CANADIAN FORESTRY SERVICE - ANNUAL REPORT TO THE EXPERT COMMITTEE ON AGROMETEOROLOGY, NOVEMBER 1-2, 1984

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A M.Sc. thesis on "Tamarack (Larix laricina) as a biological indicator of wind" was completed by A. Robertson. A report by K. P. Lim was published entitled "Cumulative degree-days for estimating peak occurrence of fourth instar larvae of the spruce budworm (Info. Rept. N-X-217). This study used a threshold of 5.5°C from 1 April and the peak occurred at approximately 204 degree-days. The study to correlate tree ring patterns to years of fire history and intensive drought in red pine continues, and a Ph.D. thesis on the subject is near completion.

Development of an energy balance measurement system for climatic studies of energy plantations in Newfoundland. This work is funded under ENFOR (Energy from the Forest) P-172 contract to Dr. J. H. McCaughey, Queen's University, Kingston, to develop a system for studying the energy balance of short-rotation willow plantations.

A new study has been initiated to study comparative wind and forest growth relationships in Britain, Iceland and insular Newfoundland. The objectives are to study the effects of wind on forest management and policy considerations on three large islands. Specific wind-related phenomena to be studied include the dynamical aspects of wave-regeneration in a coastal plain balsam fir. stand; variability in forest productivity in upland plantations in Britain and Iceland; and the impact of wind in thinned natural stands and plantations.

Maritimes Forest Research Centre, Fredericton

A report was published containing the climatic data used in a study to delineate climatic regions of New Brunswick (Info. Rept. M-X146) and a paper describing the methods has been published in the Canadian Journal of Forest Research. Plans are underway to carry out similar studies of climatic data for Nova Scotia and Prince Edward Island.

Laurentian Forest Research Centre, Ste. Foy

No update of activities is available.

CFS Headquarters, Ottawa

A fourth edition of "Tables for the Canadian Forest Fire Weather Index System" (Forestry Technical Report 25, 1984) was published. This edition incorporates new changes in both the Fine Fuel Moisture Code (FFMC) and the Initial Spread Index (ISI). It also has improved layout of tables, and a set of relative humidity tables for three ranges of station elevation.

Petawawa National Forest Institute, Chalk River

Temperature profiles at three locations in a frost hollow are measured in order to ascertain the conditions leading to damage to red pine forests.

Wind is being measured in an open field site at an automatic weather station reporting by satellite. This wind is compared to wind profiles measured at a permanent forest site and at a site on sloping terrain. Wind is measured 6 m above the forest at seven locations across a sharp valley. Although the data are used to test numerical wind models, their accumulation over several seasons provides a unique climatological record.

Cloud-to-ground lightning in the vicinity of three LLP sensors located around Maniwaki, P.Q., is being located and the data, together with forest fuel moisture and fire occurrence data are being stored.

An X-band radar is being installed at Maniwaki for precipitation estimates over the Outouais region.

Precipitation estimates from the X-band radar at Maniwaki, the S-band radar at Carp, Ontario, the C-band radar at Saint Anne de Bellevue, and the Rainsat program will be tested in 1985 using a network of 16 automated raingauges.

An interactive computer program has been prepared and is available for computing solar radiation in a clear-cut strip (or in the open) as a function of location, time, slope, cloudiness, atmospheric turbidity, and orientation and width of the strip.

M. Flannigan is currently on educational leave at Colorado State University where his thesis topic is "Monitoring and Identification of Forest Fires using the NOAA-series Satellites". This involves a case study of fires for the June 10-22, 1982 period for the Slave Lake Forest Region in North-central Alberta, using a multi-spectral approach.

Great Lakes Forest Research Centre, Sault Ste. Marie

Projects reported previously are on-going.

Forest Pest Management Institute, Sault Ste. Marie

The Icewater Creek study continues. This is primarily a biological study on songbird and terrestrial and aquatic arthropod populations in and around a small creek. Meteorological measurements are made through an automatic weather station, which records windspeed direction, and air temperature at 10 m, barometric pressure, R/H, solar radiation and creek water temperature at 1 min. intervals, and precipitation over 1/2 hr. intervals.

Northern Forest Research Centre, Edmonton

A paper is under review on climatic variation in the three subregions of the boreal forest in western Canada during the last hundred years. Work continues on analyzing the growing season climate for pine and spruce seedlings on four clearcut blocks in the Hinton area.

