

## **Climate Monitoring and Data Interpretation Division Scientific Highlights in 1998/99**

The philosophy of the Climate Monitoring and Data Interpretation Division is to:

1. Ask the right questions about climate variability and change.
2. Assemble and build the appropriate information (homogeneous datasets).
3. Conduct Analyses leading to Understanding and Answers.

1998/99 was particularly satisfying to researchers in the Division because the first two steps have been completed for several questions and datasets. The preparation of homogeneous datasets appropriate for climate variability and change studies has been a laborious, time consuming and unrewarding exercise, but completion of several data rehabilitation projects created the opportunity to begin the more interesting analysis phase in a number of projects.

Rehabilitated and homogeneous temperature and precipitation time series for the best stations in the Canadian climate network were used to create a century long time series of mapped/gridded data for all of Canada. Deep borehole temperatures and tree ring information were used as proxies for climate information to extend the temperature records for portions of Canada back into the 16<sup>th</sup> century. Appropriate global NCEP Reanalysis datasets of both surface and upper air atmospheric fields were assembled. All of these excellent datasets were then used to document and improve our understanding of past climate variations and change both for Canada and within the global context.

Spatial patterns for Canada of trends in annual and seasonal temperature and precipitation were defined for the twentieth century using a trend analysis technique which accounts for any autocorrelation in the data. Trends in both the magnitude and frequency of heavy rainfall events in Canada were also documented. Trends in both temperature and precipitation tended to be upward over the 20<sup>th</sup> century but it was found that Canada has not gotten hotter, it has gotten less cold. There were identifiable regional and seasonal changes in precipitation extremes but no indisputable evidence of changes on the national and annual scales. The climatology of global winds and waves, emphasizing extremes and their trends over the last half of the century, was studied. The effects of ocean temperature teleconnections and atmospheric circulation regimes on prairie growing season precipitation, Canadian forest fires and the climate of eastern Canada were all examined. Proxy and historical climate data were used to develop a postulate that some of the warming observed in western Canada can be attributed to land-use change. Results for all of these projects were presented at various conferences or workshops and papers are either complete or in final stages of preparation.

The Division's attention to detail in historic data rehabilitation and timely monitoring of current conditions across Canada, allowed us to authoritatively put the record-breaking 1998 in proper perspective through the internet based Climate Trends and Variations Bulletin. The country's warmest year generated lots of media interest and interviews and saw our maps and graphs appear in newspapers and magazines across the nation.