, he recomputed 1500 km. of the Canada-Greenland continental shelf delimitation line after adjusting the geodetic coordinates along both coasts to the same geodetic datum and he was a member of the Canadian Team for the Canada/France (St. Pierre and Miquelon) maritime boundary arbitration. One African, one SW Pacific and three Caribbean countries have relied on his technical advice on their maritime boundaries and limits.