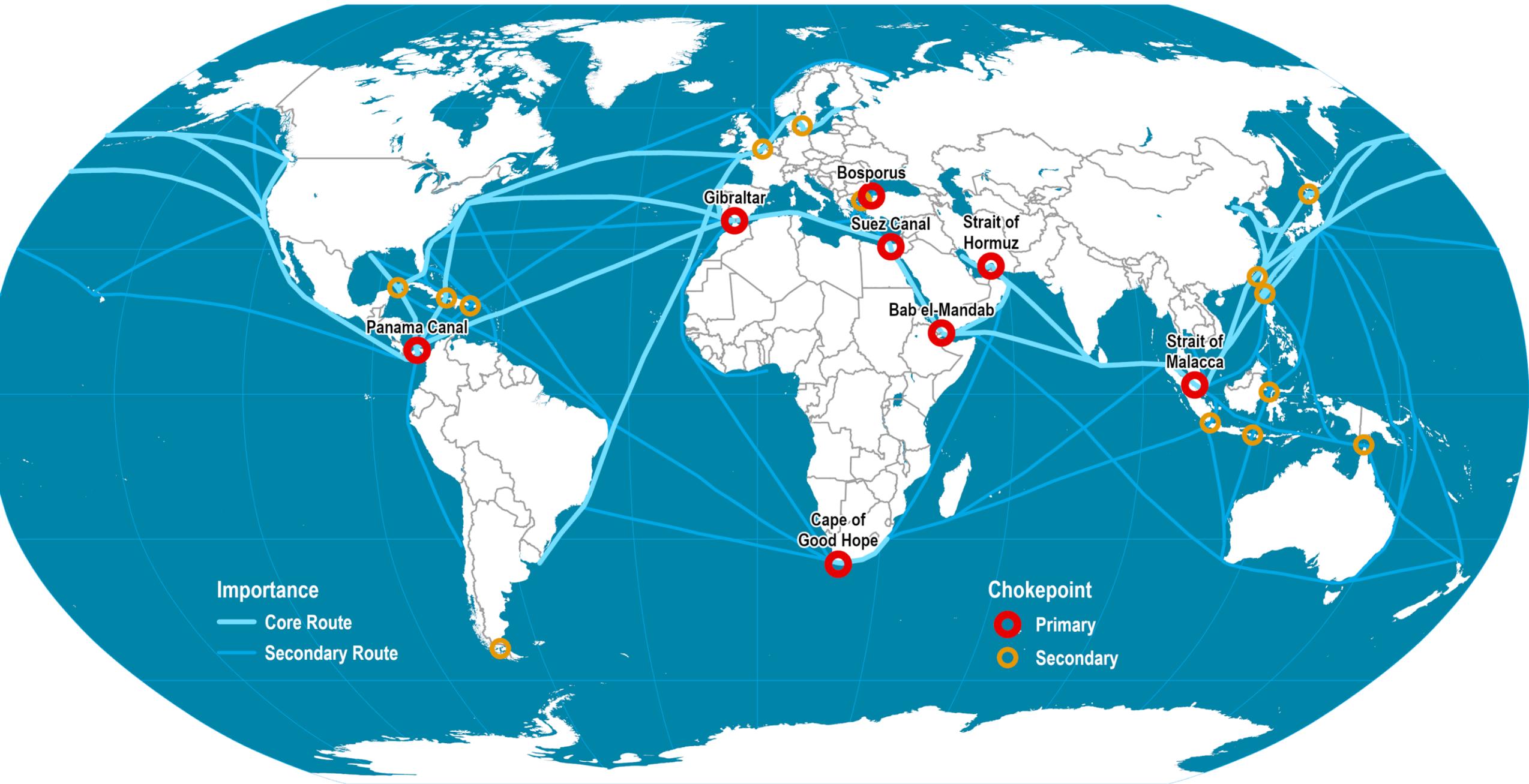


Choke Points and the Geopolitics of Bottlenecks: Vulnerabilities, Routes, and Crises in Global Transport Systems

Dr. Andrea Gallo

University of Venice Ca' Foscari



Importance

- Core Route
- Secondary Route

Chokepoint

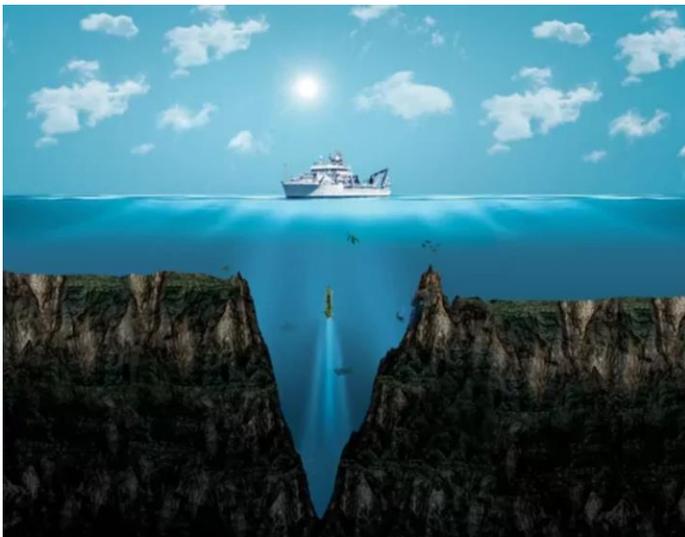
- Primary
- Secondary

The sea as a two-dimensional space

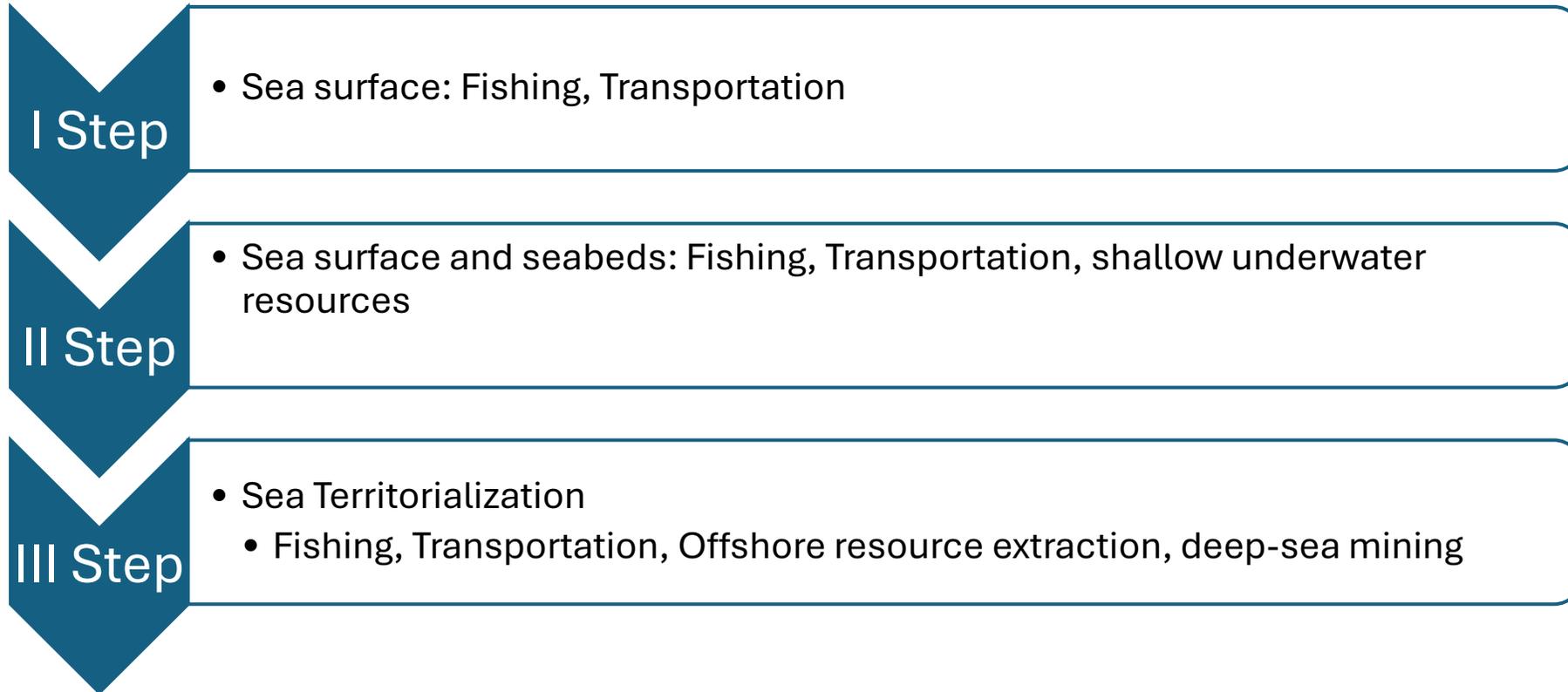


The sea is characterized by two fundamental dimensions:

- The first dimension is the surface dimension: the space connecting different lands. (connections between points in space for the movement of goods and people)
- The second dimension is the vertical dimension: a space that has depth and can also be exploited in its underwater part.



