Turks and Caicos Islands Turtle Project (TCITP)

Amdeep Sanghera

Marine Conservation Society - UK

Tom Stringell

Marine Turtle Research Group
University of Exeter in Cornwall – UK

MCS

S F S
The School for Field Studies

Duke UNIVERSITY

UNIVERSITY OF EXETER

MARINE TURTLE RESEARCH GROUP

Tom Stringell tbs203@exeter.ac.uk

Cyngor Cefn Gwlad Cymru
Countryside Council for Wales

Countryside Council for Wales:

UK Govt. Agency

Llywodraeth Cynulliad Cymru
Welsh Assembly Government
CORFF NODDEDIG | SPONSORED BODY

MARINE TURTLE RESEARCH GROUP

Marine Turtle Research Group:

University of Exeter

UNIVERSITY OF EXETER

Photo: Jeremy Stafford-Dietsch

Turks and Caicos Islands Turtle Project (TCITP)

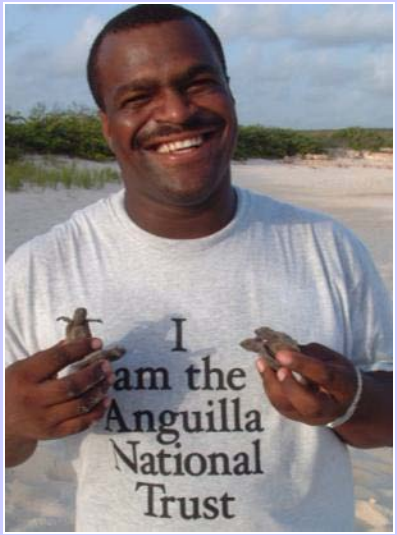
Annette Broderick, Marta Calosso, Lisa Campbell, John Claydon, Wesley Clerveaux, Brendan Godley, Kathy Lockhart, Simon Notley, Ann Notley, Quentin Phillips , Susan Ranger, Peter Richardson, Amdeep Sanghera, Thomas Stringell.

Contents

- Introduction
  - Why we are doing the project
- Social research
- Biological research
  - Harvest assessment

Contents

- Introduction
  - Why we are doing the project
- Social research
- Biological research
  - Harvest assessment


I
am the
Anguilla
National
Trust


BERMUDA
TURKS &
CAICOS
ISLANDS
BRITISH VIRGIN
ISLANDS
CAYMAN
ISLANDS
ANGUILLA
MONTSERRAT
Caribbean Sea

Major turtle fishery: Richardson *et al*., 2009. CCB

Photo: P. Richardson

TCI's fishery legislation

Turtle eggs & nesting females ✔

Turtles at sea **<** 20in. (51cm) / 20lbs (9kg) ✔

Turtles at sea **>** 20in. (51cm) / 20lbs (9kg) ✖

Photo: A. Sanghera

TCITP

Invited by DECR to:

Better understand TCI's marine turtle harvest on a biological and social basis

Assist DECR in devising sustainable management strategy for the turtle fishery

Assess status of breeding and foraging turtle populations in TCI waters

Assess scale of TCI turtle harvest and effect on overall population

Photo: P. Richardson

Further understand economic/social importance of turtles to people

Facilitate stakeholder participation in developing future turtle fishery management plan

Final outputs

Recommendations for fishery legislation amends

Draft turtle fishery management plan for DECR

Contents

- Introduction
  - Why we are doing the project
- Social research
- Biological research
  - Harvest assessment


Filming of social research documentary in TCI

Screenings of documentary

Discussion workshops.

Workshop discussions included stakeholder perceptions on future turtle fishery management scenarios…

turtle fishery ban; species bans; quotas; maximum/minimum size limits; open/closed season; co-management; enforcement and monitoring.

Fisher decision-making study

Ethnography

Commodity chain analysis to understand importance of turtle use to South Caicos communities.

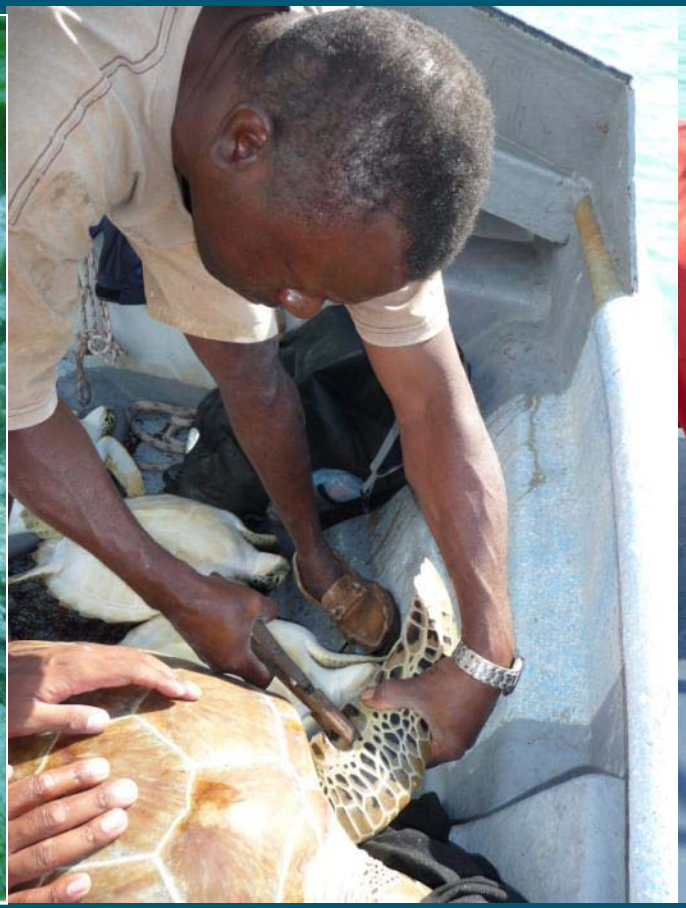
Contents

- Introduction
  - Why we are doing the project
- Social research
- Biological research
  - Harvest assessment

