

Coastal Navigation

Charts & Navigation

IHO

International Hydrographic Organization

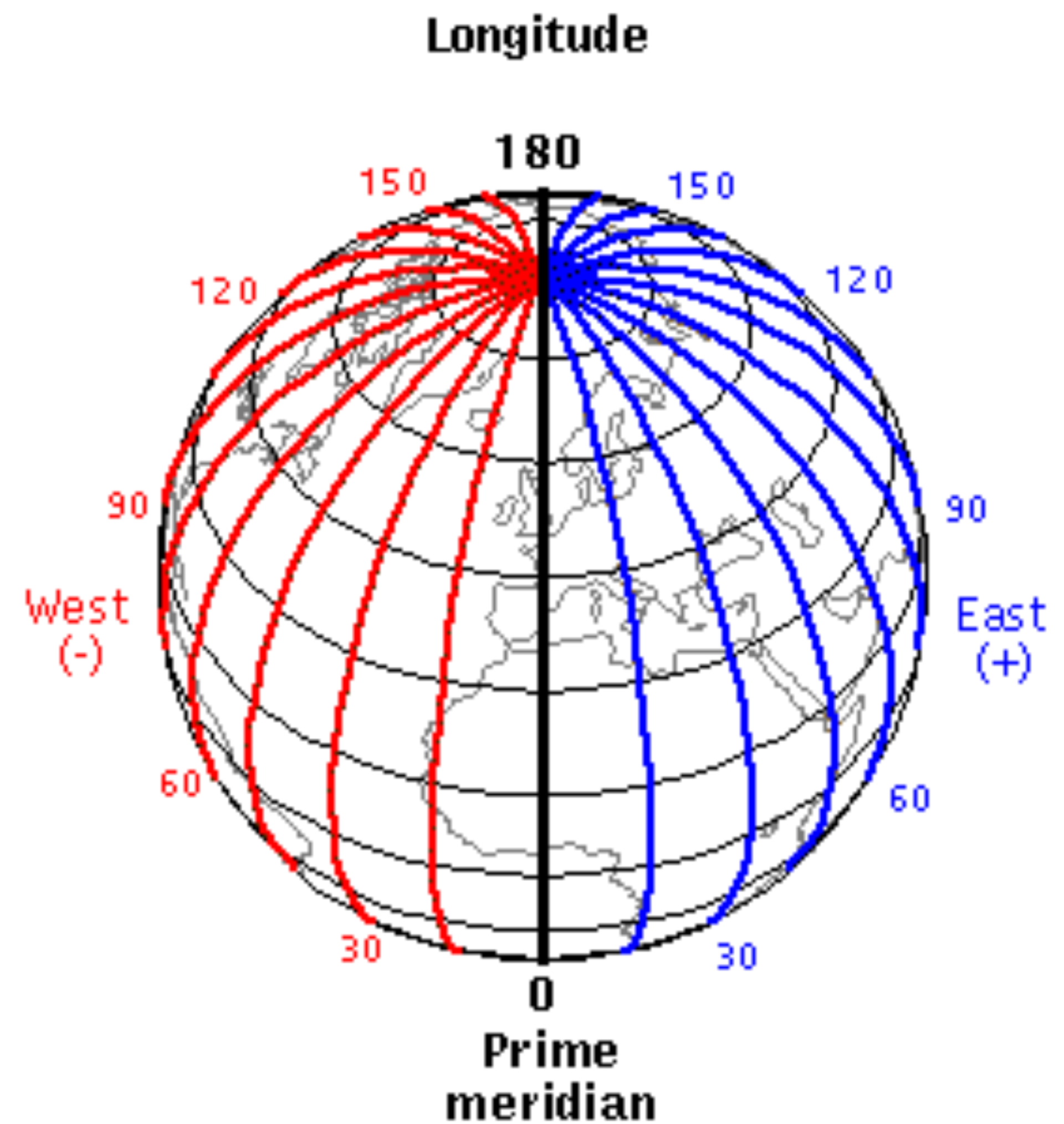
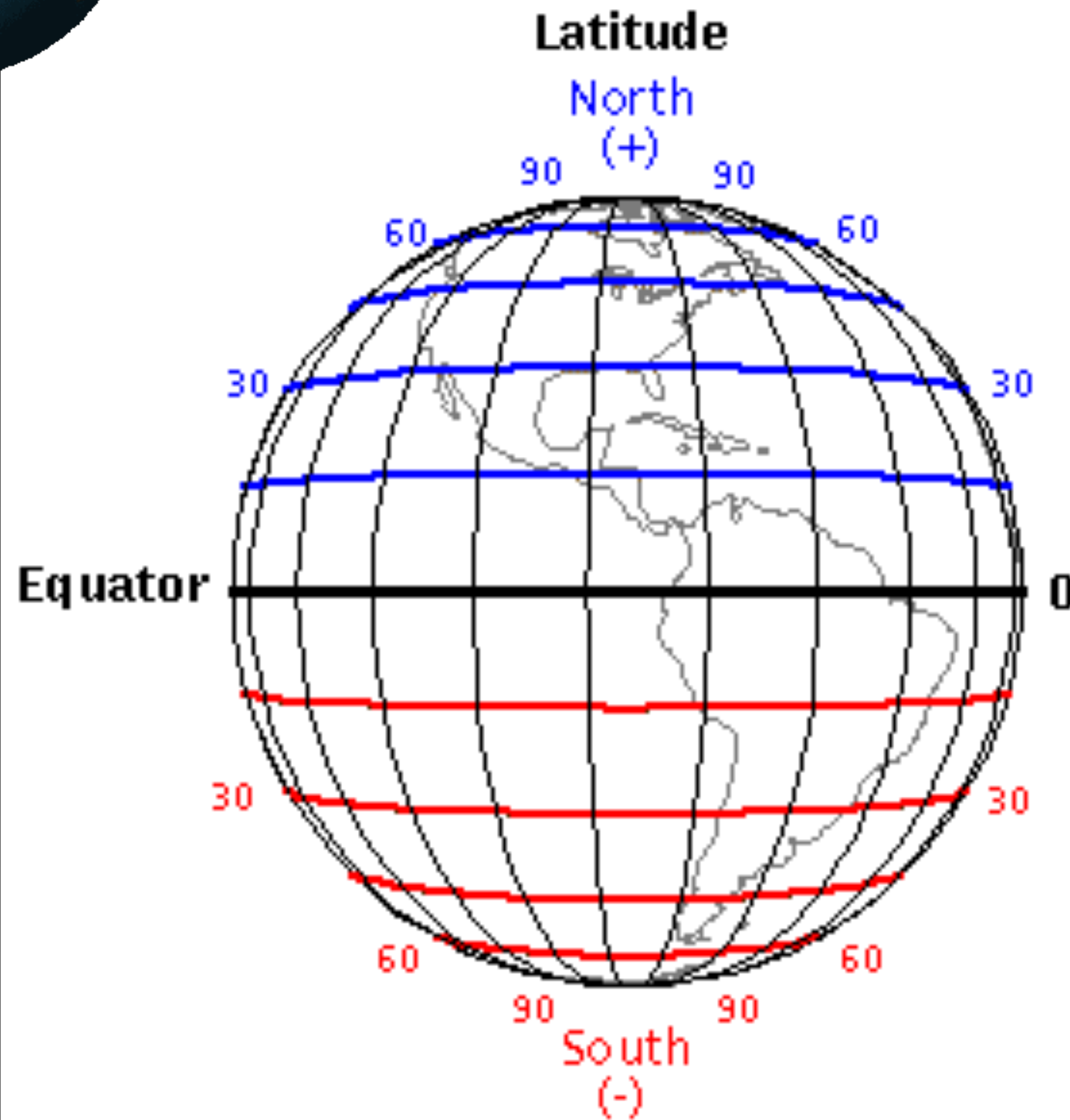
The International Hydrographic Organization is an intergovernmental organization that works to ensure all the world's seas, oceans and navigable waters are surveyed and charted. Established in 1921, it coordinates the activities of national hydrographic offices and promotes uniformity in nautical charts and documents. It issues survey best practices, provides guidelines to maximize the use of hydrographic survey data and develops hydrographic capabilities in Member States.





