

Learning through turtles

Educational opportunities with STRETCH



Laura Jim
Hawai'i Preparatory Academy
Sea Turtle Research Program



Laura Jim

laura.jim@hpa.edu

Co-Director of HPA Sea Turtle Research Program

Director of HPA Scuba Program

Marine Science Educator

www.hpa.edu

turtle.hpa.edu

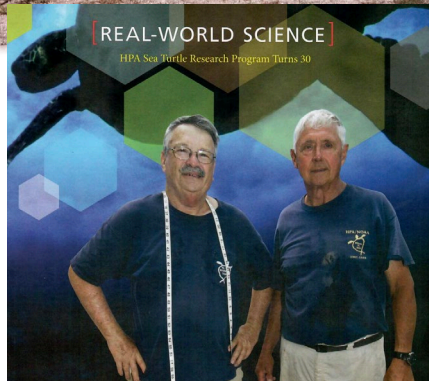
Instagram: [laurajimphotography](https://www.instagram.com/laurajimphotography)



HPA

Hawai'i Preparatory Academy





A Long-Term Partnership Continues Prosperity for Sea turtles, Students, and Scientists

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NOAA scientists work with students from Hawai'i Preparatory Academy to conduct research on Hawaiian green sea turtles on Hawai'i Island.

Research | Pacific Islands



Student explorations aid science

HPA Magazine - Fall 2007

HPA has a mission unique in the high school world: to aid National Marine Fisheries Service scientists in their search for information about the green sea turtle, which could increase the population of this threatened species.

In October fifteen Upper School students, led by science teacher Dave Colku and NMFS turtle expert George Balazs, set up camp at a "hot spot" along the Kona Coast for the first of three field studies that would

test their research skills and see their endurance. During the two night, three day field study, the student investigators assisted Dr. Balazs as he gathered information about turtle growth rates, feeding behavior, and parasitic infestation.

First, dive teams stretch a special, large-mesh net across the lagoon to snag turtles that move in and out of the area as the tide changes. (The flat-bottomed pond and five-acre lagoon in this area are important feeding and sleeping sites for the green sea turtle, which migrate here and to other major islands in the chain from their breeding grounds in French Frigate Shoals in the Northwestern Hawaiian Islands.)

The students work day and night in well-defined jobs. Most night work is done by students designated as water researchers. The turtle tenders, or research assistants, help with on-shore work, which includes tagging, recording data, and care of the captured turtles through the night. Data is also collected on how turtles utilize algae and on their feeding and sleeping habits. Other students serve as camp facilitators, cooks, and photographers (both above and underwater).

Taking four hour turns through the night, the student-scientists watch

the net flaps for signs of the elusive reptile. Once a turtle is snagged in the net, the dive team on duty swings into action to remove it before it is injured or drowns. The turtle is carefully removed from the net, carried to shore in a large inner tube, and laid on its back to await measurement and tagging. In the morning, each turtle is carefully measured and tagged on a fore-flipper with a corrosion resistant 1/2 tag. Stomach samples and fecal samples are taken, external parasites are noted and, in some cases, removed.

After all the necessary scientific data has been gathered, the students carry the turtle back to the ocean's edge and release it. The turtle rides an ocean surge to deeper water then swims away in a burst of speed, none the worse for the experience.

Six turtles were captured during the October expeditions, one of which had been originally tagged in the same area three years before. According to Dr. Balazs, the growth of that turtle was considered slow, averaging about one-half inch per year in shell length. At that rate, it will take many years to reach a large enough size (about 32 inches) to be sexually mature. One of the other turtles captured had a non-functional hind flipper, the result of an injury that Dr. Balazs suspects almost amputated the flipper. Such injuries are most often caused by entanglement in a gill net or in monofilament fishing line.

Two more trips are scheduled for the spring semester, according to Mr. Colku. "To learn about the biology of an endangered species up-close is a unique opportunity for our students. Most people have never seen a green sea turtle, but our students are gaining the hands-on experience of assisting a real scientist in real field conditions. Few get this chance, or at the undergraduate level in college."



Over the last six slippered feet, students take an inner tube to the water's edge to assist their first sea turtle.



Chris Reynolds, Jay Werhann, and Neil Oshik remove the turtle from the inner tube in preparation for its return to the ocean.

The morning air is cool in Waimea at Hawai'i Preparatory Academy (HPA), where we are greeted by sleepy-eyed students. We prepare to head out for the day to conduct sea turtle research. The team is quick to wake up and eager to get started, so we pack our gear in the car and take off down the mountain toward the coast.

