



## Assessment and Perception of Flood Risk: Risk Perception, Communication, and Partnerships in the Red River Basin



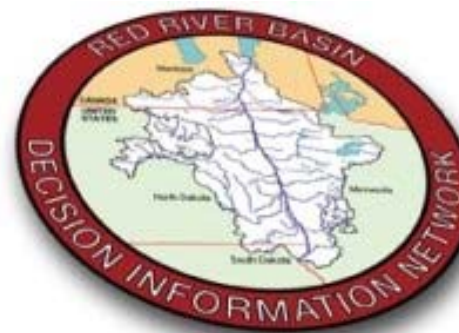
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ICLR 'Water and Disasters' International Workshop - Dec. 14<sup>th</sup>, 2004



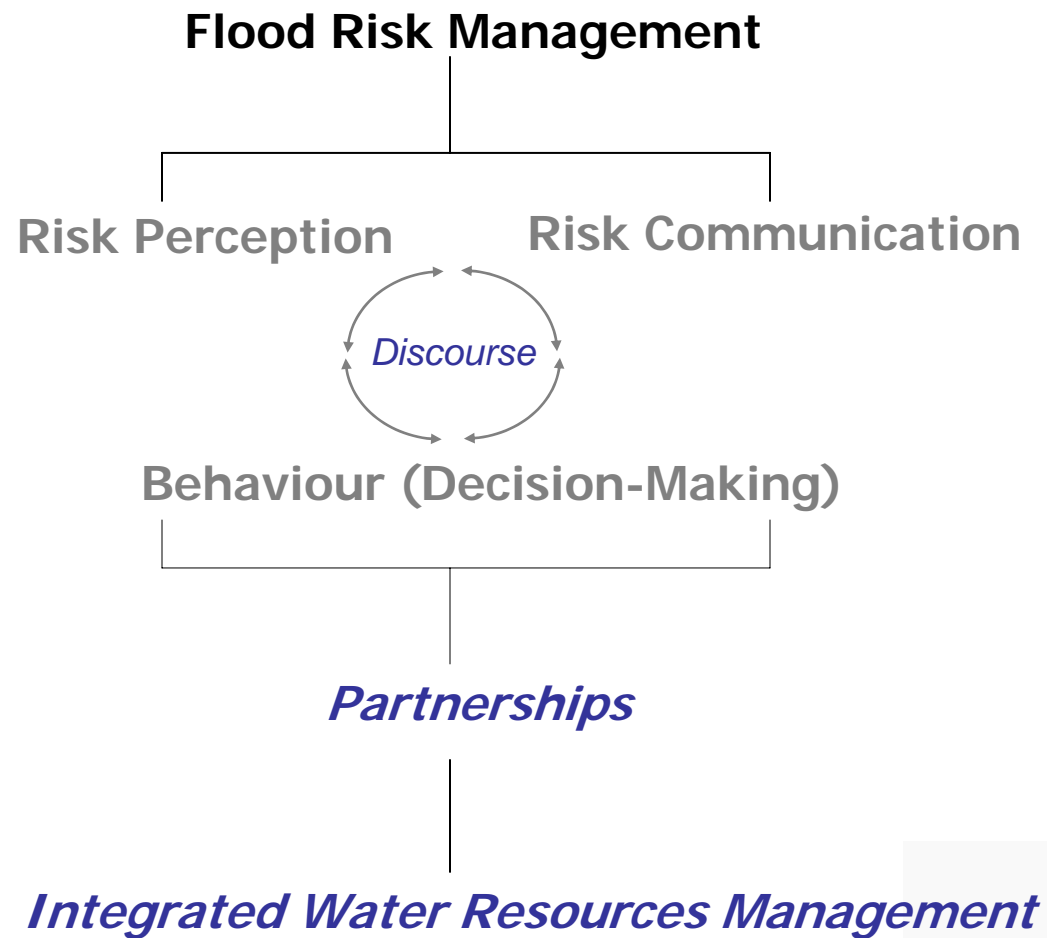
## Focus for Risk Perception, Communication, and Partnerships in Flood and Floodplain Management

- IJC Recommendations
- Lack of social science dimensions
- The need for a Decision Support System for social and integrative data
- Policy needs





## Objectives





## Methodology

Multi-phased approach:

1. Face-to-Face Interviews (Issue Generation)
2. Mail-out Iterative Delphi Survey (2 Rounds)



### Research Timeline: July 2003 - April 2004

- Issue Generation	74 Interviews
- Delphi Survey #1	62 Surveys Returned
- Delphi Survey #2	45 Surveys Returned
- Workshop	Multi-Stakeholder discussion

