

**ANNEX 15**

**RESOLUTION MEPC.226(64)**

**Adopted on 5 October 2012**

**DESIGNATION OF THE SABA BANK  
AS A PARTICULARLY SENSITIVE SEA AREA**

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

BEING AWARE of the ecological, socio-economic and scientific attributes of the Saba Bank in the North-eastern Caribbean area of the Kingdom of the Netherlands, as well as its vulnerability to damage by international shipping activities and the steps taken by the Netherlands to address that vulnerability,

NOTING the *Revised guidelines for the identification and designation of particularly sensitive sea areas* adopted by resolution A.982(24) (PSSA Guidelines) and the Revised Guidance Document for Submission of PSSA Proposals to IMO set forth in MEPC.1/Circ.510,

HAVING CONSIDERED the proposal made by the Government of the Netherlands that the Saba Bank be designated as a Particularly Sensitive Sea Area,

HAVING AGREED that the criteria for the identification and designation of a Particularly Sensitive Sea Area provided in resolution A.982(24) are fulfilled for the Saba Bank,

HAVING NOTED that the Sub-Committee on Safety of Navigation, at its fifty-eighth session, approved the recommendation on the establishment of An Area To Be Avoided (ATBA) for ships 300 gross tonnage and above and a mandatory No Anchoring Area for all ships as Associated Protective Measures (APMs) for the Saba Bank as a Particularly Sensitive Sea Area aiming at improving the safety of navigation and the protection of the marine environment,

1. DESIGNATES the Saba Bank described in annex 1 as a Particularly Sensitive Sea Area, pending the final adoption by the Maritime Safety Committee of the associated protective measures for the PSSA as set out in annex 2 of document NAV 58/14;
2. INVITES Member Governments to recognize the ecological, socio-economic, and scientific attributes of the area, set forth in annex 2, as well as its vulnerability to damage by international shipping activities, as described in annex 3; and
3. FURTHER INVITES Member Governments to note the associated protective measures established to address the area's vulnerability, the details of which are contained in annex 4, which is expected to enter into force following final adoption on a date to be circulated by the Organization to all Member Government, and request ships flying their flag that they act in accordance with such measures.

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ANNEX 1

**DESCRIPTION OF THE SABA BANK PSSA**

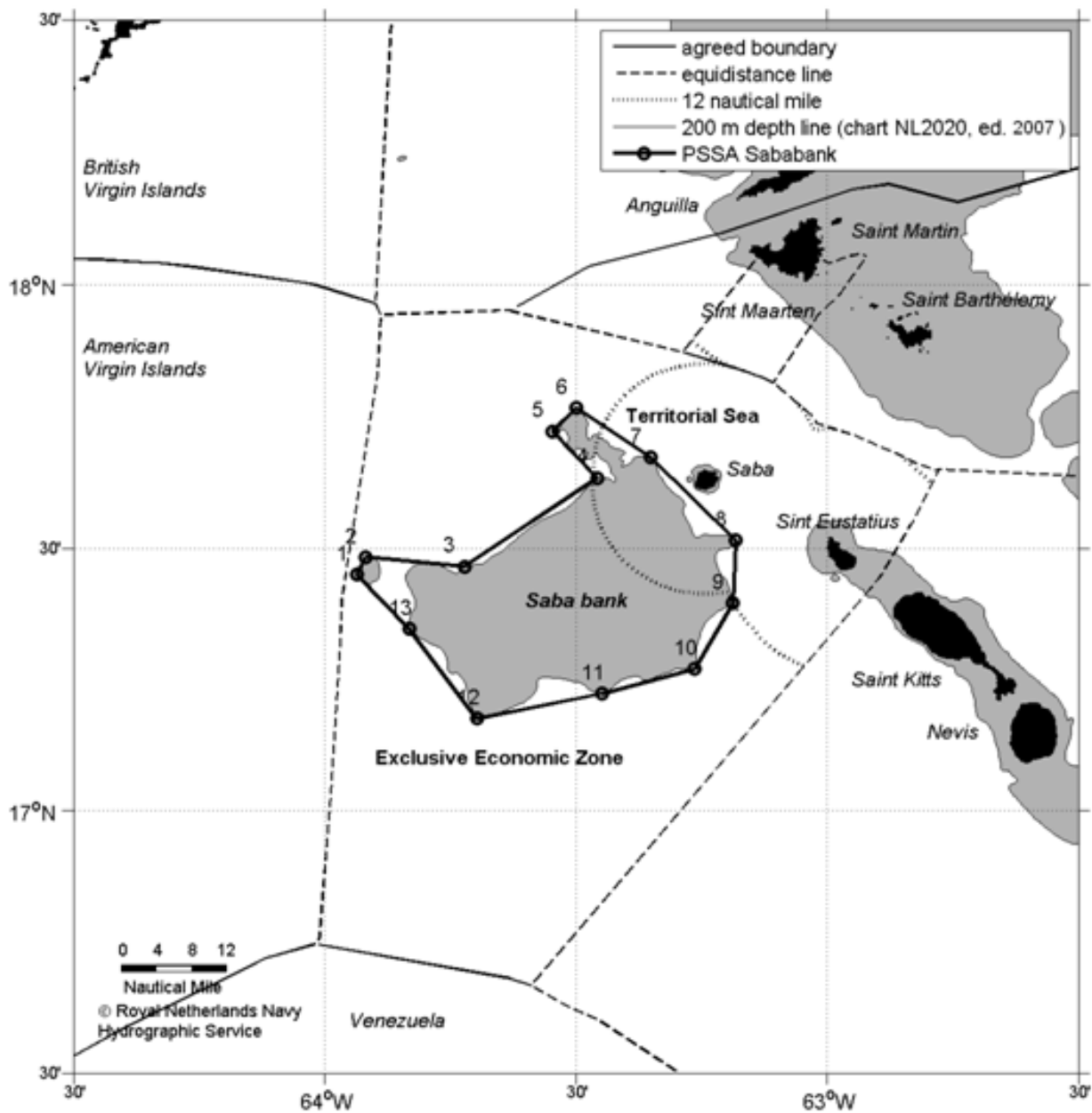
In order to avoid the risk of pollution and damage to this unique, fragile and pristine coral reef ecosystem, and the risks to the artisanal fisheries of the area, mariners should exercise extreme care when navigating in the area bounded by a line connecting the following geographical position, which is designated as a Particularly Sensitive Sea Area:

