Comments on the potential to study cloud seeding and other human affects on precipitation in Australia

This submission is primarily in response to the background paper "Harvesting the skies," submitted by Mr. John Forrest MP, which discusses the potential of cloud seeding in Australia. In such light, this submission is relevant to aspects of the 2nd and 5th points of the terms of reference.

At the time of this writing, 111 submissions have been made to the Standing Committee on Agriculture, Fisheries and Forestry's inquiry into future water supplies for Australia's rural industries and communities. Submissions have been made discussing both the existing cloud seeding program in Tasmania and the potential of a cloud-seeding program over the Snowy Mountains.

The CSIRO and the Bureau of Meteorology have both made thorough submissions that address the 5th point of the terms of reference. Both submissions contain discussions on the scientific basis of cloud seeding. Both submissions highlight a statement from the World Meteorological Organisation on the Status of Weather Modification that discusses the limitations of cloud seeding. Both submissions also highlight a study undertaken by the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ, 1995) that outlines scientific guidelines necessary for undertaking future research into cloud seeding. This study identifies that operating under such guidelines would require a time period of years and considerable resources.

The Centre for Dynamical Meteorology and Oceanography* of Monash University readily accepts both of these submissions.

Moving forward from here, the CDMO would simply like to highlight the potential of the Cooperative Research Centre's (CRC) program of the Department of Education, Science & Training (DEST) for undertaking future research into clouds seeding and related topics. As stated on the CRC program homepage (http://www.crc.gov.au):

> The Cooperative Research Centres, generally known as CRCs, bring together researchers from universities, CSIRO and other government laboratories, and private industry or public sector agencies, in long-term collaborative arrangements, which support research and development and education activities that achieve real outcomes of national economic and social significance.
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> The program emphasises the importance of developing collaborative arrangements between researchers and between researchers and research users in the private and public sector in order to maximise the capture of the benefits of publicly funded research through an enhanced process of commercialisation or utilisation by the users of that research.

CRCs are designed to have a seven-year lifetime, which is ideal for meeting the guidelines set forth in the ARMCANZ study. The partnership between industry, universities and government laboratories allows for the research to respect both commercial interests and scientific integrity. Advocates of cloud seeding would be natural industry partners. It is conceivable that even environmental interests could be part of such a centre. Applications for new CRCs have been

called for on roughly a two-year cycle with the announcements of the latest round of successful applicants just announced this past week in December 2002. Please note that the successful bid for a Bushfire CRC has many similarities to what is being proposed here. Such a proposal would also clearly fall under the government's research priority of sustainability. No future round has been announced at this time, so there is time to plan in the event of a new call for proposals.

A properly designed CRC would provide world-class research on:

- the feasibility, viability and expense of cloud-seeding programs in the Snowy Mountains and other parts of Australia,
- the hypothesis that regional pollution has already been affecting precipitation,
- the potential downwind and secondary effects of cloud seeding,
- hail suppression and other weather modification techniques,
- implementation strategies to optimize the operation of the existing program at Hydro Tasmania.

The scientific, commercial, public communities are all served to a certain extent.

The Scientific Community would find that:

- A CRC would provide an opportunity to undertake world-class research of social importance.
- The research would be in partnership with industry and the broader community, rather than on a consulting basis.
- A CRC would provide funding stability for the duration of the project.

The Commercial Community would find that:

- A CRC would provide a operation plan with a set schedule and budget.
- The research would ultimately provide the information necessary for long-term strategic planning.
- The research would be substantially subsidized.
- It would be free of direct responsibility for the project.

The Rural Community would find that:

- Environmental concerns would be addressed.
- Stakeholders would have the opportunity to shape the science program from the outset and have open access to the research through the lifetime of the project.
- The project would have a fixed seven-year lifetime at which point any outstanding issues would have to be readdressed.

the Centre for Dynamical Meteorology and Oceanography

The CDMO is the focus within Monash University for research and teaching in the fields of atmospheric science and related topics in geophysical fluid dynamics.

- The CDMO promotes research within Monash University in the field of atmospheric science and related topics in geophysical fluid dynamics.
- The CDMO promotes collaboration with both national and international research centres of similar interests. In particular it maintains and enhances the strong links that exist with the Bureau of Meteorology Research Centre, the CSIRO Atmospheric Research and industry.
- The CDMO maintains a strong, internationally-recognised graduate program in the atmospheric sciences and related fields through PhD and MSc courses offered by the School of Mathematical Sciences and the School of Geography and Environmental Science.
- Members of the CDMO maintain and provide guidance for the undergraduate sequence of units in atmospheric science for the BSc, BSc (Honours), B Env Sc and B Env Sc (Honours) offered through the School of Mathematical Sciences and School of Geography and Environmental Science.
- The CDMO takes a leading role within the Australian academic community for the development of atmospheric science. The CDMO advances education in atmospheric sciences through interaction with the Australian Meteorology and Oceanography Society (AMOS).

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