

# Starfish vanishing amid disease, warming oceans

Die-off linked to climate change

By **LYNDA V. MAPES**  
*Seattle Times*

Once a common delight of every beachcomber, sunflower starfish — the large, multiarmed starfish sometimes seen underwater at the near shore — are imperiled by disease and ocean warming along the West Coast.

The devastation occurred over just a few years, and even affected starfish in deeper water, according to research led by the University of California, Davis and Cornell University published in the journal *Science Advances*.

At one time plentiful, the sea suns, or sunflower starfish, right now cannot be found off the California coast and are rare northward into Alaska, said Drew Harvell, the paper's co-author and Cornell professor of ecology and evolutionary biology. The starfish have become so rare over the past three years the scientists consider them endangered in the southern part of their range.

"I don't know the words to describe it, these things



A dying sunflower star afflicted with sea star wasting disease.

Ed Gullekson/Science Advances

were as common as a robin in our ecosystem," Harvell said in an interview. "Never, ever would anyone imagine they would be threatened and endangered. To watch that happen on our watch has been discouraging."

Sea star wasting disease beginning in 2013 caused a massive die-off of starfish of multiple species, from Mexico to Alaska. Hid-

eous to behold, the disease causes starfish to fall apart, with pieces of their arms walking away, or their bodies disintegrating on pilings, beaches, rocks and the sea floor.

The disease also has affected starfish on shores from New Jersey to New England.

The sunflower star continues to decline, even in

the deepest ocean, and is not recovering like some other species, such as the ochre star.

Global warming is likely a major cause of the disease, causing a heat wave in the oceans. Warmer temperatures exacerbate sea star wasting disease, allowing it to kill faster and have a bigger impact, said Harvell, author of the forthcom-

ing book "Ocean Outbreak, Confronting the Rising Tide of Marine Disease."

Starfish matter in the ocean — and not only because they are every kid's first friend on the beach. Sunflower stars in particular prey voraciously on sea urchins — which keeps urchin grazing on kelp forests in check. As sunflower stars crash, urchins surge — and mow down kelp forests. That reduces the waving, green underwater nurseries that young fish need to thrive.

Sunflower stars are the lions of the subtidal zone, big as a manhole cover and with mighty appetites. That is why losing sunflower stars threatens the biodiversity they nurture, said Joe Gaydos, another author on the paper and science director at the SeaDoc Society.

"The cascading effect has a really big impact," Gaydos said.

The crash in sunflower starfish corresponds with ocean warming by up to 4 degrees Celsius that started in 2014. Trawl surveys from Mexico to the Cana-

dian border recorded a total wipeout of sunflower starfish in all states, and in deep water down to 1,000 meters.

Because they live underwater and are not often seen from shore, the sunflower starfish crash has gone unnoticed by comparison with the dripping, oozing horror of the ochre stars on display at every Puget Sound beach and beyond.

"We don't see a lot of what happens under the ocean," Gaydos said. "It reminds us that we need to pay attention, there are a lot of changes coming in the ocean. It is a little bit terrifying when you think about climate change, we know we are going to have warming and we can expect more of these marine disease outbreaks."

Harvell agreed. "A warmer world is a sicker world," she said.

"That is why we have been so determined to do the science and get the story out. There is nothing we care more about than the biodiversity of the Salish Sea waters."

## Transit district uses credit to protect bus lines from another shutdown

A \$400,000 insurance policy

By **EDWARD STRATTON**  
*The Daily Astorian*

The Sunset Empire Transportation District will take out a \$400,000 line of credit to help cover operations in case the federal government shuts down again.

Transit agencies across the U.S. receive large portions of their operational budgets through reimbursements from the Federal Transit Administration, whose employees were furloughed throughout the government shutdown that ended Friday.

Sunset Empire, which receives more than half of its operational funding from the federal government, is missing about \$185,000 worth of reimbursements covering September through December. The agency's governing board had been looking at either drastic cuts to bus lines and employee hours or a loan.

"They were very adamant that they don't want to cut service," Jeff Hazen, the transit district's executive director, said of why his board voted to accept the line of credit. "The district will have it in case there's another shutdown."

Hazen had previously warned that the bus agency would be out of compliance with state budget law if it spent its budgeted ending fund balance of \$550,000 to cover operations. He walked back the statement Tuesday, but said the agency needs

to keep the cash on hand to cover payroll and other operational costs as property taxes, timber taxes, federal reimbursements and other revenue comes in.

