TERROIR

The Earth, Wind & Fire ... and Water and Soul of winegrowing. That's what this section covers. Basically, in a word terroir – that maddeningly French term that's almost unanimously prefaced in English language wine writing as untranslatable – before a page or two is filled in attempting to define it.

James W. Wilson, in his recent book Terroir – The Role of Geology, Climate and Culture in the Making of French Wines, has a few dedicated pages in his appendices on the different explanations of terroir, before delving into the details of various French regions. He writes: "The true concept is not easily grasped but includes physical elements of the vineyard habitat – the vine, subsoil, siting, drainage, and microclimate. Beyond the measurable ecosystem, there is an additional dimension – the spiritual aspect that recognizes the joys, the heartbreaks, the pride, the sweat, and the frustrations of its history."

For a long time, the concept was ridiculed in the New World as a snotty, elitist, Gallic attempt to market their wines with mystery and romance. But lately, along the U.S. west coast and in New Zealand, the cry of 'terroir' has been taken up with the enthusiasm if not zealotry of recent religious converts. It could be they've glommed onto terroir as a marketing aid to move their wines in a crowded marketplace ... but putting cynicism aside, the recognition of a unique 'hereness' of their individual wines comes with dedication and thoughtful striving and observation in the vineyard. It is the result of a maturing region that one day realizes they are producing more than a beverage, that there's something special about wine. That is hopefully why you are reading this book; if it isn't, then the costs of production in this area will mean you can't compete with the vastly more economical torrents of wine from elsewhere in the world. However, wine from Prince Edward County can only be produced in Prince Edward County. That may be ridiculously obvious, but the unusual benefits – and severe challenges – this area offers mean there should be profound differences in the wines that will be grown here, if growers pay attention.

The Earth, Wind, Fire & Water organization in this section will help sort through just what the County physically offers and threatens. Through it all, or possibly above it all, is what can be called the "mental aspect" of terroir, the careful observation of what Hugh Johnson means when he writes that "the land itself chooses the crop that suits it best"; that there are real explanations of why there are a world of different wines out there, and should be. There is no long history in Prince Edward County identifying exactly what our different sites are telling us, but by focussing on what exists here as given, a lot of mistakes can be prevented, and misadventures gently nipped in the bud.

Wind & Fire

The climate of Prince Edward County is full of intense charms and terrors. The worst terror – Winter – earns its own section later.

The figures in this section show the basics of understanding Prince Edward County's larger climate picture. The maps from Brown, McKay and Chapman's The Climate of Southern Ontario, show the range of temperatures and snow cover. Of interest is the recognition of the County as a distinct climactic region (Figure 1), and the lines that cut through the County, reflecting different microclimates (Figures 3, 5, 8, 9, 14, and 16). The degree day map I've put together from Environment Canada's data, personal data, and observation at least gives a rough working idea of the growing season heat zones within the County (and which tend to match Brown, McKay and Chapman's maps 5 and 12). OMAFRA maps showing frost risks and heat units for the province (Figures 17, 18, 19 and 20) are also included for careful study, and it is worth getting the complete fact sheets rather than just examine the maps reproduced here. In the Soil Survey of Prince Edward County, the booklet contains a section on climate that gives some useful though outdated information, and is an important read better consulted in that booklet than reproduced once more here. The

