Seminar on Charting in Irish Waters
November 8th,2007

"International Legal Aspects of Nautical Charting"
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References to Charts in the Law of the Sea:- ***Under the LOSC 1982***:-

- Charts are vital for determining national maritime limits in the law of the sea,particularly the starting location for such limits (the 'baseline') and for defining maritime boundaries between States;they also feature in other areas of maritime law

- there are several references to "charts"(nautical?) and so charting obligations in the law of the sea conventions (1958('TSC') and 1982 Law of the Sea Convention ('LOSC')),including *publicity obligations* relating thereto (and even *deposit* obligations thereof with the UN Secretary–General in some cases

- option in lieu,with advance of technology, of defining baselines as *lists of geographical coordinates* in most situations,provided they specify the *geodetic datum* on which the lines are based

- however,this option is not given in respect of defining the normal baseline,ie the *low water line*

- it has been estimated that the LOSC has at least 10 ‘chart-referring’ instances

- Eg:-

- ***Art.5*** (low-water line is to be “marked on large-scale ***charts*** officially recognised by the coastal State”(same as in the TSC,1958)
- ***Art.6***:in the case of islands on atolls or having “fringing reefs”,the baseline is to be the “seaward low-water line of the reef,as shown by the appropriate symbol on ***charts*** officially recognised by the coastal State”[no reference to “large-scale here]

- ***Art.16(1);***baselines for measuring the breadth of the territorial sea determined in accordance with Arts 7 (“straight baselines”),9 (straight lines across “mouths of rivers”),and 10 (closing lines across mouths of bays),as well as the “lines of delimitation” used in Arts.12 (“roadsteads”) and 15 (territorial sea delimited between neighbouring States) shall be “shown on ***charts*** of a ***scale or scales adequate for ascertaining their position*** (with ***option of listing geographical co-ordinates of points*** –see below)

- ***Art.22(4):***coastal States are to “clearly indicate” *sea lanes and traffic separation schemes* in the territorial seas “on ***charts*** to which due publicity has been given”;

- ***Art.41(6***):designated sea lanes/traffic separation schemes in *straits* used for international navigation shall be “clearly” indicated on “***charts*** to which due publicity shall be given”

- ***Art.53(10***):axis of designated *archipelagic sea lanes* and traffic separation schemes must be “clearly” indicated on “***charts*** to which due publicity shall be given”

- ***Art.75***:the ***outer limit*** lines of the ***EEZ*** (and ***delimitation lines***) “shall be shown on ***charts*** of a ***scale or scales adequate for ascertaining their position***” (and, where appropriate ,“***lists of geographical co-ordinates*** of points,*specifying geodetic datum*, may be substituted” for such lines

- (it may be sensible practice in respect of the wider maritime zones such as the EEZ to also publish a *smaller scale chart depiction* (largely for illustrative purposes) in conjunction with publication of the definitive co-ordinates,as in the case eg of the Irish 200 nm zone)

- ***Art.76(9):***coastal States are to “deposit with the Secretary-General [of the UN] ***charts*** and relevant information ***including geodetic data***,*permanently* describing the outer limits of [their] continental shelf”;

- ***Art.84(1):***the outer limit lines of the ***continental shelf*** (‘cs’) and the lines of delimitation thereof “shall be shown on ***charts*** of a scale or scales adequate for ascertaining their position” (with alternative of co-ordinates plus geodetic datum);and ***(2)*** coastal States are to give “due publicity to such ***charts***” (or lists of co-ordinates) and deposit a copy with the S-G of the UN,and “in the case of those showing the outer limit lines of the continental shelf,with the Secretary-General” of the “Authority”(ie,ISA).

- charts are also relevant to the determination of limits of the outer limits of the continental shelf relative *to submission of geodetic data to the Commission for the Limits of the Continental Shelf('CLCS'*)

- under Art 76(8) of the LOSC,every State must submit information on where the outer limits of its continental margin lies to the CLCS

- in submissions to the CLCS,charts must be used under the Guidelines and Rules of Procedure of the CLCS (eg, under Rule 50 (2004) the UN S-G shall make public the "executive summary" of the submitter "including all charts and coordinates referred to in paragraph 9.1.4 of the Guidelines contained in that summary (eg. showing data on bathymetry and sediment thickness,allowing selection of points depicting the foot of the slope ,the 60nms lines therefrom,the 2,500 m contour, and the 350 nm limit from baselines (GIS digitalised programmes such as CARIS LOTS can be v.useful for such charting purposes)

- see, eg,the Irish partial submission to the CLCS in 2005 (relating to the ‘PAP’),which contains charts of appropriate scales and lists co-ordinates under the *WGS 84 geodetic* reference system

- see now Rule 54 of the *CLCS Rules of Procedure* (2004) repeating and referring to charting/publicity duties under both LOSC Articles (76(9) and 84

- ***Art.94(4)(a):***every State is to take measures to ensure that each ship before registration and thereafter as appropriate ,is surveyed and has on board ***charts,***nautical publications and navigational equipment/instruments “as are appropriate for the safe navigation of the ship”

Charting obligations under the LOSC and publicity/deposit obligations:-

- in every case where publicity must be given to baselines or limits under the LOSC,the coastal State is given a choice between depicting these *on a chart* ***or*** a *list of geographical coordinates.*

‘Chart’ References Under Other International Maritime Conventions:-

- ***Those concerned with safety at sea (SOLAS):-***

- complementing the general provision above in Art.94(4) LOSC,is *Chapter V* of the Consolidated Text of SOLAS:-

- Reg.2.2 on “Safety of Navigation” (definition of charts etc as *officially* issued)

- Reg. 9 refers to *State* duties to compile, publish etc Hydrographic data/information “necessary for safe navigation”

- to approve/inspect *electronic chart display and information systems(ECDIS)* (as in Reg.18.4)

- also a duty on the ship's master to plan voyages "using appropriate nautical publications"(Reg.34.1) ;and,of course, for "all ships on all voyages" to carry *adequate and up–to-date nautical charts* (including "nautical publications"or ECDIS in lieu) (Regulations 27 and 19.2.1.4).

- Chapter V,Reg.9 (SOLAS):-

- 1.Contracting Governments undertake to arrange for the collection and compilation of hydrographic data and the publication,dissemination and keeping up to date of all nautical information necessary for safe navigation.

- 2.In particular,Contracting Governments undertake to co-operate in carrying out, as far as possible,the following nautical and hydrographic services,in the manner most suitable for the purpose of aiding navigation:

- a - to ensure that hydrographic surveying is carried out,as far as possible,adequate to the requirements of safe navigation;

- b - to prepare and issue *nautical charts*,sailing directions,lists of lights,tide tables and other nautical publications,where applicable,satisfying the needs of safe navigation;

- c - to promulgate notices to mariners in order that *nautical charts and publications* are kept,as far as possible,up to date: and

- d - to provide data management arrangements to support these services.

- 3.Contracting Governments undertake to ensure the greatest possible uniformity in *charts and nautical publications* and to take into account,whenever possible,relevant international resolutions and recommendations [ie,those of IHO].

- 4.Contracting Governments undertake to co-ordinate their activities to the greatest possible degree in order to ensure that *hydrographic and nautical information is made available* on a world-wide scale as timely,reliable,and unambiguously as possible.

- Chapter V,Reg.18.4:-
- “…..[F]or an *electronic chart display and information system* (ECDIS) to accepted as satisfying the *chart carriage requirement* [of Reg.19.2.1.4] that system shall conform to the relevant performance standards not inferior to those adopted by [IMO] in effect on the day of installation,or,for systems installed before 1 January 1999,not inferior to the performance standards adopted by [IMO in 1995}”.

- Chapter V,Reg.34.1:-

- “Prior to proceeding to sea,the *master* shall ensure that the intended voyage has been planned using the *appropriate nautical charts* and nautical publications for the area concerned,taking into account the guidelines and recommendations [of IMO]”.

- latter obligation is supplemented by Chapter V,Reg. 27:-

- “Nautical charts and publications,such as sailing directions,lists of lights,notices to mariners,tide tables,and all other nautical publications,shall be adequate and up to date” **AND,**

- Reg.19.2.1.4 :-

- ([“all ships irrespective of size”] shall have“*nautical charts* and nautical publications to plan and display the ship’s route for the intended voyage and to plot and monitor positions throughout the voyage;and electronic chart display and information system (ECDIS) may be accepted as meeting *chart carriage* requirements of this subparagraph”).

Exemptions from Liability to Pay Compensation in Certain Marine Pollution Situations Arising from Charting Obligations:-

- Art.III (c) of the *International Convention for Civil Liability for Oil Pollution Damage* (ICCLOPD(1969))as now extended to other pollutants such as hazardous and noxious substances ('HNS' Convention)(*Int.Convention on Liability and Compensation for Damage in connection with Carriage of Hazardous and Noxious Substances at Sea*(1996) & Art 3 (3)c of the International Convention on Civil Liability for Bunker Oil 2001.

- exoneration from a shipowner's liability for pollution damage where it's proved this was "wholly" the result of *negligence or wrongful act* of any government/authority responsible for maintenance of "*navigational aids*".

- In a 1977 case *(Tsesis)* the Swedish Government were successfully sued by the owners of a Russian tanker which ran aground off Sweden as a result of an error on a Swedish nautical chart (The chart was found by the Swedish Court to be a “navigational aid” under the SOLAS treaty and that “maintenance” included the duty of *updating* charts)

- potential liability for the Irish Government (as a Party to both conventions)? (*Exxon Valdez disaster*, Exxon has already $3.4 billons in clean up costs etc and an award of $2.5 billion in punitive damages is pending in the US Supreme court)

- see regarding all 3 treaties in Ireland s.8(c) of the Oil Pollution of the Sea (Civil Liability and Compensation) Act,1988, as also implemented in the case of escaped hazardous and noxious substances from ships(s.8 of the Sea Pollution (Hazardous Substances) Act,2005 (implementing Art.7(2)(c) HNS Convention (1996)

What are the ‘Charts’ are referred to in the LOSC and other Maritime Treaties?

- ***LOSC articles are vague as to requisite type of chart,not even prefacing it with the word “nautical”***

- the hydrographic (IHO)dictionary defines ‘chart’ as a “special purpose map generally designed for navigation or particular purposes”.

- SOLAS Convention,Chapter V on *Safety of Navigation*,Reg.2.2 refers to a “*nautical* chart or *nautical publication*” as being:-

- “…..a special-purpose map or book,or a specially compiled database from which such a map or book is derived,that is issued officially by or on the authority of a Government,authorised Hydrographic Office or other relevant government institution and is designed to meet the requirements of marine navigation”.

- LOSC qualitative references only to “*large-scale*”/ “*adequate*” scale charts

- thus a “map”may not suffice,as only *nautical* charts used for navigation at sea will show the requisite *relevant* information for LoS purposes;ie,features such as low-water lines,LTEs etc

- special ‘baseline’ charts may be created for law of the sea purposes based on nautical charts

- *land maps* are rarely on the same projection as charts,so care has to be taken that all geodetic datum is consistent,possibly through computerised transformation

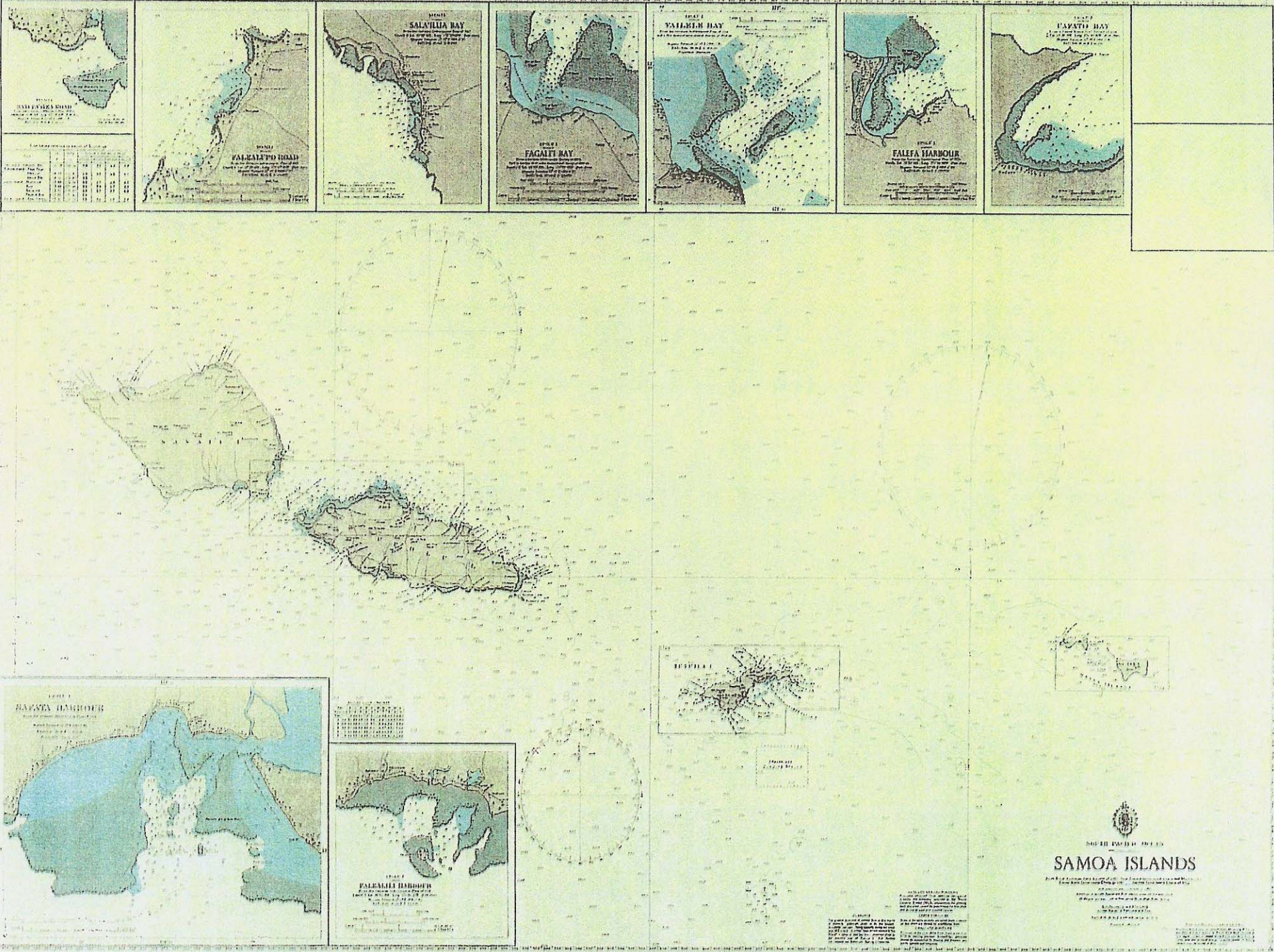
- as stated at the seminar at Cork in 1995 on the “Need for an Irish Hydrographic Office “confusion between terrestrial and marine systems has already caused problems in bays and harbours used for aquaculture”;and a fish farm “located using national grid or a similar land-based system is often found to have a different,possibly problematical location,on the marine charts”;and that similar problems have arisen due to “confusion over tidal datums”

