MAPLE SYRUP PRODUCTION AND CLIMATE CHANGE

Ontario Maple Syrup Producer's Association Survey Results

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Introduction

In this article we report on the results of a survey conducted with Ontario maple syrup producers in December 2008. We first provide some background on maple syrup production and climate change.

Maple syrup was originally produced by North America's Indigenous peoples as part of their subsistence economy and was one of the early goods traded with European settlers. Today, maple syrup is only produced in two countries, Canada and the USA, with Canada accounting for 87% of that production. Within Canada, most syrup is produced commercially in Quebec (93%) followed by Ontario at 3.5% of the market. The Ontario market is valued at $10.9M, with production mostly centered in Lanark County and the Waterloo area.

Globally, the International Panel Climate Change (2007) *Fourth Assessment Report* states that 'warming of the climate is unequivocal'. Since Ontario is a large province with diverse ecoregions and climates, the impacts of climate change will vary. On average, Ontario temperatures are expected to increase 3°C-5° C, with larger increases predicted across the north. In contrast, potential for increased water stress (e.g. drought) is more likely in the southern Deciduous ecozone. In the Great Lakes-St Lawrence ecozone, the temperatures will increase by 4°- 6°C, with little increase in the rate of precipitation. If this happens, the summer temperatures in Sudbury at the end of the next century would be similar to the current summer temperatures in Windsor. An increase of even 3°- 4°C may result in the 300 km northern migration of some tree species, but this may be hindered by the lack of suitable soils, since very acidic soils are not suitable for hardwoods, such as maples. Increasing temperatures will also lead to increased disturbance from extreme weather events, insects and forest fires as well as increased temperatures in the spring and fall seasons.

Beyond these broad predictions, the detail regarding how climate change has or might affect specific ecosystems in northern and other rural spaces is an understudied area of research. In southern

Canada, urban and agricultural spaces have received significantly more attention than the woodlot spaces and in the north, the primary focus has been on the Arctic. This research is investigating the possibility of using maple syrup data from scientific, local and Indigenous (both oral and recorded), to understand the impact of climate change in these spaces.

Ecologically, maple syrup production is a good indicator of the changes in climate because sugar maple trees are extremely susceptible to mid-winter thaws and summer droughts and a successful maple syrup season is dependant upon the right combination of weather conditions for sap to run. Sap collection is limited to a few weeks each spring season when the night temperatures are approximately -4 to -6°C and day time temperatures hover above freezing within a range of 2 to 7°C. Although, sap will continue to run beyond this narrow temperature range the quality of the syrup declines. The sugar maple trees themselves thrive where summers are cool and moist and soils are slightly acidic. They are not tolerant to hot drought-like summers and can suffer dieback due to moisture deficiency. Weather events such as late spring frosts, and midwinter thaw/freeze cycles can also affect tree vigor and lead to mortality. Climatic changes such as drought, reduced snow cover, changes in the freeze thaw-cycles and overall warming trends are expected to lead to increased disturbance from fire and insects and possibly the northward movement of the boundary for maple species.

Survey Data

We undertook a small survey that was sent out to some of the membership (those with an email address) of the Ontario Maple Syrup Producers Association. Although only nineteen producers participated, their responses have helped us identify some potentially useful avenues of research and point to some interesting insights about climate change and maple syrup production. The survey first asked respondents why they produced maple syrup. Choosing from a list, respondents selected as many answers as appropriate, covering a range of values. Notice that economic value is not necessarily the main reason for producing syrup (Table 1).

