U.S. rivers are becoming saltier

By Sujay Kaushal, Gene E. Likens, Michael Pace and Ryan Utz, The Conversation

The United States has made enormous progress in reducing water pollution since the Clean Water Act was passed nearly 50 years ago. Rivers no longer catch fire when oil slicks on their surfaces ignite. And many harbors that once were fouled with sewage now draw swimmers and boaters.

But as Earth Day approaches, it is important to realize that new, more complex challenges are emerging. In a study published earlier this year, we found that a cocktail of chemicals from many human activities is making U.S. rivers saltier and more alkaline across the nation. Surprisingly, road salt in winter is not the only source: construction, agriculture, and many other activities also play roles across regions.

These changes pose serious threats to drinking water supplies, urban infrastructure and natural ecosystems. Salt pollution is not currently regulated at the federal level, and state and local controls are inconsistent.

Our research shows that when salts from different sources mix, they can have broader impacts than they would individually. It also shows the importance of supporting water quality monitoring nationwide, so that we can detect and address other pollution problems that have yet to be recognized.

Altered waters

Our group has been studying freshwater salinization for over 15 years. In 2005 we published a paper that demonstrated that levels of sodium chloride (common table salt) were rapidly

increasing in fresh waters across the northeastern United States.

Until that time, scientists thought that salinization was a serious problem mainly in arid regions where water evaporates rapidly, leaving salts behind. But we found that it was affecting major drinking water supplies, exceeding toxic levels for some aquatic organisms and persisting in the environment year-round, even in humid regions.

The main cause we found was the spread of paved surfaces, such as roads and parking lots. Communities in cold regions use de-icing salts to clear snow from roads during winter, and the more roads they build, the more treatment is needed. We found that a 1 percent increase in paved surfaces could boost salt concentrations in nearby water bodies to levels more than 10 times higher than pristine forested conditions.

In 2013, we published another study showing that rivers were becoming more alkaline across regions of the eastern United States. At that time acid rain – i.e., too much acid in rainwater, caused by air pollution – had been a well-known environmental issue for several decades. However, alkalinization was not recognized in the same way, and its effects are still poorly understood now.

Alkalinization is the opposite of acidification: It occurs when water's pH value increases instead of falling. As water becomes more alkaline, certain chemicals dissolved in it can become toxic. For example, ammonium is a nutrient in freshwater ecosystems, but is converted to toxic ammonia gas in significant concentrations in waters with a high pH. Alkaline conditions also enhance release of phosphorus from sediments, which can trigger nuisance blooms of algae and bacteria.

We found that a process we called "human-accelerated weathering" was breaking down rock and releasing minerals into

rivers that were making them more alkaline. The process of weathering rocks and minerals that become exported to rivers is typically slow, but we showed that land development and decades of exposure to acid rain were speeding it. We also suggested that widespread use of geologic materials in fertilizers and concrete was a factor.

Identifying freshwater salinization syndrome

Our study on human-accelerated weathering showed that along with sodium chloride, other dissolved salts were increasing in fresh water across large regions of the eastern United States. This made us wonder whether there could be a link to our previous work on salinization in these regions.

We started to recognize that in theory, salt pollution and human-accelerated weathering could be sending increasing quantities of salts that were alkaline into rivers throughout the nation, and that this could increase their pH levels. We knew that ocean water, which is naturally salty, has a higher pH than fresh water because it has accumulated high levels of alkaline salts. After much analysis, we proposed that similar interconnected processes could influence salinity and pH in fresh water.

Many sources release alkaline salts into the environment, including weathering of impervious surfaces, fertilizer and lime use in agriculture, mine drainage, irrigation runoff and winter use of road salt. Initially, parts of these alkaline salts bind to soil. But when they come into contact with sodium – for example, excess road salt – chemical reactions occur that release the alkaline salts, which then wash into freshwater ecosystems.

We called this process freshwater salinization syndrome because it was producing multiple effects on salts, alkalinity and pH, which are fundamental chemical properties of water.

Different causes by region

Figuring out this process was a team project that required knowledge of limnology (the study of inland waters), geochemistry and geography. The causes vary from one location to another, but the outcomes can be similar.

