Australian Government
Bureau of Meteorology

Office of the Director of Meteorology and CEO
Bureau of Meteorology
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In reply please quote

MC14-007396

Mr Graham Williamson

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Dear Mr Williamson,

I refer to your email of 9 March 2014, concerning climate change, to the Minister for the Environment, the Hon Greg Hunt MP. Minister Hunt has asked me to respond on his behalf. I apologise for the delay in response.

In terms of your questions about the local impacts of climate change, the Minister's earlier response to you (MC14-005862) correctly notes that attribution studies at the local level have not yet been completed. This does not contradict the fact that the warming of the climate system is unequivocal and, since the 1950s, many of the observed changes are unprecedented over decades to millennia. Indeed the global warming signal is a consequence of the large majority of locations on earth experiencing increasing temperatures.

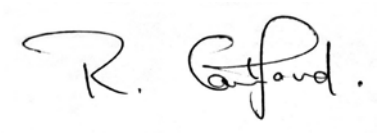
The fundamental physical and chemical processes leading to climate change are now well understood and very widely accepted, and the observational evidence for climate change is extensive and scientifically compelling. More than three decades of international research have led to clear conclusions on this issue. These conclusions, and the evidence that supports them, are contained in the Intergovernmental Panel on Climate Change (IPCC) Working Group 1 Report that was issued in September 2013. In particular, the Report concludes that:

i. Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased.
ii. Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850.
iii. The atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years. Carbon dioxide concentrations have increased by 40 per cent since pre-industrial times, primarily from fossil fuel emissions and secondarily from net land use change emissions.
iv. Human influence on the climate system is clear. This is evident from the increasing greenhouse gas concentrations in the atmosphere, positive radiative forcing, observed warming, and understanding of the climate system.
v. It is *extremely likely* that human influence has been the dominant cause of the observed warming since the mid-20th century.
vi. Continued emissions of greenhouse gases will cause further warming and changes in all components of the climate system. Limiting climate change will require substantial and sustained reductions of greenhouse gas emissions.

Research conducted at the Bureau of Meteorology has made a significant contribution to this body of work and the Bureau of Meteorology's own observations accord with the conclusions of the IPCC Working Group 1 Report. In particular, the Bureau's Australian Climate Observations Reference Network – Surface Air Temperature (ACORN-SAT) dataset, which has been developed for monitoring climate variability and change in Australia, indicates that Australia's mean temperature has warmed by 0.9°C since 1910. The data itself, and information on the data including the methodology and an independent peer review of the methodology, can be found at http://www.bom.gov.au/climate/change/acorn-sat/. I also draw your attention to the published *State of the Climate 2014* report, prepared jointly by the Bureau of Meteorology and CSIRO, which summarises the conclusions drawn from the Bureau's data in relation to Australia, http://www.bom.gov.au/state-of-the-climate/.

Thank you for writing on this matter.

Yours sincerely



Ray Canterford PSM

Acting Director of Meteorology and CEO

6 May 2014