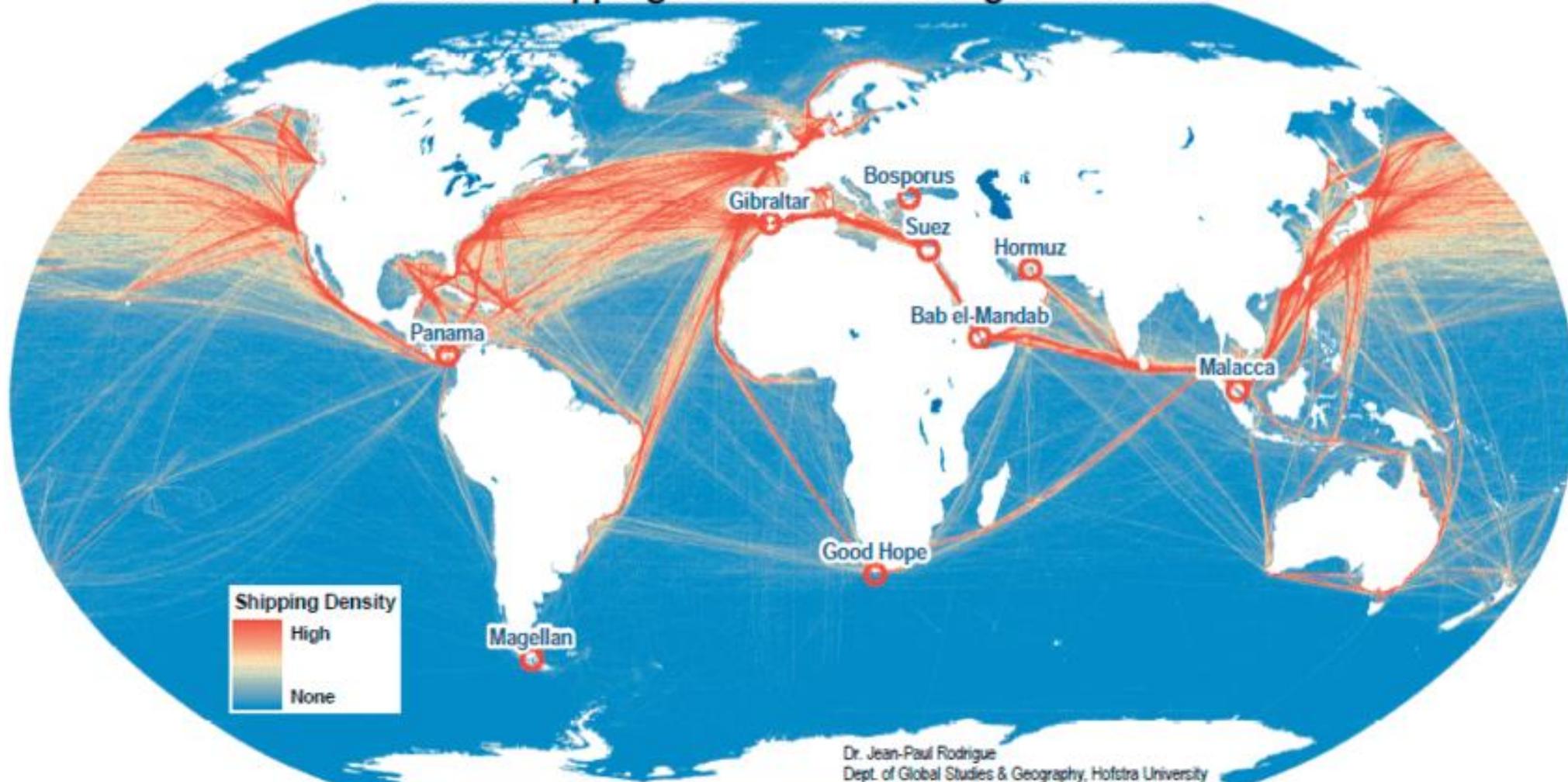
Three Stages of the Sea as a Resource



The size of maritime transport remains the most significant

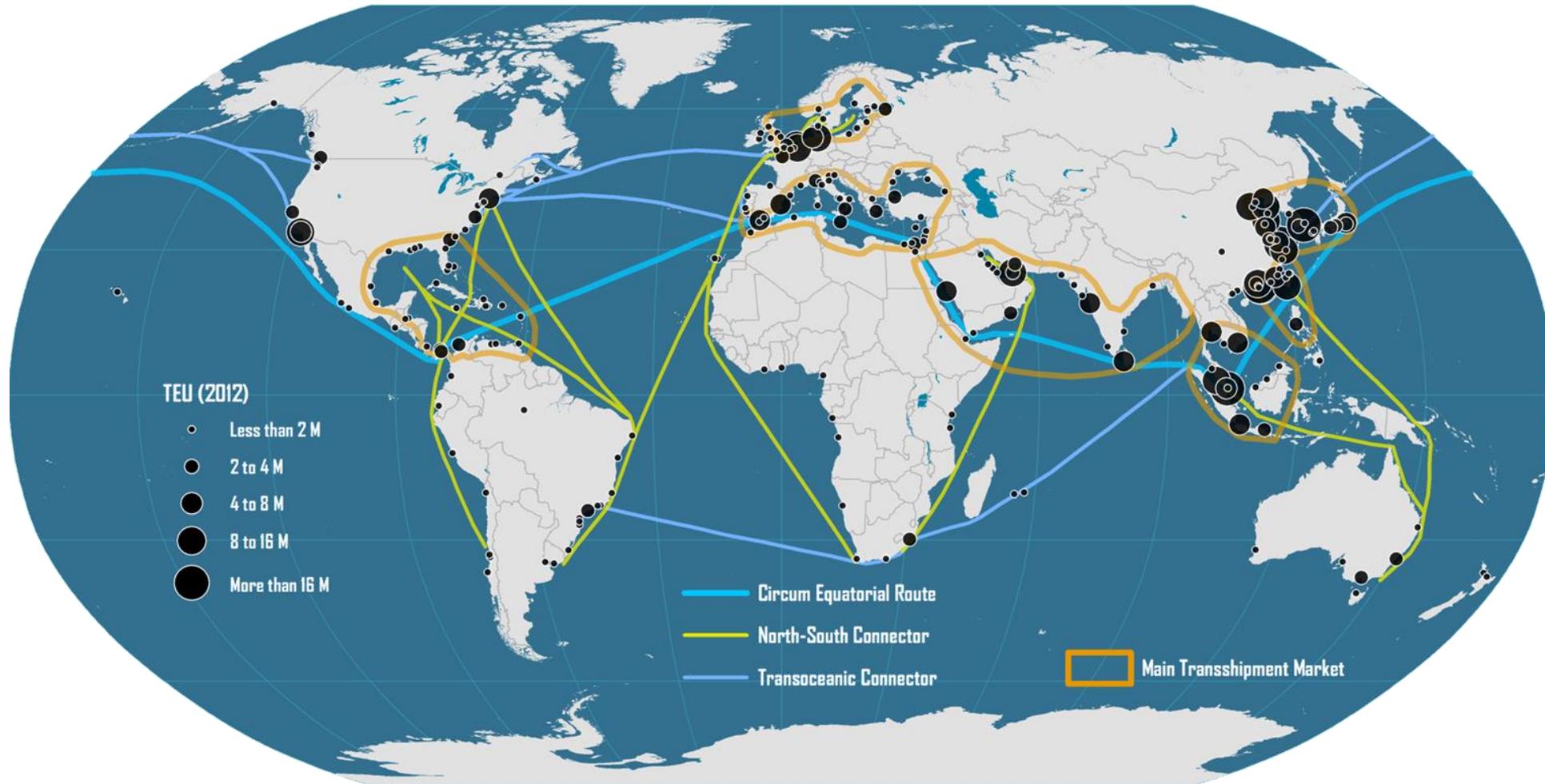
The Main Routes

Maritime Shipping Routes and Strategic Locations



Dr. Jean-Paul Rodrigue
Dept. of Global Studies & Geography, Hofstra University

Source: Shipping density data adapted from National Center for Ecological Analysis and Synthesis, A Global Map of Human Impacts to Marine Ecosystems.



There are therefore regional reference markets, which do not exhaust their dynamics at regional level but project them globally.

Consider, for example, the implications of the Bab el Mandeb crisis

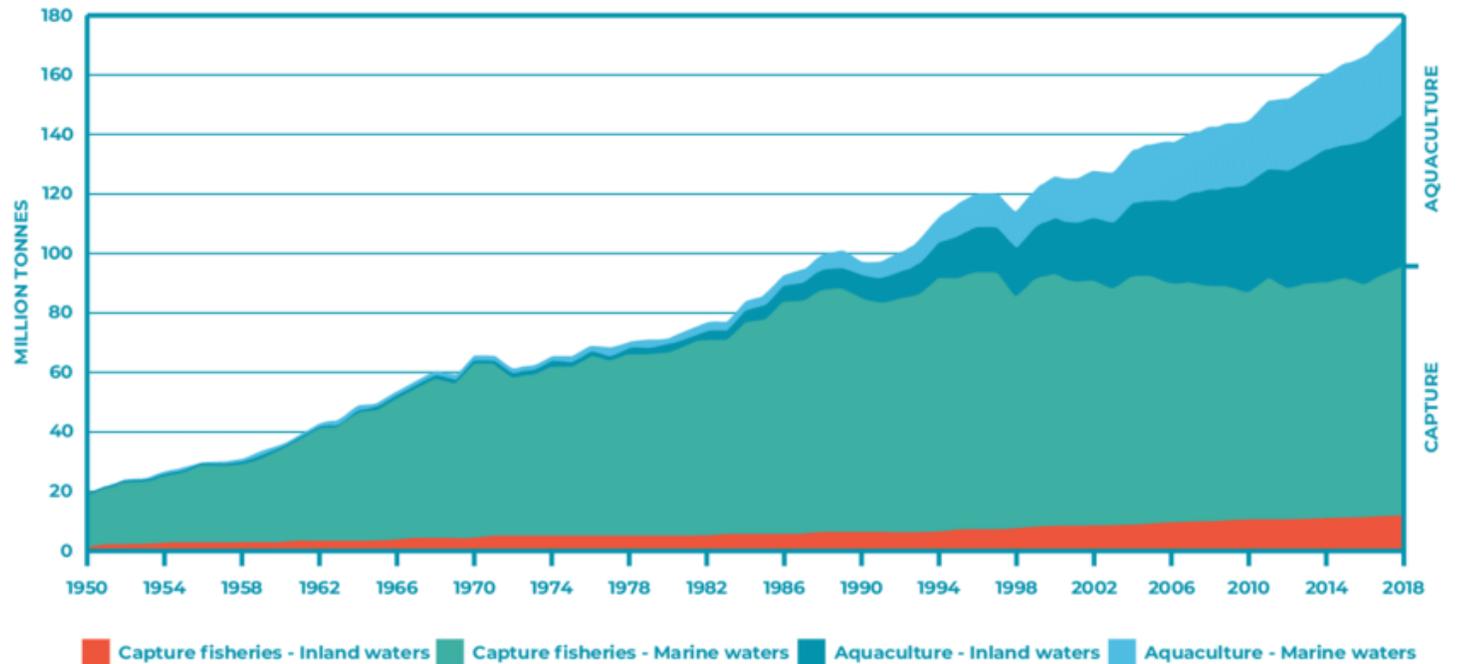
Consider, for example, the implications of a closure of the Strait of Hormuz

Not only transport

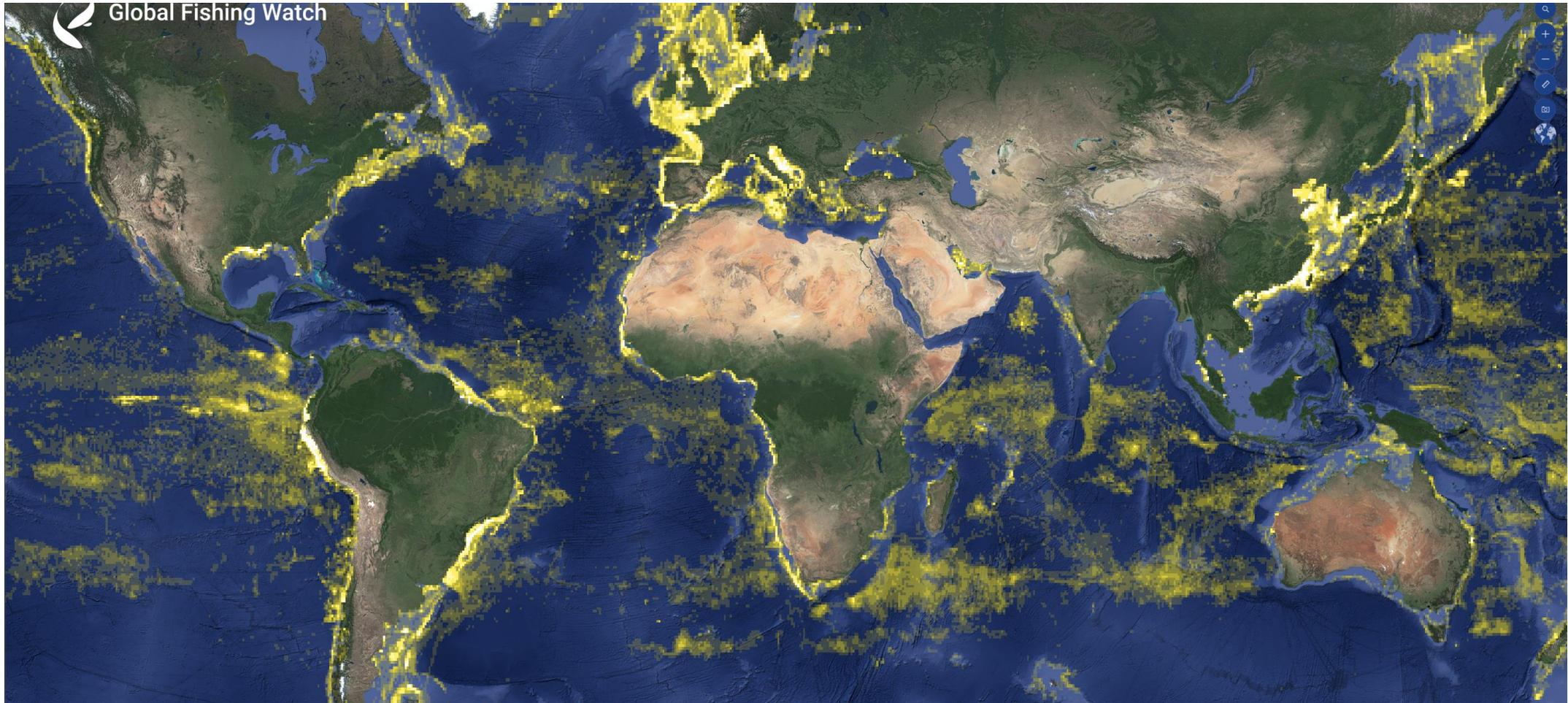
In addition to its surface aspects, the sea has other distinctive features: First and foremost, it is a provider of resources, such as food.

Fishing and aquaculture provide around 180 million tonnes per year, supplying 25% of global animal protein requirements.

There are problems of overfishing, and fishing can also become a factor of competition.



NOTE: Excludes aquatic mammals, crocodiles, alligators and caimans, seaweeds and other aquatic plants.
SOURCE: FAO



Problems of overfishing (and spillover in acts of piracy)

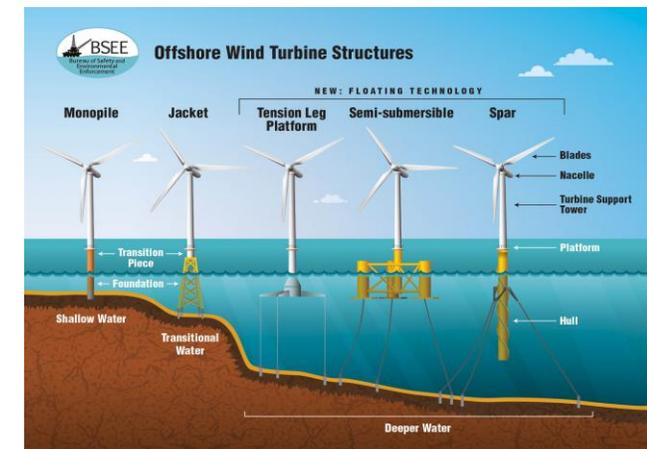
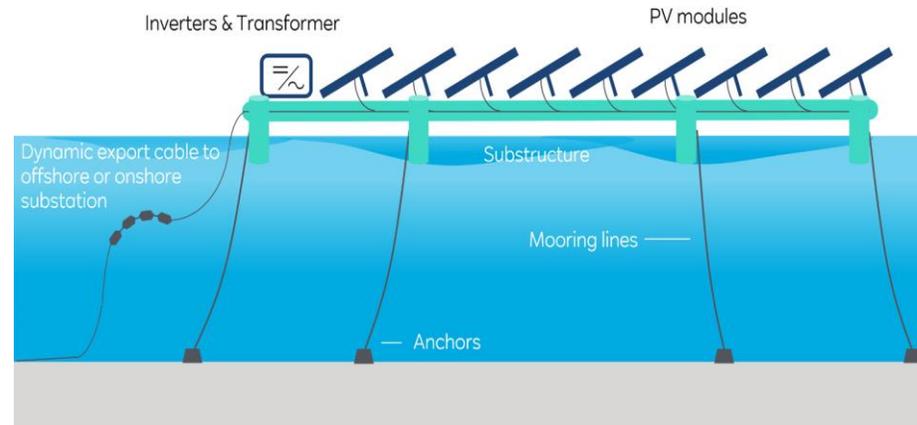
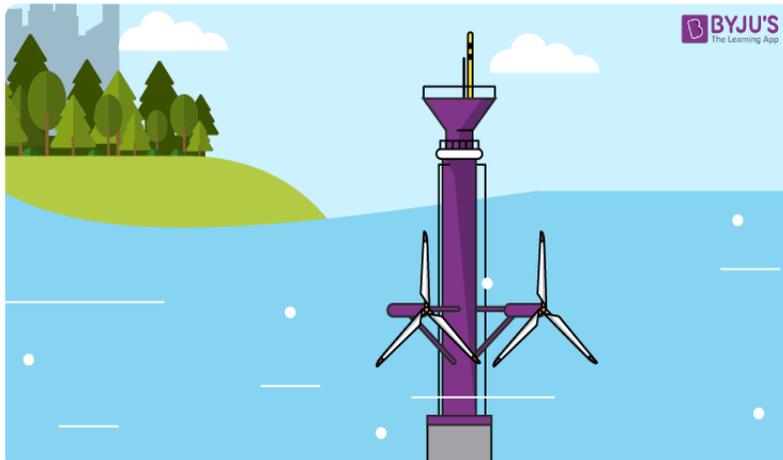
The sea as a hydrocarbon reservoir

- The seabed, and in particular the ocean floor, is also characterised by the presence of significant oil deposits that are still difficult to exploit, as the maximum operating capacity for offshore installations is approximately 3,000 metres.
- The ocean slopes also contain so-called “methane clathrates”, i.e. methane trapped in the form of dry ice.