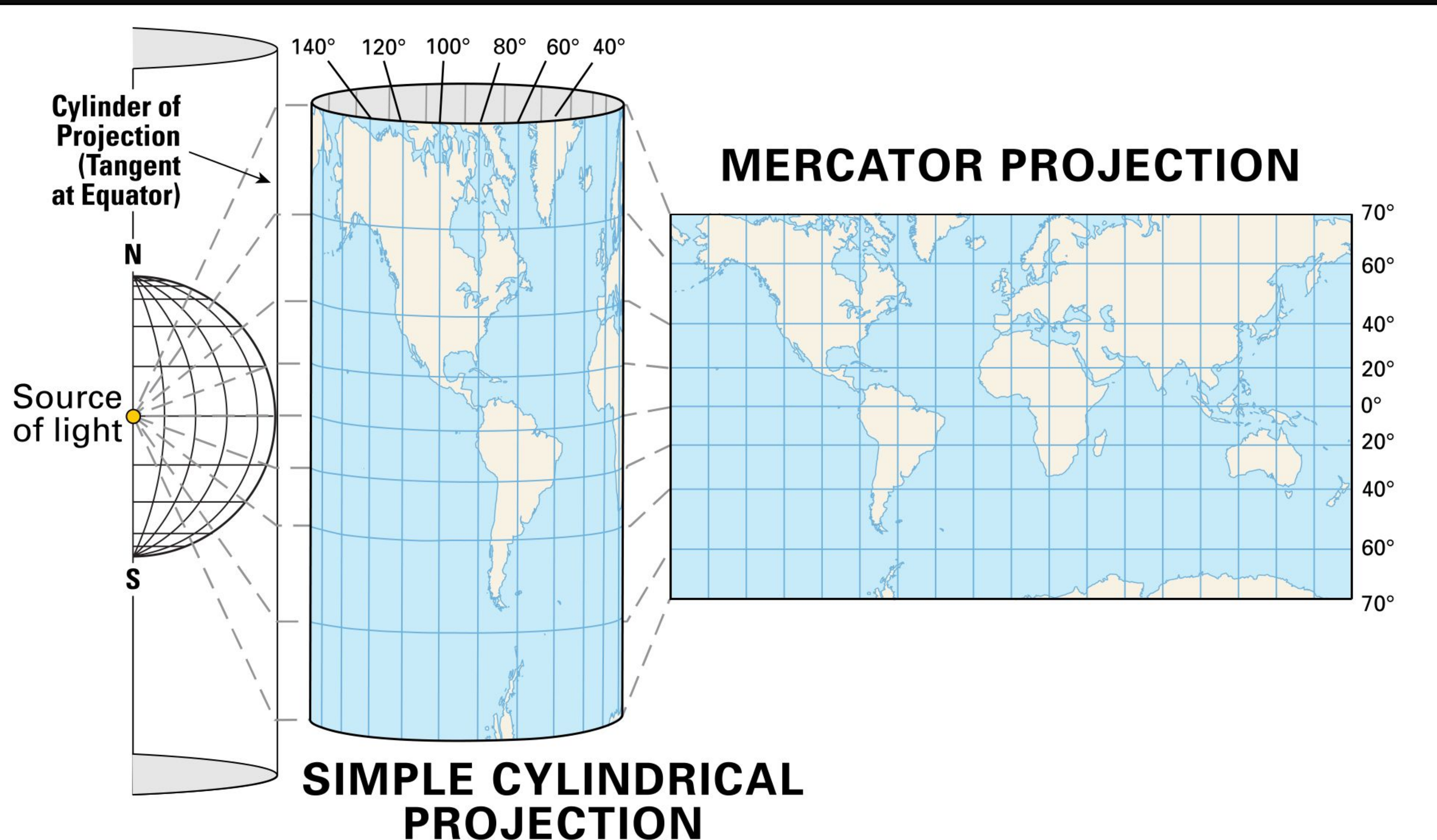
World

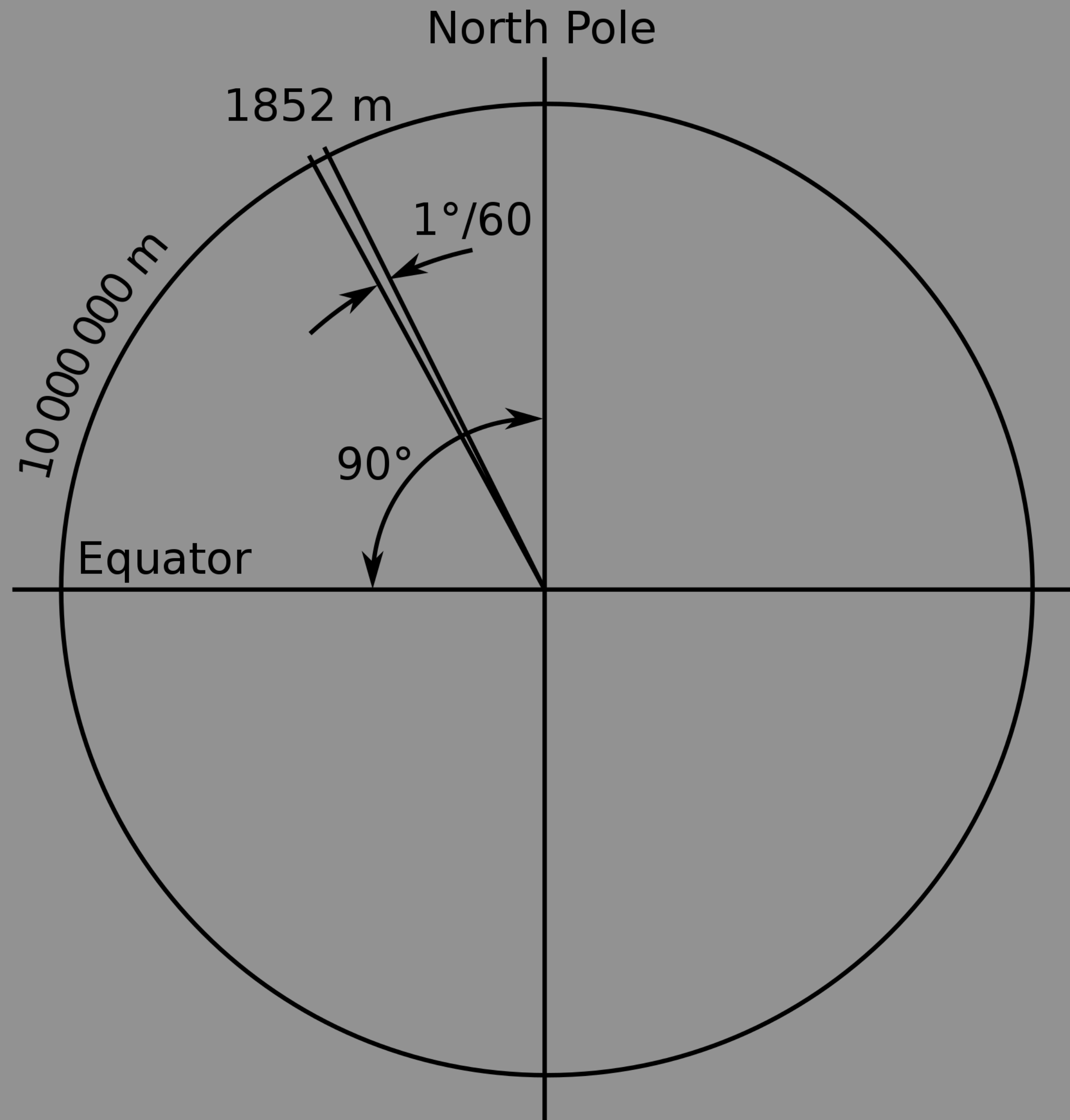
Latitude and Longitude



Charts

Mercator Chart - scale changes with latitude



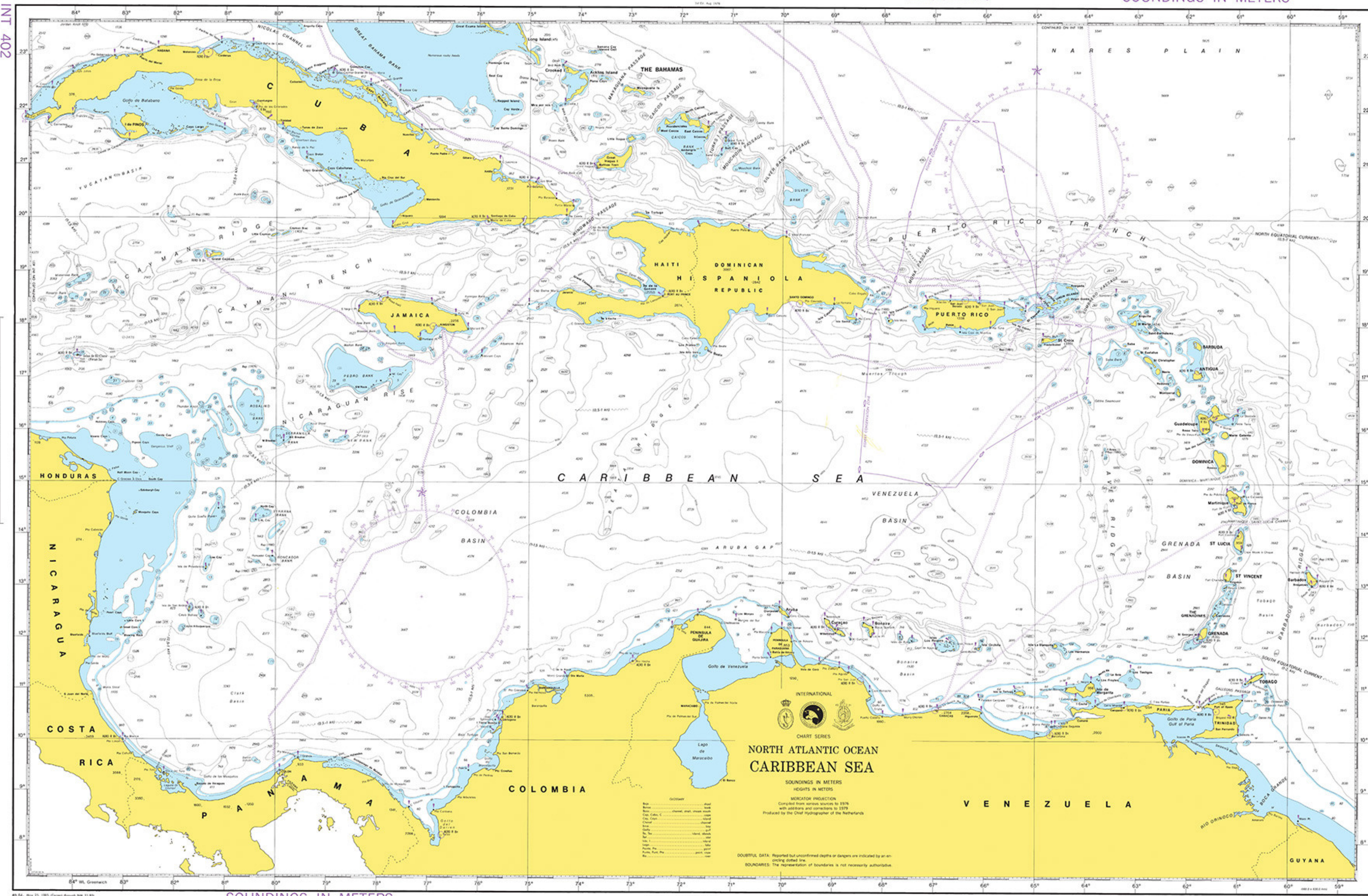


Nautical Mile

A nautical mile is a unit of length used in air, marine, and space navigation, and for the definition of territorial waters. Historically, it was defined as the meridian arc length corresponding to one minute ($1/60$ of a degree) of latitude at the equator, so that Earth's polar circumference is very near to 21,600 nautical miles (that is $60 \text{ minutes} \times 360 \text{ degrees}$). Today the international nautical mile is defined as 1,852 meters. The derived unit of speed is the knot, one nautical mile per hour.

INT 402
402

Vertical text on the left side of the chart.



SOUNDINGS IN METERS

INT 402
402

Vertical text on the right side of the chart.

INT 402
402



SOUNDINGS IN METERS

To ensure that this chart was printed at the proper scale, the line above should measure six inches (152 millimeters). If the line above does not measure six inches (152 millimeters), this copy is not certified safe for navigation.

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INTERNATIONAL
CHART SERIES
NORTH ATLANTIC OCEAN
CARIBBEAN SEA
SOUNDINGS IN METERS
HEIGHTS IN METERS
MERCATOR PROJECTION
Compiled from various sources to 1976
with additions and corrections to 1979
Produced by the Chief Hydrographer of the Netherlands

COURTESY DATA: Reported but unconfirmed depths or dangers are indicated by an enclosing dotted line.
BOUNDARIES: The representation of boundaries is not necessarily authoritative.

