

ISSUE NO. 1

SEPTEMBER 2025

STRAITS

AND SEA ROUTES



Maritimes
CRIMES

EDITORIAL

Dear lovers of the [sea and maritime spaces](#),

As you know, the sea is currently facing major challenges that directly impact climate change and biodiversity, on which the survival of humanity depends, having overexploited terrestrial resources. As a means of encounter and exchange between people and their cultures, the seas and oceans have become the lifeblood of the global economy.

As reservoirs of wealth, they are the object of much covetousness. As spaces open to all kinds of confrontation between nations and areas of expansion for all forms of crime, they have acquired an increased geostrategic dimension, much like cyberspace. For these many reasons, in order to protect and enhance these maritime spaces in a sustainable manner, we are committed to providing information that is free from manipulation, based on verified and accurate facts, with the aim of denouncing any criminal action that undermines the integrity of the ocean.

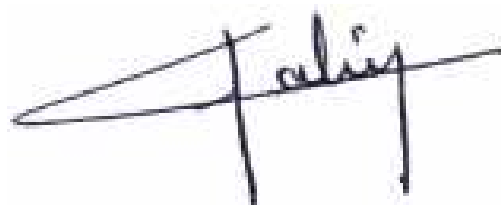
As we launch this first edition, I would like to invite you to discover a world that is both fascinating and fundamental: straits. These narrow passages, often unknown to the general public, are nevertheless at the center of the geostrategic, historical, and environmental issues that shape our era.

Today, nearly 80% of global trade is transported by sea, and straits such as Hormuz, the Bosphorus, and Malacca carry a crucial share of the energy, goods, and resources that are essential to our societies. Every day, these maritime corridors are at the crossroads of heightened geopolitical tensions, where the security of trade becomes a fragile balance, sometimes under threat. In a global context where ecological transition is imperative, these straits are also sensitive areas, subject to intense environmental pressure.

Understanding these issues means recognizing the vital importance of the oceans and their strategic passages in our daily lives, in the global economy, but also in international political stability and the preservation of our blue planet. Our ambition is to offer you, in this new format, a comprehensive and passionate immersion into this complex universe.

As a sailor who has traveled the world's seas and been involved for decades in maritime issues and strategies to protect our seas and oceans, I invite you to join us on this journey to decipher together these maritime routes at the heart of the modern world. Welcome aboard this editorial adventure, where each page is an invitation to understand and love even more the maritime world that connects us all.

Amiral, Gérard Valin
Fondateur de Maritimes Crimes

A handwritten signature in dark ink, appearing to read 'Valin', with a long horizontal stroke extending to the left.

INDEX



INTRODUCTION.....	06
01 <u>MARITIME REVOLUTION.....</u>	09
1.1 Transformation of routes.....	10
1.1.1 The Strait of Magellan, the southern gateway.....	11
1.1.2 Malacca strait.....	15
1.1.3 Suez canal.....	17
1.2 Supervision & influence.....	22
1.2.1 Panama canal.....	23
1.2.2 Gibraltar strait.....	27
02 <u>COMMERCIAL PASSAGES.....</u>	31
2.1 Law and economic.....	32
2.1.1 International law.....	33
2.1.2 Shipowners routes.....	36
2.2 Logistics.....	40
2.2.1 Goods.....	41
2.2.2 Transit fees.....	42
2.2.3 Evergreen stops Suez.....	43
03 <u>MARITIME CRISIS.....</u>	45
3.1 Conflicts in territorial waters.....	46
3.1.1 Strait of Hormuz: Energy shock and strategic leverage	47
3.1.2 Turkish straits in times of war	52
3.2 Piracy threat.....	54
3.2.1 Vulnerabilities of the Malacca Strait.....	55
3.2.2 International Fight Against Piracy.....	57
04 <u>SUSTAINABILITY OF STRAITS.....</u>	60
4.1 Environment.....	61
4.1.1 Pollution and greenhouse gas emissions.....	62
4.1.2 Initiatives Toward Decarbonization.....	63
4.1.3 Protection of marine species.....	64
4.2 Alternative routes.....	66
4.2.1 Polar routes.....	67
4.2.2 Drought in Panama.....	69
4.2.3 New chokepoints.....	71

INTRODUCTION

Three quarters of our planet is covered by oceans and seas, linking these vast waters are vital communication routes, the straits. Across the five oceans, Pacific, Atlantic, Indian, Antarctic and Arctic, there are 12 major passages and 16 secondary ones.

Holding immense strategic, geopolitical, economic and environmental importance, these straits, whether natural or man made, are essential to navigation. They serve not only as connectors between oceans but also as bridges between sea and land, bringing maritime routes closer to their overland counterparts.

The Oxford English Dictionary defines a strait as,

"A narrow passage of water connecting two seas or two other large areas of water."

Definitions we will refer to throughout our discussion, A strait can also be called a channel, a sound, or a reach, depending on the narrowness of the passage.

The term cape is used to describe a headland or a point of land jutting into the sea, which sailors have long learned to navigate around.

In Anglo-Saxon naval vocabulary, these are often referred to as chokepoints.

Bertin Projection,
1950

Maritimes CRIMES



Great maritime routes

- Main route
- Second route
- 10 biggest straits
- 16 biggest secondary straits
- 2 canal inter-oceanic route



Straits are first and foremost assets, they shorten a ship's journey and offer strategic crossing points for both trade and military operations. Traffic through these narrow passages is immense, with 90 percent of global cargo tonnage, as well as undersea power and communication cables, passing through them.

Yet they can also become vulnerabilities and constraints, making them the focus of numerous challenges. The difficulty of navigating a strait, channel, passage or cape depends on several factors, including topography such as depth and width, hydrographic conditions, meteorological elements like winds, ocean currents or ice, as well as traffic density and security risks such as piracy.

Through the lens of the blue economy, environmental regulations, geographical stakes and the history of the world's major shipping routes, this dossier aims to explore the key issues surrounding straits, in order to understand them in both their thematic and geographical dimensions.

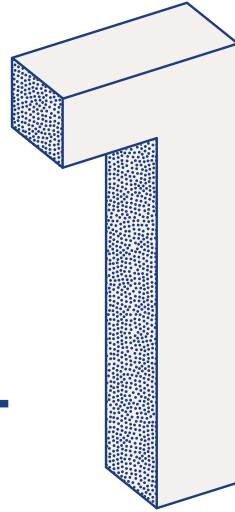
How has the history of straits shaped the major milestones of globalization, influenced global geopolitical dynamics, and at the same time threatened marine biodiversity and ecosystems?

Between vulnerability and the convergence of forces, we will examine the subject of straits by highlighting both their limitations and their advantages, the mechanisms that drive their development, and the frameworks that ensure their sustainability.

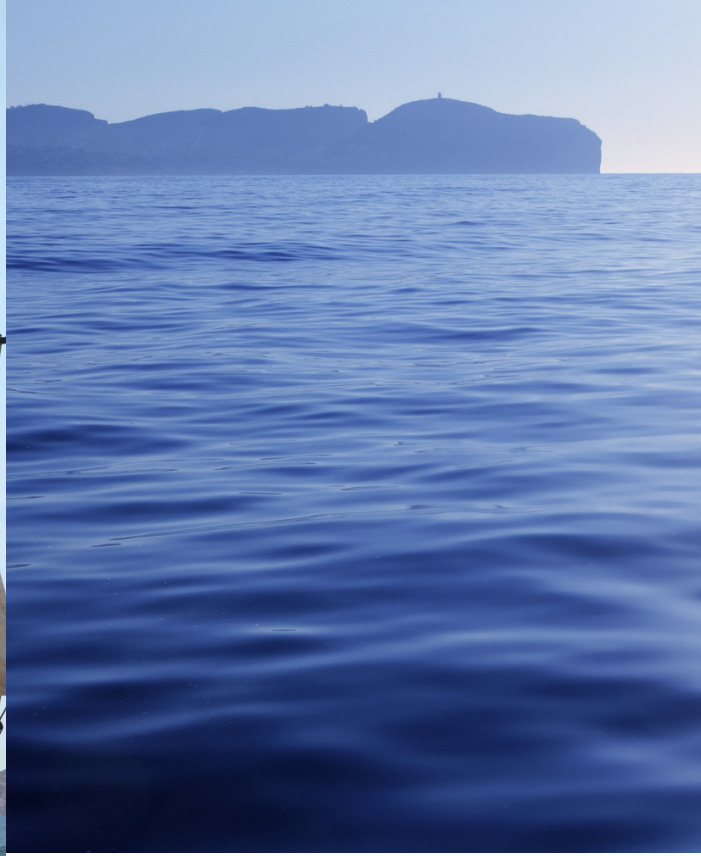




PART



MARITIME REVOLUTION



1.1 TRANSFORMATION OF ROUTES

■ **Magellan, Malacca, Suez**, the discovery or development of these great straits has revolutionized maritime navigation. Sometimes born of bold exploration, other times of unprecedented engineering, their accessibility has transformed shipping routes and shifted spheres of influence across the globe and through the oceans.

The history of these straits is closely tied to the rise and transformation of European empires and kingdoms, illustrating from the early modern period the pressing need to control these geostrategic points.

1.1.1

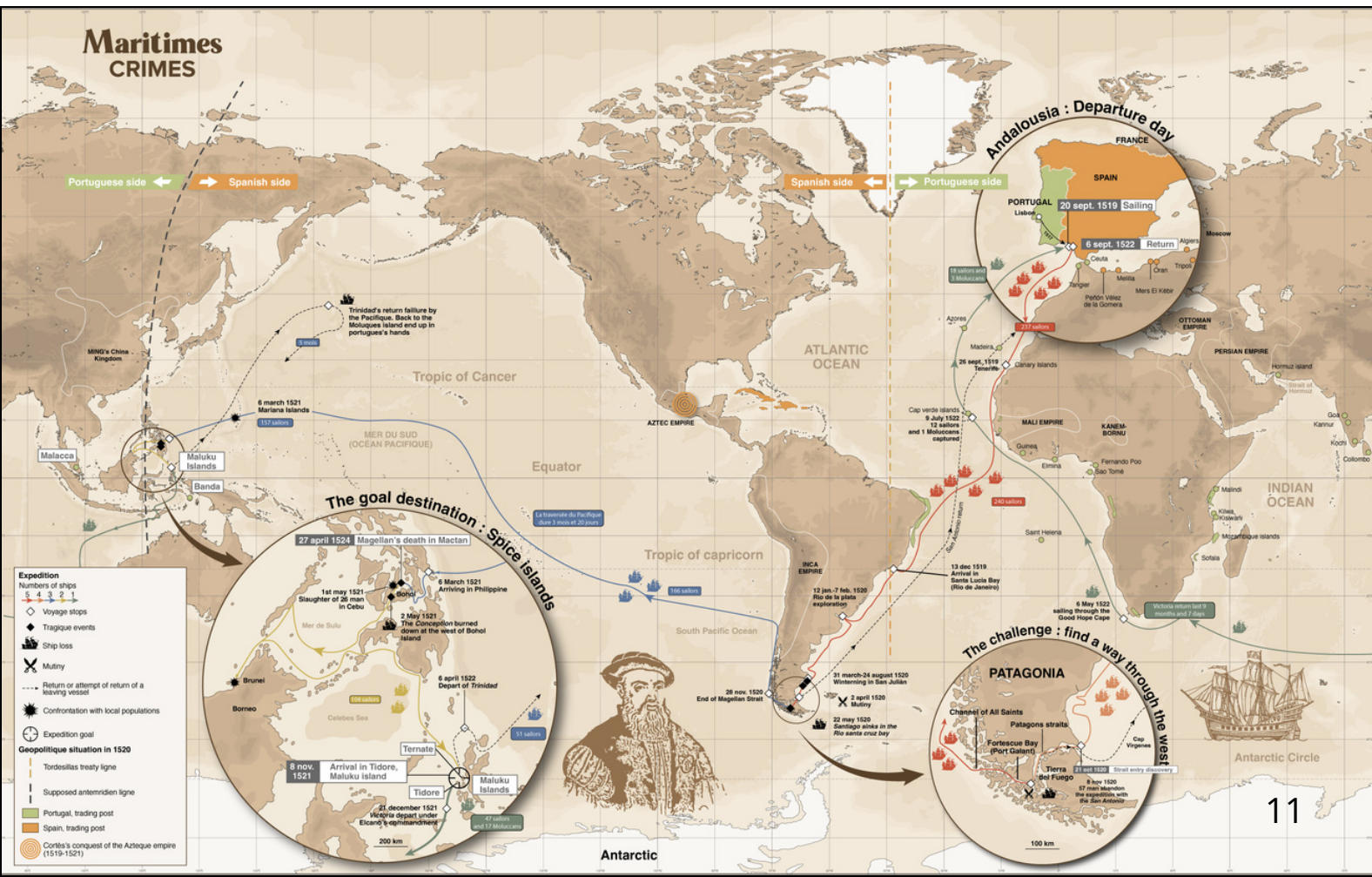
THE STRAIT OF MAGELLAN, THE SOUTHERN GATEWAY

The “Great South Sea” observed by Vasco Núñez de Balboa in **1513** stirred the curiosity of explorers of his time. It was now certain that an ocean lay between the Americas and the Indies, waiting to be reached from Europe. Ferdinand Magellan, the Portuguese navigator, was convinced he could find a passage south of the New World.

However, under the *Treaty of Tordesillas*, signed between the Kingdom of Spain and the Kingdom of Portugal, maritime routes west of the demarcation meridian and south of the Canary Islands’ parallel, near the Cape Verde Islands, belonged to Spain, while those to the east were claimed by Portugal. Thus, much like his predecessor Christopher Columbus, Magellan

sailed in **1519**, under the service of the Crown of Castile, to explore the western reaches of the globe. It was **Charles V**, then King of Spain, who entrusted Magellan with the mission of linking the Americas to the spice route and charting the path to the Moluccas by sailing westward. Since **1497**, Portugal had dominated the spice trade, holding free access to the route leading to the Indian Ocean by sailing along the African coast and rounding the *Cape of Good Hope*.

Even at that time, the control of maritime routes revealed not only economic ambitions but also geopolitical stakes in the struggle for influence





the European kingdoms. This ambition had already been strongly set in motion by the Ottoman Empire, Genoa and Venice, and later carried into the modern era by France, the Netherlands and England. This drive to control maritime passages would remain a constant for economic powers over the centuries.

Departing from the port of Sanlúcar de Barrameda, near Seville, Magellan first sailed along the Spanish trading posts on the West African coast. After passing Brazil, Magellan and his crew ventured into the unknown, as no sailor before him had charted the southern reaches of the Río de la Plata. Determined to find a passage leading directly to the Pacific Ocean, he continued along the coastline from December **1519** to March **1520**, when he and his men stopped in the Bay of San Julián, in southern

Argentina, in Patagonia. The voyage continued after a five-month halt, resuming in August with the return of favorable weather.

In October **1520**, Magellan finally reached the very objective of his expedition, the strait that would lead him to the Pacific, lying between the southern tip of Argentina and Chile. It would take him a month to navigate the 611 kilometers of this passage and emerge into the so-called "*Great South Sea*," before reaching the Philippines a hundred days later. The ocean Magellan crossed was calm and serene, prompting him to name it the Pacific Ocean, even though he and his crew had endured famine and scurvy along the way.

