

Senate Standing Committee on Economics
ANSWERS TO QUESTIONS ON NOTICE
Innovation, Industry, Science and Research Portfolio
Additional Estimates Hearing 2010-11
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AGENCY/DEPARTMENT: AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANISATION

TOPIC: Climate Change Research

REFERENCE: Written Question – Senator Colbeck

QUESTION No.: AI-58

Can you explain to us what work ANSTO performs in relation to climate change?

ANSWER

ANSTO uses nuclear-based dating techniques and analytical capabilities (through its ANTARES and STAR accelerators) to study past climate variability. This paleo-climate research is important in its own right. In addition, it provides a scientific basis to more accurately model and allow more robust predictions of future climate change. A summary of some of the research undertaken at ANSTO is as follows:

- Investigating the mechanisms of abrupt climate changes, such as the frequency and intensity of past El Niño-Southern Oscillation cycles, by analysing carbon-14 and stable isotopes contained in “natural archives”, such as sediments, corals, tree rings and stalactites and stalagmites in caves. This provides researchers with information on variations in atmospheric transport, ocean circulation, sea-surface temperatures and rainfall over the last 15,000 years.
- Investigating the growth rates of reef islands, such as those on the Great Barrier Reef, and changes in sea surface temperatures by analysing sediments of low-lying reef islands. This research provides further insight into environmental change in marine ecosystems, which is essential for their sustainable management.
- Developing long, continuous records of changes in the composition of the Earth's atmosphere by analysing atmospheric greenhouse gases, such as methane and carbon dioxide, contained in surface rocks and ice sheets, in areas such as Antarctica. This enables researchers to determine the chronology of glacial cycles in the southern hemisphere over the past 100,000 years and the stability of ice sheets.
- Investigating the frequency of large magnitude events such as cyclones and tsunamis in the Australian-Pacific region by analysing landform imprints, and providing age estimates.

Further information on the climate change research undertaken at ANSTO is available at ANSTO's website. This link is as follows:

http://www.ansto.gov.au/research/institute_of_environmental_research/science/isotopes_in_climate_change_and_atmospheric_systems