BALAZS

PART 2 OF 2

36 高知大学 Kochi University

WEXFORD

GEORGE BALAZS 808-683-8402

Wide Ruled

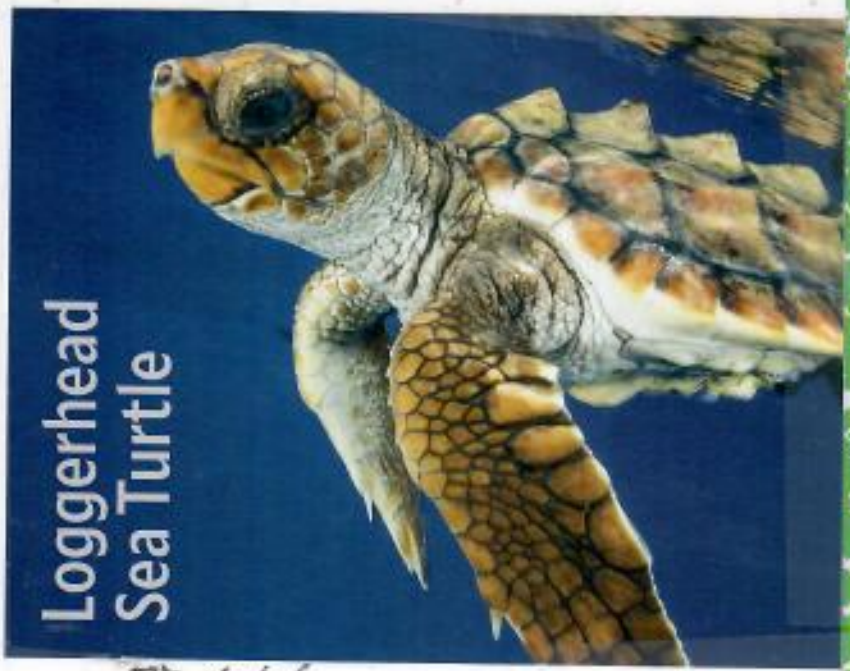
Composition Book

PNPA III 11-18 APRIL 24

14-24 JUNE 24

DIVE P. 21

#26-53



37 x 66

STRETCH

"WHY THINGS HAPPEN"

PART 2 OF 2 ARIGATO GOZAIMASU

CLASS SCHEDULE

DATE _____

NAME _____ SCHOOL _____

ADDRESS 14-24 JUNE 2024 N=28+ 1 MOCK

PERIOD	MONDAY LUNDI LUNES	RM.	TUESDAY MARDI MARTES	RM.	WEDNESDAY MERCREDI MIÉRCOLES	RM.	THURSDAY JEUDI JUEVES	RM.	FRIDAY VENDREDI VIERNES	RM.
1	ARGOS – 401.678 MHZ FREQUENCY									
2	OUTPUT – 200 MILLIWATTS									
3	2024 SAT PHONE – 00-8816-234-52310 FROM CELL									
4			FROM LANDLINE 011-8816-234-52310							

Chapter 1

Lake Biwa, the Origin of Shiga Life and Culture

滋賀の文化の源泉

amazon.com

5Q75TBfDZQ

Order #: 63467374
er of May 31, 2024 (Order ID 113-5917742-4860668)

	Item	Item Price	Total
	igital Thermometer for Adults and Kids, No Touch Forehead hermometer for Baby, 2 in 1 Body Surface Mode Infrared herm... B002NF01LJ 4TD8813C-KJ01-MB-912 193674503271 (Sold by hetaida)	$17.99	$35.98
	(120 Pcs - Bulk Value) Roll. 8 oz Paint Mixing Cup/Resin Mixing Cups | Disposable Measuring Cups | Clear Plastic Mixing ... Kitchen B09TX1VN11 RL-PMC08-120 606301081207 (Sold by Roll.)	$17.49	$17.49
3	Supmedic Nitrile Exam Gloves, 3.5 mil Disposable Medical Gloves Powder-Free Latex-Free, Box of 100 pcs (Blue) (X-Large) Apparel B0C9SHW1VK SKF-BLUE-XL-100 850049592444 (Sold by Supmedic)	$7.98	$23.94
1	Pro Grade Chip Paint Brushes - 96-Pack - 1" Chip Brushes for Stains, Varnishes, Glues, & Gesso - Home Improvemen...	$28.99	$28.1

TV
609311410319

plates your order. $10

11/18/2022 MOCK SCL 30.3 cm

0.79 cm/mo = 9.4 cm/YEAR
7 MONTHS

6/21/2023 HAVOLI SCL 35.8 cm
= 5.5 cm

July 10 COHORT 1 2023 Release @ 4PM HST 39°18.9N Latitude
N=25 146°04.0 W Longitude
4-13-2024
SHIKOKU AQUARIUM
24.8 C Seawater
MoL GALAXY ACE
KYOTO UNIVERSITY
HIDEAKI NISHIZAWA
PART 2 of 2
TOAU MOCC
"FIRMAMENT ACE"

SPLASH 10 = 119grams
387 SPOTS = 39grams
4-14-2024
SUNDAY
TOMOMI-SAN STAYS AT MEITETSU INN KANEYAMA

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

"PERICU"

ARGOS ID

#42

42

高知大学
Kochi University

Serial #: 24A0386

PTT ID: 265588

19 DAYS DELAY (42)

SPLASH PNPA 2024 STRETCH

SEA TURTLE TAGGING FORM

DATE FORM FILLED OUT / /

ID

CAPTURE DATE, LOCATION AND METHOD:

6/19/24 wednesday

PERSON RECORDING DATA:

2 small, extra Lat. Right; 1 extra small

TAGS: 5291 LFL

INCONEL

Carapace left

on TROPHY PLT

MT# 42 RIGHT SHOULDER

TAGS: STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

392145000836915

STRAIGHT CARAPACE - LENGTH: 44.1 cm WIDTH: cm

CURVED CARAPACE LENGTH: cm WIDTH: cm

HEAD WIDTH: cm

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

SEX: Male, Female or Undetermined

TAIL LENGTH: T cm C cm

SAMPLES COLLECTED:

RIGHT FRONT FLIPPER WIDTH: cm

PLASTRON LENGTH: cm

WEIGHT: #

DESCRIPTIVE REMARKS:

TAG + ELASTOMER = 34MM Height AT Anterior

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96822

"SHIWASU"

43

高知大学
Kochi University

ARGOS ID

#43

Serial #: 24U2389

PTT ID: 265572

43

19 DAYS DELAY PNPA 2024

SEA TURTLE TAGGING FORM

STRETCH

DATE FORM FILLED OUT / /

CAPTURE DATE, LOCATION AND METHOD:

6/19/24 Wednesday

PERSON RECORDING DATA:

TROVAN PIT RIGHT SHOULDER

TAGS: 5292 LFL

INCONEL

392145000817930

TAGS:

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

MT# 43

STRAIGHT CARAPACE - LENGTH: 35.7 cm WIDTH: cm

CURVED CARAPACE LENGTH: cm WIDTH: cm

HEAD WIDTH: cm

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96821

SEX: Male, Female or Undetermined

TAIL LENGTH: T cm C cm

SAMPLES COLLECTED:

RIGHT FRONT FLIPPER WIDTH: cm

PLASTRON LENGTH: cm

WEIGHT: #

DESCRIPTIVE REMARKS:

S T R E T C H
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96821

"EHNAALLY"

44

高知大学
Kochi University

Serial #: 24A0385

PTT ID: 265587

(44)

SPLASH 10 PNPA 2024 STRETCH

SEA TURTLE TAGGING FORM

DATE FORM FILLED OUT / /

CAPTURE DATE, LOCATION AND METHOD:

6/19/24 - wednesday

PERSON RECORDING DATA:

19 DAYS Delay

TAGS: 5293 LFL

INCONEL

392145000821150

TAGS:

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

TROJAN PIT RIGHT SHOULDER MT# 44

STRAIGHT CARAPACE - LENGTH: 44.0 cm WIDTH: cm

CURVED CARAPACE LENGTH: cm WIDTH: cm

HEAD WIDTH: cm

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96821

SEX: Male, Female or Undetermined

TAIL LENGTH: T cm C cm

SAMPLES COLLECTED:

RIGHT FRONT FLIPPER WIDTH: cm

PLASTRON LENGTH: cm

WEIGHT: #

DESCRIPTIVE REMARKS:

35MM TAG + ELASTOMER height AT ANTERIOR

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96821

"YOROZU"

45

高知大学 Kochi University

ARGOS ID

#45

Serial #: 24U2384

PTT ID: 265569

(45)

PNPA 2024 STRETCH

SEA TURTLE TAGGING FORM

DATE FORM FILLED OUT / /

CAPTURE DATE, LOCATION AND METHOD:

6/19/24 Wednesday

PERSON RECORDING DATA:

19 DAYS DELAY

TROVAN PIT RIGHT SHOULDER

TAGS: 5294 LFL TRICONEL

TAGS:

392145000960069

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

MT# 45

STRAIGHT CARAPACE - LENGTH: 40.9 cm WIDTH: cm

CURVED CARAPACE LENGTH: cm WIDTH: cm

HEAD WIDTH: cm

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96821

SEX: Male, Female or Undetermined

TAIL LENGTH: T cm C cm

SAMPLES COLLECTED:

RIGHT FRONT FLIPPER WIDTH: cm

PLASTRON LENGTH: cm

WEIGHT: #

DESCRIPTIVE REMARKS:

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

ARGOS ID

"URIURI"

#46

46

高知大学 Kochi University

Serial #: 24U2379

PTT ID: 265565

(46)

PNPA 2024 STRETCH

SEA TURTLE TAGGING FORM

DATE FORM FILLED OUT / /

CAPTURE DATE, LOCATION AND METHOD:

6/19/24 Wednesday

PERSON RECORDING DATA:

TAGS: 5295 LFL
INCONEL

TAGS:

19 DAYS DELAY

TROVAN PIT RIGHT SHOULDER

392145000820643

STRETCH
STYLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

MT# 46

STRAIGHT CARAPACE - LENGTH: cm WIDTH: cm

39.1 cm

CURVED CARAPACE LENGTH: cm WIDTH: cm

HEAD WIDTH: cm

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

SEX: Male, Female or Undetermined

TAIL LENGTH: T cm C cm

SAMPLES COLLECTED:

RIGHT FRONT FLIPPER WIDTH: cm

PLASTRON LENGTH: cm

WEIGHT: #

DESCRIPTIVE REMARKS:

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAIWAANOA PLACE
HONOLULU, HAWAII 96823

ARGOS ID

"ENI"

47

47

Serial #: 24U2367

PTT ID: 265558

高知大学
Kochi University

(47) END

PNPA 2024 DAY 3

SEA TURTLE TAGGING FORM

STRETCH N=7

DATE FORM FILLED OUT / /

CAPTURE DATE, LOCATION AND METHOD:

6/19/2024

PERSON RECORDING DATA:

TAGS: 5296 FL

INCONEL

19 DAYS DELAY

TROVAN PIT RIGHT SHOULDER

TAGS:

392145000960235

TROVAN PIT IN RIGHT SHOULDER

STRETCH

SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

MT# 47

STRAIGHT CARAPACE - LENGTH: 40.0 cm WIDTH: cm

CURVED CARAPACE LENGTH: cm WIDTH: cm

HEAD WIDTH: cm

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

SEX: Male, Female or Undetermined

TAIL LENGTH: T cm C cm

SAMPLES COLLECTED:

RIGHT FRONT FLIPPER WIDTH: cm

PLASTRON LENGTH: cm

WEIGHT: #

DESCRIPTIVE REMARKS:

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96821

ARGOS ID

"NIPARAYA"

#48

48

高知大学
Kochi University

Serial #: 24U2371

PTT ID: 265560

(48) DAY 4

18 DAY/5 DAY PNPA 2024 STRETCH START DAY 4

SEA TURTLE TAGGING FORM

DATE FORM FILLED OUT / /

CAPTURE DATE, LOCATION AND METHOD:

6/20/24 Thursday N=6 (1 + DUMMY)

PERSON RECORDING DATA:

TROJAN PIT RIGHT SHOULDER

TAGS: 5297 LPL INCONEL

TAGS: Mock

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

392145000820573

MT# 48

STRAIGHT CARAPACE - LENGTH: cm WIDTH: cm

39.0 cm

CURVED CARAPACE LENGTH: cm WIDTH: cm

HEAD WIDTH: cm

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

SEX: Male, Female or Undetermined

TAIL LENGTH: T cm C cm

SAMPLES COLLECTED:

RIGHT FRONT FLIPPER WIDTH: cm

PLASTRON LENGTH: cm

WEIGHT: #

DESCRIPTIVE REMARKS:

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

"PURUTAUI"

49 高知大学 Kochi University

49

Serial #: 24U2372

PTT ID: 265561

(49)

18 DAY DELAY

PNPA 2024 STRETCH

SEA TURTLE TAGGING FORM

DATE FORM FILLED OUT / /

CAPTURE DATE, LOCATION AND METHOD:

6/20/24 Thursday

PERSON RECORDING DATA:

TROVAN PIT RIGHT SHOULDER

TAGS: 5298LFL

INCONEL

392145000958247

TAGS:

STRETCH

~~SEA TURTLE RESEARCH EXPERIMENT~~

THERMAL CORRIDOR HYPOTHESIS

MT# 49

STRAIGHT CARAPACE - LENGTH: 40.6 cm WIDTH: cm

CURVED CARAPACE LENGTH: cm WIDTH: cm

HEAD WIDTH: cm

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

SEX: Male, Female or Undetermined

TAIL LENGTH: T cm C cm

SAMPLES COLLECTED:

RIGHT FRONT FLIPPER WIDTH: cm

PLASTRON LENGTH: cm

WEIGHT: #

DESCRIPTIVE REMARKS:

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96821

"MIGUEL"

50 高知大学 Kochi University

ARGOS ID

50

Serial #: 24U2381

PTT ID: 265567

(30)

18 DAYS DELAY

PNPA 2024 STRETCH

SEA TURTLE TAGGING FORM

DATE FORM FILLED OUT / /

CAPTURE DATE, LOCATION AND METHOD:

6/20/24 Thursday

PERSON RECORDING DATA:

TROJAN PIT RIGHT SHOULDER

TAGS: 5299 LFL INCONEL 392145000817149

TAGS:

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

MT# 50

STRAIGHT CARAPACE - LENGTH: 38.9 cm WIDTH: cm

CURVED CARAPACE LENGTH: cm WIDTH: cm

HEAD WIDTH: cm

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

SEX: Male, Female or Undetermined

TAIL LENGTH: T cm C cm

SAMPLES COLLECTED:

RIGHT FRONT FLIPPER WIDTH: cm

PLASTRON LENGTH: cm

WEIGHT: #

DESCRIPTIVE REMARKS:

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96822

"ROSA"

51

高知大学
Kochi University

51

Serial #:24U2390

PTT ID: 265573

(51)

18 DAYS DELAY

PNPA 2024 STRETCH

SEA TURTLE TAGGING FORM

DATE FORM FILLED OUT / /

CAPTURE DATE, LOCATION AND METHOD:

6/20/24 Thursday

PERSON RECORDING DATA:

TAGS: 5300 LFL

INCONEL

392145000957803

TROVAN PIT

Right Shoulder

TAGS:

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

MT# 51

STRAIGHT CARAPACE - LENGTH: 36.2 cm WIDTH: cm

CURVED CARAPACE LENGTH: cm WIDTH: cm

HEAD WIDTH: cm

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

SEX: Male, Female or Undetermined

TAIL LENGTH: T cm C cm

SAMPLES COLLECTED:

RIGHT FRONT FLIPPER WIDTH: cm

PLASTRON LENGTH: cm

WEIGHT: #

DESCRIPTIVE REMARKS:

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96822

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

ARGOS ID

"CRUZ"

52

52

高知大学 Kochi University

al #:24U2391

ID: 265574

(52)

18 DAY DELAY

PNPA 2024 STRETCH

SEA TURTLE TAGGING FORM

DATE FORM FILLED OUT / /

CAPTURE DATE, LOCATION AND METHOD:

6/20/2024 Thursday

PERSON RECORDING DATA:

TAGS: 5251 FL

INCONEL

392145000818307

MT# 52

TAGS:

IROWAN PIT RIGHT SHOULDER

STRAIGHT CARAPACE - LENGTH: 41.6 cm WIDTH: cm

CURVED CARAPACE LENGTH: cm WIDTH: cm

HEAD WIDTH: cm

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

SEX: Male, Female or Undetermined

TAIL LENGTH: T cm C cm

SAMPLES COLLECTED:

RIGHT FRONT FLIPPER WIDTH: cm

PLASTRON LENGTH: cm

WEIGHT: #

DESCRIPTIVE REMARKS:

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

"ANACAPA"

53

高知大学
Kochi University

53

Serial #:24U2396

PTT ID: 265576

18 DAYS DELAY

PNPA 2024 (53)

SEA TURTLE TAGGING FORM

STRETCH N=6

DATE FORM FILLED OUT / /

CAPTURE DATE, LOCATION AND METHOD:

6/20/24 Thursday

28 TOTAL
25 387
2 POT 6

PERSON RECORDING DATA:

TROJAN PIT RIGHT SHOULDER

TAGS: 5252 LFL INCONEL

392145000961300

TAGS: 3 SPLASH 10 + 1 MOCK

MT# 53

STRAIGHT CARAPACE - LENGTH: cm WIDTH: cm

41.3 cm

CURVED CARAPACE LENGTH: cm WIDTH: cm

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

HEAD WIDTH: cm

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

SEX: Male, Female or Undetermined

TAIL LENGTH: T cm C cm

SAMPLES COLLECTED:

RIGHT FRONT FLIPPER WIDTH: cm

PLASTRON LENGTH: cm

WEIGHT: #

DESCRIPTIVE REMARKS:

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96821

NO LABEL NUMBER
ON CARAPACE

WILDLIFE
COMPUTERS

PNPA TO BE ON DISPLAY

END

387 DUMMY MOCK

SPOT 6

PNPA 2024

SEA TURTLE TAGGING FORM

STRETCH

DATE FORM FILLED OUT / /

CAPTURE DATE, LOCATION AND METHOD: 6/20/24 Thursday

PERSON RECORDING DATA:

TAGS: 5333 LFL

TROJAN PIT INCONEL

Right shoulder 3921450009559 54

MT# DUMMY - MOCK

TAGS:

STRAIGHT CARAPACE - LENGTH: cm WIDTH: cm

31.5 cm

CURVED CARAPACE LENGTH: cm WIDTH: cm

HEAD WIDTH: cm

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

SEX: Male, Female or Undetermined

TAIL LENGTH: T cm C cm

SAMPLES COLLECTED:

RIGHT FRONT FLIPPER WIDTH: cm

PLASTRON LENGTH: cm

WEIGHT: #

DESCRIPTIVE REMARKS:

4 TAGS387 SPOT 6
TO TOMOMI SAITO 6/21/2

1) PTT 265583
Serial# 2402452

2) PTT 265580
Serial# 2402403

3) PTT 265571
Serial #265571

4) PTT 265581
Serial # 2402405

+ CARRY ON SUITCASE of Supplies
+ MAGNET for IMMEDIATE START UP

6/2024

16 June 2024, for Immediate Press Release:

Trinational Research Team (Japan, Mexico, U.S) Aims to Unravel Migratory Mysteries of Loggerhead Sea Turtles in the North Pacific Ocean

Japan is home to the highly mobile loggerhead sea turtle, with adult females nesting on sandy beaches and developed hatchlings dispersing to the high seas of the North Pacific. Most turtles will live their juvenile lives in this massive oceanic zone, although some will travel all the way to the eastern Pacific, along the shores of Baja Mexico and California USA. These continent-bridging movements make North Pacific loggerhead turtles the ultimate 'ocean connector'. However, many gaps remain in the scientists' understanding about the mechanisms that determine where loggerheads go, and the routes taken as they move to coastal North America.

From 2023-2026 the research team will release 100 loggerheads to monitor their movements in relation to oceanographic conditions. This year, in June 2024, the second cohort of 25 satellite-tag-equipped turtles will complete their rearing and husbandry at The Port of Nagoya Public Aquarium and set sail aboard a 'ship of opportunity' to be released in the central North Pacific. From there, scientists will track the turtles' movements via satellite and gauge how water temperatures and currents influence the journey of these tiny turtles. The team is especially interested in learning how turtles will move this year, as conditions have changed dramatically since last year's El Niño when the first group of 25 loggerheads were reared and released.

1 22

Last year, the first cohort of 25 turtles was released on 10 July 2023 and tracked daily, with the longest transmitting tag lasting until 6 April 2024 (271 total days). All turtles traveled through warmer than average sea surface temperatures, due to the combined influences of a marine heatwave and the aforementioned El Niño in the eastern North Pacific Ocean. As expected, all turtles moved north until September 2023, following seasonal patterns in the position of the habitat in which they feed. After September, they began to move south, with seven turtles moving towards North America—3 of which entered coastal waters of Southern California US and Baja Mexico—and the remainder traveling westward or to destinations unknown before their satellite tags stopped transmitting.

By learning their trans-Pacific tendencies—especially for turtles moving toward North America—the research team will provide vital data for aiding the protection and conservation of this transboundary endangered species, a responsibility that, because of its migratory habits, is shared by three nations: Japan, USA, and Mexico. Further, as our World's oceans continue to undergo significant change, the results from this effort can provide vital information for dynamic conservation and management strategies for this endangered species.

For more information about the Loggerhead Sea Turtle Research Experiment on the Thermal Corridor Hypothesis (hence the project's name "STRETCH") please visit loggerheadstretch.org.

