

# A Hotspot for Juvenile Loggerhead Turtles: the Kuroshio Extension Current Bifurcation Region



# Pelagic research of North Pacific loggerhead turtles in partnership with Japan and Taiwan



第15回日本ウミガメ会議（津屋崎会議） 2004年11月12～14日



**Partnership**

# Turtles on the edge: movement of loggerhead turtles (*Caretta caretta*) along oceanic fronts, spanning longline fishing grounds in the central North Pacific, 1997-1998

JEFFREY J. POLOVINA,<sup>1,\*</sup> DONALD R. KOBAYASHI,<sup>1</sup> DENISE M. PARKER,<sup>2</sup>  
MICHAEL P. SEKI<sup>1</sup> AND GEORGE H. BALAZS<sup>1</sup>

<sup>1</sup>Honolulu Laboratory, Southwest Fisheries Science Center, National Marine Fisheries Service, NOAA, 2570 Dole Street, Honolulu, Hawaii, USA 96822-2396

<sup>2</sup>Joint Institute for Marine and Atmospheric Research, University of Hawaii, 1000 Pope Road, Honolulu, Hawaii, USA 96822

---

**Dive-depth distribution of loggerhead (*Carretta carretta*)  
and olive ridley (*Lepidochelys olivacea*) sea turtles in the central North Pacific:  
Might deep longline sets catch fewer turtles?**

**Jeffrey J. Polovina**

Honolulu Laboratory  
Southwest Fisheries Science Center  
National Marine Fisheries Service, NOAA  
2570 Dole Street  
Honolulu, Hawaii 96822-2396  
E-mail address: Jeffrey.Polovina@noaa.gov

**Evan Howell**

**Denise M. Parker**

Joint Institute for Marine and Atmospheric Research  
University of Hawaii  
1000 Pope Road  
Honolulu, Hawaii 96822

**George H. Balazs**

Honolulu Laboratory  
Southwest Fisheries Science Center  
National Marine Fisheries Service, NOAA  
2570 Dole Street  
Honolulu, Hawaii 96822-2396

---

---

Vol. 280: 285–293, 2004

MARINE ECOLOGY PROGRESS SERIES  
Mar Ecol Prog Ser

Published October 14

---

---

# **Modelling post-release mortality of loggerhead sea turtles exposed to the Hawaii-based pelagic longline fishery**

**Milani Chaloupka<sup>1,\*</sup>, Denise Parker<sup>2</sup>, George Balazs<sup>3</sup>**

<sup>1</sup>Ecological Modelling Services Pty Ltd, PO Box 6150, University of Queensland, St Lucia, Queensland 4067, Australia

<sup>2</sup>Joint Institute for Marine and Atmospheric Research, 8604 La Jolla Shores Drive, La Jolla, California 92037-0271, USA

<sup>3</sup>National Marine Fisheries Service, Pacific Islands Fisheries Science Center, 2570 Dole Street, Honolulu, Hawaii 96822-2396, USA

**Abstract**—Diet analysis of 52 loggerhead sea turtles (*Caretta caretta*) collected as bycatch from 1990 to 1992 in the high-seas driftnet fishery operating between lat. 29.5°N and 43°N and between long. 150°E and 154°W demonstrated that these turtles fed predominately at the surface; few deeper water prey items were present in their stomachs. The turtles ranged in size from 13.5 to 74.0 cm curved carapace length. Whole turtles ( $n=10$ ) and excised stomachs ( $n=42$ ) were frozen and transported to a laboratory for analysis of major faunal components. Neustonic species accounted for four of the five most common prey taxa. The most common prey items were *Janthina* spp. (Gastropoda); *Carinaria cithara* Benson 1835 (Heteropoda); a chondrophore, *Velella velella* (Hydrodia); *Lepas* spp. (Cirripedia), *Planes* spp. (Decapoda: Grapsidae), and pyrosomas (*Pyrosoma* spp.).

## **Diet of oceanic loggerhead sea turtles (*Caretta caretta*) in the central North Pacific**

### **Denise M. Parker**

Joint Institute for Marine and Atmospheric Research  
8604 La Jolla Shores Drive  
La Jolla, California 92037  
Present address: Northwest Fisheries Science Center  
National Marine Fisheries Service, NOAA  
Newport, Oregon 97365-5275

E-mail address: Denise.Parker@noaa.gov

### **William J. Cooke**

AECOS, Inc.  
970 N. Kalaheo Avenue, Suite C311  
Kailua, Hawaii 96734

### **George H. Balazs**

Pacific Islands Fisheries Science Center, Honolulu Laboratory  
National Marine Fisheries Service  
2570 Dole Street  
Honolulu, Hawaii 96822-2396

# Forage and migration habitat of loggerhead (*Caretta caretta*) and olive ridley (*Lepidochelys olivacea*) sea turtles in the central North Pacific Ocean

JEFFREY J. POLOVINA,<sup>1</sup> GEORGE H. BALAZS,<sup>1</sup> EVAN A. HOWELL,<sup>1</sup> DENISE M. PARKER,<sup>2</sup>  
MICHAEL P. SEKI<sup>1</sup> AND PETER H. DUTTON<sup>3</sup>

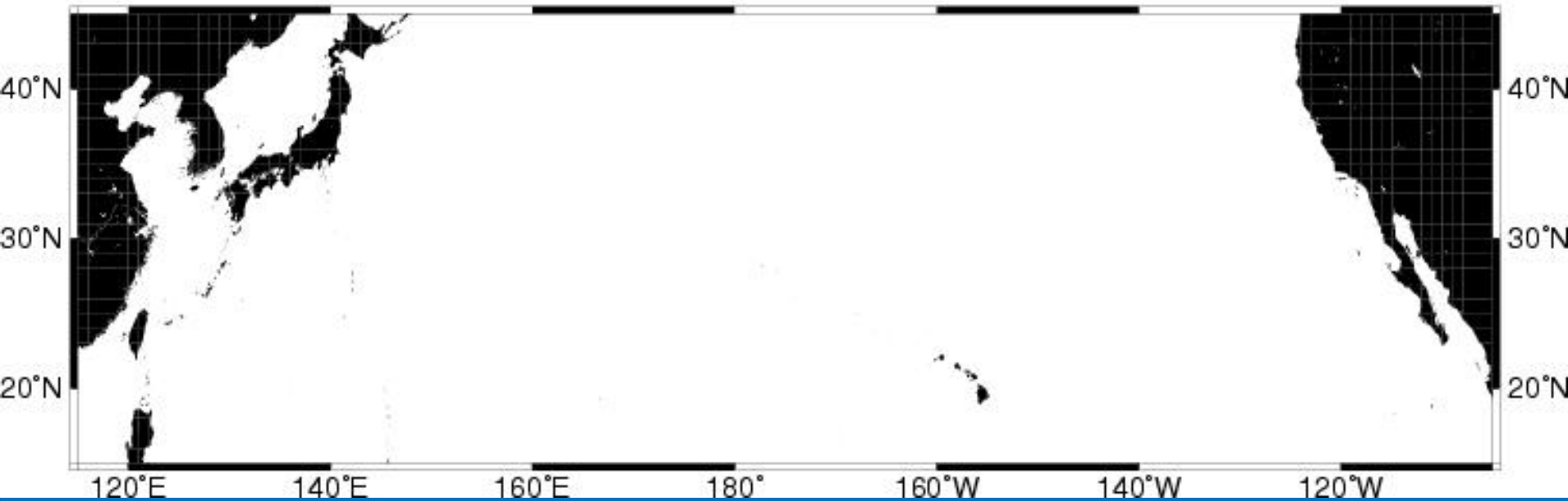
<sup>1</sup>Pacific Islands Fisheries Science Center, National Marine Fisheries Service, NOAA, 2570 Dole Street, Honolulu, HI 96822-2396, USA