Population Dynamics: in water

Abundance Estimation

Catch Mark Recapture



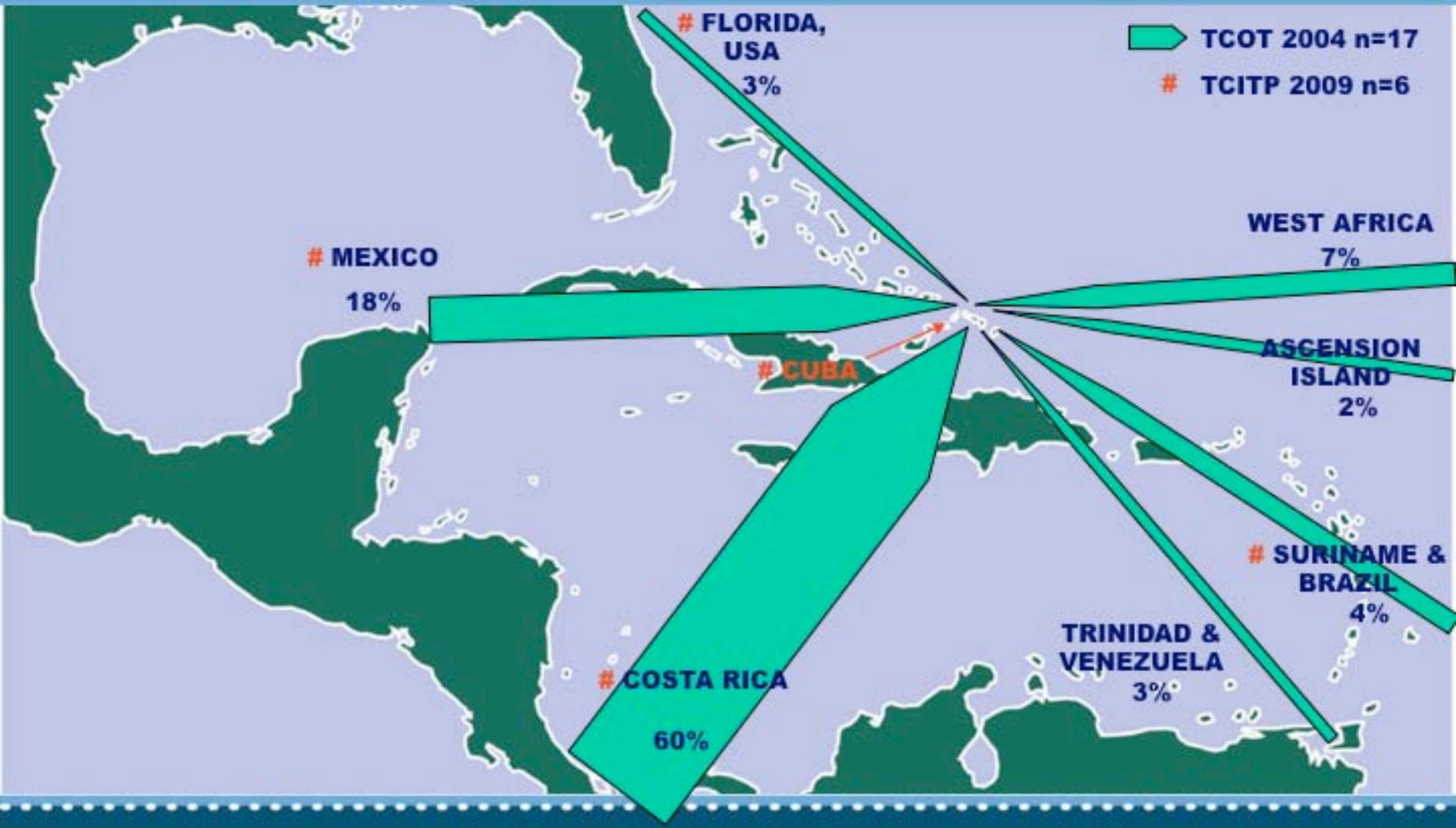
Biometrics

Genetic sampling

Mixed Stock Analysis: Foraging Populations

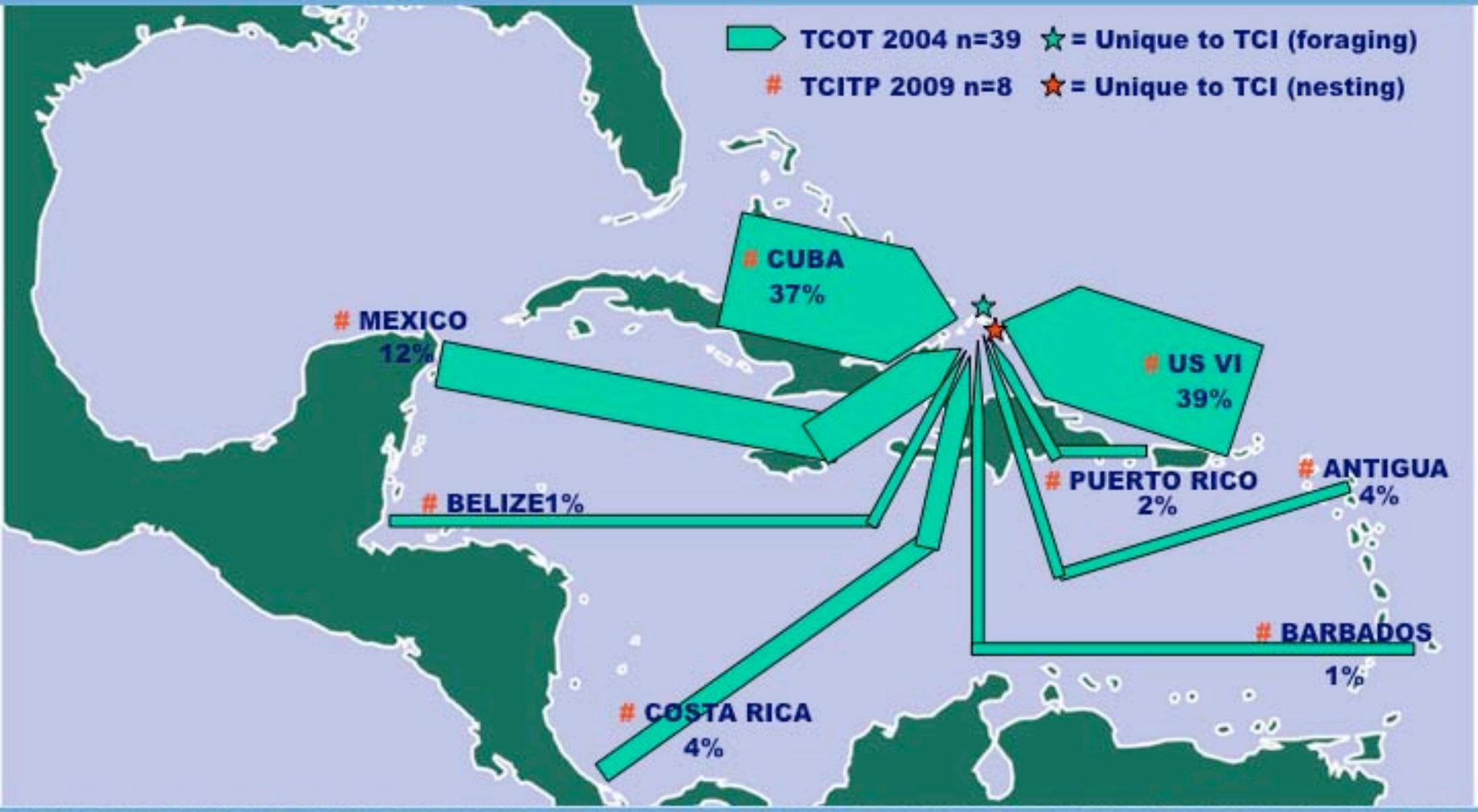
Photo: Peter Richardson/MCS

Origins & Genetic analysis - *C. mydas*



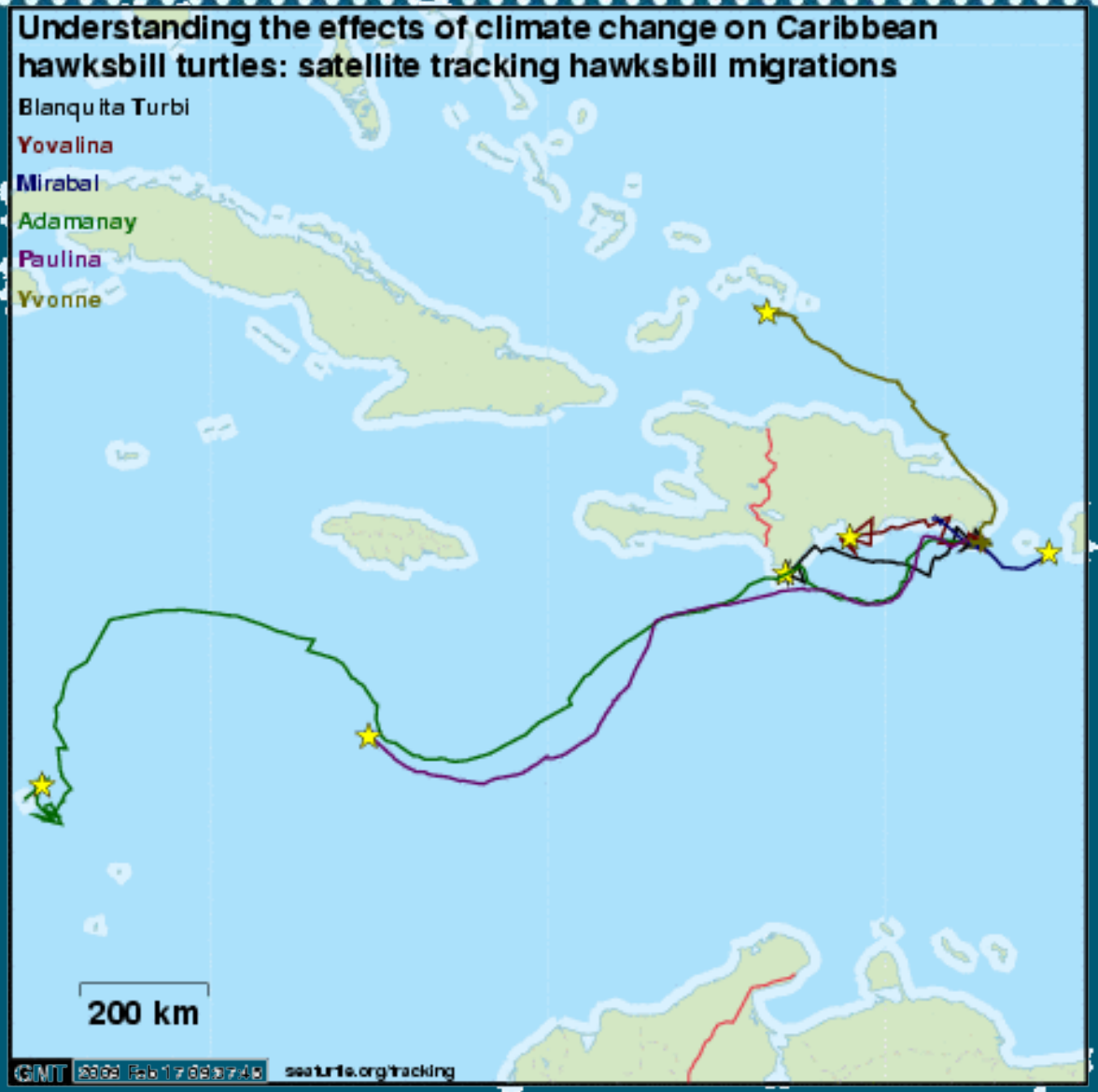
Rookeries of origin of TCI foraging Greens

Origins & Genetic analysis – *E. imbricata*

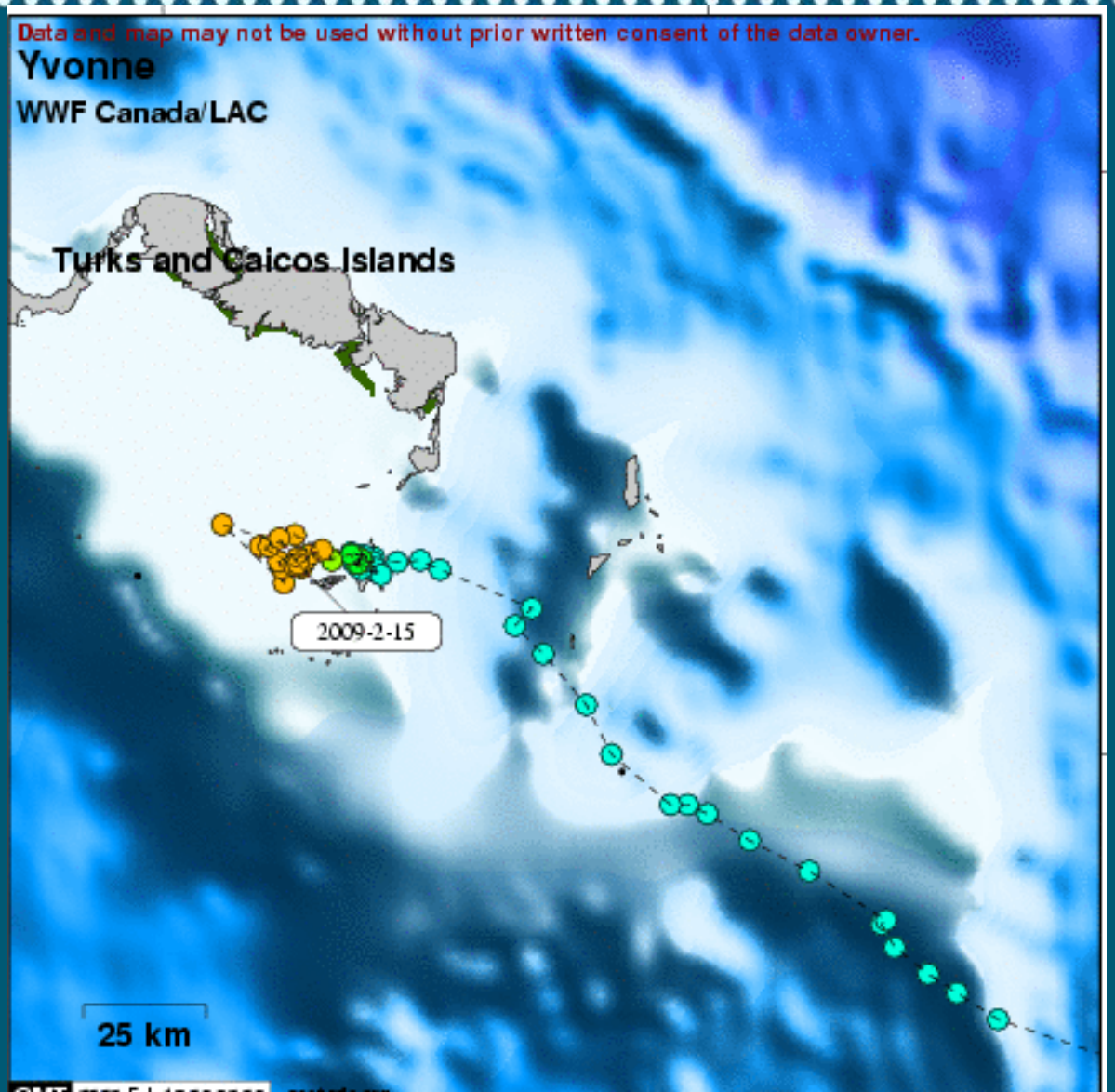


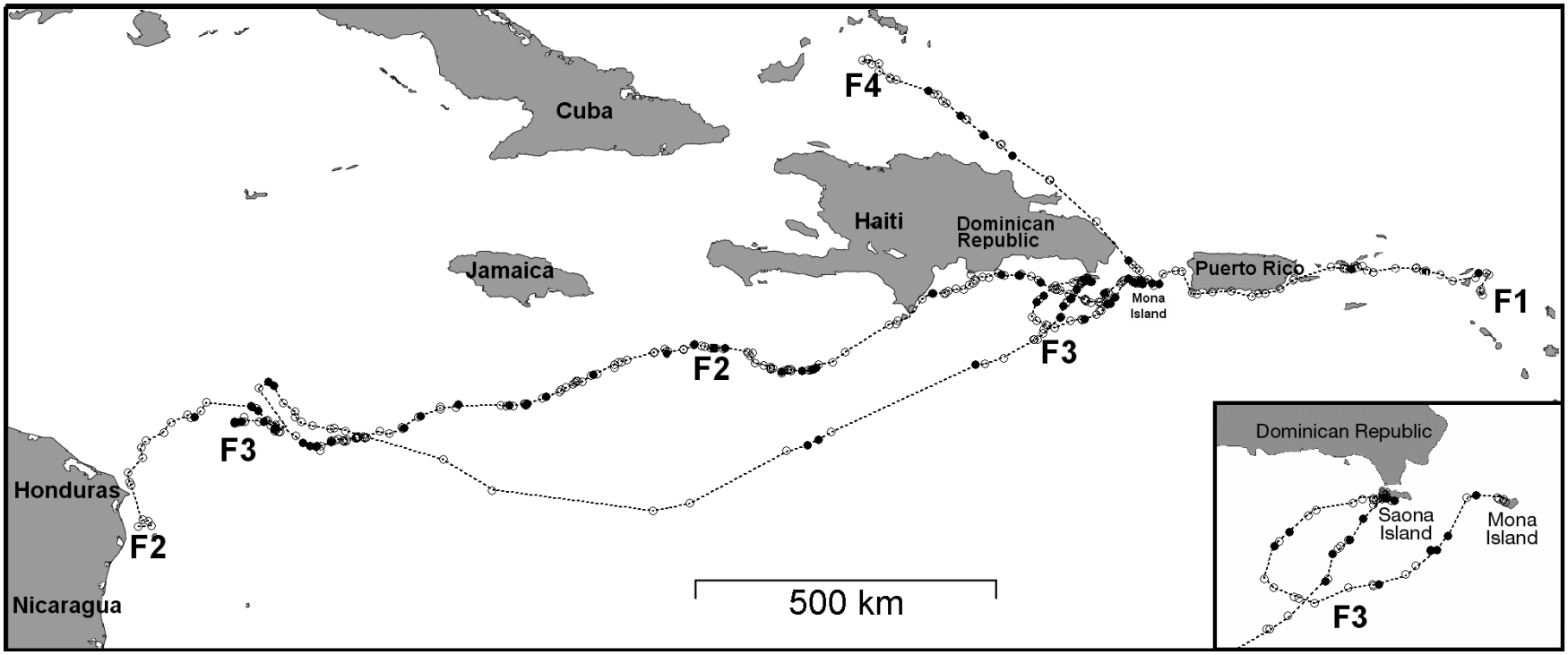
Rookeries of origin of TCI foraging Hawksbills

Origins


Understanding the effects of climate change on Caribbean hawksbill turtles: satellite tracking hawksbill migrations
Blanquita Turbi
Yovalina
Mirabal
Adamanay
Paulina
Yvonne
200 km
seaturtle.org/tracking

Origins


Data and map may not be used without prior written consent of the data owner.
Yvonne
WWF Canada/LAC
Turks and Caicos Islands
2009-2-15
25 km

