



Minister for Climate Change and Energy Efficiency  
Minister for Industry and Innovation

C12/501

Mr Scott Morrison MP  
Member for Cook  
PO Box 1306  
CRONULLA NSW 2230

13 MAR 2012

Dear Mr Morrison

Thank you for your personal representation of 10 February 2012 on behalf of Mr Laurie Cummings, concerning the global hydrological cycle.

The science of climate change is robust and I am committed to enhancing public understanding of climate change. The following information has been prepared by the Department of Climate Change and Energy Efficiency, based on expert advice from climate scientists.

- There is clear evidence that our climate is changing, largely due to anthropogenic greenhouse gases. The *Fourth Assessment Report*, produced by the Intergovernmental Panel on Climate Change (IPCC) in 2007, states global warming is 'unequivocal' and 'most of the observed increase in globally-averaged temperatures since the mid-20<sup>th</sup> century is very likely due to the observed increase in greenhouse gas concentrations'.
- There are multiple lines of evidence in the report showing that the Earth's climate system is warming. These include increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level. The report represents the international consensus on climate change science in literature that has been extensively peer-reviewed and published in scientific journals. The report can be found at: [www.ipcc.ch](http://www.ipcc.ch).
- These IPCC conclusions have been further supported by recent reports that provide updated assessments of climate change science. The Australian Academy of Science published *The Science of Climate Change: Questions and Answers* in August 2010. This document explains how human activities are influencing the climate and provides an overview of the present state of climate change science. This report can be found online at: [www.science.org.au](http://www.science.org.au), and I have enclosed a copy for your reference. Recent publications by the Royal Society in the United Kingdom ([www.royalsociety.org](http://www.royalsociety.org)) and the American National Academies ([www.dels.nas.edu](http://www.dels.nas.edu)) further support these findings.
- Globally, mean atmospheric temperature has increased by around 0.74 degrees Celsius over the last 100 years. The global climate in 2011 was heavily influenced by consecutive La Niña events, which typically lead to cooler temperatures than the years preceding and following. Preliminary global data from the World Meteorological Organization indicates that the average 2011 temperature is likely to rank as the equal 10th highest on record and the warmest La Niña year on record.

- In Australia, these La Niña events resulted in 2011 being the first cooler than average year since 2001. Despite this, the 10 year period from 2002 to 2011 is Australia's equal-warmest 10-year period on record; each decade since the 1940s has been warmer than the preceding decade.

As noted in previous correspondence regarding Mr Cummings' concerns, the response of the hydrological cycle to warming is complex and uncertainties remain. However, there is considerable evidence pointing towards an acceleration of the hydrological cycle as the climate warms. A number of peer-reviewed publications provide evidence for this acceleration. For example, recent research by Helm and others (published in *Geophysical Research Letters*, 2010) provides evidence for an acceleration of the Earth's hydrological cycle using global datasets of salinity observations.

The robustness of climate change science is underpinned by the peer review process. Peer-review is the process of allowing science to be reviewed prior to its acceptance for publication by peers in the field who judge the competence, significance and originality of the research. These scientists then challenge or support these results with peer-reviewed articles of their own and over time a consensus builds around the observations that explain the science most successfully. Without a peer-review system, publication of research findings would be arbitrary and more easily influenced by personal, social or political agendas. Mr Cummings has not submitted research for peer-review that challenges the evidence for an acceleration of the hydrological cycle.

I understand the Minister for Tertiary Education, Skills, Science and Research, Senator the Hon Chris Evans will provide you with a response addressing Mr Cummings' questions for the CSIRO.

Thank you for bringing Mr Cummings' concerns to my attention.

Yours sincerely



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