

The HPU STRETCH Workshop
FRIDAY OCTOBER 10, 2025 at
HPU's Aloha Tower Marketplace Campus

LOGGERHEAD TURTLE NESTING TREND ON KOCHI BEACH FROM 2009 TO 2024

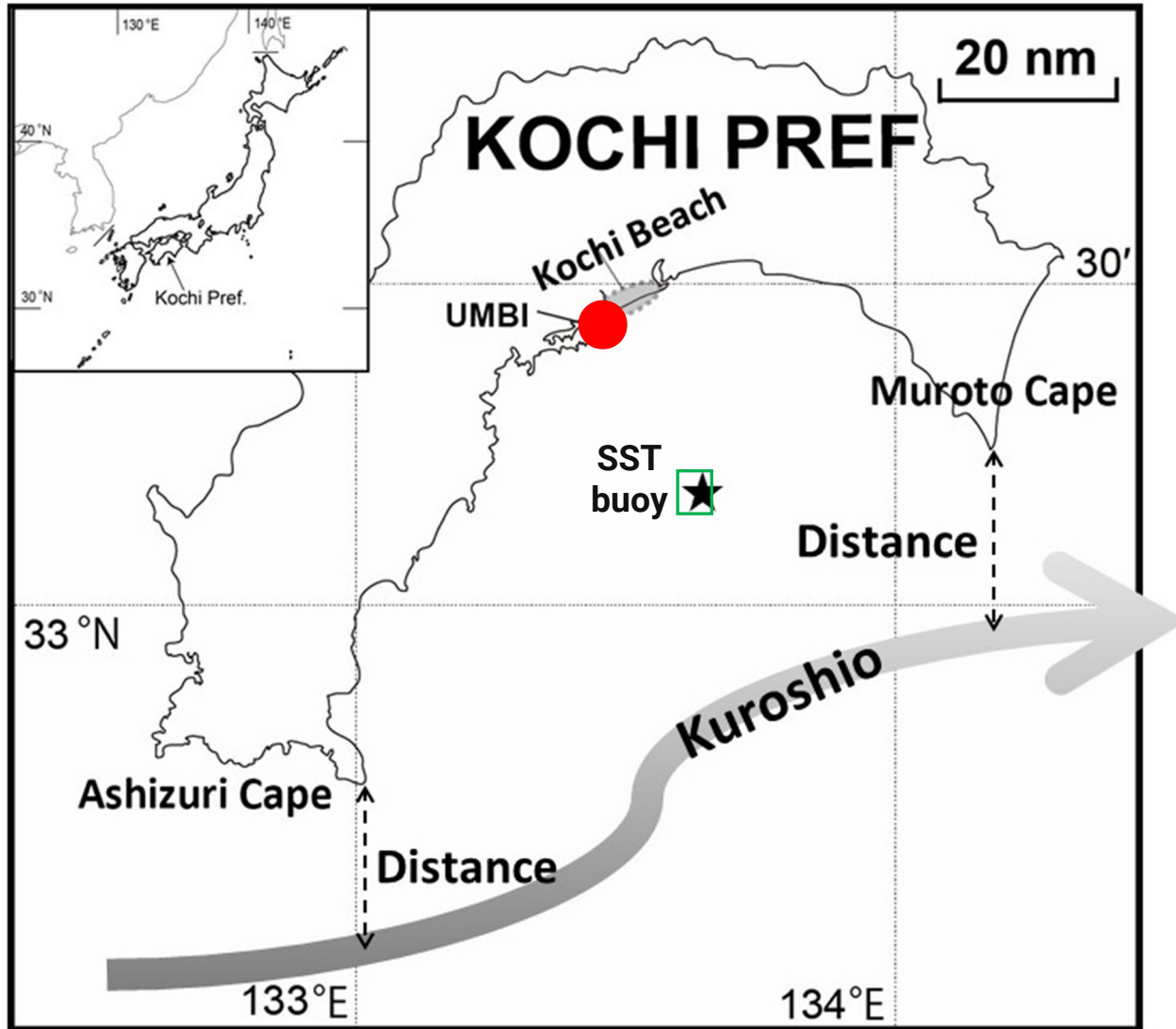
Saito, T., Yamaguchi, N., and Sugiura, K.

