

# BIONEWS

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## Editor's Letter

Dutch Caribbean, August 2018

We start this issue of BioNews with the exciting sighting of a very rare marine mammal in our waters: the Antillean manatee. The recent sightings show that manatees have the dispersal capacity to reach the Dutch Leeward Islands. Bonaire's waters are part of the Yarari Marine Mammal and Shark Sanctuary in which they are protected and it is hoped that together with other regional marine mammal protection initiatives this charismatic species could be saved from extinction.

We are also delighted to share BirdsCaribbean's news that Bonaire's Cargill Salt Ponds have been designated as a Western Hemisphere Shorebird Reserve Network (WHSRN) site of Regional Importance making it the second WHSRN site in the Caribbean. The ponds are an important stopover and wintering site for migratory birds and this designation will ensure their protection and management.

Bats fulfill a very important ecological niche. Nectar-eating bats are key pollinators of a number of native plant species, and fruit-eating bats assist with seed dispersal. As part of an ongoing study of the chiropteran (bat) fauna of the Lesser Antilles, American and Dutch bat specialists combined their findings and provided the first-ever

comprehensive assessment of St. Eustatius's bat population. Pedersen et al (2018) raised concerns over how poor and unbalanced the island's bat population is when compared to nearby islands. Chronic environmental degradation and resulting lack of habitat diversity coupled with predation from invasive species and uncontrolled livestock grazing has had disastrous consequences for the well-being of the island's bats.

Lastly, we report on the great achievements of Environmental Protection in the Caribbean (EPIC) in restoring key biodiversity areas in St. Maarten despite the significant challenges caused by Hurricane Irma last year. Their work has resulted in increased biodiversity and potential carbon sequestration at the restoration sites and has also built local capacity and support for future restoration projects while strengthening community through service projects.

**Happy reading!**  
**The DCNA Team**

## Exciting Rare Sighting in the Dutch Caribbean: the Antillean manatee

**Last month STINAPA's ranger Luigi Eybrecht was diving near Playa in Bonaire when he encountered a very rare marine mammal: the Antillean Manatee (*Trichechus manatus manatus*). This is the first confirmed record of an Antillean manatee in Bonaire.**

Bonaire's waters are part of the Yarari Marine Mammal and Shark Sanctuary. The Yarari Sanctuary, which encompasses Saba's and Saba Banks' waters and Bonaire's Exclusive Economic Zone waters, does not only protect marine mammals such as whales, dolphins and manatees, but also sharks.

The Antillean Manatee is a subspecies of the West Indian manatee (*Trichechus manatus*) (Deutsch et al. 2008). The Antillean manatee is estimated at less than 2500 mature individuals sparsely distributed throughout the tropical and subtropical Western Atlantic Coastal Zone from the Bahamas to Brazil, including the Caribbean Sea and Gulf of Mexico (Deutsch et al. 2008). The declining manatee population is threatened by habitat degradation and loss, hunting, accidental fishing-related mortality, pollution, and human disturbance and listed as Endangered on the IUCN Red list as it is predicted to decline by at least 20% over the coming 40 years (Self-Sullivan & Mignucci-Giannoni, 2008).

Manatees can inhabit waters with large changes in salinity concentrations and therefore are often found in shallow rivers and estuaries where they opportunistically feed on aquatic plants (Ortiz et al., 1998; Deutsch, 2008). They can grow up to 4.5 meter and weight up to 630 kg (U.S. Fish and Wildlife Service, 2018).

It is possible that the Dutch Leeward Islands (Aruba, Bonaire, Curaçao) prior or during the Holocene could have facilitated colonization and supported small populations of the manatee (Debrot et al., 2006). The geographic isolation of the islands and use of this defenseless species by the early Amerindian inhabitants explain why it is believed that this species could easily

have been eradicated around these islands well prior to the European colonization (Debrot et al., 2006). Today, suitable habitat for manatees is clearly missing around the Dutch Leeward island (Debrot et al., 2017). However, the few manatees seen in the past years around the Dutch Leeward Islands suggest that they could still form part of the active range of this rare and elusive species (Debrot et al., 2006). A manatee spotted in January this year by Armand Cranen in Aruba may have been the same as the one seen in Bonaire by L. Eybrecht, passing by the Leeward islands and deriving from the population inhabiting the waters of Venezuela, Puerto Rico or Hispaniola. Evidence from the Lesser Antilles suggests that in pre-Columbian times manatees could have occurred regularly in the Dutch Caribbean Windward Islands (Saba, St. Eustatius and St. Maarten) but are now regionally extinct around these islands (Debrot et al., 2006; Deutsch et al. 2008).

The recent sightings show that manatees have the dispersal capacity to reach the Dutch Leeward Islands. The Yarari Marine Mammal and Shark Sanctuary includes habitats of former and potential future renewed importance for the endangered West Indian manatee (Debrot et al, 2011). It is hoped that together with other regional marine mammal protection initiatives this charamastic species could be saved from extinction.

*(next page) Table 1:* Overview of the West Indian manatee (*Trichechus manatus*) documented in the Dutch Caribbean.

ISLAND	YEAR	RECORD	REFERENCE
Aruba	Pre-Pleistocene	Fossil <i>Manatus</i> sp.	Martin, 1888; de Buissonjé, 1974; Van Oort, 1902 ; Rutten, 1931
	January 2018	Visual sighting alive	Observed by Armand Cranen. Aruba Marine Mammal Foundation (Henriquez, A. personal communication with Paul Hoetjes on 11th of July)
Bonaire	July 2018	Visual documentation alive	Luigi Eybrecht /STINAPA Bonaire/
	Pre-Pleistocene	Fossil <i>Manatus</i> sp.	Martin, 1888; de Buissonjé, 1974; Rutten, 1931
Curaçao	1970	Visual sighting alive	M. Rijna†, personal communication to G. van Buurt, late 1970s (Debrot et al., 2006)
	February 2001	Visual sighting alive	Huang, A., van Duuren, R., personal communication (Debrot et al., 2006)
	September 2005	Visual documentations alive	Siberie, R., Lucas, F., personal communication (Debrot et al., 2006). Photo by A. Debrot can be found here on page 12.
Saba	Pre-Columbian	Fossil <i>Manatus</i> sp.	Hoogland 1996; Hoogland and Hofman 1999
St. Maarten	Late 1980's, probably 1987 or 1988	Visual sighting alive	Robbie Cijntje, Nature Foundation St. Maarten, personal communication) (Debrot et al., 2006)

**Table 1:** Overview of the West Indian manatee (*Trichechus manatus*) documented in the Dutch Caribbean.

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## Worth Its Salt: Bonaire's Cargill Salt Ponds Designated a Shorebird Site of Regional Significance

**Imagine a vast expanse of rectangular saline ponds in surreal colors – pinks, turquoises, greens – that reach out towards the horizon, flanked by a collection of enormous, immaculately white pyramids of salt. It's an extraordinary landscape, with an eerie beauty.**

Now, there is something even more remarkable about Bonaire's Cargill Salt Ponds. BirdsCaribbean is excited to share the fantastic news that this important stopover and wintering site for migratory birds has been designated a Western Hemisphere Shorebird Reserve Network (WHSRN) site of Regional Importance. This is the second WHSRN site in the Caribbean, joining the Cabo Rojo Salt Flats in southwestern Puerto Rico. This designation will ensure the protection and management of the site for shorebirds. It's excellent news for the Red Knot, in particular. In addition to this threatened migratory bird, more than 20,000 shorebirds, representing 17 species, have been recorded at the location.