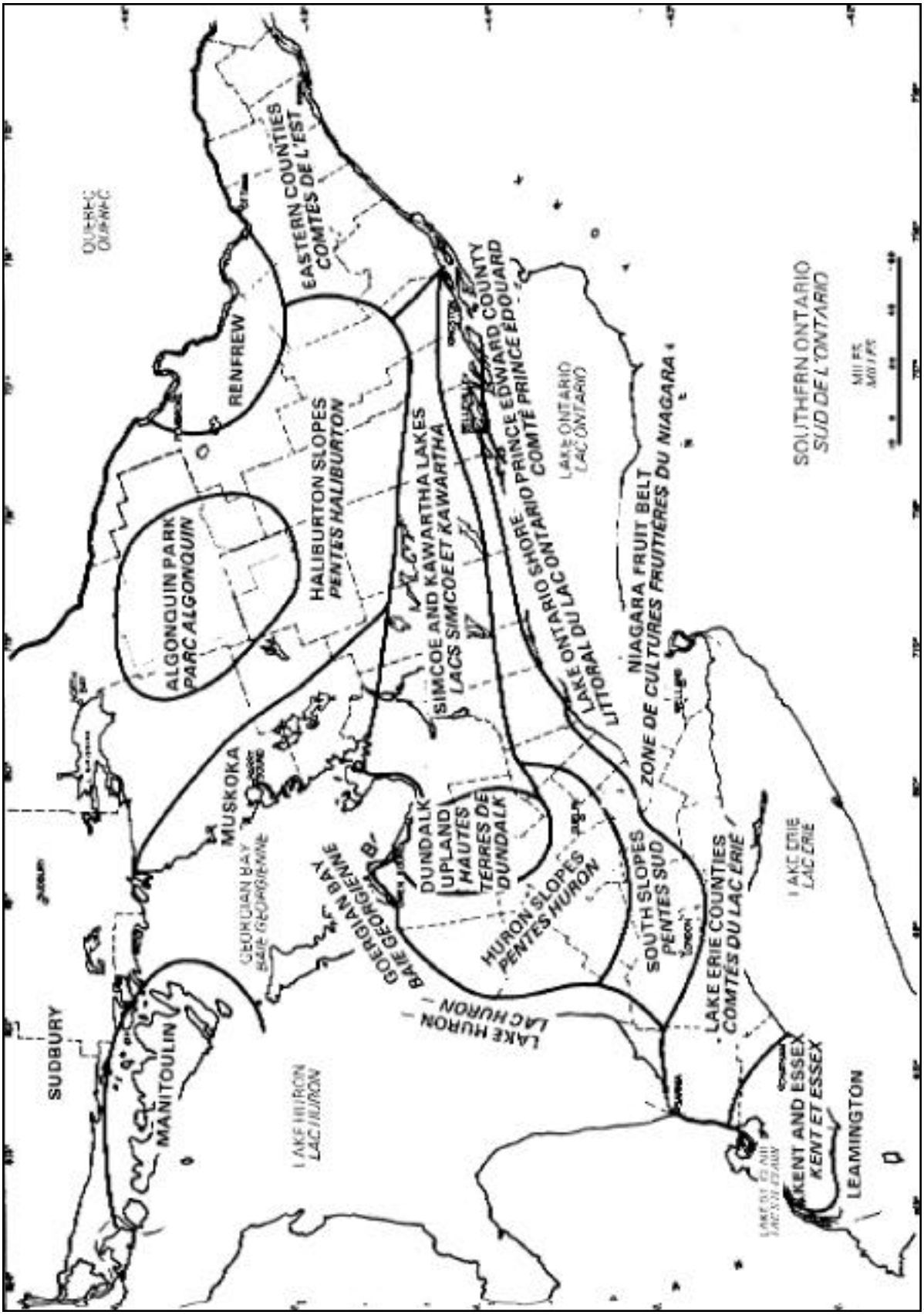


Figure 1
Climatic regions of Southern Ontario
(Figures 1-16 on Pages 26-34 reproduced with the permission of the Minister of Public Works and Government Services Canada, 2001)

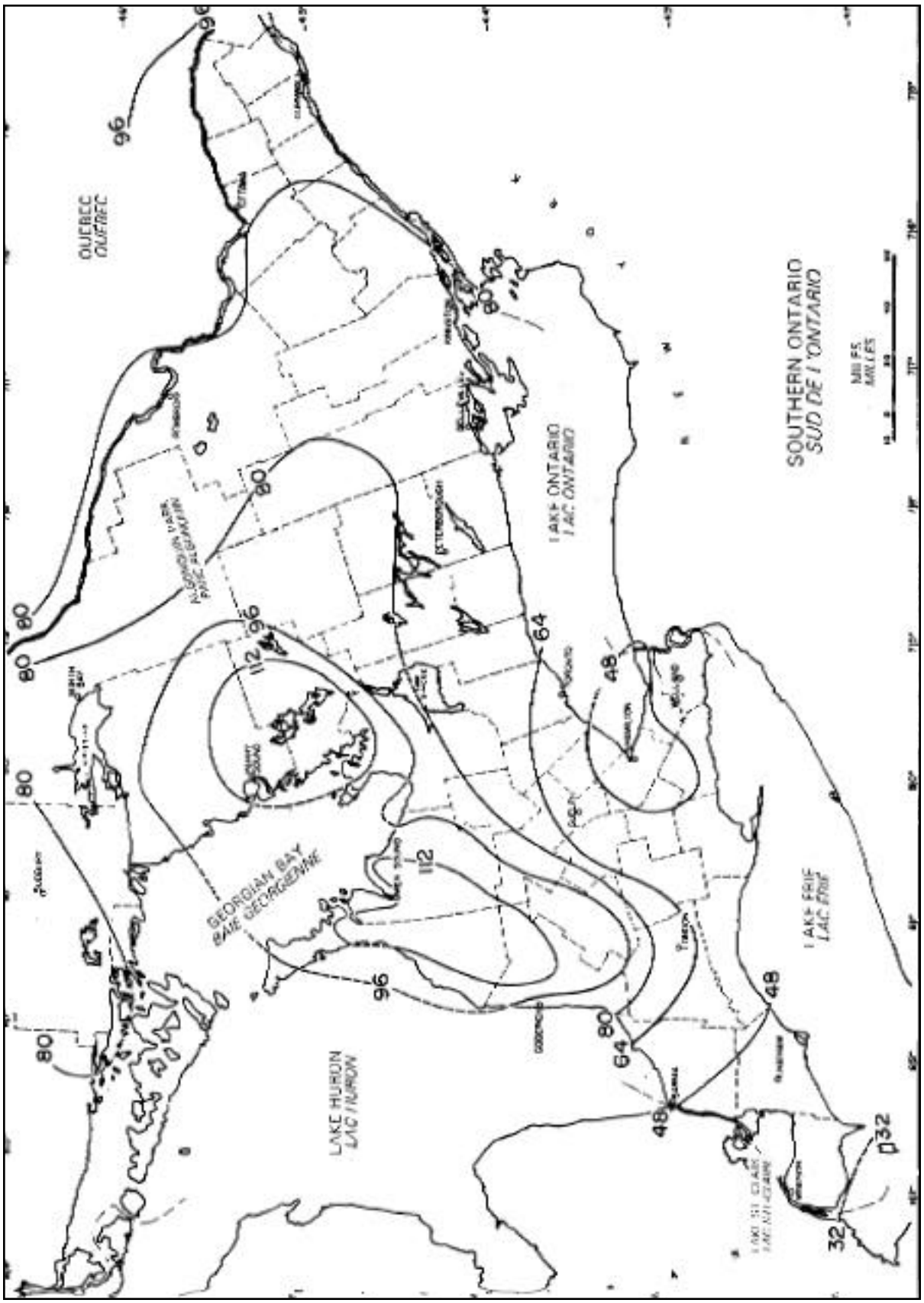


Figure 2
Mean annual snowfall (inches)