The students are participants in the HPA Sea Turtle Research Program, a hands-on research experience program that enables students to conduct scientific research side-by-side with NOAA scientists. While driving to our field site, I get a chance to chat with Marc Rice, the director of the program.

It is the mission of HPA's Sea Turtle Research Program to contribute towards the health and conservation of sea turtles through education, research, and advocacy, working with students and community members to actualize their passion and commitment to a healthier marine environment.



Supporting tagging of turtles raised at the Port of Nagoya Public Aquarium in the “early years”



*Supporting tagging of turtles raised at the
Aquarium des Lagons in New Caledonia*



Supporting tagging of turtles in Moso Island, Republic of Vanuatu



Supporting tagging of turtles with STRETCH



Potential benefits to students who engage in experiential research and field investigation opportunities

Students classroom concepts to real world contexts

Strengthens environmental awareness and stewardship of students

Student gain confidence and independence leading towards successes in the future

By contributing to a larger scientific effort students see their work's broader impact elevating the authenticity and value of their work

Students enhance their soft skills including collaboration through successful interactions of professionals

Student gain exposure to professional scientists, research methods, often inspiring academic or career goals

Develop technical skills that are typically not accessible to the age group

Potential benefits to programs that engage younger students

Collaborative partnerships
potential are elevated

Can increase research productivity

Fresh perspectives and ideas are
offered by students

Empowerment of youth leadership leading
to amplification of research intention

Pathways for mentorship and future
research opportunities are developed

Demonstrates, to funders a commitment
to community education and outreach

“Future scientist” pipeline!

Often attracts positive press
coverage and community goodwill

Dr. Larry Crowder and Dr. Alberto Abreu visit Nagoya Municipal Koyo High School hosted by instructor Ken Winterowd



アカウミガメの回遊経路調査

Research on Migration of Loggerhead Turtles

ウミガメは生涯のほとんどを海で過ごすと言われ、広い海へ散り散りした子供を捜したり追いかけてたりするのはとても困難なことで、ウミガメの生態については、一部の事例を除きほとんどがなぞのままです。ウミガメを研究したフロリダ大学のアーサー・カー博士は、かつて、ウミガメが外洋で暮らしている間を「mystery of the lost year (失われた時間のなぞ)」と呼びました。



アカウミガメの大回遊のなぞ Mystery of Loggerhead Turtle's Migration

産卵色個体アカウミガメのなかでも北太平洋域に生息するグループは、日本沿岸域を主要な産卵地とし、アメリカ側には産卵地は存在しません。

さらに、日本の海岸で生まれたアカウミガメの子ガメだが、太平洋に漂った後、産卵するまで、どこでどのような生活をしているのか、という事が大きななぞでした。

成長海域にある日本生まれのアカウミガメの子ガメは、日本沿岸を泳ぎ回りますが、アメリカの海岸やハワイ近海で、しばしば見つかっています。

日本の海岸を漂った子ガメは、黒潮と北太平洋海流によりアメリカ側まで、浮遊生物を食べて成長しながら運ばれます。そして、アメリカ西海岸を南下して北赤道海流に乗り、再び日本沿岸に戻ってくるのではという仮説が立てられました。

なぞの解明に向けて For Solving the Mystery

産卵色個体アカウミガメのように、磁石を移動する動物の器官等を探る方法として、磁石を取り付けて位置する方法があります。

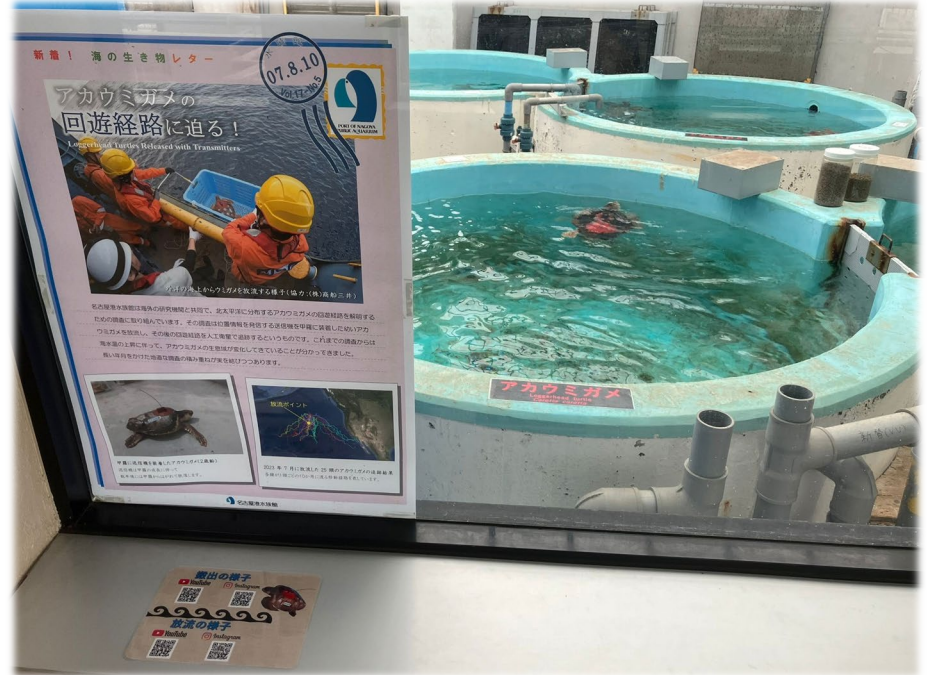
近年では、磁石だけではなく人工衛星測位装置を使用して、ウミガメが浮いた場所がわかる装置(アルゴシステム)が開発されました。

