

## 125 Years of Weather Services

by Morley Thomas

It is ironic, perhaps, that in this celebration of weather services, to reveal that the man who started the Meteorological Service did not want to provide a service, at least for some time. Professor George Templeman Kingston, director of the Toronto Observatory, asked for and was given \$5,000 in 1871 to organize a network of climate observing stations. He wished to begin work on a research scheme in which he would collect the observations and study the weather patterns. He thought this research would take him several years to complete and only after the weather patterns had been determined would he attempt to issue storm warnings.

But the Deputy Minister of Marine and Fisheries, who had obtained the money for him, "suggested" that he begin cooperating with the Americans who had just begun an operational storm warning system. And so it was that observers in Montreal, Saint John and Halifax were put on the payroll in July 1871; more observers were taken on in 1872 and a data exchange was begun with the Americans who provided some storm warnings for Canada for a few years. By 1876, the Toronto Central Office was producing general forecasts and storm warnings for the populated areas of Eastern Canada. And, with observations from his network of stations, the director also began a climate data service for government, the private sector and the general public.

During the 1880s, the Meteorological Service expanded across the country with the railway and settlement. By the turn of the century, daily weather forecasts were issued from Toronto for just about all of settled Canada west to the Rockies while a Victoria office issued forecasts for southern British Columbia. There were now more than 100 storm warning agents who, when so instructed, hoisted drums or baskets on poles near ports and harbours to warn of approaching storms. Forecasts were sent to newspapers, posted at railroad stations and post offices and in some parts of the country even displayed on the outside of trains. And, in 1883, the Meteorological Service became responsible for providing, by telegraph on a daily basis, a national time service. This had been provided locally at several eastern cities where there were observatories capable of determining exact time by the transit of stars. The Toronto Central Office was to coordinate this service for more than 50 years.

By the time of the Great War, the Service had about 50 full-time employees; 35 of these were at the Central Office and one or more at each of Victoria, Edmonton, Moose Jaw, Winnipeg, Quebec City, Saint John and Halifax. At most of these offices, and at Montreal, where McGill University received an annual grant for the work, climate data, weather forecasts and the correct time were provided to the public. Seismological observations were made at Victoria and Toronto and an earthquake information service was provided in British Columbia.

The Meteorological Service was not considered essential during the Great War and lost people and resources. After the war, there was significant demand for more services and an office was set up in the Winnipeg Grain Exchange to serve the grain trade. A start was made in distributing public weather forecasts by radio. In the mid-1920s, forestry officials became enthused over the possibility that forecasts of humidity and thunderstorms might be of great value in forest fire protection work. For a few years it looked as if the needs of forestry would necessitate an expansion of the Meteorological Service but the foresters became increasingly disappointed with the meteorological forecasts and the program was relegated to a minor role by 1930.

Aviation had made some demands for service during the early 1920s but the Meteorological Service had neither a mandate to provide special aviation services nor the resources to do so. By the late 1920s political pressure brought a grant of \$30,000 for service to aviation and, for two or three years, much attention was given to serving the needs of an experimental airship program designed for "Empire bonding," that is for the transport of people and mail between Britain and the Empire. The R-100 made a successful flight to Canada in the summer of 1930 and then the Meteorological Service turned to setting up an airmail weather service on both the Prairies and in eastern Canada. A dozen or so airport weather observing offices were put in place and it was proposed to put two meteorologists in an aviation forecast office at Winnipeg. But the worsening Depression forced the Post Office to cancel the airmail contracts and the Service had to close the new airport offices by 1932 and discharge the airport observers.

Then, during the mid-1930s, the Meteorological Service had a little time to prepare for the demands from aviation they knew would come when the economy improved. In 1936, a new Department of Transport was organized with an Air Services Branch that included the Meteorological Service, renamed the Meteorological Division. A few years earlier, a graduate degree course in meteorology had been established with the University of Toronto and graduates of this course were now hired to staff new aviation forecast offices at Vancouver, Winnipeg, Montreal and Toronto. At about the same time as Trans-Canada Airlines was beginning scheduled flights across the country, the Meteorological Service began to forecast for experimental flying boat flights across the north Atlantic. Based at Botwood and then Gander, Newfoundland, meteorologists developed new techniques and methods to provide a forecast service over an ocean from which there were very few weather reports. By Labour Day 1939, about 37 of the 50 or so meteorologists in the country were employed in aviation meteorology.