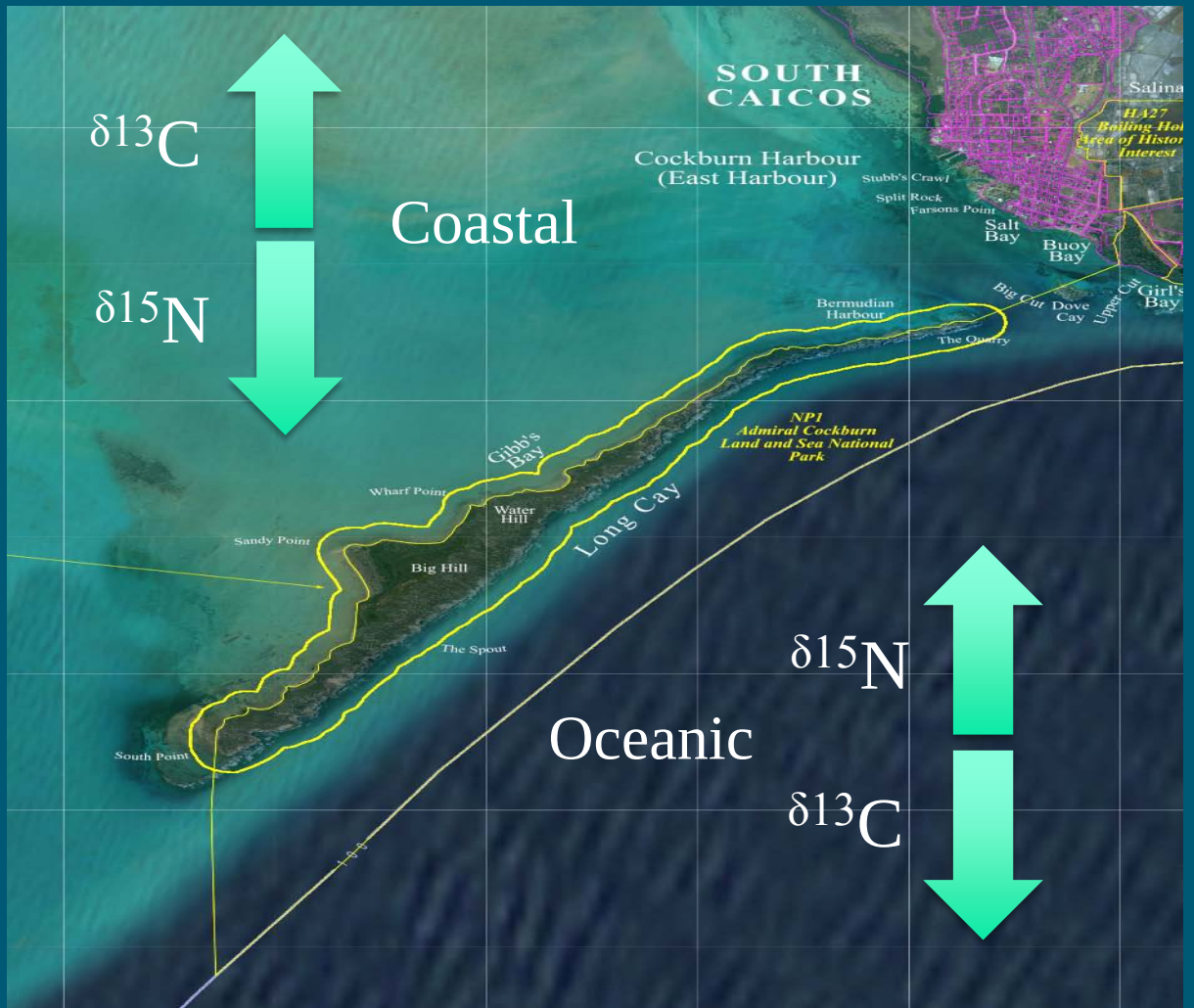


Migration tracks of female hawksbill turtles after nesting on Mona Island,Puerto Rico

