TORREYANA

THE DOCENT NEWSLETTER FOR
TORREY PINES
STATE NATURAL RESERVE

Issue 477 **May 2025**

The Changing Global Ocean

by Joan R. Simon

Dr. Lynne Talley, Professor of Physical Oceanography at Scripps Institution of Oceanography, gave a talk at the April 12 Docent Society meeting on the changing global ocean and its role in climate change. She explained that the energy balance of the Earth is out of sync due to human activity (primarily the burning of fossil fuels). About 90% of the excess heat resulting from this imbalance is taken up by the global ocean. This uptake of heat is why oceans everywhere are warming, from the surface to the bottom depths. The ocean also absorbs around 30% of the excess CO_2 from the atmosphere, an amount that has been rising sharply since 1960, resulting in an increase in the acidification of the ocean.

These two uptakes play an important role in regulating climate change; if we didn't have a global ocean (which takes up 70% of the earth's surface), we would be much warmer. Primarily because of the ocean's role, we are feeling a temperature gain of only 2%. While these uptakes by the ocean are beneficial to the land and atmosphere, they have significant consequences for the ocean itself.

Dr. Talley emphasized the importance of sustained ocean observations to follow the changes in the ocean's make-up. She highlighted the two main measurement technologies used today: traditional measurements aboard research ships (GO-SHIP) and an array of profiling floats (Argo) that are dropped into the ocean from ships. The GO-SHIP observations involve repeated crossings of ocean basins, ranging from the surface to the very bottom of the ocean (six thousand meters down), and these crossings are repeated every five to ten years. They measure temperature, salinity, carbon uptake, oxygen, nutrients, and acidification in order to monitor changes and improve projections, both globally and regionally. The measurements are taken from the sea surface to the ocean bottom (about 5 km depth), and every 30 nautical miles.

Docent General Meeting

Date: Saturday, May 10, 9:00 am

Location: St. Peter's Episcopal Church Parish Hall, Del Mar

Speaker: Dr. Tammy Russell, a marine ornithologist and postdoctoral researcher at Scripps Institution of Oceanography

Topic: Plastic Pollution & Seabirds: Understanding the extent and food web pathways of this pervasive pollution

Dr. Russell will give an overview of plastic pollution, focusing on the Penguano Project, where her team is researching plastics in the diets of Antarctic penguins; it is a collaboration between NOAA, Birch Aquarium, and Scripps. She will also discuss plastics in local San Diego seabirds, as well as balloon pollution. Dr. Russell spoke about Brown Pelicans at the November 2024 General Meeting (December 2024, *Torreyana*).

Refreshments: Docents with last names beginning with **A, B, C** will be responsible for providing snacks for this meeting.

The second method of observation is through floating robotic devices, Argo, that measure various ocean parameters, including temperature, salinity, and biogeochemical properties. After Argo floats (costing from $20,000 to $100,000) are placed in the water, they drift with the currents at 1,000-meter depth. Over the course of 10 days, they descend to 2,000 meters and then rise to the surface, where their data is picked up by satellite. They descend again, repeating this cycle for five to ten years. In addition to research ships, National Geographic, Viking, and other cruise ship companies are beginning to participate in this program. (Cont. on pg. 3.)

The Torrey Pines Docent Society publishes the *Torreyana* monthly, edited by Joan Simon and Dan Hammer on alternate months, and is formatted and produced by Roger Isaacson and Angela Bailey. Submissions are due on or about the 20th day of the preceding month and may be emailed to
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TP Conservancy: torreypines.org

Visitor Center phone: **858.755.2063**

FLASH - Don't forget to donate your nature and conservation magazines to the Museum Shop.

President's Message

Spring has sprung. Let's appreciate what we have done and who we have become.

Happy Spring! At our April General Meeting, I presented the annual report for 2024, called the State of the Society. I am proud to say that the Docent Society, now in its 50th year, is in great shape based on several metrics. We continue to grow our new docent classes, which reached a record number of 28 this past fall. Financially, thanks to **Nancy Walters, Selma Torres, Valerie Thomas,** and the rest of the museum shop crew, our bottom line has never been stronger. **Stu Rosenwasser,** who chairs the special walks program, which contributes over ten percent of our total revenue, also deserves credit for running a smooth operation. Lastly, 170 docents contributed a total of 24,913 hours to the Reserve. This gives us an average per docent of 147 hours. These three figures are all-time highs.

The Youth Program also had a banner year thanks to the leadership of **Janet Ugalde** and her team, which includes **Deborah Buffington, Dinah Carl, Pau Chau, Kathy Dickey, Paul Dunphy, Susan Elliott, Mary Friestedt, Gail Gluckman, Jennifer Greenberg, Kristi Griffith, Barbara Gunning, Paul Howard, Lisa Kakone, Wayne Kornreich, Greg Lafreniere, Mary Makowski, Gary McCook, Bruce** and **Patti Montgomery, Barney Moore, Jim Moore, Steve Neal, Ingo Renner, Lynn Riedman, Annette Ring, Stu Rosenwasser, Rachel Scherba, Glo Silva, Sally Stoffel, Beverly Toth, Lynne Truong, Alberto Trujillo, Myrna Trust, Rosemary Wareham,** and **Christie Zilberman.**

Earth Day This year was perhaps the best one yet. It was a great success thanks to **Lynne Truong's** leadership. The program this year included speakers from the Kumeyaay Nation, who lectured on traditional ecological knowledge as well as bird songs.

Let's thank the many docents who volunteered to make it happen, including: **Pam Burdt, Dinah Carl, Pao Chau, Medi Denker, Karen Frazier, Bob Friedman, Barbara Gunning, Connie Jaffe, Wayne Kornreich, Darby Lewis, Lisa Lomas, Carolyn Maclean, Gary McCook, Joanne Miale, Patty** and **Bruce Montgomery, Tulay Muezzinoglu, Steve Neal, Santosh Nichani, David Nichols, Suzan Potuznik, Ingo Renner, Diane Russell, Ed Saade, Jeannie Smith, Beverly Toth, Cindy Tozer, Gabriele Wienhausen,** and two Wannabee volunteers, Scott Henry and Bonnie Nickel.

