

# The River Current

Spring 2005



*Our Mission: Promoting watershed sustainability through awareness, linkages and stewardship.*

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## ***Climate Change and Water in the South Saskatchewan River Basin***

With the issue of Climate Change becoming increasingly relevant in the Prairie Provinces, there is increasing demand for good scientific information, communication and programs in the area. The Climate Change Impacts and Adaptation Program and the Prairie Adaptation Research Collaborative have commissioned two inter-related studies of the effects of climate change in the South Saskatchewan River Basin: One is a physical science study of changes in water availability arising from climate change and the other is a social science study of the socio-economic impacts of those changes in water availability.

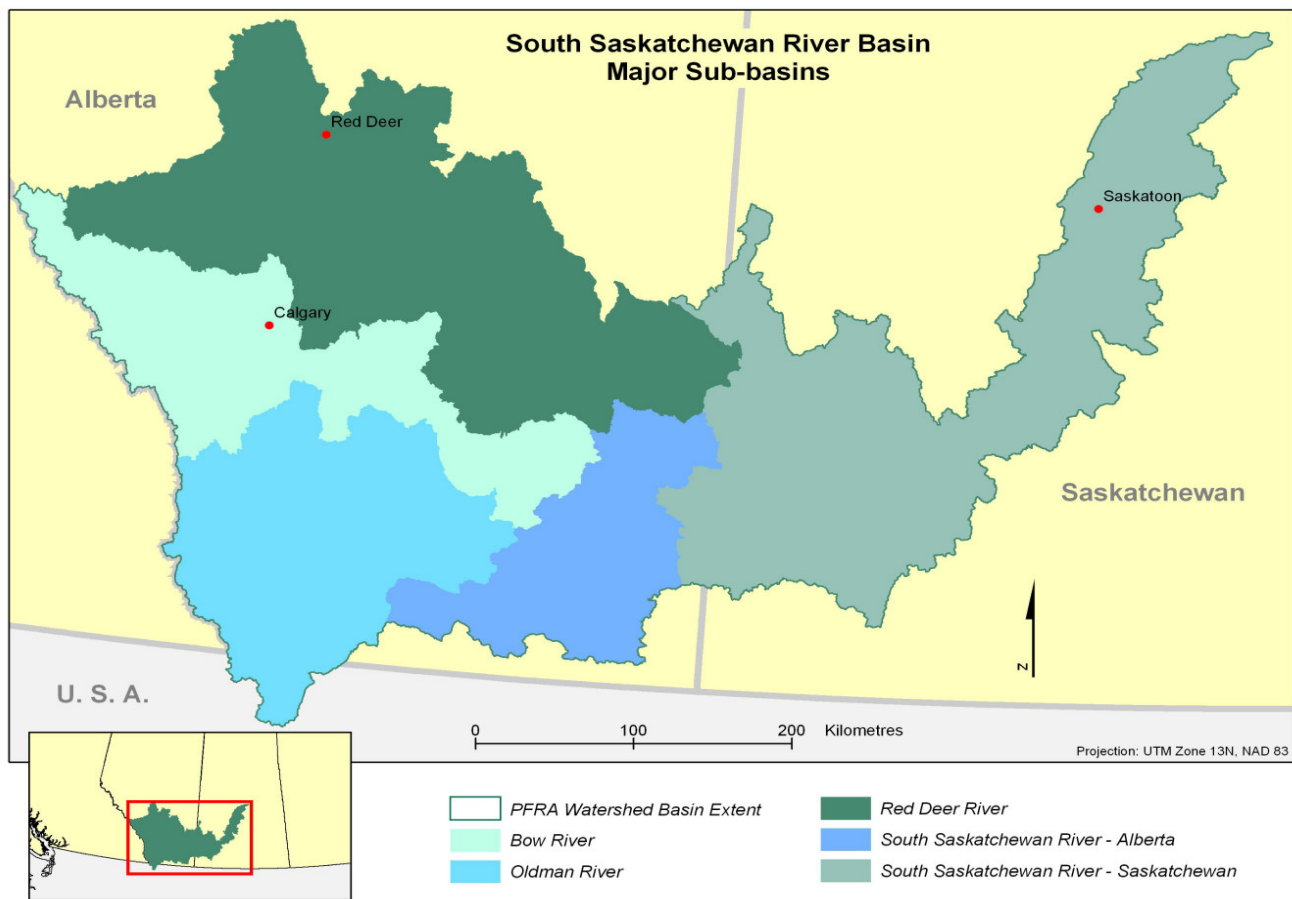
According to Environment Canada, the Canadian Prairie provinces have seen a warming trend over the past 50 years, with the largest increases in the winter months (about 3°C) and the least over the summer months (about 0.2°C). With the rise in temperature, snow-fall precipitation has decreased, while spring snow melt is occurring earlier. Climate change projections also suggest that further warming of about 1°C to 3.5°C will occur across Canada over the next century. Projections concerning precipitation are more uncertain. Soil moisture conditions and the availability of water in rivers and reservoirs will depend upon the combined effects of changes in precipitation and evaporation.

