

Nation: Whitaker denies briefing Trump. A4



Business: Apple threatens to ban developers who track iPhone use. C7



Local: How one community rebuilt after devastating wildfire. B1



World: Actor Finney dies at age 82. A5



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DAM OPERATORS WATCHING CLOSELY

Next storm worry — flooding

‘Pineapple Express’ atmospheric river could hit California next week, and ‘it looks like a batten-down-the-hatches kind of storm right now’

By Paul Rogers

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Computer models are showing a growing likelihood of an atmospheric river storm hitting California late next week, raising concerns that if a warm “Pineapple

Express” barrels in with enough force, it could melt parts of the state’s big Sierra Nevada snowpack and increase flood risk.

Atmospheric scientists and meteorologists say more will be known in a few days. The storm could still fizzle the way hurri-

cans that develop far out in the Atlantic Ocean sometimes fail to materialize or make landfall.

But for now, they say, a large wet storm seems to be coming together and is most likely to hit Central or Southern California. Some models are showing a shift

toward the north.

“It looks like a batten-down-the-hatches kind of storm right now,” said Marty Ralph, director of the Center for Western Weather and Water Extremes at UC San Diego. “But it is still pretty far out, so there’s some uncertainty.”

Ralph, one of the nation’s experts on atmospheric river storms, said his team will be working with the federal govern-

ment to send two C-130 planes over the Pacific Ocean from Hawaii on Sunday and San Diego on Tuesday to measure conditions.

Steve Anderson, a forecaster with the National Weather Service in Monterey, said Friday that for now, it looks like the storm seems to be headed roughly for the Santa Barbara area. Depending on the size of the storm, in

STORM » PAGE 6

SCIENCE AT HOME



PHOTOS BY ANDA CHU — STAFF PHOTOGRAPHER

Josiah Zayner, founder and CEO of Oakland genetic engineering company The Odin, holds a green tree frog.

TRANSPARENCY LAW

Judge rules police must release records

Union says law should not apply to old cases

By Thomas Peele, Alex Emslie and Nate Gartrell

MARTINEZ » In the first ruling on the scope of California’s new police transparency law, a Contra Costa County judge on Friday ruled that years of discipline and use-of-force documents can be made public, rejecting the arguments of law enforcement unions that records prior to Jan. 1 should be kept secret.

Judge Charles Treat immediately put a hold on the ruling to give the unions time to appeal. But his decision, made from the bench following a 90-minute hearing, was lauded by First Amendment and police-reform advocates as a victory in what they expect will be a long fight.

“The judge got the answer right,” making it “clear to all police departments” that years of records should be released, said David Snyder, executive director of the First Amendment Coalition,

RECORDS » PAGE 3



JOSE CARLOS FAJARDO — STAFF

Contra Costa County Judge Charles Treat speaks about the state’s new police transparency law during a hearing Friday.

DO-IT-YOURSELF

FROGS

By Helen Santoro
Staff writer

OAKLAND » In an ordinary house tucked away on a quiet street in Oakland, Josiah Zayner stands over a container filled with green tree frogs with a syringe in hand.

He carefully injects a liquid into a frog’s back while a cage full of crickets chirp in the background. In four to five weeks, this tiny tree frog will almost double in size.

“I want to take the knowledge I have and translate it so I can blow people’s minds,” said Zayner, whose ears glitter with an assortment of silver earrings.

FROGS » PAGE 6

Gene-editing kit puts the power of lab growth into citizen scientists’ hands



RICHMOND-SAN RAFAEL BRIDGE

Inspection failed to identify cracked concrete

By Erin Baldassari and Nico Savidge
Staff writers

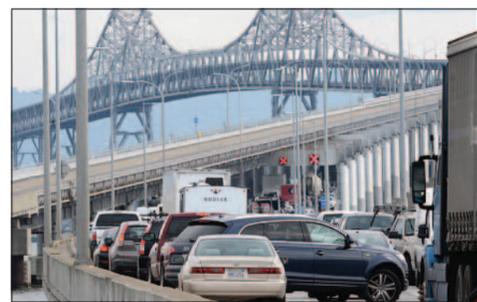
RICHMOND » An inspection last August failed to identify any obvious problem with cracking in the concrete near a 1950s-era steel joint on the Richmond-San Rafael Bridge, officials said Friday.

Chunks of concrete falling from the bridge Thursday caused some drivers to panic, as pieces

as large as footballs fell from the bottom of the upper deck onto the lower deck below, leaving behind a 6-foot-long by 7-inch-wide triangular cavity.

