

Our Island Our Water Our Future



Presentation to Water Act Consultations on October 20, 2015 in Souris, PEI

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PEI Landscape

- Island shaped by runoff from mainland mountains, melting glaciers
- ~260 watersheds. The three largest have 150-180 km of stream.
- Total stream length on PEI is > 5000 km, with thousands of springs
- Groundwater dominates
- Short productive rivers, long estuaries
- Typically tree-lined streams
- 75% of PEI land surface < 45 m above sea level. Highest point 145 m
- **Geological bedrock formation of PEI provides space for large quantities of fresh water**



Rivers are so much more than water

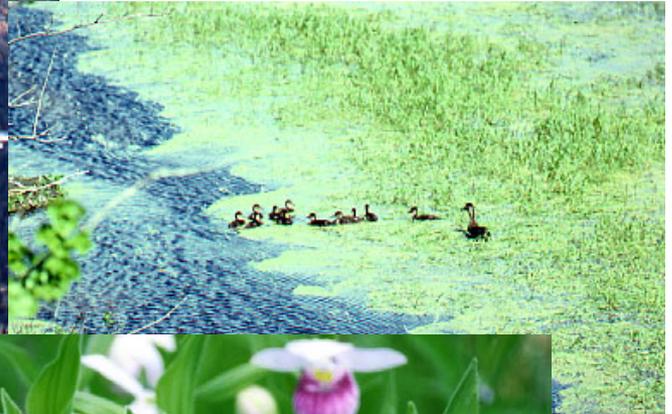


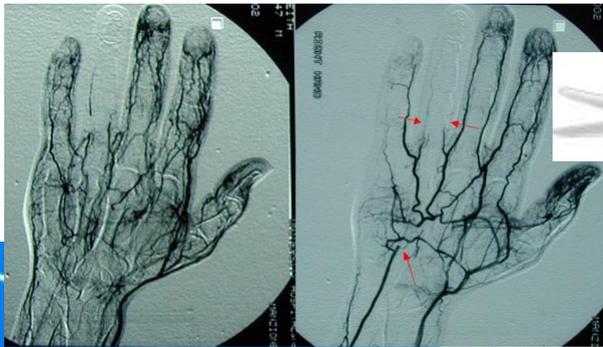
- Our rivers are not pipes carrying water to the ocean
- Rivers are complex aquatic ecosystems



- According to the PEI Dept. Environment and the PEI Potato Board, “PEI presently used only 7% of available groundwater recharge”.
- The assumption is that the remainder is there for our use.
- **THERE IS NO SURPLUS**
- Rivers need water to support aquatic ecosystems.
- These ecosystems are multi-dimensional

- Pisquid Pond – a natural pond on the Morell River
- High biodiversity

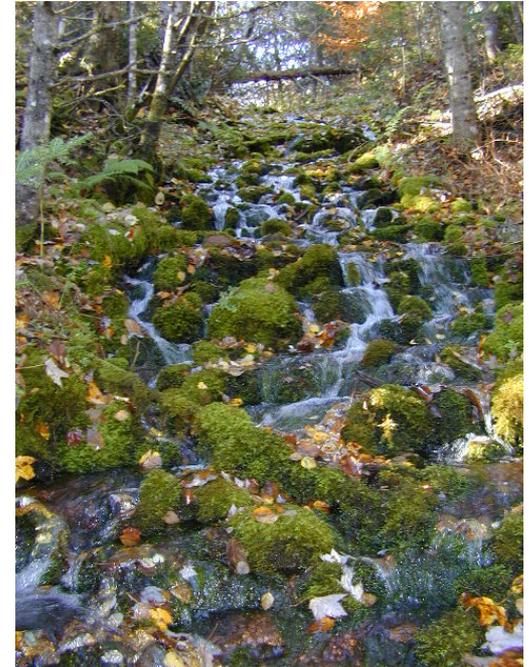




- The tiny, spring fed headwater streams are essential for the functioning of the entire river.
- If we reduce water volume in our streams, we will continue to lose biodiversity and degrade our aquatic ecosystems.
- Therefore, there is no surplus of water for us to tap. Wise management of our land and water can minimize potential harm

Importance of Springs and Headwater Streams

- 7-8°C year round. Keeps streams warmer in winter and cooler in summer.
- Cold water refugia for many organisms
- Critical for brook trout spawning and nursery areas
- 100% of stream flow in summer is composed of groundwater and thus springs are the lifeblood of our streams
- Stream flow in summer dramatically reduces the potential 17" of groundwater available for any other uses. Without the springs, our Island would become a desert.
- In a dry year, aquatic organisms are stressed in summer