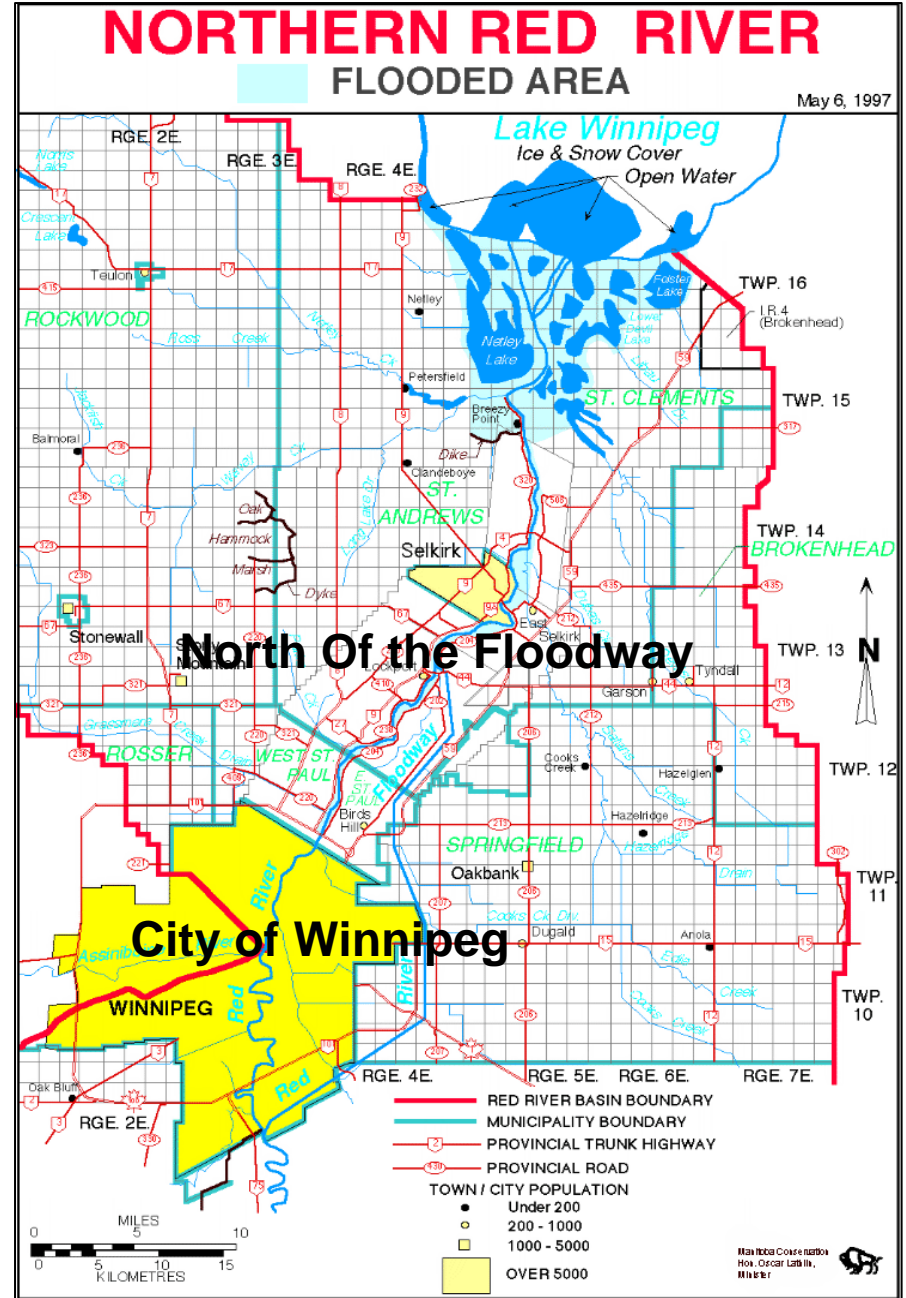
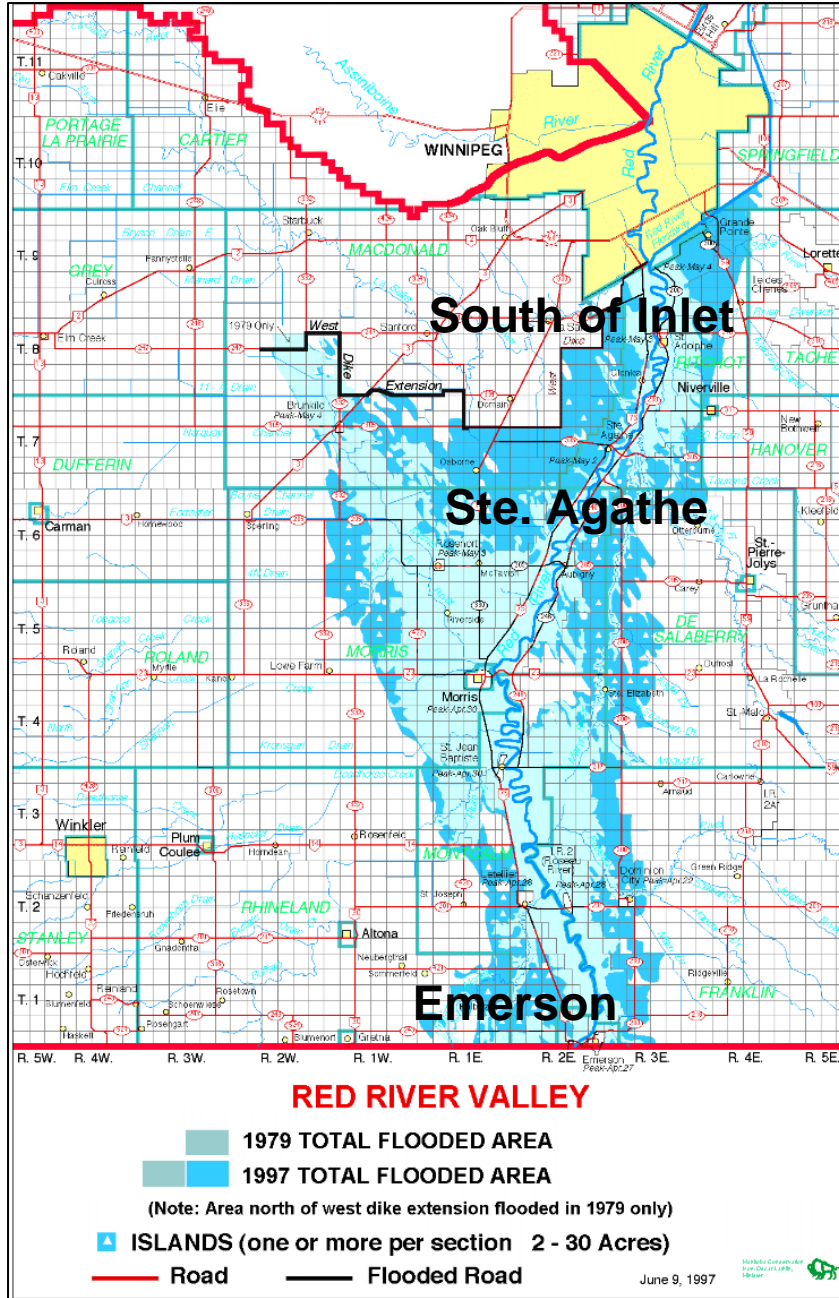


