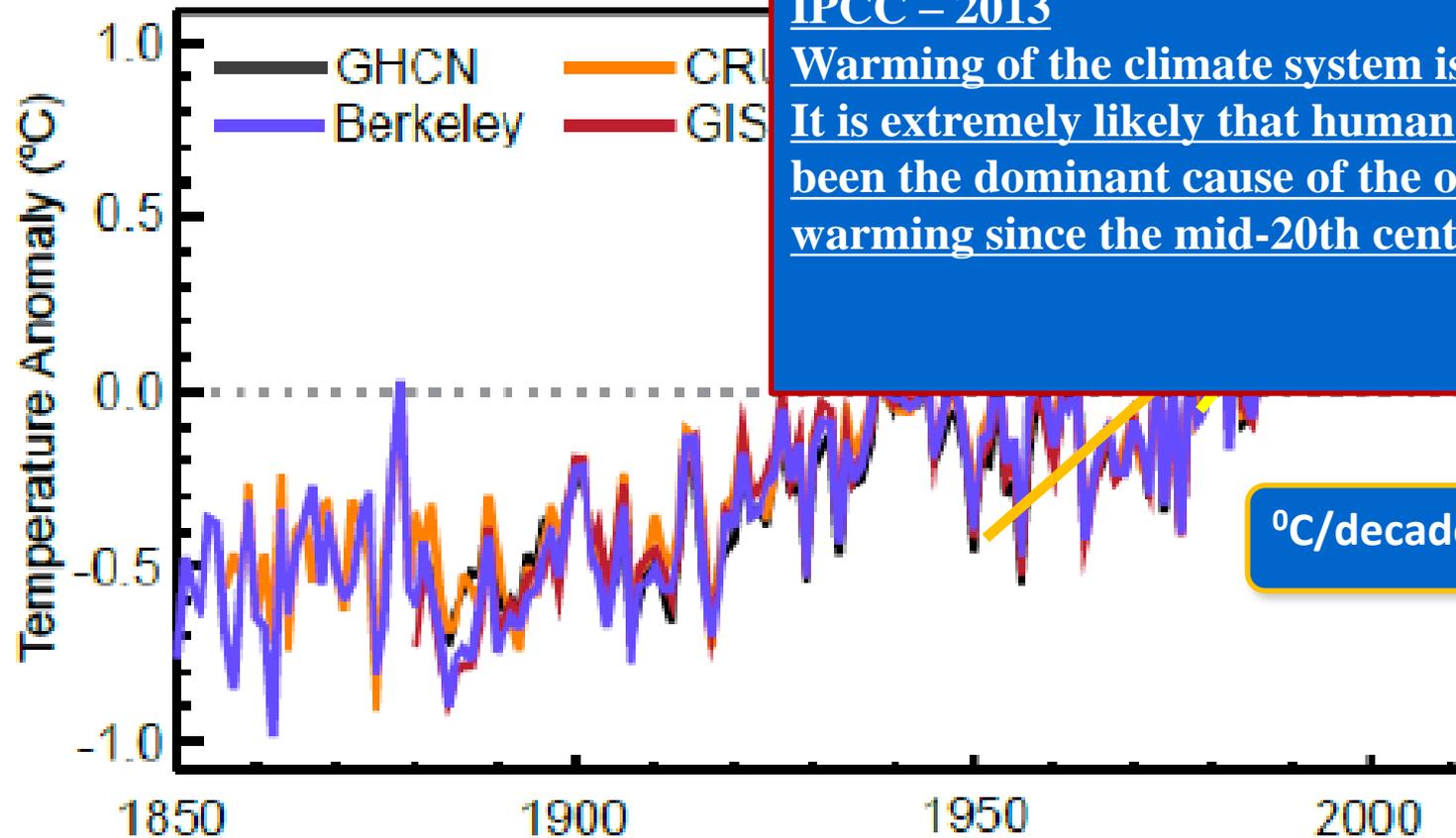


Climate Change, Lake Winnipeg and CSOs

Dr Henry David (Hank) Venema
Chief Scientist

The climate is changing

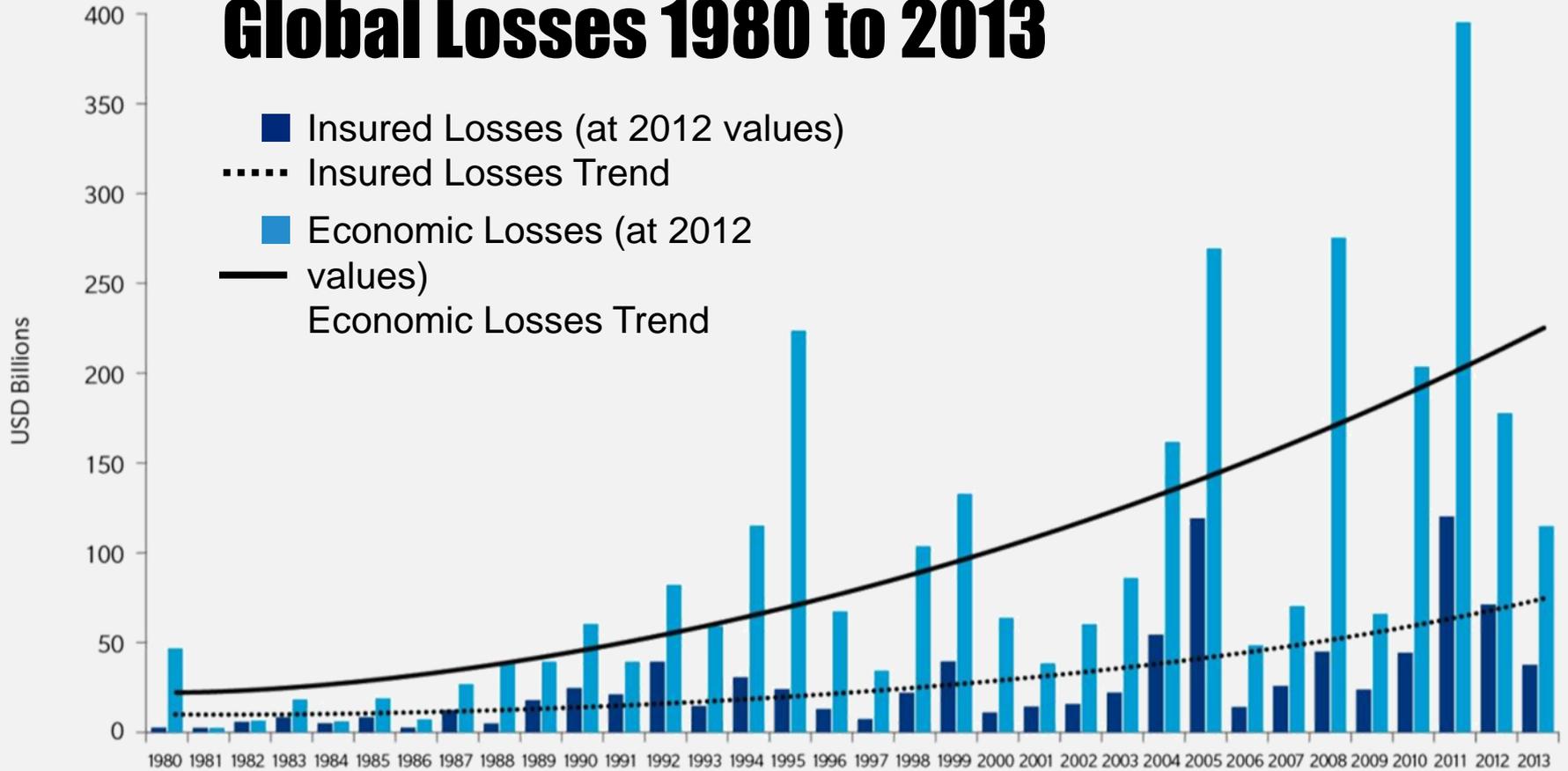


IPCC – 2013

Warming of the climate system is unequivocal.
It is extremely likely that human influence has
been the dominant cause of the observed
warming since the mid-20th century.

