



Agriculture and
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Strengthening Economic Security of Irrigated Agriculture in the Oldman Basin

Chair: Darrell Corkal, AAFC

**In collaboration with Universities of Regina, Calgary, Lethbridge,
Saskatchewan**

Vulnerability and Adaptation to Climate Extremes in the Americas

Lethbridge AAFC Research Station Nov. 6 2013

Canada

Welcome from Researchers at Nov 6 Workshop:

- U of Regina: **David Sauchyn, Jessica Vanstone, Bruno Hernani**
- U of Saskatchewan: **Suren Kulshreshtha**
- U of Lethbridge: **Stefan Kienzle**
- U of Calgary: **Ted Horbulyk**
- AAFC: **Darrell Corkal, Aston Chipanshi**

Special Thanks for helping organize workshop:

- **Ron McMullin**, Alberta Irrigation Projects Association
- **Jennifer Nietschelm**, Alberta Agriculture
- **Brent Paterson**, who planted the original idea

Workshop Format (we will focus on plausible scenarios presented by your concerns and the knowledge of climate science)

- Review the science of climate extremes (past and future) - Presentation
- Couple this science with our human experience as water users involved in agriculture and food production – discussions in small groups
- Lunch Session: Stefan Kienzle
- Consider future actions – large group dialogue
- Workshop Report

Pre-workshop Exercise (this data was used to develop the scenarios for the workshop discussions):

- Your data identified key issues for economic security caused by climate-induced water stress
- The top Problematic factors:
 - **Snowpack, Water Demands, Storage, Growing Season Precipitation**
- The top Beneficial factors:
 - **Water storage, Irrigation technology, Crop science, Irrigation conveyance, Local agricultural markets**

Today's Goals:

- Summarize what we know about climate extremes (past, future)
- Discuss how extreme events (droughts/floods) may impact irrigated agriculture
- Explore ways to strengthen economic resilience
- Consider next steps

Scenarios:

