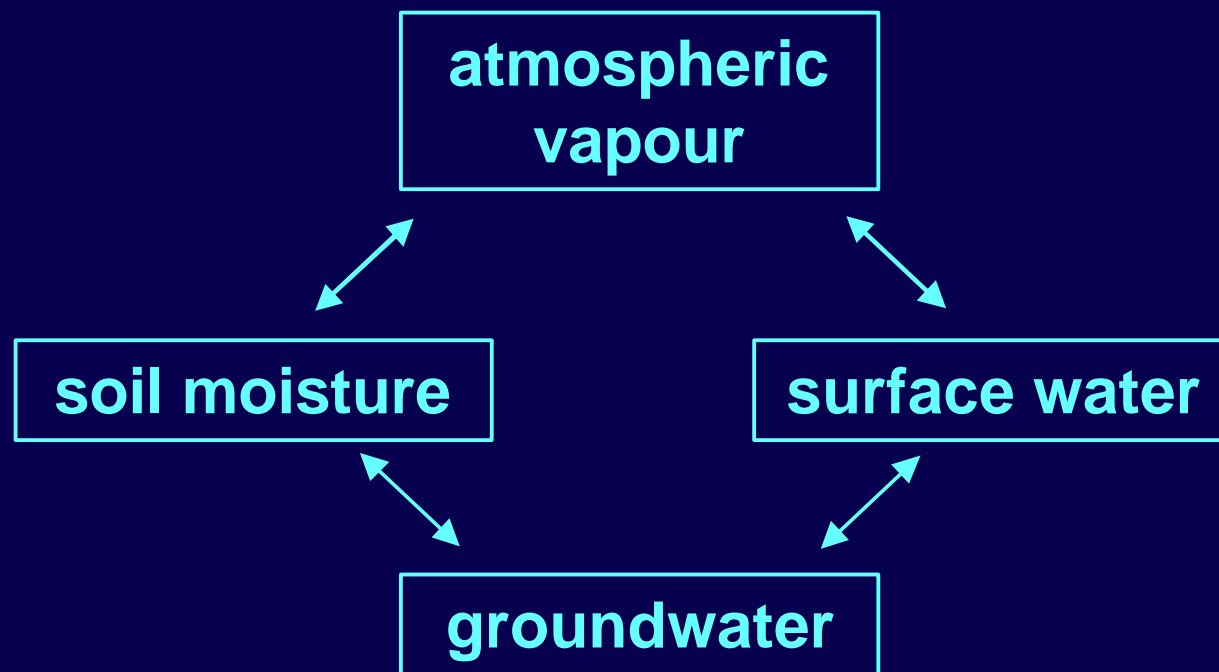


Effects of Drought on Prairie Groundwater

Masaki Hayashi

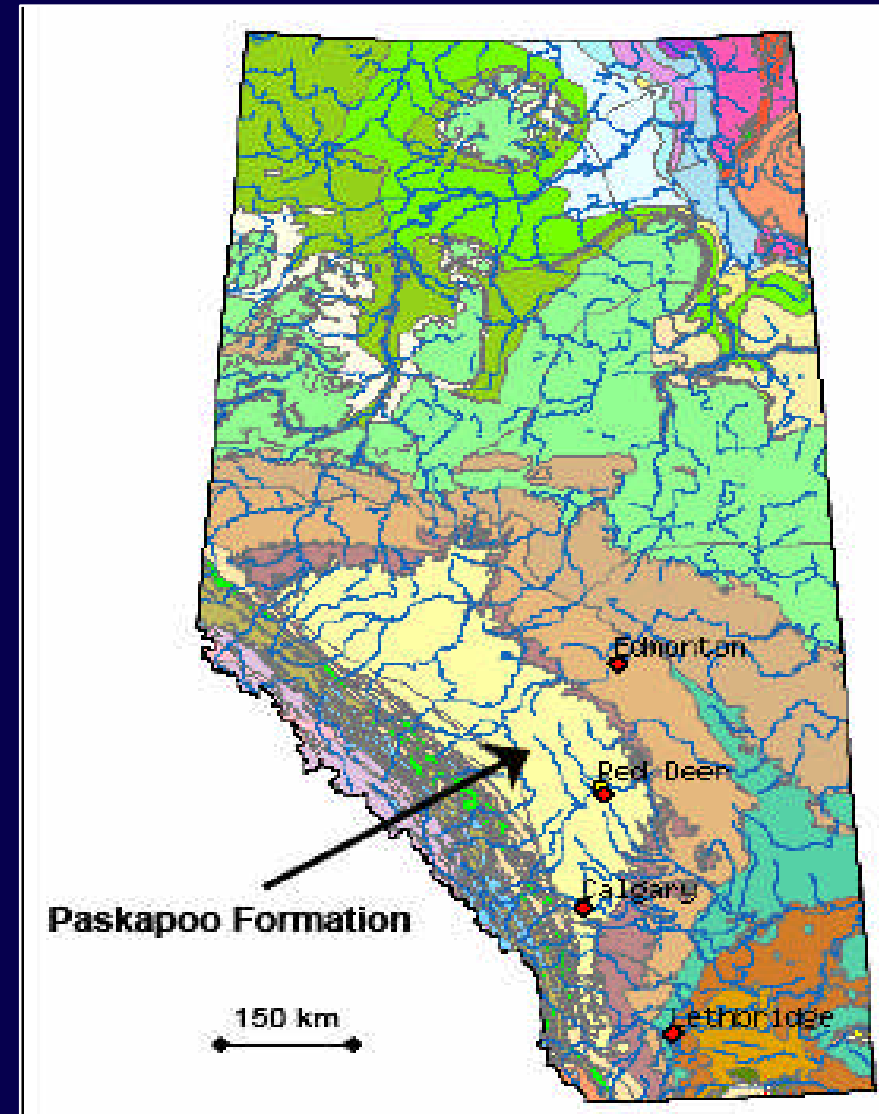
Dept. of Geology and Geophysics, Univ. of Calgary



