Adaptation as Resilience Building:

A policy study of climate change vulnerability and adaptation on the Canadian prairies:

IMPLICATIONS FOR DRI

presented at the

Drought Research Initiative Workshop
January 11, 2007

Henry David Venema, Director
Sustainable Natural Resources Management, IISD
Winnipeg, Manitoba, Canada

With funding from NRCan's Climate Change Impacts and Adaptation Directorate

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Droughts and Policy

§ reactive - disaster relief

§ pro-active: hydro-met based early warning systems

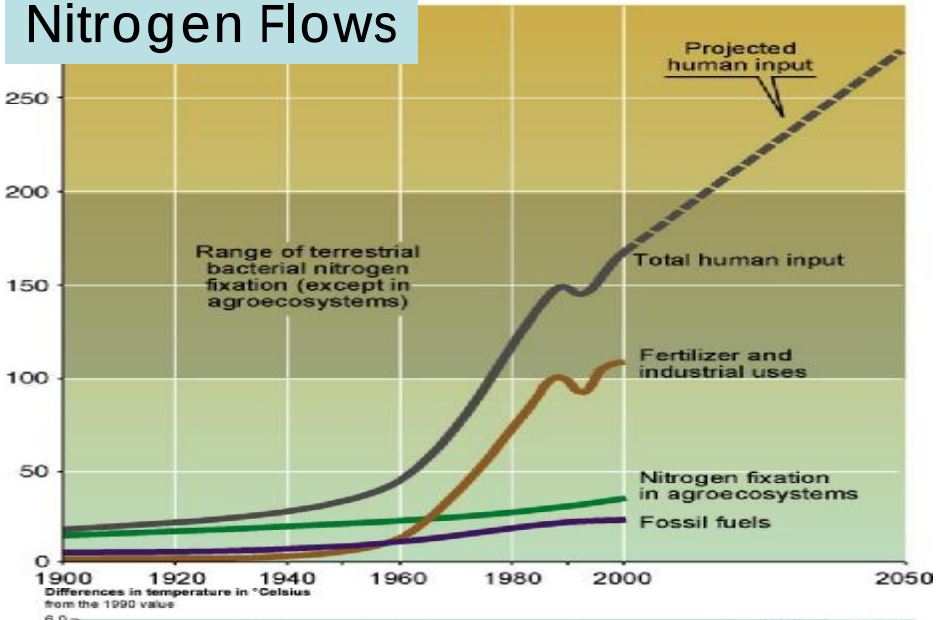
§Deep-proactive: Agriculture and water resources policy that build ecosystem-scale resilience to multiple shocks and stressors

"Outstanding Problems"

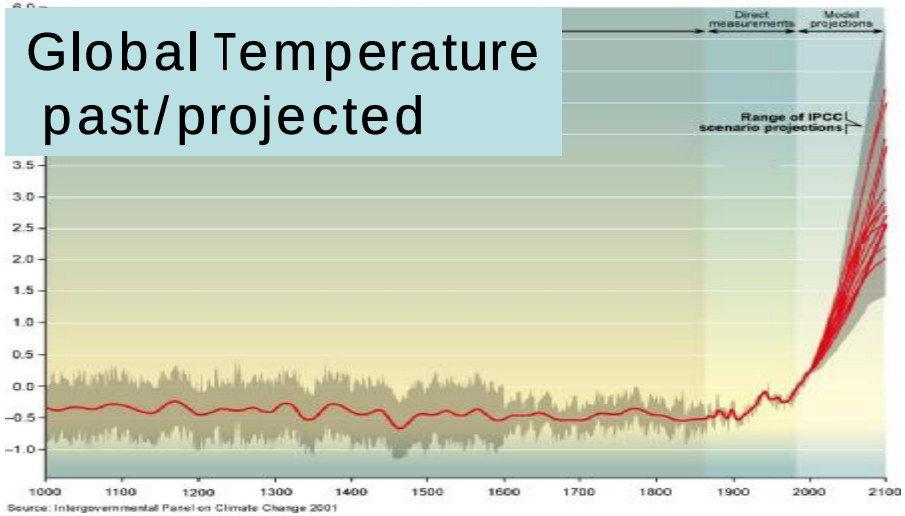
Millennium Ecosystem Assessment (2005)

"The intense vulnerability of the 2 billion people living in dryland agricultural regions to the loss of ecosystem services, including water supply; and the growing threat to ecosystems from climate change and nutrient pollution."