For example, rivers are becoming more saline and alkaline in parts of North Carolina, Florida, Virginia and other states that use little or no road salt. This is likely due to human-accelerated weathering in locations underlain by limestone (which dissolves when it comes in contact with acid rainwater) and in urbanized areas with lots of concrete infrastructure, as well as urban salt pollution from sewage, water softeners or fertilizers.

Our research was supported by the U.S. National Science Foundation and drew on enormous quantities of monitoring data from ecosystems across the United States collected mainly by the U.S. Geological Survey. We analyzed long-term trends in the chemistry of rivers over five decades and compared these trends across different major river systems and regions.

We also analyzed trends in major estuaries, such as the Hudson River and the Chesapeake Bay, to investigate whether increasingly alkaline inputs from rivers could potentially influence the chemistry of coastal waters. Our results show that changes in salts can alter concentrations of pollutants such as excess phosphorus and nutrients that are bound up in sediments at these sites.

Managing salt pollution

Freshwater salinization syndrome is affecting drinking water supplies in many parts of the United States. In some cases it is altering the taste of water or threatening the health of people with hypertension.

There is growing concern that salts in fresh water can corrode water pipes and release toxic metals such as lead into drinking water. They also can trigger reactions that mobilize

other contaminants and pollutants from soils into rivers.

As other scientists have shown, mixtures of salts can be more toxic to aquatic life than just one salt alone. The Environmental Protection Agency does not currently regulate salts as primary contaminants in drinking water, and state and local regulation of salt releases over wide areas from activities such as road treatment are sparse and inconsistent.

We believe there is a serious need for federal regulations and regional plans to reduce salt pollution in fresh water. One strategy would be to reduce use of road salts by calibrating application and adjusting application rates based on temperature. In addition, not all salts are created equal: It may be more efficient to use certain salts as deicers at lower temperatures. Finally, organic de-icing solutions use less salt than conventional versions.

New forms of water pollution are constantly emerging, and it is important to identify how different human activities accelerate geological processes in nature. Fresh water accounts for only about 3 percent of the Earth’s total water supply (the rest is in the oceans), and there will always be a need for better understanding and management of this precious resource.

Sujay Kaushal is an associate professor of geology at University of Maryland;Gene E. Likens is a distinguished research professor of ecology and evolutionary biology at University of Connecticut; Michael Pace is a professor of environmental sciences at University of Virginia; and Ryan Utz is an assistant professor of water resources at Chatham University.

SLT recreational pot ordinance taking shape

By Kathryn Reed

An adult-use marijuana ordinance is expected to be before the South Lake Tahoe City Council next month, with development agreements and a decision about what to do with the existing medical facility still to be decided.

The electeds on April 17 agreed to allow the following licenses: two micro businesses, two retail, and two cultivations not to exceed 5,000-square-feet. Other agreed to rules include: no limits on testing facilities, delivery linked to a retail establishment, dual licenses from planning and public safety, development agreement model, full cost recovery for the application fee, and permits awarded based on merit with a local preference.

Specifics to the latter will be decided by the council via a resolution.

Sergio Rudin with the law firm of Burke, Williams and Sorensen was the city attorney of record for Tuesday's meeting. He said the ordinance should be ready by May 1.

Rudin stressed that it will be necessary to have the development agreement in place before the ordinance takes effect.

With a development agreement, the city will be able to collect a fee of sorts from the businesses. This is in lieu of a tax that could be assessed on the product. The voters will have to decide whether recreational marijuana will be taxed. The council has not decided to go forward with a tax measure, but has in the past said that is an eventual route to explore.

Rudin said it would be best to employ a consulting firm to gauge the appetite of the electorate about such a tax.

He also advised that the development agreements have parameters so they don't exist indefinitely, but also would sunset if a tax were implemented.

Legal and planning have worked out their differences regarding zoning. A micro business would be allowed in the industrial area, but no retail sales would be permissible. The Y area is another area of town where a micro business could open.

The advantage to a micro business is that one company can then do multiple things like grow the plants, create product like edibles, and then sell them.

While the state allows for 10,000-square-feet of cultivation for micro businesses, it is possible for the city to make that more restrictive. The council leaned toward 5,000 square feet.