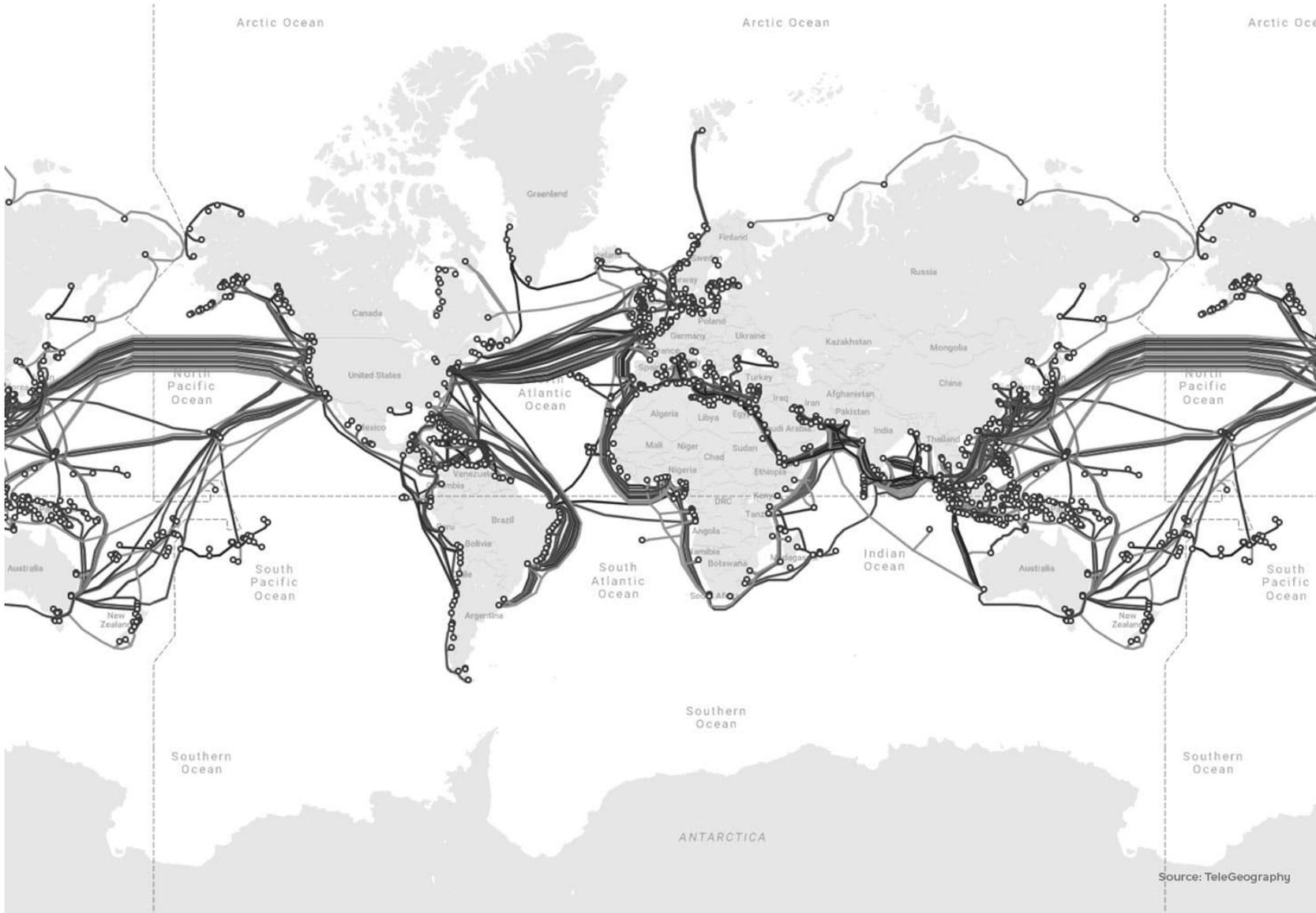
The sea supporting the energy transition

Green energy production from:

- Marine currents
- Tidal range
- Floating photovoltaic plants
- Offshore wind farms
- Waves energy



The data connection



- 10 trillion dollars are traded daily on financial markets via submarine fibre optic cables
- 98% of global internet traffic

Some fundamental seas: The Mediterranean Seas

The Mediterranean seas are:

The seas between lands, i.e. those seas that connect two or more continental masses.

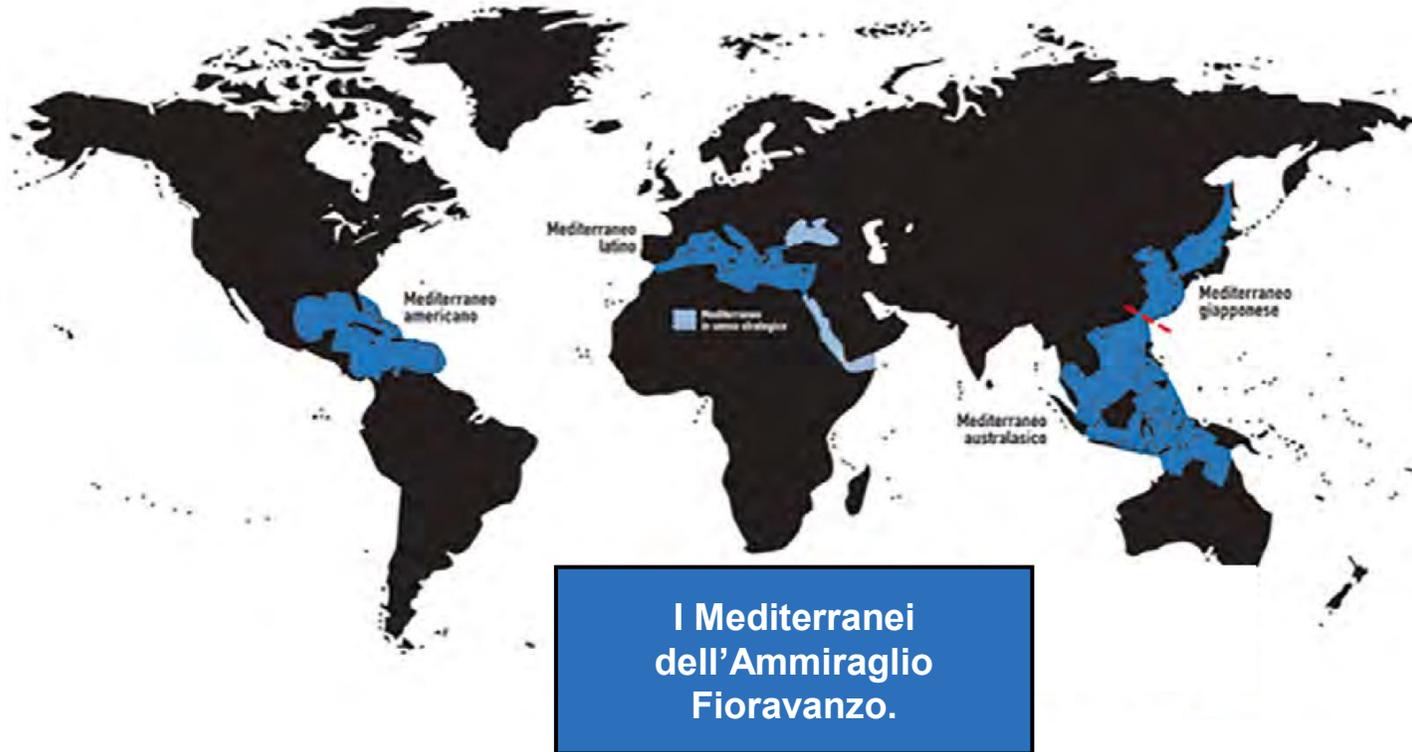
The so-called Mid-Ocean seas: those seas that connect oceanic maritime spaces.

Maritime spaces enclosed between choke points and all crossed by the circumpolar route.

Oceanography calls them 'marginal seas', a term that refers to the fact that they are on the margins of oceanic maritime spaces.

They can also be defined as 'pericontinental seas', i.e. close to continental land masses.

Some fundamental seas: The Mediterranean Seas



In 1936, Admiral Fioravanzo wrote 'Naval Bases: Aspects of Military and Strategic Geography,' a treatise in which he revisited the concept of Mediterranean mid-ocean spaces:

Latin Mediterranean (+ the extension of the Red Sea)

Mesoamerican Mediterranean (Gulf of Mexico + Caribbean Sea)

Australasian Mediterranean (South China Sea + Indonesian Seas)

Japanese Mediterranean (East China Sea + Sea of Korea)

“The greatest modern writer on naval strategy.”
— *U. S. Navy Department, 1914*

THE
INFLUENCE
OF
SEA POWER
UPON
HISTORY

1660—1783

BY
ALFRED THAYER MAHAN

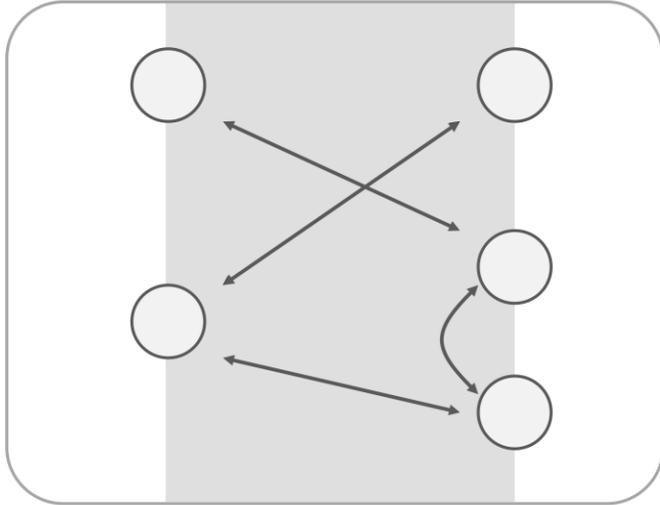
“The real father of all modern navies.”
— *Life, April, 1940*

The Mediterranean seas are of central interest to thalassocracies.

To control the Mediterranean, you must control its choke points.

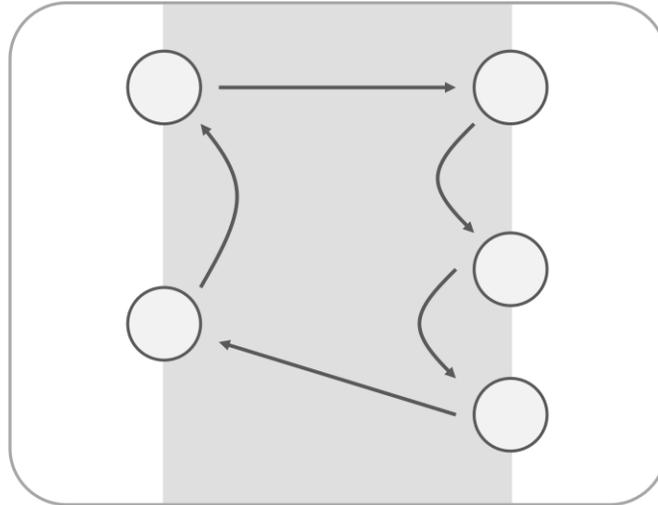
‘Whoever has the power to secure control of these maritime trade routes by preventing access to them by adversaries will be able to profoundly influence the very essence of their nation's strength’: Alfred Thayer Mahan, *The Influence of Sea Power upon History*

The types of routes:



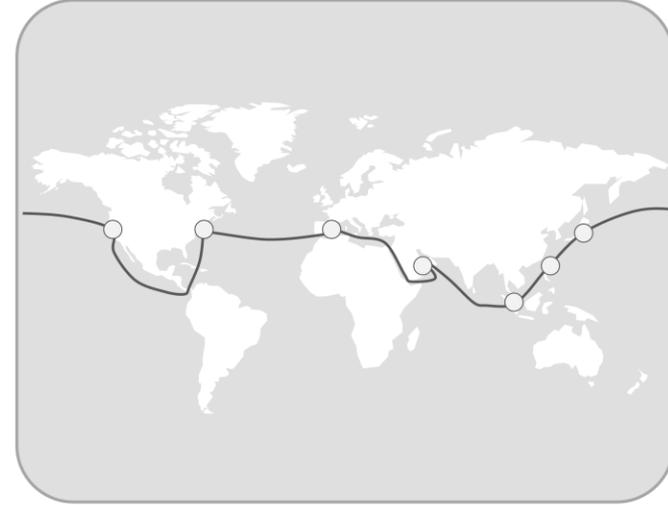
Port-to-Port

Point to point services.
Empty backhauls.
Common for bulk freight.



Pendulum

Shipping service moving back and forth
between two maritime ranges
(seaboards).
Balancing the number of port calls and
the frequency of services.
Can rely on transshipment hubs
between ranges.