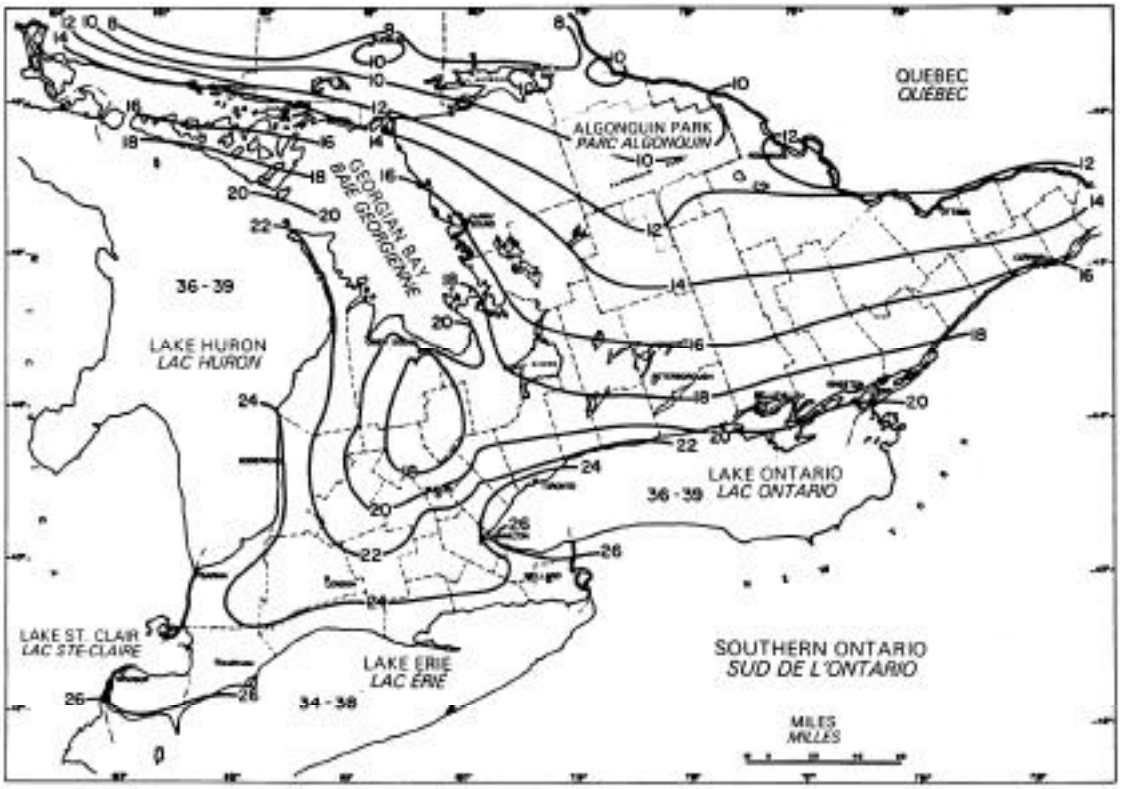


Figure 3: Mean daily temperature (ºF) for January

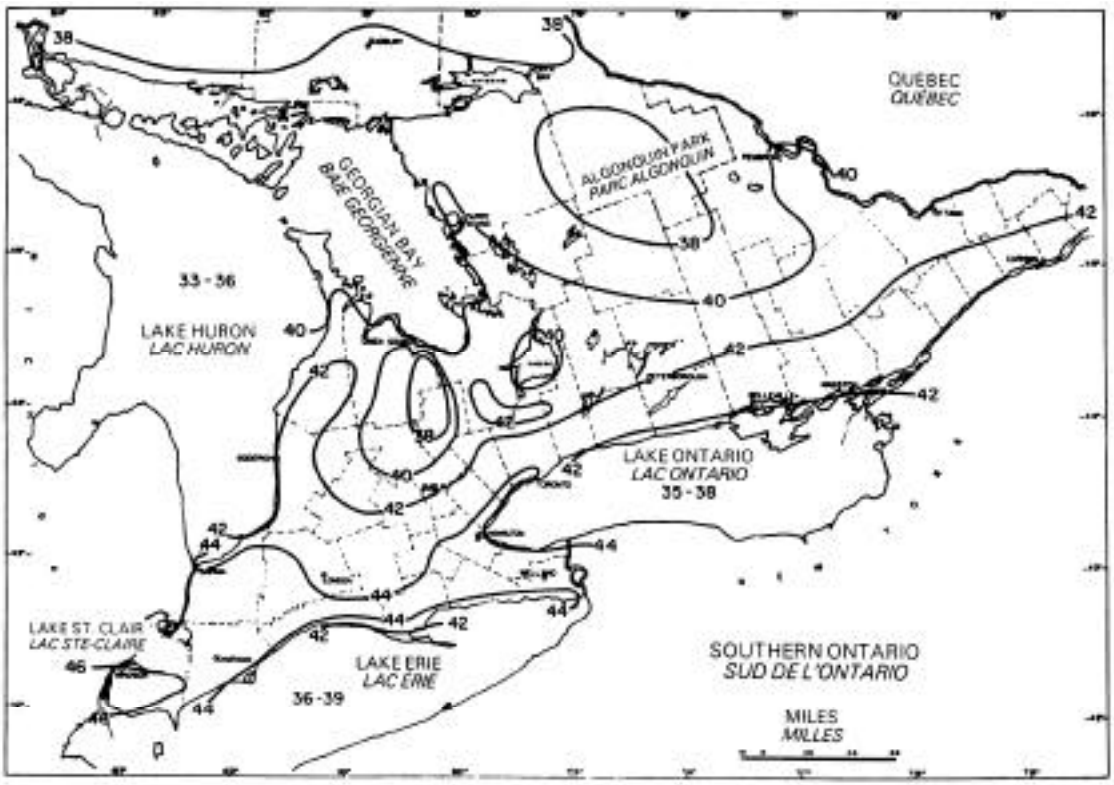


Figure 4: Mean daily temperature (ºF) for April