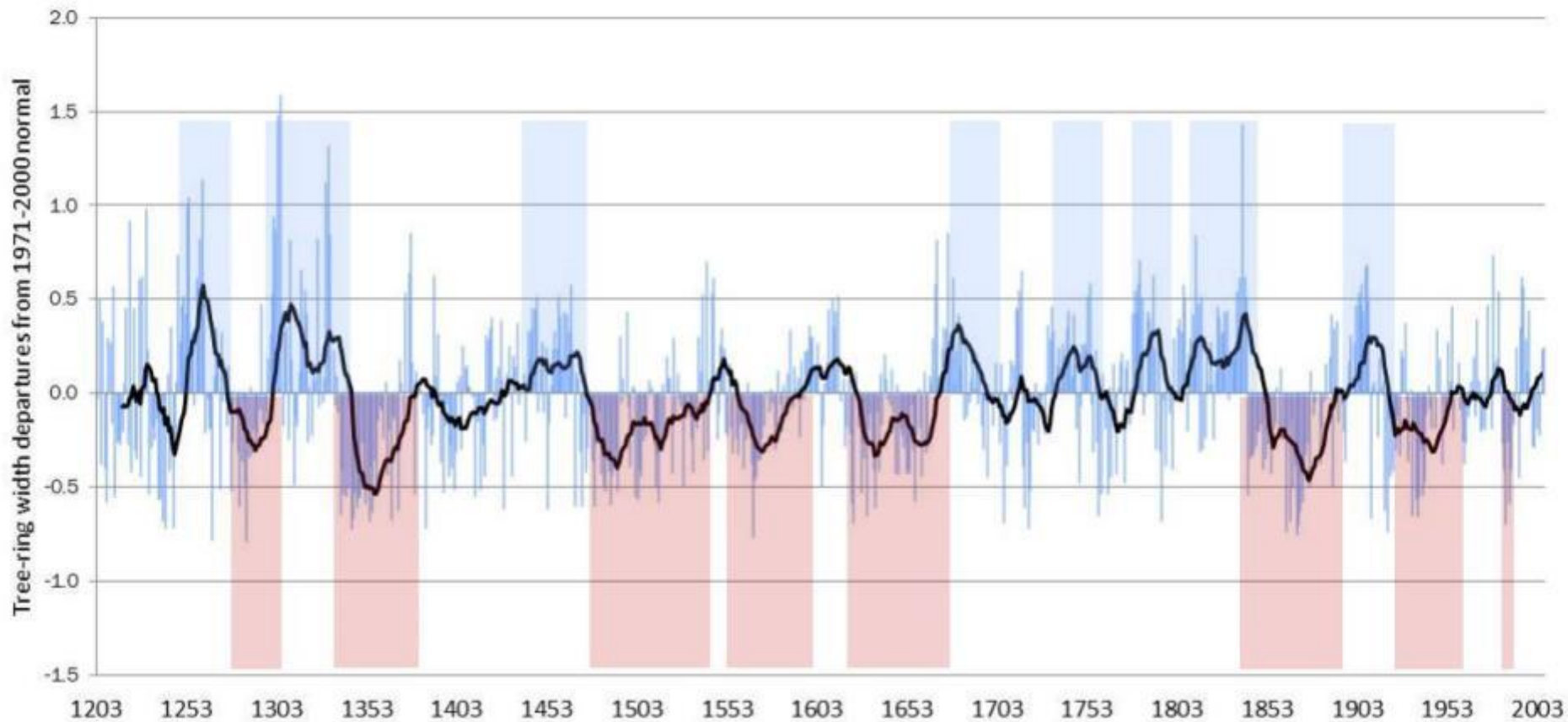


- What climate conditions persisted in the Past? Tree Ring Analogue
- Current? Instrumental Records
- Future? Climate Models
- Variability?
- Extreme Events?
- Climate Change?
- How will economics of irrigated agriculture be affected?

The past 800 years of Climate Variability

- the Oldman historic tree ring data, D. Sauchyn

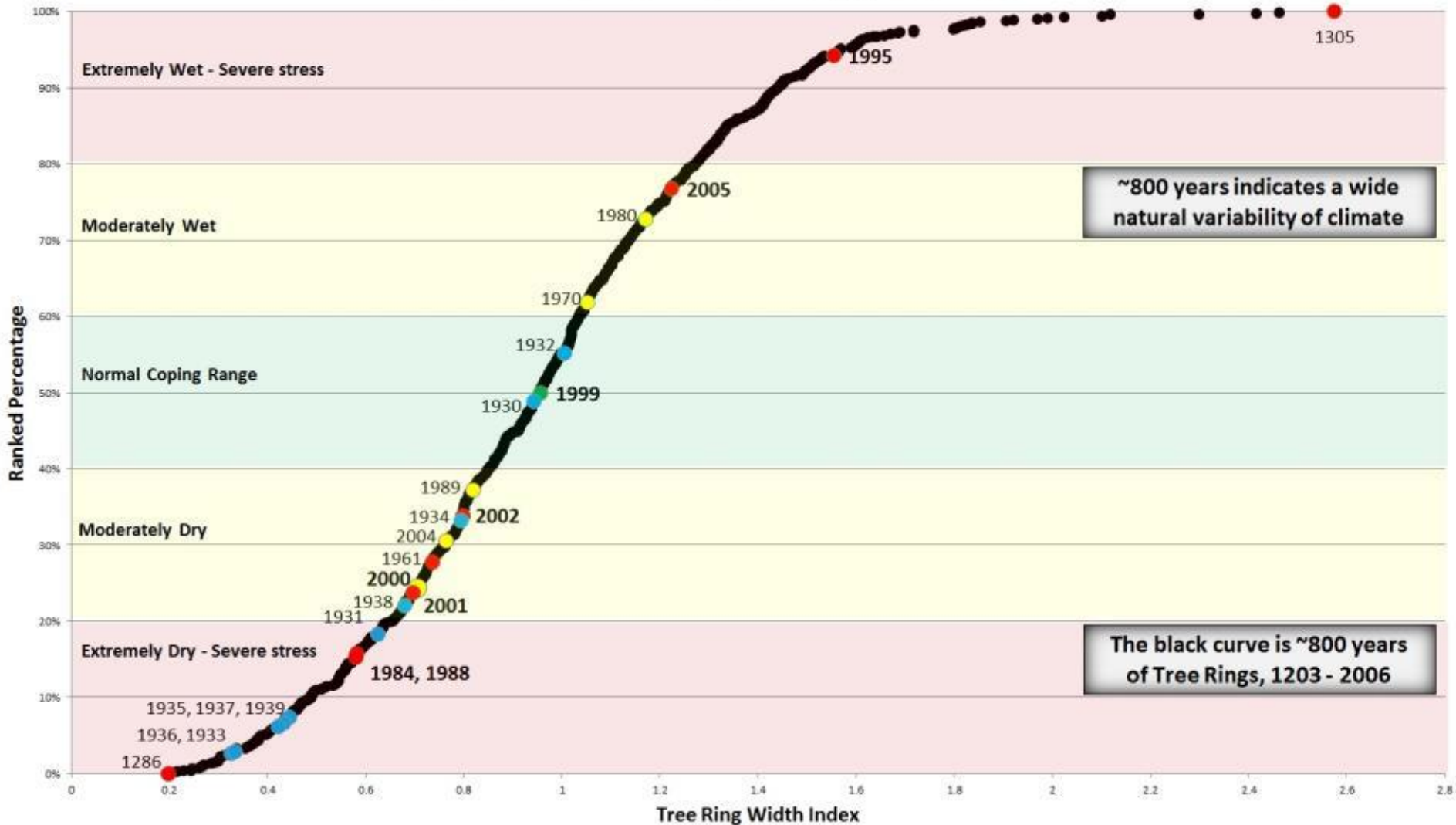
Tree-Ring width, departures from 1971-2000 average



