

FLOODPLAIN MANAGER – DECEMBER 2017- JANUARY 2018

National News

2011 Queensland floods class action

A class action by Brisbane and Ipswich flood victims against the state of Queensland and dam operators Seqwater and Sunwater over the fatal 2011 Queensland floods started in the New South Wales Supreme Court in early December. The group of 6,000 individuals and businesses are seeking compensation after they were left high and dry by insurers in what was the worst flood to hit the southeast of Queensland since 1974. The plaintiffs believe Seqwater, the managers of Wivenhoe and Somerset dams, did not adequately consider rainfall forecasts and therefore did not operate the dam infrastructure in accordance with manuals and modelling revealing the estimated downstream flooding. The dam operators argue that four to eight-day forecasts are too unreliable, and that dam water should only be released “when rainfall has actually occurred so the effect of flood mitigation ... is known with certainty”. The trial in the NSW Supreme Court will see two weeks of arguments in Sydney, before resuming in February to hear expert evidence and briefly touring the dams themselves. Read more here:

<http://www.abc.net.au/news/2017-12-04/2011-flood-class-action-begins-against-government-dam-operators/9223624>

<http://www.engineeringcareer.net.au/news/qld-flood-case-underway>

<https://www.brisbanetimes.com.au/national/queensland/no-warning-there-was-nothing-flood-class-action-to-begin-20171201-p4yxc0.html>

<http://www.smh.com.au/queensland/qld-flood-releases-could-ve-been-halved-20171205-p4yxe2.html>

CSIRO develop TraNSIT tool to reduce flood impact on transport of crops and livestock

CSIRO has recently released its Transport Network Strategic Investment Tool (TraNSIT) that can be applied to evaluate the impact of road closures and detours on the transport of valuable crops and livestock during flood events. Researchers can use TraNSIT to analyse several ways to reduce the economic impact of floods in country regions and throughout Australia, including upgrading or raising particular bridges to reduce the frequency of closures from flooding. In turn, this will reduce the occurrences where cattle or harvested crops cannot reach their market. TraNSIT is now being applied overseas, particularly in Indonesia, Laos and Vietnam, to address supply chain inefficiencies and cross-border bottlenecks. Read more here:

<http://roadsonline.com.au/csiro-report-studies-flood-impact-and-rail-to-road-feasibility/>

<https://www.vivaenergy.com.au/driven/innovation/transit-a-strategic-investment-tool-for-australia-s-transport-network>

<http://www.aginnovators.org.au/news/transit-logistics-tool-set-cut-livestock-transport-costs>

Australia's climate in 2017

The Bureau of Meteorology's Annual Climate Statement for 2017 indicates that it has been the third-warmest year since 1910 as well as the 30th-wettest year in a record spanning 1900 to present. The area-averaged mean temperature was 0.95 °C above the 1961–1990 average. 2017 was Australia's 30th-wettest year in a record spanning 1900 to present, with the nationally-averaged rainfall 8% above the 1961–1990



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average, at 504.06 mm. Annual rainfall was above average for most of central, eastern and northern Western Australia, the west of South Australia, and most of the Northern Territory. Darwin had its ninth-wettest year on record while Melbourne, Sydney, Hobart and Canberra all experienced a drier than average year.

Read more here:

http://www.bom.gov.au/climate/current/annual/aus/?utm_source=tw&utm_medium=org&utm_campaign=sm-017-0002&utm_content=vid

Record December rainfall in North Eastern Victoria

Dozens of homes were inundated in north eastern Victoria after record rainfall at the start of December 2017. Many locations recorded over 150 mm of rain in 24 hours between 1 and 2 December and several sites had their highest December daily rainfall on record. According to the BoM, the highest recorded rainfall was 186 mm at Mt Wombat near Strathbogie. Lake Eildon broke its all-time daily rainfall record by almost half, recording 149 mm, and 123 mm at Echuca was the highest daily rainfall recorded there since records began in 1881. The heavy rain caused the Ovens River in Wangaratta and Sevens Creek in Euroa to overflow, flooding dozens of homes in Wangaratta, Euroa and Myrtleford. The Minister for Justice and the Victorian Minister for Emergency Services have announced disaster assistance for those affected by the severe weather. Read more here:

<http://floodlist.com/australia/australia-homes-flooded-in-victoria-after-record-rain>