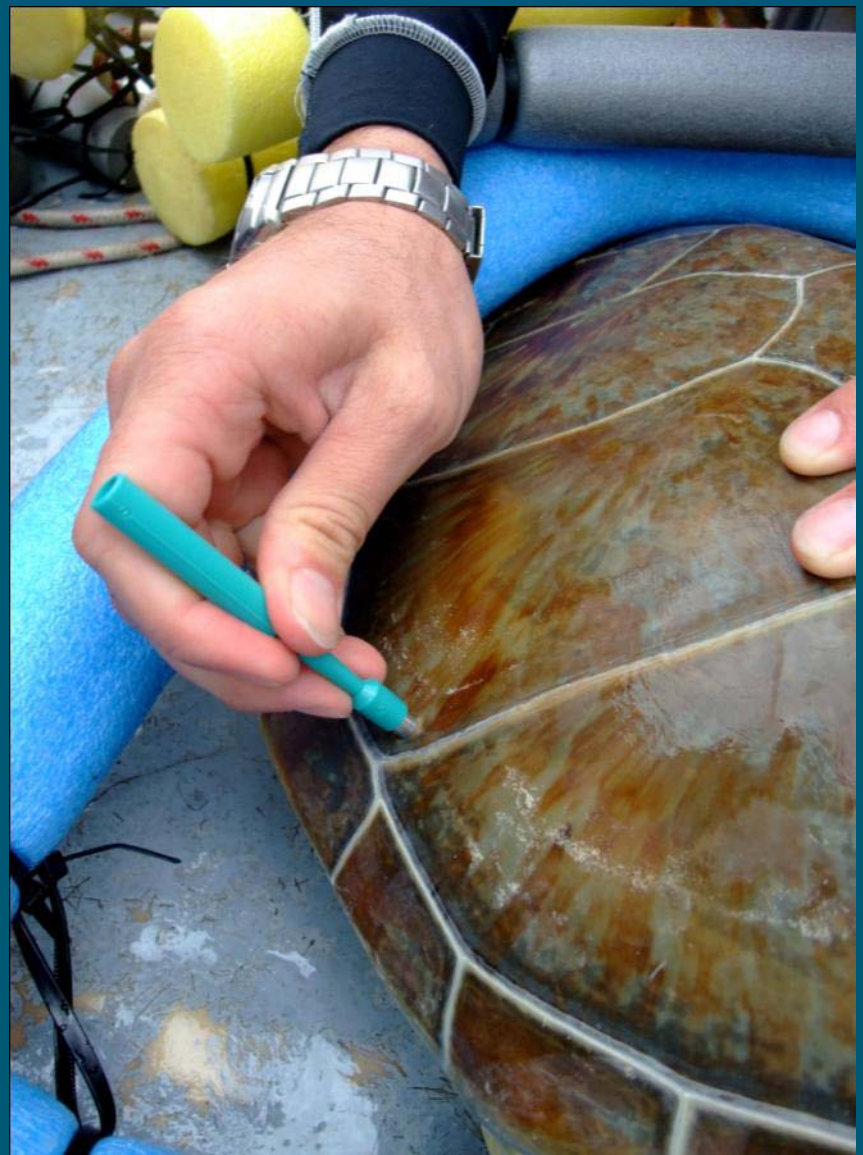
Size at Recruitment to Feeding Grounds

Ontogenetic Shifts: Recruitment to Feeding Grounds

When do turtles recruit to the foraging grounds – Stable Isotopes



Foraging ecology / Diet – stable isotopes



Diet

- **Stomach contents & Diet vouchers**

  Match Stable isotopic signatures of food to that of turtle tissue

Sex ratios

- Gonad samples from harvested turtles
- Hormone assays from blood

Results: sex ratios

Female:Male

Green – 1.96:1

Hawksbill – 10:1

Male

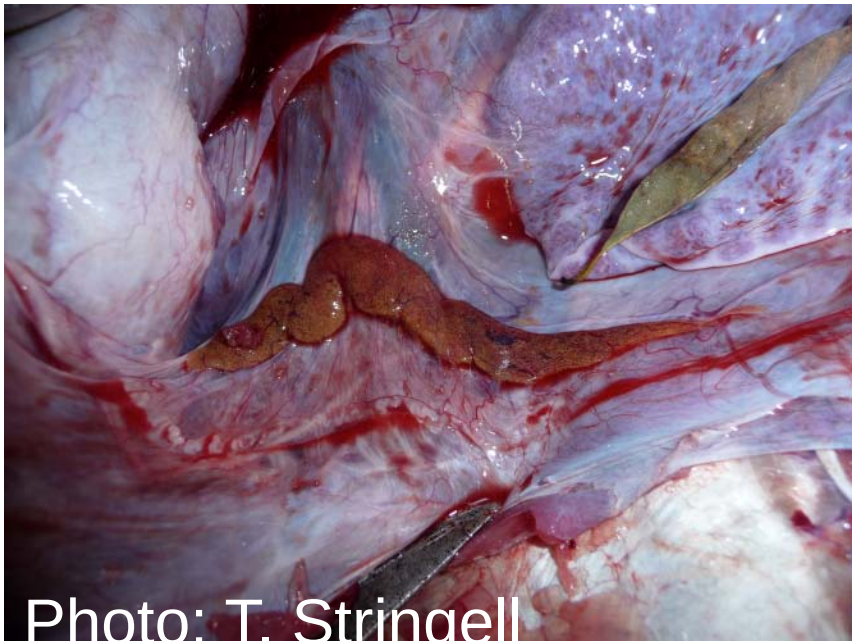


Photo: T. Stringell

Female

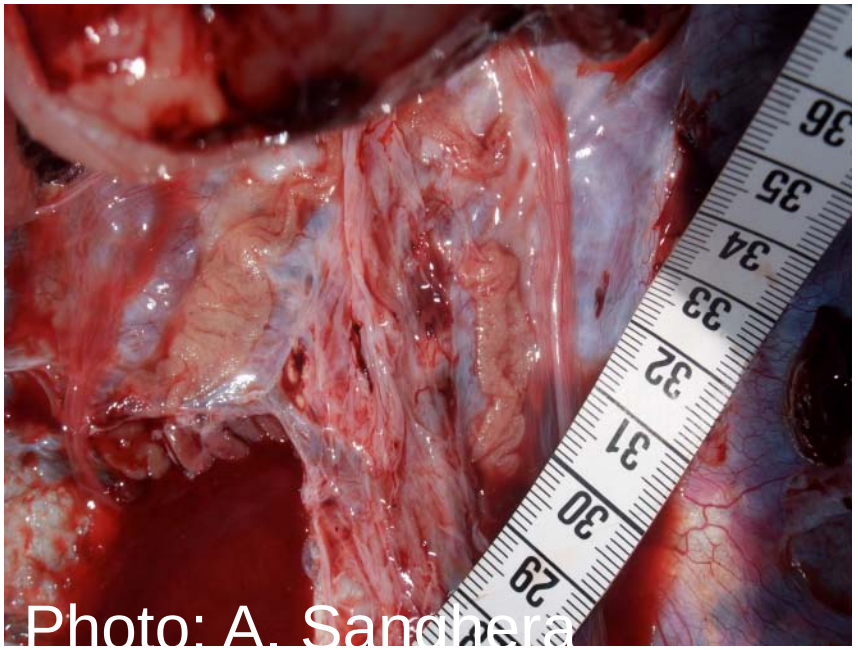
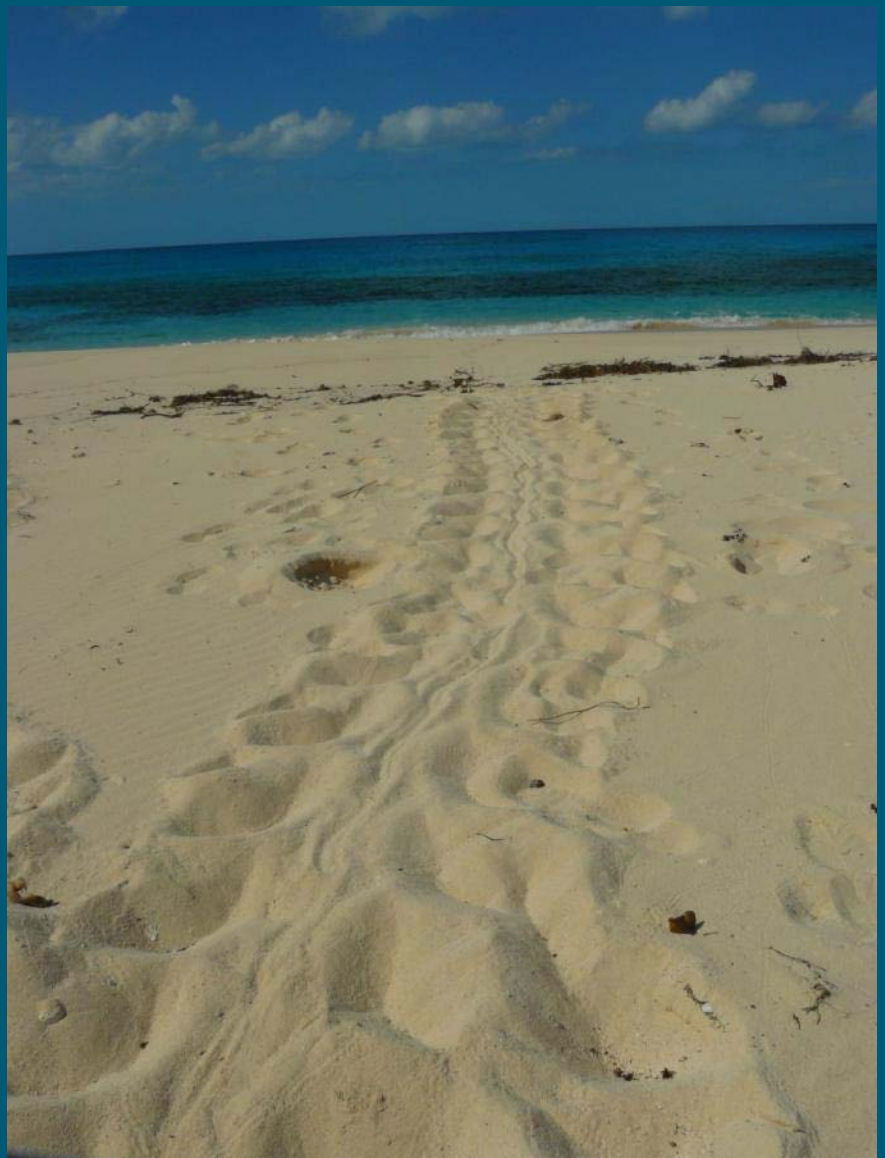
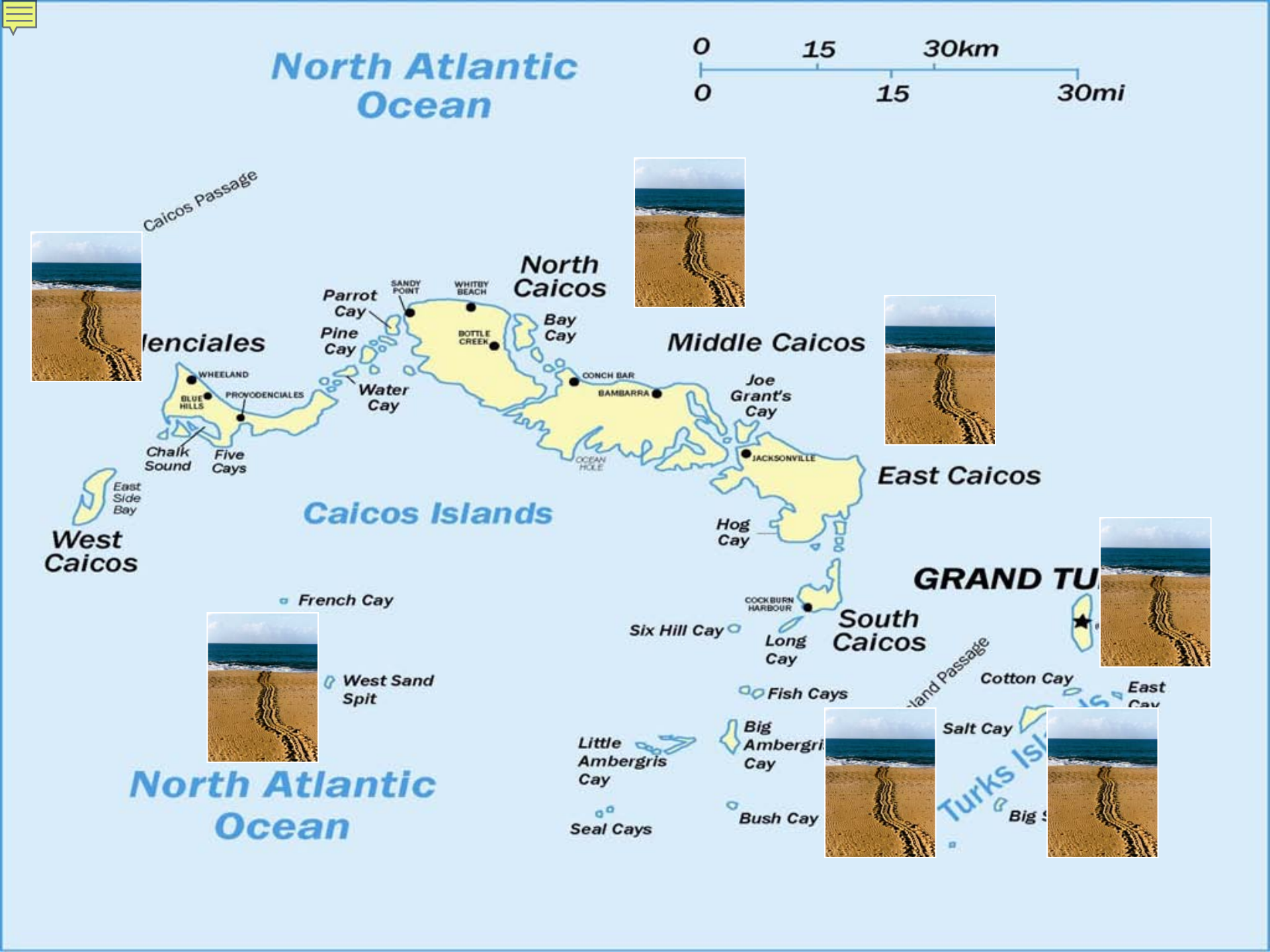


Photo: A. Sanchez

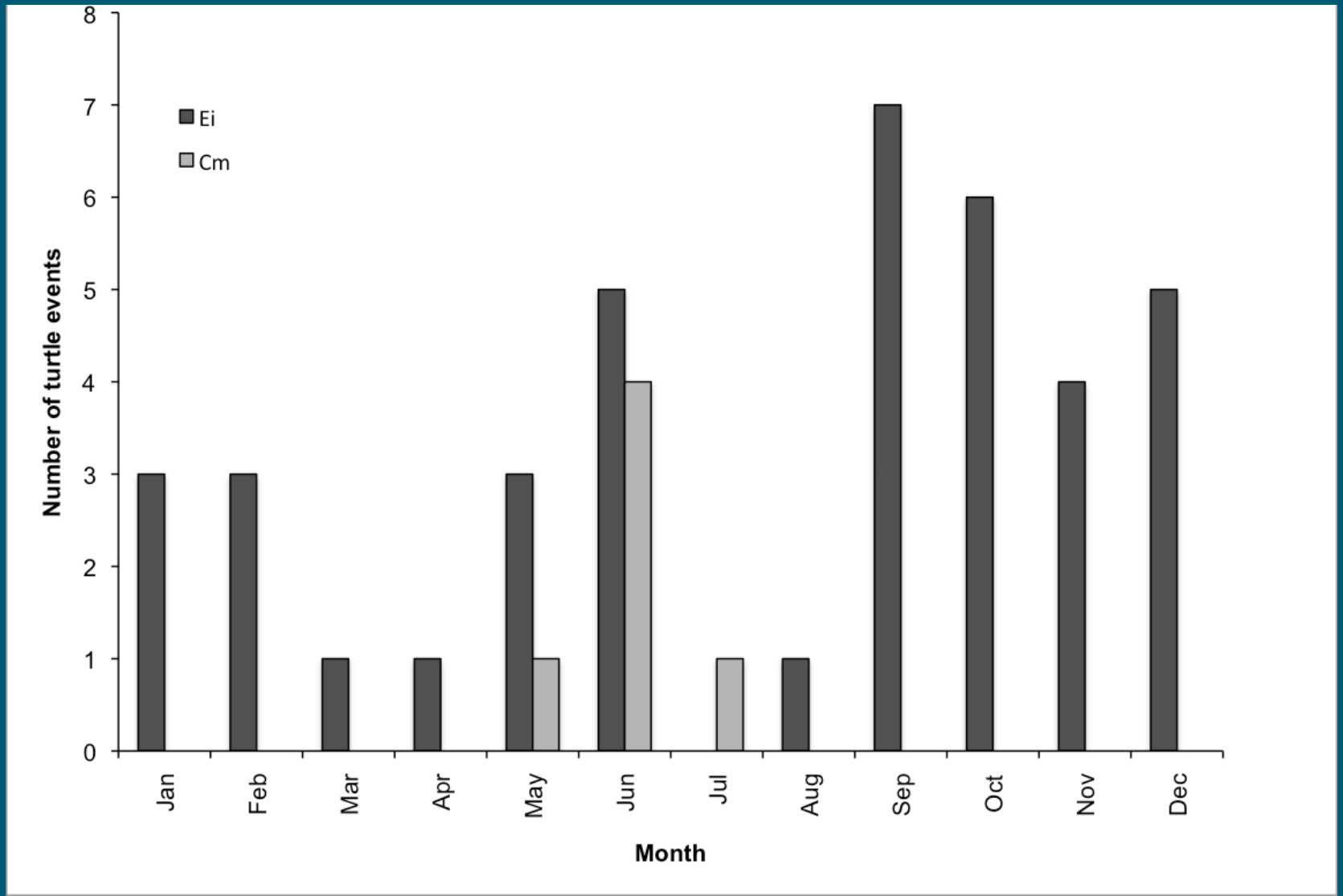
Incidental observations: FP

Nesting surveys




North Atlantic Ocean
0 15 30km
0 15 30mi
Caicos Passage
North Caicos
Parrot Cay
SANDY POINT
WHITBY BEACH
Pine Cay
BOTTLE CREEK
Bay Cay
Middle Caicos
WHEELAND
BLUE HILLS
PROVIDENCIALES
Water Cay
CONCH BAR
BAMBARRA
Joe Grant's Cay
Chalk Sound
Five Cays
JACKSONVILLE
East Caicos
East Side Bay
West Caicos
Caicos Islands
Hog Cay
GRAND TU
French Cay
COCKBURN HARBOUR
Six Hill Cay
Long Cay
South Caicos
West Sand Spit
Fish Cays
Cotton Cay
East Cay
Salt Cay
Little Ambergris Cay
Big Ambergris Cay
Turks Isl
Bush Cay
Seal Cays
North Atlantic Ocean

Nesting surveys



Contents

- Introduction
  - Why we are doing the project
- Social research
- Biological research
  - Harvest assessment

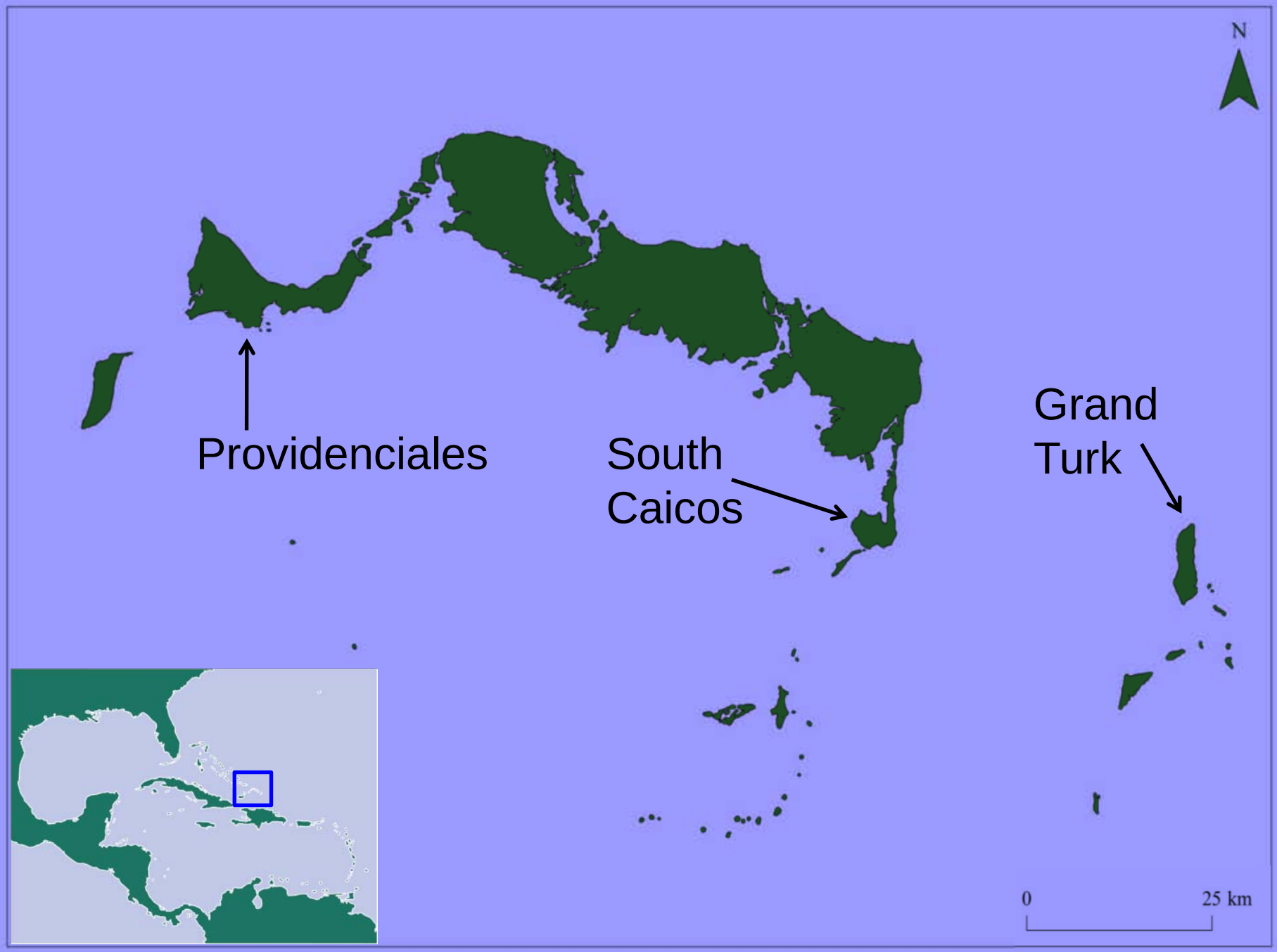
An Assessment of the Harvest of Marine Turtles in the Turks & Caicos Islands, Caribbean