World War II brought an unprecedented demand for aviation meteorology. Canada agreed to host the British Commonwealth Air Training Plan, a program in which the RCAF produced 130,000 air-crew within five years or so. Most of the aircrew trainees required instruction in meteorology as well as forecasts for flying training. Forecasting and weather briefing services were also essential to the safety of crews and the effectiveness of operational missions and the ferrying of aircraft over the Atlantic. To meet these needs, the Meteorological Division hired and trained over 370 college graduates and seconded most of them to the RCAF as civilian Meteorological Officers. Some received advanced training and went to the Aviation Forecast Offices and to the transatlantic forecast offices. The number of these forecast offices grew from four to seventeen in wartime and there were as many as sixty-six meteorological offices at RCAF training and operational bases.

Late in the war the need for military aviation meteorology decreased rapidly and two-thirds of the wartime meteorologists departed. But civilian needs for service began to rapidly increase and fortunately, the economy and politics of the day allowed the Meteorological Division to grow. The regional aviation forecasters took over public and marine weather forecasting, city offices were opened and special services were provided for radio and TV interests. Numerical weather

prediction methods were developed, a Central Analysis Office was opened and, by the mid-1960s, a new forecasting system was in place involving CAO (later called the Canadian Meteorological Centre), several Weather Centrals and many Weather Offices. In addition, the Meteorological Service provided more than 100 meteorologists to the Armed Forces, to continue a policy called the Single Service System. As research provided better numerical models, increasing computer power allowed the computer to take over much of the analysis and forecasting work.

After being overshadowed by operational weather services for some time, climate and applied meteorology services responded to public needs and expanded markedly after the war. Punched cards and then computers allowed an improved and expanded climate data service and a secondment policy was introduced under which the Service loaned meteorologists to such other organizations as Agriculture, Forestry, and the National Research Council to work in the various fields of applied meteorology and climatology (another example of the Single Service System). Then, as a result of national concerns over disastrous floods, increasing air pollution problems, and development of resources in the Arctic, a headquarters staff of service specialists was established. This culminated 25 or so years ago as regional staffs were built up to provide many of these scientific services. Also, during the late 1950s, the Service was given responsibility for a program of aerial ice reconnaissance and ice forecasting to support cold weather shipping.

Then, 25 years ago, in 1971, the Meteorological Branch (by this time briefly called the Canadian Weather Service) moved from Transport to a new Environment Canada and became the Atmospheric Environment Service. The traditional services were maintained at the same time as the scope and mandate of the Service was greatly enlarged and a research program in air quality and related sectors was expanded. Six years ago, the Green Plan was introduced and AES began to expand its research service to support departmental issues and initiatives in such sectors as toxic chemicals, smog, global warming or climate change, ozone depletion and acid rain. And more recently the AES developed and began to issue daily forecasts of the UV Index.

In the most recent decade, such essential environmental services as public, aviation, and marine weather forecasting and ice information and forecasting services have been maintained

although significant rationalization and downsizing have taken place. In other areas, government policy has caused a shift of responsibility for delivering services in applied meteorology and responsibility for delivering services in applied meteorology and climatology; cost recovery is now very important and the private sector has more opportunities than it ever had before.

Weather forecasts, climate information, and applied meteorological and related services have proved to be of great value to Canadians over the past 125 years. This is most unlikely to change and so a national service must remain at the heart of the weather service sector regardless of who actually provides the services to the users.

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Source: "*Celebrating 125 Years of Weather Services to Canadians*," paper given on October 2, 1996, while celebrating the 125<sup>th</sup> Anniversary in Downsview, Ontario.

About the author: Having published several articles on different aspects of the climate of Canada and two books on the history of meteorology in Canada, Morley Thomas is now Fellow of the American and Royal Meteorological Societies, Life Member of the Canadian Meteorological and Oceanographic Society which he has served on the national executive 1950-51, 1964-70 and as President in 1968-1970. He has been awarded the Patterson Medal in 1980 and the Massey Medal in 1985.

Quelques mots sur l'auteur: Après avoir publié plusieurs articles sur les différents aspects du climat au Canada ainsi que deux livres sur l'histoire de la météorologie au Canada, Morley Thomas est présentement "Fellow of the American and Royal Meteorological Societies", membre à vie de la Société canadienne de météorologie et d'océanographie dont il fut le président en 1968-1970 après avoir servi sur le conseil exécutif de 1950-51 et de 1964-70. Pour son travail, il a mérité les médailles Patterson (1980) et Massey (1985).