

Old Meets New: Subsurface Hydrogeological Connectivity and Groundwater Protection

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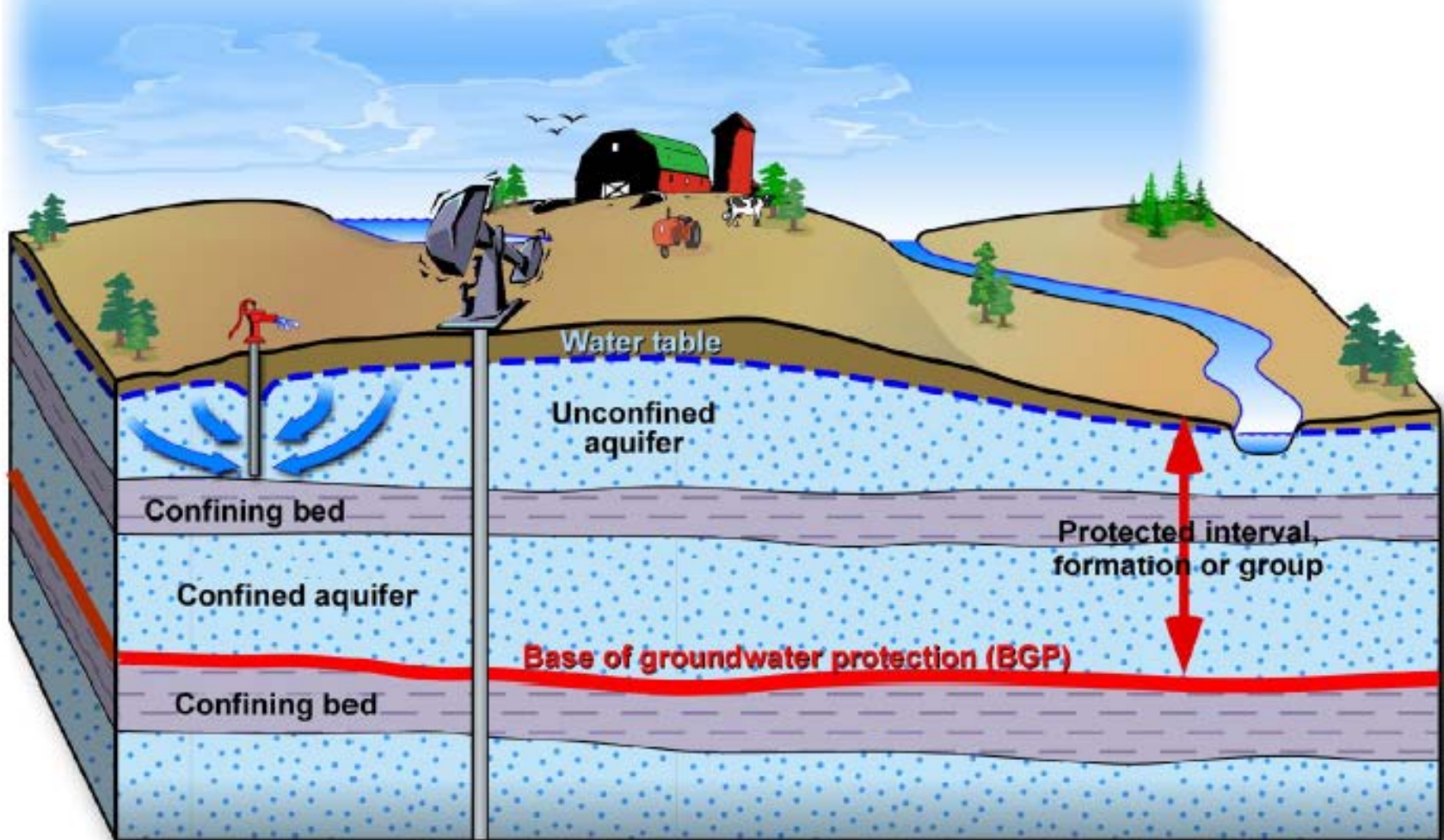
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Are deep hydrogeological systems separate from shallow aquifers and surface waters?



Recent research suggests that these systems are not isolated

Table 1 | Radioisotope (^{14}C , ^3H) evidence for post-1953 and fossil groundwater mixing.

Presence of fossil groundwater	Total ^{14}C samples with ^3H data	Presence of post-1953 groundwater	
		Present ($^3\text{H} > 0$)	Absent ($^3\text{H} \approx 0$)
May contain no fossil water (possibly 0%)	$n = 984$	74%	26%
Contains fossil water ($> 0\%$), but possibly $< 50\%$	$n = 179$	49%	51%
Contains mostly fossil water ($> 50\%$)	$n = 365$	50%	50%

From Jasechko, Ferguson, McDonnell et al., Nature Geoscience, 2017

Links to Other Projects?

- Prairie Water
 - Project involved small component on deep groundwater resources (Ferguson theme lead)
- Could potentially engage with Mountain Water Futures due to some geographic overlap
- Expansion of this project to other regions may allow for us to connect to other projects at the base of their hydrological models

Knowledge mobilization is expected to occur through engaging key government partners.

Current partners include:

- Geological Survey of Canada (NRCan)
- Alberta Geological Survey (Alberta Energy Regulator)*



**Alberta
Energy
Regulator**



Have also engaged:

- Manitoba Water Stewardship
- Saskatchewan Water Security Agency
- Saskatchewan Geological Survey
- Geoscience BC

*Note that we are excluding industrial participation at this point because the Alberta Energy Regulator is reluctant to participate in projects with industrial partners. We are actively engaged with industry (BHP, Nutrien, Mosaic, Syncrude) through related projects.