The Pinniped Press

A Newsletter by and for Noyo Center for Marine Science Volunteers
July, 2023 Vol. 2, Number 7

In This Issue

Volunteer Opportunities

We are currently in need of volunteers to work in all capacities at the Slack Tide Café:
Barista, sandwich maker, dishwasher, prep work. All shifts. Be part of a great team of people and a beautiful location!

Volunteers are needed to help with the monthly mussel collection as part of the Red Tide Program.
See the meeting time and location in the calendar below.

We are looking for volunteers to help table at events with Noyo Center information. We will pair you up with experienced volunteers. New and experienced volunteers welcome and needed.

Throughout the summer there is a need for a few volunteers to work with our education team at various children's events.

If interested in any of these opportunities or more, contact Wendi Felson, Volunteer Coordinator at wendi@noyocenter.org

Are offshore wind farms a threat to marine mammals and other sea life?

By Dobie Dolphin

When 10 whales washed up on the New Jersey shore earlier this year, there was concern that it was related to noise from offshore wind turbines. Asked if there was any evidence that wind farms were the cause of these events, James Miller, University of Rhode Island professor of Ocean Engineering and department chair said, "Periodically we read in the news that a whale or some other large animal ends up on the shore, and a lot of times the blame immediately goes to wind turbines. People feel the problem must come from turbine construction noise. Yet when the whales drift ashore, no construction is taking place. Most of those whales are either struck by ships or are entangled in fishing nets."

The Bureau of Ocean Energy Management (BOEM) along with the National Oceanic and Atmospheric Administration (NOAA), the lead federal agency for marine mammal science and management, have found "no evidence to support speculation that noise resulting from wind development site surveys could potentially cause mortality of whales, and no specific links between recent large whale mortalities and currently ongoing surveys."

Observations indicate underwater sounds produced during the construction phase of offshore wind turbines, especially that of pile-driving, pose a greater potential for physiological and behavioral impact than operational noise. Pile-driving produces intense underwater sound that can be detected at a distance from the source. Underwater sound generated by operating wind turbines is of lower intensity than pile driving, and likely to present a smaller impact than construction, although for a longer period of time. There is definitely significant noise when pilings are driven into the ocean floor. Various mitigation measures, such as bubble curtains, screens, cofferdams (an insulating sleeve around the pile) or combinations of these measures, have been developed to diminish the potential impacts of pile driving on marine life.

Underwater sounds associated with offshore wind farms do not appear to affect those fishes attracted to turbine foundations for food and protection. Wind farm foundations and additional structures to prevent erosion can lead to increased habitat complexity, which attracts fish and invertebrate species, especially those that prefer hard substrates. This is known as the "reef effect." Offshore wind farms also create zones where certain human activities, such as commercial fishing, are prohibited, offering further protection. This is known as the "shelter effect." Fish abundance has been found to increase in proximity to various offshore wind farms and many fishes have been observed in close proximity to turbine foundations.

Behavioral responses observed in some marine mammals in association with pile driving include changes in swim direction and/or speed, dive profiles, group movements, vocalizations, and respiration rates. Based on measurements of underwater sound produced by turbines, however, the impacts from turbine operations on marine mammals are predicted to be minimal to negligible.

Though it has been shown that harbor porpoises, seals, and dolphins avoid offshore wind farm areas during construction, this displacement appears to be temporary. Studies, mainly for harbor porpoise, have found most animals return to a wind farm area once construction has ceased and the farm is operational. At an offshore wind farm northwest of Amsterdam, harbor porpoise clicks were significantly more frequent in the vicinity of the operating wind farm, when compared to measurements from reference areas outside the wind farm waters. The implication of increased harbor porpoise activity near wind farm waters could be related to increased food availability (reef effect) as well as reduced vessel traffic (shelter effect). All fishing activities and vessel traffic are prohibited in the wind farm as well as in a marginal 500-meter buffer zone. These positive factors may outweigh potential negative factors such as underwater noise from turbines and service ships.