Modified reproduction of INT Chart 402, Dec. 1976
Caribbean Sea
SOUNDINGS IN METERS - SCALE 1:100,000

INT 402
402

Information

- Maker
- Chart Name
- Scale
- Chart number and edition
- Geographic features (coastline, landmarks)
- Hydrographic features (depth contours, Sounding)
- Compass rose
- Symbols and abbreviations
- Warnings and local information

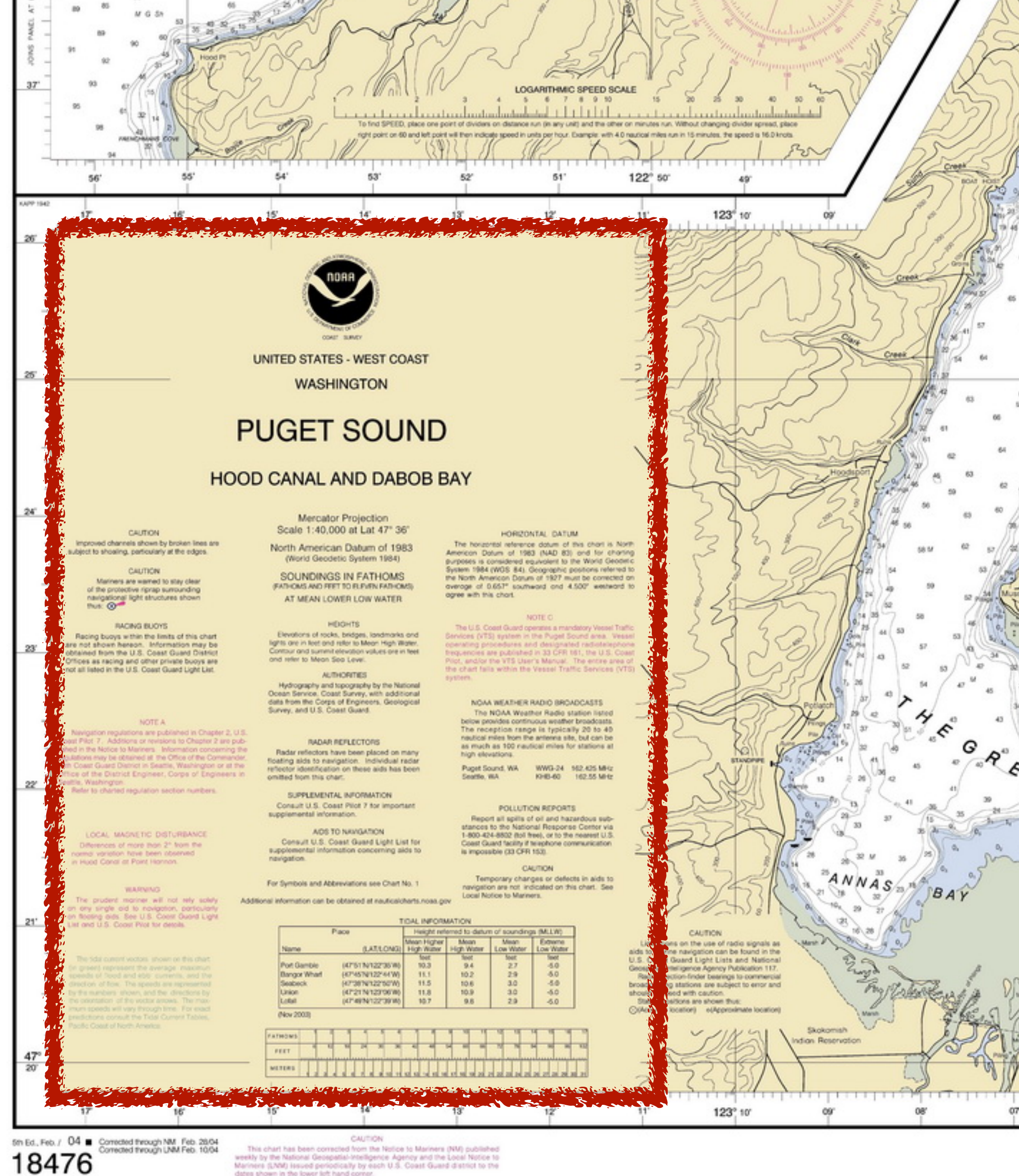
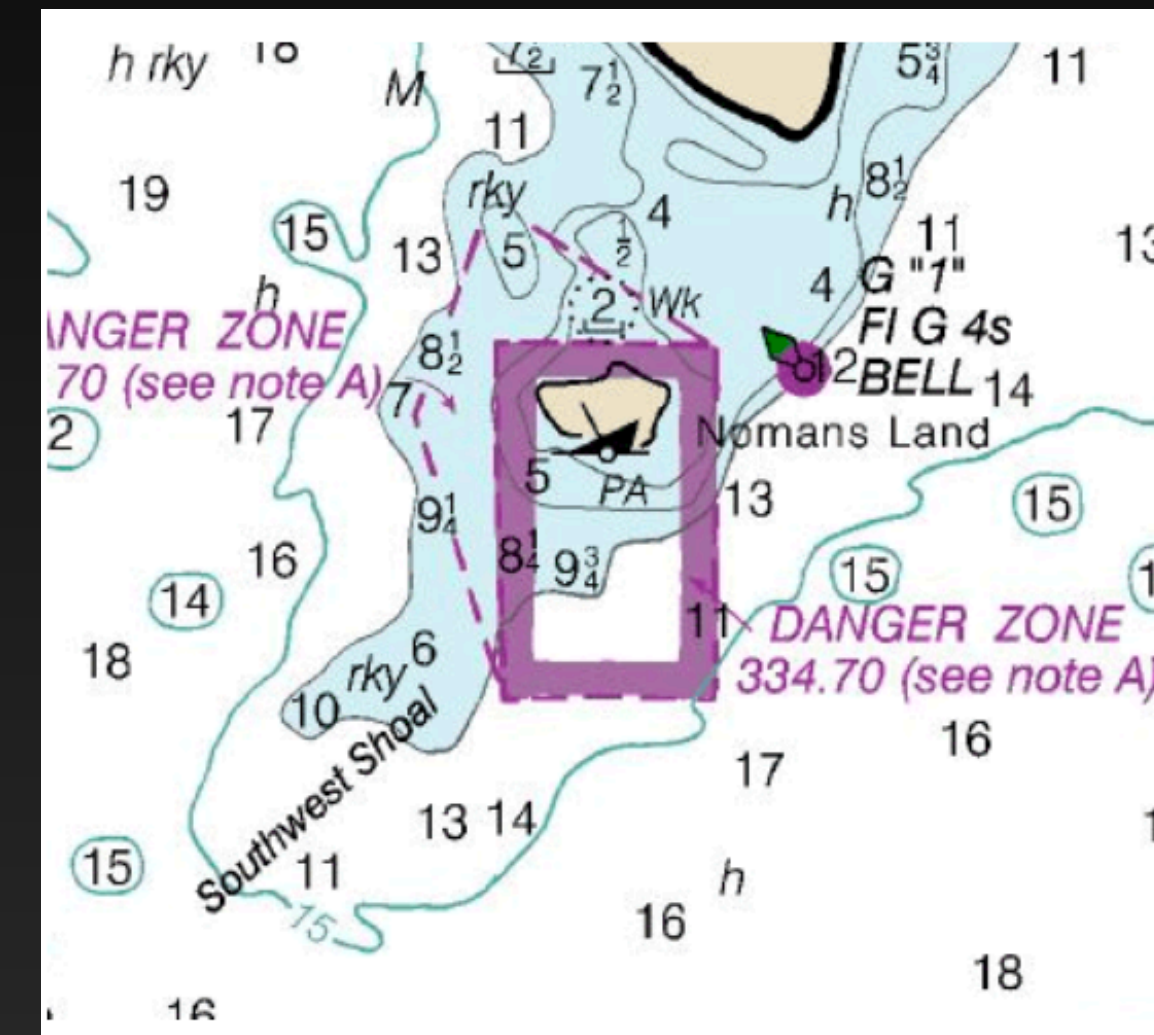
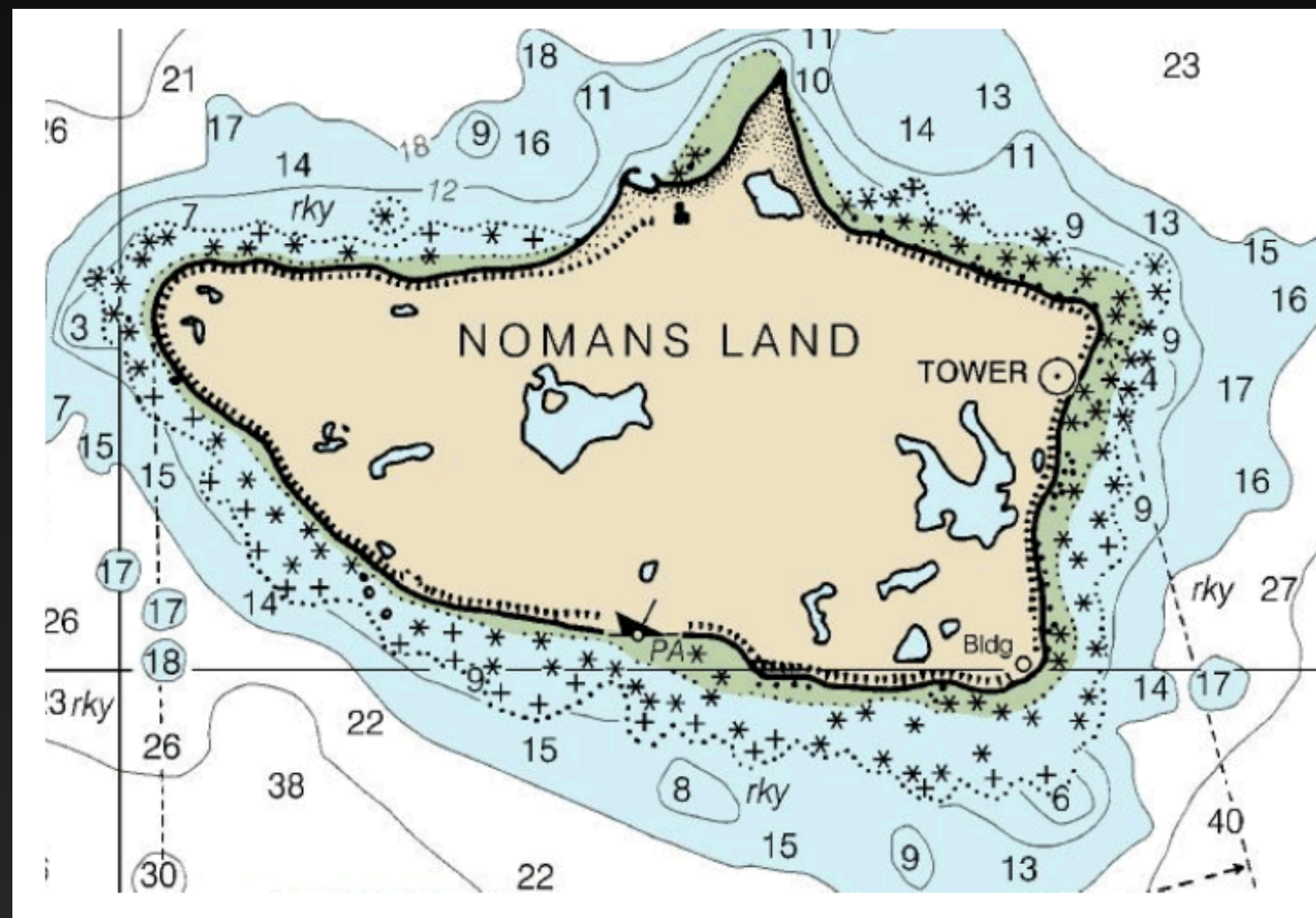


Chart scales

"Large Scale" vs "Small Scale"



- Scale
 - Sailing Chart - 1 : 600,000 or greater (small scale)
 - General Chart - 1 : 100,000 - 1 : 600,000
 - Coastal Chart - 1 : 50,000 - 1 : 100,000
 - Harbor Chart - 1 : 50,000 or less (large scale)

