Ecology and conservation of sea turtles in the Dutch Caribbean

By Dr. Marjolijn Christianne (University of Groningen, the Netherlands)

Early in 2015 the research project "Ecology and conservation of green and hawksbill turtles in the Dutch Caribbean" started funded by NWO.

The six Dutch Caribbean islands (Aruba, Curaçao, Bonaire, Saba, St. Maarten and St. Eustatius) are home to nesting populations and foraging grounds of the endangered green turtle, *Chelonia mydas*, and the critically endangered hawksbill turtle, *Eretmochelys imbricata*. The known threats in the Caribbean are: egg poaching, pollution, incidental catches, and habitat degradation. The Dutch Ministry of Economic Affairs' "Nature Policy Plan Dutch Caribbean" flags sea turtles as a high conservation priority, yet no (governmentally supported) coordinated conservation program has been implemented. The development of an effective and well-founded conservation program is hampered by the incomplete and disparate knowledge of basic sea turtle ecology. This project aims to provide a solid ecological foundation upon which to base management strategies for green and hawksbill turtles in the Dutch Caribbean, such as gaps of knowledge on the migration routes, population demographics and habitat use of sea turtles within the Caribbean.

In March 2015 the project kicked off with a Dutch Caribbean Sea turtle meeting in Puerto Rico, an event organized to strengthen connections between project partners* preceding the annual meeting of the Wider Caribbean Sea Turtle Society. Here the first fieldwork plans were laid out. From July to October 2015 several fieldwork projects were conducted.

The work started on Bonaire together with STCB where the researchers joined STCB's in-water monitoring activities. STCB has been intensively monitoring and protecting sea turtle populations in-water and on land since 1991. In Lac Bay 4 sub-adult green turtles were deployed with satellite tags. Sub-adults are rarely studied in contrast to adult sea turtles and not much is know about their habitat use. Preliminary data from the last 4 months shows high site fidelity of individual turtles that travel daily in and out lac bay to forage on seagrass leaves. More surprisingly 2 of the youngster turtles have left Lac Bay and are currently cruising Guyana and Trinidad and Tobago. These long distance migrations were previously only described for adult green turtles.

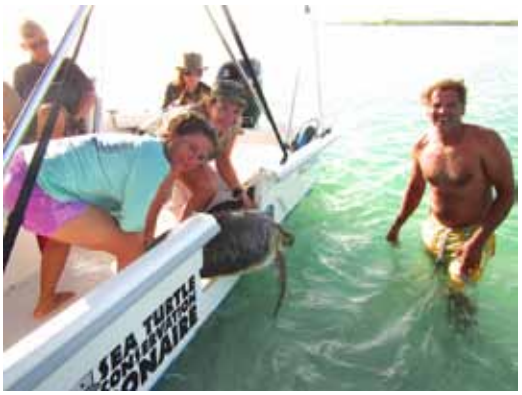
All the sea turtles that are encountered in the water or on beaches are being sampled for genetic and isotope analysis to study origins and feeding habits of green turtles.

In July a long term experiment was set up in Lac Bay to learn more about the feeding behavior of green turtles and the effect of grazing on seagrass productivity, species composition and invasive seagrass expansion rate of *Halophila stipulacea*. This seagrass species is native to the Indian Ocean but has recently invaded Caribbean meadows and might have important consequences for the carrying capacity of Lac Bay as a foraging area for green turtles. Inside turtle exclosures (under water cages) the seagrass will be monitored the next years by several MSc. students together with STCB and STINAPA.

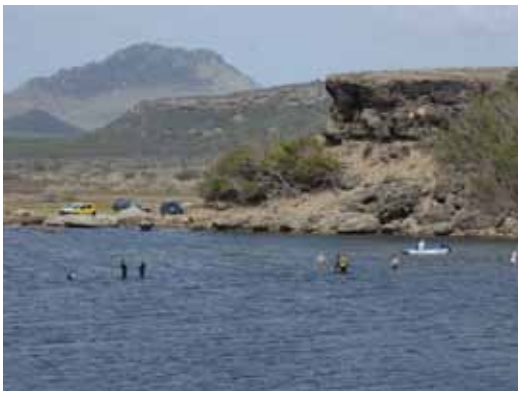
In Bonaire nests are equipped with temperature loggers to study the effects of climate change on sea turtle hatchling sex differentiation and hatchling fitness.