Offshore wind farms – continued

Ørsted, located in Denmark, develops, constructs, and operates offshore wind farms, and is recognized on the Carbon Disclosure Project (CDP) Climate Change A List as a global leader on climate action. During construction, Ørsted actively minimizes environmental impacts through use of bubble curtains, noise mitigation screens, hydro sound dampers and suction bucket jackets to reduce noise. Once built, turbine foundations act as artificial reef habitats where new, diverse ecosystems can thrive.

The wind will keep blowing forever, but the turbines used to turn the wind into renewable energy do eventually wear out and need replacing. When Ørsted decommissions a wind farm, they are currently able to recycle between 85% and 95% of the materials—mostly steel—that make up the turbines.

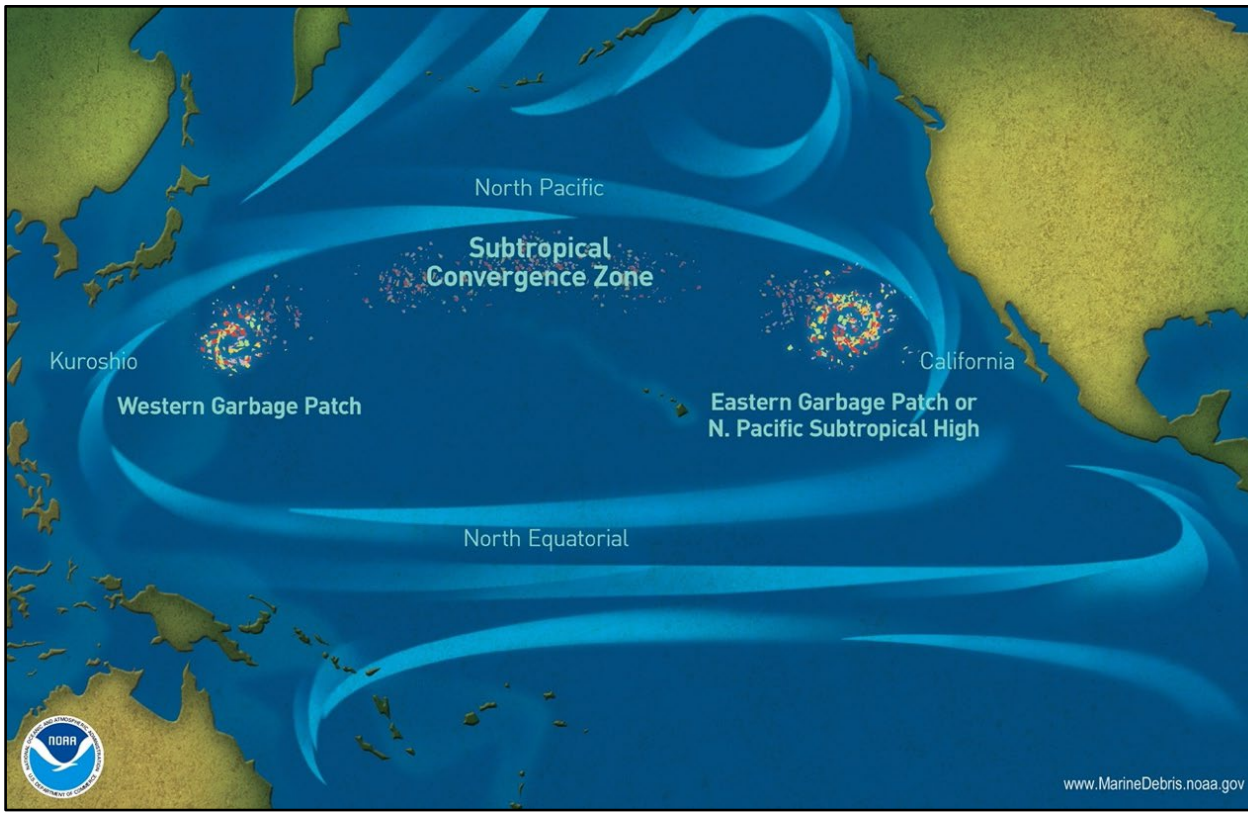
There is limited data on long term effects associated with the continual operational noise of offshore wind turbines. The size of the turbines, overall size of the wind farm, and where it is positioned, all have implications for environmental impact. In addition, cumulative effects associated with multiple wind farms in close proximity to each other, and increased human activities, such as shipping, in the area of the wind farms, are also poorly understood.

