Global Governance of the Earth's Oceans

2.2.7

Global flows of shipping and sea cables

Specification content

Changing trends, patterns, networks and regulation of shipping including containers and oil tankers

Growth of smuggling and people trafficking and international efforts to manage these flows

Growth of seafloor cable data networks including causes, trends, patterns and uses

Risks to seafloor cable data networks including those from tsunamis and undersea landslides, and international conventions to protect seafloor data cables

International shipping patterns

Compared to older ships, modern ones are:

- Larger, so can carry much more
- Faster (ave. c. 28km/h (670km/day), up to (probably) max of 45-55 km/h)
- More fuel efficient, so shipping costs per unit are relatively lower
- More automated (saving crew costs and reducing accidents (200 in 1990, 150 in 2010)
- More specialised – tankers, bulk carriers, container ships…

World Ocean Review 1, chapter 8, p167

International shipping patterns

Ocean shipping broadly divides into:

- liquid cargo
  - Largely oil and petroleum products - c. ¼ all goods transported by sea is crude oil
- dry cargo
  - Mostly iron ore and coal (mostly 'steam coal' for power generation) – routes are largely fixed
  - Food grains (wheat, barley, etc.) – routes/volumes fluctuate depending on harvest season/yield…

World Ocean Review 1, chapter 8, p169-70

International shipping patterns

Some key patterns

Growth in containerisation 'one of the key transport revolutions of the 20th century' (WOR1 p170)

Intermodal (can be used on different transport types), therefore no costs incurred by 'break of bulk' at ports…

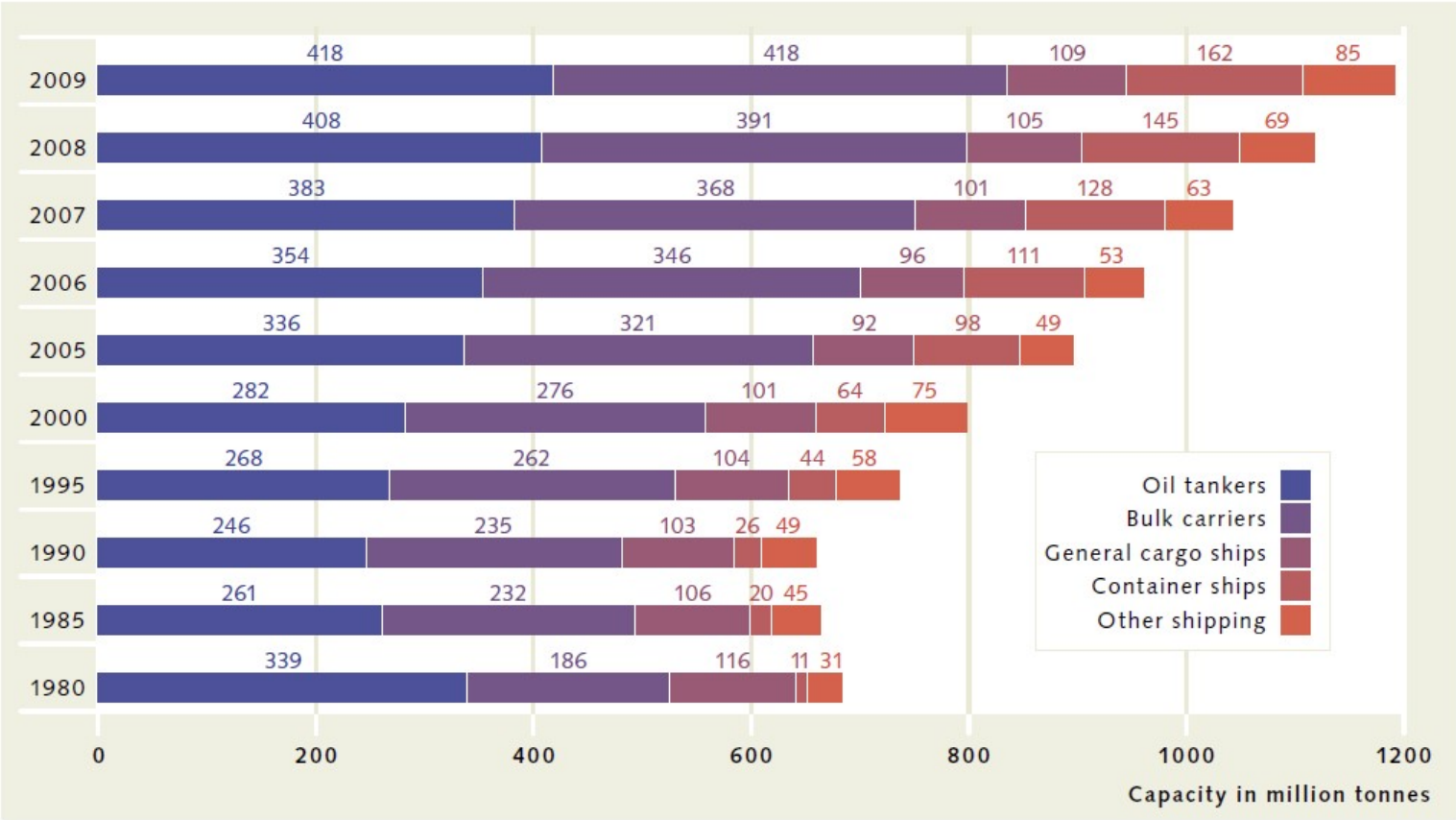
Quicker to load/unload at port so vessel spends more time at sea (est. that a traditional cargo ship spends 2/3 of operating time at port)

