Photographs exclusively taken in the waters off St. Eustatius

Field Guide to the Marine Life of St. Eustatius

Niels Schrieken and Sylvia van Leeuwen (eds.)





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By Niels Schrieken and Sylvia van Leeuwen (eds.)
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Introduction to the marine life of St. Eustatius

photo: Marion Haarsma


photo: Glenn Faires

About St. Eustatius

Marion Haarsma

The island of St. Eustatius is part of the Dutch Caribbean. Approximately 21 km^2 in size, it is one of the Leeward Islands in the northern part of the Lesser Antilles, West Indies.

Geologically, St. Eustatius forms part of an inner arc of older islands that were created from what were originally submarine volcanoes. Along with St. Kitts and Nevis, St. Eustatius is one of three islands that share an underwater foundation known as the "St. Kitts Bank". These three islands were periodically connected together as a single land mass during the ice age, whenever the sea level was low enough to make this possible. The most recent time during which the three islands were joined was about 12,000 years before the present.

St. Eustatius supports an interesting variety of biotopes (types of habitat) both on land and in the sea. The marine habitats include seagrass beds, lava fingers, wrecks, coral reefs, and drop-offs. There are three national parks, managed by STENAPA (an acronym for St. Eustatius National Parks): St. Eustatius National Marine Park, Quill - Boven National Park, and Miriam C. Schmidt Botanical Garden.

The Golden Rock

Today, "Statia" – as the island is popularly called – has a human population of around 4,000. Visitors will find no mass tourism here, no sprawling sandy beaches lined with resorts. What you will find instead is a glorious history that can be both seen and felt. That, and a restful peace. St. Eustatius is a good place to enjoy the pleasant Caribbean climate and the extraordinary diversity of unspoiled nature.

St. Eustatius' dormant volcano, "The Quill", stands head and shoulders above the rest of the island. A hike up this perfectly shaped 600-meter-high volcano is a special treat. As an extra bonus, a spectacular tropical rainforest lies hidden within the crater.

Hundreds of shipwrecks just off the coast of St. Eustatius make the island a true diver's paradise. Experience the well-preserved reef patches and abundant stands of elegant sea fans. Under the surface of the crystal-clear water live many colourful fish, lobsters, and sea turtles. The waters around the island are home to a very rich biodiversity. Coral reefs and fish populations are healthy, and St. Eustatius has its own singular assemblage of marine animals and plants. This underwater richness has been recognised, and was awarded the status of "St. Eustatius National Marine Park" in 1996.

About the book

Niels Schrieken and Sylvia van Leeuwen

This guide is intended to give an overview of the diversity of the marine life of St. Eustatius. But to show and describe all the species living in the waters around Statia is impossible; in 2016, the known total was already over a thousand, and many more species remain to be observed and recorded. It is even likely that there are several species left to be discovered which are as yet unknown to science.
In this guide we have listed many of the island's common and characteristic marine animals and plants. To showcase the uniqueness of the marine life of the island, we have included some species that are found nowhere else, or are found only in this part of the Lesser Antilles. In addition, some species are included which are easily found around St. Eustatius, but which are rarely seen elsewhere in the West Indies.
Together these beautiful and strange creatures illustrate the surprising diversity of Statia's surrounding waters, hidden treasures that await anyone who wishes to search for them.
We hope this field guide will encouraged you to explore the amazing marine life of St. Eustatius.

Learn more!
The guide is designed to be accessible to persons of all ages and backgrounds, while avoiding oversimplification. It is based on both scientific research and field observations by citizen scientists and scuba divers. More information of the marine biodiversity of the Dutch Caribbean islands and the species in this field guide is available on www.anemoon.org. For further study we recommend the identification guides of Paul Humann and Ned Deloach on Florida Caribbean and Bahamas (3 volumes). Those who need help, can use the Facebook group of The ANEMOON Foundation, https://www.facebook.com/groups/StAnemoonMOO/

Share your observations!
By doing so, you will contribute to science, and to the management and protection of the St. Eustatius Marine Park. All you have to do is observe and share your observations and/or photographs of marine species on http://statia.observation.org/ or on http://www.inaturalist.org/. You can also use the Observation Card or the Extended Observation Form in the additional information section. You can download the card and the form via www.anemoon.org/EUX.

Names and abbreviations
All photos were taken in the waters and on the Island off St. Eustatius, mainly during the St. Eustatius Marine Expedition 2015, organised by Naturalis Biodiversity Centre and The ANEMOON Foundation. The common names used in this book follow Paul Humann and Ned Deloach. The scientific names follow WoRMS (www.marinespecies.org). The abbreviations sp. and spp. are used for species and multiple species.

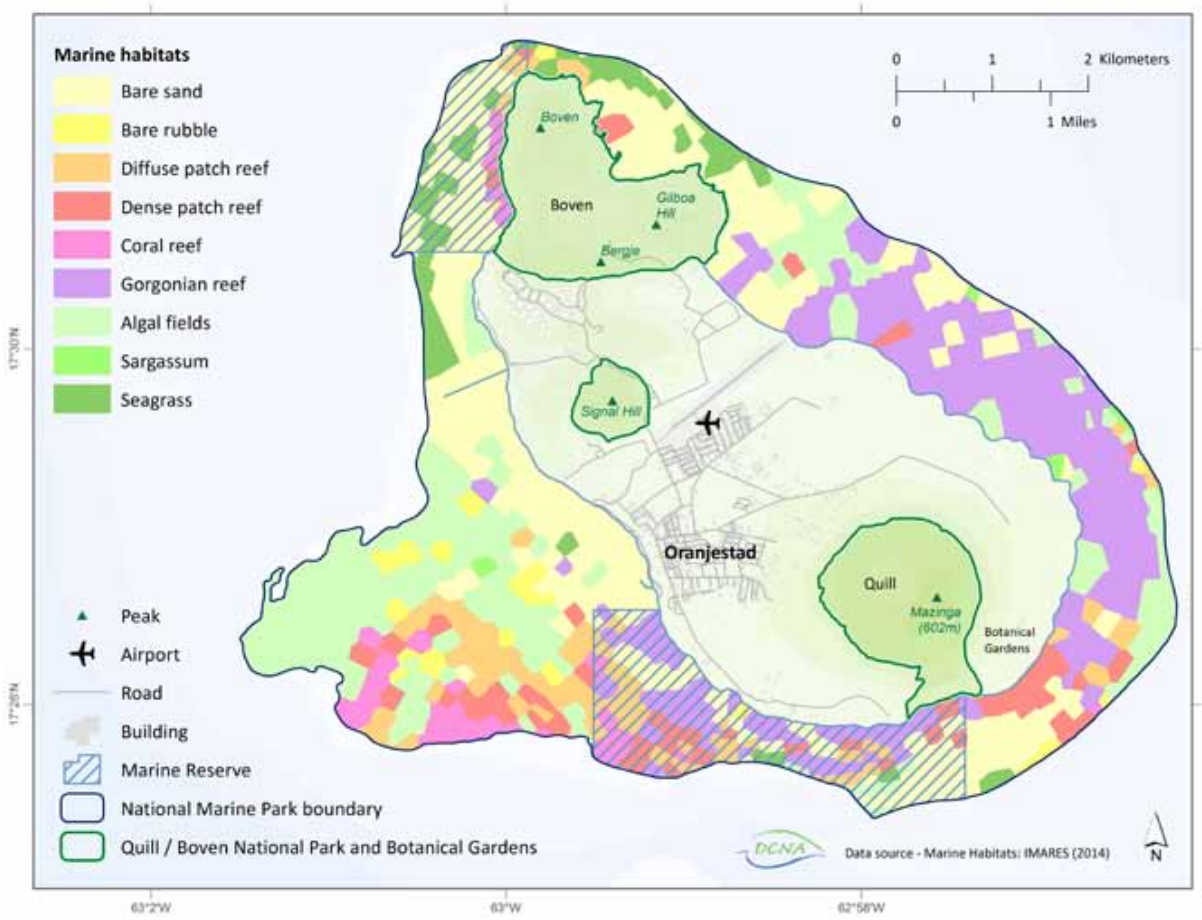
Blue beads
The origin of the blue beads goes back to the 17th century when the Dutch West India Company used these beads for trading. The pentagonal shaped beads were made in Amsterdam and travelled the world wherever the Dutch went. Thirty blue beads were used by the Dutch to purchase New York's Manhattan island from the native Indians. The beads in St. Eustatius were given to slaves as wages. After emancipation, the legend says the ex-slaves gathered at the cliffs and threw their beads in the sea to celebrate freedom. This is probably the reason that most of the blue beads are found by divers in the dive site called "Blue Bead Hole".

The best technique to find them is somewhere between swimming close to the sandy bottom and a few metres above the bottom for a wide angle view. The moment you spot something blue, you feel your heart pounding, but don't get too excited as you may end up with a small shard and they don't count. You never forget the moment you find your first blue bead and the atmosphere on the boat when the trophy is examined by fellow divers.

According to the legend you don't find blue beads but the beads find you, and if you're found, you will return to St. Eustatius again and again. Blue beads are the only artifacts that are allowed to leave the island.

Marine habitats of St. Eustatius

Niels Schrieken and Eseld Imms



Marine habitats

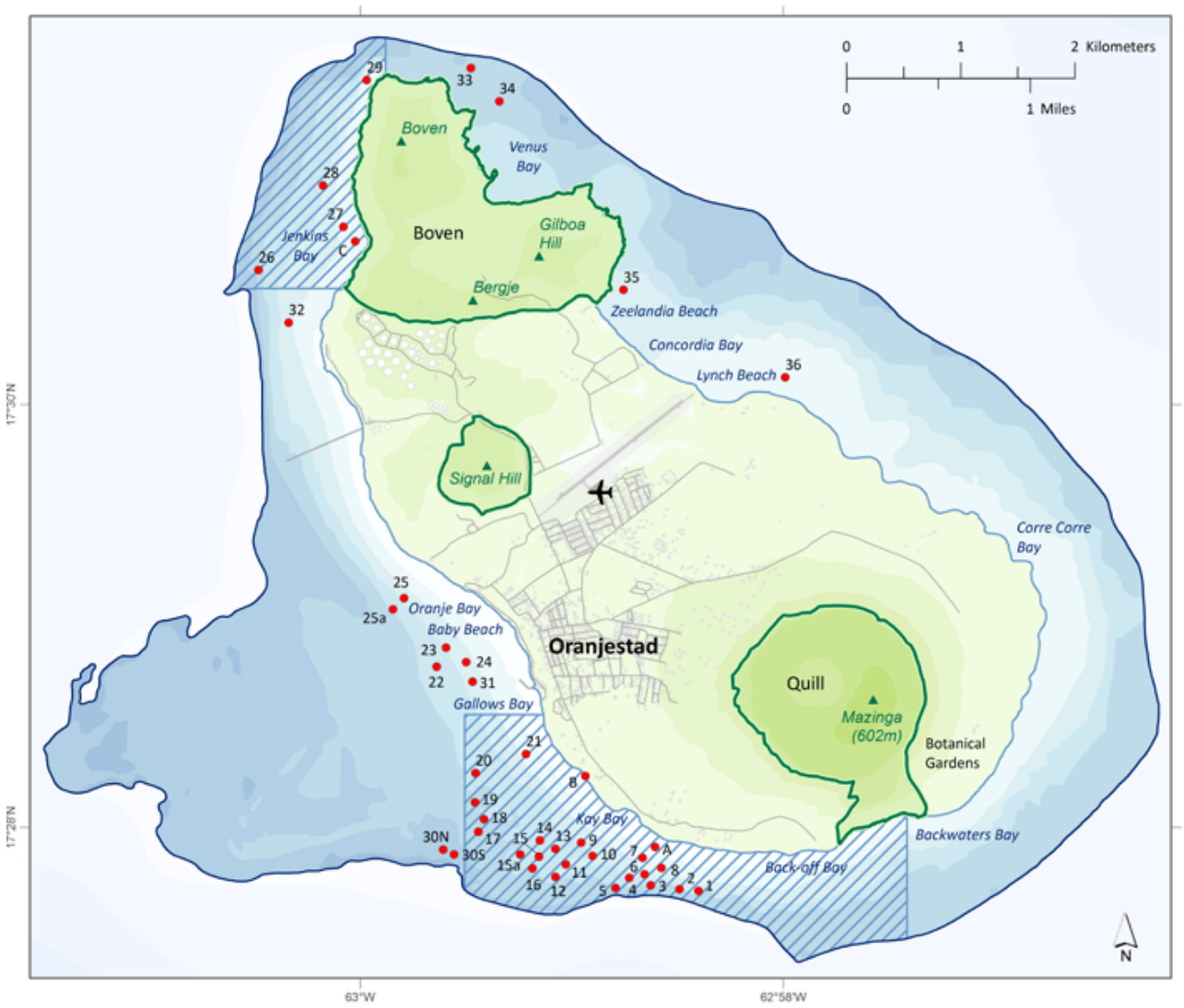
Although St. Eustatius is a small island, it is home to a number of different habitats for land, shore and underwater animals and plants. St. Eustatius offers 36 official dive sites and 3 snorkel sites (see the map on the next page). Diving on St. Eustatius is mostly done by boat, and most dive sites are on the Caribbean coast, because the waves are more gentle there. The Atlantic coast has powerful waves which makes it much harder to dive there. Around St. Eustatius, the marine waters offer a large variation of habitats (see the map above). Each habitat gives home to different species. Exploring the many dive sites of St. Eustatius means you are diving in numerous very different environments.

Almost all of the official dive sites are marked with mooring buoys to save the reef from anchor damage.

photo: Frank R. Stokvis

Chien Thong, wreck

Chien Thong, Caribbean side. Chien Tong was once a 52 m/170 ft Taiwanese longliner but is now a magnet for turtles, barracudas, reef sharks and other marine life. It is the place for night diving: giant Hawksbill Sea Turtles, Green Sea Turtles use the wreck as a hotel for the night.



- Dive Site
- Airport
- Peak
- Quill / Boven National Park
- National Marine Park boundary
- Marine Reserve
- Road / Pier
- Building

Depth in metres

2 5 10 15 20 25 30

DCNA

Data source - bathymetry: IMARES (2014)

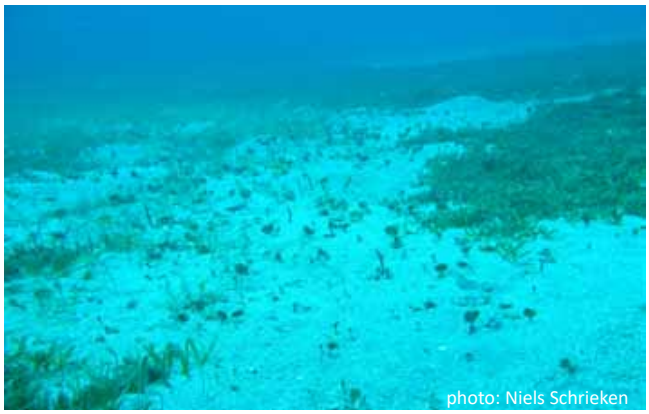
Dive sites

1	Drop Off East
2	Drop Off West
3	Grand Canyon / Off the Wall
4	The Cliffs / Down South
5	Coral Gardens
6	Mushroom Gardens
7	The Humps
8	Valley of the Sponges
9	Five Fingers North
10	Five Fingers South
11	The Ledges
12	Anchor Reef
13	The Blocks
14	Hangover
15	Anchor Point South
15a	Anchor Point West
16	Anchor Point North
17	Twin Peaks
18	Barracuda Reef
19	Nursing Station
20	Blair's Reef
21	Crook's Castle
22	Triple Wreck
23	Double Wreck
24	Stingray City
25	STENAPA Reef
25a	Chien Tong
26	Doobie's Crack
27	Outer Jenkins Bay
28	Twin Sisters
29	Gibraltar/North Point
30N	The Charles L Brown North
30S	The Charles L Brown South
31	Blue Bead Hole
32	Aquarium
33	North Man
34	Five Canyons
35	The Cave
36	English Quarter

Snorkel sites

A	Blind Shoal
B	Twelve Guns
C	Inner Jenkins Bay

Double Wreck, reef
Double wreck is a former wrecksite now fully grown with sponges and coral. You find fishes, stingrays, turtles and small marine life.

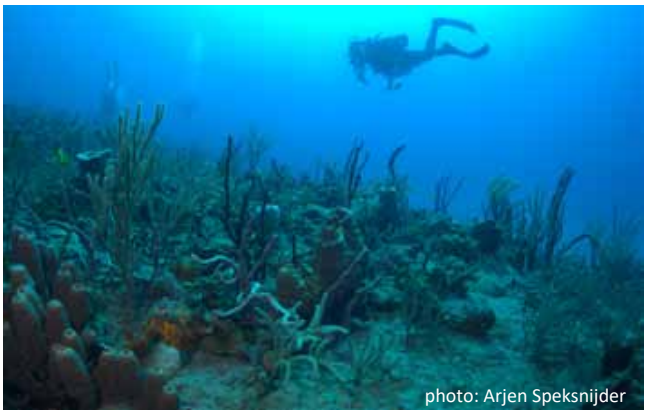


Blue Bead Hole, seagrass
Blue bead hole is sand with sea grass. Here you find the most colourful blue fins, the Flying Gurnard!

The Humps, patch reef
The Humps are huge coral-covered lava bombs and lava ‘fingers’. You find loads of (juvenile) reef fish, corals and sponges. A true heaven for macro-lovers.

Scubaqua House Reef, submerged city wall
These old city wall of stone is coverd with sponges and some corals. Small fish and other creatures hide in crevices.

North Man, boulders
On the exposed side of the Island. Large boulders overgrown with sponges and coral. Here you can find different species of marine life than on the Caribbean side.



Shark Reef, drop off
At the north of the island. The reef is surrounded by deeper water and gives you the feeling you dive in the open ocean. There is an abundance of barracudas, jacks and don’t even try to count the lobsters.

Zeelandia Beach. photo: Sylvia van Leeuwen

Coastal habitats

Susan J. Hewitt and Sylvia van Leeuwen

Most of the coastline of St. Eustatius is rocky, and exposed to rough surf and high waves. The tidal range is small, with a maximum of only 25 cm. However, during storms the water can rise higher, and wave splash can reach surprisingly far up the coastal rocks. In general, the waves and currents along the Atlantic coast of the island are more powerful than those on the Caribbean side.

Species that occur within the intertidal zone are adapted to a constant slow cycling of wet and dry, as the tide retreats and then returns. Every species has its own niche: some species live higher up than others; some species tolerate exposed places, whereas others live only in sheltered places. There is also a remarkable difference between those species which live on rock substrate, and those which live in or on sand.

Rocky littoral habitat is abundant on St. Eustatius, with much of the coast featuring large boulders and smaller rocks at the foot of cliffs. Although often inaccessible to humans, these rocks and boulders provide important habitats for marine life. Along Oranje Bay, on the central part of the west coast of St. Eustatius, species which flourish on hard substrates have colonized the ruins of former warehouses, jetties, piers, and the old town wall, now submerged.

In contrast to the rocky shore present on so much of the coast, some stretches of the shoreline of St. Eustatius feature sandy beaches and bays, and these provide a habitat for varieties of marine life which can flourish in and on the sand, including a number of different species of clams, and some predatory snails.