Latitude

&

Longitude

SOUNDINGS IN FATHOMS

18470

18470

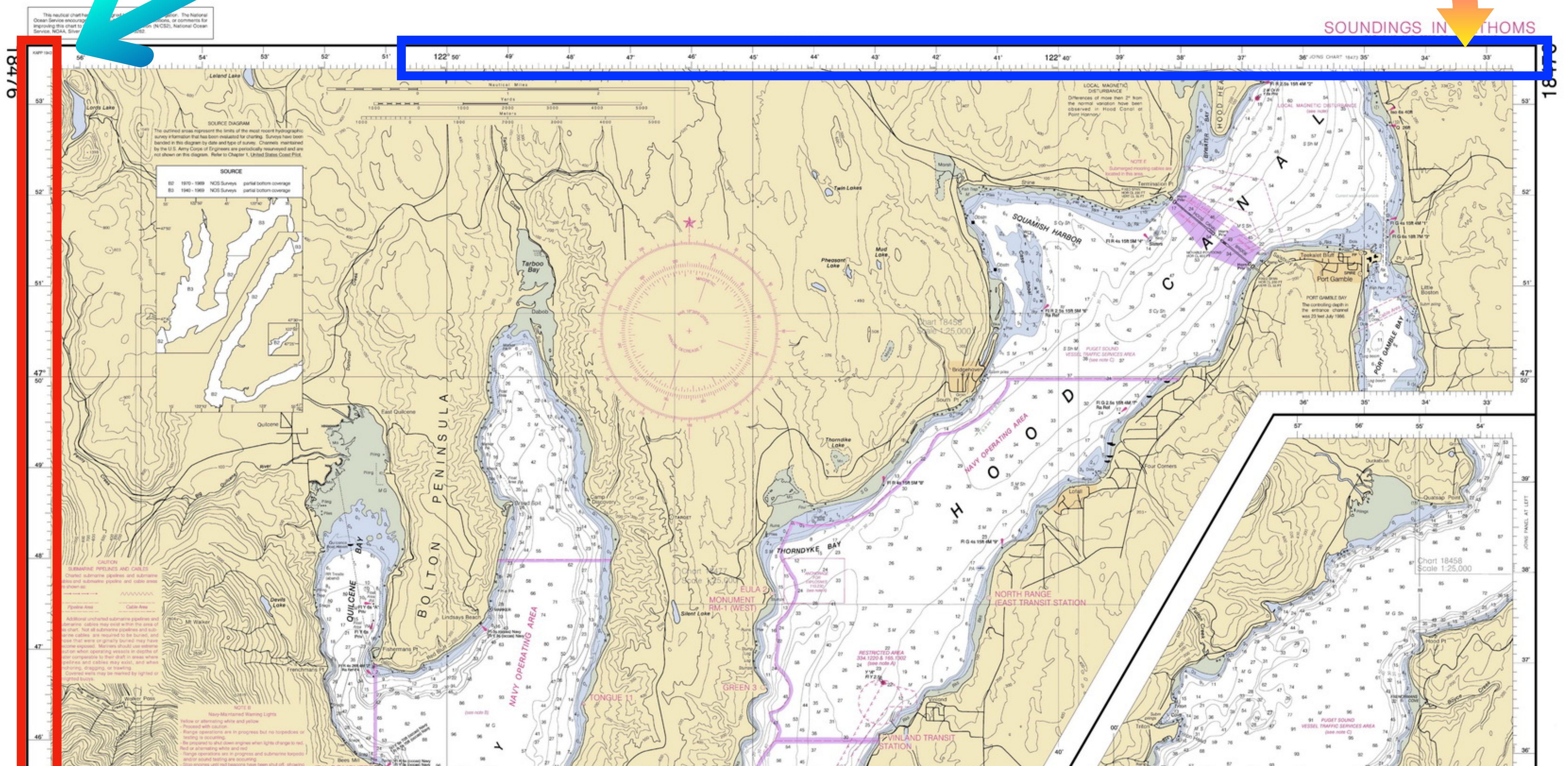
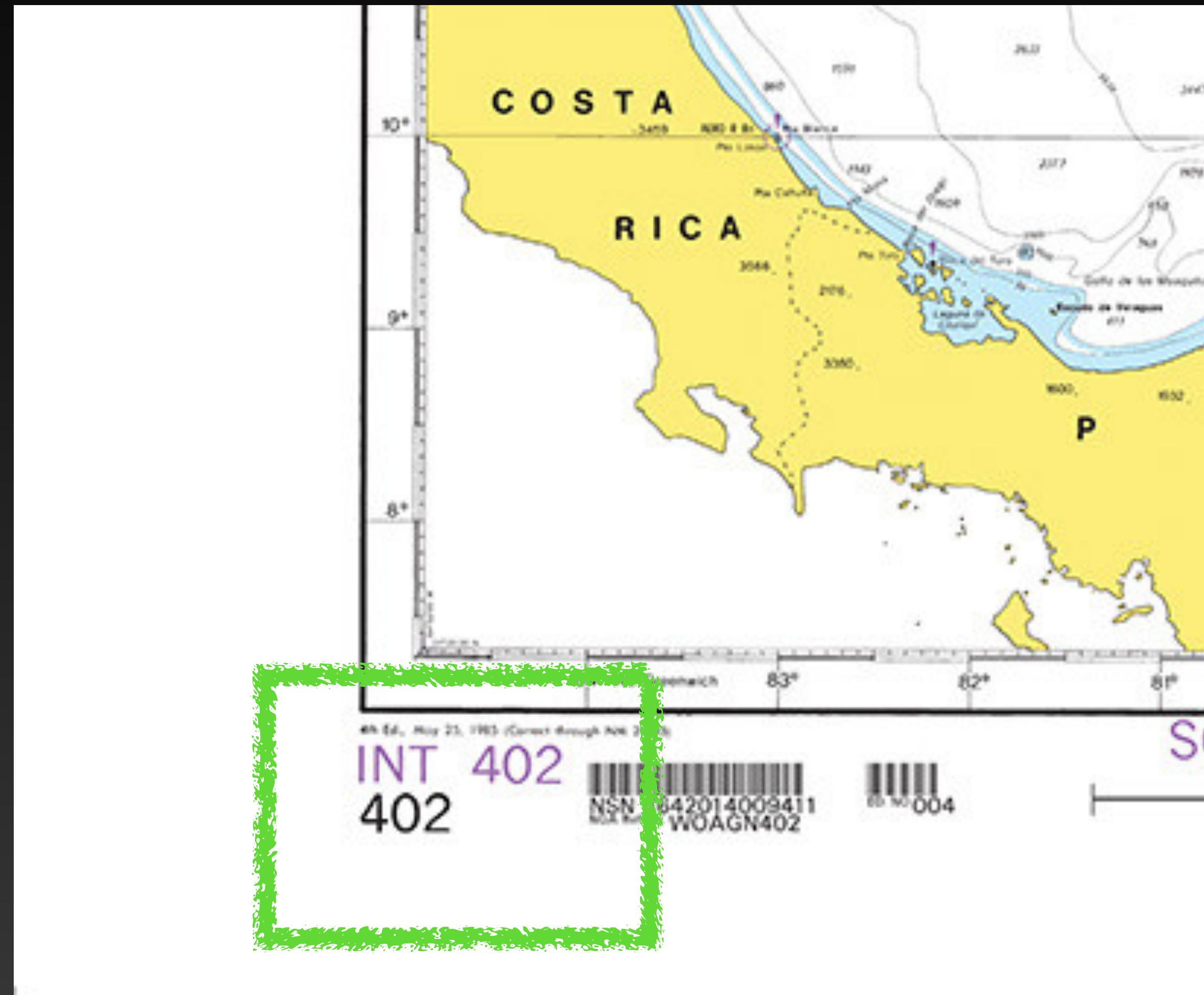
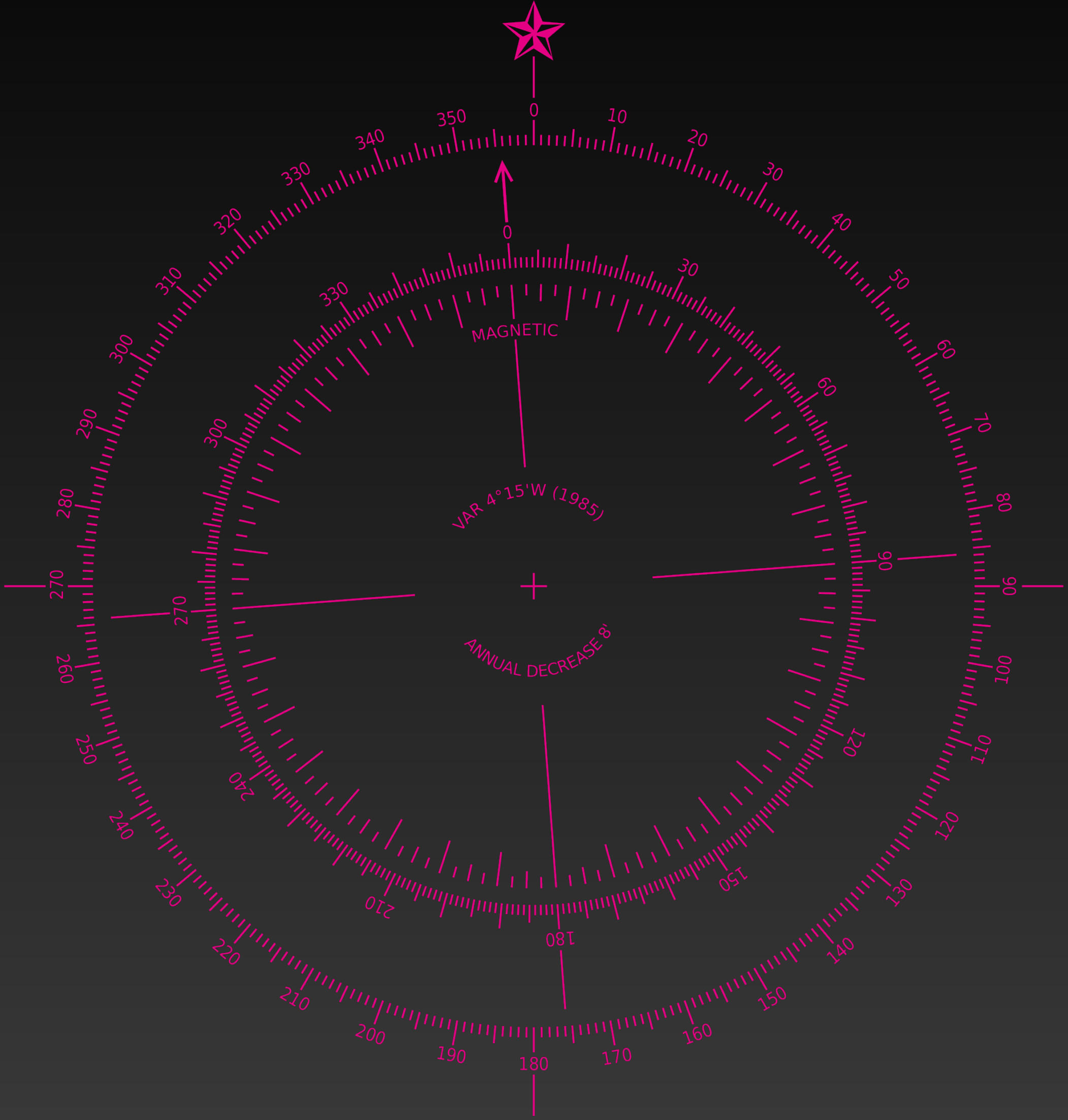
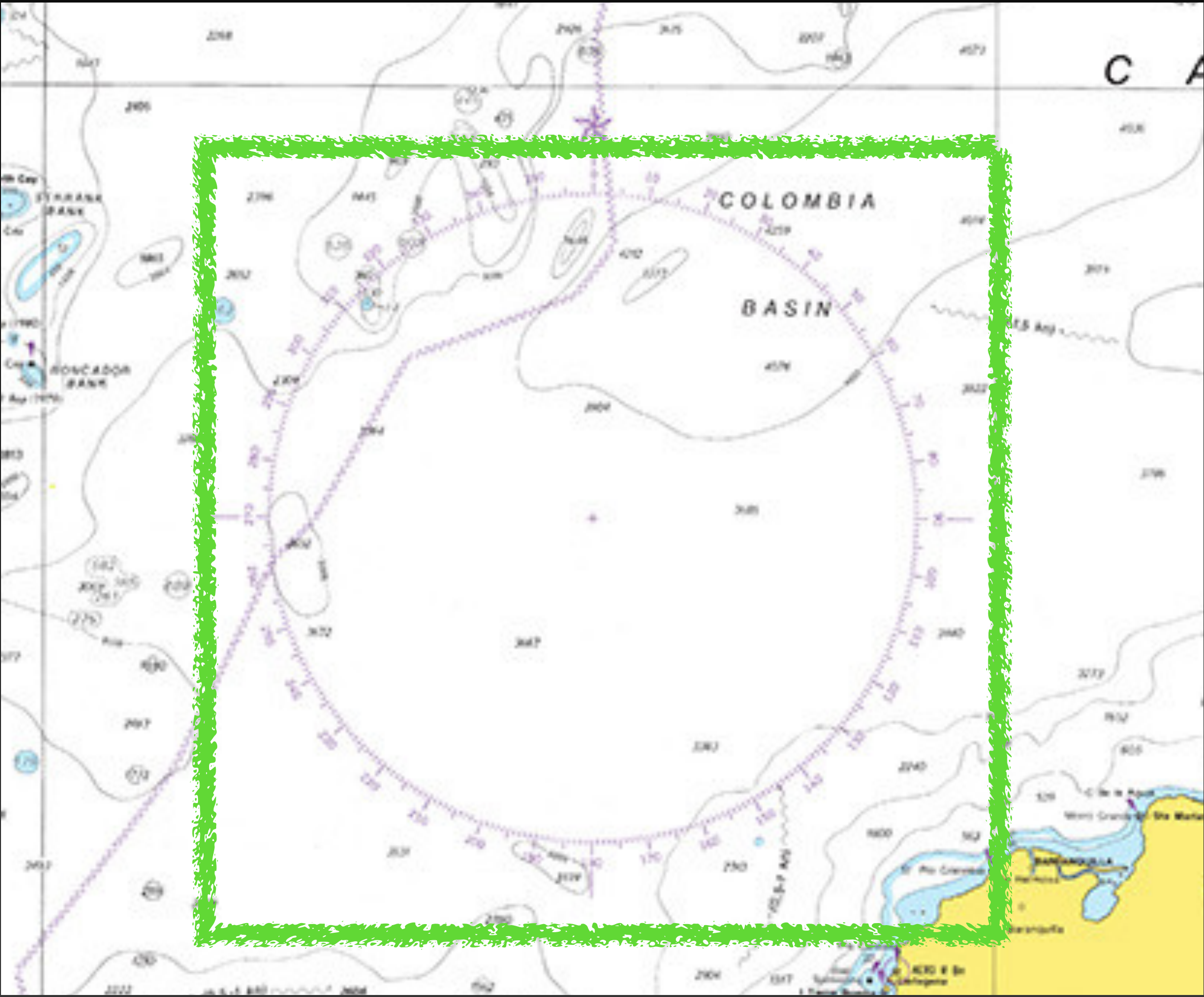