### **Study Components**

Future climate scenarios project that some of the largest potential changes in surface water quantity will occur in the Canadian prairies. Adapting to these changes requires a sophisticated understanding of both the hydrological cycle within the prairie eco-zone and the adaptive capabilities of the socio-economic systems that depend on it. The SSRB project is two linked components, each of which is funded independently. The physical modelling component examines future water availability in the SSRB under the potential impact of climate change. The socio-economic component assesses the impact of water resource availability on key water withdrawal and in-stream use sectors in the SSRB.

### **Physical Modeling Component**

Researchers use down-scaled Global Circulation Models (GCM) to project changes in local temperature and precipitation patterns. Climate information is input to simulate future river flows in the SSRB using the WATFLOOD and SACRAMENTO hydrologic models. The results of the simulation are used to assess the impact of changes in water availability on the economy and society in the basin.



Map Courtesy of GIServices, University of Saskatchewan

## Socio-Economic Component

In the SSRB, where water allocation can exceed flow volumes, water use is a major concern. Should flow volumes decline in the future under climate change, this would have implications for water management within the basin.

Several major water use sectors are considered, including: irrigation, stock-watering, rural, domestic, urban, municipal, industrial, mining, thermal energy generation, hydroelectric energy generation, inter-jurisdictional apportionment, recreation and wetlands.

## Potential Impacts of Climate Change for the South Saskatchewan River Basin

- Changes in annual streamflow (possibly with large declines in the summer) have implications for hydroelectric generation, the economy, society, water apportionment, and ecosystems
- Increased likelihood of severe drought and increasing aridity in semi-arid zones could result in losses in agricultural production and changes in land use
- Changes in irrigation demand and water availability during the irrigation season would have uncertain impacts on farm sector incomes, groundwater, streamflow and water quality

The South Saskatchewan River Basin (SSRB) extends from the Continental Divide, through southern Alberta and into south-central Saskatchewan. A small portion of the basin extends into the United States but is not directly considered in this project. The SSRB contains four major sub-basins: the Red Deer, Oldman, Bow and South Saskatchewan. Water supplied to the major tributaries of the SSRB is generated from snow and melting glaciers in the Rocky Mountains. Roughly 90% of the total South Saskatchewan River flow comes from the Rocky Mountains and 10% is contributed from runoff in the prairie region of Alberta and Saskatchewan. Soil moisture conditions and runoff in the prairie region of the basin are dependent on local snowfall and rainfall.

The current population of the SSRB is estimated at 1.5 million people. Of this, roughly 20% is in Saskatchewan and 80% in Alberta. Less than 5% of the population is estimated to live in rural communities. The largest urban centre is Calgary with a population of just under 1 million people. Differences in resource availability, institutions and policies, and economic activities between Alberta and Saskatchewan have produced different economies. Therefore, it might be expected that they will respond differently to changes in water availability. For example, in the Alberta portion of the basin, the predominant industries are manufacturing, oil and gas and agriculture. In the Saskatchewan portion, the predominant industries are agriculture, manufacturing and mining.