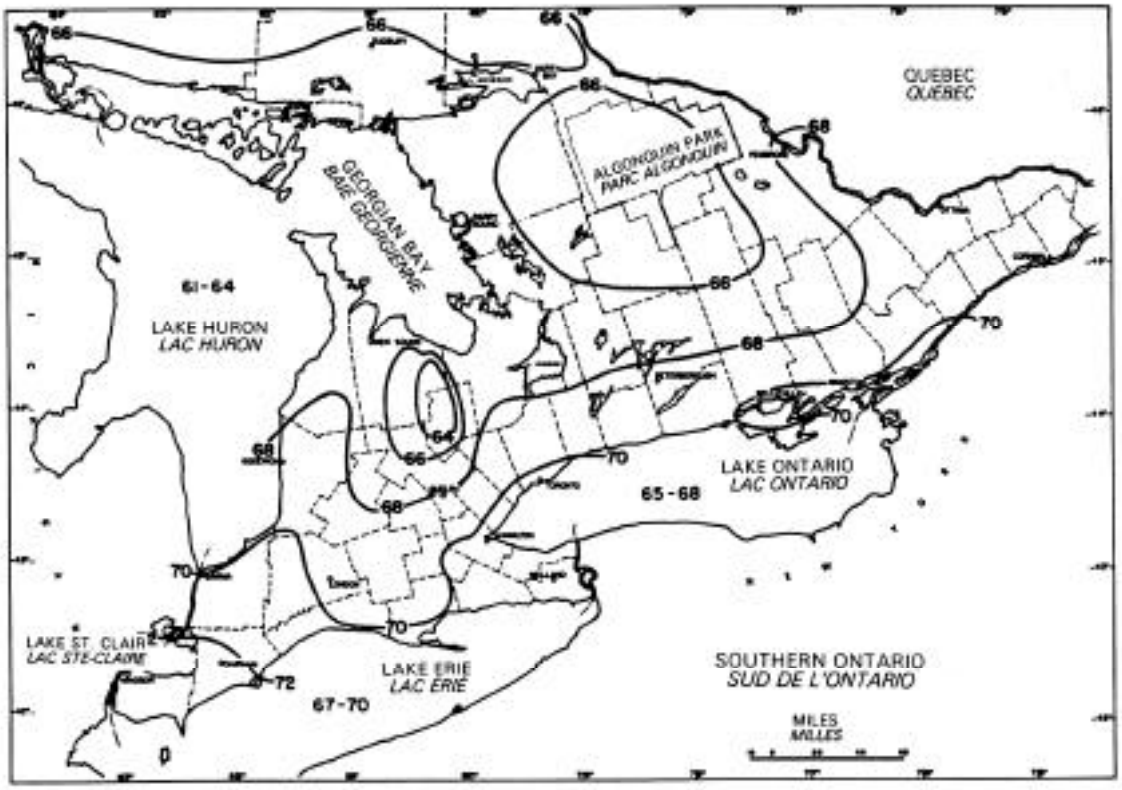


Figure 5: Mean daily temperature (ºF) for July

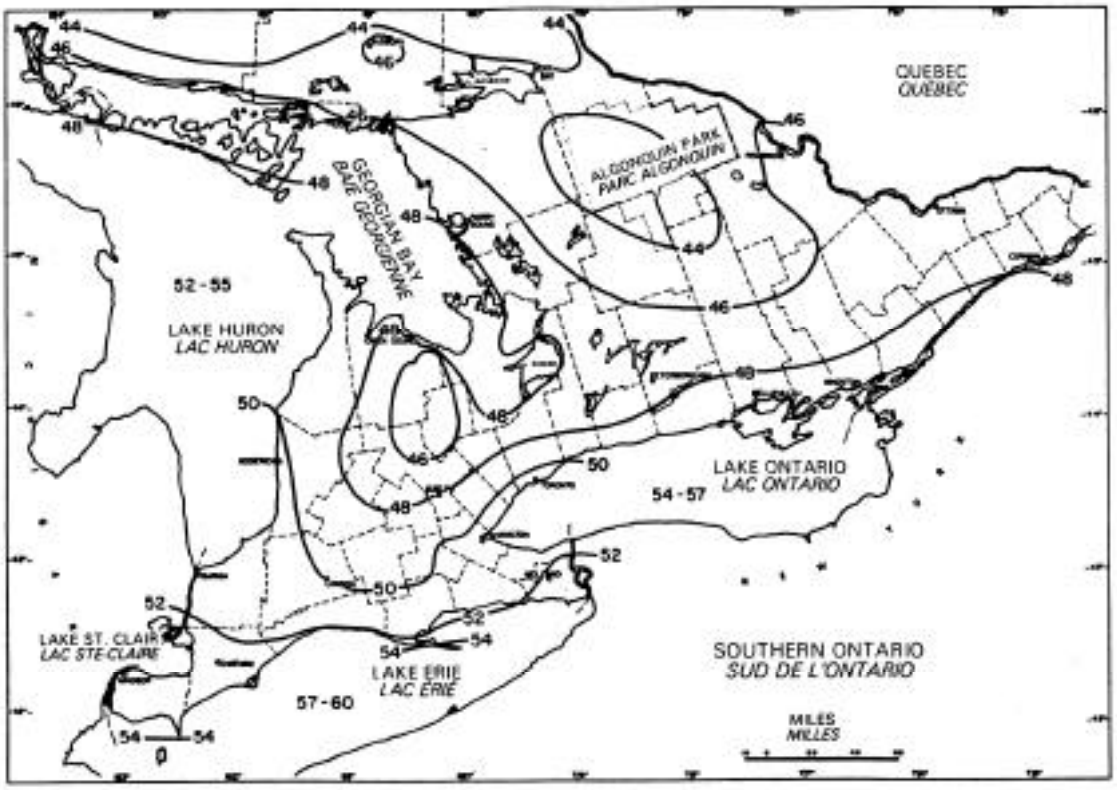


Figure 6: Mean daily temperature (ºF) for October

