Science, Service, Stewardship

NMFS

# Historical Overview of Core Marine Turtle Data Streams

G. H. Balazs
Marine Turtle Biology & Assessment Program

# Marine Turtle Biology and Assessment Program

## Data collection

- Nesting ecology
- Nearshore ecology
- Pelagic bycatch
- Strandings

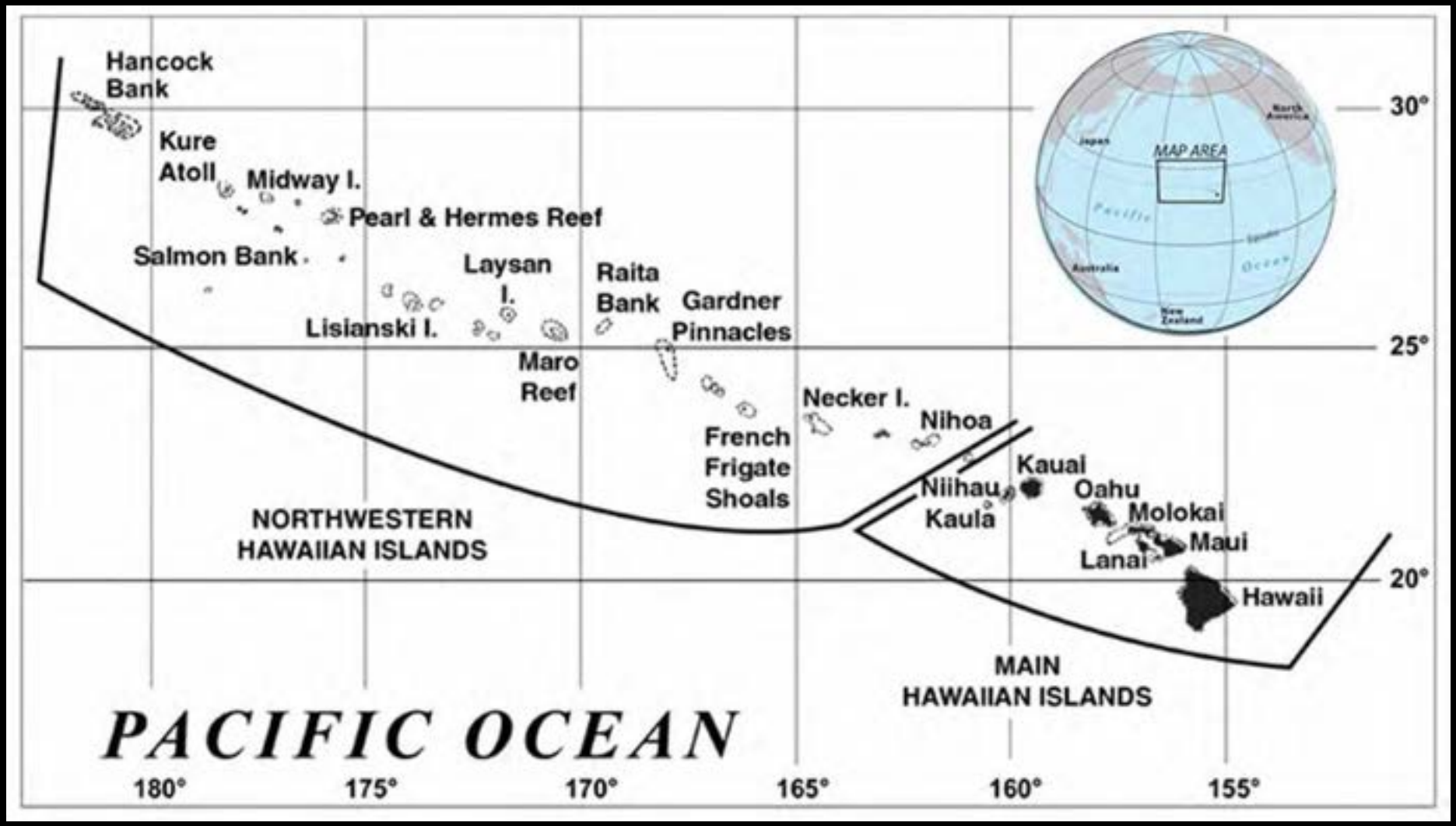
## Data stewardship

- Database management
- Public data requests

## Data analysis

- Analytical products

Hawaiian Archipelago


Hancock Bank
Kure Atoll
Midway I.
Pearl & Hermes Reef
Salmon Bank
Laysan I.
Lisianski I.
Raita Bank
Gardner Pinnacles
Maro Reef
French Frigate Shoals
Necker I.
Nihoa
Kauai
Niihau
Kaula
Oahu
Molokai
Maui
Lanai
Hawaii
NORTHWESTERN HAWAIIAN ISLANDS
MAIN HAWAIIAN ISLANDS
PACIFIC OCEAN
MAP AREA
30°
25°
20°
180°
175°
170°
165°
160°
155°

# Long-term data streams

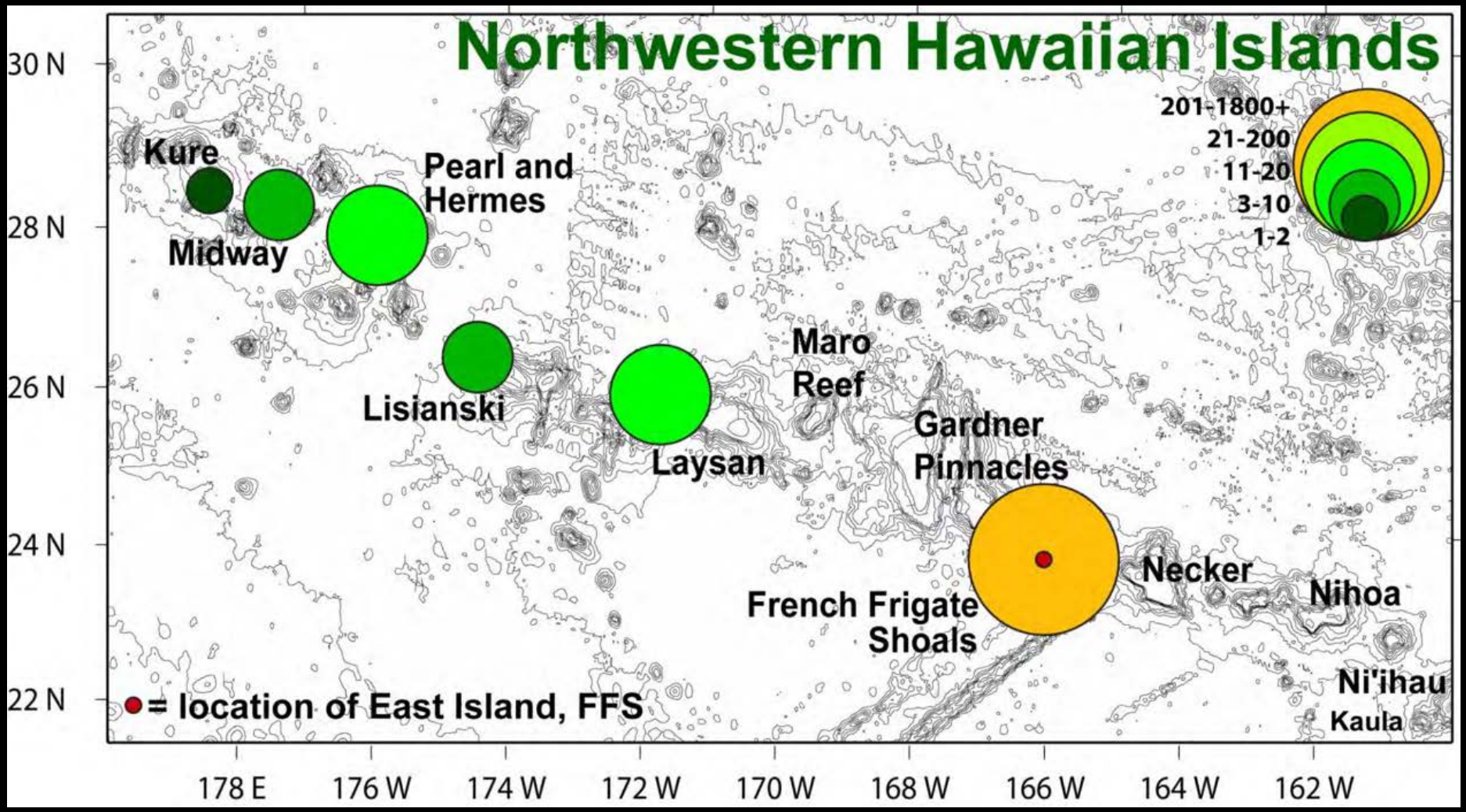
- Nesting
- Nearshore
- Strandings
  - Euthanasia & Necropsy
  - Rehabilitation & Release
- Pelagic ecology
  - By-catch
  - Captive release

