

#### UNIVERSITY OF SASKATCHEWAN

Global Institute for Water Security

www.usask.ca/water





#### International Waters

water quality

**Howard Wheater** 

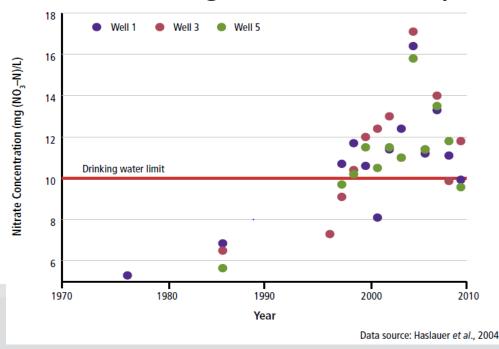
Canada Excellence Research Chair in Water Security



# Nutrient pollution – one of society's most difficult challenges

Multiple sources, multiple actors, affecting:

- local & regional water resources
- surface water & groundwater
- ecosystems, drinking water, amenity, human/animal health



Nitrate concentrations in Municipal Water wells of the City of Woodstock, Ontario



### Some costs of nutrient pollution

#### **USEPA (2011)** regarding loads to Chesapeake Bay

'Direct additions to the environment from agriculture are about 370,000 t of reactive nitrogen per year and cause \$1.7 billion worth of damage'

#### **European Nitrogen Assessment (2011)**

Environmental costs of agricultural nitrogen

€20 - €150 billion per year.

Benefits to farmers €10 - €100 billion per year



### Science needs to support policy:

- Local and Basin Scale problem definition
- Understanding effectiveness of management options (e.g. Beneficial Management Practices) and their basin scale impact



And the current situation:

- $\lor$  Loadings defined at basin scale (1<sup>st</sup> order assessments)
- X Poor understanding of BMPs and basin scale impacts