Discovery of Sound in the Sea (dosits.org), which is supported by the University of Rhode Island, provides information about marine acoustics based on research and published scientific papers. It's a fascinating website.

By-The-Wind Sailors at Home in Garbage Patch

By Toni Rizzo

The "Great Pacific Garbage Patch" contains the largest accumulation of plastic and debris in the world's oceans. According to the National Oceanic and Atmospheric Administration (NOAA), the garbage patch actually occurs as concentrations of marine debris in different regions of the North Pacific Ocean, rather than one large patch. Garbage patches form in areas of ocean gyres—rotating ocean currents that pull debris into one location. Spanning 1.6 million square kilometers (620 thousand square miles) between California and Hawaii, most of the debris consists of tiny pieces of floating plastic known as microplastics.



Great Pacific Garbage Patch. NOAA.

By-The-

Wind Sailors at Home in Garbage Patch – continued

While plastics and other debris are harmful to birds and marine life, recent research has shown that the garbage patches are home to delicate sea creatures such as *Velella velella*, also known as by-the-wind sailors. These curious blue animals are up to 10 centimeters (4 inches) long with translucent sails that allow them to drift in the wind. By-the-wind sailors sometimes wash up on California beaches in massive numbers in the Spring, including local beaches on the Mendocino coast.

Researchers spent 80 days collecting samples from the Great Pacific Garbage Patch from Hawaii to the coast of San Francisco. In addition to *Velella*, they found blue button jellies and violet snails. They reported that these creatures form a complex ecosystem, with violet snails feeding on the *Velella* and blue button jellies, and all three creatures providing food for ocean predators.

The presence of these small animals could hamper efforts to clean up the garbage patches by organizations such as The Ocean Cleanup and NOAA's Marine Debris Program. The Ocean Cleanup estimates that the Great Pacific Garbage Patch contains over 100,000,000 kilograms (220,462,262 lbs) of plastic. In addition to cleaning up rivers and coastal areas, these programs corral and remove plastics from garbage concentrations in the Pacific Garbage Patch.

Ocean debris. Leary Pete, public domain photo.

Unfortunately, plastic cleanup is also likely to remove by-the-wind sailors and other surface marine organisms as by-catch. According to a recent study, methods used to clean up ocean plastics may have negative effects on these surface ecosytems, threatening the survival of *Velella* and other species. A new high-seas treaty agreed to by 200 countries in March, 2023, aims to create protected areas in international waters, including some areas with garbage patches. This could delay clean-up efforts long enough for scientists to study the impacts on ocean life. Of course, the ideal solution would be to prevent plastics from getting into the ocean by eliminating single-use plastics. According to Rebecca Helm, a biologist at Georgetown University, "Single-use plastic is the low-hanging fruit that should be the first to go."

***Velella velella* washed up on California beach. Wikimedia Commons.**

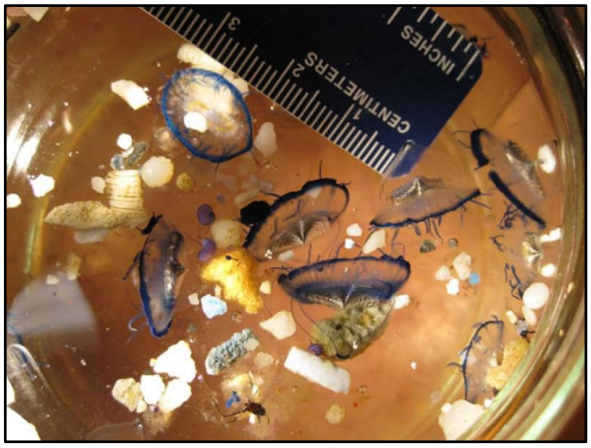
***Velella velella* at Buckhorn Cove, Little River, California. Toni Rizzo photo.**

By-The-Wind Sailors are Communal Predators

Each by-the-wind sailor is actually a colony of many individual polyps attached to a blue-rimmed, tentacled, disk-shaped float with a translucent sail on top. The disk is built by the polyps, which use their stingers to capture plankton and digest it in their shared digestive system. Each by-the-wind sailor colony is made up of all-female or all-male polyps.