Thomas Stringell, Annette Broderick, Marta Calosso, Lisa Campbell, John Claydon, Wesley Clerveaux, Brendan Godley, Kathy Lockhart, Simon Notley, Ann Notley, Quentin Phillips , Susan Ranger, Peter Richardson, Amdeep Sanghera.

tbs203@exeter.ac.uk

Methods

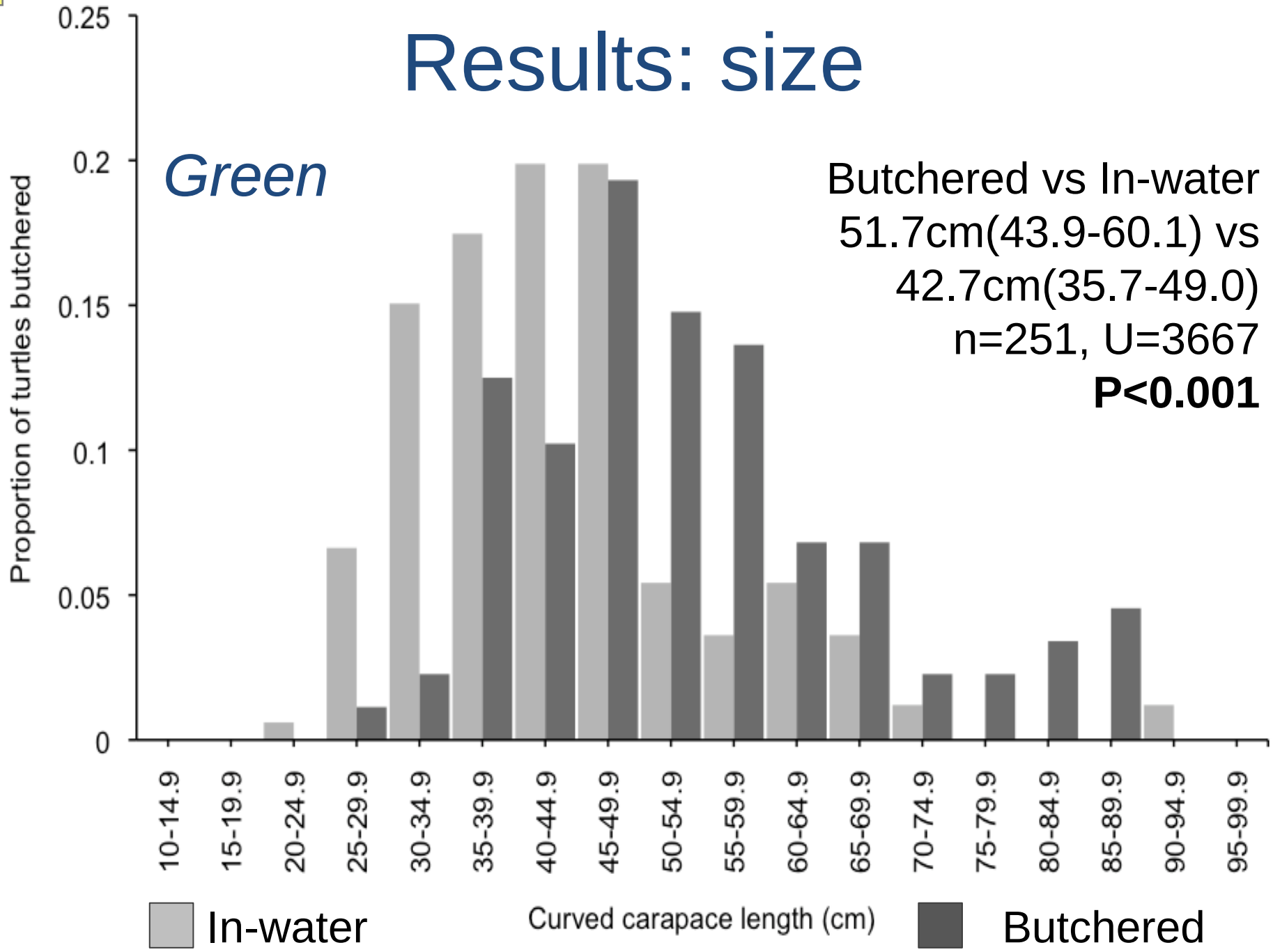
- Project staff (authors) - direct counts of butchered landings of *C. mydas* and *E. imbricata* for 1 year from 24 November 2008