Two species of invertebrate which live in the highest part of the tidal zone are the Beaded Periwinkle (on rock surfaces in the splash zone) and the Ghost Crab (living in burrows fairly high up on the sand beaches). On rocks and boulders, in the zone between high and low tide, you will find abundant populations of sea snails such as periwinkles, limpets and nerites, as well as several species of large chitons. Most of these animals are firmly attached to the rocks with a muscular foot. On flatter rock platforms, the Red Rock Sea Urchin is sometimes abundant; they create their own safe place by boring holes in the rock.

Algae, sea anemones, barnacles, crabs, shrimps and small fish are also found in these rocky habitats. Some species only thrive on the upper side of rocks, while others prefer to hide underneath stones and in crevices. If you turn rocks over to examine the sea life on the underside, please remember always to put the rocks back carefully in their original position.

Sandy beaches are the easiest and most pleasant places for humans to access the waterline. St. Eustatius beaches often don't have rich lines of beach drift, but with careful searching and some patience, numerous species can be found washed up onto the beach.

Below are listed the most accessible beaches which are sandy, followed by places that are less easy to access, but still of general interest. We subsequently list some coastal areas which may be interesting to biologists, but are quite difficult to access from the land.

Sandy beaches that are easy to access

Zeelandia (photo previous page)
Zeelandia Beach, on the Atlantic coast, is a magnificent long sandy beach. It is, however, not safe for swimming, because of extremely rough surf and strong rip currents. This beach is very pleasant to walk along, with lovely views of the Quill volcano in the distance. It may sometimes be possible to walk along Zeelandia all the way to the end of Concordia Bay.


Oranje Bay. photo: Sylvia van Leeuwen

Oranje Bay
The best beach on St. Eustatius for swimming is the sandy area at the north end of Oranje Bay, on the Caribbean (southwestern) coast of the island. The best area for safe, easy snorkeling is the central part of Oranje Bay, near the Scubaqua Dive Center, where you will see the remnants of the old town pier, and further out, underwater, is the old town wall.


Baby Beach. photo: Sylvia van Leeuwen

Baby Beach
This is the informal name given to a very small sandy beach area that also has a small boat-launching ramp. Baby Beach is situated immediately north of the Port jetty on the Caribbean coast. This little beach is very sheltered, and people consider it suitable for small children to play there, hence the name.

More rugged beach areas


Gallows Bay. photo: Sylvia van Leeuwen

Crooks Castle on Gallows Bay
The stretch of coast known as Crooks Castle, on the Caribbean side, is not very difficult to access. There is what looks like an industrial road going slightly inland just south of the Port, and that road ends at the shore. At first this is mainly a dark gravel beach, but it changes over to rocks, and these become more challenging the further south you go, ending just beyond the picturesque ruins that carry the name Crooks Castle. It is necessary to wear sturdy shoes, and be careful, but this is a good place to look for shells.

Lynch Beach
Lynch Beach, on the Atlantic side, is not very easy to access. You can hike down from the main road, or attempt to drive down on one of two parallel dirt roads, which are rutted and challenging in places. There are cliffs, but in the most northerly part of this area, it is relatively easy to get down to the water's edge.

Lynch Beach. photo: Sylvia van Leeuwen

Lynch Beach usually does have sand, sometimes quite a lot. However, the exact position of this sandy area varies. Instead of one sand beach, sometimes there are two or three separate sand patches. In the areas where there is no sand, there are small rounded rocks: some are white coral, and others are volcanic rock of various attractive colours. Lynch Beach almost always has shells that have been washed up, both small and large, as well as lots of seaweed and the remains of other interesting marine creatures. On the rare occasions when the waves are not rough, it is possible to wade around in the shallow water here, and see many live sea snails and interesting species of marine plants still alive and growing.

Other coastal areas

Corre Corre Bay. photo: Sylvia van Leeuwen

Corre Corre Bay
Visiting Corre Corre Bay requires driving slowly along a rough road which leads towards the Botanical Gardens, and then hiking half an hour to descend to the bay itself. Corre Corre has a boulder beach, and the shallow water is somewhat sheltered by a natural rock barrier which extends across much of the bay. During low tide this is an interesting place to observe marine life on the rocks.

Venus Bay. photo: Sylvia van Leeuwen

Venus Bay
A one-hour hiking trail starts near Zeelandia Bay, and leads to Venus Bay. This beach consists of boulders. There is some beach drift shells trapped between the rocks, and live animals on the rocks.

Jenkins Bay. photo: Sylvia van Leeuwen

Jenkins Bay
Jenkins Bay is currently not accessible from land because of sheer cliffs. It is possible to moor a boat here and swim to shore, but in 2015 the “beach” was a steep slope of large rounded boulders – not a great place for a picnic!

Kay Bay, **Back-off Bay**, **Buccaneers Bay**, and **Backwaters Bay** are basically inaccessible.

Galleries of marine species

photo: Marion Haarsma


photo: Marion Haarsma

Fishes

Marion Haarsma

General information

Few, if any, animal groups boast such a wide variation in form, colour, size and distribution amongst its members as fish. The colour display of fish around a tropical reef can be overwhelming and this is also the case around St. Eustatius.

Fishes are vertebrates, but there is not a single taxon to include only fish. In this field guide we use body form, colour and the way they move to categorise them in the following sequence: colourful disks and ovals; silvery, sloping heads; tapered bodies; small ovals; heavy bodies with large lips; swim with pectoral fins/obvious scales; reddish with big eyes; small-elongated bottom dwellers; odd-shaped bottom dwellers; odd-shaped swimmers, eels and sharks and rays.

Gray Angelfish *Pomacanthus arcuatus*

Yellow inner face of pectoral fin. Square-cut tail. Prefer shallow reefs, where they swim in pairs.

Fish around St. Eustatius

This field guide presents 55 marine fish species, to be observed in shallow waters around St. Eustatius during snorkelling and scuba diving. The total number of known shorefish species (< 100 m depth) on St. Eustatius is now 273. One reason why there are so many fish around St. Eustatius is because it is a marine reserve; no fishing is allowed. Also the variety in scenery gives opportunity for all kinds of fish to flourish. The slowly sloping sandy seabed around the island is covered with lava flows. The irregularly shaped rocks are teeming with life. Many cracks and crannies give the fish ample opportunities to hide and find food. The reason why there are so many juvenile fish is unknown so far...but makes further investigation worthwhile!

Queen Angelfish *Holacanthus ciliaris*
On the head a black dot ringed with blue: the crown! Tail yellow. Compressed body bluish-green. Scales with yellow-orange edge. Juvenile: dark blue body with five black bars.

Banded Butterflyfish *Chaetodon striatus*
Four bars, the frontal through the eye. Inhabits corals reefs in shallow water where it swims about, usually in mated pairs in search for food.

French Angelfish *Pomacanthus paru*
Compressed black body with yellow at the end of the scales. Yellow around the eyes and at the end of the top tailfin. Tail rounded. Juvenile: black with three yellow bars.

Foureye Butterflyfish *Chaetodon capistratus*
Black eyespot with white ring near the tail base. Usually in mated pairs on coral reefs of shallow water.

Rock Beauty *Holacanthus tricolor*
Yellow to yellow-orange forebody and tail. Mid and rear body black. Shallow coral reefs, where it patrols its territory daily. Shy.

Reef Butterflyfish *Chaetodon sedentarius*
Two bars, one through the eye another in front of the tailfin. Inhabits corals reefs in shallow water where they swim about, usually in mated pairs in search for food.

Blue Tang *Acanthurus coeruleus*
Laterally compressed,surgeonfish. A yellow caudal spine is found in a horizontal groove at the tail base. Juvenile: yellow.

Ceasar Grunt *Haemulon carbonarium*
Yellow to dark copper/bronze stripes. Dusky rear dorsal, anal and tail fins. Inhabits shallow reefs, by day drifting in small groups. By night they spread out to adjacent flats to feed.

Bigeye Scad *Selar crumenophthalmus*
Bright reflective silverly fishes. Big eyes larger than the length of the snout. In small groups or large schools that swim rapidly over the reefs.

Cottonwick *Haemulon melanurum*
Bold, black stripe on dorsal fin continues to form a “V“ on tail. Dark stripe begins on snout, runs across eye and and continues to tail in yellow. Solitary.

Great Barracuda *Sphyraena barracuda*
Long, cylindrical body. Large underslung jaw, pointed teeth often obvious. Drifts around reefs and other habitats. Solitary or in small groups.

Black Margate *Anisotremus surinamensis*
High back profile. Dark patch behind pectoral fin. Inhabit inshore reefs and rocky areas. Often under ledges or in caves. Shy and difficult to approach.

Longsnout Seahorse *Hippocampus reidi*
6 - 10 cm. Small dark spots over head and body. Curl base of tail around branches of gorgonians, seagrass or other holdfasts

Yellowtail Damselfish *Microspathodon chrysurus*
10 - 18 cm. Mainly alone or in small groups. Body laterally compressed, oval in profile. Dark bluish-brown body with yellow tail. Blue spots on head, back and dorsal fin. Juvenile: dark blue with bright blue spots.

Dusky Damselfish *Stegastes adustus*
Adult brown. Dorsal and anal fins extend backwards no further than the tail base. Narrow dark edge on anal (lower) fin. Juvenile: blue with brilliant orange upper side and dark spot on dorsal fin.

Sergeant Major *Abudefduf saxatilis*
10 - 15 cm. Silvery to greyish-white with 5 dark bars, yellow back and dusky fins. Body laterally flattened, oval in profile, caudal fin forked.

Threespot Damselfish *Stegastes planifrons*
8 - 10 cm. Mainly on coral reefs, in groups. Deep brown-grey body with hints of yellow. Juvenile brilliant yellow with a large black spot on the lower dorsal fin.

Brown Chromis *Chromis multilineata*
7 - 15 cm. Body laterally flattened, oval in profile, with a slender, deeply forked tail. Body from brownish grey to olive-brown. Border of dorsal fin and tips of the tail fin yellow.

Shy Hamlet *Hypoplectrus guttavarius*
Yellow fish with large dark area on the body, extending to the tail base. All fins, tail and crest bright yellow. Snout with dark and blue markings.

Barred Hamlet *Hypoplectrus puella*
8 - 13 cm. Related to basses, basslets and groupers. Hiding in the reef, very colourful, brown and yellow with blue accents.

Red Hind *Epinephelus guttatus*
Grouper, found alone, on shallow reefs. 30 - 60 cm. Reddish-brown spots over a pale olive-to-white background. Lower body is paler and the dots are redder. Dark margin of dorsal, anal and and tail fins.

Harlequin Bass *Serranus tigrinus*
5 - 10 cm. Greenish-white upper body with 7 dark brown bars. Cylindrical body with a pointed head. Solitary fish on sandy seabed feeding on crustaceans.

Coney *Cephalopholis fulva*
40 cm Small grouper in four colour variations among them Brown with dots, Top half red and underhalf white (on photo) and Golden variation (see next). All forms have two dots at lower lip.

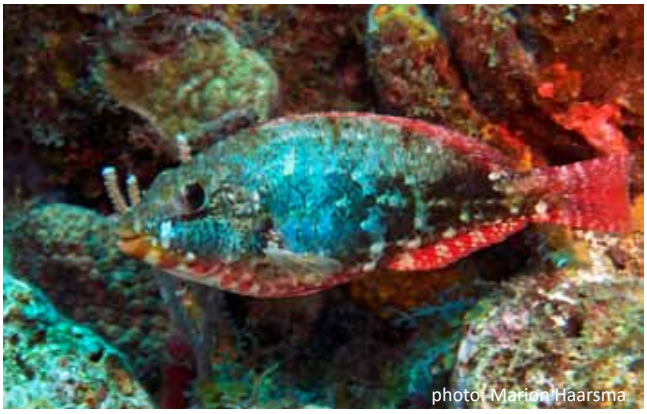
Golden Coney *Cephalopholis fulva*
40 cm. 'Golden' Coney, the yellow ('xanthic') form of the above-mentioned Coney found in deep and shallow water.

Tiger Grouper *Mycteroperca tigris*
Up to 90 cm. The body colour shades of grey, brown, or red over a pale background. Nine broad diagonal 'tiger stripes'. Swim lazily about the reef.

Redtail Parrotfish *Sparisoma chrysopterum*
35-40 cm. Photo: male in terminal phase at night. Crescent-shaped caudal fin, no parrot-like teeth. Blue area behind pectoral fin. Red band on tail.

Stoplight Parrotfish *Sparisoma viride*
30 - 60 cm. Male brilliant green with pale purplish-orange markings on the head, blue mouth. The initial phase adult has a dark brown upper body, with white scales and red fins.

Squirrelfish *Holocentrus adscensionis*
15 - 30 cm, yellow first dorsal fin. slender shaped fish red and white, with long yellow spines and big eyes. Nocturnal.



Redband Parrotfish *Sparisoma aurofrenatum*
15 - 25 cm. Photo shows initial phase: from mottled grey-brown with 2 long white stripes, to a green body with red fins. Small white spot behind dorsal fin. Terminal phase with salmon-coloured stripe under eye.

Longspine Squirrelfish *Holocentrus rufus*
12 - 25 cm. White triangular markings only at tips of dorsal fin spines. Reddish with light silvery stripes on body. During day, drift inconspicuously in shaded areas near the seabed.

Blackbar Soldierfish *Myripristis jacobus*
8 - 13 cm. Nose blunt with large eyes, red with silver and conspicuous dark bar behind head. Often in front of reef openings.

Pepermint Goby *Coryphopterus lipernes*
0.75-2.5 cm. Body yellow-gold to translucent, with blue markings on the snout and upper part of the eye. On living Cactus Coral.

Glasseye Snapper *Heteropriacanthus cruentatus*
30 cm. Reddish in colour with silver bars dorsally, which sometimes extend to the lower half of the body, where they appear as round silver spots. Found in shallow waters where, by day, it will hide.

Sailfin Blenny *Emblemaria pandionis*
Male dark to black with a large dorsal fin like a sail. Female mottled white with brown, the dorsal fin smaller than males. Lives in holes, often only head and part of the body visible.

Sharknose Goby *Elacatinus evelynae*
4 cm. Very small, torpedo-shaped fish with yellow stripe in front of each eye that joins to form a V near the tip of the snout, black and white stripes on the body. On living Star Coral.

Yellowface Pikeblenny *Chaenopsis limbaughi*
9 cm. Long and eel-like tube blenny. Snout flattened. Adult male has a long dorsal fin with eyespot, which can be highly erected. Usually in small colonies in deeper areas with rocks and rubble.

Yellowhead Jawfish *Opistognathus aurifrons*
5 - 8 cm, bluish grey with small pale blue dots. The head is yellow, fins and tail are blue.

Spotted Scorpionfish *Scorpaena plumieri*
Tail with three dark bars. Body with big head and mouth, two long dorsal spines with venom, although sting not fatal. Sits motionless with colour and skin structure matched to the background.

Peacock Flounder *Bothus lunatus*
15 - 45 cm. Flat, bottom dweller, two eyes on one side, grey brown body with bright blue rings, with long pectoral fin.

Longlure Frogfish *Antennarius multiocellatus*
Long thin lure on the snout. Adapt its colour to the background, often sponges. Tail with 2 or 3 dark light-edged spots.

Red Lionfish *Pterois volitans*
40 cm. White bars alternated with red/maroon/brown bars, fins with long venomous spines.

Redspotted Hawkfish *Amblycirrhitus pinos*
5 - 9 cm. Body white with brown bars. Red spots on head and upper fin. Dorsal fin with red spots and threads on spine tips.

Flying Gurnard *Dactylopterus volitans*
15 - 35 cm. Very large pectoral fins. When expanded, these fins reach the tail and brilliant blue dots and lines are visible. Inhabits sand, coral rubble and seagrass areas, often near shallow patch and fringe reefs.

Atlantic Trumpetfish *Aulostomus maculatus*
40 - 75 cm. Long, thin body with trumpetlike mouth, brown, purplish or yellow. Does not change colours but may quickly pale or darken.

Sand Diver *Synodus intermedius*
10 - 35 cm. Slender, cylindrical body, brownish grey with dark spots and lizard-like head. Dark spot on upper end of gill cover. Rests on sand bottoms and sometimes on reef tops.

Sand Tilefish *Malacanthus plumieri*
30 - 45 cm. Long body, long dorsal and ventral fins, yellow tail. Varies in colour from yellow grey. Head with yellow and blue.

Red Lizardfish *Synodus synodus*
10 - 18 cm. Slender, cylindrical body pale to tan, with reddish bars. Usually rests on hard surfaces like rocks and corals.

Sharpnose Puffer *Canthigaster rostrata*
5 - 10 cm., Pointed snout. No scales on the body Beige, brown, orange with two black ridges on top and on the bottom, running from the belly to the tail.

Balloonfish *Diodon holocanthus*
20 - 35 cm. Body with a truncated head, olive to brown. A dusky band runs from eye to eye. Head and body with spines which may be erected

Honeycomb Cowfish *Acanthostracion polygonius*
20 - 38 cm. Pale greenish, bluish or yellowish. A dramatic colour changer, with two horn-like spines above the eyes. Tail fin rounded.

Web Burrfish *Chilomycterus antillarum*
15 - 25 cm. Body covered with short spines, always erect, the dorsal ones most prominent.

Trunkfish *Lactophrys trigonus*
55 cm. With a pronounced hump on the back. Long tailbase. Colour varies between green, brown, blue and grey, with white spots on its back. Colour and markings changeable.

Porcupine Fish *Diodon hystrix*
30 - 60 cm. Pale brown covered with black spots. When exited it can go pale or darken, showing dusky bars. Spines lay normally flat to body.

Smooth Trunkfish *Rhinesomus triqueter*
20 cm. Dark with a pattern of small white spots. Mouth small and protrusible. Juvenile: dark body, covered with large yellow to pale spots

Whitespotted Filefish *Cantherhines macrocerus*
25 - 38 cm. Snout grey, rear body orange, sometimes white spots all over. Deep and compressed body, single long dorsal spine.

Yellow Goatfish *Mulloidichthys martinicus*
15 - 30 cm. Body white with a yellow stripe, fins and tail yellow. The snout is steep with two long barbels.

Slender Filefish *Monacanthus tuckeri*
5 - 8 cm. Yellow brown with brown spots, colour changer. Slender body, long head and pointed snout. Lives head down in soft corals.

Spotted Drum *Equetus punctatus*
10 - 25 cm. White body with big head and dark brown bars, bands and stripes. Juvenile similar to adult, but dorsal fin much longer.

Spotted Goatfish *Pseudupeneus maculatus*
15 - 30 cm. When active it is white with three square blotches on each side, it can pale or darken the blotches at will. With two long barbels.

Jackknife Fish *Equetus lanceolatus*
12 - 23 cm. White body with three dark brown bars. Juvenile similair to Spotted Drum but lack black spot on the nose.

Spotted Moray *Gymnothorax moringa*
30 - 90 cm, max 1.20 m. Serpentine-shaped body, light coloured with dark brown spots. Fin margin black. Hides during daytime, often with head sticking out, hunts at night.

Sharptail Eel *Myrichthys breviceps*
30 - 90 cm. Snake eel, long dorsal fin, brown, dark to greyish, with light underside. Dotted with small yellow spots. Most species lack fins, adding to their snake-like appearance.

Goldentail Moray *Gymnothorax miliaris*
40 - 70 cm. Serpentine-shaped body light brown or dark background colour, dotted with small yellow spots. Inside of mouth white. Stout moray with a short blunt snout.

Nurse Shark *Ginglymostoma cirratum*
150 - 275 cm. Two barbels on upper lip. Two dorsal fins, of nearly equal size, are set far back. Small mouth. Grey to yellow brown. Tail fin has no distinct lower lobe. Juveniles often have small black spots on the body.

