The Chronicle
By Alice Loyd (through August 31, 2015)

POLLUTION

Two massive explosions took place in the port city of Tianjin in northern China on August 12, 2015. The death toll has now reached 114, with 95 persons listed as missing. More than 720 people were hospitalized, with nearly 60 of these either critically or seriously injured. Officials have said it is not yet clear what triggered the blasts, which occurred at a warehouse that contained hazardous and flammable chemicals, including calcium carbide, sodium cyanide, potassium nitrate, ammonium nitrate, and sodium nitrate.

Aerial photos reveal a black crater marking the center of the damage, surrounded by rows of burnt-out cars and crooked stacks of twisted shipping containers. The total burned area is 12 square miles in size. The warehouse was located in a thinly populated area 25 miles from the center of Tianjin, a city of more than 13 million people. cnn.com and bbc.com

Chemical teams were sent immediately to scan the area for harmful materials and airborne toxins. Ravi Naidu, Director of the Global Centre for Environmental Remediation at the University of Newcastle, Australia, commented, “With a blast like this, normally you would expect the transport (of particulate matter) to be along the wind gradient or contours, but a blast this big must push it beyond that in the opposite direction. Not just people but animals and other organisms would be exposed.” Naidu was particularly concerned that soil in the area and the nearby buildings would have been infused with toxic chemicals. China’s public security minister, Guo Shengkun, said every possible measure would be taken to prevent further loss of life or injury. “Deep lessons must be learned,” Guo said. time.com
On August 15, 2015, three million gallons of polluted sludge poured into the Animas River below the Gold King mine site in Colorado. When an Environmental Protection Agency (EPA) work crew inadvertently caused the release while attempting to evaluate the toxicity of the abandoned mine, an orange slick containing high levels of beryllium, mercury, cadmium, iron, copper, zinc, and arsenic—and lead levels 12,000 times higher than normal—rushed into the river.

The people of the Navajo Nation rely on the Animas for drinking water, farming, livestock, and medicine; and other farmers and cattle growers use the river all along its length. The water flows into the San Juan River after it enters New Mexico, then passes through Arizona and eventually into Lake Powell, from which many southwestern cities get their water, including Las Vegas. truth-out.org

The trouble at Gold King can be traced back to 1996 when the Sunnyside Mine, the largest and last remaining major operator in the area, was permitted to shut down its treatment plant and switch to the less costly method of simply plugging the mine works with concrete. Plugging that hole, located at the lower level of the mountainous area, probably forced rain and snow to rise up to the levels of other old mine cavities and eventually to Gold King. The mid-level Red and Bonita mine sites discharged only about five gallons per minute before Sunnyside was closed, but 300 gallons per minute after the plug. In 2002, the Animas River Stakeholders Group reported Gold King was beginning to discharge “significant amounts of acid mine drainage.” The EPA work at Gold King was designed to monitor and prepare for unintended effects of remediation at the other mines. popsci.com

The EPA is taking full responsibility for the spill and plans to reimburse people for the damage the spill caused, but experts estimate that there are 55,000 abandoned mines across the west, and federal and state authorities have struggled for decades to clean them up. The Associated Press reported that ten years ago the EPA recommended a state-of-the-art treatment plant as the way to treat the water draining from mines in this area, but local decision-makers have preferred not to place a large federal cleanup effort in their tourist-attracting region.

Officials have announced that the river is already returning to "pre-event conditions," even though metals remaining on the river bottom could affect aquatic life and humans in ways difficult to predict. And still the mine leaks, now at a rate of 213 gallons per minute. In an effort to slow down the drainage from Gold King into the river, the EPA has set up four containment ponds. Time in the ponds gives metals opportunity to fall down to the bottom, and the ponds
also help treat the acid in the water. The prognosis? "Rest assured we will learn lessons from this," said EPA Administrator Gina McCarthy, echoing words spoken in China a few days earlier concerning the Tianjin accident. koat.com

**Athletes in next year’s Summer Olympics will be swimming and boating in contaminated waters.** An Associated Press (AP) investigation has found dangerously high levels of viruses and bacteria from human sewage in Olympic and Paralympic venues in Rio de Janeiro, Brazil. Brazilian officials and the International Olympic Committee (IOC) claim the water will be safe, but neither the government nor the IOC, relying on bacteria testing only, tests for viruses. The AP analysis is the first independent comprehensive testing for both viruses and bacteria at the Olympic sites.

Extreme water pollution is common in Brazil, where untreated sewage often runs through open-air ditches to streams and rivers that feed the Olympic water sites. As part of its Olympic project, Brazil promised to build eight treatment facilities to filter out much of the sewage and prevent tons of household trash from flowing into the Guanabara Bay. While only one of these has been built, the government has spent one billion dollars in a number of pollution-reduction measures. theguardian.com

In early August four coaches and 11 members of the US team came down with stomach illnesses at the World Junior Rowing Championships after competing in the Rodrigo de Freitas lagoon. Most were ill for 24 hours and then needed at least 48 hours to recover; two athletes required IV’s to rehydrate. In addition to the concern that an athlete’s performance might be impaired or even prevented by pollution-caused illness, there is concern that Brazilian athletes, having acquired immunity to the organisms through lifetime exposure, will have the advantage over competitors from other countries. usatoday.com