Nitrogen Flows



Global Temperature past/projected



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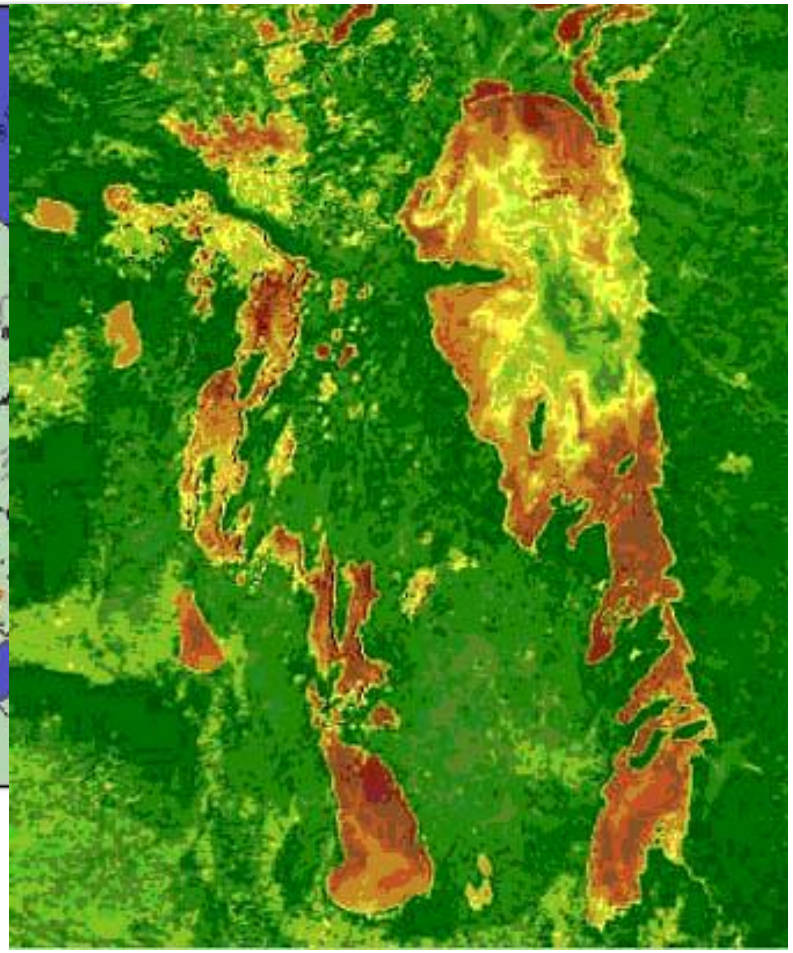
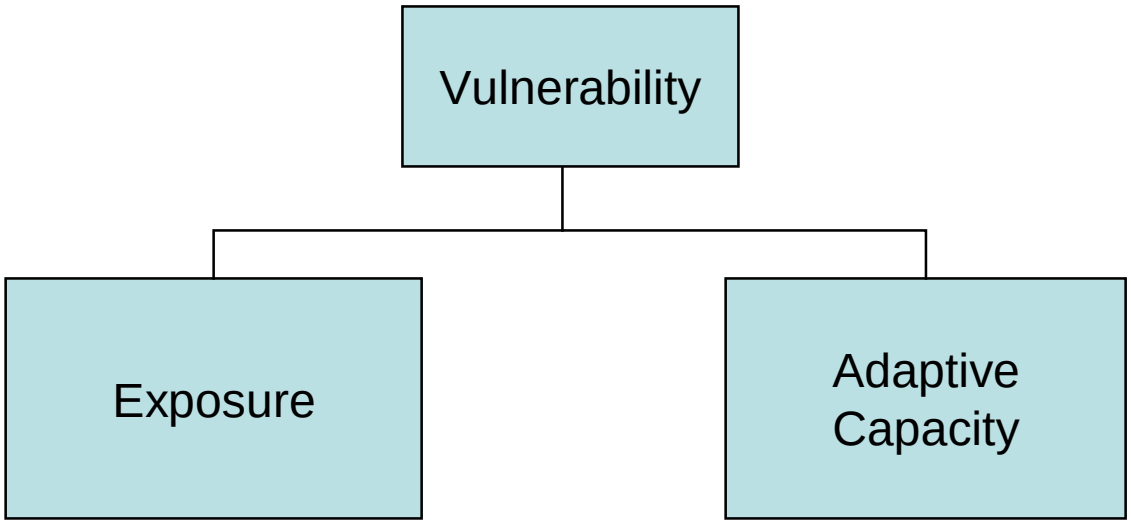
Nutrient Stresses Emerging:
(Recall the Millennium Ecosystem Assessment)



Operationalizing the Vulnerability Approach
Vulnerability = f(Exposure, Adaptive Capacity)

Smit and Pilifosova (2003)



Historic climate stress
Future climate stress

Adaptation occurs continuously; (successfully and unsuccessfully)
Ongoing successful adaptation is *resilience*
Objective: identify, learn and replicate
The policy environment that creates these successes.