# Nesting data streams (NWHI)

Aerial photo FFS

Nesting ‘honu’ FFS

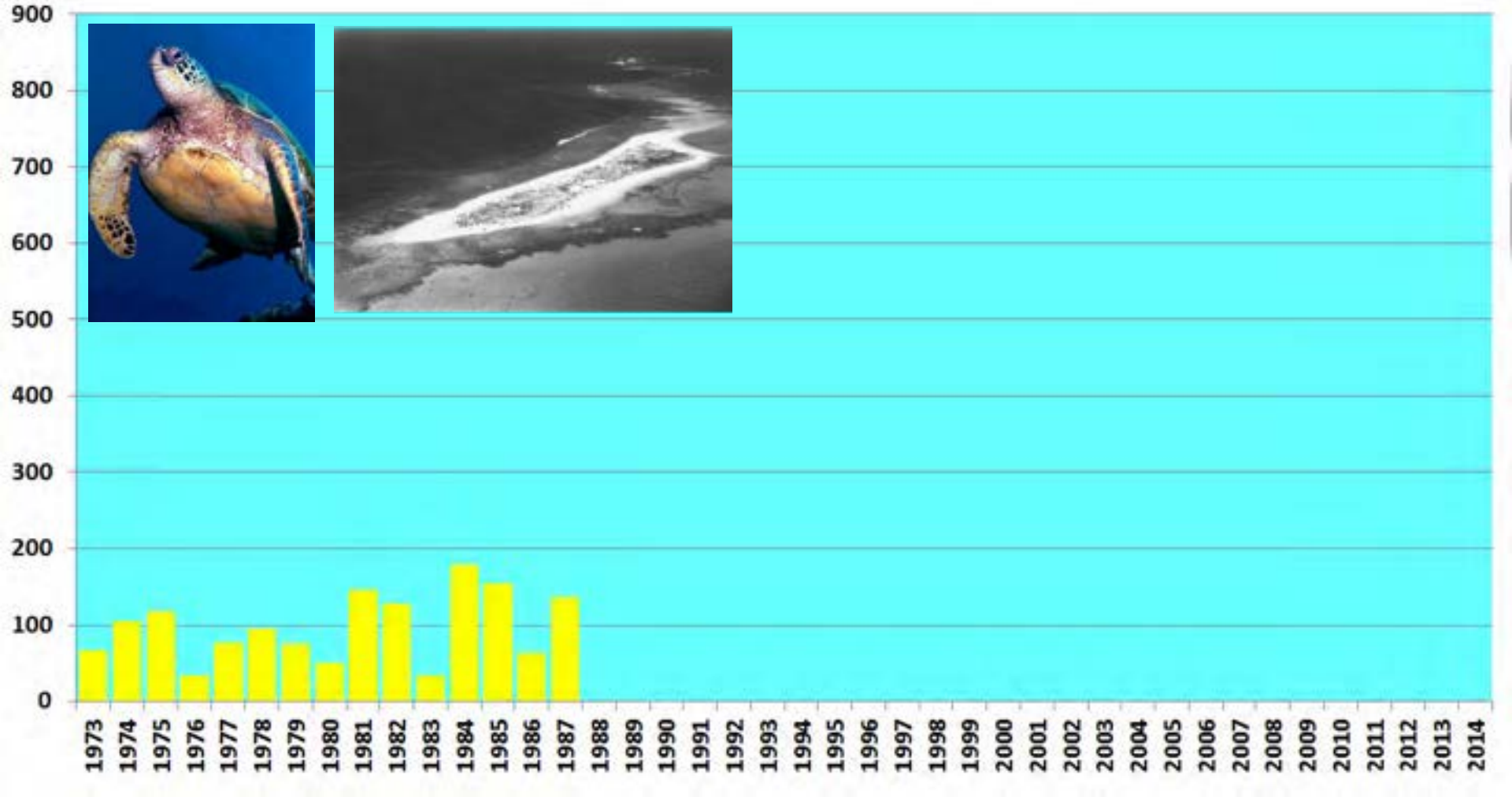
# Nesting data streams (NWHI)



