

# SHIPS OF OPPORTUNITY

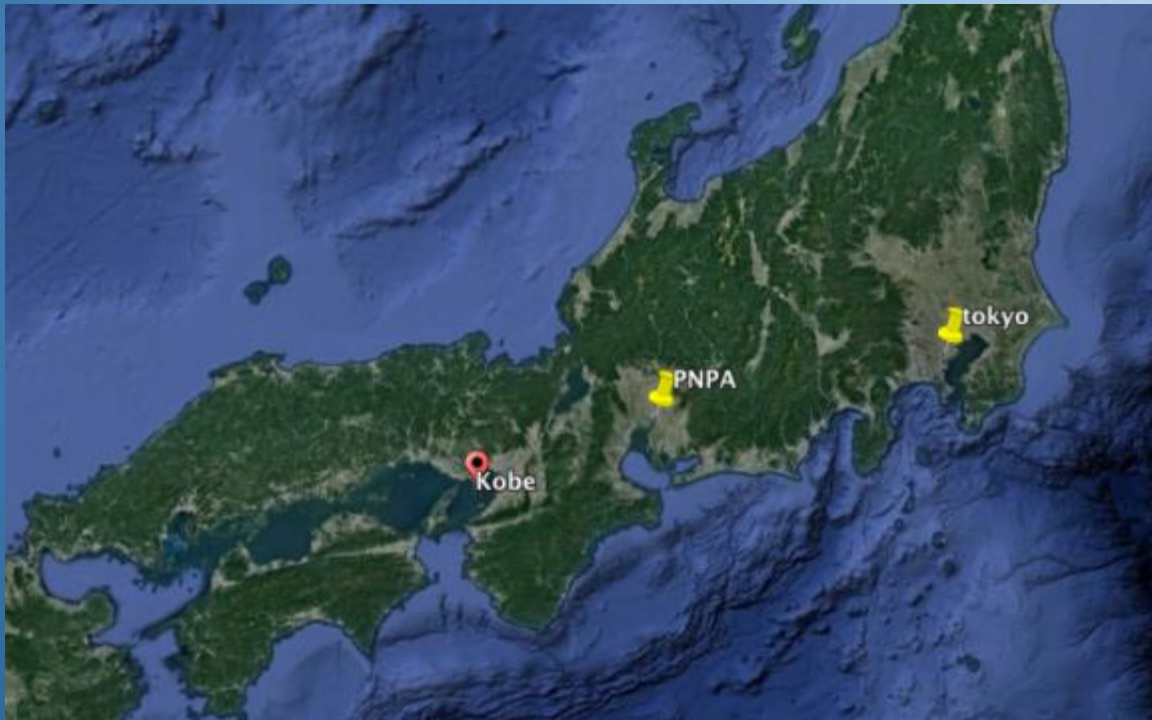
## RELEASING SATELLITE-TAGGED LITTLE LOGGERHEADS ON THE HIGH-SEAS TO STUDY THEIR PELAGIC ECOLOGY



Presented by George H. Balazs

# Obtaining Juvenile Loggerhead Study Animals

- North Pacific Population
  - Port of Nagoya Public Aquarium, Minoto-ku, Japan
  - Loggerhead hatchlings obtained from the aquarium's captive adult loggerheads were cared for and raised by the professional aquarium staff.