<http://www.bom.gov.au/climate/current/month/vic/summary.shtml>

New \$57M Sandy Gully bridge in QLD opens three months early

The new \$57 million Sandy Gully Bridge north of Bowen, Queensland, will open three months early, boosting driver safety on the Bruce Highway. This project is part of the Australian Government's \$6.7 billion 10-year commitment to upgrade the Bruce Highway, which aims to improve safety, flood resilience and capacity along this important national corridor. During Cyclone Debbie, the Bruce Highway was cut off at the old Sandy Gully Bridge, causing additional disruption to affected communities. By widening and raising the height of the road, the realigned sections of the highway are now much safer for motorists and far more reliable for freight vehicles. The upgrade improves flood immunity from Euri Creek all the way to the Merinda rail overpass. Read more here:

http://minister.infrastructure.gov.au/chester/releases/2017/december/dc420_2017.aspx

International News

Rising waters: can a massive barrier save Venice from drowning?

The MOSE (Modulo Sperimentale Elettromeccanico), an integrated system consisting of rows of mobile gates that has been designed to protect Venice and the Venetia Lagoon from sea level rise and storm surges, is set to be operational in 2018. The system consists of three separate flood barriers, one at each of the Lido, Malamocco, and Chioggia inlets of the Venetian lagoon that would be able to protect Venice and the lagoon from tides of up to 3 metres, together with other measures such as coastal reinforcement, the raising of quaysides, and the paving and improvement of the lagoon. However, the project's engineering limitations and cost overruns are raising questions about whether the barrier will provide adequate protection to Venice. Read more here:



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<http://e360.yale.edu/features/rising-waters-can-a-massive-sea-barrier-save-venice-from-drowning>

<https://www.citylab.com/life/2016/09/venices-vast-new-flood-barrier-is-almost-here/498935/>

More than 30 million people live in U.S. floodplains

Data briefs released by the NYU Furman Center have revealed the demographic characteristics of people living in the nation's flood-prone areas and in the areas hit by Hurricanes Irma and Harvey. The NYU Furman Center's three-part data brief series summarizes data from FloodzoneData.us, an online data tool describing the people and housing located in the nation's floodplains. The second brief in the series, Population in the U.S. Floodplains, has revealed that more than 30 million people (10% of the U.S. population) lived in the combined (100-year and 500-year) floodplain in 2015. Two-thirds of the population living in the nation's combined floodplain lived in one of five states: California, Florida, Arizona, Texas, and New York. Contrary to popular conception that floodplains are mostly a problem for coastal areas, Arizona had the largest share of the population living in the combined floodplain (64%), followed by Florida (26%), North Dakota (20%), and Louisiana (17%). Read more here:

<http://furmancenter.org/thestoop/entry/new-data-from-the-nyu-furman-center-finds-that-more-than-30-million-people>

Jakarta is sinking so fast, it could end up underwater

The Indonesian capital of Jakarta is currently sinking faster than any other big city on the planet, faster than climate change is causing the sea levels to rise. This is primarily due to Jakartan developers and others illegally digging numerous wells, since water is piped to less than half the population at extortionate costs by private companies awarded government concessions. These wells are slowly draining the underground aquifers on which the city rests so that approximately 40% of Jakarta now lies below sea level. Coastal districts, like Muara Baru, near the Blessed Bodega, have sunk as much as 14 feet in recent years. Despite heavy rains and the abundance of rivers, the aquifers aren't being replenished since more than 97 percent of Jakarta is now covered by concrete and asphalt. Shores of mangroves that used to help relieve swollen rivers and canals during monsoons have been overtaken by shantytowns and apartment towers. Read more here:

<https://www.nytimes.com/interactive/2017/12/21/world/asia/jakarta-sinking-climate.html>

Hurricane Harvey studies: Yesterday's 100-year storm is today's 30-year storm

Two independent scientific studies, published in *Environmental Research Letters* and *Geophysical Research Letters*, have found that human-induced climate change is increasing the likelihood and intensity of extreme rainfall events like Hurricane Harvey to occur. The studies show that a storm of Hurricane Harvey's magnitude is about three times more likely to occur and 15% more intense than in the late 1800s, due to by climate change. The research also indicates that similarly extreme rainfall could become a further three times more likely to occur by the end of the century, even if global warming is limited to 2°C. If greenhouse gas emissions continue to increase at the present rate, extreme rainfall events could become another ten times more likely, and increase in intensity by up to 50% by 2100. Read more here:

<https://arstechnica.com/science/2017/12/more-studies-examine-role-of-climate-change-in-hurricane-harvey/?platform=hootsuite>



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https://www.carbonbrief.org/climate-change-tripled-chances-hurricane-harvey-record-rain?utm_campaign=crowdfire&utm_content=crowdfire&utm_medium=social&utm_source=twitter#632155022-tw1513262491777

Thousands still await clean water months after Harvey

More than three months after Tropical Storm Harvey overflowed drainage districts, cut off water and prompted hundreds of boil-water notices across the Gulf Coast, large numbers of people do not have access to clean water and face health risks from contaminated waterways. More than 2,200 community water systems were compromised during Harvey and 1,743 wastewater facilities were affected during the storm. Thirteen boil-water notices remain in effect across Harvey's affected areas and about 3,750 people in Harvey's affected areas haven't had clean drinking tap water since late August. Of specific concern is the lack of information about how contaminated sites, affected by the widespread flooding and heavy rains, influence the overall water quality of waterways and surrounding communities. Read more here:

<http://edition.cnn.com/2017/11/16/world/nasa-sea-level-rise-forecast/index.html>

<https://phys.org/news/2017-11-nasa-tool-sea-coastal-cities.html>

https://insideclimateneews.org/news/22012018/houston-flood-plain-development-hurricane-harvey-reservoirs-overflow?utm_source=twitter&utm_medium=social

2017 was a disaster year for global insurers, with record weather-related costs

Losses from weather-related natural catastrophes set a new record in 2017. Global insured losses from natural catastrophes are estimated to be USD 136 billion, the third highest on record and almost three times higher than the average of US\$ 49bn. Approximately 10,000 people lost their lives in 710 natural catastrophes. Overall losses – i.e. including uninsured losses – amounted to US\$ 330bn, the second-highest figure ever recorded for natural disasters and almost double the ten-year, inflation-adjusted average of US\$ 170bn. The US was hardest hit, especially by hurricanes Harvey, Irma and Maria that were responsible for 50% of insurance payouts across the year. Hurricane Harvey was the costliest natural disaster with overall losses of around US\$ 85bn. In Australia, 56% of natural disaster losses in Australia were covered by insurance, compared to just 13% across the Asia-Pacific region. Cyclone Debbie, which hit Queensland in March, was the most expensive event of the year for insurance companies in the Asia-Pacific and the only natural disaster in the region to cause insured losses of more than \$US1 billion. Read more here:

<https://www.munichre.com/en/media-relations/publications/press-releases/2018/2018-01-04-press-release/index.html>

<https://www.preventionweb.net/news/view/56385>

Twitter + Citizen Science + AI = improved flood data collection

A team of scientists and engineers from Scotland's University of Dundee recently demonstrated how cutting-edge artificial intelligence (AI) techniques can be used to extract data from Twitter and crowdsourced information from mobile phone apps to develop an early-warning system for flood-prone communities. The Dundee team was looking for a method to validate the results from their hyper-resolution urban flooding computer model against actual data received on the ground. They found satellite remote sensing to be too expensive and tainted by technical problems in urban areas, and on-the-ground sensor networks to be too costly to install and maintain. They found an alternative in Twitter and MyCoast, a crowdsourcing app that collects data on coastal conditions, such as erosion and tides. They scanned Twitter and MyCoast for keywords



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that the team could identify as a flood-like event, and then used a type of AI called natural language processing (NLP), to sort the events by factors like severity and location. Read more here:

<https://www.dundee.ac.uk/news/2017/twitter--citizen-science--ai--improved-flood-data-collection.php>

<https://www.digitaltrends.com/cool-tech/ai-twitter-urban-flooding/>

A Dutch Bridge Designed To Flood As Water Levels Rise

A team of architects, commissioned to design a bridge in the flood-prone city of Nijmegen in the Netherlands, came up with an innovative design to accommodate rising water levels but also allow people to still use the bridge when it is flooded. Nijmegen is one of the country's oldest towns sited along the Waal River where water levels can rise more than 4 metres in a span of 5 to 12 days each year. The Zalige Bridge acts as an extension of an elevated pathway that takes visitors across a park on the banks of the Waal River. When the water level rises, the path is submerged and concrete blocks on the surface of the bridge – which ordinarily function as seats – become the only way of traversing the water, making the walk across like a game of hopscotch. The project was originally commissioned as part of *Room for the River*, a nationwide, government-sponsored series of infrastructure projects designed to better accommodate flooding. Read more here:

<https://www.fastcodesign.com/90156536/a-dutch-bridge-designed-to-flood-as-water-levels-rise>

<https://www.dezeen.com/2018/01/16/zalige-bridge-next-architects-hns-landscape-architects-stepping-stones-nijmegen-netherlands/>

International Floods

There were 24 international floods reported across 23 countries from beginning December 2017 to end of January 2018. At least 440 people died and more than 741,650 people were displaced.

