

## Canadian Hydrology Symposium: 77-Floods

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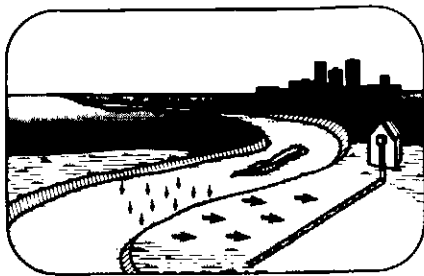
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## Canadian Hydrology Symposium: 77-Floods

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The subject of floods and the reduction of damage from floods has been receiving increased attention for a number of years and the second Canadian Hydrology Symposium was designed to bring together people dealing with all aspects of floods from the scientific study and prediction to the administrative and legal problems of dealing with the results.

CHS: 77-Floods was held in Edmonton, August 29-31, 1977. The 143 participants represented provincial agencies and institutions (65), federal agencies (33), university and educational institutes (23), consultants and private organizations (17), and one each from Thailand and Australia. They represented interest such as Ducks Unlimited, Emergency Planning, Conservation Authorities, research, administration and management from municipal to international, and consultants, in fields covering water resources, forestry, agriculture, wildlife and people.

Papers presented during the first half of Monday morning plenary sessions described a variety of floods varying from glacier outburst floods to specific flood events from various areas of Canada and the problem of evaporative loss from snow in Alberta. The second half of the session related floods to the people and discussed how people were warned and how they could be involved in avoiding damage from floods by describing the various government

activities relating to reduced flood damage or reacting to flood events.

Monday afternoon was devoted to workshop sessions where 13 groups each involving as broad a mix of disciplines as possible addressed a number of general questions and presented the results at a plenary session. The complete results will be reported in the published proceedings but the following summary indicates the breadth of discussion.

### 1. What is or should be government responsibility with regard to floods?

The government has and should assume responsibility to protect public health, to minimize the danger to life and property and to lessen the damage and financial burdens imposed on the community at large by discouraging developments in flood zones through "discinatives" and by encouraging education and involvement of the public in making decisions.

### 2. Should compensation be paid for flood damages or not? Why?

Yes, but it should discourage development in flood zones by being paid only to those outside designated flood risk areas, those inside that preceeded designation and those inside who had approved flood proofing.

### 3. How can public awareness of the flood problem be improved?

Through education by a well planned education campaign involving school programs, public hearings and local displays, to increase knowledge of the flood problem and of the regulations designed to discourage improper development in problem areas.

### 4. How can the effectiveness of flood forecasting and warning be improved?

There should be better defined and regular methods of getting information to the news media and the public. Forecasts should be in simple words related to local landmarks and previous floods that the public can relate to. More basic data should be immediately available.

### 5. How can design flood criteria be improved?

Since the major problems are in remote areas more effective data networks should be established. In all areas design floods should be those with a

return period such that the difference between benefits and costs is maximized. It was emphasized that these should include direct and indirect benefits and costs on some common basis even though the political and emotional climate can change the values drastically.

### 6. What is the scientist's responsibility with regard to floods?

Scientists should assume responsibility to communicate knowledge in practical terms both up the chain of command and to the public and should do this at the various levels of job responsibility, professional responsibility and moral responsibility.

### 7. Is the latest research on floods being applied, if not, why not?

Research results are not fully utilized except in some large projects where they have been shown to be cost-effect. They are not used because of a communication gap between researcher and practioner, largely due to a failure to stress practical application in published research.

Discussion at the following plenary session centered primarily on the seemingly conservative methods of designing for the probable maximum flood where possibly the situation did not merit use of the technique. In most cases, the concept of the probable maximum is utilized where there is a possibility of loss of life. This led to the question of how to place a value on human life which basically is the ultimate value being considered. It was suggested that this was being done indirectly by insurance companies, armed forces, highway designers and others, but because of the social implications no one wanted to state it directly.

Tuesday morning papers dealt with a number of flood situations concentrating on the application of modelling techniques for forecasting and for design purposes in ungauged areas. Tuesday afternoon workshops were larger and were looking at what is most needed to advance the science in five areas of interest. The results of each session were presented in a single short statement. The needs in the five areas were stated as:

1. Physical character of floods - more work should be directed to: the antecedent conditions of floods; the role of

"singular events" in flooding; and floods on very small watersheds.

2. Statistical character of floods - more emphasis should be placed on application of existing methods rather than the development of new methods. This would include: developing standard techniques for various features of statistical analysis; investigating the significance of splitting records as to causes of floods and their recombination; more research of other events that cause floods such as ice jams; evaluation of other sources of flood information, for instance historical records, environmental evidence, etc.; and the extension of regional analysis techniques.

3. Criteria for design floods - there is a need to attach monetary values to the intangibles (environment, human life, etc.) to allow determination of design floods based on economic optimization.

4. Forecasting of floods - while it is perhaps obvious that improved meteorological forecasts and increased real time data are required for improved flood forecasting, it was felt that insufficient attention has been given to the dissemination of the forecast product and the development of emergency measures to adequately cope with the situation.

5. Response to floods - there is a need to ensure realization by government agencies and the general public of the need to avoid flood damages to the extent possible, primarily by non-structural means, and to be better prepared to react to unavoidable situations more quickly and effectively.

Wednesday morning papers described a number of specific cases and methodologies and concluded with a paper on drought in the prairie environment which emphasized that droughts, like floods, were not unusual extreme events and because they covered greater areas they affected more people and required probably more planning and preparation to reduce their impact on people than is required for floods.

The Symposium ended with a general discussion that was almost entirely devoted to answering a sixth question that was perceived as a pervading question throughout the course of the symposium. That is, "There is a perceived need to evaluate and apply available technology and research, rather than more research per se. How can this best be accomplished?"

The consensus was that some mechanism had to be found to put more emphasis on applying available techniques and ensuring that current research can be readily translated into a form that can be used in practice. A start in this direction might be to establish a current "Canadian Code of Practice" for flood design as had been done in other countries. Flood related research would still be essential to improve on existing methods.

After the meeting a number of people commented that they had not heard much that was "new". Similar comments are frequently heard after scientific meetings and imply that perhaps such meetings are not worth the effort. I wonder if the truth is that science moves forward mostly by slow increments, and that perhaps information exchange at such meetings is better than we think.

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