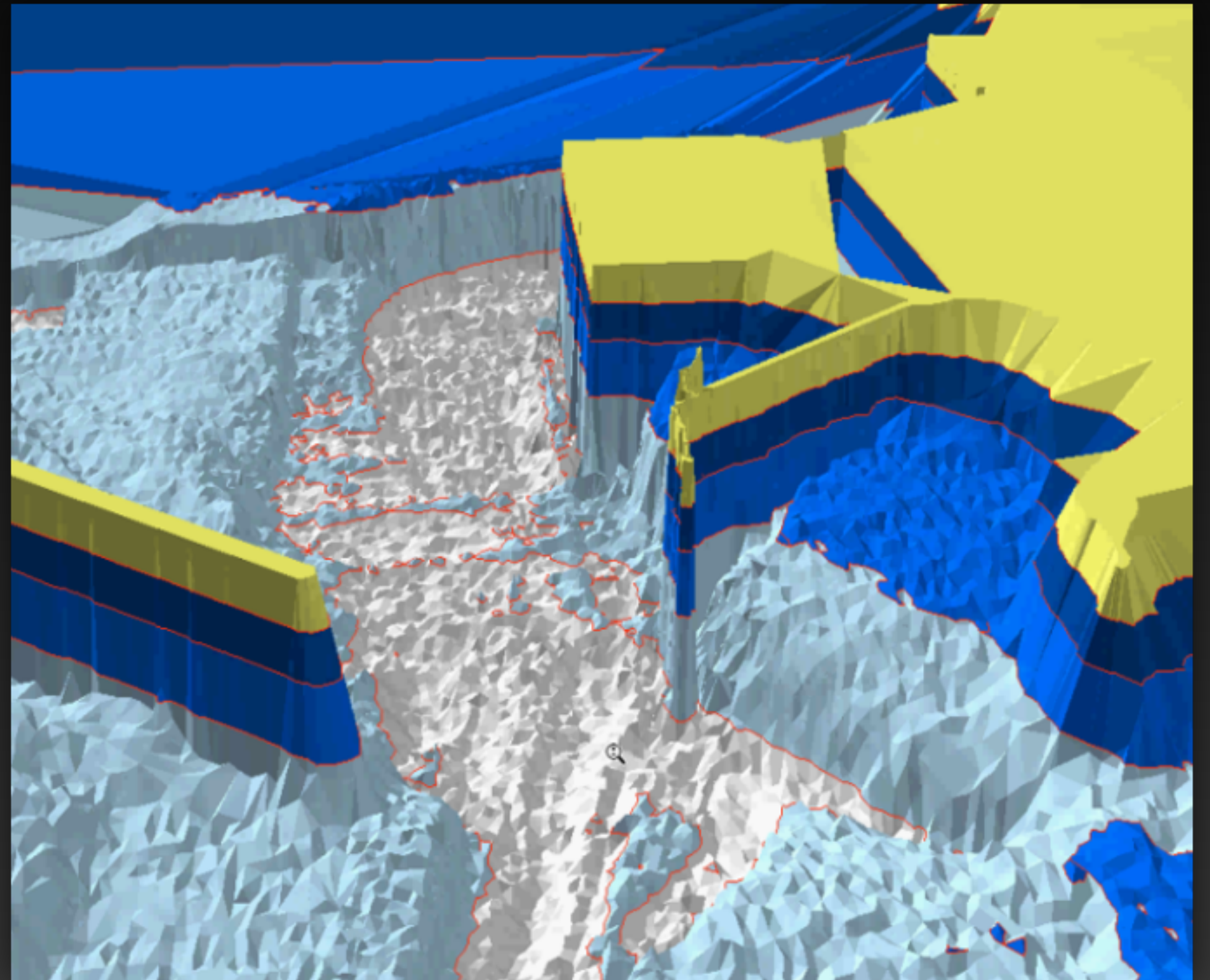
Chart Number



Compass rose



Depth



Depth Contour



Mountain

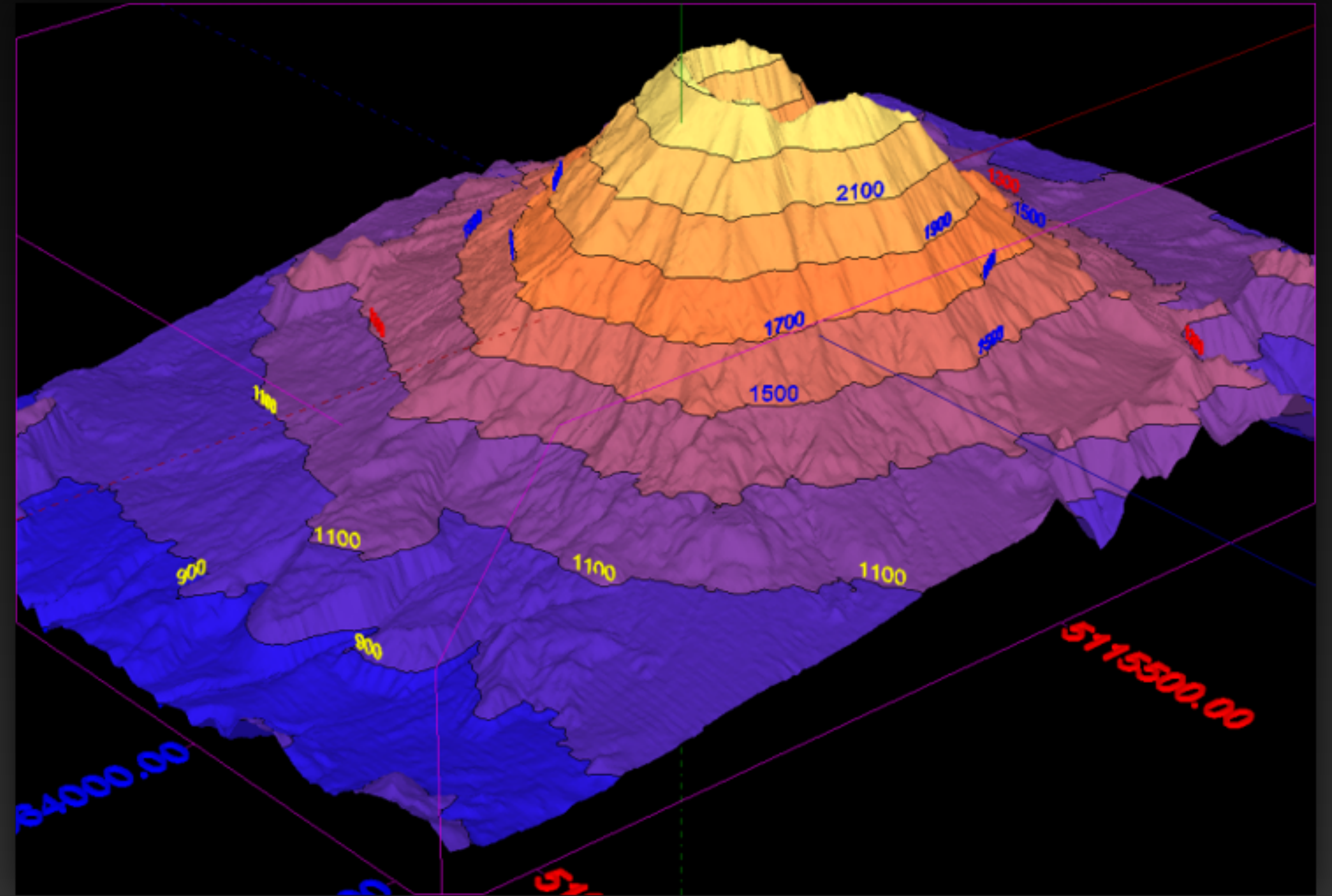
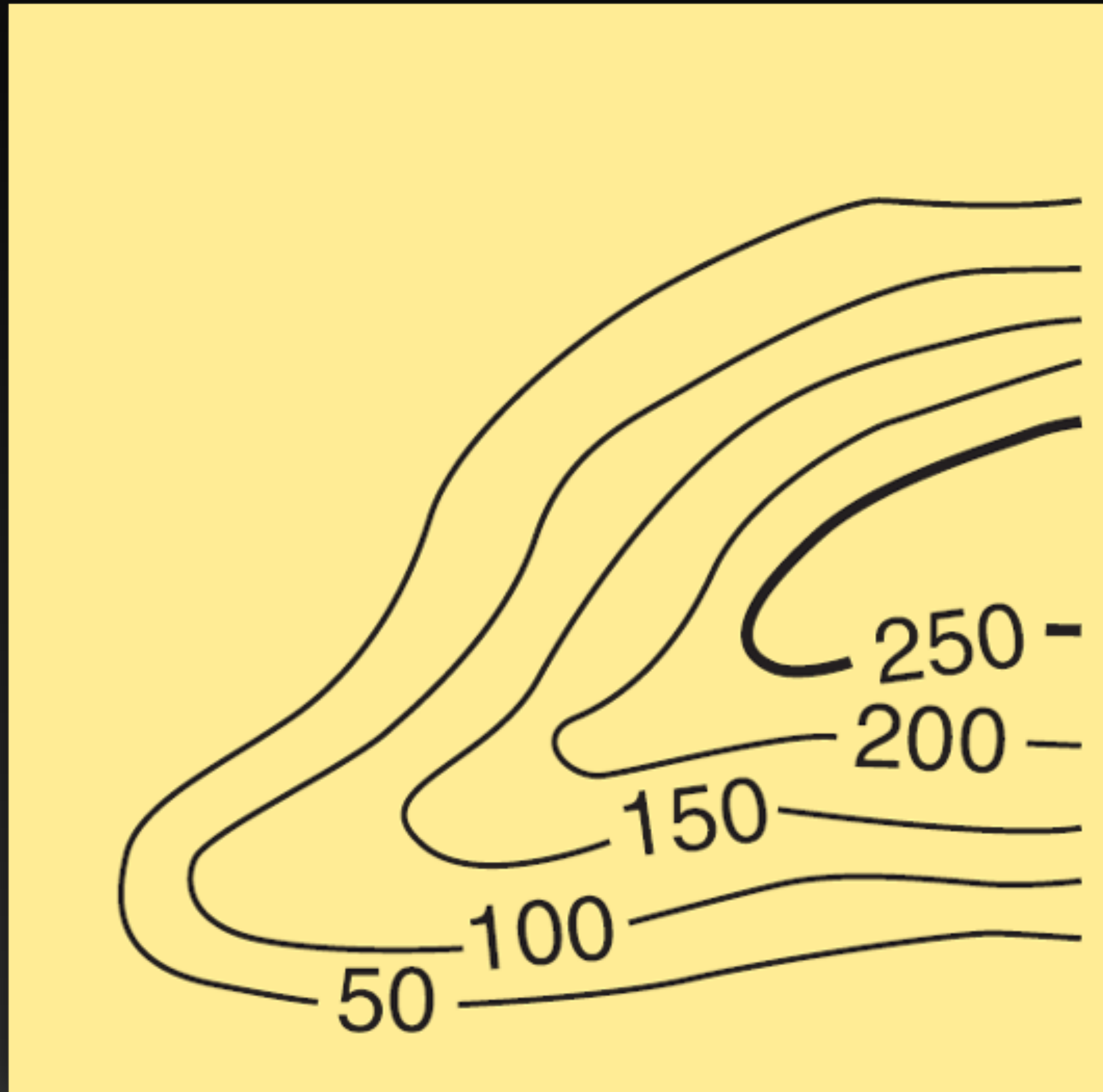
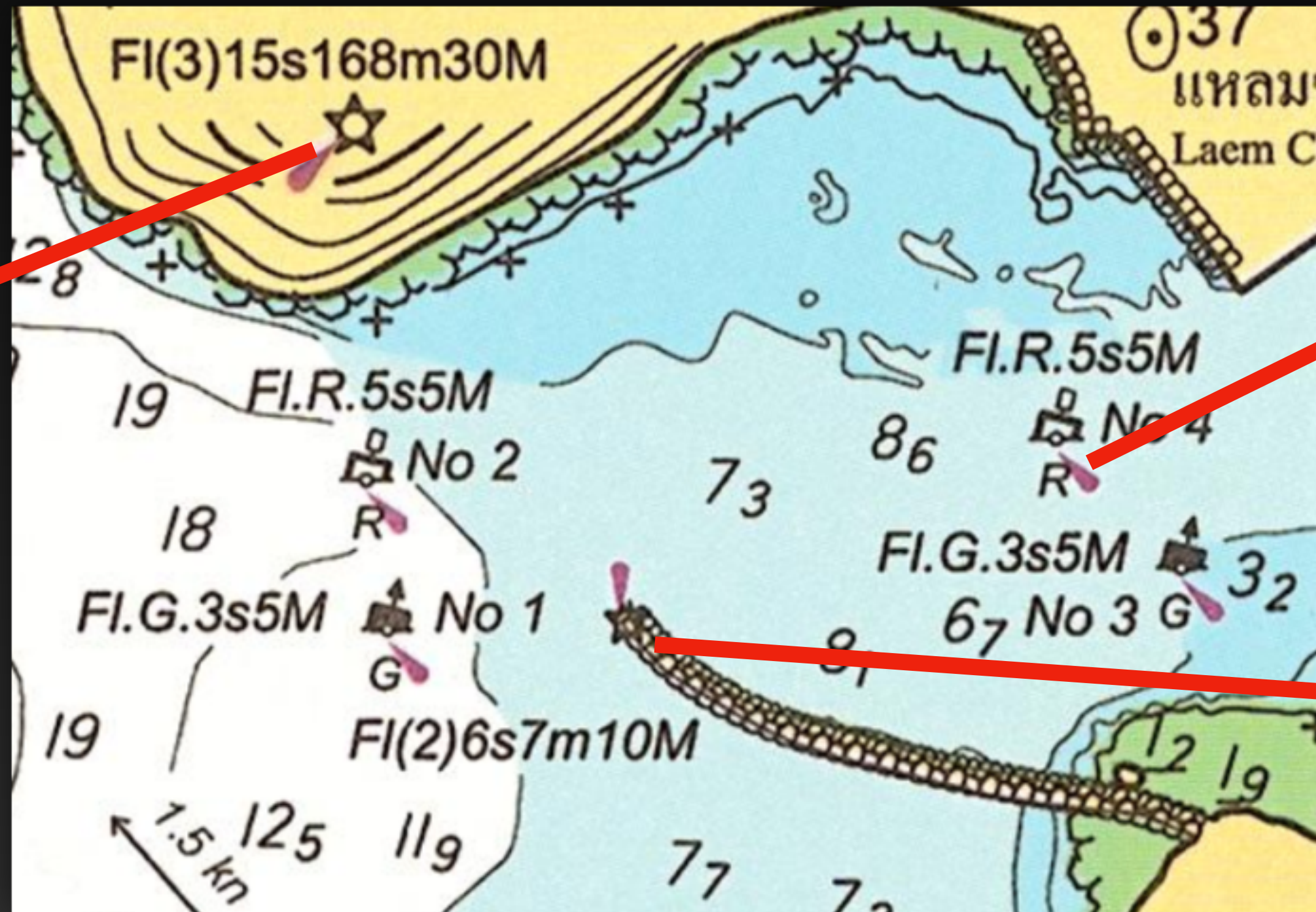


Chart symbols

A		Chart Number, Title and Marginal Notes	INT 500 412 Mercator Projection Scale 1:100,000 at Lat. 59°30' 53rd Ed., Feb. 2019 DEPTHS IN METERS
B		Positions, Distances, Directions and Compass	±15° Magnetic Variation 4°30'W 2011 (8'E) LOCAL MAGNETIC ANOMALY (see note)
C		Natural Features	
D		Cultural Features	Tel.
E		Landmarks	
F		Ports	