What the council does not want is on-site consumption.

Council members Brooke Laine and Austin Sass have been appointed to a subcommittee to work with staff to formalize the development agreement criteria as well as figure what to do with Tahoe Wellness Cooperative.

TWC has been dispensing medicinal marijuana for about nine years in the middle of town. It operates as a micro business, and allows on-site consumption. Cody Bass, who owns TWC, multiple times at the meeting said the direction the council was going would make his business obsolete unless it could be grandfathered in.

TWC's future remains to be seen. It will be up to the city's subcommittee to make recommendations to the full council regarding TWC's future.

The future of craft beer in Northern Nevada

By Mike Higdon, Reno Gazette-Journal

For almost a decade, beer geeks have asked, “Is Reno oversaturated with beer, yet?” and the answer has been a resounding “Maybe? Surely some breweries will close as the competition stiffens.”

Yet, no brewery has closed due to lack of business. More continue to open, expand their offerings and distribute out of state.

But while more than 28 local beer brands persist in the greater Reno-Tahoe area, they have not necessarily grown the craft beer-loving audience by a significant margin. Some brewers said they are all sharing the same few hundred or maybe thousand local beer geeks who have become a nomadic band of loyalists visiting their favorite spots.

Read the whole story

MontBleu ownership changing

hands

By Wayne Parry, AP

ATLANTIC CITY, N.J. — Carl Icahn's company has struck an approximately $1.85 billion deal that would fuse the gaming and hotel operations of Tropicana Entertainment to Eldorado Resorts Inc.

The agreement, announced early Monday, includes the sale of Tropicana Entertainment Inc.'s real estate to Gaming and Leisure Properties Inc. It doesn't include Tropicana's Aruba assets, which will be disposed of as a condition to closing.

Eldorado Resorts is acquiring the operating assets of seven casinos in six states, including two in Nevada — the Tropicana Laughlin and MontBleu in Stateline.

Read the whole story

Opinion: South Lake Tahoe mayor's DA investigation request may be just another violation of the law

By Kathryn Reed

Naiveté, ignorance, secretiveness, vindictiveness and complacency have no place in government. Not if the work of the people is going to be accomplished in a transparent, thorough, well thought out manner.

The South Lake Tahoe City Council appears to have hit an all-time low. Lower than the Kathay Lovell-Bill Crawford juvenile behavior, lower than Bruce Grego having to defend himself at the podium as Jerry Birdwell verbally accosted him, lower even than the JoAnn Conner censure.

Mayor Wendy David is duplicitous in her comments that she is shocked by what **Councilwoman Brooke Laine had to say in her column** on *Lake Tahoe News*. In my **March 27 column** Laine said she was "discouraged by the lack of transparency." *Lake Tahoe News* has repeatedly cited times when the Brown Act has been violated.

David in her rebuttal column to Laine took issue that her colleague had not warned the other four about the column. But then David did the same; just sent her response to the media.

Knowing Laine, one can be assured she first took her concerns to David privately before addressing the public. But why shouldn't Laine go to the public? It is the public who she works for, not any other elected official, not any staff member of the city. She – and all elected officials – should be talking to the public.

Councilman Tom Davis told *Lake Tahoe News*, "I stand behind Brooke and her letter."

The other two guys on the council had nothing to say. Maybe they will Tuesday when the council has its regular meeting at Lake Tahoe Airport starting at 9am.

While David wants credit for initiating an investigation into the council's alleged wrong-doings, *Lake Tahoe News* reached out to El Dorado County District Attorney Vern Pierson earlier this spring about the perceived Brown Act violations.

David in her column said she is recommending the police chief contact the DA. On the one hand, great, on the other this is so incredibly wrong. No council member individually has the

power to direct any staff member to do anything. Collectively, the council may tell only the city manager or city attorney what to do. There has been no discussion by the council to initiate such an investigation.

The only power the mayor has over another council member is the ability to call a special meeting.

One of the reasons former Councilwoman Conner was censured is because she was telling code enforcement what to do. One has to wonder if there might be a case building to censure David; after all, she is telling staff what to do and far exceeding her job. The mayor is a title with the same power as any council member.