## Geographical Stratification of Interviews

<b><u>Flood Area Residents</u></b>	<b>45</b>
City of Winnipeg	15
North of Floodway Outlet	10
South of the Floodway Inlet to the International Border	20
<b><u>Non-Flood Area Residents</u></b>	<b>10</b>
<b><u>Institutional Representatives</u></b>	<b>19</b>
Senior Government	6
Local Government	4
Academic	4
Non-government and Community-Based Organizations	5

**TOTAL RESPONDENTS = 74**

# Respondent Stratification





# Floodplain Management Issues







## Floodplain Management

### Issue #1

Current floodplain management decisions are focused on structural measures and flood control, and dominated by political and economic criteria (i.e. cost-benefit analysis)







## Floodplain Management

### **Residents Outside Winnipeg: Issue #1**

- Social vulnerability and community capacity
- Attachment to place (identity)
- Aesthetic and environmental values

### **Residents of Winnipeg: Issue #1**

- A need for more structural intervention
- Current proposals are being delayed unnecessarily (i.e. Floodway Expansion).





## Floodplain Management

### **Institutional Respondents: Issue #1**

- Cost-effective management does not benefit all of the public
- There is a need to develop broad standards for the social costs of flooding
- Recognize how each community contributes to the province, and discuss management within this understanding





## Floodplain Management

### Issue #2

A majority of respondents felt that policies for floodplain management should seek adaptive strategies





## Floodplain Management

### **Institutional Representatives: Issue #2**

- Land-use planning, zoning and 'buy-outs'
- Responsibility is given to municipalities

### **Residents South of Winnipeg: Issue #2**

- Policies are not adaptive as they overlook local land-use, livelihoods and lifestyles
- Adaptive policies should encourage people to 'learn to live with the river'





## Floodplain Management

### Issue #3

Respondents identified that community vulnerability is unique as a result of diverse resources and coping capacities







## Floodplain Management

- **Majority of all Respondents: Issue #3**

Floodplain management and land-use planning must integrate local knowledge and community involvement into risk reduction