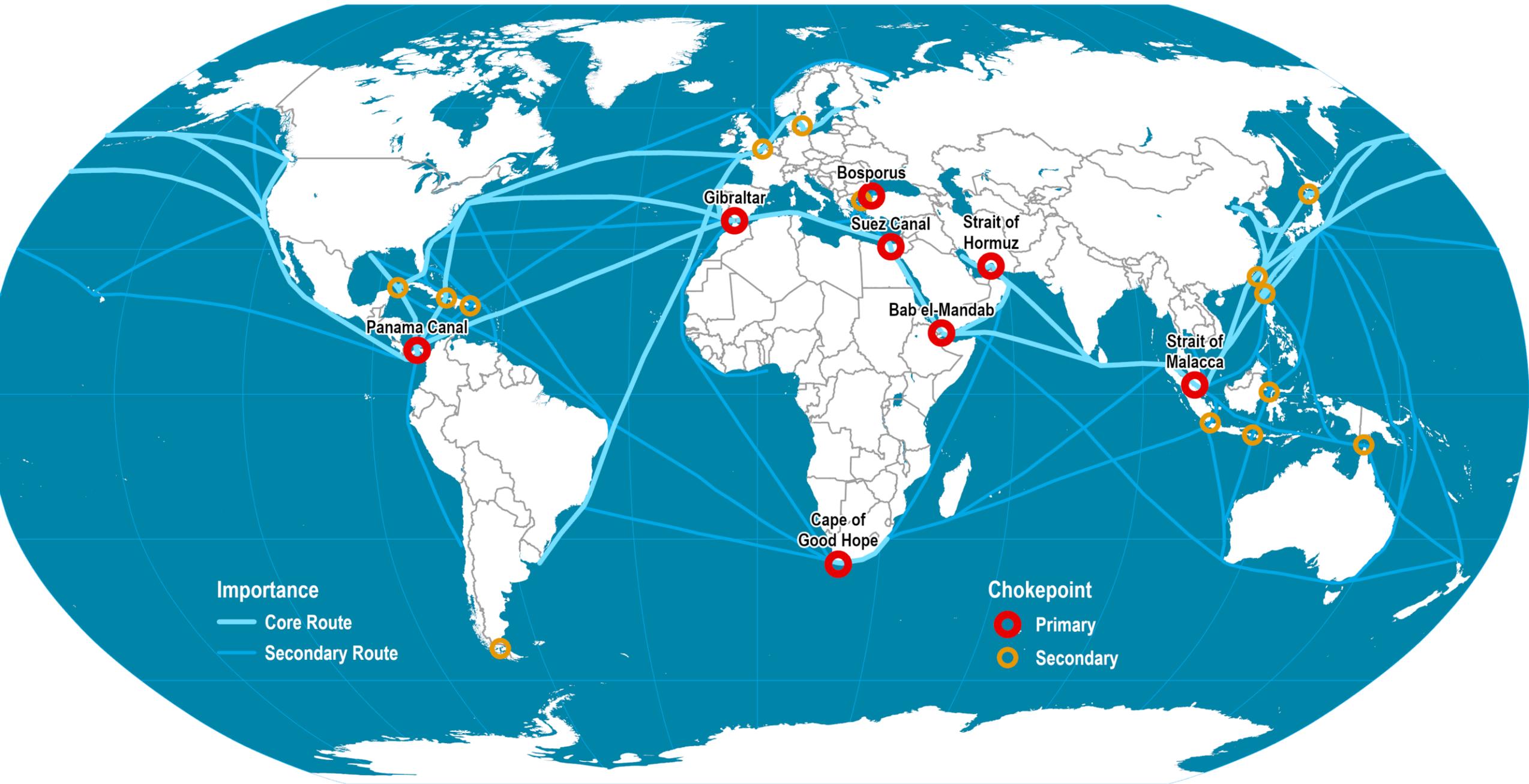
Round-the-World

Servicing continuously a sequence of
ports.
Sequence enables a round trip around the
world.
Limited amount of ports per continent are
serviced.
Involve a series of transshipment hubs.

Choke Points

Choke Points

Choke points are natural or artificial navigable passages characterised by limited transit capacity which, acting as mandatory crossing points for global maritime trade routes, acquire strategic importance from both an economic and geopolitical point of view. Their nature as “bottlenecks” makes them both essential for the continuity of maritime trade flows and elements of vulnerability in the global supply chain, as any interruptions or restrictions to their passage can have a significant impact on the stability of international trade and the global economy.



Panama Canal

Gibraltar

Bosporus

Suez Canal

Strait of Hormuz

Babel-Mandab

Cape of Good Hope

Strait of Malacca



‘Whoever has the power to secure control of these maritime trade routes by preventing access to them by adversaries will be able to profoundly influence the very essence of their nation's strength’: Alfred Thayer Mahan, *The Influence of Sea Power upon History*

La crisi di Suez 2023-2024: La timeline degli eventi

-1896: Opening of the Suez Canal

-1956: Suez Crisis due to geopolitical tensions in the area, particularly related to the nationalisation of the canal by Egyptian President Nasser against the British Empire

-1967: “Six-Day War” when, following the occupation of the Sinai Peninsula by Israeli military forces, the eastern bank of the Suez Canal is occupied and, in response, the Egyptian authorities block access to the canal for the next eight years, until June 1975.

-2021: The container ship Ever Given, over 400 metres long, ran aground in the canal, blocking navigation for six days.

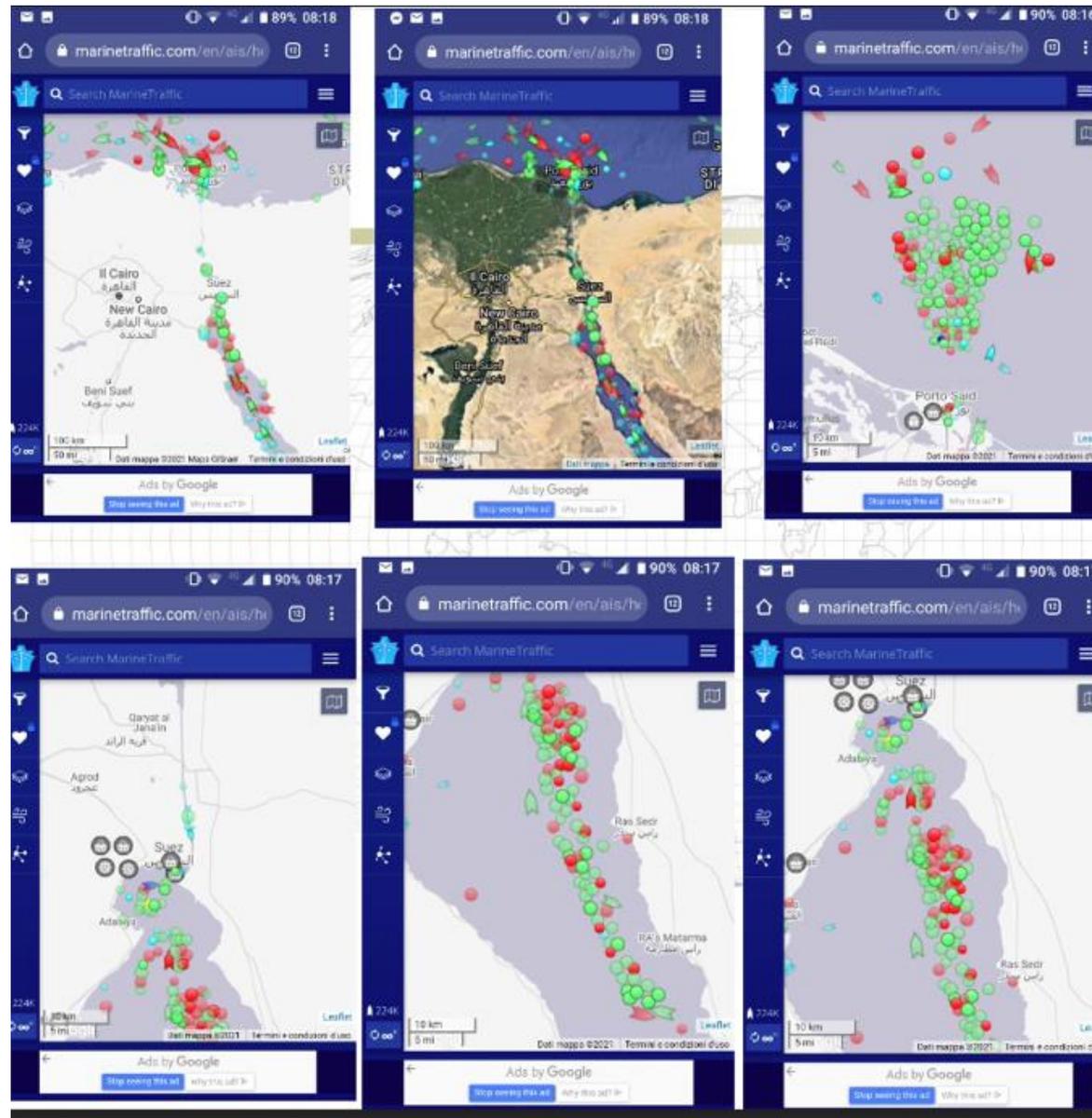
-19 October 2023: a new threat looms over the Suez Canal route.

Blockage of the Suez Canal 2021

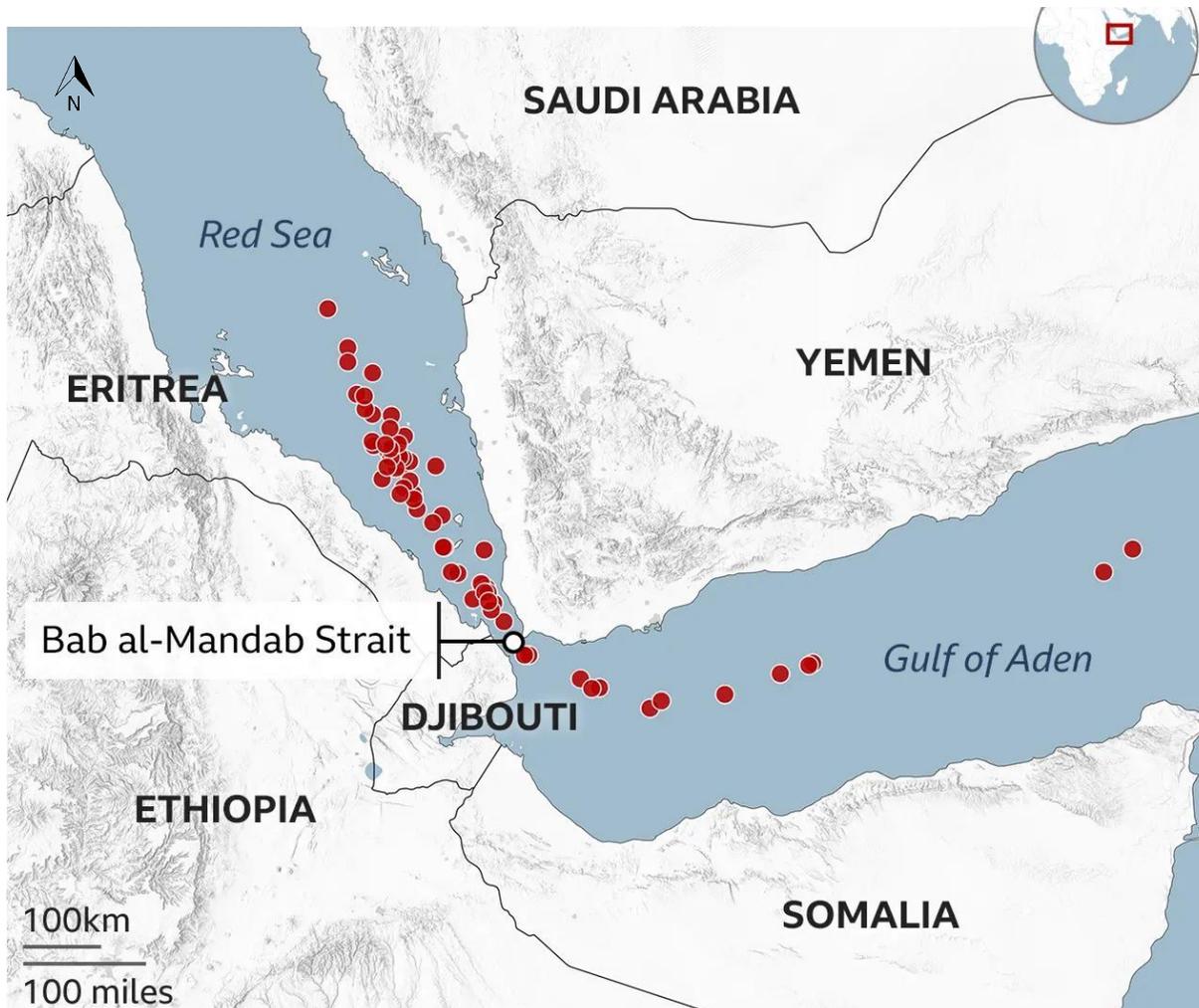


Suez Canal blocked by traffic jam after massive container ship runs aground

By Magdy Samaan, Shawn Deng, Sarah El Sirgany, Mostafa Salem and Lauren Said-Moorhouse, CNN
4 minute read · Updated 6:01 PM EDT, Wed March 24, 2021



19 October 2023, a new threat looms over the route through the Suez Canal



The Red Sea crisis began when Yemen's Houthi movement launched missiles and armed drones against Israel, demanding an end to hostilities in the Gaza Strip as part of the Israeli-Palestinian conflict. Since then, the Houthis have also launched military actions against merchant and military vessels in the Red Sea.