1.	17° 27'.06 N	063° 56'.14 W
2.	17° 29'.00 N	063° 55'.09 W
3.	17° 27'.94 N	063° 43'.32 W
4.	17° 38'.03 N	063° 27'.41 W
5.	17° 43'.35 N	063° 32'.74 W
6.	17° 45'.98 N	063° 29'.98 W
7.	17° 40'.34 N	063° 21'.10 W
8.	17° 30'.88 N	063° 10'.92 W
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10.	17° 16'.27 N	063° 15'.85 W
11.	17° 13'.44 N	063° 26'.89 W
12.	17° 10'.55 N	063° 41'.81 W
13.	17° 20'.85 N	063° 49'.89 W

(Reference Chart: Netherlands Nautical Chart no. 2020, Edition November 2007

**Note:** This chart is based on World Geodetic System 1984 (WGS 84))

### CHARTLET



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## ANNEX 2

### ECOLOGICAL, SOCIO-ECONOMIC, AND SCIENTIFIC ATTRIBUTES OF THE SABA BANK PSSA

#### *Ecological criteria*

#### **1 Uniqueness or rarity**

1.1 The reefs of the Saba Bank are far removed from land and as a consequence there is an absence of land-based influences such as elevated levels of sedimentation due to increased erosion, high nutrient concentrations caused by pollution from agricultural run-off and wastewater disposal, or sedimentation from coastal construction activities. Worldwide, reefs are in decline, from just such impacts originating from land. This unique position of the Saba Bank reefs, provide a potentially greater resilience to changes in the environmental conditions, such as climate change, and it is a relatively untouched centre for recruitment and recuperation for the coastal reefs in the region.

1.2 The coral reefs of the Saba Bank, characterized by high coral cover of around 70 per cent in some places, have been determined to be among the four healthiest of the Caribbean, based on the Atlantic and Gulf Rapid Reef Assessment (AGRRA) health index, which is a compilation of many variables, including coral cover, fish populations, presence of diseases, types and cover of algae on the reef, and ratio of living coral versus dead coral<sup>1</sup>.

1.3 Because of its location and prevailing currents in the area, the Saba Bank is a source of larval recruitment for corals and coral reef associated organisms, including important fishery species such as conch (*Strombus gigas*), and lobster (*Panulirus argus*) for the entire region.

1.4 A two-week study, carried out in January 2006 by Conservation International, the former Netherlands Antilles government and the Smithsonian Institution's Museum of Natural History, to investigate the biodiversity of the Saba Bank, found that the Saba Bank has the largest diversity of algae in the Caribbean. A diverse algae community is a critical food source for the herbivores on the Bank and provides shelters and habitats for fish and other invertebrate species.