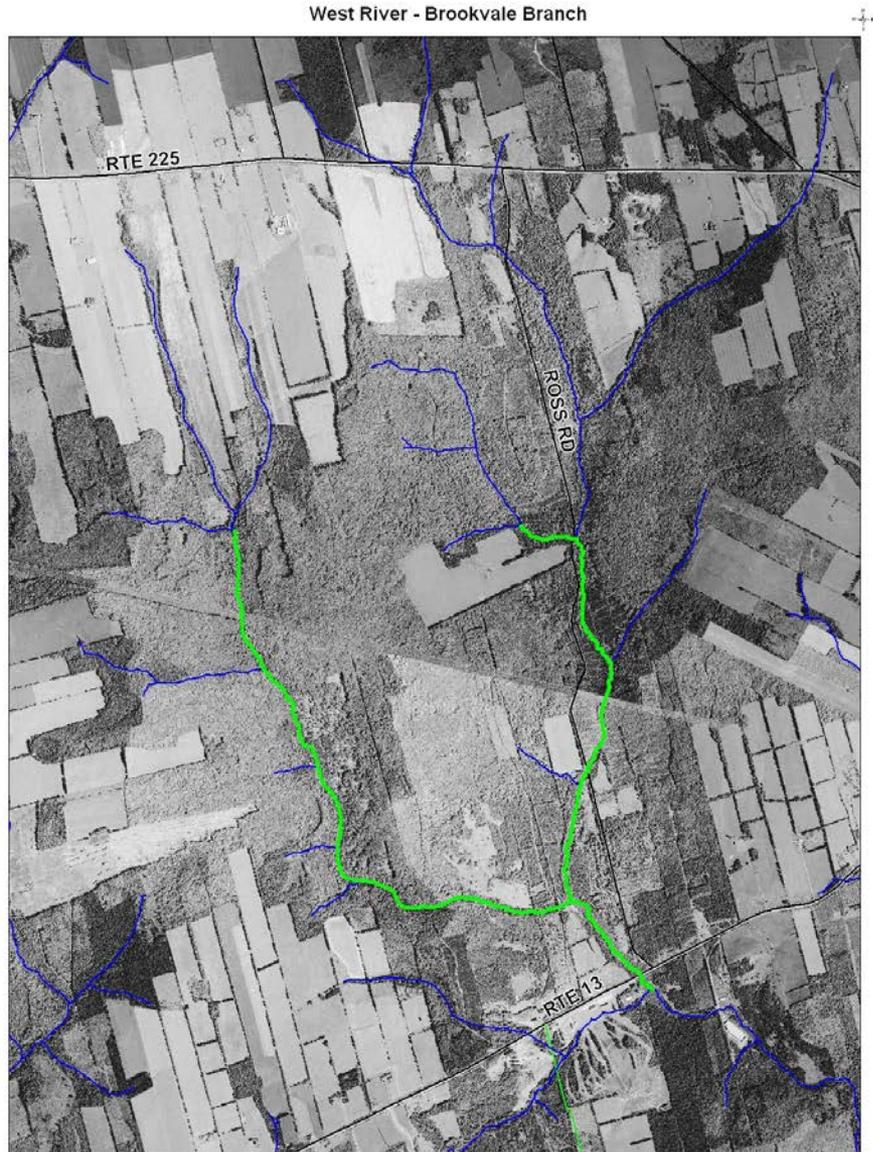
- Juvenile trout use small woody debris along stream edges for food and protection. With surface water reduction, if young fish have to move to deeper zones, they become food, rather than searching for food.



- Dry stream beds in summer or early autumn mean major unreported fish kills in these areas. Brook trout that die because streams dry up or their eggs are smothered in silt are just as dead as fish killed from pesticide runoff.



- Does our groundwater aquifer(s) always recharge fully?
 - No. For example, in 2012-2013, of the 4 major branches of the West River, only one (Brookvale – which is heavily wooded) fully recharged.



The Argument for Irrigation?