**WATER**

**Californians reduced water use by 27.3 percent in June, 2015,** in spite of the fact that it was the hottest June on record, and in spite of the fact that business-as-usual construction continues in the fourth year of a drought that makes water conservation urgent. State officials who are trying to manage the drought have stopped short of suggesting that new building be curbed statewide, and developers and many elected officials, defending the state’s history of overcoming nature’s challenges, champion growth just as always. Residential developers now advocate low-flush toilets and restrictive shower heads and say younger home buyers don’t want the vast lawns houses used to have. “Look at who uses the most water,” said a senior consultant with John Burns Real Estate Consulting. “It’s largely agriculture. And on the residential side, it’s the old houses that use more water.” The question, as reservoirs drop, is whether water savings technologies in new housing, plus new requirements for water meters and leak reduction efforts in older homes, can offset even water-sensitive growth enough to keep the faucets flowing. nytimes.com
Another question is whether Los Angeles County Board of Supervisors members will stop washing their cars two or three times a week—and at the county’s facilities that do not use recirculated water. In Santa Monica about 15,000 people have signed up for the “Dirty Car Pledge,” and city officials in Long Beach, Santa Monica, Burbank, Malibu, and San Gabriel have pledged to stop washing their cars for two months. But in California, as everywhere, it’s going to take a while to adjust to the new normal. dailynews.com

Water in the desert may be the “missing carbon sink.” Massive aquifers underneath deserts may be holding more carbon than all the plants on land, according to findings by the University Corporation for Atmospheric Research. About 40 percent of released carbon stays in the atmosphere and roughly 30 percent enters the ocean. Scientists had assumed the rest was taken up by plants on land, but after measuring plant absorption, they were left with a remaining percentage. They may have found it through studies in a Chinese desert being farmed by means of irrigation. Here’s the process: carbon from the atmosphere is being absorbed by crops, released into the soil, and transported underground to aquifers where it can’t escape back to the atmosphere. The new study estimates that because of agriculture, roughly 14 times more carbon than previously thought could be entering these underground desert aquifers every year. Such underground pools, which worldwide cover an area the size of North America, may account for at least a portion of the "missing carbon sink" for which scientists have been searching. Knowing the locations of carbon sinks could improve models used to predict future climate change and enhance calculations of the Earth’s carbon budget. sciencedaily.com

Storm-prone areas are not getting much water from hurricanes this year. The National Oceanic and Atmospheric Administration (NOAA) just released a forecast that called for a 90 percent probability of a below normal Atlantic hurricane season. It was the highest confidence forecast for a below-normal season that the agency has issued since forecasts began in 1998. One reason for the absence is that since July 1, the air’s moisture content has been very low in the areas where we typically see hurricanes form—the Gulf of Mexico, the Caribbean Sea and the central tropical Atlantic. Another feature missing this season is vertical instability, the measure of how easy it is for clusters of thunderstorms to develop and stay strong. Less vertical instability, less hurricane activity. But the primary reason is probably the unusually strong El Niño of 2015. El Niño events introduce strong wind shear in the Atlantic basin; wind shear is hostile to tropical storm and hurricane development. washingtonpost.com
ENERGY

Costa Rica set a world record by using 100 percent clean energy for 94 straight days. Between May 8, 2015, and August 9, that country produced its electricity from a variety of renewable sources including 78 per cent hydropower, 12 per cent geothermal, 10 per cent wind, and a fraction of a per cent solar. On August 10 fossil fuels were required to meet one per cent of the power demand. Costa Rica has an abundance of hydroelectric and geothermal power sources, and pledged in 2007 to go 100 per cent carbon neutral by 2021. So far in 2015, renewable energy has accounted for about 93 per cent of Costa Rica’s electricity generation. climateactionprogramme.org

Hawaii aims to go 100 percent renewable, and it’s not using natural gas as a transition fuel. Hawaiian Gov. David Ige said LNG, or liquid natural gas, is imported, and “any time or money spent on LNG is time and money not spent on renewable energy.” Hawaii is already home to the first grid-tied wave power device, installed earlier this summer. This week, the state added its first modern ocean thermal energy conversion (OTEC) project. OTEC is the process of using the temperature difference between warm and cold ocean water to generate electricity. At the launch of the project, the operators connected houses and charged a Tesla car. “For the first time, we were watching a car being powered by the ocean,” said State Rep. Chris Lee, chair of Hawaii’s Committee on Energy and Environmental Protection. “This is really the kind of stuff we should be focusing on.” thinkprogress.org

Wind energy provided eight percent of Europe’s electricity in 2014. The grid-connected cumulative capacity of the European Union (EU) in 2014 reached 129 GW. (One gigawatt (GW) is equal to one billion watts or 1000 megawatts. One megawatt (MW) equals 1,000 kilowatts or 1,000,000 watts. A typical coal plant is about 600 MW in size.) The impressive growth of the wind industry is expected to reach 12 percent of the EU’s electricity generation share by 2020—a significant contribution to the goal of the European energy and climate package of 20 percent share of energy from renewable sources. sciencedaily.com

An initiative by the Obama administration announced July 7, 2015, plans to install 300 megawatts of solar and other renewables in federally subsidized housing developments by the year 2020. The focus is on serving low-and-middle-income Americans through so-called “community solar” projects across the country—programs in which one solar installation supplies energy to multiple different homes or individuals. cnbc.com