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General

<https://www.latimes.com/local/california/la-me-ln-mega-storm-dam-failure-20190218-story.html> Rare L.A. mega-storm could overwhelm dam and flood dozens of cities, experts say. By Louis Sahagun Los Angeles Times Feb 18, 2019.

Infrastructure Operations and Maintenance Costs

<https://www.weforum.org/reports/the-global-risks-report-2019>

World Economic Forum The Global Risks Report 2019

<http://www.siwi.org/latest/9-of-the-10-worst-global-risks-are-linked-to-water/>

9 of the 10 worst global risks are linked to water

Jens Berggren, SIWI, JAN 24, 2019.

<https://www.weforum.org/agenda/2019/01/infrastructure-around-the-world-failing-heres-how-to-make-it-more-resilient/>

Infrastructure around the world is failing. Here's how to make it more resilient, 16 Jan 2019. Bt John P. Drzik. World Economic Forum blog

<https://www.infrastructurereportcard.org/wp-content/uploads/2017/01/Wastewater-Final.pdf>

Infrastructure Report Card for Wastewater. American Society of Civil Engineers, 2018.6 pages. ASCE awards US WWTPs a grade of D+. The nation's 14,748 wastewater treatment plants are the most basic and critical infrastructure systems for protecting public health and the environment. More than 56 million new users were expected to be connected to centralized treatment systems over the next two decades, requiring at least \$271 billion to meet current and future demands. New methods and technologies turn waste into energy relying on the nation's 1,269 biogas plants to help communities to better manage waste streams through reuse.

<https://www.bluefieldresearch.com/research/us-municipal-utility-operating-expenditure-forecast-2018-2027/>

27/ US Water & Wastewater Utilities costs approaching \$100 Billion Annually. Deferred maintenance now urgent. Workers aging out of industry. See @BluefieldWater report "U.S. Municipal Utility Operating Expenditure (OPEX) Forecast, 2018-2027".

<https://www.bluefieldresearch.com/research/us-municipal-utility-operating-expenditure-forecast-2018-2027/>

27/ U.S. Municipal Utility Operating Expenditure (OPEX) Forecast, 2018-2027 US Water & Wastewater Utilities costs approaching \$100 Billion Annually. Deferred maintenance now urgent. Workers aging out of industry. See @BluefieldWater report.

https://www.mswmag.com/online_exclusives/2018/04/study-provides-comprehensive-look-at-north-america-water-main-break-situation?ref=related_body

Study Provides Comprehensive Look at North America's Water Main Break Situation. Water main break rates have increased 27 percent in the past six years, with asbestos cement and cast iron accounting for a majority of that spike. The recent study released by Utah State University's Buried Structures Laboratory is a follow-up to another study about pipe materials and water main breaks it did in 2012. The 2018 study included 300 utilities responsible for about 200,000 miles of water mains, covering 48 U.S. states and seven Canadian provinces.

Impact of Hurricane Harvey on Texas Infrastructure - 2017

<https://www.tceq.texas.gov/assets/public/response/hurricanes/hurricane-harvey-after-action-review-report.pdf> Hurricane Harvey Response. After Action Review Report. Texas Commission on Environmental Quality April 3, 2018. Texas State Commission on Environmental Quality.

<https://www.politico.com/magazine/story/2017/08/28/climate-change-hurricane-harvey-215547> Harvey is what Climate Change Looks Like. By Eric Holthaus. Politico, August 28, 2017. Houston has been sprawling out into the swamp for decades, largely unplanned and unzoned. Now, all that pavement has transformed the bayous into surging torrents and shunted Harvey's floodwaters toward homes and businesses.