1.5 Further studies, conducted in 2007, found two new species of gorgonian corals, a deep and shallow water species. Since the gorgonians of the Caribbean are a well-known group of corals with only a limited number of species, the discovery of a new species in the shallowest parts of the Bank is very unique.

1.6 The Saba Bank is home to a number of species on the International Union for the Conservation of Nature (IUCN) Red List, such as the humpback whale, sperm whale, green turtle and the hawksbill turtle, yellow fin grouper, snowy grouper, Nassau grouper, queen triggerfish, yellow mouth grouper, bull shark, and tiger shark.

#### **2 Critical habitat**

2.1 The Saba Bank is a critical habitat for at least two species of sea turtles. Large areas covered in algae and areas rich in sponges provide foraging grounds for green sea turtles and

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<sup>1</sup> (Kramer, P.A. (2003) Synthesis of coral reef health indicators for the western Atlantic: Results of the AGRRA program (1997-2000). Atoll Res. Bull.(496), 1-57).

hawksbill sea turtles respectively. Such feeding grounds are declining. Both of these species of turtles are listed on IUCN Red List of threatened species. The hawksbill is listed as critically endangered and the green sea turtle is listed as endangered. In addition the Saba Bank provides critical habitat for coral species, many fish and invertebrate species, and for whales and dolphins. There are currently over 360 species of fish that have been documented on the Saba Bank and this list continues to grow.

### **3 Dependency**

3.1 The Saba Bank is formed and sustained by the growth of the corals and coral reefs on it. As such, these organisms provide habitat, food and shelter for all animals and plants living on the Bank. The high diversity of the area is maintained by the numerous feedback mechanisms characteristic for these kinds of ecosystems. As a self-sustaining ecosystem, it is highly productive and also forms an attractive feeding and nursery ground for many migratory species. The Saba Bank is the main nursery ground for fish species that are hatched in the area. The fishery on the Bank is dependent on these nursery ground facilities and derives considerable income from them. The Saba Bank is also a source of lobster and conch larvae for the whole region down-current of the Bank.

### **4 Representativeness**

4.1 As a submerged atoll with highly developed reefs the Saba Bank is uniquely representative of coral reef growth processes in relatively deep water in the Caribbean, providing typical examples of deep reef structure and deep reef growth forms. The shallower parts of the Bank are representative of various high energy hard bottom habitats, while the deeper sandy areas provide calmer lagoon-like habitats.

### **5 Diversity**

5.1 The reefs and other habitats of the Saba Bank have only recently been surveyed for species such as fish, gorgonians and invertebrates. Due to the vastness of the Bank these lists are far from complete. Nevertheless, during the preliminary coral surveys 38 hard coral species were found. Similarly, the Saba Bank is rich in gorgonians, sponges, and fish species. Discovery of new species on the Saba Bank are still made, as demonstrated by a 2006 research expedition which yielded over 200 fish species not previously known to exist in the area, and over 100 species of algae, many of which were previously unknown to science.

5.2 Renowned algae experts Mark and Diane Littler, consider the Saba Bank to have the highest diversity in the Caribbean with respect to marine algae. A 2007 research expedition also found two new species of soft coral. One of the new species was found in deep water (70 m), and the other was found to be common in shallow water (20 m). Since the gorgonians of the Caribbean are a well-known group of corals with only a limited number of species, the discovery of a new species in the shallowest parts of the Saba Bank was unexpected and indicative of the Bank's high diversity.

5.3 Further contributing to its diversity, the ecosystem of the Saba Bank contains a wide variety of habitats. For example, within the coral reefs of the Saba Bank, the percentage of coral cover varies widely, creating a series of interconnected but distinct types of coral reef habitats, or zones (e.g. fore reef, reef crest, back reef, patch reefs and lagoon). As a result of this zoning, the coral reefs of the Saba Bank contain a variety of environmental niches and resources that support a diverse array of species.

## **6 Productivity**

6.1 As an actively growing atoll, the Saba Bank is quite productive for marine life. In many places, the corals form hills and ridges up to 20 feet high, growing fast enough to outpace destructive processes in this hurricane-prone region. The Saba Bank's productivity is also exemplified by its support of the Saba fisheries, a comparatively major economic sector which accounts up to 7 per cent of the island's GDP.

## **7 Spawning and breeding grounds**

7.1 Spawning aggregations of at least three species of fish are known from the Saba Bank. These species are the red hind, the queen triggerfish as well as squirrelfish. There is a worldwide general recognition that such spawning aggregations must be afforded protection. The Island Government has closed a critical red hind spawning area to fishing during the months of December to February in order to protect this important aggregation.