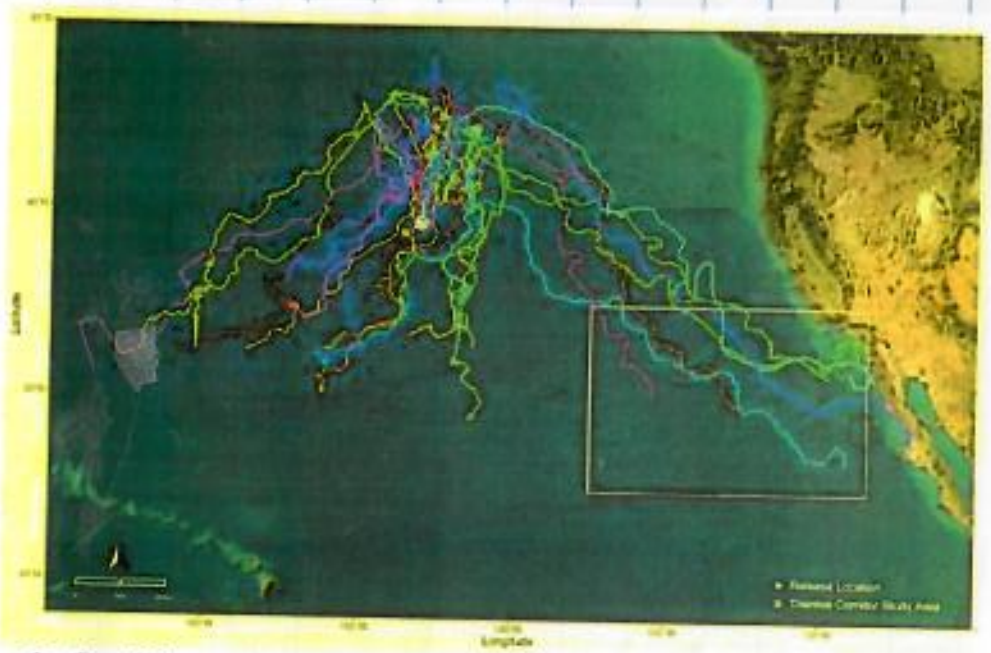


Figure 1. Satellite tracked movements of 25 juvenile loggerheads, released (at the starred location) in the Central North Pacific on 10 July 2023. The box shown depicts the "thermal corridor" scientists predicted these loggerheads could enter during warm El Niño conditions. All turtles tracked the North Pacific Chlorophyll Front as it moved first north in the summer and then south in the fall.

2023 COHORT 1

PPT#	NAME	DAYS TRANSMITTING	TOTAL DISTANCE COVERED	SPEED (km/h	
243178	Satsuki	262	7559	1.20	
143179	Ka La Ula	259	6127	0.99	
243180	Kumeyaay	262	6783	1.08	
243181	Antonio	246	5891	1.00	
243182	Sumire	229	5517	1.00	
243183	Azami	238	6512	1.14	
243184	Kai Maleno	232	5670	1.02	
243185	Luiseno	230	6375	1.15	
243186	Bety	229	6156	1.12	
243187	Nadesiko	243	6284	1.08	
243188	Pua Sakura	245	6455	1.10	
243189	Akamai	229	7396	1.35	
243190	Juaneno	228	6616	1.21	
243191	victor	247	6948	1.17	
243192	Sazanka	258	8439	1.36	
243193	Ajisai	257	6202	1.01	
143195	Gabrioleno-Tongva	245	6553	1.11	
243196	Marisel	233	5280	0.94	
243197	Tsubaki	248	7883	1.32	
243199	Lali	197	5240	1.11	
243200	Chumash	250	6312	1.05	
243201	Chuy	233	6021	1.08	
243202	Asagao	240	5753	1.00	
		241	6434	1.11	Red = Mean Values
243198	Ayame	30	551	0.77	Transmissions ended prematurely
243194	Hauoli	67	1182	0.74	Transmissions ended prematurely

126

INCONEL
5333
LFL
MOCK

387 SPOT 6

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

#42 "PERICU"

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

ARGOS ID 265588
SPLASH 10

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

#44 "EHNAALLY"

ARGOS ID 265587

SPLASH 10

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96825

#40 "MOANA KAI"
ARGOS ID 265586

SPLASH 10 ELASTOMER

STRETCH
SEA TURTLE RESEARCH EXPERIMENT
THERMAL CORRIDOR HYPOTHESIS

GEORGE H. BALAZS
992 AWAAWAANOA PLACE
HONOLULU, HAWAII 96823

Hi George

6/25/2024

34mm & 35mm

That was the total height of the SPLASH tag from the central base including the elastomer. That was for turltes 42 and 44. I don't know what number tag the SPOT tag was measured at 29 mm. From memory the height of the first SPLASH tag #40 was 31 mm?

Also just for interest, the measurement from the front of the SPLASH to the front of the carapace for #40 was 8 cm (as per attached pic) and even after we moved the position of #42 and #44 back slightly on the carapace the distance was still very similar, about 8.5 cm max, both smaller SCL lengths by 1.9 and 1.8 cm respectively.

Yes, I did a rough few measurements on the last days attachments of length and width of the fiberglass matt and thought is was probably more an illusion than anything. I didn't write it down (silly me), but last turtles were circa 15 cm long by 14 cm wide. Two I measured upstairs on the day were maybe 16 cm long by 14.5 cm wide. There was a fair bit of variability and I did note that on the last day we were far neater and used less polyester overlap than in the first few days. So the total footprint of polyester was definitely larger on the earlier turtles, but the fiber cloth footprint was very similar (IMHO). Should have taken more measurements and recorded it accurately, always easy in hindsight.

130

THE JAMESON SATELLITE

Read 6/24

By NEIL R. JONES

The mammoths of the ancient world have been wonderfully preserved in the ice of Siberia. The cold, only a few miles out in space, will be far more intense than in the polar regions and its power of preserving the dead body would most probably be correspondingly increased. When the hero-scientist of this story knew he must die, he conceived a brilliant idea for the preservation of his body, the result of which even exceeded his expectations. What, how, and why are cleverly told here.

1930s
AMAZING
MAGAZINE
1950s

PROLOGUE

The Rocket Satellite

IN the depths of space, some twenty thousand miles from the earth, the body of Professor Jameson within its rocket container cruised upon an endless journey, circling the gigantic sphere. The rocket was a satellite of the huge, revolving world around which it held to its

6/20/24 Chelonian Institute

PNPA
MINOGAME ALGA

Mori-san took from BACK of Loggerhead MALE AND fed to LARGE green in nearby tank.
PHOTOS TAKEN.

PNPA 2024 CARETTA

SCL (cm)	SCW (cm)	BW (kg)	SCL (cm)	SCW (cm)	BW (kg)	SCL (cm)	SCW (cm)
Measured on Sept. 4,2023			Measured on Oct. 3,2023			Measured on Nov.	
25.9	21.6	3.2	27.4	23.1	3.6	29.3	24.9
25.5	22.0	3.2	27.2	23.0	3.6	29.0	24.4
25.5	21.5	3.0	27.0	22.5	3.3	28.8	24.2
26.0	21.4	3.0	27.6	22.4	3.4	29.7	23.7
25.3	21.0	3.0	26.9	21.9	3.3	28.7	23.3
26.5	21.6	3.3	27.5	22.4	3.5	29.0	23.6
23.3	20.1	2.5	24.6	21.0	2.8	25.6	22.0
24.4	20.5	2.6	25.6	21.3	3.0	27.4	23.0
24.3	20.4	2.6	25.7	21.6	3.0	27.5	23.1
25.9	21.6	3.0	27.5	22.7	3.4	29.4	23.9
25.7	21.9	3.2	27.3	23.0	3.8	29.4	24.9
25.2	21.1	3.1	27.3	21.9	3.5	28.9	23.4
24.0	20.7	2.8	25.6	21.8	3.2	27.1	23.2
27.2	22.3	3.4	28.5	23.5	3.8	30.6	25.5
25.4	21.7	3.2	27.4	22.6	3.6	29.2	24.4
26.7	21.9	3.4	28.0	22.9	3.8	29.6	24.0
26.3	21.6	3.3	27.8	22.7	3.7	30.0	24.3
23.0	19.4	2.3	24.4	20.5	2.6	26.0	21.7
26.5	21.9	3.2	28.3	22.7	3.7	30.0	24.4
22.3	18.8	2.2	23.9	19.9	2.5	25.6	21.1
27.4	22.5	3.6	29.0	23.2	4.0	30.7	24.8
25.8	21.6	3.0	27.5	22.7	3.5	29.5	24.3
25.6	20.7	2.8	27.1	21.7	3.2	28.8	23.3
26.5	21.9	3.4	27.9	22.8	3.7	29.4	24.2
24.1	20.1	2.6	25.9	21.4	3.0	27.9	23.0
27.3	22.4	3.4	28.5	23.3	3.8	29.5	24.5
25.2	21.2	2.9	26.7	22.1	3.4	28.4	23.7
23.8	20.6	2.6	25.4	21.5	2.9	27.1	22.7
26.1	22.1	3.4	27.5	23.1	3.9	29.4	24.5
25.6	21.3	3.0	26.9	22.3	3.4	28.6	23.5
25.4	**21.2**	**3.0**	**26.9**	**22.3**	**3.4**	**28.7**	**23.7**

2023 PNPA CARETTA RELE

FOR RELEASE

BW (kg)	SCL (cm)	SCW (cm)	BW (kg)	SCL (cm)	SCW (cm)	BW (kg)
4,2023	3 MONTHS Measured on Dec. 7,2023			TAGS attachedon Sept 4,2023		Hatching on August 12,2022
4.7	30.8	25.5	5.2	5326		CcW22-01
4.6	30.5	25.7	5.3	5327		CcW22-02
4.0	30.0	25.3	4.6	5328		CcW22-03
4.5	31.2	25.1	5.1	5329		CcW22-04
4.3	30.4	24.8	4.8	5330		CcW22-05
4.6	31.0	24.5	4.8	5332		CcW22-06
3.2	26.4	22.9	3.5	5333		CcW22-07
3.6	28.6	23.9	4.1	5277		CcW22-08
3.5	28.4	24.2	4.1	5278		CcW22-09
4.1	30.5	24.9	4.8	5280		CcW22-10
4.5	30.5	25.7	5.2	5282		CcW22-11
4.3	30.0	24.6	4.8	5283		CcW22-12
3.8	28.2	24.2	4.3	5284		CcW22-13
4.9	32.1	26.3	5.5	5285		CcW22-14
4.3	30.4	24.9	4.9	5286		CcW22-15
4.5	31.2	24.9	5.0	5287		CcW22-16
4.8	32.0	25.9	5.6	5288		CcW22-17
3.2	27.2	23.2	3.7	5289		CcW22-18
4.3	31.8	26.1	5.1	5291		CcW22-19
3.0	27.4	22.3	3.6	5292		CcW22-20
4.8	32.3	25.6	5.5	5293		CcW22-21
4.2	31.2	25.3	5.0	5294		CcW22-22
3.8	30.5	24.7	4.5	5295		CcW22-23
4.4	31.0	25.4	5.1	5296		CcW22-24
3.1	29.9	23.8	4.5	5297		CcW22-25
4.3	31.5	25.7	5.0	5298		CcW22-26
4.0	30.3	25.0	4.7	5299		CcW22-27
3.5	28.6	24.0	4.1	5300		CcW22-28
4.6	31.3	26.2	5.6	5251		CcW22-29
4.0	30.5	24.9	4.9	5252		CcW22-30
4.1	**30.2**	**24.9**	**4.8**			

SED = $\bar{X}$ 30.5, RANGE 32.2 – 41.1 cm

国宝観音二十八部衆像

観音像の前列と中尊の四方に位置する変化に富んだ28体の仏像(国宝)は、千手観音とその信者をまもるという神々でインド起源のものが多く、その神話的な姿が迫真的に表現されている。技法的には檜材の「寄木造り」で、仏像の手や頭を別々に彫んで接着し、漆を塗って彩色仕上げをしたものである。目にはより写実性を高めるため、水晶をはめ込む「玉眼」という技法が用いられている。

The twenty-eight images placed in a straight line in front of the 1001 Kannon statues are guardian deities which protect the Buddhist deity Kannon as well as pious Buddhists who believe in Kannon. Many of these deities, whose mythic images are expressed in a vivid manner, have their origin in ancient India. Technically these statues are made in an assembled construction method. Arms and heads were carved separately, then joined together, coated with lacquer, and finished by coloring.