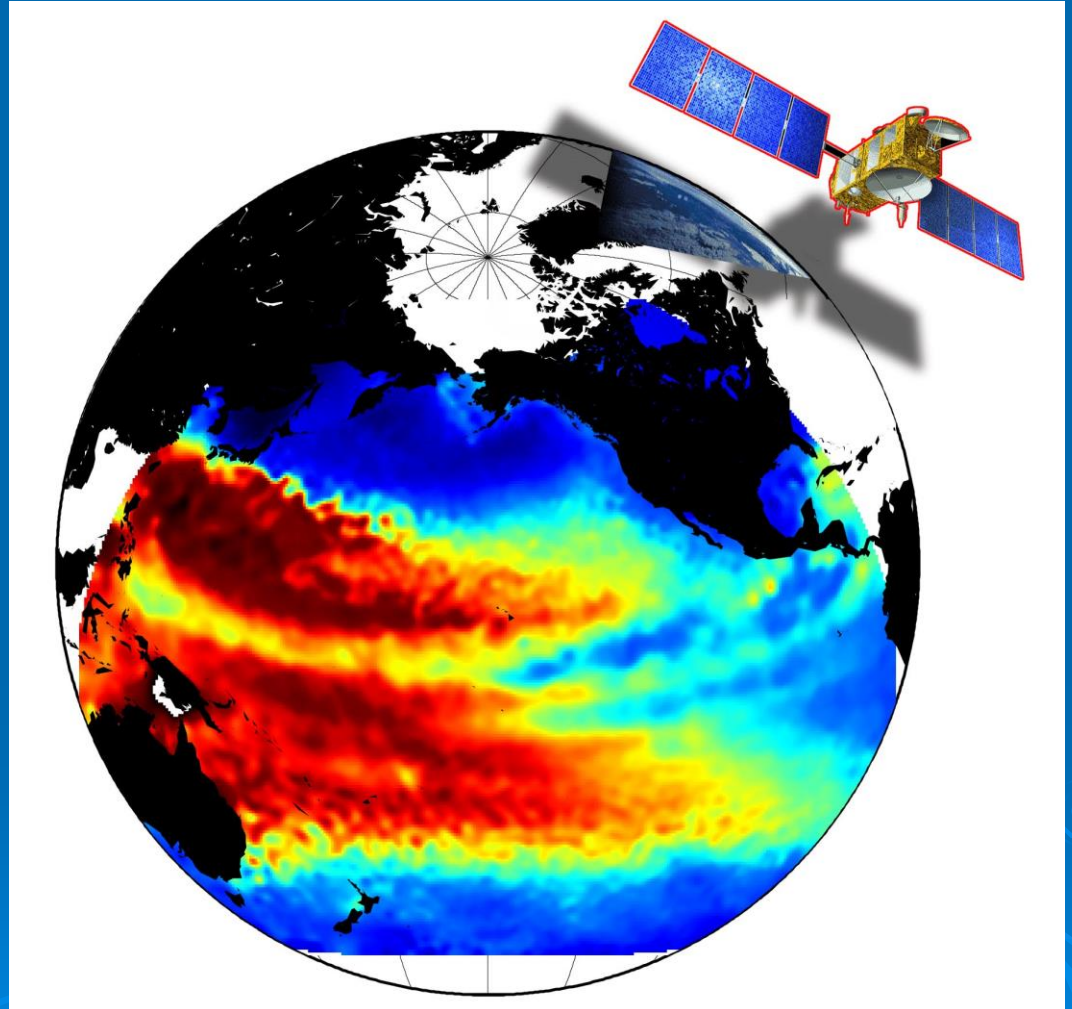
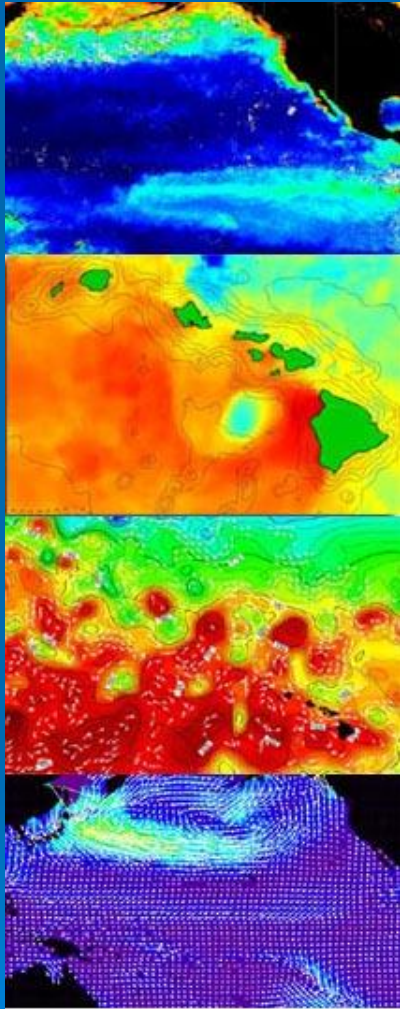
<sup>2</sup>Joint Institute for Marine and Atmospheric Research, University of Hawaii, 8604 La Jolla Shores Dr., La Jolla, CA 92037, USA