IPCC, 2013

Global Losses 1980 to 2013

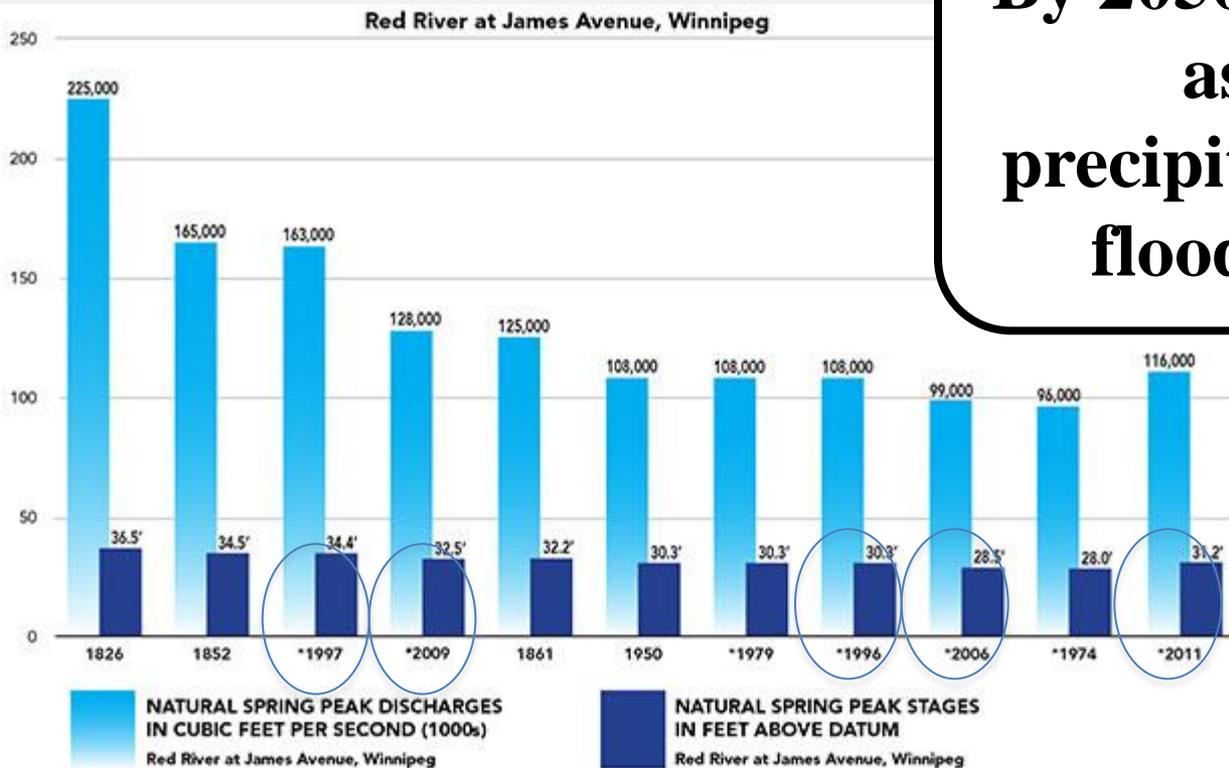


Source: Guy Carpenter, Swiss Re

Climate Change Impacts: Floods in Manitoba

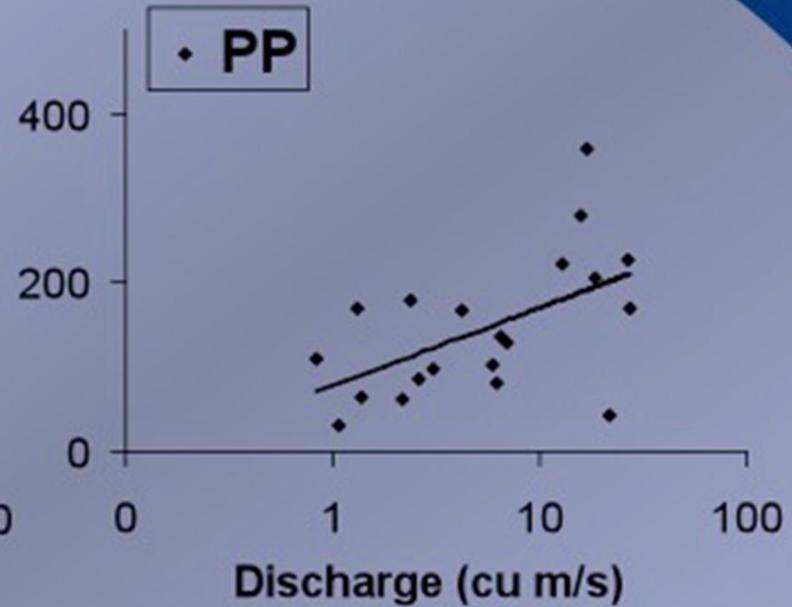
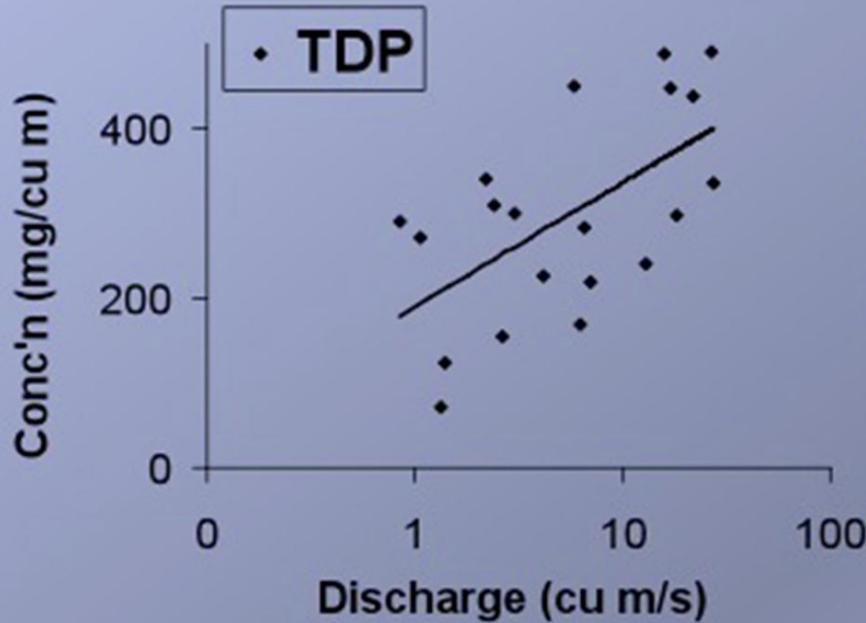
Top 10 Floods

By 2050, with almost twice as many heavy precipitation events, more floods are projected.



* Computed Natural Discharge Without Use Of Red River Floodway, Portage Diversion, Shellmouth Dam
Compiled by Manitoba Conservation and Water Stewardship