Velella. Wikimedia Commons.

By-the-wind sailors live in warm and temperate waters at the water-air interface in all of the world's oceans. The float lies above the water with the polyps hanging about one centimeter below. The small stiff sail projects into the air where it catches the wind. Their dependence on prevailing winds for moving around helps explain the mass strandings observed on beaches throughout the world. Some scientists have also found a connection between velella strandings and ocean warming events. They encourage people to document and report velella beach sightings to JellyWatch (https://jellywatch.org/node/add/new_sighting) and iNaturalist to help scientists understand the causes of these strandings.



***Velella velella* and plastics collected from Pacific Garbage Patch. NOAA.**

Sources

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2. Bartels M. Bizarre blue 'jellyfish' washing up on California beaches are a sign of spring. *Scientific American*. May 3, 2023.
3. Chong F, Spencer M, Maximenko N. High concentrations of floating neustonic life in the plastic-rich North Pacific Garbage Patch. *PLoS Biology*. 2023. https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3001646
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5. National Oceanic and Atmospheric Administration (NOAA). Garbage Patches. https://marinedebris.noaa.gov/info/patch.html
6. NOAA. What is the Great Pacific Garbage Patch? https://oceanservice.noaa.gov/facts/garbagepatch.html
7. Spencer M, Culhane F, Chong F, et al. Estimating the impact of new high seas activities on the environment: the effects of ocean-surface microplastic removal on sea surface ecosytems. *PeerJ*. 2023. http://doi.org/10.7717/peerj.15021
8. The Ocean Cleanup. Cleaning up the Garbage Patches. https://theoceancleanup.com/oceans/
9. Wikipedia. *Velella*. https://theoceancleanup.com/oceans/

Noyo Center Talks Science: Marine Mammal Pathology

Guest Presenter: Dr. Padraig J. Duignan, Director of Pathology, The Marine Mammal Center
Thursday, July 20; 6:00 PM on Zoom
Dr. Pádraig J. Duignan has over three decades of experience in marine mammal diagnostics and research in the United States, Canada, New Zealand, Australia, United Kingdom and Ireland, placing him as one of the top research pathologists in his field of study. Register for the presentation **HERE**.

Volunteer Highlight: Sharen Parker

By Linda Francis

Sharen Parker

Sharen was born in Rhode Island and still has family in the area she visits on a regular basis. She loves it there and it still feels like home even though the family left when she was ten when her Dad's entrepreneurial spirit took them to the greener pastures of California. They first lived in S. CA and then later in San Jose where Sharen graduated from Saratoga High School.

Sharen started college planning on being a veterinarian, but when she realized the time it took in school, plus also having to work, she changed her major to environmental science, where much of her pre-med biology studies came in handy. She graduated with a degree in Environmental Studies/Ecology and thus became an official "Tree Hugger."

Sharen worked for the forest service all through her college years and beyond, from Reagan to Obama, with a few years off working for the BLS, thus seeing many changes in forest management and how politics impacted it. During the Reagan era forests were seen as vast, limitless resources, resulting in thirty-acre clear-cuts and decimated habitats. This shifted to more responsible harvest plans in later years, which required restoration and habitat considerations.

The first few years with the forest service Sharen was on a wild land fire crew in Big Sur where summers were spent as part of a strike team of five engines going all over the Pacific Northwest. There were very few women in this business at the time; the forest service was the good ol' boys club. Her boss made it clear no woman had ever made it onto his crew. He got over it in time and she saw amazing wilderness areas and even the aurora borealis in northern Idaho while spending summers in a tent and sleeping bag.