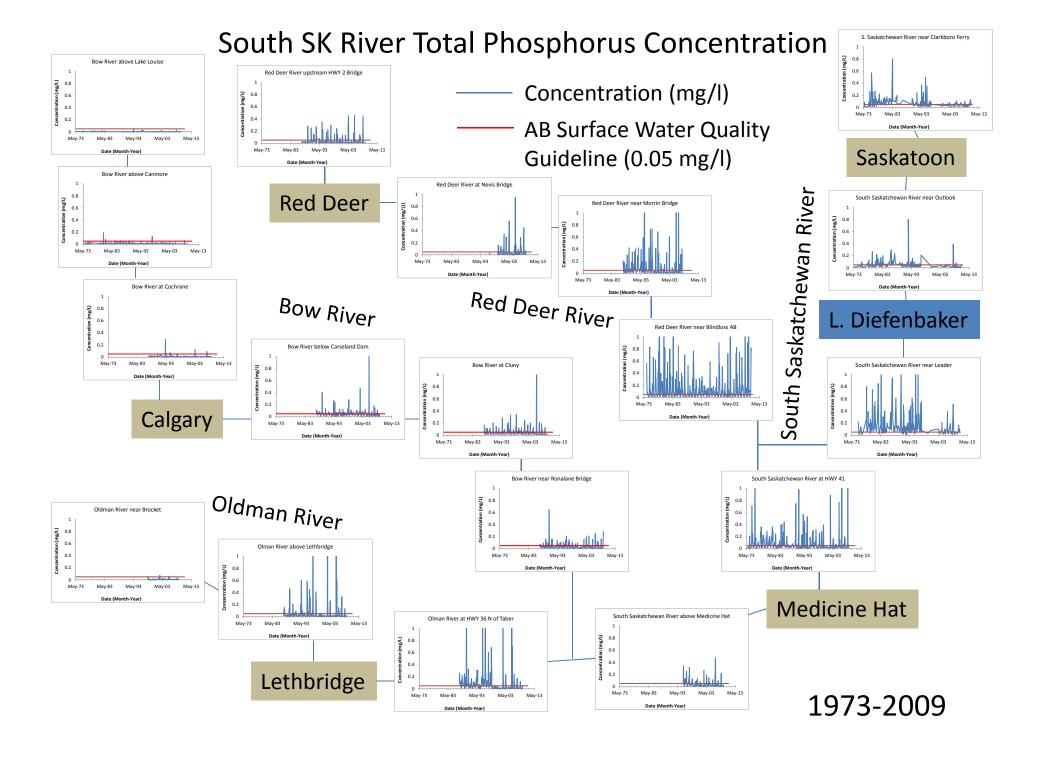
#### Saskatchewan River



The western tributary of the Winnipeg basin



SaskRB research sites





# Lake Diefenbaker/Swift Current Creek



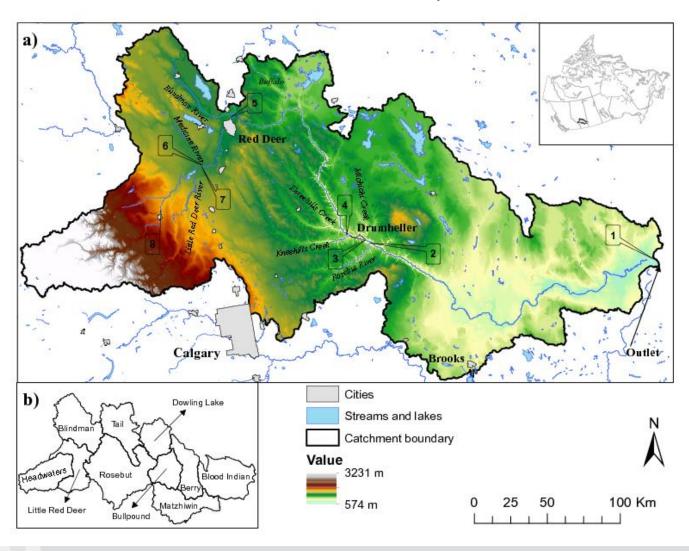








## Red Deer Basin, Alberta





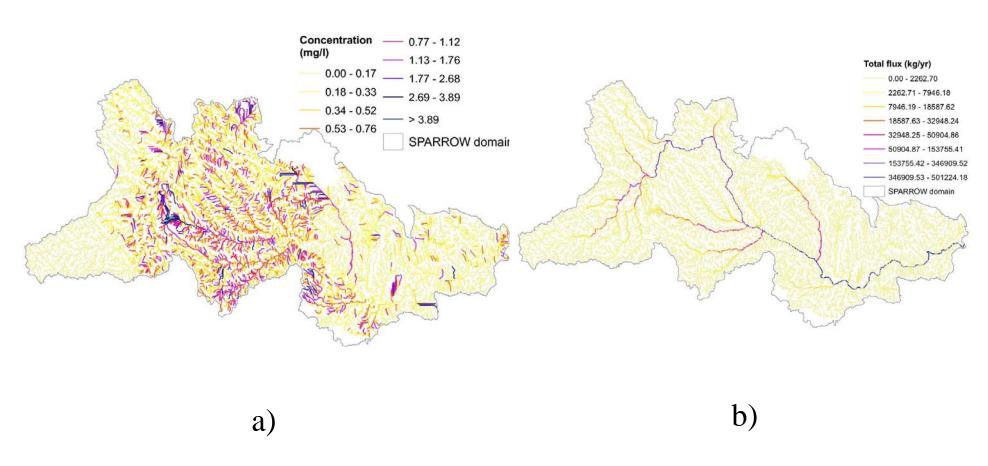


Figure. FL SPARROW model Total Phosphorus: a) concentration (mg/l) and b) flux (kg/yr)



# Water and Agriculture in Canada

Report commissioned by the Minister of Agriculture and Agri-food

Report released: February 26 2013

**Council of Canadian** 



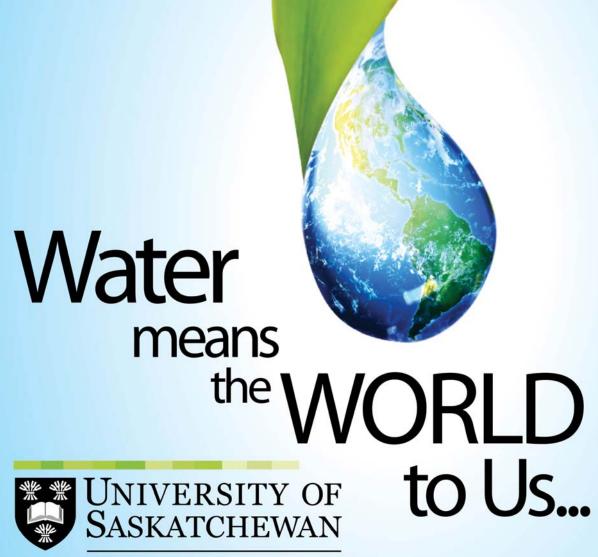
WATER AND AGRICULTURE IN CANADA: TOWARDS SUSTAINABLE MANAGEMENT OF WATER RESOURCES

The Expert Panel on Sustainable Management of Water in the Agricultural Landscapes of Canada



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