The past 800 years of Climate Variability

- the Oldman historic tree ring data, D. Sauchyn

Oldman River Tree-Ring Chronology, 1203 - 2006



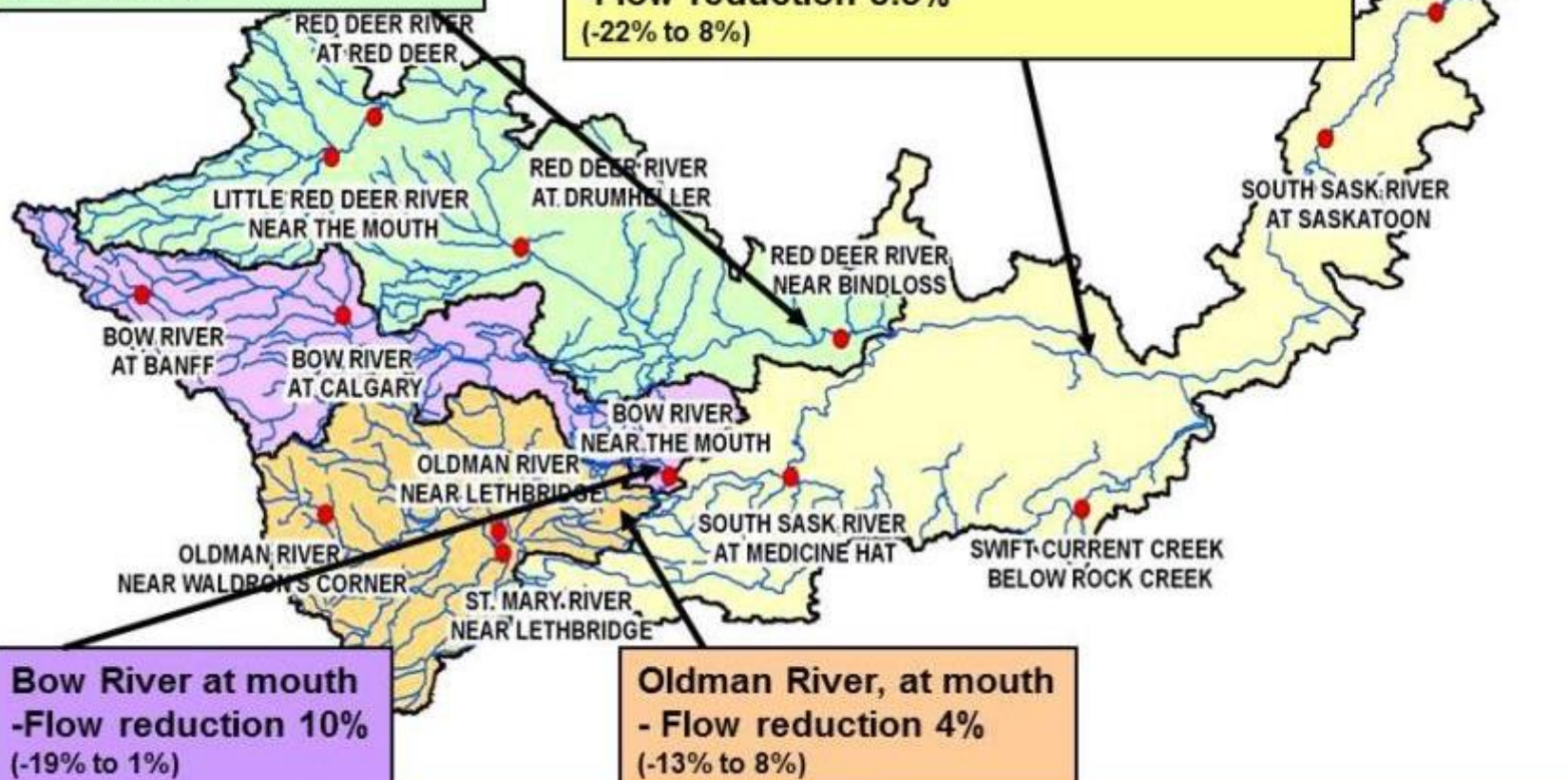
The future hydrology – Reduced Natural River Flow

Cumulative Flows in SSRB (Martz et al, 2007)

Flow reduction 4 to 13%, GCM scenario 2039-70

Red Deer River, Bindloss
Flow reduction of 13%
(-32% to 13%)

South Saskatchewan River, at Diefenbaker
-Flow reduction 8.5%
(-22% to 8%)



Future Climate Scenarios

The top of the slide features a decorative header with a warm, golden-brown color palette. It includes a stylized sun or moon on the left and several stalks of wheat on the right, with some grain falling. The background transitions from a dark orange at the top to a lighter, almost white glow where the wheat stalks are.