Two papers under review from our hydrology section are of interest. 1) Patch-clearing aspen from rangelands in south-western Alberta increases soil water content. 2) The hydrologic effects of timber harvest at Marmot Creek and Streeter Basins, Alberta. The first refers to studies in the Porcupine Hills area, while the latter is a review type paper which summarizes several studies on the two experimental basins since their establishment in the early 1960's. Some studies continue on Marmot Creek, but other than some reporting are completed for Streeter. A report on the winter climate, especially snow conditions of the Marmot Basin (Mt. Allen), the Calgary 1988 Winter Olympics ski site, is under preparation. A report is ready for review of the passive microwave method for measuring snow accumulation.

Four plots were established at the James River microclimate study site to sample forested, 1, 3 and 5 H diameter clearings to follow N-S, E-W transects of soil moisture, soil temperature, wind speed, solar radiation, air temperature and relative humidity. This will provide data to develop theoretical and/or empirical relations between microclimatic parameters, transpiration and evapotranspiration for use in hydrologic land use models. In January 1985 snowpack ablation will be followed at the site.

A new study looking at drainage of wetlands in the forested areas of Alberta to enhance tree growth for commercial production is being initiated. This will concentrate on hydrologic characteristics of drained areas.

Several manuscripts are in review covering the areas of colorimetric detection of the effects of early onset of frost damage, frost damage and ice nucleating agents, and frost hardiness of overwintered containerized seedlings.

Three discussion papers were prepared for the Forestry Working Group subcommittee to CECSS (Canada Expert Committee on Soil Survey) for possible inclusion in the Handbook of National Guidelines for Soil Interpretations for Forestry. The topics covered were windthrow, flooding and frost hazard.

A presentation on Climate and Forestry in the North, a summary of which was subsequently published, was given at the CCP Meeting on Northern Climate in Whitehorse in April 1984.

A report is nearing completion on the forest fire environment of Pukaskwa National Park. A paper was presented at the 7th Conference on Fire and Forest Meteorology (pp. 38-46) documenting the environmental conditions associated with a "blowup fire" in east-central Alberta during the 1980 fire season. A new two-year PRUF study under the guidance of Dr. E. R. Reinelt, U. of Alberta, is entitled "Climatology of atmospheric conditions related to extreme forest fire behavior in west-central and northern Canada", was initiated this summer.

A system for rating fire danger in the provincial parks of Alberta's prairie region was developed that relies on the Fine Fuel Moisture Code and Initial Spread Index of the Canadian Forest Weather Index System and an assessment of the herbaceous vegetation condition. Dew-point temperature tables for fire weather stations are currently being prepared for publication.

Pacific Forest Research Centre, Victoria

The prototype UHF telemetry system for automatic weather stations has been delivered by the contractor, Forest Technology Systems of Victoria, B. C. Tests by PFRC indicated satisfactory performance, although some minor modifications would improve performance.

A chapter on influences of forests on the hydrologic cycle is being prepared by Dr. E. Hetherington for a book on Canadian water resources and is sponsored by the Rawson Foundation.

All climate stations for the fertilization on snow project have now been closed.

Water balance aspects are now being emphasized in the Shawnigan Lake Project. This project is examining the effects of fertilization and thinning on growth. Tree water stress, soil water potential, precipitation interception, stemflow, and the usual climate variables are some of the factors being studied. FORINTEK began analysing ring density and radial increment in relation to climate variables.

Dr. T. Trofymow will be testing soil temperature and moisture models at Shawnigan Lake for his study on litter decomposition.

The Bark Beetle Dispersal Study again utilized the two 33 metre tower installations for collecting supporting climate data. Tests were also run on the Campbell Scientific sonic heat flux system and various programs on the CR7 data logger. Lightning, gusty winds, and an abnormally late development of bark beetles were some of the problems encountered.

Additional data for the Inland Spruce Cone Rust Study was gathered last spring. Unreliable humidity sensors prompted the development of a psychrometer which has performed satisfactorily in field installations.

Expert Committee on Agrometeorology

MINUTES TWENTY-SIXTH ANNUAL MEETING

November 1-2, 1984
Ottawa, Ontario

Comité d'experts sur l'agrométéorologie

PROCÈS-VERBAUX VINGT-SIXIÈME RÉUNION ANNUELLE

1-2 novembre 1984
Ottawa (Ontario)

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