

CONSULTATIVE SERVICES

The overall objective of the Consultative Services Program is to meet the need for effective application of meteorological information and expertise in the national interest through the provision of consultative services to specialised users.

The Consultative Services Program includes the provision of advice and the conduct of investigations involving the application of meteorology to such fields as agriculture, engineering, architecture, health, tourism, urban planning and design. Services are provided to Government and private users on a public interest, cost recovery or commercial basis, as appropriate. The Bureau Head Office in Melbourne coordinates the services but draws on expertise from throughout the Bureau. Most services are provided at the State level.

The services provided build on the Bureau's extensive climate and real-time databases and involve a degree of analysis and application of meteorological theory as well as professional judgement. During 1998-99 the services provided ranged from collaborative participation in air quality planning and management activities to advice on thermal comfort levels for work in specific climatic environments. Investigative studies were also undertaken for the benefit of transport system design and water supply planning and management.

The major strategies used in pursuit of the Program objectives during 1998-99 were:

- to maintain a core of expertise in areas of meteorological applications in addition to those for which routine services are provided, in order to respond to community need, for example in support of urban and building design and health; and
- to respond to demands for important tailored services and special studies on a public-interest or commercial basis.

The resources used by the Consultative Services Program are summarised in Table 3 and given in more detail in Table 10 compared with the actual resource in 1997-98 and the 1998-99 Budget and Budget plus Additional Estimates appropriations.

Program performance was assessed primarily through:

- the extent to which meteorological information and advice were extended to benefit new areas of application;
- the extent to which Government needs for advice in support of policy development were met and to which appropriate meteorological information was available to public organisations setting community standards in climate-sensitive sectors; and
- the revenue achieved from the provision of commercially-based consultative services.

Most of the work of the Consultative Services Program is project oriented and undertaken in response to specific requests by clients. Many short queries and requests for information on a range of topics were received from individuals, government departments and other organisations. The diversity of services provided shows the wide range of useful applications of meteorological science and information in virtually every sector of the economy. Program performance is assessed here through a review of major projects undertaken during 1998-99, grouped by general subject area.

Health and Safety

This year a collaborative study into the effects of climate variability on mortality was undertaken by several organisations, including the Bureau and the National Centre for Epidemiology and Population

Table 10. Consultative Services Program expenditure and revenue (\$'000) and staff level for 1998-99 together with the outcomes for 1997-98 and the 1998-99 Budget and Budget plus Additional Estimates appropriations.

<i>FINANCIAL</i>	ACTUAL EXPEND. & REV. 1997-98 (\$'000)	BUDGET 1998-99 (\$'000)	BUDGET & ADD. EST. 1998-99 (\$'000)	ACTUAL EXPEND. & REV. 1998-99 (\$'000)
Running Costs				
- Salaries	238	200	200	1,478
- Administrative Expenses	3,008			2,402
- Legal services				
- Property Operating Expenses				
- Current	29	180	180	182
- Capital	4	26	26	30
- Receipts credited under Section 31 of the FMA Act	#	5,920	5,920	#
RUNNING COSTS TOTAL	3,279	6,326	6,326	4,092
Program Costs (excluding Running Costs)				
Other Services				
- World Meteorological Organization Contribution				
- Compensation and Legal Expenses				
- Payment to AMSA				
Capital Works and Services				
- Acquisitions, Buildings and Works, Plant and Equipment				
- Commonwealth Bureau of Meteorology				
PROGRAM COSTS TOTAL				
TOTAL EXPENDITURE	3,279	6,326	6,326	4,092
Less Adjustments Affecting Outlays				
- Meteorological Services Recoverable	2			142
- Miscellaneous - Other	3			
- Receipts credited under Section 31 of FMA Act	3,622	5,920	5,920	2,783
TOTAL RECEIPTS TO CONSOLIDATED REVENUE FUND	3,627	5,920	5,920	2,925
OUTLAYS	(348)	406	406	1,167
STAFFING				
Staff Years (actual)				
- Funded from Salaries Appropriation	3.6			4.9
- Funded from Admin Expenses Approp.				
- Funded via Section 31 Receipts	15.9			18.5
TOTAL	19.5			23.4

Expenditure against Section 31 receipts is included in the expenditure shown for the Salaries and Administrative Expenses items where it is incurred. These Section 31 expenditures were, for 1997-98, \$1.061m (Salaries) and \$2.965m (Admin) and, for 1998-99, \$1.257m (Salaries) and \$2.258m (Admin).

Research at the Australian National University. The study found that death rates in the five biggest (that is, population more than 1 million) Australian cities rise during heat-waves and cold snaps, but that extremes of heat had greater impact than extremes of cold, and that weather-related deaths were highest in people over the age of 65. Changes in weather-related deaths over the next 30 years, estimated using climate-change scenarios developed by CSIRO Atmospheric Research, were found to be minor.

