

Author examines 'the human side' of tides

Sailor and surfer Jonathan White journeys the globe

By Rebecca Herren
Cannon Beach Gazette

When Jonathan White and a group of passengers were stranded by a 16-foot tide on a mud flat near Sitka, Alaska, White was able to get the tide out of the boat, but not out of his head. He wanted to know why and how this happened. To find the answers, White needed to understand the dynamics of tides, so he set out on a near 20-year journey.

"I thought I would find my answers in a couple of books, but tides are really complicated," White said. Ten years and 300 publications later, White admitted, "the more I read, the more complex, mysterious, fascinating and poetic tides became."

White spoke in front of an attentive audience on July 13 at Beach Books to discuss his journey on tide study: how tides travel, their influences, their effect on rising sea levels and what they portend for the future.

His new book, "Tides: The Science and Spirit of the Ocean" is a mix of science, history and ocean lore. White's journey took him from the canals of Venice, Italy and France to Canada's Bay of Fundy and Ungava Bay near the Arctic Circle. It also includes stories about the human side of tides.

In his readings, White noticed the lack of any human



REBECCA HERREN/CANNON BEACH GAZETTE

Jonathan White, author of "Tides: The Science and Spirit of the Ocean," at Beach Books.

stories. "There's a relationship people have with the tides over many thousands of years. I wanted to bring those two stories together: the deep spiritual, human story and the science story."

"Most of human history before 1700 believed the Earth was the center of the universe, that it didn't move," White said.

It wasn't until Newton's planetary motion discovery that humans became aware of tides.

Because people didn't understand the reasons behind

the ebb and flow of tides, they speculated, creating a rich mythological history. Some believed when the tide went out, it disappeared into a web of vents below the ocean and came out through another vent. Leonardo da Vinci believed it was the six-hour inhale and six-hour exhale breathing of a large animal, and some astrologers thought it was divine power, citing women's menstrual cycles.

"There are a lot of different ideas about this, but the science didn't even begin until about

300 years ago," he said.

He explained how a crest takes 12 hours to form from high tide to high tide and low tide to low tide. "The tide is a long, low wave that travels around the globe at 450 miles. It has no beginning and no end."

Then there is tide friction. "Any dimple of tension, any thread of stress you see on the ocean's surface is evidence of friction," he said. "The tides rub against the ocean floor and create heat and some of that is dissipated into the water, but most of it is transferred into energy that acts as a break on the ocean's surface."

Known as a global phenomenon, this friction also slows down the rotation of the Earth, acts as a torque on the moon's rotation and throws it away from the Earth, and functions as an accelerator for longer days.

Long journey

White's journey began after he graduated from Lewis and Clark College. He built a 600-foot sloop and sailed it through the Caribbean, Pacific and Atlantic oceans. In the

early 1980s, he wanted to start a graduate program and saw a picture of an old wooden schooner. He said he "felt a crush coming on" and got into his Volkswagen bug and drove to Tillamook.

It was a cold, rainy day and the boat was in the mud.

"We went down below and I could smell rotting wood. It was painted orange, it leaked about 150 gallons a day and it was perfect," White said.

He started a nonprofit organization on the boat named Crusade, and for the next 11 years offered floating seminars on the 65-foot halibut schooner built in 1923.

His first seminar seemed to

capture the essence, setting the tone for the next few years. "I invited a theater group from Chicago to perform a play." He anchored the boat in a bay, set up a do-it-yourself amphitheater for the passengers and the play was performed on board the Crusade.

From 1983 to the mid-1990s, these floating seminars kept White out at sea for about seven months of the year, sailing the Inland Passage from Puget Sound to Alaska. His seminars attracted a mix of disciplines: scientists, environmentalists, conservationists, anthropologists, theologians, ecologists and writers including Ursula K. Le Guin.

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'IT'S NOT GETTING BETTER'

Environmental group uses North Coast microplastics data to push for water standards

By Brenna Visser
Cannon Beach Gazette

After years of surveys and beach cleanups, microplastics data collected at Fort Stevens State Park and Crescent Beach near Ecola State Park will be at the forefront of an environmental group's push to influence state policy.

The Center for Biological Diversity, a West Coast nonprofit, is submitting data from several Oregon beaches to the state Department of Environmental Quality in an attempt to list the nearby water as contaminated.

"If the beach is contaminated, there's good reason to believe the water nearby is, too," said Blake Kopcho, the center's oceans campaigner.

Doing so would empower the U.S. Environmental Protection Agency to require the state to find ways keep the water cleaner. The center ultimately hopes this will lead to reduction efforts to keep plastics out of the ocean.

"The goal is to get action to get to the source," Kopcho said. "Beach cleanups are great, but ultimately we have to figure out how to stop (plastic) before it gets into the waterway."

No states on the West Coast have water quality standards that directly address microplastics, which studies show bioaccumulate carcinogenic compounds that can be released into the water and air.

Microplastics are detrimental because they can transfer into the marine food chain and eventually into people.

"There isn't a narrative for microplastics. States set

limits on other contaminants, like mercury, for example. If levels are exceeded, the state has to find a way to mitigate," Kopcho said. "There are no water quality standards that say 'there can't be this level of microplastics in the water.'"

Finding solutions

For better or worse, the North Coast has gained a reputation for a microplastics problem, as well as solutions to address it.

The region is the birthplace of the first-ever microplastic filtration system, which has helped remove thousands of tiny pieces of plastic degraded from larger waste in cleanup drives organized by the environmental nonprofit Sea Turtles Forever.

"Trash Talk," a program to convert plastics into jewelry that is sold to support the Haystack Rock Awareness Program, has raised regional awareness about plastic pollution since last year.

But despite local efforts, the problem continues to grow. According to the American Association for the Advancement of Science, at least 8 million metric tons of plastic enters the ocean each year. About 1.5 million metric tons of plastic in the ocean are estimated to be microplastics.

Surveys have shown plastic accumulation doubling at Crescent Beach. Fort Stevens State Park has a figure as high as 11,000 pieces per square meter, while other Oregon Coast beaches sit closer to 800 per square meter.

In the past two weeks alone, Sea Turtles Forever

has removed more than 1,000 pounds of microplastics just from Cannon Beach sands north of Whale Park.

"Last year it only took us three days to clean this section of the beach. This year, it took 14," Marc Ward, the group's founder, said. "That's easily four times as much from last year. It's not getting better."

Ward said strong tides pushing up against river currents could be partly to blame for high concentrations of plastics on Clatsop County beaches. Multiple plastic mold injection companies in the Portland metro area could be contributing to more plastic entering local waterways, he said, but plastic has been identified from all over the Pacific Rim.

Regional approach

That's part of the appeal of the regional approach to change water quality standards, Kopcho said.

"It's really hard to tell where this plastic is coming from," he said. "Is it coming from a pellet plant? Is it plastic in the gyre? But the good part about getting listed is it gives each state flexibility to address their amount of pollution."

Ways to do this, Kopcho said, include plastic disincentives, like recent bans on plastic straws, or offsetting microfiber plastic pollution that comes from washing machines.

"We're creatively looking for ways to address plastic pollution problems, and we think this is a powerful avenue to get there," Kopcho said.

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