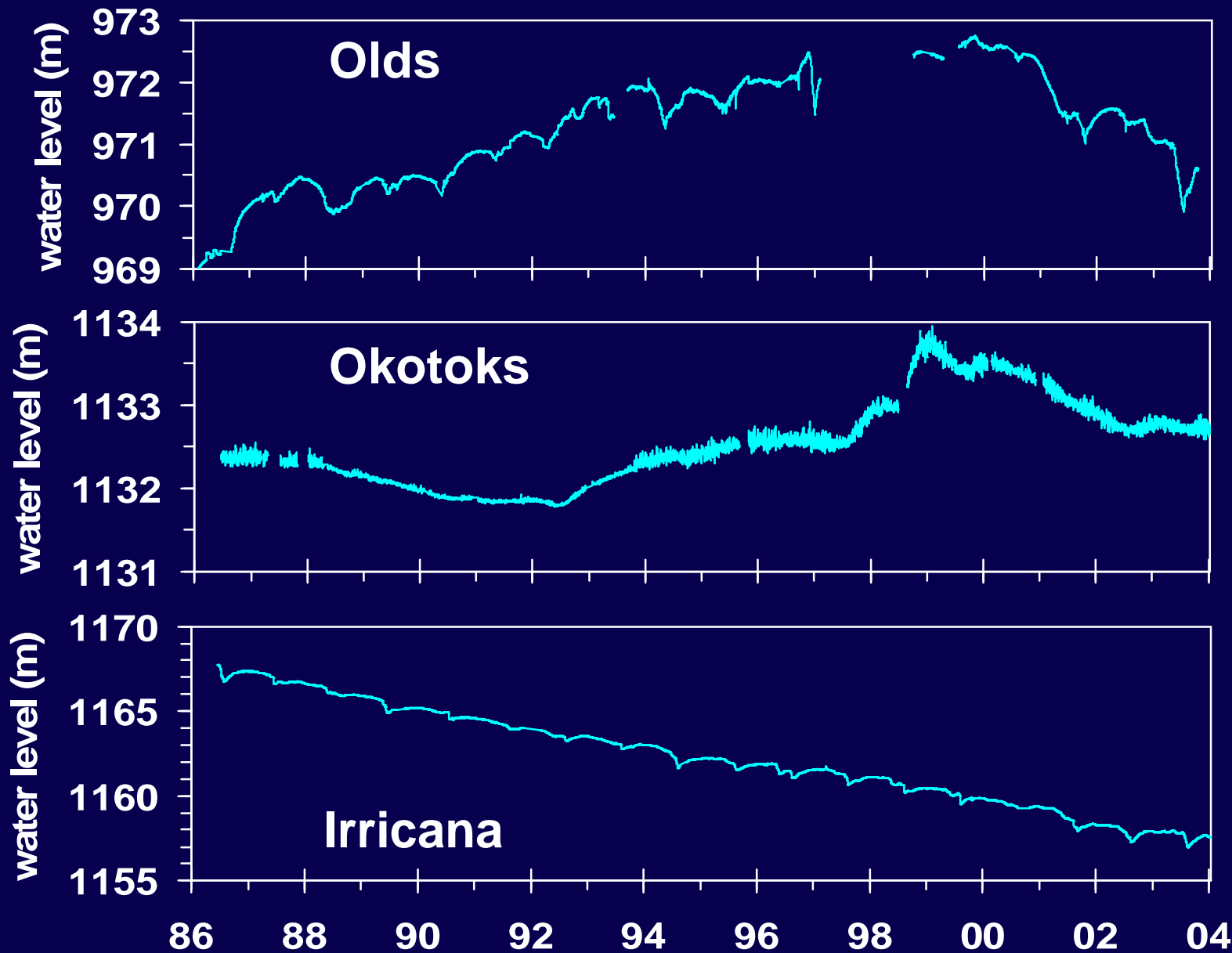
Increasing population in Edmonton-Calgary corridor