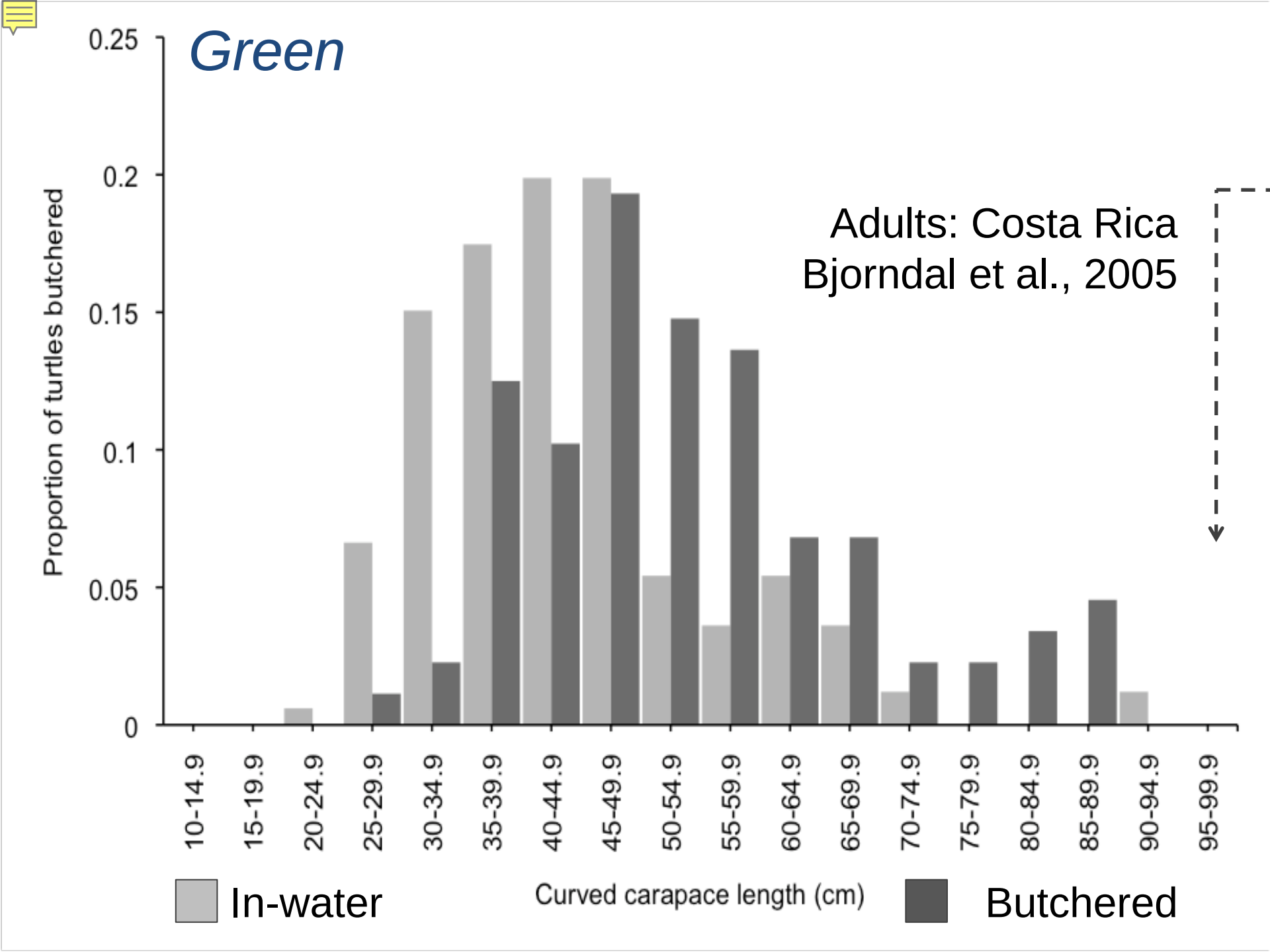

N
Providenciales
South
Caicos
Grand
Turk
0
25 km

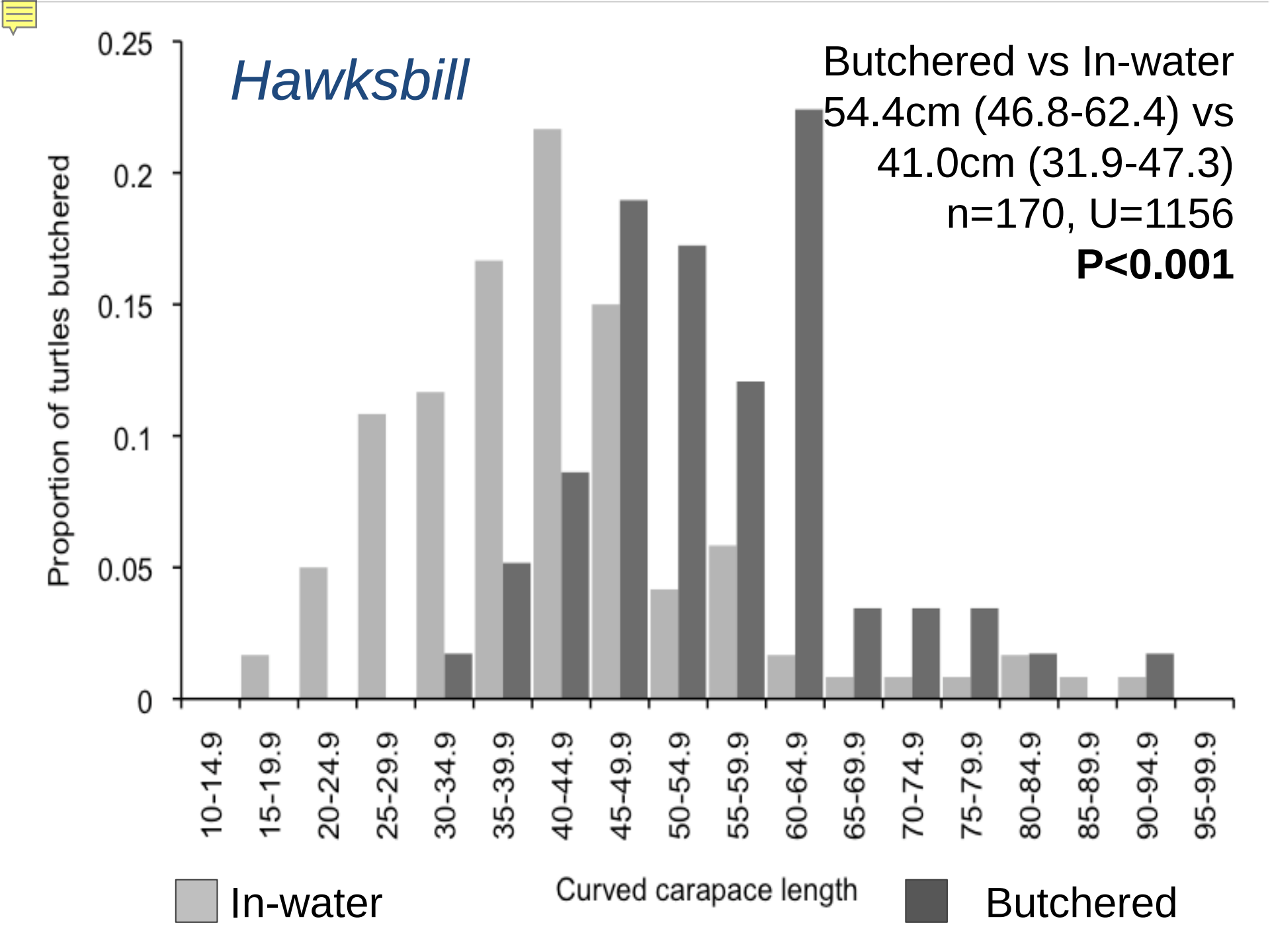
Methods: harvest estimation

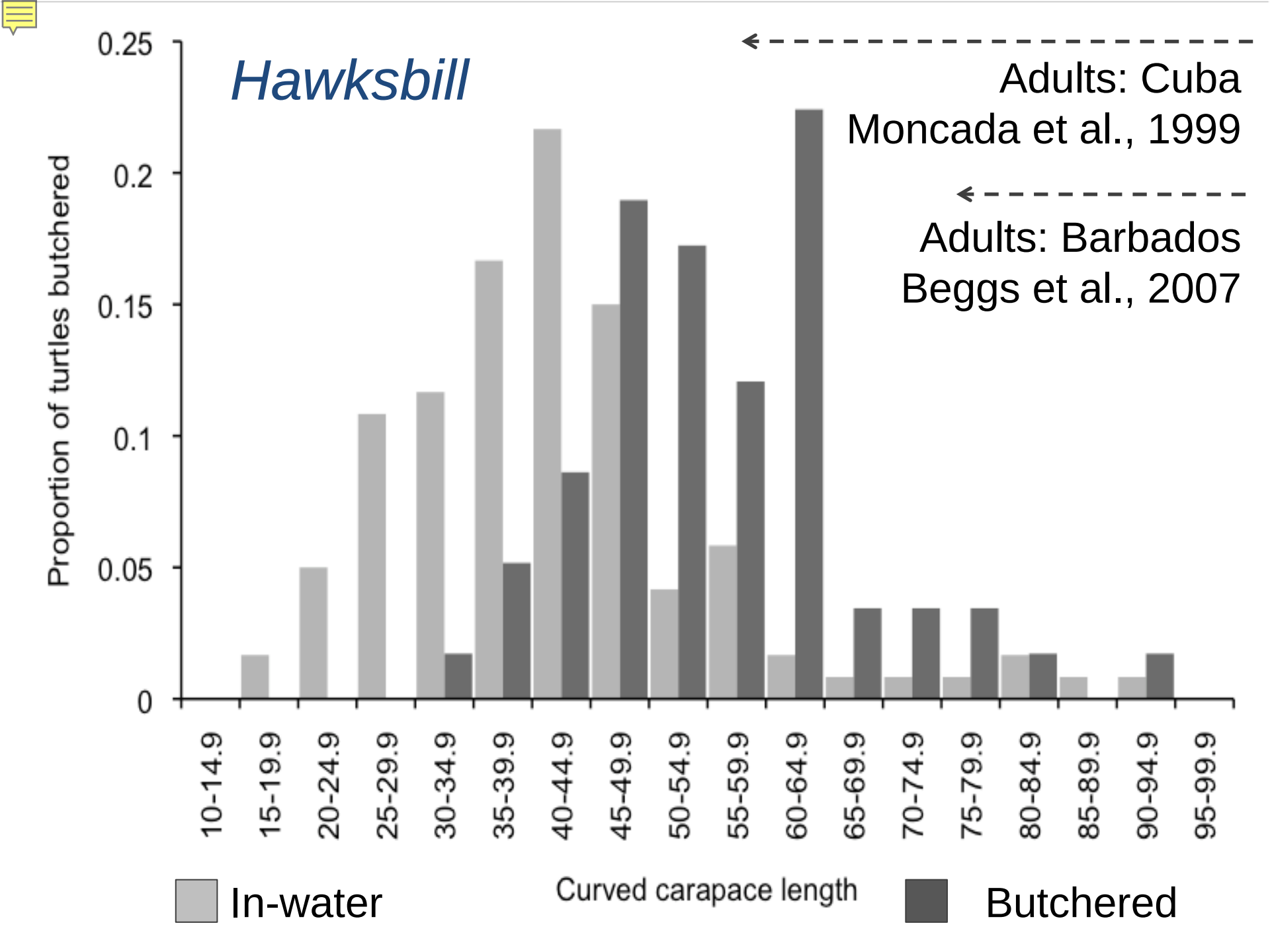
- We use the number of turtles landed to estimate the harvest at each island
- Sum of island estimates = annual harvest in TCI
- Estimates are related to observations on South Caicos – we know most about these data.
- Assumes seasonality is same at all islands

Results: size

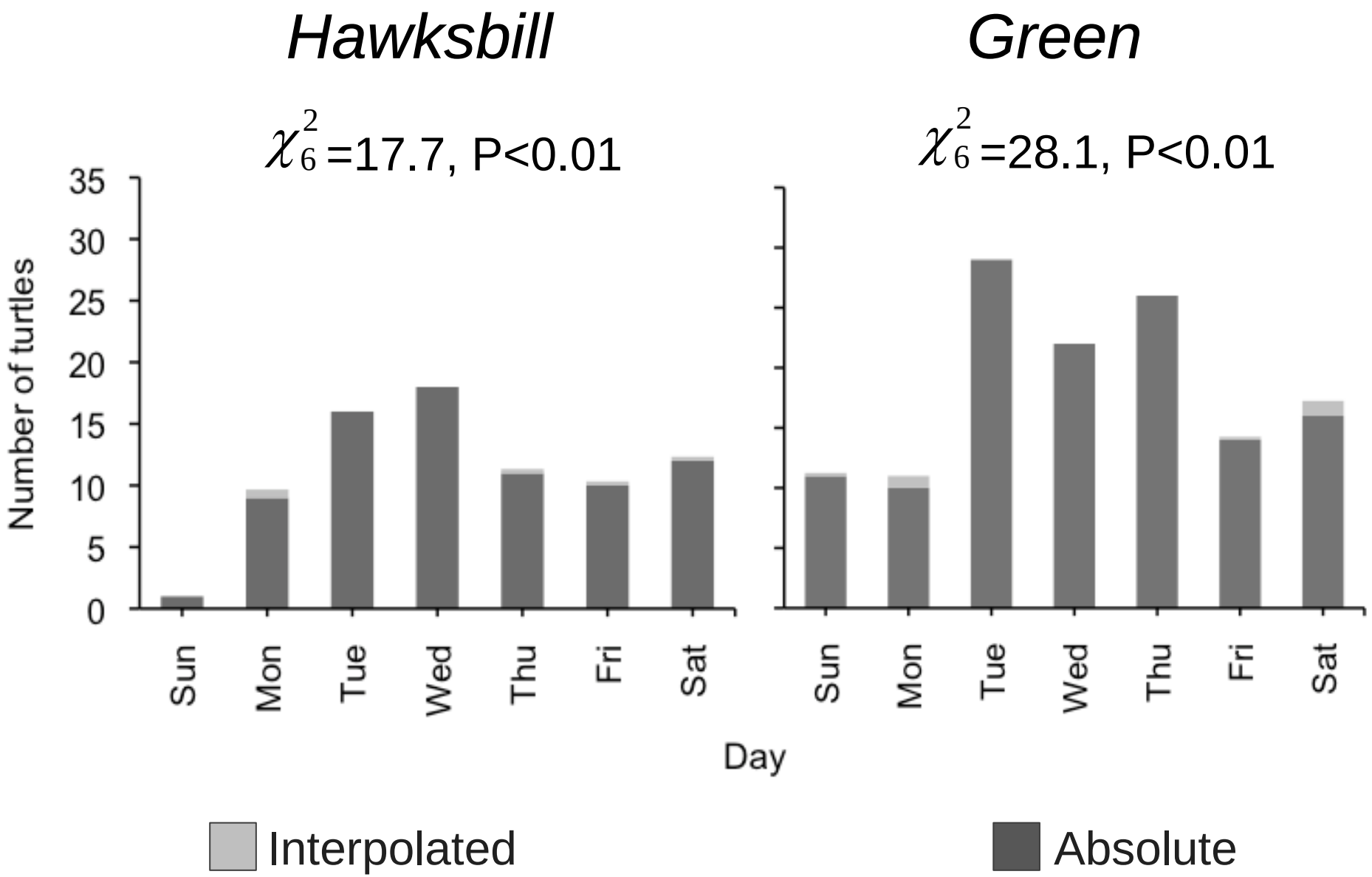



Green
Adults: Costa Rica
Bjorndal et al., 2005
Proportion of turtles butchered
0.25
0.2
0.15
0.1
0.05
0
10-14.9
15-19.9
20-24.9
25-29.9
30-34.9
35-39.9
40-44.9
45-49.9
50-54.9
55-59.9
60-64.9
65-69.9
70-74.9
75-79.9
80-84.9
85-89.9
90-94.9
95-99.9
Curved carapace length (cm)
In-water
Butchered

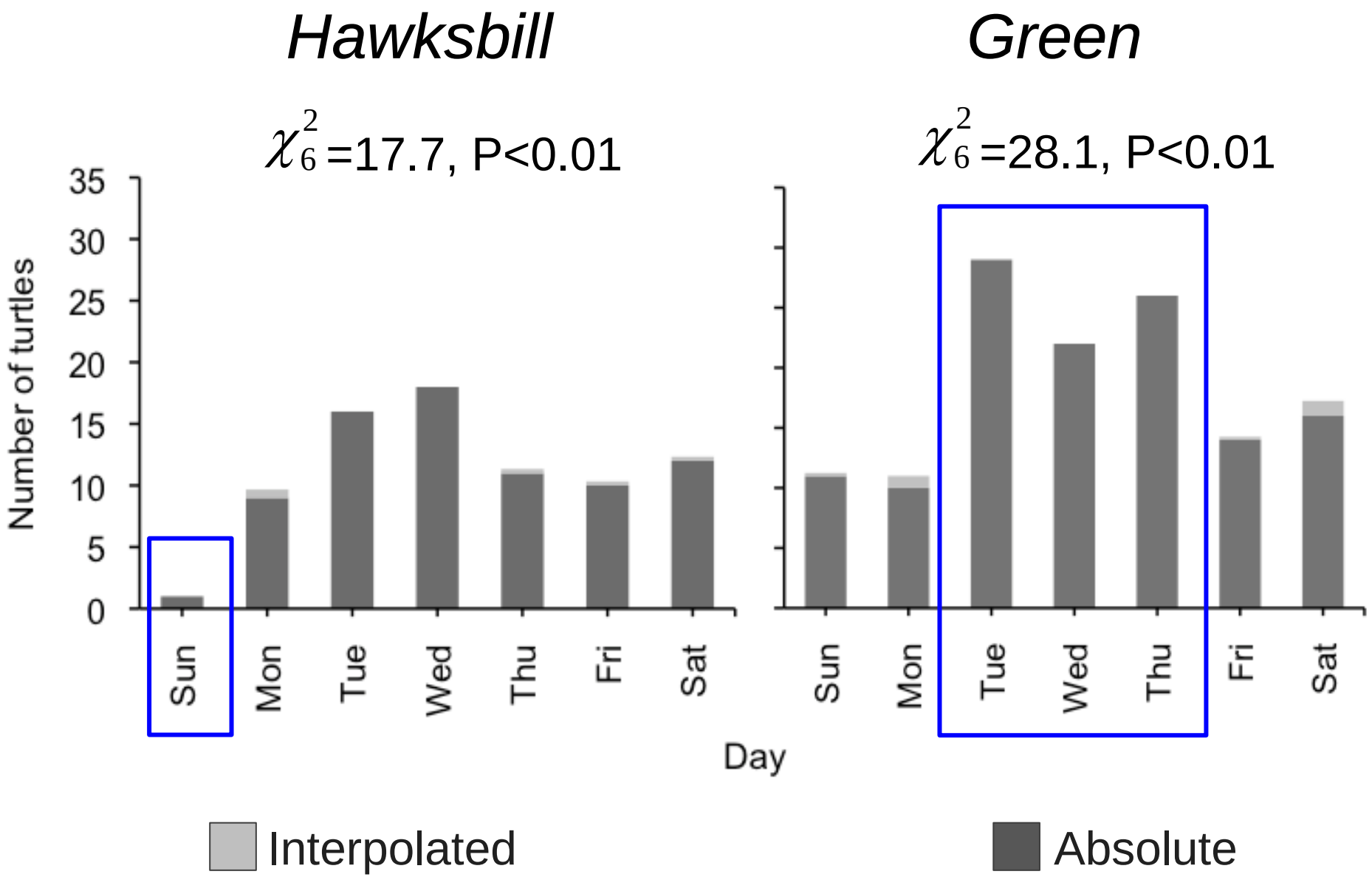

Hawksbill
Butchered vs In-water
54.4cm (46.8-62.4) vs
41.0cm (31.9-47.3)
n=170, U=1156
P<0.001
Proportion of turtles butchered
0.25
0.2
0.15
0.1
0.05
0
10-14.9
15-19.9
20-24.9
25-29.9
30-34.9
35-39.9
40-44.9
45-49.9
50-54.9
55-59.9
60-64.9
65-69.9
70-74.9
75-79.9
80-84.9
85-89.9
90-94.9
95-99.9
Curved carapace length
In-water
Butchered