The requirement to perform work duties in an environment of thermal discomfort is an acknowledged occupational stress factor. Accordingly, the number of days above an agreed level of thermal discomfort is one of the criteria for payment of a District Allowance to public servants working in remote or thermally uncomfortable locations. A study of comfort aspects of the climate of Cocos Island was undertaken on behalf of the Royal Australian Navy this year, in order to provide them with a comparative rating against mainland climates. The results enabled the Navy to pay its workers an allowance which more accurately recompenses them for their conditions of employment.

To better define air conditioning requirements to establish and maintain comfortable working conditions, the Western Australian Regional Office this year provided analyses to a geographic consulting company showing the variation of thermal stress across that State.

Air quality is an important meteorology-related health issue which was the subject of project work in several Regional Offices this year. The Tasmania/Antarctica Regional Office continued its work to further improve the accuracy of its Launceston Air Quality Forecast Model, the aim of which is to facilitate improved air quality in Launceston during the high wood-burning months of winter. The South Australian Regional Office continued work on an

aerosol dispersion model, upgraded this year to enable users to run it on the latest PC operating systems, and assisted Airborne Research Australia in the detection of photochemical contaminants over urban areas, by providing both forecast advice and high-resolution vertical sounding data from Adelaide Airport.

The area in and around Perth (Western Australia) can be subject to serious air quality problems, associated with photochemical smog during the warmer months and particulate haze in winter. The latter is associated in part with smoke from wood heaters. As part of the Perth Air Quality Management Plan, being coordinated by the Western Australian Department of Environmental Protection, an Air Monitoring and Research Working Group has been set up to gain expert input to the development of a plan for the future management of Perth's air quality. This year the Western Australian Climate and Consultative Services (CCS) Section played an active role in the planning activities of this group.

Primary Industry

During 1998-99, considerable interaction took place between the Bureau and State agricultural agencies as well as with agricultural industry groups. Advice was provided on general weather and climate issues as well as on addressing specific industry issues (Figure 53).

In a study commissioned by the Western Australia Farmers' Federation, as part of a submission to the Federal Government for exceptional circumstances assistance, the Western Australian Regional Office investigated a severe frost event, of September 1998, which was "the worst in living memory" in some sites in the southern wheat belt of Western Australia, with significant crop losses recorded. The study found that several sites had registered their lowest September air temperatures since at least the 1950s.

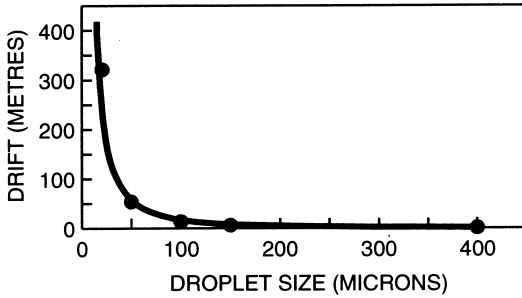


Figure 53. Relation between spray droplet size and drift, for droplets sprayed at 3m above the ground and at a speed of 5 km/h. This information from the South Australian Climate and Consultative Service Section assists local crop sprayers to more effectively target herbicide, insecticide and fungicide application.

Similarly, following a series of significant weather events affecting sugar and banana producers in north Queensland during 1997-98 and 1998-99, the Queensland Regional Office provided meteorological information to the Rural Development and Drought Services Section of the Department of Primary Industries for their submission to the Federal Government regarding exceptional circumstances assistance.

To improve understanding of weather and climate in the agricultural sector, staff of the Western Australia Regional Office and Agriculture Western Australia, conducted a one-day Weather and Climate Workshop at Merredin in the eastern wheat belt in April. The workshop covered a range of topics, including seasonal forecasting, understanding weather processes and systems, interpreting weather charts and satellite images and understanding and managing for seasonal variability. A booklet of notes from the workshop is to be published and follow-up workshops are planned for April 2000.

Urban Planning/Design, Building and Construction

Work continued on the City of Port Phillip's rooftop greening project, designed to improve the local climate and reduce stormwater runoff by installing rooftop gardens in the inner city suburbs. A study of the micro-climatic effect of placing a garden on the rooftop of a large building in South Melbourne was commenced.

Information about many aspects of wind speed measurement and quality control was provided to Standards Australia, who are preparing a joint Australia - New Zealand Standard for wind loads on buildings. Building Design Standards aim to ensure optimum building safety while avoiding unnecessary expense.

The Bureau contributed to the administration of the WMO/International Society of Biometeorology-sponsored International Conferences on Urban Climatology and Biometeorology, to be held jointly in Sydney in November 1999. The conferences will discuss ways to improve human welfare through the judicious application of weather and climate information, and are being organised by Macquarie University in association with the Bureau and the Universities of Sydney, Newcastle, New South Wales and Queensland.

Transport and Communications

The Consultative Services Program conducted several studies in support of transport and communications operations during 1998-99.

To assist the Antarctic Division and other parts of the Department in the assess-

ment of potential aircraft landing sites near Australian Antarctic bases, the Bureau undertook an analysis of climate data such as low cloud, visibility and wind, at-site and en-route, and determined the frequency with which these meteorological elements exceeded limiting adverse levels.