https://www.biologicaldiversity.org/news/press_releases/2017/harvey-superfund-sites-09-08-2017.php Analysis: Majority of Flooded Texas Superfund Sites in Low-income Neighborhoods, Communities of Color. Center for Biological Diversity. September 8, 2017

https://www.biologicaldiversity.org/news/press_releases/2017/air-pollution-09-01-2017.php Analysis: Nearly 1 Million Pounds of Seven Deadly Air Pollutants Released by Texas Refineries During Harvey Floods. Center for Biological Diversity. September 1, 2017. Staggering amounts of benzene, 1,3-butadiene, hexane, hydrogen sulfide, sulfur dioxide, toluene and xylene — estimated at 951,000 pounds so far — were emitted during Harvey-related flooding by several dozen petroleum industry facilities operated by Chevron Phillips, Exxon Mobil, Shell and other companies. These seven chemicals are all toxic air pollutants documented to cause serious harms to human health, and several cause cancer.

https://www.biologicaldiversity.org/news/press_releases/2017/flood-protection-08-29-2017.php Request Seeks Evidence That Trump's Reversal of Coastal Flood Protections Is Driven by Climate Denial, Contempt for Obama. Decision Makes Coastal Communities More Vulnerable to Storms Like Harvey. Center for Biological Diversity. August 29, 2017 The Center for Biological Diversity filed a Freedom of Information Act request today seeking public records connected to President Trump's rollback of an Obama executive order and federal flood-protection rule. Just 10 days before Harvey struck Texas, Trump issued an executive order revoking the Obama administration's Federal Flood Risk Management Standard. This standard required that federally funded infrastructure projects like highways, schools and airports be built to withstand flood damage, which will be worsened by climate change.

<https://www.usatoday.com/story/weather/2017/09/05/hurricane-harvey-floodwaters-brimming-raw-sewage-toxic-chemicals/632937001/>

Hurricane Harvey floodwaters brimming with raw sewage, toxic chemicals. By Sammy Roth, The Desert Sun. Sept. 5, 2017. Hurricane Harvey muddied the region's water and air with toxic chemicals, smog-forming pollution and raw sewage, creating the potential for serious health risks. At least 80 spills from inundated sewage and wastewater systems were reported across Texas as of this week, according to the state's Commission on Environmental Quality. About 36 industrial facilities reported toxic chemical spills as of late last week, according to an analysis by Environment Texas, an advocacy group. Oil refineries and chemical plants released nearly 1 million pounds of deadly air pollutants. At least 5 highly contaminated Superfund sites in the Houston area were deluged by floodwaters caused by Hurricane

Harvey. Most of the air pollutants come from the shutdown and startup of refineries and chemical plants, many of which closed temporarily. Pollutants released include at least two cancer-causing chemicals and 700,000 pounds of sulfur dioxide, which can make breathing difficult and lead to the formation of dangerous contaminants, according to the Center for Biological Diversity.

<https://www.usatoday.com/story/news/nation/2017/09/04/what-lurks-floodwaters-harvey/631265001/> What is lurking in Harvey's floodwaters? These 2 researchers are trying to find out. Rick Neale, USA Today Sept. 4, 2017.

<https://www.houstonchronicle.com/news/houston-texas/houston/article/Harvey-caused-sewage-spills-12213534.php>

Harvey caused sewage spills. Millions of gallons of waste leaked, according to state
By Alex Stuckey. Houston Chronicle Sep. 19, 2017.

Impact of Hurricane Irma on Florida's WWTPs - 2017

<https://www.naplesnews.com/story/weather/hurricanes/2017/09/23/after-hurricane-irma-widespread-sewage-leaks-show-utilities-were-unprepared/687100001/>

Widespread sewage leaks after Irma showed Florida's dependence on electric pumps. By Ryan Mills, Greg Stanley and Brett Murphy, Naples News. Sept. 23, 2017 After Hurricane Irma cut the electricity to Southwest Florida, raw sewage flowed onto streets and into homes, and some residents contracted water-borne diseases, all because public utilities were not prepared to manage the massive, days-long power outage. Of Collier County Utilities 840 wastewater pump stations, all lost power during the storm and only 10% had back up systems. In some cases, raw sewage poured out of manholes, covered roads and seeped into driveways and swales. Sewage bubbled up and into people's homes. Fecal contamination resulted in at least one death and one loss of limb.