Chain Moray *Echidna catenata*
30 - 60 cm. Serpentine- shaped body. Dark brown to nearly black, with interconnected series of yellow lines, forming a somewhat chainlike pattern. Irises yellow.

Southern Stingray *Dasyatis americana*
90 - 120 cm. Snout and tips of “wings“ pointed. Varies from brown to grey and black. Whiplike tail, with one or two venomous spines at base.


photo: Marion Haarsma

Sea Turtles

Marion Haarsma

General information

Unlike all other marine creatures, sea turtles (Crypyodira) are large, air-breathing reptiles. Inhabiting tropical and subtropical seas worldwide, they are some of the Earth's most ancient creatures, having been in existence for 110 million years, since the time of the dinosaurs.

Sea turtles have a flattened body shape, a protective shell or carapace, and flipper-like front limbs, adapted for swimming in the open ocean. The shell is streamlined for gliding through water. Unlike land and freshwater turtles, sea turtles cannot retract their legs and head into their shells

The seven species of sea turtles that exist today are the Green, the Loggerhead, Kemp's Ridley, Olive Ridley, Hawksbill, Flatback, and Leatherback. The colour of sea turtles can be yellow, greenish and black, depending on the species. What sea turtles eat also varies from species to species, but some common food choices are jellyfish, seaweed, crabs, shrimp, sponges, and algae, as well as snails and other molluscs.

Hawksbill Sea Turtle *Eretmochelys imbricata*
15 - 90 cm. This sea turtle species nests every year on the beaches of St. Eustatius. The Hawksbill has two visible claws on each flipper. It also has a sharp, curving beak, which makes it easy to recognize. The World Conservation Union classifies the Hawksbill as Critically Endangered.

Most sea turtle species undergo long migrations, some as far as 1400 miles between their feeding grounds and the beaches where they nest.

Did You Know?
Although they are air-breathing, green sea turtles can stay underwater for as long as five hours, even though the duration of their feeding dives is usually five minutes or less. During a dive, the turtle's pulse slows down to conserve oxygen; nine minutes may elapse between each heartbeat.


photo: Marion Haarsma

Green Sea Turtle *Chelonia mydas*
15 - 120 cm. They have brown to dark brown shells with occasional shades of olive. The shell is usually plain with no markings, but sometimes the shell has a mottled or wave-like pattern. The plates of which the shell is composed lie side by side (not overlapping). One distinctive feature of the Green Sea Turtle is that it has only two plates between the eyes.

Turtles around St. Eustatius
Three out of the seven species of sea turtle nest on St. Eustatius, and they can be observed swimming in the water around the island. Most of the time, however, you will see only two species: the Green Sea Turtle and the Hawksbill Sea Turtle. More rarely, the Leatherback Sea Turtle (*Dermochelys coriacea*) comes in to nest at St. Eustatius. All the female turtles dig their nests on the Atlantic side of the island, in the sand on beaches there. The northeasterly trade winds create strong waves, so the mother turtles have to swim to the beach and away again through the rough surf.


photo: Mike Harterink


photo: Glenn Faires

Leatherback Sea Turtle *Dermochelys coriacea*
15 - 240 cm. The largest of all living turtles, are easily distinguished by their lack of shell plates. Instead, their back is covered with a tough, leather-like, slate-black to bluish black skin. Seven prominent ridges run down the back. This generally pelagic species, that feeds on jellyfish, is rarely encountered by divers.

The staff of STENAPA monitor and protect the turtle nests, and when the time is right, tourists are invited to see the 'coming out' of the little hatchlings. If you are lucky enough to witness this, it is a sight you will never forget!


photo: Marion Haarsma

Hatchlings
Every spring, sea turtles come in to nest on the sandy beaches. The eggs take 60 days to hatch. The staff of STENAPA help by digging out the nests, but the eggs and the hatchlings must not be touched. The Hawksbill babies have to start life under their own steam!


photo: Marion Haarsma

Sponges

Floris Bennema and Godfried van Moorsel

General information

The vivid colours and impressive shapes seen on Caribbean reefs are not only the result of coral growth, but are also due to the presence and variety of sponge species. Some sponges encrust rocks and even corals, while other species form tubes, barrels, balls, vases, or rope-like structures. Boring sponges make holes in coral skeletons and empty mollusc shells.

Sponges (Porifera) do not have internal organs, but many species have microscopic needles of either calcium carbonate or silica, which serve as their skeletons. Small incurrent openings on the sponge's surface allow seawater to be pumped in, and this provides the cells of the sponge with food and oxygen. Water leaves the sponge through one or more larger excurrent openings. These openings may be very large, in fact the whole central hole in barrel sponges and vase sponges is such an opening. Many sponges feed on the sugars leaked into seawater by corals, and by doing so, they play an important role in the ecological cycle of the reef. Sponges also serve as a refuge for many organisms.

Brown Tube Sponge *Agelas conifera*

A highly variable sponge, up to 1 m. The high, soft-walled tubes are medium brown with lighter interiors. Outer surface often colonized with dark zoantharians.

Some turtles and fish eat sponges, and hide inside the osculum of barrel sponges. Polychaete worms thrive within sponge tissue.

Sponges on St. Eustatius

The reefs of St Eustatius harbour over 150 sponge species. Within shallow reefs on St. Eustatius, species belonging to three of the four sponge classes can be found: Calcarea, Demospongiae, and Homoscleromorpha.

One of the most important sponges in the Caribbean is the Giant Barrel Sponge *Xestospongia muta*; these are quite abundant, but due to their remarkable longevity – well over 200 years – they are vulnerable to anchor damage and bacterial diseases. The significant contribution of sponges to St. Eustatius's biodiversity is augmented by their role as host to hydroids, zoantharians, fish and other species.

Branching Tube Sponge *Aiolochroia crassa*
A bicoloured tube sponge, can be purple with yellow (especially inside), orange, or grey. Usually forms several thick tubes with a common base.

Azure Vase Sponge *Callyspongia plicifera*
Fluorescent pink to purple vase sponge, with meandering grooves and rounded depressions on outer surface. Can be tube-shaped. Commonly found on walls of coral reefs.

Stove-pipe Sponge *Aplysina archeri*
Slender and soft-walled lavender tubes, single or clusters. Tubes may reach 2 m in length. Lives on reefs and walls from 6 - 30 m.

Pink Vase Sponge *Niphates digitalis*
Thick vases to thin inverted cones, sometimes grows into fans. Light grey, pinkish or bluish. The sponge is rough with irregular pits and nubs covering its surface.

Yellow Tube Sponge *Aplysina fistularis*
Soft-walled yellow tubes, usually in clusters joined at the base. Length of tubes up to 1.2 m. In deeper water, the tubes tend to be longer than in shallow areas.

Giant Barrel Sponge *Xestospongia muta*
Huge (up to 2 m), barrel-shaped, exterior rough, hard, often jagged, usually red-brown. Generally solitary but sometimes individuals share the same base.

Black Ball Sponge *Ircinia strobilina*
Grey or black globular sponge often with a spiky surface. May have shallow depressions at excurrent openings on upper side. Medium sized, up to 45 cm in diameter.

Green Finger Sponge *Iotrochota birotulata*
Green sponge with irregularly distributed or upright, ramose branches with a conulose surface. Often with yellow zoantharians.

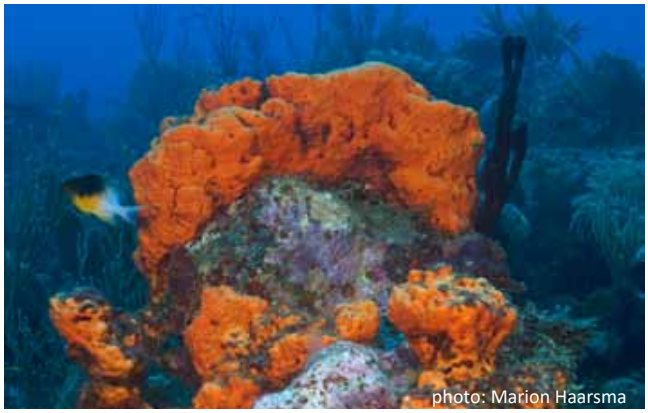
Lumpy Overgrowing Sponge *Desmapsamma anchorata*
Usually less than 30 cm across, soft pink in colour. The surface is smooth and the large excurrent openings show a darker-reddish inside.

Red Encrusting Sponge *Monanchora arbuscula*
Brilliant red encrusting sponge, may form lumps. Root-like canals radiate from slightly raised excurrent openings. White pattern of spots between channels.

Brown Encrusting Octopus Sponge *Ectyoplasia ferox*
Reddish-brown to orange, lighter colours around the raised openings, which may form tubes up to 10 cm in height. Encrusting, sometimes irregularly branched.

Star Encrusting Sponge *Halisarca caerulea*
Thin, encrusting sponge. Several short canals radiate in a star-shaped pattern from+ small groups of pitted excurrent openings. These ‘stars’ are well-separated.

Orange Icing Sponge *Mycale laevis*
A yellow to orange encrusting sponge, commonly seen underneath leafy corals. Large transparent excurrent openings with extending white lines.

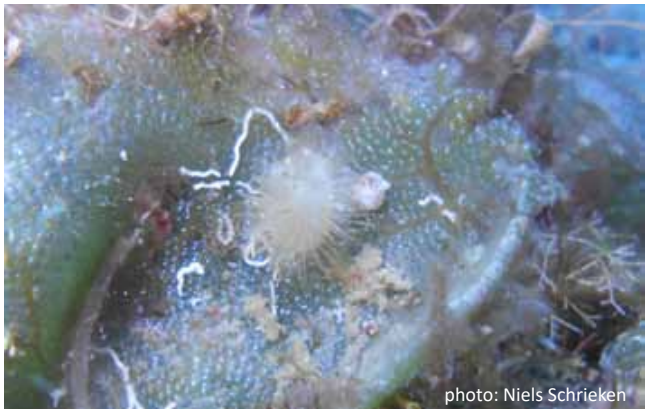


Orange Elephant Ear Sponge *Agelas clathrodes*
Massive, orange-red, rubbery sponge. Can take various forms. Distinguished from the similar-looking citron sponge by its keyhole-shaped openings.

Orange Lumpy Encrusting Sponge *Scopalina ruetzleri*
Rather soft and fluffy orange to orange-yellow cushions with weblike texture. Surface with small knobs and with scattered groups of excurrent openings.

Brown Variable Sponge *Cliona varians*
Brown to cream sponge that can encrust deeper reefs or form masses in shallow areas. The surface is smooth, velvety, and has excurrent openings on bumps.

Convoluted Orange Sponge *Myrmekioderma rea*
Massive, yellow to orange, encrusting sponge. Convoluted surface with debris or algae. Fills cavities in reefs, grows in sand and rubble at 20 m or deeper.



Spiny Ball Sponge *Leucandra barbata*
Small white globular sponge has long needles extending from its surface. One excurrent opening on top. Lives in dark places in caves on walls or slopes from 8 - 40 m.


photo: Godfried van Moorsel

Corals

Floris Bennema and Godfried van Moorsel

General information
Colourful corals, both hard and soft, dominate the reefs around St. Eustatius. Hard and soft corals are members of a group called cnidarians. Although cnidarians look like flowers of the sea, they do in fact belong to the animal kingdom. Corals, hydroids, sea anemones, and others belong to this group. A brief introduction to that phylum is given in the next chapter. In this chapter we cover the corals. You will find other cnidarians listed in the next chapter.

Corals and other cnidarians around St. Eustatius
Underwater off St. Eustatius, the most ubiquitous cnidarians are the corals: stony corals, soft corals and hydrocorals. Most of the other cnidarians (which are covered in the next chapter) are inconspicuous, camouflaged, hidden in crevices, or rare, but zoantharians can be observed on every dive.

Artichoke Coral *Scolymia cubensis*
Circular and solitary individuals with radiant septa visible through fleshy tissue. Maximum 10 cm in diameter. Colour ranges from bright green or red, to dull grey.

Coral groups
Hydrocorals Millepora and Stylasteridae
Hydrocorals are colonies of hydroids with hard, calcareous skeletons. Hydrocorals include the stinging fire corals, and the pastel-coloured lace corals.

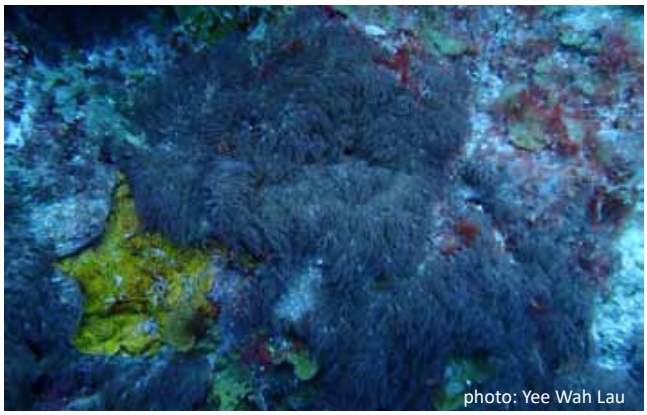
Octocorals Octocorallia
Octocorals have polyps with eight feather-like tentacles. These soft corals grow in the form of crusts or as flexible sea fans and tree-like structures. Gorgonians belong to this group.

Stony corals Scleractinia
Stony corals make up the majority of hard-coral species, and they are the basic building blocks of tropical coral reefs. Their polyps are usually retracted in the daytime, exposing the coral skeleton which has a star-shaped arrangement of septa.

Branching Fire Coral *Millepora alcicornis*
Colonies, often encrusting, also form cylindrical branches. Light brown with a white outer rim, this is the only fire coral that commonly grows below 10 m depth.

Corky Sea Finger *Briareum asbestinum*
This gorgonian has several upright cylindrical branches with a common base. It has remarkably long polyps. The skeleton is violet to purple.

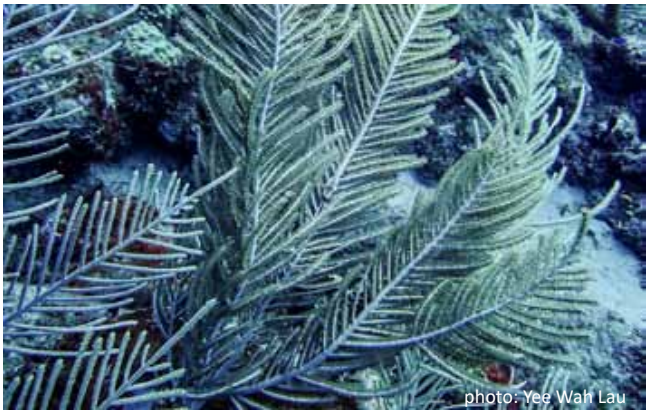
Blade Fire Coral *Millepora complanata*
The colonies are upright, plate-like branches extending from an encrusting base. Like the Branching Fire Coral, this coral is light brown with a white outer rim.



Encrusting Gorgonian *Erythropodium caribaeorum*
Colonies have long polyps with a hair-like appearance, forming encrusting mats. With polyps retracted, the mat is smooth and leathery.

Rose Lace Coral *Stylaster roseus*
The branches of colonies are tapered and predominantly grow in single planes. The branches have a pink colour at the base, changing to white at the tip.

Tube-knob Candelabrum *Eunicea laxispica*
Colonies branch near the base, resembling candelabra, exceptionally tall, calyces up to 8 mm high. Whitish to brown, sometimes blue. Inhabits semi-exposed reefs, sandy bottoms and walls to 40 m depth.



Slimy Sea Plume *Antillogorgia americana*
Colonies form bushy clusters of tall, feather-like plumes. Secondary branches extend mostly in single planes. Produces large amounts of mucus, which may be felt at the base.

Venus Sea Fan *Gorgonia flabellum*
Fan-shaped colonies up to 1 m height. Usually yellow. Can be distinguished from other Gorgonia species by having flat surfaces around the holes formed by the branches.

Grooved-blade Sea Whip *Pterogorgia guadalupensis*
Colony branches occur more or less in single planes. Polyps are arranged in grooves on the sides of flat branches. Colonies grow up to 60 cm in height. Inhabits shallow environments.

Wide-mesh Sea Fan *Gorgonia mariae*
Sea fans up to 30 cm height. Pale in colour, commonly white with slight tints of mauve. Most abundant deeper than 15 m.

Common Sea Fan *Gorgonia ventalina*
Fan-shaped colonies up to 1.8 m in height. Strong, flexible stems branch profusely. Branches are usually purple and have an interconnected structure like a network.

Deepwater Sea Fan *Iciligorgia schrammi*
Large sea fan, thick branches not interconnected as in Gorgonia species. Colonies grow in flat planes perpendicular to the predominant current.

Snowflake Coral *Carijoa riisei*
Colonies form dense clusters of tangled, branched stems with large prominent white polyps. Branches tipped with single polyps. Stems often overgrown with algae, sponges or other organisms.

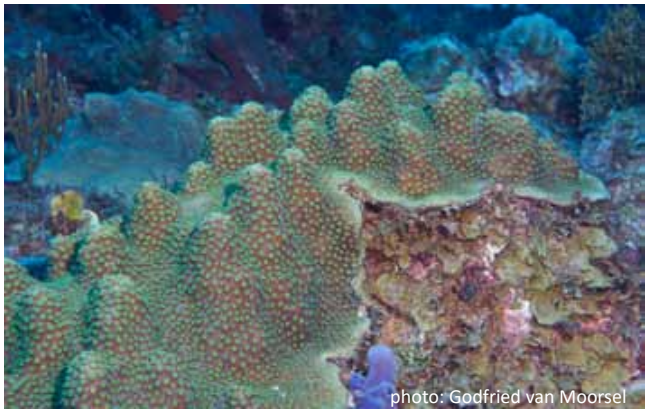
Yellow Pencil Coral *Madracis auretenra*
Colonies have small, pencil-like branches with blunt tips. Colour is pale yellow. The polyps are commonly extended both in daytime and at night, giving the colonies a fuzzy appearance.

Staghorn Coral *Acropora cervicornis*
Colonies form antler-like branches. Branches can be over 1 m long, and are round in cross-section. Staghorn coral has the ability to grow rapidly: up to 10 cm a year.

Ten-ray Star Coral *Madracis decactis*
Encrusting species with stumpy knobs or short branches. Colour greenish to brown or grey. Ten rays (septa) visible in the individual polyps. Found in a wide range of habitats.

Pillar Coral *Dendrogyra cylindrus*
Tall brownish columns on an encrusting base. Looks furry because polyps are extended even in daytime. Lives on flat and gently sloping bottoms down to 20 m.

Boulder Star Coral *Orbicella franksi*
Encrusting species that grows in irregular mounds with an uneven surface. Colour green or brown shades, often with white patches. Less common than other Orbicella species



Mountainous Star Coral *Orbicella faveolata*
Massive mounds or sheets with rows of bumps on the surface. May grow to 6 m in diameter. In deep water plate-like, at times the vertical plates partly cover each other.

Massive Starlet Coral *Siderastrea siderea*
Colonies usually are smooth domes up to 1.8 m in diameter. Polyps resemble shallow funnels with a polygonal circumference. Colour uniform per colony: pink, brown or grey.

Great Star Coral *Montastraea cavernosa*
Massive mounds or sheets with rows of bumps on the surface. May grow to 6 m in diameter. Is plate-like in deep water, with the vertical plates partly covering each other.