Matt Xavier
TPDS President

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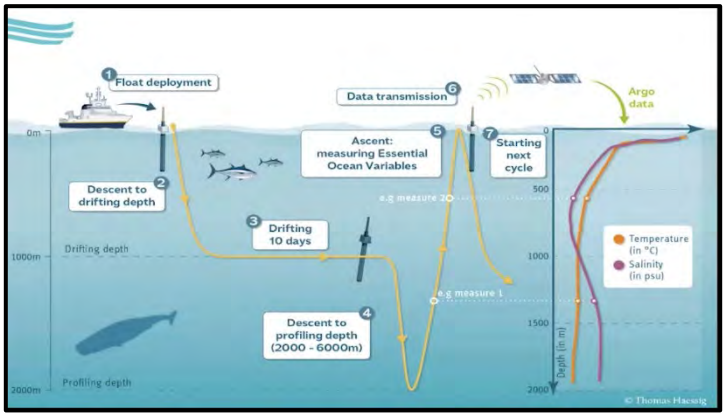
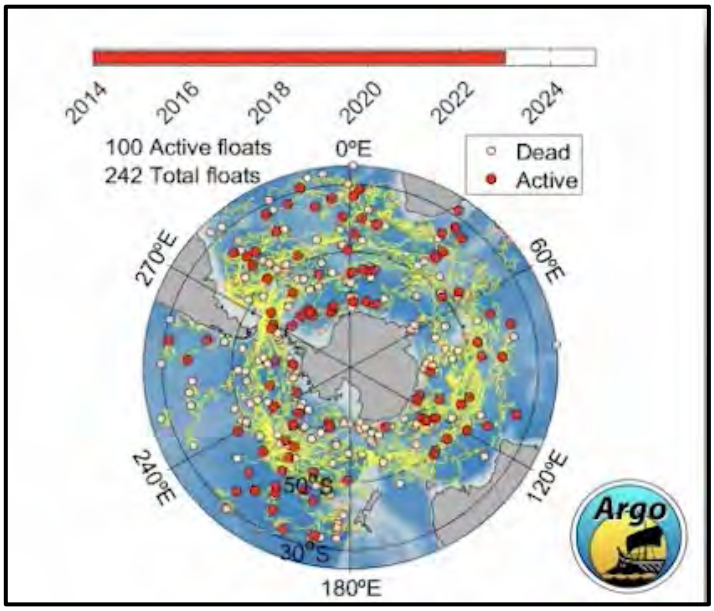


10-day cycle of the Argo floats

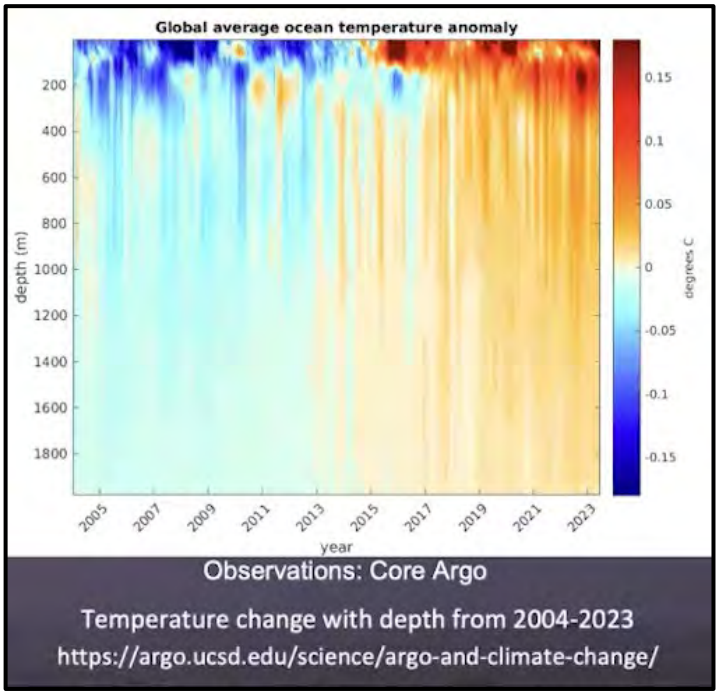
Currently there are four thousand Argo floats, with new floats added every year to compensate for the five- to ten-year lifetime of the floats, and about four hundred biogeochemical Argo floats (with more being added all the time to bring the number up to a thousand globally). They are everywhere in the global ocean except the Arctic, where the permanent ice prevents the floats from coming to the surface and transmitting their data.



Locations of Argo floats

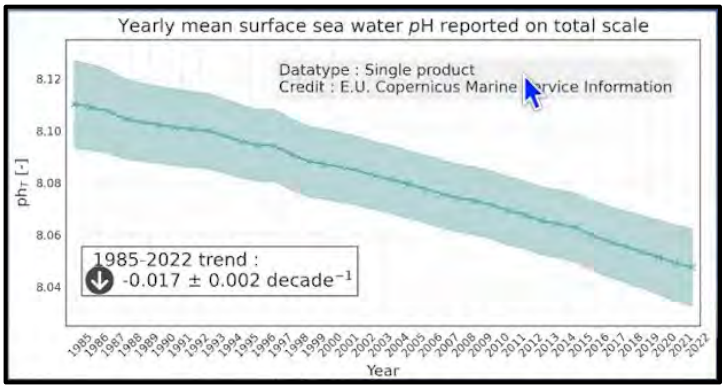
Because the upper ocean is closer to the atmosphere, it absorbs most of the heat, so ocean warming is not the same throughout its depths (just as global warming on land isn't affecting every area to the same extent). Likewise, carbon uptake varies with the depth of the ocean.