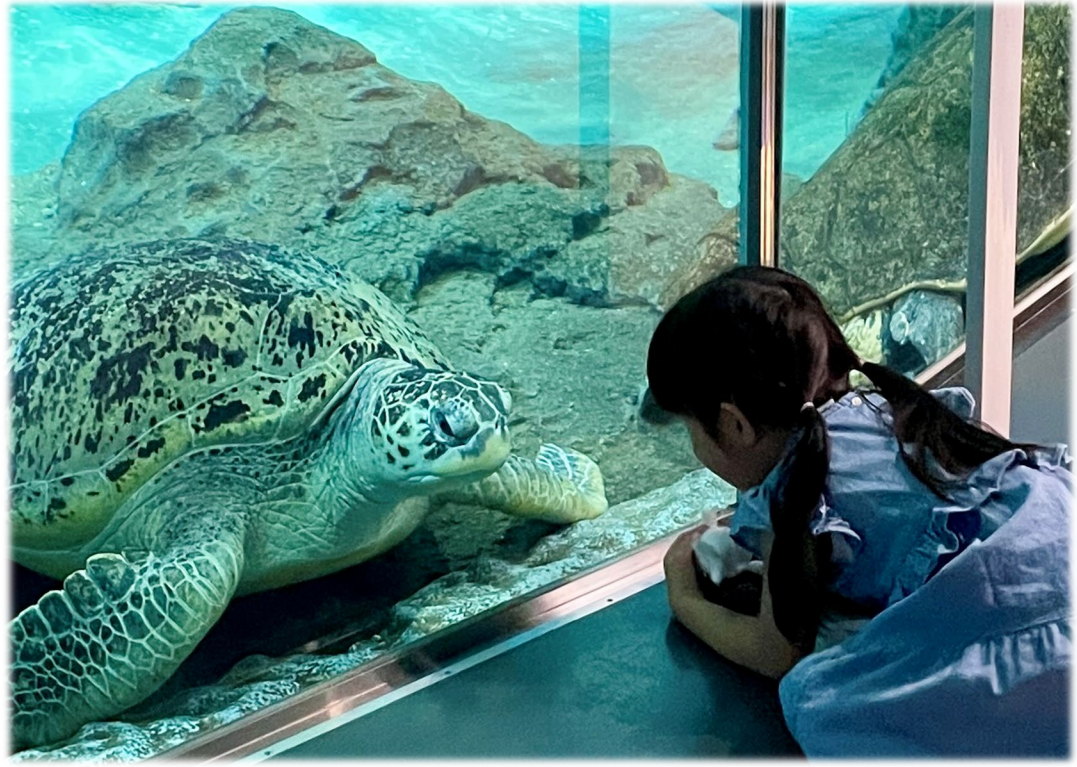
そこで、各主要産卵地帯ではアメリカ海洋大気庁(NOAA)と共同で「アルゴシステム」を用いた回遊経路追跡調査を、2003年4月から行ってきました。

追跡したデータと海洋観測データを分析した結果、北太平洋中央付近の漂流と寒流の混じり合う、餌が豊富な場所にいることが分かりました。この結果から、大きく成長した子ガメの型はアメリカ西海岸を南下することなく、海流を巡って日本の沿岸へ戻ると考えられるようになりました。



Port of Nagoya Public Aquarium's various informational displays





HPA students sharing their knowledge and "expertise" gained through field work with younger students throughout their lives



STRETCH has been a topic of interest at events





A TURTLE TRACKING TALE



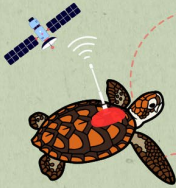
THE STORY OF LOGGERHEADS

Out in the big blue ocean, there are amazing creatures called loggerhead sea turtles. These turtles explore the vast sea and swim to far-off places. But there were some things about them that scientists didn't know, like where they travel to after they hatch.