In August researchers continued their research on Aruba together with TurtugAruba's crew and

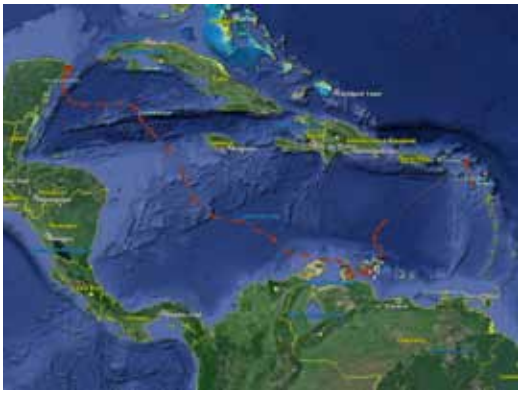
Researchers and local partners during the Dutch Caribbean Sea Turtle meeting pre-WIDECAST.
Photo credit: Marjolijn Christianen



STCB Mabel Nava, Gielmon "Funchi" Egbreghts and Marjolijn Christianen releasing the first tagged green turtle in Lac Bay.
Photo credit: Marjolijn Christianen



STCC team with volunteers at Wacawa capturing sea turtles with nets.
Photo credit: Ard Vreugdenhil



Map of preliminary data on post-nesting movements of green turtles released in Curaçao and Bonaire.
Photo credit: Marjolijn Christianen

STCB's staff. The first in-water surveys were conducted in Aruba and the first samples of sub-adult turtles were taken. Together with TurtugAruba foraging habitats and nesting grounds were roughly mapped. TurtugAruba is currently tracking nesting females to study their migration routes. At Rodger's Beach an important green turtle foraging area was identified, a location of potential future in-water surveys.

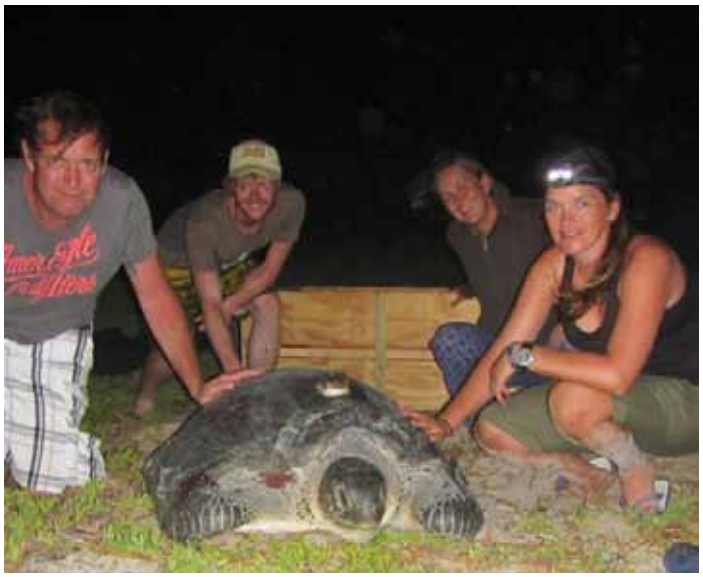
Back in Bonaire an adult green turtle female was tagged with a satellite transmitter at Playa Chikitu inside Slagbaai National Park. This female has stayed at Bonaire for approximately 2 months to lay 5 nests and returned to Venezuela where she is now foraging in the waters around El Supi.

In September the expedition continued to Curaçao where the researchers teamed up with STCC. During a very successful trip to Klein-Curaçao researchers were able to deploy satellite tags on two nesting adult green turtles. Klein-Curaçao was identified to be Curaçao's most important nesting beach for sea turtles. STCC's staff was trained and deployed a third transmitter with their volunteers. The turtle's migration routes are intriguing. The first turtle swam 3100 km in 3 weeks to settle on foraging grounds close to Cozumel Island in Mexico. The second turtle swam 2200km in 20 days to foraging ground close to Anguilla and St. Nevis islands. The third turtle is still hanging around Klein Curaçao probably to prepare for a last nest before taking off. STCC mobilized very enthusiastic sponsors to enable more satellite tags for next year. At Curaçao two areas; Boca Ascension and Wacawa, were found to serve as important foraging areas for sub-adult green turtles. In Wacawa records were broken with the highest amount of turtles catched in a single net. All turtles were measured, tagged and samples were taken for DNA and istope analysis. With isotope analysis researchers can identify the food source and the foraging location of the turtles.

Next year researchers will continue their work in St. Eustatius, Saba and St. Maarten and continue ongoing projects that are initiated in 2015.

***The Team:** Researchers of the University of Groningen; Dr. Marjolijn Christianen, Drs. Jurjan van der Zee, Dr. Per Palsboll, IMARES; Lisa Becking, Local partners; STCB (Sea Turtle Conservation Bonaire); Mabel Nava, Sue Willis, Funchi Egbregts, STCC (Sea Turtle Conservation Curaçao) (CARMABI); Sabine Berendse and STCC volunteers, TurtugAruba; Sietske, Edith and Richard van der Wal, STINAPA; Sabine Engel, STENAPA: Jessica Bervoets, NFSXM; Tadzio Bervoets, SCF: Kai Wulf.

More info: www.penyu.nl / Facebook page Sea Turte Conservation Bonaire / Facebook page Sea Turtle Conservation Curaçao.



Female green turtle with satellite tag just before her 3100km journey released by research team from Klein Curaçao
Photo credit: Marjolijn Christianen

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