Whether Sunset Empire ultimately has to tap into the line of credit, which comes with a 5.5 percent interest rate for any money taken out, will depend on

the approximately \$143,000 in federal reimbursements it expects to receive each quarter. It should receive the outstanding reimbursements in the next 30 to 45 days, Hazen said.

"And if things are OK, we still have that line of credit," Hazen said. "That can sit there as a revenue source if we have to use it."

## Marjorie L. Burke



**SNOHOMISH**— Marjorie (Margie) L. Burke was called home to be with her Lord and Savior on January 2, 2019, in Snohomish, Wash. Marjorie was born Jan. 29, 1940, to Paul and Beata (Genrich) Buesing in Merrill, Wisc., completing the family with her brother James whom she loved dearly. She grew up in Merrill and attended the University of Wisconsin, Lacrosse with a focus on Physical Education.

Margie married Charles K. Burke of Stephenson, Mich., on June 30, 1962, in Merrill, Wisc., and lived in Green Bay, Wisc., and then Snohomish, Wash., before moving to Long Beach, Wash.

Margie volunteered and coached Girls Basketball at Zion Lutheran School in Snohomish, Wash., in the mid-1970s. She continued her education, graduating in 1979 with a Bachelor of Science from Central Washington University.

She worked most of her life in accounting, many years at D.A. Duryee in Everett Wash. Margie loved the Green Bay Packers, golf, flying kites, the beach, her family, friends and the Lord Jesus, spending many happy hours flying kites on the beach, and playing cribbage with her grandson, Garrett and winning many family cribbage tournaments. She took Garrett on a road trip to Lambeau Field. They enjoyed many years of Packer stories together. Margie loved and walked with her Savior, Jesus Christ and went on many mission trips. She served with Youth with a Mission in 1990. Margie went on an outreach mission to Okinawa, Japan and worked with Jackie Pullenger's ministry in Hong Kong helping drug addicts.

Margie is survived by daughters, Debra Hawkins (James) and Stephanie Edwards (Michael); grandson Garrett Latham; dearest friend Barbara Duensing; sister-in-law Kay Buesing (James); nieces, Kim Abel (Robert) and Pam Buesing Moore (Don Moore); grandnephews Kellen Abel and Riley Abel; and numerous cousins and close friends. Her presence will be missed in our earthly lives, yet we find happiness in rejoicing in her eternal bliss.

Friends and family please join us at Margie's Celebration of Life on Saturday, March 9, at 1 p.m. at New Life Church, 405 1st Ave N in Ilwaco.

The family of Karl Hand would like to express their *heartfelt appreciation* to the following for their courtesy, compassion and kindness:

**Seaside Fire Marshall, fire department members, police department, Hughes-Ransom Funeral & Mortuary attendants.**

We also thank **Jeff Goldberg, Geno Dunton, Jena Cooke and Barber Bob** for their loving care of Karl in his final years.

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## ROASTED CHICKEN DINNER

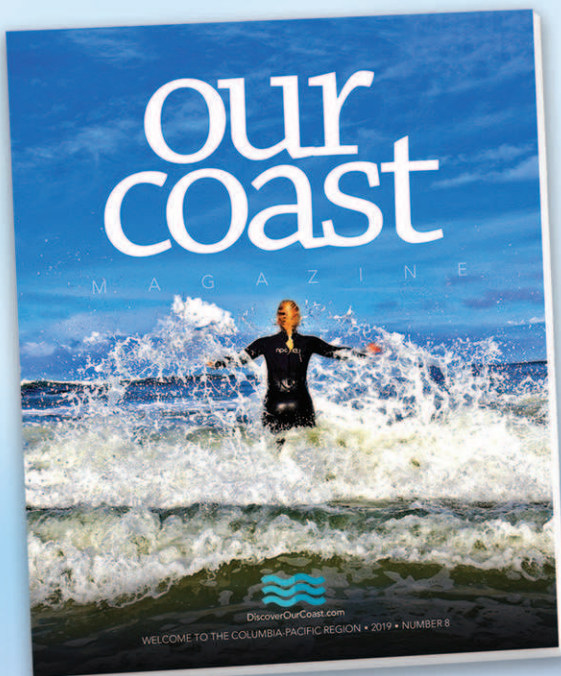
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