# Obtaining Juvenile Loggerhead Study Animals

- North Pacific Population
  - Port of Nagoya Public Aquarium, Minoto-ku, Japan





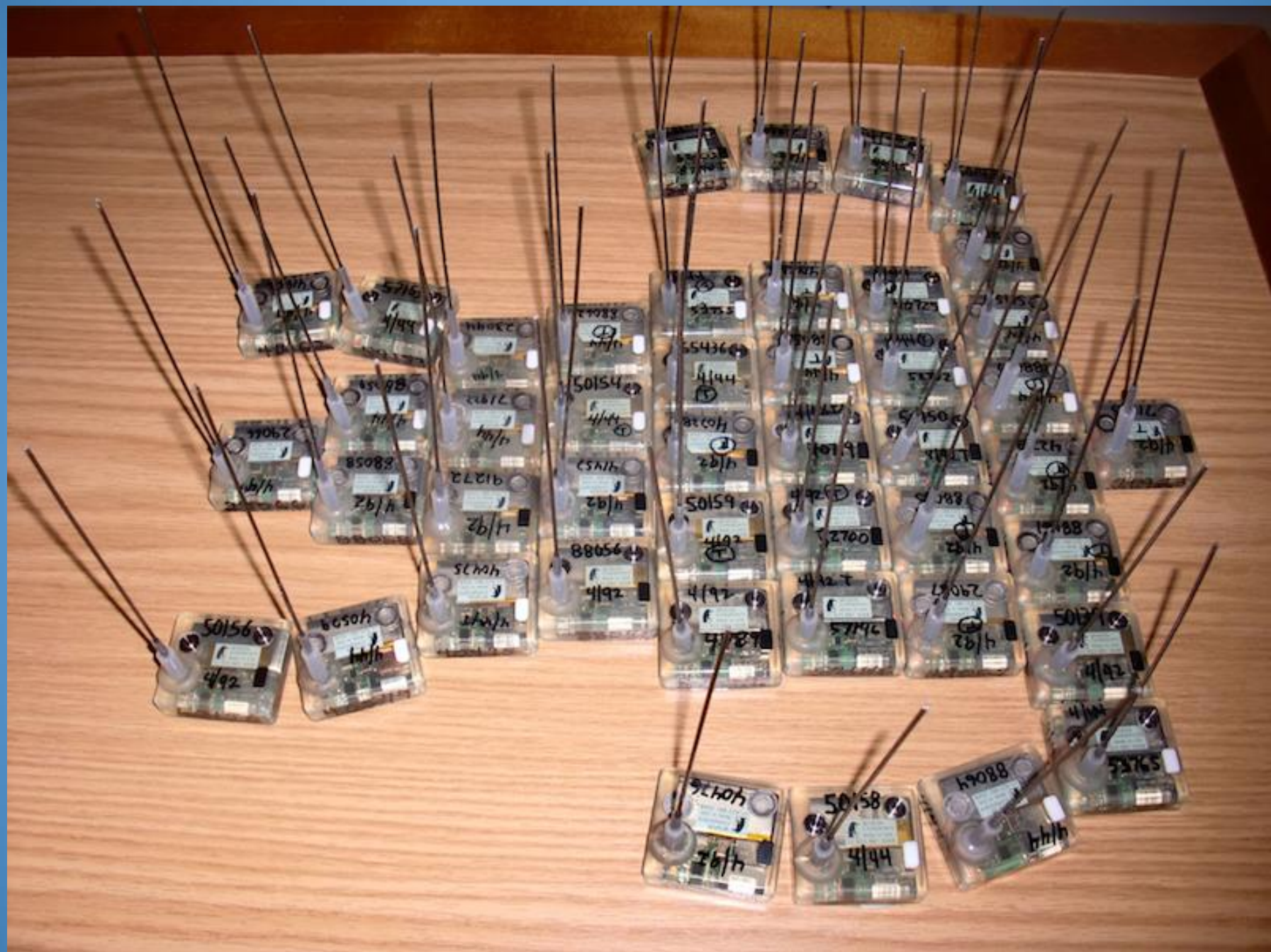














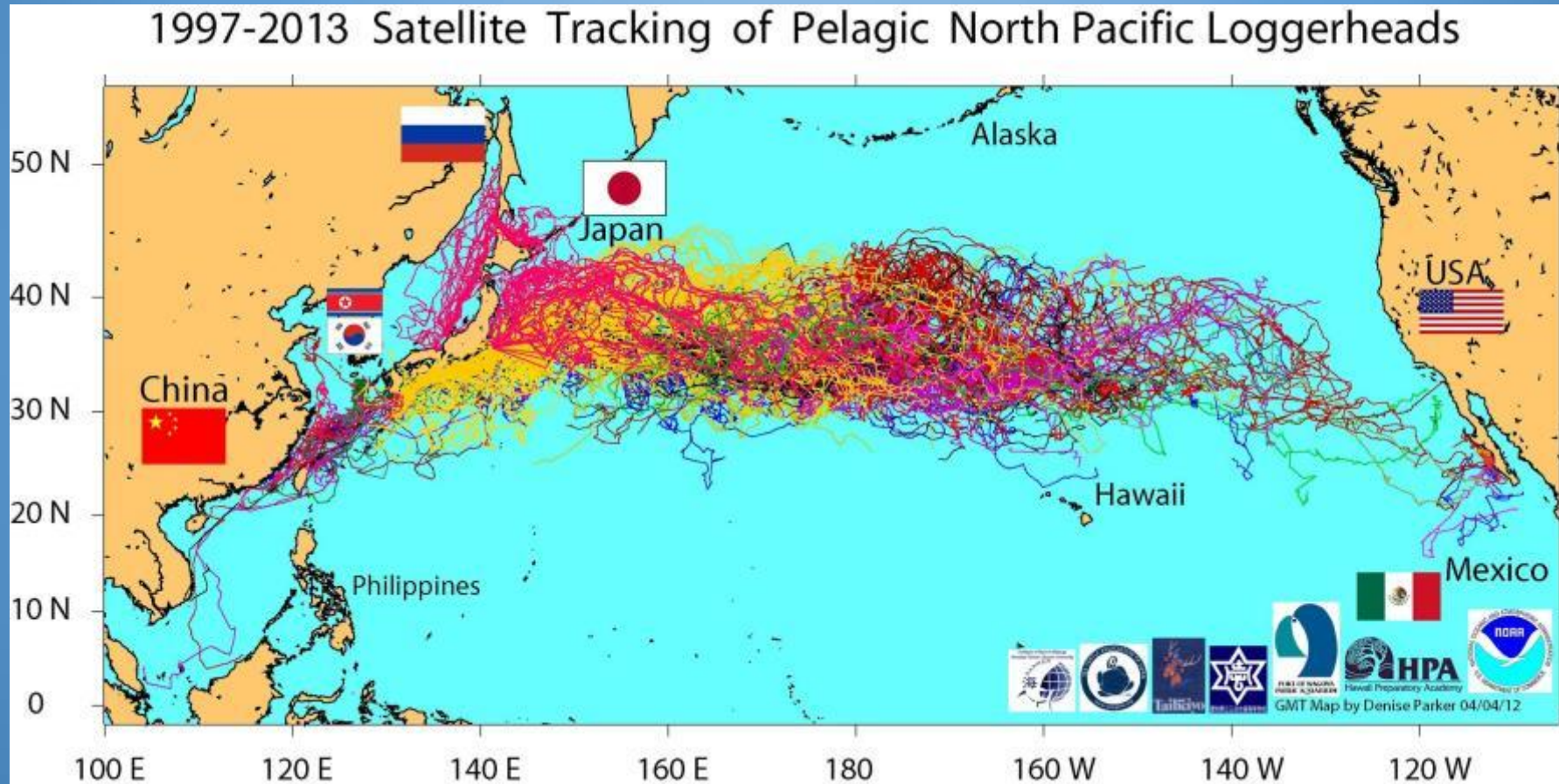








# NORTH PACIFIC LOGGERHEAD TRACKS 1997-2013



# Obtaining Juvenile Loggerhead Study Animals

- South Pacific Loggerheads
  - Aquarium des Lagons – Nouvelle-Calédonie



- Loggerhead hatchlings collected from nesting beaches in NC were raised in the aquarium for a period of 18 months to 2 years (25+ cm SCL).
- Care of the turtles was supervised by aquarium staffers and volunteers from the community helped to carry out the daily routine of feeding, cleaning and observation.