H		Tides and Currents	2.5 kn → (see Note)
I		Depths	
J		Nature of the Seabed	
K		Rocks, Wrecks and Obstructions	
L		Offshore Installations	
M		Tracks and Routes	
N		Areas and Limits	
P		Lights	
Q		Buoys and Beacons	
R		Fog Signals	
S		Radar, Radio and Satellite Navigation Systems	
T		Services	
U		Small Craft (Leisure) Facilities	

Chart symbols



IALA

INTERNATIONAL ASSOCIATION OF MARINE AIDS TO NAVIGATION
AND LIGHTHOUSE AUTHORITIES



MARITIME BUOYAGE SYSTEM

ระบบทุ่นเครื่องหมายทางเรือ



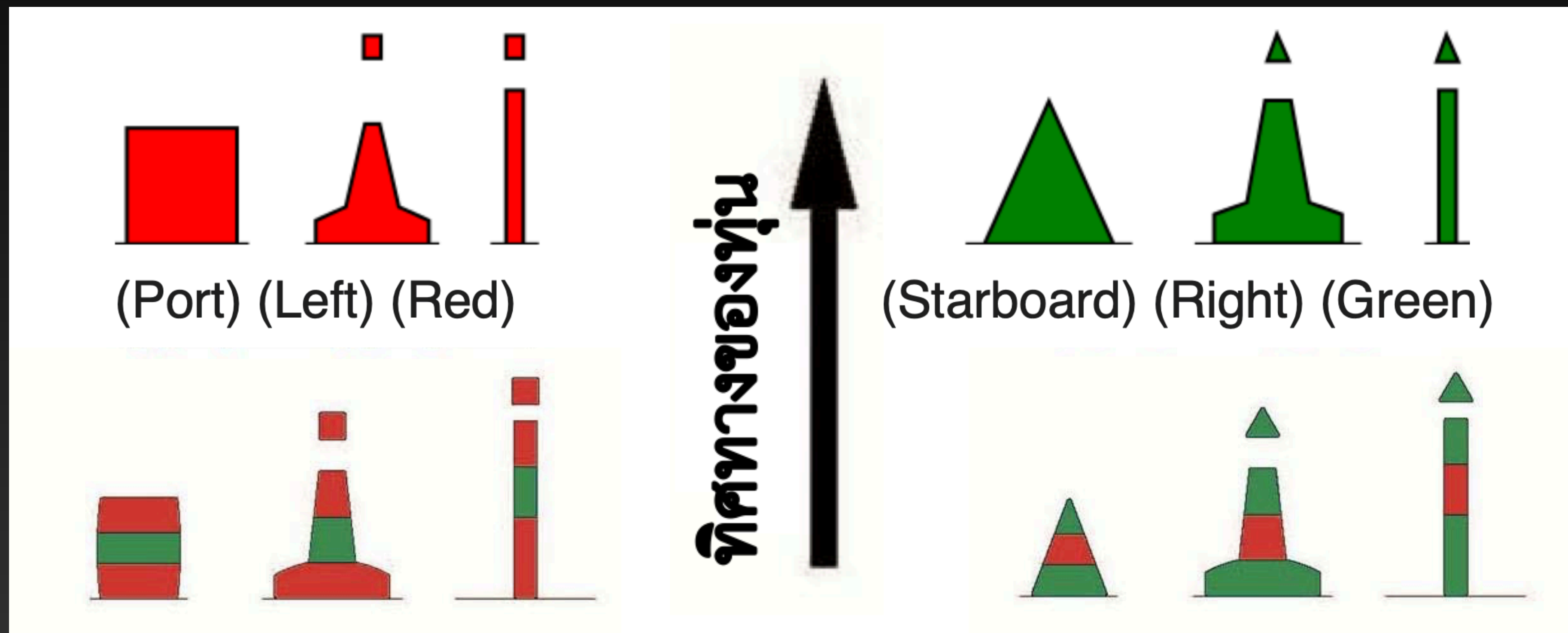


IALA Maritime Buoyage System

- Region A (port is red)
- Region B (port is green)