Hurricane Florence and North Carolina - 2018

<https://www.charlotteobserver.com/news/business/article223328915.html>

Florence bathed NC in raw sewage. New figures show it was even worse than we thought.
By John Murawski. The Charlotte Observer. December 24, 2018. The state's pig farmers and the hog industry trade group frequently express frustration that their industry attracts a disproportionate amount of negative publicity, while pollution from other sources — septic tanks, poultry farms, sewer systems and industrial waste — sometimes goes unmentioned. The comparative effects of sewage spills on the environment and on public health will likely never be known in any precise way, because the volumes of spills, overflows, breaches and discharges are estimated and sometimes unknown. What is known is that some 121 million gallons of untreated and partially treated sewage washed out at more than 200 waste water treatment systems.

<https://www.nytimes.com/interactive/2018/09/13/climate/hurricane-florence-environmental-hazards.html?>

Surging floodwaters from Florence and its torrential rains, which experts link at least in part to climate change, have released coal ash – a byproduct of coal burning that contains mercury, arsenic and other toxic substances – into the Cape Fear River in North Carolina. The torrent has also overrun several lagoons of pig waste in the state. The mishaps amplified concerns about an array of danger zones including Superfund sites, chemical plants and the region's large-scale hog farms.

<https://www.phlush.org/2018/09/13/7983/>

Emergency Sanitation Recommendations for Hurricane Florence. By Abigail Brown. PHLUSH. *Hurricane Florence is upon us. She is predicted to bring excessive rainfall (over 2 feet) and dangerous storm surge (up to 9-12 feet) to North and South Carolina. While some are rejoicing that wind speeds have been downgraded, NWS continues to predict life-threatening storm surge and unprecedented rainfall. As an*

organization focused on safe sanitation in North America, PHLUSH is concerned about storm impacts on sanitation systems and public health.

https://www.ncleg.gov/documentsites/committees/BCCI-6658/FY%202018-19/November%202013,%202018%20Florence%20Impacts%20DACS%20DEQ%20DNCR%20WRC/008%20DEQ_Hurricane_Florence_Impact_on_Water_and_Wastewater_Facilities-2018-11-09.pdf

Hurricane Florence Impact on Water and Wastewater Facilities. North Carolina DEQ Report has details on wastewater infrastructure, recovery times of damaged infrastructure, boil water notices, animal waste lagoons and estimated cost of repairs at \$352,593,309.

The total number of lead service lines is unknown; while estimates exist, approaches used in the count vary. Government Accountability Office report says study likely does not accurately reflect current estimates. https://www.gao.gov/products/GAO-18-620?mc_cid=0a527410f8&mc_eid=322767800e ... Via @circleofblue

<https://mailchi.mp/circleofblue/federal-water-tap-september-24-lead-service-line-data-is-scarce-says-gao-circle-of-blue?e=322767800e> ...

https://www.youtube.com/watch?time_continue=24&v=8ZIVH2o3

CYBERATTACK disables NC #water and #sewer utility recovering from Hurricane Florence. Crypto-virus spreads to d-bases & files. Utility refuses to pay ransom. #infrastructure #vulnerability means double #disaster @OnslowWASA Systems need #resilience !

Flooding of Mississippi and Missouri – 2019

<https://www.circleofblue.org/2019/world/historic-missouri-river-flood-damages-water-infrastructure/> Historic Missouri River Flood Damages Water Infrastructure. Sewage spills, pollution risks, and reduced capacity at drinking water plants. By Brett Walton. Circle of Blue Water News. March 18, 2019. *"Dozens of wastewater plants failed and are discharging untreated sewage, while six public water systems are not working in Nebraska. Other systems are dealing with power outages, water main breaks, and flooded wells."*