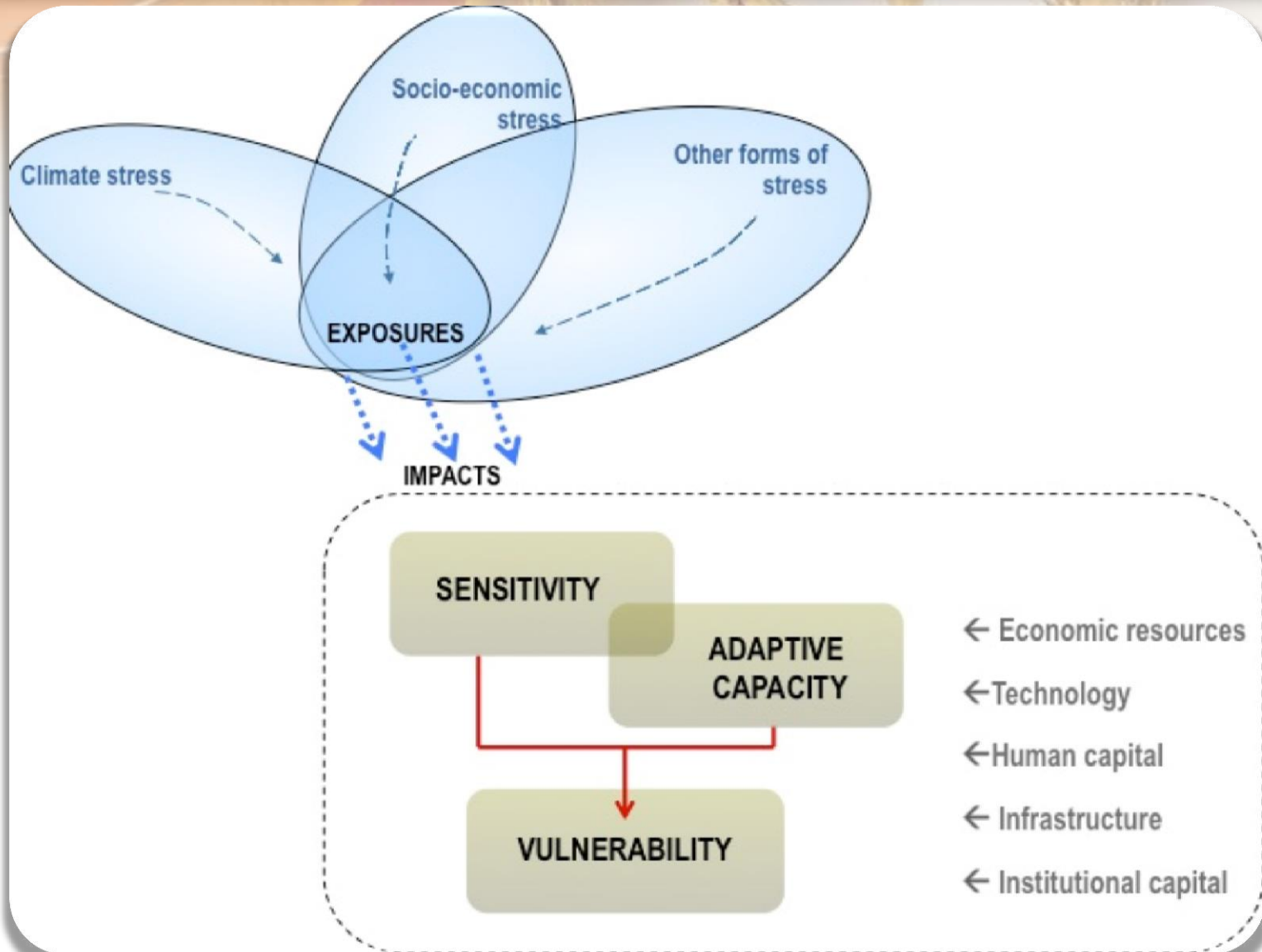
Dr. David Sauchyn Presentation

What's in it for us??

?? How vulnerable are we ??



Vulnerability of the future...



Next Steps:

- VACEA Knowledge Outreach collaboration?
- Preparedness planning: initiate a pilot project?
- Individual district planning?
- What next steps might be possible?
- Workshop report



Canada 