

The Press Democrat

WINNER OF THE 2018 PULITZER PRIZE

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TOMALES BAY » *Tentacled organism native to Southern Hemisphere discovered in mudflats, prompting research, questions about its impact*

Tiny sea anemones found far from home



PHOTOS BY CHRISTOPHER CHUNG / THE PRESS DEMOCRAT

Keira Monuki, a Ph.D. candidate at the UC Davis Bodega Marine Laboratory, left, and junior specialist Manny Delgado record sample numbers of *Anthopleura hermaphroditica*, commonly known as small brown sea anemones, at Blake's Landing in Tomales Bay on Monday.

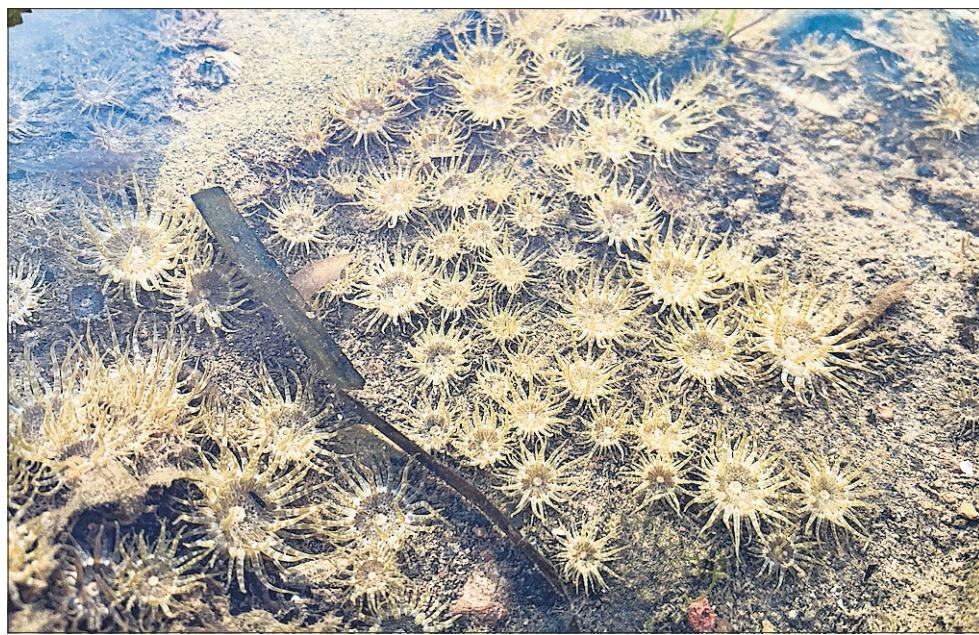
By **MARY CALLAHAN**
THE PRESS DEMOCRAT

A Monterey County man's internet post about tiny, tentacled organisms in the mudflats at the edge of Tomales Bay has spurred new research into how a species from the Southern Hemisphere got so far north and what effect it may have on the local ecosystem.

Native to the waters off Chile, New Zealand and Australia, the small brown sea anemone — *Anthopleura hermaphroditica* — appears never to have been reported north of the equator, until last year.

But already the tiny creatures can be found in dense patches at several sites along the middle reaches of the 15-mile-long inlet, primarily along the eastern shore, between Nick's Cove and Marshall.

Since last summer, a few areas of high concentrations have appeared on the opposite, Point Reyes National Seashore side, as well, according to one researcher at the



A cluster of *Anthopleura hermaphroditica*, commonly known as small brown sea anemones, at Blake's Landing in Tomales Bay on Monday.

TURN TO ANEMONE » PAGE A2

GOOD MORNING, SONOMA COUNTY

TODAY'S WEATHER IN SANTA ROSA



79
degrees, mostly cloudy today, low clouds tonight.

For more local weather, turn to **Page C6**.

NUMBER OF THE DAY

25 YEARS

Length of time Reading Cinemas operated in Rohnert Park. The theater closed abruptly Wednesday. To read this story, turn to **Page A1**.

FROM THE COMICS

'PEARLS BEFORE SWINE'



From Santa Rosa's own Stephan Pastis. For more "Pearls Before Swine," visit gocomics.com/pearlsbeforewine. To read more of today's comics, turn to **Page B4** or visit pressdemocrat.com/comics

WHAT YOU'RE READING

Here are the three most-read local stories on pressdemocrat.com.

- Trial to start in fatal Montgomery High School stabbing
- 'It's almost immoral': Nonprofits scramble to fund services as county falls behind on payments
- Rain is on the way to Sonoma, Napa counties

QUOTABLE TODAY

What community members are saying in today's newspaper.

"They've rediscovered their muse. They're proactive."

ROB SENN, Santa Rosa sculptor, says of Luther Burbank Center for the Arts. Read more on **Page D1**.

SONOMA COUNTY SIGHTS

Want your image in the paper? Submit a photo describing who, what, where, when, author of the photo and where they live. Low-resolution or missing caption information will not be selected for print. Email images in a JPEG format to pdsights@gmail.com.



NOEL BLAKE / PORTLAND, OREGON

A majestic live oak near the 15th green of Sugarloaf Golf Course in Oakmont.

SONOMA COUNTY REFLECTIONS

A daily slice of life written by our staff and our readers.

What is Jack London State Historic Park?

Sonoma Valley's own Jack London State Historic Park was featured on an episode of "Celebrity Jeopardy" that aired Oct. 18.

The question asked to contestants was: "You can buy a copy of 'The Call of the Wild' at the gift shop in the California State Park dedicated to this J. Lo."