Future stress on Paskapoo Formation aquifer?

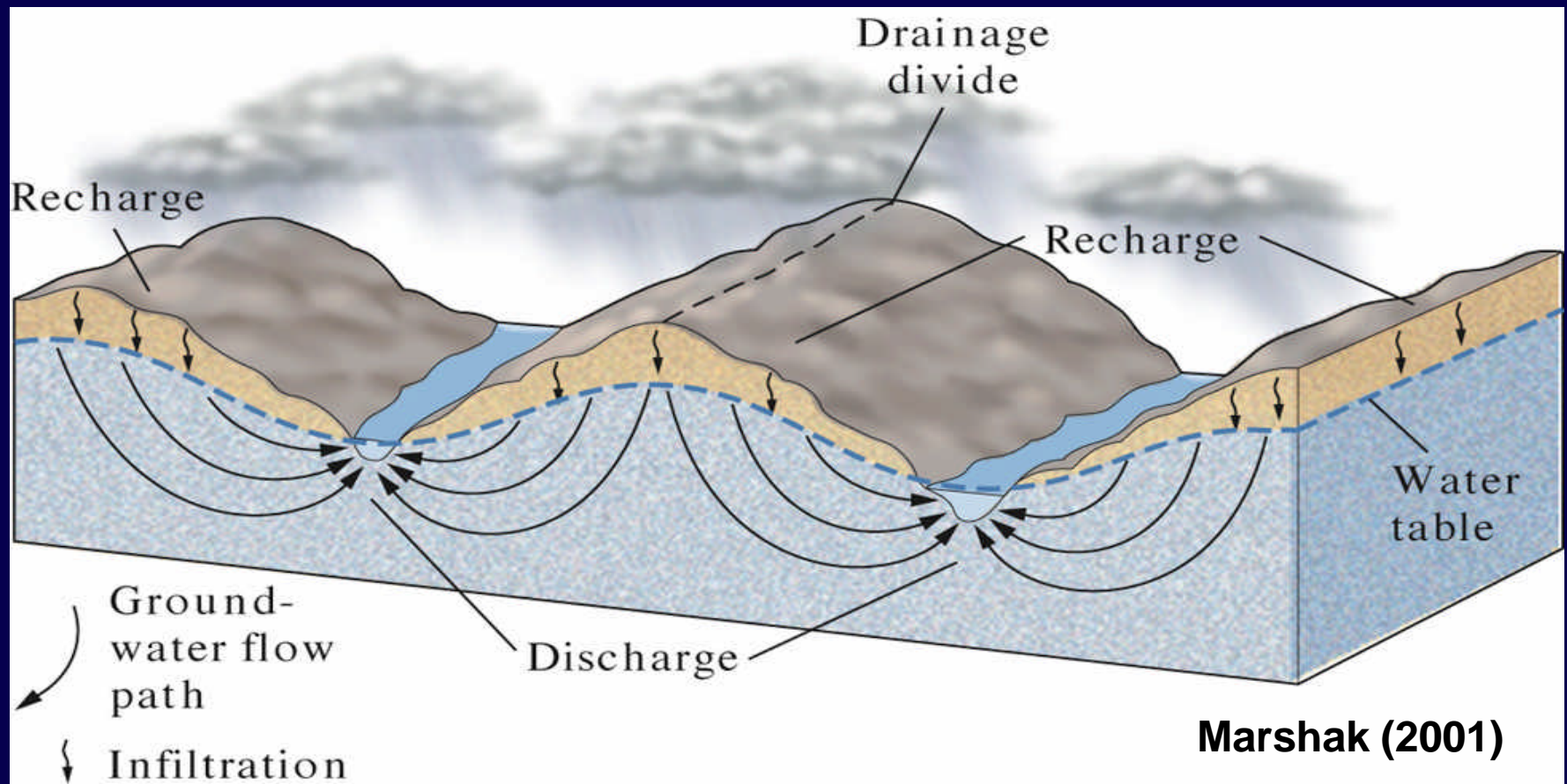


Paskapoo Formation Wells near Calgary



Data provided by
Carole Holt Odu
Alberta Environ.