For further information, please contact the South Saskatchewan River Basin Project Coordinator,  
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## *Water Strategy Implementation: From Paper to Practice*

**Partners FOR the Saskatchewan River Basin** and the **North Saskatchewan Watershed Alliance** are partnering for a conference on November 2-4th, 2005.

With all three Prairie Provinces in the process of developing Water Strategies, this is a timely event which is hoped to encourage collaboration between the three governments.

If you would like further information regarding the conference, or are interested in presenting, please contact Josi Hauschild at [Partners@saskriverbasin.ca](mailto:Partners@saskriverbasin.ca) or phone (306) 477 9140.

 **North Saskatchewan Watershed Alliance**

## *World Water Day 2005 - March 22*

Water is critical for sustainable development, including environmental integrity and the alleviation of poverty and hunger, and is indispensable for human health and well-being.

The United Nations General Assembly at its 58th session in December 2003 agreed to proclaim the years 2005 to 2015 as the International Decade for Action, “Water for Life”, and beginning with World Water Day, March 22, 2005.

The Water for Life decade sets the world’s goals on “a greater focus on water-related issues, while striving to ensure the participation of women in water-related development efforts, and further cooperation at all levels to achieve water-related goals of the Millennium Declaration, Johannesburg Plan of Implementation of the World Summit for Sustainable Development and Agenda 21.”

The assembly called upon the relevant United Nations bodies, specialized agencies, regional commissions and other organizations of the United Nations to deliver a co-ordinated response, utilizing existing resources and voluntary funds, to make “Water for Life” a “decade for action”.

The first water decade from 1981 to 1990 brought water to over a billion people and sanitation to almost 770 million. Much more still needs to be done. Safe water supply and adequate sanitation to protect health are among the basic human rights. Today, there are still almost 1.1 billion people who have inadequate access to water and 2.4 billion without appropriate sanitation.

This article is courtesy of the IRC International Water and Sanitation Centre. For further information on the Centre and World Water Day, visit <http://www.worldwaterday.com> . Since its foundation in 1968, the IRC International Water and Sanitation Centre (IRC) has facilitated the sharing, promotion and use of knowledge so that governments, professionals and organizations can better support poor men, women and children in developing countries to obtain water and sanitation services they will use and maintain.



## ***3 Prairie Provinces: 3 Strategies for Water***

All three Prairie Provinces are currently in varying stages of planning in regards to their own water strategies: Alberta, with its "Water for Life" strategy, Saskatchewan with "Watershed and Aquifer Planning" and Manitoba with "Manitoba's Water Strategy".

The provincial government websites provide a wealth of information on each individual strategy. The addresses are available below:

### **Alberta Environment**

<http://www.waterforlife.gov.ab.ca/>  
Phone: 310-4455 (toll-free)

### **Saskatchewan Watershed Authority**

<http://www.swa.ca/Stewardship/WatershedPlanning/>  
Phone: (306)694-3900

### **Manitoba Water Stewardship**

<http://www.gov.mb.ca/waterstewardship/>  
Phone: 1-866-626-4862 (toll-free)

## ***Conference Listings***

### **Research and Education in an International Watershed: Implications for Decision-Making.**

April 6-7, 2005  
Winnipeg, MB  
Hosted by the Red River Basin Institute - <http://www.tri-college.org/watershed/>

### **2005 Annual Conference and Annual General Meeting of the Canadian Prairie and Northern Section of the Air and Waste Management Association**

April 11-12, 2005  
Canmore, Alberta  
This conference will feature recent Advances in the Alternative Sources of Energy - Environment and Economics  
<http://www.cpans.org/conf.htm>

### **Alberta's Environment Conference 2005: Connecting and Collaborating**

April 20-22, 2005  
Edmonton, Alberta  
<http://www.environment2005.com/>

### **Reflections to Our Future: A New Century of Water Stewardship 58th Annual CWRA National Conference**

June 14-17  
Banff, Alberta  
<http://www.reflectionsonourfuture.ca/>

### **10th International Water Specialist Conference on Watershed and River Basin Management**

September 13-15, 2005  
Calgary, Alberta  
[www.calgary.ca/iwa2005](http://www.calgary.ca/iwa2005)

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