

**Pacific NorthWest
Economic Region
Annual Summit**

**Water
stewardship:**
Building resilient
businesses and
creating value

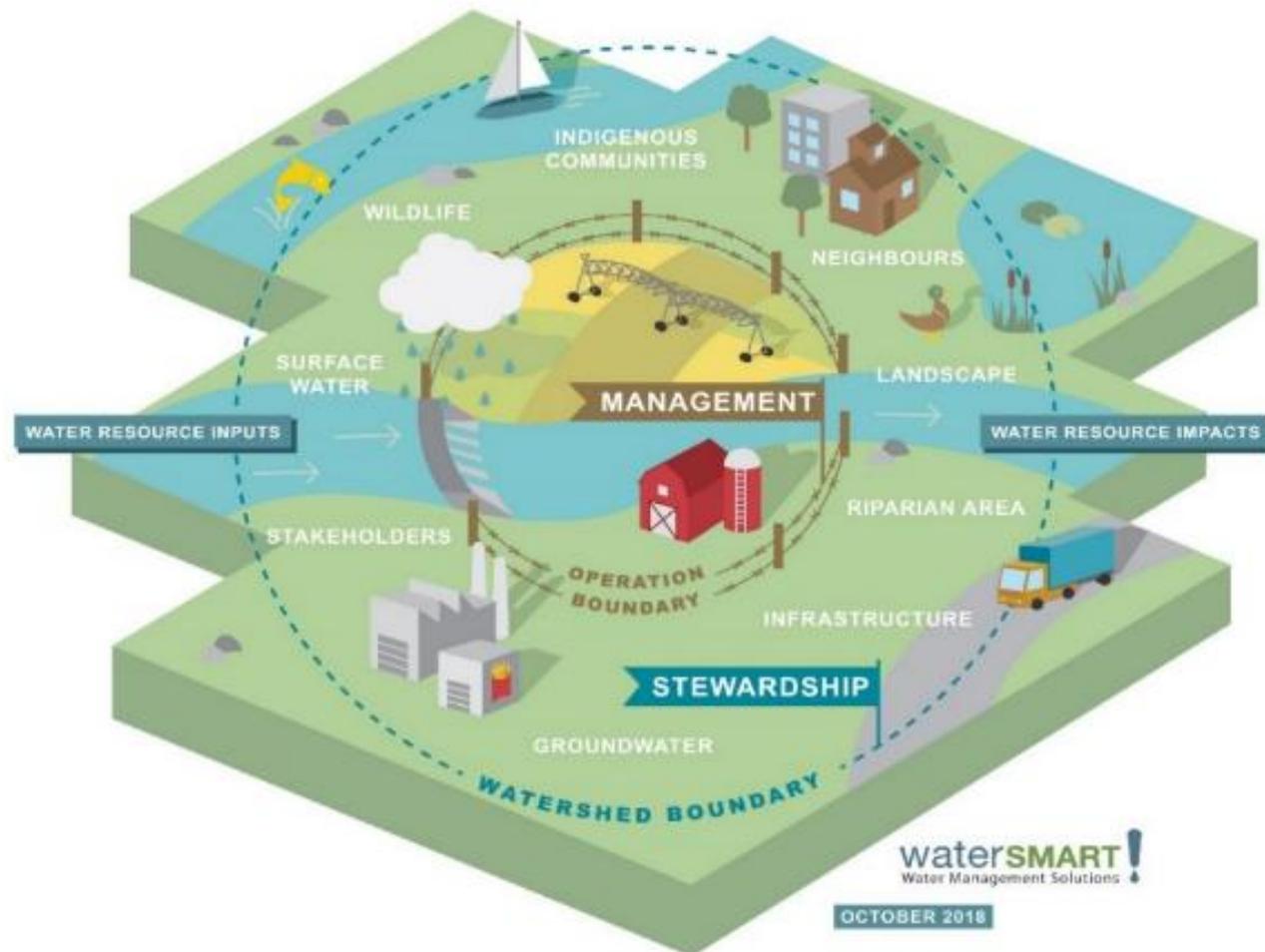
**Mike Nemeth
M.Sc., P.Ag., EP**

**July 23, 2019
Saskatoon**

Water stewardship

Water stewardship is the use and safeguarding of fresh water that:

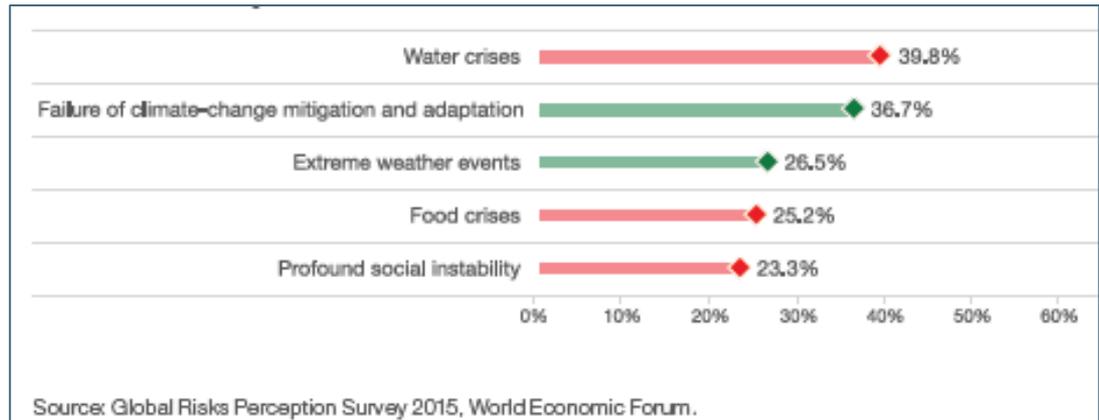
- Is **socially equitable, environmentally sustainable, and economically beneficial**
- **Envelopes water management**, which is the planning, developing, distributing and use of water within an operation's footprint.
- Requires **understanding how you fit into the watershed as a whole** ("beyond the fence-line")
- Is achieved through a **stakeholder-inclusive process that involves both site- and watershed-based actions**