Table 1. Why Produce Maple Syrup

Economic Values	14 responses	Part of Canaadian Heritage	6
Family/Community Relationships	12	Connection to Environment	16
Connection to History/Ancestors	7	Other	5

In order to assess the type of data that might be available, the survey asked a series of questions about the type of record, the information in the record, and the length of record (See Tables 2A-D). For Tables 2A, B, and D multiple answers were again possible. The most common type of data available appears to be personal diaries and formal records. This is a bit surprising, since all producers would have their own perceptions and stories about past production. We suspect that producers may not be aware that their personal stories may be valuable for this type of study. The fact that formal records exist for 14 of the 19 producers (2A) and that production records were available throughout the province (2C) suggests that there are potential data sources available to assess climate change. The type of information that is available, e.g. boiling dates is also potentially useful for our study (2B). The ultimate value of this data, however, is affected by its length. As demonstrated in Table 2D, fully half of the respondents have been making maple syrup at the same location for 50+ years, but only 3 indicated that they had records over that same time period. This again points to the value of oral histories.

Table 2. Records

2A: Type of Record

Oral History/Family Stories	3 responses
Personal Diaries	10
Formal Records	14

2B: Information in Records

First/last Boiling	17 responses	Sap sugar content	9
Air Temperature	8	Grade of Syrup	13
Rain/Snow/Ice/ Frost	8	Costs/Sales	14
Quantity of Syrup	17	Other	7

2C: Regions with Records Available

Southwestern	1
Waterloo/Wellington	1
Simcoe	2
Haliburton/Kawartha	4
Quinte	2
Lanark	3
Renfrew (Ottawa Valley)	2
Algonquin	2
Grey-Bruce	2

2D: Record Length:

	How Long Producing at that Location?					
Record Length:	Less than 10 years	10-20 years	20-50 years	50-100 years	100+ years	Total:
10 years or less	3	2	3	-	1	9
10-20 years	-	4	1	1	1	7
20-50 years	-	-	2	1	-	3
Total:	3	6	6	2	2	19

Finally, the survey asked respondents if they had noticed any changes in their production patterns or woodlots and then asked if they thought those changes might be related to climate change. Of the 14 respondents who had noticed changes, 9 believed that climate change might be involved (Table 3). When asked about the impact of climate change, their responses suggest that producers have a fairly good understanding of the problem. Some survey respondents stated that seasonal variability has increasingly affected the predictability of their production and that they have noticed some dieback amongst the sugar maples. One producer was very clear about the impacts of climate change and identified the type of information that is available:

Comparing our ten year history to local oral history it appears that we have greater variations in first and last boiling dates and that the average boiling dates are earlier. Oral history suggests that the syrup season was more continuous between first and last boil – our documented experience shows abrupt changes in temperatures during the season ie stretches of too cold or too warm for sap runs in the middle of the season resulting in fewer sap runs. Again comparing our recent records with local oral history, the winter weather has greater variability.

Table 3: Role of Climate Change:

Any Changes Noticed:	Climate Change Responsible?	Responses:
No		4
Yes	No	2
	Yes	9
	Not Sure	3

Next Steps

Our project goal is to use this survey data, along with scientific climate data and interview data to begin to develop an understanding of climate change on maple syrup production.

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Note: Full references available from author

LABELLING CHOICES FOR AMBER MAPLE SYRUP

The grade standard for amber maple syrup is written in the provincial Maple Regulation 386 and is the same as the federal amber standard. Pure maple syrup that is amber in colour class and meets the grade standard must be labelled as Canada No. 2 Amber for retail sale. However, a few years ago the Ontario Maple Syrup Producers Association (OMSPA) successfully lobbied for an additional standard that would allow good quality amber maple syrup to be labelled and sold as Ontario Amber at the farm gate. The standard adopted is identical to that for Canada No. 2 Amber.

In other words, if a producer has packed amber syrup, he could have two sets of labels for the same product. For syrup he's selling at home/farm gate, the Ontario Amber label could be used. When the same product is taken to the local farm market or retail outlet, the Canada No. 2 Amber label must be used. **Same maple syrup, different grade label.**

Remember that the Ontario Amber designation can only be used for farm gate sales anything offered for sale beyond the farm gate must be labelled as Canada No. 2 Amber. If the producer only wants to deal with one label, the Canada No. 2 Amber designation can also be used for farm gate sales.

If you have any questions please contact John Henderson at the information below.

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