Another casualty of climate change is difficult to discuss.

The city of Brisbane is built on a flood plain. We know this well. In the initial inspection of the site in 1824 and 1825, evidence was found that suggested a flood of over 100 feet. Major Edmund Lockyer commented that "marks of drift grass and pieces of wood washed up on the sides of the banks and up into the branches of the trees, marked the flood to rise here of one hundred feet".[88]

In 1841, the highest official level of flood waters was recorded in Brisbane at 8.43 meters. Between 1841 and 1893, the river flooded 22 times. The 1893 flood, while 7 cm lower than the flood of 1841, caused considerable damage, sweeping away the two bridges that spanned the river at the time and leading to considerable loss of life.

The same site as examined in 1824, flooded to 94 feet 10.5 inches in 1893. Maybe we should have taken heed to Major Lockyer's observations. Two major ships, the Elamang and the gunboat Paluma were carried and left aground in the Brisbane Botanical Gardens. Three separate floods actually hit Brisbane in 1893. Nine days after the first flood, a second minor flood only reached a peak of 3.29 meters. A week later, a third major flood carried the stranded ships back into the Brisbane River.

Figure 126 - Brisbane floods in 1893 with residents rowing around Queen Street. Source: Public Domain.

Flooding continued into the next century, with a major flood again in 1908. There was a moderate flood in 1931, with 1300 homes drenched. But only a few minor floods occurred in the decades that followed. People and building standards became flood complacent.

Then in 1974, a major flood again hit Brisbane. Not as big as the record floods of the 1800s, this one was still huge. Previous heavy rains made the ground saturated and Cyclone Wanda, while very weak in cyclone terms, was the final straw. The city gauge peaked at 5.5 meters and 6700 homes were flooded.

Following the 1974 floods, the Bureau of Meteorology issued its report into the causes of the flooding and future flood mitigation for Brisbane.[89] It found that there was geological evidence of water levels 5.5 meters higher than the 1974 flood. Meteorological studies suggested that rainfalls well in excess of those experienced in the floods of 1893 and 1974 are possible. The report called for mitigation and weather radar:

> Therefore it seems certain that unless major flood mitigation schemes, such as the proposed Wivenhoe Dam, are implemented, floods even greater than those of 1974 will again be experienced in Brisbane.
>
> Development of the weather-watching radar facility with a capability for operational determination of rainfall intensity is considered to be the only way by which the provision of an adequate quantitative flood prediction service for the Brisbane metropolitan creeks is feasible.

The Wivenhoe Dam was constructed. The weather radar was built.

Jump ahead to 2011. The rainfall experienced in South East Queensland was considerable, but not unique. Certainly higher rainfalls could have occurred. The 1974 report called for the possibility of even more significant rainfall events.

On 11 January, Hubert Chanson, a professor in hydraulic engineering at the University of Queensland, told the ABC news that "the dam was built to withstand an event similar to what we are seeing – we have been spared of any flooding in Brisbane thanks to the Wivenhoe reservoir."[90]

The Wivenhoe Dam has a capacity of 225%. Over this level the dam would be breached and flowing water could undermine its foundation, putting the security of the entire dam under question. On 11 January, the dam was already at 173%.

Professor Chanson was optimistic. The Wivenhoe Daw was easily built to withstand the rainfall, but not in the manner in which it was managed.

The same Bureau of Meteorology report from 1974 highlighted the problem of dam management:

> There are considerable problems in deciding when to empty the flood storage. If floodwaters were retained by the dam for too long not only would there be major and prolonged flooding upstream from the storage but the dam would become virtually useless for flood mitigation downstream in the event of a repetition of excessive rainfall. Meteorologically such a situation has already occurred (in 1893 when there were three floods within a month) and a recurrence appears inevitable.

On 13 January, the Brisbane Courier Mail newspaper reported that the Queensland Police investigated a false text message that was circulated claiming the Wivenhoe Dam wall was breached.