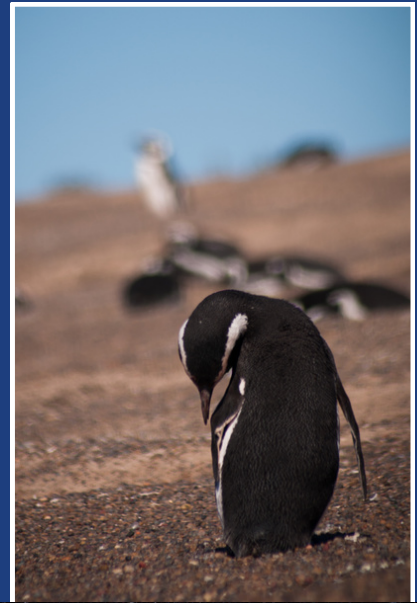
Thus, the Portuguese explorer not only charted the coasts of South America but also discovered the location of the strait that now bears

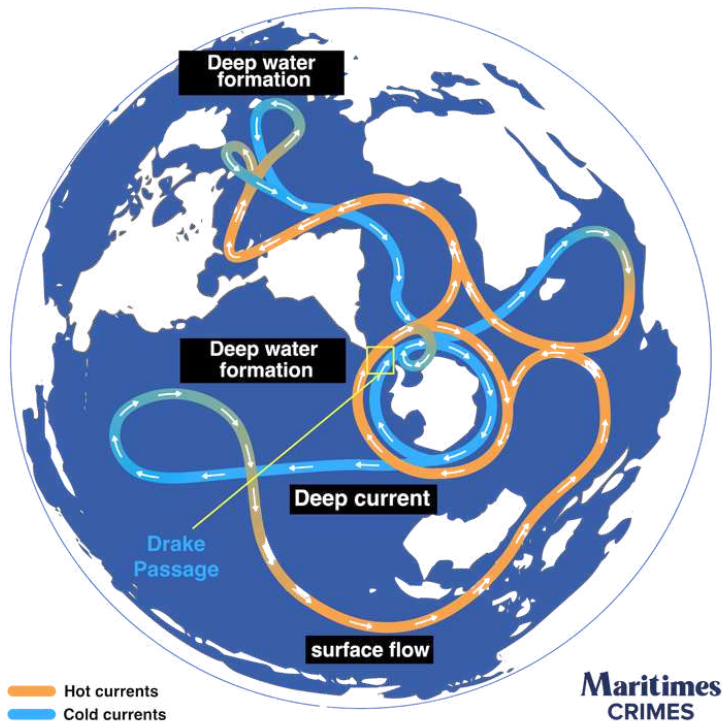
his name, but also became the first known European explorer to have crossed the largest ocean in the world, the Pacific.

Setting out with five ships and **239** men, the expedition returned to the port of Sanlúcar de Barrameda three years later, in **1522**, without Magellan, with only one ship and **17** surviving crew members. They were the first known men to have sailed around the world. This discovery played a pivotal role in reshaping global maritime trade.

The Strait of Magellan opened a new route to Asia as well as to the southern regions of the Americas, linking two of the world's largest oceans, the Pacific and the Atlantic.

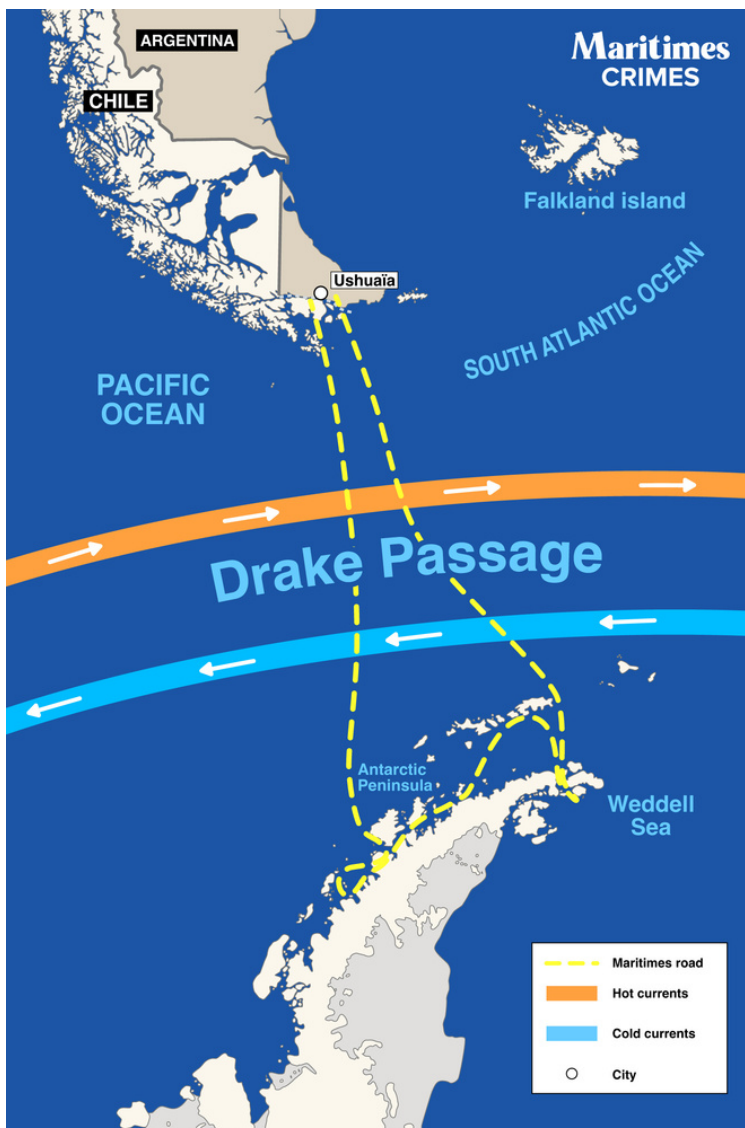
It allowed sailors to avoid the long voyage around Africa, perilous due to strong currents and, above all, monopolized by Portugal. The strait quickly became a strategic point for the Spanish crown and played a role in the early stages of European competition. Despite its rocky islets and fierce gusts of wind, it was favored over Cape Horn, located further south and discovered in **1616**.





Less exposed to the powerful currents of **Cape Horn and the Drake Passage, the Strait of Magellan** is also sheltered from icebergs.

It was not until **1914**, with the opening of the Panama Canal, that the Strait of Magellan lost its status as an essential maritime route. Today, although the strait benefits from port infrastructure such as Punta Arenas, it remains underdeveloped in terms of service ports and logistical support. While there are no customs duties or transit fees to access the strait, vessels may be subject to escort charges due to occasionally challenging weather conditions.



Chile and Argentina both exercise sovereignty over the Strait of Magellan and may enforce measures and restrictions, particularly regarding the preservation of marine biodiversity. Although less frequented by merchant vessels today, the passage remains popular with tourists, cruise ships, and expeditions, drawn by the richness of its birdlife.

1.1.2 MALACCA STRAIT

Unlike the **Strait of Magellan**, the **Strait of Malacca** was well known to Chinese, Arab, and Indian navigators since antiquity. For centuries, these traders came to exchange goods such as cloves, black pepper, camphor, rare resins, pearls, and nutmeg.

As the main maritime channel between the Indian Ocean and the Pacific, Malacca's position was so strategic that the Portuguese chronicler Tomé Pires said in the **16th**

century, *"Whoever is lord of Malacca has his hands on Venice's throat."*

Perfectly positioned between India and China, linking the two oceans that dominated the spice trade, Malacca was destined to become the focus of European ambitions. The shortest route between the Indian Ocean and the South China Sea stretches for **940** kilometers, with a minimum depth of **25** meters, and a width ranging from **3** to **39** kilometers depending on the location within the strait.



In the early 16th century, the Portuguese launched a determined campaign to monopolize the spice trade route.

At that time, Malacca was not only a point of convergence between Java and the Moluccas, China, Yemen, and Gujarat, but also a major center for theological exchange and Muslim literature. Linking the South China Sea with the Andaman Sea, the strait formed the strategic lock of the Asian world.

The city of Malacca then had a population of around **40,000** and was governed by the Malay Sultanate.

In the **1450s**, the Portuguese were still engaged in crusades against the Moors in Europe and against the Ottoman Empire in the Mediterranean, and they sought to confront Islam on its eastern flank as well. The Strait of Malacca therefore held both commercial and religious significance. King Manuel I of Portugal sent Afonso de Albuquerque to seize the East Indies.

Commander of a Portuguese armada, this great navigator had already built the fortress of Cochin in India in **1503**, captured Ormuz in **1507**, and taken Goa in **1510**, which he transformed into the capital of Portuguese possessions.

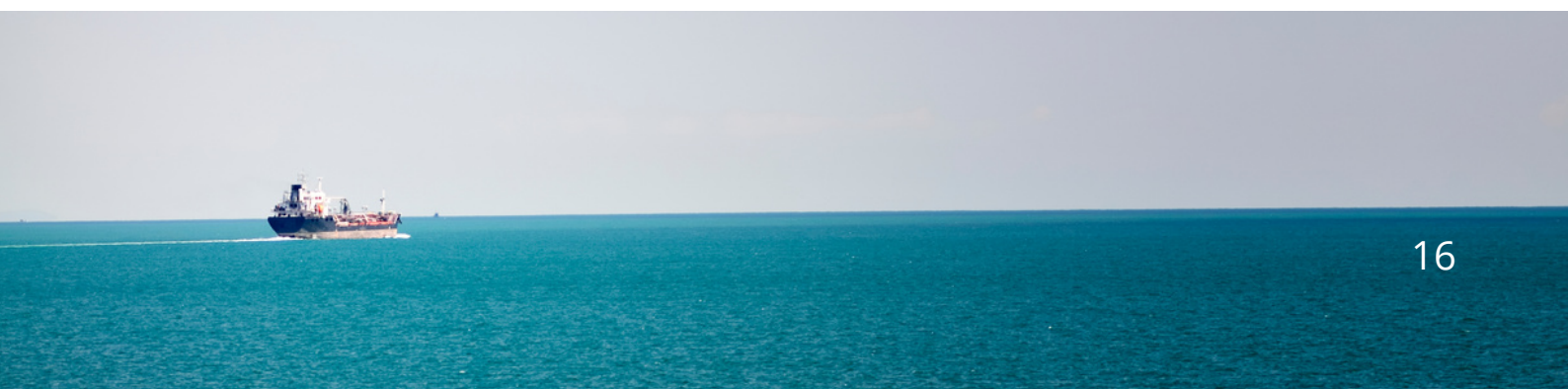
Having already secured the Arabian and Indian routes, he arrived in **1511** before the port of Malacca.

The conquest was made possible by internal divisions within the Malay Sultanate as well as the Portuguese's superior naval power.

After defeating the Malays, the Portuguese feared losing control of the strait. In truth, the fortresses they built would protect them only until 1641, when the Dutch arrived. Insulinian trade later came under British control in 1786 with their establishment on the island of Penang, where they developed the strait's port infrastructure.

It was not until **1957** that the Federation of Malaya gained autonomy and took possession of the strait. Today, the Strait of Malacca is jointly controlled by Malaysia, Singapore, and Indonesia.

In modern times, the Strait of Malacca is the busiest strait in the world and one of the primary transit points for oil tankers, with 15 percent of them passing through its waters. However, this massive flow of ships brings significant challenges, including the risk of accidents, piracy, territorial disputes among littoral states, and influence rivalries within ASEAN. These strategic and security concerns remain at the forefront of both regional and international agendas.



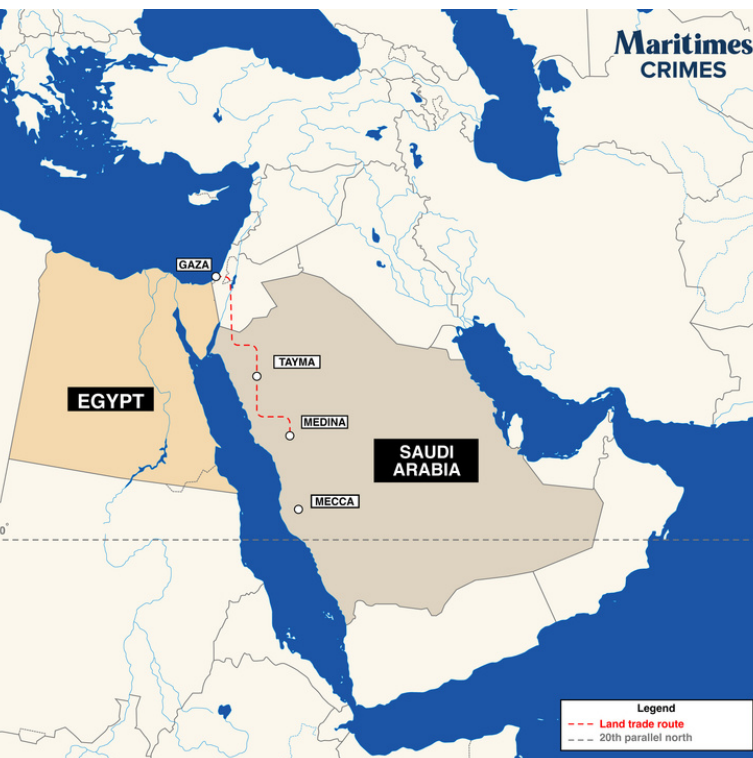
1.1.3 SUEZ CANAL

Since antiquity, the Egyptians were well aware of the geographical potential of their land, bordered by two of the most important seas for regional maritime trade,

the Mediterranean Sea and the Red Sea, this territory was already destined to become a key gateway. At that time, the incense and spice trade flowed both overland, along the Arabian Peninsula via the route from Medina through Tayma and finally to Gaza, and by sea. The monsoon winds in the southern **Red Sea** diminished beyond the **20th parallel**, south of Mecca.

As a result, the calmer navigation in the northern Red Sea and at the entrance to the Gulf of Suez prompted Necho II to dig the so-called “*Canal of the Pharaohs*.”

This new route also provided an opportunity to divert a significant portion of Arabian Peninsula trade toward Egyptian customs, increasing both the region’s commercial influence and its strategic control over maritime exchanges.



Herodotus notes in Histories that the construction works are said to have claimed the lives of **120,000** men. Necho II’s ambition was well-founded, based in particular on a geostrategic assessment that took into account the concessions

granted to Greek settlements such as Naucratis and the city of Memphis, which he sought to overshadow.

Although the Canal of the Pharaohs was not completed during the reign of Necho II of the Saite dynasty, it was

eventually finished under the Persian king Darius I, who was equally aware of the canal’s importance and commercial potential, in the **4th** century. Two centuries after the Persian king’s works, Ptolemy II, the Macedonian ruler, considered

the canal as a strategic tool. Master of the Mediterranean, his influence aimed to extend into the Red Sea and along the coasts of Eritrea, passing through the port of Adulis, a true thalassocracy. Trade also diversified with goods unique to Africa, such as ivory.

Finally, after the Saite dynasty, the Persians, and the Romans under Trajan, the Arabs under the conqueror Amr ibn al-As began dredging works on the waterway in **642**.

The opening between the **Red Sea** and the **Mediterranean** via the Gulf of Suez and the **Suez Canal** created a genuine zone of economic and commercial attraction in the region, while the Nile Delta, with its branches such as Damietta, formed a major river network flowing into the Mediterranean.

Along this new communication route emerged towns and ports such as *Bubastis*, *Pithom*, and the port of *Clysma*. These were not only important commercial hubs but also vital for military resupply and, much like the **Strait of Malacca**

and also served a religious function with the construction of temples.

Ultimately, it was Caliph Abu Ja'far al-Mansur who sealed the canal in **768** to prevent any foreign invasion of the holy city of Mecca, located on the opposite shore of the Red Sea. This was the same reason Necho II had halted construction after receiving an oracle warning him that he was "*working for the barbarian*." The two seas would not meet again for eleven centuries.

The location of Suez was so crucial that, in **1798**, it became the focal point of rivalry between the British Empire and revolutionary France in a struggle for influence.



Historic rivals in Europe, France sought to blocking the British route to their colonies in the Indies.