- The Industry says:
 - “We’re not competing anymore... Elsewhere the yield has gone up and if we don’t get our yields up we will be economically out of the picture”.
 - “Without irrigation, productivity will decline”
- Experts say:
 - Management practices to improve soils can significantly increase potato yield (23-51%) and can serve as a substitute to supplemental irrigation in the cool, humid northeast.
 - “So growers have the option of either investing in irrigation or improving their soils in order to increase potato yield.” Dr. Wayne Honeycutt, Research Leader and Soil Scientist

Climate Change

- How global warming is affecting water cycle
 - Ocean levels are rising
 - Fresh water aquifers are dropping
 - Salt water intrusion into wells near the coast will become more prevalent.
- In the future, the amount of rain falling on PEI may be similar, but intensity of storm events and massive surface runoff will likely result in much less recharge to aquifers

Dunk River – Emerald
Spring flood 2013



Severe flooding is typical of highly deforested watersheds.

3 weeks later – note the river is now a small stream at the lower left of the photo.

Thus, water running off fields and towards the ocean results in less recharge of the groundwater aquifer in spring.



- Locally, there isn't much we can do about intense rainfall events due to climate change.
- However, the damages caused by these rainfall events can be considerably reduced through wise land management

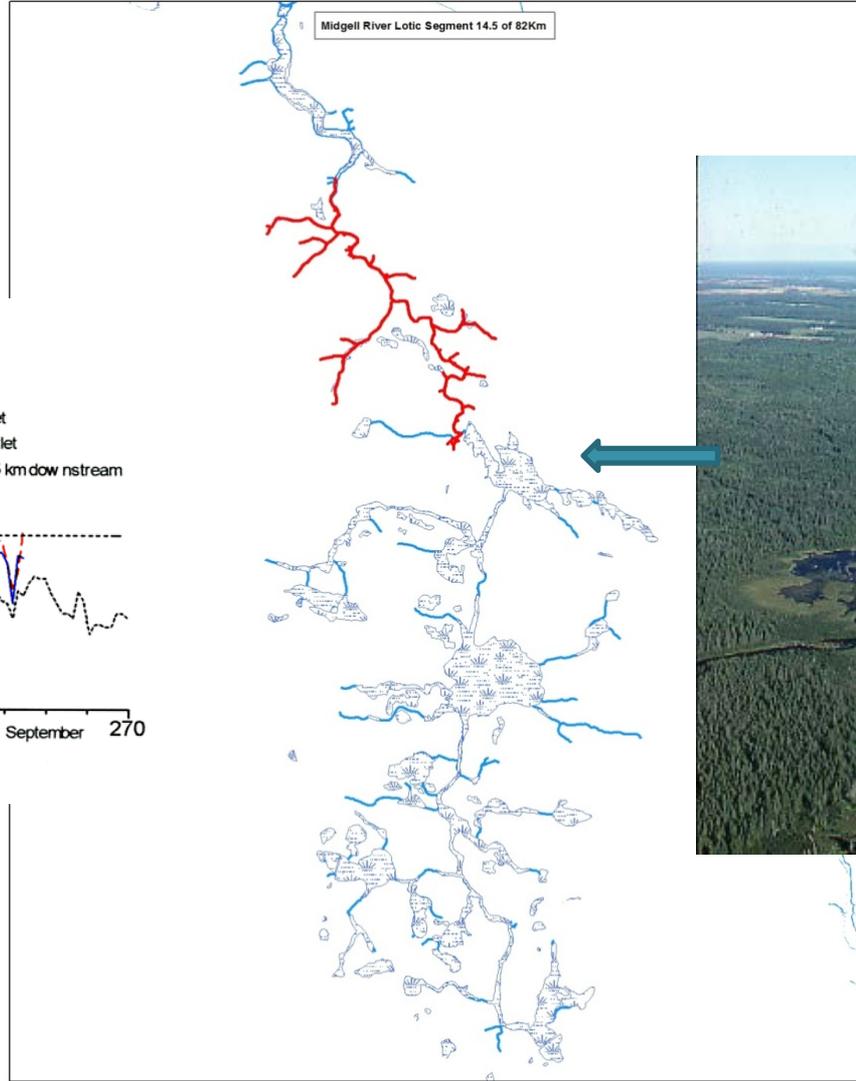
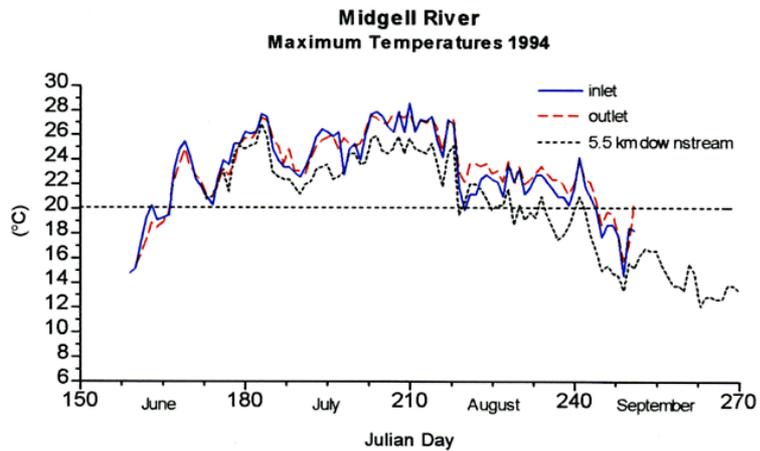