位于观音像的前排和中尊四周的富有变化的28尊佛像(国宝)，是保护千手观音及其信徒的神。大多起源于印度，其神话般的姿态得到了逼真的表现。在技法上以桧柏为原料采用“木块镶嵌工艺”制成，分别雕好佛像的手和脸后粘结在一起，最后涂漆上色而成。为使影响显得更加逼真，采用了镶嵌水晶这一被称为“玉眼”的制作工艺。

国宝雷神と風神像

堂内両端のひときわ高い雲座にのった風神と雷神像は力強く躍動的。古代人の自然や天候に対する畏れや感謝の心が、空想的な二神を創造し、風雨をつかさどり、「五穀豊穣」をもたらす神々として信仰された。太鼓を打つ雷さまと風の袋をかかえた風の神というイメージを決定づけた鎌倉彫刻の名品(国宝)である。

The powerful and dynamic statues of the Thunder God and the Wind God are placed at either side of the temple hall on raised pedestals of cloud shape. The images of these gods derived from people's fear of and gratitude for nature in the old days. People worshipped them as deities who controlled rain and wind, and brought about good harvests. These statues are representative masterpiece sculptures of the Kamakura period(12th-14th centuries).

大堂两端更高一层的云座上坐着的风神和雷神给人一种力量强大，栩栩如生的感觉。古人对自然及气候所怀有的畏怖和感激之情创造出假想之神，作为能够支配风雨，带来“五谷丰登”的神灵而受到人们的信仰。这两座佛像是决定击鼓雷神和怀抱风袋的风神形象的镰仓时代的名作(国宝)。

(南)

(北流・初夏)

5-30-2024 STRETCH (136)

ord.edu>

To: Cali Turne Thu 5/30/2024 4:22 PM

Cc: Alberto A

STRETCH Agenda May 30, 2024

1. Update on turtle rearing and readiness for tag deployments.
2. Tagging be done June 17-22, updates, concerns?
3. Turtles to be deployed from MOL Primrose Ace, departing Nagoya June 24-26. Noah Yamaguchi and Catherine Lee Hing.
4. Update on oceanographic conditions and finalizing of deployment location along ship's route.
5. Considerations around turtle care and deployment on board. Procedures and documentation.
6. Website updates? Are we ready to go?

Analysis updates?

1. Manuscripts and planned presentations?
2. Updates on appointments and staffing.

Other issues?

Talk soon, Larry

Larry B. Crowder (he, him, his)
Edward F. Ricketts Provostial Professor

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Report Results

FULL STRETCH TEAM

TEAM

1 PM HST Thursday TO 2 or 7 PM

Registration for PICES?

Sabine Winterowd: She lives in Japan with her parents. I believe that her father is an American teacher and her mother is a physician. She will not be staying at the hotel with us rather will be commuting from her home but will be with us on all research days. She is new to turtles but a lovely student and enjoys marine science.

Jack van der Reis: He lives in Oahu and just graduated from HPA. He is certified in our turtle program but was unable to participate in any trips due to his various school commitments. He will be attending Harvey-Mudd in the fall and very excited to be joining us. He will be on all the flights with us.

CKASSIS@HPU.EDU

Charlotte Kassis: Charlotte has done everything with us related to turtles. She has traveled to Vanuatu, participated in almost all of our tagging trips since 7th grade (she is now a senior). She is currently working on an independent project chewing up some of the Vanuatu data with our recently tagged cohort. She will be in Japan already due to her father having an astronomy conference and is currently scheduled to join us Monday to Wednesday. She is from Waimea.

ckassis@hpa.edu

Read / Unread

Graduate Bianca 6/16 Sunday

Cc: Alberto Beverly, Bianca, Cali, Catherine, Bbisco, Denise, Polovina, Larry Marc Alberto

My suggested additions of topics are listed below- although most blend into what Larry-san has already set forth- but I mention them anyway, so 'no stones are left unturned' everyone is informed-

Denise: Nani

-Attachment Team Composition
-Supplies for Attaching
-Tags= 25 Spot 6 387s + 3 Splash with dive recording ability including programing
-Extra Tags Saito + Programing
- Rowan Calder of Wildlife Computers Inc.
-Mock tag on PNPA for a one-year captive test
-Mori-san's superb leadership role
-Ship transport of turtles- containers & safeguards
-Drone on Ship- not MOL approved for this year maybe next year.

Every other day transmit

And last but Not Least-

-What we learned from Cohort 1 tracking- short write up on paper including final maps for use with Japan Media and others.

gb

2024- The Urashima Taro Robotic in Front of the Port of Nagoya Public Aquarium. Praise by George Balazs

George Balazs <itsahonuworldinhawaii@hotmail.com>
Thu 2/1/2024 8:16 AM

To:George Balazs <itsahonuworldinhawaii@hotmail.com>

From: 桜井　美由紀 <sec@nagoyaminato.or.jp>
Sent: Thursday, February 1, 2024 2:24 AM
To: itsahonuworldinhawaii@hotmail.com <itsahonuworldinhawaii@hotmail.com>
Subject: Urashima Taro

Hello George,

Thank you for your compliment. It's always nice of you!

Kurita san asked me to send you a message letting you know that he had a meeting with people of NPA and quoted all of your comments. He said the quotes impressed them a lot and they were hap to learn how much you thought about Urashima Taro.

"To me the Urashima Taro has always represented the Silver Heart and Soul of the Port of Nagoya Public Aquarium. Forever greeting visitors from near and far, teaching them, reminding them, of the Good Will and Kind Deeds rooted deep within Japan's culture. What a beautiful way to start off the undersea journey into the world of the aquarium!"
私にとって浦島太郎は、名古屋港水族館の輝きを放つ心のよりどころを表しています。見る人が日
の文化に深く宿る善意や親切な行いに思いを致すよう、様々なところから来訪されるお客様を出迎
ています。水族館で海の世界への旅を始めるのに、素晴らしいスタートではありませんか。

"In past years, I've stood many times and watched the Urashima Taro open and tell its story of kindness to the turtle and all creatures of the sea. I've also taken the time to watch those that are watching the Urashima Taro story. The expressions on children's and parents' faces are always deep and meaningful. What a marvelous way to start the journey into Taro's undersea world, the Port of Nagoya Public Aquarium!"
これまで名古屋港水族館を訪ねた年月、浦島太郎のからくり時計が開き、ウミガメや海の生き物に
切にする物語を披露するのを何度も立ち止まって見たものです。同時にその物語を見ている人たち
じっくり観察したものです。子供たちや両親の顔に浮かぶ表情はいつも深く意味のあるものでした
名古屋港水族館という、浦島太郎がいざなう世界に入っていく、なんと素晴らしい方法でしょう。

"Dr. Itaru Uchida, my friend and the first director of the Port of Nagoya Public Aquarium, once said "We are all Urashima Taro's given the task to save sea turtles and the ocean home where they live". The Urashima Taro story inspires and teaches that lesson even before entering the aquarium! It's the perfect way to start the undersea journey awaiting inside."
名古屋港水族館の初代館長で、私の友人である内田至博士がかつて言われました。「ウミガメとその
住処の海を守るという仕事をしているのだから、私たちは皆浦島太郎です。」水族館に足を踏み入
る前から浦島太郎の物語は、人の心に大切なことを照らし教えているのです。お客様が水族館で海

世界への旅を始めるのに完璧なしつらえでしょう。

"During my many recent visits to the Port of Nagoya Public Aquarium, I've felt sad when walking by the silvery dome where Urashima Taro has been silent and asleep all these years. I've felt that Taro is eager to arise once again- to come out and greet the people with his story of kindness and caring for the creatures of the sea. I hope that his day will come again soon."
名古屋港水族館への最近数年の訪問時、通り過ぎても、あの銀色の貝が口を開けないのを淋しく感じています—浦島太郎はずっと貝の中で静かに眠っているのです。太郎はまた皆の前に現れ、海の生き物を大切にする物語で人々を出迎えたいに違いないと感じています。もう一度そのような日が早く来ることを希望しています。

Cheers,
Miyuki

ZOOM STRETCH 8-13-24

ZOOM 8/13/2024 FRIDAY

Here are a few short topics to add to today's agenda-

—ON STRIKE — since July 1st

-Status of Stretch Manuscript Briscoe, Polovina et al. next → VANCOUVER 2nd ← BIANCA LOOK

-Oceanographers please render some views on what Cohort II turtles are going?

-Splash 10 three dive tags- someone to take on stewardship/analysis of the data as a student project (a Japan student?)

→Balazs travel to Japan STAJ-35 early December and likely again in late January

— Re. cob Flagged PAT Turtles

From: loggerhead-stretch@googlegroups.com <loggerhead-stretch@googlegroups.com> on behalf of Larry B. Crowder <lbcrowd@stanford.edu>
Sent: Friday, August 16, 2024 6:27 PM
To: loggerhead-stretch@googlegroups.com <loggerhead-stretch@googlegroups.com>
Subject: Zoom address 2 pm PDT Today

PPs from Larry

Need Genetics = HAWAII

Stanford News (http://news.stanford.edu/)

JULY 12, 2023 0600 PST

New experiment to test whether ocean warming opens a pathway for sea turtles

Scientists are tracking the epic migration of 100 endangered North Pacific loggerhead turtles from Japan to test a hypothesis that warm water events like El Niño unlock a corridor allowing some turtles to ride ocean currents all the way to North America.

BY JOSIE GARTHWAITE

Every now and then, small groups of endangered North Pacific loggerhead turtle hatchlings swim from Japan to the coastal waters of Baja Mexico and California, a journey of nearly 8,000 miles that has mystified scientists for decades.

The crux of the mystery is not how loggerheads find their way: Scientists believe they navigate the globe using Earth's magnetic fields, as do salmon, elephant seals, some species of shark, and other turtle species. Rather, experts have puzzled over how these young, tropical, temperature-sensitive turtles manage to cross a deep-ocean zone that's cold enough to be nearly impassable for most creatures.

(https://news.stanford.edu/wp-content/uploads/2023/07/Loggerhead2.jpg)

A new experiment seeks to help solve the question of how tropical, temperature-sensitive turtles manage to cross a co deep-ocean zone. *(Image credit: Ralph Pace)*

"They go past the point of no return and head toward Baja, when most of the other turtles turn back," said Stanford marine ecologist **Larry Crowder (https://profiles.stanford.edu/larry-crowder)**. Now, an international team of scientists has released from a ship on the high seas 25 satellite-tagged turtles in an experiment that could confirm or modify the leading explanation for how they do it. Three more cohorts are planned for release over the next four years, for a total of 100 tagged turtles.

The hypothesis the scientists are testing, **first published (https://news.stanford.edu/2021/04/08/illuminating-se turtle-mystery/)** in 2021 by Stanford researcher **Dana Briscoe (https://profiles.stanford.edu/dana-briscoe)** with Crowder and colleagues, is that El Niño and other intermittent ocean warming phenomena occasionally create a corridor of warm water that cuts through the cold **California Current (https://earthobservatory.nasa.gov/images/87575/california-coastal-current)**, allowing migrating turtles who happen to be nearby to cross the barrier and continue on to foraging grounds in Baja.