To aid in the design of replacement roads and bridges for the town of Katherine following the 1998 flood, the Northern Territory CCS Section analysed the river heights and rainfall intensities associated with this and prior floods on the Katherine River, with particular reference to the average annual recurrence intervals of these events. This is an important input to developing effective repair and replacement strategies for infrastructure following severe weather events.

In support of plans to launch small rockets from the Woomera Rocket Range for the deployment of communication satellites, Bureau staff at the South Australian Regional Office provided advice on the best means of obtaining high resolution vertical soundings of the atmosphere, and agreed to supply observation support and tailored weather forecasts for the launches.

Water Supply Management

To assist local water management and agricultural agencies in the southwest of Western Australia with operational planning decisions, the Western Australian CCS Section provided information regarding prospects for rainfall over the 1999 winter season. A study was also completed for the Water and Rivers Commission of Western Australia, of the rain-producing mechanisms at work during 17 individual months in the past 90 years, identified by the

Commission as being associated with high rainfalls in the southwest.

Education and Promotion

As in previous years, the Climate and Consultative Services Sections in each Regional Office, in support of their role with respect to education in, and promotion of, the use of meteorological information, gave many talks to community organisations and industry groups during 1998-99. As well, papers were presented at conferences, interviews were provided to the media and lectures and workshops were provided to tertiary and mature-age students. Input was also provided to a book for farmers on managing climate variability and displays illustrating the links between climate and public health were created.

A large volume of educational material about climate and its impacts was added to the Bureau's World Wide Web site this year, including information about the various ways in which climates can be described or classified, climate advice and thermal safety tips for tourists and a page directed at students, to help them to research weather and climate topics.

The Western Australian Climate and Consultative Services Section, as part of a larger study of declining rainfall in the southwest of Western Australia, prepared a poster entitled *An updated look at aspects of rainfall trends and variability in the southwest of Western Australia*, for presentation at two fora. The poster provided details of changes in the average rainfall over the region from 1910 to 1998, and illustrated aspects of the rainfall variability within that period at selected sites (Figure 54).

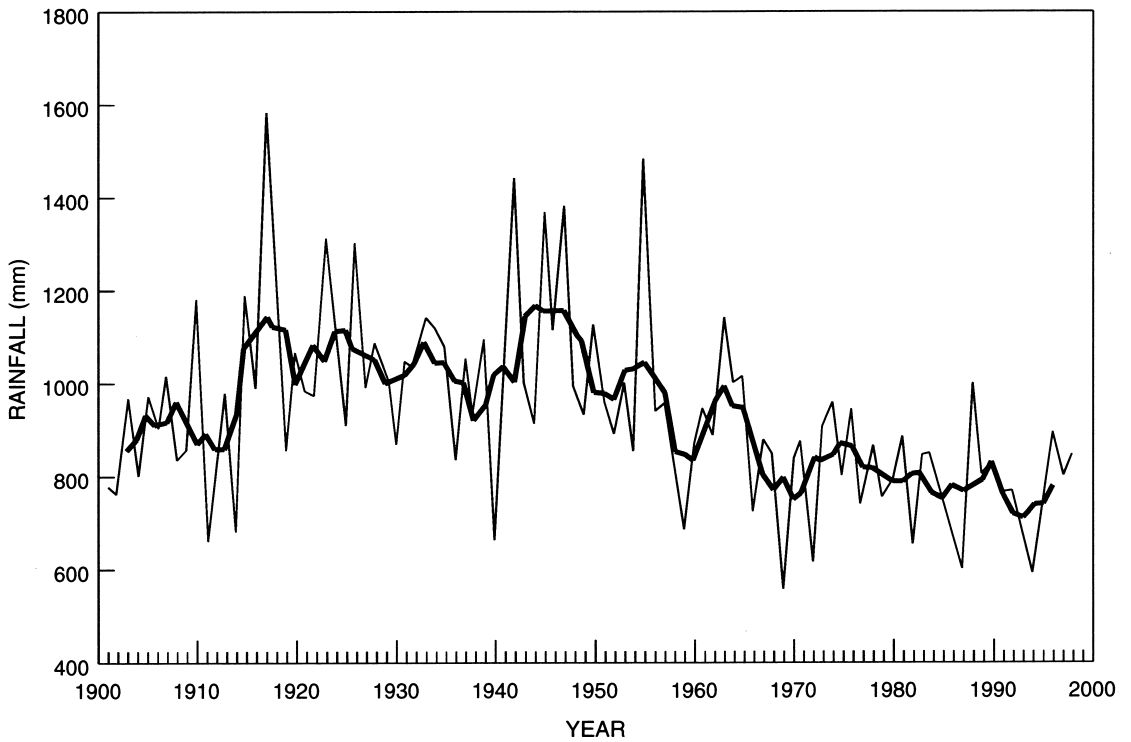


Figure 54. Annual rainfall (mm) near Manjimup in the far southwest of Western Australia, from 1901 to 1998, showing a decreasing trend over the last 30 years. The heavy trace is a five-year running mean.