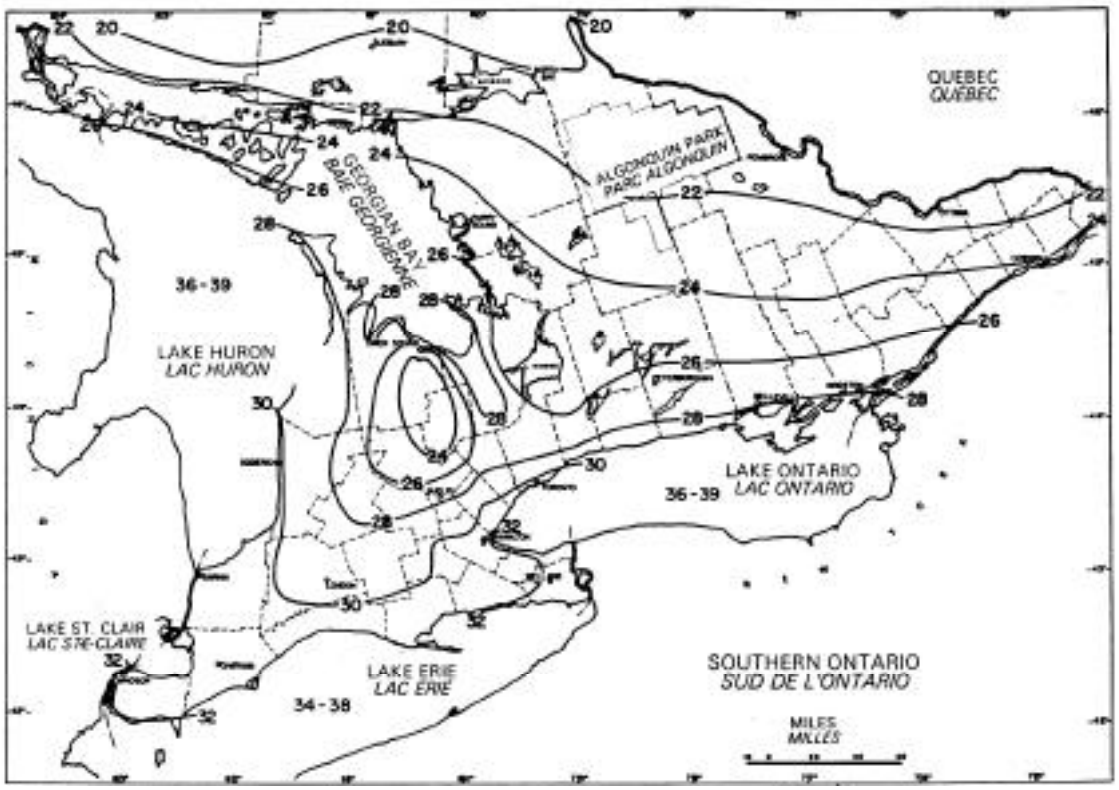


Figure 7: Mean daily maximum temperature (ºF) for January

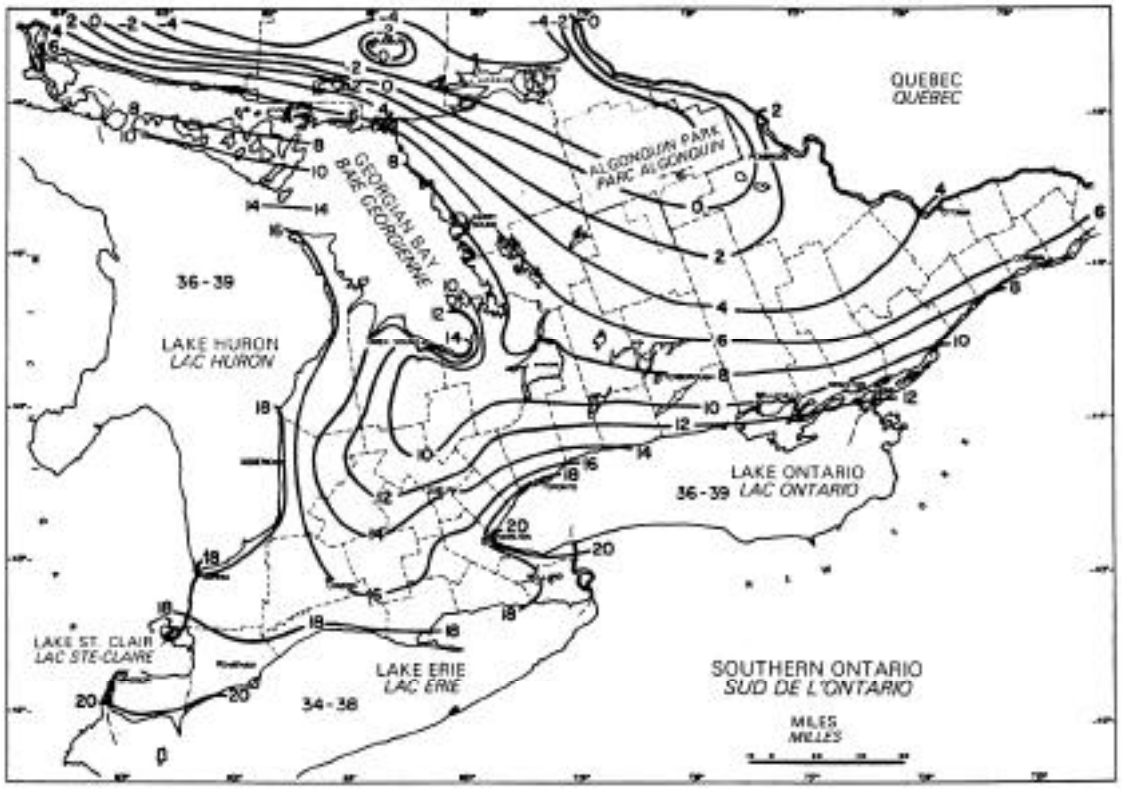