Internationally significant floods included:

Philippines

The Philippines was hit by two tropical storms in short succession from mid to end December 2017. Tropical Storm Kai-Tak swept through central areas of the country from 16 December, causing flooding and landslides. At least 27 people were reported in Biliran and 230,000 people were displaced. Tropical storm Tembin hit Mindanao island in the Philippines on 22 December, causing severe flash floods and landslides, destroying over 1,600 homes and displacing thousands of people across 23 provinces. Over 240 deaths were reported but this figure is expected to rise as search, rescue and retrieval teams locate missing people believed to be buried in mud or swept by flood waters. Read more here:

<http://floodlist.com/asia/philippines-storm-kai-tak-december-2017>

<http://floodlist.com/asia/philippines-tropical-storm-tembin-december-2017>

Madagascar



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Tropical Cyclone Ava swept across Madagascar during early January, bringing with it strong winds between 140-190 kph and heavy rainfall that has caused flooding and landslides in Antananarivo, the port city of Toamasina and in the eastern town of Tamatave. At least 51 people have died and over 54,000 people were displaced. Many communities were left without electricity and road access to some south-eastern and southwestern parts of the country has been cut off.

<http://floodlist.com/africa/madagascar-cyclone-ava-january-2018>

<https://reliefweb.int/disaster/tc-2018-000001-mdg>

Mozambique

Heavy rain and flooding in middle January have left at least 11 people dead and 28,000 people displaced in northern areas of Mozambique. Over 5,000 homes have been destroyed in the provinces of Nampula, Niassa and Cabo Delgado, and damage to power cables and poles have left some areas without electricity. Roads have been flooded and some areas have been left isolated. The United Nation's World Food Programme has assisted 13,892 families with food.

<http://floodlist.com/africa/mozambique-floods-north-nampula-january-2018>

Democratic Republic of the Congo

Torrential rainfall in early January has caused flooding and landslides in and around the city of Kinshasa, capital of the Democratic Republic of the Congo. At least 44 people died, mainly due to houses and walls collapsing in the mudslides. Kinshasa also faces the threat of a cholera outbreak with three-quarters of homes being slums with no access to sanitation, electricity or adequate drainage.

<http://floodlist.com/africa/drc-floods-landslides-kinshasa-january-2018>

<https://citizen.co.za/news/news-africa/1776454/rdcongo-health-inondations-flood/>

France

Northern and eastern areas of France experienced nearly double their average rainfall in January. Rainfall during December and January were also the highest measured for the period in 50 years. Flooding along the River Seine and its tributaries affected 242 communes in the suburbs and outskirts of Paris, the French capital. The River Seine peaked at about four metres above its normal water level at 5.84m. Paris authorities shut down roads, river traffic and parts of the city's rail network in the face of rising levels of the Seine and the lower level of the Louvre was closed to visitors over the weekend. Read more here:

<http://www.bbc.com/news/world-europe-42856634>

<http://floodlist.com/europe/france-paris-seine-floods-january-2018>

Resources

Australian disaster resilience handbook 4: Evacuation planning



<https://www.preventionweb.net/publications/view/56588>

Flood Damages Reduction with Evacuation Plans

<https://www.mssanz.org.au/modsim2017/K1/frongia.pdf>

Supercomputers and satellite data allow 10-minute updates of rain and flood predictions

<https://www.sciencedaily.com/releases/2018/01/180117125525.htm>

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Biodiversity Offsetting Policy and Calculator for Campbelltown City Council

Molino Stewart's Diane Campbell, an experienced Government Certified Biobank Assessor, has prepared a Biodiversity Offsetting Policy and Calculator to determine appropriate offsets for the impacts arising from development activities within the Campbelltown LGA. The Biodiversity Offsetting Policy and Calculator was developed in order to satisfy the requirements of the *Local Government Act 1993*, and integrate the principles of ecologically sustainable development in strategic land use planning for the future growth of the city.