Symmetrical Brain Coral *Pseudodiploria strigosa*
Colonies ranges from smooth plates to hemispherical domes. Long valleys often connected and usually convoluted. Ridges have smooth curves, no ridges on top

Mustard Hill Coral *Porites astreoides*
Massive boulders, maximum 2.5 m in diameter, with large button-shaped polyps. In deep water may form plates.

Knobby Brain Coral *Pseudodiploria clivosa*
Hemispherical colonies, usually knobbed on the surface. Ridges smaller and more convoluted than *P. strigosa*. May reach 1.2 m in diameter. A shallow-water species.

Grooved Brain Coral *Diploria labyrinthiformis*
Recognizable by grooved and broad meandering ridges. Yellow-brown to grey in colour. May grow to 1.2 m in diameter. Inhabits seaward reef slopes to 40 m depth.

Lettuce Coral *Agaricia agaricites*
Colonies show variable growth forms, including encrusting sheets, upright leaves with sharp ridges, plates with irregular projections, and flat plates. Colour cream to shades of brown.

Maze Coral *Meandrina meandrites*
Hemispherical heads or flattened, with ridges formed by conspicuous plates (septa). Usually light brown. Inhabits most reef environments, especially seaward reefs.

Low Relief Lettuce Coral *Agaricia humilis*
Colonies are small circular encrustations with reticulated patterns. Colour yellow-brown, usually with white areas. Mostly found on dead coral heads in exposed shallow locations.

Whitestar Sheet Coral *Agaricia lamarcki*
Colonies form large, mostly rounded plates, which often overlap. Upper surface has concentric rows of shallow valleys. Brown in colour with white polyps.

Orange Cup Coral *Tubastraea coccinea*
Colonies are small clumps of tubular corallites. Together, clumps may cover many square meters, particularly in dark places. Colonies are bright orange or red. This is an introduced species.


photo: Godfried van Moorsel

Other Cnidarians

Floris Bennema and Godfried van Moorsel

General information on Cnidarians

The most noteworthy common factor shared by all cnidarians (Cnidaria) are their polyps. These are sac-like structures each with a central cavity that connects to the exterior through a mouth surrounded by tentacles.
The sea anemone is one big polyp. Many other cnidarians are colonial animals, a colony consisting of many polyps. Hydroids (among them the hydrocorals) have alternating generations: polyps give rise to free-swimming, jellyfish-like medusae, and subsequently the medusae form polyps again.
Another common feature of cnidarians is their ability to sting. They possess specialized cells that, when touched, release a small harpoon-like structure filled with toxins. These stinging cells, which are unique to cnidarians, enable them to defend themselves, and also enable them to catch and immobilize prey.

Hydroids Hydrozoa

Fire corals and lace corals (see Corals) belong to this group. Most other hydroids form tree-like structures with small polyps around St. Eustatius.

Corkscrew Anemone *Bartholomea annulata*

Sea anemone with long grey to greenish tentacles with a white corkscrew-like pattern. Inhabit reefs and areas of sand and coral rubble. Often under rocks or other hard objects, down to 40 m.

Sea anemones Actiniaria

At least 7 species may be found at St. Eustatius, some of them, such as the Giant Anemone, host shrimp species. Sea-anemone density is not particularly high around St. Eustatius.

Zoantharians Zoantharia

These small sea anemones are colonial and polyps have two rows of tentacles. Fourteen species have been found around St. Eustatius. Several grow in large numbers on hydroids and sponges, and each of those has its own range of hosts.

Corallimorphs Corallimorpharia

These sea anemone-like organisms resemble stony corals but they lack a hard skeleton. Two corallimorph species were recorded at St. Eustatius but due to the rarity of these species, others are likely to be found.

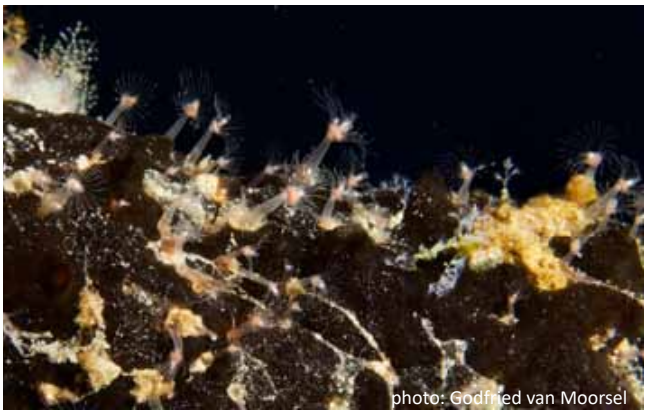
Feather Bush Hydroid *Dentitheca dendritica*
Bush-like hydroid. Brown stalks with branches and feather-like sub-branches. Often with zoantharians on the branches. From 10 - 40 m.

Christmas Tree Hydroid *Pennaria disticha*
Brown stalk, branches extending alternately in a single plane. Conspicuous white polyps at the tip of the branches and stalk. Usually in clusters.

Trifid Hydroid *Heterocoryne caribbensis*
Small hydroid with slender capitate tentacles. Outer tentacles have two side tentacles. Lives in association with encrusting red sponge.

Solitary Gorgonian Hydroid *Ralpharia gorgoniae*
Large white polyps with long, thin tentacles that often curl. Attached to tips of gorgonian branches, especially sea plumes at 5-15 m depth.

Branching Hydroid *Sertularella diaphana*
Feather-like hydroid. Firm brown stalk, branches extending alternately in a single plane. Conspicuous white polyps alternately attached to branches. Solitary or in small clusters



Solitary Sponge Hydroid *Zyzzyzus warreni*
Solitary pinkish polyp with long, thin tentacles that do not curl. Attached to sponges at 5 - 35 m depth.

Giant Anemone *Condylactis gigantea*
Large and colourful sea anemone. Long, white, grey or greenish tentacles, usually tipped with a pink or purple bulb. Common on reefs and in rocky shallows from 5 - 30 m.

Sponge Zoantharian *Umimayanthus parasiticus*
Zoantharian with light brown tentacles and a white column. Lives in large numbers on several sponge hosts down to 30 m.

Hidden Anemone *Lebrunia coralligens*
Only the stout pseudotentacles are visible, extending in a single row from clefts in living or dead corals. White, but bulbs are brown to bluish and often striped. Has a mild sting.

Golden Zoantharian *Parazoanthus swiftii*
This yellow zoantharian is symbiotic with several sponge species from 12 - 30 m. It grows in rows, often winding around branches of the host sponge.

Branching Anemone *Lebrunia neglecta*
An unusual-looking sea anemone with knob-bearing pseudotentacles surrounded by true tentacles. The rest of the body is hidden in crevices. Grey, greenish or brown. From 2 - 40 m.

Maroon Sponge Zoantharian *Bergia puertoricense*
Body and tentacles are dark maroon, burgundy or purple, with small white spots between the tentacles. Symbiotic on a wide variety of sponges, a common zoantharian below 20 m.

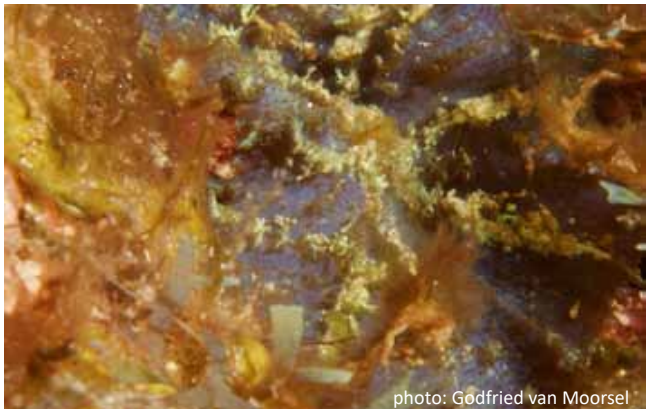
Brown Sponge Zoantharian *Bergia catenularis*
Polyps arrange in short, chainlike rows. The outer ring of the disk is yellowish brown, and the centre darker. Each polyp has 20 tentacles. Lives on sponges below 20 m.

Mat Zoantharian *Zoanthus pulchellus*
Green to brown zoantharian with stubby tentacles. Often grows in mats of such density that the individual disks become polygonal. Inhabits reef tops down to 20 m.

Green Hydroid Zoantharian *Hydrozoanthus antumbrosus*
Polyps with 30–38 golden tentacles. Colouration resembles an annular solar eclipse. Encrusts Feather bush hydroid. Found on coral reefs or rocky substrates at 1 - 60 m.

White Encrusting Zoantharian *Palythoa caribaeorum*
Brownish-white mats with round polyps surrounded by a tentacle-bearing ridge. Overgrows reefs in shallow areas that have some water movement, down to 12 m.

Hydroid Zoantharian *Hydrozoanthus tunicans*
Encrusts Feather bush hydroid. Pale yellow to brown or dark green, but tentacles may have other colours. From 9 - 40 m.



Umbrella Corallimorph *Discosoma neglecta*
Disk with short, square-tipped tentacles at the edge. Greenish or dark brown, colour of disk usually not uniform. Solitary on protected areas of the reef from 9 - 20 m.

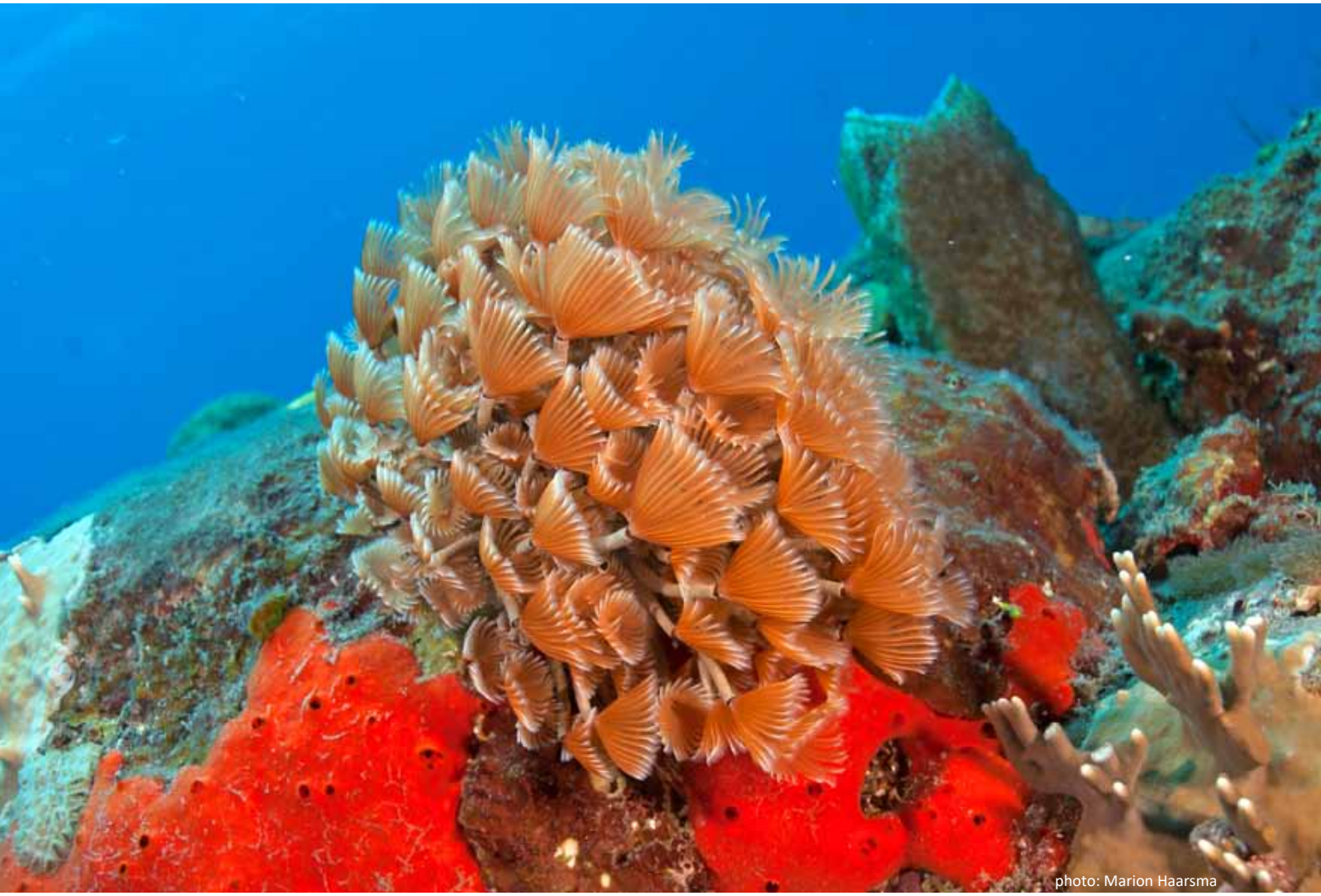


photo: Marion Haarsma

Segmented Worms

Floris Bennema and Godfried van Moorsel

General information

Marine segmented worms contribute significantly to the vivid colours of coral reefs. Polychaetes are soft-bodied, and would be very vulnerable to predators if they did not have various kinds of adaptations to protect themselves. Numerous species live in hidden places, while some of the free-living ones, like fireworms, protect themselves with sharp and poisonous bristles.

Some marine segmented worms live in tubes, which are constructed by the secretion of building material around their soft body parts. Feather duster worms (Sabellidae) incorporate fine sand into their tubes. Calcareous tube worms (Serpulidae) build strong tubes of calcium carbonate. The worm's crown of gills, which provide the animals with both food and oxygen, protrude from the shell. Several species have eyes, and can retract quickly into their tubes in case of danger.

Social Feather Duster *Bispira brunnea*

These tubeworms have a single circular crown, which can be white or brown or purple, sometimes with a darker centre. They live in clusters, in places with some water movement, at depths from 5 - 18 m.

Polychaetes around St. Eustatius

St. Eustatius offers excellent opportunities to view polychaete worms, both the free-living species, such as the fire worms, and also the tube-living species. The soft-tubed Social feather duster worm is is very abundant, and the huge, solitary Magnificent feather duster can also be seen. Calcareous tube worms range from tiny spirally-coiled worms on seagrass, up to the much larger and colourful Christmas-tree worms, which live in association with stony corals. Crevices and sandy areas are other favourite habitats for sessile worms.

Bearded Fireworm *Hermodice carunculata*
These free-living worms have a distinctive orange-red (or partly greenish) body, with red gills and white tufts of bristles along their sides. Their bristles deliver an extremely painful and long-lasting sting.

Star Horseshoe Worm *Pomatostegus stellatus*
The crown of this species is folded in to a U-shape. They can close the hard, calcareous tube with a chitinous brown lid (operculum), which has a star-like tip.

Magnificent Feather Duster *Sabellastarte magnifica*
This is the largest Caribbean feather duster worm. It has a double, circular crown up to 20 cm in diameter, and often strikingly coloured.

Christmas Tree Worm *Spirobranchus giganteus*
These well-known calcareous tube worms have two, often strikingly coloured, spiralled crowns. The tube is partly hidden within stony coral, and can be closed with a purplish, calcareous lid. In fire coral and stony corals.

Split-crown Feather Duster *Anamobaea orstedii*
The crown of this feather duster is split in the middle. Although colour and pattern are variable, both halves are identical. Usually alone or in small groups between corals or on adjacent sandy areas. In Lettuce coral.

Sea Frost *Salmacina huxleyi*
Sea frost worms live in narrow, white, intertwining tubes. They are encrusting, or instead grow in small clumps. The worms are extremely sensitive to changes in light, withdrawing rapidly when disturbed.


photo: Marion Haarsma

Crustaceans

Jaap de Boer

General information

Crustaceans (Crustacea) are a group of arthropods that includes crabs, lobsters, crayfish, shrimp and barnacles. All crustaceans have bilaterally symmetrical bodies which are covered with a chitinous exoskeleton. When the animal undergoes metamorphosis, or when it outgrows its shell, it moults its exoskeleton. Like other arthropods, adult crustaceans have segmented bodies and jointed legs. The segments are usually grouped into a head, thorax, and abdomen. In the majority of larger crustaceans, the head and thorax are fused into a cephalothorax, which is protected by a carapace. Body sizes can range from smaller than 1 mm to over 40 cm. Crabs, lobsters and shrimps are consumed by humans.

The majority of crustaceans are aquatic, living in either marine or freshwater environments. However, a few groups have adapted well to life on land.

Caribbean Spiny Lobster *Panulirus argus*

May reach up to 60 cm, but usually 20 – 30 cm due to overfishing. Cephalothorax covered with spines. Long, thick antennae. Olive-green to brownish-blue or purplish-mahogany, with lighter areas. Shallow water, occasionally down to 90 m depth, perhaps deeper. Nocturnal. Found among rocks, on reefs, in eelgrass beds or any habitat that provides protection. Popular as sea food.

Crustaceans around St. Eustatius

On the local reefs, crabs, shrimps and lobsters are abundant. They can be found under coral rubble, between coral branches, in cracks and crevices, burrowed in sand, inside empty gastropod shells, or commensal on other organisms. Almost all the crustaceans shown in this field guide live underwater, but the Sally Lightfoot Crabs are common on rocks on the shore, and Caribbean Hermit Crabs *Coenobita clypeatus*, are very commonly seen on land, especially at night.

Banded Coral Shrimp *Stenopus hispidus*
Largest cleaner shrimp, up to 6 cm. Carapace, abdomen and claws banded red and white. Two pairs of long, white, hairlike antennae. On coral reefs. Monogamous.

Squat Anemone Shrimp *Thor amboinensis*
13 mm. Olive brown with white patches edged with thin blue lines. Tail often curved upwards. Commensal with sea anemones and mushroom corals.

Golden Coral Shrimp *Stenopus scutellatus*
4 cm. Walking legs spiny, with red and white bars. Carapace, abdomen and other legs yellow. Long white antennae. Back is orange-red and white. On coral reefs. Usually found in pairs.

Pederson Cleaner Shrimp *Ancylomenes pedersoni*
3 cm. Translucent cleaner shrimp with bluish or lavender markings on the body and long white antennae. Associated with a sea anemones.

Arrow Shrimp *Tozeuma carolinense*
4 cm. Slender, elongated body with long, pointed snout and prominent abdominal hump. Colour varies from translucent tot tan, grey, purple or green. Found in all shallow habitats.

Spotted Cleaner Shrimp *Periclimenes yucatanicus*
2.5 cm. Transparent body with coloured spots and saddle-like markings. Claws and walking legs striped with white, red and purple. White antennae with dark bands. Associated with sea anemones.

Striped Bumblebee Shrimp *Gnathophyllum americanum*
3 cm. Blunt headed shrimp, with brown-black and white transverse stripes. Claws and legs with yellow-orange markings. Usually associated with echinoderms.

Urchin Bumblebee Shrimp *Gnathophylloides mineri*
6 mm. A tiny shrimp that lives exclusively between the spines of sea urchins and feeds mainly on its epithelium, of which dark pigment is incorporated. Up to 13 individuals on one host. Males are smaller.

Spotted Spiny Lobster *Panulirus guttatus*
Around 15 cm, but can be larger. Purplish black with white spots on body and legs. Two long, thick, spiny antennae. On shallow coral reefs. Nocturnal, feeds on molluscs and crustaceans.

Whitespeckled Hermit *Paguristes puncticeps*
13 cm. Reddish to rust brown hermit, with white spots. Deep blue eyes on long stalks. Claws nearly similar in size. Nocturnal. Offshore, near reefs.