## **8 Naturalness**

8.1 The Saba Bank is relatively isolated from land-based sources that generally cause the degradation of coral reefs. The Bank is close to the small island of Saba and separated from other islands by deep water. Biological surveys so far all describe the pristine conditions of the coral reefs of the Saba Bank.

## **9 Integrity**

9.1 The Saba Bank ecosystem contains a wide variety of interconnected habitats. The diversity of habitat types enables the survival and coexistence of high numbers of marine species.

## **10 Fragility**

10.1 Coral reefs are highly complex and diverse marine ecosystems which are very sensitive to any alteration of the environmental conditions. Due to a combination of anthropogenic and natural causes Caribbean Reefs are in decline and many of them, in this area, show decades of decrease in coral cover. The Saba Bank is relatively free from land-based sources of pollution, overfishing, and sedimentation, however, due to its high level structural complexity and biodiversity, the Saba Bank's resilience to natural disturbances is low and this Bank could be seriously affected by the anchoring of merchant vessels, especially by tankers.

10.2 Coral reefs require a delicate balance across a range of environmental conditions in order to be healthy. The existence of a coral ecosystem may be threatened by changes to even one of those environmental conditions. Corals derive a substantial portion of their nutrition from symbiotic algae (*zooxanthellae*) within their tissues. Because algae require light for photosynthesis, clear and clean water conditions are necessary for growth and well-being. The introduction of sediments increases turbidity and retards growth rates. The introduction of pollutants can be toxic to numerous parts of the ecosystem. The isolation of the Saba Bank allows protection from invasive species, which can be transferred by ships. Non-native species can displace native species and seriously disrupt and imbalance the natural ecosystem.

10.3 The physical structure of the reef is provided by calcium carbonate, which forms the rock framework or reef "skeleton". This calcium carbonate is deposited at a rate of about one centimetre per year by the living coral animals (*polyps*). These polyps exist in a thin layer at the surface of the reef rock. The Saba Bank coral reef system has taken

thousands of years to build. If optimal conditions for regeneration exist, it would take substantial time (decades) for a damaged area of the reef to recover and fully return to its original condition.

10.4 The impact of activities like anchoring and the passage of merchant ships indisputably threatens the ecosystem of the Saba Bank. The anchors of merchant ships, and in particular the heavy anchor chains, destroy acres of coral reef as the ships swing on their anchors, waiting to load or unload at the large oil terminal of St. Eustatius only 25 miles east of the Saba Bank, or just waiting for their next voyage. Regeneration of such damage will take decades, even under good conditions. Moreover, shipping traffic brings potential destruction from groundings, collisions, and pollution from operational and accidental discharges. Secondary, and cumulative damage, may occur when dislocated coral fragments caused by anchoring are tossed against healthy coral by wave action, currents and violent storms. Based on information collected from 2007 till 2009, the average number of days a ship is anchored increased from 4.5 to 7.8 days.

10.5 The Saba Bank is also vulnerable to so-called ghost traps. Ghost traps are lobster or fish traps lost by fishermen. Merchant ships crossing the Saba Bank do not notice the little buoys marking the locations of the traps and run over them. The buoys are lost or destroyed in the process, and the traps become ghost traps. This has a serious impact on the local fish stocks.

## **11 Bio-geographic importance**

11.1 The Saba Bank has been discovered to be an atoll only recently. Its richness in terms of biodiversity is only just emerging. It is by far the largest atoll in the Caribbean, being four times the size of the next largest atoll and, as such, a unique bio-geographic object in the Caribbean.

### ***Social, cultural and economic criteria***

## **12 Social or economic dependency**

12.1 In 2000, a year-long survey of the Saban fishery concluded that the fishery on the Saba Bank is of relatively major social and economic importance to Saba. The fishery sector generates US\$1.2 million annually, or about 7 per cent of the island's GDP, and employs 8 per cent of the economically active population. The main target species of the fishery is the lobster, which accounts for 90 per cent of the catches. A management plan for sustainable fishery on the Saba Bank is in preparation and will be implemented in 2011.

12.2 The lobster fishery (lobster traps) is completely dependent on the availability of suitable habitat on the Saba Bank, (i.e. coral reefs and associated habitats which require a healthy marine environment). The destruction of the coral reefs has a devastating impact on the people and the economy of the island of Saba.

12.3 Although as yet unrealized, the extensive, healthy coral reefs on the Saba Bank and the discovery of a wreck constitutes a potential for the development of dive tourism industry, which could help the economy of the island of Saba. Especially in view of the worldwide decline of coral reefs, and the fact that the Saba Bank reefs are among the healthiest of the region, the chances are considerable that this as yet untapped potential will be developed. Consequently the conservation of a healthy marine environment on the Saba Bank is of paramount importance.