Florida's Failing Septic Systems and Nutrient Loading

https://www.nytimes.com/2019/02/20/opinion/ban-ki-moon-miami-climate-change.html?emc=edit_th_190221&nl=todaysheadlines&nlid=704019120221 Miami Battles Rising Seas. In 2017, voters agreed to finance adaptation efforts through property taxes. Now the first phase of those projects is underway. By Ban Ki-moon and Francis Suarez. Feb 17, 2019. New York Times. Mr. Ban is the former secretary general of the United Nations. Mr. Suarez is the mayor of Miami.

https://www.nytimes.com/interactive/2019/04/10/magazine/climate-change-pinkertons.html?emc=edit_th_190414&nl=todaysheadlines&nlid=704019120414 Climate Chaos Is Coming —and the Pinkertons Are Ready. As they see it, global warming stands to make corporate security as high-stakes in the 21st century as it was in the 19th. By Noah Gallagher Shannon. New York Times. April 10, 2019

<http://gatehousenews.com/sewers/> 'Sewer crisis in the state of Florida' Aging infrastructure and storms contribute to massive spills. By Josh Salman, Jennifer Borresen, Daphne Chen and Dak Le / GateHouse Media. 2019. Excellent comprehensive report.

<https://www.floridatoday.com/story/opinion/2019/03/27/turning-toxic-tide-florida-must-fix-septic-sewer-and-biosolids/3084306002/> Florida has a poop problem. And we need to clean up the mess. There are an estimated 2.6 million septic tanks in our state. We don't know how many are properly functioning to ensure they don't leak into waterways because there's no inspection requirement. Florida had such a requirement for two years, until the state Legislature repealed that law in 2012.

<http://www.governing.com/topics/transportation-infrastructure/gov-florida-septic-system.html>

After Toxic Beaches and Waterways, Florida Eyes Septic Tank Upgrades: Officials increasingly want to move away from underground waste storage systems, which can leak chemicals that fuel toxic algal blooms. By Daniel C. Vock. Governing States and Localities. January 29, 2019. (Florida Atlantic University professor Brian) LaPointe says the biggest reason for the algal bloom, fish kills, goopy water and awful smelling rivers over the last few years has been contamination from septic systems. Nearly two out of every five Floridians rely on septic tanks. "These local governments cannot do this on their own. They need help," he told Florida senators this month. "We need a Manhattan Project. We've got to go to war against algae."

<https://phys.org/news/2019-01-billion-problem-miami-dade-septic-tanks.html>

\$3 bil problem: Miami-Dade's septic tanks. Regs assume elevation of groundwater stable over time. Says Miami-Dade County Water and Sewer Department officials "Now we find ourselves in a situation where we know sea level has risen and continues to rise."

<https://www.wptv.com/news/protecting-paradise/martin-county-leaders-hoping-for-legislative-support-for-septic-to-sewer-conversions>

Martin County leaders hoping for legislative support for septic to sewer conversions

Posted: 5:41 PM, Jan 28, 2019 County leaders continue to ask for legislative support every year until completing their goal of converting more than 10,000 septic tanks.

http://www.floridahealth.gov/environmental-health/onsite-sewage/research/_documents/rrac/hazensawyer/ervolireportmall.pdf

Florida Onsite Sewage Nitrogen Reduction Strategies Study Evaluation of Full Scale Prototype Passive Nitrogen Reduction Systems (PNRS) and Recommendations for Future Implementation - Volume I of II August 2015 Volume I – Report Volume II - Appendices 205 pages

http://www.floridahealth.gov/environmental-health/onsite-sewage/research/_documents/rrac/hazensawyer/ervolireportmall.pdf

The state of Florida has gone to great lengths to study passive systems. Units tested there were able to reduce nitrogen by 95 percent. Florida has now proposed rules that have a phased-in implementation of in-ground nitrogen-reducing biofilters as a prescriptive design and aerobic treatment units certified under NSF 245.