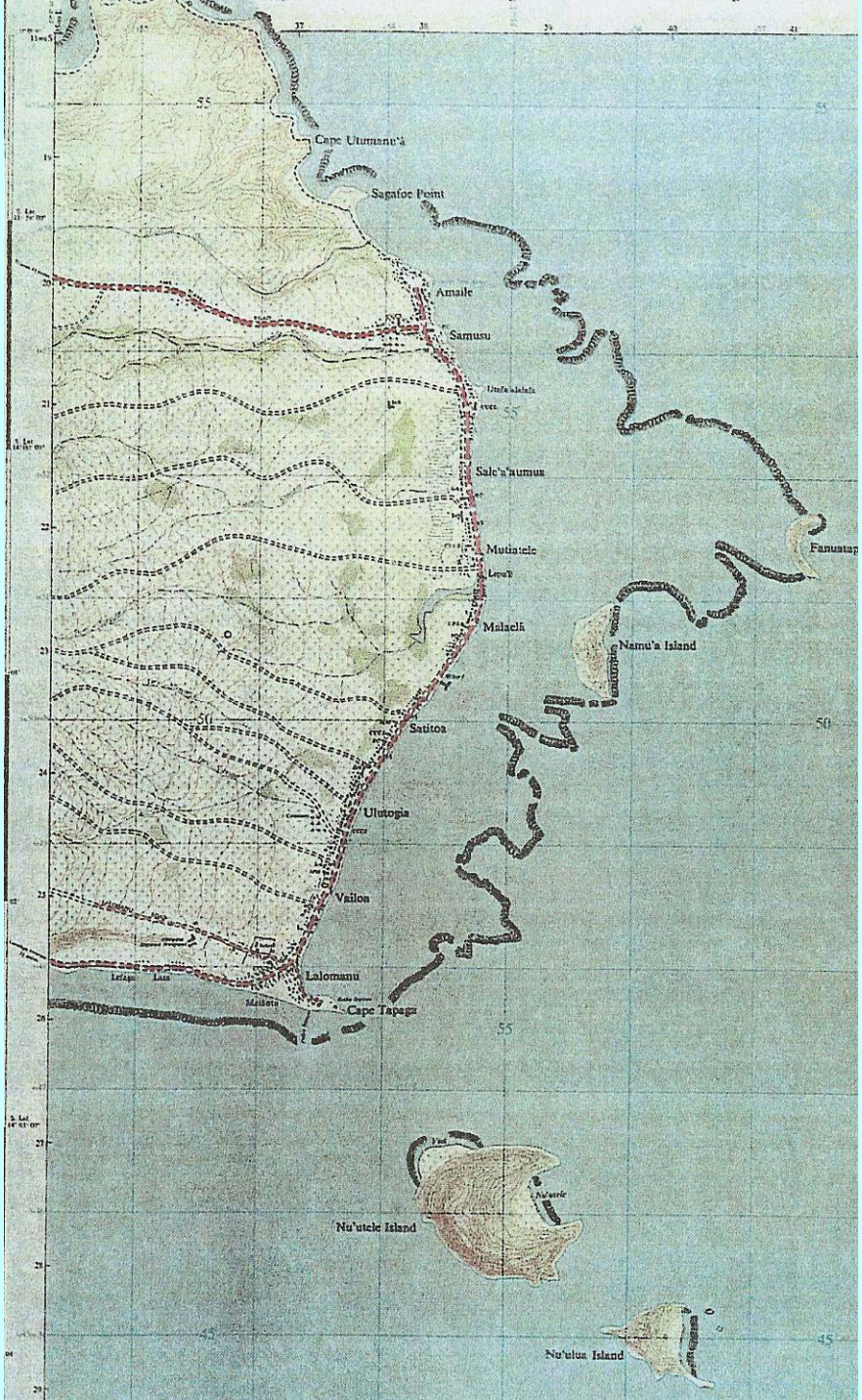
- most particularly,the vertical datum used in land mapping (eg,based on mean sea levels) may depict a low water line using different datum from a nautical chart ,giving rise to big differences if,eg,the tidal range is significant

- however,faut de mieux,a land map may have to be used,with care being taken to ensure that the co-ordinates derived from such a map are consistent with points taken from large-scale charting of other parts of the coastline (cf the Irish straight baselines below)

- as Carleton points out,if,eg,part of a coast is not covered by a large scale chart, “reference to modern larger scale *land* mapping may be required”

- see, eg.,NZ chart 86 of Samoa Islands on a scale of 1:446,400 with inset larger scales for approaches to ports etc;but *where large parts of the coast are only covered at a scale which is too small for an accurate determination of the territorial sea basepoints.*


SALAILUA BAY
FAGALII BAY
FALEFA HARBOUR
SAMOA ISLANDS



•however, the latter areas are covered by a relatively modern series of land maps on a scale of 1:20,000 which depict the low-water line of the fringing reefs.

What charts for LOSC purposes in Ireland?

- under Art.5 of the LOSC a coastal State must ***indicate its low-water line*** (as seen) on large –scale charts "*officially* recognised by [that] coastal State"

- word "officially" implies that every coastal State must legislatively or otherwise designate *which charts* it is using for this purpose if it has no published charts of its own

- obviously,as Ireland has in the past had *no national hydrographic service*,it has published no charts of its own:instead it has had to rely on *British Admiralty charts* under its maritime legislation

- see now under s.92 of the Sea-Fisheries and Maritime Jurisdiction Act (2006)('S-FMJA'):-

- s92.-(1) The Government may *by order …prescribe the charts which may be used for the purpose of establishing the low-water mark,or the existence and position of any low-tide elevation [LTE],or any other matter in reference to the internal waters,the exclusive economic zone or the exclusive fishery limits,and any chart so prescribed purporting to be a copy of a chart so prescribed,shall,unless the contrary is proved,be received in evidence as being a prescribed chart without further proof.*

- (2)The Maritime Jurisdiction Act 1959 (Charts) Order 1959…,if in operation on the passing of this Act,continues in force as if made under this section.

- this statutory provision updates and substantially repeats what was previously in s.s.13 of the Maritime Jurisdiction Act (‘MJA’) 1959

- so applies not only to *relevant baselines* or *features* related to same (such as LTEs),but also *the outer limits of all Irish maritime surface-water zones*,including now the 200 nm *EEZ* (established in s.87 of same Act)

- and Irish *contiguous zone*(established in Art.84)?

- *type of relevant chart* (referred to in subs.(2)) is fleshed out (at present) by a statutory instrument of 1959 (the “Charts Order”)(MJA 1959 (Charts) Order)

- this says that *charts published by the Admiralty*,*London*,shall be charts for the purposes of (then) s.13 of the MJA

- s.92(2) of the S-F & MJ Act 2006 Act has preserved this reference to UK charts *verbatim*

- thus *such charts currently apply* as no other charts were prescribed at the time of passing of the Act in 2006

- this reference still to UK charts is unfortunate as some of these date back to the latter part of the 19th century (even pre-1860),and in any case are now very out of date

- the British Admiralty ceased to carry out hydrographic surveys off Ireland in the 1920s,with only limited up-dating since

- several UK charts of Irish waters thus carry a warning as to the age and incomplete nature of the surveys

- recent research (Wallace) has found on a sample of 17 Admiralty charts covering Irish waters at a variety of scales,*52%* of the data was collected *before 1860* (*also old datums*)

- they also have practical drawback of being in varying scales from one area to another

- the reference to charts published by the “Admiralty, London”(as in the ‘Charts Order’) has been challenged in Irish courts:-

- in a maritime drug-smuggling case in 1996 – ***People(DPP) v.Van Onzen*** -(1996) - the defendants alleged that the Prosecution’s charts were inadmissible as the “Admiralty” was now part of the Department of Defence;and the Hydrographic Office (which now draws up British nautical charts) was no longer situate in London (in fact now at Taunton)

- thus for wrongful name and location reasons the charts in that case were alleged to be invalid

- however,on appeal to the SC this point was dismissed,as O'Flaherty J held that the two changes were "more apparent than real",as such charts continued to be published under the auspices of the "Admiralty" in London

- see also the *Marita Ann* incident:*The People (DPP) v.Ferris & Brown* CCA,Dec 15,1986

- see J.Edwards and M.Mellett, "Ireland's Maritime Boundaries and the Prosecution of Offences within the Territorial Seas of the State" U of Limerick L.R. 91,98.

Deficiencies in Irish Charting Practice:-

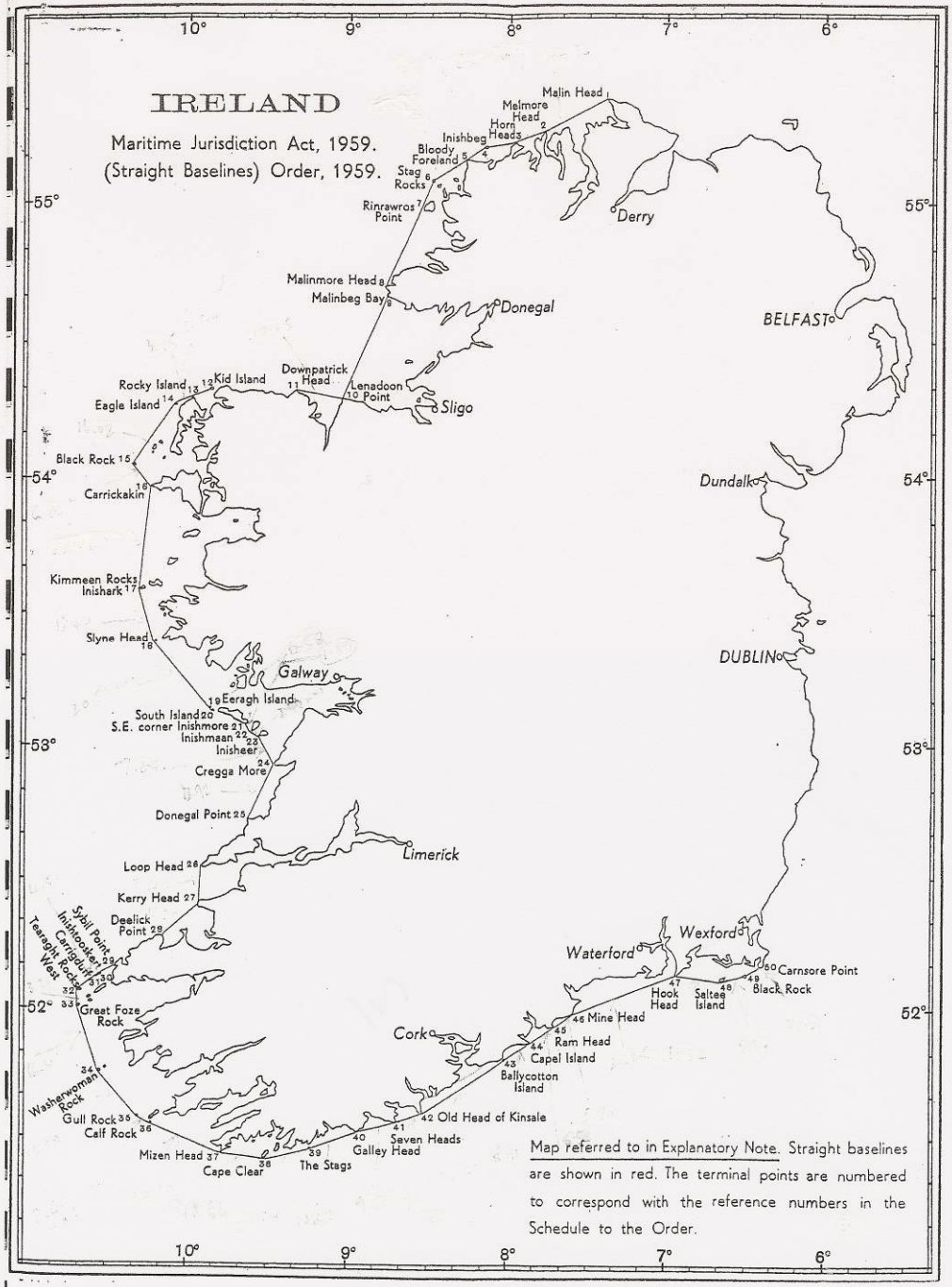
- In “An Analysis and Evaluation of Irish Admiralty Charts” in 2001 John Wallace (of Marine Informatics) concluded that it was clear that “apart from fulfilling their obligations under international law,the Irish Government must recognise that in the light of [its] findings…there is a responsibility to address the issue of hydrographic charting and act in an appropriate manner without delay”.