LATERAL MARKS

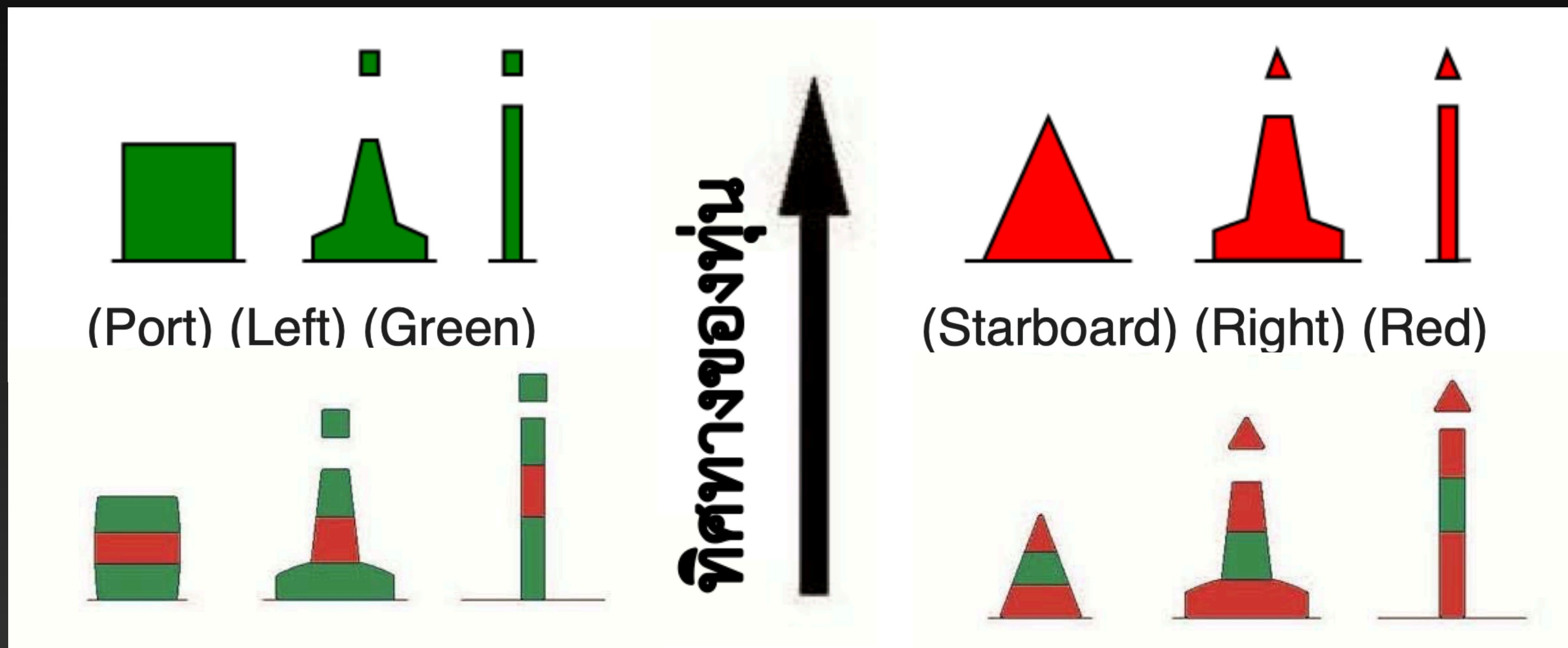
REGION A



ประเทศที่ใช้ระบบ ภูมิภาค A : EUROPE, AFRICA, ALMOST ASIA, OCEANIA, GREENLAND.

LATERAL MARKS

REGION B



ประเทศที่ใช้ระบบ ภูมิภาค B : AMERICA, JAPAN, SOUTH KOREA, PHILIPPINES, TAIWAN HAWAII

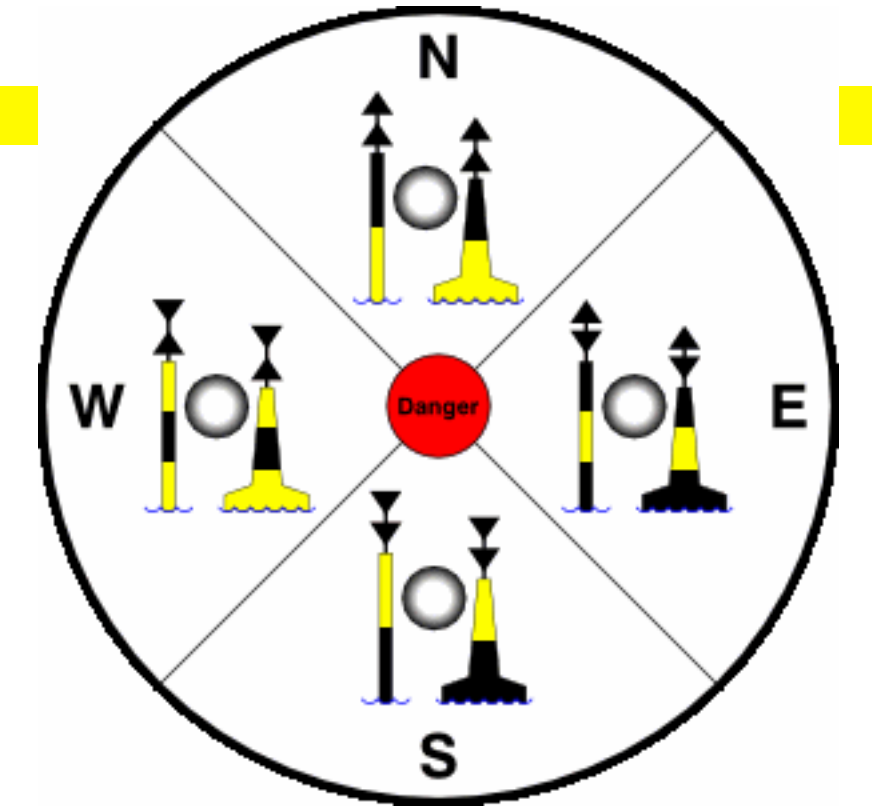
CARDINAL MARKS

เครื่องหมายจตุรทิศ



CARDINAL MARKS

เครื่องหมายจตุรทิศ



A cardinal mark is a sea mark (a buoy or other floating or fixed structure) commonly used in maritime pilotage to indicate the position of a hazard and the direction of safe water.

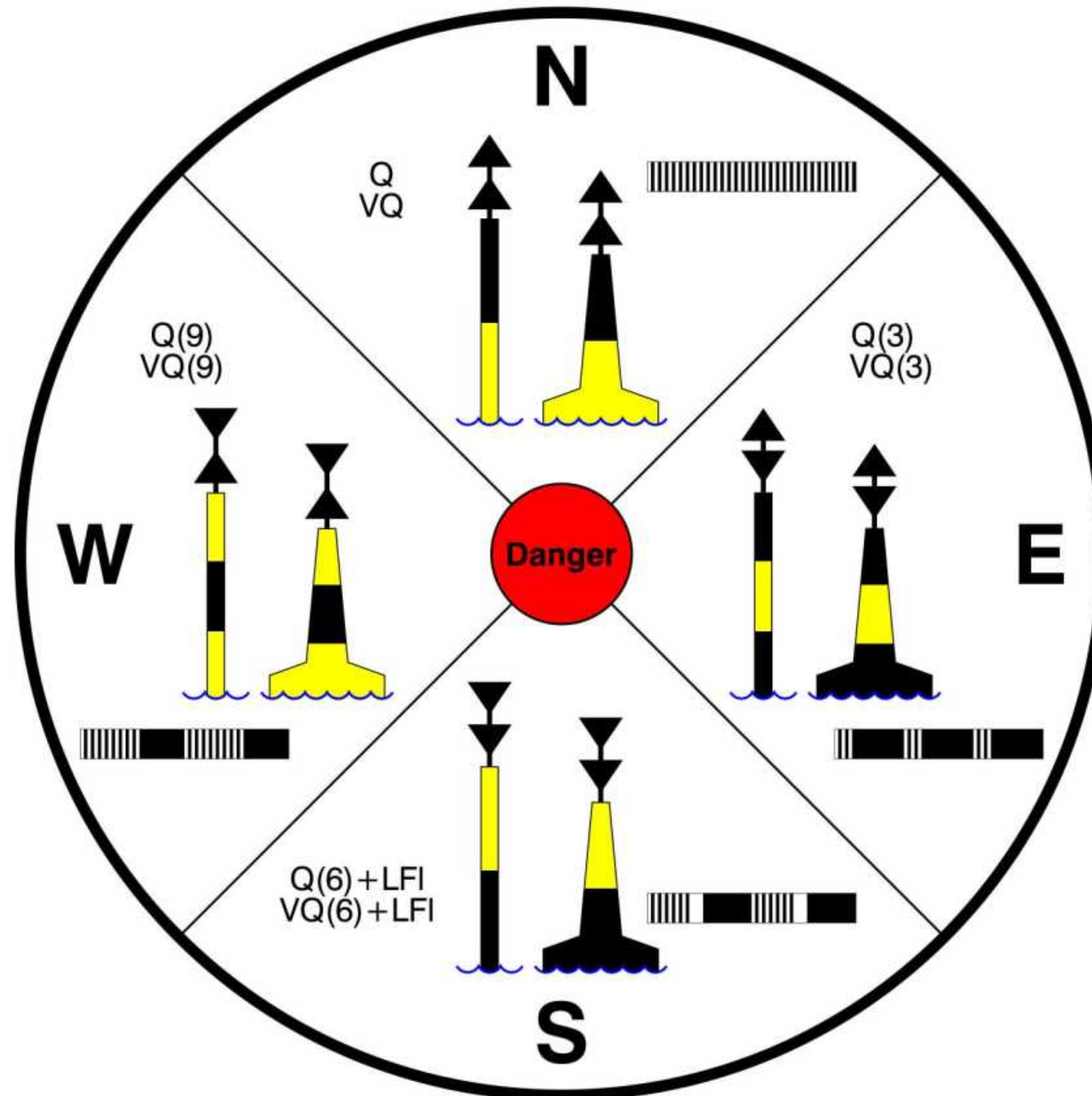
Cardinal marks indicate the direction of safety as a cardinal direction (north, east, south or west) relative to the mark. This makes them meaningful regardless of the direction or position of the approaching vessel, in contrast to the (perhaps better-known) lateral mark system.

