

NORTHERN RESEARCH BASINS

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Summary Report and Recommendations
of the Workshop Symposium on Northern Research Basins
(Edefors, Sweden, 7–11 April 1975)

“For Better Use of Land & Water Resources in Northern Environments”

Following recommendations of a preliminary meeting in Calgary, Canada, in February 1974 between representatives of the IHD Committees of Canada, USA and Sweden, and discussions at the Unesco House in Paris, France, in September 1974 between representatives of the IHD Committees of Canada, USA, Finland, Norway and Sweden, a Workshop Symposium on *Northern Research Basins – Objectives and Measurements* was organized at Edefors, Sweden, 7–11 April 1975.

The meeting was convened jointly by the Swedish IHD Committee and the Swedish Meteorological and Hydrological Institute and organized by the Swedish Meteorological and Hydrological Institute. It was held close to the Lapträsket Research Basin.

Participation in the workshop was arranged through the National IHD Committees of the participating countries: Canada, USA, Norway, Finland, the Soviet Union and Sweden.

CONCLUSIONS AND RECOMMENDATIONS

NORTHERN RESEARCH BASINS

An adequate understanding of hydrological conditions is necessary for the rational development of northern regions. Up to now, the study of northern

hydrology has been greatly neglected. An important means of improving our knowledge of northern hydrology is full utilization of and collaboration in Northern Research Basin research programs.

A Northern Research Basin is a catchment where snow, ice and frozen ground have a dominant role in the hydrologic regime.

OBJECTIVES

Recommendation 1: Objectives of Northern Research Basin studies should be – to gain a better understanding of hydrologic processes, particularly those in which snow, ice and frozen ground have a major influence on the hydrologic regime, and to determine the relative importance of each component of the water balance;

– to provide data for the development and testing of transposable models which may be applied to regional, national and international water and land resource programmes;

– to provide opportunities and facilities for

a) professional and technical training and

b) co-operative interagency activities and interdisciplinary research;

– to assess and predict the effects of Man's activities on the hydrologic regime in Northern Environments;

– to develop, test and compare instrumentation and measurement techniques for use in northern regions; and

– to provide information for improving network design in northern regions.

Recommendation 2: The studies should be interdisciplinary involving co-ordinated participation by individuals from universities and government or other agencies, and they should be comprehensive and serve multipurpose functions, needs and requirements.

When studies having the same objectives are undertaken by different countries in Northern Research Basins, the standardization of collection and tabulation of information should be encouraged.

INSTRUMENTATION AND MEASUREMENT TECHNIQUES

Recommendation 3: Hydrometeorologic instruments should be properly calibrated, following standard accepted procedures and practices (for example as detailed in Unesco and WMO guide books).

Recommendation 4: An error analysis should be performed on the data, following standard accepted procedures and practices.

Recommendation 5: Participating countries should exchange instruments, in particular precipitation gauges for the measurement of solid precipitation, to allow objective comparisons of data and results. The exchange of hydrological instruments should be arranged through National IHP Committees or other appropriate entities.

Recommendation 6: Work should be accelerated on the application and development of techniques for using point measurements to derive a spatial estimate. Special emphasis should be directed to areal measurements of snow cover, allowing for factors such as slope, aspect and type of cover.

Recommendation 7: The use of remote sensing techniques (e.g. gamma radiation) for measurements on an areal basis of hydrometeorological parameters should be encouraged. There should be an interchange of information on the type of equipment, methods of survey, accuracy of equipment and problems which have been encountered.

Recommendation 8: Specific attention should be directed to problems of hydrologic measurements in seasonally or perennially frozen ground.

MODELS

Recommendation 9: Models should be used in the study of hydrologic systems and phenomena. These models should be process-oriented, based on physical concepts and laws.

Recommendation 10: The models should be transposable and designed to support regional, national and international water and land resource programs.

Recommendation 11: Maximum use should be made of synoptic and forecast meteorological data to improve the performance of hydrologic models.

EXCHANGE OF DATA AND COOPERATION

Recommendation 12: A mechanism for the exchange of personnel – technicians, scientists, research officers and other personnel – among participating countries should be encouraged through the National IHP Committees.

Recommendation 13: The exchange of information on a regular basis should be encouraged. The manner of information transfer should be in the form of technical notes, research papers etc. with special emphasis given to technological advances in measurement and analytical techniques and methods. English summaries or abstracts including conclusion should be provided.

Recommendation 14: When exchanging data they should be published according to WMO, Unesco/IHP, work guidelines and additional information on such aspects as equipment, measurement, procedures, resolution, continuity, restrictions, and other pertinent details which will assist in the interpretation of the data, should be provided.

Recommendation 15: International organizations such as WMO, Unesco, IUGG, IAHS should be encouraged to include special sessions or workshops on Northern Basin Research as part of their main program.

ACTION REQUESTS

Recommendation 16: A project concerned with a problem important to all participating countries should be established in the initial stages of the Northern Research Basin Program. The primary objective of this project should be to stimulate mutual cooperation and participation of countries in such aspects as: program planning, data requirements, collection and tabulation of data, other matters. It is suggested that the evaluation of snow accumulation and ablation models may serve this purpose.

Recommendation 17: Participating countries should encourage their respective National IHP Committees to promote research activities concerned with northern hydrologic problems.

Recommendation 18: Participating countries in the Northern Research Basin Program should request that their National Committees for the International Hydrological Program (IHP) establish a Regional IHP Working Group on Northern Research Basins.

Recommendation 19: Meetings of members of countries participating in the Northern Research Basin Program should be held at regular intervals, with the next meeting to be held in 1977 in North America, with a specified main theme.

Recommendation 20: An *ad hoc* committee consisting of 3 to 4 members from participating countries should be established to make plans for the next meeting in 1977, to draft a Northern Research Basin Program, and to arrange for the establishment of the proposed Regional IHP Working Group on Northern Research Basins.

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