Agriculture and Agri-Food Canada
Agriculture et Agroalimentaire Canada
Prairie Farm Rehabilitation Administration
Administration du rétablissement agricole des Prairies
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http://www.iisd.org

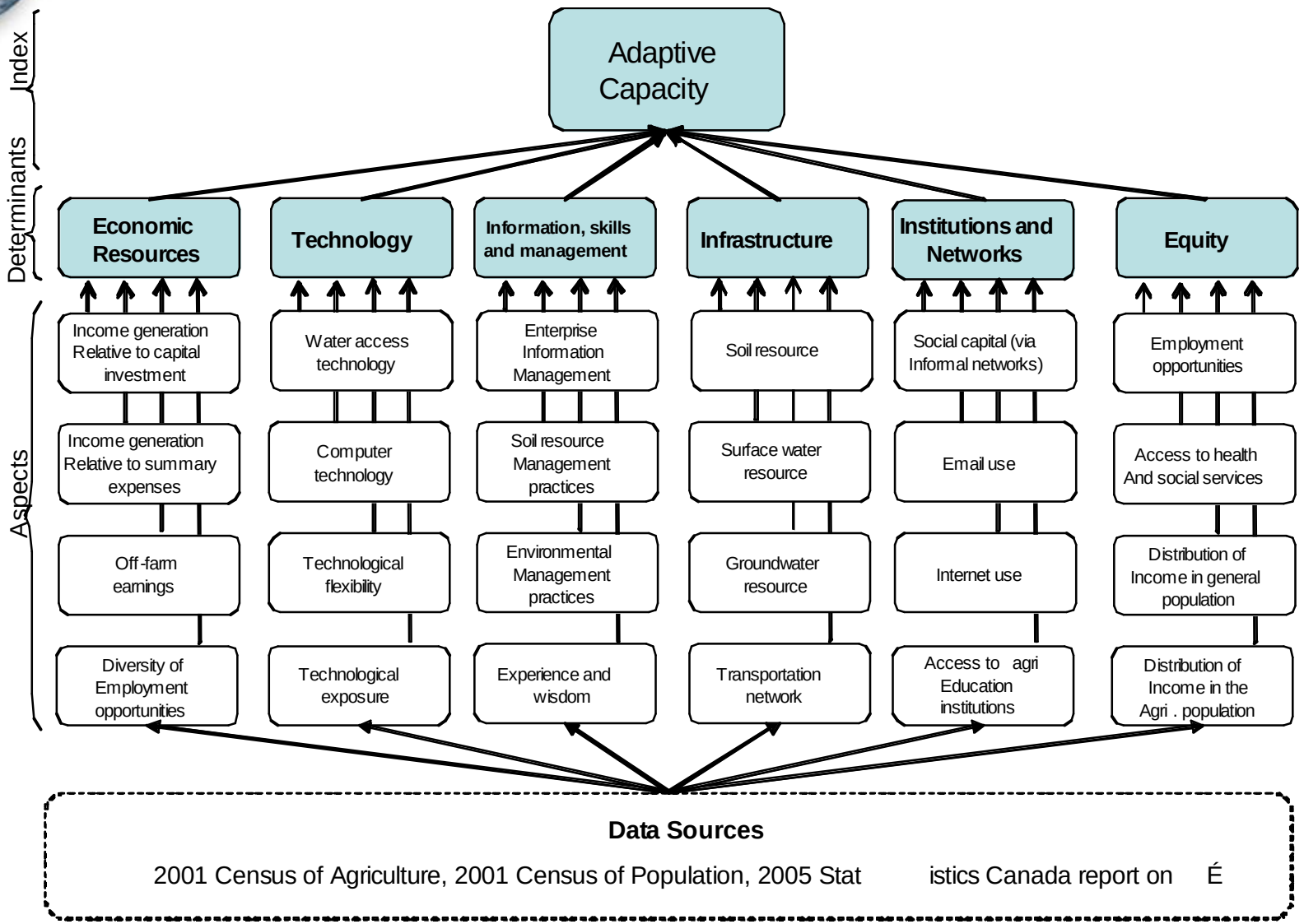
Indicators of Adaptive Capacity to Climate Change for Agriculture in the Prairie Region of Canada