The falling pieces, which tumbled down from the middle of the upper deck near the Richmond side of the bridge, prompted Caltrans to close the roadway for most of the day Thursday. All lanes reopened about 8 p.m., and as of Friday afternoon

BRIDGE » PAGE 6



Motorists begin to turn around Thursday on the eastbound lanes of the Richmond-San Rafael Bridge because of an emergency inspection.

ALAN DEP/MARIN INDEPENDENT JOURNAL

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INDEX

BusinessC7
ClassifiedCA10

Comics/TVB8
LotteryA2
MoviesB7

ObituariesB4
PuzzlesB4, C5
WeatherB10

WEATHER

H: 54-56 L: 42-43
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Storm

FROM PAGE 1

that location it could cause rain in the Bay Area or, if it moved further north, rougher conditions.

"If it shifts just 50 or 100 miles north — which is almost nothing on the global scale — we could get heavy rain here, or if it shifts further south we could get nothing," Anderson said. "We're keeping an eye on it."

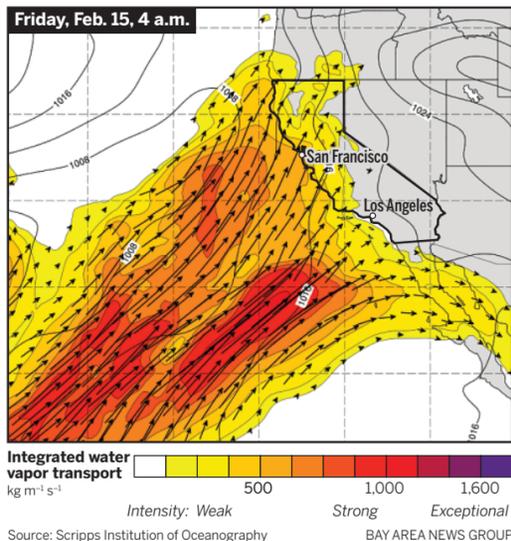
Memories of the flooding in 2017, when atmospheric river storms in February wrecked the spillway at Oroville Dam in Butte County, are still fresh. In 1997, warm rainstorms on a large Sierra snowpack caused significant flooding in Yosemite National Park and other parts of the state.

"The main problem if it does come to pass is that there is the potential for major flooding issues," said Daniel Swain, a climate scientist at UCLA who closely monitors atmospheric rivers. "It's a big if, but this is one of the few times recently we have had an above-average snowpack. This storm could cause some really big problems. But it is a big if."

On Friday, the statewide Sierra Nevada snowpack

HEAVY RAINS NEXT WEEK?

Weather forecasting computer models show the potential for a strong atmospheric river storm to hit California late next week, perhaps early Friday.



was 123 percent of its historical average, and 135 percent in the Southern Sierra. Storms this weekend are expected to bring up to 3 feet of new snow.

Many of the big reservoirs around the state are already at high levels, due to soaking storms over the past month. Lake McClure, in the Sierra Nevada foothills 40 miles east of Modesto, is 66 percent full, or 135 per-

cent of its historical average. New Melones lake, in the Sierra foothills near Angels Camp, is 133 percent of its historical average, or 79 percent full. And Shasta Lake, the largest reservoir in California, is at 98 percent of its historical average, or 67 percent full.

Swain said weather experts will know more by Monday.

"In the context of this

winter, this would probably be the biggest storm by a significant margin," he said. "If it's cold it will be manageable."

But he added: "A very warm rain on a mountain snowpack will be very problematic."

Dam operators around the state said Friday they are watching closely.

Todd Plain, a spokesman for the federal Bureau of Reclamation in Sacramento, said his agency has begun increasing water releases from Folsom Reservoir near Sacramento and from New Melones reservoir this week. But that's to free up space to handle water coming in from storms that are forecast this weekend and from storms a few days ago that brought water that is still pouring off saturated soils into reservoirs.

Early next week, when more is known about the potential atmospheric river storm, the agency could further increase releases, or begin increased releases from other big dams it operates, like Shasta, Plain said. Typically, dam operators want to save as much water as they can in reservoirs for summer months. But if they let reservoirs fill to the top, and are hit by a series of soaking storms,

that can cause flooding to homes and communities downstream, as the water pours down dam spillways into rivers without the ability for dam operators to limit the amount.

"We will adjust accordingly to current conditions," Plain said. "It's a balancing act."