<https://sealevelrise.org/states/florida/> & multimedia overview <https://sealevelrise.org/states/florida/>

Majority of Miami-Dade County's 105,000 septic tanks to fail within 25 years. Horrifying detail in gov't report Time for Florida to lead nation w decentralized waterless container-based sanitation systems. #toilet

<https://phys.org/news/2019-01-billion-problem-miami-dade-septic-tanks.html>

\$3 bil problem: Miami-Dade's septic tanks. Regs assume elevation of groundwater stable over time. Says Miami-Dade County Water and Sewer Department officials "Now we find ourselves in a situation where we know sea level has risen and continues to rise."

<https://www.miamiherald.com/opinion/letters-to-the-editor/article225271075.html>

Miami-Dade septic tanks vulnerable, but working. Letter to the Editor from James F. Murley, Chief Resilience Officer, Miami-Dade County. Miami Herald, Jan 2019.

<https://www.wptv.com/news/protecting-paradise/martin-county-leaders-hoping-for-legislative-support-for-septic-to-sewer-conversions>

Martin County leaders hoping for legislative support for septic to sewer conversions

Posted: 5:41 PM, Jan 28, 2019 County leaders continue to ask for legislative support every year until completing their goal of converting more than 10,000 septic tanks.

<https://www.wptv.com/news/protecting-paradise/environmental-issues-label-2018-as-toxic18>

Environmental issues label 2018 as #toxic18 Dec 27, 2018

By Alex Hagan

<https://www.wptv.com/news/region-martin-county/lake-okeechobee-discharges-to-begin-friday-following-historic-rain> Lake Okeechobee discharges to begin Friday following heavy rain
Lake levels up more than a foot since mid-May May 31, 2018. By Scott Sutton , Amy Lipman Discharges exacerbated by nutrient loading in run off

<https://www.miamiherald.com/opinion/letters-to-the-editor/article225271075.html>

Miami-Dade septic tanks vulnerable, but working. Letter to the Editor from James F. Murley, Chief Resilience Officer, Miami-Dade County. Miami Herald, Jan 2019.

http://www.floridahealth.gov/environmental-health/onsite-sewage/research/_documents/rrac/hazensawyer/ervolireportmall.pdf

Florida Onsite Sewage Nitrogen Reduction Strategies Study Evaluation of Full Scale Prototype Passive Nitrogen Reduction Systems (PNRS) and Recommendations for Future Implementation - Volume I of II August 2015 Volume I – Report Volume II - Appendices 205 pages

<http://www.wrbl.com/news/local-news/new-proposed-initiative-in-smiths-station-could-affect-wallets-in-the-city/1126612032> Most low-lying Florida cities are struggling with onsite systems.

"When you have a septic tank...especially a failing septic tank or a high water table...that can put waste into the water." explains the mayor of Smith Station FL. ... #climaterisk #sealevelrise

Pathogen Destruction and Anti-Microbial Resistance

<https://www.cdc.gov/drugresistance/index.html> Antibiotic / Antimicrobial Resistance (AR / AMR). Centers for Disease Control and Prevention.

<https://www.cdc.gov/drugresistance/threat-report-2013/pdf/ar-threats-2013-508.pdf>

Antibiotic Resistance Threats in the United States, 2013. Centers for Disease Control and Prevention. 114 pp. Includes excellent photos and graphics, which may be in the public domain.

<https://www.who.int/features/qa/75/en/What-is-antimicrobial-resistance?> WHO

Antibiotic resistance occurs when bacteria change in response to the use of antibiotics used to treat bacterial infections (such as urinary tract infections, pneumonia, bloodstream infections) making them ineffective. *Antimicrobial resistance* is a broader term, encompassing resistance to drugs that treat infections caused by other microbes as well, such as parasites (e.g. malaria or helminths), viruses (e.g. HIV) and fungi (e.g. Candida).

<https://www.who.int/antimicrobial-resistance/en/> Antimicrobial resistance (AMR) is the ability of a microorganism (like bacteria, viruses, and some parasites) to stop an antimicrobial (such as antibiotics, antivirals and antimalarials) from working against it. As a result, standard treatments become ineffective, infections persist and may spread to others. World Health Organization website.