# Green turtles nesting at East Island French Frigate Shoals, 1973-1987



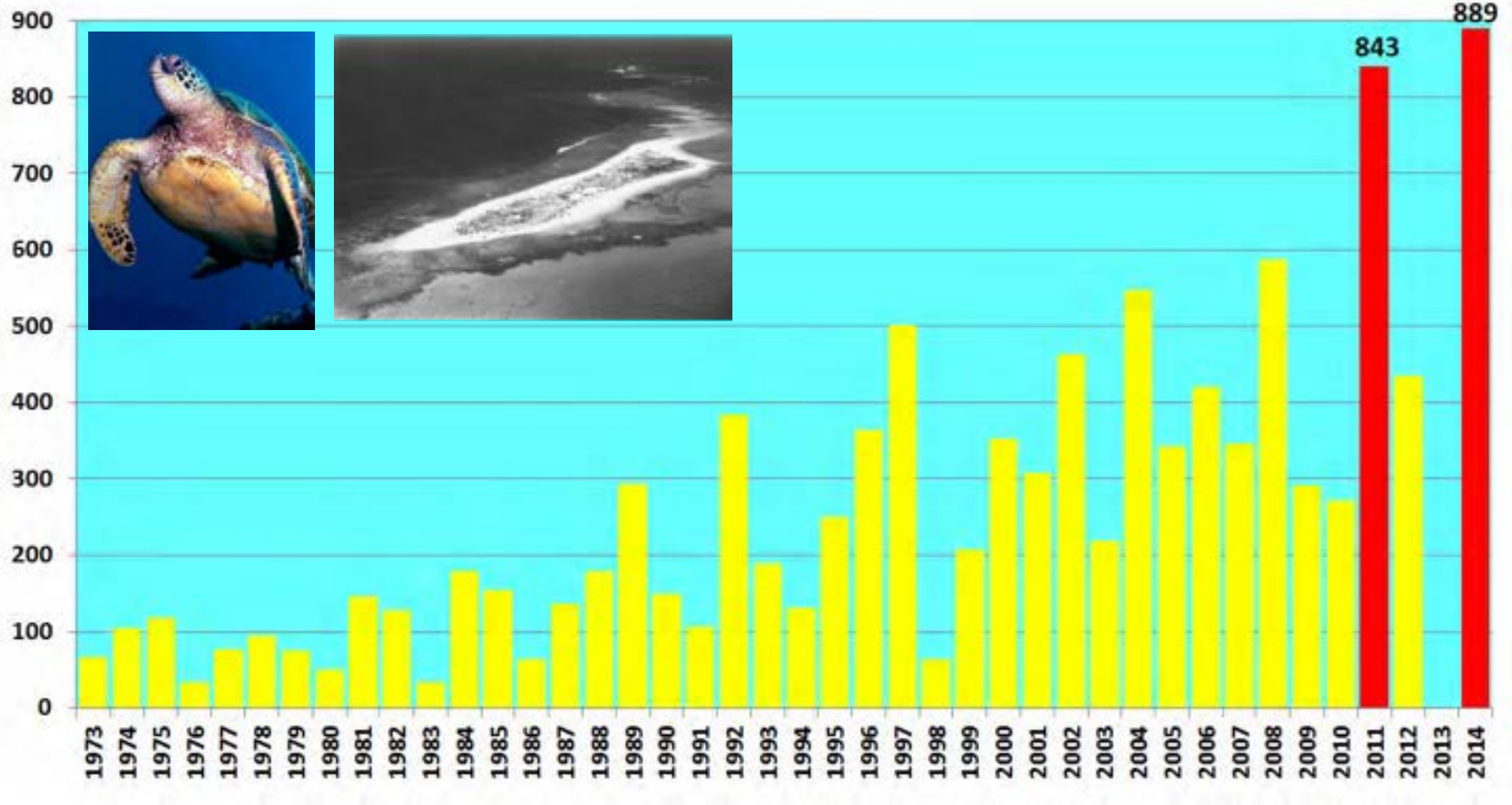




# Green turtles nesting at East Island French Frigate Shoals, 1973-2014



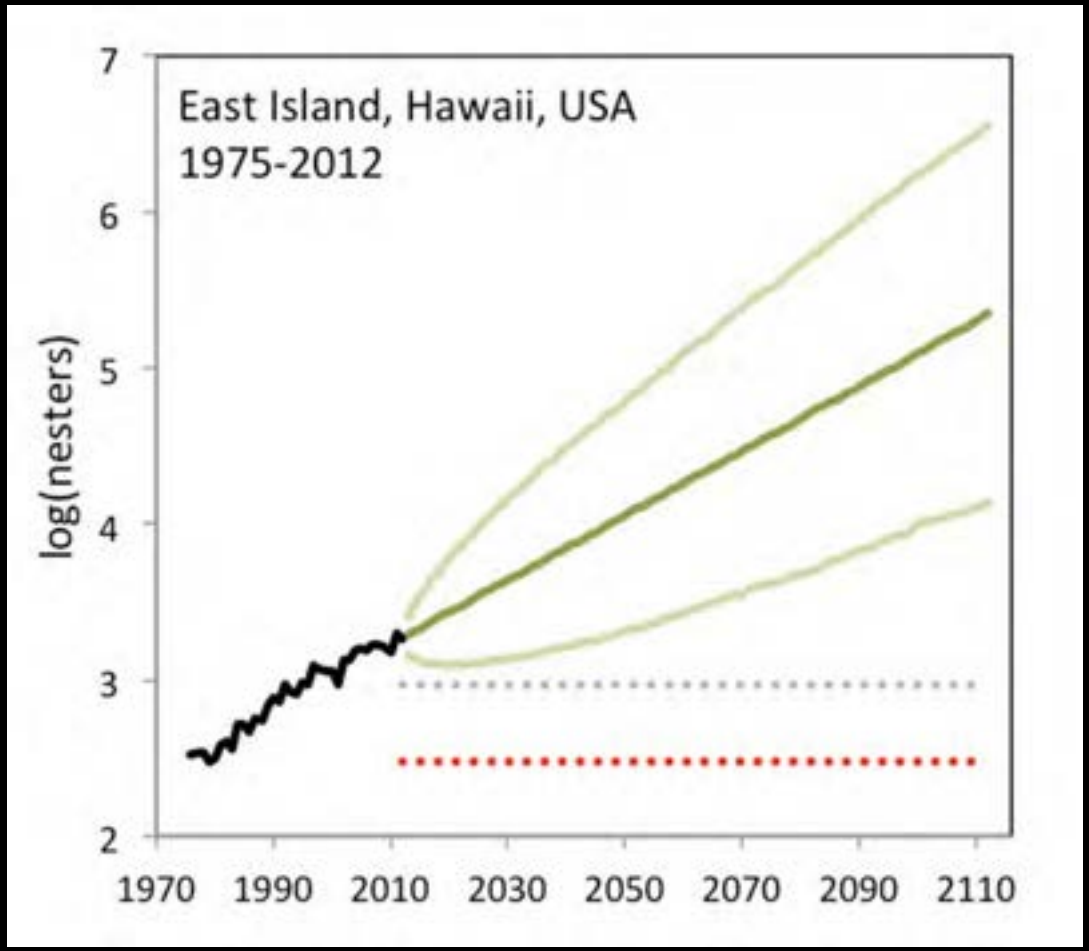





## Annual Trend for 42 seasons

Nurzia Humburg & Balazs 2014. Forty years of research. NOAA Tech Memo NMFS-PIFSC-40

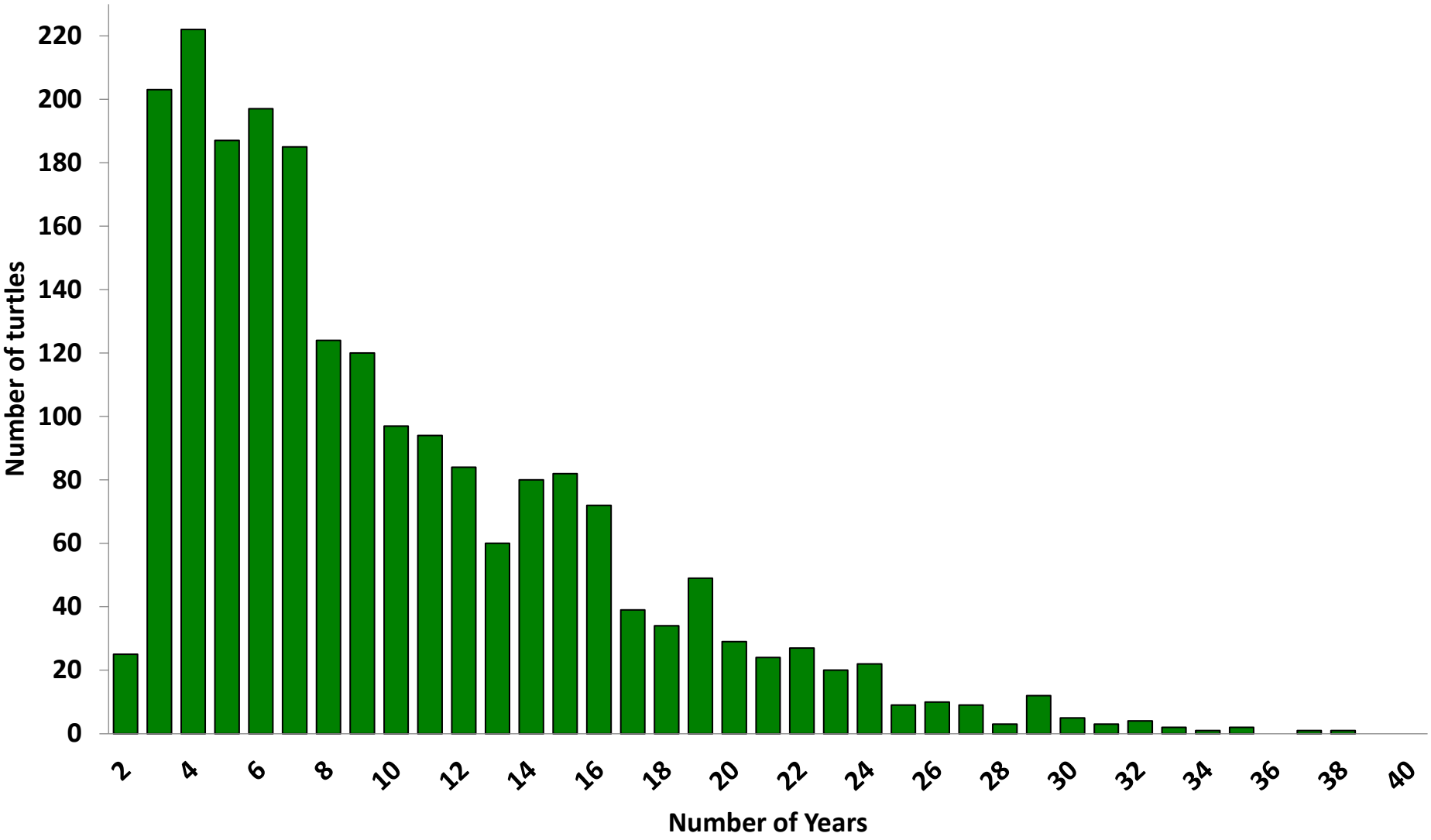
# Stochastic Exponential Growth Model for East Island, French Frigate Shoals




- Black line = observed values
- Red line = absolute reference
  - 100 nesters/yr
- Grey line = 50% decline
- Dark Green = simulated mean
- Light Green = 2.5, 97.5% CI

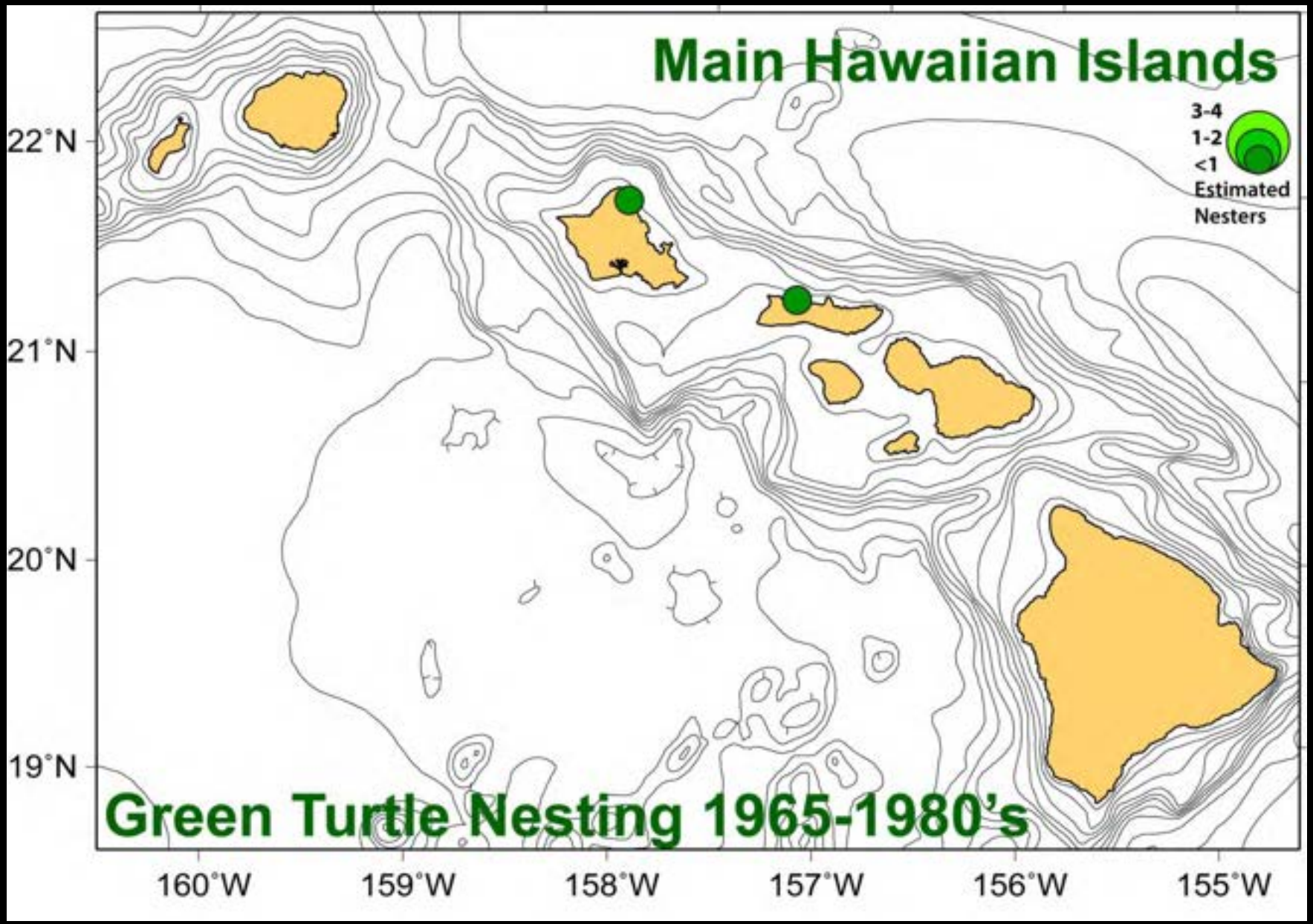
Seminoff et al. 2015. Status review of the green turtle. NOAA-TM-NMFS-SWFSC-539

