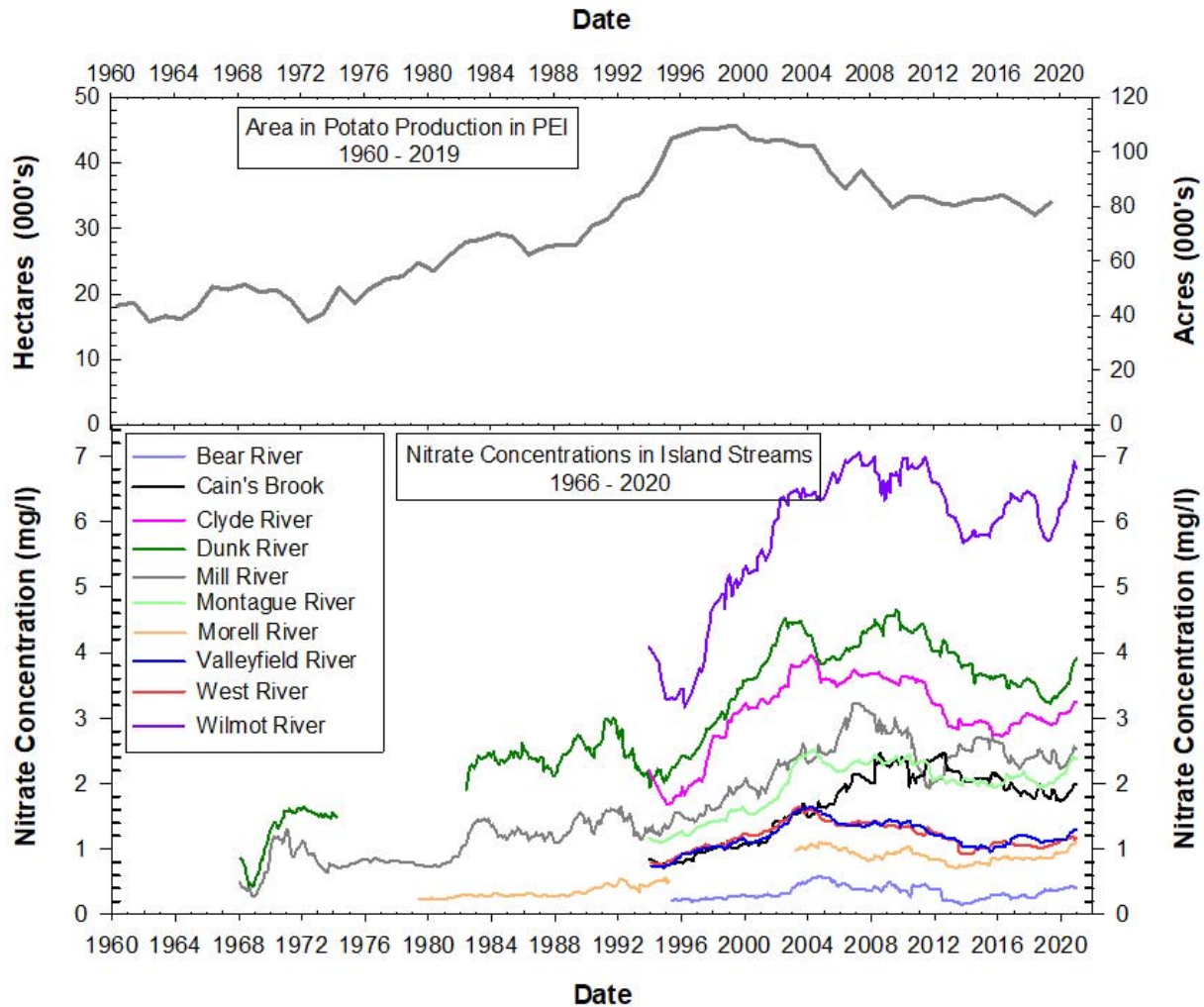




Land Use and Long-Term Nitrate Trends in Island Streams

PEI Department of Environment, Energy and Climate Action

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Most of the nitrate in Island streams comes from agriculture in the form of fertilizers applied to land used for potato production. The graph shows that ups and downs in Island potato production are generally matched by ups and downs in nitrate but with a time lag of 5-8 or more years. This lag is due to the time it takes for nitrates to travel through the groundwater system to get to streams.

Nitrate concentrations have shown an overall increase in each stream since the time that they were first sampled. The concentrations for some streams increased more rapidly than others and reached a higher level overall due to differences in land use in each watershed. Overall, the streams which have a higher percentage of agriculture and land in potato production have the

highest nitrate levels. The rate of increase was highest after the rapid increase in potato production which occurred in the early 1990s.

Peak potato production occurred in 1999. The decline in production that has occurred since then may be part of the reason for the overall decline in nitrates observed in these results from about 2009 onward. Some of the overall decline may also be due to nitrate management practices in use by many farmers. Unfortunately, annual potato production information is not publicly available at the watershed level, so the relationship between potato production and nitrate levels cannot be tested for each stream individually.

Results from the last several years indicate that all 10 of the streams in this monitoring network are showing increasing nitrate concentrations. This recent increase does not align with values for acreage in potato production which have remained relatively stable Island-wide since about 2008. Watershed-level potato production data might help determine what is happening in individual watersheds to produce these increases.

In the past, increases in potato production have resulted in increasing nitrate levels. If the production of potatoes or other high-nitrate-leaching crops increases in each watershed, stream nitrate levels may further increase.

The overall declines in stream nitrates that have been observed since the beginning of this sampling are a step in the right direction, but they are not enough to properly address the issues of anoxia in estuaries or nitrates in drinking water. The recent increases that have been observed are evidence that some of this improvement has now been lost.

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