Water stewardship is at the core of any discussion of water and food security

- World Economic Forum identified the **top five global risks for 2015-2025** and **nearly all relate to water risks**
- Given these risks, **agriculture can expect greater pressure for reallocation of water resources due to its high share of water use.**
 - *“Agriculture - 70% of freshwater withdrawal globally, and higher consumptive use when evapotranspiration is considered.” – The World Bank*
- Global agri-food players are already engaging in water stewardship projects like the WWF/Ceres AgWater Challenge

Top 5 global risks for the next 10 years relate to water World Economic Forum



Global players are already engaged (e.g., AgWater Challenge)

The AgWater Challenge commits companies to:

- **Reduce water impacts** associated with key agricultural commodities
- **Implement locally-relevant strategies** to mitigate risk in agricultural areas where water is scarce
- **Support and incentivize farmers and other agricultural producers** to strengthen water stewardship practices



Background: The Agriculture Water Future (AWF) project

In 2017, the AWF aimed to build a business case and framework for water stewardship to improve productivity and food security, and create economic value from water stewardship

Focus on crop-based agri-food supply chain in the South Saskatchewan River Basin (SSRB).

Project outcomes

1. Developed a **business case blueprint and water stewardship framework for implementing water stewardship** in the agri-food supply chain
2. Created a **process for identifying and realizing tangible benefits** that can be applied by any implementer in the agri-food sector through common dialog between agri-food and other users of the watershed



Core funding provided by:

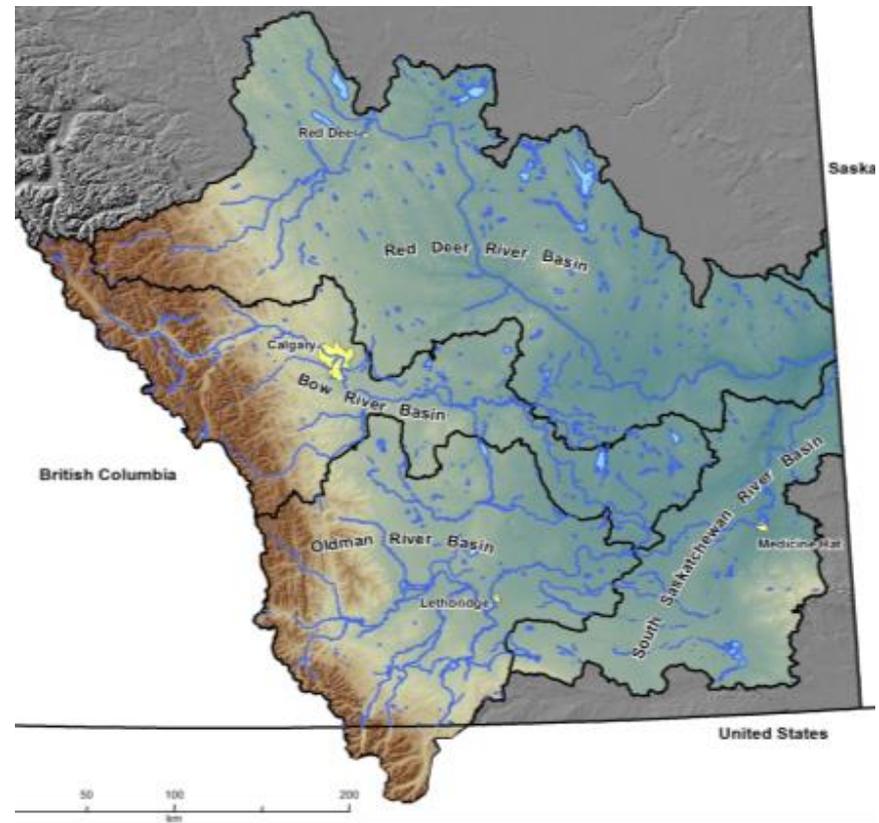
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AWF: starting in the South Saskatchewan River Basin (SSRB)

Focus on the SSRB to cover the broad spectrum of water stewardship issues and opportunities in the agri-food supply chain.