# Risk Perception

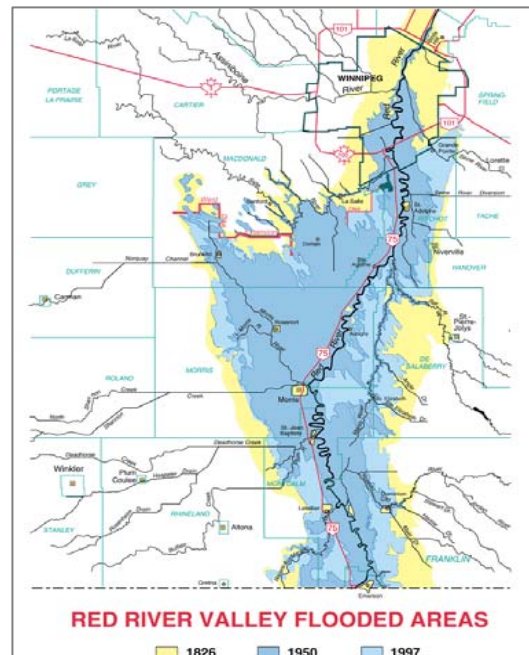






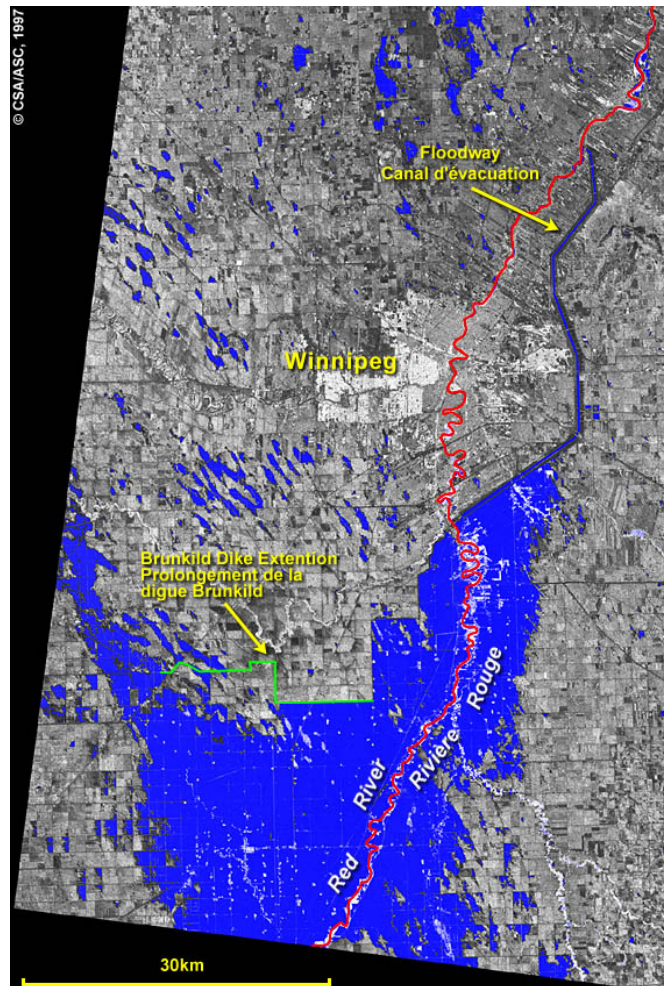
## Risk Perception and Uncertainty

- Uncertainty results from a lack of communication
- Uncertainty amplifies residents' perceptions of flood-risk
  - *"We felt secure at 1997+2, but now with the West Dike being raised we feel less secure"* (respondent X)
  - *"With Floodway Expansion our flood protection will be useless"* (respondent X)





## Risk Perception influences from Structural Mitigation Focus

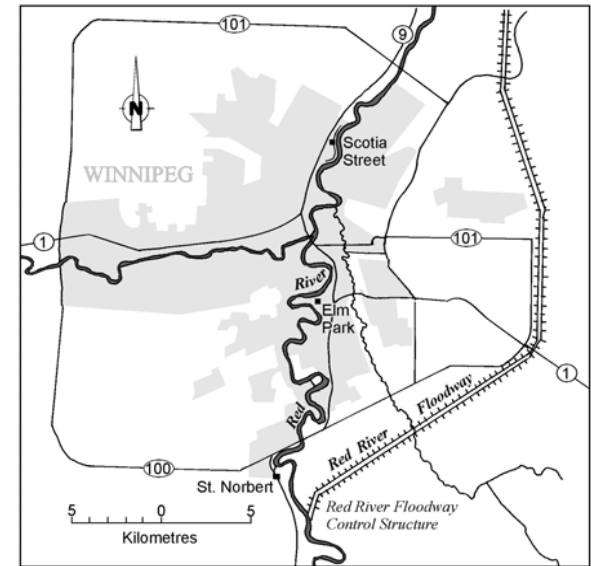


- Flood control works, such as the Floodway, have attenuated perceptions of flood-risk within the City of Winnipeg
  - *"I'm not concerned when I hear predictions, if a 1997+2 level flood is coming I wouldn't move my stuff out because it is not worthwhile [...] I'll rely on the Floodway"* (respondent X)





## Risk Perception and Government Roles and Responsibilities





## Risk Communication





## Risk Communication

- Lack of understanding of scientific information
  - statistical estimations of flood magnitude and frequency

*“During an event, local communities receive information that is too technical and complex in nature. This requires attention so that local communities receive relevant and useable information regarding all hazards and emergencies.”*

- Varied outcome of recovery and mitigation programs







## Risk Communication

- Multitude of information sources = mixed information
  - television, radio, RMs, Province