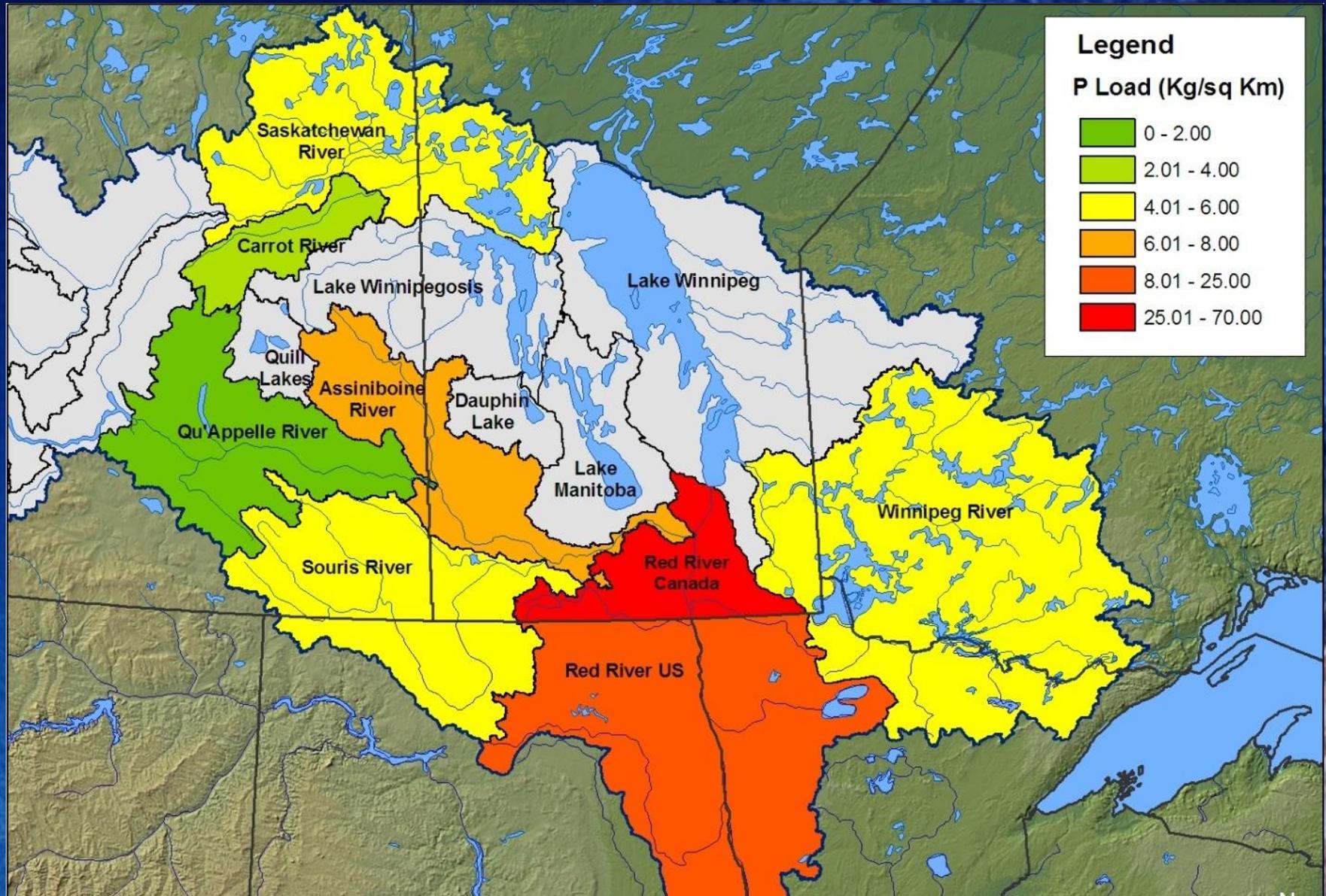
Correlated stress



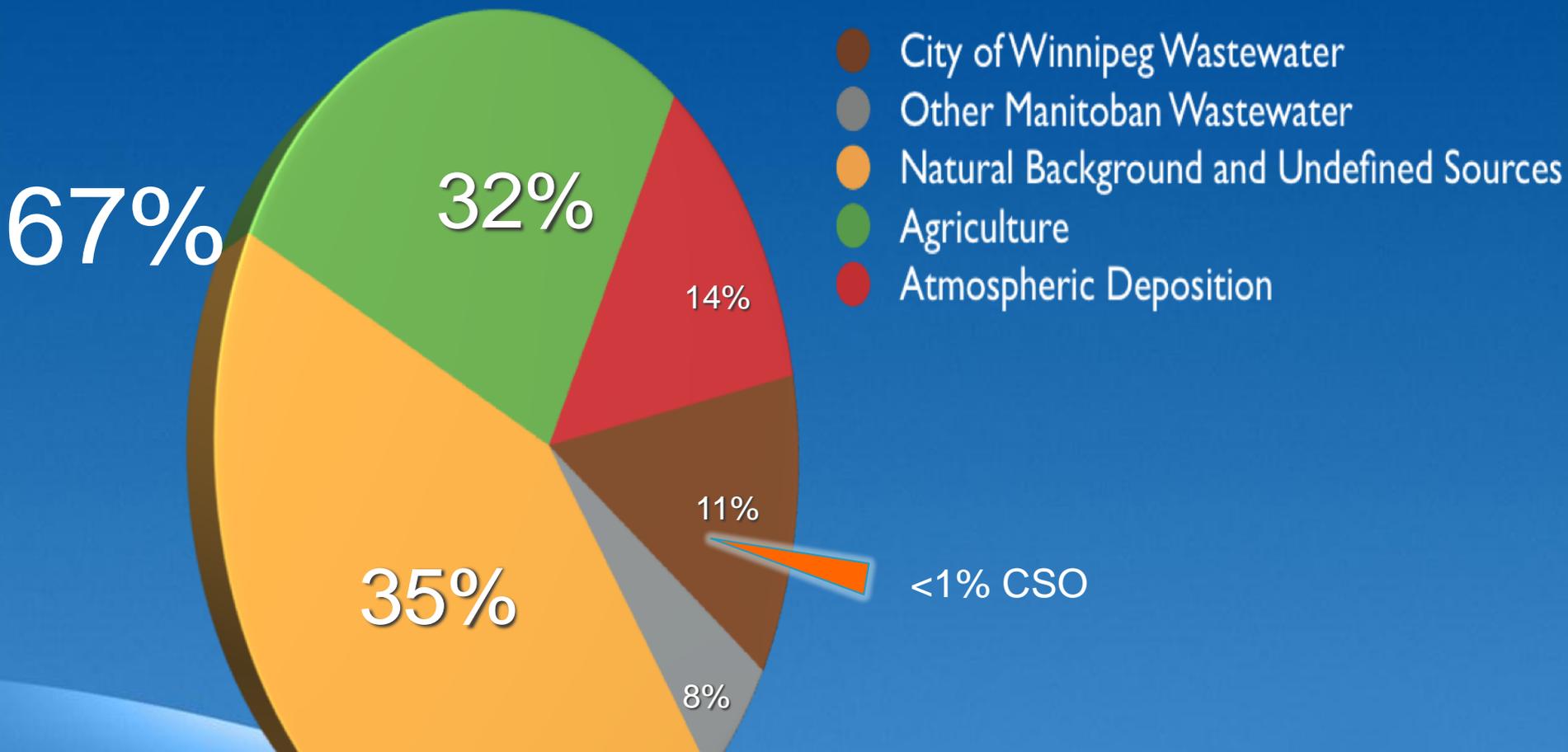
Source: McCullough, 2010



It's our Issue



Phosphorous Sources from Manitoba



**2/3 of the of the MB
P load non-point
watershed sources**

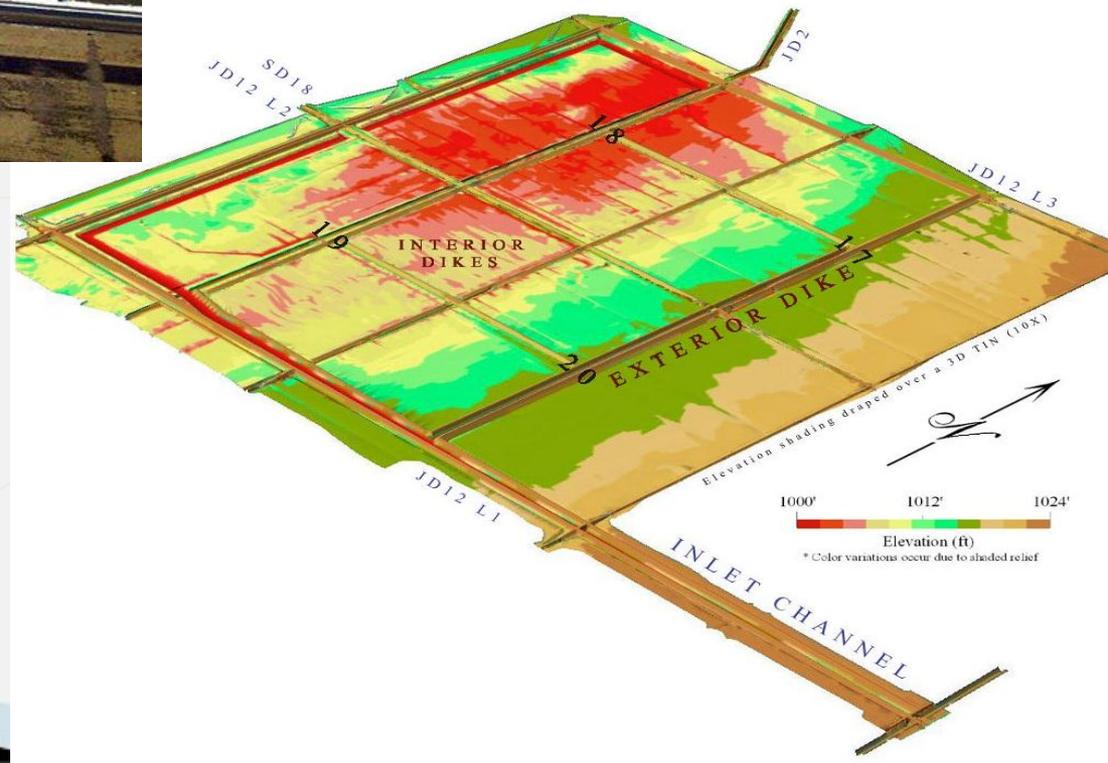
Lake Winnipeg
Stewardship Board 2006

Alternative Approach

Combining flood protection, nutrient management and biomaterial production



- Stores spring runoff water
- Has resulted in increased production in surrounding farmland
- Reduced peak flooding and reduction in downstream water flow