TRACKING THE MYSTERY

This is where sea turtle satellite trackers come into play! To learn more about the turtles' mysterious adventures, researchers use special devices called satellite transmitters. These gadgets are like backpacks that turtles carry on their shells. To put these transmitters on the turtles, scientists use a special kind of glue that keeps them comfortable and happy with their new backpacks.



Whenever a turtle swims up to take a breath at the surface, the transmitter sends a message to the sky using satellites called ARGOS. The satellites up in the sky then signal the scientists where the turtles are, and they can follow the turtles' journeys on a computer. It is like having a turtle treasure map!

UNDERSTANDING THEIR JOURNEY

By tracking loggerheads with satellites, scientists can learn about where turtles are when the ocean is warmer versus colder. This is important because it can help us protect loggerheads and make sure they stay safe no matter where they travel. So, thanks to these satellite trackers, we know more about a loggerhead's journey and can make sure they have a bright and happy future in the big blue ocean, leaving trails of joy and knowledge wherever they go.



THE END

Creators: B. Scharnhorst, F. Turner, Tomaszewicz

Website educator resources

SOLVING THE MYSTERY

Why is the STRETCH Team Tracking Loggerhead Sea Turtles?

To find out if warmer water is needed to reach the coast of North America!

Is the warm water like a "bridge" to the Eastern Pacific?

And if colder water keeps them from making the long journey across the North Pacific Ocean.

Without a warm water "bridge", do they stay in the Central North Pacific?

Creators: B. Scharnhorst, C. Turner Tomaszewicz

LOGGERHEAD SEA TURTLES

Complete the storyboard to learn about a loggerhead's life journey! Hint: Check out the [FAQ page](#) on [LoggerheadSTRETCh.org](#) for clues.

10. Loggerheads can face challenges during their life journey, including interactions with fisheries, climate change, and pollution.

Be_ch Cl_an_ps

Red_ce Pl_st_c

Susta_nab_e Sea_f_od

11. Loggerheads and many other sea turtle species are endangered or threatened with extinction.

12. Scientists can use satellite trackers to help save loggerheads!

What are some ways we can help protect these amazing animals? Fill in the missing letters to find the answers!

Can you name 4 other species of sea turtle?

Knowing where loggerheads are in the ocean can reduce local threats and protect their habitats. Complete the space satellite to help transmit the loggerhead's location!

Creators: B. Scharnhorst, C. Turner Tomaszewicz

Educational Resources

Find tons of classroom-ready activities put together by NOAA National Marine Sanctuaries and NSF. Includes educational resources, factbooks, curricula, lessons, webinars, videos, and more!

Lesson Plans



NOAA National Marine Sanctuaries
NOAA National Oceanic and Atmospheric Administration

Multimedia



NOAA National Marine Sanctuaries
NOAA National Oceanic and Atmospheric Administration

Get Involved

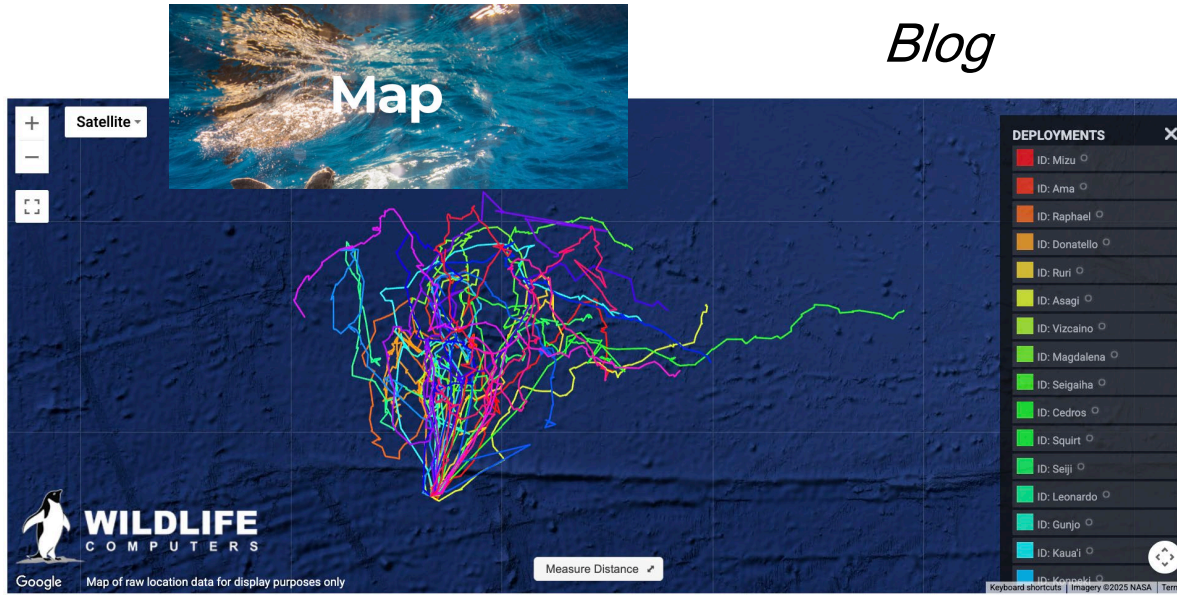
There's always a turtle safety report, learn about how you can protect these animals, whether you're on our daily list, and become a citizen scientist! Click the links below to register to NOAA research, monitorable transmitters, and sustainable wildlife practices.