Dr. Talley stressed that measurements are necessary to observe changing global ocean heat content and to improve projections of future sea level rise – both globally and regionally. "If you don't observe it, you won't know what is happening," Dr. Talley cautioned. And you have to observe for a long time if you want to measure not just the changes, but the rate of those changes.



Ocean warming chart from the upper ocean to the abyssal ocean

What are some of these changes and their consequences? Sea level has risen 10 cm since 1993 (almost 4 inches). The rise is driven by two things: melting land ice (glaciers and ice sheets) and warmer water, because the mass of water expands as it warms. CO_2 is also increasing, with serious consequences. When you dissolve CO_2 in water, it makes the water more acidic. This lower pH value affects everything made of calcium, e.g., bones, teeth, and shells.



Ocean acidification

Looming over the talk was the threat of defunding much of the long-term research into the condition of the ocean. In fact, some budget cuts have already taken place. While all of the projects Prof. Talley spoke about are internationally sponsored and run, the United States (primarily the federal government) provides 50% of the funding and facilities. "Without a steady, long-term collection of data, we will have no idea what is happening in the oceans."

To watch Prof. Talley's presentation, click here.

Docent of the Month: Sue Lange

Photo by Herb Knufken

Wow! What an honor to be selected as Docent of the Month. I humbly thank the board and all the docents who have mentored me over the years.

Moving from the East Coast to San Diego, I loved all the recreational activity here -- and the weather. I started running and eventually ran the La Jolla 1/2 Marathon. Voila! I found Torrey Pines. I continued running and hiking at Torrey Pines and eventually discovered the TIK. ***Donna Close*** *and former Park Aide Jake Mumma always seemed to be there having a good time chatting with visitors, and that planted a seed in my mind. One day, after retiring, I had an epiphany – I wanted to be a docent!*

Joining the training class of 2016 was quite challenging. I loved learning about the history of the Reserve, the Torrey Pine tree, and nature from a different perspective. It was a lot of studying all week, then taking a written quiz, but the trainers were always encouraging. Torrey Pines Reserve has become my Happy Place!

For the first few years, I worked at the TIK, in the Lodge, and as a Roving Interpreter. I knew next to nothing about flowers and plants, but Donna Close and ***Ingo Renner*** *were excellent mentors. Looking for a new and interesting project, I signed up to help start the "Budding Botanists," an ethnobotany research group. We researched how plants were used by Native Americans and presented our findings at the monthly meetings. We were "foodies" and used our culinary skills to make Native American treats to serve at the meetings. For example, we used the fruit from the prickly pear cactus to make a drink, a jelly, and a dip.*

My next project was weaving Kumeyaay-style baskets. The reward comes when the basket is completed and sold. I continue to work at the Lodge, and I love meeting visitors, hearing their stories, and seeing their enthusiasm for the Reserve.

The Docent Society offers many ways to follow your passion. Awesome thanks and gratitude to so many inspiring, knowledgeable, and dedicated docents. May all of us continue to follow our passion. I hope to pass this forward to "newbies" and fellow docents.

General Meeting Minutes: April 12, 2025

Speaker: Dr. Lynne Talley, Distinguished Professor of Physical Oceanography, Scripps Institution of Oceanography

Topic: The Changing Global Ocean (See pg. 1.)

Approximately 70 docents attended. President **Matt Xavier** led the business meeting.

Docent of the Month: Sue Lange, class of 2016, who is a frequent Lodge host, Roving Interpreter, and TIK host.

Selma Torres presented **Nancy Walters**, class of 2012, with a "going away and thank you" gift for her leadership of the Museum Shop team. Nancy is moving to Sonoma to be closer to her daughter's family. She and Selma worked in the Museum Shop together and were a great team. "It was one of the most rewarding chapters in my life," Nancy said.

Ambassador Stations: We have had three additional well-attended training sessions for the ambassador stations. See box on pg. 10 for more details on the program. The benches are being modified so that docents do not have to carry the chairs or the umbrella.

Wildflower Walks: The class of 2025 has requested guides to take them on the trails to learn more about how to identify wildflowers and how to understand their importance for storytelling purposes.

Lynne Truong has done an excellent job planning Earth Day events. The day will be a bit richer in terms of the presentations. Kumeyaay bird singers will be coming, and an elder of the Kumeyaay will also be present to talk about Native American history. Jeff Nordland, the "snake guy," will also be returning.

Wine in the Pines is on April 26. A rock band will be playing this year. Parking will be at the North Parking lot, where there will be a shuttle service to the Children's Pavilion for the event.

Annual Report Highlights: The Docent Society is in its 50th year. There are an increasing number of docents and visitors. There were a record 28 new docents in the latest training class. President **Matt Xavier** gave an update on the Docent Society finances, which are posted in the Library and on the docent website. Louis Sands's position is expected to be filled in the coming months. Matt also thanked **Lynne Truong** for an amazing job helping manage finances, along with the finance committee: **Lisa Kakone, Harry Proctor,** and **Matt Xavier.**

Accomplishments in 2024:

- Increased Lodge hours and docent participation
- A record 24,913 docent hours have been logged and over 3,000 children from 42 schools were served through the Youth Program
- Revamped training program

- Guy Fleming House tours for docents following the house renovation
- CEED and OAKS events
- Development of a Conflict Resolution Policy (an ombudsman is needed)
- Implementation of several projects, including an outside lighting upgrade at the Lodge, the Peñasquitos Lagoon watershed model, the bridge replacement on the trail between Yucca and Razor Points, and an electric unit to replace the gas fireplace at the Lodge.