Transport costs therefore greatly reduced, e.g. the cost of transporting electrical goods from Asia to Europe is < 1% of selling price

World Ocean Review 1, chapter 8, p170

International shipping patterns

Changing pattern of vessel use

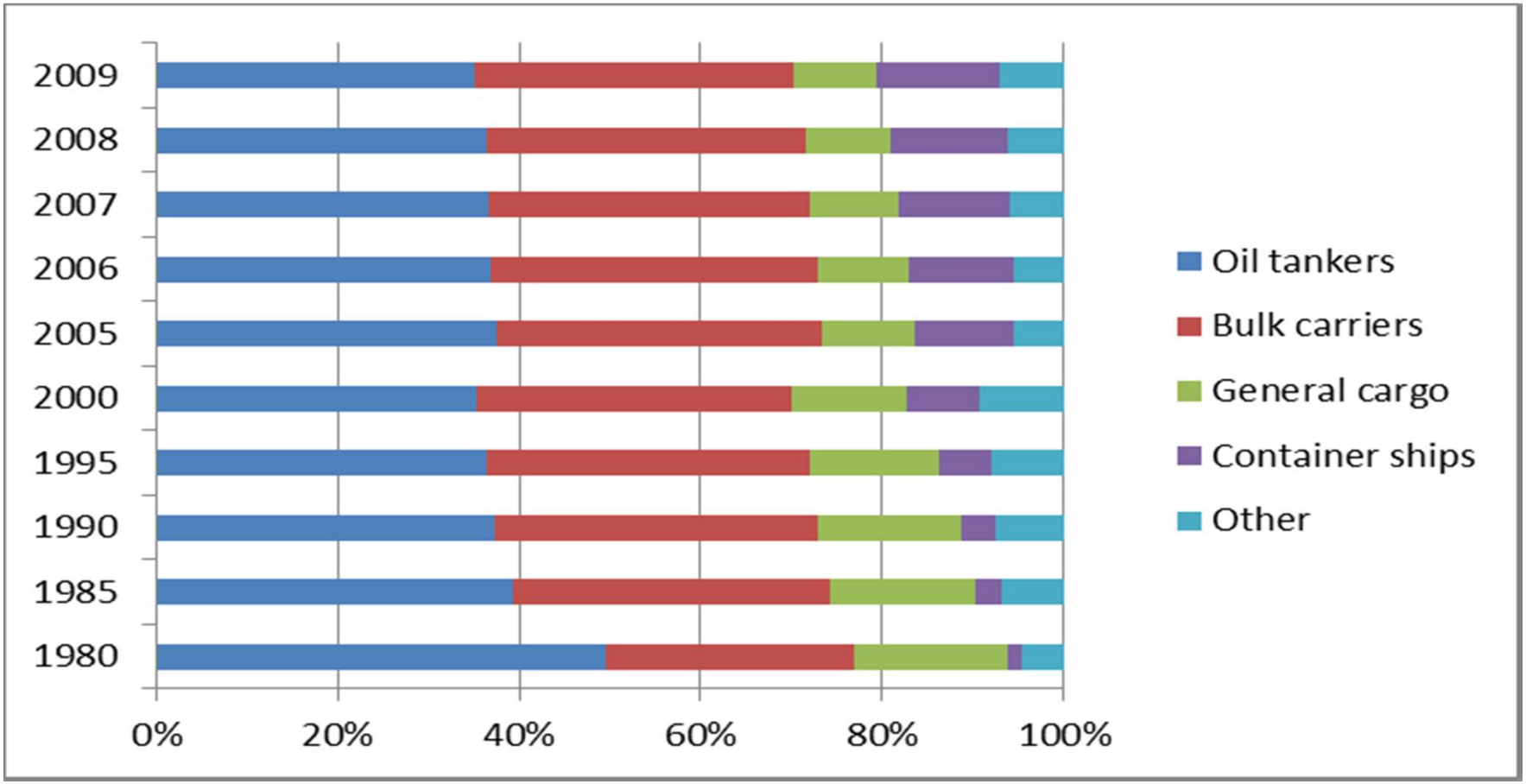


8.2 > The growth of the global merchant fleet according to type of vessel (as at 1 January).

World Ocean Review 1, chapter 8, p167

International shipping patterns

Changing pattern of vessel use



Based on data from **World Ocean Review 1**, chapter 8, p167

International shipping patterns

Top trade routes

Top Trade Routes (TEU shipped) 2013

Route	West Bound	East Bound	North Bound	South Bound	Total
Asia-North America	7,739,000	15,386,000			23,125,000
Asia-North Europe	9,187,000	4,519,000			13,706,000
Asia-Mediterranean	4,678,000	2,061,000			6,739,000
Asia-Middle East	3,700,000	1,314,000			5,014,000
North Europe-North America	2,636,000	2,074,000			4,710,000
Australia-Far East *			1,072,016	1,851,263	2,923,279
Asia-East Coast South America			621,000	1,510,000	2,131,000
North Europe/Mediterranean-East Coast South America			795,000	885,000	1,680,000
North America-East Coast South America			656,000	650,000	1,306,000

* : 2012 data

TEU: twenty-foot equivalent units – i.e. standard size containers

http://www.worldshipping.org/about-the-industry/global-trade/trade-routes (22/01/18)

International shipping patterns

Cargo imbalances typical of traffic with Asia:

- Most obvious with Pacific route (10M TEU, 2007) and Europe (8M TEU, 2007)
- Least imbalance between Europe N Am (c. 2M TEU, 2007)
- Impact of globalisation – but also geographical disparity between sources of raw materials and processing/manufacturing regions

World Ocean Review 1, chapter 8, p170

International shipping patterns

Regulation of shipping including containers and oil tankers:

Review notes on UNCLOS and MARPOL

Smuggling and people trafficking

Growth of smuggling and people trafficking and international efforts to manage these flows

Make sure you've read pp60-1 in the Study Guide

Smuggling and people trafficking

Growth of smuggling and people trafficking and international efforts to manage these flows

Table 19 Examples of illegal trans-oceanic flows and activities

People trafficking	■ More than 90% of the migrants who cross the Mediterranean illegally use services provided by criminal networks and their associates, according to the security agency Europol. ■ It is estimated that in 2015 alone, criminal networks involved in migrant smuggling had a turnover of between €3 billion and €6 billion. Migrant smuggling is a highly profitable business.
Smuggling	■ Smuggling and unusual shipping activity have increased across the Mediterranean and Atlantic in recent years. Europe has 70,000 km of coastline, much of which is poorly monitored by security agencies. ■ This weakness is exploited by organised criminals and terrorist organisations. Illegal drugs, guns and counterfeit goods enter the EU routinely via its coastal margins. ■ After the 2001 terror attacks in New York, maritime security standards were strengthened globally with the 2004 International Ship and Port Security Code (ISPS). Introduced by the UN's International Maritime Organization, the ISPS code gives port authorities heightened security powers to monitor shipping and control access for vessels. ■ However, much more could to be done to track the movements of shipping in territorial waters. According to the maritime security company Mast: 'If you can get a bunch of AK47 assault rifles into a shipping container somewhere in the world, then you could get them into Europe pretty easily'.