(UMBI: Usa Marine Biological Institute, Kochi University)

RESEARCH OBJECTIVES

- How can we analyze the loggerhead turtle nesting trends in Kochi Beach using long-term data?
- How can we apply them to conservation and international collaborative research?

AROUND KOCHI BEACH



Data on Sea Surface Temperature (SST) and Kuroshio Current axial distances from both capes were obtained from Kochi Prefecture Fisheries and Oceanographic Information System.



HISTORY OF ACTIVITIES AT KOCHI BEACH

2009 A local nature conservation group began several activities

2012 I moved to Kochi University

2013 Joined the local group

2020 Took over all activities

2021 Started preparing STRETCH

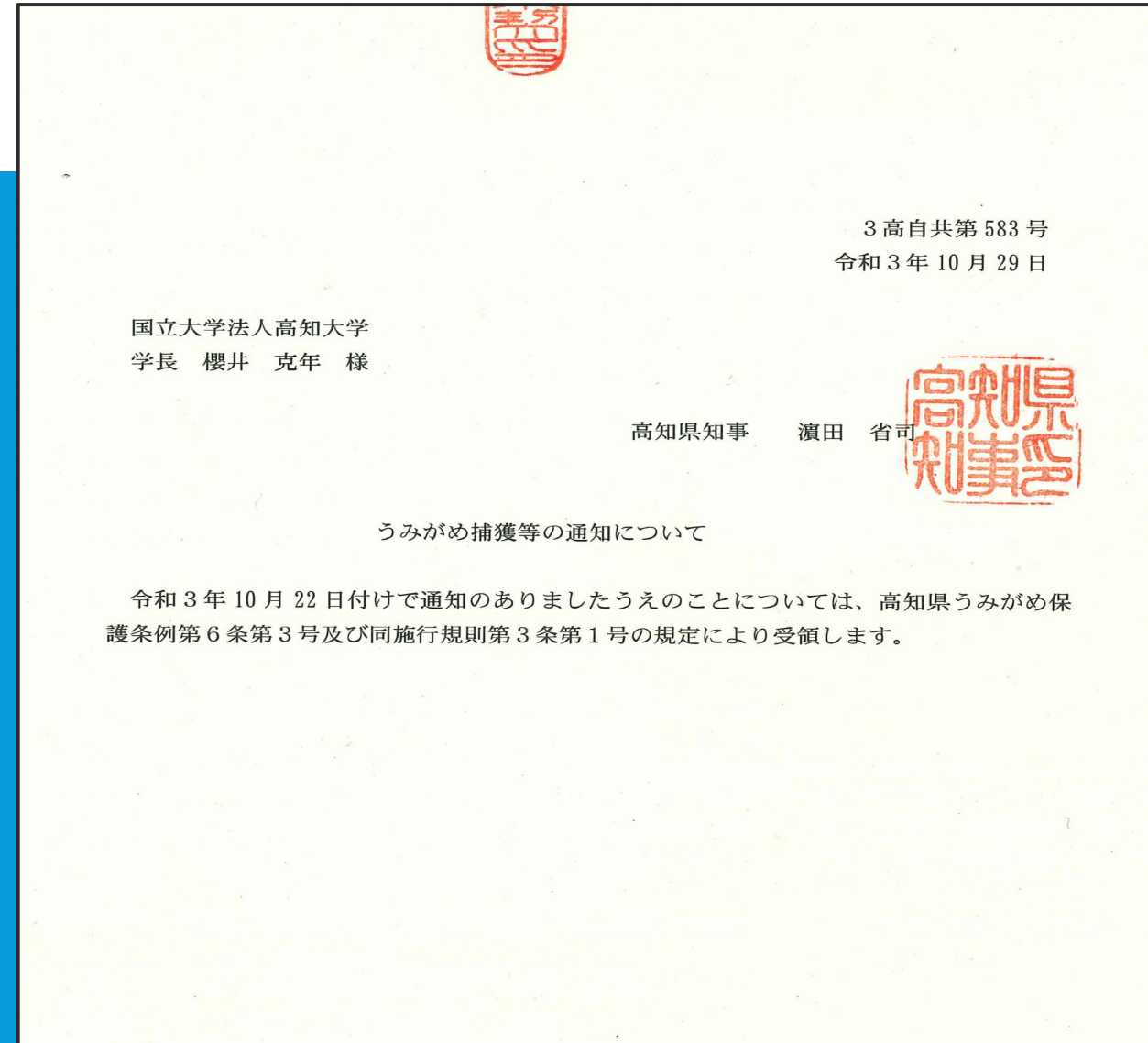


Outreach with local groups and students

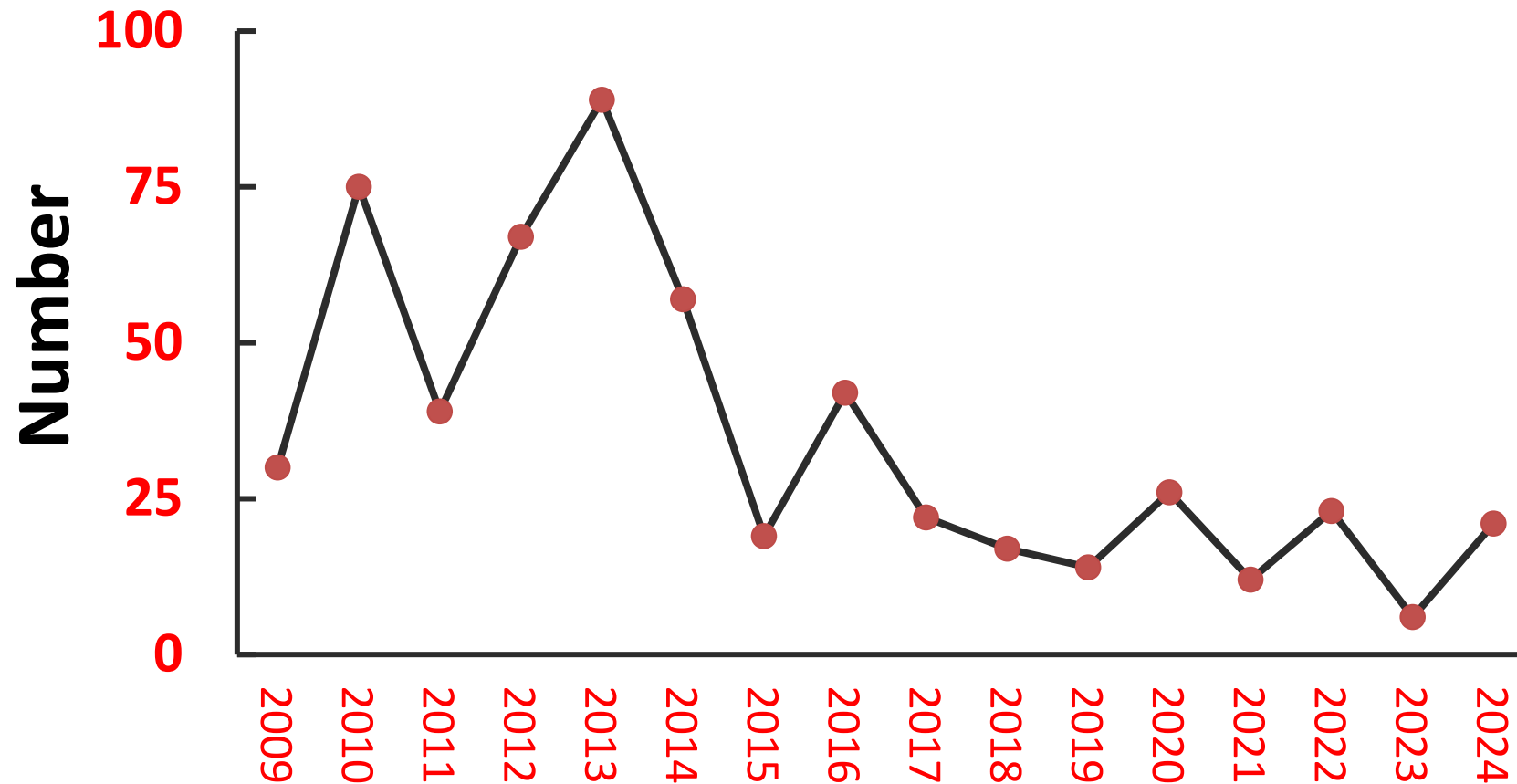


PERMISSION

- Kochi Prefecture has the sea turtle protection ordinance.
- We obtain official permission every yr, which is necessary for research and egg collection.
- This legal framework is essential to balance conservation with scientific study.



LOGGERHEAD TURTLE NESTS ON KOCHI BEACH



Annual numbers of loggerhead turtle all crawls and nests on Kochi Beach

NESTS & FEMALES ON KOCHI BEACH IN 2009-2024 (NUMBER OF FEMALES ESTIMATED USING THE OCF METHOD)

Year	Nests (N)	Nest density (nest km ⁻¹)	Abundance with OCF (N)
2009	30	3.1	8.6
2010	74	7.6	21.1
2011	39	4.0	11.1
2012	66	6.7	18.9
2013	88	9.0	25.1
2014	76	7.8	21.7
2015	19	1.9	5.4
2016	41	4.2	11.7
2017	22	2.2	6.3
2018	17	1.7	4.9
2019	14	1.4	4.0
2020	26	2.7	7.4
2021	12	1.2	3.4
2022	23	2.3	6.6
2023	6	0.6	1.7
2024	21	2.1	6.0
Overall	574	58.6	164.0
Mean	35.9	3.7	10.3