Upcoming Events:

- Ocean Day at the BLIK (in the planning stages)
- 50th anniversary celebration for the Docent Society (planned for late August or September)
- Holiday Potluck

Refreshments: It was suggested that docents who bring homemade refreshments include a recipe card. Next general meeting refreshments to be provided by docents with names ending in **A, B, C.**

Science Fair Award Recipients

by Wayne Kornreich

The 2025 Greater San Diego Science and Engineering Fair entries had some very notable projects. The judges this year (**Wayne Kornreich, Robert James, Kathy Dickey**, and **Leigh Fenly**) selected two projects as TPDS grand prize winners and five projects for honorable mention.

The grand prize winners, who we hope will agree to present at one of our meetings, are:

- Austin Zhang (grade 11, Del Norte High School): *Smart Park Management: A Drone-Based AI Solution for Vegetation Health and Wildfire Risk Mitigation*
- Martin Valkanov (grade 7, San Diego French American School): *Eco-Safe Marine Sunscreen: Development and Effectiveness Testing Against Conventional Products*

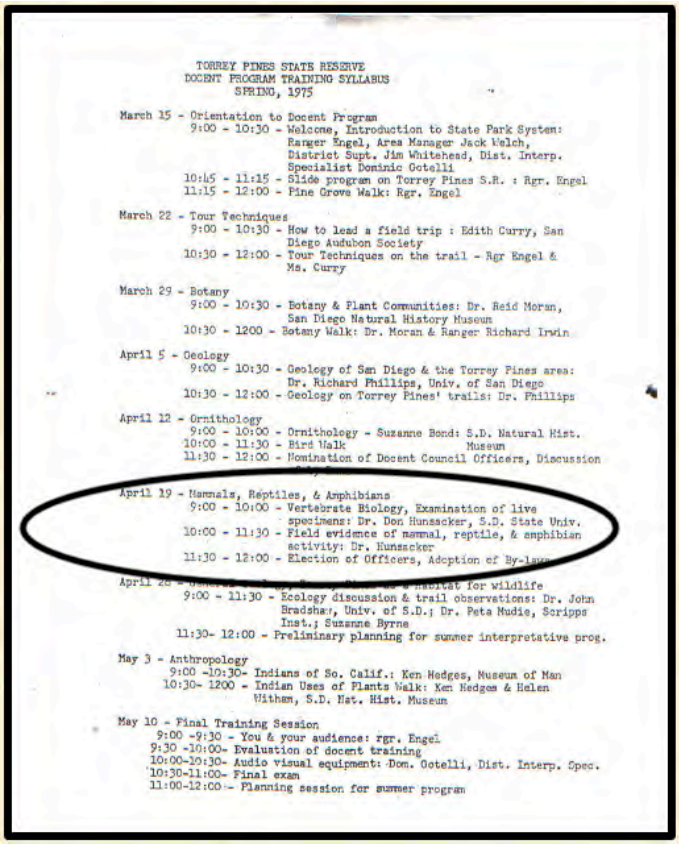
The honorable mention student projects are:

- Steven Chen (grade 9, Canyon Crest Academy): *Nature-Inspired Living Device to Degrade Organic Pollutants in Water*
- Anna Luo (grade 11, Canyon Crest Academy): *Allelopathic Effects of Cynara cardunculus on Native Coastal Sage Scrub Species*
- Rishabh Bhatia (grade 7, The Rhodes School): *Applying Image Recognition Algorithms for Identification of Strongylocentrotus purpuratus*
- Leela Goel and Luna Ye (grade 8, The Rhodes School): *Effect of Salinity on California Coastal Sage Scrub Seed Germination*

The First Docent Training Class

by Judy Schulman, TPDS Historian

The first docent training class was in spring 1975. Ranger Linda Engel oversaw the program. There were 28 trainees (17 women and 11 men). It was followed by another class in the fall. By June 1975 we were already conducting tours and staffing the Visitor Center. The February 1976 roster showed that there were 53 active members. That is quite a growth spurt! Here is a copy of the spring 1975 training schedule and a photo of Dr. Don Hunsaker of SDSU giving the trainees a class on Mammals, Reptiles and Amphibians.



TORREY PINES STATE RESERVE
DOCENT PROGRAM TRAINING SYLLABUS
SPRING, 1975

March 15 - Orientation to Docent Program
9:00 - 10:30 - Welcome, Introduction to State Park System: Ranger Engel, Area Manager Jack Welch, District Supt. Jim Whitehead, Dist. Interp. Specialist Dominic Gotelli
10:45 - 11:15 - Slide program on Torrey Pines S.R. : Rgr. Engel
11:15 - 12:00 - Pine Grove Walk: Rgr. Engel

March 22 - Tour Techniques
9:00 - 10:30 - How to lead a field trip : Edith Curry, San Diego Audubon Society
10:30 - 12:00 - Tour Techniques on the trail - Rgr Engel & Ms. Curry

March 29 - Botany
9:00 - 10:30 - Botany & Plant Communities: Dr. Reid Moran, San Diego Natural History Museum
10:30 - 1200 - Botany Walk: Dr. Moran & Ranger Richard Irwin

April 5 - Geology
9:00 - 10:30 - Geology of San Diego & the Torrey Pines area: Dr. Richard Phillips, Univ. of San Diego
10:30 - 12:00 - Geology on Torrey Pines' trails: Dr. Phillips