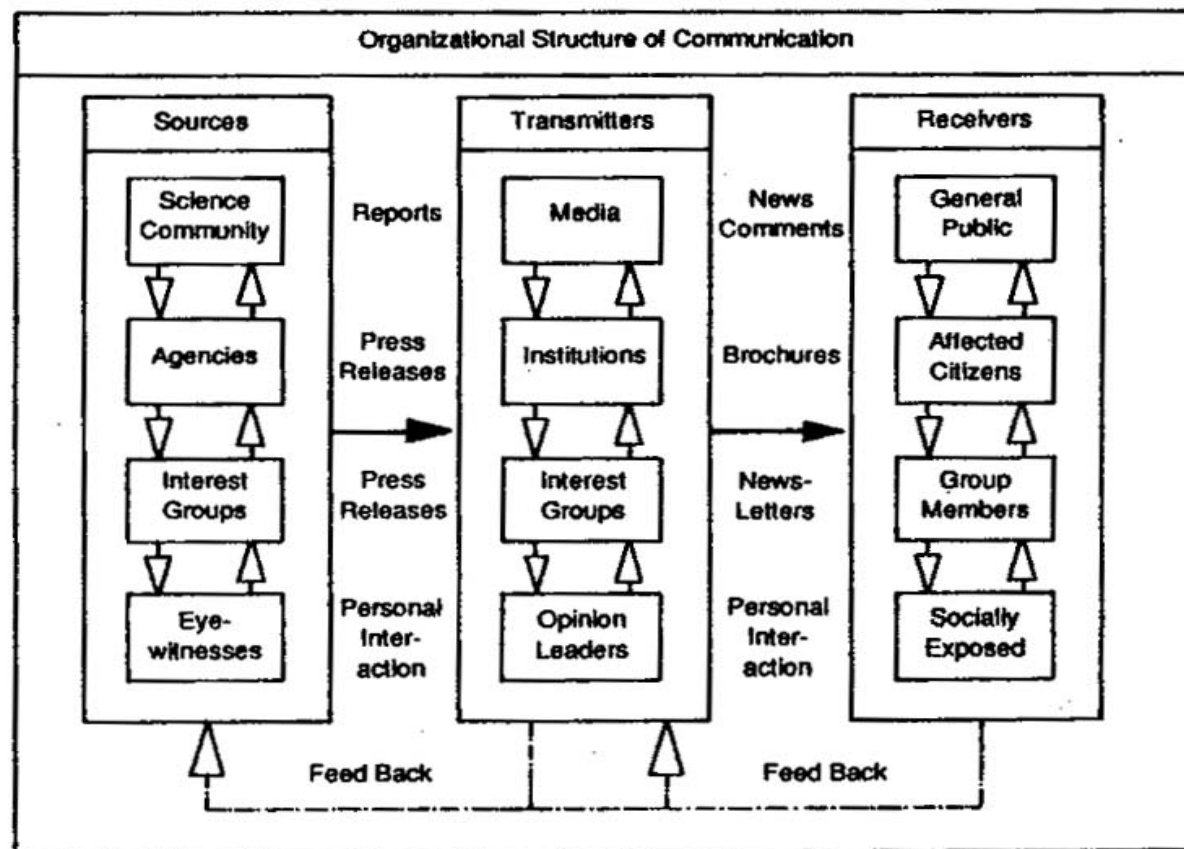
*“Media and news coverage do not capture small-scale local events, concerns, and issues, and only covers large dramatic events. This limits local access to required information that is needed for emergency preparedness and response.”*





## Risk Communication

- Bridge the gap







## Partnerships





## Organizational Partnerships

- A means to help address floodplain management, risk perception, and risk communication concerns
- Partnership benefits identified:
  - Encourage resource sharing
  - Facilitate information and knowledge exchange
  - Enhance communication
  - Increase efficiency and organization





## Organizational Partnerships

- Few partnerships exist that directly involve local community

*Local community groups provide effective support for floodplain residents. The formation of such groups should be encouraged and supported by governments.*

- General support for partnerships with local groups





## Basis for Further Research





## Basis for Further Research

### Idea Generating Process:

- Floodplain management, risk perception, risk communication and partnerships.
- Analysis generated more questions