### What is the Western Hemisphere Shorebird Reserve Network?

The Western Hemisphere Shorebird Reserve Network is dedicated to protecting key habitats throughout the Americas, helping sustain healthy populations of shorebirds. With the addition of Cargill Salt Ponds Bonaire, there are now 103 WHSRN sites covering nearly 15 million hectares (38 million acres) in 17 countries. Sites are categorized as having Regional, International or Hemispheric Importance based on the total number of shorebirds they support annually; or if the sites support a substantial percentage of the population of a single species. The new site, the first for the Dutch Caribbean, also lies within BirdLife International's Important Bird Area (IBA) Pekelmeer Saltworks, Bonaire. This area includes the 400-hectare Pekelmeer Ramsar site (a designation given to Wetlands of International Importance).

### The Big Attraction for Shorebirds at Cargill Salt Ponds

Why do shorebirds thrive at the Salt Ponds? What could possibly survive in this alien landscape? The answer: brine shrimp and brine flies. These small invertebrates lay the foundation that support thousands of shorebirds annually. Most of them are hungry migrants, taking a much-needed break before continuing on their journey, or spending the winter at this food-rich site. A privately-owned salt production facility at the southern end of Bonaire, owned by Cargill Salt Bonaire B.V., the site comprises 3,700 hectares: 2,700 hectares are artificial wetlands – primarily solar evaporation ponds for salt extraction. Brine shrimp fill the ponds. The dike roads running between the ponds are covered with brine flies. For shorebirds, the shrimp and flies are a delicious food source, right amongst the mountains of salt. Many are familiar with the extraordinary migratory cycle of the Red Knot: every year, this shorebird flies a roundtrip of close to 19,000 miles, from the Arctic to southern Chile and Argentina. If that wasn't impressive enough, this bird's journey includes multi-day stretches (even up to one week!) of continuous flight between stopover sites. These sites that allow the birds to rest and refuel are critically important to the success of the Red Knot's migration. Without them, this fascinating shorebird would not survive.



## Cargill's Invaluable Support for Shorebird Surveys

Daniel DeAnda Jr., Cargill's Production Manager, collaborated with Lisa Sorenson, Executive Director of BirdsCaribbean, on the nomination of the salt ponds for WHSRN status. With Cargill's support, BirdsCaribbean led surveys, beginning in 2015, to learn more about the species and numbers of birds using the site. Survey results revealed that more than 20,000 shorebirds visit the wetlands annually, qualifying it as a WHSRN site at the "Regional" level of importance. This large concentration of shorebirds includes at least 1% of the biogeographic population of the threatened *rufa* (American) subspecies of Red Knot (*Calidris canutus rufa*) and Short-billed Dowitcher.

Unfortunately, shorebird numbers are declining. Some species have seen dramatic and worrying decreases in numbers. The *rufa* subspecies of the Red Knot has declined 80% over the last 20 years. The population of Semipalmated Sandpiper, which winters on the northern coast of South America, has shown similar declines over 30 years. This is a global problem: The Spoon-billed Sandpiper, which breeds in Russia and winters in Southeast Asia, may have just 100 breeding pairs left. The greatest threats to shorebirds are habitat loss, predators, hunting, and climate change. Areas such as WHSRN sites, which are preserved and protected for shorebirds, are crucial for successful breeding and migration.

BirdsCaribbean and partners recorded 15 other species during the salt pond surveys, including: Semipalmated Sandpiper, Least Sandpiper, Stilt Sandpiper, Semipalmated Plover, and Sanderling. Significant numbers of Snowy Plovers are also found regularly at the location. These are probably a combination of migrants (nominate *Charadrius nivosus*) and resident birds belonging to the Caribbean breeding subspecies (*C. n. tenuirostris*). The area is the only known nesting area on Bonaire for the Royal Tern. It also supports one of the most important American Flamingo nesting colonies in the Caribbean.

## The Power of Partnerships

BirdsCaribbean was very fortunate to have motivated and passionate international and local partners, who were essential during the survey periods. The partnership included staff and volunteers from STINAPA Bonaire, WILDSCONSCIENCE, US Fish and Wildlife Service, Cornell Lab of Ornithology, and Dutch Caribbean Nature Alliance. Survey teams led by Fernando Simal (WILDSCONSCIENCE) counted birds at 110 points, over five counting periods. Their findings informed the site's WHSRN designation. Lisa Sorenson, Executive Director of BirdsCaribbean commented, *"We are very grateful for the support we received from Cargill and our partners and volunteers, who enabled us to complete this work. We are especially thankful to Environment and Climate Change Canada for its principal funding support for the surveys, as well as the contribution of the U.S. Forest Service's Department of International Programs. We also deeply appreciate the encouragement and support we received from Manomet for our nomination."* BirdsCaribbean looks forward to continuing to work together with Cargill and all the partners to monitor and manage the site for shorebirds.

**To learn more about the Caribbean Waterbird Census (CWC) and how to participate, visit:**

<https://www.birdscaribbean.org/our-work/caribbean-waterbird-census-program/>

## What can we do to help our shorebirds?

What can we do to help our shorebirds and their habitats? The Caribbean is a key link on the Atlantic Flyway. Its beaches, lagoons, marshes, swamps, rice fields, and other wetlands support enormous numbers of shorebirds annually. In order to ensure shorebird survival and mitigate against ongoing population declines, it is critical to identify and protect important sites in the region. One way you can help is by taking part in the Caribbean Waterbird Census, when professionals as well as citizen scientists count waterbirds during a 3-week period from January 14th to February 3rd as well as other times of year. Read more about shorebirds and the efforts to conserve them through the Atlantic Flyway Shorebird Initiative.

## Acknowledgments

BirdsCaribbean thanks Fernando Simal (WILDCONSCIENCE), Jeff Gerbracht (Cornell Lab of Ornithology), Frank Rivera-Milan (US Fish and Wildlife Service) and Lisa Sorenson

(BirdsCaribbean) for many hours in the field to survey shorebirds. We also thank the following individuals for field assistance: Paulo Bertoul, Caren Eckrich, Herman Sieben, Elise Lara Galitzki, Diana Sint Jago and Luigi Eybrecht from STINAPA Bonaire, Elly Albers from Bonaire Wild Bird Rehabilitation Center, and Jilly Sarpong (Biology student at HAS University of Applied Sciences in The Netherlands). Dr. Frank Rivera-Milan carried out the data analysis needed to support our nomination of Cargill Salt Ponds as a WHSRN site. Funding support was provided by Environment and Climate Change Canada with additional assistance from the US Forest Service and in-kind support from STINAPA Bonaire, Cargill Salt, STINAPA and Dutch Caribbean Nature Alliance.

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<https://www.birdscaribbean.org/2018/05/worth-its-salt-bonaire-cargill-salt-ponds-designated-a-shorebird-site-of-regional-significance/>

## Bats of St. Eustatius

In 2015, Naturalis Biodiversity Center set out to create a baseline study of St. Eustatius' marine and terrestrial fauna and flora. Marine studies were done in collaboration with Anemoon Foundation and terrestrial studies in collaboration with Naturalis, the Dutch Mammal Society, RAVON, EIS and Leiden University. Prior to this effort, the biodiversity of the island had been poorly investigated. One of the many exciting finds of the terrestrial exploratory expedition was the discovery of a new species of bat for the island, the Insular Single-leaf bat (*Monophyllus plethodon*), which was found on the edge of The Quill's crater. Bats may not be the most conspicuous of animal species in the Dutch Caribbean, however they have a very important ecological niche. Nectar-eating bats are key pollinators of a number of native plant species, and fruit-eating bats assist with seed dispersal. As part of an ongoing study of the chiropteran (bat) fauna of the Lesser Antilles, American and

Dutch bat specialists combined their findings to provide the first-ever comprehensive assessment of St. Eustatius's bat population. The results of the study were recently published by Pedersen et al. (2018) in the Occasional Papers of the Museum of Texas Tech University (Number 353, March 13th 2018).