Suggest why managing the issues of people trafficking and smuggling is difficult

Study Guide p61

Seafloor cables

Growth of seafloor cable data networks including causes, trends, patterns and uses

Transfer of (initially) analogue now digital data for computer networks, telecommunications (phone/broadcasting), global trading, social media…

>90% total mileage of the internet uses fibre optic cables

99% intercontinental data traffic is transmitted via seafloor cables and the demand for bandwidth is growing by up to 40%/yr - driven partly by growing affluence

Growth very closely linked to globalisation (see p62 in the Student Guide for a useful summary of different aspects of globalisation and how they interlink with the growth of telecommunications networks.)

Animated map to show growth:

https://qz.com/657898/this-map-shows-the-explosive-growth-of-underwater-cables-the-power-the-global-internet/

Seafloor cables

The uneven seafloor cable network

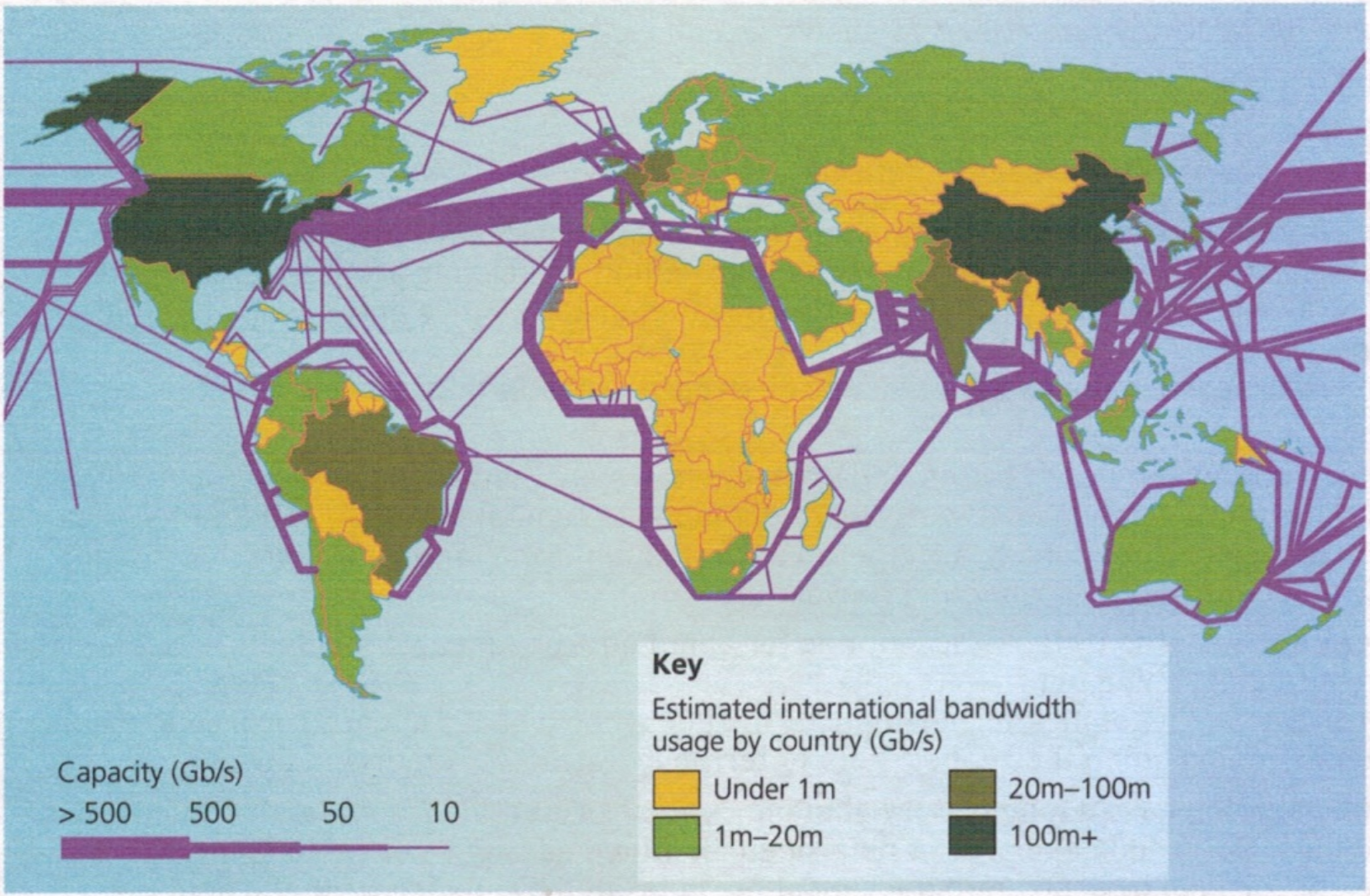


Figure 33 The uneven global distribution of undersea data cables (2012)

Seafloor cables

Reasons for the uneven seafloor cable network?

- Levels of development: more developed = more cables
- Importance to global trade (e.g. Singapore)
- Continental shelf is shallower, so easier access to monitor and repair damage. (there are no restrictions on states laying cables through EEZ/continental shelf of other states)
- As shorter cables are cheaper and less prone to damage, cables tend to follow shortest routes – often through chokepoints (e.g. Suez Canal)
- Risk mitigation – where possible the following are avoided:
  - areas of deep-sea fishing
  - areas prone to earthquakes/landslides
  - environmentally sensitive areas

Seafloor cables - risks

Some would argue that cables are mostly “poorly armoured, rarely patrolled and only occasionally monitored”[1]

However, such is their importance that there are methods to reduce the likelihood of loss of service (**mitigate** risk):

- Mylar sheaths and steel wires
- Self-healing rings
- Dual landing points
- Fast-switching between different networks
- Burying cables (widespread from 1980)

