

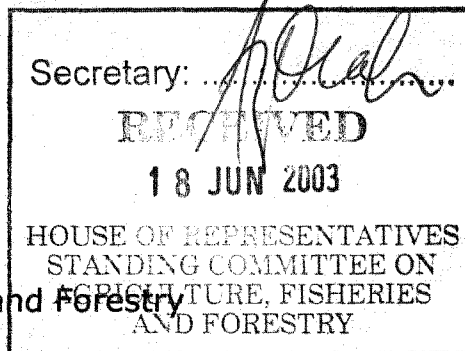
**Australian Management  
Consolidated Pty. Ltd.**

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17 June 2003

Committee Secretary  
House of Representatives  
Standing Committee on Agriculture, Fisheries and Forestry  
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Parliament House  
CANBERRA ACT 2600  
AUSTRALIA

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**SUPPLEMENTARY SUBMISSION TO THE STANDING COMMITTEE ON  
AGRICULTURE FISHERIES AND FORESTRY INTO FUTURE WATER  
SUPPLIES FOR AUSTRALIA'S RURAL INDUSTRIES AND  
COMMUNITIES**

On Friday 6 June 2003 Prof. Rosenfeld informed me that the World Meteorological Organization (WMO) has adopted his findings in their report to the United Nations and which I presented in Casablanca Morocco.

I enclosed for your information a copy of WMO report that serves as the policy guidelines for the executive council of the WMO and the United Nations for the next four years.

Please refer sections 3.3.5, and particularly 3.3.5.4. which is based on my presentation that I made on Prof. Rosenfeld's behalf in Casablanca, Morocco.

I believe that this document provides us with the support of the WMO and the UN in our dealings with Australian government concerning any disputes with the CSIRO or Bureau of Meteorology and gives the Australian government ability to approve weather modification as legitimate option to mitigate drought, hail and severe weather conditions in Australia.

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Yours faithfully,  
Australian Management Consolidated Pty. Ltd.

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Cg-XIV/PINK 3.3(2)  
(21.V.2003)

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ITEMS 3.3.1 to 3.3.5

Original: ENGLISH

**ATMOSPHERIC RESEARCH AND ENVIRONMENT PROGRAMME**

**Report to plenary on items 3.3.1 to 3.3.5**

*(Submitted by the Dr A.M. Noorian, chairperson of Committee B)*

**References:** Cg-XIV/Docs. 3.3(2), 3.3(2), CORR. 1 and B/WP 3.3(2)

**Appendix:** Draft text for inclusion in the general summary on item 3.3.

**ACTION PROPOSED**

It is recommended that the draft text in the Appendix be included in the general summary of the work of the session.

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**DRAFT TEXT FOR INCLUSION IN THE GENERAL SUMMARY OF Cg-XIV**

**3.3 ATMOSPHERIC RESEARCH AND ENVIRONMENT PROGRAMME (agenda item 3)**

**3.3.0 Atmospheric Research and Environment Programme: the report of the president of CAS (agenda item 3.3.0)**

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**3.3.1 Support to ozone and other environment-oriented conventions (agenda item 3.3.1)**

3.3.1.1 Congress recognized that the GAW programme had a prominent role to play in monitoring of global atmospheric composition. Through the GAW ozone network, WMO was providing unique and comprehensive continuous series of non-satellite ozone measurements available. Those data are essential for the detection of long-term trends in ozone and therefore was a major contributor to the Vienna Convention for the Protection of the Ozone Layer and its Montreal Protocol. Congress endorsed continuation and further development of that activity. Furthermore, it appreciated the leading role of WMO in periodic assessments of the state of the ozone layer such as the recently published *Scientific Assessment of Ozone Depletion: 2002* and for providing the annual series of *Antarctic Ozone Hole Bulletins*. Continued support by GAW of observations and analysis for UNFCCC and Climate Agenda activities is needed. Congress also recognized the important support provided by WMO to the Convention on Long-range Transboundary Air Pollution by co-chairing the Task Force on Measurements and Modelling of EMEP.

