

## Submission to Queensland Floods Commission of Inquiry

Name: Alan Mitchell, aged [REDACTED]

Background: Retired scientist with interest in rainfall patterns and climate change.

Qualifications: BSc (Hons), MPhil.

Previous employment: Support Scientist at the Australian Institute of Marine Science (AIMS), Townsville, 1975-2001, in the field of Biological Oceanography - early retirement for health reasons, then Water Quality Scientist at Australian Centre for Tropical Freshwater Research (ACTFR) at James Cook University (JCU), Townsville, 2004-2009.

### Summary statement:

As painful and expensive as these admissions will be to this inquiry, we must strive for the truth so that we do not repeat any mistakes in a future event. In this submission, I am critical of the management by the Wivenhoe Dam operators because of their failure to release water earlier than they did. However, I think that political pressure and ideological issues made this management worse than it would have otherwise been.

### Evidence:

#### *A) Summary*

According to newspaper and internet articles, Wivenhoe Dam levels were around or above 100% (nominal) levels before the weekend of 8-9th January, 2011. By Monday 10th January, dam levels had risen to around 148%. Despite increasing flows into the dam, the operators did not release significant water from the dam until the next day, Tuesday 11th January, when the decision was forced on them by the imminent danger of dam-wall breaching and uncontrolled release. They then rapidly released a huge amount (unknown) of dam water, suggested to have been half the dam's full capacity in a single day. A day to two later (13th-14th January), downstream at Brisbane, at the time of the flood peak, around 80% of the water in the Brisbane River at Brisbane City was estimated to have come from Wivenhoe Dam, with just 20% resulting from other runoff and rainfall. If this account is largely true, it represents a massive failure by the dam operators. In the Dam Operator's Manual, flood mitigation is the second highest priority objective, after the first which is ensuring the dam's safety. The conflicting priority objective, that of water storage, is ranked number four.

#### *B) Weather forecasts*

SEQ Water have already recently released their own assessment, in which they blame inadequate weather forecasts from the Bureau of Meteorology (BoM). But the operators themselves failed to use basic forecasting guides. For example, how on earth did they miss

seeing the sheer strength of this present La Nina. It had already brought earlier flooding rains to North Queensland, then to Central Queensland, flooding Rockhampton, etc. and these rainfall patterns were heading south towards Brisbane. To claim that they did not see significant rainfalls coming simply beggars belief. Isn't this part of their job? It should be!  
*Note for recommendations - ensure meteorologist employed on staff in future.*

### *C) Dam Operator's Manual*

It has also been reported that the Dam Operator's Manual does not differentiate between the different ENSO states. In other words, there is no difference to the instructions regardless of whether it is an El Nino year, a neutral year or a La Nina year. This is a remarkable omission, given how much we know now about the link between La Ninas and flooding rainfall. This omission reflects very poorly on the management by the Queensland Government. If they felt strongly enough to insist on a dam operator's manual, why didn't they make sure it was relevant? This question has been analysed by Dr Roger J. Pielke Jr., a scientist specialising in weather disaster studies. In the following article:

<http://rogerpielkejr.blogspot.com/2011/01/large-balls.html>

he commented:

"If it is in fact the case that Wivenhoe is managed without regard to ENSO, then this would be a case of decision making under wilful ignorance, rather than decision making under uncertainty, as the ENSO signal is extremely strong in Australia and has a demonstrable influence on the probabilities of extreme (high and low) precipitation. Thus, when Wivenhoe Dam operators say that they did everything by the book, they may indeed be correct, but at the same time "the book" may have led them astray.

While the Queensland flood inquiry will focus on hydrology and the dam's management, there will be deeper issues here of decision making under uncertainty and ignorance, and how such decisions should be made in the future".

*Note for recommendations - That the Commission read this article referred to above and others, with published comments, in order to get the greatest understanding of the issues.*

### *D) Critical weekend*

While dam-water releases might have been prudently made earlier, the weekend of 8-9th January was critical. Catchment inputs increased considerably between Saturday and Monday. Had the operators started releases that weekend and continued releases over the Monday, there would not have been the need for the massive release on Tuesday. Some lower level flooding may have occurred, but not the much larger flooding that actually occurred. Was the lack of decisions on that weekend a "weekend effect", when operators were dispersed and no senior operator was willing to make a decision on his or her own? *Note for*

*recommendations - ensure that a full complement of operators is rostered for weekends during heavy rain periods.*