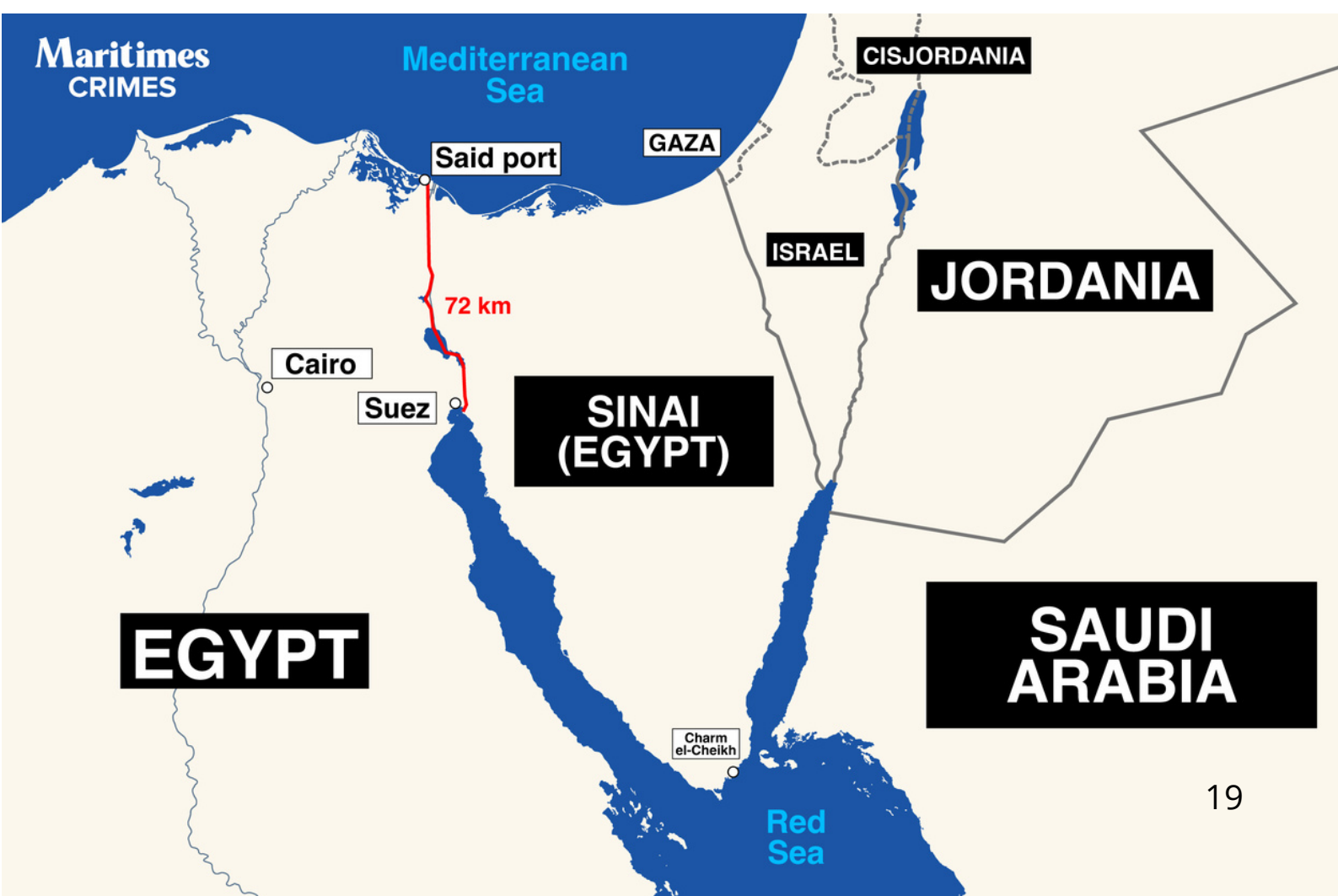
During the Egyptian campaign, the French took the opportunity to study the Suez isthmus with scientists such as Jacques-Marie Le Père. The young General Bonaparte, sent during the Egyptian expedition, wrote

: *"At this very moment, I am carrying out the necessary operations to identify the spot where the waters can be directed to link the Nile with the Red Sea."*

"This connection once existed, for I have found traces of it in several places."

The idea of a canal has endured through the ages, never losing its geostrategic, commercial, or political significance. Building on the discoveries made at the end of the 18th century, the French proposed to the Egyptian governor, Mohamed Said Pasha, the concession of land for the canal's construction. In **1846**, the **Suez Canal** Survey Company corrected the earlier research that had been carried out

by confirming that the difference in sea level between the Red Sea and the Mediterranean was only nine meters, making the canal's construction simpler as it would not require a system of locks. An agreement was reached in 1854 between Ferdinand de Lesseps and Said Pasha, despite British appeals to the Ottoman Empire to cancel the works in favor of a railway line. With the support of Napoleon III and the active involvement of Ferdinand de Lesseps in overseeing the canal's construction,



the works began in 1859.

Echoing the first breakthrough in antiquity, the construction of the Suez Canal, initially 164 kilometers long, is said to have claimed the lives of 125,000 people, victims of cholera. The canal was completed in 1869, crossing the Great Bitter Lakes and Lake Timsah, with an initial width of only 52 meters.

This new passage between Asia and Africa required ships to be equipped with engines, and its construction accelerated the adoption of steam power, which in **1860** equipped only **5%** of vessels.

When the **Suez Canal** was completed, Egypt held a **44%** ownership stake, with the remainder in the hands of French shareholders. However, the situation changed in **1875**, when Egypt, burdened by heavy foreign debt, sold its shares to the United Kingdom.

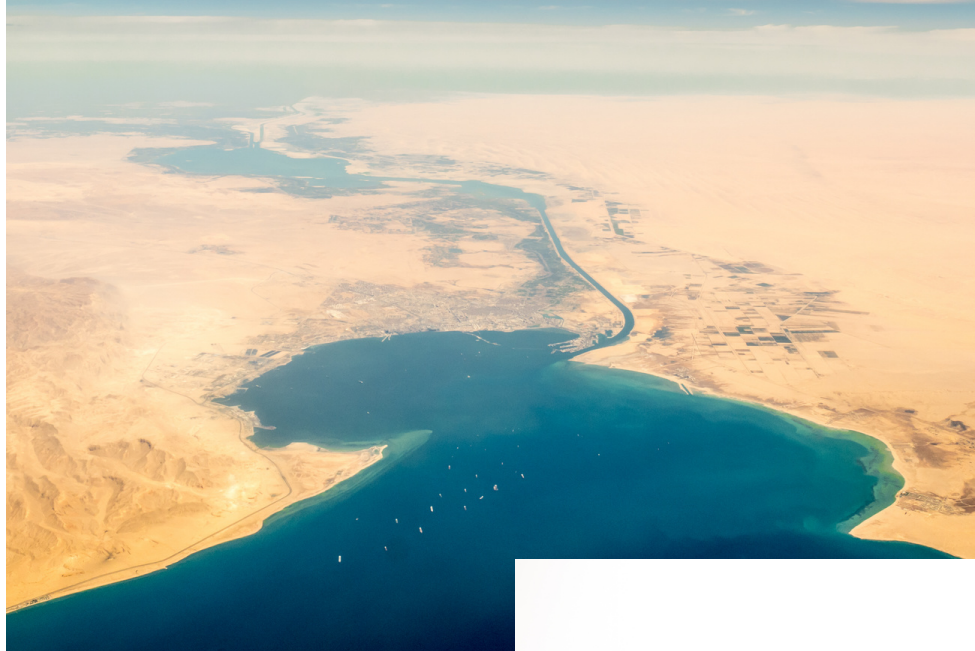
It was a major opportunity for the British, who seized it to secure their routes to India. Just a few years later, in 1882, they further strengthened their position in

the region by becoming Egypt's overseers, replacing the Ottomans.

It was no coincidence that the world's two greatest empires found themselves here. After the First World War and the *Sykes-Picot* Agreement, France and Great Britain divided the Middle East into spheres of influence.

Control of the area secured the **Suez Canal**, as British and French interests were now aligned, and the fall of the Ottoman Empire removed a potential source of regional tension.

However, Egyptian leaders, first in **1951**, with Prime Minister Mostafa El-Nahhas Pasha, and later in 1956, with Gamal Abdel Nasser, President of the Republic of Egypt, openly





rejected the presence of Europeans. Finally, in **1956**, the canal was nationalized, triggering an unprecedented crisis.

From the English Channel, the Suez Canal shortens the route to the Indian Ocean by **9,000** kilometers, and from Marseille by 11,500 kilometers, saving around ten days at sea, making it one of Europe's most valuable maritime passages.

Its geographical position offers further advantages: the Red Sea is relatively easy to navigate thanks to favorable weather conditions, providing a direct link to the **Bab el-Mandeb Strait**, the **Suez Canal** opens eastward toward the Arabian Peninsula's coastline and, beyond the **Gulf of Aden**, to the Gulf countries.

This maritime route, encompassing oil-producing countries such as Kuwait, Bahrain, Qatar and Oman, is therefore one of the major corridors for the petroleum industry, with 10 percent of global oil trade passing through this strait according to the International Energy Agency. However, this massive influx of tankers carries the risk of an environmental disaster, with a heightened threat of oil spills.

Moreover, despite its ideal location, the threat of pirate attacks remains in the area, particularly further south in the **Bab el-Mandeb Strait**, which vessels cannot avoid if they transit through the **Suez Canal**.

Despite technological advances and successive widenings, the strait remains constrained by its width and depth. Finally, among the world's major maritime routes, the Suez Canal has the highest transit fees, ranging from **250,000** to **400,000** US dollars per passage according to the *Suez Canal Authority*.



1.2

SUPERVISION & INFLUENCE

- Major maritime passages, **the Strait of Gibraltar** and the **Panama Canal** are the gateways to the Atlantic. The former, located between Spain and Morocco, is known as the entrance to the Mediterranean and, throughout history, has been a focal point of geostrategic ambition for its position between Europe and Africa.

More recently built, the **Panama Canal** is an artificial strait that has long been the subject of controversy and political interest. Between surveillance and influence, these two passages share the fact that they are, or once were, in the hands of foreign powers.

1.2.1 PANAMA CANAL

The Isthmus of Panama was first crossed by Europeans in **1513** by Vasco Núñez de Balboa, a Spanish navigator. From the moment it came into contact with the Western world, the isthmus, linking the Caribbean Sea to the Pacific Ocean, was quickly seen as a potential site for a new maritime route.

At that time, and until **1914** with the opening of the canal, ships coming from Europe had to sail around Cape Horn. Aware of the time savings offered by a crossing through Central America, goods were first transported overland and then shipped from the Pacific coast,

a system that became firmly established and was regularly used during the Gold Rush to reach what is now California.

The route through Panama, by ship from Europe, was considered safer than a land crossing of the United States.

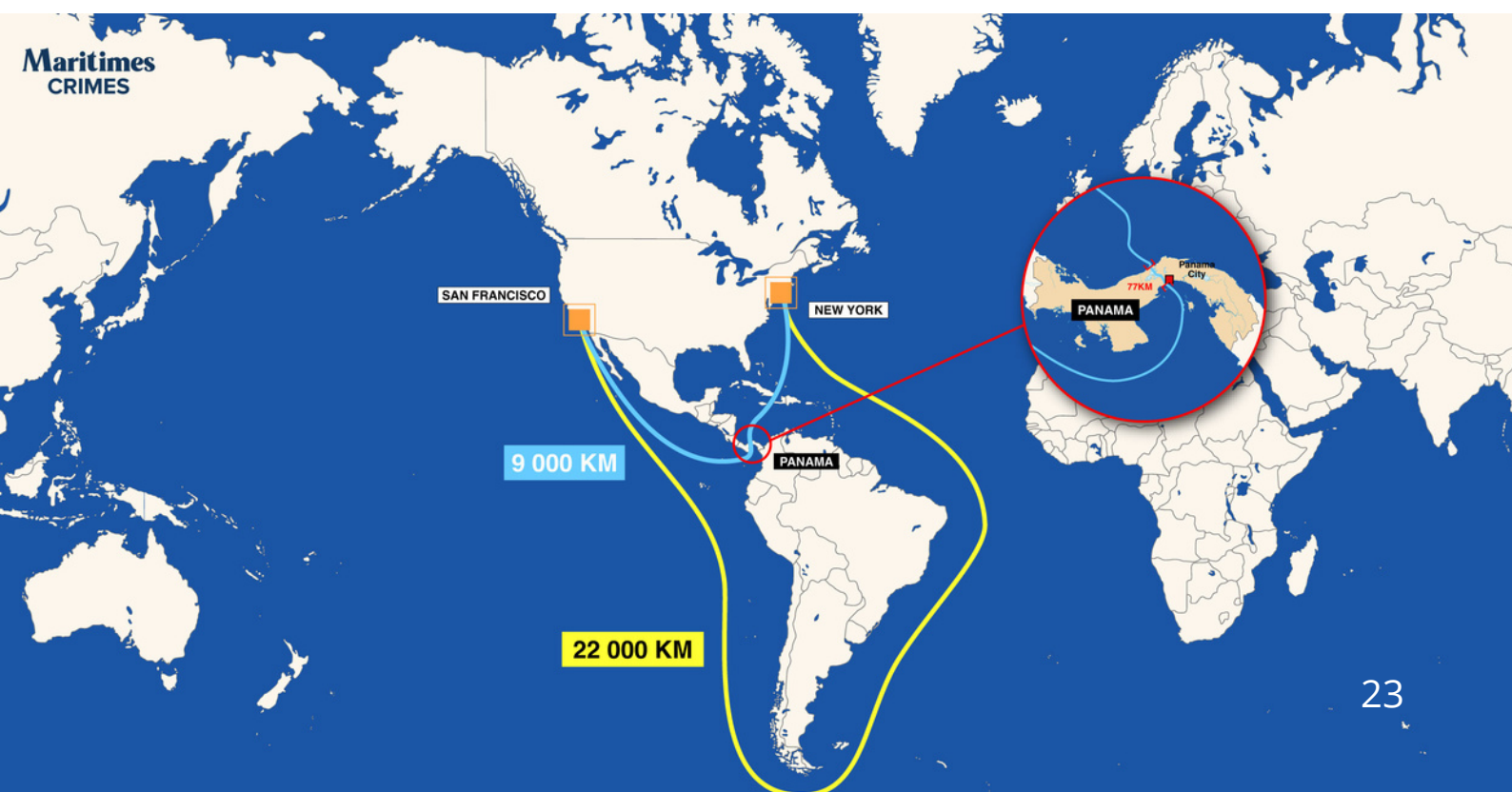
Buoyed by his success in Suez, Ferdinand de Lesseps was among the first engineers to propose works for the construction of the **Panama Canal**.

Indeed, the location was geographically ideal, as crossing the isthmus saved weeks of travel between the Pacific Ocean and the Atlantic Ocean. The canal would span 80 kilometers and could be navigated in just a few hours by sea, between **8** and **10** hours.

and it was already partly crossed by the Chagres River. The concession was negotiated in **1878** for a duration of **99 years** with Colombia, which at the time held sovereignty over Panama.

More complex to build than the **Suez Canal**, the creation of the Panama Canal proved to be a failure for the French commission, despite having renowned engineers such as Gustave Eiffel.

Unlike the **Suez Canal**, the Panama Canal lay in a tropical zone subject to storms, earthquakes, challenging terrain, and a heavy rainy season. Logistical difficulties were compounded by political scandals and a devastating sanitary crisis, with **27,000**



people dying from yellow fever and malaria, along with funding issues that turned the canal's construction into a financial abyss.

The story of Panama did not end there. The Americans, who had initially set their sights on Nicaragua for a canal project, shifted negotiations toward the Isthmus of Panama after the French withdrawal. Reluctant to repeat the French experience, Colombia refused at the start of the 20th century to grant the United States a concession

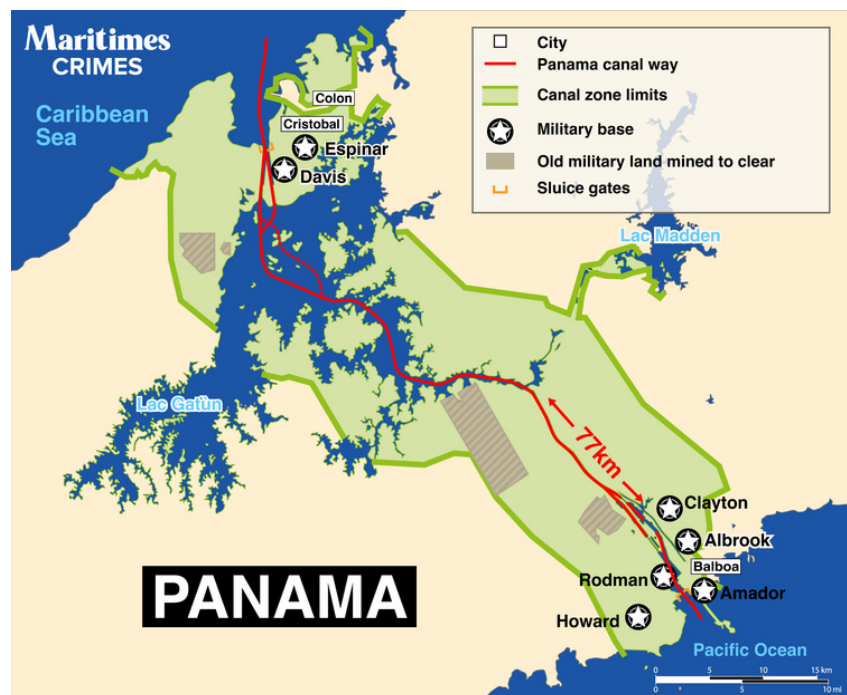
To reach an agreement, the United States did not hesitate to support Panama's independence from Colombia following the latter's refusal. In 1903, U.S. President Theodore Roosevelt aimed to negotiate directly with Panama, which was far more willing to grant the concession for the Panama Canal.