State Water Project officials said Friday they have not yet begun increased releases to free up space in state-owned reservoirs, and they will make a decision of whether to do so by Monday. At Oroville, they kept the lake level low during construction to rebuild the spillway, said Molly White, chief of water operations for the State Water Project. On Friday, Oroville was 43 percent full or 65 percent of its historical average. By some estimates, it could go to two-thirds full in the next 10 days.

"We still have quite a bit of room," she said.

Already this week, the Santa Clara Valley Water District announced it will draw down six of its 10 reservoirs. At the largest reservoir, Anderson, near Morgan Hill, state seismic safety rules prohibit it from going above 58 percent full until a modernization project is finished in the com-

ing years. Friday, it was 35 percent full. Some other district reservoirs have similar limits, and some are being lowered due to recent storms and the forecast.

The district, which came under fire after flooding in 2017 from Anderson caused \$100 million in damage to downtown San Jose, doesn't anticipate water shortages this summer, said spokesman Marty Grimes, because its groundwater supplies are robust and there are still two more months of the winter rainy season to go.

"We want to make more room so there is less chance that the reservoirs will spill," he said. "That has the effect of reducing flood risk. We can do that without jeopardizing our water supply."

Mike Anderson, state climatologist with the Department of Water Resources, said the storm, if it materializes, could also bring a lot more Sierra snow. How much tropical moisture it carries and how long it lingers over land will be key, he said.

"Pay attention to the forecast," Anderson said. "Each day we'll know a little more."

Contact Paul Rogers at 408-920-5045.

Frogs

FROM PAGE 1

Since founding his company, The Odin, in 2006, Zayner and his team have been striving to give the public the education and tools to safely edit organisms' genes. So far, they have sold thousands of gene-editing kits and brought in around \$500,000 in revenue just last year. With these inexpensive devices, individuals can practice feats of science once contained to a lab, such as making glow-in-the-dark yeast and precise gene mutations in bacteria.

Now, with the release of the new frog kits last November, people can alter a frog's anatomy with a few simple injections right in their own home.

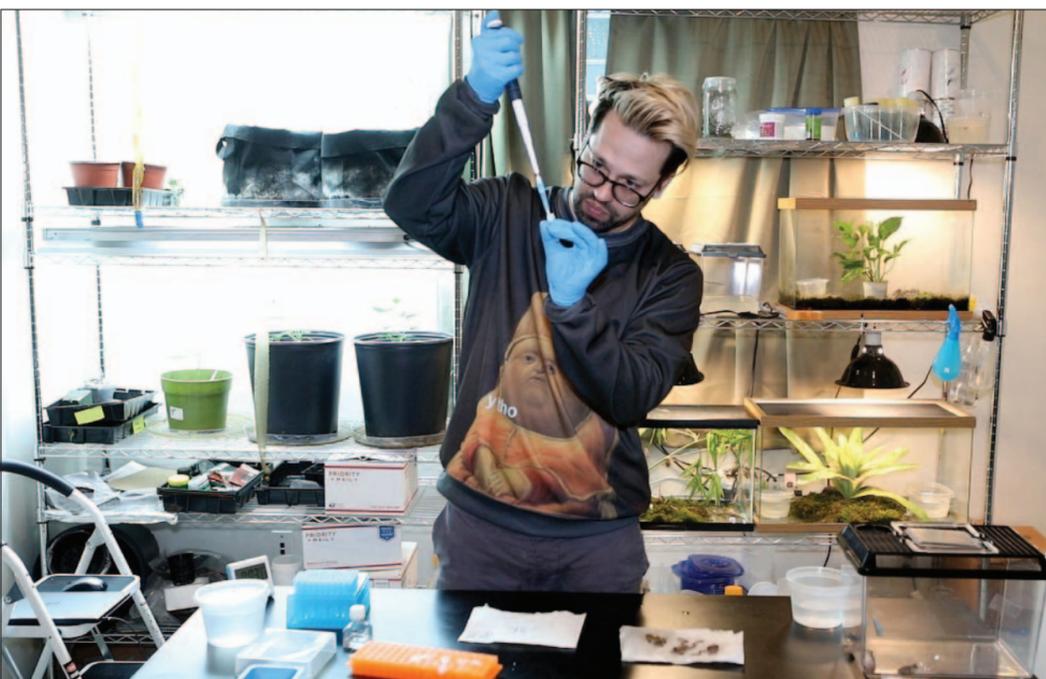
"When we watch movies and when we dream, the stuff we want is humans with wings or dragons," said Zayner. "People are more interested in the creative, artsy side of science. And you can't get grants for that stuff."

Zayner is no stranger to the world of gene editing.