"If they're at the east end of this North Pacific transition zone and it happens to be an extremely warm year, they can go to Baja. But if they hit cold water, they turn back because that just shuts them down physiologically," said Crowder.

"We believe this migratory pathway is only open during anomalously warm water events, providing a missing piece to the puzzle as to how turtles access important North American habitat," said Briscoe, who developed the "thermal corridor hypothesis" with Crowder based on analysis of tracking data from hundreds of turtles and the oceanographic conditions that greeted them at that normally cold tongue of water in the open ocean.

El Niño opens a transient corridor

El Niño is the "warm phase" of a cyclical weather pattern marked by unusually warm ocean temperatures right along loggerhead sea turtles' path from Japan to Baja. El Niño conditions typically arise every two to seven years, on average, bringing dramatic shifts in temperature, rainfall, and winds around the globe.

Follow the turtles!

The researchers have created a website called **Loggerhead STRETCH (https://www.loggerheadstretch.org/)** (Sea Turtle Research Experiment on the Thermal Corridor Hypothesis) where anyone can check in on the turtles' progress. Every time a turtle comes to the surface, the small tag on its shell will ping the location to a satellite and show up on a map.

(https://news.stanford.edu/wp-content/uploads/2023/07/Loggerhead3-rotated.jpg)

Larry Crowder, Dana Briscoe, and Marc Rice carefully attach a tag to a turtle in the first cohort set for release in July 2023. *(Image credit: Laura Jim, Hawai'i Preparatory Academy)*

During the most recent El Niño phase, in 2016, tens of thousands of **loggerhead sea turtles showed up (https://www.sandiegouniontribune.com/news/environment/sdut-loggerhead-turtles-southern-california-2016may12-story.html)** off the coast of San Diego, California. "Everyone said, well, it's warm, they just came up from Mexico," recalled Crowder, the Edward Ricketts Provostial Professor and professor of oceans in the **Stanford Doerr School of Sustainability (http://sustainability.stanford.edu)**. But analysis of skin tissue showed that they had been living off a diet found only in the open ocean, strongly suggesting the turtles had originated near Japan and adding weight to the thermal corridor hypothesis.

"I think most scientists would have just stopped there. But we conceived of this idea: Let's release cohorts of loggerheads over four years, hoping to hit a hot year and a cold year. In the cold year, they should not go to North America, and in the warm year, they might," Crowder said. Collaborators from Kochi University collected turtles from nesting beaches in Japan beginning in the summer of 2021 and brought them to the **Port of Nagoya Public Aquarium (https://nagoyaaqua.jp/english/)** for raising.

Migrating across a changing ocean

Because El Niño conditions usually last for less than a year, the onset of El Niño conditions **in early June 2023 (https://www.weather.gov/news/230706-ElNino)** opened a narrow window to release a cohort of loggerheads at a time when the California Current is expected to be warm enough to cross. Missing this year's El Niño could mean the next opportunity wouldn't arise again for another seven years.

> "With climate change, one might expect this corridor to become more open, more often."
>
> —Larry Crowder
> Edward Ricketts Provostial Professor, Professor of Oceans

So, during the week of June 19, the team attached tags to the 25 young turtles. The next week, in the port of Nagoya, they loaded the turtles onto an eastbound cargo carrier. After roughly two weeks at sea, researchers from the Port of Nagoya Public Aquarium and Kochi University gently lowered the turtles into the water near the east end of the North Pacific transition zone.

Over the next few years, the experiment could help scientists better predict where and how loggerheads may be harmed by industrial fisheries in international waters or off the coast of North America. The results could also help researchers anticipate shifts in the species' migration patterns under global warming. "With climate change, one might expect this corridor to become more open, more often," Crowder said.

"We're hoping to challenge more people in the science community, in the management community, to think about using satellite tagging as a device not just to describe what animals are doing and make hypotheses, but to test those hypotheses experimentally," Crowder said. "So, there's a philosophical jump into a new phase of experimental oceanography that comes out of this project."

Crowder is also a senior fellow at the **Stanford Woods Institute for the Environment (http://woods.stanford.edu)** and a professor, by courtesy, of biology. Briscoe is a senior data scientist at the Stanford Woods Institute for the Environment. Additional project collaborators include **Bianca Santos (https://profiles.stanford.edu/bianca-santos)**, a PhD student in Stanford's **Emmett Interdisciplinary Program in Environment and Resource (https://eiper.stanford.edu/)**s (E-IPER), and researchers affiliated with the University of Hawai'i at Mānoa, NOAA-Southwest Fisheries Science Center, Universidad Nacional Autónoma de México, Golden Honu Services of Oceania, and Hawai'i Preparatory Academy's Sea Turtle Research Program. Wildlife Computers supplied the satellite tags.

This project is supported by the National Geographic Society and the Gordon and Betty Moore Foundation.

View talk by Crowder (https://news.stanford.edu/wp-content/uploads/2023/06/lcrowder-pices_2022_657-1.mp4) on the project. View videos of **an overview of the loggerhead STRETCH project (https://www.youtube.com/watch?v=hYQ5KU97vTs)**, researchers **attaching the first seven satellite tags (https://www.youtube.com/watch?v=h2Hjj7cR_7A)**, and **attaching the second batch of tags (https://www.youtube.com/watch?v=otfbiLgIZSg)**.

Media Contacts

Larry Crowder, Stanford Doerr School of Sustainability: **larry.crowder@stanford.edu (mailto:larry.crowder@stanford.edu)**
Dana Briscoe, Stanford Woods Institute for the Environment: **dana.briscoe@stanford.edu (mailto:dana.briscoe@stanford.edu)**
Josie Garthwaite, Stanford Doerr School of Sustainability: (650) 497-0947, **josieg@stanford.edu (mailto:josieg@stanford.edu)**

Related Story

(https://news.stanford.edu/2021/04/08/illuminating-sea-turtle-mystery/)

SCIENCE & TECHNOLOGY (HTTPS://NEWS.STANFORD.EDU/SECTION/SCIENCE-TECHNOLOGY/)

Illuminating a sea turtle mystery (https://news.stanford.edu/2021/04/08/ill sea-turtle-mystery/)

North Pacific loggerhead turtles' years-long oceanic journeys remain poorly understood. Using data from satellite tracking and other techniques, scientists reveal a unique phenomenon that may explain the endangered migrants' pathway.


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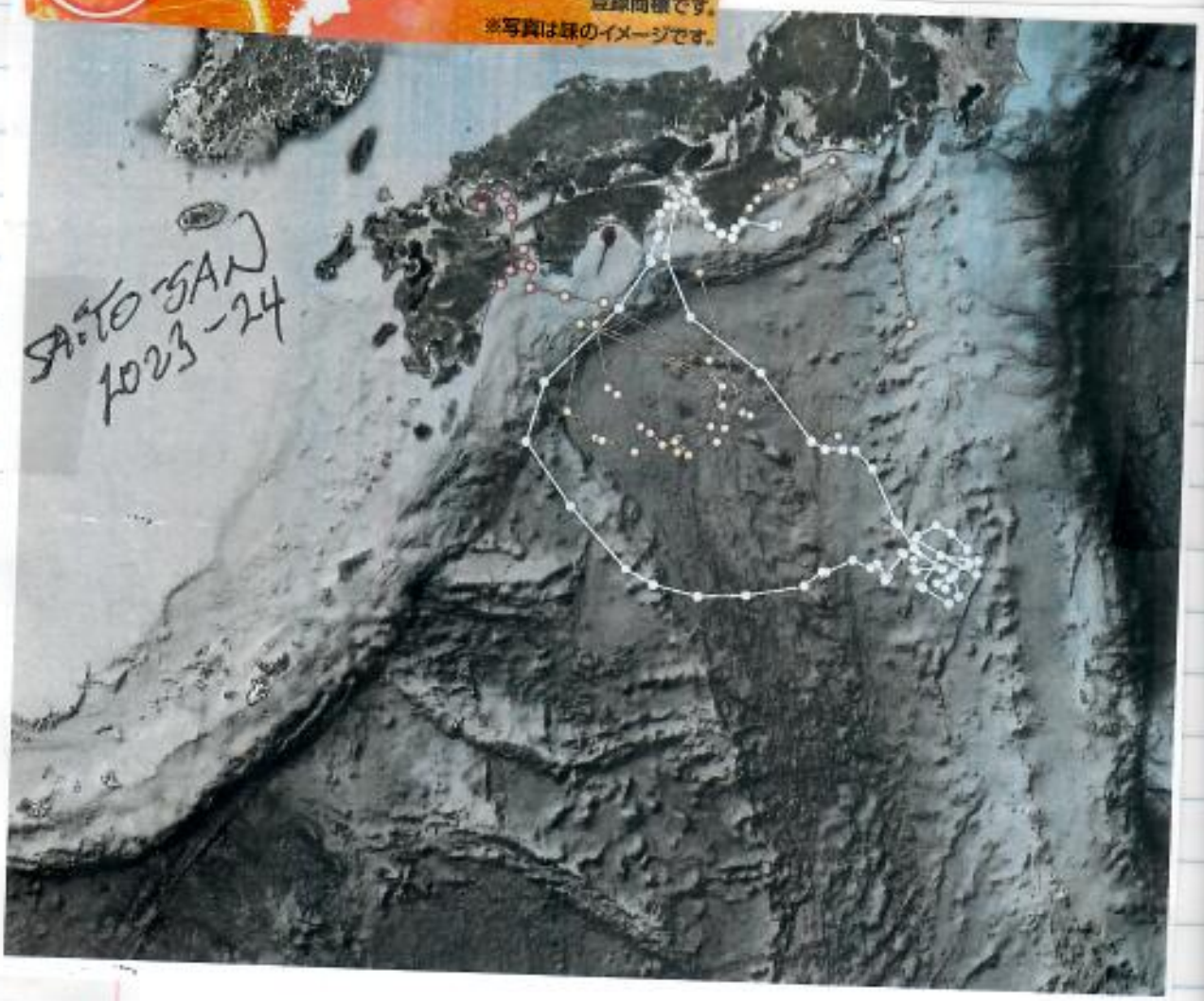
SATO-SAN
1023-24

146

Catherine Lee Hing

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cleehing@stanford.edu
www.linkedin.com/in/catherine-lee-hing

Kornhuit, D & Lee Hing, C. 2020. A guide to practical resources for business and headwork support following Climate Challenge. (Pending).

Lee Hing, C., Quetros, A, March, D, Salley, S, Clark, J, Godley, B, Kascher, K & Garilao, C. 2023. Adding Plastics to the Reef. Frontiers in Marine Science, 1235. https://doi.org/10.3389/fmars.2022.883062

Lee Hing, C., Gutierro Z, Dueñas D, Ochoa G, Nunez A, Forman K, Craig Nand McField M (2022). Management Responses in Belize and Honduras, as Stony Coral Tissue Loss Disease expands its prevalence in the Mesoamerican

Publications

Fellowships & Awards

2022-2024 Enhancing Diversity in Graduate Education Doctoral (EDGE) Fellow • 2022-2024 Diversity, Equity & Inclusion Liaison • 2022 Dean's Graduate Scholars Award • Sir Geoffrey Holland Prize • Exeter Leader Award • Exeter Award

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(146)

Catherine Lee Hing

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Nationality: United States of America & Spain

My goal is to pursue a Ph.D. where I will be able to build on the skills that I have developed in order to promote evidence-informed policy and legislation that support sustainable environmental management.