Figure 8: Mean daily minimum temperature (ºF) for January

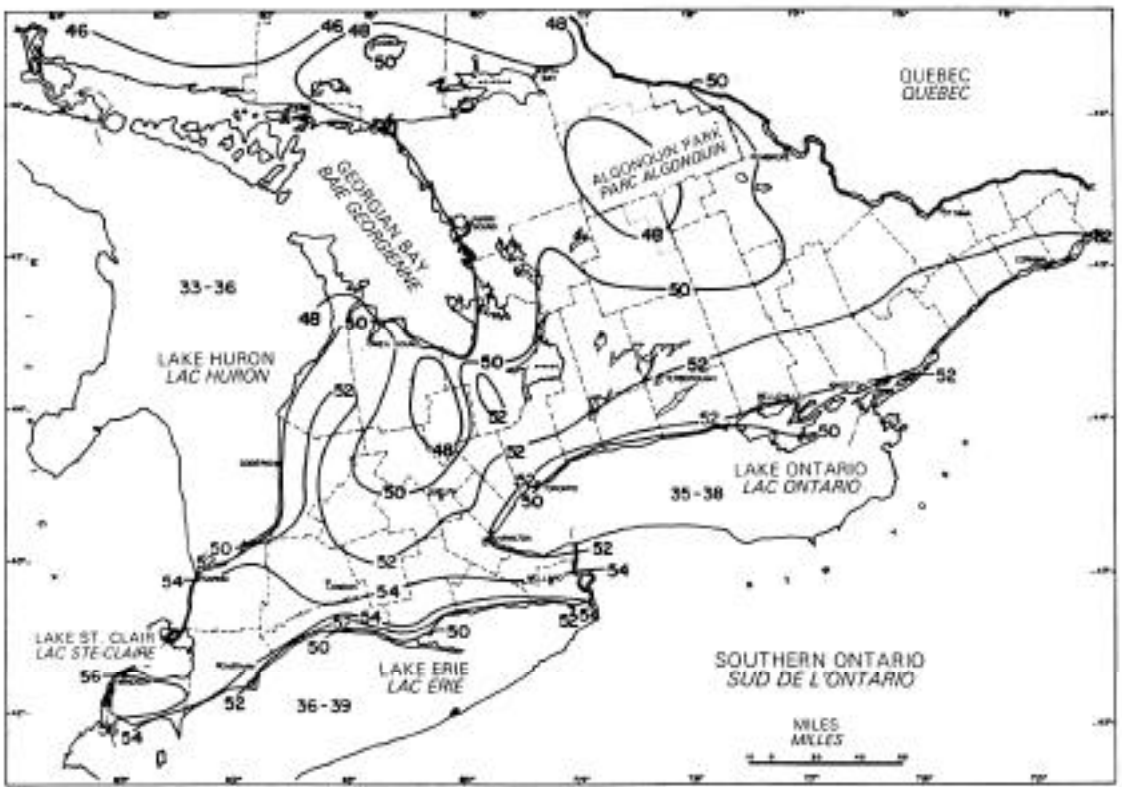


Figure 9: Mean daily maximum temperature (ºF) for April

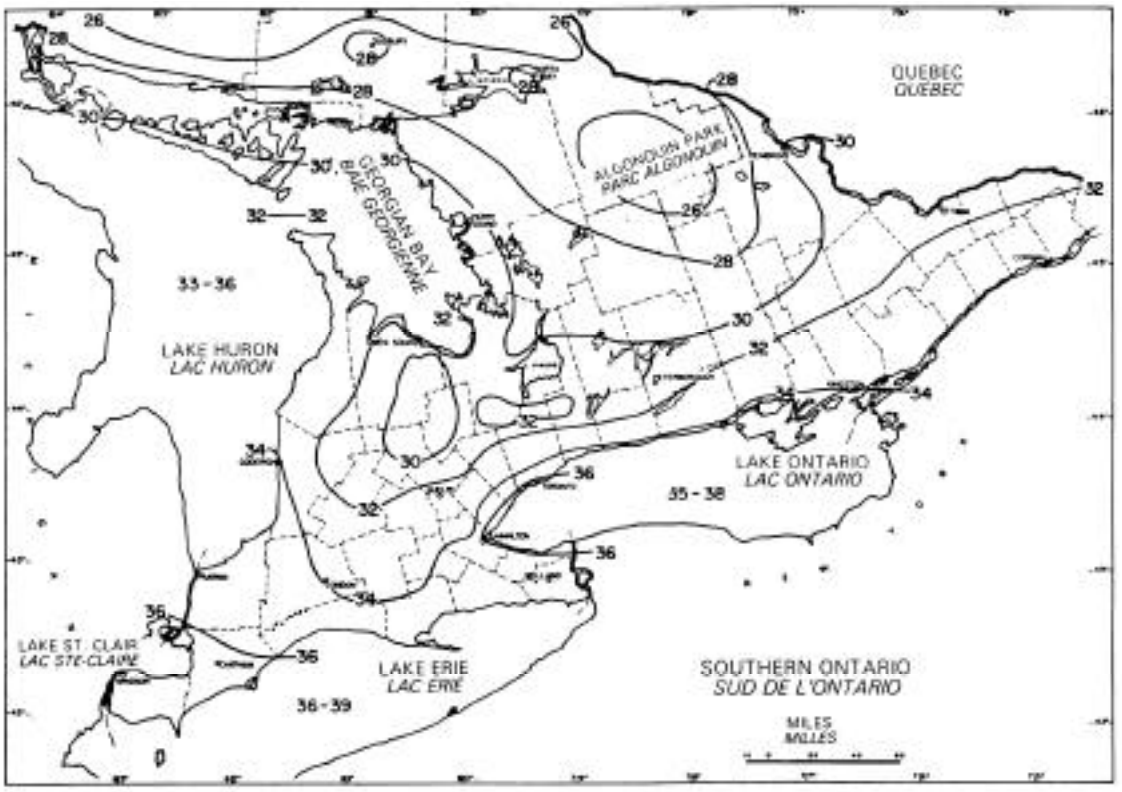