# Aquarium Director: Richard Farman



# AQUARIUM DES LAGONS Nouvelle-Calédonie





# AQUARIUM DES LAGONS Nouvelle-Calédonie



# Recently Completed Sea Turtle Display and Nesting Area













# Loggerhead turtles raised from hatchlings to 30 cm SCL



# Loggerhead turtles raised from hatchlings to 30 cm SCL





# Loggerhead turtles raised from hatchlings to 30 cm SCL







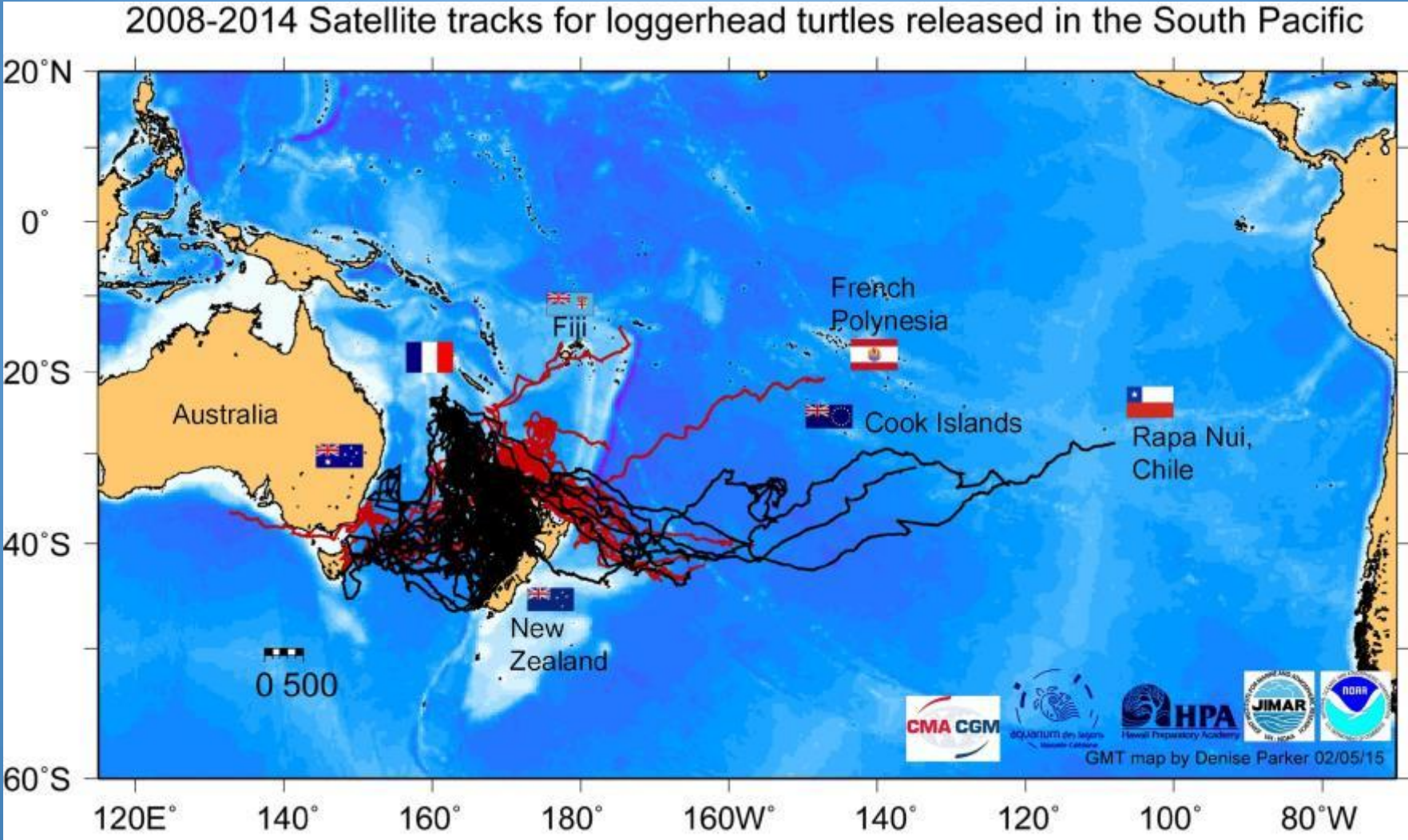


# SPOT5 Tags attached and ready to deploy

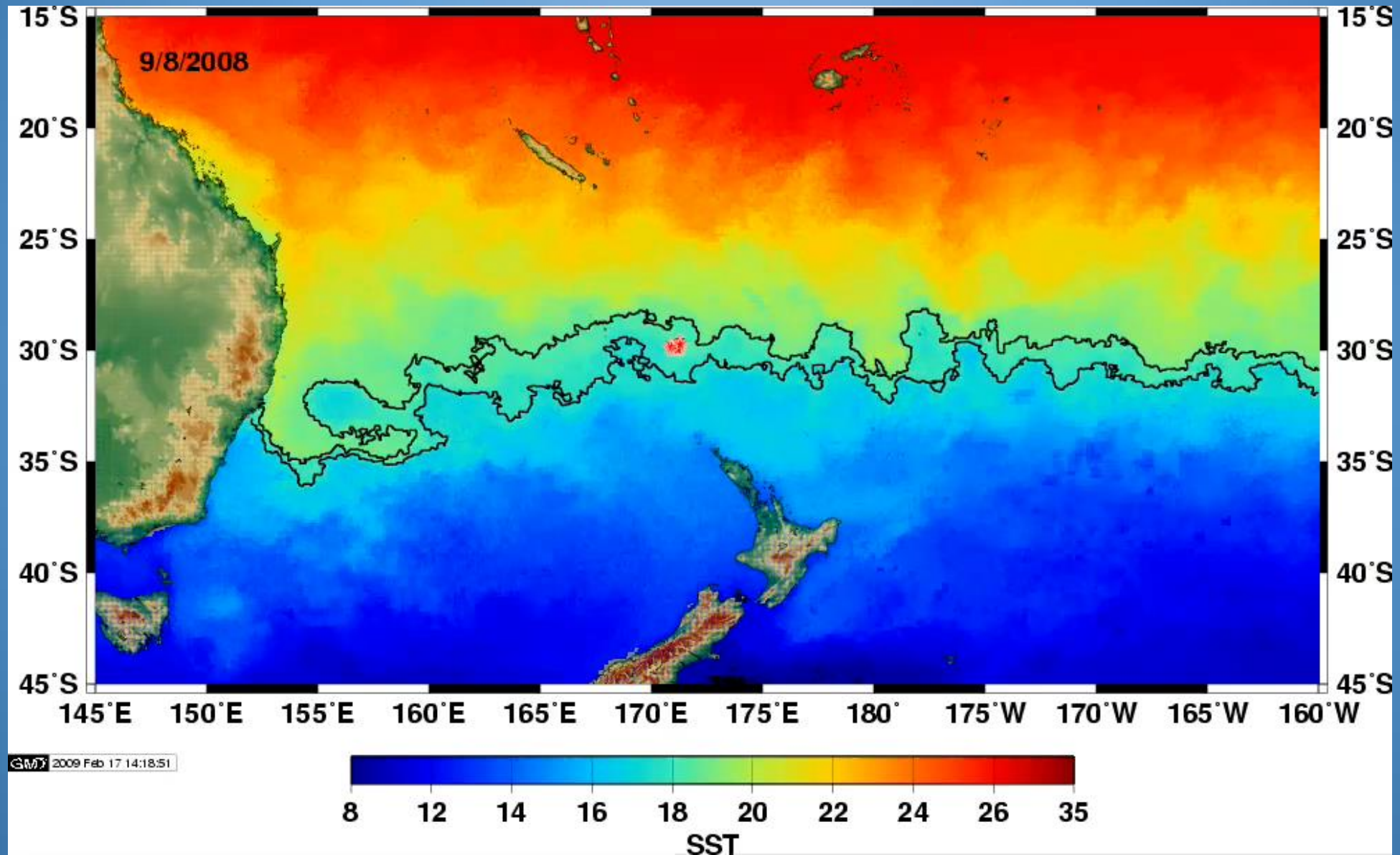




# South Pacific Tracks



# Animation by Donald Kobayashi





# Ships of Opportunity: Releasing Satellite-tagged Loggerheads on the High-seas to Study their Pelagic Ecology

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Life on the high-seas is one of the last great frontiers for sea turtle exploration, inquiry and discovery. In the Pacific ocean, significant progress has begun in understanding the ecology and genetic movements of juvenile pelagic loggerhead sea turtles and eastern hemisphere carrying animal genetic stocks derived from nesting beaches in Japan and New Caledonia/Australia respectively. Our advances in knowledge to-date have been made possible by the availability of smaller satellite-linked tracking tags and the enhanced security of U.S. Navy escorts on board military sailboats. We have overcome the immense challenge of directly capturing immature loggerheads on the high seas by substituting video-aquarium-reared turtles transported by ship for offshore release. We have also utilized turtle release as pelagic long line by-catch that was by-catch and released by trained dolphin observers. Turtles incidentally taken in offshore commercial pond net-seining pelagic fish have also contributed to our international research partnership program.