We will analyse the situation at three different points in time:

- Pre-crisis situation
- Current situation
- Possible future scenarios

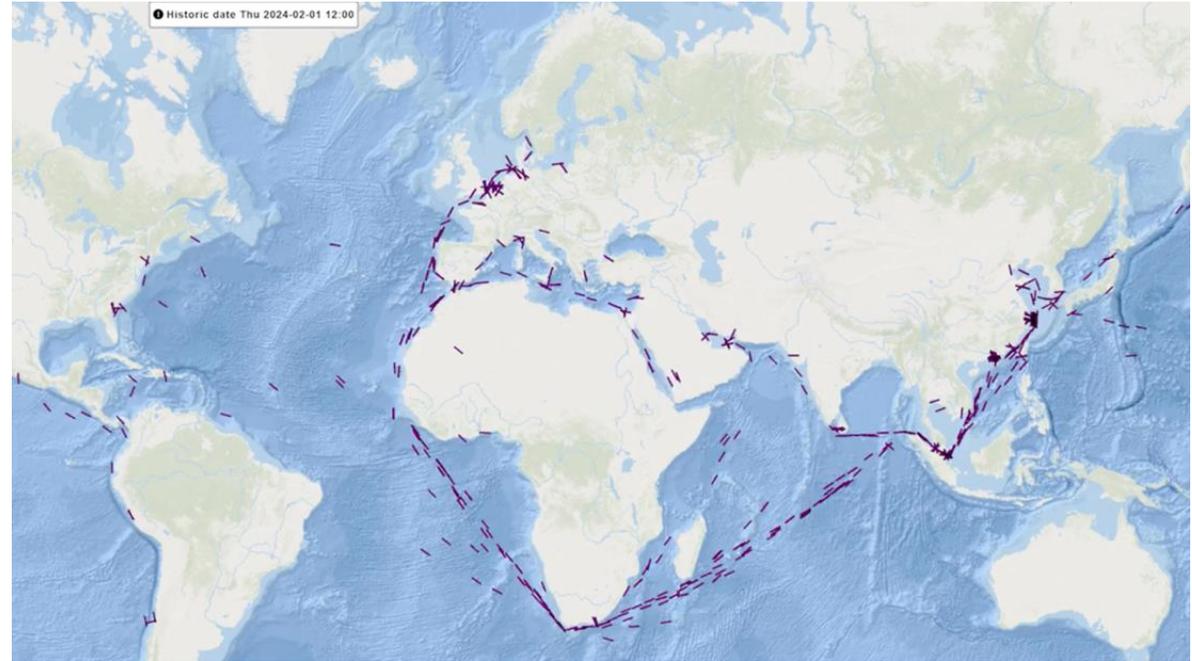
Pre-crisis situation

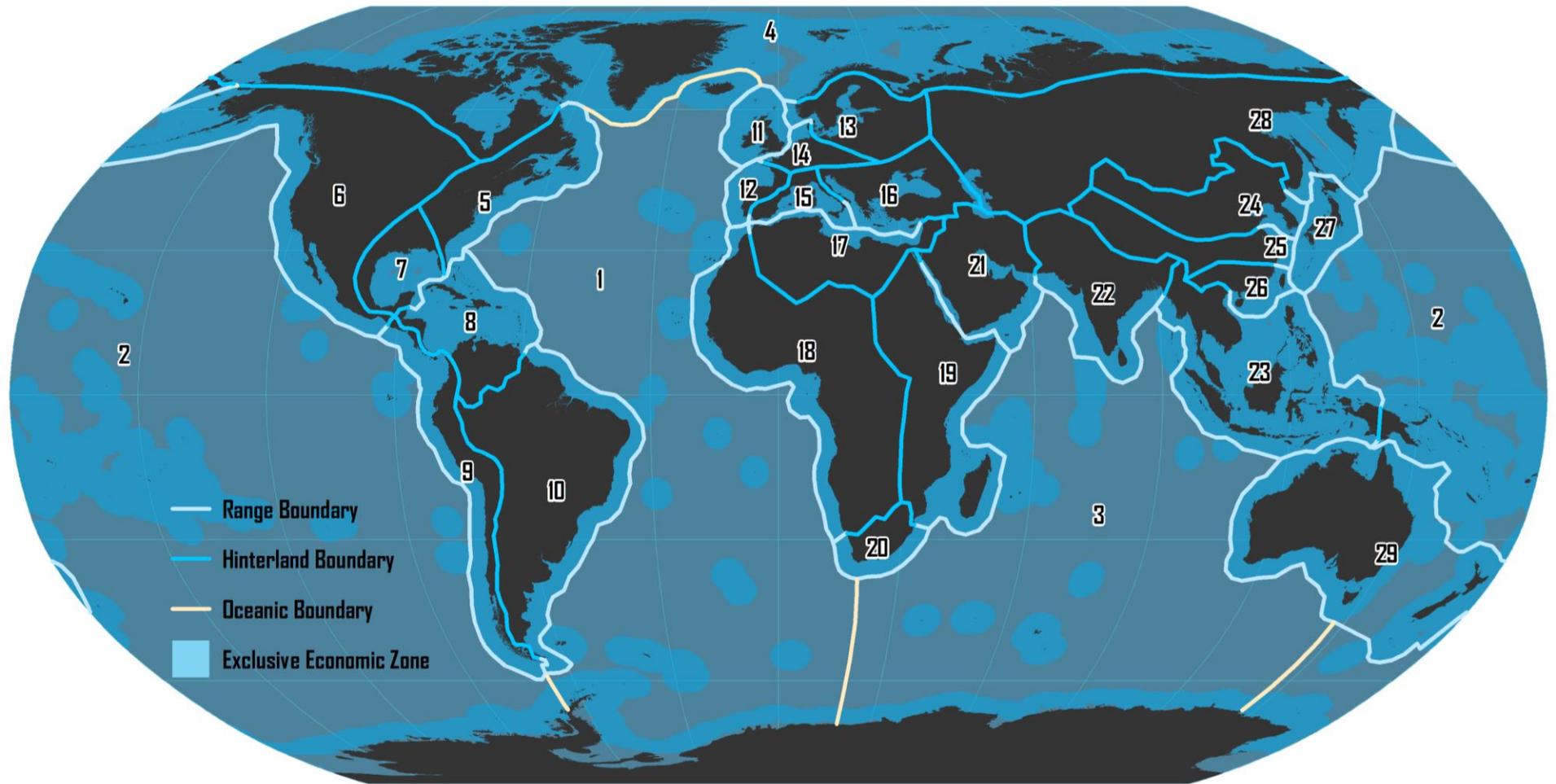
- The 'pendulum' and 'Round the World' routes, which connected Europe and the Far East, accounted for between 12 and 15 per cent of world trade volume.
- More than 100 million barrels of oil passed through the Bab al Mandab Strait every day, representing about 8.7 per cent of global demand.
- The time and cost efficiency of the route through Suez also enabled highly optimised supply chain management, with heavy use of just-in-time logistics, which allowed European companies to maintain low inventory levels and respond quickly to changes in demand and any short-term market shocks.
- The strategic role of ports in the Mediterranean area is evident not only from the point of view of traffic dynamics, but also from the investment and vertical integration strategies implemented by the various shipping companies.
- If we consider the Shanghai-Genoa and Shanghai-Rotterdam routes, we can see that in the period 2012-2020, the cost of handling a container fluctuated between \$1,800 and \$2,200.

Current status

- Almost all commercial vessels in transit have decided to take the alternative route via the Cape of Good Hope and around Africa. This alternative route extends the Far East-Europe passage by approximately 7,000 nautical miles, adding between 10 and 12 days of sailing time compared to the Mediterranean route via Suez.
- Major shipping companies have reorganised their operations using the route to circumnavigate the African continent. - The resulting increase in delivery times has caused transport costs to skyrocket due to increased fuel consumption and higher operating and insurance costs.
- Companies operating on a just-in-time production model may find themselves without the raw materials and semi-finished products needed to complete their production cycles, causing disruptions and delays.
- The accumulation of goods awaiting shipment or processing could saturate available warehouse capacity, causing further logistical problems.
- The Red Sea crisis has drastically reduced the centrality of Mediterranean ports in global trade flows. The redirection of traffic from the Suez Canal through the Cape of Good Hope has effectively transformed the Mediterranean into a region unsuitable for catalysing global flows.

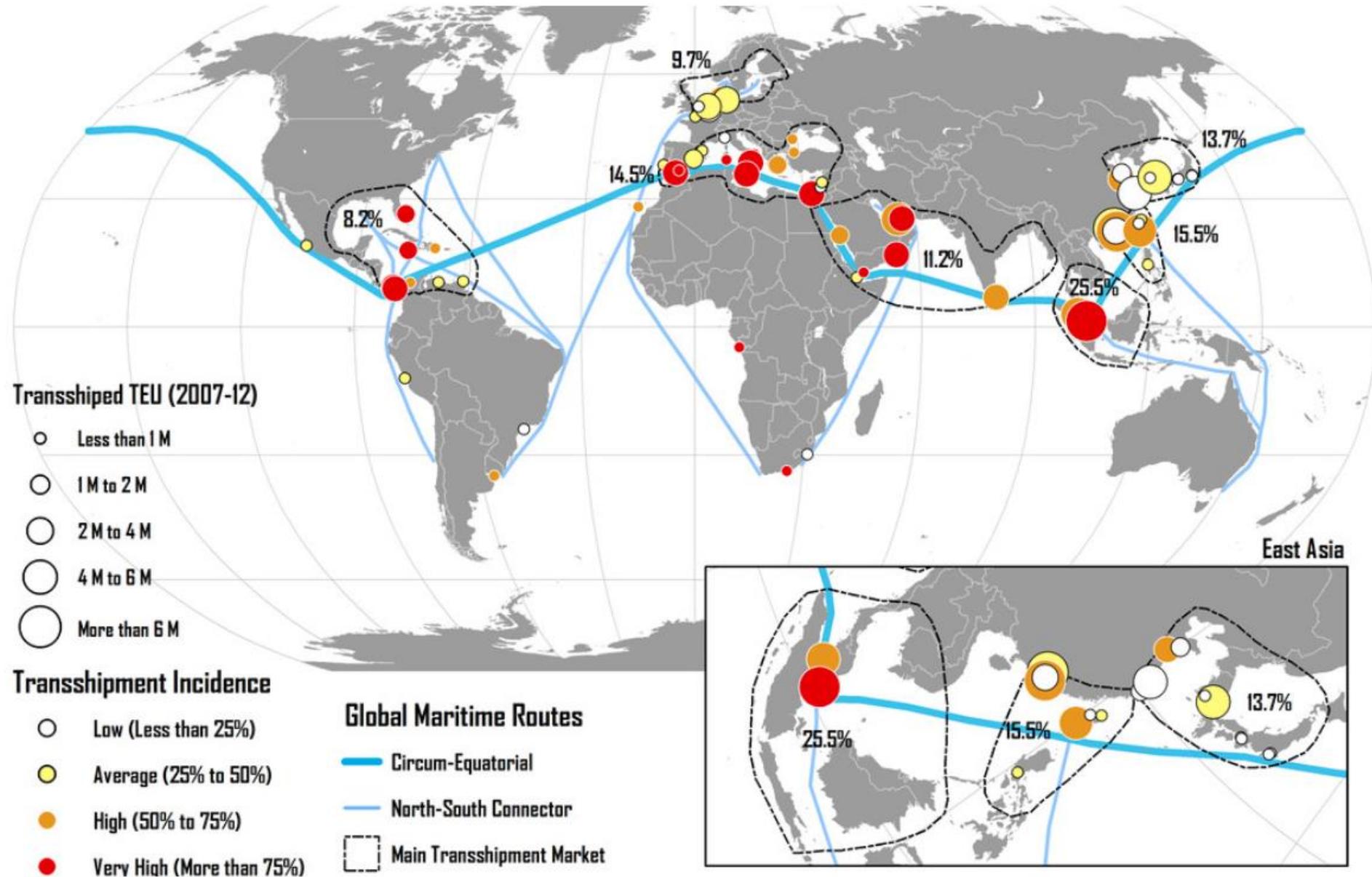
The reorganisation of transport has marginalised the role of Mediterranean ports in relation to intercontinental transport dynamics.