Hawksbill
Adults: Cuba
Moncada et al., 1999
Adults: Barbados
Beggs et al., 2007
Proportion of turtles butchered
0.25
0.2
0.15
0.1
0.05
0
10-14.9
15-19.9
20-24.9
25-29.9
30-34.9
35-39.9
40-44.9
45-49.9
50-54.9
55-59.9
60-64.9
65-69.9
70-74.9
75-79.9
80-84.9
85-89.9
90-94.9
95-99.9
Curved carapace length
In-water
Butchered

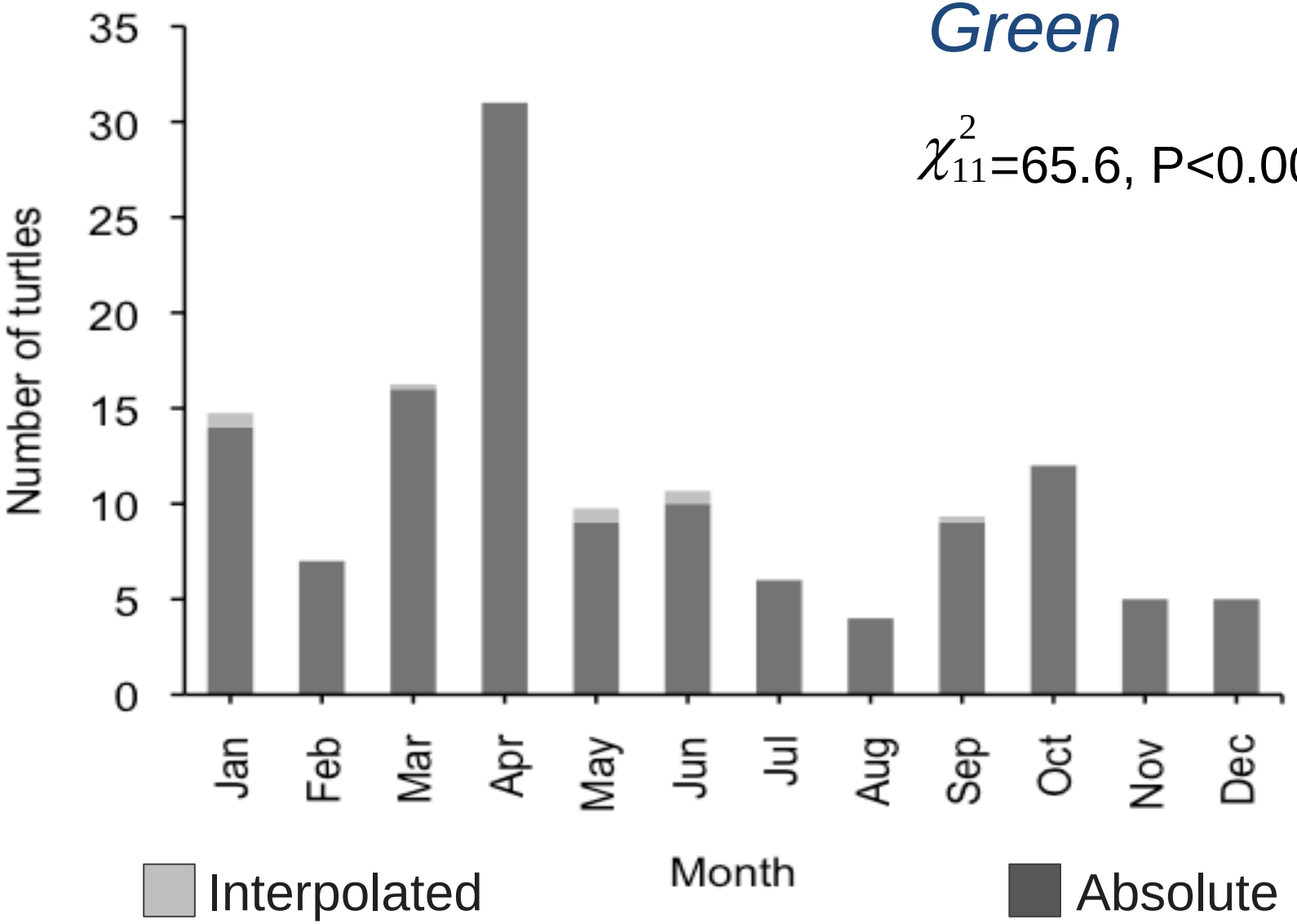
Results: seasonality (South Caicos)



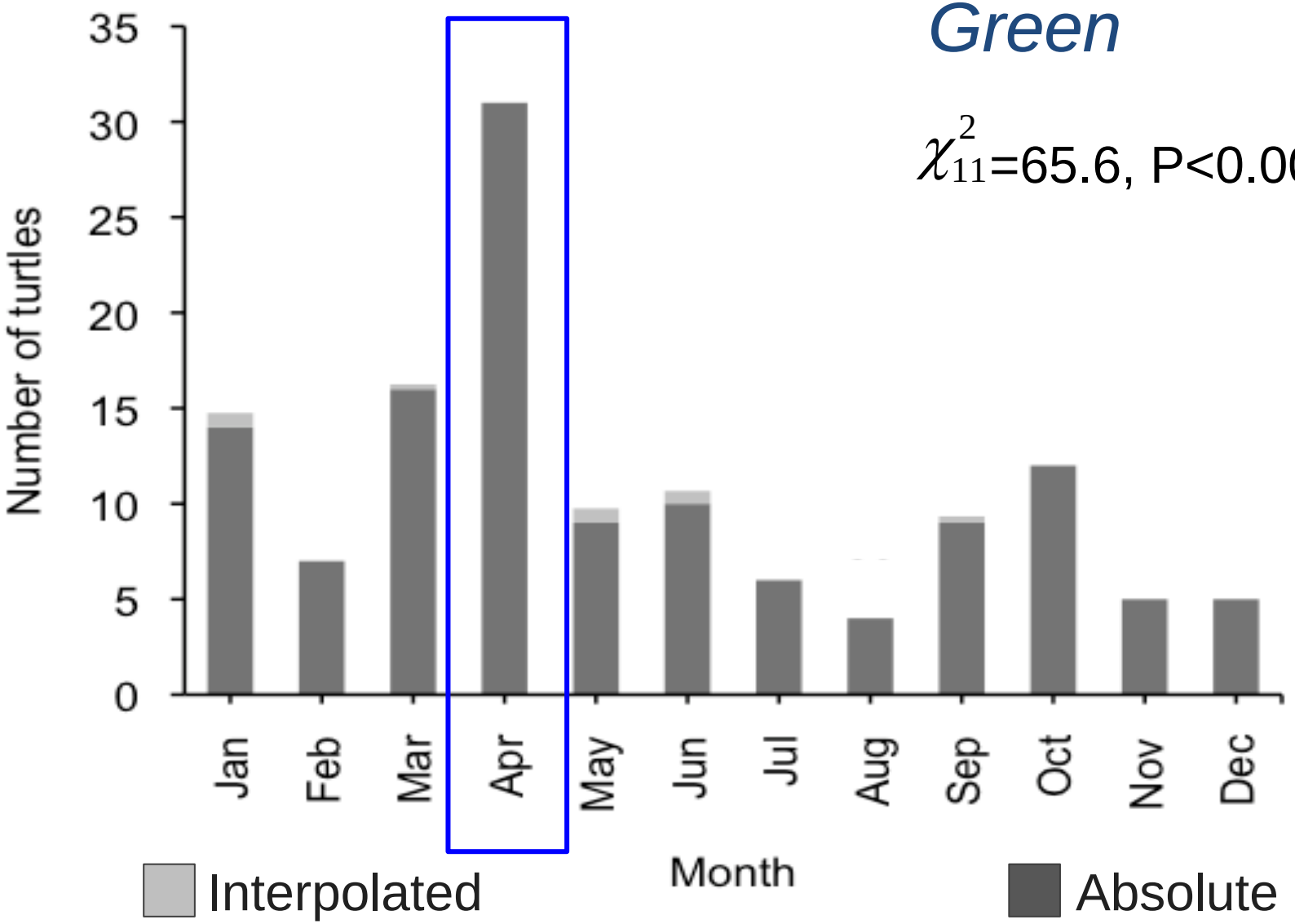
Results: seasonality (South Caicos)



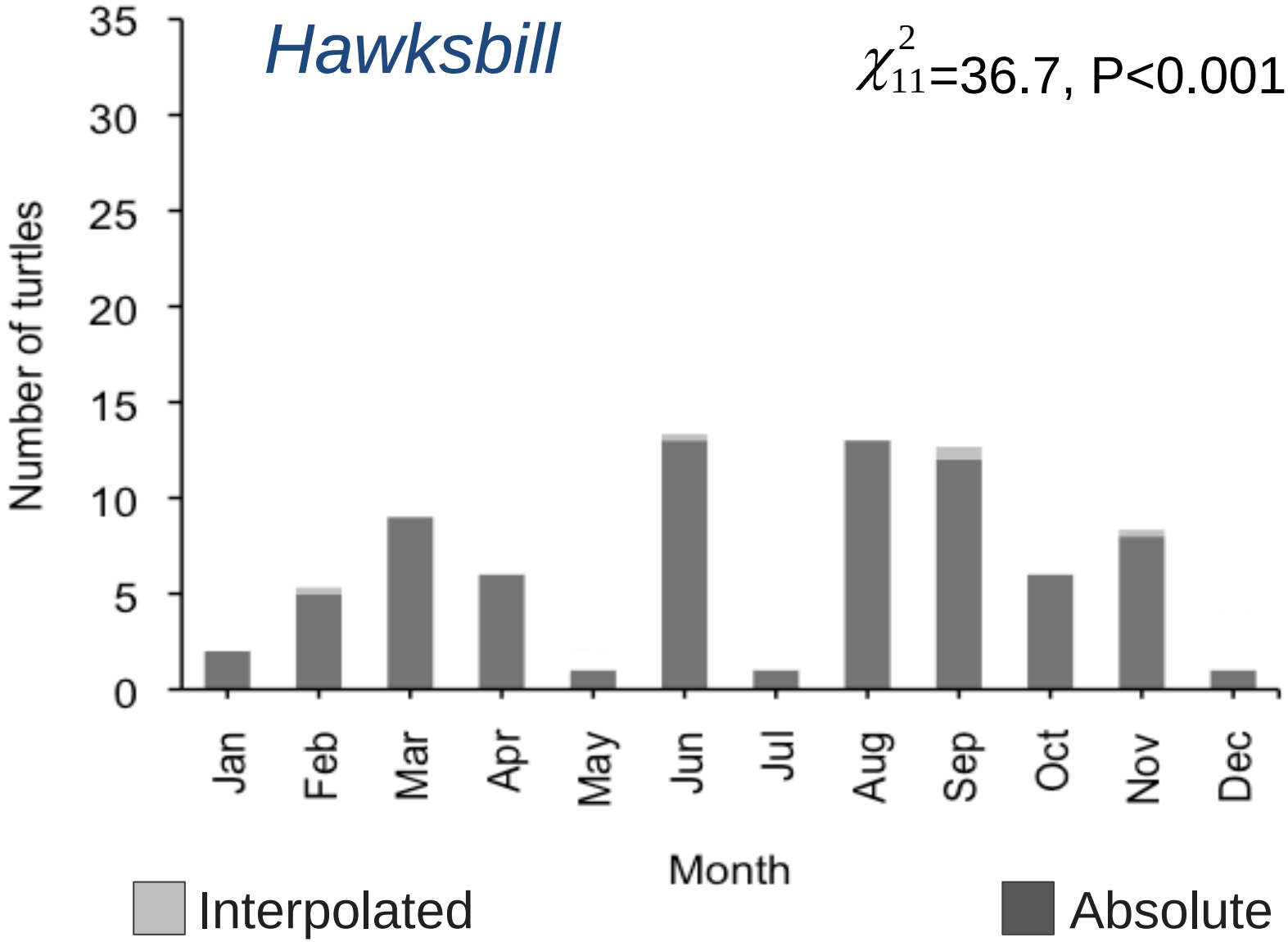
Results: seasonality (South Caicos)