An Analysis based on Statistics Canada's Census of Agriculture

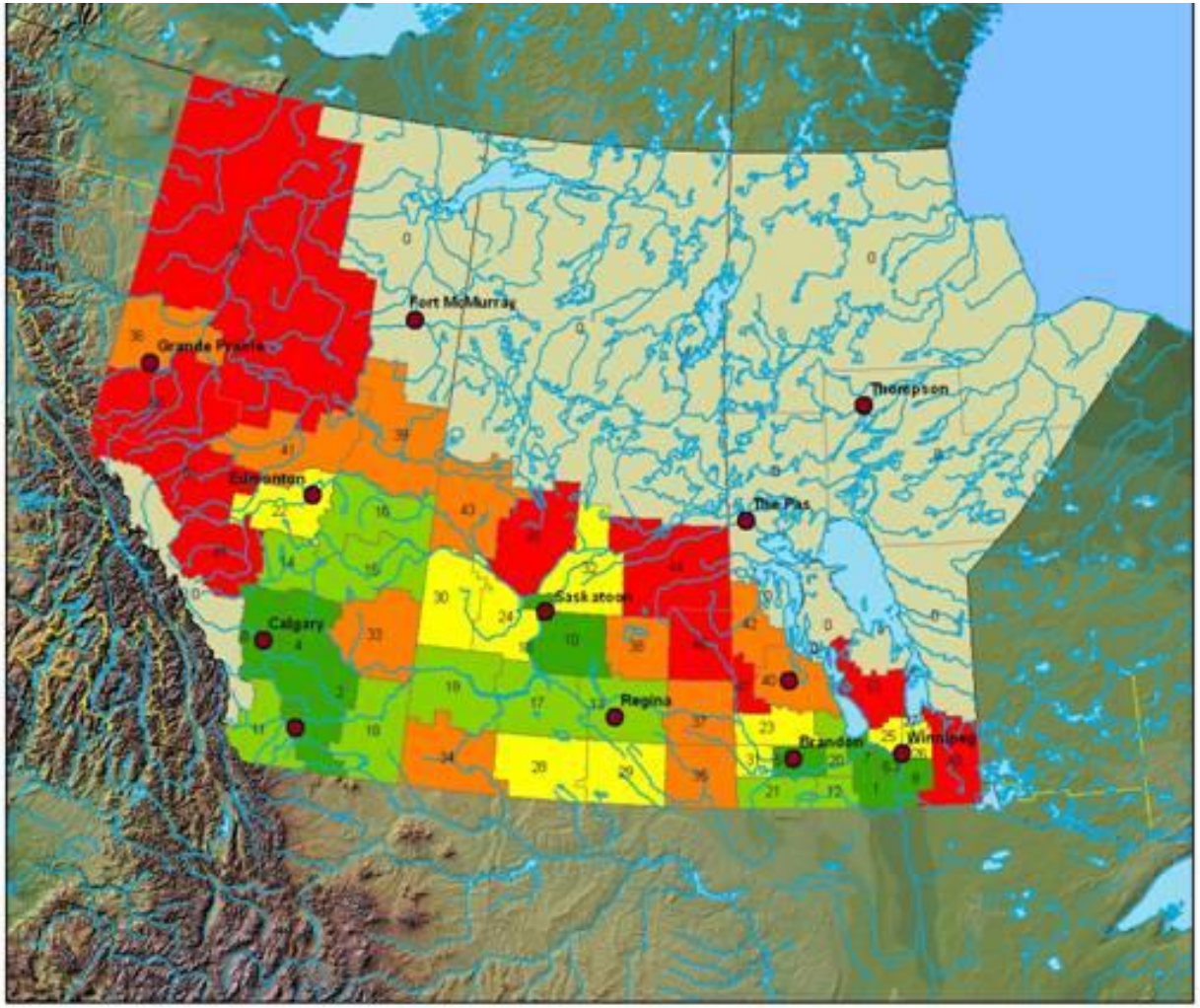
Darren Swanson - IISD
Jim Hiley – Prairie Farm Rehabilitation Administration (PFRA)
Henry Venema – IISD

DRAFT 2 – November 2nd 2006

Measuring Adaptive Capacity



Adaptive Capacity Mapped



Adaptive capacity:

Aggregrated indicator ranks

Six adaptive capacity indicators, make up the overall rankings.