Education

SEPTEMBER 2022 ADMITTED

PhD Student Emmett Interdisciplinary Program in Environment Resources Stanford University, USA
• Developing skills to design and develop my research project that will blend marine spatial planning and international law to inform marine policy development and decision-making in the Caribbean.

SEPTEMBER 2019- APRIL 2021

MSc Conservation Science & Policy with Distinction University of Exeter, UK
Dissertation: *Climate-resilient and plastic free marine protected areas for blue whale.*

MAY 2008- MAY 2010

MA International Relations Webster University, UK, NL
Dissertation: *The Theoretical Framework of Justice at the International Criminal Tribunal for the Former Yugoslavia.*

SEPTEMBER 2000- SEPTEMBER 2004

BA Biology (Marine Science) Boston University, USA
• Conducted three research projects to examine the effects of the environment on different marine /aquatic species – groundfish populations (e.g., *Lophius americanus)*, African cichlids, and brittle stars (*Ophioderma brevispinum*).

Experience

NOVEMBER 2022 — MAY 2022

Program/Project Coordinator Broward County Government, USA
• Worked in the Natural Resources Department on Water Conservation initiatives throughout Broward County, Florida. • Managed the Conservation Pays program, working with 16 municipalities in the county to implement water savings initiatives. • Implemented education outreach programs through social media, and summits (Broward Youth Climate Summit 2022) to raise awareness.

BAJA "MADE IT"

PUA-SAKURA - 34.1 SCL

VICTOR - 38.8 SCL

TSUBAKI - 39.8 SCL

SE SORT OF MADE IT.

SAZANKA - 35.0 SCL

KADESIKO - 38.2 SCL

CHUX - 35.2 SCL

KALAULA - 37.4 SCL

6-5-2023 By Mori-San

X = 36.5 SCL

RANGE - 32.2 - 41.1 cm SCL

2023, Cohort #1

5 Largest ones

SATSUKI

- 40.4

42.1 AZUKI

39.9 KAI MARCINO

- 41.6 GAB-TOU

39.8 TSUBAKI

About Shiga 滋賀県について

Shiga Prefecture is located just northeast of Kyoto, at the center of Japan's main island. We're home to Japan's largest lake, Biwako, or Lake Biwa, and to communities of unique culture and traditions that developed over time in harmony with the nature that sustains our local cuisine, industry, and lifestyle. Scenic lake views and abundant nature have been a continual source of inspiration for artists. Since long ago when Shiga was known as Omi Province, the area has been a junction between East and West Japan, now seen by its historic sites such as temples and castle ruins, as well as many enchanting traditional towns.

日本列島のほぼ中央、古都京都の北東に位置する滋賀県。日本最大の湖「琵琶湖」を有する滋賀県では、水と共に生きる人々の知恵から生まれた独特の食文化、産業、暮らしが古くから well as many enchanting traditional towns.

Easy Access from Kyoto!
京都からのアクセスも便利！

By SHINKANSEN

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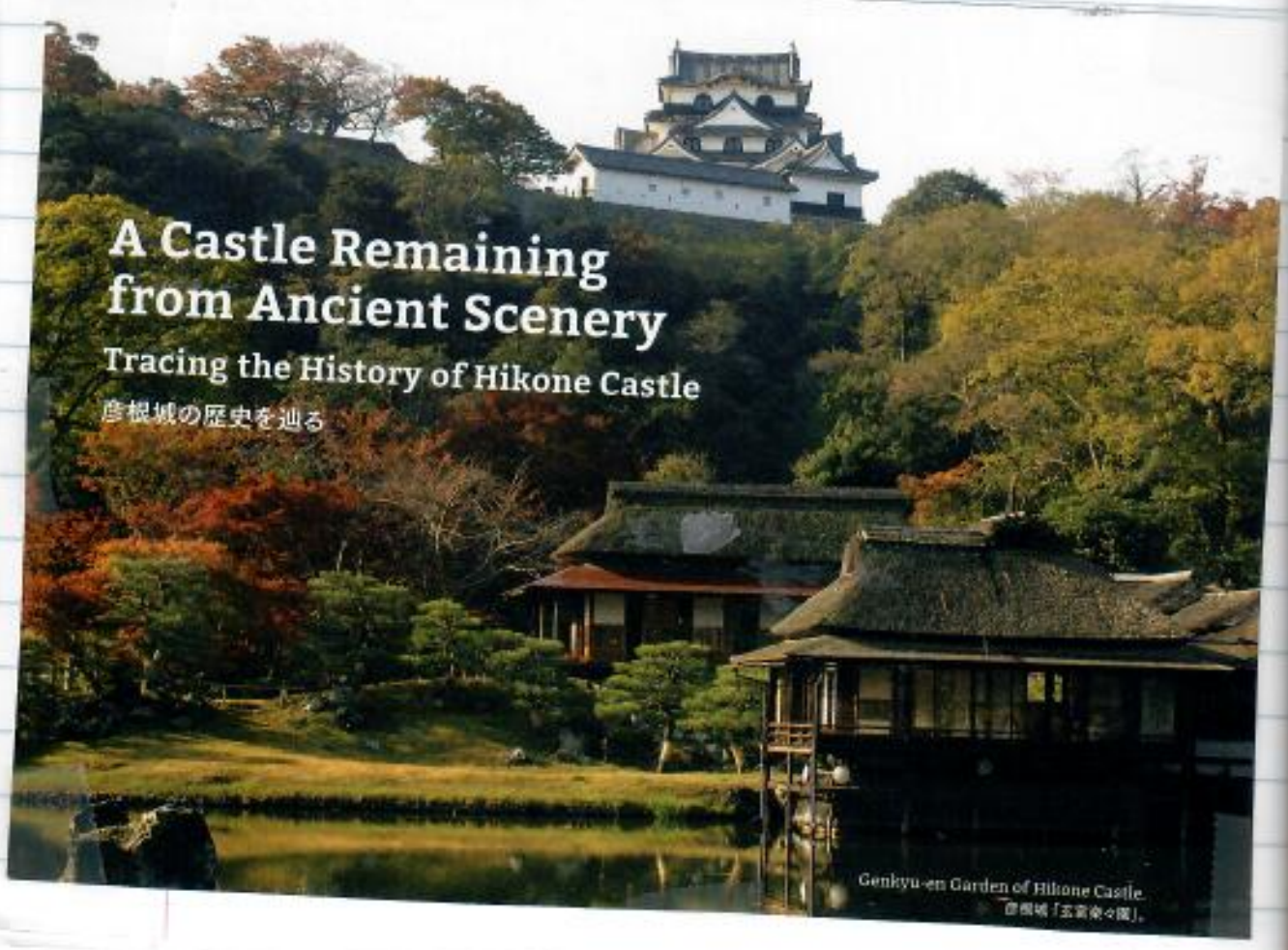
- **Nagoya Sta.** to Maibara Sta. in about 27 min.
  名古屋駅から米原駅まで約27分

By JR TRAIN

- **Kyoto Sta.** to Otsu Sta. in about 9 min.
  JR京都駅から JR大津駅まで約9分



A Castle Remaining from Ancient Scenery

Tracing the History of Hikone Castle

彦根城の歴史を辿る

Genkyu-en Garden of Hikone Castle
彦根城「玄宮楽々園」

150

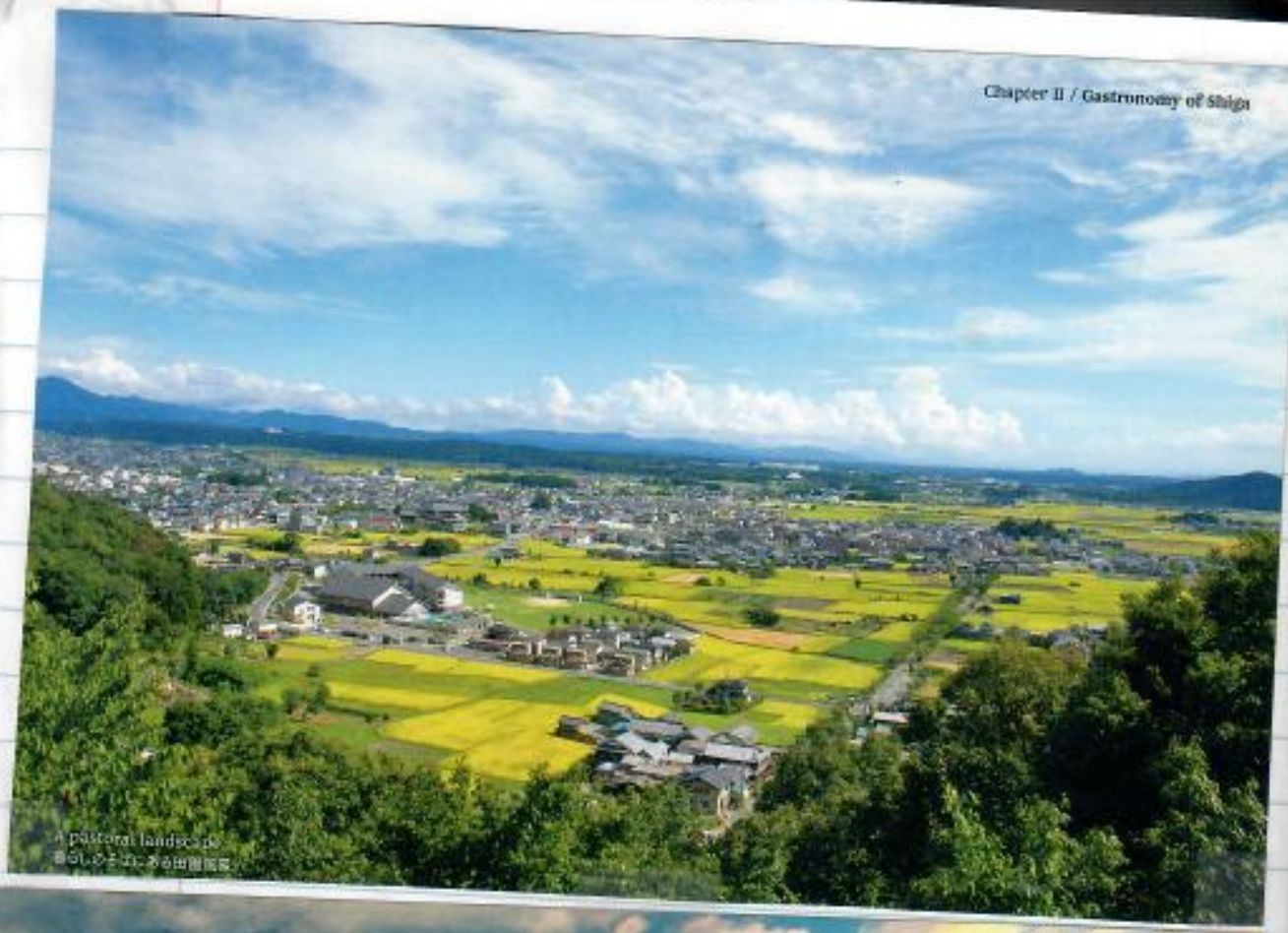
From: Paula M Wetzel <pwetzel@stanford.edu>
Date: June 10, 2024 at 2:49:19 PM PDT
To: "Larry B. Crowder" <lbcrowd@stanford.edu>, Anna Macatuno <annam8@stanford.edu>
Subject: Re: Payment to PNPA