### **13 Human dependency**

13.1 The inhabitants of the island of Saba, as well as St. Eustatius, have been fishing in their small boats on the Saba Bank for generations, with written documentation going back as far as 1907.

#### ***Scientific and educational criteria***

### **14 Research**

14.1 As one of the few atolls in the Caribbean, and as an area with coral reefs that are still among the most untouched in the Caribbean, the Saba Bank is an important area for scientific research, although that potential is just beginning to be realized. In 2006, the Dutch research ship HMS **Snellius** conducted a detailed bathymetric study of a large part of the Bank. In cooperation with Conservation International, a very detailed bathymetric map of the Bank was compiled from the state of the art sonar data of the **Snellius**. This detailed information has been the basis for a six-month study to further investigate and classify the diverse habitat types which comprise the Saba Bank, and forms a very important resource for further research on the Bank.

14.2 This area is of high scientific interest and offers unparalleled opportunity for research. Given the fact that the Saba Bank has been relatively unexplored by scientists and is not impacted from pollution from the surrounding islands, it provides one of the few areas in the Caribbean where researchers can conduct large-scale comparisons between human-impacted marine ecosystems and unimpacted marine ecosystems.

14.3 As mentioned in paragraph 3.1.5, further evidence of the importance of this area for research was given in 2006 and again in 2007, when an international team of biologists made discoveries on the Saba Bank of two species of coral new to science and 20 new algae species that had never been described before. The researchers also recorded over 150 new fish species records for the Saba Bank, including some very rare species found only once or twice elsewhere in the Caribbean. These scientific discoveries suggest that much research remains to be done to fully understand and appreciate this complex ecosystem.

14.4 Ongoing research and monitoring of the marine ecosystems in the Saba Bank will continue to provide significant insights, not only for the Island of Saba but for the marine ecosystems around the Caribbean.

14.5 Saba Bank is one of the few marine regions on earth where monitoring and research activities can be conducted in the virtual absence of land-based human habitation and activities. It thus provides ideal baseline conditions with regard to biota and environmental characteristics because it did not have any impacts from land based sources and is thus in a natural or near-natural condition.

### **15 Baseline for Monitoring studies**

15.1 In past years, some preliminary monitoring of the reefs of the Saba Bank took place. An Atlantic and Gulf Rapid Reef Assessment survey was completed in 1999, documenting coral cover and health, algal composition, and fish populations on three reef sites. In 2007, another AGRRA survey was completed to add to the data of the previous survey. The Saba Bank was classified as being one of the healthiest reefs in the Caribbean and, as such, forms an almost perfect baseline for comparison with other reefs in the Caribbean.



## **16 Education**

16.1 Because baselines of human perception are bound to shift as more and more reefs become degraded, reefs like the ones found on the Saba Bank are an example of well-functioning and healthy reefs. Because the Saba Bank is in such a good condition it offers ample opportunity for education.

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## ANNEX 3

### VULNERABILITY TO DAMAGE BY INTERNATIONAL SHIPPING ACTIVITIES

#### *Vessel traffic characteristics*

#### **1 Operational factors**

1.1 In addition to merchant shipping traffic, there is also a lot of traffic consisting of small artisanal fishing boats crossing the Saba Bank. In addition, some recreational traffic of sailing yachts is common in the area. Occasionally, live-aboard dive vessels operate in the area, and vessels of the Coastguard of the Netherlands in the Caribbean patrol this area. Currently there are no vessels or rigs conducting the exploration or development of oil, gas or minerals in this area.

#### **2 Vessel Types**

2.1 There is a wide variety of vessels operating in this area. The main bulk of traffic consists of tankers of various sizes coming from or going to the St. Eustatius Oil Terminal, 25 miles east of the Saba Bank. In addition, various dry cargo ships, as well as cruise ships, cross the Saba Bank. Smaller vessels include artisanal fishing boats and recreational yachts. Almost all of the merchant ships are trading on international voyages. Domestic traffic is limited to artisanal fishing, almost all less than 12 metres, and Coastguard vessels.

#### **3 Traffic characteristics**

3.1 Ship traffic is heavy in the area around the Saba Bank. Apart from the fishing boats, there are many cargo ships, tankers and cruise ships passing through the area. In 1995, St. Eustatius Oil Terminals doubled its capacity to 11 million barrels and the number of visiting ships was estimated to be at least 100 a month. The port is one of the busiest tanker ports in the region. As from February 2008, the capacity has been 14 million barrels per year. It is estimated that about 200 tankers and cargo ships pass over the Saba Bank annually. An extension of the terminal is foreseen in 2011.