“Dam managers say all dams are safe and operating within design specifications,” the newspaper claimed.

This was not true.

The Brisbane Mayor, Campbell Newman warned that the dam could no longer protect the Queensland capital. "The dam is full. Every bit of rain that falls on the catchment can get to Brisbane, and there is not much more we can do about that."

The river peaked at 5:00am on 13 January at 4.46 meters, well below the initial forecast of 5.5 meters. Not as big as 1974 and about half the size of 1841. Yet the damage was more significant, with 33,701 properties flooded.

The Wivenhoe Dam peaked at 190%.

Had a second or third rain event occurred, such as in 1893, the police investigation into the false text message might not have been necessary.

On 21 January, the Australian newspaper reported that leaked emails from the Wivenhoe Dam’s engineering office revealed that its operators held on to water for too long. Brisbane’s flood could have been largely avoided if action was taken earlier.[91]

The Queensland State Premier, Anna Bligh, has called a commission of inquiry to investigate if the dam’s release strategy and subsequent flood was avoidable. It is due to complete its findings by 17 January 2012.

So how does this story become a climate change casualty?

Not to pre-judge the results of the Government inquiry, but the hyper-inflated claims of climate change causing long term, prolonged drought in Australia could easily have had a bearing on the decision to keep the dam close to its maximum capacity.

On 10-11 February 2007, the Brisbane Courier-Mail ran a feature on the water crisis facing Southeast Queensland.[92] The headline read:

Bring us a monsoon

Near-tropical storms needed to fill storages

Rob Drury, the Seqwater operations manager for Wivenhoe and the smaller Somerset and North Pine dams, said "you do need large, uncommon events to fill large dams. You don't fill them every year." He told us that Wivenhoe has the capacity to store 1,165,000 megalitres as well as an additional capacity of 1,450,000 megalitres to mitigate flooding. He added, "There have only been four main rainfall events in the past 15-16 years. It has been seven years since we had a major rainfall event that has given us a refill of 50 per cent of the dam."

Seqwater is South East Queensland's bulk water supply provider. Taken from their corporate website:

> We deliver innovative and efficient management of catchments, water storages, and treatment services to ensure the quantity and quality of the region's water supply.

Actually, Seqwater is their trading name. Their actual name is Queensland Bulk Water Supply Authority. They were established in 2007 as part of a water reform agenda by the Labor Queensland Government under Anna Bligh - the same Anna Bligh who called for the enquiry into the dam's release strategy. Her website lists water reform as one of her main achievements.

Seqwater's *Strategic Plan* is available from their website.[93] Their first strategic goal is to supply customers with reliable water of quality. They took great pride that a new, single focused organisation was created out of 14 regional water entities. Their new mission statement is all about catchments:

> Catchments are vital regional resources. We define catchments as the combined natural and built infrastructure needed to source, store and supply water to meet the quality and reliability needs of our customers.

In the 36 page *Strategic Plan*, flood mitigation gets mentioned only 3 times. One of these references is actually linked to green energy and recreation.

Their number one key performance indicator in *whole-of-catchment-knowhow* is: **budget achievement** – "the degree of accuracy with budget forecasts."

Did someone forget to tell them that the Wivenhoe Dam was actually built to flood proof Brisbane? A city built on a flood plain. A dam built after the 1974 public outcry.

Southeast Queensland is the fastest growing region in Australia. The Queensland Department of Infrastructure and Planning estimates that the population will continue to grow from 2.8 to 4.4 million people by 2031.

To handle this growth, development permits allowed housing and businesses to be established in known flood prone areas. So now a flood of half the size impacts double the amount of people.

Climate change hype told us that drought was our fear. We were told that rainfall patterns have been changed forever. And the proud Queenslander, Kevin Rudd, told us there was nothing worse than being a sceptic. You were not allowed to question these claims.