Over the course of several years, both the US and Dutch researchers set out mist nets around St. Eustatius and identified a total of five bat species for the island: Insular Single-leaf bat (*Monophyllus plethodon*), Antillean Fruit-eating bat (*Brachyphylla cavernarum*), Jamaican Fruit-eating bat (*Artibeus jamaicensis*), Antillean Tree bat (*Ardops nichollsi*) and Pallas's Mastiff bat (*Molossus molossus*). The Brazilian Free-tailed bat (*Tadarida brasiliensis*) is listed as a provisional species as there is record of it within the literature but no live specimen was found during the course of the study. Of great concern to the



researchers is how impoverished and unbalanced St. Eustatius's chiropteran fauna is compared with nearby islands that boast an average of 8 to 10 bat species. Pedersen et al. (2018) believe that the clearing of the island's vegetation for agriculture and charcoal production since the 19th century has resulted in chronic environmental degradation and a lack of habitat diversity. This, in turn, has resulted in lack of diversity of the bat fauna in favor of those species that are more adaptable. St. Eustatius's three most abundant bat species - *Molossus molossus*, *Artibeus jamaicensis* and *Brachyphylla cavernarum* - have a broad environmental tolerance and are "capable of living in habitats that are heavily impacted by human activity and natural disasters". The other two species, *Ardops nichollsi* and *Monophyllus plethodon*, require much more specialized habitats and are classified by Pedersen et al. (2018) as rare to very rare on the island. Bats are the only non-introduced mammal species present on St. Eustatius. Goats and cats were brought to the island by humans during colonization and have had a devastating impact on the native

bat population. Predatory species such as cats and dogs prey directly on bats; in fact, cats were observed pulling bats out of mist nets during this research project. The uncontrolled grazing of feral livestock is preventing native trees that provide food and shelter to bats from maturing. In some cases, invasive species have outcompeted native plants that are an important food source for the bats. Fruit- and pollen-feeding bats depend upon a diverse collection of tree species providing a year-round supply of fruit, pollen, and nectar.

The active management of the Quill/Boven National Park will allow the island's bat populations to rebound in the future. The park's forests are protected and provide roosts, protection and food resources for the bats. In order to further protect St. Eustatius's chiropteran fauna, Pedersen et al. (2018) recommend the protection of all caves and rock shelters as well as man-made equivalents of these such as mines and wells. Many of the island's bat species use caves as day roosts as well as a refuge during storms and hurricanes.

## Restoration of Key Biodiversity Areas of St. Maarten

By Ildiko (Kippy) Gilders and Natalia Collier (EPIC)

**In July 2017, Environmental Protection in the Caribbean (EPIC) Foundation initiated a project to restore coastal and terrestrial biodiversity by planting native tree species at three ecologically degraded sites on St. Maarten while simultaneously increasing community involvement and appreciation for conservation.**

St. Maarten is the most densely populated island in the Caribbean. The massive loss of biodiversity initiated upon human contact has accelerated in recent decades with the development of the tourist industry, upon which most of the economy depends, yet no terrestrial legally protected areas exist on the island.

Three sites served as the focal point for restoration actions: 1) Little Key, 2) Sentry Hill, and 3) Cay Bay. Each offers a different habitat type: coastal mangrove wetland, montane dry forest, and coastal terrestrial scrub respectively.

The aim of restoring Little Key was to increase Red Mangrove coverage, thus increase habitat and nursery grounds for native species and to increase the provisioning of ecosystem services such as water filtration and carbon sequestration. In the past, mangrove restoration at Little Key was hindered by wave disturbances. Therefore, it was decided to use the Riley Encased Methodology (REM) which uses full-length PVC tube encasements to reduce wave action and create an environment favorable to the seedlings' initial stages of development while protecting the plant long enough to become established. Similarly, the goal at terrestrial sites was to remove non-native plant species and establish a secondary forest comprised of a higher diversity of native species.

Since many mature trees at the restoration sites were lost due to Hurricane Irma in September

2017, the goal was not to increase the number of trees on site over the year-long project but instead to increase the diversity of native species of tall canopy trees and to ensure high survival rates.

The hurricane caused an average two-month delay in the timeline of activities. EPIC's headquarters lost its roof and suffered major damage to equipment and furniture, complicating operations. In addition, nearly all mangrove propagules were blown or washed away so they could not be grown locally and instead were ordered from Florida. Likewise, many local nurseries lost their terrestrial plant stock to the storm and could not source plants until commercial shipping resumed. During this period, the focus was on preparing the terrestrial sites for planting by removing invasive species.

In November a team of volunteers, with boat support from the Nature Foundation of St. Maarten, planted 290 Red Mangrove propagules at Little Key. In January, a landscaping crew and volunteers planted approximately 309 plants at Sentry Hill and 125 at Cay Bay over three days.

Delays in establishing irrigation systems required significantly more hours of staff time in watering the plants three times per week until April. In addition, goats foraged on a number of plants that escaped through damaged fencing at Cay Bay; all but 13 recovered from the foraging.

Student scientists from the nearby St. Dominic High School were recruited to monitor the individually tagged plants at Sentry Hill once a week for eight weeks while EPIC staff monitored the Cay Bay plants. The mangroves planted at Little Key were monitored every two weeks by volunteers with a boat donated by St. Maarten Sails.

Plant species diversity increased from pre-restoration to post-restoration by 25 to 35 different species at Cay Bay and 41 to 52 different species at Sentry Hill. The post-restoration survival rates were found to be up to 96.1% at Sentry Hill, 89.6% at Cay Bay and 84.5% at Little Key. These results point to an increased biodiversity at the restoration sites when compared with pre-restoration

assessments and, as the new plants mature into large trees, an increased carbon sequestration capacity.

To ensure long-term management of the restoration sites, a formal Transfer Agreement was created and signed by the site owners/managers in May 2018. The Transfer Agreement includes a guide of Best Practices and lessons learned during restoration to ensure successful management of the sites over the long-term.

The outreach component of the project reached approximately 1,253 participants who took part in volunteer opportunities, educational presentations, and field trips. Stickers and reusable water bottles with the tag line "*plant a tree, grow a forest*" were shared with participants. Survey response forms confirm that teachers found the presentations and field trips to be informative, engaging, and beneficial.

A volunteer WhatsApp group created for this project was also active and used to inform volunteers of upcoming events. The group was very motivated and popular with recurring volunteers who contributed 435 days of volunteer time.

A campaign in support of the establishment of terrestrial protected areas was also started and some 507 people signed the online petition and 84 people signed the in-person signature sheet. The advocacy campaign may have been limited by the focus of residents and businesses on rebuilding. A letter writing campaign resulted in one letter of support.

A video summarizing the restoration project was produced and received 1,800 views by the end of project implementation.

Local organizations and government representatives visited the restoration sites, offering an opportunity to share lessons learned and the value of habitat restoration. An open house was held at the end of the project to welcome the community to walk the nature trail established at the Sentry Hill restoration site. Signs along the pathway provide information about biodiversity and the restoration work.



Despite significant challenges caused by Hurricane Irma, the project met its objectives thanks to the dedication and hard work of staff and volunteers. This work has resulted in increased biodiversity and potential carbon sequestration at the restoration sites but has also built local capacity and support for future restoration projects while strengthening community through service projects. Seedlings can also be seen as symbols of hope and the promise they hold for a better future was much needed during recovery from Irma's devastation.



For further information on this project, please check the Post-Restoration Assessments and Best Practices Report available at EPIC's website.

This project was made possible through the contribution of the BEST 2.0 Programme funded by the European Union, Global Giving, BirdsCaribbean Hurricane Relief Fund, and donors to EPIC's Irma Recovery Fund.