After receiving his Ph.D. in molecular biophysics from the University of Chicago, he worked for two years for the NASA Ames Space Synthetic Biology program, where he engineered bacteria that could help transform Mars into a planet suitable for human life.

Since 2016, he has invested his time fully in The Odin and became known for his controversial do-it-yourself CRISPR kits.

But unlike the CRISPR kits, the frog kit employs a lesser known gene-edit-

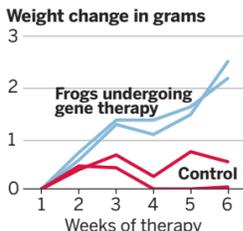


ANDA CHU — STAFF PHOTOGRAPHER

Josiah Zayner, founder and CEO of The Odin, extracts protein used in the genetic engineering company's frog gene therapy kit during a demonstration in Oakland. The company creates gene-editing kits that individuals can use at home.

GROWING FROGS AT HOME

Example growth curves of typical frogs from the at-home gene therapy kits.



Source: ODIN BAY AREA NEWS GROUP

ing process called formulated liquid to enhance the engineering of biology, or FLEEB.

FLEEB uses a special liquid that is a mixture of fats

and a protein called insulin-like growth factor, or IGF-1, that is critical in tissue and muscle growth in adults. Once injected into the frog, the fats allow for IGF-1 to slip smoothly through the cell wall. The DNA within IGF-1 then tricks the cell into thinking it is part of the cell's DNA, thus stimulating cell growth.

But these changes are not carried onto the frog's offspring. The cells modified by IGF-1 injections are not the same as the frog's reproductive cells that make up their sperm or eggs.

Zayner's goal is to promote this type of science in high school classrooms around the globe.

"We're trying to say, 'Look,

your high school doesn't need to do frog dissection anymore,'" he said. By giving students the opportunity to do hands-on gene editing projects, "They can move into 2019 and do modern scientific experiments."

Biochemist Kate Adamala, who is a guest lecturer in Zayner's online CRISPR and biohacking class, believes these classes are key in dispelling public fears and misunderstandings around genetic engineering. They may also promote more students to pursue a career in science.

"If we expose more people to the idea that it's not black magic, they may consider going into science," said Adamala. "It can

make science education more fun and show people who thought they were not smart enough to go into science that they really are."

But Stanford University infectious disease expert Dr. David Relman, who co-directs the Center for International Security and Cooperation, has serious concerns.

Although Relman supports the thoughtful and productive engagement in science by the general public, he strongly opposes Zayner's method.

"You can't simply go into a cockpit and fly a plane," said Relman. "Likewise, you can't simply pick up a pipette and do science."

Science involves a set of moral and ethical princi-

ples, particularly when it comes to animal testing. Handing out frog gene therapy kits for anyone to use is a clear noncompliance with those principles, argues Relman.

"There is a sense from looking at this work that frogs have been judged to be of lesser meaningfulness and value, and therefore it is OK to play with their genomes," he said. "I reject that."

Although the gene editing only modifies the frog's nonreproductive cells, Relman worries that these kits are the beginning of a slippery slope.

Zayner assures that the creation of his frog gene therapy kits involved extensive research and compliance with animal testing laws. However, he understands that selling these kits will stir up a lot of anger and apprehension.

"What I'm learning is that the timing (in selling the kits) is sometimes more important than just knowing you can do it," he said.

But regardless of other's reactions, Zayner is determined to continue breaking new ground in the field of gene editing, particularly through his online CRISPR tutorial — one of The Odin's most popular items.

By reaching as wide an audience as possible, he hopes citizen scientists will eventually use their education to uncover new opportunities in gene editing and invent products that can one day save lives.

"When science and gene editing enter our culture through people exploring the unknown, I think that's when I will feel happy," Zayner said. "I want to live in that world."

Bridge

FROM PAGE 1

there were no new reports of falling concrete, said Tony Tavares, the director of Caltrans District 4, which covers the Bay Area.

It was likely that wear and tear caused the concrete to crack. The cracking occurred near an expansion joint that dates back to the bridge's original 1956 construction. A heavy truck passing over the joint might have crushed the brittle and aged concrete near the antiquated joint, Tavares said.

He said no work on the bridge would be done over the weekend, and drivers could expect to use the bridge normally. Exact plans for the work still are being drawn up, but Tavares said the work probably would start Monday and take place at night. Repairs are expected to take anywhere from "several days" to "a few weeks," he said.