- the *international charting obligations under the LoS* are plainly not implemented adequately in Ireland,most particularly in the case of the Irish ***straight baseline system***,the *connecting points and lines of which,in terms of Art.16 of the LOSC ,are not “shown on a chart…..of a scale or scales adequate for ascertaining their position*”***; NOR does the accompanying “list of geographical co-ordinates of points” specify the “geodetic datum”***

- eg,s.13 of the Maritime Jurisdiction Act('MJA'),1959 on Irish baselines etc (now incorporated in s.92 of the Sea-Fisheries and Maritime Jurisdiction Act,2006('S-FMJA') *expressly preserves the MJA (Charts Order) of 1959* and thus retains the problem of such reference back to UK *Admiralty charts in the Irish maritime context* (with all their obvious defects respecting charting of Irish waters) *without an update even of the former source references* as challenged in,eg,the Irish case of *People (DPP) v.Van Onzen* (1996) above

- amazingly,also,the S-FMJA(2006) has ***not updated*** the Irish *straight* baseline system of 1959(in the MJA(Straight Baselines) Order (s.85(3) of the SMJA) to conform with proper international charting requirements (as noted above)

- this expansive straight baselines system implemented under the 1959 MJA Order has been laid down and depicted on a small chart (without any reference to basic datum accompanying the coordinates),so making transposition of the references there problematic in terms of conversion to accurate *WGS locations* on current Admiralty charts(see further below)



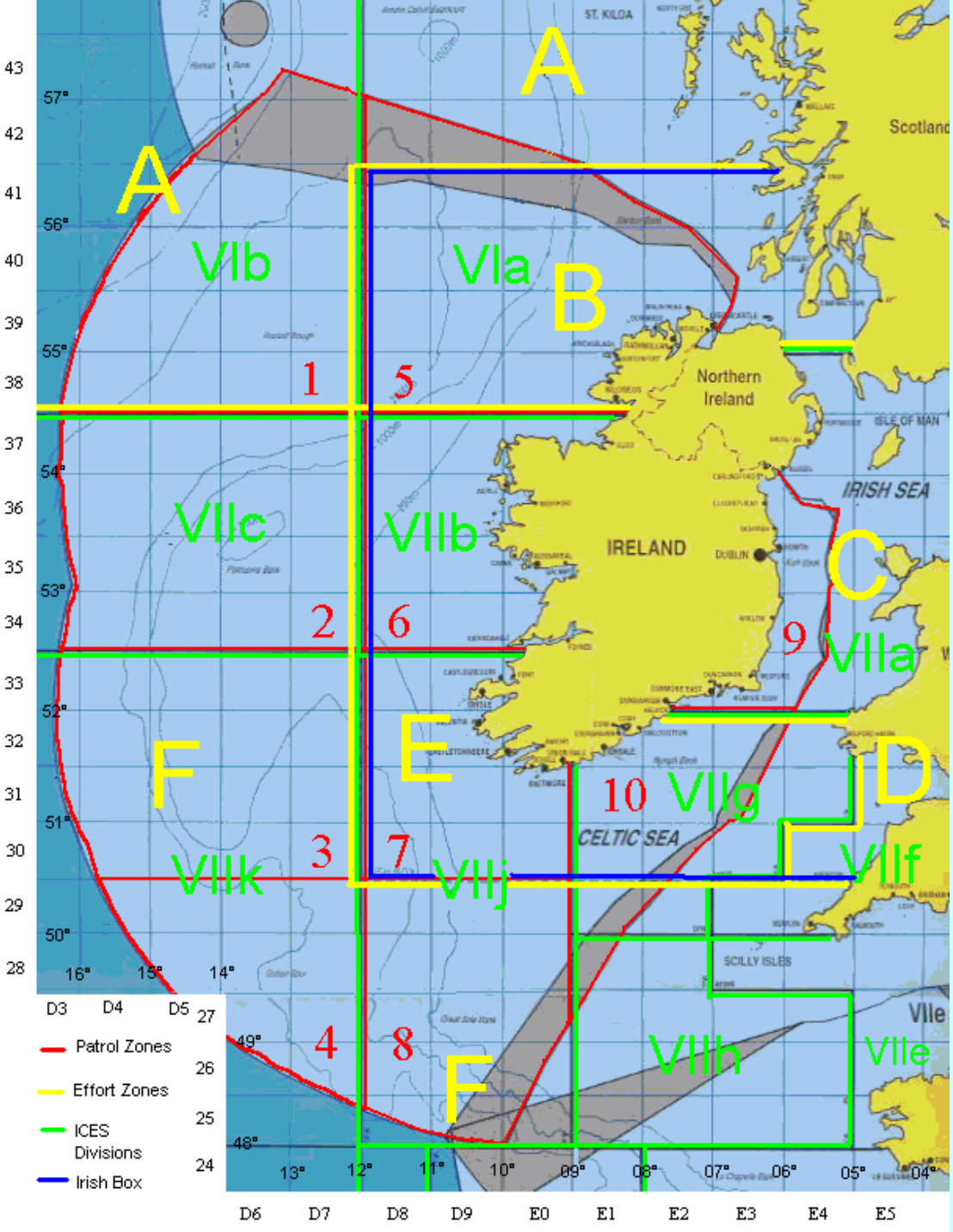
- apart from deficient charted lines being not opposable to other States,such charting defects may cause problems in *domestic criminal prosecutions*

Edwards and Mellett emphasise the need for accurate definition and plotting of the baseline in connection with criminal prosecutions within Irish internal waters/ ts (see now on this s.89 of the S-F MJA (2006))

- ***also examples exist of past failure of Ireland as to charting compliance in case of:-***

- LOSC UN ‘deposit’obligations as to showing relevant *baseline positions* (Art.16(2) of the LOSC) not done

- ‘*due publicity’/ ‘deposit’ obligations(at the UN),* as,eg,in respect of *outer limits of a 200nm claim to an ‘EEZ’(exclusive economic zone* as required under Art.75(2) of the LOSC :see now s.87 of the S-FMJA ,2006)



The outer zonal limits - Irish 200nm fishery zone *arc* not shown in the form of chart co-ordinates until new chart in 2000 (and even now no known deposit of same with UN

S-G under Art.75(2) of LOSC)

- curiously,under Art.33 of the LOSC there is no charting obligation re outer limits of the 24 nm *contiguous zone* which Ireland has now claimed

- furthermore,outside the LOSC,the *other* charting obligations/implications arising under both *SOLAS and ICCLOPD*(as extended) still remain unresolved relative to *Irish waters* because of past charting deficiencies.

What Scale Charts under the LOSC?

- Art.16 of the LOSC (relating to the majority of types of baselines etc) gives a discretion to the coastal State on the *scale of chart required* (ie,they do not have to be “large-scale” except to show the low-tide mark)

- possibly this is because the alternative of geographical coordinates are likely to be the *definitive documents* defining the various limits of jurisdiction,charts being nowadays essentially *only illustrative*

- as no specific scale is mentioned in the LOSC,many countries with a long coastline may use charts having a variety of scales

- however, Art.16,as also Arts 75(EEZ) & 84 (cs),do add that in such cases the scale(s) of charts used for most baselines etc "*must be adequate for ascertaining [the] position*" of same (*size implication* here)

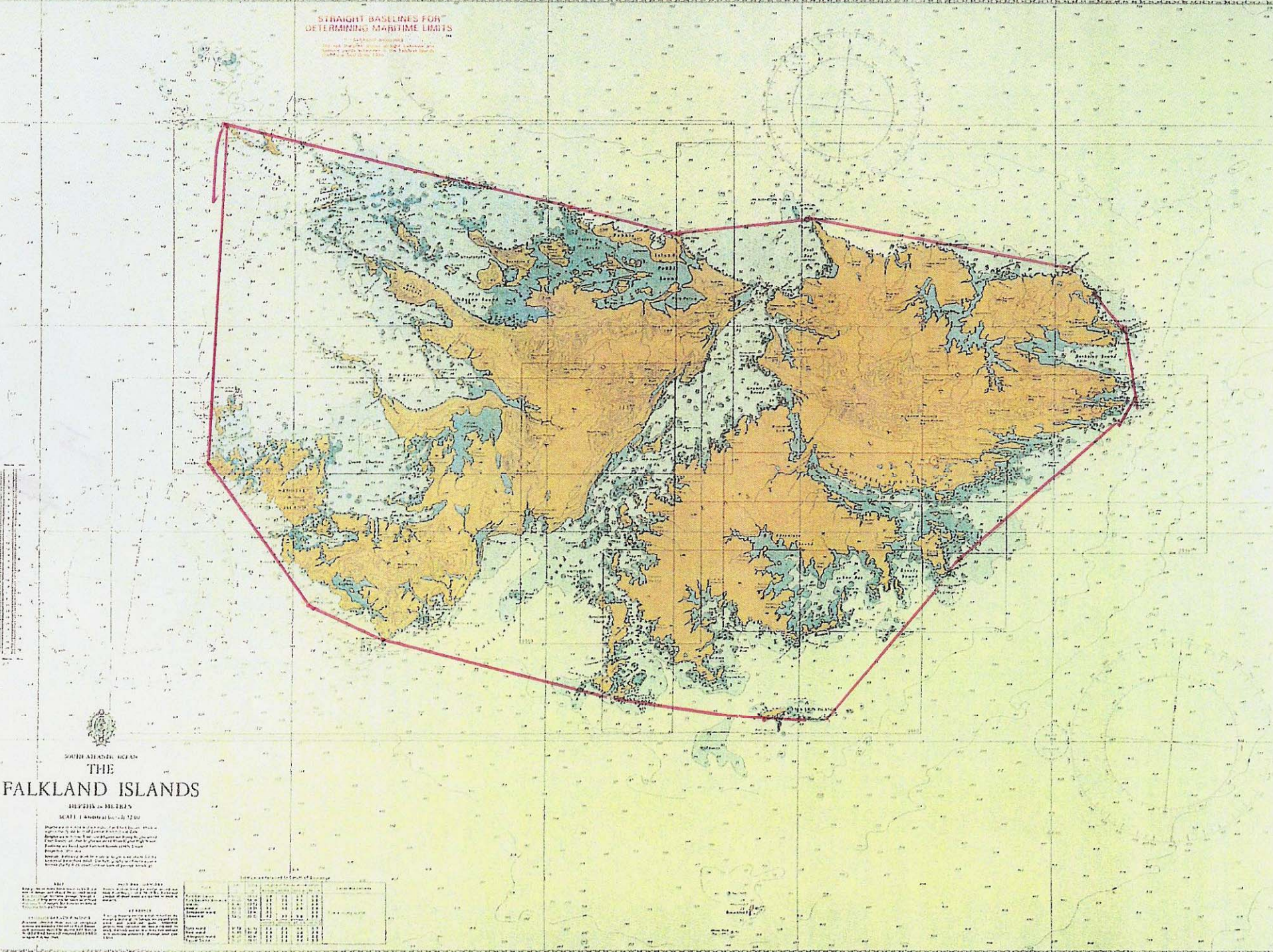
- typical charting scales useable may be between 1:50,000 and 1:100,000,with possible larger scales around ports etc

- scales smaller than 1:100,000 should not be used – ideally 1:20,000 or larger

- even on some larger-scale charts (eg.,1:50,000) the distance between high and low tide may not be clearly visible (distance of 100 metres being barely noticeable)

- baselines based on very deficient *small charts* may not be “opposable” to other States as it is implicit from the ‘adequacy of scale’ wording that if the scale used is not adequate for ascertainment of baselines,the State is in breach of its LOSC obligations (see “*shall* be shown”)

- often States use combination of chartlet and coordinates to show zonal information:see,eg.,the straight baselines system around Falklands as shown on Admiralty chart,with definitive coordinates listed in the accompanying SI (see specialty of charting –“Straight Baselines for Determining Maritime Limits” and addendum “not to be used for navigation”!)