1: https://www.wired.com/2013/04/how-vulnerable-are-undersea-internet-cables/ (22/01/18)

Seafloor cables - risks

Incidence of cable faults, average per 1,000 km/yr (Atlantic/Caribbean)[1]

- 1959-79: 3.7
- after 1985: 0.44 (largely as a result of burying cables)

However, cuts/breaks happen all the time, “on average once every three days” usually from cables rubbing against rocks on the sea floor[1]

While a cut in a cable crossing the Atlantic has "no significant effect" due to the many alternate cables, only a handful of Internet cables serve the Middle East. These disruptions are only noticeable because of the small number of cables[2]

There have been > 50 repairs/yr in the Atlantic alone and significant breaks in 2006, 2008, and 2011[1]

1: https://en.wikipedia.org/wiki/Submarine_communications_cable (22/01/18)
2: https://en.wikipedia.org/wiki/2008_submarine_cable_disruption (22/01/18)

Seafloor cables - risks

1959-1996 fewer than 9% of breaks in the Atlantic Ocean and Caribbean Sea were due to natural events[1]

Earthquakes, tsunami and undersea landslides:

- 26/12/04: Indian Ocean earthquake/tsunami severely damaged coastal telecomms
- 26/12/06: 2 earthquakes in Taiwan seriously affected connections between Asian countries and North America – service had improved by 29 Dec to some extent

Anchors & trawling:

- Most usual cause of damage, e.g. 2008 a number of serious breaks occurred in Middle East/Mediterranean networks

Others:

- Reports of sharks and other fish biting cables – disagreement on scale of issue
- Hurricanes – 1982 Hurricane Iwa triggered landslides damaging cables off Hawaii
- Sabotage – difficult at depth, but has happened in the past

1: https://en.wikipedia.org/wiki/Submarine_communications_cable (22/01/18)

Seafloor cables – International Conventions

Convention for the Protection of Submarine Cables (1884) – telegraph cables – signed by c. 20 European, North & South American countries

UNCLOS – extends protection to fibre-optic cables:

- No-fishing/no-anchoring around cables
- Freedom to lay/maintain cables in EEZ and continental shelves of other states