- | | | | | |
|------------------------------|-------------------------------|----------------------------|------------------------|-----------------------------|
| 1. Atlantic | 7. Gulf Coast | 13. Baltic | 19. East African Coast | 25. Central China |
| 2. Pacific | 8. Caribbean Basin | 14. Northern Europe | 20. South Africa | 26. Southern China / Taiwan |
| 3. Indian | 9. South American West Coast | 15. Western Mediterranean | 21. Middle East | 27. Japan |
| 4. Arctic | 10. South American East Coast | 16. Eastern Mediterranean | 22. South Asia | 28. Russian Far East |
| 5. North American East Coast | 11. British Isles | 17. Southern Mediterranean | 23. Southeast Asia | 29. Oceania |
| 6. North American West Coast | 12. Europe Atlantic | 18. West African Coast | 24. Yellow Sea | |

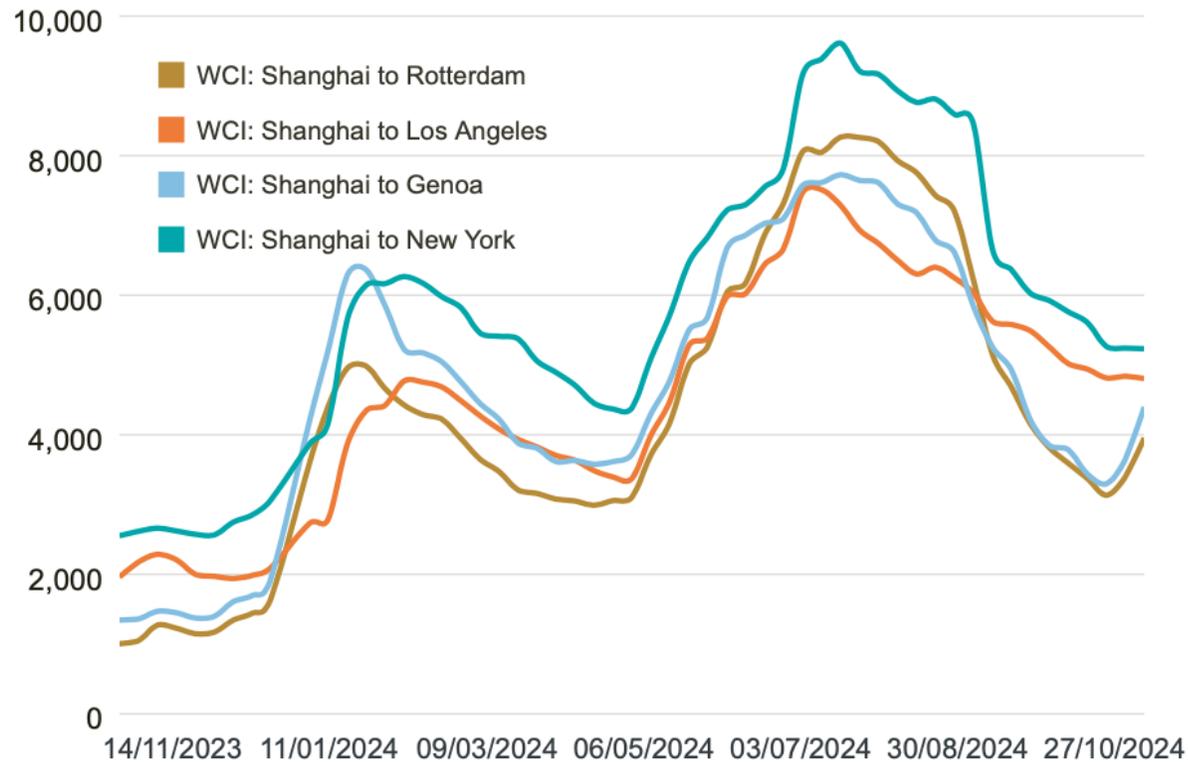
Transshipment hub



Container Index

Route	Route code	24-Oct-24	31-Oct-24	07-Nov-24	Weekly change (%)	Annual change (%)
Composite Index	WCI-COMPOSITE	\$3,095	\$3,213	\$3,444	7% ▲	129% ▲
Shanghai - Rotterdam	WCI-SHA-RTM	\$3,132	\$3,396	\$3,954	16% ▲	211% ▲
Rotterdam - Shanghai	WCI-RTM-SHA	\$548	\$543	\$524	-3% ▼	14% ▲

Drewry WCI: Trade Routes from Shanghai (US\$/40ft)

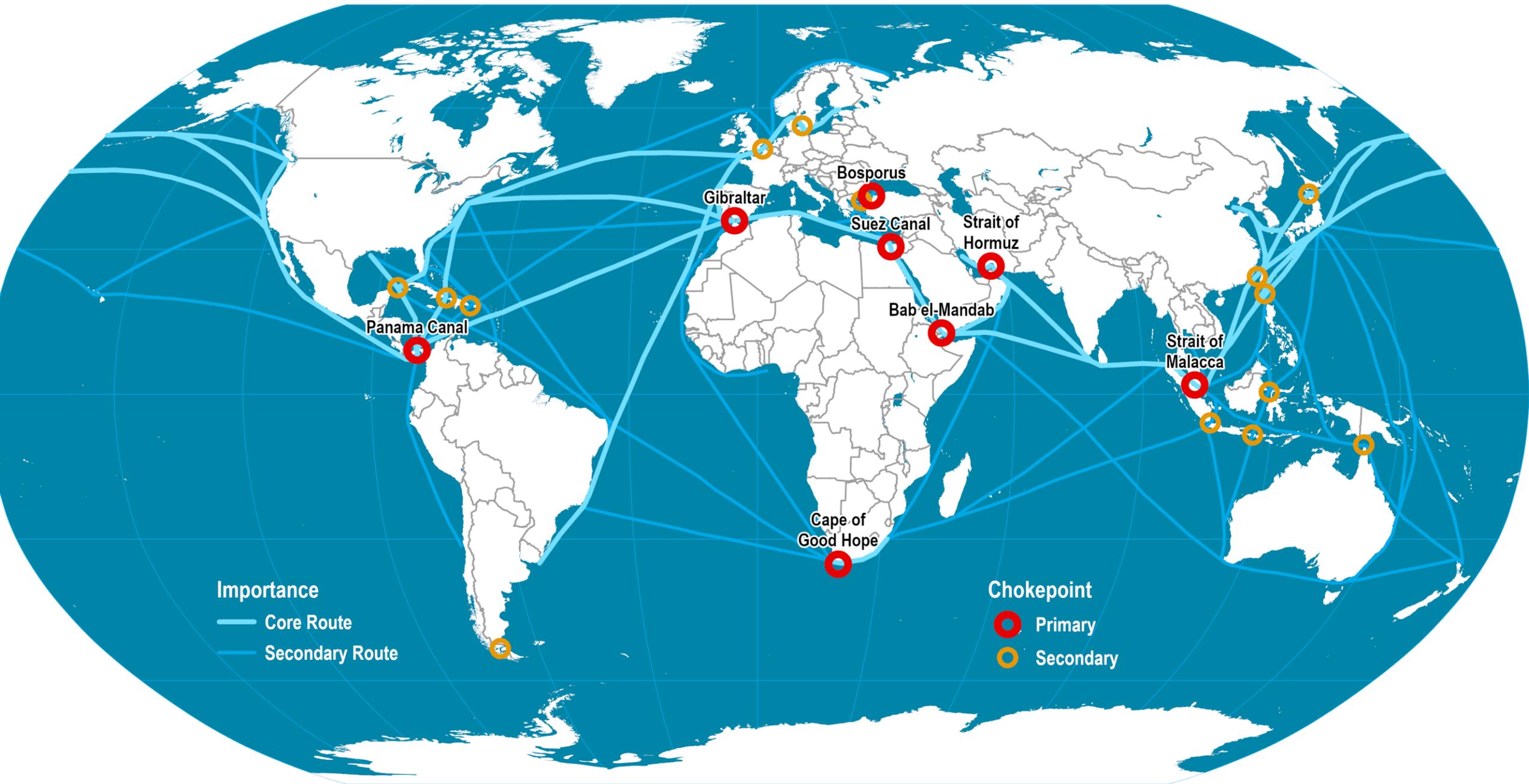


\$3,296	\$3,648	\$4,399	21% ▲	199% ▲
\$4,814	\$4,839	\$4,806	-1% ▼	110% ▲
\$710	\$718	\$720	0%	-6% ▼
\$5,266	\$5,241	\$5,233	0%	97% ▲
\$761	\$760	\$785	3% ▲	30% ▲
\$2,663	\$2,664	\$2,624	-2% ▼	76% ▲

Possibili scenari futuri

- The high level of integration and complexity of logistics systems makes this environment extremely fragile.
- The cessation of hostilities in the Bab Al-Mandab Strait area by the Houthis would have the main effect of redirecting commercial ships back to the Suez route.
- This would reaffirm the centrality of Mediterranean ports.
- The reorganisation of traffic flows would probably be accompanied by a significant reduction in transport costs, as has been the case in all crises in recent years.