STRAIGHT BASELINES FOR
DETERMINING MARITIME LIMITS
SOUTH ATLANTIC OCEAN
THE
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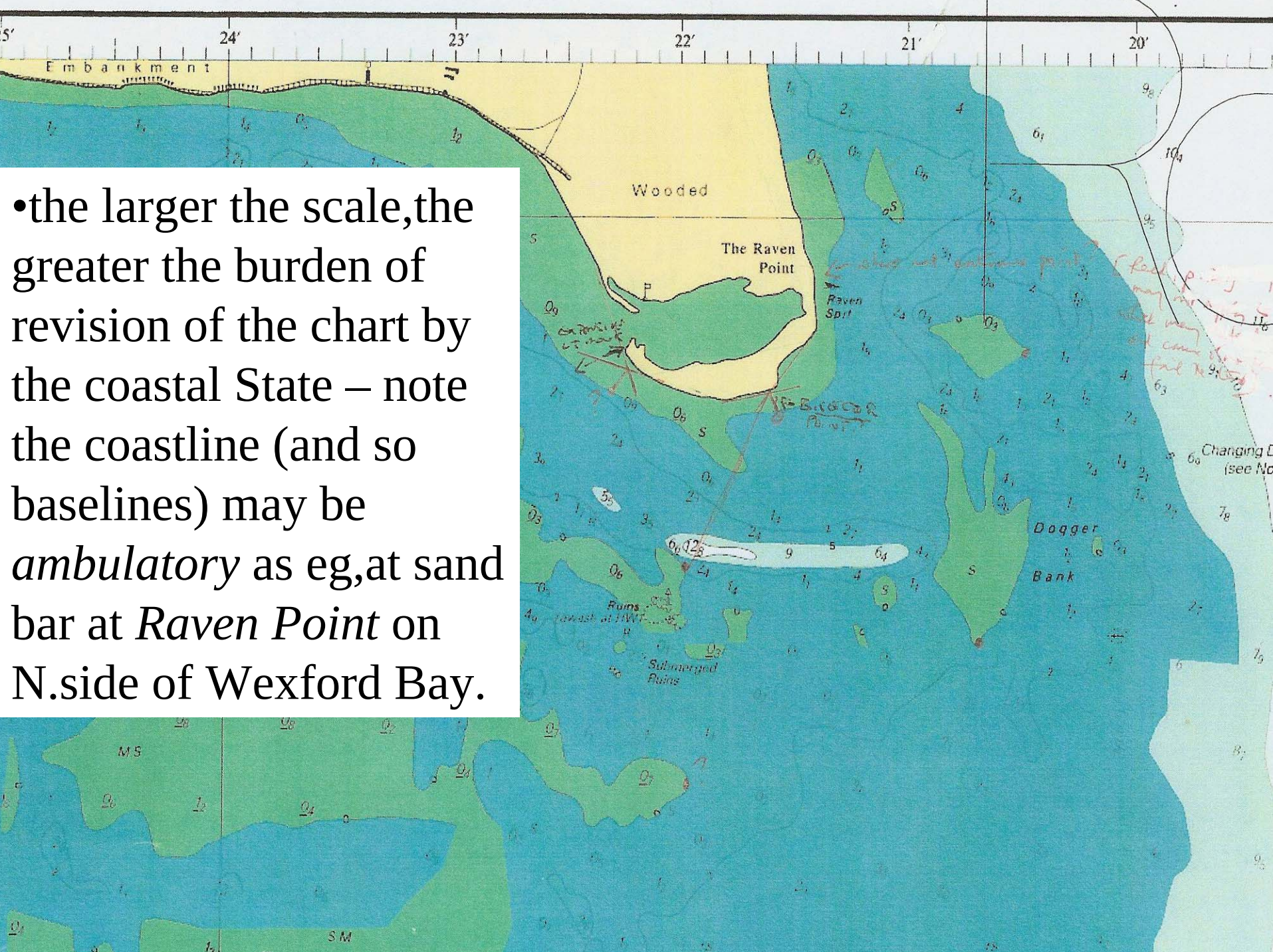
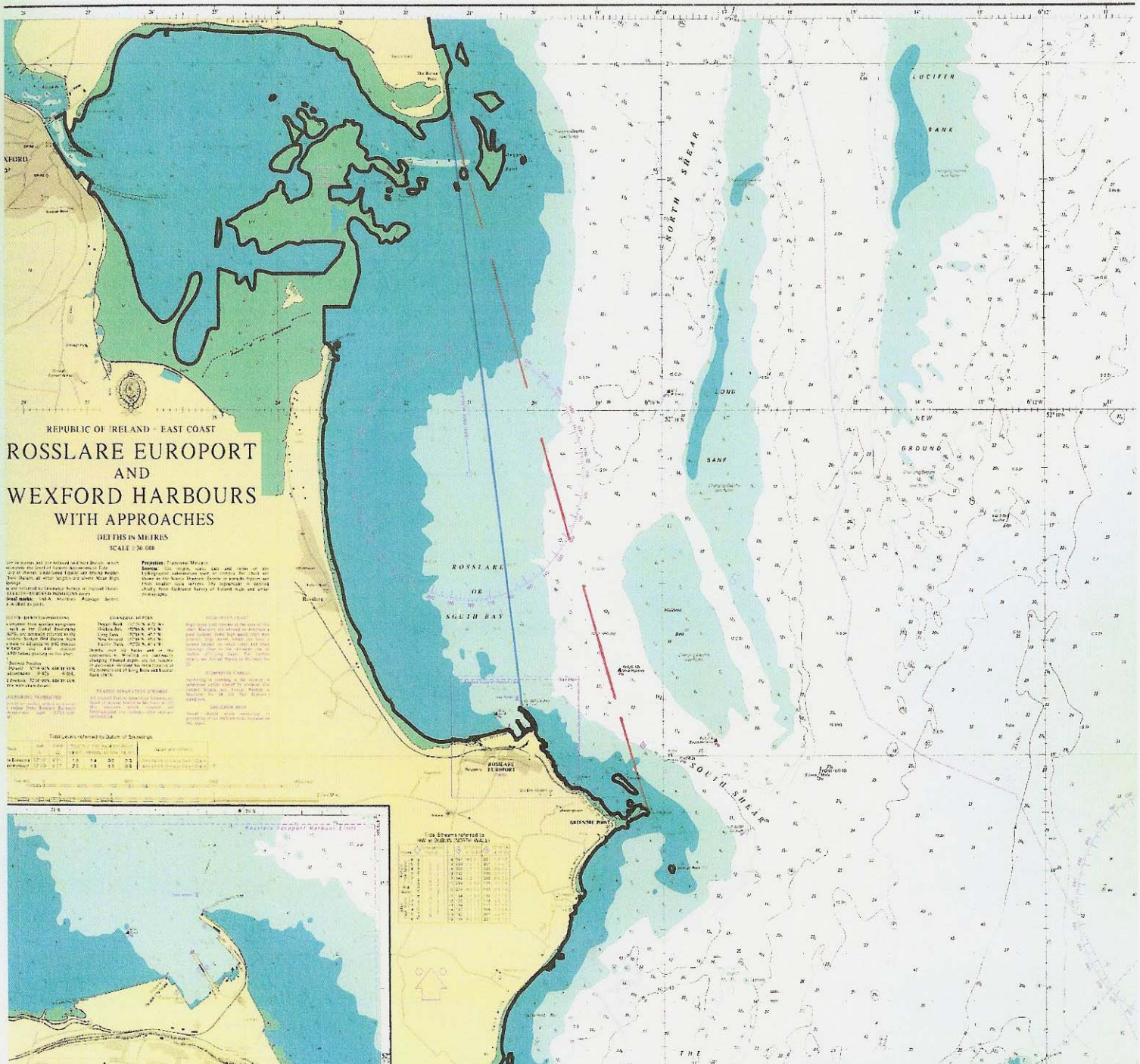


•the larger the scale,the greater the burden of revision of the chart by the coastal State – note the coastline (and so baselines) may be *ambulatory* as eg,at sand bar at *Raven Point* on N.side of Wexford Bay.


REPUBLIC OF IRELAND – EAST COAST
ROSSLARE EUROPORT
AND
WEXFORD HARBOURS
WITH APPROACHES
DEPTHS IN METRES
SCALE 1:30 000
ROSSLARE
OR
SOUTH BAY
NORTH SHEAR
SOUTH SHEAR
LUCIFER
BANK
LONG
BANK
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THE

- ***“large-scale”:-***

- note only the *low-water lines* ***must*** be marked on a *large-scale* chart.

- Carleton recommends a modern chart scale of 1:20,000 or larger to accurately depict the *low-water line*(cf.UK Admiralty charts))

Vagueness as to Chart Datum Required **in LOSC:-**

- the LOSC specifies no requisite *chart datum*,whether *horizontal or vertical* (eg,what is “low-tide”?)(see below various datum possibilities such as LAT/mean tidal datums etc(see below)

- but it does now specify in Arts.16,75 & 84 that where geographical ***coordinates*** are *given in lieu of a chart*’s depiction of lines,the “***geodetic*** *datum*” must be specified.

Horizontal Chart Datum: Straight Baseline Positioning and Charts:-

- without a chart datum on charts depicting baseline/outer zonal limits (or *geodetically-specified* co-ordinate references - see above) point positions on the sea surface will be unclear.

- IHO has in the past recommended World Geodetic System 1960 (WGS 1960). globally for all nautical charts

- research evidences that even in the case of assessment of the *Irish low-water line*,the UK Hydrographic Office (now responsible for Admiralty charts (some 80 in all covering Irish waters)) may have largely resorted to *Irish OSI maps* (datums dating to 1965 and 1975),seemingly with origins in the so-called War Office False Origin Spheroid for Ireland ("WOFO" of 1939) for calculating the *low tide mark on Irish coasts*

WGS 84 is now common in US etc:see eg,the outer limits of Ireland's exclusive 200nm fishery limits(EEZ) published in 2000,the coordinates of which were plotted in WGS 84 format *in ellipsoid* after the EU Directive which obliged Member States to produce satellite-linked outer limits coordinates for the purposes of the CFP

- this OSI map use reportedly has led to discrepancies of up to 30 metres between OSI datum and actual British chart datum(see Delaney research)

- it seems clear therefore that Ireland has failed in its obligation under Art 5 of the LOSC to ‘mark’ such a line on large scale charts because of the lack of accuracy

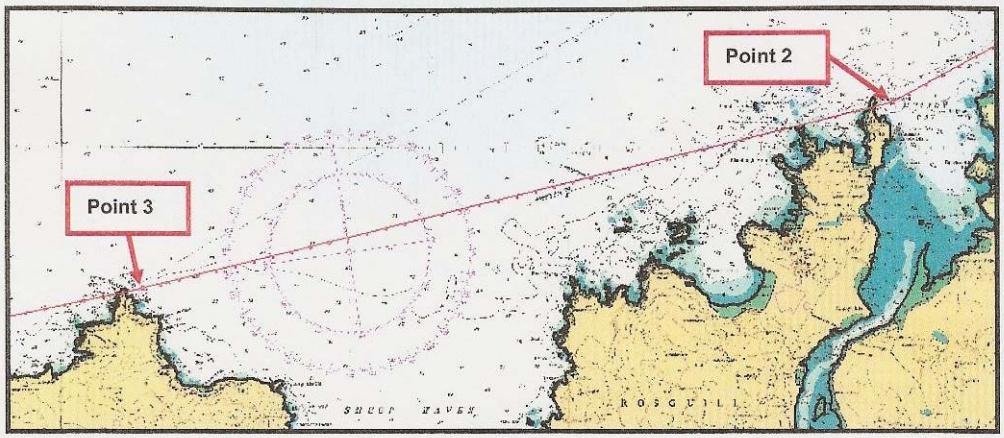
Irish straight baseline system:-

- the expansive *straight baselines* system implemented under the 1959 Baselines Order has been,as seen, laid down and depicted on a small chart and by coordinates *without any reference to basic datum*,so making transposition of the references there problematic in terms of conversion to accurate WGS locations on current Admiralty charts.

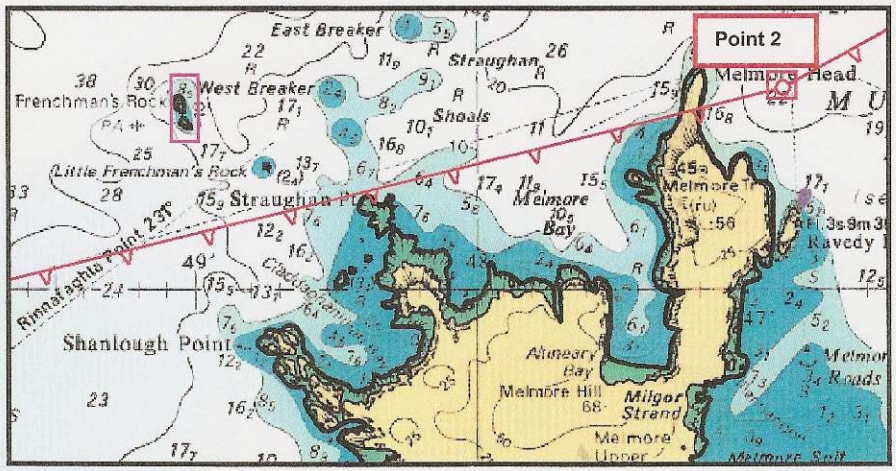
- *lack of datum* in the 1959 Order has thus led to “extraordinary” results on the south and west coasts of Ireland ,where,for example,a point which is supposed to represent a headland on a chart may be “some tens of metres out to sea”(Delaney) and others inland (Edwards/Mellett) when the straight baseline coordinates are plotted onto conventional Admiralty charts

- **Eg**:-

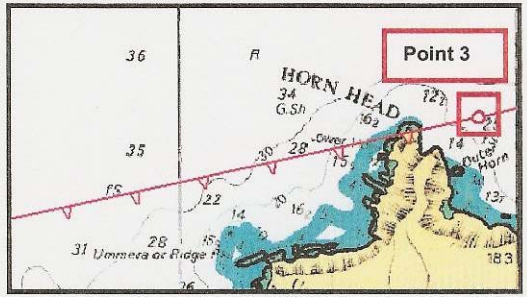
- some of the longer lines actually cut across terra firma,as eg.,the line between Points 1 and 2 cutting across Melmore Head or across an island (eg,Point 4 (cutting Inishbeg) or Point 14))



Straight baseline connecting Point 2 to 3: Melmore Head to Horn Head. Chart Number 2699.