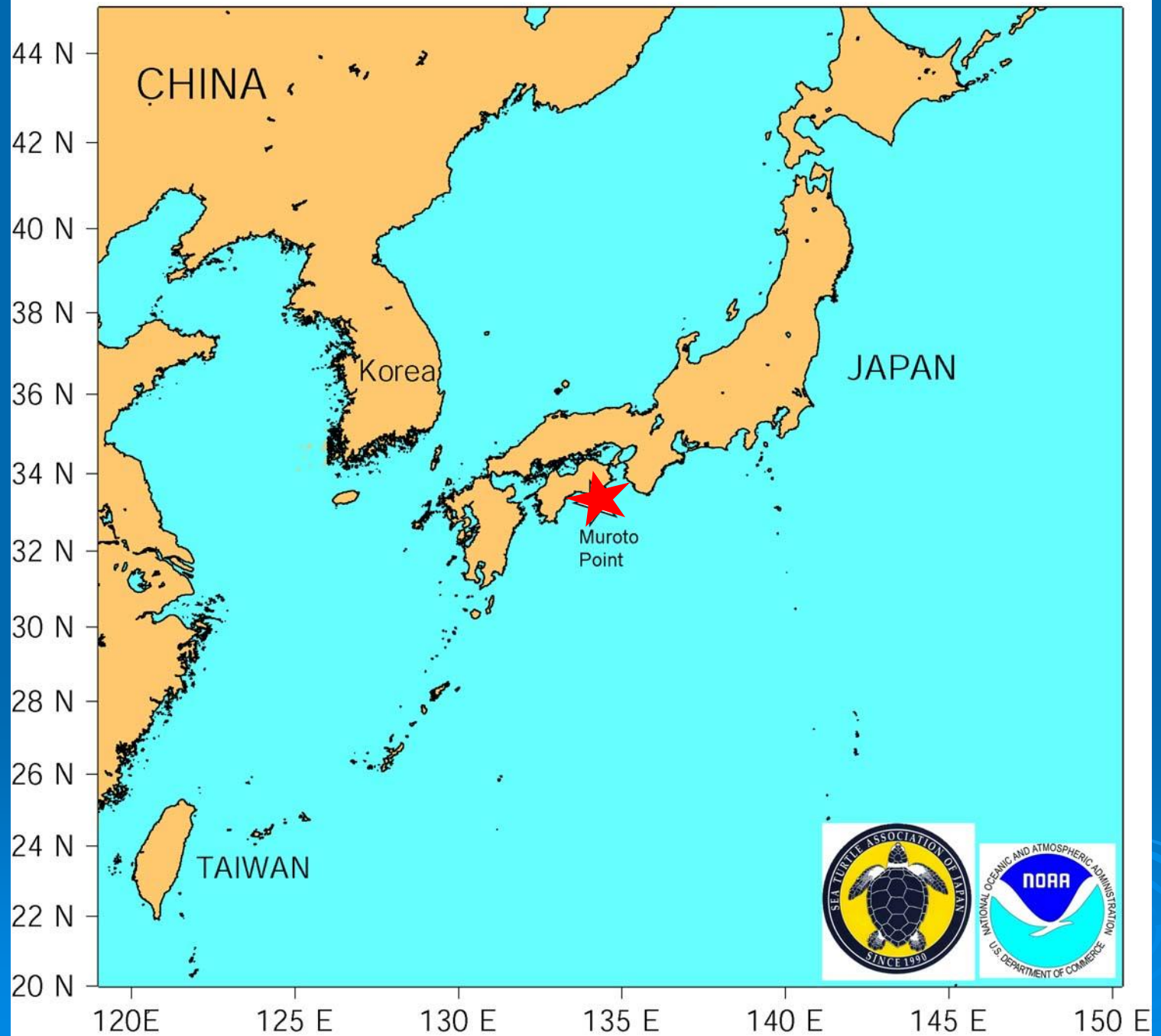
<sup>3</sup>Southwest Fisheries Science Center, National Marine Fisheries Service, NOAA, 8604 La Jolla Shores Dr., La Jolla, CA 92037, USA



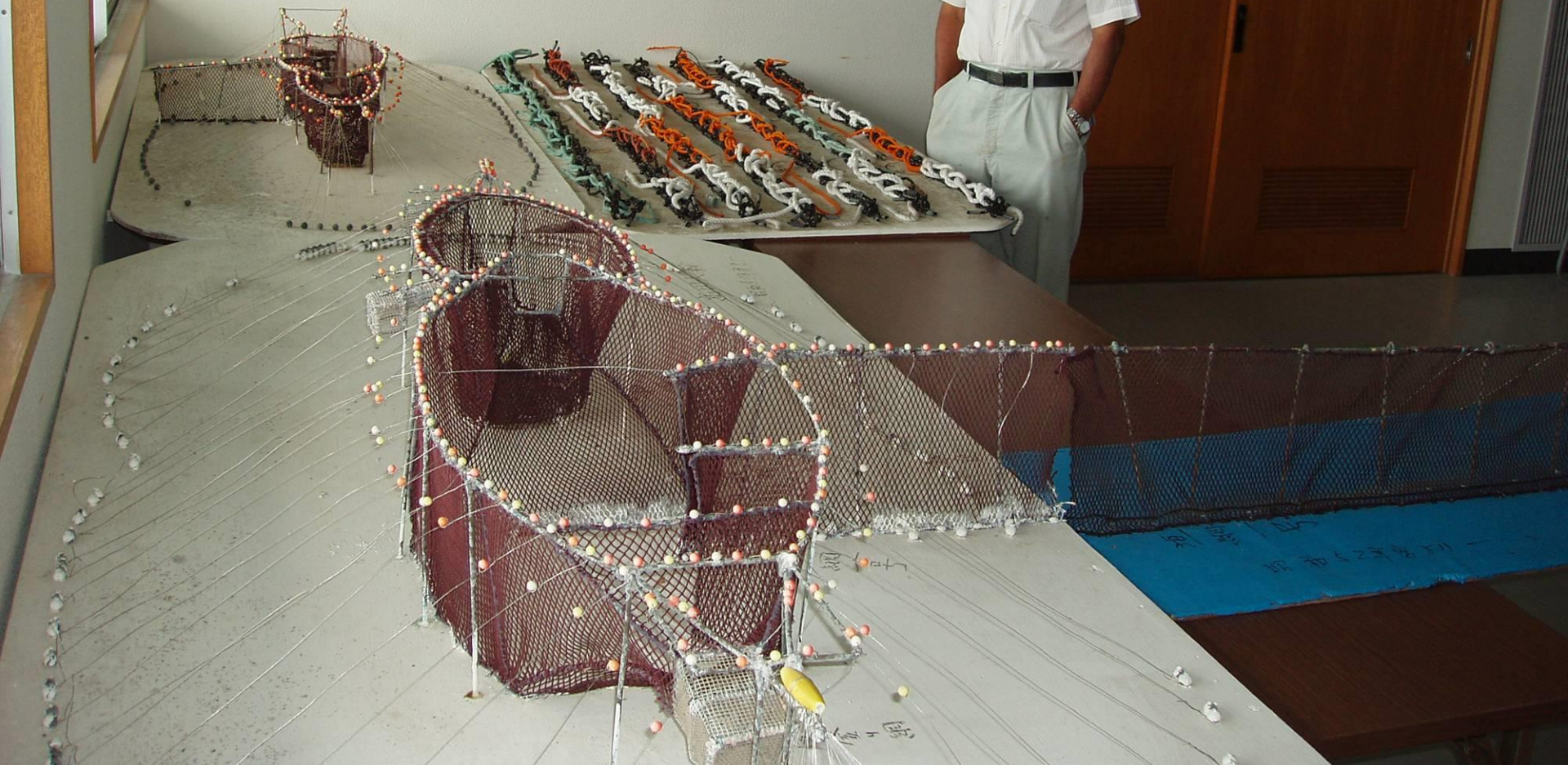
### Satellite tracking of 67 tagged loggerhead sea turtles