### FURTHER RESEARCH:

- Organizational Partnerships
- Local-Level Mitigation Strategies





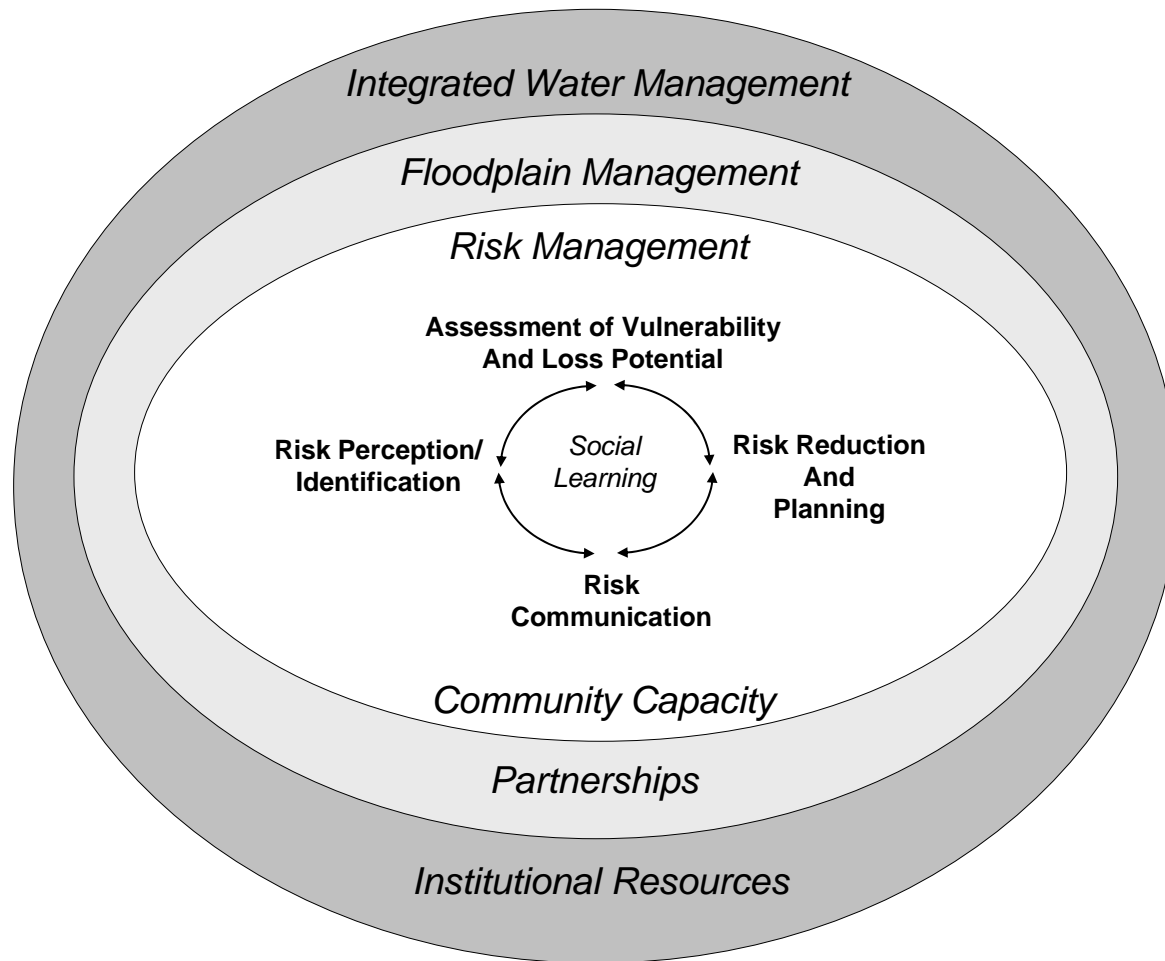
## Acknowledgements

- Social Sciences and Humanities Research Council of Canada
- Natural Resources Institute, U of M
- Study Respondents – Local Residents and Institutional Representatives
- Water Stewardship Department (Province of Manitoba)





## Sustainable Floodplain Management: Cross-scale institutional linkages to enhance risk knowledge and communication



Community Capacity is enhanced through local risk management efforts and social learning

Regional Partnerships in Floodplain management share information and RRP strategies

Resources from a range of institutions support public involvement, information and regional capacity

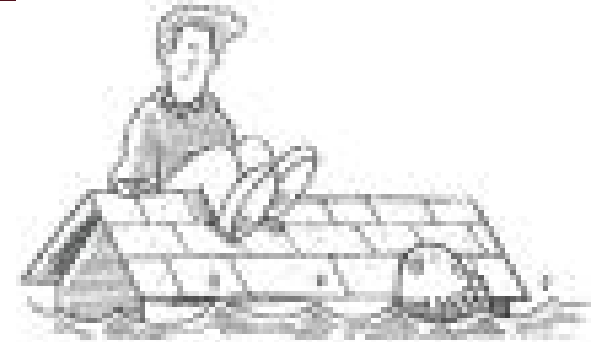




## Partnerships in Flood Emergency Management

### Research focus:

- Flood emergency management requires cooperation and collaboration among various institutions
- Are partnerships effective in flood emergency management?