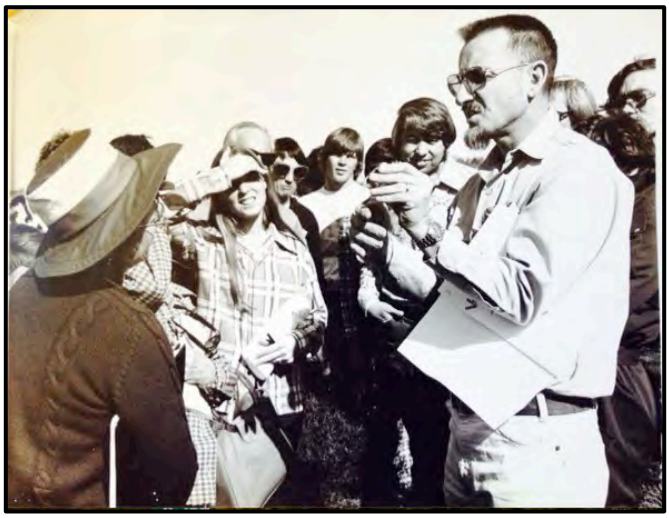
April 12 - Ornithology
9:00 - 10:00 - Ornithology - Suzanne Bond: S.D. Natural Hist. Museum
10:00 - 11:30 - Bird Walk
11:30 - 12:00 - Nomination of Docent Council Officers, Discussion

April 19 - Mammals, Reptiles, & Amphibians
9:00 - 10:00 - Vertebrate Biology, Examination of live specimens: Dr. Don Hunsacker, S.D. State Univ.
10:00 - 11:30 - Field evidence of mammal, reptile, & amphibian activity: Dr. Hunsacker
11:30 - 12:00 - Election of Officers, Adoption of By-laws

April 26 - [illegible] for wildlife
9:00 - 11:30 - Ecology discussion & trail observations: Dr. John Bradshaw, Univ. of S.D.; Dr. Peta Mudie, Scripps Inst.; Suzanne Byrne
11:30- 12:00 - Preliminary planning for summer interpretative prog.

May 3 - Anthropology
9:00 -10:30- Indians of So. Calif.: Ken Hedges, Museum of Man
10:30- 1200 - Indian Uses of Plants Walk: Ken Hedges & Helen Withen, S.D. Nat. Hist. Museum

May 10 - Final Training Session
9:00 -9:30 - You & your audience: rgr. Engel
9:30 -10:00- Evaluation of docent training
10:00-10:30- Audio visual equipment: Dom. Gotelli, Dist. Interp. Spec.
10:30-11:00- Final exam
11:00-12:00 - Planning session for summer program



What's On the Beach? Shells

by Kathy Dickey; photos from an exhibit by the San Diego Shell Club

On March 19, a group of 33 docents gathered at the BLIK for a lecture on "The Mollusks of Torrey Pines Beach and Los Peñasquitos Lagoon." Dr. Paul Tuskes and David Berschauer of the San Diego Shell Club led us on a whirlwind tour of our local shells. At the end of the talk, they gifted us their beautiful book for our library, *Sea Shells of Southern California*.

Paul started his talk with the bivalves (shells with two-hinged sides), including clams, scallops, oysters, and mussels. Here are some interesting facts:

- Most clams and scallops live on the surface of the sand, or as much as one inch below. An exception is the elongated jackknife clams (3 varieties), which live 4 to 5 inches under the sand. Piddock clams are unique in that they burrow onto rocks. Oysters also attach themselves to rocks. Clams can live up to 90 feet under the water. Some clams live where eel grass grows.
- Judging from Paul and David's book, there appear to be dozens of species of clams in San Diego. Some common ones are the white chione (three varieties), littleneck or venus clams (many), gaper, geoduck, Washington, Pacific razor, manila, clipped, fat, tiny bean clams, and the very large pismo clams.
- Common scallops in San Diego are the speckled bay scallop and the kelp scallop. They have deep ridges in their shells and "wings" in the area where the bivalves come together, sometimes called "ears."
- Common oysters in San Diego are the native California and Pacific oysters, but there is also a huge influx of introduced Japanese oysters.
- Most clams are sedentary, but others use their siphon tubes to swim. Scallops are free-swimming bivalves that quickly open and close their shells to suck in and expel water and move themselves over the sediment.
- The bivalve mollusks primarily eat phytoplankton, zooplankton, algae, and other microscopic organisms. They are filter feeders, pulling water through their siphons and using specialized structures to capture food particles.
- Predators of clams, scallops, and oysters include moon snails, sea slugs, octopus, lobsters, rays, shorebirds, crabs, and horn sharks.

The other group of shells presented during the lecture were the gastropods. Some members of this family of shells are rounded and look somewhat like garden snails. Others (such as the whelks) are much more elaborate. Here are some of my notes:

- Most of them have an oval "lid" called an operculum that can open or shut like a door to keep moisture in and predators out.
- Common gastropods in San Diego include the moon, whelk, murex, wavy top turban, bubble, slipper, chestnut cowry, and olive. The California horn snail lives in estuary entrances.
- Gastropods are found in a wide variety of habitats, ranging from the deep ocean to tidepool areas.
- Gastropods have a diverse diet. Many are herbivores or omnivores, feeding on algae, plants, and other organic matter. Some are carnivores or scavengers (cone snails and whelks).
- Like land snails, marine gastropods move primarily using their muscular foot, which they slide along surfaces using waves of contraction and mucus secretion. Some gastropods also use their foot for swimming or burrowing.
- Predators of gastropod shells are similar to those mentioned above for the bivalves.

Paul said that due to climate change, cooler-water species of shells have moved further north, and species commonly from Baja have moved north into San Diego's bays, estuaries, and beach areas.

For more information, visit thesandiegoshellclub.com

Bird of the Month: Least Bell's Vireo

by Robert James; photo by Omar Moquit

I first learned about the Least Bell's Vireo (*Vireo bellii pusillus*) as an example of a recoverable endangered species. This is proving to be accurate as their populations increase and expand, and as people increasingly encounter them. This bird migrates from Mexico and Central America and arrives in the spring, nesting in and on the edges of streamside woodlands, commonly in willows (*Salix*) and mulefat (*Baccharis salicifolia*), and remains through the summer. From its distinctive song, it has been described as the bird that repeatedly asks a question, and then answers it!