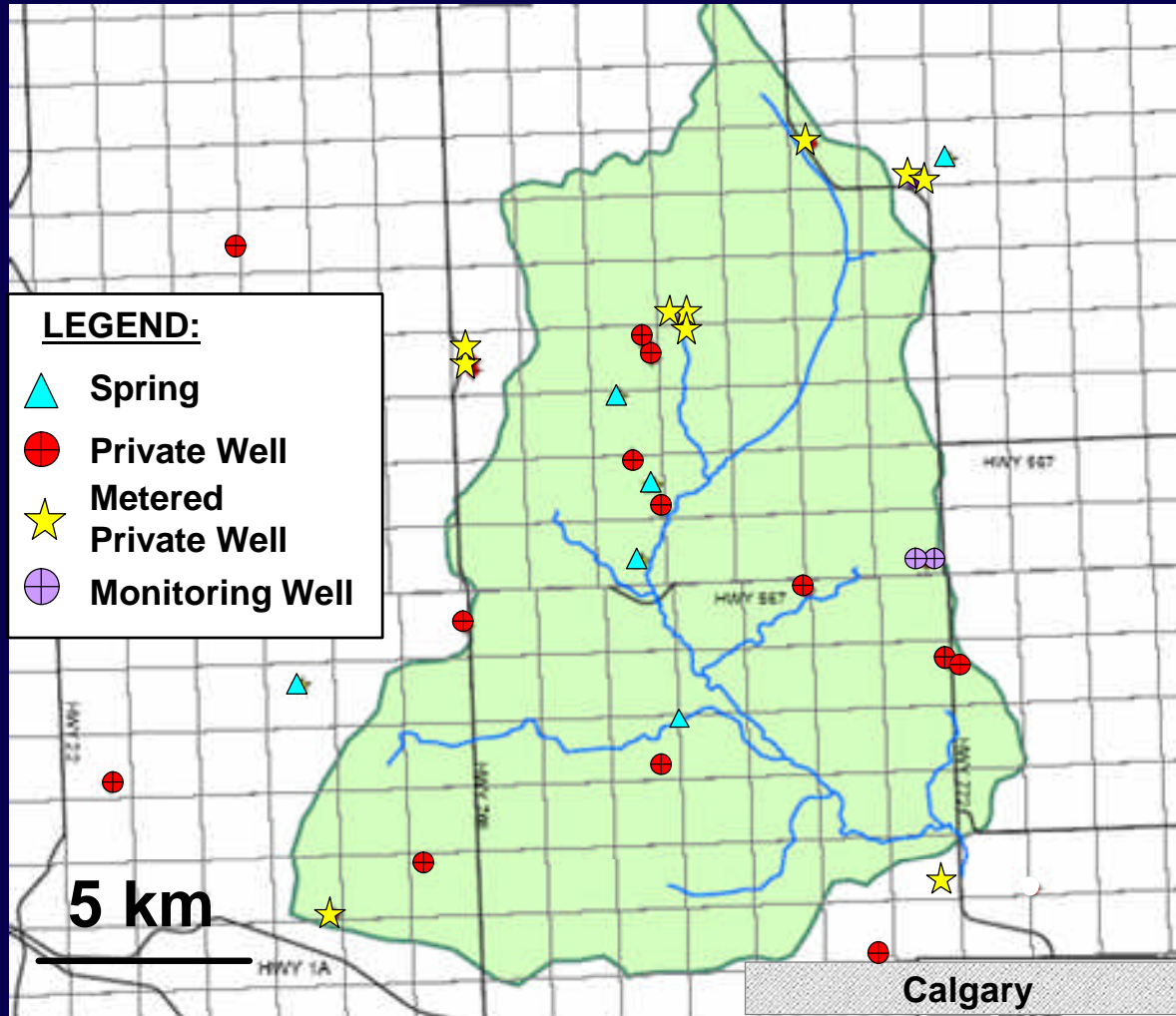
Groundwater Flow System



Drought presumably diminishes recharge, causing aquifer water level to decline. How fast, how much?