# Lifespan based on tagging of green turtles nesting at French Frigate Shoals

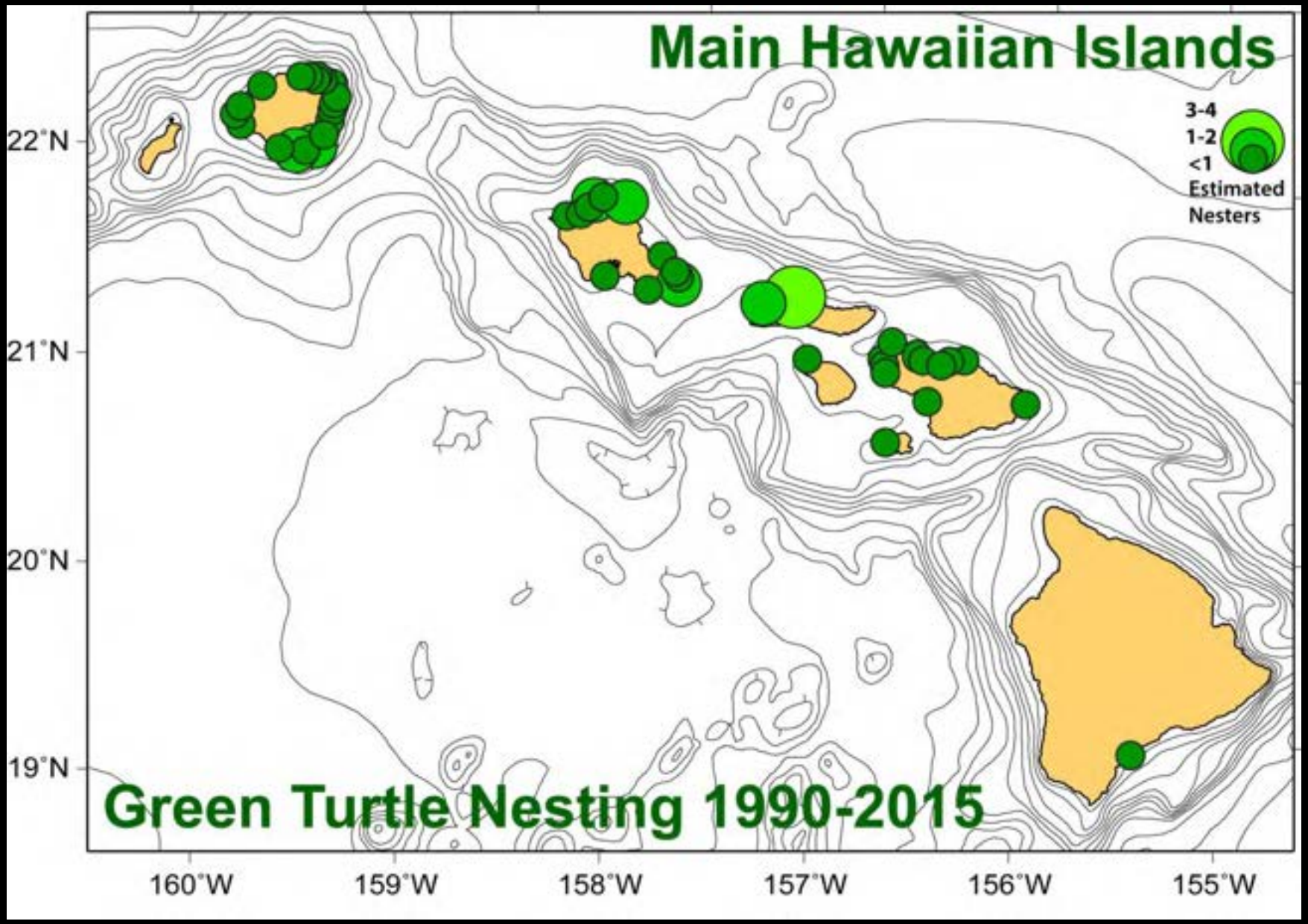



Nurzia Humburg & Balazs. 2014. Forty years of research. NOAA Tech Memo NMFS-PIFSC-40

# Nesting data streams (MHI)



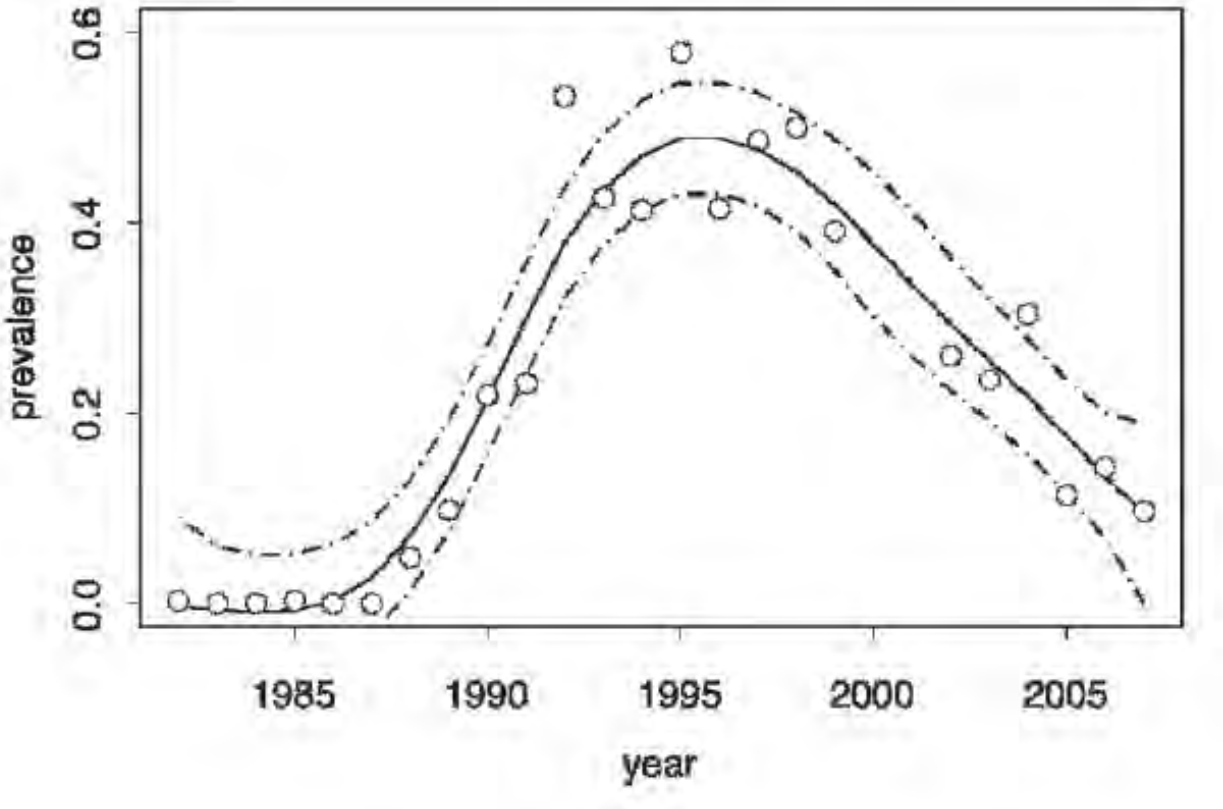
# Nesting data streams (MHI)