3.3.1.2 Congress welcomed the explicit mention in the *Strategy for the Implementation of the Global Atmosphere Watch Programme (2001-2007): A Contribution to the Implementation of the WMO Long-term Plan (GAW-142, WMO/TD-No. 1077)* of the need to expand the use of GAW data for, inter alia, scientific assessments. In that regard, the recognition of GAW as the key network for atmospheric composition measurements in the Global Climate Observing System (GCOS) was emphasised since GAW was global in scope and atmospheric chemistry data were critical to the assessment of climate change. Congress, also, urged CAS, in cooperation with relevant programmes and agencies, to investigate the possibility of conducting more periodic assessments for some of the greenhouse gases and aerosols. Such assessments would provide important information to both the IPCC and the Parties to the UNFCCC.

**3.3.2 Global Atmosphere Watch (agenda item 3.3.2)**

3.3.2.1 Congress expressed its satisfaction with the development of GAW, which was created in 1989 to encompass the existing WMO monitoring activities that focused on global issues of changing atmospheric composition. It noted that by strengthening the measurement network and by continuing to develop essential support facilities and training, WMO was positioned to contribute extensively to the implementation of the relevant parts of the Rio Declaration and Agenda 21, especially Chapter 9 - Protection of the atmosphere. Scientific advice was being provided by the GAW Scientific Advisory Groups. Congress especially acknowledged the global support facilities of GAW operated by Canada, Germany, Italy, Japan, Russia, Switzerland and the United States that maintained the GAW Station Information System, primary gas standards, measurement calibration, quality assurance/science activity and world data centres. Congress was pleased by the strong support provided by other Members in the development and maintenance of GAW activities. Congress urged all the Members operating GAW Global and Regional stations to submit data to the World Data Centres in a timely manner. Recognizing the critical need to maintain and develop atmospheric composition measurements in developing countries, Congress urged members to contribute to dedicated central Trust Funds through which their contributions could be focused on outstanding infrastructure problems in the global GAW network. A notable case was

the trust fund for Research and Systematic Observations relevant to the Vienna Convention established by the Parties to the Vienna Convention in 2003.

3.3.2.2 Congress noted that the scientific input to the debate on environmental issues must be derived from an adequate knowledge basis. That could only be achieved through high quality, strategically-oriented observations, and research related to the particular issues. That necessitated the maintenance and improvement of proper global environmental observing systems like GAW. Congress affirmed that GAW filled an important gap by ensuring systematic collection of atmospheric composition and related data worldwide, which was done according to comparable and clearly defined measuring criteria by promoting standardization, quality assurance and coordinated data processing and by facilitating the distribution and provision of available information to a varied group of users. It was noted that a key role of GAW was to promote capacity building for atmospheric composition measurements and modelling in developing countries. That complex international task, Congress acknowledged, was being addressed by WMO in collaboration with international organizations and the scientific community. In particular, Congress recognized the importance of the Brewer spectrophotometer component of the GAW global ozone and UV network and the urgent need for capacity building through training and the maintenance, calibration and upgrade of those instruments in developing countries similar to the current practices for the Dobson network. In that regard, Canada, as developer of the Brewer spectrophotometer and host of the GAW World Standard for Brewer measurements, was pleased to announce an annual contribution of US\$ 30,000 to a WMO Trust Fund dedicated to capacity building through training and the maintenance, calibration and upgrade of Brewer instruments in developing countries operating GAW stations. The WMO Secretariat was asked to coordinate the optimal use of those funds through its GAW programme and associated Scientific Advisory Groups and to encourage others to contribute to that fund. With respect to the request of Region I countries operating GAW Global stations, Congress recognized the importance of coordination of regional measurement activities facilitated by the Region and GAW. It urged that other regions consider the need for such coordination. Congress emphasized that the training and education needs for GAW participants from developing countries needed to be a continuing priority for GAW and extended its appreciation to the Government of Germany for its substantive support for the GAW Training and Education Centre and to the Czech Republic for conducting training in ozone measurements.