This effort paid off with the signing, in the same year and just days after Panama's independence, of the *Hay-Bunau-Varilla Treaty*.

The treaty granted considerable advantages

for Washington, granting permanent rights including "the use, occupation and control of the Canal Zone (8 km), for the maintenance, operation, sanitation and protection of the canal."

These advantages also included the possibility of acquiring land outside the Canal Zone, deemed necessary for the long-term operation of the canal. This applied in particular to additional water areas such as Gatun Lake, then the largest man-made lake in the world, and Lake Alajuela.



From this French failure, however, came a few advances. First, when the Americans took over the concession and the works in **1903**, they built on the idea of locks originally conceived by Gustave Eiffel and further developed by John Frank.

Located **26** meters above sea level, the Panama Canal was far more complex to construct than the Suez Canal.

These locks, described as “water steps” operating through water pressure, transformed the canal’s design. In total, there are 6, 3 on each side, to raise vessels to an altitude of 26 meters above sea level.

The Americans also made progress with the help of scientists. The health crisis caused by yellow fever led several doctors, including Walter Reed, to work toward what would later become a vaccine.

The construction of the Panama Canal by the United States reshaped the very structure of global maritime trade. This American determination can be explained by several factors. The first was the reduction in sailing time between New York and San Francisco by sea, cutting the distance by 14,800 kilometers.

Beyond commercial considerations, pre-war America sought to pursue an imperial-style policy of influence, aiming to tighten the United States’ presence both in the Caribbean Sea and in the

Caribbean and in Latin America. Already outlined in the Monroe Doctrine, this policy was formalized through the Roosevelt Corollary, its direct extension, as well as Theodore Roosevelt’s Big Stick Doctrine in the early 20th century. It was during this period that the United States took control of Cuba, Puerto Rico, California, Guantánamo, as well as Guam and the Philippines.

The final gateway in the Caribbean, which would bring together the two spheres of American influence, was the **Panama Canal**.



By establishing themselves on the isthmus, the United States expanded their military presence in Central America. The locks were enlarged to allow U.S. warships to pass through the canal, a standard that would go on to define the size of the new generation of merchant vessels, known as "Panamax."

Coco Solo, Fort Clayton,
co Solo, Fort Clayton,



Rodman, Sherman, Howard, numerous military, naval, and air bases were built around the canal.

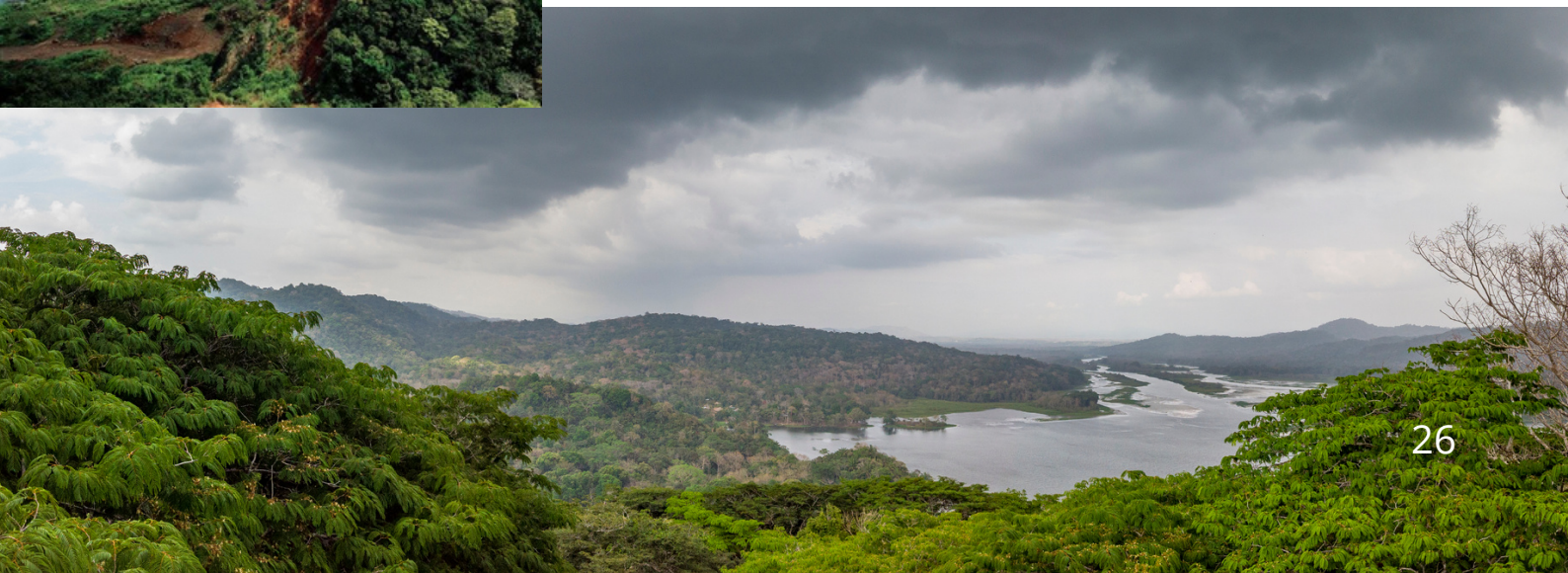
Opened in **1914**, the Panama Canal returned to Panamanian control in **1977** under the Carter administration in the United States and the Torrijos government in Panama, with the signing of the *Carter-Torrijos Treaty*. From that date, the United States had until 1999 to withdraw from the canal, hand over its administration to the Panamanians, and dismantle their military bases.

This shift was driven by Panamanian opposition dating back to **1914** over several disputed points in the agreement, as well as by tensions between Panamanians and Americans, and a change in policy under the Democratic Party.

Nevertheless, U.S. ambitions did not end there.

In **2025**, during his inauguration speech, Donald Trump, elected as the 47th President of the United States, declared his intention to "*take back Panama*," even though it was fully under Panamanian sovereignty.

Accused of being under Chinese control, the Panamanian government denied falling under Beijing's influence, despite the presence of two Hong Kong-operated ports, *Balboa* and *Cristóbal*. Washington has every reason to keep a close watch on the situation, as the canal accounts for **71 %** of U.S. vessel transits.



1.2.2

GIBRALTAR STRAIT

The Strait of Gibraltar is regarded as the gateway to the Mediterranean and the main maritime corridor between Africa and Europe. It is a natural strait controlled by three countries: Morocco, the United Kingdom, and Spain. While Morocco and Spain are the two historic coastal nations bordering the strait, the United Kingdom has held a presence on the Rock of Gibraltar since 1704, a consequence of the War of the Spanish Succession following the death of King Charles II.

This period marked the true rise of British power and its growing weight in geopolitics and maritime affairs. The Rock of Gibraltar gave the British a firm presence in the Mediterranean, threatening their historic rival, France, which had to contend with this new challenge throughout the 18th and 19th centuries.

In this context, the Battle of Trafalgar in 1805, fought northwest of the Strait of Gibraltar between the British and the French, illustrates the role the strait played in access to and control over the Caribbean, from where European ships had long set sail.

The Strait of Gibraltar gained even greater strategic importance with the opening of the Suez Canal. Although it had already held a privileged position as the entrance from the Atlantic into the Mediterranean, a sea otherwise largely enclosed, it became a key waypoint for ships linking to East Africa through the Suez Canal after 1869.

It was nothing short of a maritime revolution, as the British could reach their colonies in India more quickly by passing through the Strait of Gibraltar. They thus had every interest in maintaining sovereignty over the Rock of Gibraltar, despite Spain's claims. The route around Cape Horn became



obsolete, as ships gradually abandoned it and shifted importance to the Mediterranean Sea.

Such an advantageous position that during the Second World War the Germans considered seizing the British Rock (Operation Felix) in order to cut off Britain's route. The operation, however, was never carried out, as U-boats faced major difficulties maneuvering. Strong currents and limited depth put an end to the Third Reich's ambitions.

On the African coast, two autonomous Spanish cities border the **Strait of Gibraltar**: *Ceuta* and *Melilla*. Both are significant, giving Spain a major commercial role in direct competition with the port of Tangier, ranked as the 10th largest port on the African continent. Tangier Med has established itself as a key maritime player, a vital logistical and commercial hub connecting the two continents.

In **2024**, it recorded a record traffic volume of **142.6 million** tonnes, with growth

notable in container traffic, up by **18.8%**. This dynamism has made *Tangier Med* a direct competitor to Spanish ports in the region, particularly in the field of maritime freight.

The **Strait of Gibraltar** is one of the busiest maritime passages in the world, with around 300 vessels transiting each day. This intense flow highlights the importance of port infrastructure in the region to ensure the smooth movement of maritime trade.



Tangier Med, in particular, plays a key role in transshipment and the distribution of goods between Asia, Africa and Europe.

For shipowners, using the Strait of Gibraltar is a favorable option since it is an international waterway with no tolls or customs duties applied. However, pilotage fees and port charges in surrounding port areas must be taken into account by shipping companies.

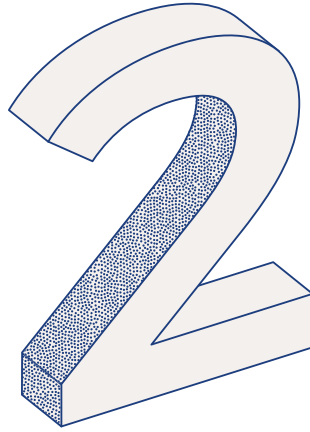
Today, the strait faces demographic challenges and migratory flows between Africa and Europe. Diplomatic relations, particularly between Spain and Morocco, are at times strained or even severed, leading to disputes over border migration policies.

The security challenge posed by people crossing the **Strait of Gibraltar** by boat or even swimming represents a significant risk. The strait's commercial importance has also allowed the Mediterranean and the English Channel to strengthen the role of ports such as Marseille and Antwerp, making the area a focal point for major economic players like China, which has included the Strait of Gibraltar in its *New Silk Roads initiative*.





PART



COMMERCIAL PASSAGES



2.1

LAW AND ECONOMIC

- The conventions and treaties governing straits are numerous and shape the accessibility of these passages. Their provisions are varied and at times complex.

Both structural and economic organization are essential to the smooth conduct of maritime journeys, benefiting not only states but also economic stakeholders.

2.1.1 INTERNATIONAL LAW

The Montego Bay Convention, also known as the United Nations Convention on the Law of the Sea (UNCLOS), redefined the legal framework of straits. Some straits that had long served international navigation gradually shifted toward a territorial regime, falling within the twelve nautical miles of national waters. In 1995, Y. Lacoste identified five distinct legal statuses for straits. Straits located in inland seas form a special category, such as the **Danube** and the **Dardanelles**.

In the Baltic region, several agreements have shaped the regulation of straits, including the Treaty of Versailles of **1919**, the Geneva Convention of **1921**, and the **1979** agreement between Sweden and Denmark.

The **Montego Bay Convention**, signed in 1982, came after most of these treaties. Under Article 35(c), *UNCLOS* specifies that Part III does not alter the legal regime of straits already governed, in whole or in part, by long-standing international conventions

. Earlier agreements therefore remain valid, with their own provisions. These include the internationalization of the Kiel Canal, provided that both merchant and military ships are at peace with Germany, and the treaty on the **Gulf of Bothnia**, which established a Finnish demilitarized zone and prohibits the passage of warships, including those of *NATO*.



■ However, the Danish ordinance of **1999**, which limits to three the number of warships from the same country that may pass through at the same time, does not comply with *UNCLOS*. In general, the conventions and treaties applicable to the law of the Baltic Sea guarantee the free movement of merchant vessels.

During the two World Wars, the Baltic straits played a crucial geostrategic role.

Today, these straits remain particularly important within the framework of European cooperation.



The situation is somewhat different for the Turkish straits, particularly the Dardanelles and the Bosphorus.

Both are located within Turkish territorial waters and are governed by the Montreux Convention of 1936 and the Geneva Convention of 1948.

It should also be noted that Turkey is not a signatory to UNCLOS.

Transit between the Black Sea and the Mediterranean is controlled by two major straits, the Dardanelles and the Bosphorus.

Since 1936, control of these straits has been entrusted to Turkey, which may close them to belligerent states in times of war or if it feels threatened.

Innocent Passage

This refers to the passage of warships or merchant vessels through the territorial waters of a state on their way to international waters, provided that such passage does not cause harm to the coastal state. The United Nations Convention on the Law of the Sea defines innocent passage as *"navigation that is not prejudicial to the peace, good order or security of the coastal State"* (Article 45).

High Seas Freedoms Regime

Straits subject to this regime are considered part of the high seas only if they are more than 24 nautical miles wide between the coasts of two littoral states. They are therefore not under the exclusive sovereignty of any single coastal state. Freedom of navigation is guaranteed for all ships, regardless of their nationality (Article 36).

Transit Passage

This refers to the freedom of navigation for continuous and expeditious transit (Article 38).

In peacetime, the transit of warships and submarines through these straits must be preceded by notification to Turkey, which retains the right to deny access. Littoral states benefit from a shorter notification period.

Control over these straits is crucial in this part of Europe, particularly since Russia's invasion of Ukraine. On the diplomatic level, Turkey manages them in line with its own interests and alliances. It should be recalled that Turkey has been a member of *NATO* since **1952**, a decision largely influenced by earlier Russian pressure over the Bosphorus Strait.

Access to the **Strait of Hormuz** is at the heart of recurring tensions between Iran and the United States.

The legal status of this passage is problematic, since neither Iran nor the United States has ratified *UNCLOS*, while the Sultanate of Oman, which controls the southern shore of the strait, has done so. Aware of the strait's importance, where 35 percent of global crude oil transits, Iran has regularly threatened since **2011** to close the passage or even mine its surrounding waters.

Oman, applying *UNCLOS*, has developed a narrow maritime corridor regulated by traffic separation schemes adapted to the depth of the sea. Thanks to its territorial waters, vessels may cross the Strait of Hormuz under international law and the right of transit passage.

Ships navigating here must take care not to leave the designated lanes, at the risk of being harassed by the Pasdaran aboard speedboats or by helicopters.



SHIPOWNERS ROUTES

■ Taken as a whole, these alliances provide crucial advantages for global trade. By pooling their fleets, shipowners reduce operating costs and offer more competitive rates, while increasing the frequency of sailings through vessel sharing, which allows for more regular services.

They also extend their geographical coverage, offering a truly global network. These partnerships help secure supply chain stability, with about 30 percent of world trade passing through the Strait of Malacca, **12%** through Suez and **Bab el Mandeb**, and **5%** through the **Panama Canal**.

When confronted with disruptions such as regional conflicts, piracy or weather conditions, alliances can quickly redirect traffic, for example via the Cape of Good Hope, and maintain continuous service.

In short, these strategic partnerships are the key to smooth and secure global navigation, ensuring that vital straits do not become bottlenecks for international trade.