Spanish Slipper Lobster *Scyllarides aequinoctialis*
30 cm. Reddish to orange-brown, with flattened, plate-like antennae. On sand or rocks, often in the outer reefs. Nocturnal and sluggish, often buried, but can swim when disturbed.

Carribean Hermit Crab *Coenobita clypeatus*
7 cm. Juveniles pale, adults darker, to deeply red. This crab can scale trees and climb hills. Eggs hatch in the ocean. A common sight on the island. Mostly nocturnal.

Red Reef Hermit *Paguristes cadenati*
3 cm. Hermit crab with bright red legs and claws. The eyestalks and eyes are pale yellow to green. Inhabits the coral reefs, down to 30 m

Nimble Spray Crab *Percnon gibbesi*
3 cm. Fast moving, vertically flattened crab. Brown to olive-brown with yellow rings on the legs. Associated with Long-spined sea urchin *Diadema antillarum*.

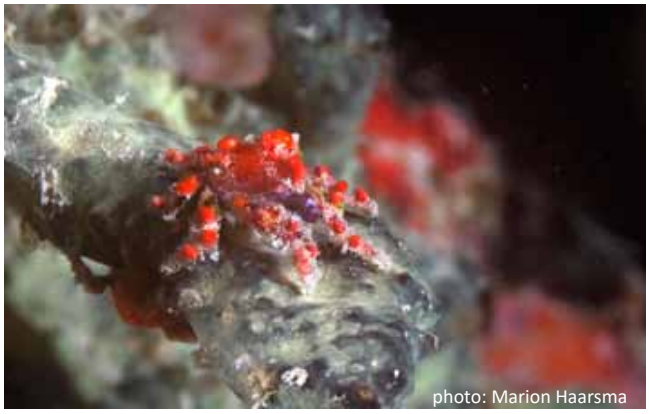
Giant Hermit *Petrochirus diogenes*
25 cm. This hermit crab can grow large enough to inhabit the shell of a fully grown Queen Conch. Body generally reddish in colour. Right claw dominant. Usually subtidal.

Hairy Clinging Crab *Mithrax aculeatus*
12 cm. Reddish-brown, hairy spider crab. Both body and walking legs have numerous spines. Claws smooth and relatively small, with rounded ends. Inhabits rocky areas and reefs, 5 - 15 m.

Heart Urchin Pea Crab *Dissodactylus primitivus*
7 mm. This tiny white pea crab lives between the spines of two larger species of heart urchin. This commensal relationship is probably mildly parasitic.

Channel Clinging Crab *Damithrax spinosissimus*
18 cm. Nearly circular carapace. Walking legs reddish, claws purplish-grey. Covered with spines. Tubercles on the claws in a row on the upper edge. Shallow water. Nocturnal.

Yellowline Arrow Crab *Stenorhynchus seticornis*
5 cm. Carapace triangular. Rostrum serrated, spine-like. Slender legs. Body cream to brown with fine dark lines, legs reddish or yellow, claws blue or violet. Coral reefs, 3-10 m. Associated with sea anemones. Nocturnal.



Cryptic Teardrop Crab *Pelia mutica*
Carapace 2 cm wide. Colour variable: reddish or orange to purple. Camouflages itself with bits of sponge or algae. On reefs, 5 - 45 m. Often seen at night on fire coral.

Redeye Sponge Crab *Dromia erythropus*
7.5 cm. Colour of body and claws variable, tip of pincers red. Felt-like hair on carapace, legs and pincers. Large spine beside each eye. On reefs. Covers itself with a sponge “cap”. Nocturnal.

Sally Lightfoot Crab *Grapsus grapsus*
8 cm. A crab that lives on rocky shores, primarily eating algae. Adults colourful, brownish-red with brown, pink, or yellow spots. Juveniles black or dark brown and well camouflaged. The crab has a surprising speed and agility.

Gaudy Clown Crab *Platypodiella spectabilis*
2.5 cm. Smooth crab with variable patterns of orange, yellow, black and cream. Carapace almost square, legs short, wide claws. Usually associated with zoantharians, occasionally with sponges.

Cymothiod Isopods *Anilocra* sp.
Parasites that attach themselves, usually to fish, and suck blood. Adults need a specific site on a particular host species, but juveniles are not specific. A group with many species.

photo: Marion Haarsma

Molluscs

Sylvia van Leeuwen and Susan J. Hewitt

General information

A numerous and diverse group of animals, Molluscs (Mollusca) are the largest species group in marine habitats. Some have shells and some do not. Gastropods are Sea Snails and Sea Slugs, including Nudibranchs. Bivalves are Clams, Scallops, Oysters and Mussels. There are also Chitons (polyplacophorans), Tusk Shells (scaphopods), and Octopus and Squid (cephalopods).

Many species are small and inconspicuous, living under rocks or buried in sediment. For this field guide we have selected larger species which can easily be seen by divers on rocks, corals or seagrass beds. We have also included a number of species that live in the intertidal zone, and so can be seen without diving.

Caribbean Reef Squid *Sepioteuthis sepioidea*
A torpedo-shaped squid, with a body of about 20 cm. Tentacles usually held together. The fin is continuous around the body, similar to a cuttlefish.

Molluscs around St. Eustatius

As of 2016, over 350 species of mollusks have been observed and recorded in the waters around St. Eustatius. However, this is probably only half or less of the total number of mollusc species.

The largest shelled species is the Queen Conch, beautiful and also tasty. On many islands of the West Indies, it has been seriously overexploited. Fortunately St. Eustatius has only a very small fishery of this species. Because of the CITES agreement, it is illegal to export either the meat or the shell.

St. Eustatius is also home to species that are remarkable either because they are very uncommon generally, or because they are endemic to the region. Examples include Henderson's Lucine, and the Globose Vase.

Common octopus *Octopus vulgaris*
30 - 50 cm, max 90 cm. The colour and texture of this octopus is highly variable. Often mottled reddish-brown, but when disturbed, it can turn white. Dark rings around the suckers.

Queen Conch *Lobatus gigas*
To 30.5 cm. Shell interior bright pink. Outer lip in young animals is thin and straight; in adults thick, broad and flaring out. Protected by CITES regulations.

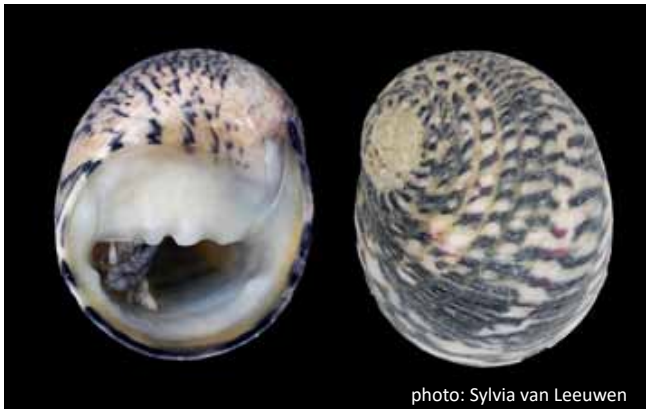
Rooster-tail Conch *Lobatus gallus*
The shell can be up to 15 cm in length. In adults the outer lip flares into a long narrow projection.

Flamingo Tongue *Cyphoma gibbosum*
To 2.9 cm. Mantle of the animal has orange dots. Shell off-white, tinted with yellow or light orange, with a transverse ridge near the centre.

Milk Conch *Lobatus costatus*
Shell up to 17 cm, with a white interior, sometimes tinged with peach. Outer lip in adults is thick and forms almost a right angle at the spire.

Fingerprint Cyphoma *Cyphoma signatum*
To 3.3 cm. Mantle has a fingerprint-like pattern. Foot shows numerous black lines. Shell off-white with transverse ridge near the centre.

Wide-mouthed Purpura *Plicopurpura patula*
To 10 cm, but normally smaller. Outside is dark brown with rows of knobs. Wide mouth tinted with orange.



Four-tooth Nerite *Nerita versicolor*
To 2.7 cm. Mouth of shell has 4 strong teeth. Shell off-white, with red, black and/or purplish markings on the spiral cords. Operculum grey-brown with fine pimples.

Checkered Nerite *Nerita tessellata*
To 2.5 cm. Shell mouth has two very small teeth. Exterior black, often with white markings forming a tile-like pattern. Operculum dark grey to black, with fine pimples.

Beaded Periwinkle *Cenchritis muricatus*
To 2.7 cm. Shell light grey, with a regular pattern of fine pimples. This species lives very high up in the splash zone.

Bleeding Tooth Nerite *Nerita peloronta*
To 4.3 cm, on St. Eustatius mainly to 2.5 cm. Surface with weak spiral ridges. Mouth with two strong teeth and a red, blood-like spot.

Periwinkles *Echinolittorina* sp.
Three species in the intertidal zone: A. Zebra Periwinkle (*E. ziczac*); B. Prickly Periwinkle (*E. tuberculata*); and C. Slender Periwinkle (*E. angustior*).


photo: Sylvia van Leeuwen

Globose Vase *Vasum globulus*
To 4 cm, often smaller, with a very solid, almost spherical pale shell. Endemic to the Leeward Islands.


photo: Luna van der Loos

Harlequin Blue Sea Goddess *Felimida clenchi*
To 2.3 cm. Very colourful seaslug. Also known as Chromodoris clenchi, or Blue-spotted Doris.


photo: Marion Haarsma

Lettuce Sea Slug *Elysia crispata*
To 4.0 cm. Mantle flaps (parapodia) wavy and frilled, like curly lettuce. Body colour often green, but also blue or white, with lighter spots.


photo: Marion Haarsma

Red-tipped Sea Goddess *Doriprismatica sedna*
To 6.5 cm. Foot and mantle have three different colours on the outer border: white, red and yellow. Tips of rhinophores and gills are red.


photo: Marion Haarsma

Ornate Leaf Slug *Elysia ornata*
To 7.5 cm, often smaller. Translucent green with numerous black and white dots all over. Mantle flaps (parapodia) have a black edge with an adjacent yellow or orange line.


photo: James Thomas

Atlantic Hooded Nudibranch *Melibe arianeae*
Smaller than 1.5 cm. Circular oral hood with elongate papillae along the border. Body nearly transparent, with numerous orange and white blotches. Orange-brownish internal organs visible.

Marbled Chiton *Chiton marmoratus*
To 6.5 cm. Valves smooth and glossy, olive drab to brownish, marbled with dark chestnut or purplish black. Girdle with smooth scales like snakeskin.

Fuzzy Chiton *Acanthopleura granulata*
To 7.5 cm. Girdle crowded with calcareous spines of different forms and sizes. Valves brown with white bands, often eroded. Lives high in the intertidal, on rocks.

Squamose Chiton *Chiton squamosus*
To 6.5 cm. Valves dull. Central area of valves smooth, sides with pustules and stripes. Girdle with smooth scales, like snakeskin. Interior of valves dark turquoise.

Rough Girdled Chiton *Ceratozona squalida*
To 3 cm. Girdle leatherly, yellow-brown, with long, hairy projections. This chiton often has algae growing all over it. Interior of valves pale turquoise.

West Indian Green Chiton *Chiton tuberculatus*
To 9 cm. Valves with grooves and triangles of elongated nodules. Girdle with smooth scales, like snakeskin, alternating lighter and darker patches. Interior of valves light blue.

Frons Oyster *Dendostrea frons*
To 5 cm. Irregular outline with coarse zig-zag folds at the margin. Interior pale with a metallic appearance.

Amber Pen Shell *Pinna carnea*
To 19 cm. A long narrow wedge-shaped bivalve with a thin and brittle shell. Colour pinkish.

Magnum Cockle *Acrosterigma magnum*
To 6.5 cm. Sturdy shell with 30 to 33 strong radial ribs, speckled with brown. Interior of the shell white, tinted with yellow or orange.

Hendersons Lucine *Pleurolucina hendersoni*
To 1.5 cm. Shell white with coarse concentric ribbing. A rare species only known from Antigua, Barbados, Cuba and St. Eustatius. Live specimens have never been reported.

Great Tellin *Laciolina magna*
To 10 cm. A very uncommon species. Shell strong but thin, somewhat translucent, often cream or pink in colour.

Rough File Clam *Ctenoides scaber*
To 8 cm. Shell white with about 50 radial ribs, sculptured with small spines or knobs. Soft parts red, tentacles white or orange-reddish.

Tusk Shells *Graptacme* sp.
To 4 cm. Shell is a curved, tapering, white tube, with a smooth glossy surface.

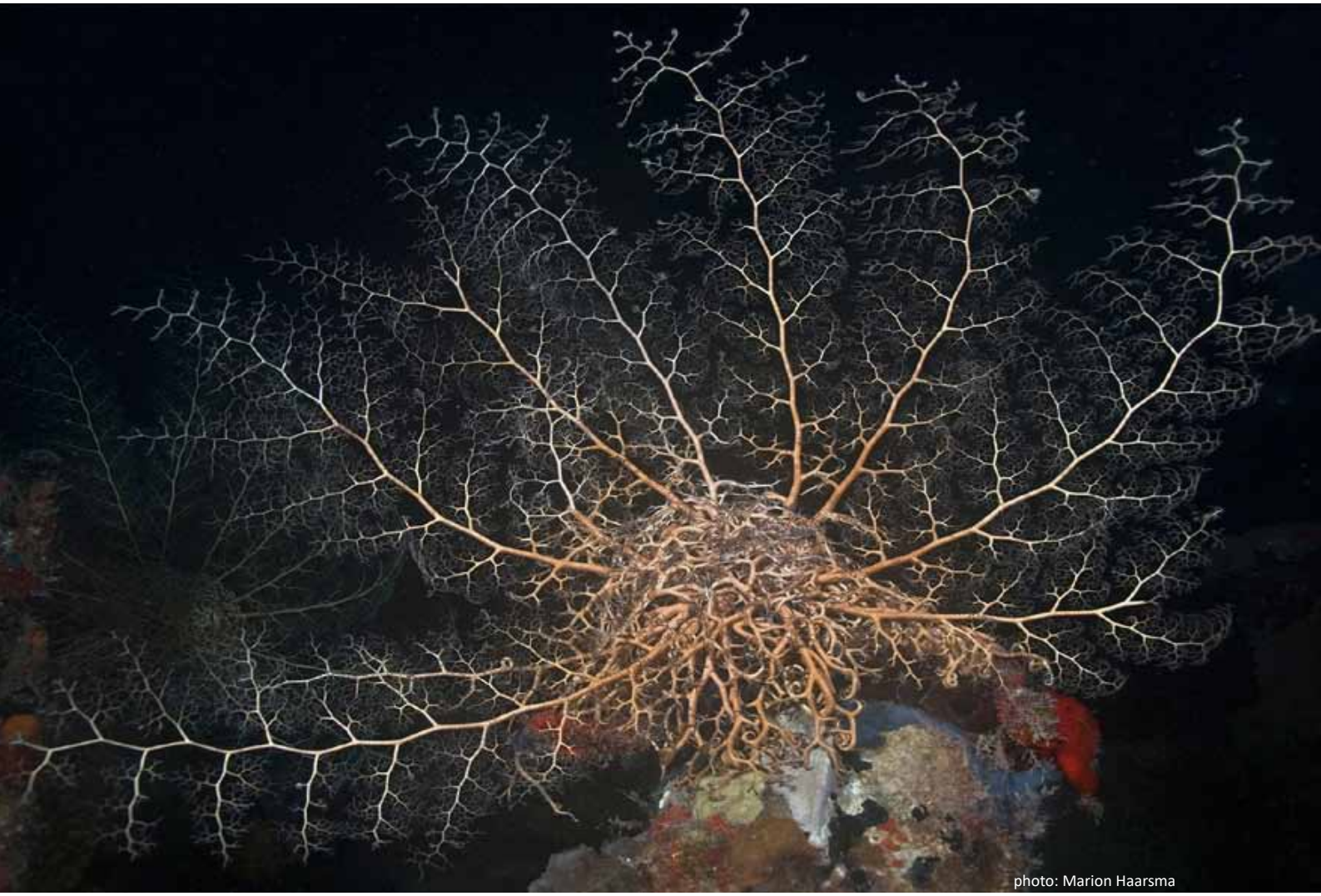


photo: Marion Haarsma

Echinoderms

Jaap de Boer

General information

Echinoderms (Echinodermata) are a phylum of about 7,000 living species of animals, which are almost exclusively marine and benthic in adult phase. This phylum includes sea urchins, sand dollars, sea stars, brittle stars, sea lilies and sea cucumbers. The hard skeleton in most of these animals has a five-fold symmetry, and is composed of small calcareous plates called ossicles. Most echinoderms possess remarkable powers of regenerating their tissue: in some species the entire body can be regenerated from a single severed limb.

Echinoderms have a worldwide distribution, and are found at every ocean depth, from the intertidal to the abyssal zone. Ecologically speaking, echinoderms play an important role in benthic ecosystems. The grazing of sea urchins reduces the rate of colonization of bare rock and keeps algae in check. Starfish and Brittle stars also prevent the growth of algal mats on coral reefs. The burrowing of echinoderms, such as sand dollars and some starfish, stirs up the sediment, increasing the depth to which oxygen can penetrate.

Giant Basket Star *Astrophyton muricatum*
Numerous thin, branched arms which, when extended, form a fan-shaped plankton net. Coil into a tight ball during the day. Feed at night.

The five extant classes of echinoderms are: Sea Lilies (including Feather Stars) (Crinoidea), Brittle Stars (including Basket Stars) (Ophiuriodea), Starfish (Asteriodea), Sea Urchins (including Heart Urchins, Sand Dollars and Sea Biscuits) (Echinoidea) and Sea Cucumbers (Holothuroidea).

Echinoderms around St. Eustatius

The Caribbean echinoderm fauna is composed of over 400 species in all five classes, with four endemic species. The richest class is Ophiuroidea (Brittle Stars and Basket Stars) with almost 150 species. Six species of echinoderms are used commercially. Collecting echinoderms for souvenir trade is one of the major threats for some species. Echinoderms sometimes have strong population fluctuations that can have consequences for ecosystems. An example is the change from a coral-dominated reef system to an alga-dominated one that resulted from the mass mortality of the Long-spined Sea Urchin *Diadema antillarum* in the Caribbean in 1983.

Sponge Brittle Star *Ophiothrix suensoni*
Arms 12 cm, covered with many long, thin, glassy spines. Arms lavender, pink, yellow or red with a thin, dark line along the edges. On coral reefs, usually among sponges, at depths of 3 - 40 m.

Rock-boring Urchin *Echinometra lucunter*
Test diameter 8 cm. Dark, nearly black spines in reddish body. This rock-boring species is very common in the intertidal zone all around St. Eustatius.

Blunt-spined Brittle Star *Ophiocoma echinata*
Length of arms up to 25 cm, densely clad with short spines. Black or dark brown with pale or creamy markings. Coral reef habitats and sandy bottoms, under rocks, shallow water down to about 30 m depth.

West Indian Sea Egg *Tripneustes ventricosus*
Test diameter 15 cm. Regular sea urchin with black, dark purple or reddish brown body and short, white spines. In seagrass beds and on shallow reefs, 0 - 10 m. Ususally covered with fragments of shells and other debris.