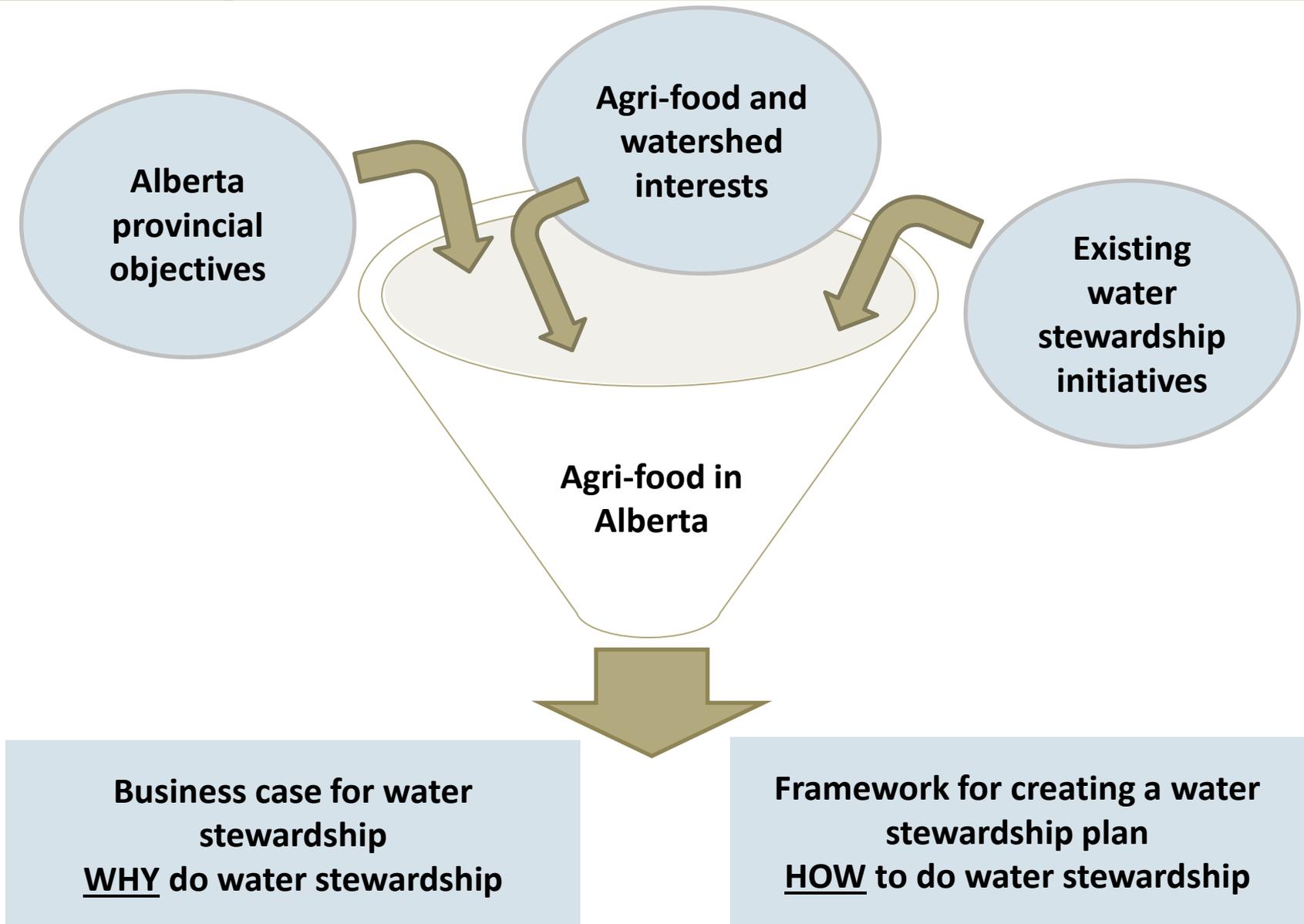
SSRB is a microcosm of global primary production systems

- Dryland and irrigated crop production
- Commodity and specialty crops
- Water quality concerns
- Water scarce region
- Good economic growth opportunity.



The project work presented here is scalable and transferable to livestock and other agricultural activities, as well as other sectors for the rest of Alberta, or anywhere else in the world.

Translating existing stewardship efforts into actions for agri-food in Alberta...and beyond



What needs to be shown to prove the business case for investing resources and effort in water stewardship?

- We heard from participants:
 - There needs to be **clear financial incentive**
 - **One or more water risks need to be mitigated** (social licence, public assurance, financial risk due to water emergencies, etc.)
 - **Implementation** needs to be **accessible and convenient**
 - A credible system or body needs to be in place which raises **awareness and recognition of efforts on water stewardship initiatives**
 - **Roles and responsibilities** of the different players need to be **clearly identified**

A business case is built on the principle that **water risks are inherent to all operations** that use water, and **addressing those risks brings value**.

Risk categories



OPERATIONAL



FINANCIAL



REGULATORY



REPUTATIONAL

Examples of business in action

Sustainability: Not because it is the right thing to do, but because there are clear business benefits.



Integrated water resource management

First agribusiness site certified by the Alliance for Water Stewardship (AWS) for sustainable water management within and beyond the company fence.

Impact: Convened the different water users into a formal water users association, to address the shared water challenges faced by 300,000 people living in the river basin.



Water reuse in manufacturing

95% reuse of cleaning water at a Chinese manufacturing site, responding to strict regulatory requirements and local water scarcity.

Impact: Over 60,000 m³ in annual water savings. Today, this site is the company's international benchmark for water reuse.



LafargeHolcim

Increasing resilience

Quarry areas converted into storm water areas to reduce flooding risk, create wetlands, and harvest rainwater. Driven by regulatory requirements and community demand.