<https://www.stockholmresilience.org/research/research-news/2018-01-23-building-capacity-to-limit-antibiotic-resistance.html> Building capacity to limit antibiotic resistance. Three-year project aimed to improve the ability of society to respond effectively to increases and shifts in antimicrobial resistance. Stockholm Resilience Center. Stockholm University. 2017.

<https://www.acs.org/content/acs/en/pressroom/presspacs/2011/acs-presspac-december-7-2011/sewage-treatment-plants-may-contribute-to-antibiotic-resistance-problem.html> Sewage Treatment Plants May Contribute To Antibiotic Resistance Problem. "Water discharged into lakes and rivers from municipal sewage treatment plants may contain significant concentrations of the genes that make bacteria

antibiotic-resistant. That's the conclusion of a new study on a sewage treatment plant on Lake Superior in the Duluth, Minn., harbor that appears in ACS' journal Environmental Science & Technology."

<https://www.wateronline.com/doc/a-post-antibiotic-world-0001> A 'Post-Antibiotic World?' Antibiotic resistance is spreading from wastewater treatment plants. *Water Online News*, March 6, 2019.

"[Researchers] discovered two key findings: the resistance in the biomass and effluent are different and therefore one cannot be used to predict the other; and the correlations they found between the added antibiotic and the resistance genes weren't always clear cut. In fact, their results indicated multi-drug resistance in which bacteria had genes allowing for resistance to multiple classes of antibiotics.

"The multi-drug resistance does seem to be the most alarming impact of this," Smith said. "Regardless of the influent antibiotics, whether it's just one or really low concentrations, there's likely a lot of multi-drug resistance that's spreading."

They believe this is due to the presence of gene elements called plasmids. One plasmid may carry resistance genes for several different types of antibiotics, resulting in positive correlations between one type of antibiotic and the resistance gene of another. This not only further complicates things, but can be extremely dangerous. Because of their extremely small size – 1,000 times smaller than bacteria – free-floating plasmids can easily make it through the filtration system in the treatment process and exit the plant in the effluent."

https://www.onsiteinstaller.com/online_exclusives/2018/11/could-your-septic-job-make-you-sick?utm_source=campaigner&utm_campaign=OIN181219&utm_content=newsletter&cmp=1&utm_medium=email

Could Your Septic Job Make You Sick? You should assume anything being exposed to wastewater is contaminated, but following these best practices will keep you healthy on the job. By Sara Heger, Ph.D. November 05, 2018. Good info on pathogens in blackwater and safety and health precautions for workers. @OnsiteInstaller

<https://www.autoblog.com/2019/01/28/steering-wheel-dirtier-public-toilet-study/>

Tony Markovich. AutoBlog. Jan 28, 2019. The steering wheel reportedly has 629 colony-forming units (CFUs), which is six times dirtier than the average cellphone screen, four times dirtier than a public toilet (!), and two times dirtier than public elevator buttons. Your steering wheel is 4 times dirtier than a public toilet seat, study shows. Of 1,000 surveyed, 32% of people clean cars once a year.

<https://www.epa.gov/sites/production/files/2015-09/documents/primer.pdf> Primer for Municipal Wastewater Treatment System. United States Environmental Protection Agency Office of Water Office of Wastewater Management. EPA 832-R-04-001 September 2004. 30 page overview of common treatment modalities and stages in the process.

www.heraldmailmedia.com/news/nation/butte-county-faces-massive-cleanup-after-camp-fire-it-is/article_65d53cfe-a2fc-5b24-98b7-5a430afe191c.html

Nearly 12,000 septic systems in Paradise CA are at risk of damage during post Camp fire debris clean up. Systems sit in shallow basalt soil resting on hardened bedrock. Scraping too deep can also spoil the location of future leach fields.

<http://www.emnrd.state.nm.us/wastewater/documents/Oil%20and%20Gas%20Produced%20Water%20Governance%20in%20the%20State%20of%20New%20Mexico%20Draft%20White%20Paper.pdf>

"Produced Water." Joint EPA New Mexico State white paper on local drought conditions and water produced by fracking and natural gas industries. Informative. Controversial.