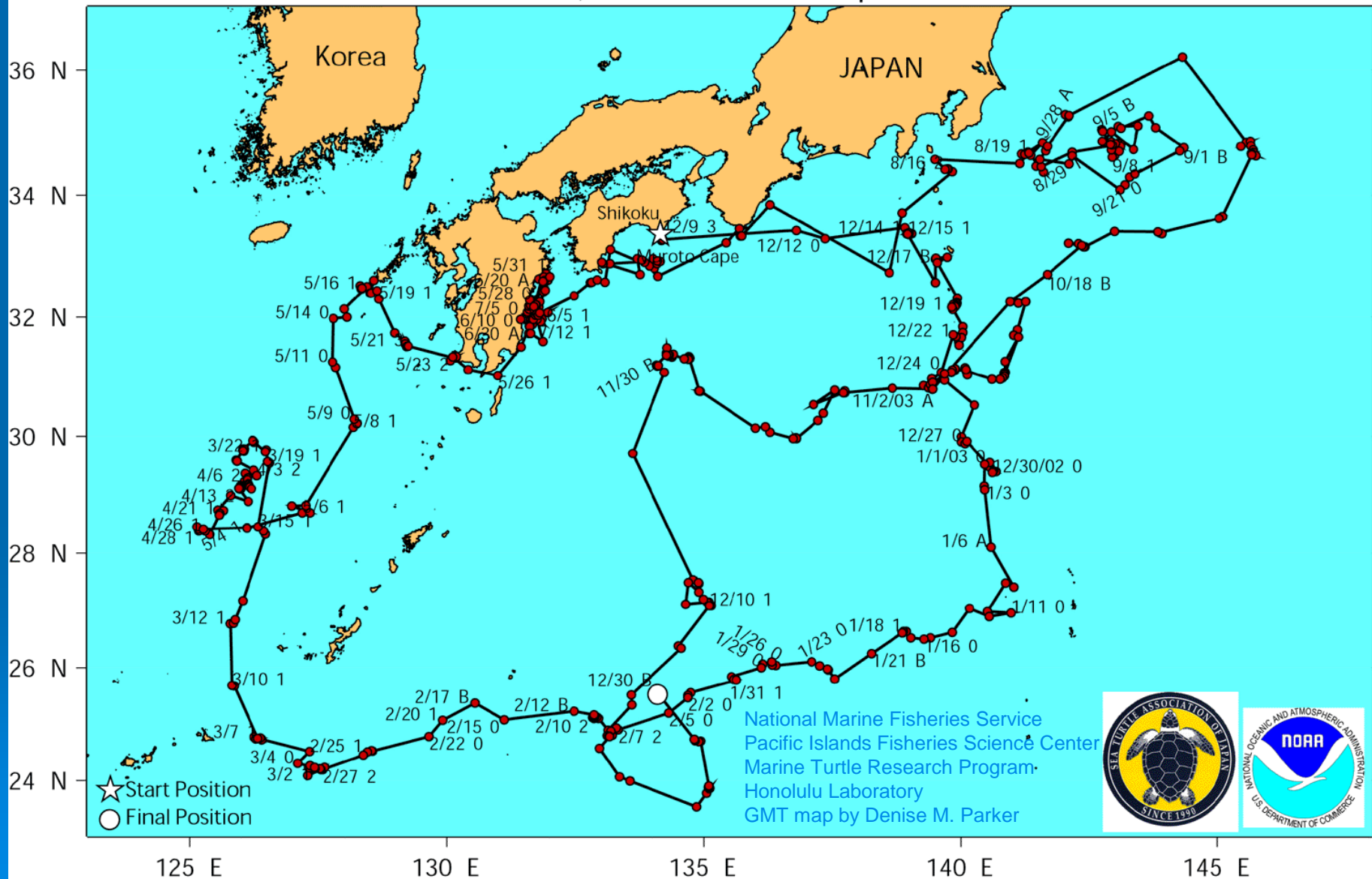
# FINAL MAP:

2002-2003 Movement of Coastal Net By-catch Male Loggerhead turtle 22168

ST-18 Duty Cycle: 12 hours on, 48 hours off SCL: 76.5 cm

from Kochi Prefecture, Shikoku, Japan Days Transmitting: 386 days

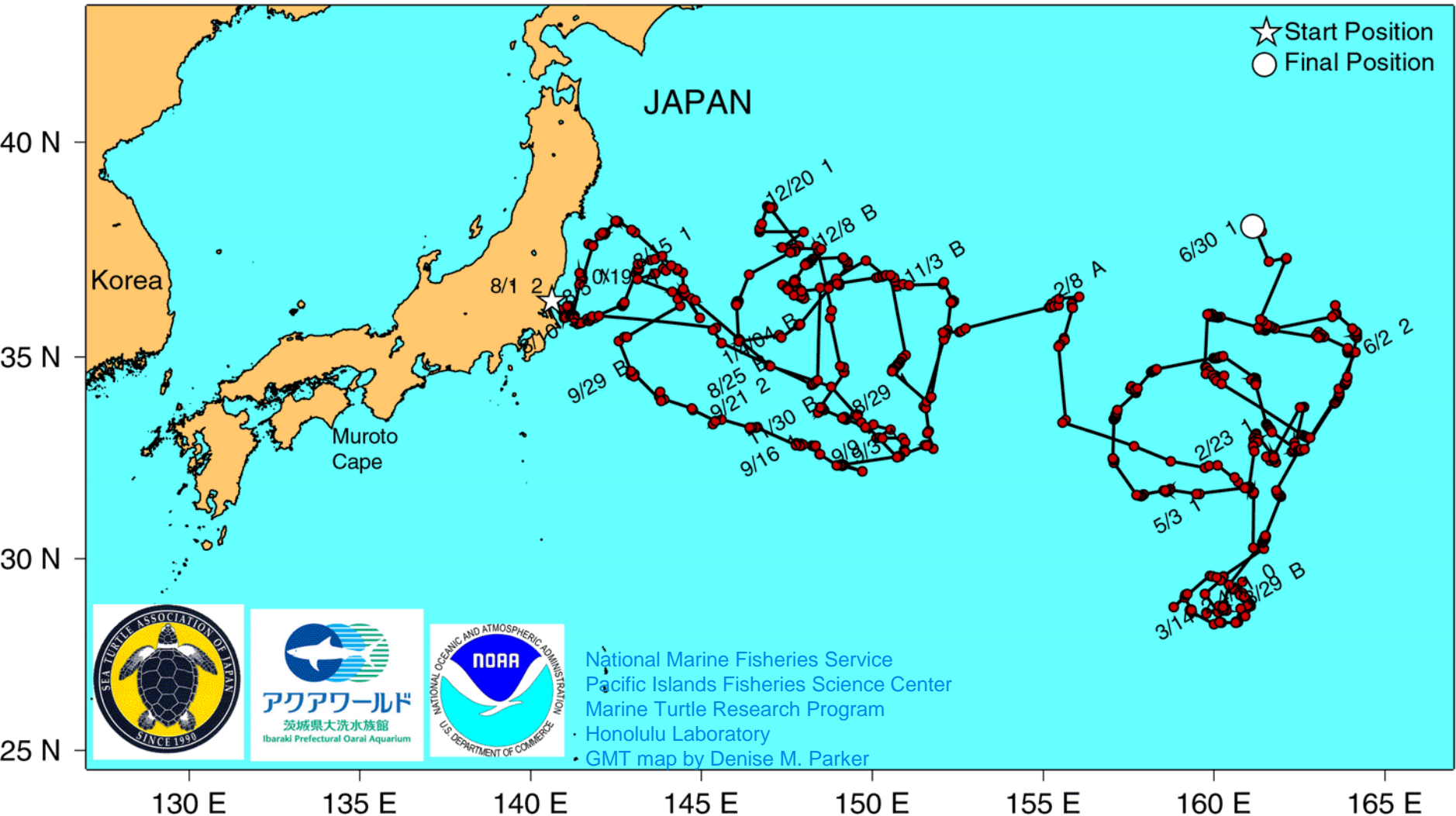
Distance Traveled: 11, 333 km Mean Speed of Travel: 1.2 km/hr