At one time she was a field observer on active fires helping strategize plans of attack before the fire crews arrived. It was an interesting experience observing fire behavior, particularly when doing so out on her own. After observing the situation, it was her job to return to camp to draw maps of possible advantage points and natural barriers. She was sent to many beautiful forests, unfortunately those on fire, but it was an amazing opportunity to visit places with no signs of human visitors.

After graduation she joined the Forest Service's planning department and worked with interdisciplinary teams writing timber harvest and other environmental documents and post-fire plans designed to help forests recover. She worked on the Los Padres, Plumas and Mendocino National Forests but had the opportunity to join other writing teams periodically throughout the US.

Sharen retired six years ago and moved to Mendocino County just ten months before the Paradise fire destroyed her old home. She was glad she left when she did. But life became a bit boring here and she missed having science in her life. So while her science background was as a pine forest biologist, she found the Noyo science talks amazing and it perked up her spirit to have science back in her life.

Sharen just received her five-year pin as a docent at the Crow's Nest and attends many of Noyo Center's events. She loves the spirited energy of the organization and finds people creative, progressive, and welcoming of new ideas. She is an out-of-the-box thinker who has even more to offer the Noyo Center in the future. Lucky us.

Articulating the Bones

By Devreaux Baker

They brought her in cardboard box-loads
what once had been a great blue god
dreaming oceans with her fins and filled
with the aftertaste of rivers in her blood.

Now she is returning to the land,
laid out vertebrae by vertebrae
on the floor of a makeshift lab
in the town's community center.

We kneel over her to recreate a life
determined by current and wave, by moon
or the machinations of men.

We place her bones in a shape
water will recognize as one of her own
and call her wandering spirit back
to that soundless deep

Even as I teach my daughter
how in death a voice can rise and speak to us
Is able to reach across that wide plain
that separates the living and the dead

To help guide us into our own uneasy future.
This is called *articulating the bones*
the lab technician says. But I know
he is opening Neruda's blue door

Releasing consonants and vowels
of hopeful sorrow, defining a body
by loss or gain, the color of skin,
luck of the draw, or the inexplicable moment

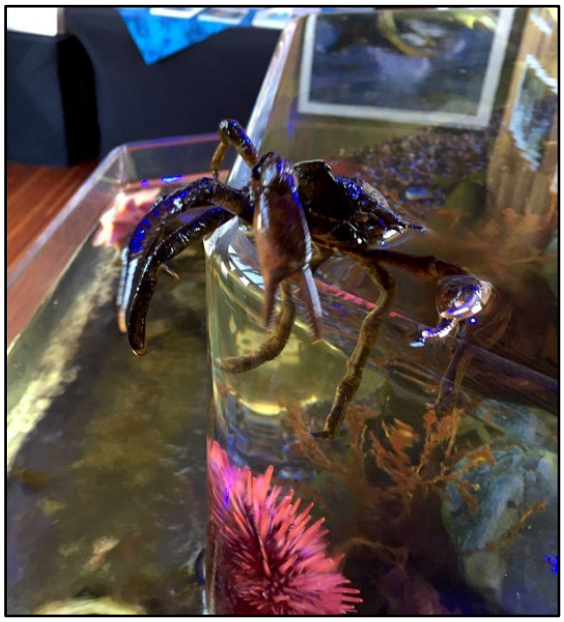
That creates the journey of a lifetime.
I tell my daughter we are waking
the great blue whale, pulling her from
her deep sleep
resurrecting a life as mysterious and ancient
as our own, opening the blue door
stepping into the house
we all share.