# Nearshore data streams

# Hand-capture technique

# Fibropapillomatosis epidemic curve: Three phases for Molokai case study

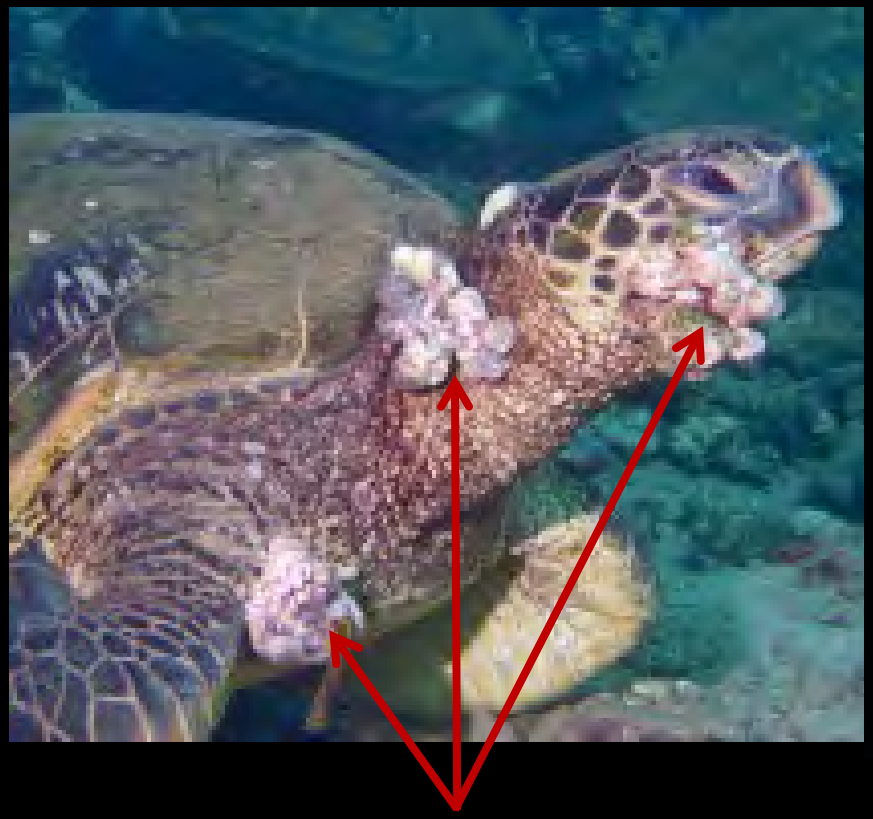



**Dash line is the 95% CI and circles represent the apparent prevalence estimates**

- **Increasing – 1988-1991**
- **Peak – 1992-1998**
- **Decline – 1999-onward**

Chaloupka, M., G.H. Balazs, T.M. Work. 2009. Rise and fall over 26 years of a marine epizootic in Hawaiian green sea turtles. J. Wildl. Dis. 45(4):1138-1142.
Data from Palaau, Molokai