Impact: Flood protection for local communities, increased biodiversity and water supply, and a recreational area for the local community.



PEPSICO

More crops per drop

Replaced flood irrigation with drip irrigation with farmers on more than 2,600 acres, provided training on efficient practices, and invested in new technologies to save water in India in 2016.

Impact: Annual water savings of over 800 million liters in Maharashtra (2016, verified by Deloitte) and greater reliability of supply of potatoes for the growers and PepsiCo.

DIAGEO

Business case for WASH in agriculture

Implementation of WBCSD WASH Pledge in own operations & work with selected supply chain farmers on WASH provision where the issue is identified as priority e.g. in Tanzania, Kenya, Nigeria, Cameroon and Ghana.

Impact: Reduced incidences of water-borne diseases, increased school attendance; women spend less time sourcing water.



Nestlé

Good Food, Good Life

Going water-circular

Zero-water withdrawal technologies have been used at a water-scarce site by recovering water from milk (in a milk powder production facility in Mexico) for daily operational water needs.

Impact: The dairy factory can operate without using any groundwater, running solely on water recovered from milk.

Business case metrics: How to measure results

Metrics are a way to **measure if set goals are achieved by defining, comparing, or tracking performance**. Metrics require data at the site and watershed level, and can be used internally and externally.

Metrics to make a business case

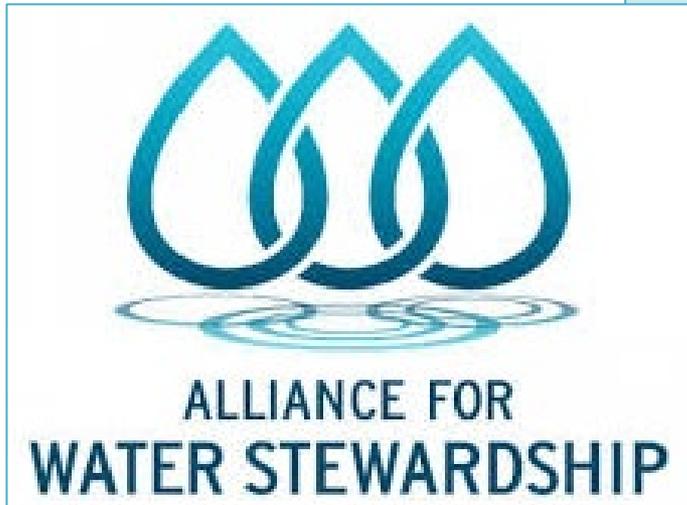
- “Return on investment” (not always financial)
- “Cost” of inaction
- “value” of taking action

Metrics are used to:

- **justify action**, support ongoing action
- **measure progress and success** of actions
- relate to goals, objectives, and targets
- **demonstrate impact** of stewardship actions
- track progress and **assess actions and determine future actions**, changes to plans
- **demonstrate how actions address stakeholder concerns**
- monitor and measure actions taken to mitigate water risks
- **track improvements** in operational efficiency and resilience

Examples of metrics for water stewardship in the agri-food supply chain

1. Total water applied to crops throughout growing season
2. Soil moisture at planting
3. Water use per unit crop yield
4. Water use per unit food processed
5. Size of buffer zone surrounding water body
6. Number of water quality violations per year
7. Number of stakeholders engaged
8. Number of viewers on sustainability page on website
9. \$ spent on shared infrastructure repairs (e.g., dams, pipelines, canals)
10. Number of watershed meetings attended
11. Number of stakeholder complaints (emails, phone calls, etc.)
12. Change in government or other funding over time for water-related projects



The Alliance for Water Stewardship (AWS) is a global membership collaboration comprising businesses, NGOs and the public sector.

Members contribute to the sustainability of local water-resources through their adoption and promotion of a universal framework for the sustainable use of water – the International Water Stewardship Standard, or AWS Standard – that drives, recognizes and rewards good water stewardship performance.

Why use the AWS Standard?

The AWS Standard is an international water stewardship framework for identifying water risk and capturing water-related value.

- ✓ **Credible global framework** for water stewardship, adaptable for any type of water user, in any sector, anywhere in the world
- ✓ Verifiable framework – including steps, criteria, and guidance - to **develop and implement a water stewardship plan**
- ✓ Work toward **self-verification or third-party certification**, if desired
- ✓ **Complement your existing initiatives** in water sustainability, management and stewardship
- ✓ Help your organization to **understand its water use and impacts**, and to work collaboratively and transparently with others for **sustainable water management** within the wider water catchment context

Five key steps...



...improve performance in 5 areas



Join 120+ water stewardship leaders using the AWS Standard

The AWS Standard is the first-ever comprehensive global standard for measuring responsible water stewardship across social, environmental and economic criteria.

Currently, 120+ organizations in the private sector, NGOs and the public sector are working with credible national and regional partners, like WaterSMART, to use the AWS Standard.



Key learnings and next steps for the AWF work...