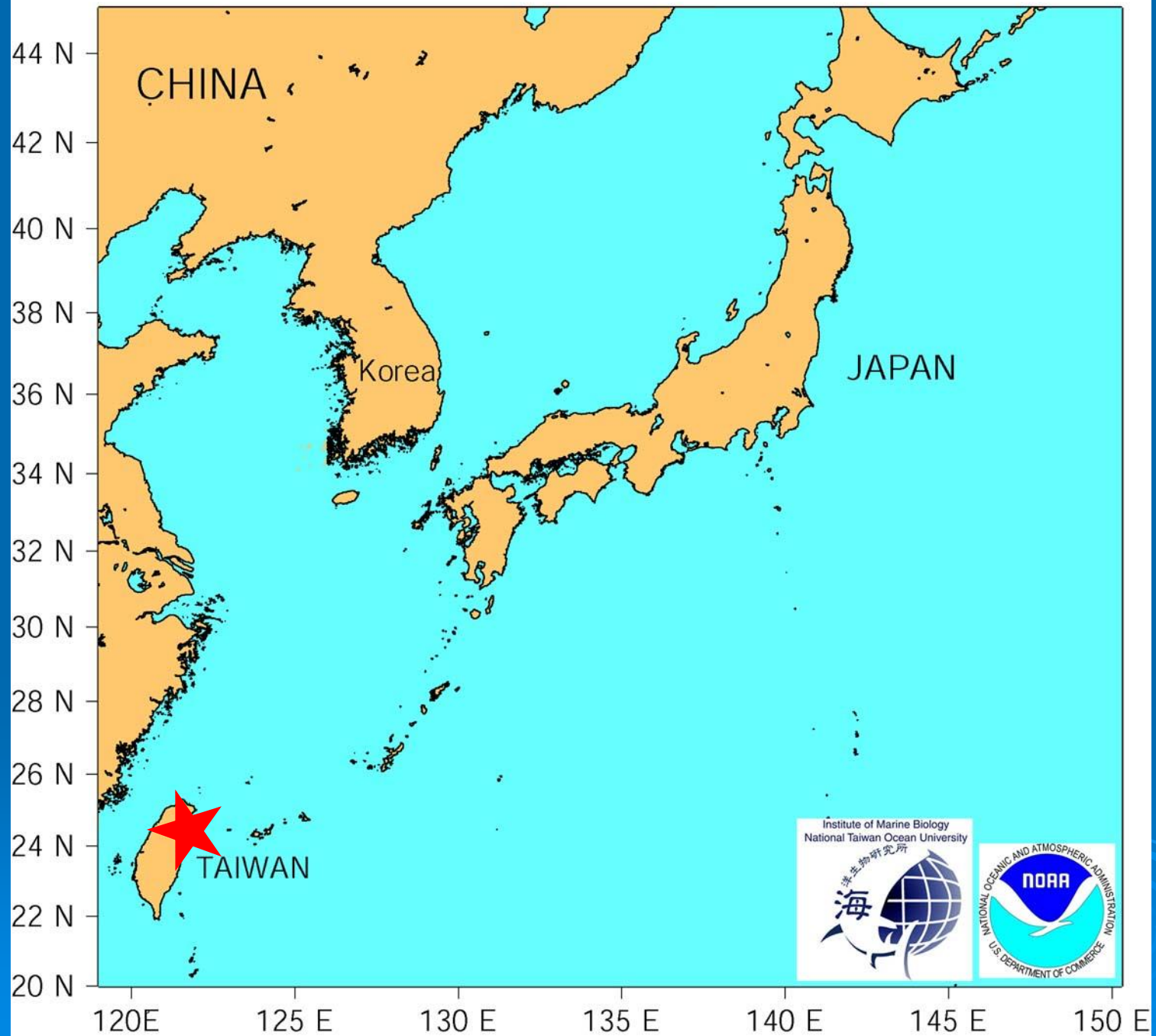




# Final Map:

2003-2004 movement of Coastal Net By-catch Loggerhead turtle 29060 from Ibaragi, Japan  
ST-18 Duty Cycle: 12 hours on, 48 hours off SCL: 68.1 cm  
Days Transmitting: 336 days Distance Traveled: 14,579 km Mean Speed of Travel: 1.8 km/hr









HAWAII

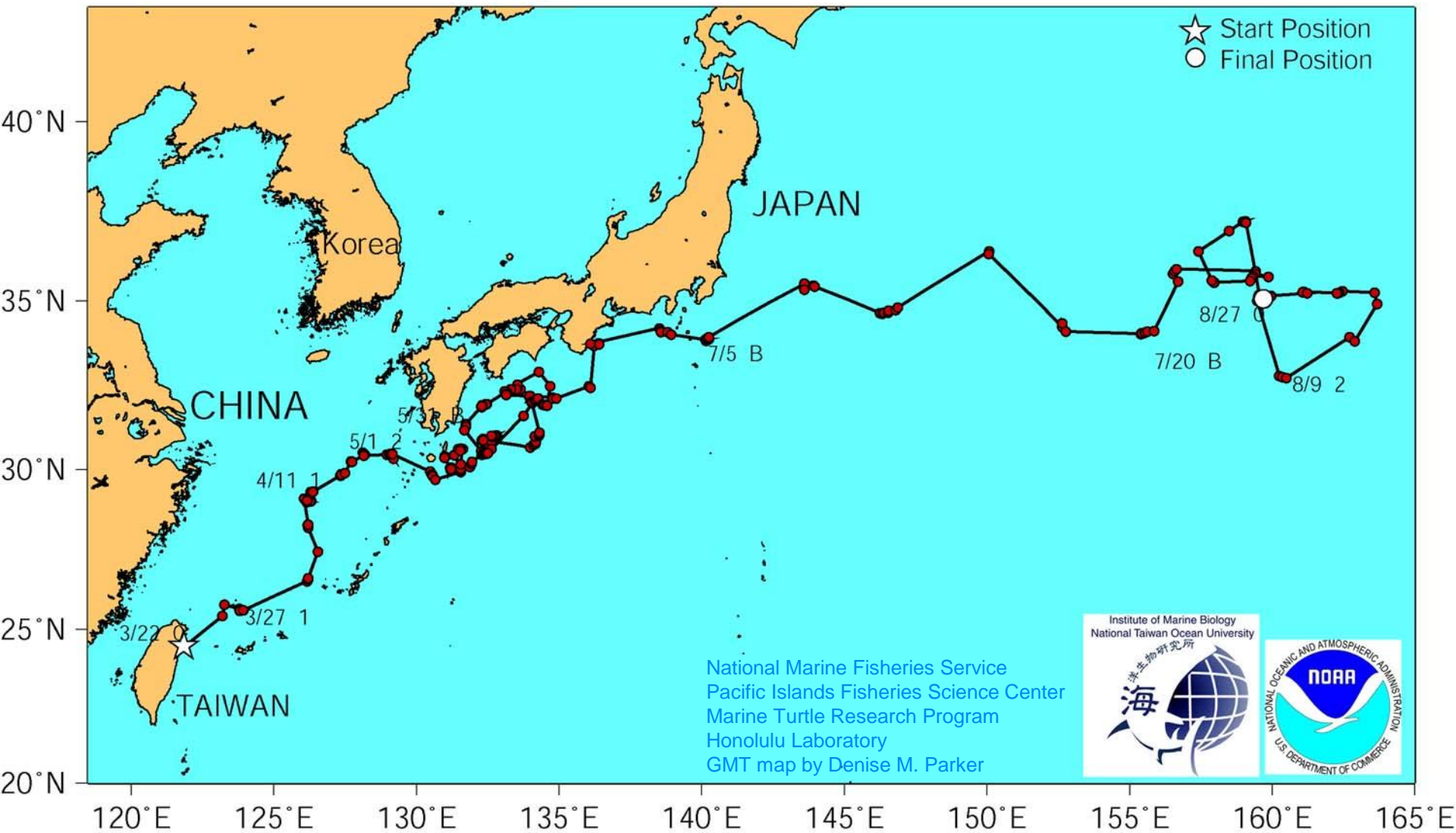




RZ-5927

# Final Map:

2004 movement of Coastal Net By-catch Loggerhead 22981  
ST-18 Duty cycle: 12 hours on, 48 hours off SCL: 74.0 cm  
Days Transmitting: 158 days Distance Traveled: 7754 km  
Mean Speed of Travel: 2.0 km/hr