3.2 Ships use the Saba Bank area mostly for passage only, but the fishermen on the Saba Bank report witnessing tank rinsing, oil spills, and the emptying of sewage tanks, and frequent sightings of anchoring on the Bank. All these activities have a severe impact on the environmental conditions of the Saba Bank, because they increase the intensity of traffic.

3.3 Some ships do not simply pass, but anchor on the Saba Bank, while waiting to load at Statia Terminals. Anchoring ships are both tankers and cargo ships with a draught of up to 12 m. Larger tankers avoid the Saba Bank because their draught when loaded is between 12 and 20 m, which is too deep for the shallow areas of the Bank. Tankers have been seen anchoring on the Bank for a few hours to many weeks. A six-month survey of the Saba Bank in 2007, recorded a total of 21 ships anchoring on the Bank for a total of 94 anchoring days, ranging from 1 to 17 days a ship (based on visual observation). This is an under estimation since only about half of the Saba Bank can be monitored visually from the island of Saba. As of December 2007, an Automatic Identification System (AIS) monitoring system was put in place to more accurately monitor ship movements and anchoring (coverage 50 per cent of Saba Bank).

#### **4 Harmful substances carried**

4.1 The majority of ships crossing the Saba Bank consists of tankers carrying crude oil on their way to or from the St. Eustatius Oil Terminal.

#### ***Natural factors***

#### **5 Hydrographical**

5.1 Coral reef ridge – the more than 50 km long shallow ridge on the east and south-east sides of the Saba Bank constitutes a navigational hazard for ships with a draught more than 12 metres.

5.2 The water depth of the proposed PSSA varies from 12 m on its eastern and south-eastern edges where the bottom drops steeply to depths in excess of 500 metres, to 20-30 metres on its southern and south-western side where the bottom also falls steeply to great depths, to about 50 metres on the north-western side where the slope is more gradual.

5.3 The bottom topography of the Saba Bank includes everything from spectacular coral reefs to fine sand bottoms. Within this spectrum some of the more important bottom types are: highly diverse algae meadows, coarse rubble fields, hard limestone substrate with evidence of past "karst" formations, and carbonate sand bottoms of varying degrees of coarseness.

#### **6 Meteorological**

6.1 The Saba Bank is located in the tropics without clear wet or dry seasons. However, the Saba Bank is located in the Caribbean hurricane belt and during the hurricane season from June to November, the Bank is regularly exposed to a hurricane or a tropical storm. The area is within the trade wind zone with almost constant year-long eastern to north-eastern winds, except for the months of August to October when windless periods sometimes occur.

#### **7 Oceanographic**

7.1 The Saba Bank is situated in an area where surface ocean currents predominantly run east to west, although deviations both towards the north and to the south are known and even reversed currents are known to occur. It is unknown whether upwelling occurs along the eastern to south-eastern edges.

#### **8 Other helpful information**

8.1 Ship grounding and collisions on the Saba Bank did not occur yet, but could cause great damage to the Bank coral reefs. The grounding of large tankers or engine failure appears to be a genuine danger, because the prevailing winds and currents would carry the tanker rapidly from St. Eustatius towards the Saba Bank.

8.2 The heavy ship traffic on the Saba Bank also poses a danger to the small (average < 12 m length) artisanal fishing boats, which run the risk of being run over by large tankers. This risk has already caused the fishermen to avoid these traditional fishing grounds, causing a noticeable decrease of their catches.

8.3 Surveys carried out since 2007 show that anchoring on the Saba Bank has increased from an average of 4.5 days per ship till 7.8 days. The number of ships observed anchoring was 21, 20, and 24 respectively in 2007, 2008, and 2009. However, the surveys only cover about 40-60 per cent of the Bank. Most ships only anchor for a couple of days, but some may stay for as much as a month (see table 1).

**Table 1: Anchoring and ship traffic on the Saba Bank in 2007, 2008, 2009 and 2010**

YEAR	ANCHORING Ships	TOTAL Days	AVERAGE Day/ship	RANGE Day/ship	PASSING Ships
2007 <sup>2</sup>	21	94	4.5	1-17	
2008 <sup>3</sup>	20	60	3.0	1-11	54
2009 <sup>4</sup>	24	187	7.8	1-33	29
2010 <sup>5</sup>	20	68	3	1-14	

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<sup>2</sup> Monitoring was mostly visual and not continuously during the year; figures indicate the minimum.  
<sup>3</sup> On the basis of AIS covering 40-60 per cent of the Saba Bank.  
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<sup>5</sup> On the basis of AIS covering 40-60 per cent of the Saba Bank.