Legend

- 0 - 10
- 11 - 21
- 22 - 32
- 33 - 43
- 44 - 53

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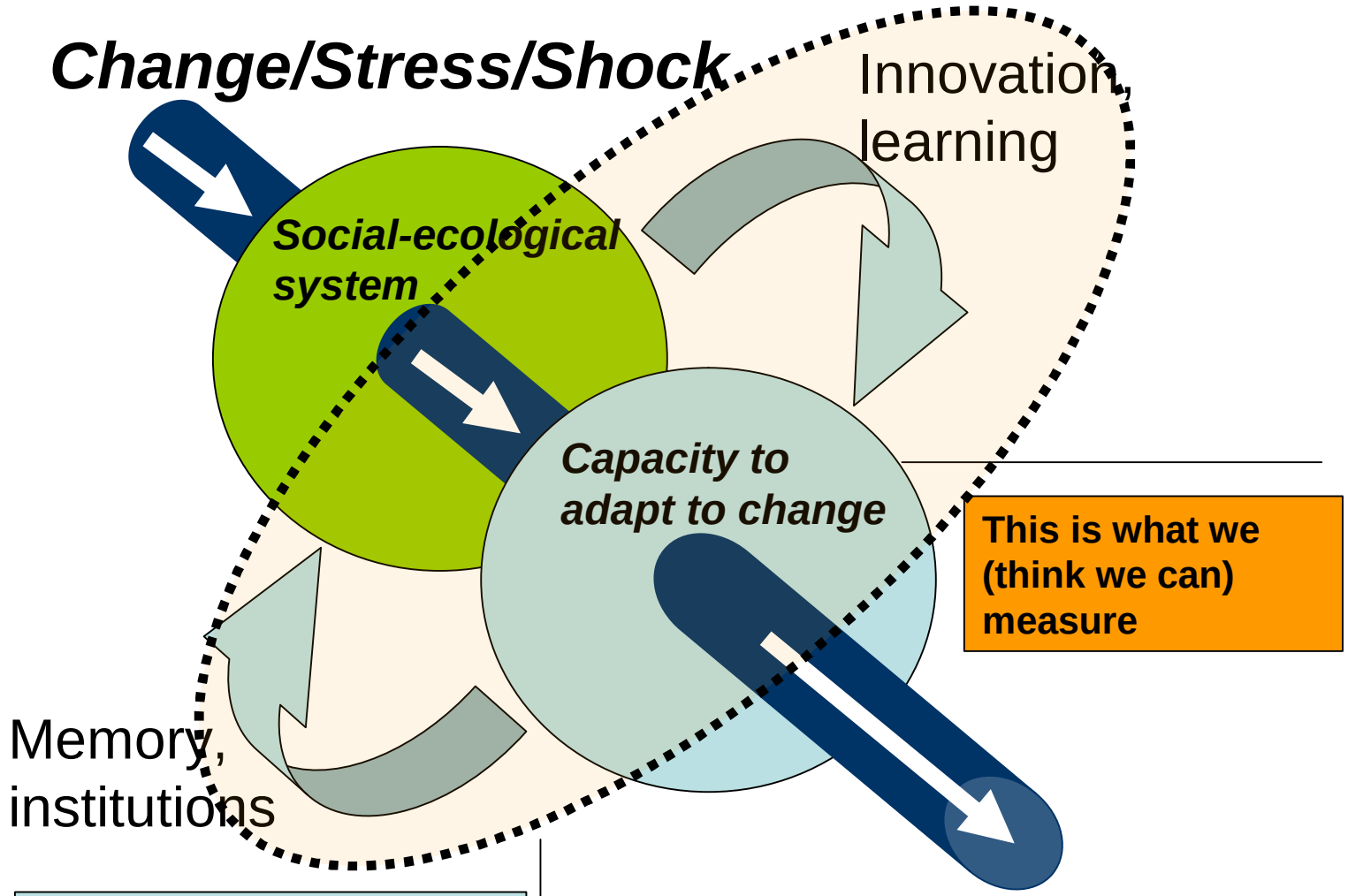
A Resilience Theory Framework [Berkes et al,2003]