Key learnings

- Face-to-face communication is valuable
- Cross-sectoral conversations are important
- Water stewardship is a shared responsibility
- Common dialogue makes for positive change
- There is often a disconnect between corporate goals and local needs

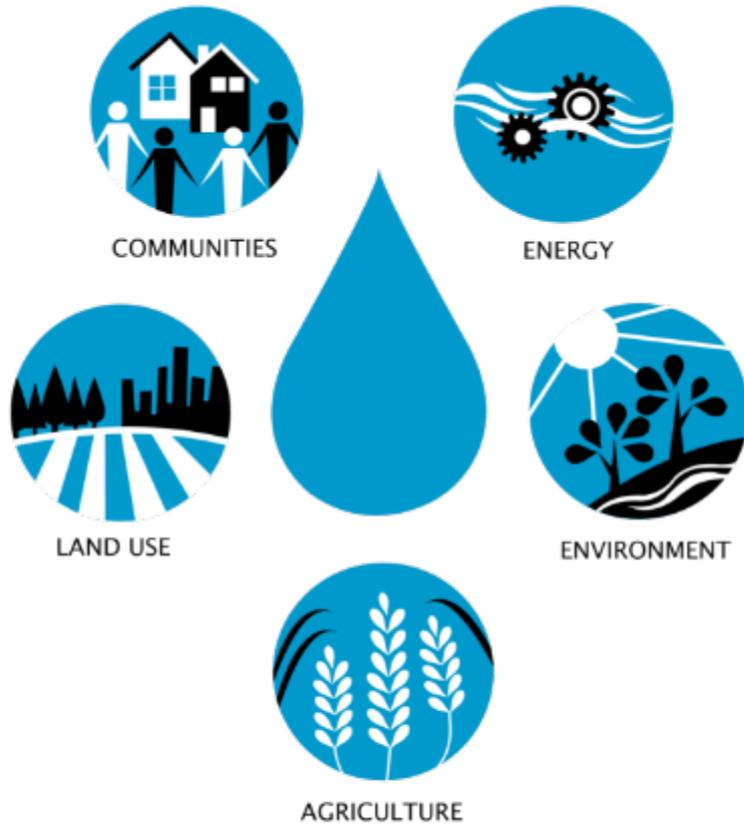
Next step: Pilot the water stewardship process and evaluate the outcomes to verify a scalable global model.

Driver: to increase uptake of water stewardship in the agri-food supply chain to **improve productivity, food security, and economic value throughout the supply chain.**

Proposed pilot projects include:

1. Rotational crops in the SSRB
2. Livestock in the SSRB
3. Crop-based pilot in another jurisdiction

Acknowledging trade offs is the policy challenge



What is the Nexus?

The interconnectedness and interdependency of our global resources including **water, food, and energy.**

The Nexus is the interconnectedness between water, communities, environment, agriculture, energy, and land.

Check out www.albertawater.com/nexus

Water: The key to our sustainable future

Water is a shared opportunity for us all to benefit. Water is everyone's business.
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waterSMART!
Water Management Solutions

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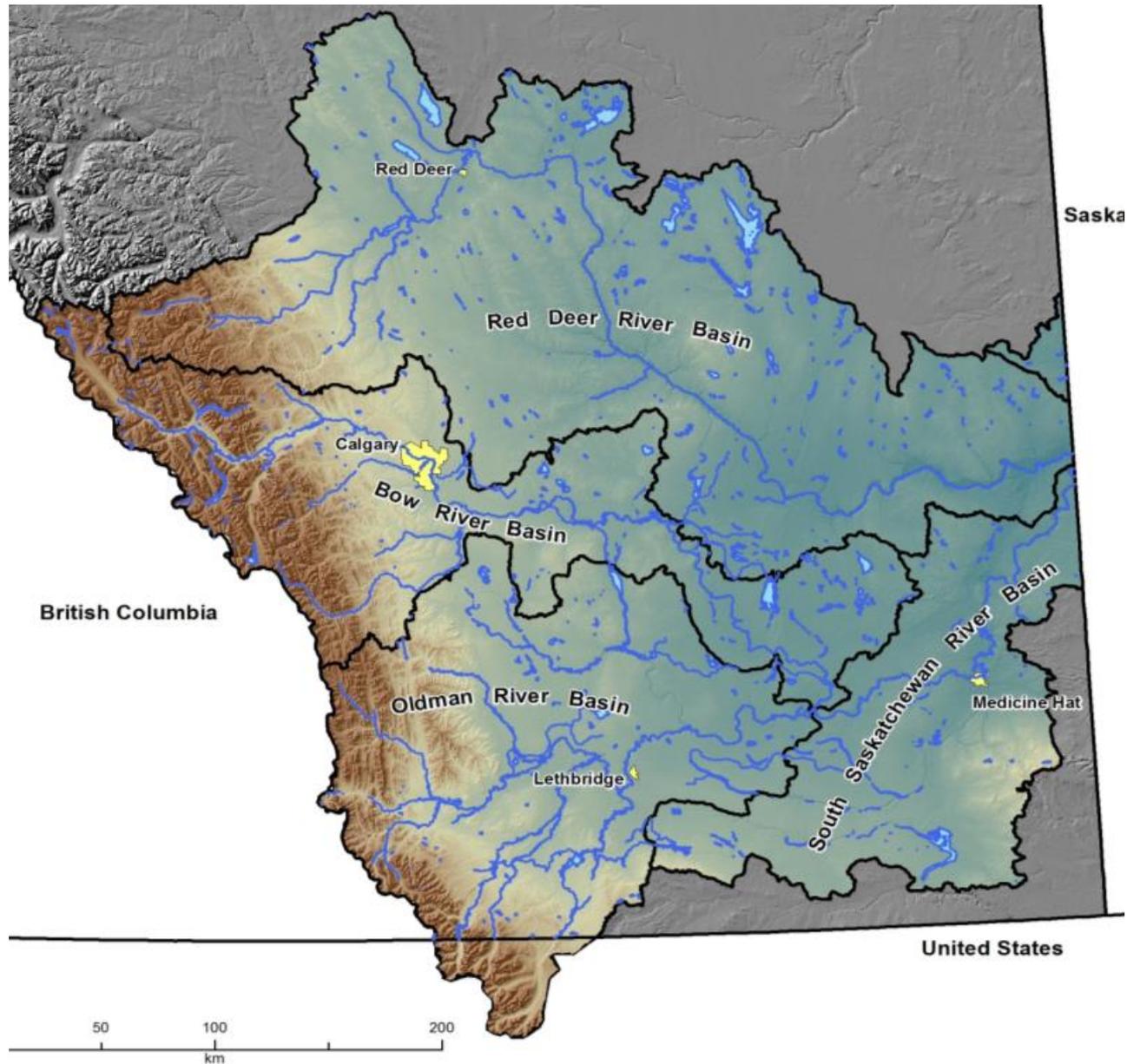
**Pacific NorthWest
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**Collaboratively
building
resilience**