The Least Bell's Vireo has been State and Federally listed since the 1980s primarily due to wetland habitat loss and nest parasitism by the non-native Brown-headed Cowbird (*Molothrus ater*). However, there has been large-scale habitat restoration. This has included efforts to remove invasive, exotic tamarisk (*Tamarix*) and giant reed (*Arundo donax*), such as the ones on the Santa Ana River and locally on the San Luis Rey River. Seasonal cowbird control by many partners has also contributed to recovery.

My first experience with the Least Bell's Vireo was to survey a location on the Santa Clara River when they were still uncommon. I felt confident that I located the bird and was pleased when it was confirmed. I participated later in surveys at Camp Pendleton, and there were so many that it was challenging for us to count them accurately. A good problem to have! Nowadays, with the free Merlin phone app, we can also take recordings to best document and share our observations.

Frank Stephens, a prominent naturalist and the first director of the San Diego Natural History Museum, noted in 1919 that the Least Bell's Vireo was "common." We are returning to that point in the region, but for State and Federal delisting to occur, as with the Bald Eagle and Peregrine Falcon, time is needed for additional larger populations to re-establish in northern California.

Detections at the Reserve have been on the Marsh Trail (along Flintkote Avenue), which has excellent habitat with preferred vegetation edges and openings. They have been observed on at least one recent monthly bird count. From eBird data, which provides more information, there have been 32 detections, mostly in April and May. So, take a hike to the wild side of the Reserve soon and listen for, and hopefully see, a recovering endangered species.

Bee of the Month: Mining bees (*Calliopsis*)

by Robert James

To find most bees, we look first to the flowers and then to other vegetation parts, but mining bees (*Calliopsis*) can often be found on the ground or at their nest holes. These native bees, uncommonly observed at the Reserve, are small to medium size (one to two grains of rice in length), appear flattened, and often have eye-catching abdominal bands. Their Latin name is derived from "beautiful" as these striking bees certainly are. As members of the bee family Andrenidae, they bear some resemblance to the more commonly observed fairy bees (*Perdita*).

Like most of our native bees, *Calliopsis* mining bees are ground nesters. They can nest in dense groups in hard-packed soil. They are even known to hide their nest entrances with dirt, possibly limiting their exposure to predators and nest parasites. An amazing fact is that nest occupants at one location were documented to survive underwater for at least three months! The WannaBees have been fortunate to spot at least three different species of mining bees along the Marsh Trail, portions of which receive periodic inundation.

In our area, these bees are predominately above ground only in the late spring and early summer, so being in the right place at the right time is crucial to spotting them. In fact, three-quarters of the observations for our county posted to iNaturalist were from April and May. At the Reserve, in our moderate coastal environs, that time may be extended. Half of our observations are from those months, with the other half in June, though our sample size to date is small. Interestingly, mating pairs can sometimes be seen, staying attached while flying from flower to flower or when on the ground. This behavior can strongly suggest an identification, along with photographs of their wing venation, and other characteristics, which are more definitive.

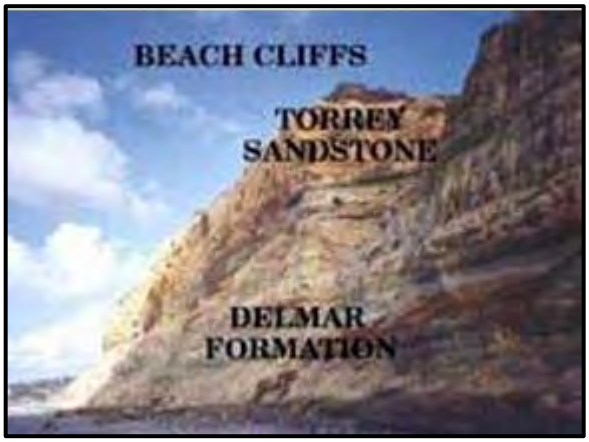
Calliopsis mining bees are important native plant pollinators and are generally considered to be specialists, gathering pollen from particular species of flowers. Based on county iNaturalist observations, flowers in the sunflower family seem to be favored by many species. However, more information is needed to better identify and understand these relationships. The 17 known *Calliopsis* mining bee species in San Diego County contribute to the amazing biodiversity of the over 700 native bee species in our county.

The Geology of Here –What Do You See?

by Kathy Dickey; edited by Norrie Robbins

At the April 3 BLIK Learn at Lunch gathering, about 30 docents came out hear Dr. Eleanora (Norrie) Robbins's talk about the geology of Torrey Pines Reserve. Here are some of my notes, edited by Norrie:

- The geology around TPSNR is totally amazing and yes, complex. At the top, we stand on sediments from the Ice Age. We look out across the eastern horizon to the mountains of the Peninsular Ranges. Once those mountains were magma that was injected into the Earth's crust, then cooled to form igneous rocks like granite and granodiorite. Some of the individual peaks closer to us, such as Black Mountain and Mt. Miguel, were once volcanoes on a tectonic plate that now is almost gone (the Farallon Plate).
- Geomorphology is the study of landforms and how they were made, such as cliffs, terraces, mountain ranges, and volcanoes. It studies erosion, weathering, deposition, and structural changes.
- Structural geology is the study of earth's tectonic features, such as faults, folds, and cracks. Most cracks around here tell the story of different earthquakes through time. The cracks in buildings, walls, and roadbeds are pretty obvious. But the Los Peñasquitos wetland sits in a pretty straight valley – is that an earthquake fault?
- The study of sedimentology classifies dirt or sediments as boulders, cobbles, pebbles, granules, sand, silt, or clay.
- Three different tectonic plates created the geology we see at TPSNR: The Pacific Plate pushed the Farallon Plate under the North American Plate. When this happened, volcanoes on the Farallon Plate got scraped off onto the North American Plate. We now see cobble evidence of those 125-million-year-old volcanoes in the black and green andesite cobblestones on the beaches.
- These andesite cobbles were carried by huge rivers to the ocean. Andesite that is green in color was metamorphosed ("cooked") and is softer than the unmetamorphosed black cobbles. Indigenous people preferred the green andesite, which they used to prepare some of their stone tools.
- As the Farallon Plate continued to move under the North American Plate (plate subduction) about 95 million years ago, the heat created more magma that cooled to become the mountains of the Peninsular Ranges.
- About 50 million years ago (in the Eocene), sediment from the Peninsular Ranges flowed down the rivers toward the ocean and formed the Del Mar siltstone and the Torrey Sandstone. The Del Mar Formation was deposited in estuaries and lagoons, leaving fossils of oysters, other shellfish, and worms. The Torrey Sandstone was deposited in tidal flats and beaches.
- What happened next is a mystery because there is a 40-million-year-old gap. On top of those Eocene sediments, the redbeds, called the Linda Vista Formation, were mostly deposited during the Ice Age, and are about