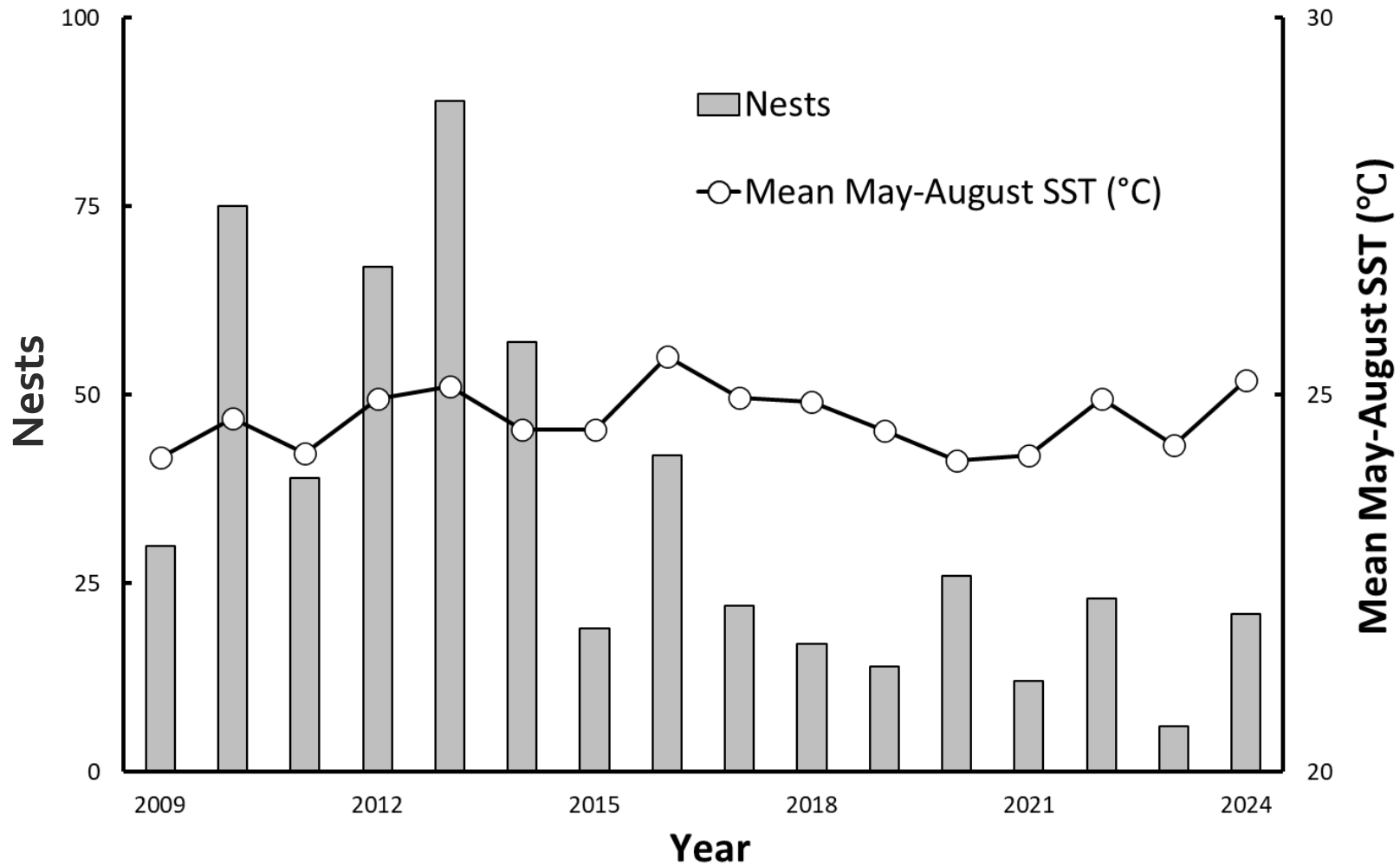
- OCF (observed clutch frequency):
3.5 times / female / yr

- FN (nesting females from OCF,
number of females considering a
return cycle of 2.6 yrs):
27 females