NATIONAL MARINE  
FISHERIES SERVICE  
MARSHALL ISLANDS

FISHING FOR  
LIFE



「いしかり」フェリー・オブ・ザ・イヤー  
92-02 11年連続受賞

おかげさまで「いしかり」は、  
船旅専門誌「クルーズ」の  
「読者が選ぶフェリー・オブ・  
ザ・イヤー」を11年連続受賞

NAGOYA

SENDAI

TOMAKOMAI

# 名古屋 ≡ 仙台 ≡ 苫小牧

TOMAKOMAI

ゆとり・優雅・安い船旅

SENDAI

NAGOYA



運賃

平成15年4月1日～7月17日 / 8月25日～平成16年3月31日

ご予約は2ヶ月前から

## 名古屋

隔日運航	翌日
20:00発	17:00着
翌日	隔日運航
09:20着	12:20発

## 仙台

毎日運航	翌日
20:00発	10:45着
翌日	毎日運航
09:20着	19:00発

## 苫小牧









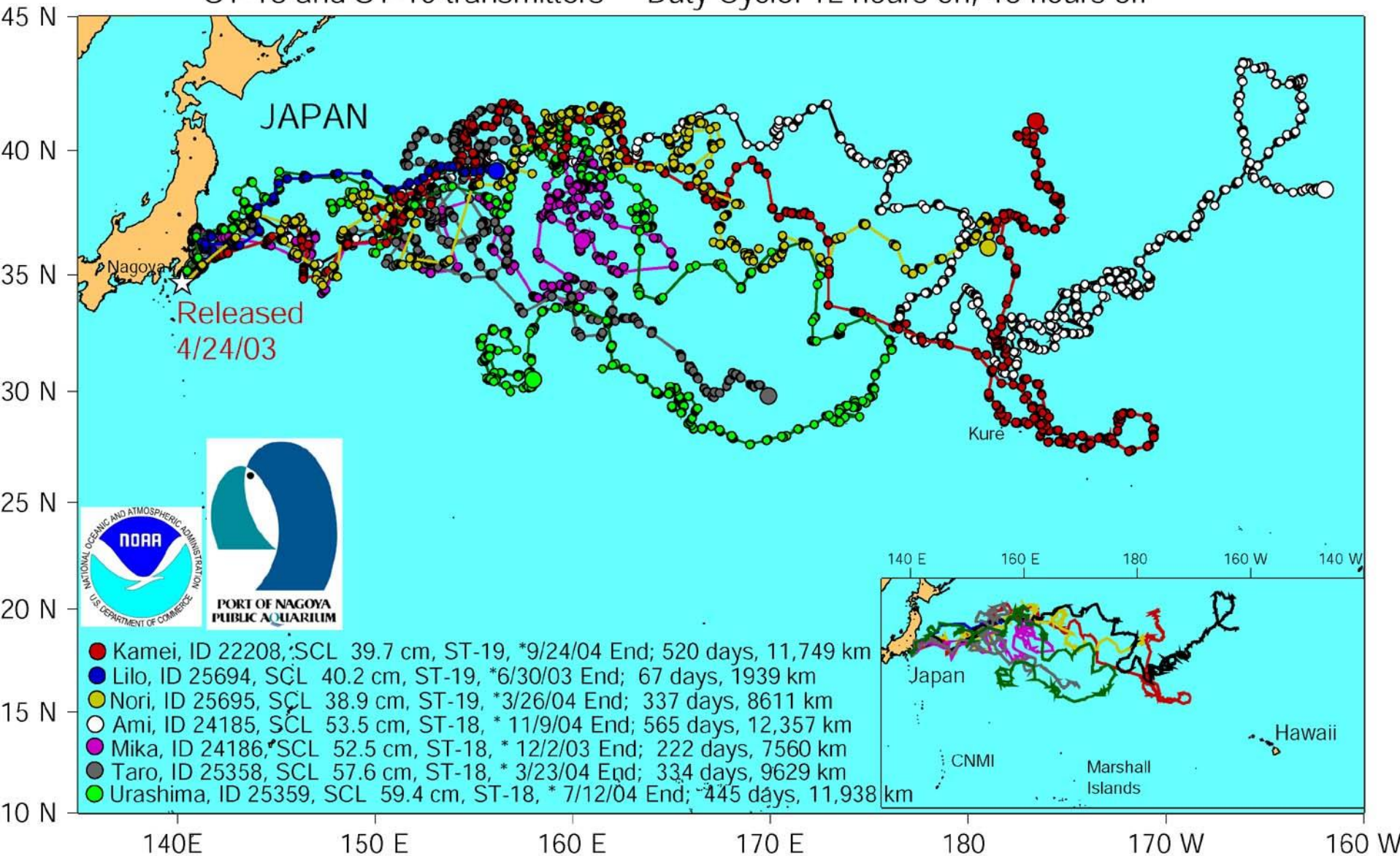




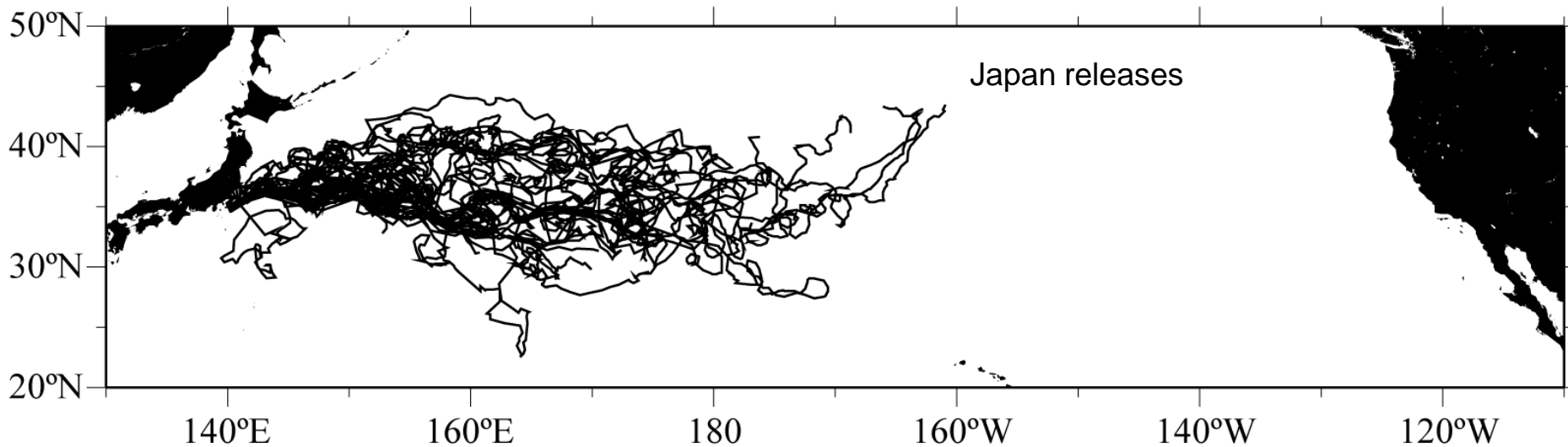