Hi Larry,

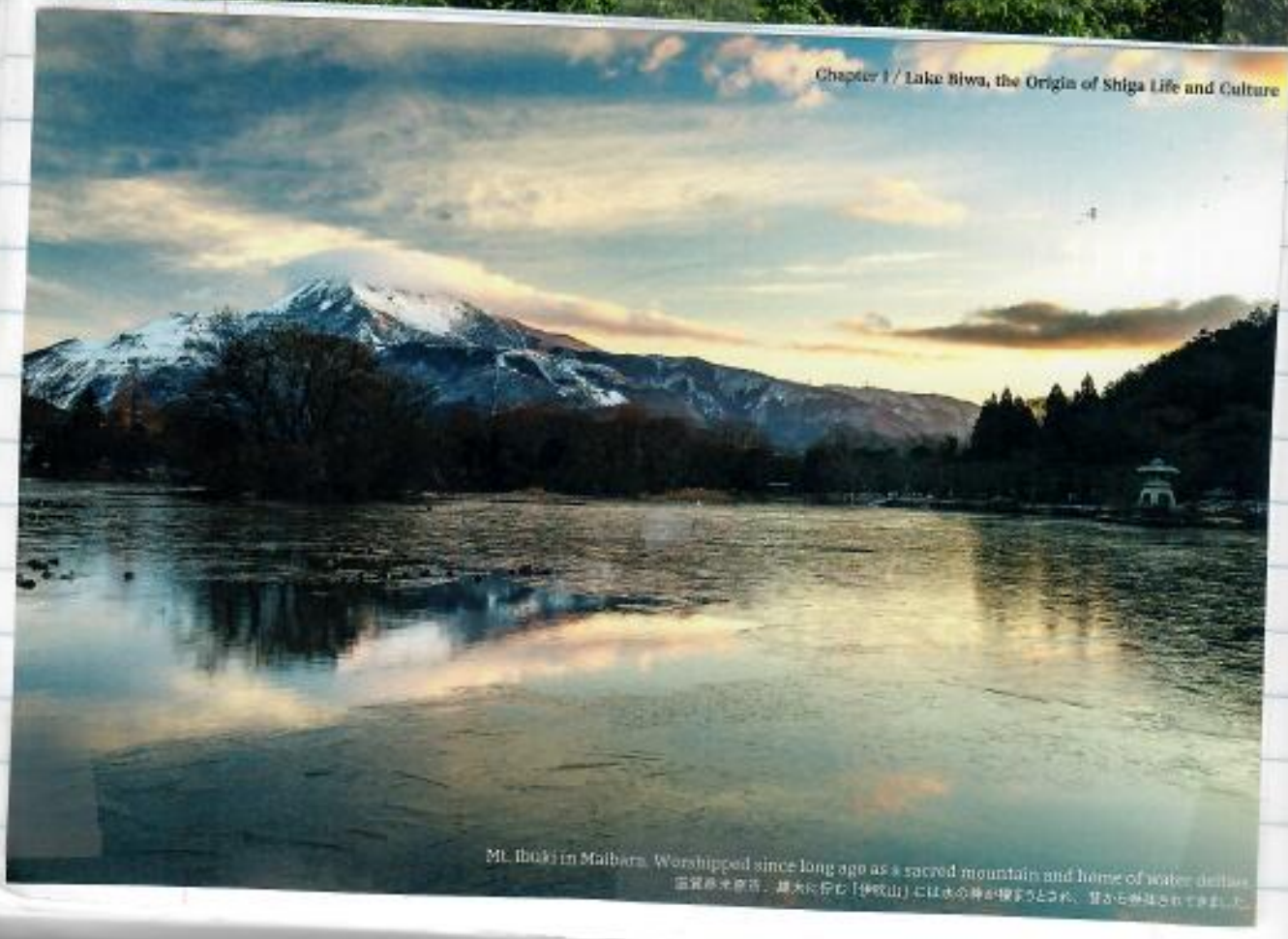
I confirm all submitted invoices have been paid in full. $135,600 has been paid against $260,000 Purchase Order number **62966824**.

Thanks,

Paula Wetzel, Assistant Director Research Administration
Stanford Woods Institute for the Environment
"Creating Practical Solutions for People and the Planet"



A pastoral landscape
のどかな近江の田園風景



Mt. Ibuki in Maibara. Worshipped since long ago as a sacred mountain and home of water deities


nity of residents.

THE VILLAGES OF KANNON

A Life with the Deity of Mercy

Bordering both Kyoto and Nara, the historic centers of Japanese Buddhism, Shiga is home to many Buddhist sites and relics. The Kohoku (lit. "lake north") region of the prefecture in particular is known as the "Villages of Kannon." These numerous small village communities have preserved their local Kannon statues depicting the Buddhist deity of mercy since ancient times. While monks are usually the ones acting as primary caretakers for Japanese temples, in these villages, that task has been taken on by the local residents themselves for centuries. An example of the region's unique culture of Kannon devotion is seen in the medieval Warring States period, when the villagers removed their temples' Kannon statues and hid them in river beds or underground to protect them from fires and looting.

The Eleven-Headed Kannon statue at Shakudo-ji Temple, Ishimichi Village of Nagahama.
長浜市「石道町」の十一面観音立像。

Children walking home outside the Kannon hall of Okamoto Shrine, Odani Yono Village of Nagahama.
長浜市「岡本神社」。人々の暮らしに信仰が寄り添く。

滋賀の人々と仏「観音の里」

滋賀県には仏像が多数あり、中でも「観音の里」と呼ばれる湖北エリアは人々の生活の中に当たり前に神仏が存在する全国でも珍しい地域。かつて戦乱の焼き討ちにあった際には、住職と村人たちが観音像を守るため川底に沈めたり、地中に埋めるなどして難を逃れてきたと伝わるほど、人々と仏との距離が密接です。

BIWAICHI

- Cycling around Lake Biwa -

ビワイチ ～自転車で琵琶湖をめぐる～

Biwaichi is a cycling route of approximately 200 km around Lake Biwa. In 2019, the route was designated as one of Japan's National Cycling Routes. According to the pace or level of cyclist, lanes are separated to allow a comfortable cycling journey while enjoying the scenery of the lake. There are also numerous points of interest along the route where you can dig deeper into local culture and history. Finishing the entire route in a single day is a good challenge, but spending 2 to 3 days at a slower pace is recommended for a more relaxing immersion into nature, or exploring more of the local food and culture.

琵琶湖の周囲約200kmを自転車で1周するのが「ビワイチ」。2019年、日本を代表する魅力的なサイクリングルートとして、「ナショナルサイクルルート」に認定されました。走行レベルに応じて低速・上級と、2つのコースに合わせた通行空間も整備され、琵琶湖を感じながら快適にサイクリングが楽しめます。沿道には豊かな生活文化が残る場所や貴重な歴史遺産も点在。湖岸を走るだけではなく、自然や文化、食など、滋賀県の奥深い魅力を体感しながらゆっくりと2～3日かけて走るのがおすすめです。

BIWAICHI CYCLING NAVI

BIWAICHI
Cycling around Lake Biwa Japan
https://www.biwaichi.jp

BIWAKO VISITORS BUREAU
https://en.biwako-visitors.jp/

154

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1 room	$527
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Phone: +81 72 455 1111
GPS Coordinates: N 034° 26.193, E 135° 14.569

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Nyoirin Kannon / Ishiyama-dera Temple.
如意輪観音半跏像（重文）石山寺所蔵。

ISHIYAMA-DERA TEMPLE

Sacred Home to a Statue Seen Only Once Every 33 Years

Among over 3,000 temples in Shiga, Ishiyama-dera Temple is one of the oldest, having been constructed during the reign of Emperor Shomu (701-749). The temple's principal deity, Nyoirin Kannon, is the only Buddhist statue to feature a *chokufu*, an imperial seal which requires permission from the Emperor before any public unveilings. The figure is an impressive 5-meter-tall statue housed in a small *zushi* shrine within the main temple hall. Public viewing only takes place once every 33 years, or in the year following a new emperor's ascendance.

33年に一度しか見られない石山寺の秘仏

滋賀県には3,000を超す寺院がありますが、中でも大津市にある「石山寺」は、聖武天皇（701-749）の時代に開創した歴史ある寺院。御本尊の如意輪観世音菩薩は、像高約5mある巨大な厨子の中に納められた秘仏で、日本唯一の勅封のため、開帳には天皇の許可が必要。33年に一度、または新天皇即位の翌年にのみ開帳されています。

Todaimon (East Main Gate) of Ishiyama-dera Temple, Otsu.
大津市「石山寺」の東大門。

The temple is located along the Seta River, the only outlet of Lake Biwa.
琵琶湖から唯一流れ出る瀬田川沿いに建つ。

(58)

Japan Railways (JR) system is made up of six regional JR companies, each distinguished by color.

Visit the websites of the JR companies for more information such as operation status.

https://www.jrhokkaido.co.jp/global/
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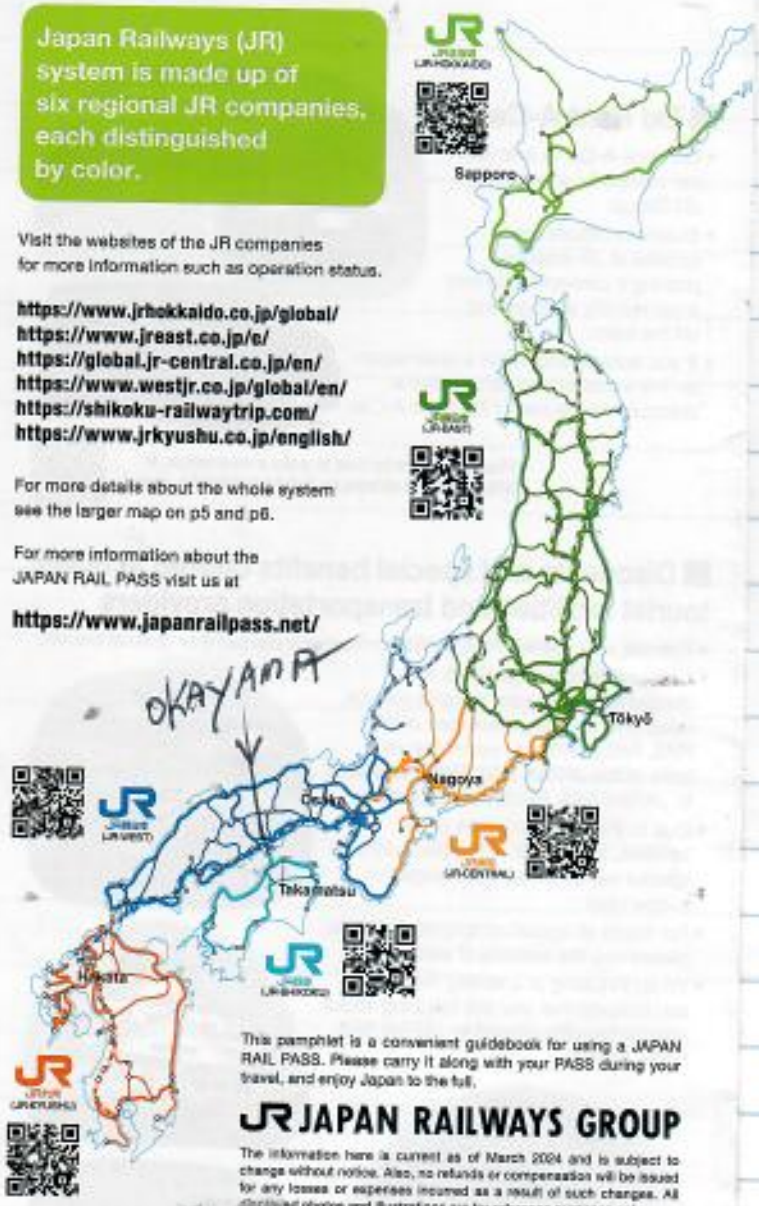
https://www.westjr.co.jp/global/en/
https://shikoku-railwaytrip.com/
https://www.jrkyushu.co.jp/english/

For more details about the whole system see the larger map on p5 and p6.

