The Senate Standing Committee on Economics

Submission to :

"Inquiry into Australia's space science and industry sector"

from the

Australian Antarctic Division,

Department of the Environment, Water, Heritage and the Arts

"The current state of Australia's space science and industry sector, examining options to strengthen and expand Australia's position in fields that strongly align with space science and industry, giving consideration to any national strategic coordination requirements and taking into account findings and policy options of the National Innovation System review."

The Australian Antarctic Division (AAD) of the Department of the Environment, Water, Heritage and the Arts takes this opportunity to respond to the Inquiry from the viewpoint of Australia's Antarctic program. For six decades Australia has conducted a program of scientific research in east Antarctica and much of it has been in the fields of physics of the atmosphere above the stratosphere, and beyond it out into space. In the past 15 years the program has shifted its focus away from broad-spectrum science to focus on matters of high strategic importance to the Department of the Environment, Water, Heritage and the Arts. These concern natural resource management and environmental protection. The Antarctic research program contributes strongly to collaborative studies in high-latitude climate science with the CSIRO, the Bureau of Meteorology and a number of national and international partners. Australia's Antarctic science program is not funded for space science, despite the good astronomical observing conditions found in Antarctica. The AAD's comments to the Inquiry relate to opportunities to enhancing observations of Earth from space, and not to observation of space from Earth.

a) Australia's capabilities in space science, industry and education

Australia has a longstanding and excellent reputation in many aspects of space science. Australia is fortunate insofar as its territory stretches from close to the equator to inside the Antarctic circle and thus is able to obtain comparative research observations from a broad slice of the southern hemisphere. Australia operates three permanent stations in Antarctica, at Mawson, Davis and Casey. While there is a concentration of equipment for the study of the upper atmosphere and beyond at Davis, all stations have equipment which could be utilised more fully. In the event that Australia's space science initiatives obtain the required amount of support the Australian Antarctic program would be happy to assist with access to the facilities in Antarctica and with their development, subject to suitable arrangements being made regarding costs.

b) Arguments for and against expanded Australian activity in space science and industry.

Australia's responsibility for the management of 41% of Antarctica (the Australian Antarctic Territory) increasingly requires the use of remotely sensed data. As the Intergovernmental Panel on Climate Change points out in the 4th Assessment report (2007) knowledge about the ice sheet overlying Antarctica, and the continent's fringing sea ice is sketchy, and are significant sources of uncertainty in the predictive models. Undertaking the research needed into these aspects of the globe will require a mixture of people on the ground but, increasingly, remote sensing from space. It is necessary that satellites with sensors able to measure surface temperate and elevation of ice sheet and sea ice, as well as water surface temperature, elevation and colour, are deployed and maintained in service. Many existing satellites are not designed to view the South Pole and only observe small swathes of the continent as they pass on their way towards the northern hemisphere. Australia needs to take leadership in the various international forums where future satellite deployments are developed to ensure technical specifications enable coverage of Australia's Antarctic Territory. Lack of remotely sensed data about the changing Antarctic environment will inhibit and constrain adaptation to future sea level rise, and will inhibit strong Australian involvement in the construction of better future models of climate prediction. Broad-scale observations of changes in the biological productivity of the Southern Ocean require analyses of surface colour as a proxy for algal communities in the upper layers of water. Such instruments can, additionally, be used for surveillance of the Southern Ocean for the operation of illegal fishers.

Australia needs to be able to provide ground stations for the receipt and transfer of satellite data from new-generation satellites and for quite a small investment could play a significant role in handling satellite data from a large area of Antarctica. Such development could occur at Australia's Antarctic stations without increasing the footprint of human activity in Antarctica, and could run with minimal maintenance. The Australian Antarctic Division is happy to discuss the technical aspects of the location and operation of Antarctic land receiving stations.

Thank you for this opportunity to respond.