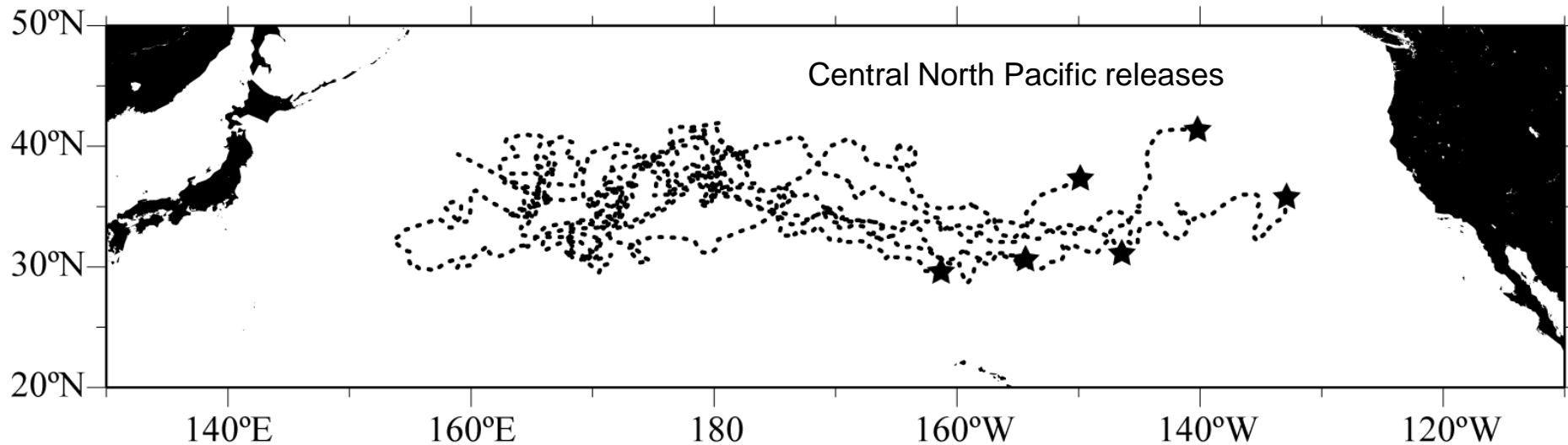


# Final Map:

2003-2004 movement of Juvenile Loggerhead turtles released from the M/V Kitakami  
 Hatched and Raised by the Port of Nagoya Public Aquarium  
 ST-18 and ST-19 transmitters Duty Cycle: 12 hours on, 48 hours off

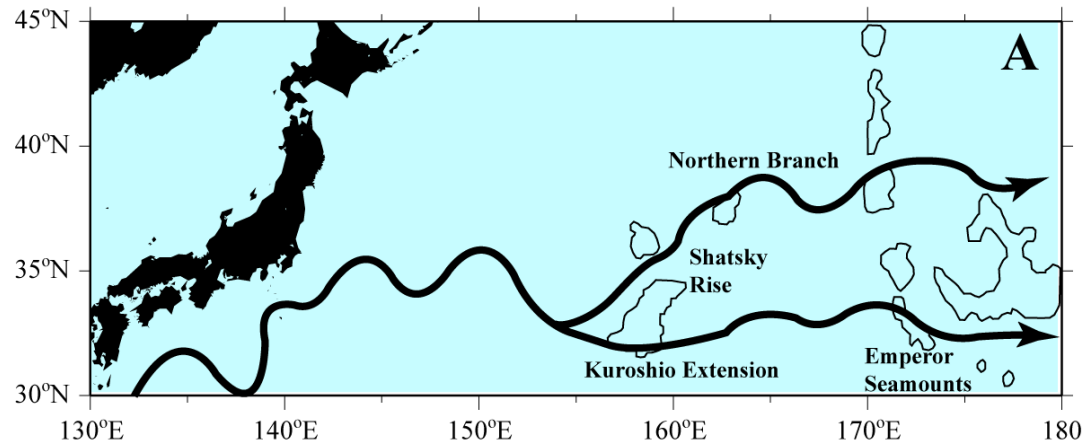


# Track lines for juvenile loggerhead turtle releases

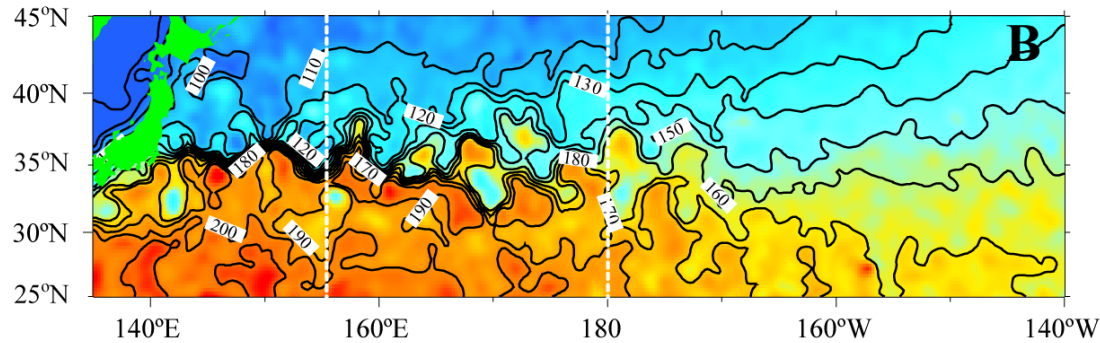




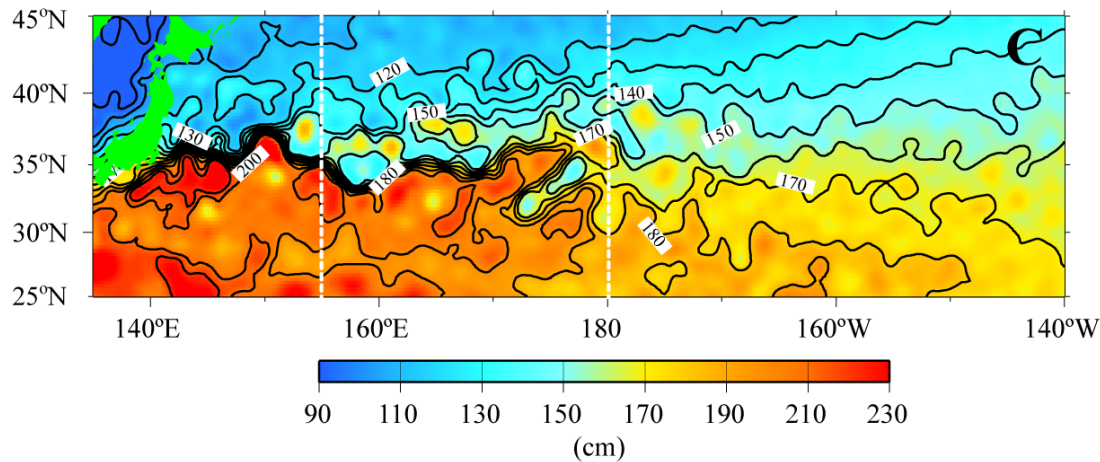
# Schematic of the Kuroshio Extension Bifurcation region (A)