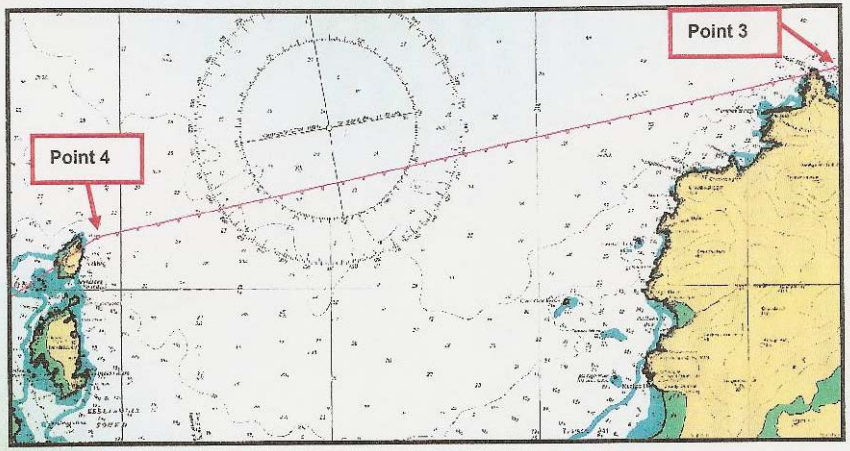


Melmore Head, with Frenchman's Rock shown in purple box. Chart number 2699

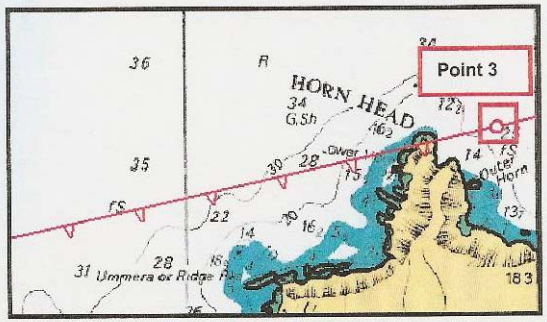


Point 3: Horn Head. Chart Number 2699.

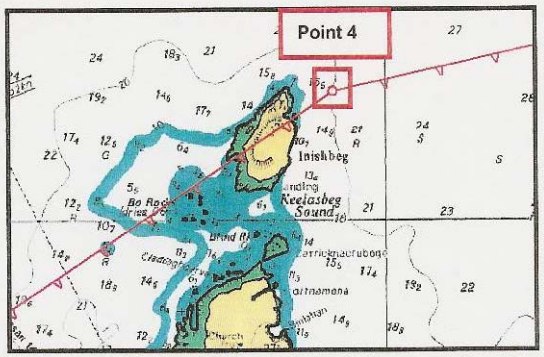
Straight baseline connecting Point 3 to 4: Horn Head to Inishbeg



Straight baseline connecting Point 3 to 4: Horn Head to Inishbeg. Chart Number 2752.

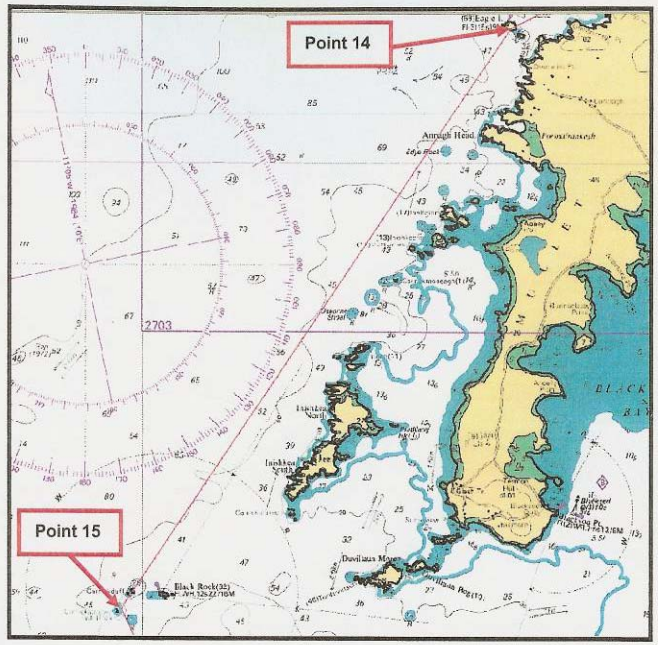


Point 3: Horn Head. Chart Number 2752.

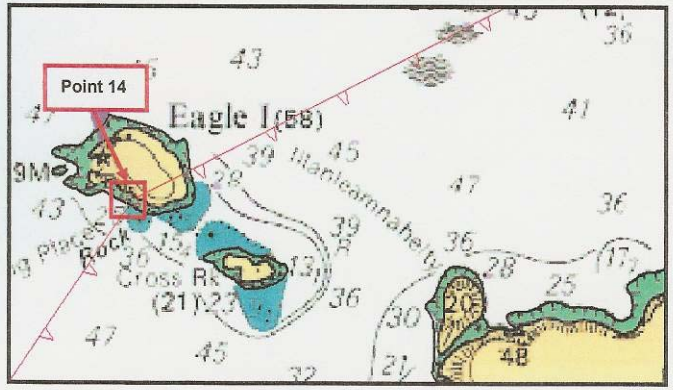


Point 4: Inishbeg. Chart Number 2752.

Straight baseline connecting Point 14 to 15: Eagle Island to Blacksod Bay (Rock to south-west of Black Roc



Straight baseline connecting Point 14 to 15: Eagle Island to Blacksod Bay (Rock to south-west o Rock), Chart 2420.



Point 14: Eagle Island. Chart Number 2703.

- where a headland has several prongs or the headland is considerably rounded,the geographical description in the SI may be insufficiently detailed to solve the intended exact positioning of the baseline point:-

- see,eg.,Points 9-10 between “west entrance to Malinbeg Bay” and Lenadoon Point;

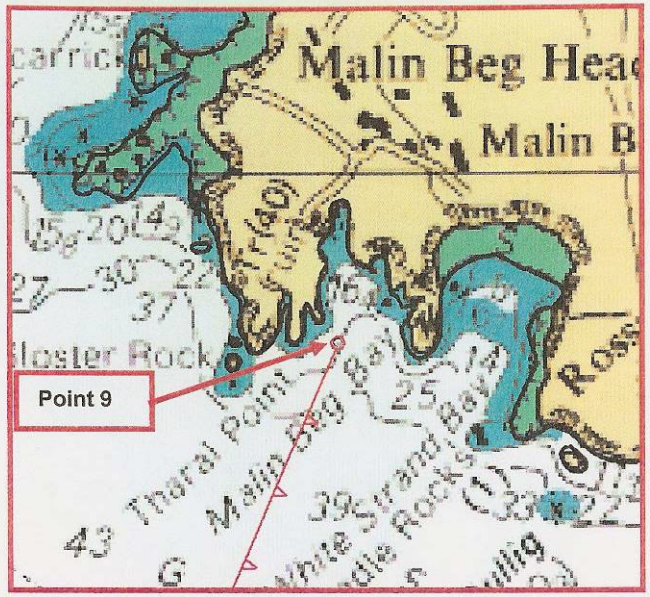


Figure XX Inset area of Figure XX above showing Malin Beg Bay. Chart number 2702.

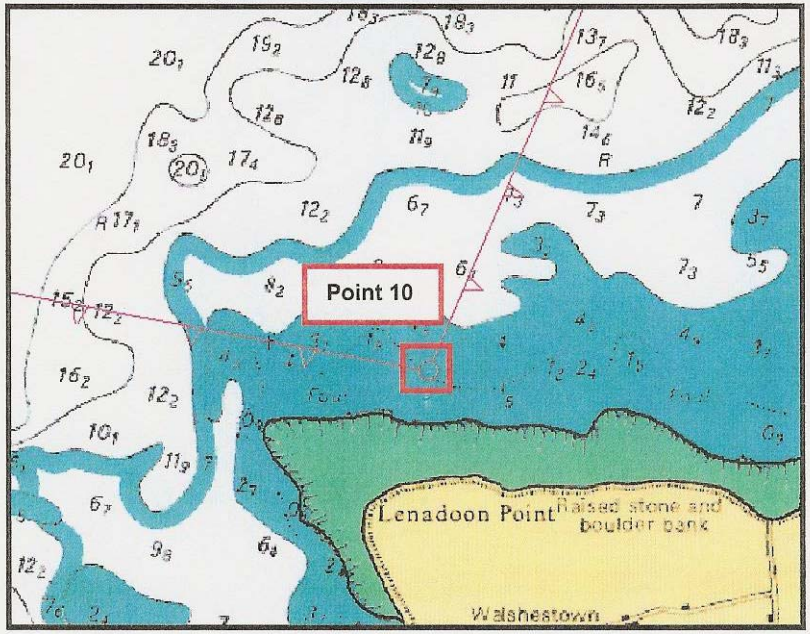
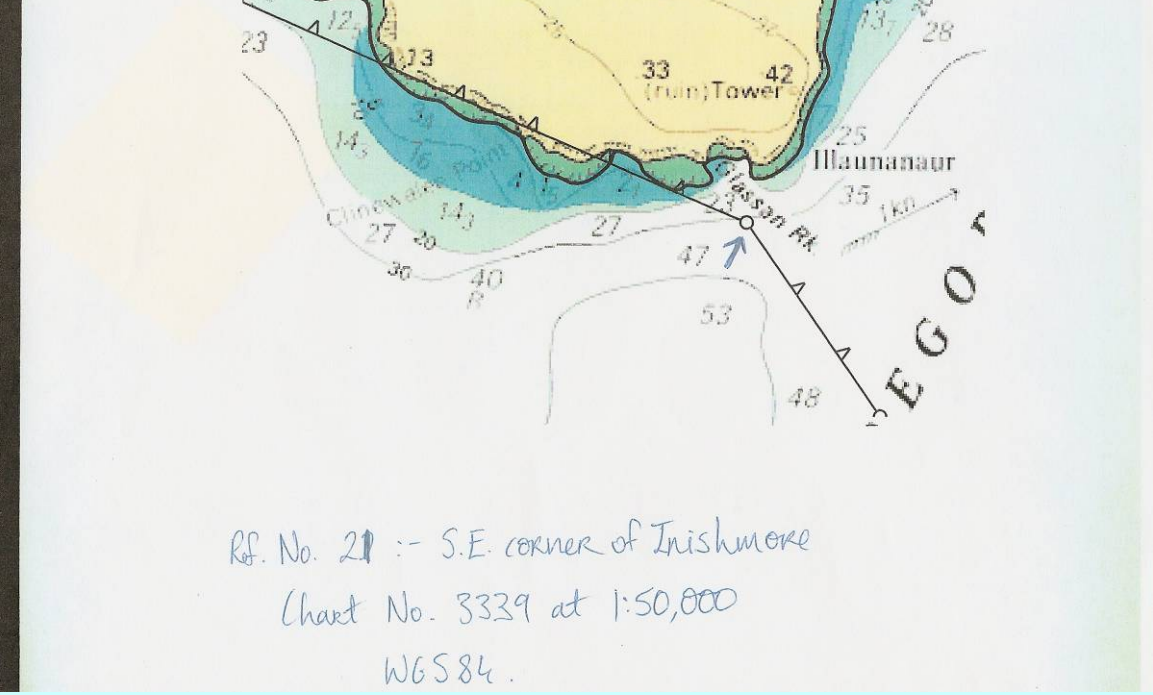
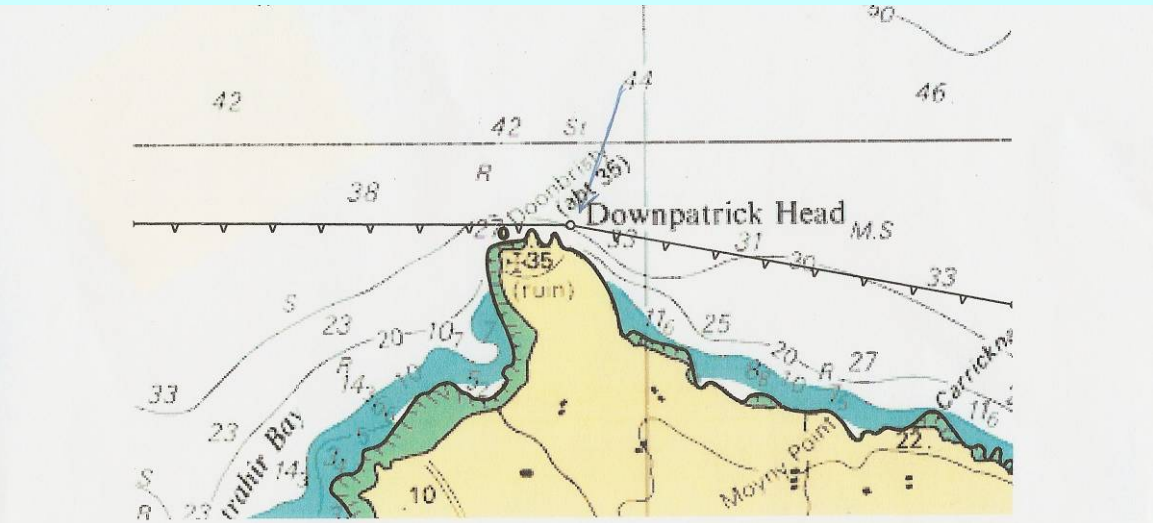


Figure XX Lenadoon Point. Chart Number 2715.



Ref. No. 21 :- S.E. corner of Inishmore
Chart No. 3339 at 1:50,000
WGS84.

Point 21
("SE corner of Inishmore")



Ref. No. 11:- Downpatrick Head
Chart No. 2767 at 1:75,000
WGS84.