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## Research Overview

July 2018

CATEGORY	SUBJECT	DC ISLANDS	ORGANIZATION(S): LEAD SCIENTIST(S)
Birds	Suitability study and re-forestation of exclosures facilitating the Yellow-shouldered Amazon Parrots ( <i>Amazona barbadensis</i> ) on Bonaire	BON	<b>Echo:</b> Julianka Clarenda, Quirijn Coolen
Coral Reef ecosystems	Larval biology of corals and reef microbiology	CUR	<b>Marhaverlab, Curacao:</b> Kristen Marhaver <b>CARMABI</b>
Coral Reef ecosystems	Coral reproduction	CUR	<b>CARMABI:</b> Laurent Delvoye
Coral Reef ecosystems	Multispectral imaging of reef communities	CUR	<b>Max Planck Institute for Marine Microbiology, Germany:</b> Joost den Haan <b>CARMABI</b>
Coral Reef ecosystems	Environmental epigenetics	CUR	<b>Florida International University, U.S.A.:</b> Jose Eirin-Lopez <b>CARMABI</b>
Coral Reef ecosystems	Genetics of Caribbean Acroporids	CUR	<b>Penn State University, U.S.A.:</b> Iliana Baums <b>CARMABI</b>

CATEGORY	SUBJECT	DC ISLANDS	ORGANIZATION(S): LEAD SCIENTIST(S)
Coral Restoration	Cryopreservation of Caribbean coral species	CUR	<b>Marhaverlab, Curacao:</b> Kristen Marhaver <b>University of Hawaii, U.S.A:</b> Mary Hagedorn <b>CARMABI</b>
Coral Restoration	3D Printing of reef restoration materials	CUR	<b>University of Illinois:</b> Haley Thoren <b>CARMABI</b>
Environmental Policies	Environmental Policies within the Kingdom of the Netherlands	SAB, SXM	<b>Radboud University:</b> Lisanne Corpel (student)
Invasive species	Testing and comparing various lionfish traps to study their potential use in a directed lionfish fishery	SAB	<b>Leiden University:</b> Serena Rivero (student) <b>WUR:</b> Dolfi Debrot <b>SCF (SBMU):</b> Ayumi Kuramae Izioka <b>7Senses:</b> Madelon van Eelderink & Evert-Jan van Hasselt
Invasive species	Research into mitigation measures for Sargassum Seaweed	SXM	<b>NFSXM:</b> Tadzio Bervoets <b>Government of St. Maarten</b>
Invasive species	Impacts of grazing and nutrients on the invasiveness of <i>Halophila stipulacea</i>	AUA	<b>WUR:</b> Marjolijn Christianen, Noel Diepens, Fee Smulders, Tatiana Becker (student)
Plants	Germination of seeds of indigenous trees of Curaçao	CUR	<b>CARMABI:</b> John de Freitas
Reptiles	Human land use affects within-island diversity and distributions of lizards and snakes -post-hurricane perspectives (Part of NOW project: Caribbean island biogeography meets the anthropocene)	EUX	<b>VU:</b> Wendy Jesse
Reptiles	Investigating Caribbean-wide effects of green turtle grazing on seagrass meadow carbon dynamics	BON	<b>University of Florida, United States:</b> Robert Johnson, Alan Bolten, and Karen Bjorndal Collaborating with: <b>STINAPA:</b> Sabine Engel, Olivier Kramer <b>STCB:</b> Mabel Nava <b>WUR:</b> Marjolijn Christianen, Fee Smulders
Sponges	Sponge ecology and energetics	CUR	<b>Uva:</b> Jasper de Goeij <b>CARMABI</b>

CATEGORY	SUBJECT	DC ISLANDS	ORGANIZATION(S): LEAD SCIENTIST(S)
Other finished projects in 2018			
Birds	Bird ecology	CUR	<b>Smithsonian Center for Conservation Genomics, U.S.A.:</b> Sara Kaiser <b>CARMABI</b>
Fungi	Fungi Diversity in the Soil	EUX	<b>Leiden University:</b> Janna Horjus
Sea urchins	Ecology of Diadema	CUR	<b>NIOZ:</b> Andy de Haas <b>CARMABI</b>
Sea cucumbers	Ecology of sea cucumbers	CUR	<b>Central Connecticut State University, U.S.A.:</b> Jeremiah Jarrett <b>CARMABI</b>
Tropical forest	Species Traits, Richness, and vegetation Structure in Tropical Forests	EUX	Oxford University/ Naturalis: Jesus Aguirre Gutiérrez

## Long Term Projects

CATEGORY	SUBJECT	DC ISLANDS	ORGANIZATION(S): LEAD SCIENTIST(S)
Coral Reef Ecosystems	Deep Reef Observation Project (DROP) (ARMS: Autonomous Reef Monitoring Structures)	CUR	<b>Smithsonian:</b> Carole Baldwin
Coral Reef Ecosystems	St. Maarten's Coral Restoration Project	SXM	<b>NFSXM:</b> Tazio Bervoets, Melanie Meijer zu Schlochtern <b>CRF</b>
Coral Reef Ecosystems	Development of restoration methods for threatened Caribbean coral species	BON, CUR, SAB	<b>CRF Bonaire:</b> Augusto Montbrun, Francesca Virdis <b>SECORE Project</b> <b>CARMABI:</b> Mark Vermeij <b>UvA:</b> Valerie Chamberland
Coral Reef Ecosystems	Developing a plan to manage the waters around Curaçao sustainably, profitably, and enjoyably for this and future generation - including mesophotic reef dropcam project	CUR	<b>Waitt Institute (Blue Halo Curaçao):</b> Kathryn Mengerink

CATEGORY	SUBJECT	DC ISLANDS	ORGANIZATION(S): LEAD SCIENTIST(S)
Database	Dutch Caribbean Species Register: Taxonomic knowledge system Dutch Caribbean ( <a href="http://www.dutchcaribbeanspecies.org/">http://www.dutchcaribbeanspecies.org/</a> )	All	<b>Naturalis:</b> Sander Pieterse, Hannco Bakker, Bert Hoeksema
Endemic species	Overview endemic species	SAB EUX SXM	<b>WUR:</b> Dolfi Debrot, Oscar Bos, Rene Henkens <b>Naturalis:</b> Hannco Bakker
Interstitial biodiversity	Moleculair biodiversiteit analysis of marine communities by metabarcoding	EUX	<b>Naturalis:</b> Arjen speksnijder <b>ANEMOON:</b> Niels Schrieken
Invasive species	Global Register of Introduced and Invasive Species GRIIS	All	<b>IUCN Invasive Species Specialist Group ISSG:</b> Shyama Pagad
Invasive species	CIRCULATIONS (Connectivities between Islands Alters Traveling Invasive Seagrasses)	BON	<b>Development and Knowledge Sociology, ZMT:</b> Rapti Siriwardane <b>Mangrove Ecology, ZMT:</b> Lucy Gillis <b>Algae and Seagrass Ecology, ZMT:</b> Inés González Viana
Marine ecosystems	Taxonomy and biodiversity in Lac Bay	BON	<b>STINAPA</b> Sabine Engel, Caren Eckrich <b>Ecosub:</b> Godfried van Moorsel <b>CEAB:</b> Daniel Martin
Marine ecosystems	Marine species discoveries in the Dutch Caribbean	All	<b>Naturalis:</b> Bert Hoeksema <b>CNSI</b> <b>CARMABI</b>
Molluscs	Population dynamics and role in the food chain of the Queen Conch <i>Lobatus gigas</i> in the Dutch Caribbean Territories	EUX, SAB, SXM	<b>WUR:</b> Aad Smaal, Leo Nagelkerke, Martin de Graaf Erik Boman (PhD candidate) <b>SCF (SBMU):</b> Ayumi Kuramae Izioka <b>CNSI</b>
Public Health	DNA waterscan: Monitoring disease vectors in the Caribbean (mosquitoes and midges)	CUR EUX	<b>Naturalis:</b> Klaas-Douwe B. Dijkstra <b>ECPHF:</b> Teresa Leslie <b>CBHRI:</b> Delia-Maria Goilo (NWO DUCAMID project)
Sponges	Bioerosion of reefs by coral-excavating sponges	BON,CUR, SAB, EUX	<b>NIOZ:</b> Fleur van Duyl <b>WUR:</b> Erik Meesters, Didier de Bakker (PhD student)