2.1.2

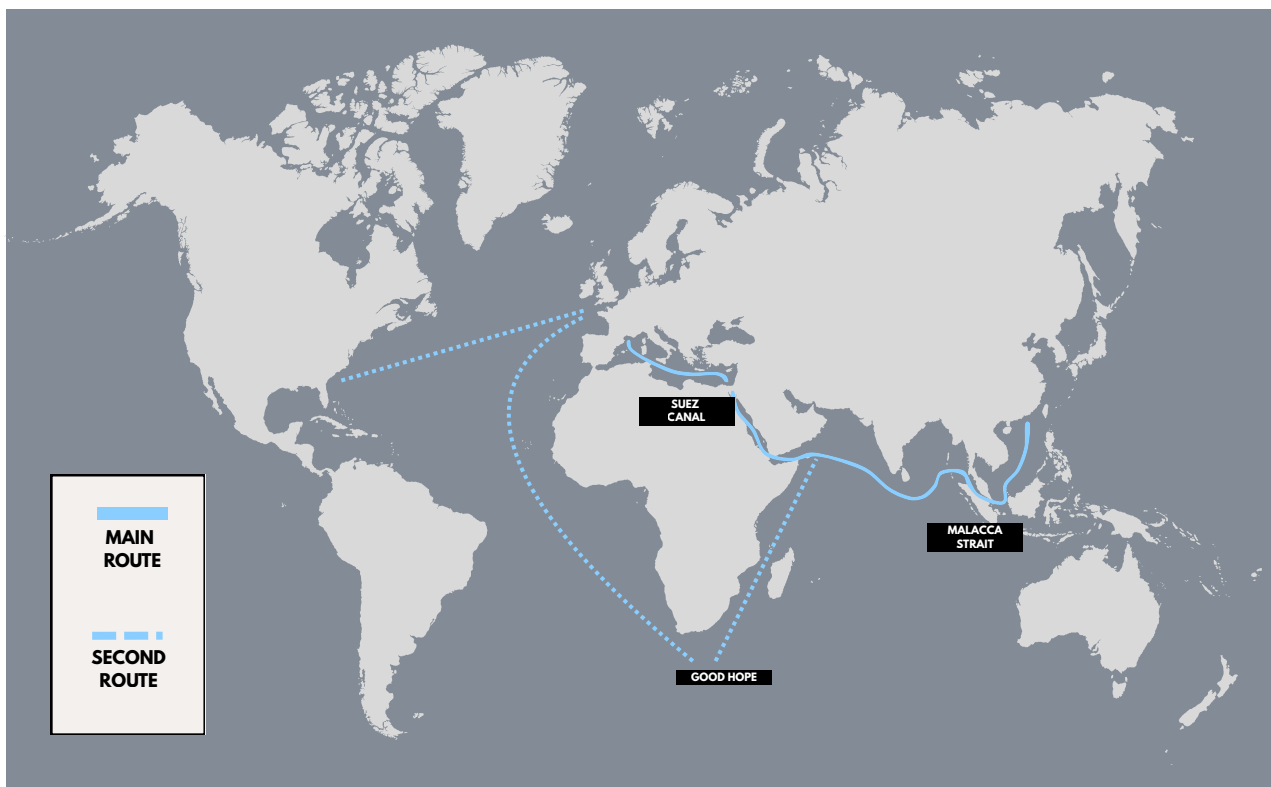
OCEAN ALLIANCE



Launched in **2017**, the Ocean Alliance brings together industry giants *CMA CGM* of France, *COSCO SHIPPING* of China, Evergreen of Taiwan and *OOCL*, a *COSCO* subsidiary. It is now the largest operational network in the world, with more than **330** container ships deployed across 35 services. The alliance covers the main East–West trade routes, linking Asia with the European, American and Middle Eastern markets.

These vessels sail through strategic straits such as Malacca, the main Asia–India–Mediterranean corridor, and **Bab el Mandeb** and **Suez** for the Asia–Europe route, as well as the Panama Canal for Asia–East Coast of the Americas.

In the Mediterranean and the Atlantic, the Strait of Gibraltar is an unavoidable passage to reach the ports of Northern Europe or the Atlantic seaboard. These chokepoints concentrate a crucial share of global traffic, strengthening both the logistical and geopolitical weight of the alliance.



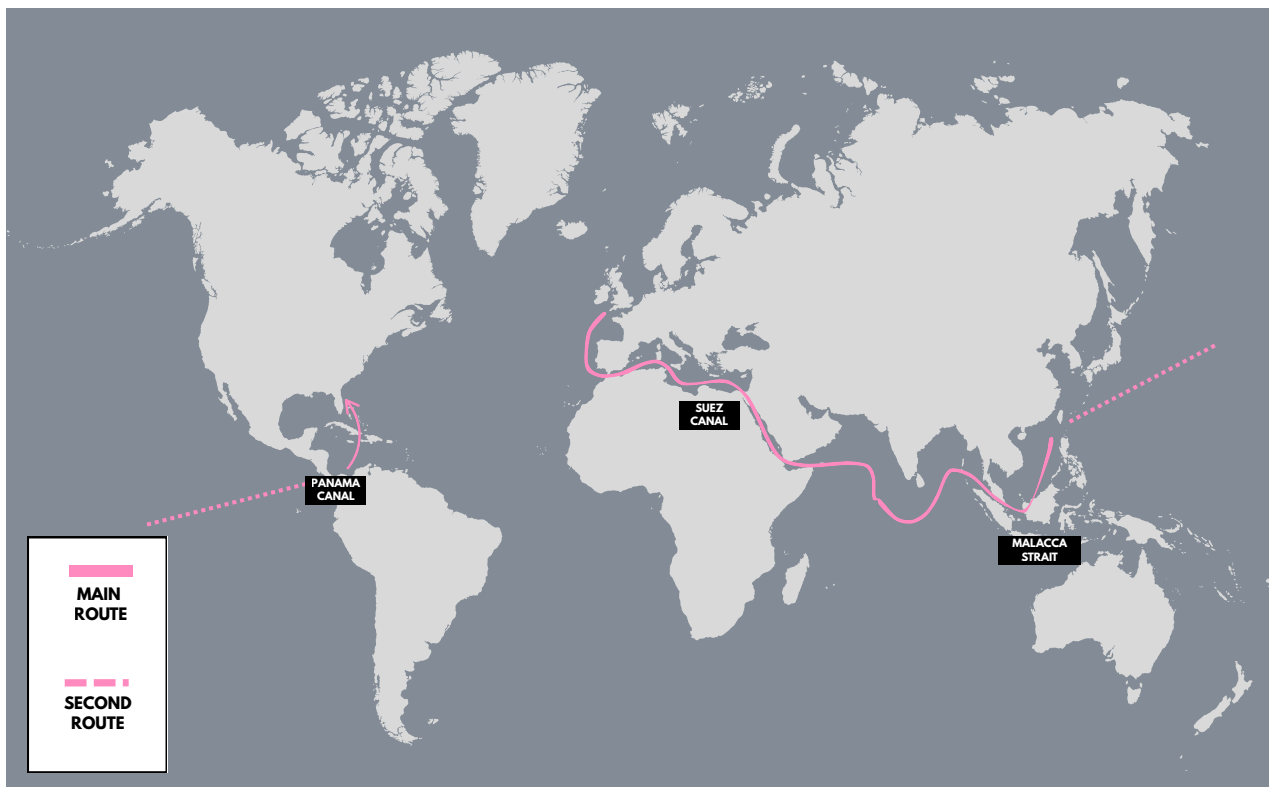
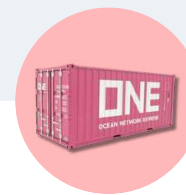


2.1.2

PREMIER ALLIANCE

THE Alliance, renamed *Premier Alliance* at the start of 2025, now brings together three major Asian carriers: Hyundai Merchant Marine of South Korea, Ocean Network Express (*ONE*) of Japan, and Yang Ming of Taiwan, following Hapag-Lloyd's move to Gemini.

Its key routes include the I and the Suez Canal to connect Asia with Europe, the Panama Canal for access to North America's East Coast, and the Strait of Gibraltar for Mediterranean exit to the Atlantic. The Middle East is served through the Red Sea and the Persian Gulf via the Strait of Hormuz, underscoring the importance of these strategic transit hubs.



2.1.2

GEMINI COOPERATION

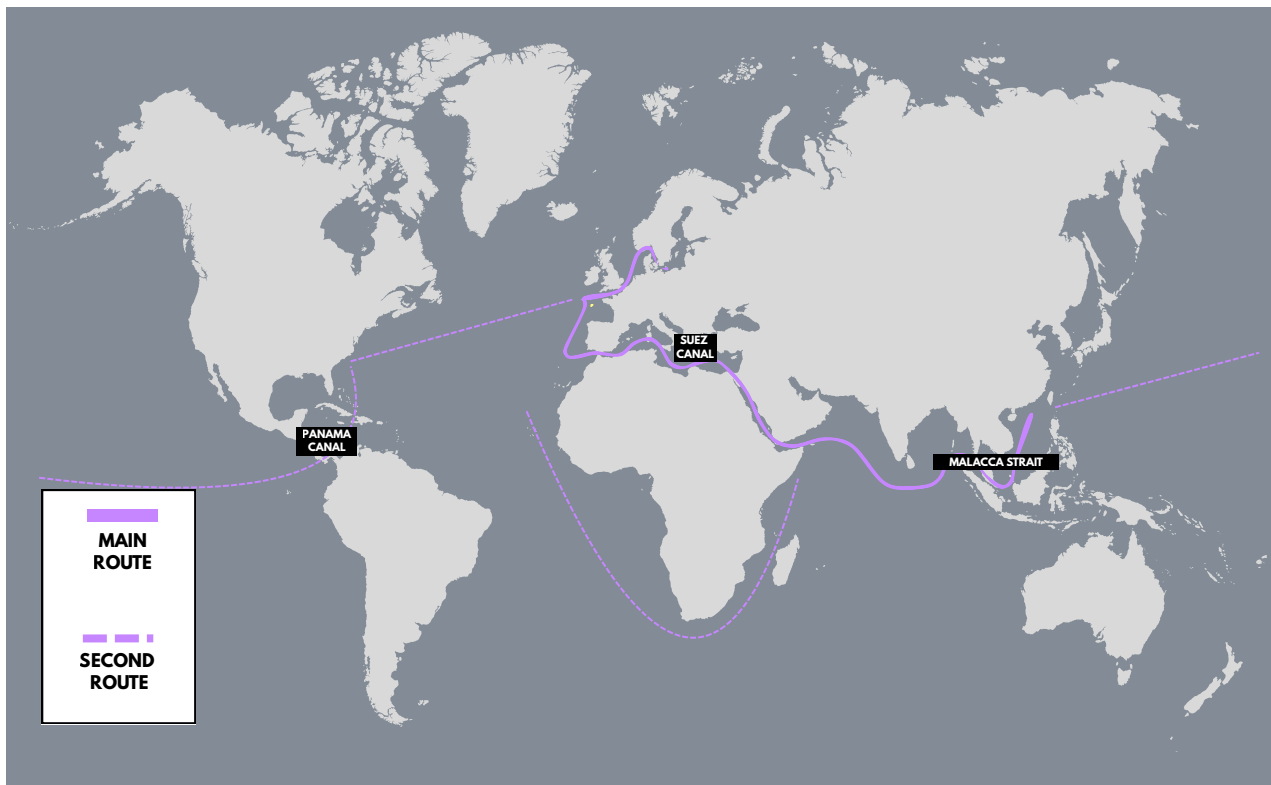


■ Launched in February **2025**, the Gemini Cooperation is the new strategic partnership between Maersk of Denmark and Hapag-Lloyd of Germany.

This network primarily targets the major East–West trade lanes, connecting Asia with Europe and Asia with the Americas.

Geographically, Gemini now prioritizes Northern European ports along with several Mediterranean hubs such as Barcelona, Tangier Med and Algeciras. In Asia, it covers all the major export platforms.

In terms of maritime routes, its services follow the usual passages, including the Strait of Malacca for Asia to the Indian Ocean and the Panama Canal for the U.S. East Coast. However, for security reasons linked to threats in the Red Sea, Gemini now reroutes around Africa via the Cape of Good Hope instead of transiting through **Suez** and **Bab el Mandeb**.





2.2

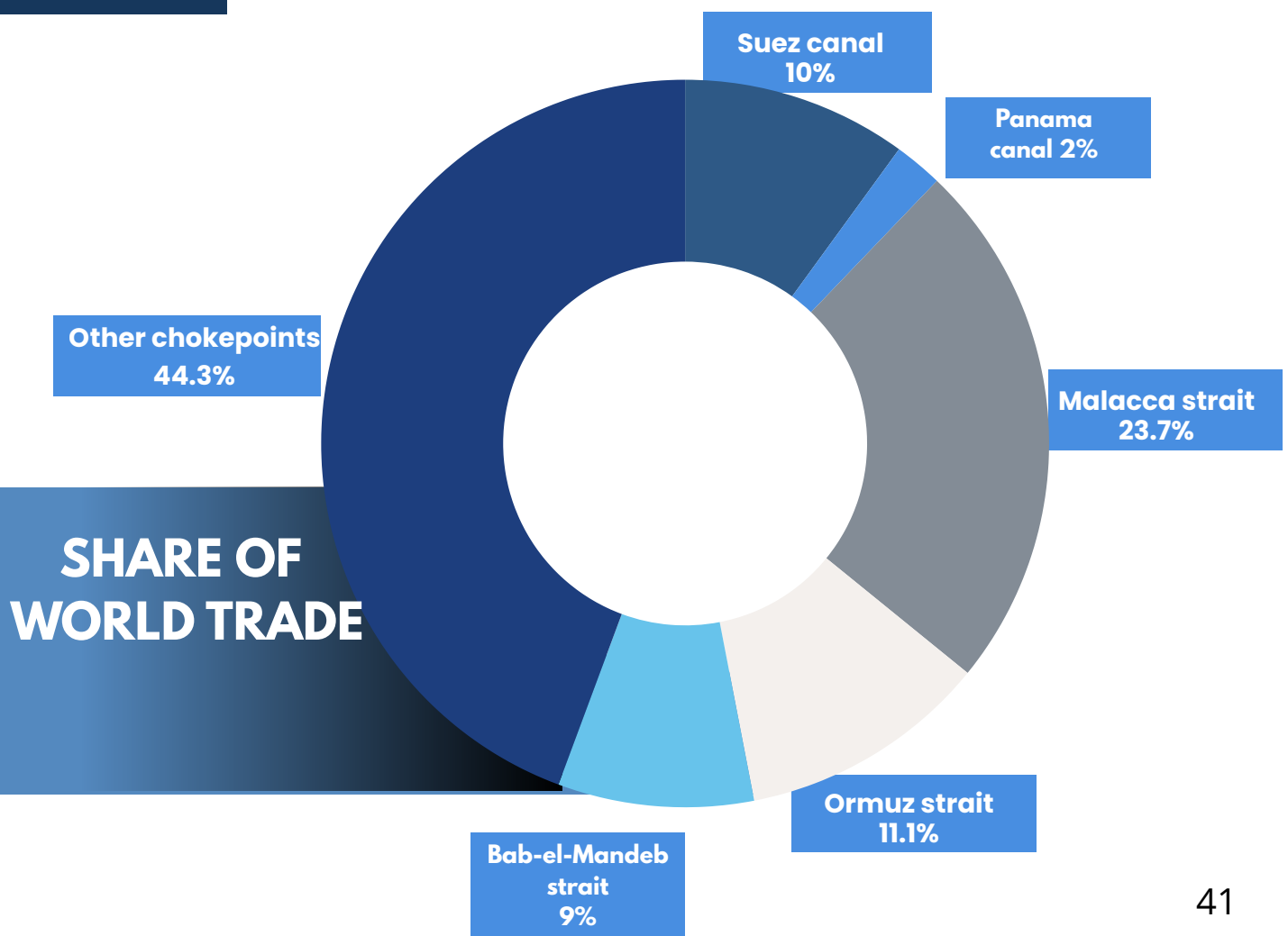
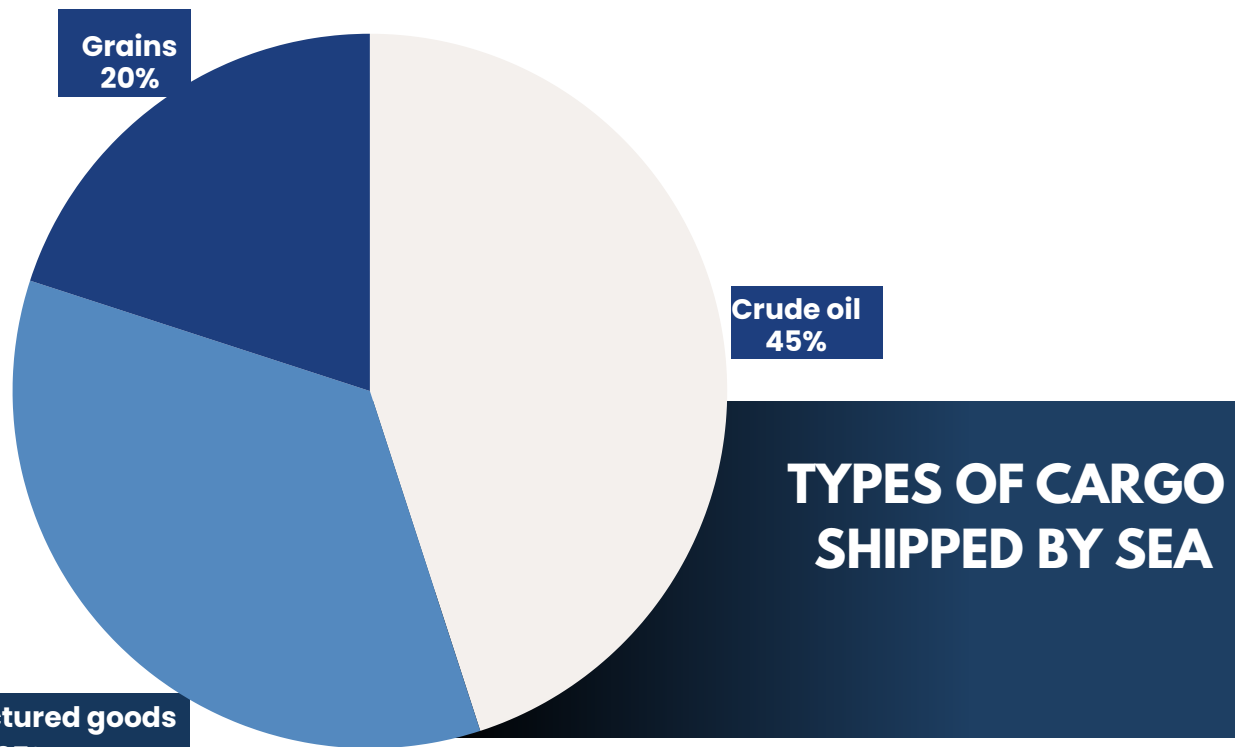
LOGISTICS