David met with acting City Manager Jeff Meston on April 16 to discuss opening an investigation.

Meston told *LTN*, "I had been thinking for a while this needs to go to the grand jury or at least the district attorney. There is no way we cannot not investigate." He further said, "In my discussion with the mayor she recommended that we need to take some form of action. I agreed with her and said I would direct the police chief to get in contact with the district attorney."

Police Chief Brian Uhler spent the day gathering information for the DA based on Laine's comments. Here is **the letter** he sent to the DA.

The letter, instead of just providing facts, is full of Uhler's opinion; he essentially admonished Laine for going to the public and not to law enforcement with her concerns. Then he left out the most important part for the DA, which is the Mary Egan contract that to this day has not been brought out in the open. It is an illegal contract that is a misuse of public funds that interim City Attorney Nira Doherty condoned.

Misuse of public funds could be a felony. Laine brought that

whole contract up in her public column, but Uhler ignored this alleged crime in his letter.

Laine and Davis prior to seeing Uhler's letter said they support the investigation.

"The only way we will find out is with an outside independent investigation," Davis told *LTN*. "I don't see why the council would not want to seek the truth."

Laine told *LTN,* "I am thrilled that the city is taking my claims seriously. I do not make those assertions lightly. I look forward to a thorough and independent investigation."

David also sent out a statement April 16 via Tracy Sheldon, the city's public information officer. Both were asked who reviewed the letter before it was sent. Sheldon was asked more than once, and then got snippy and unprofessional with her reply to *LTN*. Neither answered the question.

Meston told *Lake Tahoe News* he had seen it before it was sent.

The release said, "Because of the gravity of Ms. Laine's allegations, I, as mayor, believe I have a duty to ensure that the claims that the City Council, city clerk, previous city manager, acting city manager, previous city attorney, interim city attorney, and indeed any city employee has violated the law are fully and adequately investigated."

It's ironic she is asserting this authority when she repeatedly was critical when Austin Sass as mayor tried to claim power that he didn't have. Now David seems to think by holding the gavel she has special powers. She doesn't. No one does. South Lake Tahoe is not a strong mayor form of government.

Then the fact she lists people, at least by position, that Laine never mentioned is suspect. It also could get the city into a world of hurt because the settlement agreement between

the former city manager and the council states that neither can say anything against the other. David is walking a precarious legal line that could open the city up to potential litigation.

Opinion: Taking issue with council colleague's accusations

By Wendy David

The last few months have been some of the most difficult for our City Council, for our city and for our community. Similar to the national conversation, with immediate access to social media in many forms, controversial opinion pieces go immediately out to the public, even before the accused have an opportunity to hear the allegations. Soon after, public comment and "opinion" on the opinion begins with little interest in whether there is truth.



Wendy David

I have very seldom felt the need to respond publicly, but Ms. [Brooke] Laine invites and demands this public response by making her concerns and opinion very public, while stating

that she is providing information. I would like to respond to a few of her opinions, accusations and allegations.

I would like to address the truth in reference to the minutes that were approved at the April 3 meeting. Ms. Laine was absent. Very often the minutes of a meeting have corrections made to them after review by council, the city manager or department heads, before they are formally adopted by the council. In this case, Ms. Laine noticed a transcription error in a motion that had been made which added additional language that was not part of the motion. She contacted our city clerk the day before our meeting, who then took action and publicly amended the minutes during the public meeting before they were adopted. She gave credit to Ms. Laine for advising her of the error. It is common to have the minutes corrected, often in public. I have done it myself on a few occasions.

I take great exception to the comment of secrecy taking place in local government. Ms. Laine states, “If one councilmember is not privy to the same information as other councilmembers the question is why?” All information is equally available to every councilmember. Calls to the acting city manager, interim city attorney, city clerk, and city staff do not go unanswered. The mayor and the mayor pro tem do meet and confer on the proposed agenda one week before the meeting, but these meetings in no way preclude any councilmember from being provided the same information.

Surprisingly, although Ms. Laine alleges that transparency is lacking, in a stunningly secretive display, she let no one know in advance of her decision to publicly accuse her fellow council members, her acting city manager, city clerk and interim city attorney of breaking the law.