3.3.2.3 Congress recognized the lead role that GAW was playing in developing strategies for integrated non-satellite and satellite measurements systems for atmospheric composition in the context of the multiagency IGOS partnership. It also encouraged CAS to assist GAW in developing partnerships with space agencies for that important activity. Integrated data systems and the resulting chemical data sets were essential for the development and evaluation of atmospheric transport and climate models and for realizing the full potential of satellite observations in global trends detection.

3.3.2.4 Congress welcomed the close cooperation of GAW with the atmospheric sciences and environment protection communities both within and beyond NMHSs including many international, regional and national organizations and programmes such as EMEP, IAEA, IAMAS, IGAC, UNEP and WHO. The need for close cooperation and coordination of international activities was stressed in particular for such environmental issues as smoke and haze pollution resulting from biomass burning, urban pollution, persistent organic pollutants and other potentially toxic substances. It was the intent of GAW to increase the involvement of NMHSs in climate studies, for example, by encouraging GAW stations to be used as aerosols and chemical composition platforms for the Atmospheric Brown Cloud project, the goal of which was to reduce the uncertainty of natural and man-made aerosols and air pollutants in climate forcing.

3.3.2.5 Satisfaction was expressed by Congress with respect to continued GAW assistance and advice provided to address urgent environmental problems such as the transboundary transport of smoke and air pollution in south and south-east Asia and long-range atmospheric transport and deposition of pollution. GAW was encouraged to continue to provide its expertise to

existing and emerging environmental issues where possible. Continued GAW collaboration with established major chemistry precipitation deposition networks in North America, Europe and East Asia and the development of networks in areas with critical gaps in measurement was needed. CAS was encouraged to foster merging regional precipitation chemistry data sets into a global GAW database handled by the appropriate GAW World Data Centre and to make the data available through a central Web site.

3.3.2.6 Congress agreed that the urban component of GAW, the GAW Urban Research Meteorology and Environment (GURME) project, was viewed by members as an important undertaking by WMO. Congress noted the excellent progress made in the GURME pilot projects in Beijing and Moscow. It also noted that workshops had been held in China and Russia to determine the requirements of Member countries for development of the project. Those workshops resulted in guidelines for GURME. A workshop on Air Quality Forecasting was held in Malaysia followed by an experts workshop in Mexico (supported by the USA). Congress was pleased that training and technology transfer aspects and information exchange in operational and applied air quality forecasting capabilities had been addressed in GURME. Congress recognized the importance of including heat island studies in GURME and noted with satisfaction that the city projects had already begun to address that question. Congress recommended that forecasting workshops and pilot projects be continued in other parts of the world.

3.3.2.7 Congress was pleased that Australia and the United States had developed a prototype database containing results of a number of research campaigns relating to transport and dispersion of atmospheric pollutants. Those results would be of great interest to the modelling community in conducting both sensitivity and verification studies. Congress noted that the database had been provided to each Regional Specialized Meteorological Centre for Emergency Response.

### **3.3.3 World Weather Research Programme (*agenda item 3.3.3*)**

3.3.3.1 Congress noted with satisfaction the continued progress made in the programme, aimed at facilitating international action to improve forecasting of high impact weather in support of the operational meteorological community. It was noted that the programme focused on weather events where there was a good likelihood of garnering sufficient international resources and where such research would lead to a verifiable and significant outcome.

3.3.3.2 Congress was informed that both the WWRP Mesoscale Alpine Programme, whose objective was the understanding and prediction of intense weather in mountainous areas, and the Aircraft In-Flight Icing Project were successfully conducting research campaigns. Congress, aware that both those projects were addressing topics which affect the safety of human life, encouraged the international research teams in their efforts to develop societal applications of their work.