- With so many goods and vessels moving through maritime passages, straits hold a truly strategic position. Whether through the type of cargo carried, the cost of passage, or disruptions with heavy consequences, straits operate much like a vast enterprise.

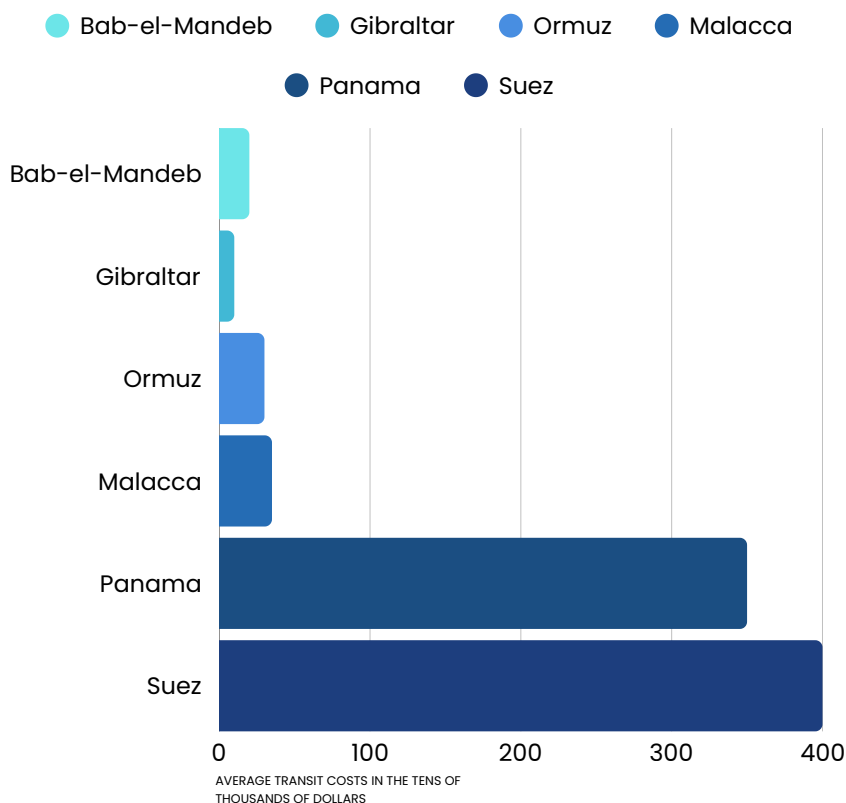
The logistical management of straits therefore demands strict coordination to ensure the smooth flow of trade while safeguarding both the security and the sustainability of these critical points in global maritime transport.

2.2.1 GOODS



2.2.2

TRANSIT FEES



Artificial passages, such as the **Panama Canal** and the **Suez Canal**, are among the most expensive transit points. The high costs are linked to construction and maintenance, including locks, ports, and water supply systems.

The Panama Canal accounts for **6%** of Panama's GDP, while the Suez Canal represents **4%** of Egypt's GDP. Transit fees vary according to vessel size and tonnage.

As for the Bab el-Mandeb and Hormuz straits, located near piracy-prone areas, costs are tied mainly to insurance premiums and naval escort services.

Meanwhile, the Straits of Malacca and Gibraltar benefit from the principle of free navigation under maritime law, with expenses limited to indirect services such as pilotage and dredging.



2.2.3 EVERGREEN STOPS SUEZ



On March 23, 2021, one of Evergreen's container ships, the *Ever Given*, ran aground across the Suez Canal after being hit by wind gusts of 93 km/h. This navigational mishap was far from insignificant. It triggered a massive disruption in global maritime trade, highlighting both the scale of commercial flows and the vulnerability of strategic chokepoints.

Along the Suez Canal, the *Ever Given* incident also revealed its limitations. The striking image of a single small excavator struggling to free the massive vessel wedged between the canal's banks became symbolic of the challenge. The task was monumental: shifting **200,000 tonnes**, a ship **400 meters** long and **59 meters** wide, in order to clear the way for more than a hundred waiting vessels.

For nearly a week, teams from the Suez Canal Authority, assisted by the Dutch salvage company Royal Boskalis Westminster, worked to refloat the ship. They pumped out fuel and ballast water while attempting to free its bow.

The economic fallout was enormous. In total, **425** ships were left stranded, with global trade losses estimated at **\$9.6 billion** per day. The delays in cargo deliveries were

significant. Some shipping companies chose to reroute their vessels around the Cape of Good Hope, adding considerable time to their journeys.

For Egypt, the financial loss was severe. The Suez Canal represents a major source of national revenue, and according to the Suez Canal Authority, the country incurred losses of \$13 million per day during the blockage. Egypt later sought \$550 million in compensation from the vessel's owner, the Japanese company Shoei Kisen Kaisha.

On March 29, six days after the incident, Evergreen, the vessel's operator, announced with relief that the *Ever Given* was finally "free." Yet the episode highlighted the limits of the shipping industry's race toward ever-larger vessels. According to the marine protection NGO KIMO International, these increasingly massive ships represent "*a threat to the environment.*"



PART

3

MARITIME CRISIS



3.1

CONFLICTS IN TERRITORIAL WATERS

- Primarily affected by major geopolitical stakes, straits often fuel the expansionist and territorial ambitions of certain nations, putting the stability of these passages at risk.

Two maritime areas are particularly exposed to these issues: the South China Sea and the Aegean Sea. Such conflicts could disrupt maritime traffic in these regions and alter existing trade flow dynamics.

3.1.1

STRAIT OF HORMUZ: ENERGY SHOCK AND STRATEGIC LEVERAGE

The Strait of Hormuz is a major energy artery. Before the 2026 war, around 20 to 21 million barrels per day of crude oil and petroleum products crossed this narrow, heavily militarized passage. The strait also carried more than one quarter of global LNG trade, linking Gulf producers to Asian, European and worldwide markets.

A SHOCK THAT BECAME REAL

Within days, tanker traffic was sharply curtailed by attacks, security warnings and the fear of mines, drones and coastal missiles. Storage filled up while ships were unwilling or unable to load cargoes.



THE STRAIT OF HORMUZ A LIMITED SPACE WITH GLOBAL REACH

BEYOND OIL

The disruption also affected refined products, LPG, jet fuel, petrochemical feedstocks and fertilizer inputs. The costs spread through transport, industry, food systems and household energy bills.

A NARROW PASSAGE GLOBAL IMPACT

Shipping lanes between Iran and Oman leave little room for error. A crisis in this limited maritime space can rapidly disrupt ports, refineries and consumers far beyond the Gulf.

A CLOSURE WITH GLOBAL IMPACT

THE SCALE OF THE DISRUPTION

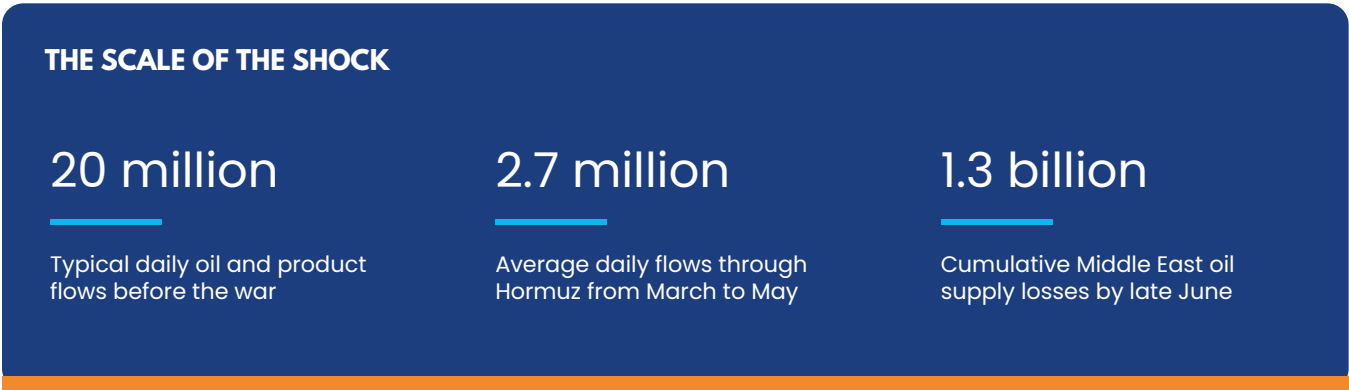
In March, the IEA assessed that the conflict had cut Gulf oil production by at least 10 million barrels per day. Flows through Hormuz fell from about 20 million barrels per day to a trickle.

THE MARKET SHOCK

The shock quickly went beyond crude. Brent rose above 100 dollars per barrel, while European gas prices increased by around 60 percent. Aviation, freight and insurers absorbed higher fuel and war risk costs.

THE FOOD AND INDUSTRY EFFECT

Fertilizer and chemical inputs depend on Gulf exports. Prolonged disruption therefore raised costs for import dependent economies, especially in parts of Africa, South Asia and the wider Middle East.



AFTER TWO MONTHS

By late June, cumulative oil supply losses from Middle Eastern producers had exceeded 1.3 billion barrels. Average daily flows through Hormuz from March to May were only 2.7 million barrels.

NOT A SIMPLE DETOUR

Alternative pipelines and emergency stock releases softened the shock but could not replace regular shipping. The longer the disruption lasted, the greater the pressure on inventories and refining systems.

INFLATIONARY PRESSURE

A prolonged interruption would keep freight, fuel, heating and industrial costs high. It would also raise the price of oil derived goods, from plastics and chemicals to agricultural inputs.

3.1.1 A BLOCKADE AS LEVERAGE

WHY KEEP A NEAR HERMETIC BLOCKADE

For Iran, Hormuz is not only an export route. It is a symbol of sovereignty, energy independence and influence over a vital link between the Gulf and the wider world.

A NEGOTIATING INSTRUMENT

Restricting navigation can transform the passage into a negotiating instrument. Each delayed cargo raises pressure on markets, governments and logistics chains, potentially tying normal traffic to political or economic concessions.

ENVIRONMENTAL AND MILITARY RISK

Dense tanker traffic in confined waters increases the risk of collision and oil spills. Drones, coastal missiles, fast craft and naval mines can create a high risk operating environment at relatively low cost.



ENERGY ROUTES AND LIMITED BYPASS OPTIONS

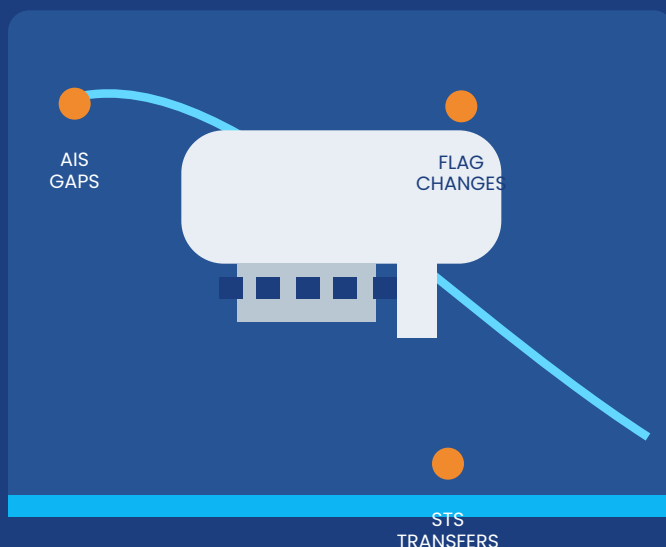
LIMITED BYPASS OPTIONS

Saudi Arabia and the United Arab Emirates have pipelines that can move part of their exports toward the Gulf of Oman and other outlets. These routes provide relief, not a full substitute for Hormuz.

3.1.1 MOSCOW AS INDIRECT BENEFICIARY

A supply crisis can redistribute revenue and strategic leverage. Moscow could benefit indirectly from higher benchmark oil prices. Even without exporting more, a rise in global prices can lift the value of remaining sales and support state revenues.

Even under sanctions, crude from Moscow continues to reach Asian markets. Some cargoes face insurance and service restrictions, while another share moves through opaque shipping networks often described as the shadow fleet. These networks can involve frequent flag changes, gaps in AIS transmissions and ship to ship transfers at sea.



A SHADOW FLEET CAN BE A RISK MULTIPLIER

The result is not only economic. Lower transparency can increase navigational, environmental and regulatory risks. If the Middle East crisis persists, alternative trading patterns may become more important, extending the consequences far beyond a regional confrontation.

CONCLUSION

The Strait of Hormuz concentrates the core forces shaping the maritime system: an energy corridor, a space of confrontation and a strategic lever. The 2026 crisis showed how a geographically limited waterway can affect global trade, prices and political stability.

No response can fully compensate for a prolonged closure. Naval protection and mine clearance can reduce immediate risks, but they cannot by themselves restore confidence. Alternative pipelines, strategic stocks and diversified suppliers can absorb part of the shock, but their capacity is finite. Diplomacy remains essential to restore safe, regular and unimpeded navigation.

MILITARY

Naval protection, escorts and mine clearance can reduce immediate danger. They still require de-escalation and credible rules for navigation.

ECONOMIC

Strategic stocks, diversified suppliers and bypass pipelines can soften the shock. Their capacity is finite and unevenly distributed.

DIPLOMATIC

A sustainable recovery depends on agreements that protect crews and restore safe, regular and unimpeded transit.

A durable recovery depends on more than announcing that the passage is open.

It requires credible safety guarantees for crews, shipowners, insurers and coastal states.