Figure 10: Mean daily minimum temperature (ºF) for April

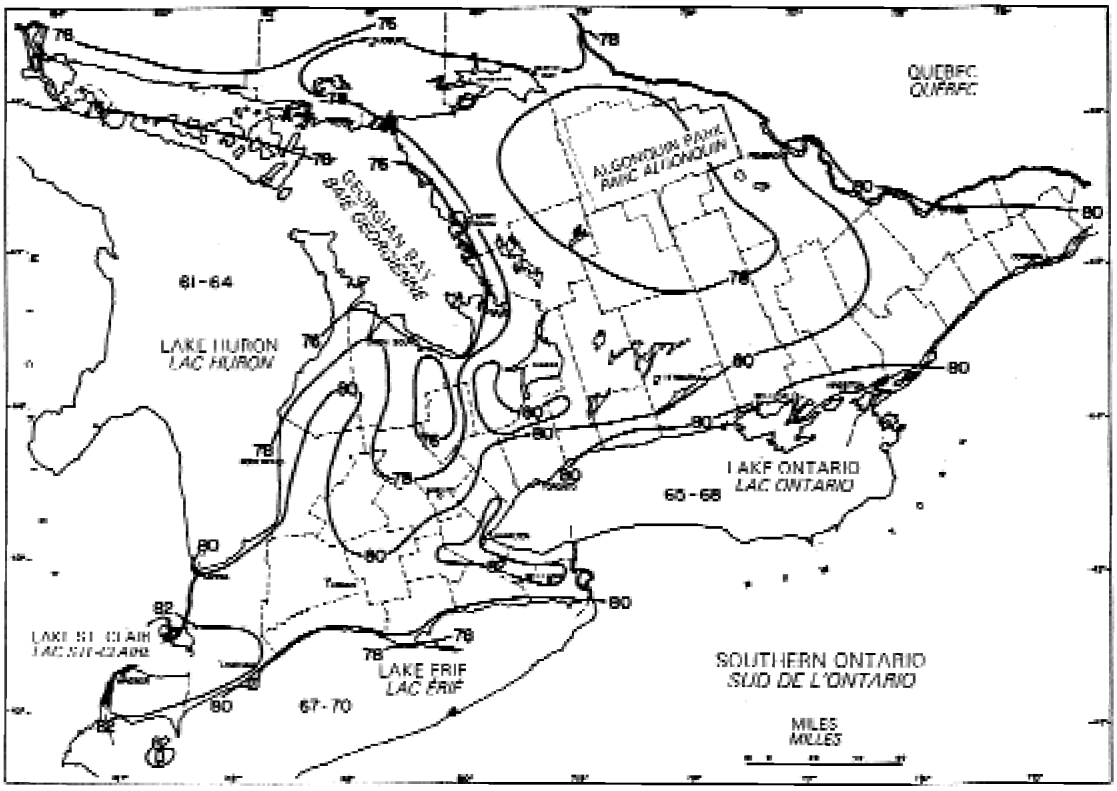


Figure 11: Mean daily maximum temperature (°F) for July

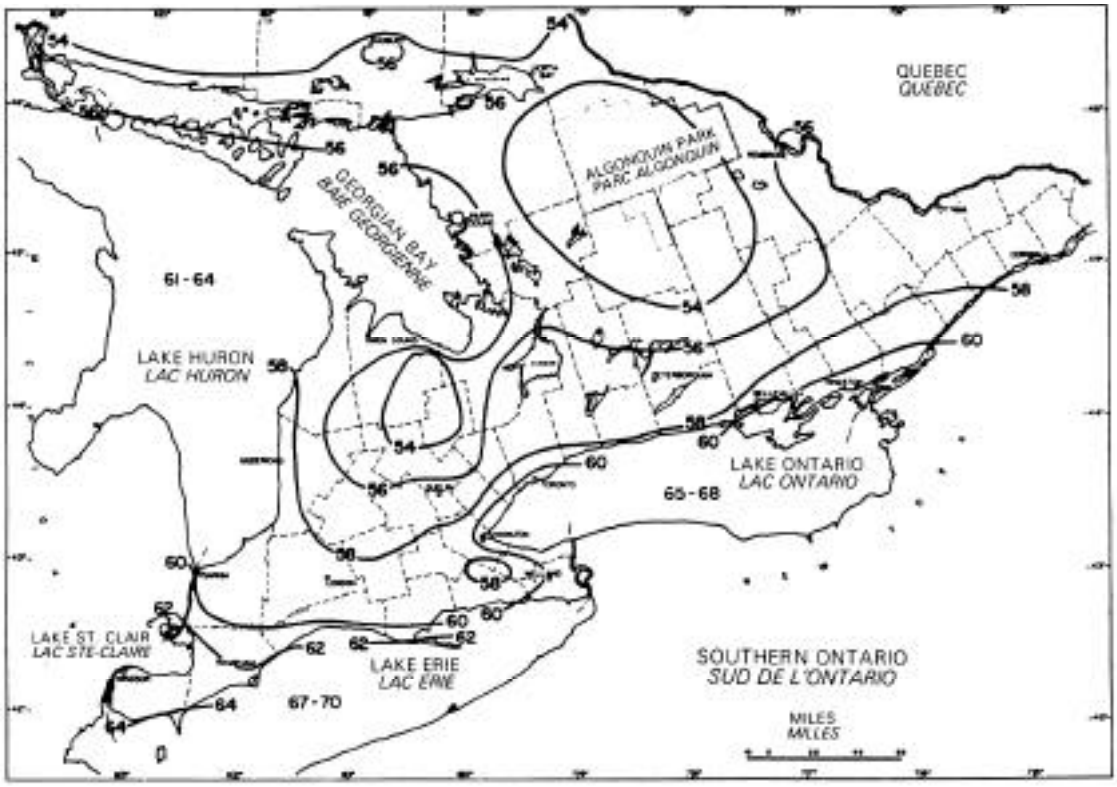