3.3.3.3 Congress noted with satisfaction the great success in the implementation of the WWRP Sydney 2000 Forecast Demonstration Project, and urged that further steps were taken for technology transfer to the operational community. Congress noted with satisfaction the efforts of the China Meteorological Administration to prepare a WWRP Forecast Demonstration Project in association with the 2008 Olympic Games in Beijing. The Sydney 2000 Forecast Demonstration Project team was encouraged to maintain continuous interaction with the planning efforts for the Beijing 2008 Forecast Demonstration Project.

3.3.3.4 Congress was pleased with the substantial progress made in developing the Mediterranean Experiment on Cyclones that Produce High Impact Weather in the Mediterranean, and urged active participation of Members in the region.

3.3.3.5 Congress considered that sand and dust storms could result in serious socio-economic dislocation in many arid and semi-arid regions of the world and, therefore, supported the organization of a multidisciplinary international symposium on sand and dust storms, to be held next year in Beijing, China with co-sponsorship of the China Meteorological Administration, WMO and other scientific organizations, and a WWRP workshop, focusing on development of coordinated research plans, to be held in conjunction with the symposium.

3.3.3.6 Congress noted with satisfaction the efforts made by the Meteorological Service of Morocco for research development and operational performance of its NWP system based on the ALADIN model. In that connection, Congress encouraged that further efforts for transfer of limited-area models to developing countries should be continued.

### **3.3.4 Tropical Meteorology Research Programme (agenda item 3.3.4)**

3.3.4.1 Congress noted the evident progress made in the programme since its last session. It recalled that the series of International Workshops on Tropical Cyclones had been a feature of WMO's Tropical Meteorology Research Programme for many years and had resulted in several publications as well as a forecast guide. Congress, therefore, was pleased to note that the fifth workshop in the series held in Cairns, Australia in December 2002, resulted in important recommendations addressed to WMO, research communities and practicing forecasters, thus the essential global and forecaster-researcher character of the series had been maintained.

3.3.4.2 With respect to the role of the Monsoon Activity Centres in New Delhi, Nairobi and Kuala Lumpur, Congress agreed with the CAS Working Group on Tropical Meteorology Research that those Centres should also serve as dissemination and coordination centres for NWP products relevant to monsoon forecasting, as well as data centres for ENSO and interannual variability studies in the region. Congress urged CAS to provide the necessary guidance and technical assistance to those Centres with their increased responsibilities.

3.3.4.3 Congress agreed with the recommendation of the Second International Workshop on Monsoon Studies (New Delhi, March 2001) that an ongoing Web-based training document should be developed in order to update forecasters on developments of direct relevance to monsoon forecasting.

3.3.4.4 Congress noted the increasing progress being made in the field of ensemble forecasting, and therefore encouraged further research in that field and its practical application through the implementation of LAM (Application of limited-area modelling to tropical countries) projects.

3.3.4.5 Congress recognized that great challenges existed for improving the prediction of landfalling tropical cyclones and welcomed the close collaboration between the WWRP and TMRP in developing an International Tropical Cyclone Landfall Programme, which would contribute to improving further safety and to reducing the economic losses of tropical cyclone affected countries.

3.3.4.6 Congress welcomed the Canadian initiative supported by CAS to hold the Second International Workshop on Extratropical Transition of Tropical Cyclones in Halifax, Canada, November 2003.

### **3.3.5 Programme on Physics and Chemistry of Clouds and Weather Modification Research (agenda item 3.3.5)**

3.3.5.1 Congress noted the outcomes of the different meetings, workshops and conferences organized in the programme and expressed its overall satisfaction for the systematic effort made by the programme in support of the continuous interest of many WMO Members in the areas for hail suppression and precipitation enhancement, as well as for improved parameterization of cloud

processes in weather forecasting models and for a better understanding of the behaviour of clouds in climate.