- NOAA National Marine Sanctuaries
- NOAA National Oceanic and Atmospheric Administration
- NOAA Fisheries
- NOAA Wildlife Services

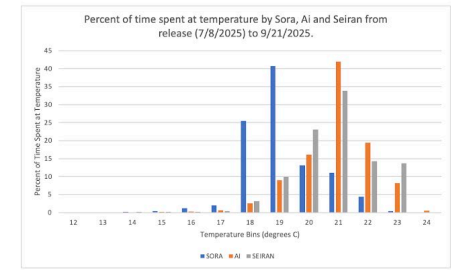


Blog

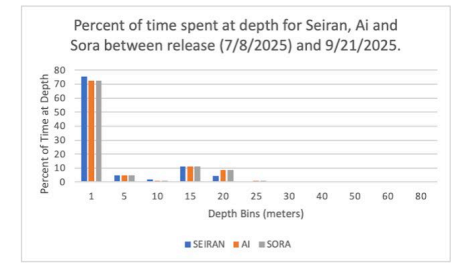


September 22, 2025 COHORT III DIVING BEHAVIOR

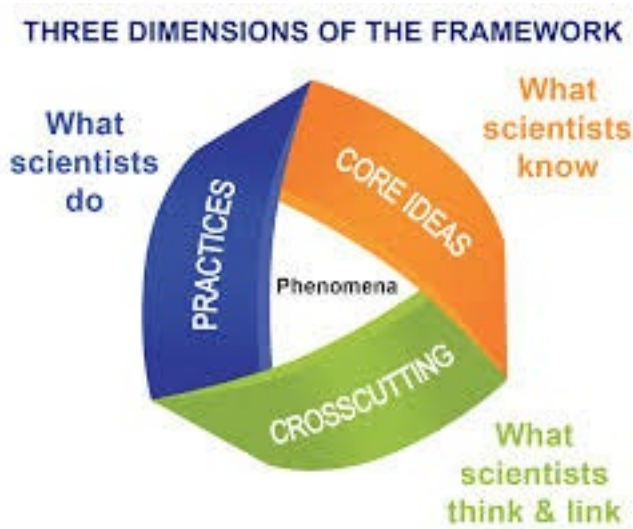
The three Cohort III loggerheads tagged with depth recording tags (Seiran, Ai and Sora) are all reporting depth and temperature data every 6 hours. In looking at their temperature data up through 9/21/2025, it appears that both Ai and Seiran have been spending the majority of their time in the 20 to 22 degree C waters while Sora has spent the majority of its time in the 18-19 degree C waters.



All three loggerheads have spent the vast majority of their time in waters that are less than 1 meter deep, i.e., at the surface. They have however spent nearly 20 percent of their time at 15 to 20 meter depth. The question now is when are they doing their diving to depth and what are they doing down there?



Challenge :Create lessons with “meaty” mapping / computational analysis to support the use of current and “real” scientific data for high school level students



DATA Nuggets

Activities that bring real scientific data into the classroom, guiding students through the entire process of science while building their quantitative abilities.

What are Data Nuggets?

Data Nuggets are free classroom activities, co-designed by scientists and teachers. When using Data Nuggets students are provided with the details of authentic science research projects, and then get to work through an activity that gives them practice looking for patterns and developing explanations about natural phenomena using the scientific data from the study. The goals of the Data Nuggets project are to (1) help scientists increase the broader impacts of their research by sharing their “science story” and data with the public, and (2) to engage students in the practices of science through an innovative approach that combines scientific content from authentic research with key concepts in quantitative reasoning.



Melissa and Liz heading to the classroom to present their research!





Ma ka hana ka 'ike
By doing, one learns