Contestants for the episode included Melissa Fumero, an actor and director originally from Lyndhurst, New Jersey, playing for the International Community Foundation and supporting This is About Humanity; Shane Battier, a two-time NBA champion originally from Birmingham, Michigan, playing for the Battier Take Charge Foundation; and Steven Weber, an actor originally from Queens, New York, playing for the SAG-AFTRA Foundation.

The question was presumably asked during Round 1 under the Historical Markers category.

— *Rebecca Wolff, Sonoma Index-Tribune*

TODAY IN HISTORY

1992: Democrat Bill Clinton was elected the 42nd president of the United States, defeating President George H.W. Bush.

FOR THE RECORD

If you find an error on our news pages, please let us know; call 707-526-8585 or email pdnews@pressdemocrat.com.



PHOTOS BY CHRISTOPHER CHUNG / THE PRESS DEMOCRAT

Keira Monuki, a Ph.D. candidate at the UC Davis Bodega Marine Laboratory, takes a photograph to record sample numbers of Anthopleura hermaphroditica, commonly known as small brown sea anemones, at Blake's Landing in Tomales Bay.

ANEMONE

CONTINUED FROM A1

UC Davis Bodega Marine Laboratory, where several people are studying the newly arrived organism.

"It's kind of funny," Keira Monuki, a fourth-year Ph.D. candidate at the marine lab, said as she surveyed small brown sea anemones at Blakes Landing earlier this week. "Last year, I went to the west side, and I hardly saw any. I went again yesterday, and they were all over the place."

Light brown with light-colored mottling, the small brown sea anemone is, like its name suggests, very small: about a centimeter across at full size. In most cases, only the disc-like mouth area and tentacles are visible at the water's edge — the column that supports it mostly nestled in the mud.

But it can reproduce through self-cloning, without the need of a mating partner, and thus can proliferate quickly, producing crowded areas of sea anemones among the rocks, eel grass and scattered sea shells along Tomales Bay's rugged beaches.

The sea anemones also belong to a family of anemones that host symbiotic algae — photosynthetic organisms that create energy from the sun that leaches into the host. It's possible that feature is a factor in the sea anemone's successful occupation of Tomales Bay.

But sea anemones, whose species number more than 1,000, also are generally hearty and highly adaptable, though their chosen environment at Tomales Bay is similar to their native context, Monuki said.

Scientists say it's too early to know the ramifications of their presence, though the findings of one marine lab student indicate they can out-compete native sea anemones for food resources in their midst, Monuki said.

Anything that crowds out or starves native species would threaten local biodiversity, Bodega Marine Lab Professor Eric Sanford said.

But the experts also say there's no immediate cause for alarm.

Those consulted were unaware of any obvious ecological or economic threat from the southern



Keira Monuki records sample numbers Monday of the sea anemones reported in this hemisphere for the first time.



ERIC SANFORD / UC DAVIS BODEGA LAB

A nonnative small brown sea anemone, or Anthopleura hermaphroditica.

anemones, unlike known invasives long ago introduced to Tomales Bay — such as the Atlantic oyster drill, a predatory sea snail that feeds on oysters, or the European green crab, which also eats oysters and native invertebrates, like clams.

But much is still unknown.

James Carlton, professor emeritus of marine sciences and director emeritus of the Williams-Mystic Coastal & Ocean Studies Program of Williams College in Connecticut, is a world expert on invasive species. He described a kind of "ecological roulette" as to whether a non-native species introduced somewhere new may herald "first order human impacts."

"You do not know which one is going to be the next marine zebra mussel," Carlton said, referring to a highly invasive, Eurasian freshwater bivalve that has threatened waterways and water supply equipment in many areas of the United States, including California and local reservoirs.

But for an Asian species from the western Pacific to make it all the way into Tomales Bay is pretty remarkable, he said.

The new arrival in Tomales Bay was brought to light when a teacher visiting during a family vacation in June 2022 saw some intertidal critters near Marconi State Historic Park that he didn't recognize, despite a

arriving in bilge water or even coming in with seed stock for aquaculture.

Yet no sighting for San Francisco Bay or even Bodega Harbor has been reported, though it doesn't necessarily mean the sea anemone hasn't arrived there. It could be it's just not been reported.

Debris that crossed the Pacific after a massive March 2011 earthquake and tsunami in Japan transported non-native organisms, too. Almost 400 Japanese species have been found on the coasts of Hawaii and the mainland since 2012, Carlton said, one of them believed to be related to Anthopleura hermaphroditica, though it's not yet been subject to genetic testing.

"We've been moving a lot of marine species in the oceans and seas around the world since the 1600s, so its been a busy game for 400 years," he said.

Climate change and the habitat alterations it fosters also is pushing wildlife into new spaces.

Climate-related range shifts are the focus of Monuki's studies, but she's embraced the inquiry into the small brown sea organism, conducting much of the field work under Sanford's oversight. The Tomales Bay Foundation is funding some of her work.

She's just done her second round of annual surveys, collecting data on densities at selected sites, and is interested to know how the sea anemone spreads or recedes from different areas, both within Tomales Bay and nearby areas.

"I think it will be kind of interesting to see over the next few years if it shows up somewhere, like in San Francisco Bay," Monuki said. "We haven't seen them there yet, so maybe they did try to establish there and didn't do well."

They also may have a brief residence in some area but not found conditions favorable, she said.

A key focus will include the anemone's interaction with and impact on other aquatic organisms and communities in the mud.

"I think that we just don't know a lot," she said, "so it's a pretty exciting project to be involved with."

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