The Strait of Hormuz

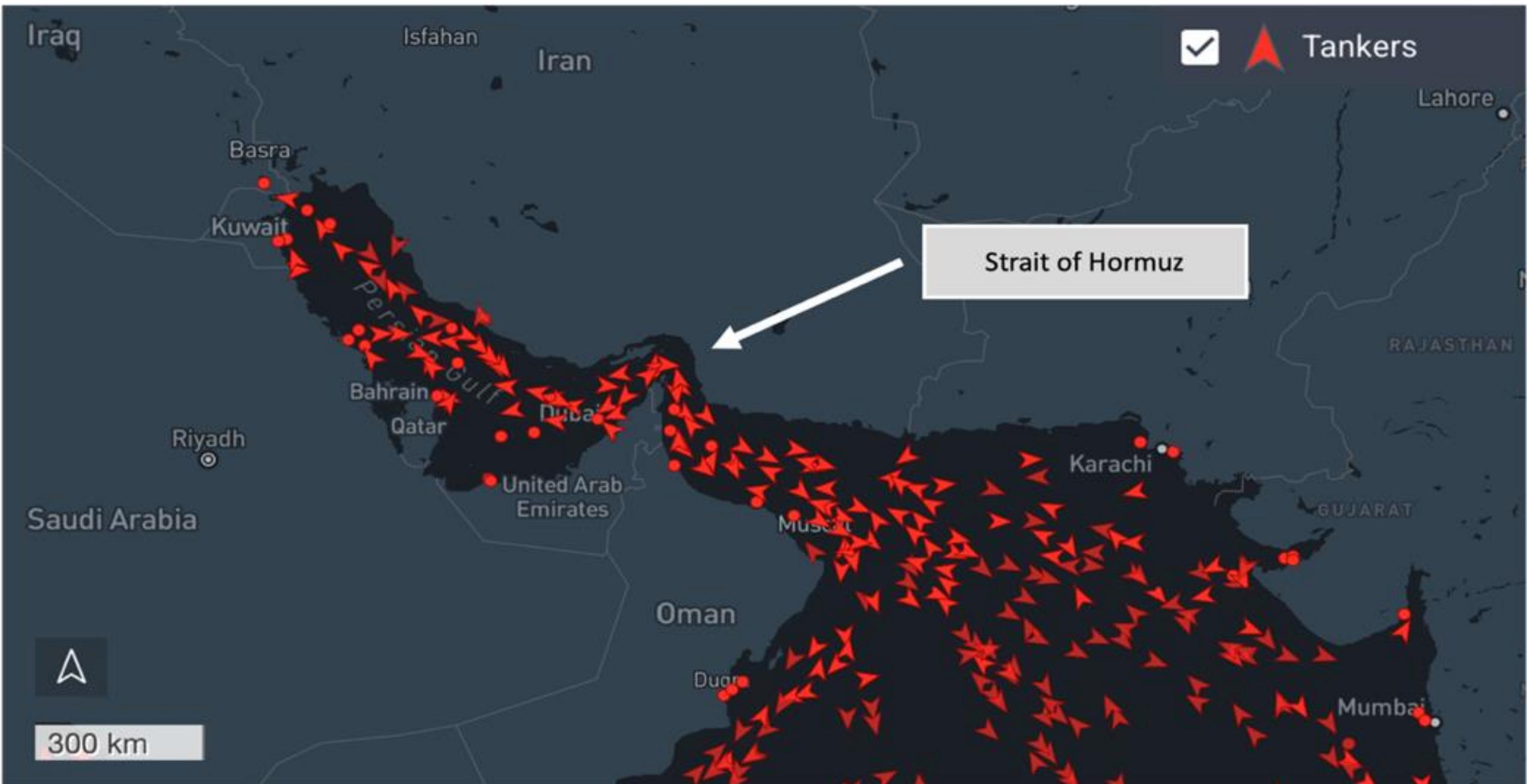


Importance

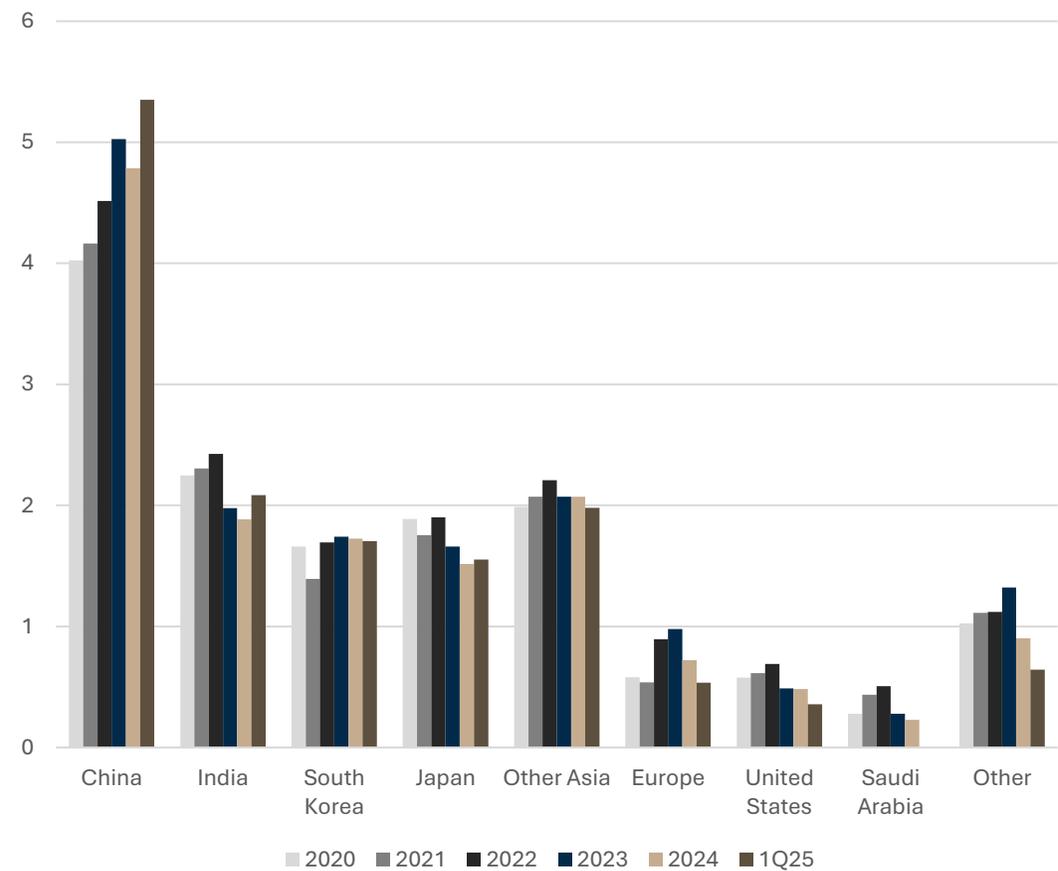
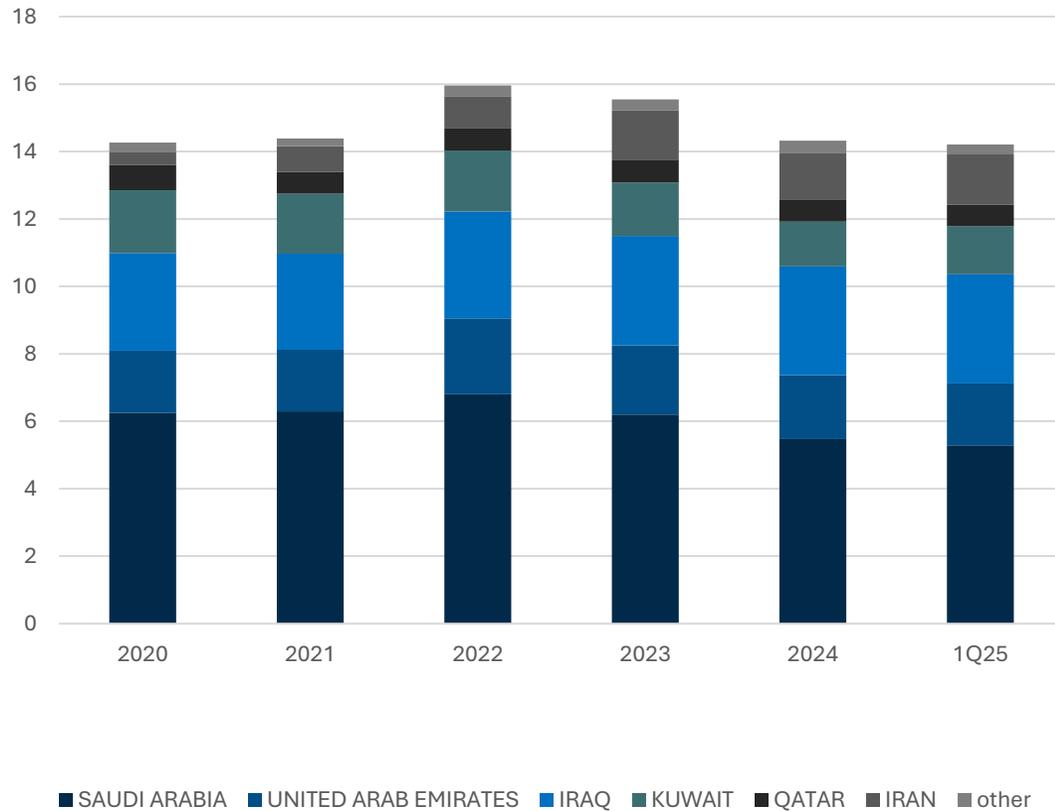
- Core Route
- Secondary Route

Chokepoint

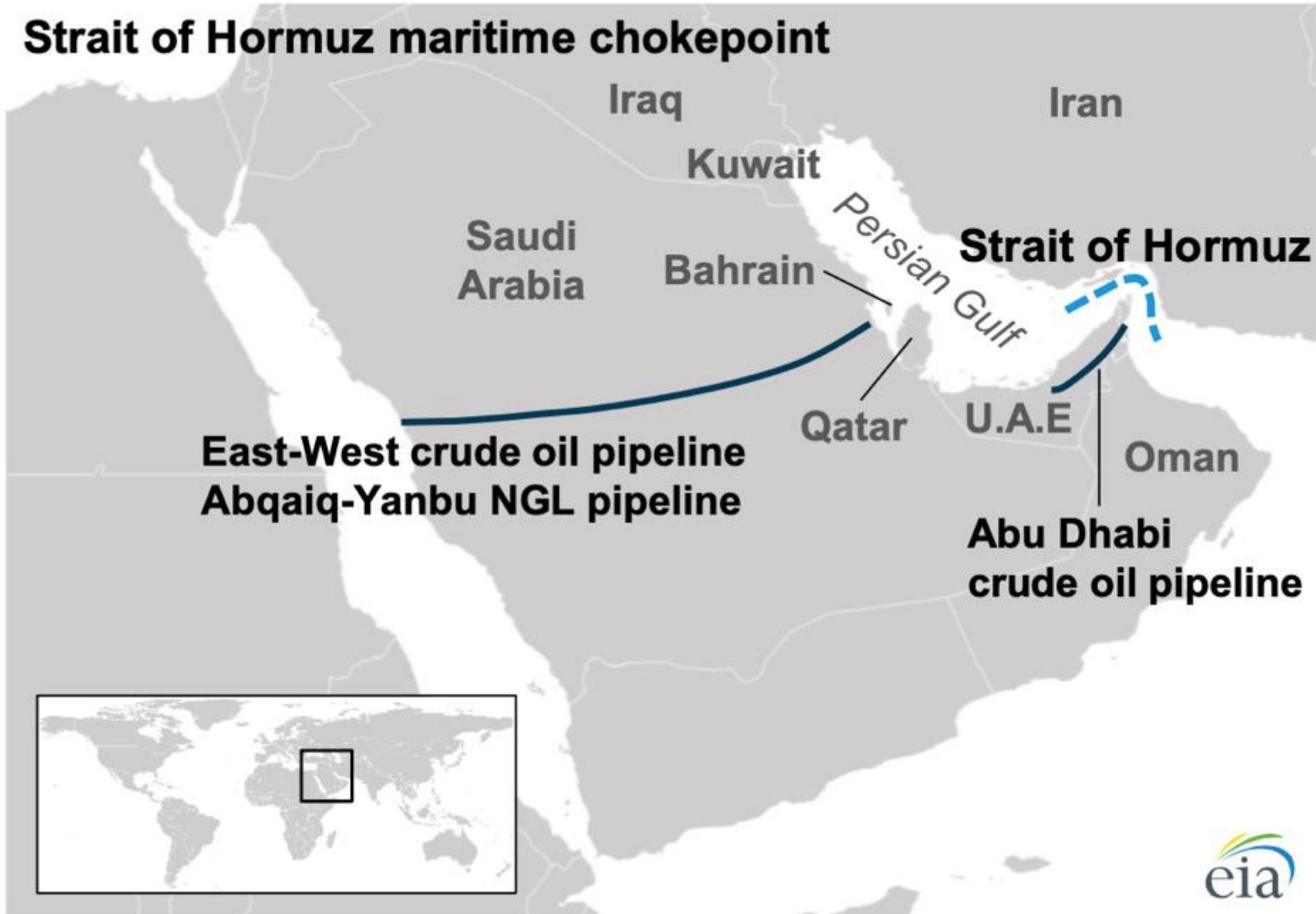
- Primary
- Secondary



Oil and Gas Export and Import

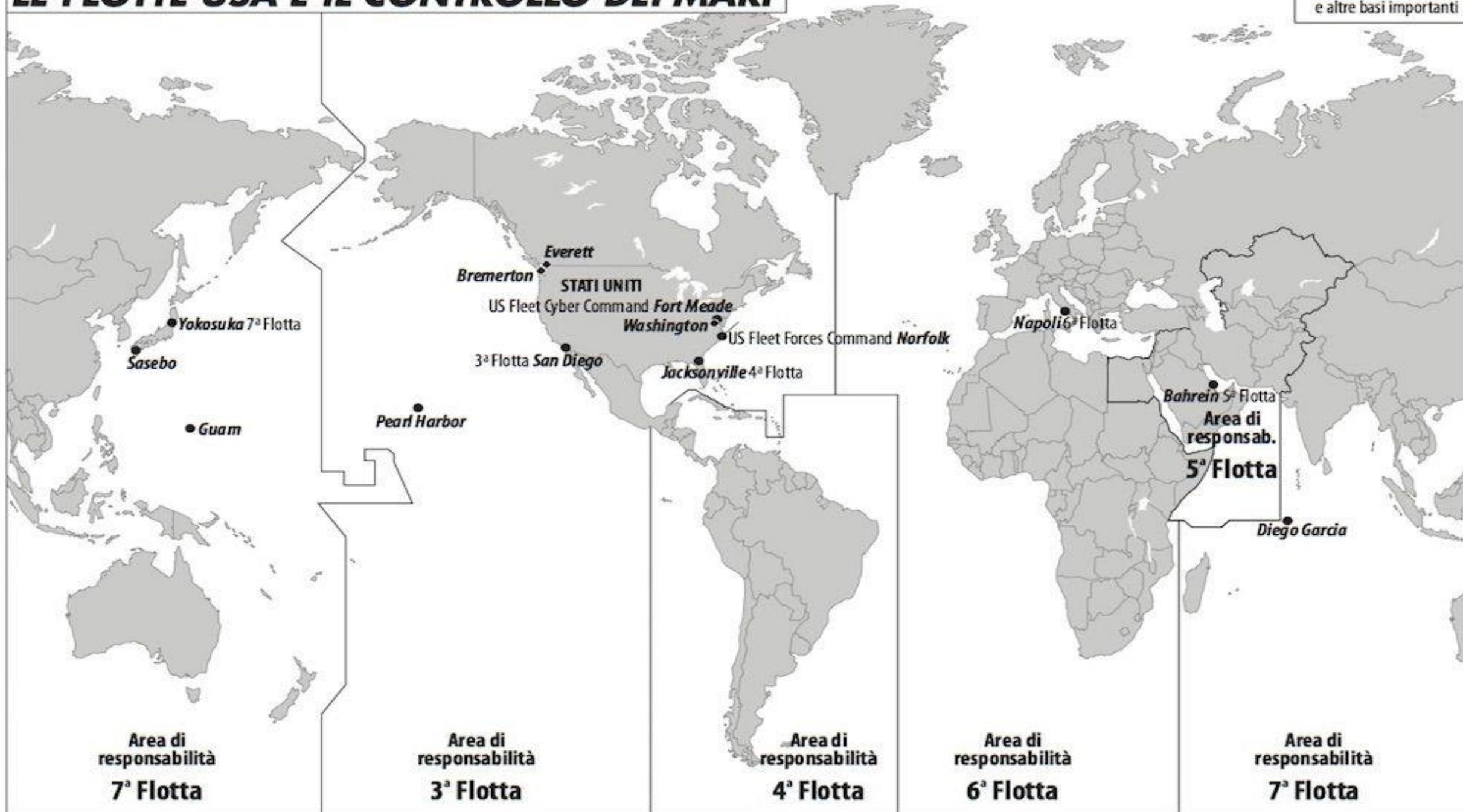


Strait of Hormuz maritime chokepoint



LE FLOTTE USA E IL CONTROLLO DEI MARI

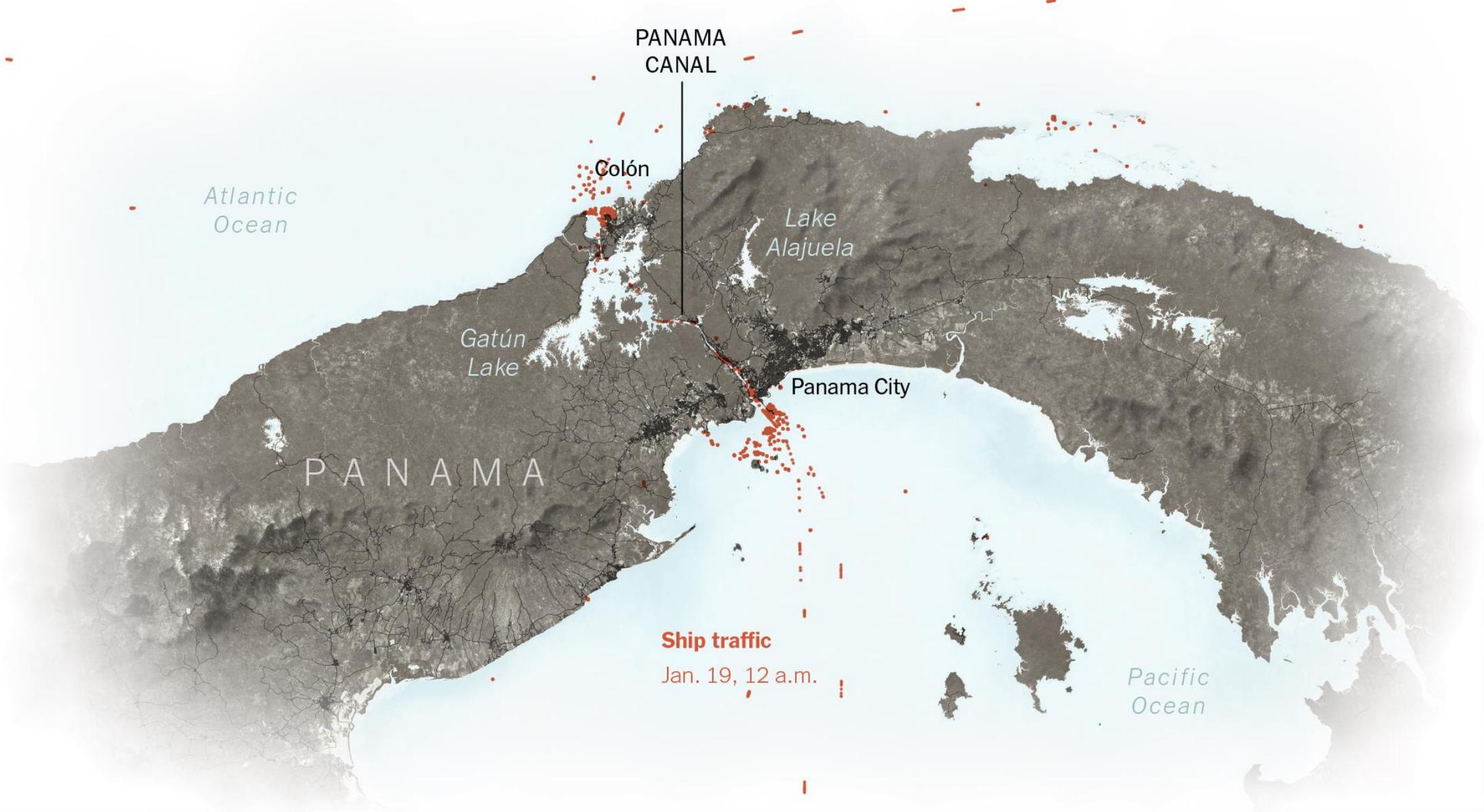
● Basi delle flotte e altre basi importanti