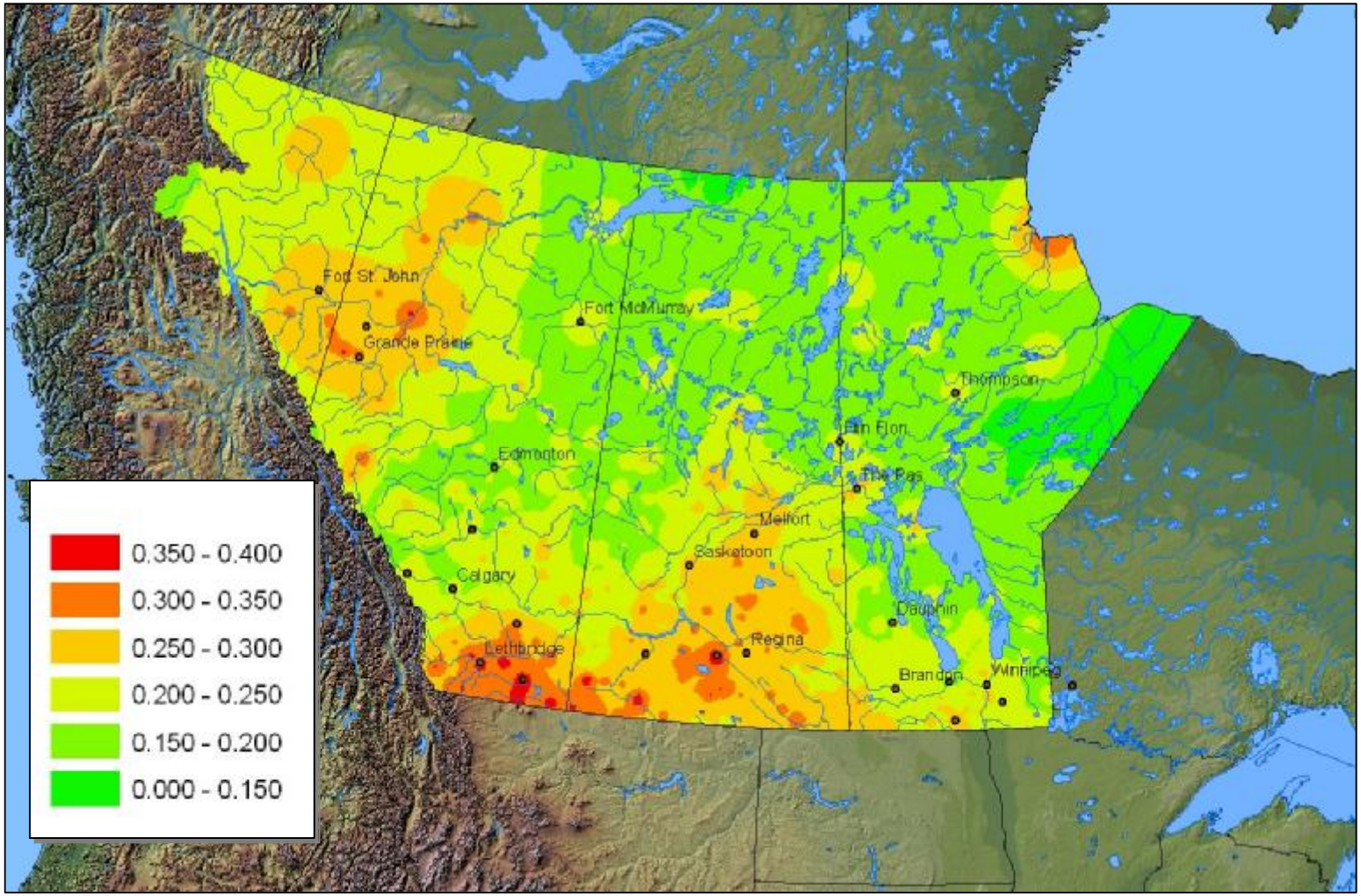
Lessons From Recent Development Practice

- Agricultural (Scoones, 2004):
  - *Past policy interventions that assume equilibrium conditions "wildly inappropriate" in large swaths of Africa where the coefficient of variation of annual rainfall is more than 30% - linear policy models failed.*