3.1.2

TURKISH STRAITS IN TIMES OF WAR

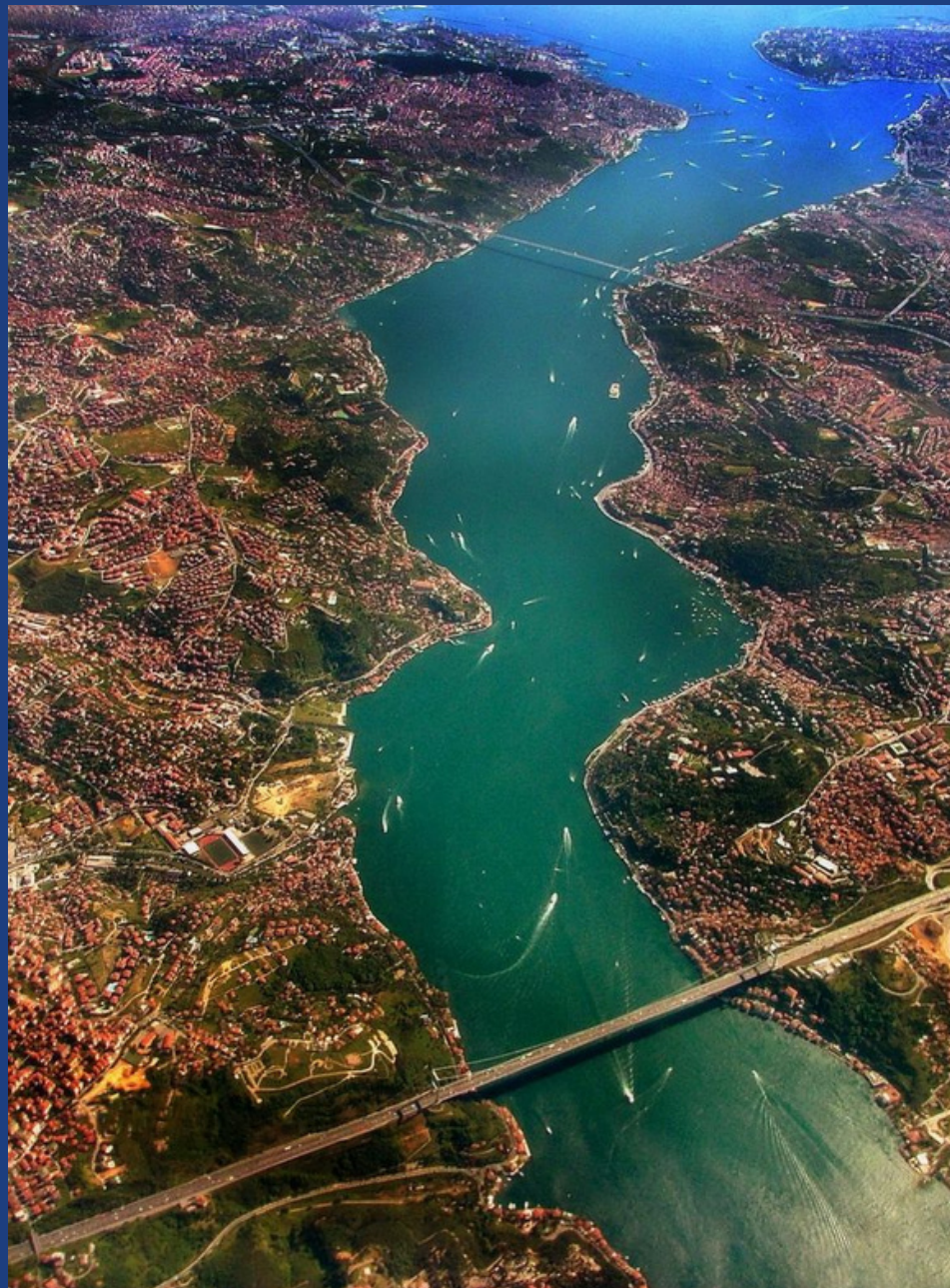
The war in Ukraine has profoundly reshaped the security landscape in the Black Sea.

Turkey, as guardian of the Straits under the **Montreux Convention (1936)**, plays a pivotal role. It invoked wartime provisions to block the passage of foreign warships.

As a result, naval presence has collapsed, only 34 warship transits were recorded in 2022, 24 of them before the Russian invasion, and 46 in 2023.

Coastal states rely on Montreux to guarantee free passage for merchant vessels in peacetime, but in times of conflict only civilian ships enjoy unrestricted transit. The Dardanelles have become a vital corridor for Ukrainian exports, particularly grain.

The grain deal, brokered in Istanbul by the UN and Turkey in **July 2022** and renewed in July 2023, enabled the export of nearly **33 million** tons of Ukrainian grain through the **Bosphorus** and the **Dardanelles**.





Even after the suspension of the pact, exports resumed through alternative routes. For instance, a “*Romanian-Bulgarian corridor*” to the ports of Romania and Bulgaria, and then through the Bosphorus to the Mediterranean, enabled Ukraine to ship a record 5.2 Mt of grain in February 2024.

In total, the United States Department of Agriculture (USDA) estimates exports at 63.77 Mt, nearly reaching pre-war levels. Security concerns, however, remain significant.

Russia has deployed numerous floating minefields in the Black Sea, with more than one hundred detected since **2022**, in an effort to disrupt Ukrainian exports. International mine-clearing exercises, known as Sea Breeze, have been organized to secure maritime routes.

At the same time, the sinking of the Russian cruiser Moskva in April **2022** and several strikes on Ukrainian ports have underlined the militarization of the conflict. In this context, Turkey balances its role as guarantor of commercial traffic with its strategic alliances, being both a NATO member and an independent regional actor.

Grain exports, which are indispensable for global food security, ultimately depend on Ankara’s decisions regarding passage through the Dardanelles.



3.2

PIRACY THREAT

- A major point of convergence, straits are also exposed to significant pressures. The first of these is piracy. The *International Maritime Bureau* defines it as ***“any act of boarding against a ship with the intent to commit theft or any other crime, and with the capability to use force in carrying out the act.”***

Caught between threat and resistance, straits illustrate the geostrategic importance of maritime chokepoints.

3.2.1 VULNERABILITIES OF THE MALACCA STRAIT



■ The South China Sea has become a hotspot of regional frictions, while the Strait of Malacca remains a vital artery for global trade.

Beijing claims around 80% of the South China Sea, overlapping with the exclusive economic zones of the Philippines, Vietnam, Malaysia and several other states. Naval and aerial confrontations are increasingly frequent.

In January **2025**, for example, the Philippines suspended a research mission after aggressive maneuvers by the Chinese navy against their vessels near Thitu Island (Spratlys).

At the international level, these incidents are a growing concern for Southeast Asia and beyond. Nearly 3 trillion dollars in global trade transits the South China Sea every year. Europe also follows the situation closely, as these maritime routes are critical for Asia to Europe exchanges.

In the Strait of Malacca and surrounding waters, piracy long remained a scourge. Cartels and criminal groups exploited the geography to target ships and their crews. Since the early 2000s, however, regional cooperation has sharply reduced such risks. Littoral states including Singapore, Malaysia, Indonesia and Thailand have implemented joint patrols (SOMALS and Eyes in the Sky) and strengthened information sharing through mechanisms such as ReCAAP.



As a result, in 2024 ReCAAP's Information Sharing Centre reported 62 incidents of piracy and armed robbery in the Straits of Malacca and Singapore, still significant but far fewer than twenty years ago.

Most violations involved boarding merchant vessels in territorial waters, including hostage-taking of crew members and fuel theft. Such incidents carry significant economic and logistical consequences. Ships are forced to reinforce their security measures, such as additional lighting and watch rotations, while freight costs increase due to higher insurance premiums.

Critical port facilities can also be disrupted, creating ripple effects across global supply chains. Littoral states cooperate where possible through multilateral patrols, yet remain divided by competing national interests.

For instance, while China and ASEAN countries move cautiously toward a Code of Conduct, the so-called "Quad" the United States, Japan, Australia and India, conducts regular naval exercises in the South China Sea.



3.2.2

INTERNATIONAL FIGHT AGAINST PIRACY

Faced with the threat of maritime piracy — in Somalia, the Gulf of Guinea and Southeast Asia — Europe has engaged on several fronts. A key element is the Regional Maritime Information Fusion Centre, developed in Madagascar under the framework of the Indian Ocean Commission (IOC).

This *RMIFC*, financed by the EU, covers a vast area stretching from the Cape of Good Hope to the Bab el-Mandeb Strait. It aggregates real-time surveillance data, vessel observations and security alerts to detect trafficking, piracy or illegal migration. An operational centre in Mahé (Seychelles) complements the system. The *RMIFC* enables regional states (Madagascar, Mauritius, Seychelles, Comoros) to coordinate their naval operations more effectively.

On the military front, the European Union has been leading the *EUNAVFOR ATALANTA* naval operation since 2008, protecting humanitarian shipments and fighting piracy off the Somali coast.

Its core missions are to secure World Food Programme (*WFP*) vessels and other vulnerable cargoes, to deter pirate attacks, and to monitor illegal trafficking (fishing, drugs, arms) in the Horn of Africa.

In **July 2024**, the EU extended the mandate until February 2027, underlining the importance of maintaining this presence.

For example, European forces (ships and aircraft) have driven away numerous pirates: in 2023, the *IMB* Centre reported 120 global incidents (105 boardings and 4 hijackings), most of them outside Somalia, showing that while the Somali threat has receded, it still lingers.



The effectiveness of Atalanta and allied patrols is also reflected in ICC figures: in 2023, 120 incidents of piracy or armed robbery were recorded.

Most of the 2023 attacks were successful boardings, with a handful of attempts (9) and 2 cases of vessels being fired upon. At the European level, several states contribute regularly to Atalanta and to the fusion centres.

France, for example, periodically deploys frigates to the Indian Ocean for surveillance and interception missions.

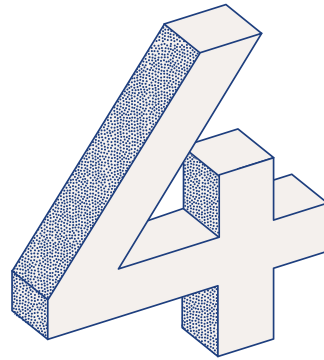
At the same time, the European Union provides financial support to strengthen local coast guards (through the EUCAP Nestor program) and to the creation of a U.S.–NATO Combined Maritime Forces (CMF) in the region.

The results of these combined efforts are tangible: reported Somali attacks remain low (only a few dozen per year), and former pirates increasingly apply to join the maritime sector, a sign that international pressure is yielding results.





PART



SUSTAINABILITY OF STRAITS



4.1 ENVIRONMENT

■ Faced with growing economic stakes and the multiplication of crises, a crucial question arises about the long-term sustainability of these passages.

In the constant pursuit of greater efficiency and higher yields, straits and maritime traffic cannot escape the very foundation of their function: marine ecosystems. Looking ahead, the challenge is how to anchor these strategic corridors in time while addressing both present risks and future perspectives.

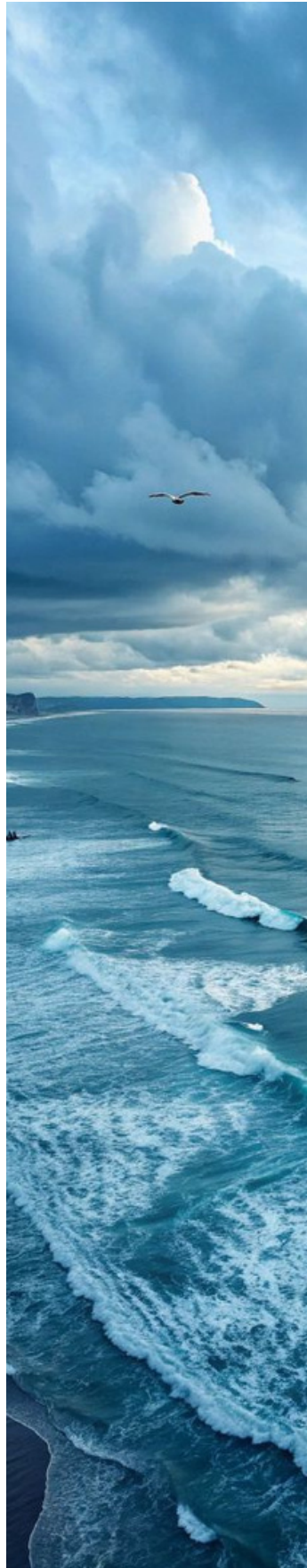
4.1.1

POLLUTION AND GREENHOUSE GAS EMISSIONS

With so many vessels navigating through narrow waterways, the concentration of pollution can be not only diverse but also intense.

The International Maritime Organization (IMO) has conducted three studies on greenhouse gas emissions from shipping. CO₂ emissions have been rising since 2012: that year, shipping accounted for 2.76% of global emissions, increasing to 2.89% in 2018. Projections show no real decline ahead, as the IMO anticipates a continued growth of maritime transport.

According to the Interreg Europe report, which studied European passages, major canals and straits are often coupled with heavy industrial activity and additional transport flows (road, rail, and inland waterways), compounding the environmental pressure.



According to the same study, within strait zones, it was revealed that in 2016 the Strait of Calais alone generated 14,547,543 MtCO₂e in greenhouse gas emissions.

This major carbon footprint has already been addressed by several bodies, including the European Commission through its MRV regulation (Monitoring, Reporting, Verification) for maritime transport, and by the IMO's Data Collection System (DCS).

As one of the busiest waterways in the world, the Strait of Malacca is heavily affected by marine pollution. Industrial wastewater, plastic debris, and oil spills from leaking ship engines all contribute to environmental degradation.

Yet shipping is not the only source: offshore gas and oil exploration, as well as drilling operations, have further damaged the marine ecosystem. As early as 1996, Malaysia's Environmental Quality Reports identified samples of *Escherichia coli* (E. coli) and polycyclic aromatic hydrocarbons (PAHs) in local waters.

In the broader effort toward decarbonization, the European Union has set ambitious targets, aiming to cut its emissions by 80% to 95% by 2050, including measures for maritime straits. In parallel, the IMO has recommended using existing sustainable technologies to reduce greenhouse gas emissions from shipping by 75%.

4.1.2

INITIATIVES TOWARD DECARBONIZATION

Several initiatives are underway to reduce the carbon footprint of high-traffic maritime passages, particularly in the Dover Strait. On 8 November 2022, French President Emmanuel Macron set a national objective to halve France's industrial emissions by 2030.

The ultimate aim is to develop Low-Carbon Industrial Zones (ZIBAC), relying on key technologies for the ecological transition, including hydrogen, carbon capture, renewable heat, and low-carbon electricity. These measures also involve the electrification of port facilities and the integration of CO₂ capture and storage infrastructure.

With €13.6 million in funding, the French government is supporting public and private partners in the decarbonization project of the Dunkirk industrial-port zone.

Another key player in this effort is the group of major container shipping companies such as the Italo-Swiss MSC, Germany's Hapag-Lloyd, South Korea's HMM, Denmark's A.P. Moller-Maersk, and France's CMA CGM. Together, they have launched a "collective initiative" aimed at the full decarbonization of maritime transport in the long run.

This initiative, supported by France, Denmark, and South Korea, aligns with the IMO's target of achieving net zero emissions by 2050, despite the continuous expansion of global maritime trade.

These objectives will not only benefit the maritime industry as a whole but will also directly improve conditions in straits, combining logistical efficiency with environmental responsibility

greenhouse gas emissions are not the only threats straits are facing. Plastic pollution is a pressing and concerning danger, particularly in sensitive areas such as the Strait of Gibraltar.

Marine wildlife is heavily impacted by plastic waste and is regularly found to be among its victims.

Finally, climate change is another critical factor affecting marine well-being, as ocean acidification and rising water temperatures alter the behavior and natural patterns of marine species.



4.1.3

PROTECTION OF MARINE SPECIES

Some high-traffic areas remain flourishing ecosystems, such as the Baltic Sea, known for its many straits, as well as the Strait of Bonifacio and the Torres Strait in the Arafura Sea.

These three areas benefit from special protection and are listed under the IMO program as Particularly Sensitive Sea Areas (PSSAs).

This program and the UNESCO World Heritage Marine Site initiative work hand in hand to reduce marine pollution and its impact on ecosystems. Measures include separating navigation flows into two lanes to prevent collisions and limit disruption to surrounding marine life.

Additional measures apply to vessels over 300 tons and those carrying hazardous cargo.

A true biological crossroads, the Strait of Gibraltar is essential for migrations of cetaceans, birds, and fish. This vital corridor also hosts a rich seabed, including extensive seagrass meadows of Posidonia. For all these reasons, the strait between Africa and Europe, between ocean and sea, is subject to particularly strict precautions.