200,000 to 3 million years old. The redbeds are full of magnetite and concretions.

- The concretions or nodules in the redbeds are round iron manganese spheres that are concentrated on top of many terraces. They are red or purple marbles, from about 10 mm to 2.5 cm. Many contain magnetite and so are magnetic. They are called "blueberries" when seen on Mars. Kids on Earth call them "rollers."
- The Linda Vista Formation was formed on most of the 20 terraces in San Diego coastal areas. The terraces formed in a complex interplay of tectonic uplift and sea level highstands. But during the last Pleistocene lowstand, sea level went down as much as 400 feet. The Lodge is on the 11th uplifted terrace.
- The red to purple rhyolite cobbles on the beach, along with beige-colored dacite cobbles, started as Eocene volcanoes in Sonora, Mexico. But over the past 16 million years, the cobbles traveled 180 miles north on the Pacific plate and then down rivers that carried them to our beaches.

All in all, it's not a simple story. And we haven't even told you how we humans have modified it all!

BLIK: Learn at Lunch

Date/Time: Thursday, May 1, 12 noon

New Venue: Docent Shed at the northern end of the North Beach parking lot

Speaker: Pao Chau

Topic: The Plants at the Los Peñasquitos Lagoon

Bring your lunch, a chair, and your curiosity/no need to register. You may claim one hour on Better Impact under Training, Continuing Education (up to 12 hours per year).

BLIK Learn at Lunch is the first Thursday of every month at noon at the Docent Shed at the North Beach parking lot. All docents, park employees, and visitors are welcome.

The BLIK is open on Friday, Saturday, Sunday, and holidays, with shifts from 10:00 am to12:00 pm and 12:00 pm to 2:00 pm. Sign up on Better Impact.

Torrey Pines Earth Day Celebration on April 19, 2025

Photos by Joan Simon, Joanne Miale, Jeannie Smith, and Ed Saade

Earth Day 2025 included a community clean-up event, Kumeyaay speaker and bird singers, four guided walks, an Eco-Fair, and a youth art contest. Other featured activities designed for children ages 4 – 14 were the Earth Day passport, special scavenger hunts, and a spring flowers focused bingo game.

Earth Day at the BLIK with the Peñasquitos Lagoon watershed model

Patty and Bruce Montgomery welcoming visitors at the information booth

Jeff Nordland with an alligator lizard

Barona Cultural Center table

Kumeyaay Nation bird singer

Nature art: children depicting animals and flowers using their colorfully inked thumbprints

Ingo Renner showing a visitor a king snake

Zero waste sign at the TIK trailhead booth

Ambassador Stations are Up and Running

The Ambassador Stations are open on Friday, Saturday, Sunday, and holidays at two locations:
1. Walk-in entrance at the golf course
2. Along the road above the South Beach entrance

Shifts are from 9:00 am to 11:00 am; 11:00 am to 1:00 pm; 1:00 pm to 3:00 pm. Sign up on Better Impact. There will be additional training sessions in May. Questions can be directed to **Gabriele Wienhausen**, chair of the Trails Committee.

Museum Shop Spotlight

The Museum Shop is carrying a wonderful array of t-shirts, perfect for the upcoming warmer season. New on our shelves is this women's relaxed fit short sleeve shirt in aqua, which is 99% cotton and retails for $20.95.

Lodge and Parking Lot: Temporary Closings in May

Work on the front entryway to the Lodge will necessitate some temporary closures in May, as follows:

On May 5-9 the front porch and Lodge parking lot will be closed. The Lodge will remain open with access through the back door. The Youth Program will continue as normal. On the **weekend of May 10-11**, the Lodge parking lot will reopen, but access to the Lodge will still be through the back.

For May 12-16, the Lodge will be closed along with the Lodge parking lot, while the main part of the construction will be underway. The Pavilion and back porch area will still be available for the Youth Program and other scheduled interpretive activities, but will be closed to the public.

After May 16, **there will be no further closures** while state employees apply the various coats of plaster to finish the project. There will be scaffolding and some fencing of areas on the front porch for several weeks but none that will impact access to the Lodge or parking lots.

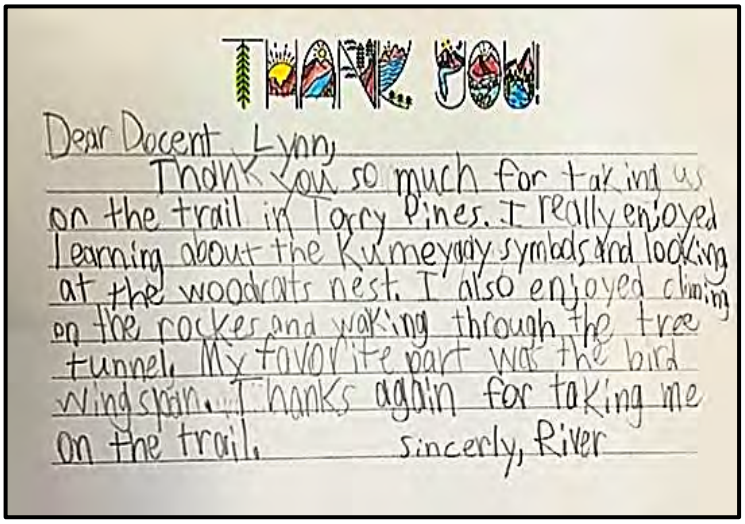
Youth Program

by Janet Ugalde, Program Director

Thank you, Youth Program docents, for your awesome loyalty and adaptability throughout the 2024-25 school year! May will be our final month, but there is still time for you to join us as we share our magnificent Reserve wearing its spring flowers.