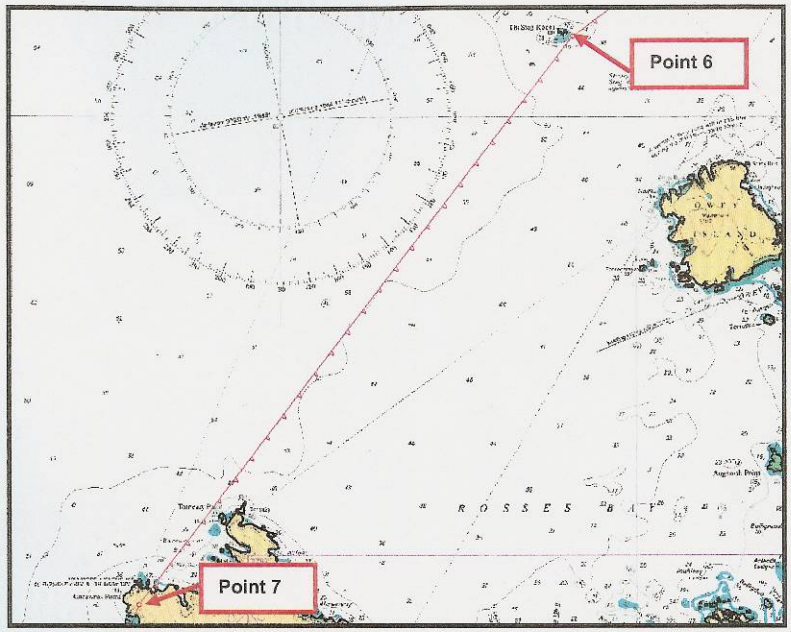
Point 11
(Downpatrick Head)

OR where an *unnamed* "rock" in a *group of several rocks* is referred to:-

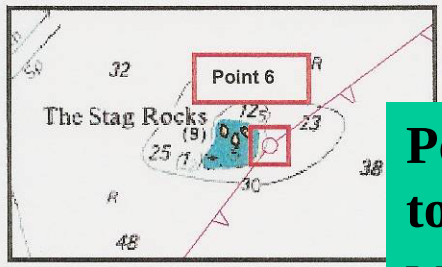
•Eg., Point 6 connecting to "Stag Rocks" – which rock?

•(nb:low tide elevations *cannot* be normally used as straight-baseline anchoring points)

Straight baseline connecting Point 6 to 7: Stag Rocks to Rinrawros Point, Aran Island



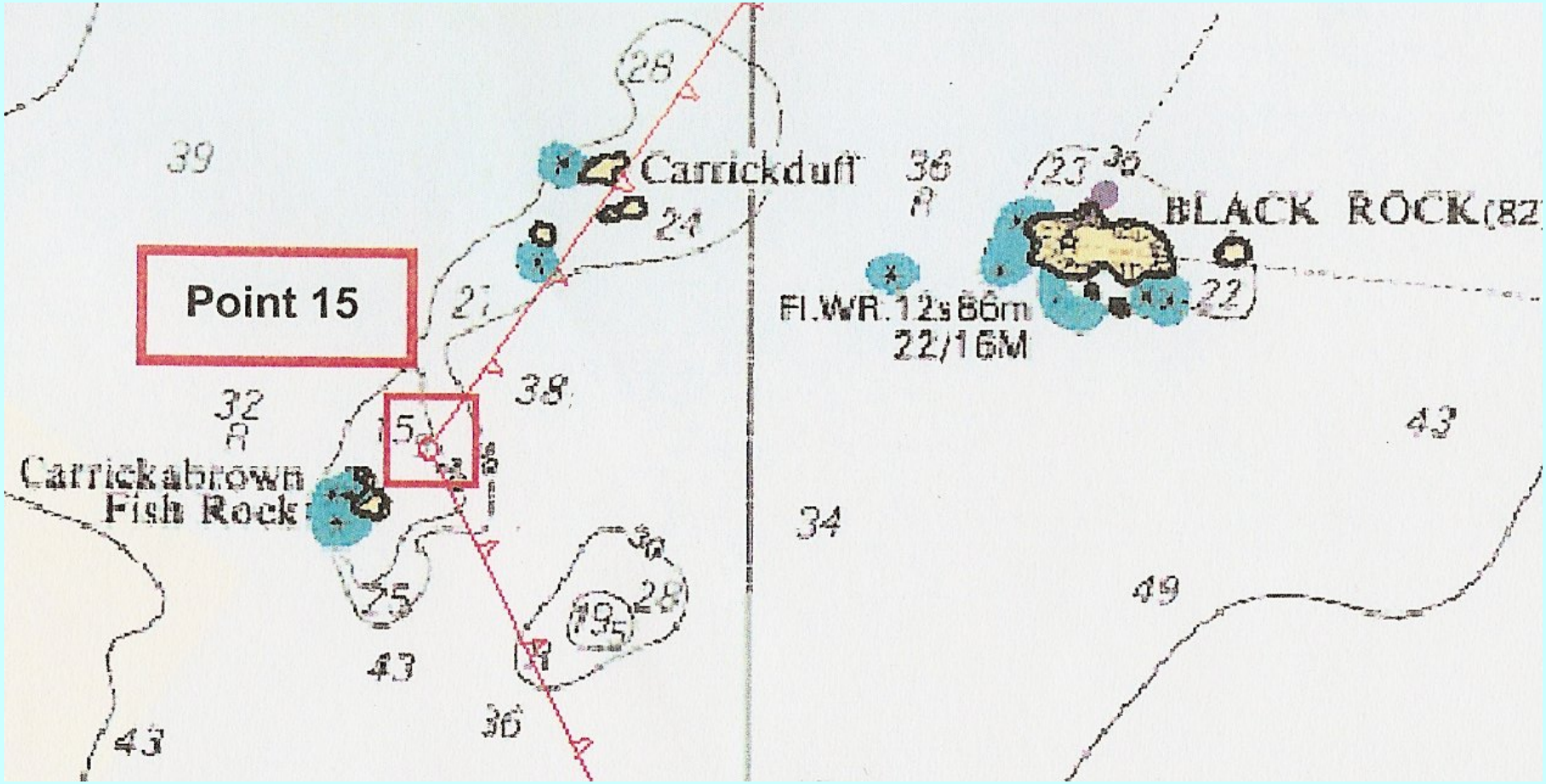
Straight baseline connecting Point 6 to 7: Stag Rocks to Rinrawros Point, Aran Island. Chart Number 1883.



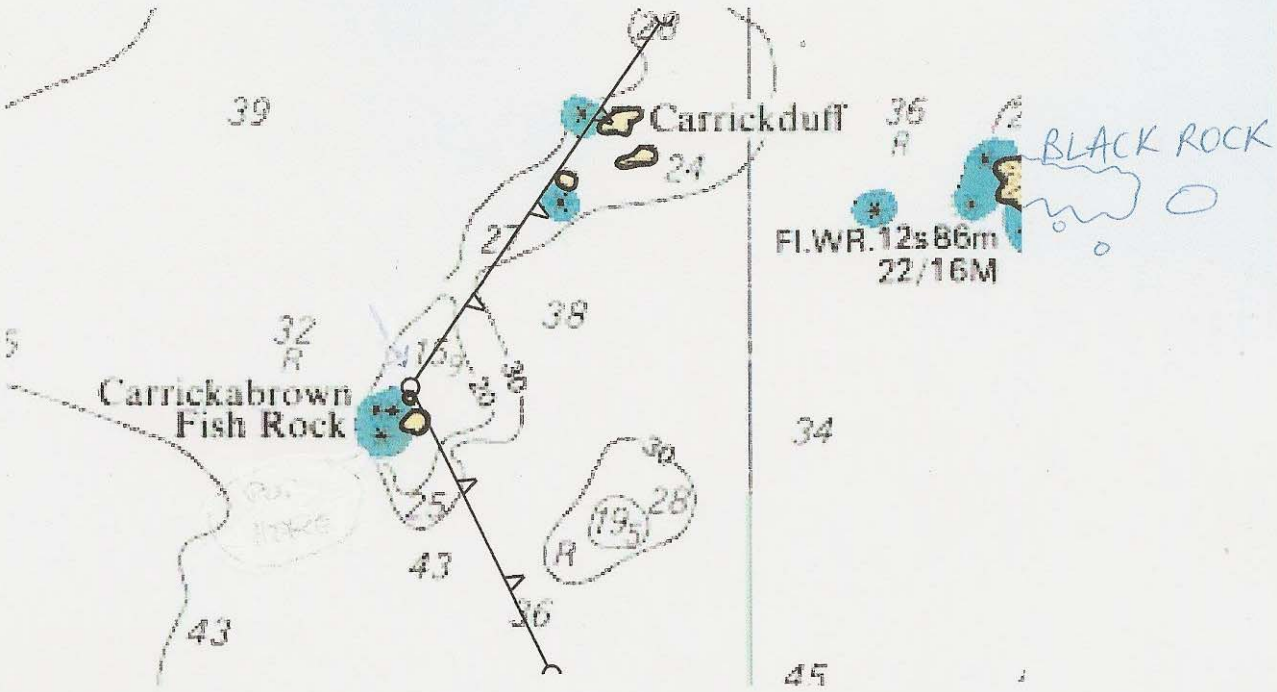
Point 6: Stag Rocks. Chart Number 1883.

Point 6 connecting to "Stag Rocks" – which rock?

Point 7: Rinrawros Point, Aran Island. Chart Number 1883.

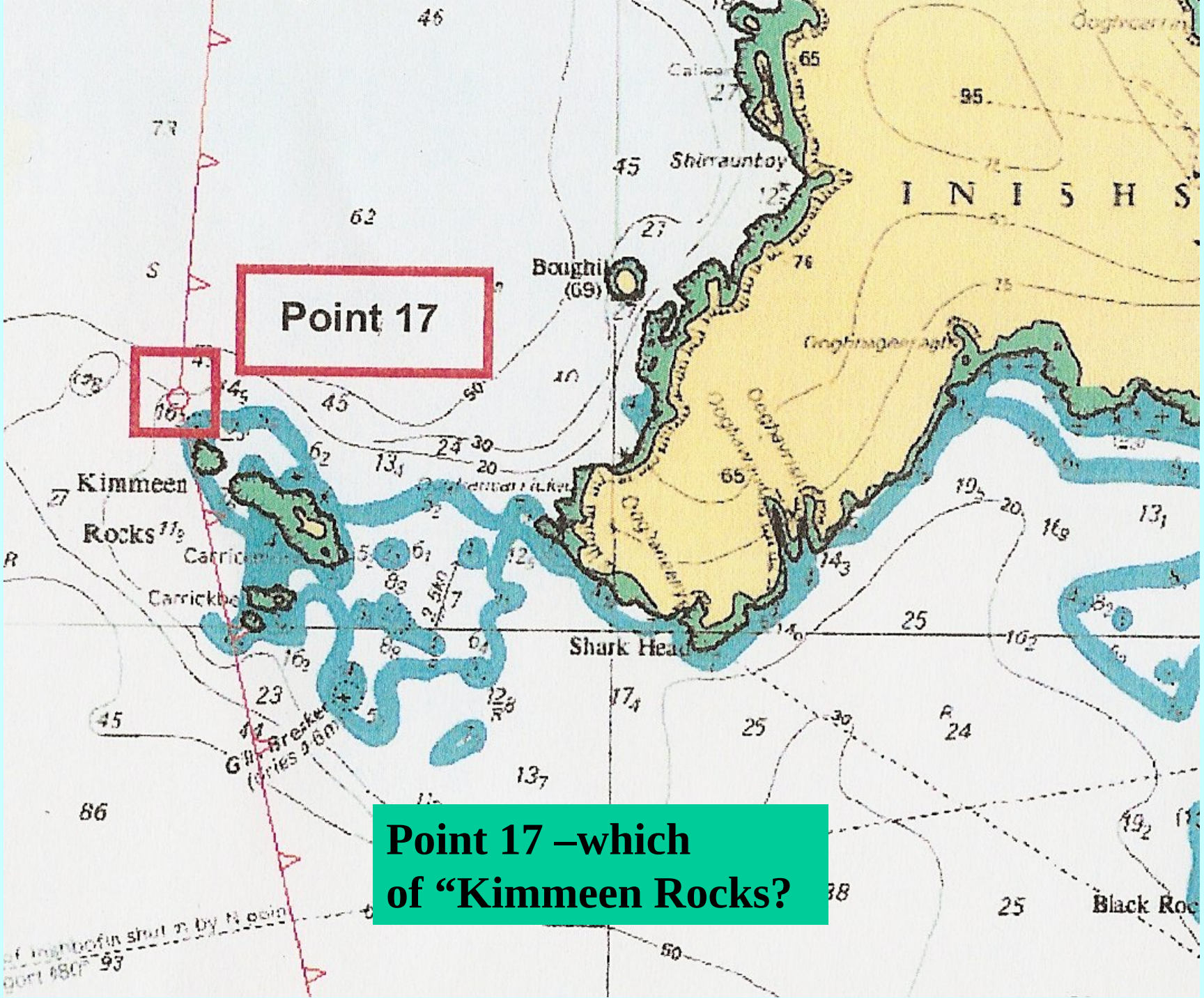


Point 15 (“rock to SW of Black Rock”)

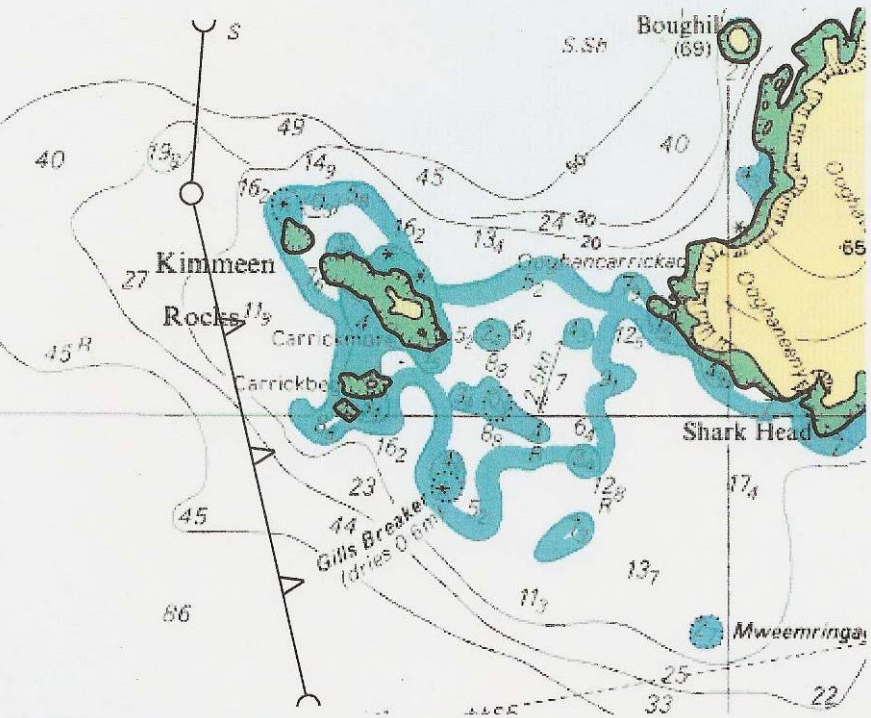


Ref. No. 15:- Blacksod Bay (Rock to S.W. of Black Rock)
Chart No. 2704 at 1:50,000
WGS84.