The first intercontinental biosphere reserve, created through cooperation between the Regional Government of Andalusia and Morocco's High Commission for Water, Forests and the Fight Against Desertification, is a joint conservation project.

Protected marine species are mainly located along the coastlines. On the Spanish side lies El Estrecho Natural Park, while on the Moroccan shore the Jbel Moussa Park near the port of Tanger-Med plays a key role. Marine life here is emblematic of species such as the Mediterranean monk seal and the bottlenose dolphin.



On the Andalusian side, this park was declared a natural reserve in 2003 under IUCN Category V, a protected terrestrial or marine passage. Since 2006, it has been recognized by UNESCO as the first biosphere reserve spanning two countries and two continents.

The reserve is organized around three marine eco-provinces: Lusitanian, Macaronesian, and Mediterranean, hosting more than 1,900 species of marine flora and fauna. It promotes sustainable activities such as artisanal fishing and ecotourism while limiting pollution and human pressures like urbanization.

It also drives scientific research, along with intercontinental monitoring and surveillance efforts.



This is not the only protected area. The Special Area of Conservation (SAC) of the Teno-Rasca coastal and marine environment, on the Spanish side near Tenerife, is part of the European Union's Natura 2000 network.

The marine fauna there benefits from the protection and conservation of their natural habitats. Seasonal, rare, sporadic, and resident species coexist in these waters, including turtles, dolphins, orcas, and whales.

Other conventions, such as the London Convention, the Ramsar Convention, the Bonn Convention, and the Barcelona Convention, more broadly encompass the protection of marine species and environments.

Some of these apply specifically to straits and passages like Messina, Gibraltar, the Bosphorus, or Malacca, particularly concerning migratory species.





4.2

ALTERNATIVE ROUTES

■ The importance of straits can be measured not only by their size or traffic volume but also by their critical role in maritime trade.

The use of certain strategic passages can sometimes be offset by alternative routes and itineraries.

For the Strait of Malacca, alternative routes exist, and delays caused by using them remain relatively limited. In contrast, detours around the Suez or Panama canals significantly extend voyages. The Turkish straits (Bosphorus and Dardanelles) stand out as truly vital, since no maritime alternative exists. The creation of new routes is often considered in response to climate change or to ease congestion in critical zones.

4.2.1

POLAR ROUTES

With 14 million km² and 4 million inhabitants, the Arctic has become the new economic frontier of the great powers.

Several straits are found in this region: the Bering Strait, Peel Strait, Kara Strait, Vilkitsky Strait, Sannikov Strait, Dmitri Laptev Strait, Victoria Strait, and Dease Strait.

An Arctic Council has existed since 1996, proof that the region is moving toward globalization.

In addition to potential resources, oil, gas, gold, copper, zinc, and nickel, the Arctic is emerging as a new space for global trade.

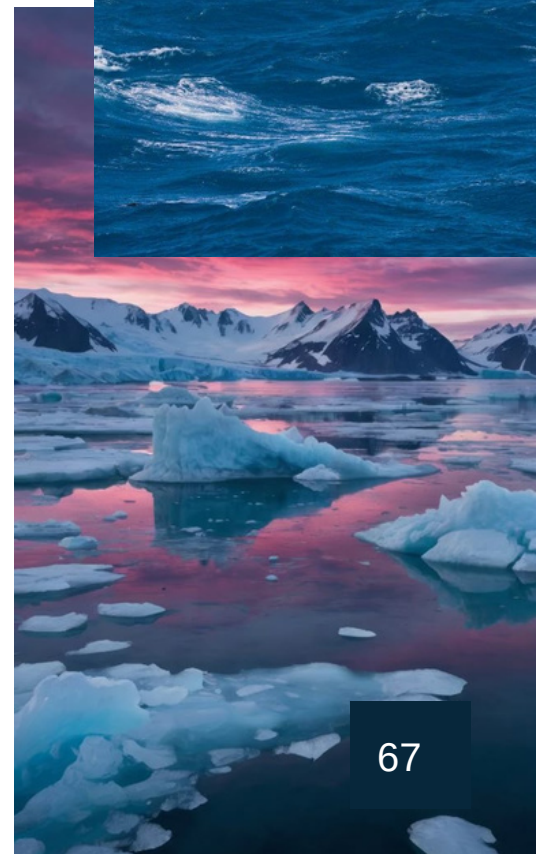
Russia's presence is significant, particularly through Novatek's gas production and the deployment of Russian icebreakers to transport hydrocarbons and develop its northern coasts as new maritime routes. However, oil extraction in the Arctic remains costly, disconnected from market prices, with over \$20 difference per barrel.

Since 1960, the ice cap has declined by 42 %, compounded by rising water temperatures and desalination. The Arctic is warming twice as fast as the global average.

With melting ice, three new passages are opening: the Northeast Passage, the Northwest Passage, and the Transpolar Route, accessible only when the polar ice cap reaches its minimum.

The route from Shanghai to Rotterdam is up to 40 % shorter than via the Suez Canal.

Maritime borders have become a major issue, often disputed between powerful actors:



Russia, the United States, Canada, Norway, Denmark, and even China, which defines itself as a “Near-Arctic State.”

The strategic importance is considerable, since some of these passages lie in Canadian waters, while the United States rejects such national claims in favor of the principle of permanent freedom of navigation.

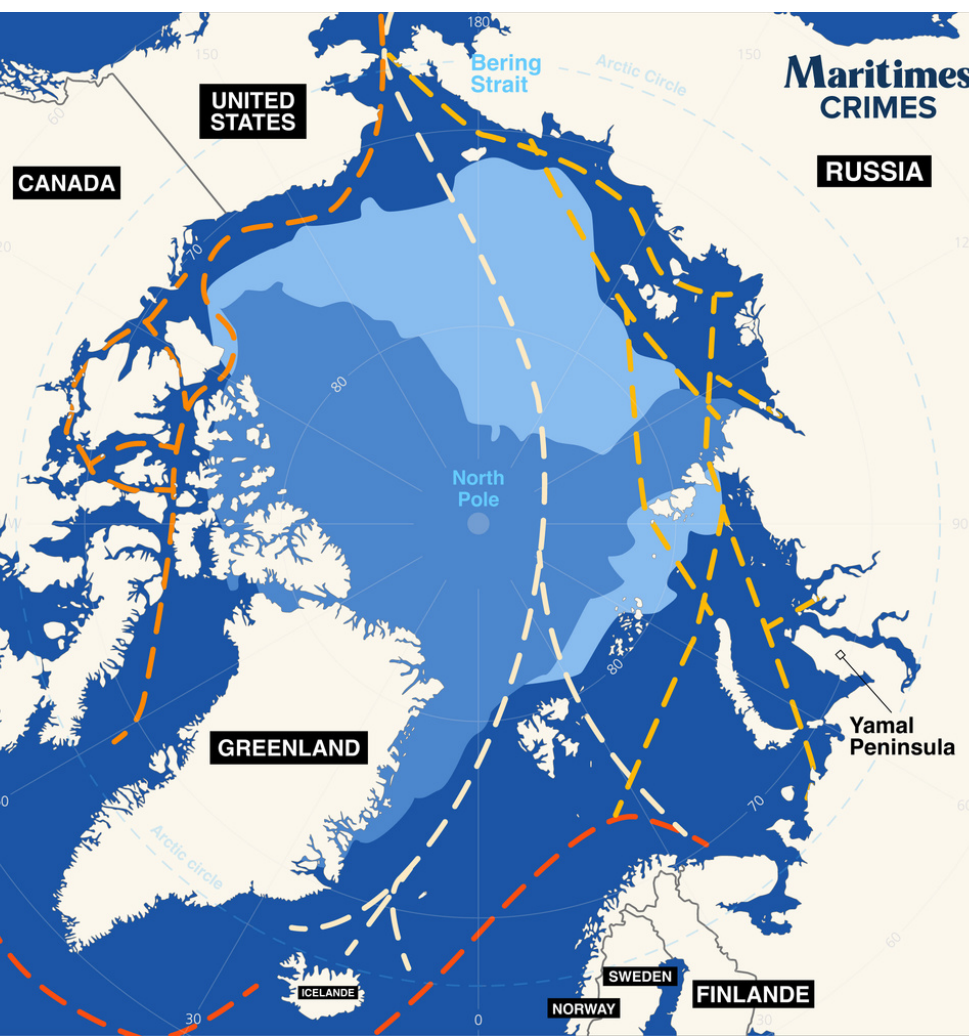
However, the profitability of polar routes remains questionable, mainly due to high insurance costs and the need for icebreaker escorts.

Even if the journey is shorter, its feasibility is still limited. Advances in shipbuilding have made reinforced hulls possible, such as the Finnish-built Norilsk and Lunni vessels, which can sail at speeds not exceeding 13 knots, roughly the average speed of a commercial vessel.

The size of vessels is also constrained by the region’s topography: ships are limited in both width and draft. Progress is further slowed by drifting ice and frequent fog.

The situation of polar routes remains uneven. The Northwest Passage is rarely used, as its accessibility depends heavily on sea ice density, making it more of a seasonal transit corridor. The Northeast Passage, on the other hand, is under firm Russian control.

The overall picture is mixed: polar routes and their straits have not yet established themselves as part of the global maritime market, though they are increasingly considered as potential strategic corridors for future hydrocarbon trade.



4.2.2

DROUGHT IN PANAMA

Never since 1950 had the Panama Canal experienced such a drought as in 2023. The effects of this climate crisis severely disrupted the canal's operations, as it depends on the flow of the El Niño-affected river basin. During periods of drought, the transit basin, normally flooded by the river, is no longer deep enough to ensure safe passage.

In such conditions, water levels in Gatún Lake become too low for merchant ships to navigate. Water is especially precious here, as the same lakes feeding the canal, Gatún and Alajuela, also provide drinking water for nearly 2 million people. It is worth noting that the Panama Canal is the only major waterway in the world that relies on freshwater.

In 2023, traffic through the canal was drastically reduced, causing record bottlenecks at its entrance, with up to 160 ships waiting. The number of merchant vessels dropped by half during this period.

As a result, transit prices soared, reaching as high as 4 million dollars for a single passage, forcing some shipowners to abandon the canal in favor of the Cape Horn route. Others chose to unload cargo at the canal's entrance to move it overland, while some vessels had to reduce their draft to avoid grounding.

To restore water supply to the Panama Canal, an underground diversion project was also considered, though it risks further destabilizing the region's fragile hydrological balance.

“ IF WE DON'T ADAPT
WE WILL DIE . ”





Another project was the Nicaragua Canal, launched in 2015 by HK Nicaragua Canal Development Investment. Ambitious and presented as a direct competitor to the Panama Canal, it was ultimately abandoned after the company's bankruptcy.

The project already faced major shortcomings: unclear financing, an uncertain route three times longer than Panama's, ecological risks, hydrological stress, and above all the displacement of 30,000 farmers and indigenous people. In the end, while the Nicaraguan government had hoped for Beijing to revive the project, China instead turned toward Panama, signing a series of trade agreements with the country.

Too small, too congested, and increasingly costly, the Panama Canal risks losing ground to new projects emerging in Central America.

The first challenger comes from Mexico. An advanced project envisions a canal link between the states of Veracruz and Oaxaca.

In 2023, then President Manuel López Obrador inaugurated the future 300-kilometer corridor.

Initially developed as a land route, it connects the port of Salina Cruz on the Pacific coast with Coatzacoalcas on the Gulf of Mexico.

With an investment of 3.2 billion dollars, Mexico aims to position this interoceanic corridor as a serious competitor to the Panama Canal, targeting the transit of 1.4 million containers by 2033.

4.2.3

NEW CHOKEPOINTS



New canal projects are also underway. Turkey controls two strategic straits, the Bosphorus and the Dardanelles. As the only maritime access to the Black Sea, the Bosphorus suffers from heavy congestion, with around 40,000 ships transiting every year.

These straits, especially the Bosphorus, are under strong geopolitical pressure, particularly since the outbreak of the Russia–Ukraine conflict.

Moreover, although Turkey administers the Bosphorus and Dardanelles, it earns no direct revenue from ships passing through them, whether commercial or otherwise.

Or not, under the Montreux Convention. Added to this is the security concern for Istanbul, through which the Bosphorus runs. A historic city, the transport of dangerous and explosive materials through its strait could prove devastating in case of an accident, as seen in Beirut.

For all these reasons, Recep Tayyip Erdoğan announced in 2011 the creation of a third canal, the Istanbul Canal. This project aimed to bypass the 1936 Montreux Convention regulations and would have turned Istanbul into an island. Alongside it came the construction of a new airport intended to revolutionize the country's economy. Initially planned for completion in 2023, on the centenary of the Republic, the project was eventually abandoned.

The proposed canal was to be located 30 km from the Bosphorus, measuring **40 to 45 km**, and, according to Erdoğan, would have *“surpassed the Panama and Suez canals.”* Technically, the project was feasible, as it would be dug in a dry area, though it remained smaller than the Suez Canal (193 km). The main objective was financial: by diverting ships to the Istanbul Canal and creating a less congested route, Turkey could finally profit from this new passage. However, several issues quickly emerged.

The new canal's utility was questioned since, although theoretically less congested, a toll-paying Istanbul Canal would struggle to compete with the toll-free Bosphorus. Moreover, the motivations behind the project remained unclear, with many accusing it of serving AKP supporters rather than the population. The canal's planned surroundings were to be urbanized on concessions belonging to the Finance Minister, who happens to be the president's son-in-law.

What began with enthusiasm soon turned into skepticism from scientists and urban planners, who warned of a probable ecological disaster. The main risk lies in creating a new flow between the two seas, the Sea of Marmara and the Black Sea.

On this point, it is important to note that the strait's complex hydrodynamics are due to differing physico-chemical characteristics: the Sea of Marmara is warmer and saltier, while the Black Sea is more polluted and poorer in oxygen.

It was not until 2017 that a proper environmental impact assessment was carried out. Some 200,000 trees and 150 million m² of farmland and pasture are at risk, as well as the region's freshwater supplies, on which Istanbul depends for 97% of its needs.



Another key maritime chokepoint is the Strait of Malacca. Faced with heavy traffic and China's ambitions, a new canal could emerge, the Kra Canal in Thailand, linking the Gulf of Thailand to the Andaman Sea.

According to estimates, the Kra Canal could divert up to 30% of Malacca's traffic and save between two and six days of navigation.

Backed by China, the project would allow Beijing to bypass transit ports controlled by the US Navy.

The very idea that the Strait of Malacca, through which three-quarters of China's oil supplies from the Middle East and Africa pass, could be closed to Chinese shipping represents a strategic threat for Beijing. For Washington, this "Malacca Dilemma," as former Chinese president Hu Jintao described it, offers a way to curb China's presence at sea.

China, compelled to safeguard its access to the Strait of Malacca, could turn increasingly assertive, particularly toward weaker neighboring states. The construction of the Kra Canal could strip Malacca of nearly half its maritime traffic, a devastating blow for Singapore, whose economy relies heavily on this route.

The project is not solely to China's advantage. Countries such as Sri Lanka and Thailand could also benefit. Sri Lanka may eventually position itself as the "new Singapore," with Beijing already financing the construction of the Hambantota port on the island's southern coast. Thailand, as the primary beneficiary of this new passage, would likely need to cede part of its sovereignty. While Bangkok favors the initiative, championed by the Thai Canal Association (TCA), public opinion in Thailand remains uneasy with China's growing influence, complicating the project further.

Pakdee Tanapura, a member of the national committee studying the Kra Canal project, has suggested that multiple nations could co-finance the waterway to dilute Chinese dominance. This has drawn in new actors such as India. Like Istanbul's proposed canal, the Kra Canal faces strong criticism, not only on environmental grounds but also religious ones, as Buddhist communities in the south oppose being geographically split from the rest of the country.





Maritimes CRIMES

Maritimes CRIMES

A LIGHTHOUSE FOR MARITIME SECURITY

FOLLOW US
ON SOCIAL MEDIA



READ MORE ABOUT
MARITIME SECURITY ON
OUR WEBSITE

[MARITIMESCRIMES.COM](https://maritimescrimes.com)

