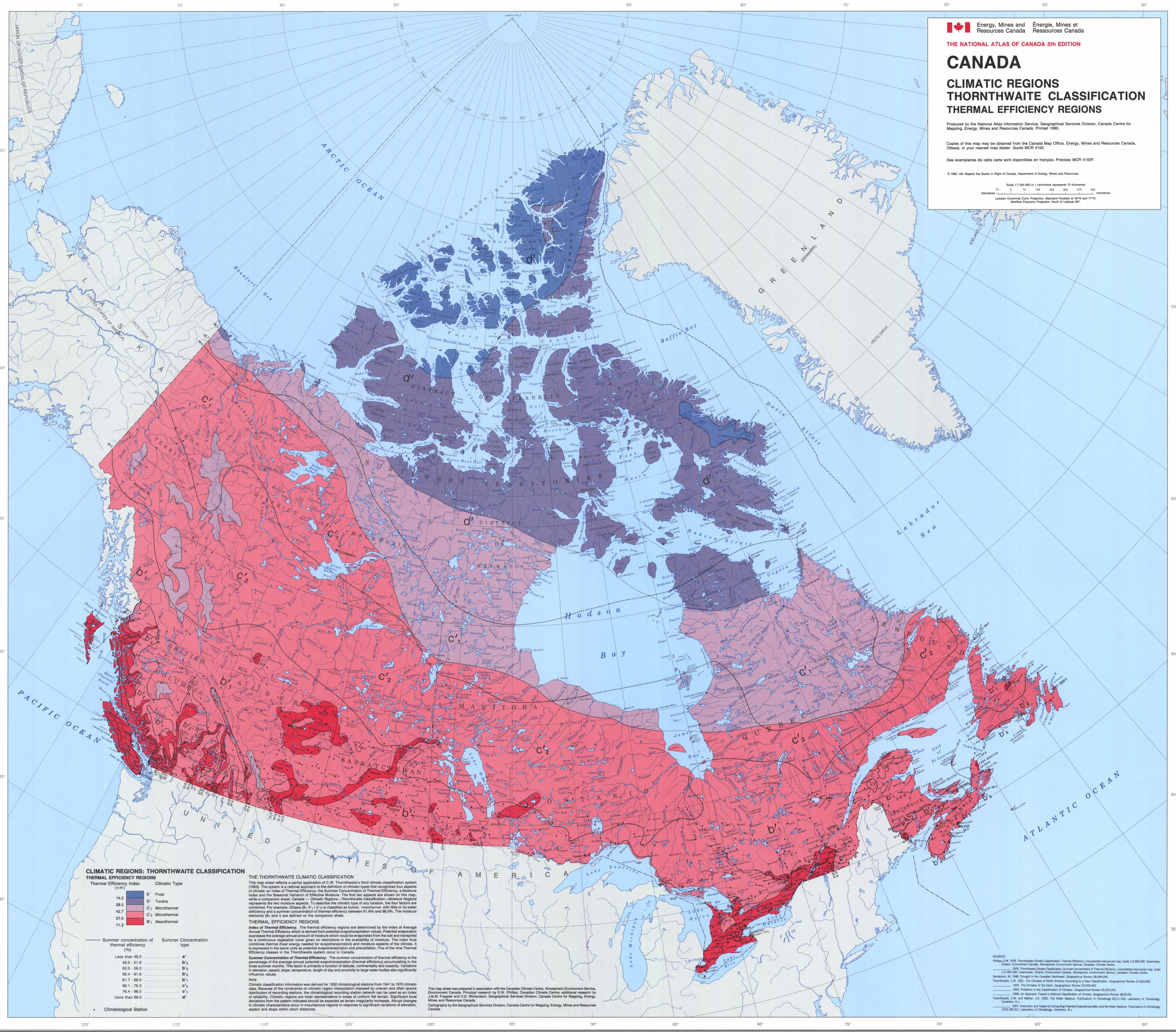
 Energy, Mines and Resources Canada / Énergie, Mines et Ressources Canada
THE NATIONAL ATLAS OF CANADA 5th EDITION
CANADA
CLIMATIC REGIONS
THORNTHWAITE CLASSIFICATION
THERMAL EFFICIENCY REGIONS
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 Scale 1:7 500 000 or 1 centimetre represents 75 kilometres
 Kilometers 0 75 150 225 300 375 450
 Miles 0 47 93 140 187 234 281 328 375 422 469
 Lambert Conformal Conic Projection, Standard Parallels at 49°N and 77°N, Modified Polyconic Projection, North of Latitude 80°