Point 15 ("rock to SW of Black Rock")



Point 17 –which of “Kimmeen Rocks?



f. No. 17 :- Kemmeen Rocks, Inishark
Chart No. 2707 at 1:25,000
WGS84.

Point 17 –which of “Kimmeen Rocks?

- it seems clear therefore that Ireland is in breach of its obligation under Art 5 of the LOSC to show such a line whether on charts or by coordinates because of the lack of clarity

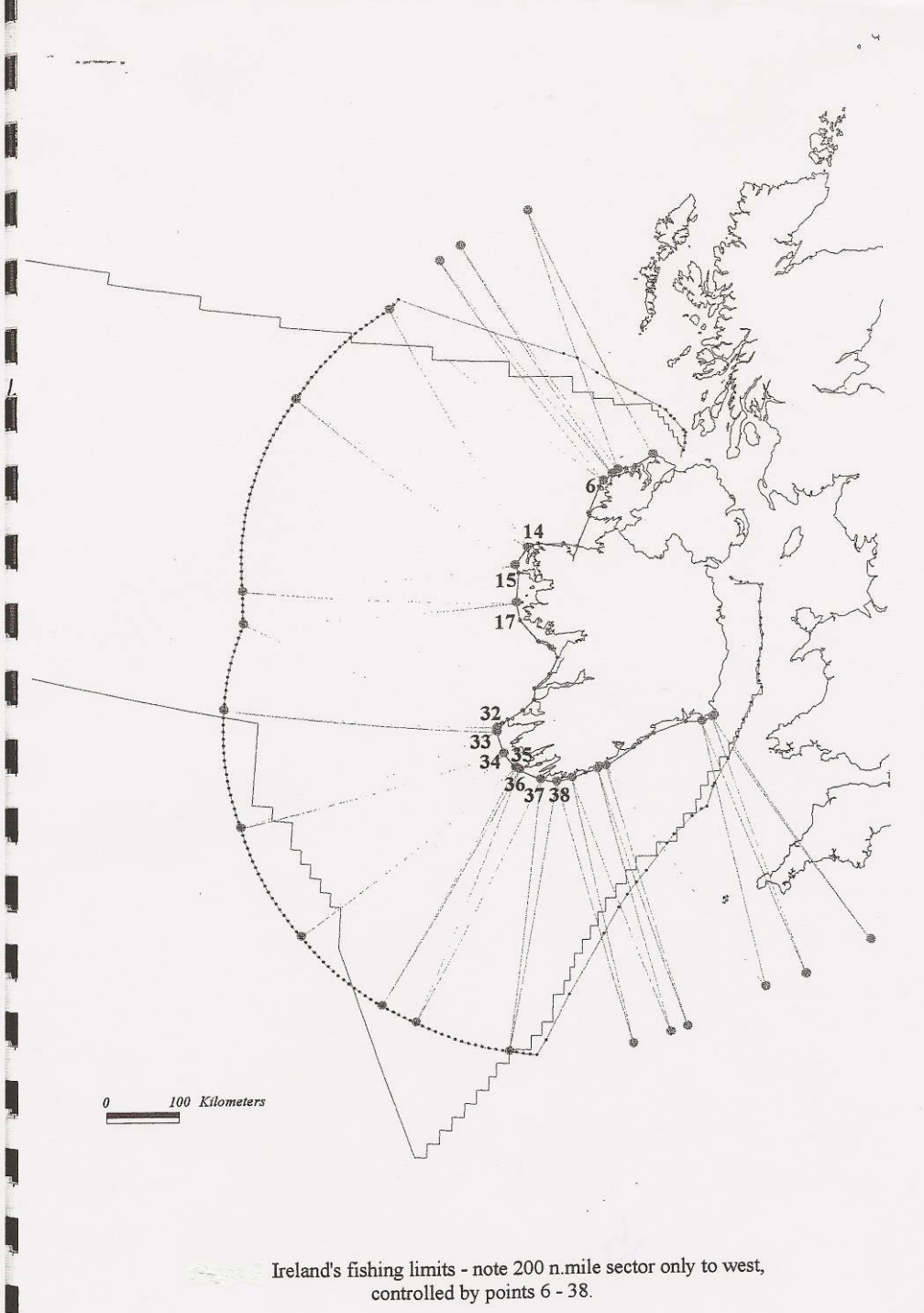
Vertical Datum:-
Tidal Datum Problems:-

- vital to determination of the low-tide line – the normal baseline – is the tidal datum (a vertical datum (see above LOSC references to tidally-defined concepts such as LTEs,islands,drying reefs,low water line and high tide)

- according to IHO,chart datum (CD) is the “plane of reference to which all charted depths and drying heights are related”

- note in the case of definitions of *LTEs,drying reefs and islands* no reference to depiction thereof on *charts* officially recognised by a State is made in the LOSC,though the low tide baselines of such do refer back implicitly to Art.5 LOSC and thus *these* must in turn be depicted on officially-recognised charts in such cases

•such *surface* features are *very relevant* to determining the *normal baseline* under Art.5 of the LOSC (ie,for the ts,cz,EEZ,even cs beyond 200nms,one of ‘cut-off’ criteria of latter under Art 76 LOSC being the 350 nm point from baseline)



Ireland's fishing limits - note 200 n.mile sector only to west, controlled by points 6 - 38.

•obviously the further to sea the baseline,the further to sea the *outer limits* of the relevantly generated zones;though the ‘controlling points’ have less effect as the width of the zone increases.

•even nautical charts may not clearly or accurately depict the true status of a small formation in the sea:and *supplementary evidence* may have to be sought elsewhere (as in our NUIG research) - eg, *sailing instructions*. may give additional information not on a chart (as in the UK series of *Admiralty Pilots*)

- the *LOSC does not specify any tidal datum for such purposes* (the ILC recognised this fact at UNCLOS I in 1950s ("no uniform standard"))

- cf. *Irish legislative* references, such as the *Foreshore Act (1933)* ("foreshore" is area "below the line of high water of *ordinary spring tides*";but "tidal area" is the area below the "line of high water of *ordinary or medium tides*")

- :so what should datum be for *international legal purposes*?

- seems any one of various datums, if used on large scale charts, may be considered as legitimate *vertical* datums

- eg.,re outer limits submissions of cs (beyond 200nms), the CLCS' finalised guidelines (1999) stipulated that certain info must relate to "geodetic definition of baselines"if 350nm long-stop test is used,but the CLCS admitted that "there is uniform and extended State practice which justifies the acceptance of *multiple interpretations of the low-water line*" and that *all* of them would be regarded as "*equally valid in a submission*" (cf previous CLCS reference non-acceptability of features "falling below the level of lowest astronomical tide")

- in the Irish situation such datum may vary from (Admiralty) chart to chart (older UK charts appear generally to show a different datum – the mean spring tide low/high tide test)

- international practice is thus inconsistent in using various datums for LoS purposes (using,eg, both mean and astronomical levels),*though lowest astronomical tide ('LAT')is becoming increasingly used*,as on modern British charts

- ideally a ***LAT datum*** should be used to give maxi*mum legal effect* to a marine formation in marginal cases as related below – note, however, the impractical nature of this datum,as it should ideally take into account all tides over a 19 year cycle (many States (even the US as in *US v Alaska* (1996)) do not have such data to hand)

- the IHO – which aims at harmonising all national charts - *originally* recommended for this purpose that the vertical datum *level used should be a plane so low that the tide will not frequently fall below it* (thus giving States considerable discretion)

- in 1996 the IHB recommended introduction of a "precise definition of an international law water datum";so that where tides have an *appreciable* effect on water level,*IHO now recommends LAT* (i.e.,the lowest astronomical tide which can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions)(or *HAT*)

- but not mandatory for international legal purposes and aimed at navigational safety for ship clearance purposes (still useful in interpreting gaps in the LOSC)

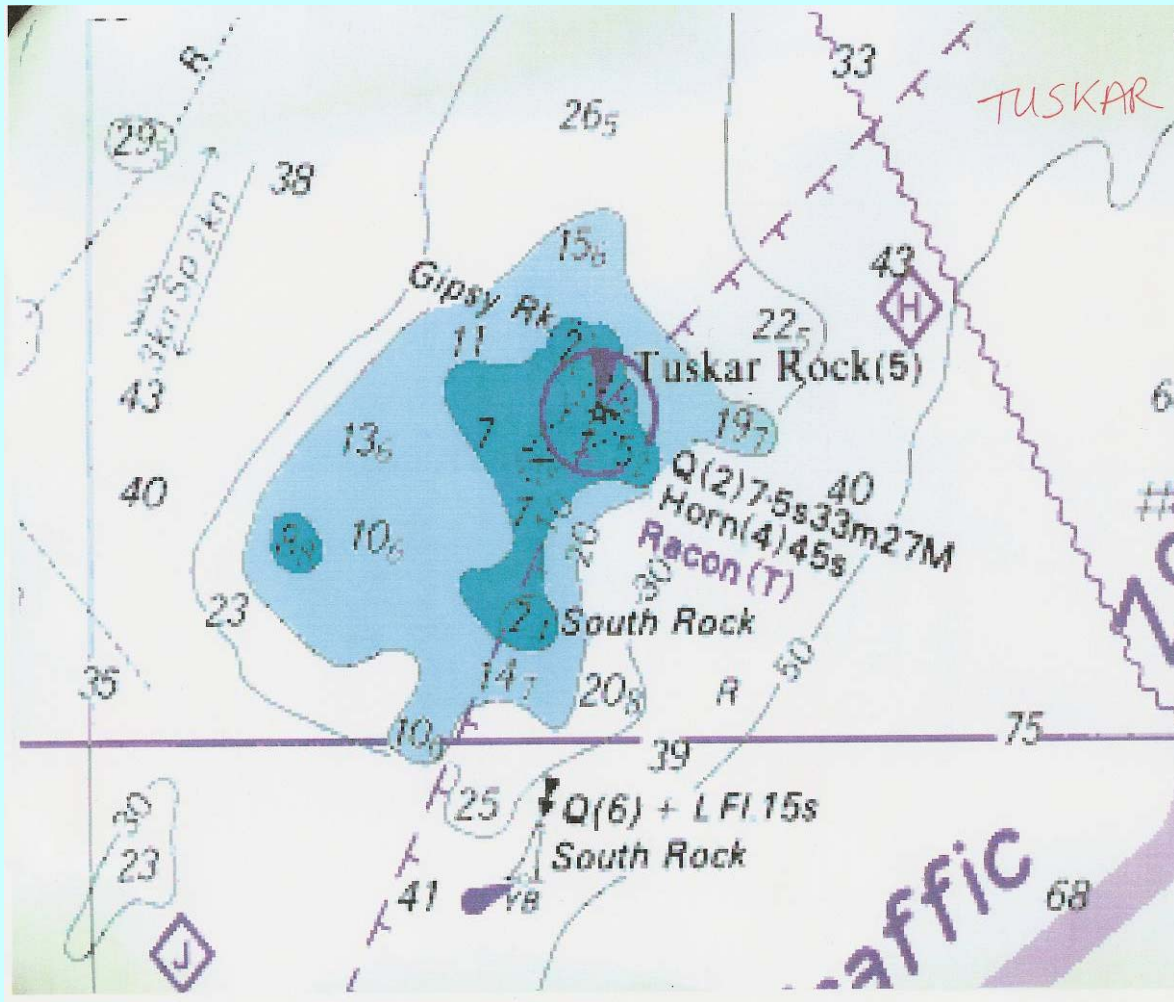
- Admiralty charts /OS maps may,for example, use both LAT and other datums (eg.,MLLWS (mean lower low water springs)) *relating to same feature on different charts* (eg,Island of Rona)) -many land maps use simply Mean Sea Level

- such inconsistency or lack of clarity may cause international dispute (see also below on *delimitation of boundaries*),*particularly in case of LTEs* the existence of which is *very dependent* on the vertical datum used