<https://www.helsinki.fi/en/news/health-news/wastewater-reveals-the-levels-of-antibiotic-resistance-in-a-region>

Wastewater Reveals The Levels Of Antibiotic Resistance In A Region. By Anu Partanen. University of Helsinki News. March 27, 2019. A comparison of seven European countries shows that the amount of

antibiotic resistance genes in wastewater reflects the prevalence of clinical antibiotic resistance in the region. However, modern wastewater treatment plants seem to be able to eliminate antibiotic resistance efficiently.

Understanding Septic Systems

<http://www.recodenow.org/portfolio/septic-tanks-demystified/>

Septic Tanks Demystified. Illustrated presentations of how septic systems work. Recode. First posted January 2014.

<https://plymouth.wickedlocal.com/news/20180826/plymouth-urges-alternative-septic-option>

Plymouth urges alternative septic system. By frank Mand. Plymouth Wicked Local. August 26, 2018. Layer cake septic systems. The challenge (that we also face on Olympic Peninsula.)

https://www.onsiteinstaller.com/online_exclusives/2017/12/an_introduction_to_passive_nitrogen_removal

!

An Introduction to Passive Nitrogen Removal. It is very likely passive nitrogen removal systems will become more popular in the future. Here's what you need to know. By Sara Heger, Ph.D. Onsite Installer. December 18, 2017.

https://www.onsiteinstaller.com/editorial/2018/02/what-happens-when-granny-moves-in?ref=related_boddy

"What Happens When Granny Moves In?" Straight talk on sizing of septic systems and code implications of adding another person to a decentralized wastewater system. In @OnsiteInstaller #toilet #technology #wastewater

https://www.google.com/url?rct=j&sa=t&url=https://www.mtexpress.com/news/blaine_county/to-county-septic-rules-may-be-flush-with-opportunity/article_3bef991a-25a7-11e9-9926-e7601ddb5d1f.html&ct=ga&cd=CAEYACoUMTMxODczMDI3NTk0MDU4MTQ0NjkyGjE5NTg1ZWJmNTVhODA1YmM6Y29tOmVuOIVT&u sg=AFOjCNHHyQHOJVqMoygR746lgrpMJ8CEYw

To county, septic rules may be flush with opportunity. Commissioners move to tweak requirements By Mark Dee. Idaho Mountain News. Feb 1, 2019. Article show how one rule does not fit all and look at trade offs in any policy. Stops short of calling for performance codes.

https://www.chinookobserver.com/news/local/search-on-for-septic-solution/article_d4a685e0-4fed-11e9-84d9-7f411d65c1a4.html

Search on for septic solution. Luke Whittaker, Chinook Observer, March 26, 2019. *"The stinky situation started roughly six weeks ago when Evergreen Septic was notified by the Warrenton Wastewater Treatment Plant that it would no longer accept commercial waste. It is still processing Evergreen's residential effluent.... The letter came as a shock to Woodby, whose septic company serves more than 120 commercial accounts across Pacific and Wahkiakum County, representing approximately 30 percent of his business...." I called every wastewater plant that we can get a hold of," Woodby said. All the other plants I called aren't set up for receiving of waste. The other issue is some have made policies where, if we're not servicing their county, we can't haul waste to them. I've met the chamber and all of the sewer districts and county commissioners...it's not just a Pacific County problem, it's a Washington state problem."*

Climate Change, Drought and Wildfire

https://www.circleofblue.org/2018/world/new-estimate-finds-less-fresh-groundwater-in-u-s-than-previously-assumed/?mc_cid=af06e1f385&mc_eid=322767800e ... Less Fresh Groundwater in US! At 1000 ft, main threats are 1) naturally occurring salts & 2) those from the oil and gas industry. New study uses USGS data to map transition between fresh & salty groundwater in 28 basins. @waltonwater @circleofblue

<https://www.circleofblue.org/2018/groundwater/pfas-what-you-need-to-know/>

PFAS: What you need to know. Nitrates, industrial waste & pathogens in groundwater. Circle of Blue. Accessed 1/31/19

www.circleofblue.org/2018/world/comprehensive-government-climate-report-warns-that-warming-planet-threatens-u-s-water-security/?mc_cid=97aba9503c&mc_eid=322767800e

Comprehensive Government Climate Report Warns That Warming Planet Threatens U.S. Water Security. By Brett Walton Circle of Blue Water News. November 23, 2018/in Water Management.