CATEGORY	SUBJECT	DC ISLANDS	ORGANIZATION(S): LEAD SCIENTIST(S)
Sponges	<p>The role of sponges as key ecosystem engineers of coral reef ecosystems</p> <p>Pumping iron: can iron availability fuel the sponge loop and affect coral reef community structure? (Misha Streekstra)</p>	CUR	<p><b>Uva:</b> Jasper de Goeij, Benjamin Mueller  <b>CARMABI:</b> Mark Vermeij  <b>PhD students:</b>  <b>WUR:</b> Misha Streekstra  <b>UvA:</b> Sarah Campana*, Meggie Hudspich*, Niklas Korner*  * Part of the ERC project "SPONGE ENGINE — Fast and efficient sponge engines drive and modulate the food web of reef ecosystems"</p>
NWO Projects in the Dutch Caribbean			
Bioproducts	Stand-alone production of algal products for food, feed, chemicals and fuels	BON	<p><b>WUR:</b> R.H. Wijffels  <b>CIEE:</b> Rita Peachey</p>
Coral Reef Ecosystems	Caribbean coral reef ecosystems: interactions of anthropogenic ocean acidification and eutrophication with bioerosion by coral excavating sponges - Bioerosion and climate change	BON, SAB, EUX	<p><b>NIOZ:</b> Fleur van Duyl, Steven van Heuzen (PostDoc), Alice Webb (PhD student)  <b>STENAPA</b>  <b>CNSI</b></p>
Coral Reef Ecosystems	Seawater chemistry of CO <sub>2</sub> system and nutrients as drivers of benthic community structure and carbon metabolism of coral reef ecosystems of different trophic status in the Caribbean	SAB, SABA BANK	<p><b>NIOZ:</b> Gert Jan Reichart, Lennart de Nooijer, Alice Webb (PhD student)  <b>WUR:</b> Didier Bakker</p>
Coral Reef Ecosystems	Benthic-pelagic coupling on coral reefs of the Saba Bank and Saba	SAB, SABA BANK	<p><b>NIOZ:</b> Fleur van Duyl</p>
Coral restoration	Artificial Reefs On Saba and Statia (AROSSTA)	SAB EUX	<p><b>VHL:</b> Alwin Hylkema, Marlou Heemstra  <b>WUR:</b> Dolfi Debrot  <b>STENAPA:</b> Jessica Berkel, Erik Houtepen  <b>SCF:</b> Kai Wulf, Aymi Kuramae Izioka  <b>CNSI:</b> Johan Stapel  <b>Students:</b> Marijn van der Laan, Daniel Heesink, Marit Pistor, Callum Reid, Jan Koschorrek</p>
Environmental	Caribbean island biogeography meets the anthropocene	AUA, BON, CUR, EUX, SXM	<p><b>VU:</b> Jacintha Ellers, Matt Helmus, Wendy Jesse (PhD. Student), Jocelyn Behm (Postdoc)  <b>CNSI</b></p>



CATEGORY	SUBJECT	DC ISLANDS	ORGANIZATION(S): LEAD SCIENTIST(S)
NWO Projects in the Dutch Caribbean			
Environmental psychology	Confronting Caribbean Challenges: Hybrid Identities and Governance in Small-scale Island Jurisdictions - Behavioral differences between/within the BES islands when it comes to nature conservation and cultural heritage.	BON, SAB, EUX	<b>KITLV, Leiden University:</b> Gert Oostindie (Project director) <b>KITLV, Leiden University:</b> Stacey Mac Donald (PhD student)
Geosciences	Stability of Caribbean coastal ecosystems under future extreme sea level changes (SCENES) - The effects of climate change on calcifying algae	BON, EUX, SXM	<b>UU:</b> Henk Dijkstra, <b>NIOZ:</b> Peter Herman, Rebecca James (PhD student) <b>TU Delft:</b> Julie Pietrzak <b>STENAPA</b> <b>CNSI</b>
Geomorphological	4D crust-mantle mod- elling of the eastern Caribbean region: toward coupling deep driving processes to surface evolution - Reconstructing past climate change	EUX	<b>UU:</b> Wim Spakman <b>NIOZ:</b> Lennart de Nooijer <b>Alfred Wegener Institute Germany</b> <b>CNSI</b>
Invasive species	Exotic plant species in the Caribbean: foreign foes or alien allies? (1) Socio-economic impacts of invasive plant species (2) Ecological impacts of invasive plant species	BON, SAB, EUX	(1) <b>UU:</b> Jetske Vaas (PhD student), Peter Driessen, Frank van Laerhoven and Mendel Giezen (2) <b>UU:</b> Elizabeth Haber (PhD stu- dent), Martin Wassen, Max Rietkerk, Maarten Eppinga. <b>CNSI</b>
Invasive species	Global defaunation and plant invasion: cascad- ing effects on seagrass ecosystem services	BON	<b>WUR:</b> Marjolijn Christianen, Fee Smulders (PhD student) <b>Smithsonian:</b> Olivier Kramer <b>STINAPA:</b> Sabine Engel
Reptiles	Ecology and conservation of green and hawksbill turtles in the Dutch Caribbean	AUA, BON, CUR, SAB, EUX, SXM	<b>RuG:</b> Per Palsbøll, Jurjan van der Zee (PhD student) <b>WUR:</b> Lisa Becking, Marjolijn Christianen <b>STCB:</b> Mabel Nava <b>STINAPA</b> <b>CARMABI</b> <b>STENAPA</b> <b>CNSI</b>

CATEGORY	SUBJECT	DC ISLANDS	ORGANIZATION(S): LEAD SCIENTIST(S)
NWO Projects in the Dutch Caribbean			
Tourism and sustainable development	Vulnerability is dynamic: Enhancing adaptive governance to climate change for Caribbean tourism through interac- tive modelling	CUR	<b>WUR:</b> Jillian Student, Machiel Lamers <b>UOC:</b> Filomeno A. Marchena
BO-projects in the Dutch Caribbean (Min EZ)			
Coral Reef Ecosystems	BO-43-021.04-003 – Inventory corals Includes monitoring and research of the longest coral reef time-series in the world (since 1973)	BON, CUR	<b>WUR:</b> Erik Meesters
DCBD	BO-43-021.04-001 - Expansion knowledge system Dutch Caribbean	AUA, BON, CUR, SAB, EUX, SXM	<b>WUR (Alterra):</b> Peter Verweij
Envirnmental Hazards	BO-43-021.04-008 - Sunscreen and risks for coral reefs	BON	<b>WUR:</b> Diana Slijkerman
Fisheries	BO-11-019.02-006 - Fish stocks and fisheries Caribbean Netherlands	EUX, SAB, BON	<b>WUR:</b> Dolfi Debrot <b>CNSI:</b> Kimani Kitson-Walters <b>PiskaBon, STINAPA</b> <b>SCF:</b> Kai Wulf, Ayumi Kuramae
Marine biodiversity	BO-43-021.04-002 – Saba Bank – Marine biodiversity	SAB	<b>WUR:</b> Erik Meesters (benthic communities), Dolfi Debrot, Thomas Brunel, Leo Nagelkerke (fish stocks)
Marine mam- mals & sharks	BO-43-021.04-005 – Management plan marine mammal and shark sanctuary Yarari	SAB, EUX	<b>WUR:</b> Dolfi Debrot, Dick de Haan, Meike Scheidat, Ayumi Kuramae Izioka <b>SCF (SBMU):</b> Ayumi Kuramae Izioka
Marine mammals	BO-43-021.04-009 Acoustic monitoring of cetacean distribution	SAB	<b>WUR:</b> Dolfi Debrot, Dick de Haan, Hans <b>verdaat</b> <b>SCF:</b> Kai Wulf, Ayumi Kuramae