**Mike Nemeth
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**July 24, 2019
Saskatoon**

South Saskatchewan River Basin



Bow River Basin – flood still a big focus after 2013

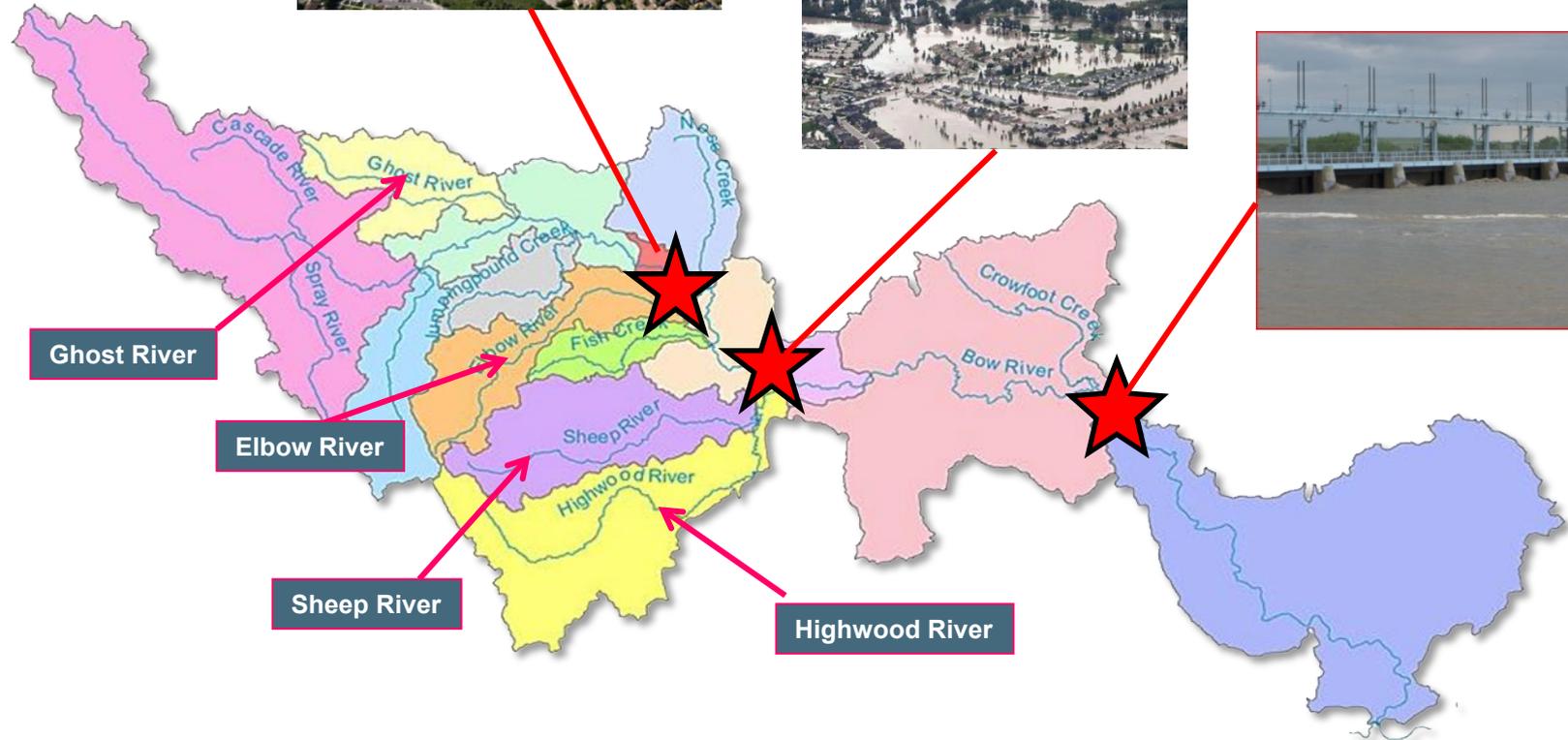
Calgary



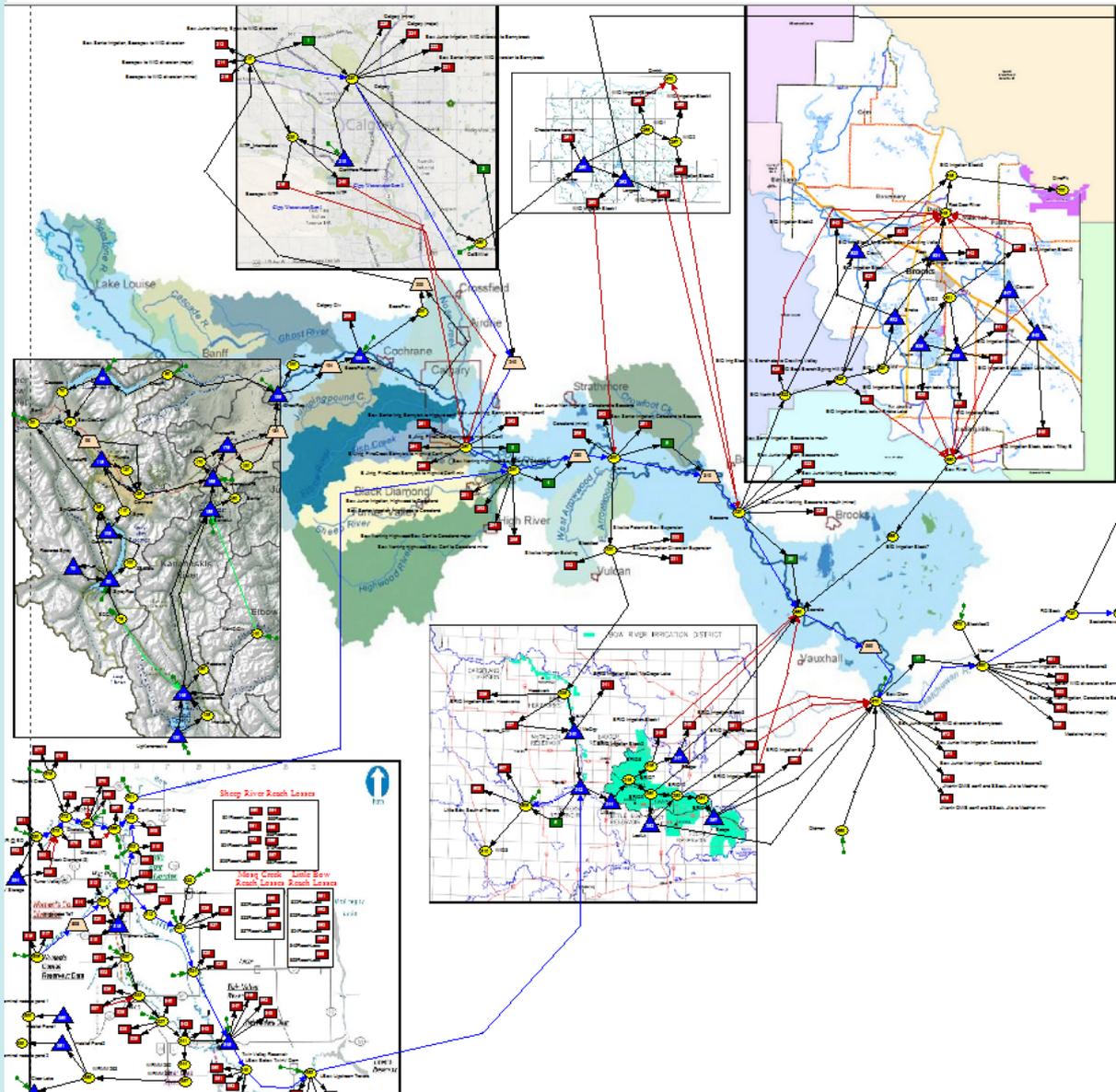
High River



Bassano Dam



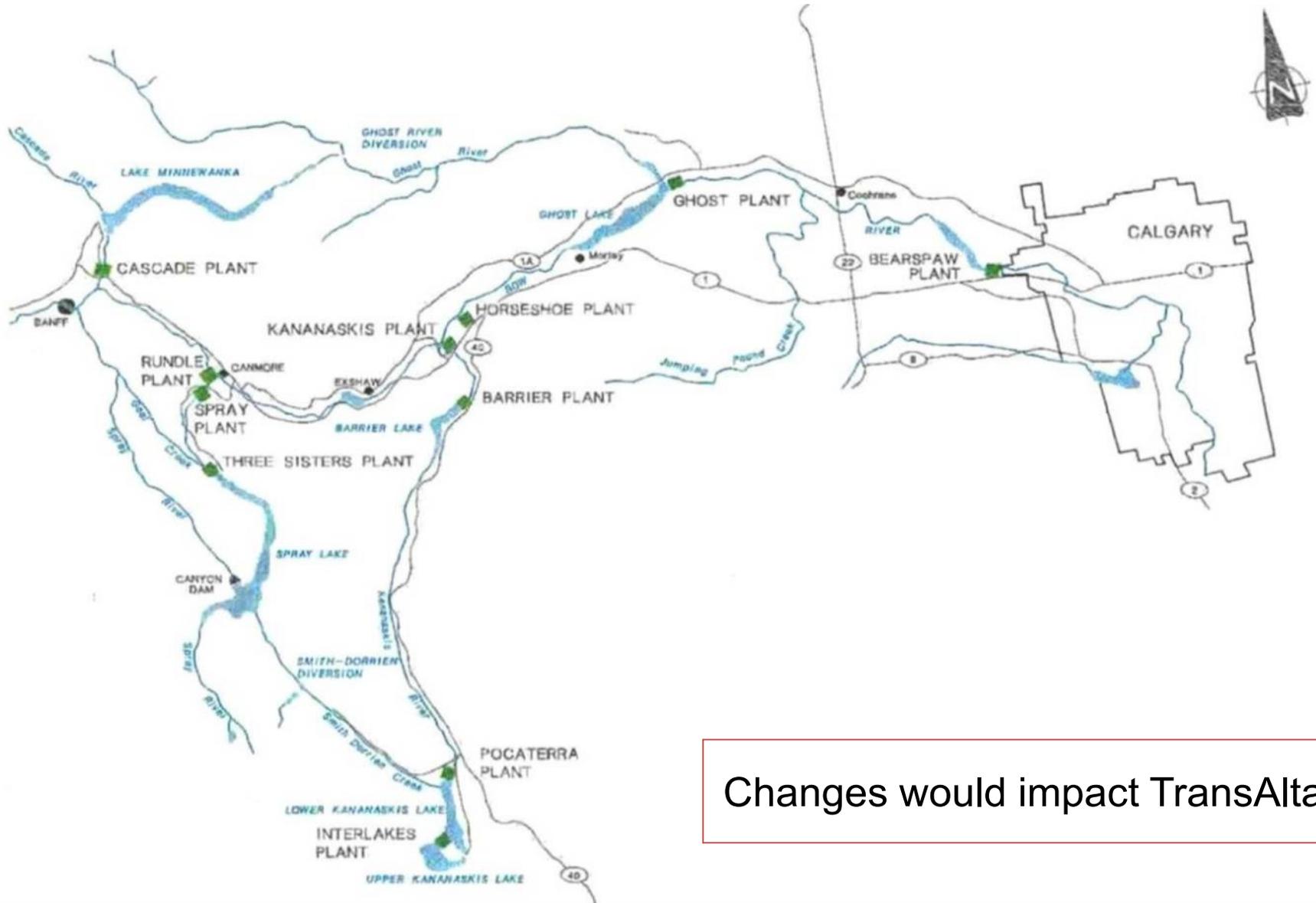
Using the Bow River Operations Model for informed discussion



Work collaboratively with Bow River basin water management experts to assess potential flood mitigation and water management options

- Including operational, natural and infrastructure opportunities
- Using existing knowledge, tools and data
- Capturing both qualitative and quantitative assessment

Upstream Hydro Sites Enable Flow Changes



Changes would impact TransAlta

Flow Targets – What Are We Mitigating To?

Location	Hourly Flow Target 1 (cms)	Hourly Flow Target 2 (cms)	Hourly Flow Target 3 (cms)	1:100 Flood Flow (cms)
Bow River upstream of the confluence with Elbow	~1050	~825	~540	1970
Elbow River downstream of Glenmore Reservoir	~450	~300	~180	758