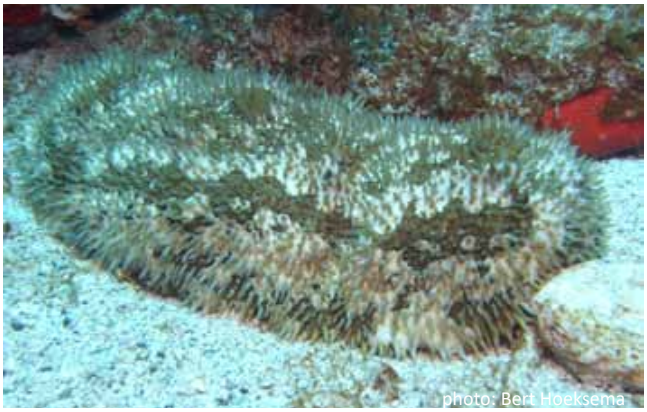
Long-spined Sea Urchin *Diadema antillarum*
Test diameter 20 - 30 cm. Regular urchin with long, sharp spines. Purple to black, occasionally with lighter spines. Juveniles always with black and white banded spines. Grazes at night, mainly on algae, 0 - 40 m depth.

Slatepencil Urchin *Eucidaris tribuloides*
Test diameter 10 cm. Regular urchin with thick, blunt, cylindrical spines. Body reddish brown. Large spines often covered with algae, bryozoans or even sponges. In seagrass beds and reef rubble, 2-50 m depth.

Red Heart Urchin *Meoma ventricosa*
Test diameter 20 cm. Irregular urchin with somewhat flattened, heartshaped body and pentagonal petal design. Densely covered with short, dark reddish-brown spines. Inhabits coral sands, intertidal-200 m depth.

Three-rowed Sea Cucumber *Isostichopus badionotus*
Body length 30 - 40 cm. Transversely wrinkled sea cucumber. Generally orange-brown-cream with darker knob-like podia. Underside with three rows of podia. On sandy bottoms and seagrass beds, 1 - 60 m depth.

Donkey Dung Sea Cucumber *Holothuria mexicana*
Body length 50 cm. Transversely wrinkled sea cucumber. Top surface brown or grey, with warts. Bottom surface reddish, orange or pale. On sandy bottoms and seagrass beds, 2 - 20 m depth. Commercially valuable species.



Furry Sea Cucumber *Astichopus multifidus*
Body length 40 cm. Body covered with hundreds of soft spines. Chocolate brown to dark grey, sometimes spotted. Can be found on sandy seabeds near reefs and occasionally in seagrass meadows, at 10 - 30 m depth.


photo: Marion Haarsma

Tunicates, Sea Squirts

Niels Schrieken

General information

Tunicates (Tunicata) are a subphylum of animals without backbones; instead they have a cellulose body covering, which is called a “tunic”, hence their name. Tunicates are also known as “sea squirts”, because when members of some species are picked up, they can squirt water out of their bodies.

Most tunicates are of the benthic type, that is they live attached to a substrate such as rock at one end of their body, and have two siphons at the other end. Water is drawn in one siphon and pumped through a net of gills in the body, where food and oxygen are extracted. The depleted water is then discharged through the other siphon. Both the body shape and the size vary considerably among species; some tunicates are only half a cm in length, while others can be larger than ten cm. Tunicates come in a dazzling array of colours which are often further enhanced by the translucence of the tunic.

Although tunicates are among the most common marine invertebrates, they are the least well-recognized.

Bluebell Tunicate *Clavelina puertosecensis*
0.5 - 1.5 cm. Body a dense green, blue, or purple in colour. The rim of the siphons is white. Found inhabiting reefs.

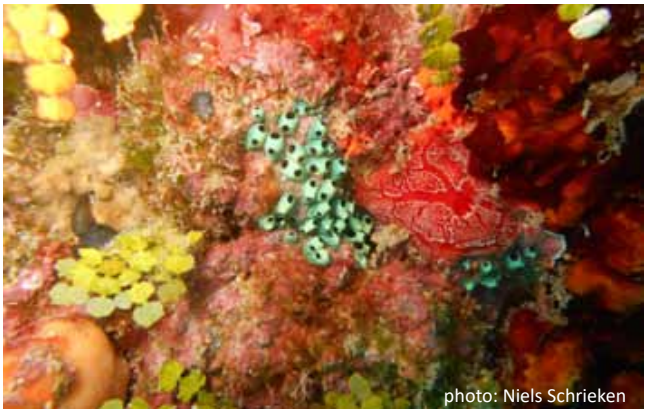
They are often overlooked or ignored, or they can be mistaken for sponges. To tell the two groups apart, note that when tunicates are disturbed, muscular bands rapidly close the siphons. This ability is not present in sponges, which either cannot close their openings, or do so only very slowly.

As well as benthic tunicates attached to a substrate, there are also pelagic or free-swimming tunicates. These are occasionally observed swimming over reefs.

Tunicates around St. Eustatius

In the entire Caribbean, the tunicate fauna is known to consist of over 140 species, and the species line-up in different parts of the Caribbean is fairly consistent. During the St. Eustatius Marine Expedition 2015, only 23 different species were found in the waters around St. Eustatius, but it seems likely that more will be discovered around the island in the future.

Reef Tunicate *Rhopalaea abdominalis*
2 - 4 cm. Lavender to dark purple or brown, may appear black in deeper water. Heavy, thick, gelatinous body. Solitary. Inhabits coral reefs, where most of its body is hidden in a crevice or hole.



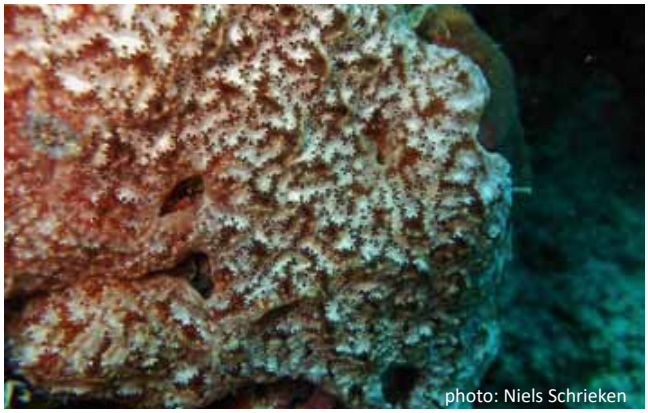
Encrusting Social Tunicate *Symplegma viride*
0.5 cm. Tiny individuals grow in clusters, their tunics joining at the base to form a common tunic that encrusts the substrate. Coloured yellow-green, green, orange, or purple. Living on coral and large sponges.

Giant Tunicate *Polycarpa spongiabilis*
7.5 - 10 cm. Mottled in shades of brown, the globular body is covered in algae but has two large protruding siphons. Just inside each siphon is a ring of bristle-like tentacles that are unbranched. Inhabits coral reefs.

Strawberry Tunicate *Eudistoma* sp
2.5- 4 cm. From violet to orange, resembling a berry: numerous small individuals are embedded in a firm, common tunic, attached to the substrate by a short stalk. Inhabits reefs.

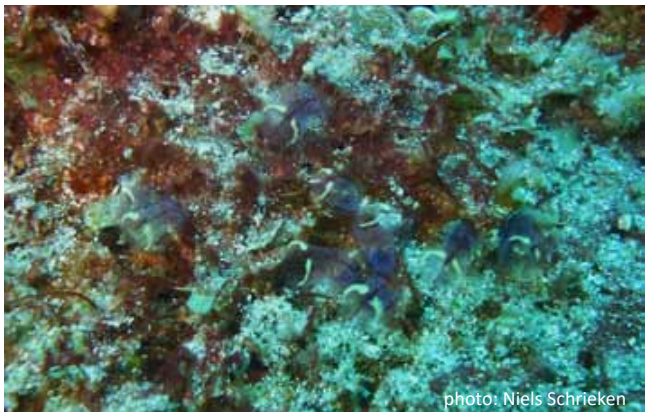
Painted Tunicate *Clavelina picta*
1 - 2 cm. Body transparent but often tinted with white, red or purple. Siphon rims and internal body parts are typically dark red to purple. Inhabits reefs and rock walls. Grows in clusters, and is attached to other species.

Overgrowing Mat Tunicate *Trididemnum solidum*
7.5 - 30 cm. Resembles an encrusting sponge. Numerous tiny individuals embedded in a tough, leathery tunic. Usually grey, but can be blue-green, green or white. Inhabits shallow reefs.



Mottled Encrusting Tunicate *Distaplia bermudensis*
Mottled in colour, brown, pink, red, or even blue. Tiny individuals growing in a common tunic form circular or oval patterns around the central outflow openings.

Overgrowing tunicates Didemnidae
This family of tunicates is typified by numerous tiny individuals embedded in a thin tunic. Outflow openings are large. Inhabits reefs.



Purple Stripe Tunicate *Clavelina obesa*
1 - 2 cm. Bodies transparent, tinted with white, red or purple. Siphon rims and internal body parts usually deep red to purple. Inhabits reefs and walls. Grows in clusters.

Black Condominium Tunicate *Stomozoa gigantea*
2.5 - 10 cm. Numerous small individuals embedded in a firm, globular tunic. The two siphon openings of each individual protrude slightly from the surface. Inhabits reefs


photo: Godfried van Moorsel

Marine Plants and Algae

Luna van der Loos and Floris Bennema

General information
Coral reefs and seagrass beds play a vital role in tropical marine environments. In both of these ecosystems, larger algae (macroalgae) play an important part: they provide food for herbivores, and they stabilize the structure of reefs. Algae are also remarkable in that they are responsible for the high productivity that characterizes coral reefs and seagrass beds.

Flowering plants
Seagrasses are the only flowering plants that live under the sea.

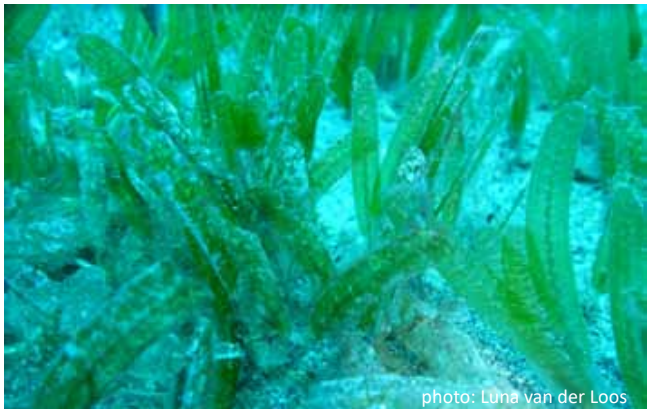
Green algae
Green algae, the most diverse group of algae, are common on tropical reefs.

Brown algae
People who live in the temperate zones are familiar with brown algae because of the great size that some species, such as the kelps, attain.

Mermaid's Tea Cup *Udotea cyathiformis*
A green alga having a goblet or funnel-shaped blade, with a sharp junction between the blade and the stalk. Lives on sand at variable depths.

Red algae
There are numerous types of red algae, ranging from filamentous to crustose. Crustose coralline algae are especially important for the structure of coral reefs. These red algae grow as a crust over and between the gaps in coral reefs, and cement the corals together.

Marine plants and Algae on St. Eustatius
St. Eustatius has a rich marine flora, with more than 150 species of macroalgae, and four species of seagrasses. Macroalgae vary tremendously in shape and colour, and are found in a range of habitats. Various different species flourish in shallow and deep areas, and on hard substrates as well as in sandy areas. Seagrasses, covered in macroalgae, form dense beds, where turtles feed and other animals seek shelter. However, there is one invasive seagrass species around St. Eustatius which competes with the three native seagrasses. It is important to learn more about how this is impacting the seagrass ecosystems on St. Eustatius.



Broadleaf Seagrass *Halophila stipulacea*
This invasive seagrass species from the Red Sea has flat leaves up to 5 cm high, growing in pairs. Slightly toothed leaf edges, with two large scales at the base. It competes with native Caribbean seagrasses.

Fan Algae *Udotea* spp.
The wedge-shaped blade of this species rises from a stem connected to the holdfast. The blade is lightly to moderately calcified. These algae are found in a large range of habitats, from shallow areas down to 50 m.

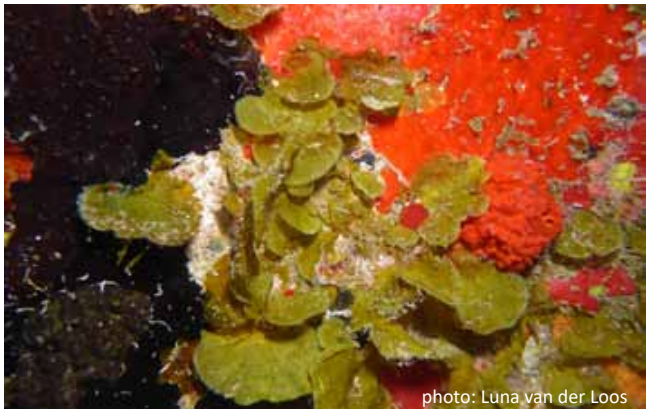
Manatee Grass *Syringodium filiforme*
Seagrass with thin, cylindrical leaves 2-3 mm in diameter, and up to 30 cm high. Native to the Caribbean. Previously it formed dense seagrass beds, but now is mainly found mixed with the invasive Broadleaf seagrass.

Small-leaf Hanging Vine *Halimeda goreaui*
Forms chains of semi-rectangular blade segments, which are held together by a thin strand. Tends to grow in shaded areas of the reef, often hanging from ledge undercuts, and along walls, down to 80 m.

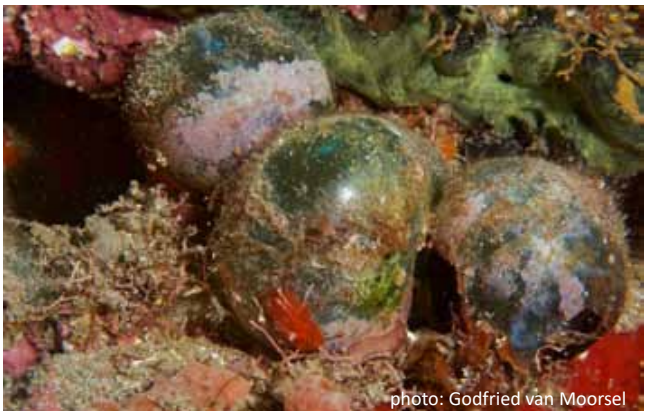
Shaving Brush Algae *Penicillus* spp.
A green algae with the peculiar shape of a brush. The tip of the brush merges into a short stalk anchored in the substrate. It is abundant in shallow, calm, protected water, but is also seen as deep as 30 m.

Green Feather Alga *Caulerpa sertularioides*
Green alga with several feather-shaped, upright branches up to 20 cm high, arising from horizontal, creeping runners. Often grows in shallow sandy areas, or within seagrass beds.

Saw-blade Alga *Caulerpa serrulata*
Small blades, often twisted or spiralling, with serrated edges. Blades grow upwards from long runners. Green in colour, often with a bluish tint. Grows in shallow, rocky substrates, usually with some sand covering.

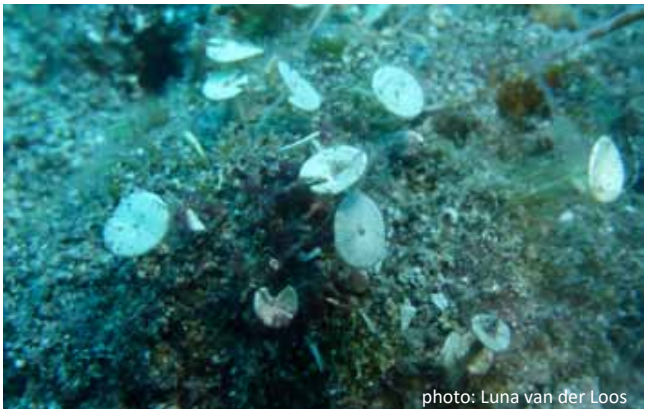


Leathery Lobeweed *Lobophora variegata*
This brown algae has three different forms, depending on depth and habitat: fan-shaped, encrusting or ruffled. Light brown to orange in colour. A very common algae that grows over coral and rocks.



Sea Pearl *Valonia ventricosa*
This alga forms large, thin-walled, round or elliptical sacs. The sacs are single cells that may grow to 10 cm in diameter, among the largest known on Earth.

Wireweed species *Sargassum* spp.
These brown algae can reach several meters in length. They are leathery, tough and grow erect. The axils bear small blades and air bladders.

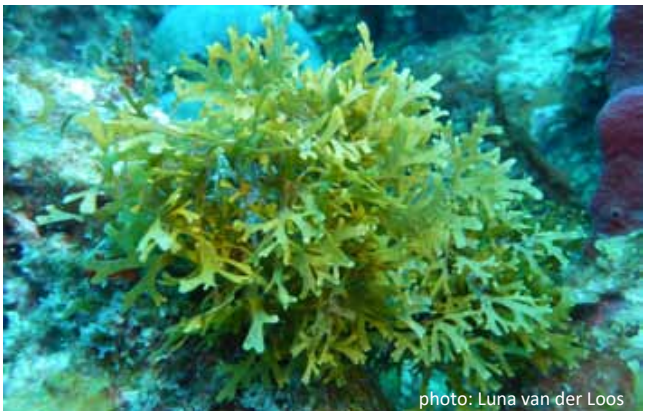


Mermaid's Wineglass *Acetabularia schenckii*
Blades in the form of small parasols, consisting of fused rays. 3-8 cm high. Heavily calcified and can appear to be green or white. Grows in shallow areas, attached to stones, shells or coral.

Broadleaf Gulfweed *Sargassum fluitans*
A brown alga with short-stalked blades bearing round air bladders with no spine. Does not grow attached to rocks, but instead forms free-floating clumps which drift in the ocean or wash up on the beach.

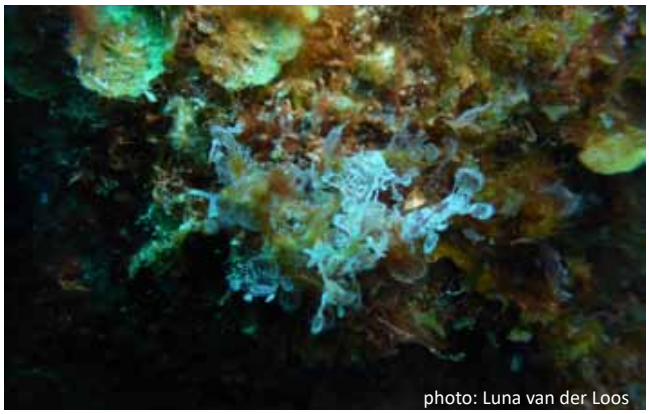
Peacock's Tail Algae *Padina* spp.
This brown alga forms rounded, thin, undulating blades that curve upward near the edges. The surfaces of the fans are calcified and whitened. Attaches to rocky substrates on shallow reef flats.

Red Fan Alga *Flahaultia tegetiformans*
Inconspicuous alga with fan-shaped blades and a minute stipe, reaches 1-4 cm in diameter. Dark purple-red colour with a golden sheen. Grows in dark caves and in crevices, up to 30 m depth.

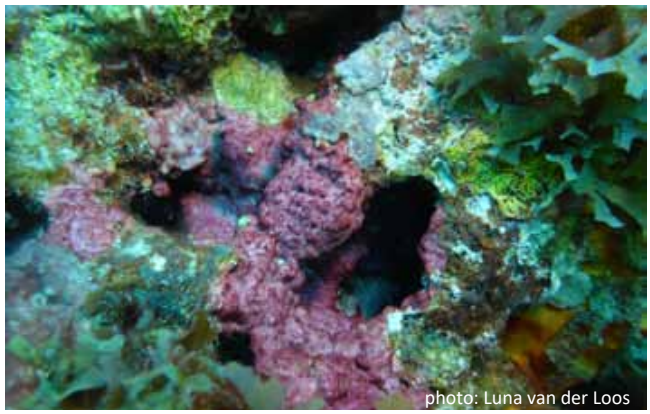


Y-branched Algae *Dictyota* spp.
Algae with flat, strap-shaped blades. All species have branches that fork near the end. Generally form mats of leaves that overgrow the substrate. Found in many reef environments, but most common in protected areas.