# Fibropapillomatosis development & remission

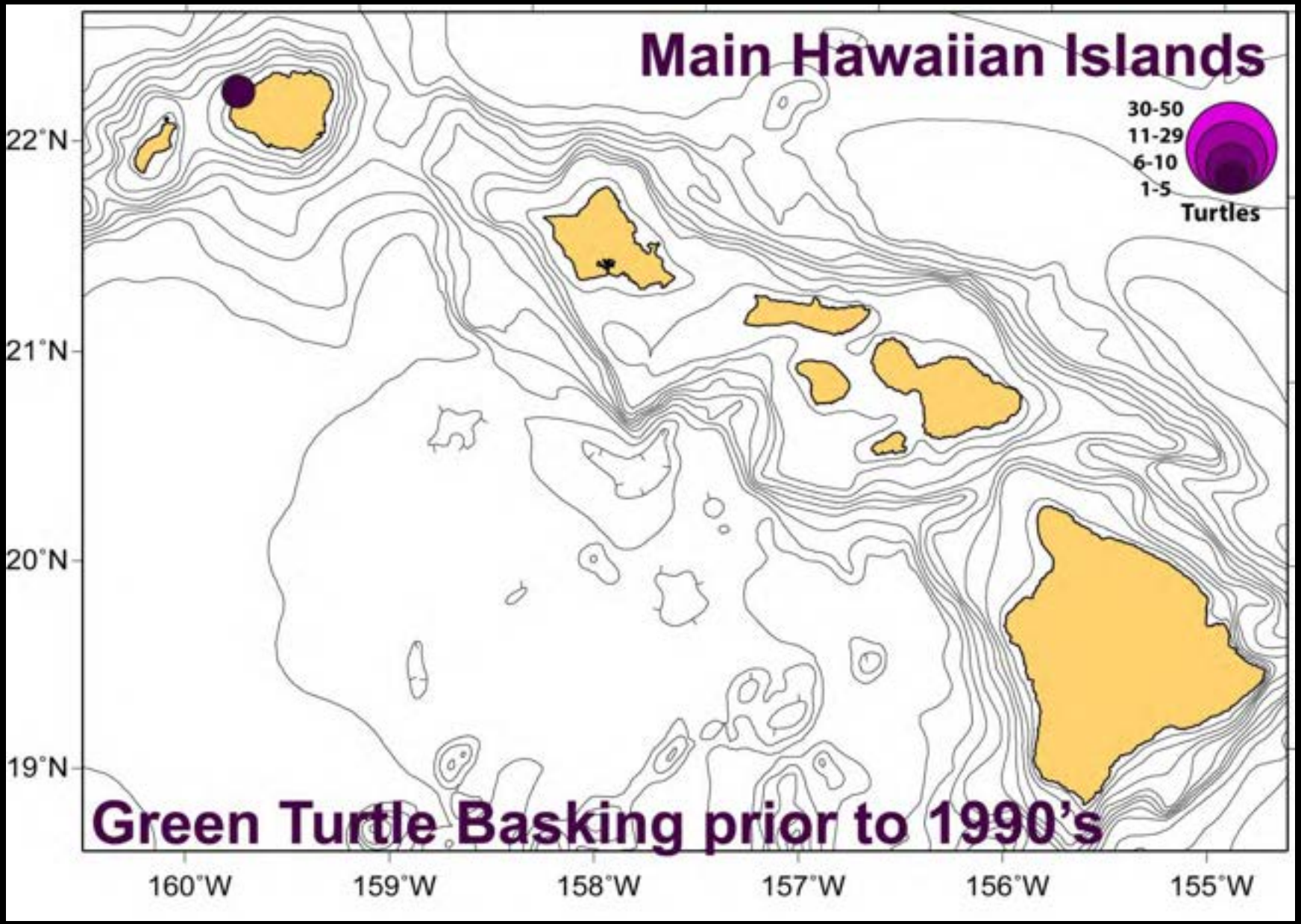


FP tumors

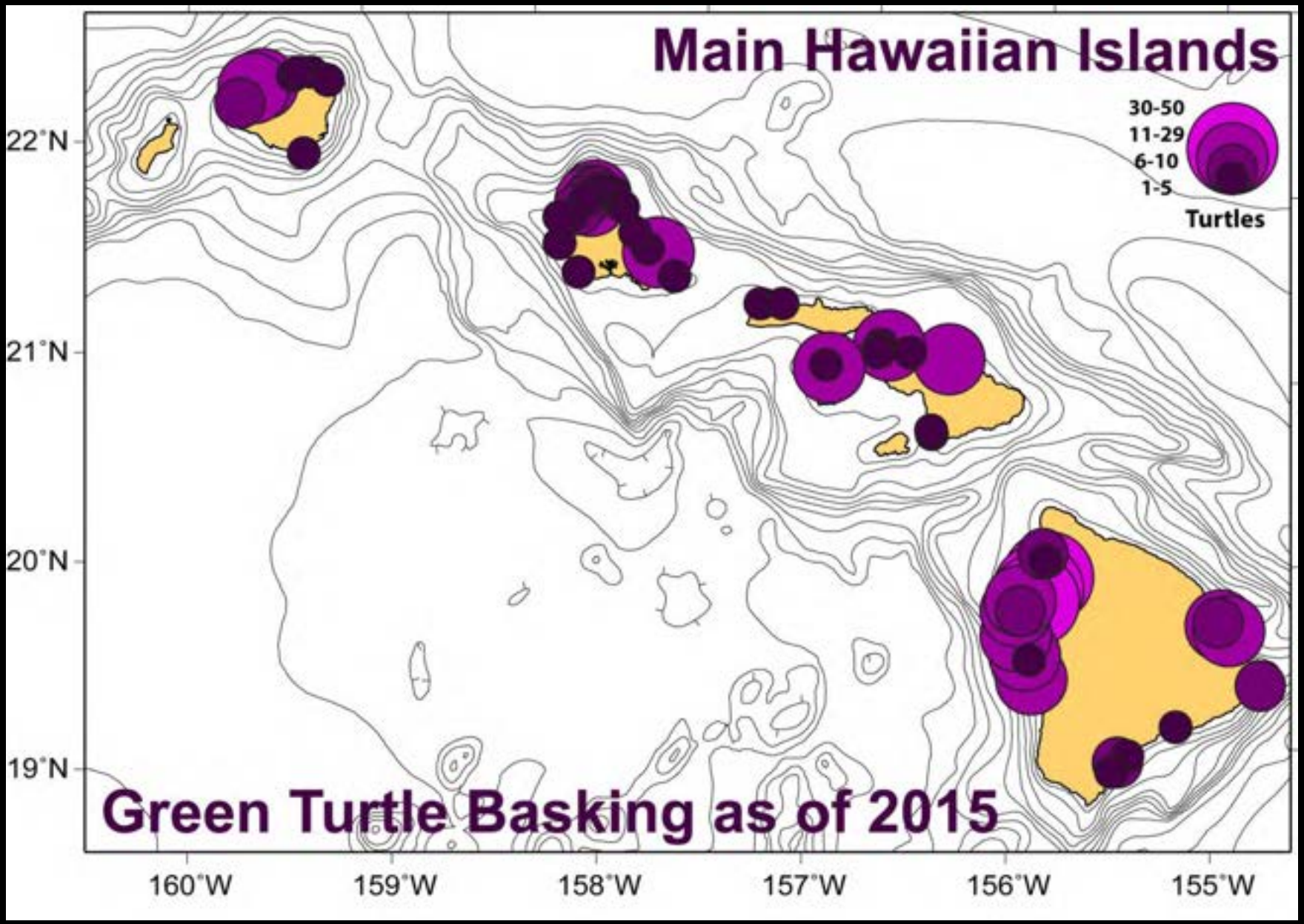
Absence of FP

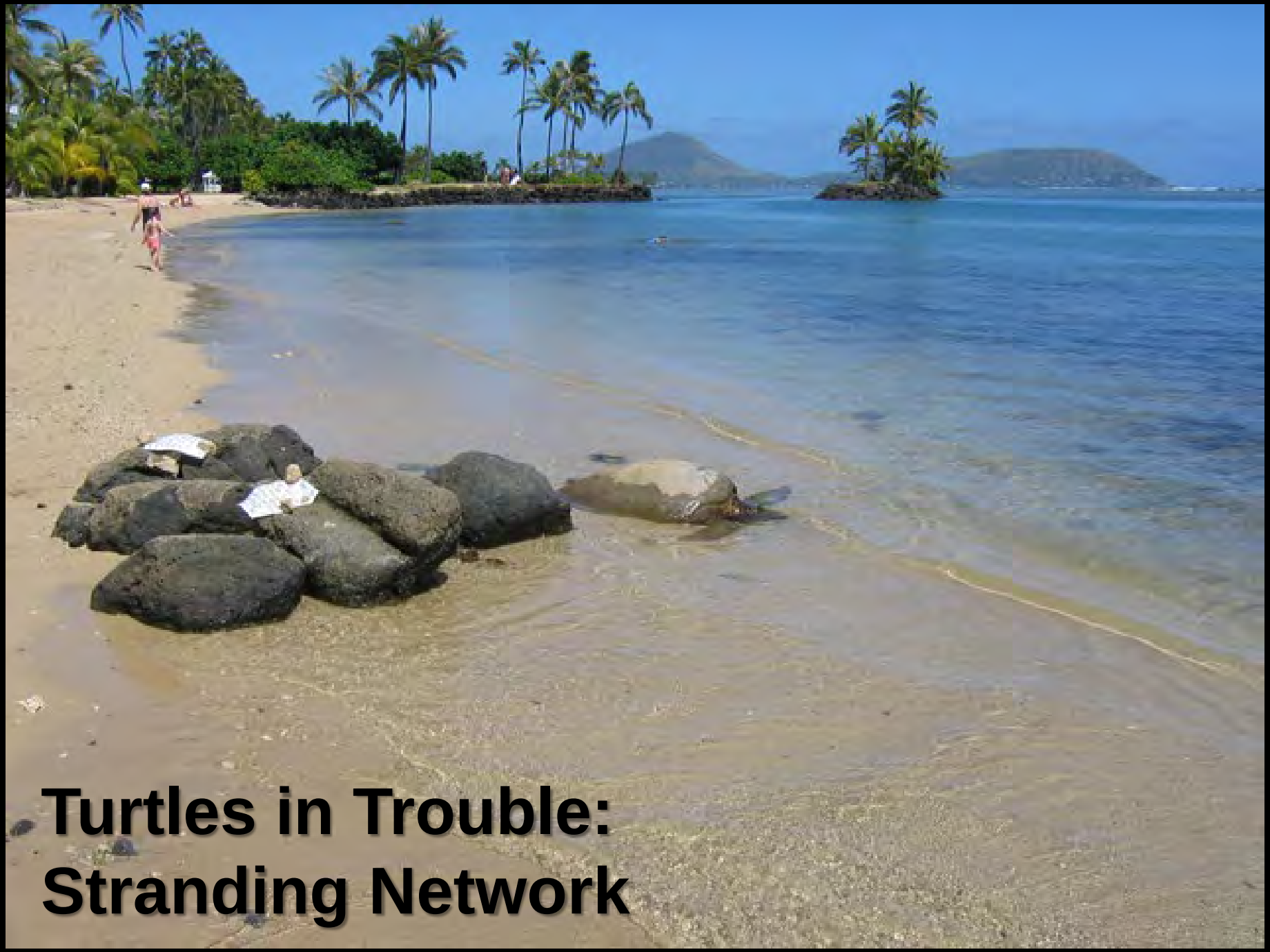
# Hawaii's basking green turtles

# Prevalence of basking in the MHI

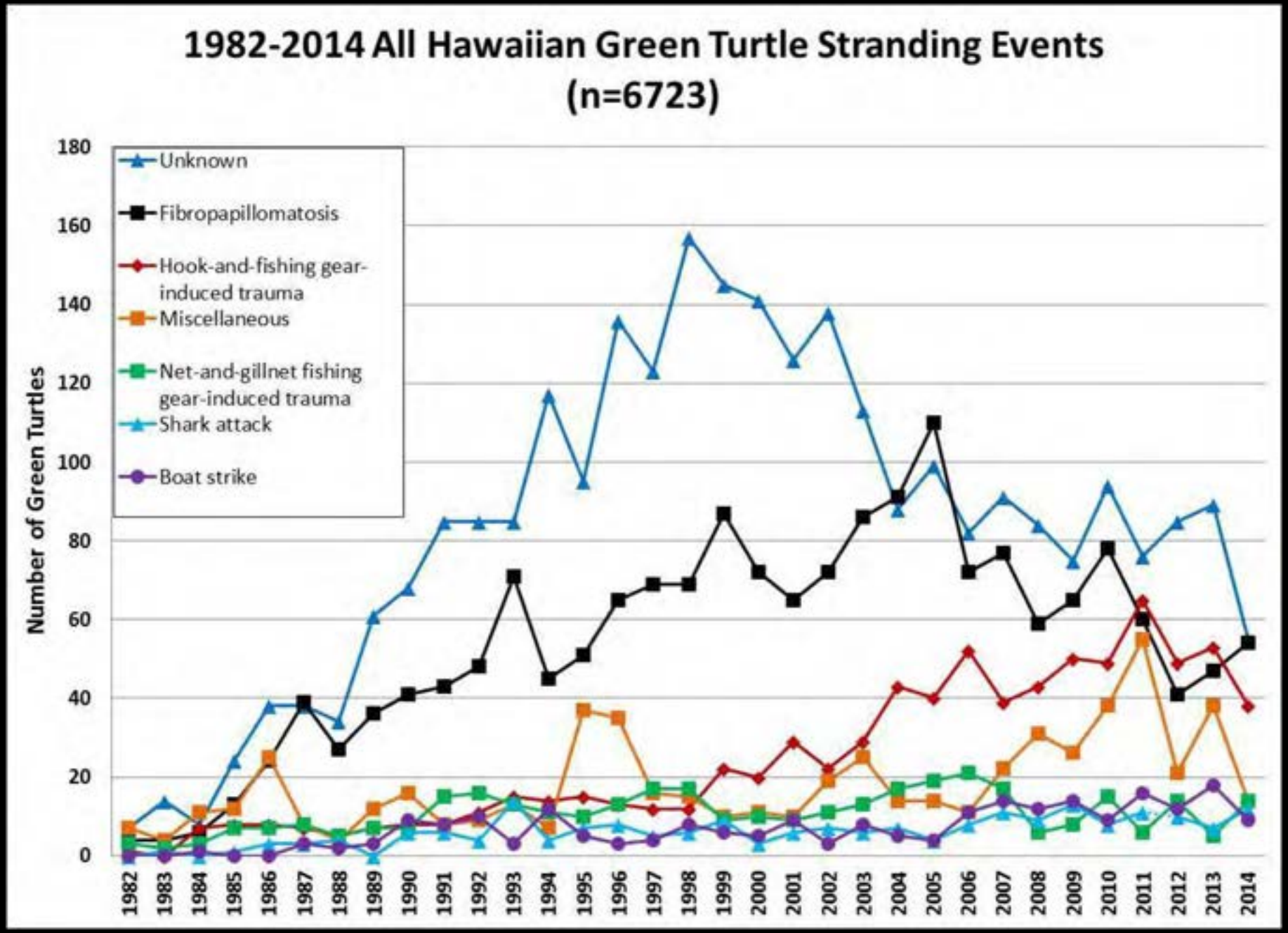


# Prevalence of basking in the MHI




Turtles in Trouble:
Stranding Network

# Necropsy of stranded turtle



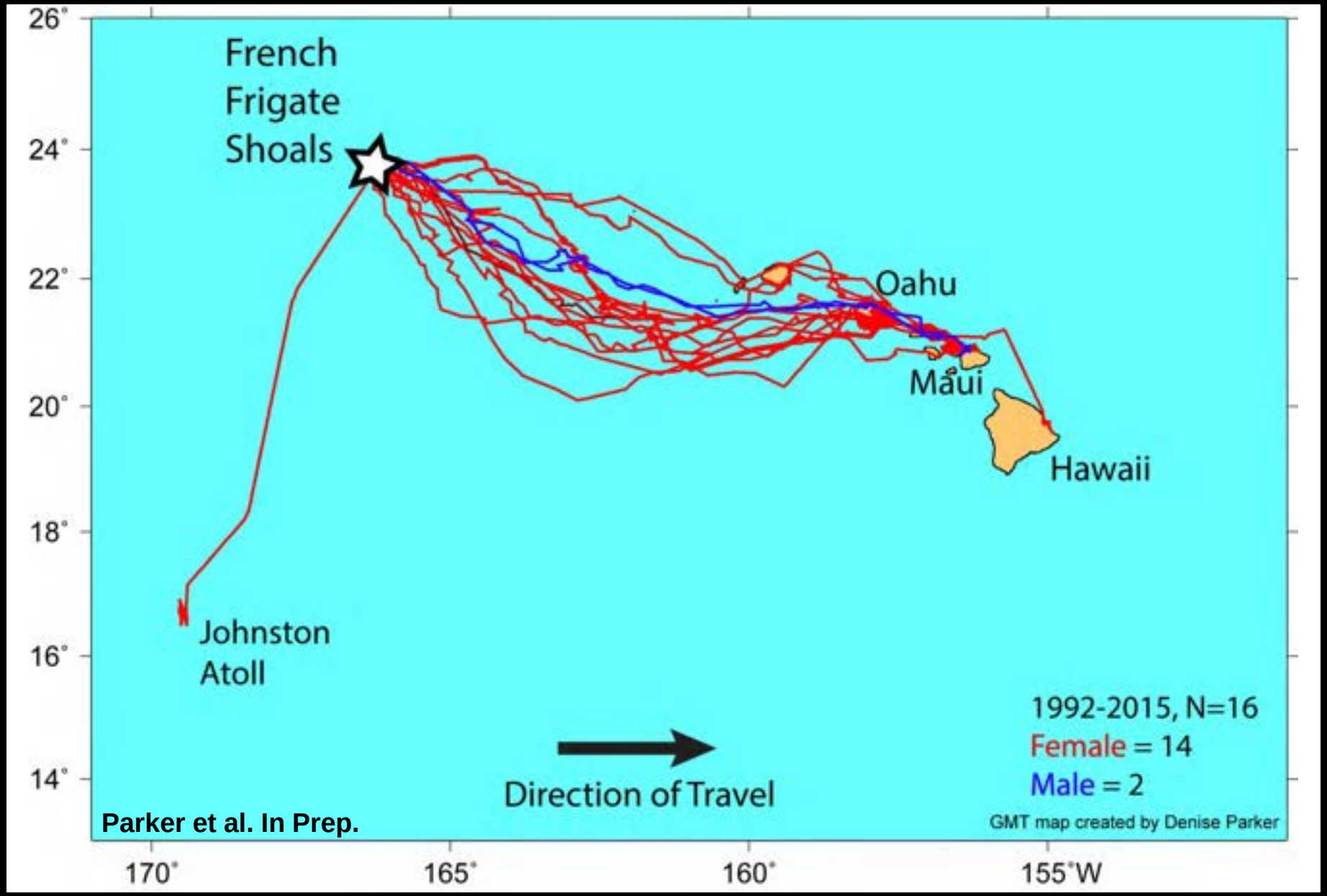

Francke et al. 2014. PIFSC Internal Report IR-14-003

# Rehabilitation

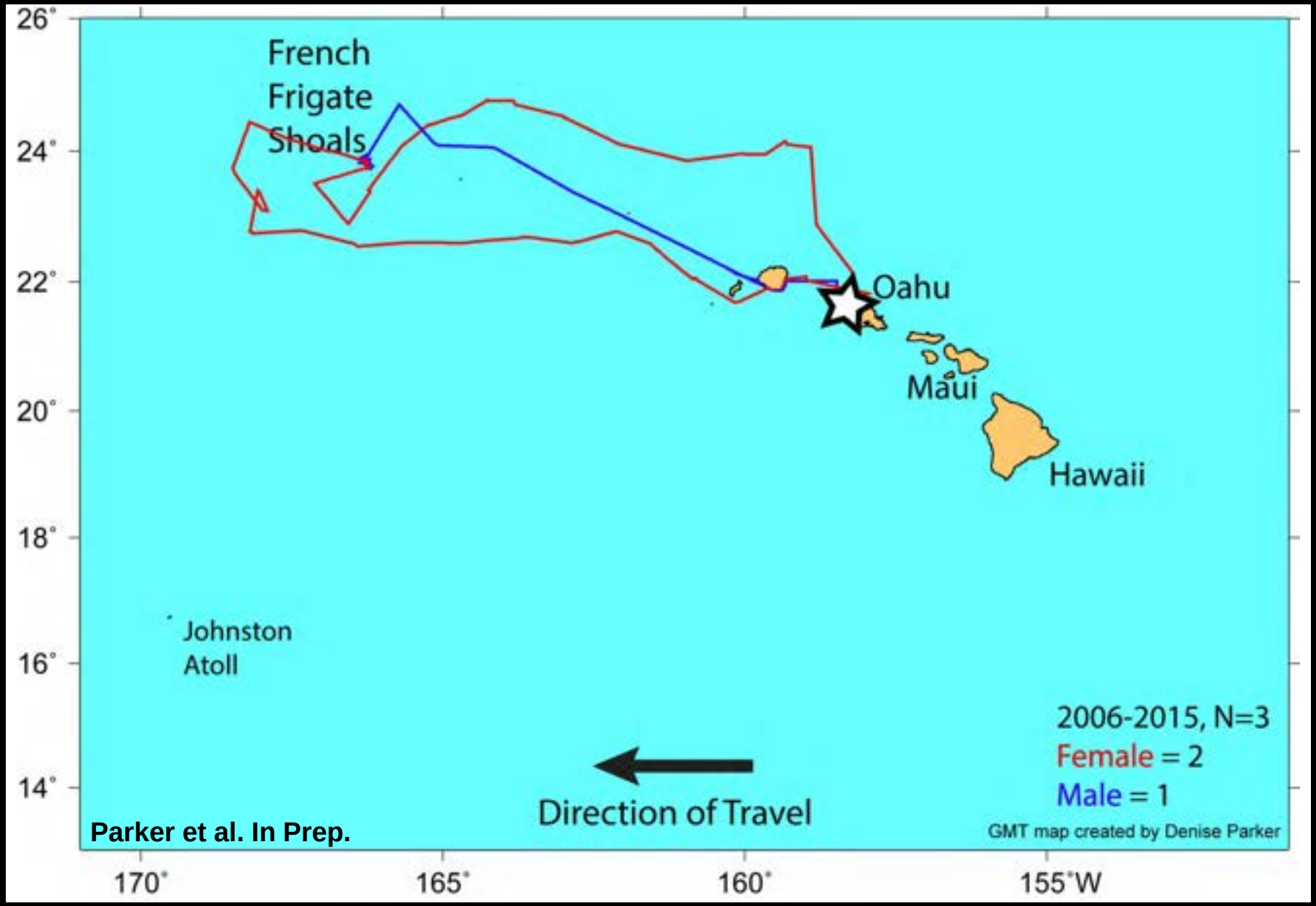
# Release

# Nesting ecology: satellite tracking

# Nesting ➡ Nearshore



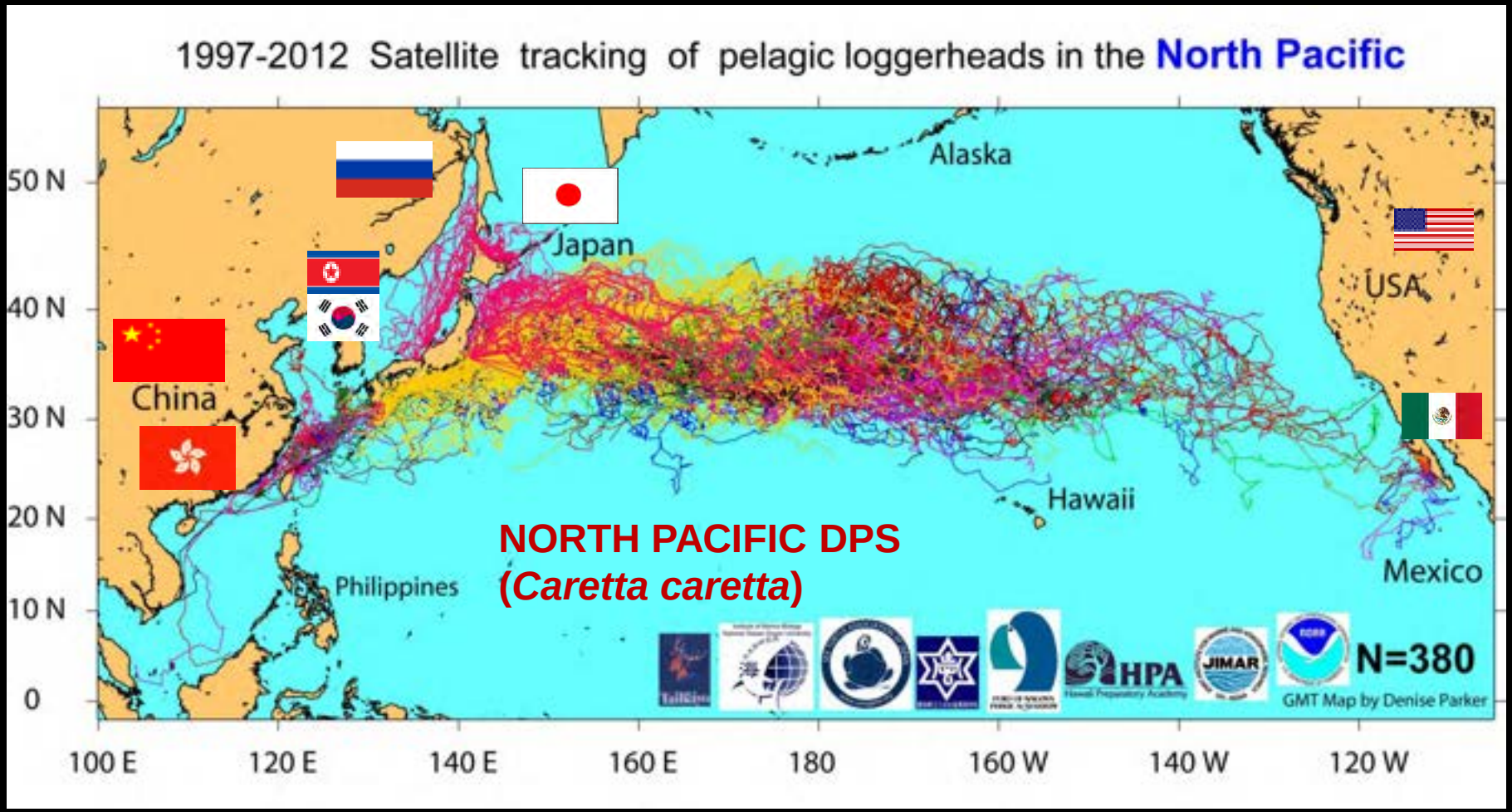
# Nearshore ➡ Nesting




Parker et al. In Prep.