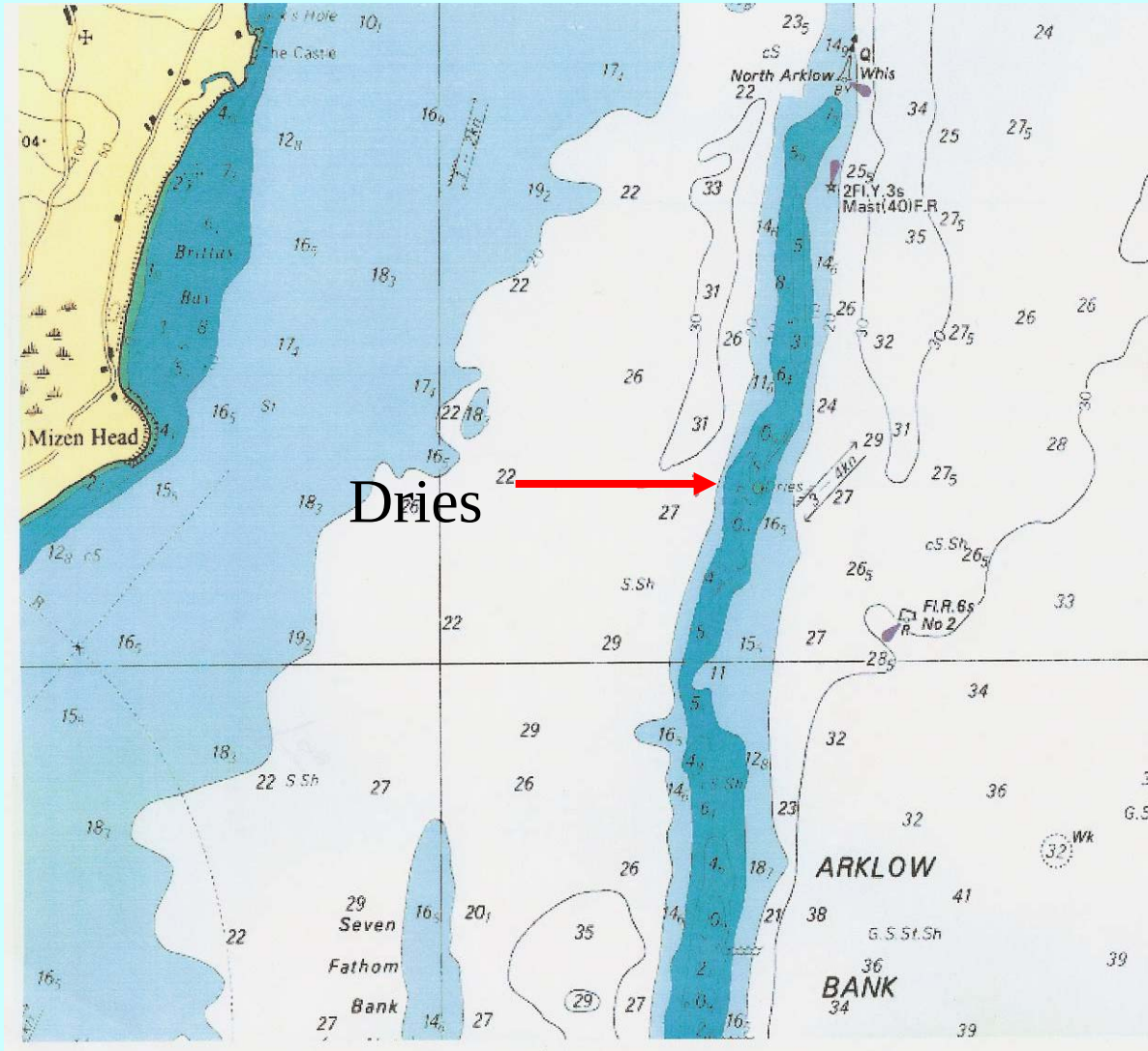
- eg,in determining whether a particular rock/sandbank etc *is a low-tide elevation at all* (rather than part of the seabed) as this is highly dependent on the vertical datum used (and they may be highly ambulatory (ie need constant charting)

•*if not marked green* on an Admiralty charts,a named rock,as eg,Tuskar's satellite rocks are probably only part of the seabed.

•but difficult assessments arise re small 'green-marked' features



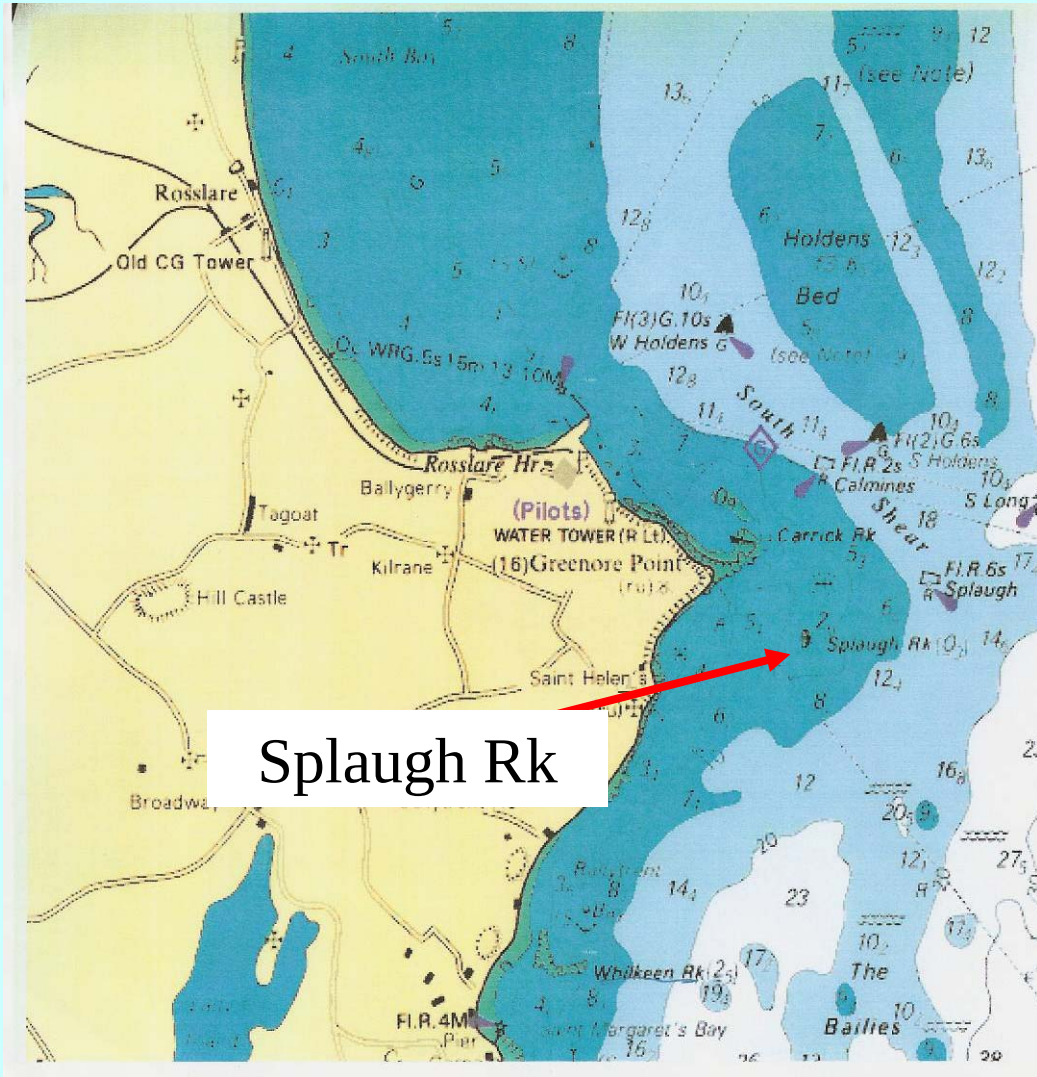
•see,eg,in the Irish situation,the possible LTE on Arklow Bank - a small drying area? - of the East Arklow Bank about 4nms off coast – which reportedly “dries” (a vital potential basepoint because of distance from shore - now addedly important as a baseline because of the expansion of the ts to 12nms)



•nb ambiguity of ‘chart’ term “rock(s) awash”

•is such a formation an LTE *or simply part of the seabed*? (if latter,it has no legal effect in the LoS)

•for example,what is status of ***Splaugh Rock*** off Greenore Point? (seemingly shown as an LTE on Admiralty chart,and in the ICC (Irish Cruising Club) publication described as being “partly dry at LAT”and all of it less than 2ms deep



- a low-tide elevation *or an island* ?(see Eddystone situation in *Western Approaches* Arbitration for differing high water datums (UK mean springs,France H E(equinoctial)T);and *Dinkum Sands* in *US v.Alaska* (1996

Admiral Nygren's 1949 Photograph of Dinkum Sands

Photograph of Dinkum Sands, 25 July 1979

Charts used in Maritime Delimitation (Agreed Maritime Boundaries):-

- as seen,charting is specifically required in the LOSC in respect of a territorial sea *boundary* (Art.16 LOSC),an EEZ boundary (Art.75) and a cs boundary (Art.84)

- charts are often also annexed to the text of agreed maritime boundaries

- charts so used (on a horizontal datum) to show *agreed maritime boundaries* with another State may cause later problems if charting in the maritime delimitation treaty is deficient

- as in the *Western Approaches Arbitration* and the original *UK/Norway continental shelf agreement*,where a 1965-agreed position (*graphically*-produced) of the northern point did not tie in with the later 1978-agreed connecting *computerised* point on the southern part of the northern section(a difference of 331 metres)

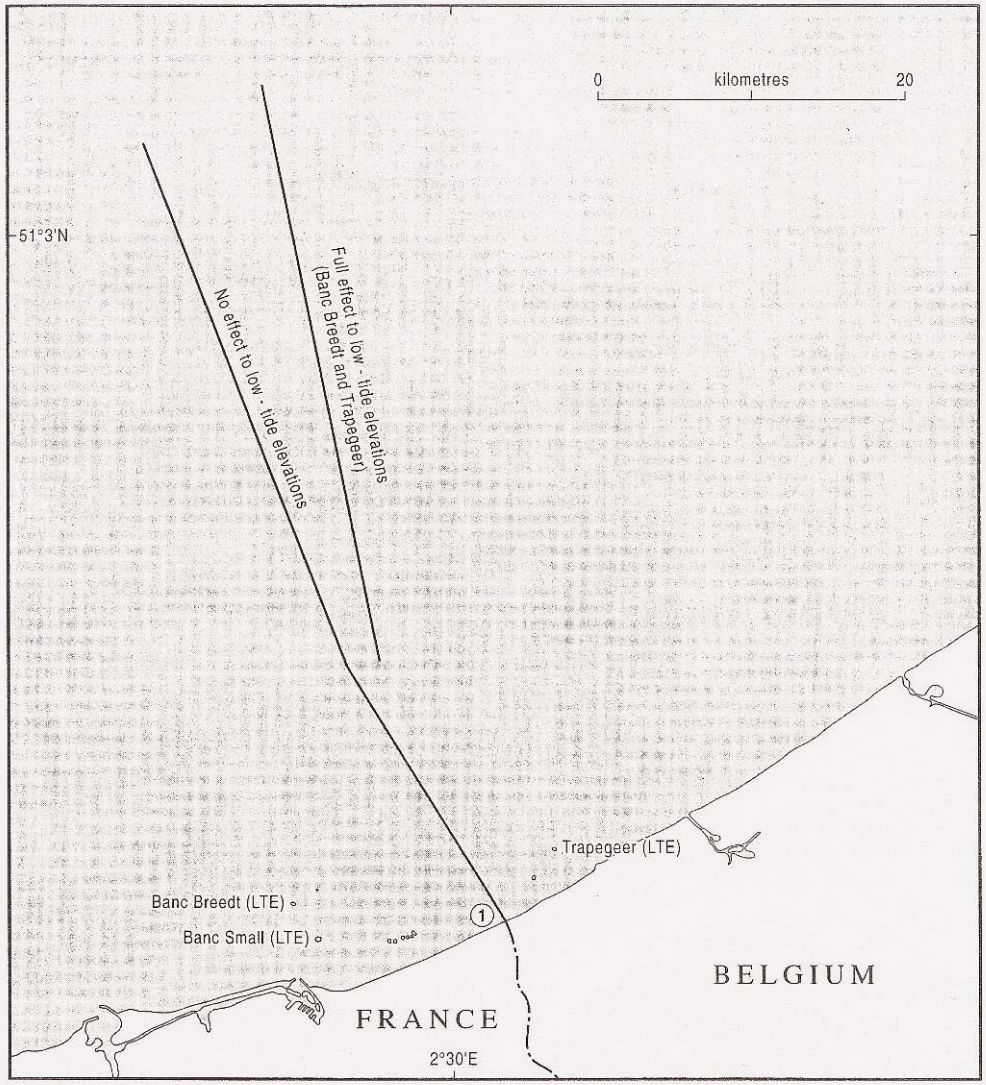
- thus it is nowadays important to specify the *geodetic datum* on maritime boundaries so that when States delimit boundaries between themselves the co-ordinates used are based on the same datum (thus Carleton recommends adoption of a *common datum* in negotiation on boundaries)

- hence modern practice is to use charts in such instances for *illustrative purposes only*,modern treaties defining the definitive boundary by *listed co-ordinates* with specified geodetic datum

- also as maritime boundaries are often are based on the median /equidistance line -and this is calculated from the respective ts baselines of the States involved, - differing *vertical* tidal datum practices may cause problems

- in the *Gulf of Maine* case (between Canada and the US) both States agreed for the purposes of maritime boundary adjudication by the ICJ that notwithstanding that both States used different tidal datums in the Gulf of Maine,the two datums should be “deemed to be common”

•see,eg.:-
the Franco-Belgian Agreement on delimitation of the ts and cs (1990),where,eg,one formation ("*Banc Breedt*") was *not* an LTE on *Belgian* charts (*using MLowerLWS*) but it *was* on *French* charts (using LAT,lower than the Belgian datum by c.30cms)



Based on Admiralty Chart No. 1872
Chart Datum: approximately LAT
High-Water Datum: MSL

Type of Horizontal (Straight) Line Trajectories also vague in the LOSC:-

- on what charting basis should straight baselines,closing lines and the various maritime zonal limits be drawn on a chart?

- although traditionally boundary lines etc have been drawn as *loxodromes* (ie,straight or *rhumb* lines) on a Mercator's projection mapping basis (widely used on eg.,Admiralty charts),in fact such lines give an inaccurate lineal depiction over longer distances because they ignore the curvature of the earth's surface,unlike a *geodesic* line

- cf the problem over the westerly stretch of the 170 nm boundary line decreed in the *Western Approaches Arbitration* (1977) where the line was drawn a loxidrome and so was placed some 4nms north of a geodesically drawn line

- maritime limits and boundaries are thus nowadays generally represented by a *geodesic line*

- for example,the CLCS advises that the outer limits straight lines in submissions of States claiming seabed to the edge of the continental margin should be geodesically drawn

The End.