Why didn't the operators take any notice of the many requests (as reported) to release dam water earlier or on that weekend. These requests apparently came from people as high up as the Brisbane Mayor, Campbell Newman, locals and retired hydrologists, who were concerned. Are the dam operators so arrogant that they will not listen to outside advice? Are they Labor political appointees who would not take notice of a Liberal, like Newman? SEQ Water have apparently admitted that they were afraid of causing low-level flooding if they released water earlier. If this is correct, why were they not more concerned with bigger flooding from later releases. We note that the operators have recently reduced dam levels to 75% nominal, after criticism that another flood could occur (see risk issues in C above). *Note for recommendations - Set up an emergency, non-partisan decision-making body to help ensure quicker decisions.*

#### *E) Drought and the psychology of Anthropogenic Global Warming (AGW)*

The question of whether Australia will get decreasing or increasing rainfall with AGW is one of the most contentious issues within the science of climate change. There is no consensus on this question, with probably 50% of scientists (including myself), believing that a warmer climate will generally bring more, not less rain (as I have observed among the staff in two institutions). We simply don't know. The popular, media-promoted view of Tim Flannery, supported by the BoM and CSIRO, held that Climate Change had brought a permanent reduction in rainfall over Eastern Australia, exemplified by the ongoing drought. But when very heavy rains started falling again this year, some of these views quickly changed to the global climate disruption angle, i.e. of more extreme rainfall, both droughts and floods (?). Hence, there is confusion about what the real trend will be. However, the psychology of increasingly dry weather may have been formed in the minds of the dam operators, to the point where they did not think a big flood was likely again. *Note for recommendations - Attempt to reduce preconceptions about diminished rainfall (probably unnecessary now).*

The closed-mind mentality of the BoM regarding the Pacific Decadal Oscillation (PDO), also known as the Interdecadal Pacific Oscillation (IPO), might have further hindered any forecast of extreme rainfall. This oceanic oscillation, discovered in 1997 (Mantua *et al.*, 1997), is a recurring cycle of 20-30 years in which either El Ninos or La Ninas dominate. For example, a "cool phase" was recognised from 1947-1976 in which La Ninas dominated. A "warm phase" then commenced in 1977 to at least the late 1990s and probably to 2006 (some argument here), when there were around twice as many El Ninos as La Ninas. From 2007 (perhaps earlier), the "cool phase" commenced again, with two La Ninas, One El Nino and one neutral year since then. This dominance of La Ninas is expected to run for another 16-25 years, depending on which starting year is selected for the present phase.

Since there is a good correlation of periodic changes in trends of average global temperatures with the PDO, periods in which temperatures go up or down, climate-change sceptics have used this to argue that this ocean cycle rather than increasing atmospheric CO2 is the

temperature driver. In response, for apparent ideological reasons in their strong support of AGW, the BoM refuses to acknowledge the relevance of this cycle (much discussion of this matter on climate blogs). As an ex-oceanographer, I personally believe that the PDO is a useful forecasting tool. For example, the last two extreme floods of Brisbane River (1974 and 2011) occurred during La Ninas in the cool phase of the PDO ( I don't know about previous extreme floods). There have been suggestions that La Ninas may be stronger (wetter) during the cool phase. An acknowledgement of this cycle by BoM and the Wivenhoe Dam Operators may have radically changed their pre-conceived thinking about diminished rainfall - more La Ninas, more likelihood of very heavy rain, continuing rain suggests less need to conserve dam water. *Note for recommendations - BoM and Dam operators should be more open-minded with weather forecasting tools.*

#### *F) Cost saving*

There has been reported an apparent order from the Queensland Government to try to conserve as much water as possible, in other words minimal releases to avoid having to run the costly desalination plant. I don't know if this is true, but the Commission should at least ask the question. While clearly there must be balance between the two conflicting objectives (2 - flood mitigation and 4 - water storage), some commentators have said that it is understandable that after a drought period, the operators would be more likely to want to conserve than release. However, the last three years have seen pretty good wet seasons through most of Queensland and in Brisbane. In any case, the objective of flood mitigation is considered more important than the objective of water storage. *Note for recommendations - There should be no political influence on the dam operators either in their appointments or in their objectives. Flood Mitigation must be emphasised as the second-top priority objective.*

#### Recommendations (not ordered by priority)

*Ensure meteorologist employed on staff in future.*

*That the Commission read this article referred to above and others, with published comments, in order to get the greatest understanding of the issues.*

*Ensure that a full complement of operators is rostered for weekends during heavy rain periods.*

*Set up an emergency, non-partisan decision-making body to help ensure quicker decisions.*

*Attempt to reduce preconceptions about diminished rainfall (probably unnecessary now).*

*BoM and Dam operators should be more open-minded with weather forecasting tools.*

*There should be no political influence on the dam operators either in their appointments or in their objectives. Flood Mitigation must be emphasised as the second-top priority objective.*