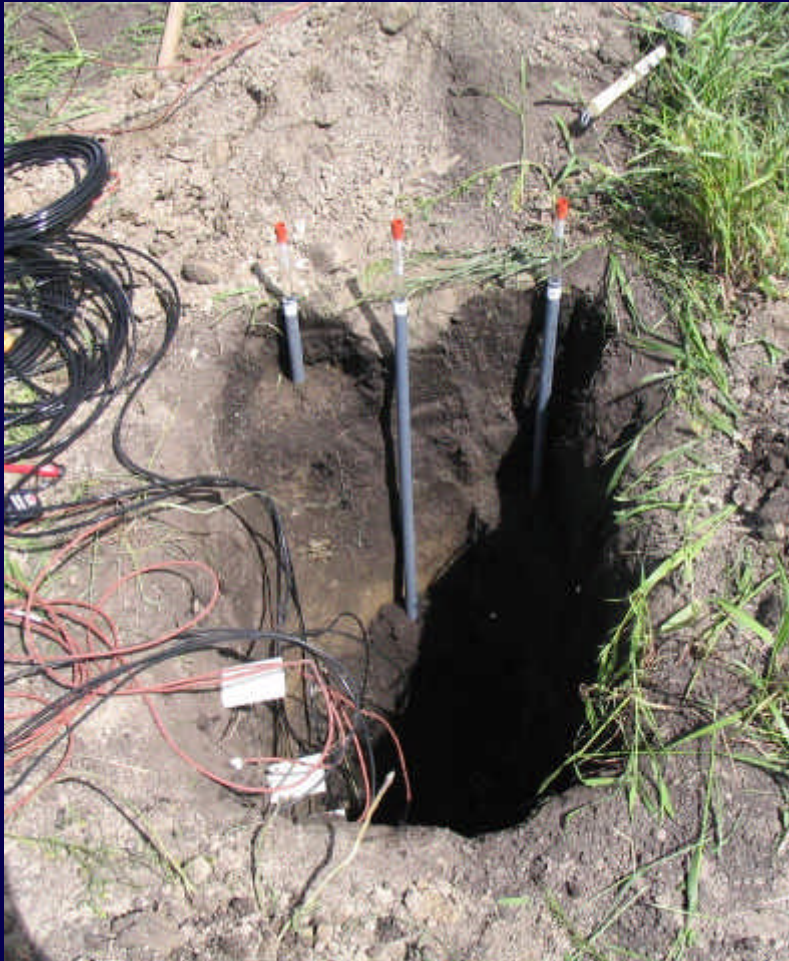
West Nose Creek Watershed

Community-based groundwater monitoring network



West Nose Creek – Wooliams Farm Study Site

Soil moisture monitoring

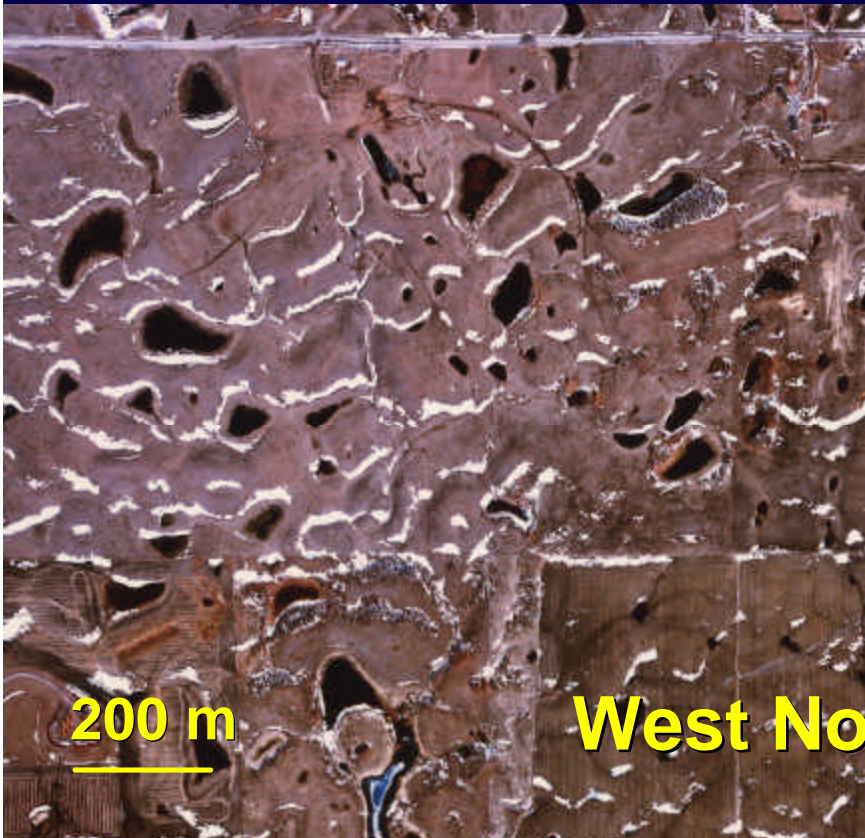


Energy & water flux



Groundwater recharge is focused under depressions

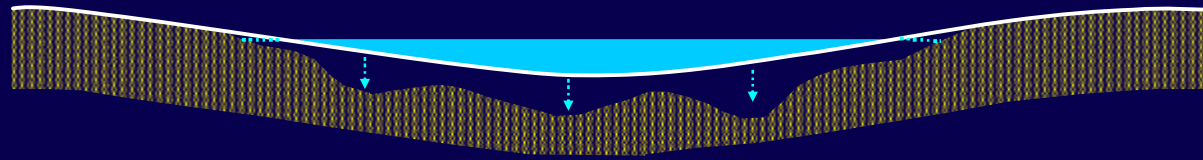
- Frozen soil with high ice content is impermeable
- Blowing snow and snowmelt runoff fill up depressions



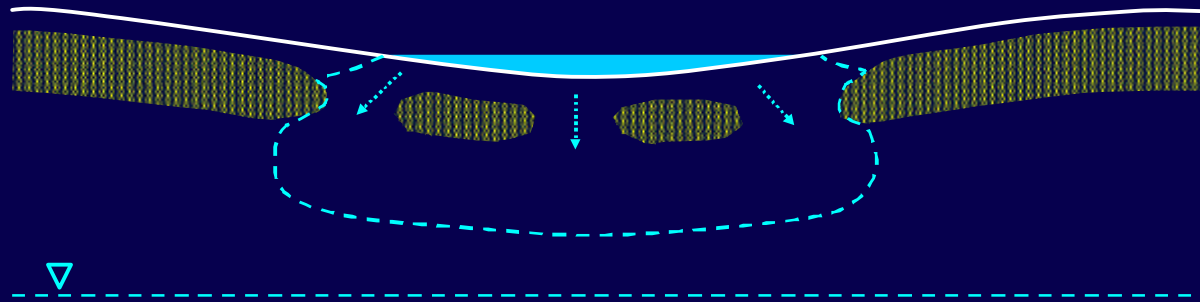
Depression-Focussed Infiltration

Hayashi et al. (2003. J. Hydrol., 270: 214-229)

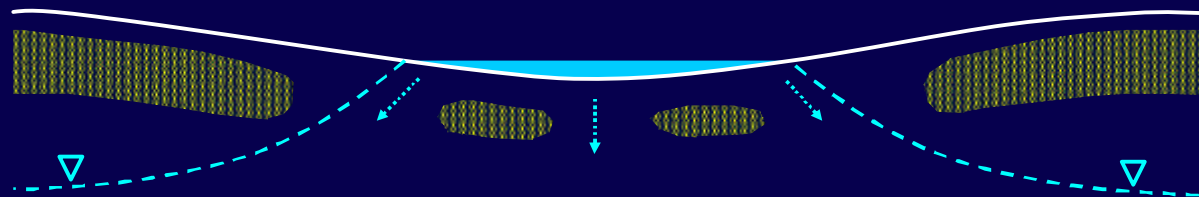
Slow stage



Short transition



Fast stage



Depositional Environment of Paskapoo Fm.



Anastomosing streams?

**Paskapoo is highly heterogeneous.
Fractured sandstone provides high yield.**



Summary

- 1. In DRI, we will understand the integrated response of surface water and groundwater system to atmospheric forcing using the WNC watershed.**
- 2. Working with DRI researchers, we will develop a coupled model of surface water and groundwater.**
- 3. This will eventually allow us to predict the impacts of drought on prairie groundwater**
- 4. Stakeholder collaboration will be required in data collection and sharing.**