Devreaux Baker

Blue Whale Bones

The Smart Cannibal Crab

by Donna Worster



Donna Worster photo

When I started working at the Crow's Nest on the bluff there weren't too many visitors. To keep the activity interesting, I watched the creatures in the aquarium as the best means of learning about the tide pool inhabitants. Star fish were now called sea stars, kelp was on the endangered list because of the sea star wasting disease, and the sunflower sea star was much larger than the cute little sea stars we had on display. I learned where the sea star stomach was and how it ate and how all the inhabitants were collected off our special low tide spot on the coast. Collecting is done by permit only. I learned that we had two different anemones. One is called giant green, the other aggregating. The latter is somewhat special as it is territorial and warns other aggregating anemones to stay on their side of the property line. When threatened it will divide itself, which has happened recently. At one time we even had a small octopus.

On one occasion, I watched as a crab sluffed out of its shell, became soft-shelled, hardened up, out-grew that shell and did it again. When the crab grew larger, it was moved into the inner tank where it could play with the big boys. One day, I kept hearing claws scratching on glass. Upon investigating, it was the big crab trying to get back into his former home. It finally used a large red urchin as a ladder and climbed to the rim of the tank.

Donna Worster photo

I used my camera to catch its movements along the top edge of the tank. I also got a large cleaner probe to put the crab back in if it fell over on the wrong side. With camera poised, clicking away, the crab edged around the top until it suddenly dropped into its former home and sliced a small crab in half! Never had I witnessed such a horrible event. What I surmised was that the big crab had been eying this younger crab as a tasty meal and waited until the urchin had positioned itself close to the glass so it could climb onto it and over the tank wall to this upstart. I used the probe, put the crab back into the larger tank, called Sarah, our custodian of the aquarium, with the facts of this cannibal event. Later, when I inquired about the crab's whereabouts, Sarah said she put him back where he belongs. Maybe he was hoping to be the star in the movie "Crabs" that was a feature last year at the Film Festival.

What Washed In

by Nancy Lloyd

Commercial fishing dragnet entanglement contributed to the tragic death of a female Steller sea lion. Found on Ten Mile Beach in Fort Bragg, she was young, perhaps 3 years old, considered too immature to breed. Steller sea lions are the largest member of the family Otariidae, the "eared seals," which includes all sea lions and fur seals.

California Academy of Sciences authorized Noyo Center to retrieve the entire Steller sea lion skeleton and netting samples for future display, to represent threats relating to human interaction with marine animals. The Beach Response team included Anna Antonovich, Sara Sundberg, and Noyo Center summer intern Lizeth Granados. Net forensics were completed by Noyo Center Science Advisor Jeff Jacobson.

What Washed In - continued

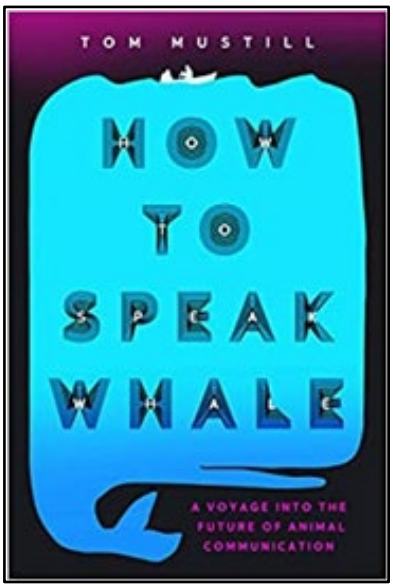
To respect locally nesting snowy plover birds for the season, removal of the heavy dragnet will be delayed until more favorable conditions for the environment. Snowy plovers are vulnerable to many beach disturbances and should not be approached or harassed in any way. As always, dogs should be on a leash. Watch for signs at beaches and parks to see whether dogs are allowed at all.

In addition to the Steller sea lion, other marine animals found included a harbor seal and a California sea lion. Sarah Grimes reminds us to keep her number 707-813-7925 in our phone Contacts to report local marine life dangers and deaths. It was a member of the public who called Sarah about the Steller sea lion sighting, simply because she remembered having Sarah's stranding card in her wallet!

Book Review: How to Speak Whale

By Nancy Lloyd

I highly recommend this book, "How to Speak Whale," by Tom Mustill, published in September 2022, about whales and other cetaceans. I think every reader supporting Noyo Center for Marine Science would find the book both enchanting and educational.