So Seqwater's Rob Drury prayed for a monsoon. And he got one! 631mm of rain fell in Lindfield, part of the catchment, in the month of January, a massive 257mm on 10 January alone. With this water flowing into the dam, and its level already at 173%, the cities of Brisbane and Ipswich were doomed.

The actual weather event was quite isolated. At the Cape Moreton Lighthouse, near Brisbane, just 26.2mm of rain was recorded on 10 January 2011. But it was not a surprise, the rain event was watched on the weather radar that was supposed to provide additional safety.

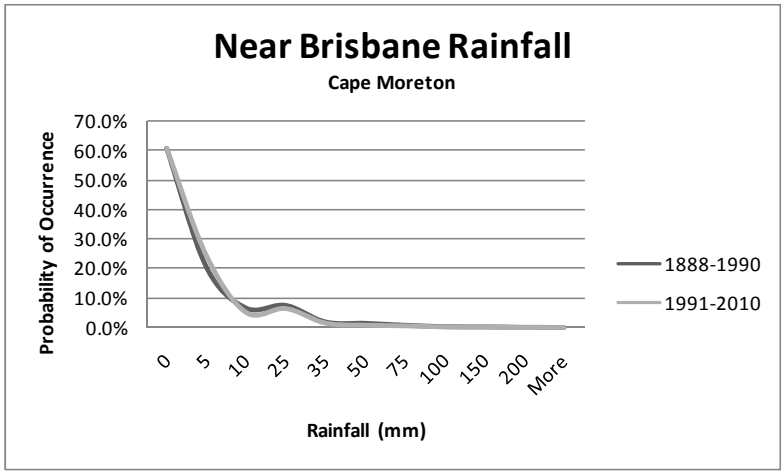

Figure 127 - The rain profile for Cape Moreton, near Brisbane has not changed since 1888. There is a 1.34% change of rainfall over 75mm. The dam was built to mitigate this flood risk in Brisbane.

Extreme weather events happen in South East Queensland. Even with the feared drought, the rain profile has not changed in over 100 years. From 1888 to 1990, there was a 60.8% change of it not raining. From 1990-2010, the percentage was 60.9%.

The really ironic thing is that we don't learn from our mistakes. Queensland has a history of repeat flooding. On 3 February, Tropical Cyclone Yasi crossed the north Queensland coast. In 1974, the floods worsened when a weak cyclone named Wanda dumped 526.5mm of rain on Brisbane over two days. Had Yasi, a Category 5 storm, travelled down the coast rather than proceeding inland, Brisbane would have been inundated with rainfall again, just like the second flooding in 1893. The Wivenhoe Dam operators again ignored this threat. The dam was 100% full in early February. Realising the risk, on 14 February plans to reduce the dam levels to 75% were announced. The media reported that the 291,000 megalitres of water to be released represents a one year supply of drinking water for Brisbane.

It is obvious that doubling the population requires more water. Queenslander's had their chance to resolve this problem when a dam across the Mary River in Traveston was proposed to solve the water crisis in 1996.

The dam came under strong local protests, but it was the environmental concerns over several fish and aquatic species believed to be under threat from the dam that received the greatest attention. The most significant was the Mary River Turtle, who breaths through its bum and the Queensland lungfish. In the end, climate change won the battle – no dam. It was calculated that rotting vegetation from the shallow waters would generate more greenhouse gas, in the form of methane, than the CO_2 needed for sea water desalination. In November 2009, Labor's Federal Environment Minister, Peter Garrett, refused approval for the project.

As reported in the Brisbane Times, Australian Greens Leader Bob Brown congratulated Peter Garrett on his decision to reject Queensland's controversial $1.8 billion Traveston Crossing Dam - "I've sent a letter of congratulations to minister Garrett on making the only decision an environment minister could have made, that is, to veto the dam," Senator Brown said.

Losses and rebuilding costs for the Queensland floods are forecast to be in excess of $16.78 billion.

The impact on the ski industry and the failure to perform flood mitigation are just two examples of *hyper-inflated marketing* for the common good that resulted in unfavourable outcomes.