Her accusation of decision-making taking place outside of the public’s view could not be further from the truth. As a council, we very publicly discuss, deliberate and reach decisions at our meetings in front of the public. For anyone

that has attended a meeting, this should be obvious as you watch the council debate, sometimes vigorously and with passion our most controversial topics. We have tough decisions that take many meetings of discussion to thoroughly and thoughtfully vet through all of the options. This can be frustrating for the public and for the council, but is an integral part of public government. I am offended and devastated to learn that this is Ms. Laine's belief.

Ms. Laine further accuses the council of engaging in a power struggle, one that is for personal gain and is selfish, creates hostility and purposely keeps many in the dark. I do not know who she is referring to, but her statement is false and unfounded. She speaks against our city's public servants that step up and out to serve the public in today's polarized culture. For me, this elected position certainly is not one that has provided any personal gain. In fact, quite the opposite is true. The sleepless nights, the huge weight of knowing that I must always act in the best interests of the entire city's community, not just one person or one opinion, before supporting any action, the lack of being at liberty legally to comment on any item that is confidential and restricted to closed session all take a considerable toll for any responsible and professional person.

Because of the gravity of Ms. Laine's false accusations, as mayor, I have made a recommendation to our chief of police to initiate conversation with the El Dorado County district attorney to investigate Ms. Laine's numerous allegations that "multiple violations of the law have occurred."

I am saddened and disappointed that Ms. Laine has taken this path and holds these damaging opinions. I hope that we can find a path back and provide the community, the City Council, city staff and other elected and appointed officials facts and truth as opposed to opinion and biased conjecture. I believe a thorough and independent investigation will provide this.

Wendy David is mayor of South Lake Tahoe.

Sierra snow drought endures despite March moisture

By Benjamin Spillman, Reno Gazette-Journal

The series of March storms that slammed the Sierra Nevada made skiers and snowboarders rejoice and provided a much-needed boost to water storage reservoirs in California and Nevada.

But even a one-month snow total that rivaled the “Miracle March” of 1991 isn’t enough to erase the snow drought that lingered through winter 2017-18.

“The takeaway is we had another snow drought year,” said Dan McEvoy, regional climatologist for the Western Regional Climate Center in Reno. “We are still below average this year and we are going to lose our snowpack earlier than average.”

Read the whole story

Travel conference redefines South Shore’s image

By Terra Breeden

Glasses of bacon bloody Mary’s and craft beers clanged together in salutations while a disc jockey spun pop hits over

a booming sound system. Guests shook their tail feathers on the dance floor and enjoyed a vast buffet of pork belly sliders, veggie platters, and pizza slices. Needless to say, it was a party. But this wasn't your everyday Heavenly fiesta, this was the 2018 Mountain Travel Symposium, the largest ski business conference in the world and the meeting ground for many of the industry's top leaders.

This year, Lake Tahoe Visitors Authority hosted the Mountain Travel Symposium; a gathering of professionals from ski resorts and mountain towns across the globe. Ski business-people representing more than 35 countries met with vacation home suppliers, buyers and vendors to boost the mountain-travel economy and create lasting connections within the industry. More than 1,000 people attended the event from April 8-14, which was at Harrah's Lake Tahoe, Lake Tahoe Resort Hotel and Heavenly Mountain Resort.

"It's all the people involved in the mountain and winter agencies from all over the world who sell winter vacations to clients," LTVA Vice President of Tourism Development Tony Lyle told *Lake Tahoe News.*

The Mountain Travel Symposium is hosted by a different resort town each year.

To host the event, LTVA successfully placed a bid with a destination marketing organization in 2015. LTVA then partnered with Heavenly, Harrah's, and Lake Tahoe Resort Hotel to provide the conference center, mountain activities, and accommodations for attendees. LTVA's goal was to unite the worldwide ski industry and grow the local economy by bringing new businesses and clients to the South Shore.

"We are a tourist destination and LTVA is bringing the mountain business here," Lyle said. "We did a lot of outreach and this event is good for everybody, from banquet servers to hotel owners."