ANNEX 4

**DESCRIPTION OF THE AREA TO BE AVOIDED FOR SHIPS 300 GT AND ABOVE AND  
MANDATORY NO ANCHORING AREA FOR ALL SHIPS**

An area to be avoided by ships of 300 GT and above and a mandatory no anchoring area for all ships is established in the area designated as a Particularly Sensitive Sea Area and bounded by a line connecting the following geographical positions:

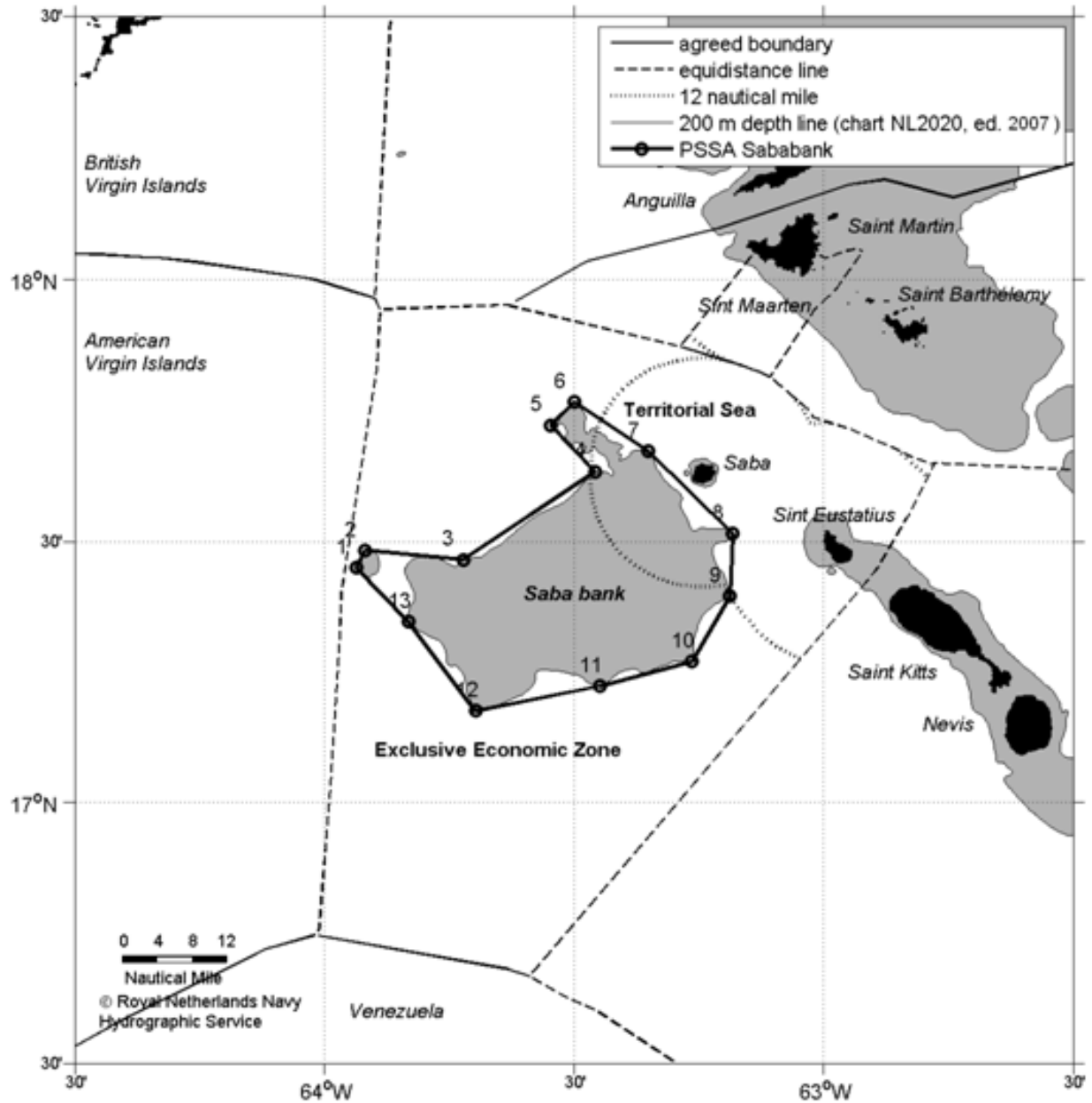
(Reference Chart: Netherlands 2020, Edition November 2007