Highwood River at High River	~1500	~1300	~1100	750
Sheep River at Okotoks	~750	~650	~550	954
Bow River at Carseland	~3200	~3200	~3200	3450?
Bow River at Bassano	~3450	~3450	~3450	3450?
Flow into Travers Reservoir	~250	~250	~250	-

Flow Target Scenario 1 vs. Flow Target Scenario 3

Flow targets Scenario 1:

Bow River upstream of Elbow = 1050 cms

Elbow River downstream of Glenmore = 450 cms

Highwood River at High River = 1500 cms

Sheep River at Okotoks = 750 cms

Flow targets Scenario 3:

Bow River upstream of Elbow = 540 cms

Elbow River downstream of Glenmore = 180 cms

Highwood River at High River = 1100 cms

Sheep River at Okotoks = 550 cms

Flow Target Scenario 1 (1050, 450, 1500, 750)



Flow Target Scenario 3 (540, 180, 1100, 550)



Key Take Home Points from this Work

We cannot prevent floods or droughts but we can **achieve some level of flood mitigation**

Any mitigation has positive and negative consequence; the goal is to pursue those with the most benefit and the least negative impact

Mitigation solutions must collectively build resilience throughout the basin against the **full range of potential future flood events**

Maximizing natural resiliency is a crucial aspect of water management

Getting out of the way is the only certain way to avoid flood damage

Be careful about simply shifting the flood risk from one geography to another and there must be **coordination on basin scale flood mitigation and local flood mitigation** measures

Effectively **linking forecasting to system wide flood operations** is vital

Changes in operational objectives

Ghost Reservoir dam deal to help protect Calgary from flood over 5 years for \$5.5M per year

TransAlta cedes control to province over water levels for both flood mitigation and drought mitigation

By Robson Fletcher, CBC News | Posted: Apr 27, 2016 3:17 PM MT | Last Updated: Apr 27, 2016 3:32 PM MT



The province and TransAlta have reached a deal on using Ghost Reservoir as a flood mitigation tool. (Jeff McIntosh/Canadian Press)

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