Above is the Port of Nagoya Public Aquarium and below is Aquarium des Lagons where loggerhead turtles have been used and used in these satellite tracking studies.



An array of SPOT5 satellite tags prior to their attachment to juvenile loggerhead turtles at Aquarium des Lagons, Nouvelle Calédonie.

From 1997-2012, 523 loggerheads with satellite tags have been released, 374 of which were aquarium reared involving 14 deployments after 2003 from eight different ships, including fishery training vessels, cargo vessels, a passenger liner, a French Navy ship and a whale-watching tour boat. Eighty-eight turtles from the New Caledonia 'Aquarium des Lagons' were released south of the equator, and 286 from the Port of Nagoya Public Aquarium (Japan) were released in northern latitudes. Carapace lengths ranged from 23-75 cm. Deployment locations included: the Kuroshio Current off Japan (30-35N, 131-141E); the Sea of Japan (37N, 136E); midway between Japan and Hawaii (33N, 176E); midway between New Caledonia and New Zealand (30S, 171E); and 200 nmi southeast of New Caledonia (25S, 167E). Tracking lasted up to 3434 days in the northern hemisphere and 764 days in southern latitudes. Maximum distance traveled by a northern-stock turtle was 25,900 km and 15,290 km for a southern-stock turtle. Detailed findings to date of our pelagic loggerhead investigations are presented in 12 journal publications available at: <http://akepa.jpia.edu/~mrice/spot/Pelagic.html>.



Above are four of the ships that we have used to deploy some of the 374 juvenile loggerheads raised at the Port of Nagoya Public Aquarium, Japan and the Aquarium des Lagons, Nouvelle Calédonie. From left to right top to bottom, French cargo ship (New Caledonia), Japanese Fisheries training vessel, Japanese whale watching vessel and a Japanese Taiheiyō Ferry. Additional vessels that have been used are a French Navy vessel, Japanese deep sea crab fishing vessel, and a Singapore cargo ship.



Six satellite tagged juvenile loggerheads are ready for transport one of our Ships of Opportunity and release into the open ocean.

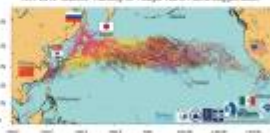
## Three overall conclusions can be drawn from the success of our work:

- 1) International partnerships of mutual understanding, trust and goodwill are essential to study sea turtle populations that span an ocean basin;
- 2) Aquarium-reared loggerheads released into appropriate high-seas habitats are acceptable replacements for the research of wild-captured turtles; and
- 3) our voluminous archive of tracking data constitutes a significant resource for new analytical approaches involving collaboration.



Two of the ways we released satellite tagged juvenile loggerheads: on the left 48 juveniles are released from a cargo ship southwest of New Caledonia and on the right juveniles are released off the west coast of Japan.

1997-2011 Satellite Tracking of Pelagic North Pacific Loggerheads



Satellite tracks of juvenile loggerheads raised at the Port of Nagoya Public Aquarium, Japan and released into the North Pacific Ocean.

2000-2014 Satellite tracks for loggerhead turtles released in the South Pacific



Satellite tracks of juvenile loggerheads raised at Aquarium des Lagons, Nouvelle Calédonie and released into the South Pacific Ocean.



Taiheiyō Ferry



SPOT5

# A note about releasing these turtles

- Releasing Juveniles into an environment where they would normally be located-pelagic- (not from shore)
- Need some way to safely and humanely transport the juveniles to an offshore location
- Select a method of releasing them safely
- At what cost? Finding cooperating partners that will donate ship space and time to the release



# French Navy Ship















# In Japan we used an array of vessels



# Japanese Fisheries School Training Vessel











# Deep Sea Crab Fishing Boat – Sea of Japan













# Taihyo Ferry – Tokyo to Sendai









# Whale Watching Tourist Boat













17 PUBLICATIONS RESULTING FROM THE PELAGIC  
LOGGERHEAD TRACKING PROJECT-and counting

# Cooperating Entities

