



The Hon Greg Hunt MP

Minister for the Environment

MC14-005862

Mr Graham Williamson
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Dear Mr Williamson

I refer to your email of 21 February 2014 concerning climate change and the Australian Government's Direct Action policy.

You raised a number of questions around climate change at the local scale, particularly in Sydney, the extent to which it is caused by human activities, and the role of global data in understanding local change.

As you would be aware, climate is the long-term average of the atmospheric conditions near the Earth's surface, and it generally involves information on average temperature, rainfall and extreme weather patterns for a region. The study of climate often occurs at a regional rather than local scale, and scientists require long term data to have confidence in distinguishing average climate from the effects of seasonal, annual and decadal variability. Climate change is also generally studied at regional scales, including global scales. In many ways it is this scale of study that gives scientists confidence that climate change is occurring and observed trends in weather are not just a local phenomenon.

Australia's climate has changed over the last century, and data available on the Bureau of Meteorology website show that Australia's temperature is on average almost a degree higher than it was in 1910. There are multiple lines of evidence that much of the warming that has occurred since the 1950s has been as a result of human activities.

All parts of Australia, including local areas such as Sydney, are experiencing this background increase in temperature. Previous responses provided to you from the Department of the Environment indicate that attribution studies of the warming experienced on a local scale in Sydney have not yet been completed.

Global and regional data are necessary to understand the climate of an individual location, because an area's climate is influenced by a range of factors which occur at different scales. For example, Sydney's climate is moderated by the ocean and influenced by factors such as the prevailing westerlies in the mid-latitudes, the prominence of East Coast Lows, the direction and strength of the El-Niño Southern Oscillation (ENSO) and the position of the sub-tropical ridge. Local data are important to understand Sydney's climate, but alone they are by no means sufficient.

In terms of sea level, the relative sea level trend recorded at Fort Denison, Sydney over the period 1966 to 2010 is 0.8 mm per year, which is less than the global average trend over 1966 to 2009 of 2.0 mm per year. A range of local factors such as wind speed and the direction and strength of ocean currents influence sea level at any particular location. As such, trends in sea level will vary from one particular point to another. This is why it is important to consider multiple datasets in determining trends in regional sea level change.

For the period from 1993, when satellite altimeter data are available, the sea level trends in southern Australia are similar to the global mean sea level trend. Off south-eastern Australia, the altimeter shows a larger trend offshore than the tide-gauge trends. This is thought to be associated with a strengthening of ocean currents in the South Pacific Ocean and a southward extension of the East Australian Current, resulting in lower trends at the coast compared with offshore.

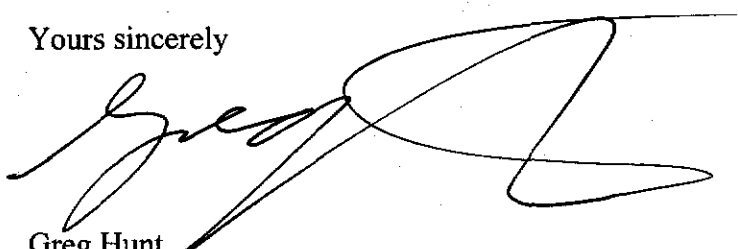
The Australian Government accepts the findings of the Intergovernmental Panel on Climate Change (IPCC), which state that there is robust evidence that multiple components of the Earth's climate system are changing and that most of the warming since 1950 has been caused by human activities. As also advised previously, the Government takes its primary advice on climate science from the Bureau of Meteorology and CSIRO. This advice aligns with information provided by the IPCC and national and international organisations such as the Australian Academy of Science, World Meteorological Organisation, the Royal Society in the United Kingdom, and the National Academy of Sciences, National Oceanic and Atmospheric Administration, and National Aeronautics and Space Administration in the United States of America.

You also asked a number of questions about the Government's policy for Direct Action on climate change. The Direct Action Plan outlines how the Government will meet its five per cent emissions reduction target by 2020. Australia's mitigation policies are based on a number of metrics, including per capita emissions, economic competitiveness and comparison to the actions of major economies and Australia's key trading partners and competitors. On a range of indicators, Australia's five per cent target is comparable with most other advanced economies.

This target and the associated emissions reductions are Australia's contribution to global emission reductions. Australia cannot limit global increases in average temperatures and sea level rise by domestic action alone, but Australia is committed to sharing the global emissions reduction effort.

Thank you for writing on these matters.

Yours sincerely



Greg Hunt