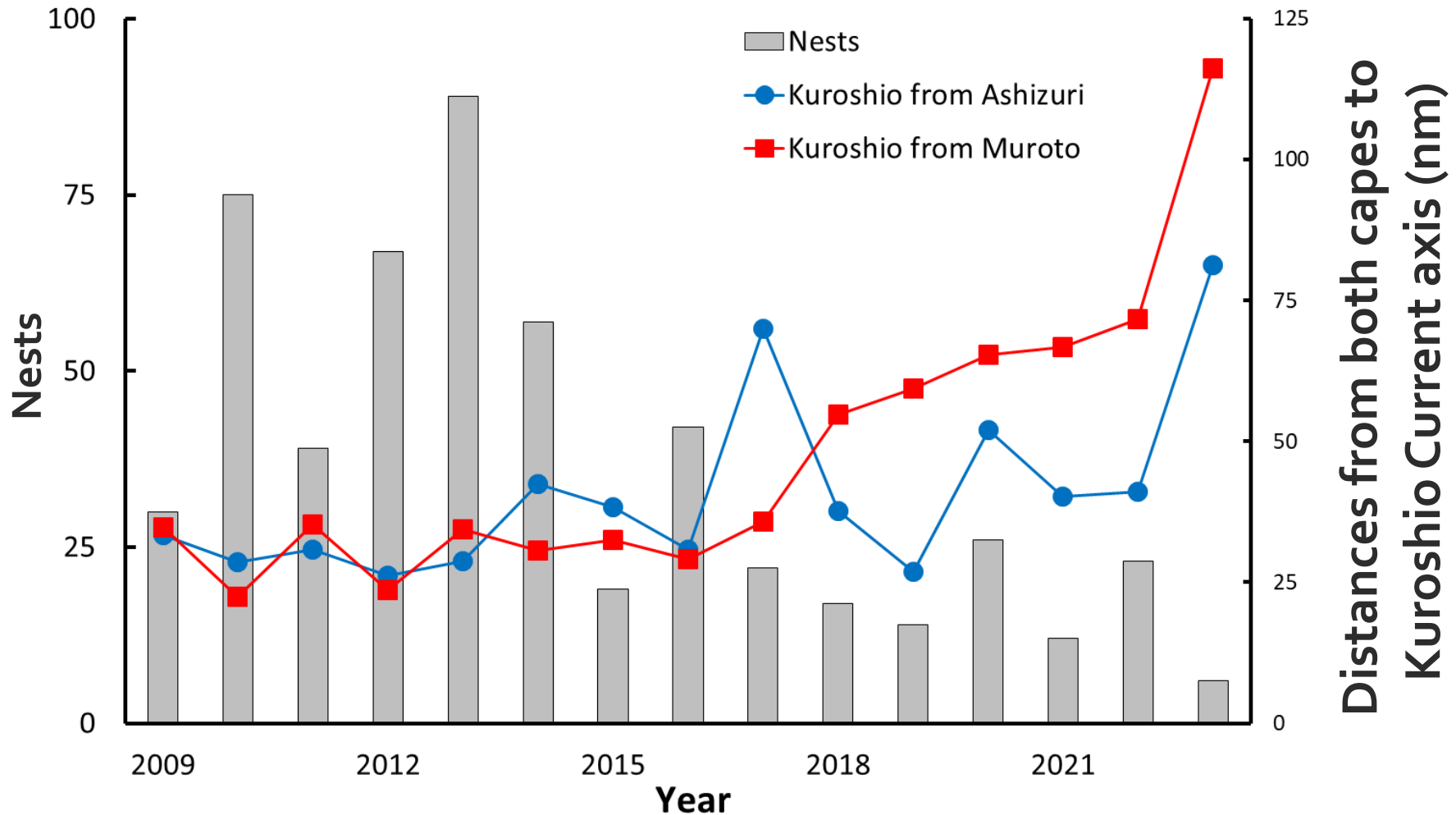
- CFN (current FN from OCF, number of
females in the last 3 yrs):
14 females

- For the number of times nesting per
year and return cycle
(see van Buskirk & Crowder, 1994)