But Abolhassan Astaneh-Asl, a professor emeritus of structural engineering at UC Berkeley who served on the advisory committee for the Richmond-San Rafael Bridge when it was undergoing a seismic retrofit in 2005, said opening the bridge so soon would be "a disaster."

Caltrans shouldn't open the bridge until the agency can say with certainty the cracks are lo-

calized to only the area where the concrete fell, Astaneh-Asl said. But, he added, without inspecting the entire span where similar conditions exist, there's no way to know for sure.

"It's not the safety of the bridge," he said. "It's the safety of the drivers."

But Tavares said the bridge is safe.

"Out of an abundance of caution, our engineers have been on the bridge today continuing inspections and will continue to perform additional inspections of all bridge joints over the coming week," he said.

"We do not have any concerns with additional expansion joints having any issues at this time," Tavares said Friday.

But Astaneh-Asl said the fact that the pieces fell from the middle of the deck — as opposed to being caused by a heavy truck driving or parking on the shoulder of the bridge — is a big problem for motorists passing underneath.

"If it's really widespread, it's a very serious concern," he said.

Historically, there have been repeated problems with expansion and deck joints on the Richmond bridge, as well as other bridges with similar joints, said Andrew Fremier, the deputy executive director of operations for the Bay Area Toll Authority, which works with Caltrans to oversee maintenance of the Bay Area's state-owned toll bridges.

Holes popping up on the bridge prompted \$50 million in emergency repairs in 2004, work that was added to the \$795 million seismic retrofit, which included replacing 63 concrete deck sections and 700 expansion joints. In early 2006, just four months after the 2005 retrofit work was deemed complete, more holes in the concrete cropped up near joints on the bridge, prompting an additional \$25 million in repairs.

In the last five years, the toll authority has shelled out \$46 million for various projects on the bridge, mostly joint repairs and painting, said John Goodwin, a spokesman for the authority. It's also planning another \$80 million in ongoing maintenance and replacement of the joints, along with other work, over the next 10 years.

In the short term, Caltrans crews placed steel plates over the affected area, with plywood boards below the deck, to allow motorists to drive over the concrete without more pieces shaking loose and crashing onto the cars and trucks below.

The concrete itself varies in thickness throughout the span but can be up to 10 inches thick. It has a ¾- to 1-inch-thick protective coating that is periodically ground off and replaced. The coating is more durable than the concrete below and has grooves on it to provide better skid resistance and tire ad-

hesion.

Below the surface, however, sections of the concrete date back to the original construction. It's lightweight concrete, which makes it more prone to breaking off in small chunks, Astaneh-Asl said.

Given the age of the bridge, it shouldn't be a surprise to see more pieces crumbling off, said Robert Bea, professor emeritus of catastrophic risk management at Berkeley. Age, combined with exposure to salt air, earthquakes, occasional bumps by passing ships and daily traffic, weaken the bridge, he said.

"This process has been going on for a long time," Bea said, adding that incidents such as the falling concrete motorists encountered Thursday "are not getting less frequent. They're getting more frequent."

The bridge has never been a joy for drivers, said Holmann Perez of Fremont. He crosses it nearly every workday to head to his job in San Rafael. He's never felt comfortable on the bridge's long, narrow span, he said.

"Who wouldn't feel nervous?" Perez said. "But there's no choice when you have to head to work."

Other commuters opted for a come-what-may approach. Ramona Ortiz-Smith of Woodacre said she just crossed her fingers and hoped no more rocks would fall.

"If they fall, they fall," she said.

BRIDGE REPAIRS SHOULDN'T AFFECT WEEKEND DRIVERS

Drivers won't have to worry about repairs to the Richmond-San Rafael Bridge disrupting their weekend travel plans, Caltrans officials say. That's barring any new problems on the 63-year-old span, of course.

Repairs are expected to start Monday night to fix a broken expansion joint on the bridge's upper deck that dropped chunks of concrete onto its lower span Thursday.

Crews have installed a steel plate over the top of the failed expansion joint and a plywood barrier below it to catch any additional concrete.

All lanes on the bridge have been open to traffic in both directions since Thursday night, said Tony Tavares, director of the Caltrans district that covers the Bay Area.

There are no plans for lane closures or any other disruptions to traffic over the weekend, Tavares said, though he added Caltrans will take action if it discovers any new problems.

"Throughout the weekend we will have crews that will be monitoring the site, and if any issues arise we will address those issues immediately," he said.

Caltrans will likely have to close lanes once it starts repairs, but the work will be done overnight to limit the impact on commuters, Tavares said. The project is estimated to take "several days if not a few weeks," he said.