Panama Canal



Panama Canal



Panama Canal



Strait of Bering

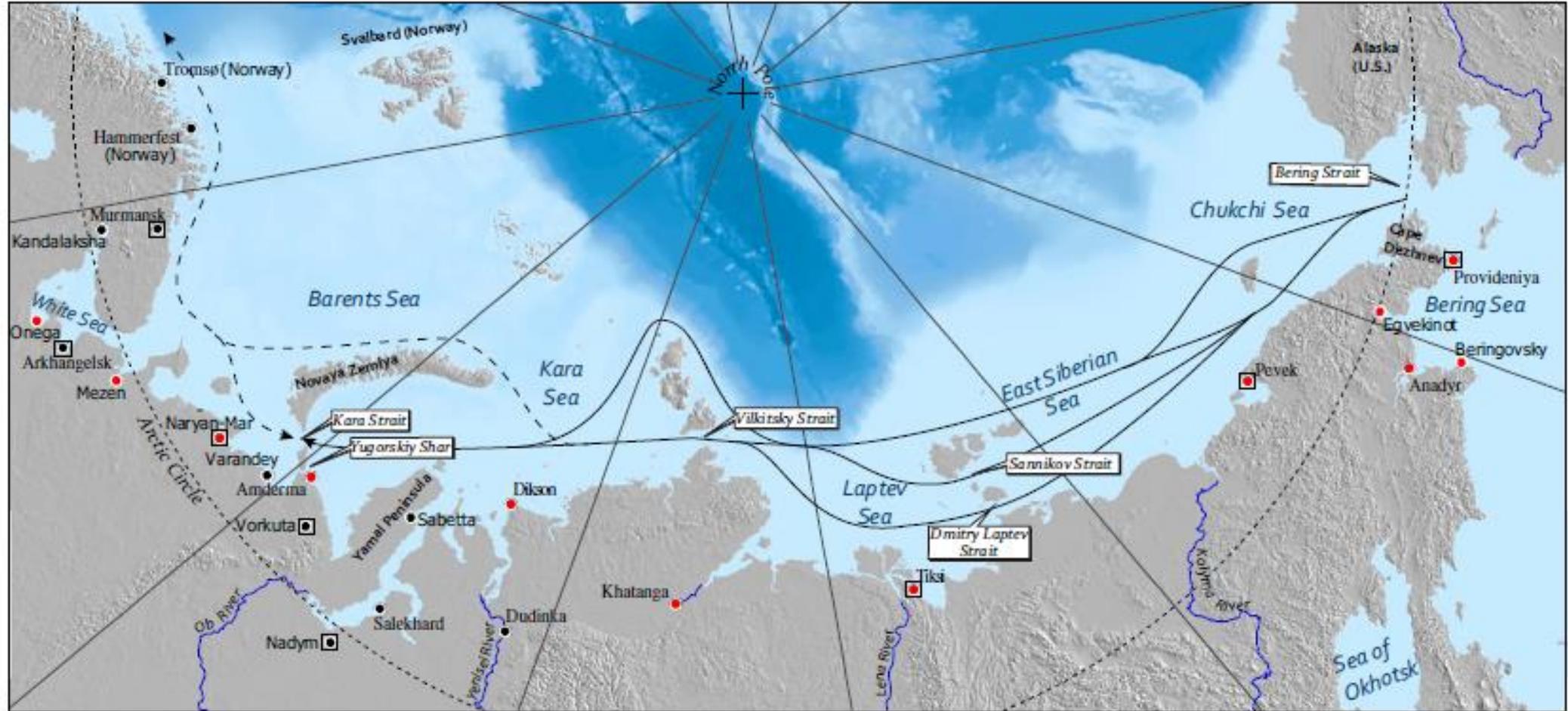


Figure 2. Map of the Russian and Norwegian Arctic coasts, showing the NSR (solid line) and its extension to the NEP (dotted line). Settlements in red have been identified by the Russian Government (FSUE 2013) as having port facilities in a state of disrepair. Planned SAR stations are also identified with a square (adapted from Stephenson *et al.* 2013a).



Three routes: Northwest Passage, Northeast Passage, transpolar route, in international waters.

Most promising route: NSR (Northern Sea Route – Russian coast).

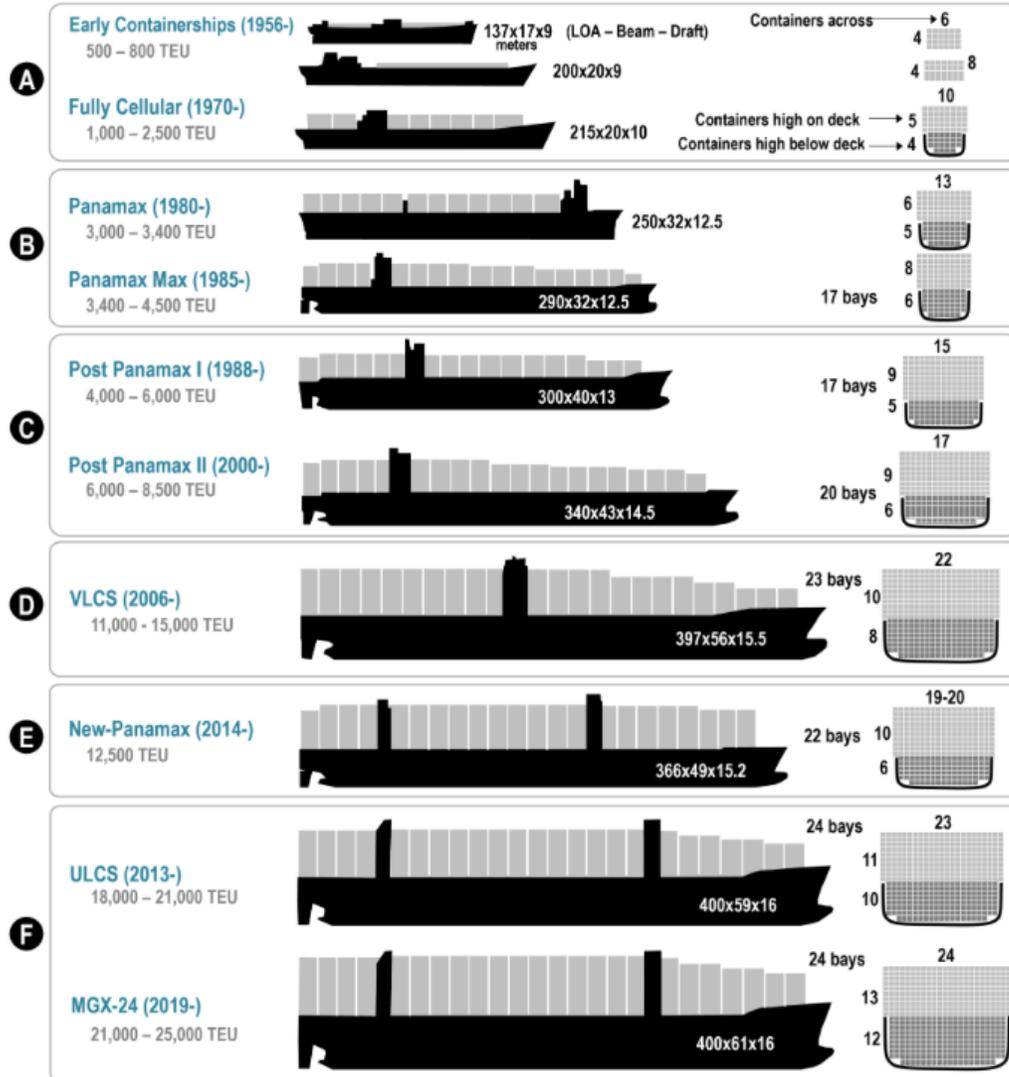
From July to late October/early November. CC = longer sailing periods (icebreakers still required).

Time savings: Yokohama-Rotterdam via Suez 31 days; via NSR 19; Shanghai-Rotterdam (29.22); Shanghai-Genoa (24.31)

Two main types of traffic: raw material exports from the Arctic to Europe; transit (alternative to Suez), currently of little significance

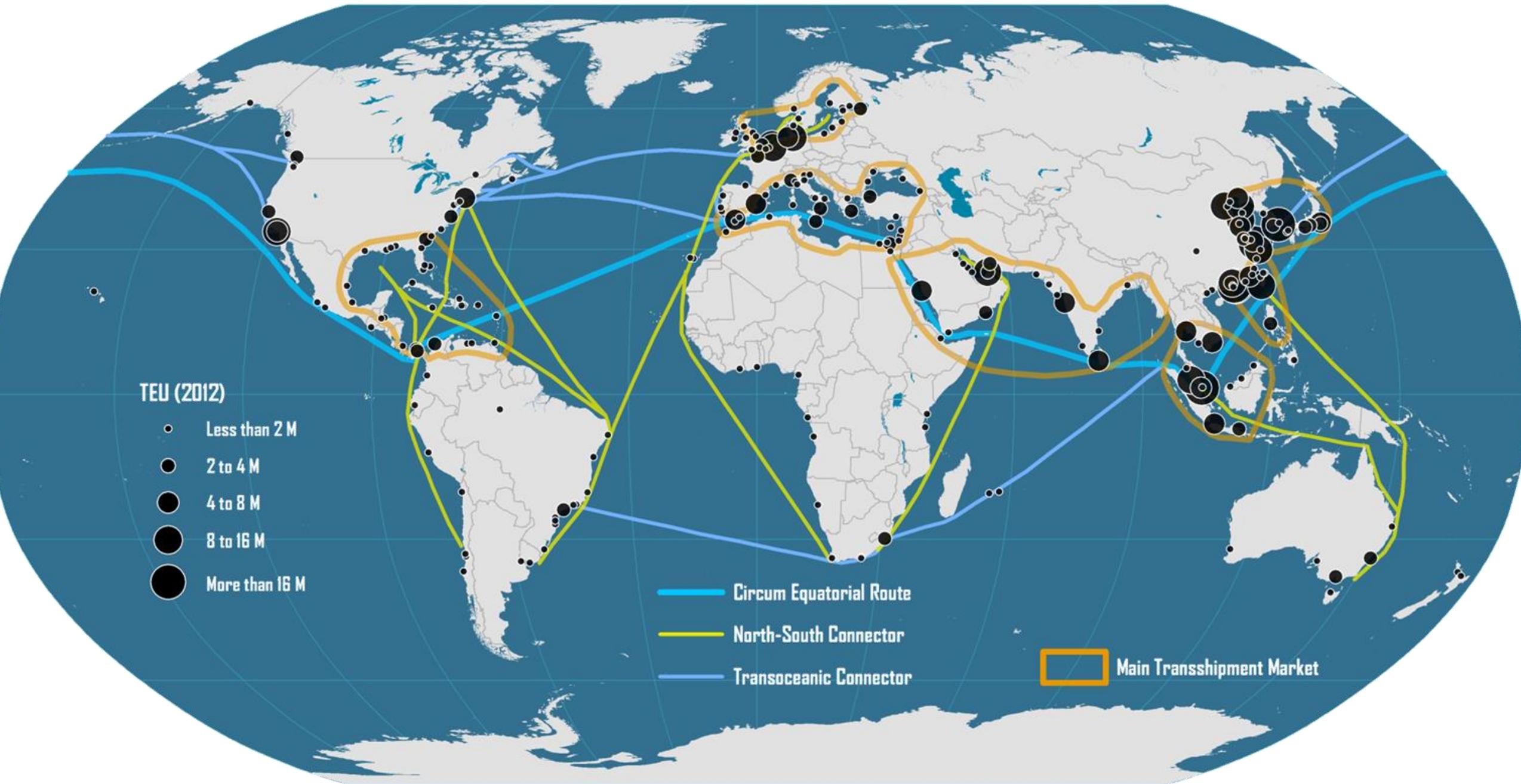


Different type of vessels



Evolution of Containerships





TEU (2012)

- Less than 2 M
- 2 to 4 M
- 4 to 8 M
- 8 to 16 M
- More than 16 M

— Circum Equatorial Route

— North-South Connector

— Transoceanic Connector

□ Main Transshipment Market