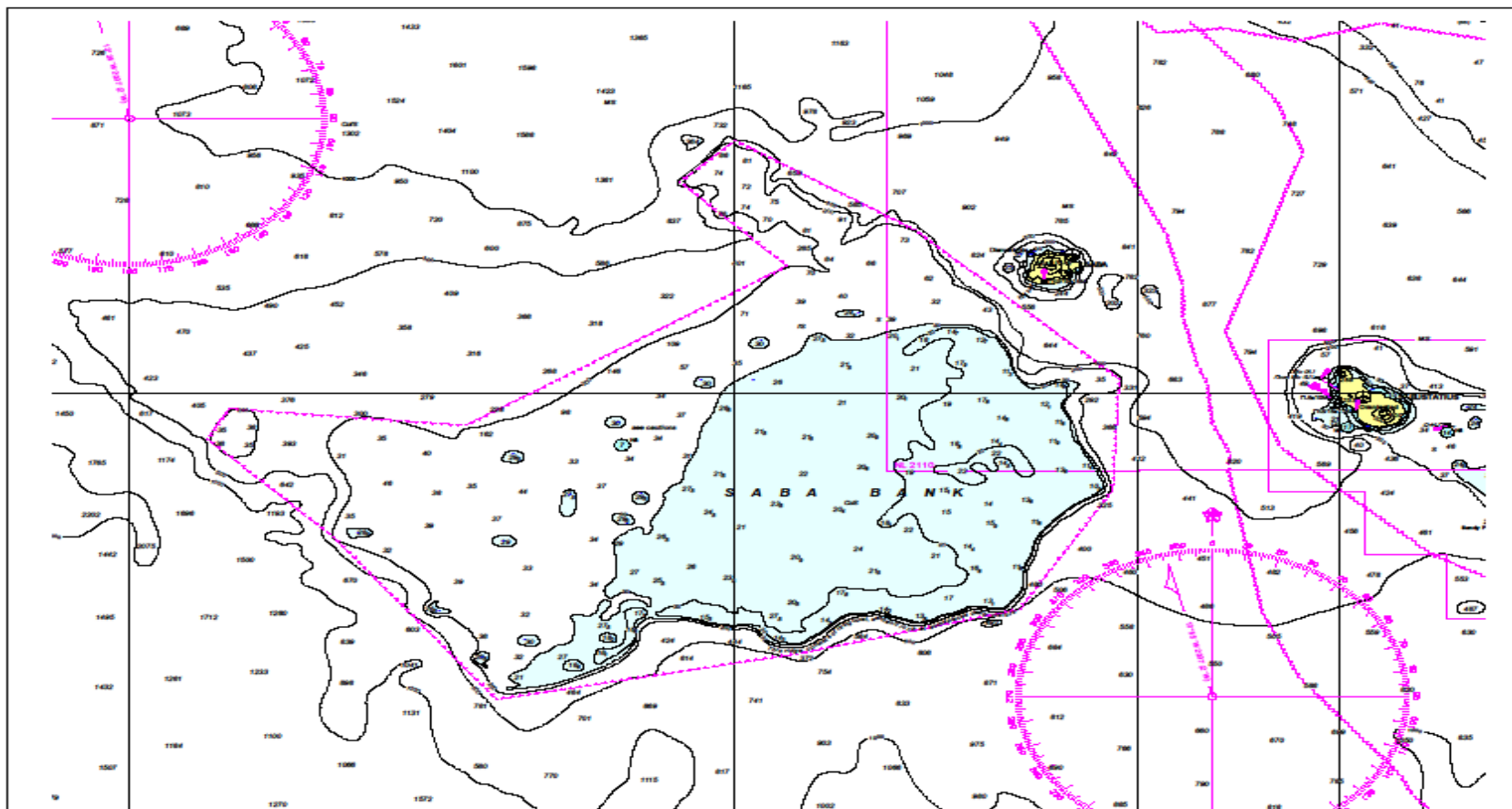
**Note:** This chart is based on World Geodetic System 1984 (WGS 84))

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12.	17° 10'.55 N	063° 41'.81 W
13.	17° 20'.85 N	063° 49'.89 W

### CHARTLET

#### CHARTLETS OF THE MANDATORY NO ANCHORING AREA AND AREA TO BE AVOIDED





Map is an extract from:  
Netherlands Nautical Chart no. 2020, Edition November 2007  
Scale: 1:300,000  
This chart is based on World Geodetic System 1984 (WGS 84)  
Royal Netherlands Navy Hydrographic Service

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