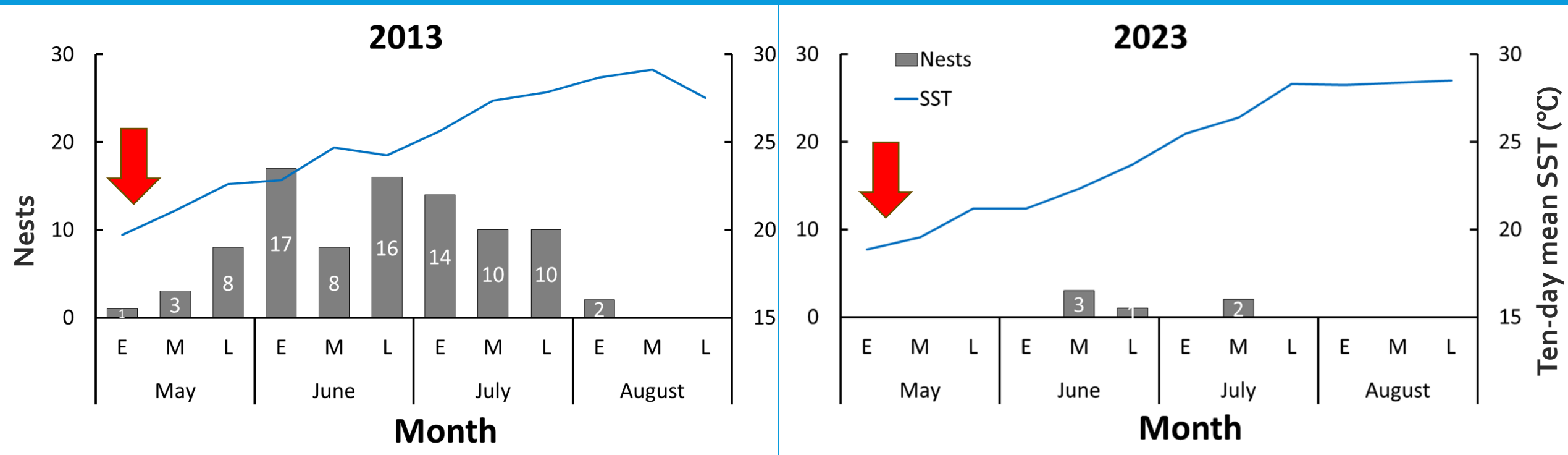
ANNUAL NESTS & SST



ANNUAL NESTS & DISTANCES FROM KUROSHIO CURRENT AXIS

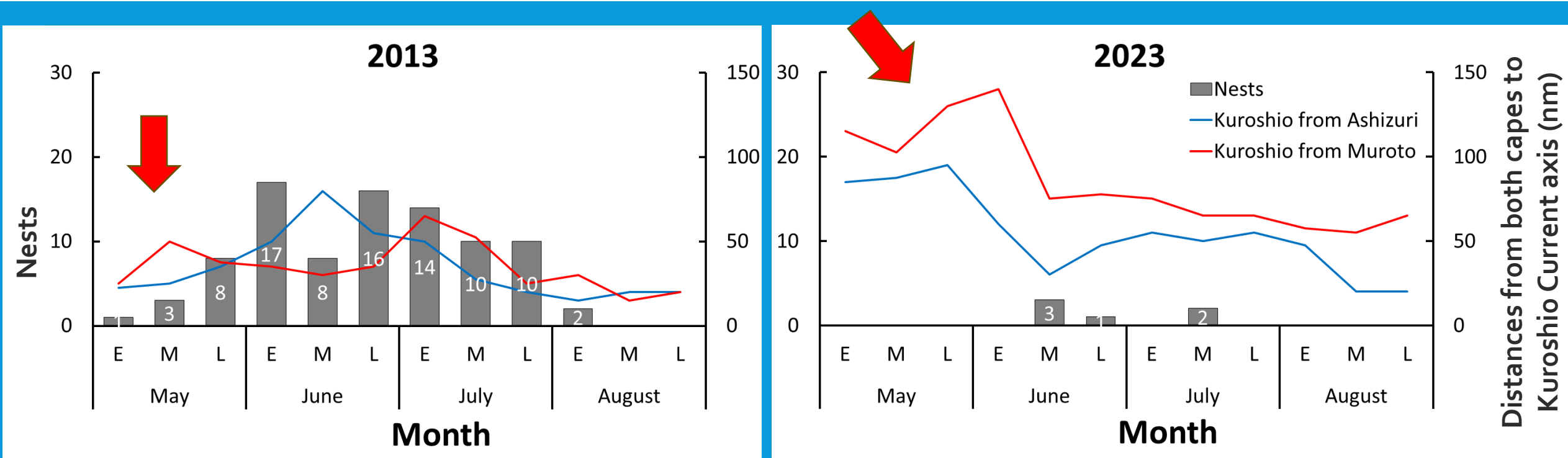


TEN-DAY MEAN NESTS & SST



- High water temperatures in early seasons are thought to cause early nesting.

TEN-DAY MEAN NESTS & DISTANCES TO KUROSHIO CURRENT AXIS



- Distances to Kuroshio Current axis in early seasons are considered to cause early nesting.
- We performed various analyses using the first and last nesting dates as objective variables, and SST & Kuroshio Current axis distances as independent variables, with units such as day, season, & month.

