Maintain and improve capacity for meteorological research and services to Australians

The cuts to CSIRO climate science amount to much more than a loss of climate change research capability. They are a loss of capability in the study of droughts, El Niño, tropical cyclones fire weather and storm surges, and will have impacts on health, agriculture, the economy, safety, and the surrounding oceans and reefs.

By Mary Voice, John McBride and Jeff Kingwell, representing the National Council of the Australian Meteorological and Oceanographic Society (AMOS)

The Australian Meteorological and Oceanographic Society (AMOS) is an independent society representing the atmospheric and oceanographic sciences in Australia. It has members drawn from the Bureau of Meteorology, CSIRO, the university sector, other State and Federal agencies, as well as the private sector.

The Society covers both meteorology and oceanography, noting that:

- 'meteorology' in its broadest sense includes the sciences of weather, climate and atmospheric composition; and
- scientific study of 'climate' requires integrated study of atmosphere, ocean, land, cryosphere and biosphere.

In October 2013 the electronic billboard above the Age newspaper office in Collins St showed a figure from a scientific paper. The paper had appeared in the latest issue of the science journal Nature, and was written by Bureau of Meteorology and CSIRO climate scientists. The topic was how the El Niño phenomenon will change as the globe warms. El Niño often brings widespread drought to Australia as well as bringing summers with extreme bushfires. The article in Nature was investigating whether this will be the same in coming decades when the global oceans are warmer than at present.

The scientists asking these questions are not specialists in climate change science. Rather they are experts in the study of the El Niño phenomenon, and of why it occurs and how to predict it several months in advance using observations, using theory and using large coupled computer models of the atmosphere and the ocean.

In fact the CSIRO divisions that are targeted for the current large reductions in staff don't really include specialist "climate-change" scientists. There are no university departments where one can gain a PhD degree or other qualification as a climate-change scientist. If asked their profession, they would reply research scientist in atmospheric science, or in meteorology, or in atmospheric chemistry, or in air pollution, or in extreme weather events such as thunderstorm and fire weather, or in climate. These are the specialty areas in which the CSIRO scientists did their university degrees and their later on-the-job training.

What are the consequences of reducing the number of scientists working in CSIRO *Oceans and Atmosphere*, bringing about a large reduction in the number of atmospheric and oceanographic scientists working across Australia? The answer is that the nation loses capability in the study of tropical cyclones, AND of the weather conditions leading to extreme fire disasters AND in the meteorology of floods, AND in storm surge events, AND in the relationship between El Niño and Australian rainfall, AND in droughts, AND in air pollution, AND in global sea level rise.

CSIRO researchers have a long tradition in studying these phenomenon. The Southern Oscillation Index or SOI now used to monitor El Niño activity and to forecast seasonal variations in rainfall, in tropical cyclones and in Australian wheat yield, was developed by a CSIRO researcher located at their Aspendale laboratories, back in the 1960's.

Australians have always lived in a land of weather and climate variations, a land of "droughts and flooding rains", and we have been served by a community of dedicated scientists doing public good research who study these phenomena. As international science in meteorology and oceanography progresses along with all sciences, it is important that we retain our scientific capability, and that we have experts at the cutting edge of knowledge of the science.

And yes, there are still many questions about how these phenomena will be affected by the changing climate. In the past 50 years rainfall has increased in North-western Australia, but decreased in Southern and eastern Australia. Are these changes permanent and a result of anthropogenic climate change, or are they examples of multidecadal variations in rainfall such as have occurred over past centuries in the absence of anthropogenic climate change? Will the number of tropical cyclones affecting Australia increase or decrease? Will droughts become more severe?

Clearly it is important that Australia retain a scientific capability in the study of the causes of long-term variations in rainfall, and in the mechanisms governing the annual number of tropical cyclones, and in the causes and severity of drought.

Modern early-warning systems and extreme weather alerts are possible only because of that long-term research. Few of us realise the enormous difference they have made to loss of life and property. When did you last hear of many lives lost from an Australian tropical cyclone or a shipwreck on the Australian coast? And yet both events were common in the past.

In summary, the very large reduction currently in process– over 140 research specialists - would mean a loss of capability in atmospheric and oceanographic science that extends far beyond the study of climate change. It is a loss of capability in measuring, observing, understanding, modelling and forecasting the weather and climate phenomena that govern both life and safety, as well as the economy of our nation. It represents a loss that the nation cannot afford.

AMOS strives to be completely politically neutral, but has a role as a credible, independent voice for the profession. This is an open letter and request to all major political parties. AMOS requests all current and forthcoming members of Federal Parliament to consider what is needed to build a resilient economy in the face of the challenges of severe weather, a highly variable climate, and the likely impacts of climate change. Australia critically needs a stable ongoing infrastructure for atmospheric and oceanographic monitoring, modelling, data management and prediction. AMOS urges all parties to commit to a stable staffing and resourcing structure (combined with the capacity for flexibility, innovation and the continuation of world-class expertise).

Australian Meteorological & Oceanographic Society

AMOS supports the national endeavour of pure and applied scientific research as well as meteorological and oceanographic services to the Australian community. These programs and services should include: effective monitoring and data collection, effective archiving and data management, quality and relevant research, support to our international obligations, and ability to continue converting research into services for the Australian community (including in air quality, weather and seasonal forecasting, and new longer-term forecasting where possible).

By Mary Voice, John McBride and Jeff Kingwell, representing the National Council of the Australian Meteorological and Oceanographic Society (AMOS)

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Photo credit: John McBride.

Response received from CSIRO

From: Alex.Wonhas@csiro.au [Alex.Wonhas@csiro.au]
Sent: Tuesday, June 21, 2016 8:37 AM
To: Mary Voice

Subject: RE: Meteorological research for Australia and the resulting services to Australians.

Dear Dr Voice and AMOS colleagues,

Dr Larry Marshall has referred your email to me as the Executive Director responsible for our environment, energy and resources work.

Thank you for your support of CSIRO. As you note, CSIRO is proud of the contribution we have made to climate science, a contribution which is acknowledged internationally.

Our ongoing commitment to climate research is shown in the announcement of the new Climate Science Centre (see link). The Centre will be based in Hobart and will focus on climate modelling and projections for Australia, underpinned by oceans and atmospheric observations, and drawing on both national and international research expertise. It will have a guaranteed research capability for 10 years with the foundation of the Centre being the equivalent of at least 40 full time CSIRO scientists. The Climate Science Centre provides a great opportunity to provide a long-term foundation for climate monitoring, modelling, adaptation and mitigation, and it will also serve to reassure our partners and collaborators that we are in climate science for the long haul.

It is worth noting that the loss of CSIRO capability in the climate area is of the order of 40 staff, not 140 as you state. CSIRO Oceans and Atmosphere will continue to employ around 100 scientists from the two research programs that currently focus on climate specific research. Furthermore, this is not all of CSIRO's climate research expertise, and although we are reducing some of the capabilities mentioned in your letter, we will retain capability to address most or all of the important scientific questions you raise. CSIRO will also continue to work closely with key partners such as the Bureau of Meteorology and universities through the new Climate Science Centre to address the climate questions of most importance to Australia and the region.

Thanks again for your support of CSIRO.

Best regards,
Alex

Dr Alex Wonhas
Executive Director Environment, Energy and Resources
CSIRO