Twig Algae *Amphiroa* spp.
Heavily calcified algae, but with non-calcified joints. Dichotomously branched. Pink or white in colour. Brittle and fragile. Some species grow as tall as 15 cm.



Red Lace Alga *Martensia pavonia*
Lobed blades that form thin, delicate lacework, pale pinkish-blue in colour. Stalks are absent. A common species which often grows attached to other algae.



Crustose Coralline Algae
These rock-hard algae grow as calcified crusts on hard substrates. Most species are difficult to identify in the field. Very important in the formation of coral reefs; they act as cement and promote coral growth.

Practical information: organisations and addresses

photo:Marion Haarsma

Tourist information and accommodations

Statia Tourism Office
St. Eustatius Tourism Development Foundation has a website with a wealth of information about the island and the facilities available to visitors. The staff is always willing to help you to arrange your trip.
Address: Fort Oranje, Oranjestad, St. Eustatius, Dutch Caribbean.
Phone: +599 318-2433.
info@statia-tourism.com
www.statiatourism.com


photo: Statia Lodge

Statia Lodge**
Located just outside Oranjestad in a beautiful setting. Statia Lodge offers you ten wooden bungalows, a pool house and a beautiful swimming pool with a fantastic sea view.
infostatialodge@gmail.com
www.statialodge.com


photo: Old Gin House

Old Gin House**
The Old Gin House is a quaint historical waterfront hotel, located near the dive centres. The hotel has a beautiful restored historical bar, ocean terrace, lobby and pool.
info@theoldginhouse.com
www.oldginhouse.com

Palm Spring Inn and Dolphin Valley
Apartment located at the Atlantic side of St. Eustatius. This two bedroom apartment is fully equipped with a living area, fully equipped kitchen and bathroom with shower.
info@palmspringinn.com
www.palmspringinn.com


photo: Talk of the Town apartments

Talk of the Town apartments
Studio apartments ideal for business and leisure traveller. Accommodations feature king-size bed, fully equipped kitchenette, modern bathroom Free Wi-Fi.
info@norakonv.com
www.norakonv.com

Statia apart, Little Paradise**
Two beautiful luxury apartments lie at 10 minutes' walk from Oranjestad. Friendly and relaxed atmosphere in a quiet area with a magnificent terrace on the Caribbean sea view.
info@statia-apart.com
www.statia-apart.com


photo: Harbor View apartments

Harbor View apartments ***
Since 2012 the high standard apartments on the cliff with the best sea view are for rent. Restaurants and the centre of the old town are in walking distance.
info@statiaharborviewapartments.com
www.statiaharborviewapartments.com

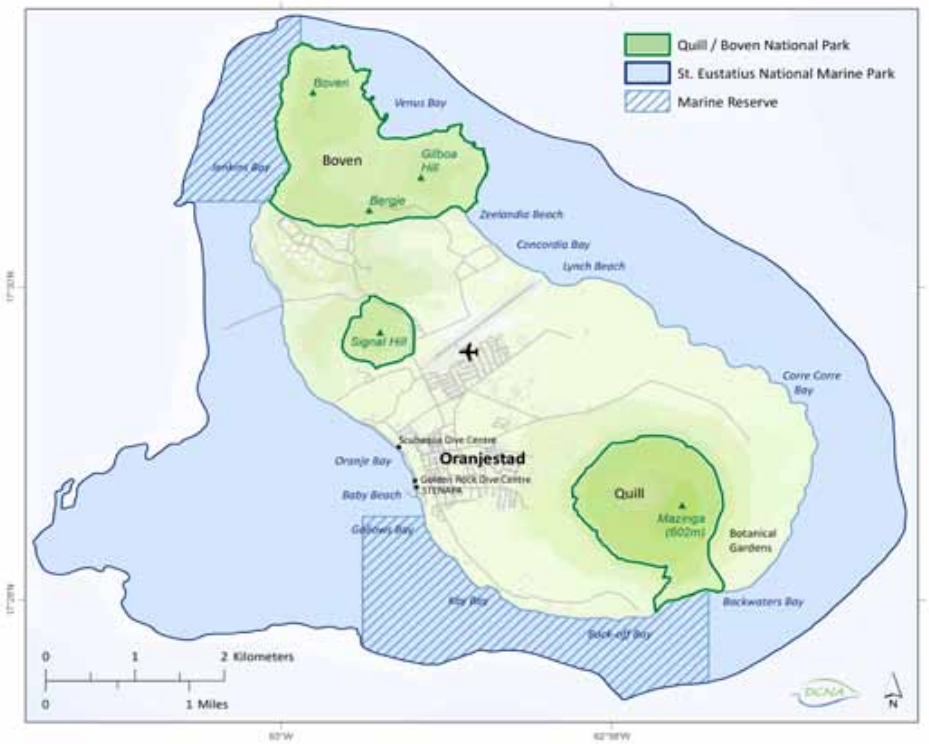

photo: Country Inn Guesthouse

Country Inn
Located at Concordia, in close proximity to the airport, is the Country Inn. Six comfortable air-conditioned rooms are offered, nestled within a beautiful tropical garden.
info@countryinn-statia.com
www.countryinn-statia.com


photo: Sylvia van Leeuwen

STENAPA and the Marine Park

Jessica Berkel and Eseld Imms



The St. Eustatius National Parks Foundation (STENAPA) is a non-governmental, non-profit established in 1988 by a small group of visionary Statians. It is the only organization on the island mandated to manage the protected areas on the island, one of which is the St. Eustatius National Marine Park.

The National Marine Park was established in 1996 and has been actively managed since that time. The Park extends around the entire island from the high water mark to the 30 m depth contour and covers an area of 27.5 km2. The Park is protected by the Marine Environment Ordinance of 1996 and several international conventions and treaties.

Within the National Marine Park are two reserves whose aim is to conserve marine biodiversity, protect fish stocks and promote sustainable tourism. Fishing and anchoring is not permitted within the reserves.

To protect the reefs, all divers must dive with the local dive shops as well as pay a dive fee which goes towards the maintenance of moorings in the Marine Park.

STENAPA carries out a number of activities in the Park such as an extensive nature education and awareness program especially geared towards school children, research and monitoring in the Park in order to have accurate information about the marine environment, maintenance of the infrastructure such as the moorings and collaborative law enforcement.

The Park faces some ongoing challenges such as coastal development and increased shipping traffic and more difficult threats such as coral bleaching. However Park management is determined to work hard to protect the beauty that is the marine environment of St. Eustatius. This environment is made up of beautiful coral reefs which are mainly built up on volcanic substrate such as lava fingers and lava bombs, seagrass beds which support a thriving foraging sea turtle population, the ocean and the beaches.

STENAPA also manages the Quill/Boven National Park and the Miriam C. Schmidt Botanical Garden. Visit **www.statiapark.org** to learn more about the conservation work in the Marine Park and in those terrestrial areas.

STENAPA
Jessica Berkel
Gallows Bay, St. Eustatius
info@statiapark.org
www.statiapark.org

Scubaqua Dive Center

Scubaqua Dive Center is located in a beautiful restored 17th century warehouse on the beach. We offer, since 1997, customized service 365 days a year. We welcome every diver no matter the dive certification-agency and level. We have everything that you can expect from a professional Dive Center. We are an official Aqua Lung partner store. Well-maintained Aqua Lung rental equipment is available for those who want to travel light, and we are experts if it comes to fixing things in our repair workshop. Feel welcome to soak up the Caribbean atmosphere with a cold drink on our terrace and enjoy the best view St. Eustatius has to offer.

Our mission is to give you the best diving St. Eustatius has to offer with care for your personal safety and the environment. We offer low guest-to-guide ratios, just the way we want to dive ourselves during our holidays. St. Eustatius offers dives for all levels and no matter which level of diving you have, we always listen to your personal needs and do everything to give you an unforgettable experience. Our team is highly trained but even more important, we are passionate about diving and our oceans. As instructors, we feel it is our duty to promote environmental awareness and responsible behaviour towards our student divers. We always strive to leave the environment as we found it, so future divers can enjoy the St. Eustatius reefs as much as we do.

We dive in small groups and before every dive we give you a detailed briefing about the dive site and plan. All the dives we make are guided dives (marine park rule), but we try not to restrict your feeling of freedom. Custom-diving Scubaqua style means we give the experienced diver the dives they want but we also give the unexperienced diver the extra attention they need. Dives are 'limited' by the no decompression limits, often exceeding 70 minutes.

Scubaqua Dive Center
Mike Harterink and Marieke Wetering
Lowertown 1, P.O. Box 16, St. Eustatius
dive@scubaqua.com
www.scubaqua.com

Golden Rock Dive Center

Golden Rock Dive Center is owner-operated since 1994 and we have had the unique privilege to watch the diving on St. Eustatius develop over the years. During this time GRDC has worked diligently supporting these developments, from the setting up of the St. Eustatius National Marine Park to the sinking of the C/S Charles Brown and the creation of an artificial reef. GRDC continues to work very closely with the Marine Park and the Caribbean Netherlands Science Institute on various environmental projects. Many of our guests enjoy diving with the volunteers and interns and learning about the research and conservation that is ongoing.

Being a family run business we have made lots of friends over the years and it's been great being part of their life memories. For us it's all about the guests and each one matters, that's why we are very flexible and adjust to everyone's needs. A big part of diving is the people you do it with and finding the right people will make the difference, that's why we always suggest looking at our social media to see if we are a good fit. You will find we are not a big over commercialized dive operation, just divers like you with a passion for the ocean and decades of experience here on St. Eustatius.

GRDC is a PADI five-star facility with comfortable covered boats, and is well equipped with everything you could possibly need for a great day of diving. The shop is conveniently located within walking distance from the hotels, water front, and with an on-site pier for easy access to the Statia Marine Park. Contact us today for a customized diving holiday package!

Golden Rock Dive Center
Glenn Faires
P.O. Box 61, St. Eustatius
www.goldenrockdive.com
grdivers@gmail.com

Les Fruits de Mer

Les Fruits de Mer is a non-profit association based in St. Martin whose core mission is to raise awareness about nature, culture, and sport. The organization carries out this mission through publications, an education program, and special public outreach events that entertain, inspire, and inform.

Les Fruits de Mer offers several free downloadable e-books. 'Wild Statia' by Hannah Madden and Mark Yokoyama and several other e-books on nature and landscapes of the Lesser Antilles are available at: http://www.lesfruitsdemer.com/resources/books/
'The Incomplete Guide to the Wildlife of Sint Eustatius' by Mark Yokoyama and Hannah Madden is in preparation and will include all kind of terrestrial species. See: http://www.statiawildlife.com.

Les Fruits de Mer
Mark Yokoyama
info@lesfruitsdemer.com
www.lesfruitsdemer.com

DCNA

The pristine nature of the Dutch Caribbean contains the richest biodiversity in the Kingdom of the Netherlands. The diverse ecosystems are a magnet for tourism and at the same time the most important source of income for the islanders. Nature on the islands is unique and important but it is also fragile. The lack of sustainable funding, policy support and adequate spatial planning pose the most significant threats.

The Dutch Caribbean Nature Alliance (DCNA) is a regional network of protected areas set up to help and assist the park management and conservation organisations on the islands of Aruba, Bonaire, Curaçao, Saba, St. Eustatius and St. Maarten. Together we are working to safeguard our unique natural world.

DCNA's goals are to:
- support and assist the efforts of conservation organizations to secure sustainable sources of funding for nature conservation, both for themselves and collectively.
- Promote and assist institutional capacity building, training, partnership building and technical resource sharing amongst conservation organizations.
- Promote and represent nature conservation in the Dutch Caribbean, nationally and internationally.
Provide a central dynamic repository for information related to biodiversity and conservation management and encourage information exchange.

Dutch Caribbean Nature Alliance
Kalli De Meyer
P.O. Box 412, Kralendijk, Bonaire
info@dcnanature.org
www.dcnanature.org

CNSI

The Caribbean Netherlands Science Institute at St Eustatius (CNSI) is a facility that fosters scientific curiosity and knowledge development on the Dutch Caribbean islands. The institute has a multifunctional objective supporting basic, strategic, applied, societal and policy relevant research and education in the fields of the earth and life sciences, medical sciences, social sciences and humanities, addressing issues and questions relevant to the sustainability of tropical small island economies.

CNSI's mission is to realise a permanent presence in the Caribbean Netherlands with research facilities, outreach facilities and accommodation for visitors, addressed within the scientific, political and socioeconomic context of the greater Caribbean region, based on: 1) mutual responsibility and understanding 2) sustainable development 3) commitment to multidisciplinary knowledge development and human and institutional capacity building The ambition is to develop CNSI as an authoritative expert and facility centre acknowledged in the Caribbean Netherlands and the wider Caribbean region, positioned at the intersection of science, research, education, management and governance.

Caribbean Netherlands Science Institute
Johan Stapel
L.E. Saddlerweg / P.O. Box 65
St Eustatius, Caribbean Netherlands
cnsi@nioz.nl
www.cnsi.nl

Naturalis

Naturalis Biodiversity Center in Leiden is the national museum of natural history of the Netherlands. It has expositions for the public, scientific reference collections, a large library, and modern laboratories for state-of-the-art research. The scientific staff of Naturalis consists mostly of professional botanists, geologists, and zoologists. Education is also important. Biology students of several universities have participated in research projects. New discoveries by staff researchers and students are published in scientific journals to inform the world about what kinds of animals and plants can be found in the seas. Much scientific output is also produced by retired staff members and other volunteers. Collaboration with citizen scientists of the ANEMOON Foundation is an additional way to reach this goal.

Naturalis has a long tradition in marine science. In the past it organized large ship-based expeditions in Indonesia, the Caribbean and the East Atlantic for explorative research. Many marine specimens collected during these expeditions were deposited in the collections and are still being used to describe new species. Nowadays, most marine research at Naturalis concerns the biodiversity of coral reefs and Naturalis is intensifying its fieldwork activities in the Dutch Caribbean, both in the sea and on land. Recent marine expeditions were organized in collaboration with local scientists and colleagues from other countries. Naturalis has collaborated with CNSI, STENAPA, and Scubaqua at St. Eustatius and with CARMABI Research Station and Sea Aquarium / Substation Curaçao at Curaçao.

Naturalis Biodiversity Center
Bert Hoeksema
P.O Box 9517,
2300 RA Leiden, The Netherlands
bert.hoeksema@naturalis.nl
www.naturalis.nl

The ANEMOON Foundation (Stichting ANEMOON)

Since its start in 1993, the ANEMOON foundation has been focussed on marine life, investigating the diversity of life beneath and beside the sea in Dutch waters. Aided by a large group of volunteers (citizen scientists) who take part in several monitoring projects, ANEMOON tracks changes that are taking place in marine habitats including the sea itself, intertidal zones, and beaches.

The foundation has several different projects. The 'Littoral Inventory and Monitoring Project' LIMP) carries out research at low tide, primarily on hard substrates. The 'Beachdrift Monitoring Project' (SMP) takes place at several stations along the Dutch coastline: volunteers (citizen scientists) catalogue beach debris in designated areas, using standardized methods. 'Monitoring Underwater Banks' (MOO) is carried out by recreational SCUBA divers who have a serious interest in, and commitment to, marine life. Each project produces a continuous string of data over time, with findings entered into a computerized database. The SMP project goes back as far as 1977.

With the information collected by ANEMOON, our knowledge of the marine animals and marine plants of the Netherlands has greatly increased, especially in cases where changes have occurred in the fauna and flora. One of the objectives of the foundation's research is to attempt to determine whether these changes are a result of human factors.

The results of the findings are shared with the public in several ways: on the ANEMOON website, reports to authorities and management bodies, in the newsletter 'Zoekbeeld' (published in Dutch), and via several other media.

On October 10, 2010, the Caribbean Islands of Bonaire, St. Eustatius, and Saba became official Dutch municipalities, which means they are now part of the Netherlands. The three islands are collectively known as the Caribbean Netherlands (Caribisch Nederland). A fascinating and fragile ecosystem exists around each of these islands, with many special floral and faunal elements. ANEMOON is carrying out research to help protect all these marine organisms. The main objectives are to collect necessary information, to raise official awareness of the importance of the ecosystem, and, perhaps most vital, to increase public awareness of the richness of the sea life in these interesting but vulnerable areas. You too can contribute to this process, by sharing your observations with the ANEMOON Foundation.

Interested people can download some helpful research tools from www.anemoon.org, including an identification sheet and the MOO-form for the Caribbean Netherlands. All data will be made freely available to the organisations with which we collaborate on St. Eustatius that includes STENAPA and the Caribbean Netherlands Science Institute (CNSI).

Because ANEMOON participated in the Naturalis Biodiversity Center's St. Eustatius Marine Expedition 2015, information on many of the species that live in the waters around St. Eustatius has been incorporated into the ANEMOON website.

The creation of this field guide was made possible by a grant from the Prins Bernhard Cultuurfonds Caribisch Gebied (PBCCG) which also enabled the development and design of the fieldwork poster, the listings and descriptions of species given on the ANEMOON website, and the launch of a MOO-like project using volunteers and citizen scientists on St. Eustatius.

ANEMOON Foundation
Adriaan Gmelig Meyling
anemoon@cistron.nl
www.anemoon.org/EUX
P.O. Box 29, 2120 AA Lisse, The Netherlands

Additional information

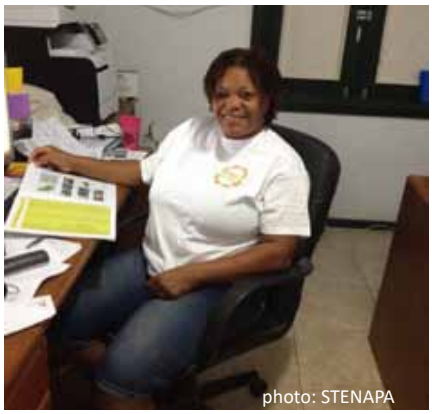
photo: Godfried van Moorsel

Authors

Floris Bennema
Biologist specialized in the reconstruction of the state of marine ecosystems in the past.

Kalli De Meyer
Nature conservationist and Executive Director Dutch Caribbean Nature Alliance.

Mike Harterink
Dive school owner and dive guide at St. Eustatius.



Jessica Berkel
Marine park manager at STENAPA. She manages funding requests, research projects and coordinates the turtle conservation program.

Glenn Faires
Dive school owner and dive guide at St. Eustatius.

Susan J. Hewitt
Citizen scientist dedicated to Malacology. She worked for the mollusc department of the American Museum of Natural History.

Jaap de Boer
Citizen scientist dedicated to malacology. Volunteer at the ANEMOON Foundation and the Dutch Malacological Society.

Marion Haarsma
Experienced diver and underwater photographer. Monitors marine life for the ANEMOON Foundation.

