

Adaptation to the Impacts of Climate Change on Water Supply in the City of Regina



Principal Investigator: P. Diaz (Sociology)

Co-investigators: D. Gauthier (CPRC), B. Cecil (Geography)

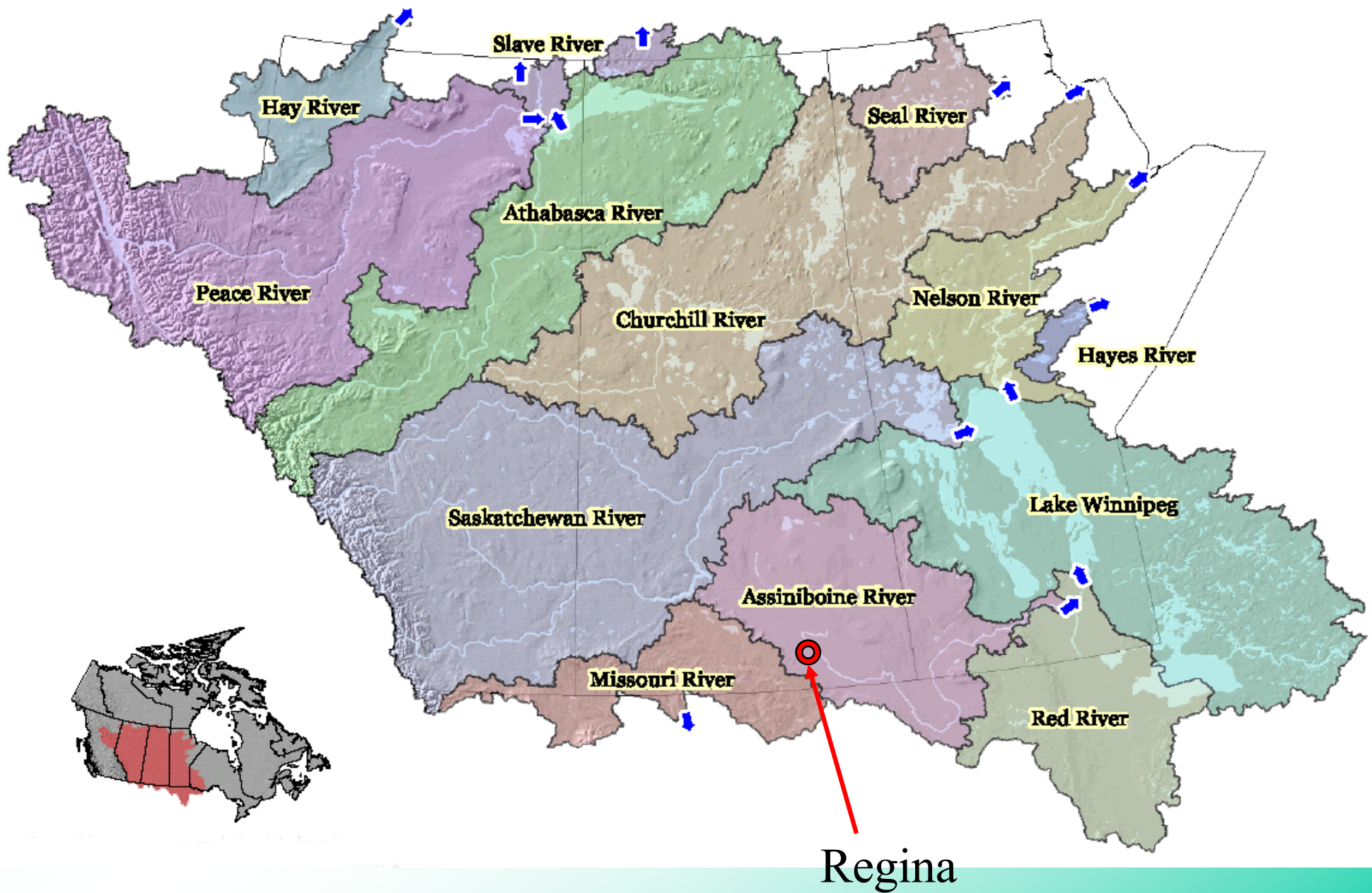
**D. Sauchyn (PARC) and
J. Piwowar (Geography)**



**UNIVERSITY OF
REGINA**

Background

- Climate change has potential for significant impact on water supplies in the Prairies and the City of Regina.
- The main source of drinking water for the City of Regina is Buffalo Pound Lake (a shallow lake in the Qu'Appelle river system).
- The natural flow in the river system is augmented by releases from Lake Diefenbaker, which is part of the South Saskatchewan River Basin (SSRB), a basin where the availability of water may reach a critical threshold as a result of climate change.



Source: Prairie Farm Rehabilitation Administration (PFRA)



- Impacts of climate change on the regional SSRB water supply, and on the supply of drinking water to the City of Regina, require adaptations to maximize the benefits of water in the area and reduce threats associated with scarce water resources.
- Those adaptations will likely include the development of new technological measures and the implementation of political and social measures in order to avoid the potential of resource scarcity on one side and institutional and policy failures on the other.