Upmanu Lall of Nat'l Climate Assessment says, "The country's basic governing frameworks are based on a climate that no longer exists. Insurance policies, water rights... take into account **neither past** climate variability nor future changes." <https://>

<https://nca2018.globalchange.gov/chapter/24/>

FOURTH National Climate Assessment on NW infrastructure: "...communities..with systems that lack redundancy..most vulnerable. Adaptation strategies that address more than one sector, or..coupled with social and environmental co-benefits, can increase resilience."

Cyber and Bio Security Threats

<https://www.epa.gov/homeland-security-research/water-system-security-and-resilience-homeland-security-research> Water System Security and Resilience in Homeland Security Research. Water Security Handbook: Planning for and Responding to Drinking Water Contamination Threats and Incidents:

<https://www.epa.gov/waterutilityresponse/water-security-handbook-planning-and-responding-drinking-water-contamination> Cybersecurity threats to US infrastructure warrant 'moonshot' response, By Richard Mroz and Suedeen Kelly. The Hill — 02/26/19.

https://pacinst.org/reports/water_terrorism.pdf Water and terrorism Peter H. Gleick Pacific Institute, 654 13th Street, Oakland, California, USA. www.pacinst.org.

Disaster Sanitation Social Media

WATCH! <https://www.youtube.com/watch?v=UJ7Qc3bsxjI> ... Central Washington University geology professor Nick Zentner discusses field evidence for great earthquakes in the Pacific Northwest including buried soils onshore, turbidites offshore, and CWU Geology's PANGA data from GPS receivers. @GeologyNick

@BCPreparedness When the earth quakes, pipes break, & toilets don't flush. BAD ADVICE in your guide could result in mixed solid & human waste & lead to epidemic. PLEASE adopt Twin Buckets. <http://EmergencyToilet.org> #separate PEE #ContainPOO @ShakeOut

Have You Planned For Number 2 After The Big One?

<https://www.opb.org/news/article/emergency-toilet-disaster-preparedness-earthquake/> ... @waEMD @BCPreparedness @waShakeout @FEMARegion10 #ShakeOut

SUNDAY VIEWING! https://www.youtube.com/watch?v=t_IWJx-mOw0 ...

M9.0 earthquake has just struck west coast. Tsunami races towards land. Video simulates hypothetical but realistic disaster scenario & looks at expected damage & what we can do to prepare ourselves. @OregonShakeOut @waShakeOut @ShakeOutBC

<https://www.portlandmercury.com/news/2018/08/08/21907729/portland-considers-a-new-disaster-preparedness-model> Cool 'PrepHub' coming to Portland, says @PortlandBEM in @portlandmercury

Sound, actionable advice on protecting oneself from Hepatitis A, B and C. Finally.
[http://www.ironmountaindailynews.com/opinion/editorials/2018/07/take-steps-to-prevent-hepatitis/ ...](http://www.ironmountaindailynews.com/opinion/editorials/2018/07/take-steps-to-prevent-hepatitis/)
Thanks @IMDailyNews

Toward More Resilient Systems

<https://www.wateronline.com/doc/wastewater-methane-could-soon-power-socal-0001>

Wastewater Methane Could Soon Power SoCal. Peter Chawaga, Ed. Water Online. April 2, 2019.
Southern California utility companies say they want to offer a greener option for natural gas. The plan is to utilize the organic waste that results from wastewater treatment processes, as well as from landfills and dairy operations, and harvest the methane that it produces.