

Emissions not making rivers run dry

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Stewart Franks | *September 12, 2008*

IS the ongoing drought in the Murray-Darling Basin affected by climate change? The simple answer is that there is no evidence that CO2 has had any significant role. Like it or not, that is the science.

In fact, the drought was caused by an entirely natural phenomenon: the 2002 El Nino event. This led to particularly low rainfalls across eastern Australia. The subsequent years were either neutral or weak El Nino conditions. Significantly, neutral conditions are not sufficient to break a drought. In 2006, we had a return to El Nino conditions which further exacerbated the drought. What we didn't have was a strong La Nina.

Last year finally brought a La Nina event but it was relatively weak. It produced a number of major storm events in coastal areas and some useful rainfall in the Murray-Darling basin and elsewhere. Approximately half of NSW drought-declared areas were lifted out of drought (albeit into "marginal" status) and Sydney's water supply doubled in the space of a few months.

This was the first rain-bearing La Nina since 1999 but proved insufficient to break the drought. In short, the drought was initiated by El Nino, protracted by further El Nino events and perhaps more importantly, the absence of substantial La Nina events.

Despite the known causes of the drought, many have claimed that CO2 emissions are to blame. There have been arguments put forward to justify this claim, all eagerly adopted by various groups, but none of which have serious merit.

A key claim is that the multiple occurrence of El Nino is a sign of climate change. This is speculative at best. Recent analysis showed the nine-year absence of La Nina was not unusual. In fact long-term records demonstrate alternating periods of 20-40 years where El Nino is dominant, followed by similarly extended periods where La Nina dominates. Ominously, the data demonstrates that it is possible to go 14-15 years without any La Nina events. The consequent drought would be devastating but entirely natural.

The observation that El Nino and La Nina events cluster on 20-40 year, multi-decadal timescales is an important one. It demonstrates that Australia should always expect major changes in climate as a function of natural variability. When viewed in this light, the drought is most likely a recurring feature of the Australian climate.

A more recent claim is that higher temperatures are leading to increased evaporation of moisture. The weather bureau acknowledges that rainfall from September 2001 until now has not been the lowest recorded, however much has been made of the fact that consequent inflows have been the lowest. It has been claimed increased evaporation, driven by climate change, can make up this discrepancy. Indeed, Wendy Craik, the chief executive of the Murray Darling Basin Commission has stated that temperatures were warmer, leading to more evaporation and drier catchments.

This is disturbing to hear from the head of the MDBC, as it is completely at odds with the known physics of evaporation. While it sounds intuitively correct, it is wrong.

When soil contains high moisture content, much of the sun's energy is used in evaporation. Consequently, there is limited heating of the surface. When soil moisture content is low (as occurs during drought) nearly all of that energy is converted into heating the surface, and air temperatures rise significantly. Consequently, higher temperatures are due to the lack of evaporation, not a cause of significantly higher evaporation.

Cloud cover also provides a major control on air temperatures. El Nino delivers less rainfall but also less cloud cover. This has a major impact on the amount of the sun's energy reaching land; far greater than the trivial increase in radiant energy caused by increased CO₂. Again, in the absence of soil moisture, air temperatures increase.

These are known and accepted processes of environmental physics and are not contentious. They are ignored because they detract from the simple message that we should sign up to the concept of "dangerous climate change" and an emissions trading scheme. After all, who would pay for carbon emissions if they were not proven to be detrimental? Who would provide extra funds for climate change science if it wasn't a proven significant factor compared to natural climatic variability?

None of the above is to say that CO₂ is not having some effect; the atmospheric CO₂ concentration has risen and this is largely attributable to anthropogenic emissions. CO₂ is a radiatively-active gas and leads to a minor increase in downward radiation. However, there is no evidence that this is in any way significant, especially when compared to the naturally varying processes that dominate rainfall variability and evaporation.

We do know why inflows are so low and why various ecosystems of the Murray-Darling are in crisis: the system is over-allocated and has experienced a growth in groundwater extraction and in the number of farm dams preventing rainfall from becoming run-off. This is due to a failure of planning, management and leadership from the relevant authorities. Under these conditions, when a prolonged drought strikes, the system collapses.

This is a man-made problem but not one that is attributable to CO₂.

Craik is not alone in her desire to view CO₂-induced climate change as proven and affecting the drought. Numerous politicians, environmentalists and especially scientists have made spectacular leaps of faith in their adherence to the doctrine of climate change over recent years, too many to document here. However, the most literally fantastic claim on climate change must go to Kevin Rudd, who has guaranteed that rainfall will decline over coming decades; one can only assume he's based his view on deficient climate models and bad advice.

Perhaps our leading climate authorities who have played such a prominent role in fomenting speculation about climate change, and who apparently adhere to the notion that climate is amenable to prediction, should also point out that these models cannot reproduce the observed multi-decadal variability of El Nino and La Nina in anything like a realistic manner.

Given the uncertainty of El Nino and La Nina behaviour, one clearly cannot predict the future.

There is no direct evidence of CO₂ impacts on the drought, nor is there any rational basis for predicting rainfall in 30 years time. One just hopes that sensible and sustainable management from our leaders will enable struggling rural communities to weather the vagaries of climatic and political extremes.

Stewart Franks is a hydroclimatologist and an associate professor at the University of Newcastle