CATEGORY	SUBJECT	DC ISLANDS	ORGANIZATION(S): LEAD SCIENTIST(S)
BO-projects in the Dutch Caribbean (Min EZ)			
Marine mammals	BO-43-021.04-007 – Marine mammals in the Dutch Caribbean	BON, SAB, EUX	<b>WUR:</b> Dolfi Debrot, Dick de Haan, Meike Scheidat
World Heritage nomination	BO-43-021.04-004 – World Heritage nomination Bonaire National Marine Park	BON	<b>WUR:</b> Dolfi Debrot <b>Wolfs Co.:</b> Esther Wolfs <b>UNESCO:</b> Josephine Langley <b>DRO:</b> Frank v Slobbe <b>CARMABI:</b> Mark Vermeij, John de Freitas <b>Curacao Footprint Foundation:</b> Leon Pors
“Nature Funding” Projects in the Dutch Caribbean (Min EZ)			
Coastal ecosystems (Lac Bay: Mangroves and seagrass beds)	Ecological restoration Lac Bay and South coast, Bonaire	BON	<b>STINAPA:</b> Sabine Engel <b>WUR:</b> Klaas Metselaar <b>STCB:</b> Mabel Nava <b>DRO:</b> Frank van Slobbe
Sustainable Agriculture	The sustainable agriculture and rural development program (POP Bonaire)	BON	<b>Bonaire Agri &amp; Aqua Business BV:</b> Sherwin Pourier <b>Wayaká Advies BV:</b> Jan Jaap van Almenkerk <b>DRO:</b> Frank van Slobbe
Invasive species	Feral Pig Control	BON	<b>Echo:</b> Julianka Clarenda <b>DRO:</b> Frank van Slobbe
Reforestation	Reforestation Project	BON	<b>Echo:</b> Julianka Clarenda, Quirijn Coolen <b>DRO:</b> Frank van Slobbe
Invasive species	Goat eradication and control in Washington Slagbaai National Park	BON	<b>STINAPA</b> <b>DRO:</b> Frank van Slobbe
World Heritage nomination	World Heritage Nomination Bonaire Marine Park and/or other interconnected sites	BON	<b>Wolfs Company:</b> Esther Wolfs, Boris van Zanten, Amilcar Guzman, Viviana Lujan <b>DRO:</b> Frank van Slobbe
Terrestrial ecosystems	Combating Erosion and Nature Restoration on Bonaire	BON	<b>Bonaire Agri &amp; Aqua Business BV:</b> Sherwin Pourier <b>Wayaká Advies BV:</b> Jan Jaap van Almenkerk <b>DRO:</b> Frank van Slobbe

CATEGORY	SUBJECT	DC ISLANDS	ORGANIZATION(S): LEAD SCIENTIST(S)
"Nature Funding" Projects in the Dutch Caribbean (Min EZ)			
Terrestrial ecosystems	Cave and karst nature reserve	BON	<b>DRO:</b> Frank van Slobbe <b>CARIBSS:</b> Fernando Simal
Nature communication	Campaign environment and nature on Bonaire	BON	<b>DRO:</b> Frank van Slobbe, Peter Montanus
Agriculture	Horticultural Project	SAB	<b>Government of Saba:</b> Randall Johnson
Recreation	Hiking trails	SAB	<b>Government of Saba:</b> Robert Zagers
Pollution	Tent Reef Protection	SAB	<b>Government of Saba:</b> Robert Zagers
Invasive species	Goat buy-back program	SAB	<b>Government of Saba:</b> Randall Johnson
	Yacht mooring project	SAB	<b>Government of Saba</b> <b>SCF:</b> Kai Wulf
	Saba national park	SAB	<b>Government of Saba</b> <b>SCF:</b> Kai Wulf <b>SABARC:</b> Ryan Espersen
	Crispeen trail project	SAB	<b>Government of Saba:</b> Robert Zagers <b>SCF:</b> Kai Wulf
Community outreach	Nature Awareness project	EUX	<b>Government of St Eustatius</b> <b>STENAPA:</b> Clarisse Buma <b>CNSI:</b> Johan Stapel, Hannah Madden
Nature management	Strengthening management of nature	EUX	<b>Government of St Eustatius</b> <b>STENAPA:</b> Clarisse Buma
Invasive species	Rodent assessment and control	EUX	<b>Government of St Eustatius</b> <b>CNSI:</b> Johan Stapel, Hannah Madden <b>ECPHF:</b> Teresa Leslie
Coral ecosystems	Coral restoration	EUX	<b>Government of St Eustatius</b> <b>STENAPA:</b> Jessica Berkel <b>CNSI:</b> Johan Stapel

CATEGORY	SUBJECT	DC ISLANDS	ORGANIZATION(S): LEAD SCIENTIST(S)
"Nature Funding" Projects in the Dutch Caribbean (Min EZ)			
Erosion	Erosion control	EUX	<b>Government of St Eustatius</b> <b>CNSI:</b> Johan Stapel
EU-BEST funded Projects in the Dutch Caribbean			
Marine ecosystems	Marine Park Aruba	AUA	<b>Directie Natuur en Milieu:</b> Gisbert Boekhoudt <b>TNO:</b> Kris Kats
Coral Reef Restoration	Pop-Up Nursery and Coral Restoration (Oil Slick Leap)	BON	<b>CRF:</b> Francesca Virdis
Coral Reef Restoration	Restoration Ecosystem Services and Coral Reef Quality (Project RESCO)	SAB, EUX	<b>WUR:</b> Erik Meesters <b>SCF (SBMU):</b> Ayumi Kuramae Izioka <b>STENAPA:</b> Clarisse Buma <b>Turks &amp; Caicos Reef Fund</b>
Conservation	Watershed & Biodiversity Conservation of Roi Sangu valley	BON	<b>Echo:</b> Julianka Clarenda, Quirijn Coolen
Ecosystem services	MOVE, Facilitating MAES (Mapping and Assessing the state of Ecosystems and their Services) to support regional policy in OVerseas Europe: mobilizing stakeholders and pooling resources	AUA, BON, SAB, EUX	<b>Fundo Regional para a Ciência e Tecnologia, Portugal</b> (consortium leader) <b>Wolfs Company:</b> Esther Wolfs
Reptiles	Enacting a news regional recovery plan for the Lesser Antillean iguana: an endangered ecological keystone species	EUX	<b>STENAPA:</b> Clarisse Buma
Terrestrial ecosystems	North Saba National Park, Phase I	SAB	<b>Government of Saba:</b> Menno van der Velde <b>SCF:</b> Kai Wulf <b>SABARC</b> <b>Nature2:</b> Kalli De Meyer <b>Coastal Zone Management:</b> Duncan MacRae



