Ecology & Conservation of Green & Hawksbill Turtles in The Dutch Caribbean

WIDECAST meeting Puerto Rico | 6 March 2015

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How the project started

NWO call for proposals on research
Dutch Caribbean

1 PhD & 1 PostDoc – 4 yrs
Introducing the team
Dr Lisa Becking
Coordinator / Supervisor
IMARES, NL (Caribbean marine ecology)
UC Berkely, USA (population genetics)
Introducing the team
Jurjan van der Zee
PhD student
Introducing the team
Marjolijn Christianen
Coordinator / Supervisor
Introducing the team
Per Palsbøll
Supervisor

Professor of Marine Evolution and Conservation, University of Groningen

Population genomics large marine vertebrates
Ecology and conservation of green and hawksbill turtles in the Dutch Caribbean
Key Questions for green & hawksbill turtles in the DC

1. How are turtles utilizing the present foraging and breeding habitats in the region?
2. Which critical habitats are under threat?
3. How many turtle populations frequent the region and which of these breed locally?
4. What are the levels of past and present connectivity and abundance?
Key Questions for green & hawksbill turtles in the DC

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Key Questions for green & hawksbill turtles in the DC

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Sub-project 1
Habitat use & tracking
Sea turtles can change structure and functioning of their own food source...
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UNGRAZED VS GRAZED
...And can protect their habitat against disturbances
...And can protect their habitat against disturbances

INCREASE RESILIENCE TO EUTROPHICATION!
...which can turn into a negative effect if populations are increasing at a fast rate and not controlled top down (eg sharks)

Heithaus, Christianen et al 2014, Frontiers Marine Science
Functioning of turtle habitat is affected by connectivity of turtle populations...
Tracking & habitat use

SUB-PROJECT 1: RESEARCH QUESTIONS & AIMS
Research aim 1
Determine the distribution of foraging and nesting habitats from published literature and reports, aerial images, and in-water monitoring surveys.
Patterns of seagrass show health of foraging ground

Photo: Marjolijn Christianen
And.. add color to the Caribbean Sea marine habitat maps
Research aim 2: Map **movements of turtles** between habitats by GPS, flipper tagging stable isotopes of adult & sub-adult turtles on foraging and nesting grounds.
Using traditional tags...

Happy after recapturing a turtle tagged 4 yr ago

Photos: Marjolijn Christianen
And less traditional ones.
Isotopes also tell migration routes.

Seminoff et al. 2012, Plos one
Research aim 3:
Determine “health” of nesting beaches and foraging grounds (seagrass meadows), and the habitat use, e.g. effect of foraging on habitat.
Effect of nest temperature and moisture levels on the sex ratios and hatching success ...
Seagrass experiments under different grazing regimes in cages
Feeding preferences
Population genetics

SUB-PROJECT 2:
RESEARCH QUESTIONS & AIMS
Sea turtle population genomics

- Past abundance
- Gene flow
- Genomics
- Population bottlenecks
- Breeding populations
Sampling

Foraging ground:
- Males & Female
- Sub-adults & Adults

Nesting ground
- Adult females
- Hatchlings

LINKED TO: health turtles, isotope, toxicology
health of habitats
Incorporate this in existing platforms SWOT d-base (OBIS Seamp) & Dutch Caribbean Biodiversity Database.
This as input to advise Dutch Caribbean nature management plans.
Summary of our successful pre-WIDECAST meeting!
Thank you!