3.3.5.2 Congress was particularly pleased by the outcome of the Eighth WMO Scientific Conference on Weather Modification organized in Casablanca, in April 2003. The Conference demonstrated once again the very large interest in the subject, with more than 40 countries participating and reporting considerable achievements in weather modification. Congress was pleased to note the clear benefit of advanced technology and computers for those activities, thus allowing dramatic improvements in parameters in cloud observational capabilities and more complex modelling of clouds and mesoscale processes, leading to a sound scientific approach in planning of weather modification activities. The initiative led by Morocco for the launching of a Regional Precipitation Enhancement Project (PEP) in the North West part of Africa was endorsed and participating countries were encouraged to plan and execute according to the scientific requirements reflected in the WMO guidance.

3.3.5.3 Congress noted with appreciation that many WMO Members were conducting operational and research weather modification activities concerning precipitation enhancement and hail suppression. However, the need to conduct rigorous analyses of the results for international peer review was considered essential. Therefore, CAS was requested to review the criteria for assessing the success of weather modification experiments and in collaboration with IAMAS to redefine them based on recent advances in cloud microphysical measurements, application of statistics and scientific discussions which took place at the 8<sup>th</sup> WMO Scientific Weather Modification Conference in Casablanca.

3.3.5.4 Congress noted with concern the new additional evidence, also presented at the 8<sup>th</sup> WMO Scientific Conference on Weather Modification, that was pointing to an apparent substantial reduction of the rainfall efficiency of clouds by plumes of smoke caused by biomass burning (agricultural practices, forest fires, cooking and heating) and industrial processes. Congress also noted the evidence that such non-raining clouds could regain their raining ability once they moved over oceans or large bodies of water (such as the Aral Sea) because sea-salt was then mixed into the clouds and overrode the detrimental effect of the smoke particles. Therefore, Congress recommended CAS to establish an ad-hoc Group on Biomass Burning and Smoke Plumes in general, charge it to prepare a summary report for information of the Members, addressing relevant issues such as (1) the climatology of smoke and weather active aerosol (Cloud Condensation Nuclei or CCN) plumes, (2) the *in situ* and remote measurement of CCN and cloud droplet concentrations, (3) strategies to reduce biomass burning and hence the density of smoke plumes, and (4) the seeding procedures and evaluation methods to re-establish raining ability of clouds affected by smoke plumes, and CAS to report to Fifteenth Congress.

3.3.5.5 Congress noted with appreciation that in order to recognize, stimulate and award further scientific work, the Department of Water Resources Studies, Office of His Highness the President of the United Arab Emirates, had decided to provide the necessary funds for establishing an UAE Prize-for Excellence in Advancing the Science and Practice of Weather Modification in collaboration with WMO. This competitive Prize would be open for institutions, groups and/or individual scientists. It would be awarded in three categories, the First Prize US\$ 250,000, the Second Prize US\$ 200,000 and the Third Prize US\$ 150,000. At first, the Prize would be awarded at the end of 2004 and the Secretary-General was requested to arrange for the necessary collaboration.

3.3.5.6 Congress also noted with interest the outcome of the WMO International Workshop on Hygroscopic Seeding: Experimental Results, Physical Processes and Research Needs, jointly organized by WMO, NCAR and the Mexican State of Durango in Mexico (December 1999). Congress agreed that the better scientific understanding of the results obtained through hygroscopic seeding was a key to future improved precipitation enhancement experiments. Congress furthermore requested CAS to pursue its strategy to elucidate further the scientific questions associated with those techniques.



3.3.5.7 Congress was also pleased by the Secretary-General's initiative to examine the possibilities of European Union support to precipitation enhancement in the Mediterranean Basin, south-east Europe and the Middle East and recognized the potentially important contribution that any increase in precipitation could make to the region's water resources. It urged its Members and WMO to continue to play an active role in that long-term project. Congress urged NMHSs of the region to thoroughly examine available climatological and microphysical information for establishing feasibility for precipitation enhancement in advance of attempting weather modification experiments.

3.3.5.8 Congress noted with satisfaction that both the WMO Statement on the status of weather modification and the Guidelines for advice and assistance related to the planning of weather modification activities were revised by CAS and that the new versions were endorsed by the fifty-third session of the Executive Council.