CATEGORY	SUBJECT	DC ISLANDS	ORGANIZATION(S): LEAD SCIENTIST(S)
Birds	Flamingo Abundance	BON	<b>DRO:</b> Frank van Slobbe <b>Cargill</b> <b>STINAPA:</b> Paulo Bertuol
Birds	Monitoring vulnerable parrot nests (remote camera sensing work)	BON	<b>Echo:</b> Julianka Clarendra, Sam Williams
Birds	Yellow-shouldered Amazon parrot roost counts	BON	<b>Echo:</b> Julianka Clarendra <b>DRO:</b> Peter Montanus <b>STINAPA:</b> Paulo Bertuol
Birds	Bird Monitoring (Caribbean Waterbird Census)	BON SXM	<b>STINAPA:</b> Paulo Bertuol <b>EPIC:</b> Adam Brown
Birds	Tern monitoring (artificial nesting islands)	BON	<b>STINAPA:</b> Paulo Bertuol <b>Cargill</b> <b>DRO</b> <b>WUR:</b> Dolfi Debrot
Birds	Terrestrial Bird and Habitat Monitoring	BON CUR SAB SXM EUX	<b>Echo:</b> Julianka Clarendra <b>STINAPA:</b> Paulo Bertuol, Caren Eckrich <b>STENAPA</b> <b>Curassavica:</b> Michelle da Costa Gomes <b>Nature Foundation:</b> Binkie van Es
Birds	Red-billed Tropicbird monitoring	SAB EUX	<b>STENAPA</b> <b>SCF:</b> Kai Wulf
Birds	Pelican monitoring	SXM	<b>NFSXM:</b> Melanie Meijer zu Schlochtern
Coral reef ecosystems	Global Coral Reef Monitoring Network	BON CUR SAB EUX SXM	<b>STINAPA:</b> Caren Eckrich <b>CARMABI:</b> Mark Vermeij <b>SCF (SBMU):</b> Ayumi Kuramae Izioka <b>STENAPA:</b> Jessica Berkel <b>NFSXM:</b> Tadzio Bervoets <b>CNSI:</b> Johan Stapel, Kimani Kitson-Walters
Coral reef ecosystems	Monitoring and research of the longest coral reef time-series in the world (since 1973) (Part of BO-11-019.02-022 –Inventory corals)	BON CUR	<b>WUR:</b> Erik Meesters, Didier de Bakker (PhD student) <b>NIOZ:</b> Fleur van Duyl, Rolf Bak

CATEGORY	SUBJECT	DC ISLANDS	ORGANIZATION(S): LEAD SCIENTIST(S)
Environmental	Water quality testing	SXM	<b>NFSXM:</b> Tadzio Bervoets <b>EPIC:</b> Natalia Collier
Environmental	Nutrient (phosphate, ammonium, nitrate and nitrite) monitoring of St Eustatius' coastal waters	EUX	<b>CNSI:</b> Johan Stapel
Fish	Shark monitoring: - Shark sightings - Shark Abundance, distribution and movements (tagging, acoustic telemetry)	AUA BON CUR SAB SXM EUX	<b>WUR:</b> Erwin Winter, Dolfi Debrot, Martin de Graaf <b>FPNA:</b> Giancarlo Nunes <b>STINAPA:</b> Caren Eckrich <b>CARMABI:</b> Mark Vermeij <b>SCF(SBMU):</b> Ayumi Kuramae Izioka, Guido Leurs <b>STENAPA:</b> Jessica Berkel <b>NFSXM:</b> Tadzio Bervoets
Fish	Spawning monitoring: Red hind surveys on Moonfish Bank	SAB	<b>SCF (SBMU):</b> Ayumi Kuramae Izioka
Fish	Fish and fishery monitoring (Barracuda's, sharks and eagle rays, tarpons, marine mammals, (fishing) boats, fisherman)	BON	<b>STCB:</b> Mabel Nava
Insects	Bee tracking	BON	<b>Echo:</b> Julianka Clarenda
Invasive species	Goat and/or donkey removal: - Washington Slagbaai National Park - Lac Bay area (exclusion plots) - Quill National Park (exclusion plots)	BON EUX	<b>STINAPA:</b> Paulo Bertuol <b>WUR:</b> Dolfi Debrot <b>DRO:</b> Frank van Slobbe <b>STENAPA</b>
Invasive species	Lionfish abundance and control	BON CUR SXM SAB EUX	<b>STINAPA:</b> Paulo Bertuol (50 meter traps) <b>CARMABI:</b> Mark Vermeij <b>NFSXM:</b> Tadzio Bervoets <b>SCF (SBMU):</b> Ayumi Kuramae Izioka <b>STENAPA:</b> Jessica Berkel
Invasive species	Monkey Monitoring: abundance and distribution	SXM	<b>NFSXM:</b> Tadzio Bervoets

CATEGORY	SUBJECT	DC ISLANDS	ORGANIZATION(S): LEAD SCIENTIST(S)
Invasive species	Feral pig population assessment (trapping)	BON	<b>Echo</b>
Mammals	Bat monitoring	AUA BON	<b>FPNA</b> <b>WildConscience:</b> Fernando Simal, Linda Garcia
Mammals	Dolphin monitoring (since 1999)	BON	Ron Sewell
Mammals	Marine Mammal Monitoring (noise loggers Saba Bank)	SAB	<b>WUR:</b> Dick de Haan, Dolfi Debrot <b>SCF (SBMU):</b> Ayumi Kuramae Izioka
Molluscs	Conch ( <i>Strombus gigas</i> ) on St. Eustatius, Saba Bank, Anguilla	SAB EUX	<b>WUR:</b> Martin de Graaf, Erik Boman (PhD student) <b>SCF (SBMU):</b> Ayumi Kuramae Izioka
Plants	Monitoring of tree growth and survivorship in reforestation areas	BON	<b>Echo:</b> Quirijn Coolen
Reptiles	Lesser Antillean Iguana: Monitoring population density & removing invasive Green Iguana and hybrids	EUX	<b>STENAPA:</b> Clarisse Buma <b>RAVON:</b> Tim van Wagenveld
Reptiles	Boa and Cascabel Monitoring	AUA	<b>FPNA</b> <b>Toledo Zoological Society:</b> Andrew Odum
Reptiles	Red-bellied racer snake monitoring	EUX	<b>CNSI:</b> Kimani Kitson-Walters
Reptiles	Behavior of the endemic Aruban Whiptail lizard	AUA	<b>FPNA</b> <b>Auburn University:</b> Jeff Goessling
Seagrass and mangrove ecosystems	Seagrass and mangrove monitoring (BON: also conch and benthic fauna)	BON EUX SXM	<b>STINAPA:</b> Sabine Engel, Caren Eckrich <b>WUR:</b> Klaas Metselaar <b>NFSXM:</b> Tadzio Bervoets <b>CNSI:</b> Kimani Kitson-Walters
Reptiles	Sea turtle monitoring: -Satellite tracking -Nest monitoring -In water surveys (BON, CUR, SXM) -Fibropapillomatosis presence (BON)	AUA, BON, CUR, SAB, EUX, SXM	<b>TurtugAruba Foundation</b> <b>STCB:</b> Mabel Nava <b>CARMABI (STCC):</b> Sabine Berendse <b>STENAPA:</b> Jessica Berkel <b>SCF:</b> Kai Wulf <b>NFSXM:</b> Tadzio Bervoets

## List of Acronyms

<b>AUA</b>	<b>Aruba</b>	Naturalis	Naturalis Biodiversity Center, The Netherlands
<b>BON</b>	<b>Bonaire</b>	NIOZ	NIOZ Royal Institute for Sea Research, the Netherlands
<b>CUR</b>	<b>Curaçao</b>	NWO	NWO Netherlands Organisation for Scientific Research
<b>SAB</b>	<b>Saba</b>	RAVON	Reptielen Amfibieën Vissen Onderzoek Nederland
<b>EUX</b>	<b>St. Eustatius</b>	RuG	University of Groningen, the Netherlands
<b>SXM</b>	<b>St. Maarten</b>	RU	Radboud University Nijmegen, the Netherlands
AMMF	Aruba Marine Mammal Foundation	SABARC	Saba Archaeological Center
BEST	Biodiversity and Ecosystem Services in Territories of European overseas	SBMU	Saba Bank Management Unit
BO project	Policy Supporting Research project	SCF	Saba Conservation Foundation
CARIBSS	Caribbean Speleological Society	Smithsonian	Smithsonian's National Museum of Natural History
CARMABI	Caribbean Research and Management of Biodiversity Foundation	STCB	Sea Turtle Conservation Bonaire
CEAB	The Blanes Centre for Advanced Studies, Spain	STCC	Sea Turtle Conservation Curacao
CRF	Coral Restoration Foundation	STENAPA	St. Eustatius National Parks Foundation
DCNA	Dutch Caribbean Nature Alliance	STINAPA	National Parks Foundation Bonaire
DCBD	Dutch Caribbean Biodiversity Database	UsA	University of St. Andrews, Scotland
DRO	Directorate of Spatial Planning and Development, Bonaire	UU	University of Utrecht, the Netherlands
DLVV (Santa Rosa)	Department of Agriculture, Livestock, Fishery and Farmers market (Santa Rosa), Aruba	UvA	University of Amsterdam, the Netherlands
EcoPro	Ecological Professionals Foundation	VHL	University of Applied Sciences VHL, the Netherlands
ECPHF	Eastern Caribbean Public Health Foundation	VU	VU University Amsterdam, the Netherlands
EPIC	Environmental Protection in the Caribbean	Wildconscience	Wildlife Conservation, Science and Education
FPNA	Fundacion Parke Nacional Arikok, Aruba	WNF	World Wide Fund for Nature
HAS	HAS University of Applied Sciences, the Netherlands	WUR	Wageningen University and Research Centre, the Netherlands
LVV	Department of Agriculture, Animal Husbandry & Fisheries, St. Eustatius	WUR (Alterra)	Wageningen Environmental Research, the Netherlands
MinLNV	Ministry of Agriculture, Nature and Food Quality		
NFSXM	Nature Foundation St. Maarten		