Travel conference attendees are treated to skiing and dining at Heavenly. Photo/Terra Breeden

Additionally, LTVA is focused on producing more business on the South Shore by inspiring ski clubs and councils who attend the symposium to plan their annual winter vacations at the ski resorts and hotels in this area. Many of the clients who came to the event were impressed by the transformation of the area since the Great Recession, especially in areas like the Heavenly Village.

“A lot of people have been blown away by the village, the mountain, and the beauty of the lake,” Lyle said. “These people had preconceived notions from 10-15 years ago, but there is new business being booked already during this conference.”

At the weeklong Mountain Travel Symposium, a wide range of networking opportunities, activities, and business

presentations were offered each day. Attendees learned how to grow their companies with social media marketing tactics and vacation home rental schemes during the popular breakout sessions on Wednesday and Thursday. And over the weekend, attendees met with other like-minded professionals to discuss business strategies and network in speed-dating-style, one-on-one meetings and group assemblies.

“This is a great place to meet with current clients and develop new relationships because the sharing of information and networking is critically important. Everybody is an expert here when it comes to the ski and snowboard industry. It is a great venue and event,” Janet Janssen, director of property management at Travel Guard International in Stevens Point, Wis., told *Lake Tahoe News.*

Janssen, who has been attending the Mountain Travel Symposium for eight years, said that the symposium has been growing in popularity with more international companies joining this conference than in earlier years. Attendees wore name tags emblazoned with their home countries and hailed from places such as Spain, France, the Netherlands, Italy, and Belgium.

“The international companies bring a new perspective. Their mountains and customers are different from the U.S.,” Janssen said. “Everyone gains a better insight on how to run their business. They learn about marketing and gain more knowledge about the industry as a whole.”

Although most of the conference days were spent within the confines of Harrah’s, this rowdy bunch of professional outdoor enthusiasts were more likely to form meaningful business relationships in skis and snow boots than they were in suits and heels. Heavenly was awash in ski-industry professionals conducting impromptu meetings on the chairlifts before hitting the slopes with their newfound business partners.

Skiing conditions were warm and sunny during the event and

Heavenly was relatively quiet; winding down during the last couple weeks of operation. The Mountain Travel Symposium guests virtually had the mountain to themselves. Multiple languages and accents could be heard as symposium attendees skied together in small groups and explored the mountain.

“This place is magical. I can’t believe how great the spring skiing is,” Herman Buchan, symposium attendee and manager of Hotel Castor, a luxury resort in Champoluc, Italy, said.

Next year, the Mountain Travel Symposium is scheduled in Whistler, British Columbia. The event returns to the Lake Tahoe area in 2020 and will be at Squaw Valley.

Oil lease plan for Nev.’s Ruby Mountains reopened

By Benjamin Spillman, Reno Gazette-Journal

It’s almost time for the Forest Service to make a recommendation on a proposal to offer oil and gas leases in Nevada’s Ruby Mountains.

But first the agency is giving the public another chance to weigh in.

“We want to make sure if there is any new information out there we didn’t receive the first go around we get it and we consider it like we are supposed to,” said Joshua Nicholes, acting district ranger for the Mountain City, Ruby Mountains, Jarbidge Ranger District of the Humboldt Toiyabe National Forest.

Read the whole story

White House, Congress side with Calif. growers to raise Shasta Dam

By Carolyn Lochhead, San Francisco Chronicle

WASHINGTON — Congress and the Trump administration are pushing ahead with a plan to raise a towering symbol of dam-building's 20th century heyday to meet the water demands of 21st century California — a project backed by San Joaquin Valley growers but opposed by state officials, defenders of a protected river and an American Indian tribe whose sacred sites would be swamped.

The fight is over Shasta Dam, at 602 feet the fourth-tallest dam in California and the cornerstone of the federal Central Valley Project, which provides water to cities and farms throughout the state. One of its biggest customers is the Westlands Water District in the arid western San Joaquin Valley, which distributes water to numerous large farms.

With enthusiastic support from Westlands, the Trump administration and Republicans in Congress want to raise the dam 18½ feet to store more water and guard against losing farmland to future droughts. Some farmers in the valley received no water at all from the Central Valley Project for two straight years during the five-year drought that ended with the winter of 2016-17.

Read the whole story