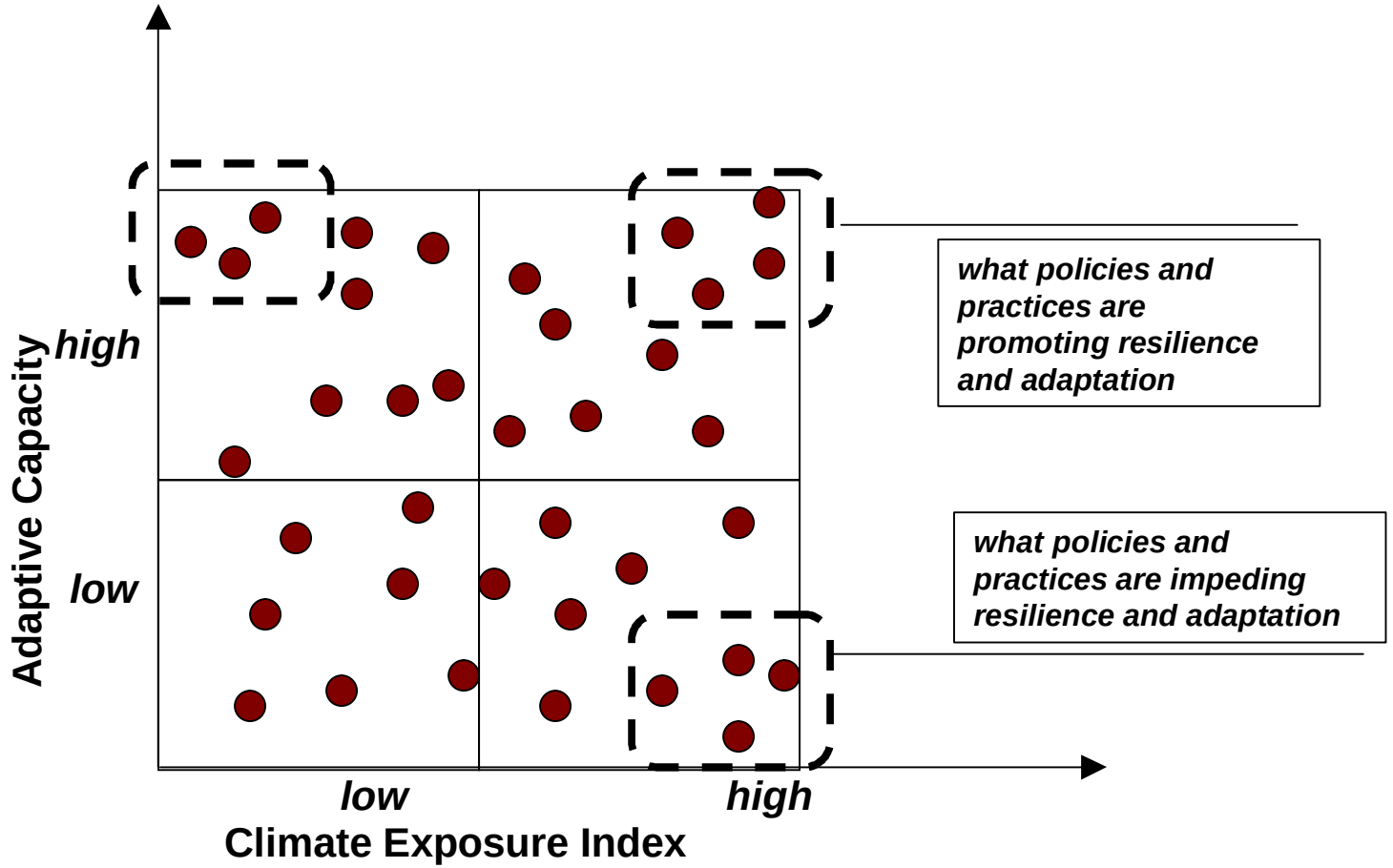
- Water resources (Moench et al, 2003)
  - "While it may be possible to identify some emerging problems in advance, changing conditions often render specifically targeted management proposals irrelevant or impossible to implement. Because of this, **our research indicates a clear need for frameworks that are "adaptive" - that reflect uncertainties and can respond and adapt as contexts change or unforeseen problems emerge.** Specific solutions are less important than the existence of processes and frameworks that enable solutions to be identified and implemented as specific constraints and contexts change."

- Hazards / Disaster (International Strategy for Disaster Reduction, 2003)
  - *"Experience gained coping with current climate variability is the basis for future adaptation to climate change"*

Climate Variability
(a surrogate for “Change/Stress/Shock”)
Growing Season Precipitation Coefficient of Variation: precursor to desertification