A cardinal mark may be used to accomplish the following :

- **Indicate that the deepest water is an area on the named side of the mark**
- **Indicate the safe side on which to pass a danger**

CARDINAL MARKS

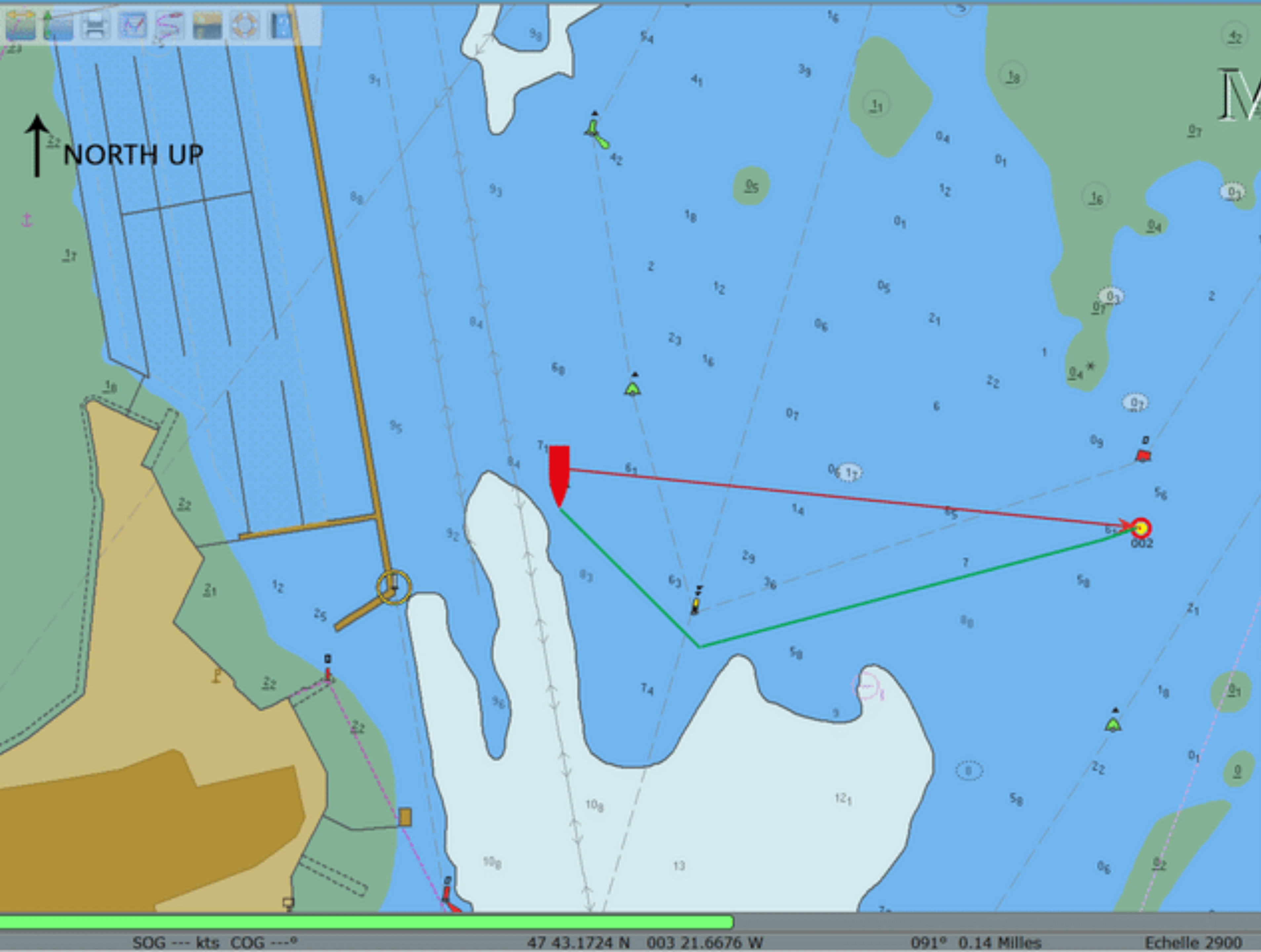
เครื่องหมายจุดรุทศ



CARDINAL MARKS

เครื่องหมายจตุรทิศ





The user look at
the south cardinal
?
?



ISOLATED DANGER MARKS

เครื่องหมายสิ่งอันตรายโดดเดี่ยว



ISOLATED DANGER MARKS

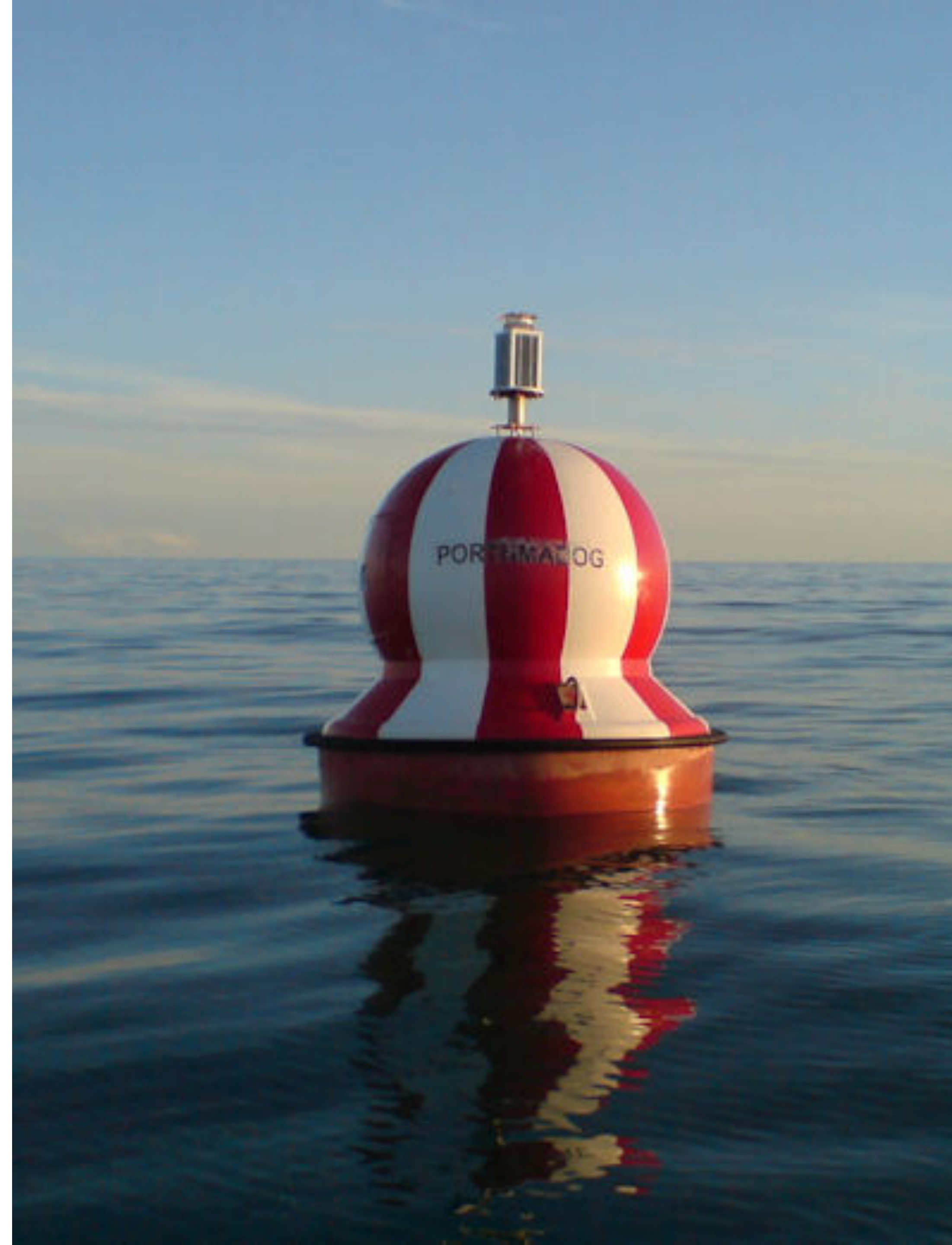
เครื่องหมายสิ่งอันตรายโดดเดี่ยว



An Isolated Danger Mark, as defined by the International Association of Lighthouse Authorities, is a sea mark used in maritime pilotage to indicate a hazard to shipping such as a partially submerged rock.

SAFE WATER MARKS

เครื่องหมายแสดงที่ปลอดภัย



SAFE WATER MARKS

เครื่องหมายแสดงที่ปลอดภัย



A safe water mark is a sea mark used in maritime pilotage to indicate the end of a channel. They usually imply that open, deep and safe water lies ahead. They are also used to indicate the start and end of a buoyed section of a continuous narrow channel; and a series of them may mark a safe route through shallow areas. It is therefore important to consult appropriate charts to determine their meaning in each location. They are also known as fairway buoys and clear water buoys.

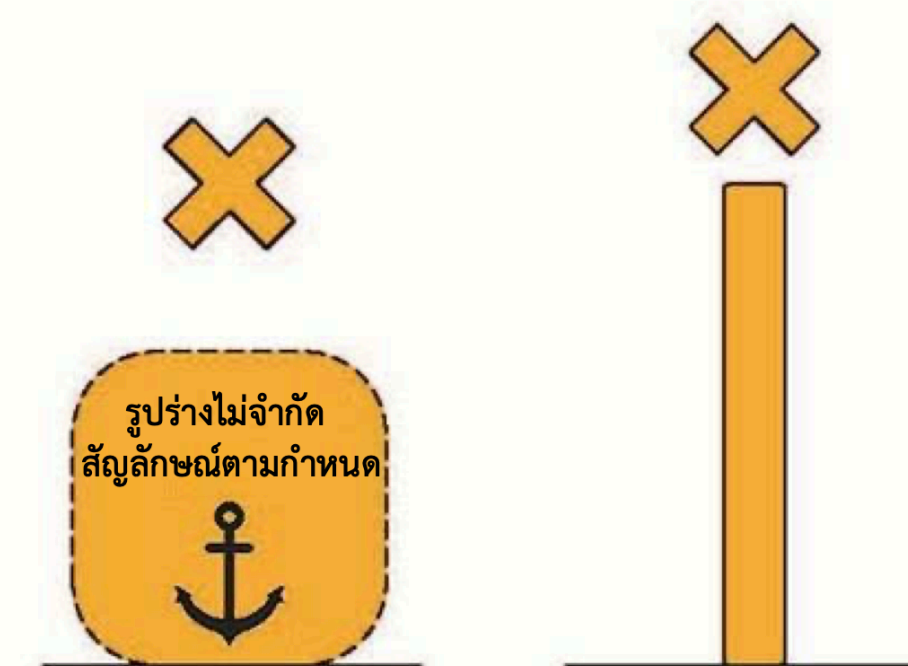
SPECIAL MARKS

เครื่องหมายพิเศษ



SPECIAL MARKS

เครื่องหมายพิเศษ



A Special Mark is a sea mark used in maritime pilotage. It is recognisable by its yellow colour and X, (also referred to as a St. Andrews Cross or saltire) top-mark. It has a distinctive sequence of various flashes that does not match any other navigational mark flashes in its vicinity.

SPECIAL MARKS

เครื่องหมายพิเศษ

Special marks can indicate:

- Administrative areas
- Water skiing areas
- Anchorage areas
- Mooring areas
- Waiting areas
- Traffic separation scheme
- Oil wells
- Dead ends
- Pipelines
- Historic wrecks
- Protected areas
- Outfall pipes (such as Stormwater, and Cooling water)
- Sewerage pipes
- Intake pipes
- Submarine cables



EMERGENCY WRECK MARKING BUOY

เครื่องหมายสิ่งอันตรายใหม่



EMERGENCY WRECK MARKING BUOY

เครื่องหมายสิ่งอันตรายใหม่



An Emergency wreck buoy is used to warn of a new wreck which has not yet been listed in maritime documents. The buoy is expected to be deployed for the first 24-72 hours after the wreck occurs. After that time more permanent buoyage (such as isolated danger marks or cardinal marks) should be deployed and charts updated.

Mariner's Navigation kit

- Divider
- Nautical triangle ruler
- Nautical parallel ruler

