



## COLLABORATION ON WEATHER & CLIMATE RESEARCH

ACCESS is Australia's national earth system science and climate modelling suite, targeted in the 2016 Draft Research Infrastructure Roadmap as critical infrastructure to deliver the next generation of prediction products for business, government, and environmental management.

ACCESS is a complex coupled-system model that comprises atmosphere, ocean, sea-ice, land, and other components—derived from the best of the UK, USA, France, and Australia to provide our national weather and climate prediction capability. The model's complexity comes from the vast span of time scales over which it has to work: from hours for extreme weather events (storms and bushfires), days for general weather prediction, months for seasonal prediction, decades for planning for environmental change, through to centuries and millennia for long-term climate change.

ACCESS is developed through a collaboration of the Bureau of Meteorology, CSIRO, the academic community through the ARC Centre of Excellence in Climate System Science, and NCI. NCI's role is critical, not only as the collaborative, integrated development platform, but also through its unique expertise in optimising the performance of key model components. Performance improvements of 30-40% and much higher code scalability (up to 20-fold improvements with some codes now exploiting up to 20,000 cores), enable greater operational efficiency and productivity for the Bureau with faster time to results, more accurate simulations that enable new scientific outcomes and insight, and much heightened prediction capability.

These contributions are world-leading, with the improvements being fed back into international systems through the UK Met Office and NOAA in the USA. In real terms, the outcomes are wide-ranging and include multi-billion dollar benefits for agriculture through more accurate seasonal prediction, the reduction of severe economic losses and the mitigation of dangers to public safety from extreme weather events, and the provision of essential tools and information systems for Australian policymakers.

### IMPACTED GOVERNMENT PORTFOLIOS:

Environment & Energy  
Agriculture & Water Resources  
Industry, Innovation & Science  
Infrastructure & Transport