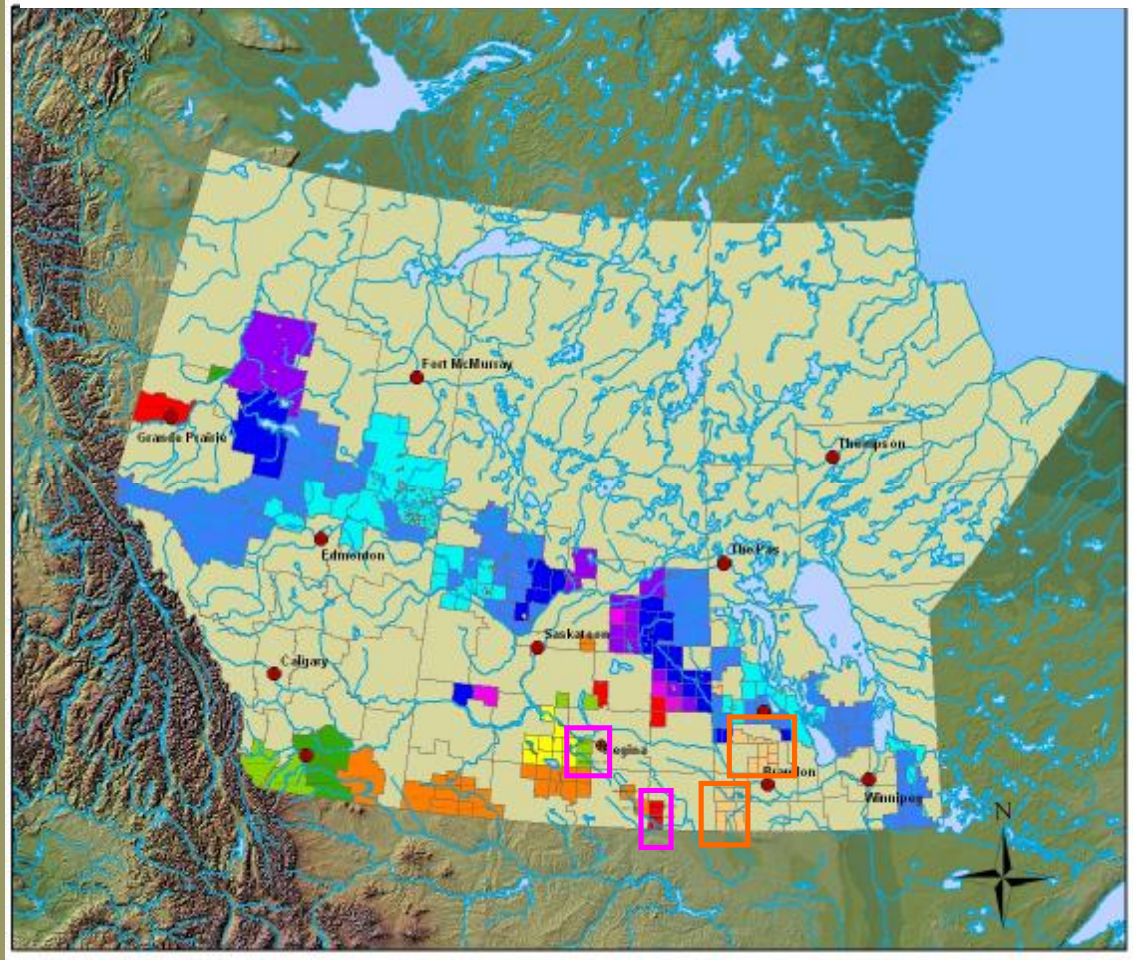


Case Study Identification with Vulnerability Space Mapping



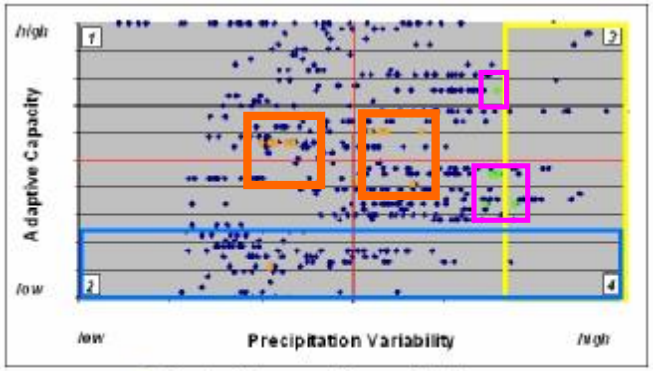
Vulnerability Space Map

Adaptive Capacity vs. Precipitation Variability



Legend

25% Highest Precip Variability classified by Adapt Capacity (AC)	*25 % Lowest Adaptive Capacity classified by Precip Variability (PV)*
HIGH AC	HIGH PV
LOW AC	LOW PV



- Saskatchewan Case Studies
- Manitoba Case Studies

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Drought Research:
Socio-economic and Policy Directcions

§ We need to analysing multiple droughts and understanding differential impacts based on climate, adaptive capacity, and natural capital

§Recommendation: standardized diagnostic protocols for drought analysis - need common platform for comparative analysis of historical droughts.

§Recommendation: companion research on adaptive capacity, and natural capital - for understanding drought impacts from a historical perspective - policy lessons for the future (ie wetlands and drainage).