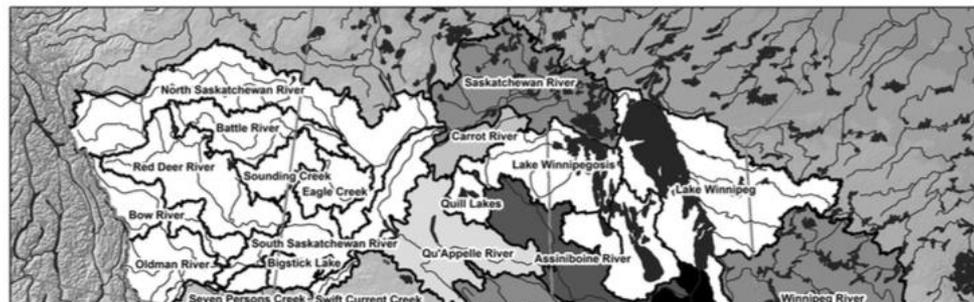
The Proposition: Water Quality Trading



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Water quality trading

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Sustainable Natural Resources Management

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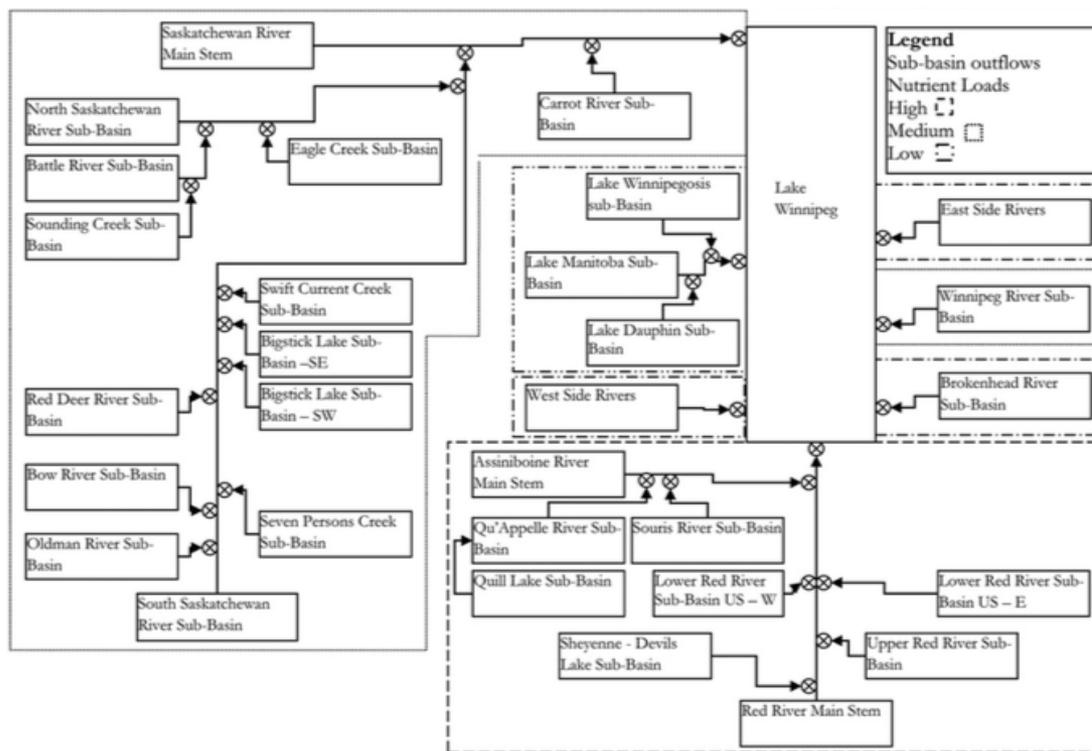


Fig. 4. Conceptual representation of a multilevel trading system for the Lake Winnipeg watershed.