South Saskatchewan River Basin Adaptation to Climate Variability Project

Phase III: Oldman and South Saskatchewan River Basins

A Message from the Project Team

April 2014

Water management is not a new concept to many residents of the South Saskatchewan River Basin (SSRB). Much has been done to build today's water systems to ensure safe, reliable water supplies for economic, social, and environmental needs. The SSRB Adaptation Project brought together those who know the region's water systems best to look for opportunities to further enhance the resiliency of the Oldman and South Saskatchewan (OSSK) River Basins.

The OSSK region continues to be a desirable location for population and economic growth, both of which place new and growing demands on water supplies. The region's water is already being managed efficiently, effectively, and, to some extent, collaboratively, which will be a tremendous advantage in the event of future water challenges, whether caused by drought or flood. If, as a society, we want to ensure that access to water is not a barrier to meeting future population and economic needs while better protecting critical environmental outcomes, then we need to take action when not operating in "crisis mode." This project identified adaptive and robust water management strategies that take into account the complex nature of this system, potential impacts of climate variability and change, and potential reductions to the international flows from the US in the St. Mary River.

The most promising strategies that provide the most benefits in conditions of climate variability, particularly drought, included:

- Expand offstream storage at Chin Reservoir by approximately 74,000 cdm (60,000 AF) and add the entire storage of the expanded reservoir to the Alberta Environment and Sustainable Resource Development (ESRD) balancing system.
- Recognize and implement environmental improvement opportunities using relatively small operational changes when water is available in the system to improve the health and long-term resiliency of the watershed, including functional flows for riparian regeneration and low-flow augmentation for fisheries.
- Consider the added value of expanded storage capacity in the southern tributaries, specifically, an appropriately-sized Kimball Reservoir, modelled in OSSK as 125,800 cdm (102,000 AF) upstream of the St. Mary Reservoir near the international border; or a Lower Belly Reservoir, modelled at 493,200 cdm (400,000 AF) on the Belly River just before the confluence of the Belly and Oldman Rivers.
- Put in place and test the procedures, agreements, and tools needed to implement forecast-based rationing in the event of a multi-year drought, using the water-sharing agreement implemented for the Southern Tributaries during the drought of 2001 as a starting point.

There is no one simple solution for adapting to climate variability in the OSSK basins. Refining how specific strategies could be applied in combination while planning and testing for implementation are the next key steps in adaptive, integrated river management. This should include:

1. Arrange a one-year pilot between ESRD and the St. Mary River Irrigation District to test balancing Chin Reservoir with the ESRD reservoirs.
2. Develop the full business case for expanding the storage capacity of Chin Reservoir and balancing with the ESRD reservoirs.
3. Initiate a multi-year pilot to identify and implement further opportunities for opportunistic environmental flows, building on what is currently being done on functional flows for cottonwood regeneration.

WaterSMART Solutions Ltd.
#200, 3512 - 33 Street N.W. Calgary, Alberta T2L 2A6 | P 403.210.5276 | F 403.210.5393

Alberta Innovates - Energy and Environment Solutions
18th Floor, Phipps McKinnon Building | 10020 101A Avenue Edmonton, AB T5J 3G2 | P 780.638.3782 | F 780.643.1432

4. Run a live modelling simulation with all major licence holders, similar to that done on the Bow River system, to test procedures, agreements, and tools needed in the event of a prolonged drought; e.g., operational details, forecast-based triggers for action, legal agreements, and governance.
5. Assess findings from Alberta Agriculture and Rural Development's Storage Study in combination with this project's findings to confirm opportunities, recommendations, and next steps for potential new storage sites.

Although land cover and headwaters protection were not part of this modelling exercise, we understand and agree with many participants that sound watershed management includes protective and well considered land management practices throughout the headwaters region. Similar to other regions, building capacity, knowledge transfer and training will be a significant challenge over the next several years as many senior water managers and regulators reach retirement age. The valuable collaborative interactions among the universities, irrigation districts, ESRD and others should be built into something more durable for longer term water and land management in Southern Alberta.

This work has reinforced the fundamental importance of maintaining and building the resiliency of our river systems and the ecosystems and communities that rely on them in the face of growing demands and variable climate. Expectations are high within the water community and the opportunities for improved decision making and outcomes are real. Alberta continues to benefit from the commitment and involvement of the water community. Now is the time to move from "talk" to "walk" and implement water resource management strategies and solutions that build on what is already being done.

Written by:

Mike Kelly
Mike Nemeth
Kim Sturgess
David Hill
Ryan MacDonald
Megan Van Ham
Jon Sweetman

Project updates and reports can be accessed through the Alberta WaterPortal at: www.albertawater.com

If you have any specific questions regarding this work, please contact Alberta WaterSMART.

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