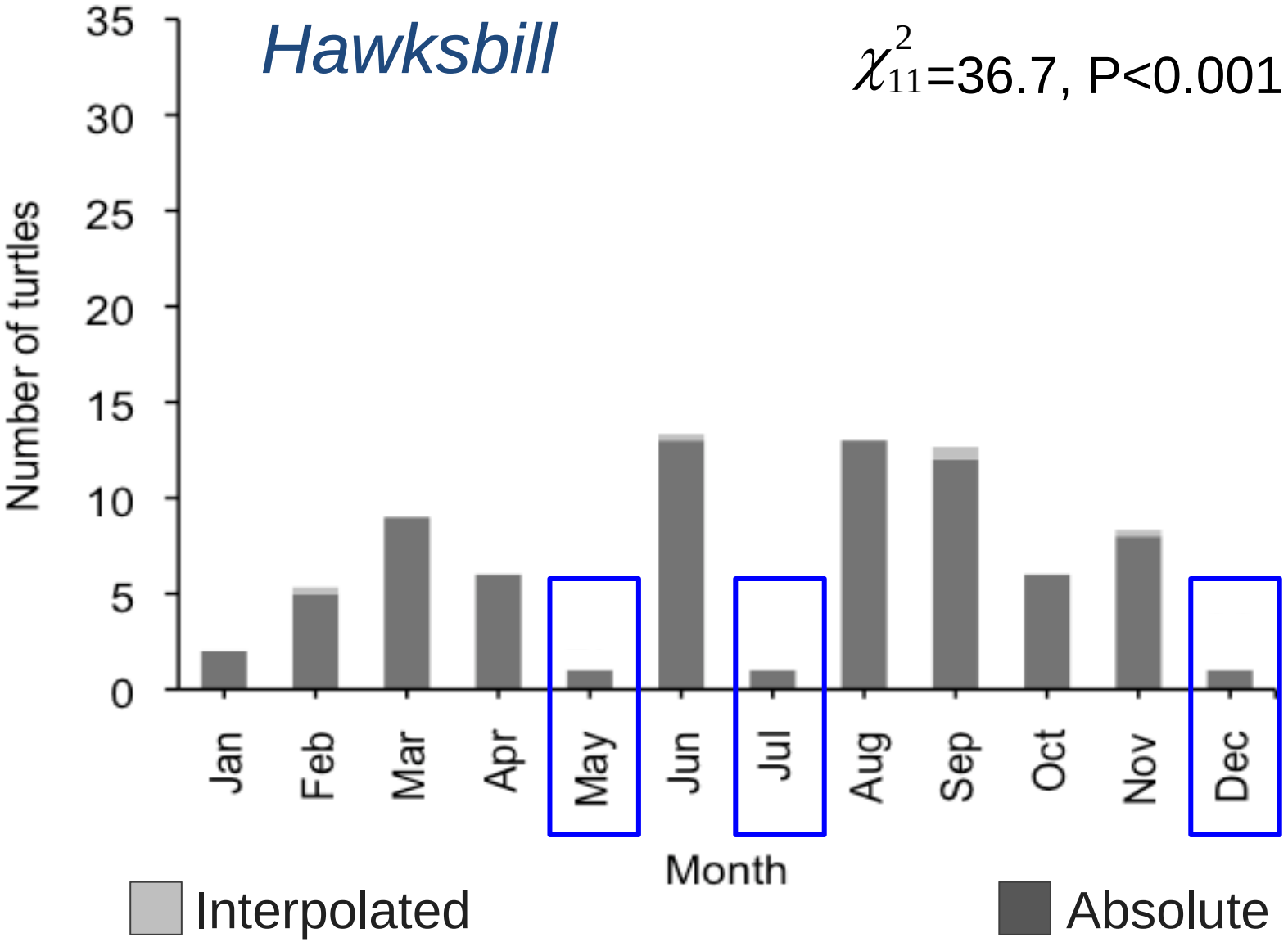
Results: seasonality (South Caicos)

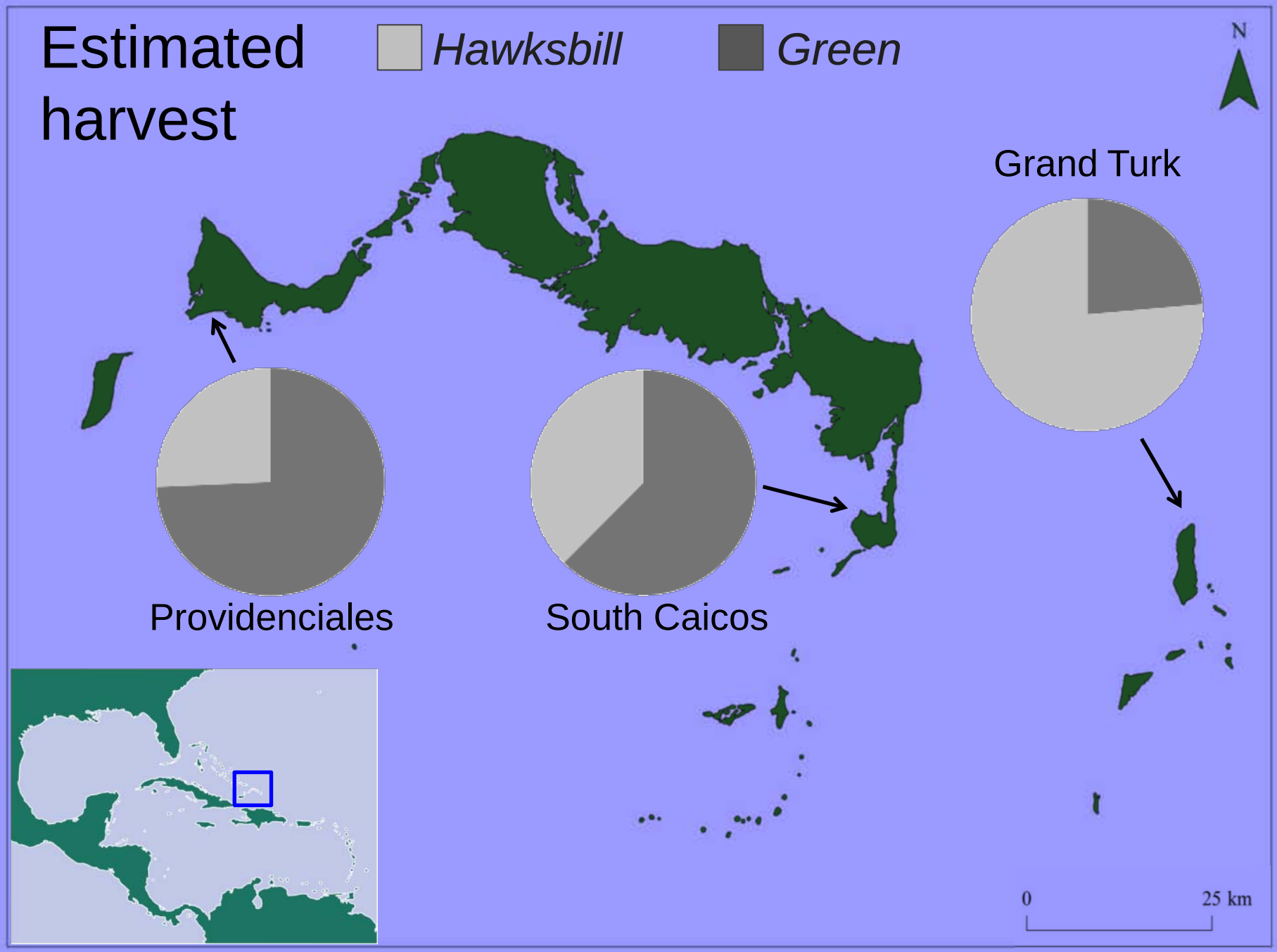


Results: seasonality (South Caicos)



Results: seasonality (South Caicos)




Estimated harvest
Hawksbill
Green
N
Grand Turk
Providenciales
South Caicos
0
25 km

Estimated harvest

Scale:

249 – 297 green turtles

356 – 392 hawksbill

~1 turtle per day per sp.

MINIMUM

Conclusions

- Work in progress:
  - assessing whether there is a need for legislative change,
  - developing a sustainable management strategy

Photo: T. Stringell

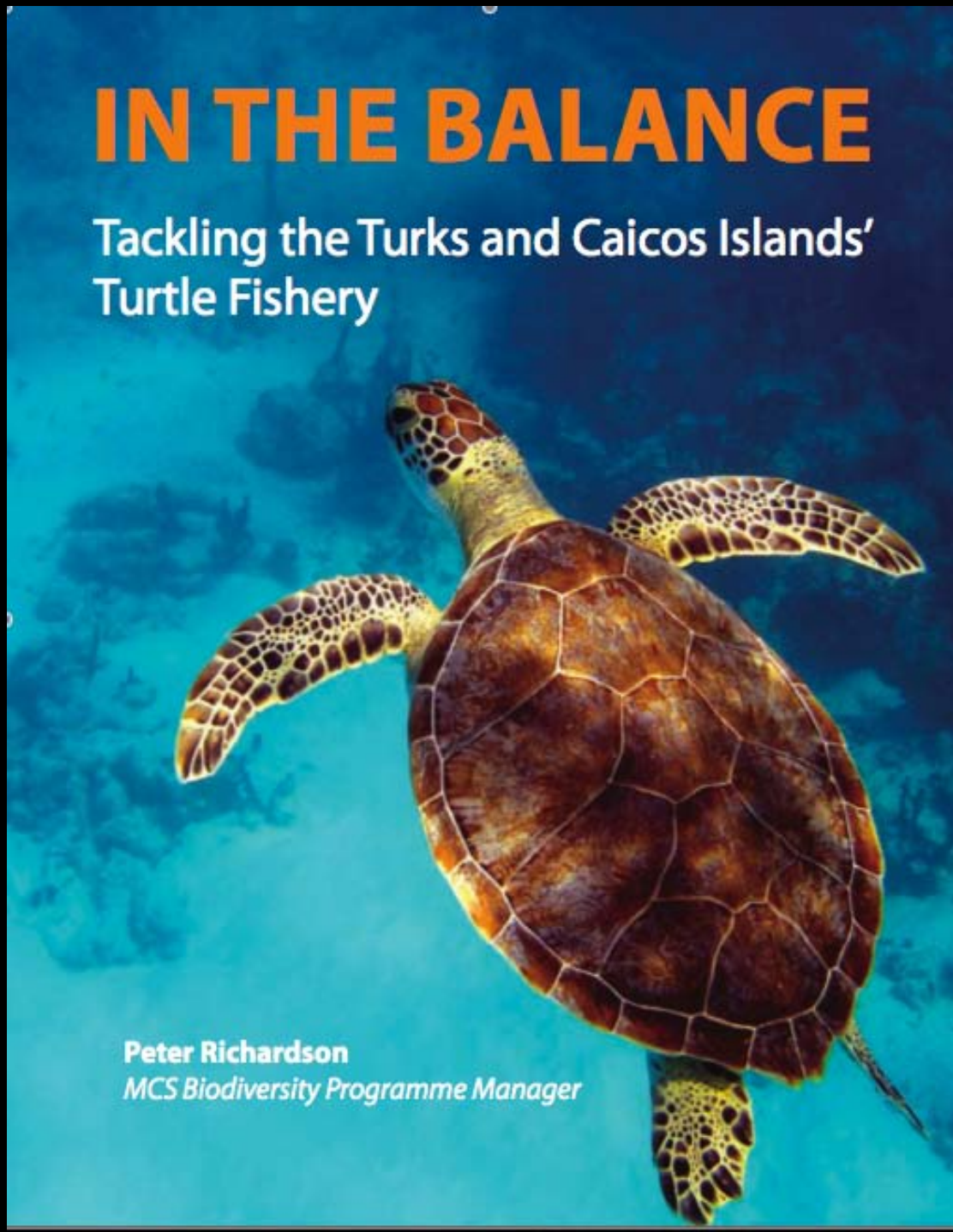
Thank you!

Amdeep Sanghera (MCS)

amdeep.sanghera@mcsuk.org

Tom Stringell (MTRG)

tbs203@exeter.ac.uk



Acknowledgements

- Simon and Ann Notley
- Fishermen of South Caicos
- Kathy Lockhart and staff at DECR
- Students & staff at SFS TCI

tbs203@exeter.ac.uk