The author starts by describing his own near-death experience during a whale-watching tour on kayak, and then takes the reader on a mind-blowing journey, both in geographic and intellectual terms. His curiosity, fueled by his own unforgettable whale encounter, drives him to fascinating places and meetings with extraordinary people. While mainly a popular science book, this book also blends in travel, nature, and acknowledgement of people who have devoted their lives to understanding cetaceans. The first-person perspective works perfectly, engaging the reader, and the style is fresh and witty.

Beginning with historical references of indigenous peoples and European whalers in Twofold Bay, Australia, humans observed behaviors of a pod of killer whales starting in the 1800s and coordinated humpback whale hunts with humans as a team over decades. This team was filmed in 1910 in an early documentary. After the humpback kill, the meat bounty was cooperatively shared among both killer whales and humans. Interestingly, the killer whales chose to only eat the tongue of the humpback. Killer whales have localized feeding preferences (local killer whales in the San Juan Islands, WA eat salmon, while transient killer whales prefer capturing pinnipeds for food).

Book Review: How to Speak Whale – continued

A chapter also reviewed the use of modern necropsies and magnetic resonance imaging (MRI) scans of cetaceans, like our own Noyo Center research, and yet different.

Artificial intelligence has begun to process the massive volume of whale-song recordings and travel routes to find variations and similarities in their communications. There are implications of learned culture among whale groups, which spread new song updates around the world each year.

I hope you enjoy this book too!

I was able to read it through the library system, but of course you can buy it at a local bookstore or on Amazon as well.

Journal Club

The journal club meets the 4th Monday at 11 am at Slack Tide Café to discuss a variety of marine science related topics—a different topic and moderator each month. We give a list of suggested articles to read or pick your own. It's a fun way to learn a little more science. Articles will be listed in the Pinniped Press each month for the next meeting. Everyone is welcome whether you have had a chance to read the articles or not. The topic for July will be Orcas in the news. They've been in the news lately because of some novel behaviors being observed. Below are the links to the articles for the next meeting.

For more information contact wendi@noyocenter.org.

Orcas attacking boats in Spain: https://www.npr.org/2023/06/13/1181693759/orcas-killer-whales-boat-attacks
Old Thom, and New England Orcas: https://whdh.com/news/researchers-spot-rare-sight-orcas-in-new-england-waters-along-with-dozens-of-whales-and-dolphins/
General overview of Orcas: https://www.fisheries.noaa.gov/species/killer-whale
Outer Coast Orcas (off the Oregon and California coasts): https://hakaimagazine.com/news/scientists-found-a-new-kind-of-killer-whale/
Puget Sound Orcas: https://www.theatlantic.com/science/archive/2021/01/orcas-killer-whale-resident-transient/617862/
Why Just the Shark Livers?: https://www.scientificamerican.com/article/why-do-killer-whales-rip-out-shark-livers/

Calendar

Saturday, July 1, 10 am: New Volunteer Orientation, Slack Tide Cafe
Monday, July 3, 6 pm: Pinniped Press monthly zoom meeting
https://us02web.zoom.us/j/85045100225
Wednesday, July 12, 10:00 am: Crow's Nest docent meeting, Crow's Nest.
Wednesday, July 12, 6:30 pm: Beach Survey Program zoom meeting
https://us02web.zoom.us/j/81628595428
Thursday, July 20, 6 pm: Science Talk, Marine Mammal Pathology
Monday, July 24, 11 am: Journal Club, Slack Tide Café
Sunday, July 30, 1 pm: Poetry on the River, Slack Tide Café

The Pinniped Press team: Dobie Dolphin, Wendi Felson, Linda Francis, Nancy Lloyd, Toni Rizzo, Donna Worster, and Devreaux Baker, with Trey Petrey and Sarah Grimes. Thank you to our contributors!

If you have photo or writing skills or have a particular idea for an article, want to join a great group, or send a letter to the editor, write to Toni at: editor@noyocenter.org