Youth Program docents received many wonderful thank you notes from grateful students this school year.

Here's a sample:



May CEED Event

Date/Time: Friday, May 9, 9:00 am (corrected)

Place: Gonzales Canyon, Sword Way Trailhead

What: A walk focusing on local native plants. This will be a great opportunity to fine-tune your identification skills of plants in the chaparral, coastal sage scrub and riparian habitats near TPSNR.

Duration: 2 hours

Leader: Ingo Renner

Directions: From the coast, head east on Del Mar Heights Rd., then north (left) on Lansdale Dr.; then north (left) on Sword Way until you reach the bottom of the hill.

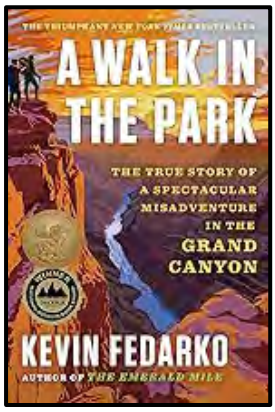
RSVP: Ingo Renner

Torrey Pines Book Club

We will meet this month via Zoom. Please notify **Annette Ring** if you plan to participate or if you need any extra help getting connected.

When: Tuesday, May 13, 1:00 pm

What: *A Walk in the Park: The True Story of a Spectacular Misadventure in the Grand Canyon* by Kevin Fedarko



Amazon says:

Two friends, zero preparation, one dream. A rollicking and poignant account of an epic 750-mile odyssey, on foot, through the heart of America's most magnificent national park and the grandest wilderness on earth.

National Geographic photographer Pete McBride approached his best friend, author Kevin Fedarko, with a vision as bold as it was harebrained. Together, they would embark on an end-to-end traverse of the Grand Canyon. McBride promised the journey would be "a walk in the park," unaware that the small cluster of experts who had completed the crossing billed it as "the toughest hike in the world."

The ensuing ordeal, which lasted more than a year, revealed a place that was deeper, richer, and far more complex than anything the two men had imagined – and came within a hair's breadth of killing them both. They struggled to make their way through the all but impenetrable reaches of its truest wilderness, a vertical labyrinth of thousand-foot cliffs and crumbling ledges where water is measured out by the teaspoon and every step is fraught with peril; where even today, there is still no trail along the length of the country's best-known and most iconic park.

June 10: *Beaverland: How One Weird Rodent Made America* by Leila Philip.

Torrey Pines Docent Society Bird Survey: April 2024

Number of species: *83*

Gadwall 2
Mallard 13
Bufflehead 2
Red-breasted Merganser 4
California Quail 4
Mourning Dove 54
White-throated Swift 9
Anna's Hummingbird 37
Rufous Hummingbird 1
Allen's Hummingbird 7
Virginia Rail 2
American Coot 6
Whimbrel 7
Long-billed Curlew 2
Willet 13
Ring-billed Gull 4
Western Gull 22
California Gull 20
Caspian Tern 2
Elegant Tern 200
Royal Tern 10
Eared Grebe 5
Western Grebe 12
Red-throated Loon 2
Pacific Loon 2
Brandt's Cormorant 7
Double-crested Cormorant 5
White-faced Ibis 4
Tricolored Heron 1
Snowy Egret 3
Great Egret 8
Great Blue Heron 6
Brown Pelican 11
Osprey 1
Cooper's Hawk 4
Red-shouldered Hawk 7
Red-tailed Hawk 7
Downy Woodpecker 1
Nuttall's Woodpecker 21
American Kestrel 1
Peregrine Falcon 3
Black Phoebe 12
Say's Phoebe 3
Ash-throated Flycatcher 1
Cassin's Kingbird 7
Western Kingbird 2
Hutton's Vireo 4
Warbling Vireo 1
California Scrub-Jay 14
American Crow 23
Common Raven 94
Northern Rough-winged Swallow 25
Bushtit 48
Wrentit 106
Blue-gray Gnatcatcher 1
California Gnatcatcher 2
Northern House Wren 30
Bewick's Wren 26
European Starling 4
California Thrasher 20
Northern Mockingbird 4
Western Bluebird 2
Hermit Thrush 2
House Finch 104
Lesser Goldfinch 22
Chipping Sparrow 1
Dark-eyed Junco 13
White-crowned Sparrow 56
Golden-crowned Sparrow 1
Savannah Sparrow 1
Song Sparrow 32
Lincoln's Sparrow 2
California Towhee 55
Rufous-crowned Sparrow 3
Spotted Towhee 34
Hooded Oriole 2
Red-winged Blackbird 16
Orange-crowned Warbler 39
Common Yellowthroat 30
Northern Parula 1
Yellow-rumped Warbler 25
Townsend's Warbler 2
Black-headed Grosbeak 1

Observers: *Donna Mancuso, Dinah Carl, Luz Chung, Marci Rimlinger, Dave Rimlinger, Gale Darling, Gabriele Wienhausen, Andy Rathbone, Pam Burdt, Kathy Estey, Robert Turner, Manolo Turner, Robert James, Karen Turner, Paul Mulholland*

Herb Knufken's photo gallery includes many birds: **pbase.com/herb1rm**

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