CLIMATIC REGIONS: THORNTHWAITE CLASSIFICATION

THERMAL EFFICIENCY REGIONS

Thermal Efficiency Index (cm)	Climatic Type
14.2	E ⁺ Frost
28.5	D ⁺ Tundra
42.7	C ¹ Microthermal
57.0	C ² Microthermal
71.2	B ¹ Mesothermal

Summer concentration of thermal efficiency (%)	Summer Concentration type
Less than 48.0	a ⁷
48.0 - 51.9	b ⁴
52.0 - 56.3	b ³
56.4 - 61.6	b ²
61.7 - 68.0	b ¹
68.1 - 76.9	c ¹
76.4 - 88.0	c ²
more than 88.0	d ¹

• Climatological Station

THE THORNTHWAITE CLIMATIC CLASSIFICATION

This map sheet reflects a partial application of C.W. Thornthwaite's third climate classification system (1955). The system is a rational approach to the definition of climatic types that recognizes four aspects of climate: an Index of Thermal Efficiency, the Summer Concentration of Thermal Efficiency, a Moisture Index and the Seasonal Variation of Effective Moisture. The first two aspects are shown on this map, while a companion sheet, Canada - Climate Regions - Thornthwaite Classification - Moisture Regions represents the two moisture aspects. To describe the climatic type of any location, the four factors are combined. For example, Ottawa (B¹, b¹, c¹) is classified as humid, mesothermal with little or no water deficiency and a summer concentration of thermal efficiency between 61.6% and 68.0%. The moisture elements (B¹ and b¹) are defined on the companion sheet.

THERMAL EFFICIENCY REGIONS

Index of Thermal Efficiency. The thermal efficiency regions are determined by the Index of Average Annual Thermal Efficiency which is derived from potential evapotranspiration values. Potential evaporation expresses the average annual amount of moisture which could be evaporated from the soil and transferred by a continuous vegetation cover given no restrictions in the availability of moisture. The index thus combines thermal (heat energy needed for evapotranspiration) and moisture aspects of the climate. It is expressed in the same units as potential evapotranspiration and precipitation. Five of the nine Thermal Efficiency classes in the Thornthwaite system occur in Canada.

Summer Concentration of Thermal Efficiency. The summer concentration of thermal efficiency is the percentage of the average annual potential evapotranspiration (thermal efficiency) accumulating in the three summer months. This factor is primarily a function of latitude, continentality and oceanity. Variations in elevation, aspect, slope, temperature, length of day and proximity to large water bodies also significantly influence values.

Note: Climatic classification information was derived for 1250 climatological stations from 1941 to 1970 climatic data. Because of the constraints on climatic region interpolation imposed by uneven and often sparse distribution of recording stations, the climatological recording station network can be used as an index of reliability. Climatic regions are most representative in areas of uniform flat terrain. Significant local deviations from the pattern indicated should be expected as terrain irregularity increases. Abrupt changes in climatic characteristics occur in mountainous regions in response to significant variations of elevation, aspect and slope within short distances.

This map sheet was prepared in association with the Canadian Climate Centre, Atmospheric Environment Service, Environment Canada. Principal research by G.W. Phillips, Canadian Climate Centre, additional research by J.M.M. Froggier and D.E. Richardson, Geographical Services Division, Canada Centre for Mapping, Energy, Mines and Resources Canada.
 Cartography by the Geographical Services Division, Canada Centre for Mapping, Energy, Mines and Resources Canada.

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