## Partnerships in Flood Emergency Management

### Objectives:

- to determine the effectiveness of partnerships using criteria for successful partnerships from literature
- to examine the effects expanding the partnership
- to recommend actions necessary to expand the use of partnerships in flood emergency and sustainable floodplain management

### Methods:

- Multi-layer Delphi process - basis for further research
- Multiple case studies



## Partnerships in Flood Emergency Management

### Application of case study to sustainable floodplain management

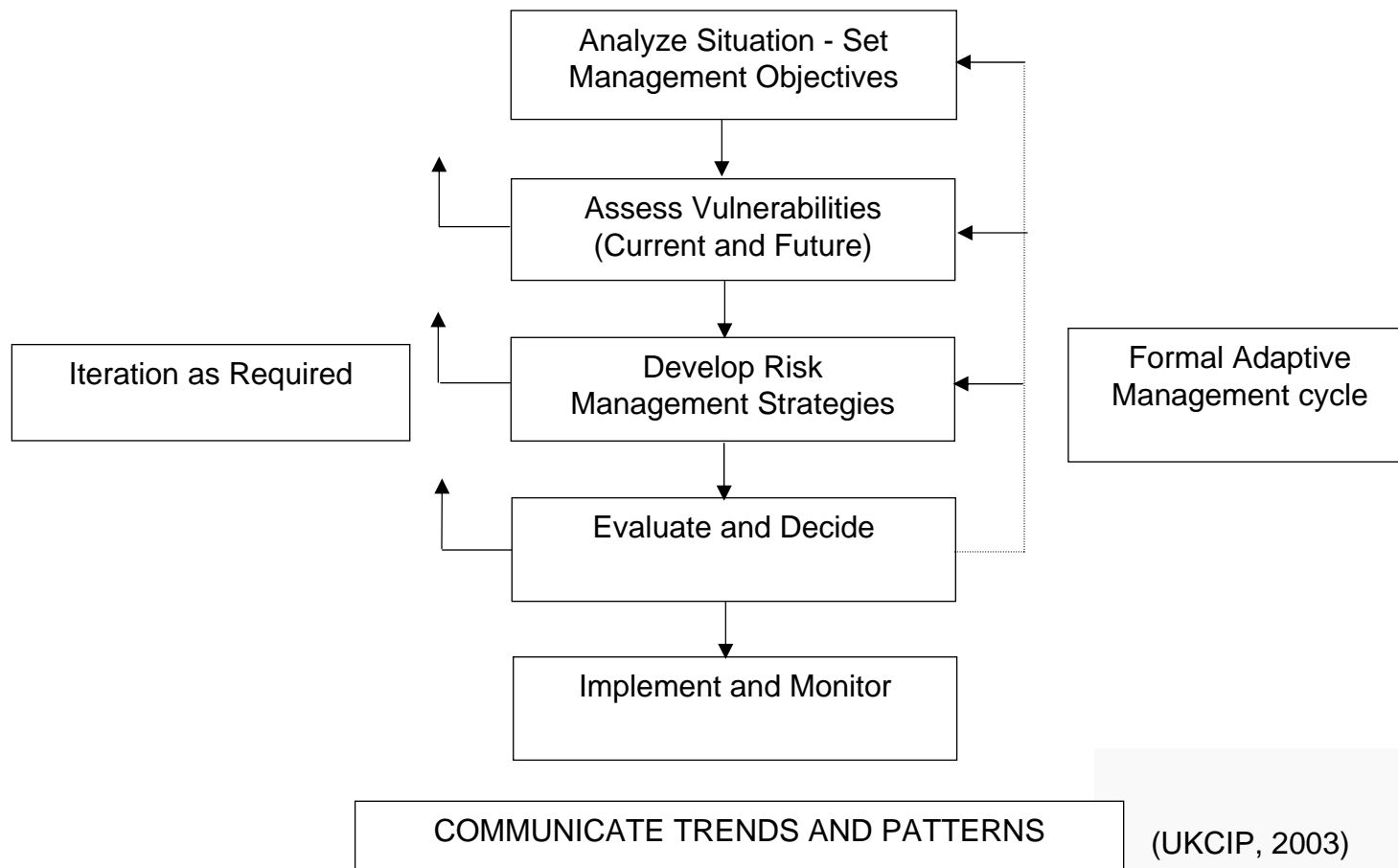
- partnership linkages across government, community, and NGO will promote dialogue, enhance risk knowledge and communication, clarify roles and responsibilities of institutions
- The sharing of information and resources will enhance institutional capacity to address issues at watershed- and basin-scales