For more information about the JAPAN RAIL PASS visit us at

https://www.japanrailpass.net/



This pamphlet is a convenient guidebook for using a JAPAN RAIL PASS. Please carry it along with your PASS during your travel, and enjoy Japan to the full.

JR JAPAN RAILWAYS GROUP

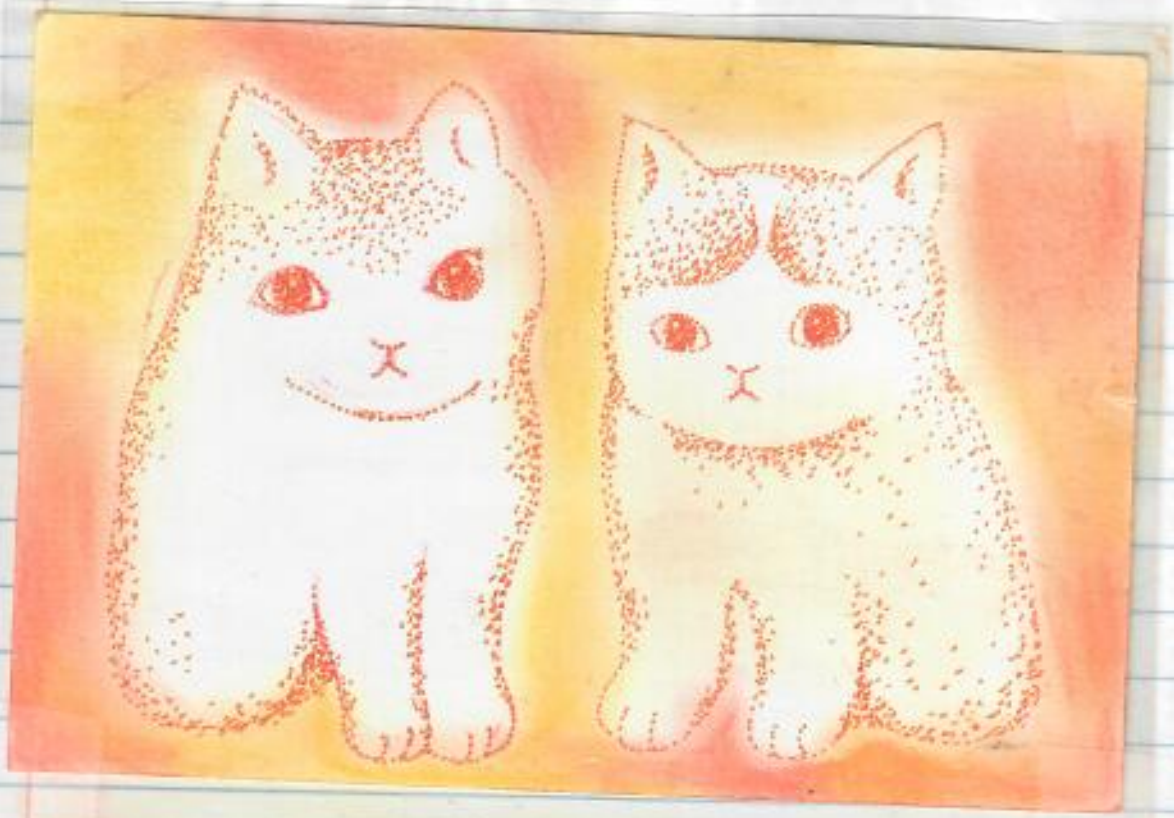
The information here is current as of March 2024 and is subject to change without notice. Also, no refunds or compensation will be issued for any losses or expenses incurred as a result of such changes. All displayed photos and illustrations are for reference purposes only.

3/2024 Printed in Japan

4/2024

- If sterilizing tag, do it before you remove peel ply fabric.
- Apply epoxy to tag immediately after removing peel ply.
- Do not touch exposed tag bottom surface before attaching.

160



Howell et al, 2010

Mar Biol (2010) 157:1011–1026

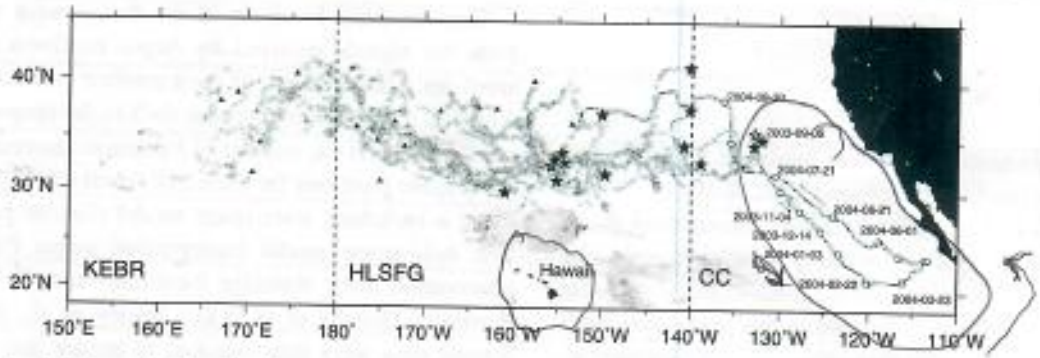
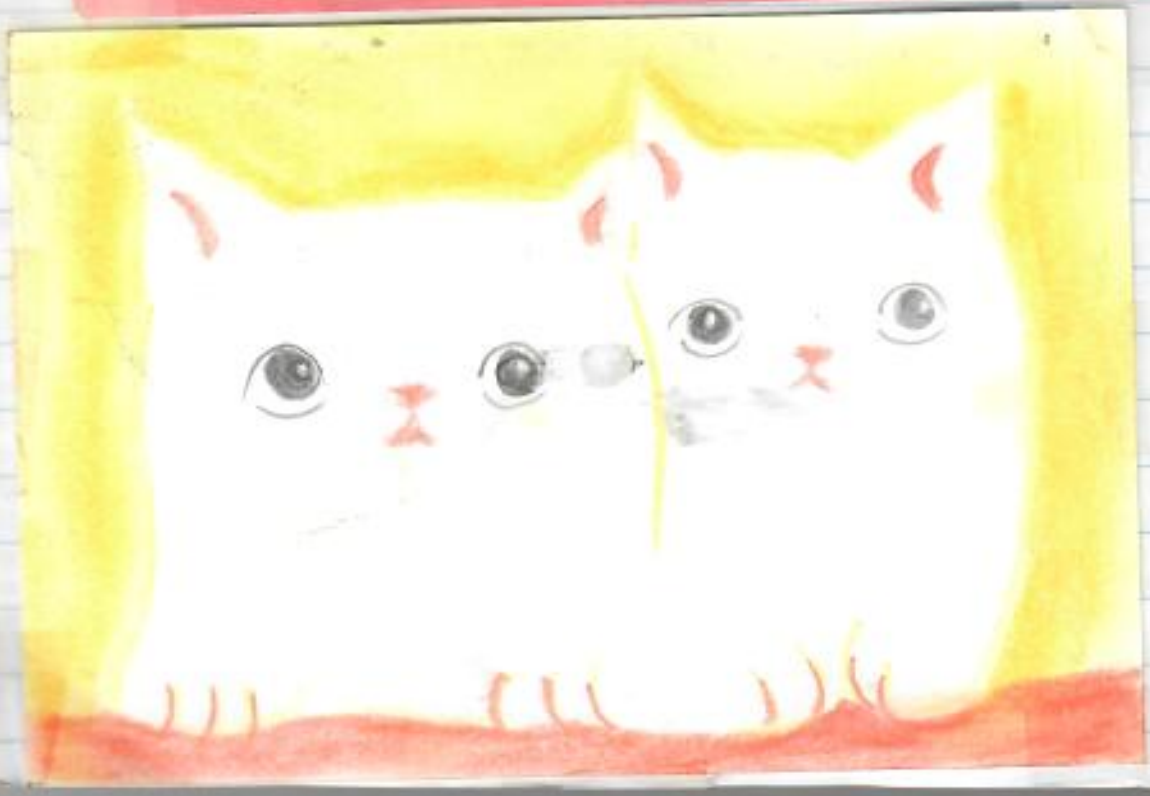


Fig. 1 Movements of 17 juvenile loggerhead turtles after release from longline fishing gear with annotation of the defined study areas: The Kuroshio extension bifurcation region (KEBR), the Hawaii Longline Swordfish Fishing Grounds (HLSFG), and the California Current (CC) region. Stars indicate release points. *Triangles* indicate final transmission locations of individuals. The *white square* represents the Long Beach point of origin for the California-based longline fishery. *Dates* and *white circles* indicate representative locations for turtle 16129 within the CC region



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ERSION TABLE

METERS	
1.000	
0.914	

CENTIMETERS	
1.00	
2.54	
30.48	1

KILOMETERS
1.000
1.609

GRAMS	O
1.00	
28.35	
453.59	
1,000.00	

KILOGRAMS	OU
1.000	35
0.028	1
0.454	16

LITERS	PINTS
1.000	2.113
0.473	1.000
0.946	2.000
3.785	8.000

LENGTH

1 meter (m) = 100 cm
1 milimeter (mm)
1 centimeter (cm)
1 decimeter (dm)
1 decameter (dkm)
1 hectometer (hm)
1 kilometer (km)

CAPACITY

1 liter (l) = 100 cl
1 milliliter (ml)
1 centiliter (cl)
1 deciliter (dl)
1 decaliter (dkl)
1 hectoliter (hl)
1 kiloliter (kl)

WEIGHT

1 gram (g) = 100 cg	=	1,000 mg
1 miligram (mg)	=	0.001 g
1 centigram (cg)	=	0.01 g
1 decigram (dg)	=	0.1 g
1 decagram (dkg)	=	10 g
1 hectogram (hg)	=	100 g
1 kilogram (kg)	=	1,000 g

MA

ime Measu
1 minute
1 hour
1 day
1 week
1 calend
1 year
1 commo
1 leap ye
1 century

ry Measure
1 quart (q
1 peck (p
1 bushel (
128 cu. ft.

id Measu
1 pint (pt.
1 quart (q
1 gallon (
1 barrel (
1 hogshe

ir Measu
1 quire
1 ream
1 bale

r Measu
= 1 foo
= 1 ya
= 1 ro
= 1 fur
= 1 mi

Measu
dozen
gross
great g
score
inches
feet
278 feet
leagues
lbs.
36 lbs.
48 liquid
os.
1.1416

e is 14.2
eighs 1

TION

			3
			3
			6
			9
			12
			15
6	6	12	18
7	7	14	21
8	8	16	24
9	9	18	27
10	10	20	30
11	11	22	33
12	12	24	36

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