What happens when water levels get reduced?

- Tributaries can run dry
- Fish can be prevented from reaching preferred spawning areas
- Juvenile fish mortality
- Reduction in aquatic insect production which affects not only fish, but also forest birds, amphibians, etc.



• Global Warming – Water Temperature



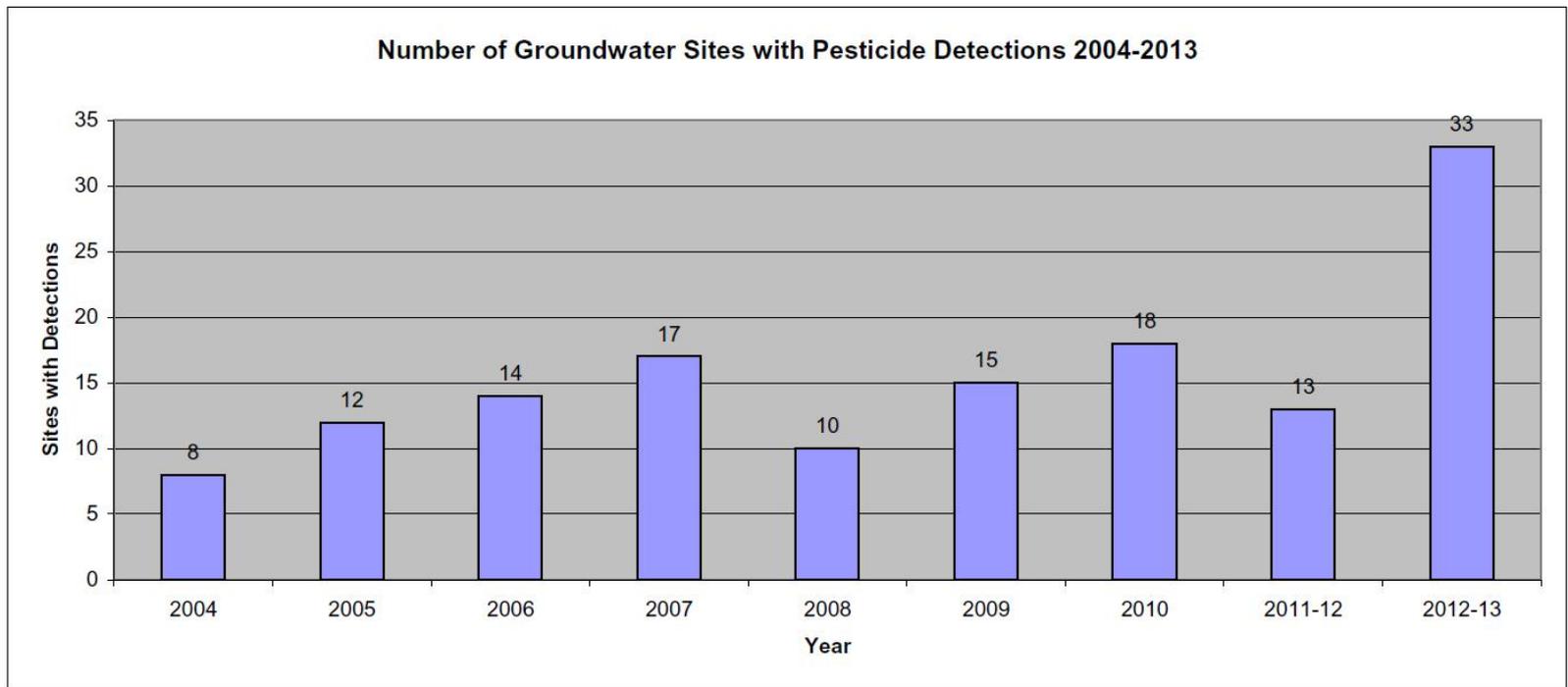
Water Quality Problems



- What chemicals are already present in our groundwater?