MULTIPLE REGRESSION ANALYSIS (FIRST NESTING DATE)

Independent variables	β Standardized regression coefficients	Explanation
Distance from Muroto Cape to Kuroshio Current axis (late Apr)	+0.41	The further the Kuroshio Current axis is from Muroto Cape, the later the first nesting date (strong impact)
SST (late Apr)	-0.40	The higher the SST in late April, the earlier the first nesting date (strong effect)
Distance from Ashizuri Cape to Kuroshio Current axis (mid-Apr)	+0.21	If the Kuroshio Current axis off the Ashizuri Cape is far away, the beginning of nesting will be slightly delayed.

MULTIPLE REGRESSION ANALYSIS (LAST NESTING DATE)

Independent variables	β Standardized regression coefficients	Explanation
Distance from Muroto Cape to Kuroshio Current axis (mid-July)	-0.82	The further the Kuroshio Current axis is from Muroto Cape, the earlier the last nesting date (greatest impact)
SST (late June)	+0.53	The higher the SST in late June, the later the last nesting date (strong effect)
SST (late-July)	-0.53	The higher the SST in late July, the earlier the last nesting date (strong effect)

KEY FINDINGS

- High water temperatures in spring tend to accelerate first nesting
- Distance to the Kuroshio Current axis is also significantly related

Further analysis underway.....

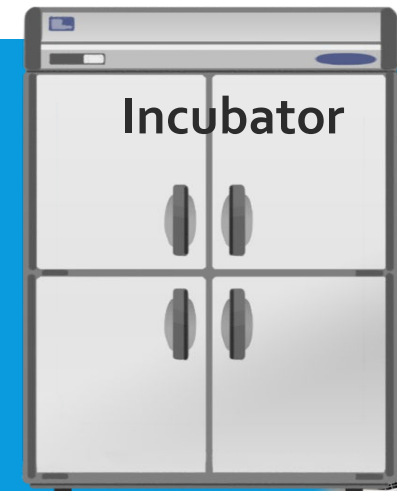
COLLECTION OF STRETCH TURTLES

Cohort	Date of nesting	Clutch size	Hatching success (%)	Date of hatching
1	2021/8/2	113	83.2	2021/9/23
2	2022/6/8	116	76.3	2022/8/12
3	2023/7/18	114	85.7	2023/9/6
4	2024/8/6	110	30.3	2024/9/25

INCUBATION AND KEEPING HATCHLINGS



29°C



SUMMARY: SIGNIFICANCE OF THE RESEARCH AT KOCHI BEACH

Why is research in Kochi Beach important?

- 1. A medium-sized nesting site nationwide and typical for Japan**
- 2. Easily linked to environmental changes (Kuroshio Current, SST...)**
- 3. Foundation for international research**

Thank you!

Collaborator: Haruno no Shizen wo Mamoru Kai; Kochi Prefectural Government; the Ministry of Land, Infrastructure, Transportation & Tourism; Shikoku Regional Dev. Bureau; Port of Nagoya Public Aquarium; Okinawa Churaumi Aquarium; Muroto Schoolhouse Aquarium; Sea Turtle Association of Japan; Okinawa Prefectural Government; Staff of Saito's Lab & UMBI

Founder: Wild Animal Fund of the Japanese Association of Zoos & Aquariums; Mitsui & Co., Ltd.; Sasakawa Scientific Research Grant from the Japan Science Society; JSPS KAKENHI

STRETCH Team: L. B. Crowder; G. H. Balazs; D. K. Briscoe; J. J. Polovina; J. A. Seminoff; A. Abreu-Grobois; P. Gaspar; L. M. R. Jim; M. Kurita; C. A. Lee-Hing; M. Mori; D. M. Parker; M. R. Rice; B. S. Santos; J. Temple-Boyer; C. N. Turner Tomaszewicz

All field surveys, animal care, animal use, and treatments were performed in accordance with the guidelines of the Animal Ethics Committee of the Kochi University.