## Reports and Publications Overview

*Below you will find an overview of the reports and publications on biodiversity related subjects in the Dutch Caribbean that have recently been published.*

**"Burg, M.P. van den, Madden, H., van Wagenveld, T.P., Buma, C. (2018).**

Anthropogenic Mortality in the Critically Endangered Lesser Antillean Iguana (*Iguana delicatissima*) on St. Eustatius. *IRCF Reptiles & Amphibians Journal*: 120-124."

**"Bond, M.E., Valentin-Albanese, J., Babcock, E.A. et al. (2018).**

The trophic ecology of Caribbean reef sharks (*Carcharhinus perezii*) relative to other large teleost predators on an isolated coral atoll. *Marine Biology* 165: 67."

**"CARMABI (2018).**

Coral Spawning Predictions for the Southern Caribbean"

**"Carrington, C.M.S., Edwards, R.D., Krupnick, G.A. (2018).**

Assessment of the Distribution of Seed Plants Endemic to the Lesser Antilles in Terms of Habitat, Elevation, and Conservation Status. *Endangered and Threatened Species of the Caribbean Region 2*: 30-57."

**"Duyl, F. van, Meesters, E.H. (2018).**

Cruise report RV Pelagia 64PE433 Saba, St Eustatius and Saba Bank Benthic habitat mapping, and Benthic–Pelagic coupling."

**"Domingo Carrillo-Briceñ, J. et al (2018).**

Shark and ray diversity in the Tropical America (Neotropics)—an examination of environmental and historical factors affecting diversity. *Peer J*."

**"Gilders, K. (2018).**

St. Maarten Post-restoration Assessments and Best Practices.. "

**"Heimans & Thijsse Stichting (2018).**

Thema: natuur in Caribisch Nederland. *Newsletter* 54."

**"Polaszek, T., Lacle, F., van Beukering, P., Wolfs, E. (2018).**

The Economics of Ecosystems and Biodiversity, Aruba. Pp. 1-129."

**"Rocha et al. (2018).**

Mesophotic coral ecosystems are threatened and ecologically distinct from shallow water reefs. *Science* 361, 281–284."

**"Schaap, I., Slijkerman, D.M.E. (2018).**

An environmental risk assessment of three organic UV-filters at Lac Bay, Bonaire, Southern Caribbean. *Marine Pollutin Bulletin* 135: 490-495."

**"van 't Hof, T. (2018).**

Hiking on Saba: a guide to the trails of Saba"

**"van Zanten, B., Laclé, F., van Duren, S., Soberon, V. van Beukering, P. (2018)**

The Value Natural Capital for the Tourism Industry of Aruba, pp. 1-43."

**"Veglia, A.J., Hammerman, N.M., Rivera Rosaly, C.R., Lucas, M.Q. (2018).**

Characterizing population structure of coral-associated fauna from mesophotic and shallow habitats in the Caribbean. *Journal of the Marine Biological Association of the United Kingdom*. "

**"Wolfs, E., Lacle, F., Bubalo, M., van Beukering, P., Pols, R. (2017).**

Cultural Ecosystem Service (CES) for Local Community in Aruba. Pp. 1-99."



## Reports and Publications Overview

*Below you will find an overview of the reports and publications on biodiversity related subjects in the Dutch Caribbean that have recently been published.*

**“Zobel, M., van Wagenveld, T., Madden, H., van den Burg, M.P. (2018).**

Orange-bellied racer (*Alsophis rufiventris*); diet and arboreality. *The Herpetological Bulletin* 144: 26-28.”

### Student Reports

**“Jordan, A. (2018).**

Patterns in Caribbean Coral Spawning. Nova Southeastern University.”

**“Heger, T. (2018).**

A Social-Ecological perspective on the invasive creeper Coralita (*Antigonon leptopus*) on St. Eustatius, Dutch Caribbean: a review.”

These reports and publications can be found in the Dutch Caribbean Biodiversity Database (DCBD) (<http://www.dcbd.nl>). The DCBD is a central online storage facility for all biodiversity and conservation related information in the Dutch Caribbean.

If you have research and monitoring data, the DCNA secretariat can help you to get it housed in the DCBD. *Please e-mail us: [research@DCNANature.org](mailto:research@DCNANature.org)*

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## Calendar

The International Coral Reef Initiative (ICRI) has declared 2018 the third International Year of the Reef (IYOR 2018)



### August

20-23	Meeting	Latin American & Caribbean Climate Week, Uruguay.
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### September

15	Event	World Cleanup Day
18	Event	World Water Monitoring Day
24-28	Meeting	Regional MPACoconnect peer-to-peer learning exchange on fisheries management for Caribbean Marine Protected Area (MPA) managers. Initiative of GCFI & NOAA and hosted by SCF, Saba.
25-4 Oct	Workshop	Coral reproduction and restoration workshop, SECORE, Curaçao.
25-26	Meeting	CARIMAM launch meeting, Fort-de-France, Martinique.
Dates TBC	Working Group	2nd Meeting of the OSPESCA/WECAFC/CRFM/CFMC/CITES Working Group on Shark Conservation and Management:
Dates TBC	Meeting	3rd Meeting of the WECAFC/CRFM/OSPESCA/CFMC Working Group on Queen Conch: Dates TBC
Dates TBC	Working Group	5th Meeting of the WECAFC / OSPESCA / CRFM / CFMC Working Group on FAD fisheries

### October

Whole month	Event	Sea and Learn, Saba
29-1 Dec	Meeting	RedLAC meeting, Santa Cruz de la Sierra, Bolivia.
Dates tbc	Meeting	15th meeting of the Scientific Committee of the Inter-American Sea Turtle Convention (IAC). Honduras
1-5	Meeting	Seventieth meeting of the CITES Standing Committee (SC70), Sochi, Krasnodar, Russian Federation
4	Event	World Animal Day
13	Event	International Migratory Bird Day
13	Event	International Day for Disaster Reduction (IDDR)
19-21	Conference	3rd bi-annual Global Invertebrate Genomics Alliance Conference and Workshop (GIGAll), Curaçao
21-29	Meeting	13th Meeting of the Conference of the Contracting Parties to the Ramsar Convention on Wetlands (COP13), Dubai, United Arab Emirates
29-30	Meeting	DCNA Board meeting, Aruba.
24	Event	Sustainability Day
24	Event	International Day of Climate Action

**More events to add to this calendar? Please e-mail us: [research@DCNAnature.org](mailto:research@DCNAnature.org)**

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### Exciting Rare Sighting in the Dutch Caribbean: the Antillean manatee

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