Bert Hoeksema
Marine biologist /zoologist at Naturalis Biodiversity Center. He is specialized in taxonomy and systematics, and mainly works on coral reefs.


photo: Eseld Imms

Eseld Imms
GIS consultant and project manager in the field of environmental management and public outreach.


photo: Sylvia van Leeuwen

Godfried van Moorsel
Marine biologist at Ecosub. Did coral reef research on Curaçao and Bonaire. Co-operates with the ANEMOON Foundation.


photo: Agnes Etchegoyen

Mark Yokoyama
Naturalist, author and wildlife photographer living in Grand Case, Saint Martin. Active in nature education via Les Fruits de Mer.


photo: Sylvia van Leeuwen

Sylvia van Leeuwen
Citizen scientist dedicated to malacology. Volunteer at the ANEMOON Foundation and the Dutch Malacological Society


photo:Anita Schrieken-Mulder

Niels Schrieken
Niels has over 20 years off experience in marine biology, expeditions and citizen science. He monitors species with the Roving Diver Technique.


photo: Robin Gmelig Meyling

Adriaan Gmelig Meyling
Chair of the ANEMOON-Foundation


photo: Marion Haarsma

Luna van der Loos
Biologist with a passion for macroalgae. Her research focusses on these fascinating organisms and their role in coastal ecosystems.


photo: Johan Stapel

Johan Stapel
Director of the Caribbean Netherlands Science Institute (CNSI).

Observation Card

OBSERVATION FORM FOR DIVING AND SNORKELING

Your name (optional)

Your e-mail address (optional)

After each dive or any snorkeling, please note down how many individuals or colonies you saw of each species. **0** = you did not see any. **X** = you saw the species but you don't know how many. **?** = you do not know if you saw the species or not. Then please send the form to the ANEMOON Foundation at the address below, or bring it to the STENAPA Office at Gallows Bay. Thank you!

	Dive 1	Dive 2	Dive 3	Dive 4
Date				
Name of dive site				
Green Turtle				
Hawksbill Turtle				
Nurse shark				
Southern Stingray				
Great Barracuda				
Red lionfish				
Caribbean Spiny Lobster				
Queen Conch				
Elkhorn Coral				
Staghorn coral				
Common Sea Fan				
Orange cup coral				

The ANEMOON Foundation is a Dutch organisation of volunteers who are dedicated to marine biodiversity, and who work to help increase the understanding of marine life in the Netherlands – since 2010, St. Eustatius is one of three islands which make up the Caribbean Netherlands. ANEMOON has developed several successful monitoring projects, and these have proven that observations from vacationing beachcombers, divers and snorkelers can serve as valuable additions to research carried out by professional scientists.

To get more information about the St. Eustatius ANEMOON project and a free e-book about the marine life of the island, go to www.anemoon.org/EUX

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anemoon@kistron.nl
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STENAPA
Gallows Bay, St. Eustatius
research@statiapark.org
www.statiapark.org

DID YOU SEE THEM?

GREEN TURTLE *Chelonia mydas*

This turtle has only two plates between the eyes and normally no barnacles on the carapace. Endangered by overconsumption and degradation of nesting habitat. STENAPA protects the nesting beaches of all sea turtles on the island.

HAWKSBILL TURTLE *Eretmochelys imbricata*

Sharp curving beak, overlapping plates and often barnacles growing on them. Four plates between the eyes. Critically endangered by overconsumption and degradation of marine habitats.

TELL US, AND HELP PROTECT THE UNDERWATER LIFE IN THE ST. EUSTATIUS MARINE PARK!

NURSE SHARK *Ginglymostoma cirratum*

One of the top predators of the reefs, can grow up to 275 cm. The two triangular fins are nearly the same size. Small mouth with two barbels. Likely to be a threatened species but data to assess population stability are lacking.

SOUTHERN STINGRAY *Dasyatis americana*

Maximum disc width 67 cm (males) to 150 cm (females). This slow-to-reproduce species is vulnerable to fishery, but data are insufficient.

ELKHORN CORAL *Acropora palmata*

Colonies of flattened branches, look like the horns of Elk (UK) or Moose (USA). In shallow water to 10 m depth. This important reef builder is critically endangered.

STAGHORN CORAL *Acropora cervicornis*

Antler-like branches of over one meter long and round in cross section. Critically endangered, due to diseases, climate change, and human factors.

GREAT BARRACUDA *Sphyraena barracuda*

Up to 1 meter in length and with strong, sharp teeth. They are not afraid of divers on Statia, but please do not feed or touch them.

RED LIONFISH *Pterois volitans*

This fish species originates from the Indo-Pacific and is now an invasive problem in the Caribbean Sea. The venomous spines make it inedible for most predators.

COMMON SEA FAN *Gorgonia ventalina*

These beautiful purple colonies can grow 1.8 meter in height. Each polyp extends its eight tentacles to catch plankton drifting by.

ORANGE CUP CORAL *Tubastraea coccinea*

Bright orange coral with yellow tentacles. It is native to the Indo-Pacific and is introduced in the Caribbean. It competes for space and food with native corals.

CARIBBEAN SPINY LOBSTER (LANGOUSTE) *Panulirus argus*

May reach up to 60 cm but usually 20-30 cm, due to overfishing. To assess the stability of the populations, more data are needed.

QUEEN CONCH *Lobatus gigas*

Large conch up to 30.5 cm with pink mouth. This species is vulnerable to overconsumption and trade, and is protected by the international CITES Convention.

YOUR HELP IS VALUABLE!

THESE BEAUTIFUL CREATURES are part of the surprisingly rich diversity of the marine life around St. Eustatius. Everyone can contribute to protecting the vulnerable underwater life forms here. Please share with us which of these species you saw during your dive or snorkel trip.

THE COUNTS YOU PROVIDE will be gathered together with information from other people. After the records are analysed, the results will be sent to STENAPA, who will use the information to help manage and protect the Marine Park of this special island.

Download a free e-book about the marine life of St. Eustatius at: **www.anemoon.org/EUX**

Extended Observation Form

Divers with more knowledge of marine species are invited to share their observations via this extended observation form. The digital form is available at: www.anemoon.org/EUX.

	Vernacular name (ENG)	Scientific name	?	0	1-9	10-99	>100	Egg
Corals	Pillar Coral	*Dendrogyra cylindrus*						
	Yellow Pencil Coral	*Madracis auretenra*						
	Ten-ray Star Coral	*Madracis decactis*						
	Mountainous Star Coral	*Orbicella faveolata*						
	Great Star Coral	*Montastraea cavernosa*						
	Mustard Hill Coral	*Porites astreoides*						
	Massive Starlet Coral	*Siderastrea siderea*						
	Symmetrical Brain Coral	*Pseudodiploria strigosa*						
	Knobby Brain Coral	*Pseudodiploria clivosa*						
	Grooved Brain Coral	*Diploria labyrinthiformis*						
	Maze Coral	*Meandrina meandrites*						
	Whitestar Sheet Coral	*Agaricia lamarcki*						
	Lettuce Coral	*Agaricia agaricites*						
	Low Relief Lettuce Coral	*Agaricia humilis*						
	Orange Cup Coral	*Tubastraea coccinea*						
Other Cnidarians	Corkscrew Anemone	*Bartholomea annulata*						
	Feather Bush Hydroid	*Denthitheca dendritica*						
	Giant Anemone	*Condylactis gigantea*						
	Sponge Zoantharian	*Umimayanthus parasiticus*						
	Golden Zoantharian	*Parazoanthus swiftii*						
	Maroon Sponge Zoantharian	*Bergia puertoricense*						
	White Encrusting Zoantharian	*Palythoa caribaeorum*						
Segmented Worms	Social Feather Duster	*Bispira brunnea*						
	Bearded Fireworm	*Hermodice carunculata*						
	Split-crown Feather Duster	*Anamobaea oerstedi*						
	Star Horseshoe Worm	*Pomatostegus stellatus*						
	Christmas Tree Worm	*Spirobranchus giganteus*						
	Sea Frost	*Filograna huxleyi*						
Crustaceans	Caribbean Spiny Lobster	*Panulirus argus*						
	Banded Coral Shrimp	*Stenopus hispidus*						
	Squat Anemone Shrimp	*Thor amboinensis*						
	Pederson Cleaner shrimp	*Ancylomenes pedersoni*						
	Spotted Cleaner Shrimp	*Periclimenes yucatanicus*						
	Spanish Slipper Lobster	*Scyllarides aequinoctialis*						
	Red Reef Hermit	*Paguristes cadenati*						
	Giant Hermit	*Petrochirus diogenes*						
	Yellowline Arrow Crab	*Stenorhynchus seticornis*						
	Cryptic Teardrop Crab	*Pelia mutica*						
	Gaudy Clown Crab	*Platypodiella spectabilis*						
Molluscs	Caribbean Reef Squid	*Sepioteuthis sepioidea*						
	Queen Conch	*Strombus gigas*						
	Flamingo Tongue	*Cyphoma gibbosum*						
	Lettuce Sea Slug	*Elysia crispata*						
	Frons Oyster	*Dendostrea frons*						
	Rough File Clam	*Ctenoides scaber*						

	Vernacular name (ENG)	Scientific name	?	0	1-9	10-99	>100	Egg
Echinoderms	Giant Basket Star	*Astrophyton muricatum*						
	Sponge Brittle Star	*Ophiothrix suensoni*						
	Long-spined Sea Urchin	*Diadema antillarum*						
	West Indian Sea Egg	*Tripneustes ventricosus*						
	Slatepencil Urchin	*Eucidaris tribuloides*						
	Red Heart Urchin	*Meoma ventricosa*						
	Donkey Dung Sea Cucumber	*Holothuria mexicana*						
Tunicates, Sea Squirts	Bluebell Tunicate	*Clavelina puertosecensis*						
	Reef Tunicate	*Rhopalaea abdominalis*						
	Encrusting Social Tunicate	*Symplegma viride*						
	Strawberry Tunicate	*Eudistoma sp*						
Marine Plants and Algae	Mermaid's Tea Cup	*Udotea cyathiformis*						
	Broadleaf Seagrass	*Halophila stipulacea*						
	Saw-blade Alga	*Caulerpa serrulata*						
	Sea Pearl	*Ventricaria ventricosa*						
	Twig Algae	*Amphiroa spp*						

General information		Observation time (minutes):
Name observer:		Reef
e-mail:		Wreck
Name Buddy:		Sand
e-mail buddy:		Total dive time
Date:		
Name of dive site:		
X-coördinate:		
Y-coördinate:		
Visibility in meters:		

Additional species

After each dive, please note down how many individuals or colonies you saw of each species. 0 = you did not see any, 1-9, 10-99, > 100 = you saw this number. ? = you do not know if you saw the species or not. Egg = you saw eggs.

Please bring the completed form to the STENAPA Office at Gallows Bay, Lower Town, or send the form to the ANEMOON Foundation. Thank you!

Address of the ANEMOON Foundation:
P.O. Box 29, 2120 AA Bennebroek, The Netherlands, anemoon@ctron.nl

More information on:
www.anemoon.org/EUX

	Vernacular name (ENG)	Scientific name	?	0	1-9	10-99	>100	Egg
Fishes	Gray Angelfish	*Pomacanthus arcuatus*						
	French Angelfish	*Pomacanthus paru*						
	Rock Beauty	*Holacanthus tricolor*						
	Banded Butterflyfish	*Chaetodon striatus*						
	Reef Butterflyfish	*Chaetodon sedentarius*						
	Blue Tang	*Acanthurus coerulus*						
	Great Barracuda	*Sphyraena barracuda*						
	Caesar Grunt	*Haemulon carbonarium*						
	Cottonwick	*Haemulon melanurum*						
	Black Margate	*Anisotremus surinamensis*						
	Longsnout Seahorse	*Hippocampus reidi*						
	Dusky Damselfish	*Stegastes adustus*						
	Yellowtail Damselfish	*Microspathodon chrysurus*						
	Sergeant Major	*Abudefduf saxatilis*						
	Brown Chromis	*Chromis multilineata*						
	Red Hind	*Epinephelus guttatus*						
	Barred Hamlet	*Hypoplectrus puella*						
	Nassau Grouper	*Epinephelus striatus*						
	Harlequin Bass	*Serranus tigrinus*						
	Coney	*Cephalopholis fulva*						
	Tiger Grouper	*Mycteroperca tigris*						
	Stoplight Parrotfish	*Sparisoma viride*						
	Squirrelfish	*Holocentrus adscenionis*						
	Longspine Squirrelfish	*Holocentrus rufus*						
	Blackbar Soldierfish	*Myripristis jacobus*						
	Glasseye Snapper	*Heteropriacanthus cruentata*						
	Sharknose Goby	*Elacatinus evelynae*						
	Pepermint Goby	*Coryphopterus lipernes*						
	Sailfin Blenny	*Emblemaria pandionis*						
	Yellowface Pikebleny	*Chaenopsis limbaughi*						
	Yellowhead Jawfish	*opistognathus aurifrons*						
	Peacock Flounder	*Bothus lunatus*						
	Red Lionfish	*Pterois volitans*						
	Spotted Scorpionfish	*Scorpaena plumieri*						
	Longlure Frogfish	*Antennarius multiocellatus*						
	Redspotted Hawkfish	*Amblycirrhitus pinos*						
	Flying Gurnard	*Dactyloperus volitans*						
	Sand Diver	*Synodus intermedius*						
	Atlantic Trumpetfish	*Aulostomus maculatus*						
	Sand Tilefish	*Malacanthus plumieri*						
	Web Burrfish	*Chilomycterus antillarum*						
	Porcupine Fish	*Diodon hystrix*						
	Honeycomb Cowfish	*Acanthostracion polygonius*						
	Smooth Trunkfish	*Rhinesomus triqueter*						
	Whitespotted Filefish	*Cantherhines macrocerus*						

	Vernacular name (ENG)	Scientific name	?	0	1-9	10-99	>100	Egg
Fishes	Slender Filefish	*Monacanthus tuckeri*						
	Spotted Goatfish	*Pseudupeneus maculatus*						
	Yellow Goatfish	*Mulloidichthys martinicus*						
	Spotted Drum	*Equetus punctatus*						
	Jackknife Fish	*Equetus lanceolatus*						
	Spotted Moray	*Gymnothorax moringa*						
	Chain Moray	*Echidna catenata*						
	Sharptail Eel	*Myrichthys breviceps*						
	Nurse Shark	*Ginglymostoma cirratum*						
	Southern Stingray	*Dasyatis americana*						
Sea Turtles	Green Sea Turtle	*Chelonia mydas*						
	Hawksbill Sea Turtle	*Dermochelys imbricata*						
Sponges	Brown Tube Sponge	*Agelas conifera*						
	Branching Tube Sponge	*Aiolochroia crassa*						
	Stove-pipe Sponge	*Aplysina archeri*						
	Yellow Tube Sponge	*Aplysina fistularis*						
	Azure Vase Sponge	*Callyspongia plicifera*						
	Pink Vase Sponge	*Niphates digitalis*						
	Giant Barrel Sponge	*Xestospongia muta*						
	Lumpy Overgrowing Sponge	*Holopsamma helwigi*						
	Black Ball Sponge	*Ircinia strobilina*						
	Brown Encrusting Octopus Sponge	*Ectyoplasia ferox*						
	Spiny Ball Sponge	*Leucandra barbata*						
	Red Encrusting Sponge	*Monanchora arbuscula*						
	Green Finger Sponge	*Iotrochota birotulata*						
	Star Encrusting Sponge	*Halisarca caerulea*						
	Orange Icing Sponge	*Mycale laevis*						
	Orange lumpy Encrusting Sponge	*Scopalina ruetzleri*						
	Convoluted Orange Sponge	*Mymekioderma styx*						
	Orange Elephant Ear Sponge	*Agelas clathrodes*						
	Brown Variable Sponge	*Cliona varians*						
Corals	Artichoke Coral	*Scolymia cubensis*						
	Branching Fire Coral	*Millepora alcicornis*						
	Blade Fire Coral	*Millepora complanata*						
	Rose Lace Coral	*Stylaster roseus*						
	Corky Sea Finger	*Briareum asbestinum*						
	Encrusting Gorgonian	*Erythropodium caribaeorum*						
	Tube-knob Candelabrum	*Eunicea laxispica*						
	Slimy Sea Plume	*Antillogrogia americana*						
	Grooved-blade Sea Whip	*Pterogorgia guadalupensis*						
	Deepwater Sea Fan	*Iciligorgia schrammi*						
	Snowflake Coral	*Carijoa riisei*						
	Staghorn Coral	*Acropora cervicornis*						
	Elkhorn Coral	*Acropora palmata*						

Acknowledgements

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The participants of the **St. Eustatius Marine Expedition 2015**, greatly contributed to the knowledge of the marine biodiversity around Statia, and kindly allowed their photographs of the species they observed to be used in this guide. The expedition team was composed of professional marine biologists from the Naturalis Biodiversity Center in the Netherlands and from several universities in other countries, as well as citizen scientists from the ANEMOON Foundation, and personnel from several St. Eustatius organizations. The expedition participants included: **Bert W. Hoeksema,** PhD and coordinator from Naturalis Biodiversity Centre (stony corals and associated fauna); **Ronald Vonk**, PhD (interstitial bottom fauna); **Arjen Speksnijder**, PhD (molecular biodiversity of bottom fauna); **Frank R. Stokvis**, MSc (technician for molecular analyses); **Koos van Egmond** (collection technician); **Yee Wah Lau,** MSc (octocorals); **Luna van der Loos**, BSc (marine plants and algae); **Willem F. Prud'homme van Reine**, PhD (marine plants and algae); **Jim D. Thomas**, PhD (amphipods); **Slava Ivanenko**, PhD (coral-associated copepods); **Simone Montano**, PhD (hydrozoans); **James D. Reimer**, PhD (zoantharians); **Jaaziel E. García-Hernández** (sponges), **Niels Schrieken**, MSc and coordinator from ANEMOON (ascideans); **Godfried W.N.M. van Moorsel**, PhD (scleractinians, fishes); **Marco Faasse**, MSc (hydrozoans, bryozoans, general marine fauna); **Marion Haarsma** (photography, general marine fauna); **Sylvia van Leeuwen**, MSc (molluscs); **Susan J. Hewitt** (molluscs); **Steve Piontek**, MSc (fishes); **Jessica Berkel** (STENAPA park manager); **Matt Davies** (STENAPA park ranger); **Mike Harterink** (Scubaqua Dive Center diving logistics); **Menno Walther** (diving logistics and boat person); **Marieke van de Wetering** (diving logistics); and dive guides **Laura Aubac**, **Noortje de Boer**, and **Vincent Bourcier**.

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Adriaan Gmelig Meyling
Chair of the ANEMOON Foundation

Index of species

Field Guide to the Marine Life of St. Eustatius

Explore the fascinating marine life of the Dutch Caribbean island of St. Eustatius. This guide features nearly 300 vivid colour photographs and descriptions of fish, turtles, sea stars, corals, sea snails, crabs, marine plants, sponges, and many other kinds of underwater organisms. The guide includes a number of species that are found only around Statia (as the island is affectionately known). Images of some strange and unusual creatures that are seldom seen anywhere are included, as well as many species that are common in other parts of the Caribbean.

Based on fieldwork by the team of the Statia Marine Expedition 2015, this little book is both scientifically accurate and as fascinating as nature itself. It is a practical guide for anyone exploring the coastline and underwater world of St. Eustatius and nearby islands, ideal for those who would like to be able to identify the beautiful things they see, and to learn more about them.

Here is your connection to both professional marine biologists and to the enthusiastic citizen scientists of the ANEMOON Foundation of the Netherlands. Together they tell the story of the underwater flora and fauna of St. Eustatius, showing why these marine wonders must be preserved for future generations.

Please visit www.anemoon.org/EUX for additional publications and supplements to this guide.

Stichting ANEMOON

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