15/33 pesticides have been detected in groundwater.

- Atrazine
- Metribuzin
- Metalaxl
- Hexazinone
- Imadacloprid
- Carbofuran
- Thiabendazole
- Glyphosate
- Chlorothalonil
- Azinphos-methyl
- Phorate
- Dimethoate
- Chlorantraniliprole
- Clothianidine
- Thiamethoxam

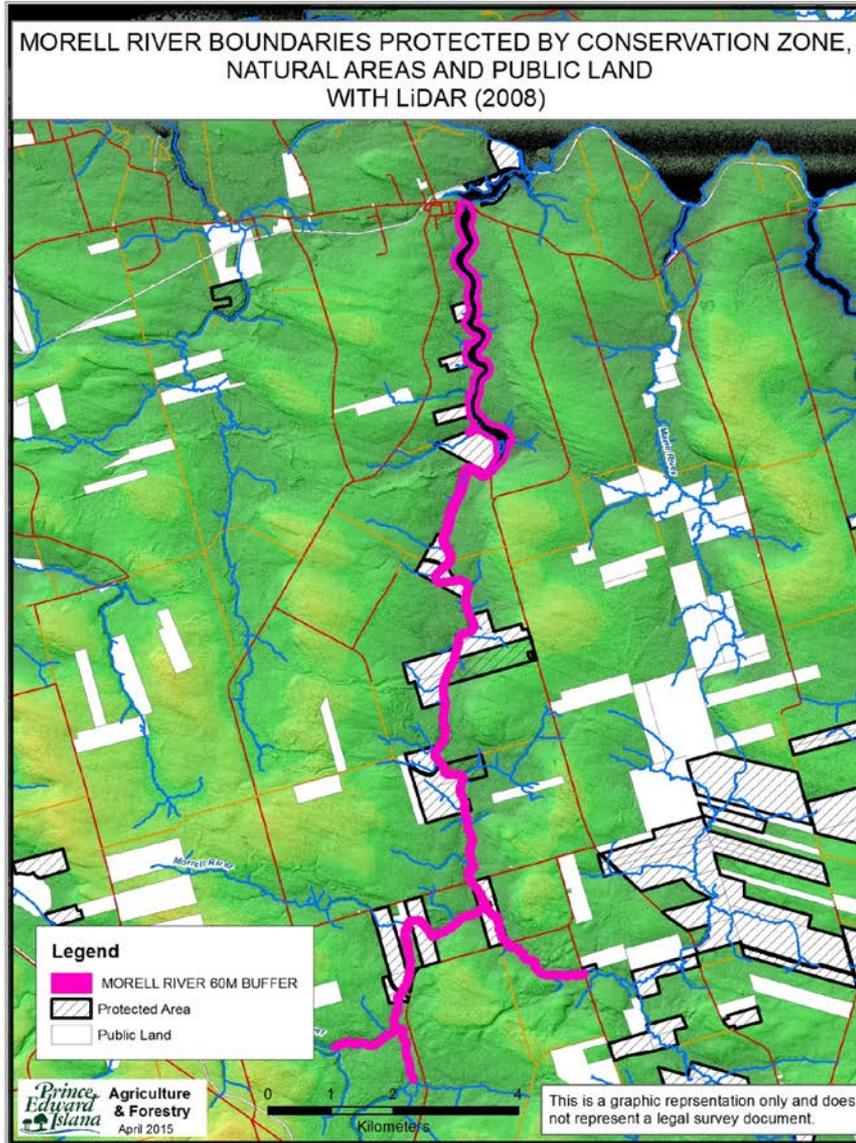


PEI Gov't website



Photo taken by Chris Hadfield, CDR of the Space Station

Riparian “Buffer” Zones



- A 60 metre buffer zone is essential.
- Landowners should be encouraged (not forced) to afford protection for these precious wildlife zones through various means – donation, Island Nature Trust, Nature Conservancy of Canada, Provincial Natural Area program, etc.
- Ecosystem benefits of old growth deciduous forest





Sean Landsman Photography

We have a very special Island – let's restore and protect it for future generations