# Pelagic Ecology

# Pelagic Ecology: Captive, Bycatch, and Nearshore

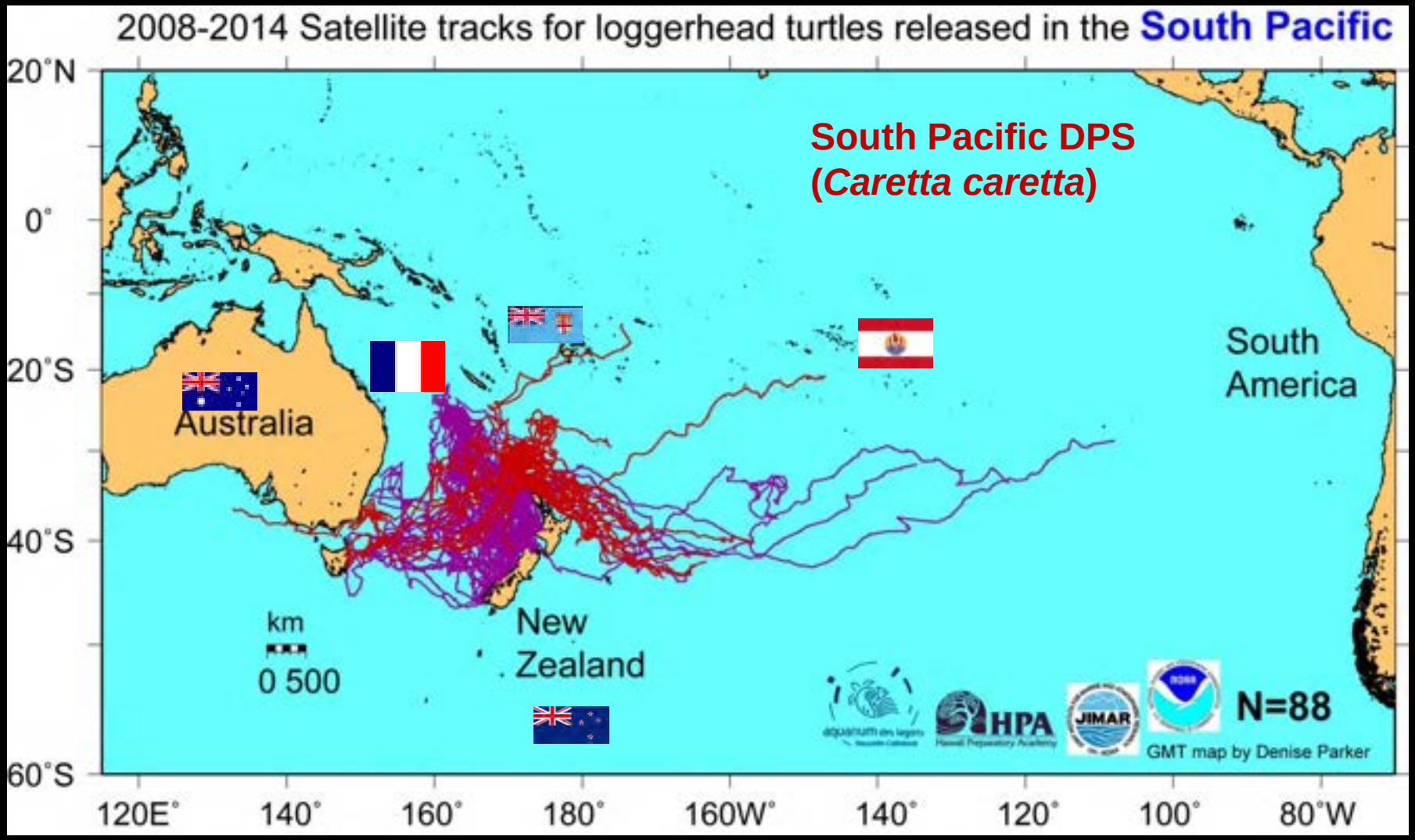



Publications (16 and 3 *in press*):


Kobayashi et al. 2008. Pelagic habitat characterization. J. Exp. Mar. Biol. Ecol. 356:96-114
Polovina et al. 2006. Kuroshio extension bifurcation region. Deep Sea Research 53(3-4):326-339
Polovina et al. 2000. Turtles on the edge. Fish. Oceanogr. 9:71-82
Howell et al. 2008. TurtleWatch Endang. Species Res. 5:267-278.


→ 215 citations

# Pelagic Ecology - Captive




Publications (1 and 2 *in press*):

Kobayashi et al. 2014. "Going with the flow" or not: evidence of positive rheotaxis. PLoS ONE 9(8): e103701

# Workshops & Summits


CHINA/USA Sea Turtle Workshop
NOAA CAFS USGS
Hawaii 2014


2015 International Summit on Fibropapillomatosis of Marine Turtles: Global Status, Trends, and Population Impacts
Hawaii
USGS
NIST
EXIT

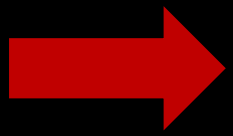
# Looking back, moving forward

## Successes:

- Established long-term data streams: nesting, nearshore, bycatch, stranding
- Data streams inform recovery efforts, fulfill ESA mandates
- Understand green turtle nesting abundance, trends in NWHI

## Challenges:

- Remote nesting sites in NWHI
- Expansive strandings sites in MHI
- Limited budget & staff for field efforts



Rely on:

- Monk seal field logistics (ships, remote camps)
- NWHI contractors
- Stranding contractors

## Future Goals:

- Additional NWHI nesting studies of demographic parameters, vital rates, productivity, nest conditions, spatio-temporal patterns, etc.
- Partner with universities & students to expand research capacity