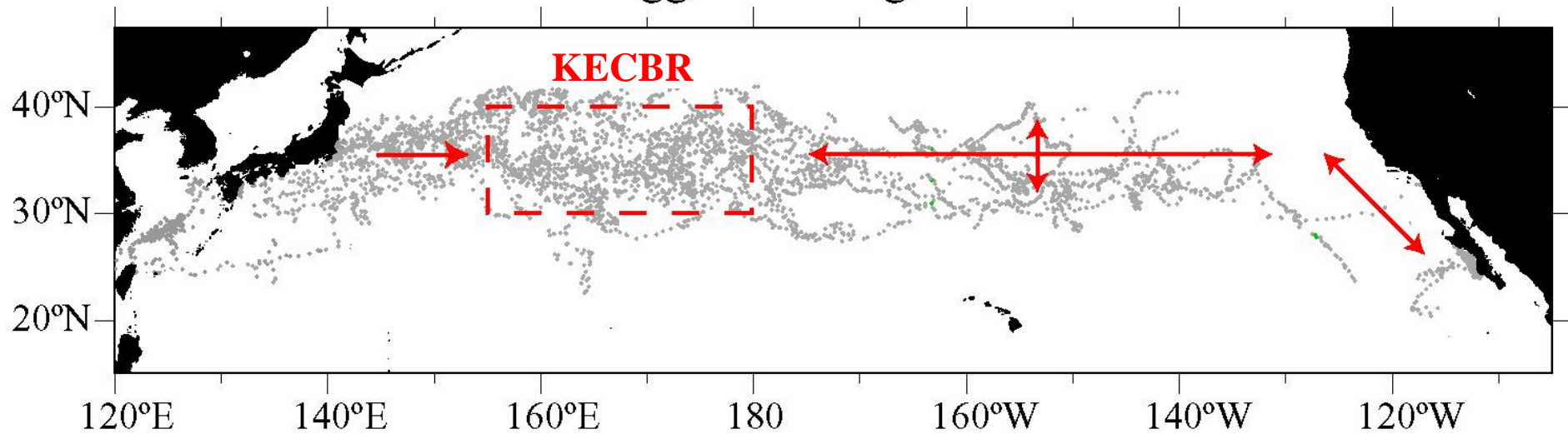
# AVISO altimetry for March 2003



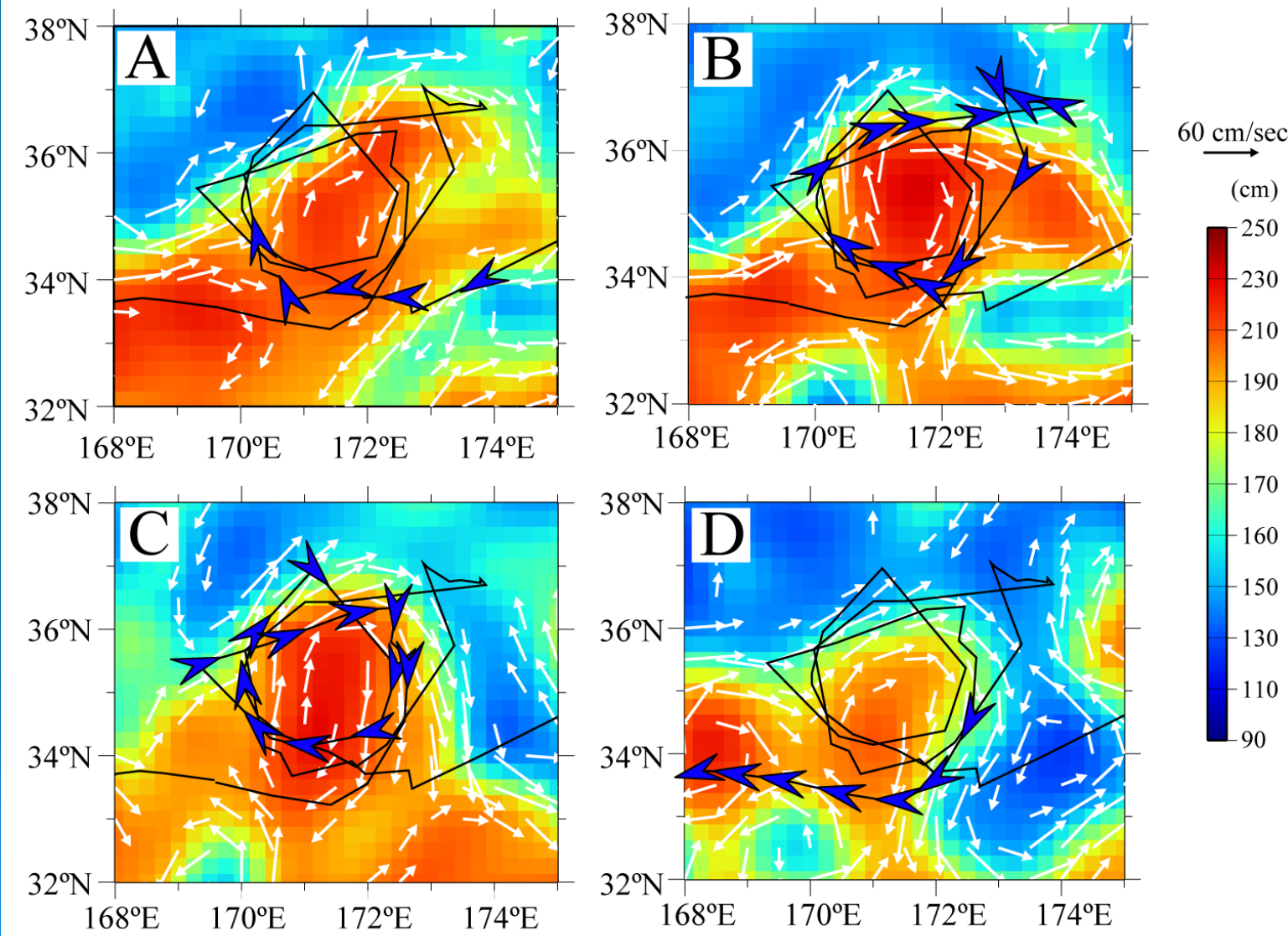
# AVISO altimetry for September 2003



## Juvenile Loggerhead Migration Schematic



# Loggerhead track over SSH and geostrophic currents for October 2003 (A), November 2003 (B), December 203 (C), and January 2004 (D)



# summary

- KECBR an important habitat for loggerheads
- They use KEC in winter, spring, and fall and the TZCF in summer
- They use cyclonic and anticyclonic eddies
- They actively navigate this energetic area
- Some turtles may use KECBR for their entire juvenile period

# summary

- KECBR important international fishing ground – need to document and reduce threats to loggerheads in that region
- Likely considerable interannual and decadal variation in productivity of KECBR and this could impact population aspects of loggerheads

2004-2005 movement of Juvenile Loggerhead turtles  
 Released from the R/V Aichi Maru and M/V Kitakami  
 Hatched and Raised by the Port of Nagoya Public Aquarium  
 ST-24 and Spot4 transmitters Duty Cycle: 6 hours on, 48 hours off