Research Gap: What is the relationship between water usage and climatic variations and the activities of households that influence water usage in times of water shortages? There is a need for:

1. an assessment of institutions and capacities;
2. the development of improved institutional settings that could facilitate the process of adaptation, such as social capital;
3. approaches that reduce or impede the environmental conflicts; and
4. understanding of the predisposition of people to support adaptation initiatives related to consumption, water conservation, and disposal.

From: Wittrock, V. and E. Wheaton, 2001, Adaptability of Prairie Cities: The Role of Climate, Presentation at the CCAF Impacts and Adaptation Workshop, October 2, 2001, Calgary, Alberta. Project Overview CCAF A107; PARC QS-1.

Objectives

1. To identify and characterize the main stakeholders with an interest in water resources within the SSRB.
2. To assess the level of knowledge of those stakeholders regarding climate change and its potential effects upon the availability of water in the SSRB and on the City of Regina, their definitions of the scarcity of water and their potential vulnerabilities, and of the potential strategies for adaptation that these stakeholders may have.
3. To explore the relationships between social capital and the stakeholders' approach to conflict and adaptation.

Carried out during May, June and July, 2003

All Regina households composed the target population.

A stratified sampling frame of 4,000 household phone numbers.

523 interviews (65% refusal rate)

Demographic questions:	Awareness of climate change issues:	Adaptation: water issues:	Climate change mitigation efforts:	Social capital:
Educational level	Environmental values	Potential interest in xeriscape landscaping	Importance of different measures (increase household efficiency, using fuel efficient vehicles, and others)	Level of trust
Age and Gender	Causes of climate change	Use of filters	Changes in household activities (recycling, safe disposal of chemicals, etc.)	Participation in organizations
Ethnic background	Sources of information about climate change	Concerns regarding Regina's tap water	Usefulness of different programs (planting trees, educational programs, etc.)	
Marital status	Level of concern regarding potential effects of climate change	Water conservation measures	Levels of responsibility of different type of organizations	
Type of Residence	Potential impacts of climate change on economic and recreational activities	Support for improvements of the city's water quality		
Family income		Opinion about different options to ensure adequate water supplies		

Survey Results

- Water pollution is the most serious issue for most respondents (92%) followed by soil degradation/loss (89%) and climate change (84%).
- 98% feel climate change may/will occur and that temperature change is the most likely outcome.
- 82% felt they had “some knowledge” to “extensive knowledge” about climate change
- However, when asked specifically about their informed status on specific issues related to climate change, the majority felt they were only “somewhat informed”
- Respondents identified major causes of climate change as forest destruction, CO₂ emissions, driving vehicles, ozone layer depletion
- Respondents identified recycling programs and driving more fuel efficient cars as the most effective mitigation efforts

Survey Results (continued)

- 62% felt that water quality and water supply would be most adversely affected by climate change
- 42% felt Saskatchewan would be more adversely affected than other provinces; 43% felt all Canadians would be equally affected
- There are “very serious concerns” about drier climate related to droughts (75%) and agricultural productivity (71%)
- The greatest impacts of climate change will be on agricultural productivity (73%) and the public water supply (61%)
- Respondents were optimistic that people would be able to adapt to change
- 82% favour tax breaks or subsidies for converting to water-efficient fixtures
- 70% favour higher utility bills if it means improved city water quality

Objective 4

To evaluate institutions in terms of their capacity to

- identify and evaluate potential needs and problems relevant to water issues,
- balance the interest of different actors in terms of negotiating solutions and agreements about water consumption, conservation, and disposal, and
- implement solutions that emerge from those agreements

The evaluation of institutional adaptive capacity

Detailed interviews with specific representatives of public and private organizations and agencies. Those interviews were focused on the identification of the present capabilities of organizations and norms to deal with water scarcities and the development of new strategies.

Interview Questions

The interview consisted of questions about:

1. The ability of the institution to gather and evaluate relevant information and its use
2. Institutional adaptation to the current vulnerabilities of the water system
3. The degree of institutional coordination
4. Adoption of practices for a more sensible use of the resource.
5. The existence of the appropriate resources and human capital.
6. Identification of stakeholders' needs.
7. The institutionalization of climate change in the decision-making process of the institution.

The Institutions

- The City of Regina
- Saskatchewan's Population and Public Health Services
- The Prairie Farm Rehabilitation Administration
- The Saskatchewan Watershed Authority
- The City of Regina's Urban Environment Advisory Council

The results

- There is a comprehensive system of collection of information on water quantity and quality.
- Concerns about lack of standards in the measurements of water quality.
- A high level of concern with water quality within the City of Regina.
- History of building of adaptive capacity in response to climate variability by the City of Regina.
- Awareness of the importance of climate change, but no integration of climate changes issues into the institutional agenda and organization.