# Floodplain Management

## Risk Reduction and Planning (RRP)





# Floodplain Management

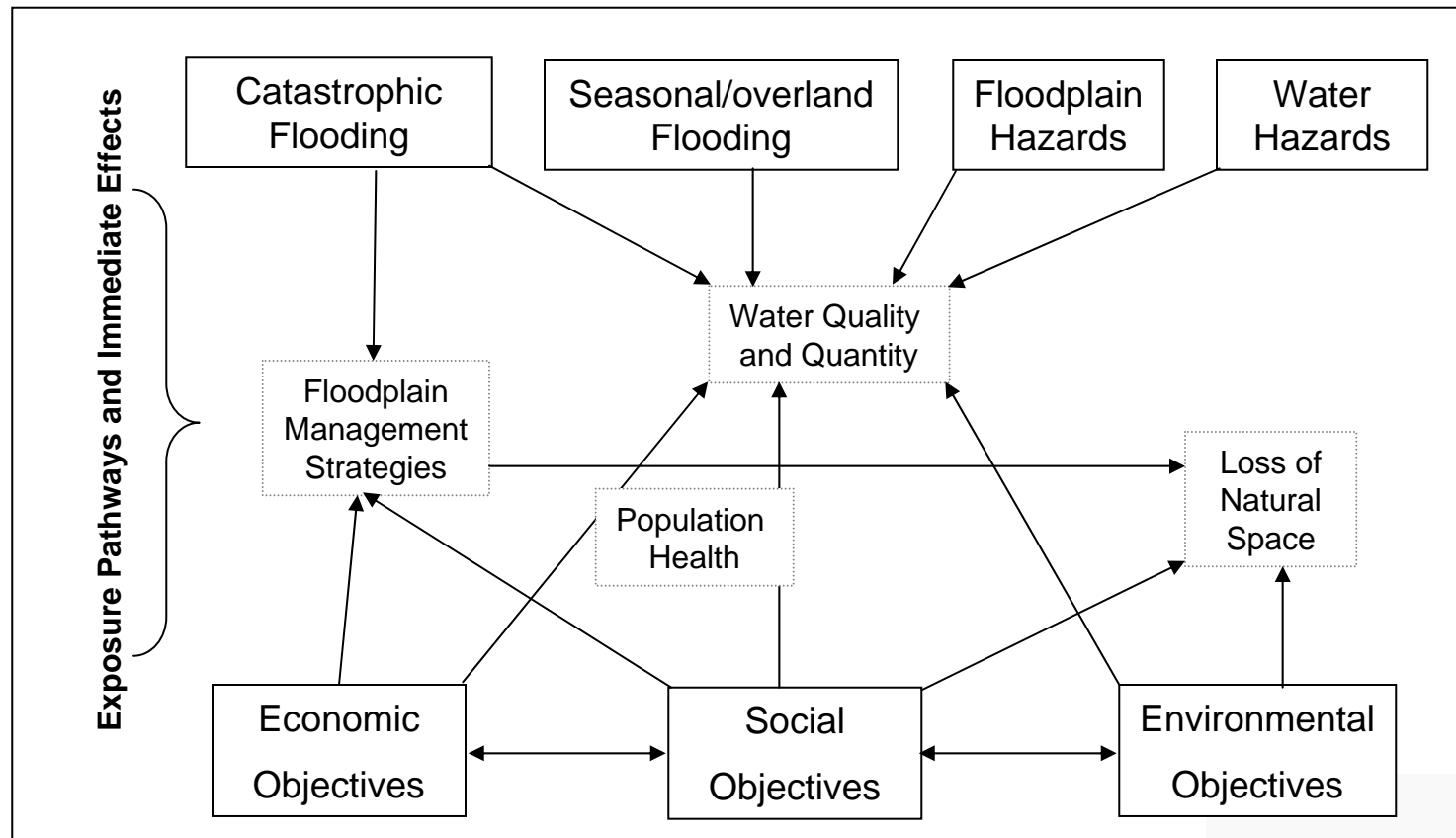
## 1. Setting Management Objectives

	<b>Management Objectives</b>	<b>Performance Measures</b>	<b>Required Data, Tools and Info</b>
<b>Environmental</b>	<ul style="list-style-type: none"><li>•Ensure sustainable water resources</li><li>•Flood Resilience</li></ul>	<ul style="list-style-type: none"><li>•water quality and quantity</li><li>•Magnitude</li><li>•probability</li></ul>	<ul style="list-style-type: none"><li>•Water monitoring and sampling</li><li>•Inventories</li><li>•Quantitative/qualitative</li></ul>
<b>Economic</b>	<ul style="list-style-type: none"><li>•Maintain Agriculture tax base</li><li>•Maintain tourism and recreation use</li></ul>	<ul style="list-style-type: none"><li>•Hazards and yields inventory</li><li>•Property values</li><li>•Business diversity</li></ul>	<ul style="list-style-type: none"><li>•Municipal tax rolls</li><li>•domestic./international exports</li><li>•Tourism jobs, profits</li></ul>
<b>Social</b>	<ul style="list-style-type: none"><li>•Aesthetics</li><li>•Environmental friendliness</li><li>•Demographic adjustments</li></ul>	<ul style="list-style-type: none"><li>•Sustainability/value measures</li><li>•Recreational use</li><li>•Suitability to demographics</li></ul>	<ul style="list-style-type: none"><li>•Communication</li><li>•Taxes</li><li>•surveys</li><li>•Census info</li></ul>



# Floodplain Management

## 2. Assessing Vulnerabilities





## Floodplain Management

### 3. Develop and Evaluate Risk Management Strategies

Management Objectives	Strategy A	Strategy B	Strategy C
Environmental	← Trade-offs Across Strategies →		
Social			Trade-offs across Objectives
Economic			