Figure 12: Mean daily minimum temperature (°F) for July

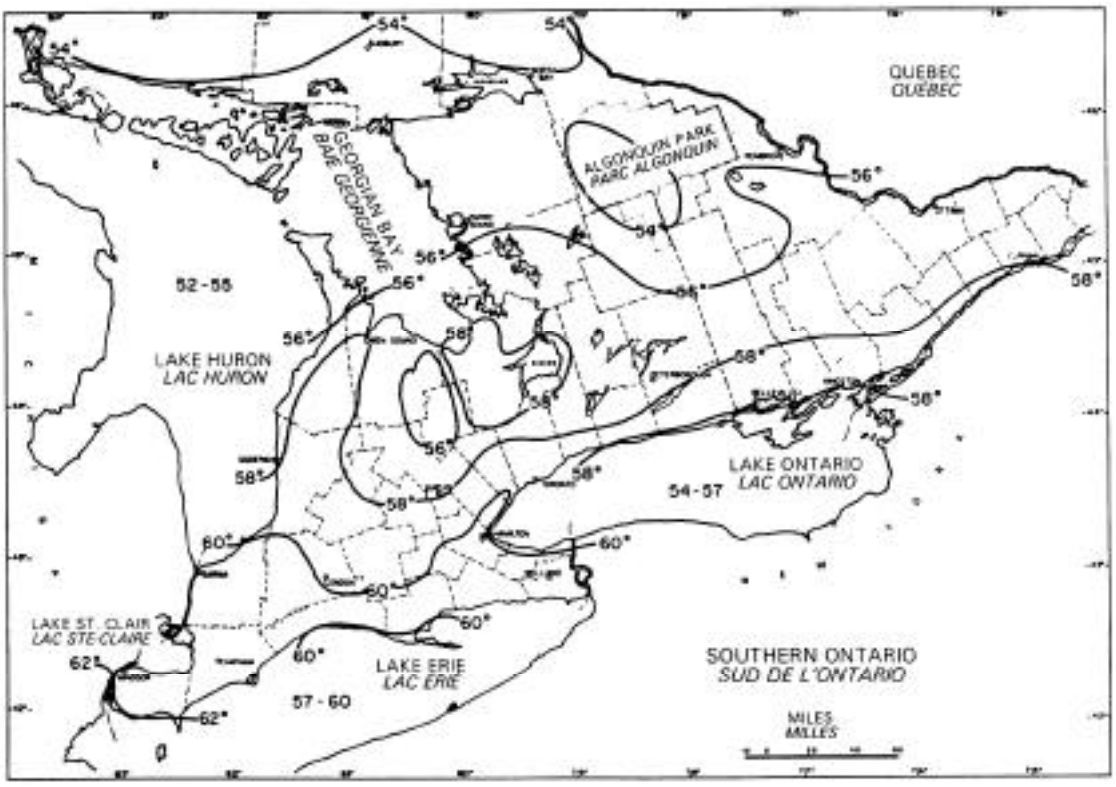


Figure 13: Mean daily maximum temperature (ºF) for October

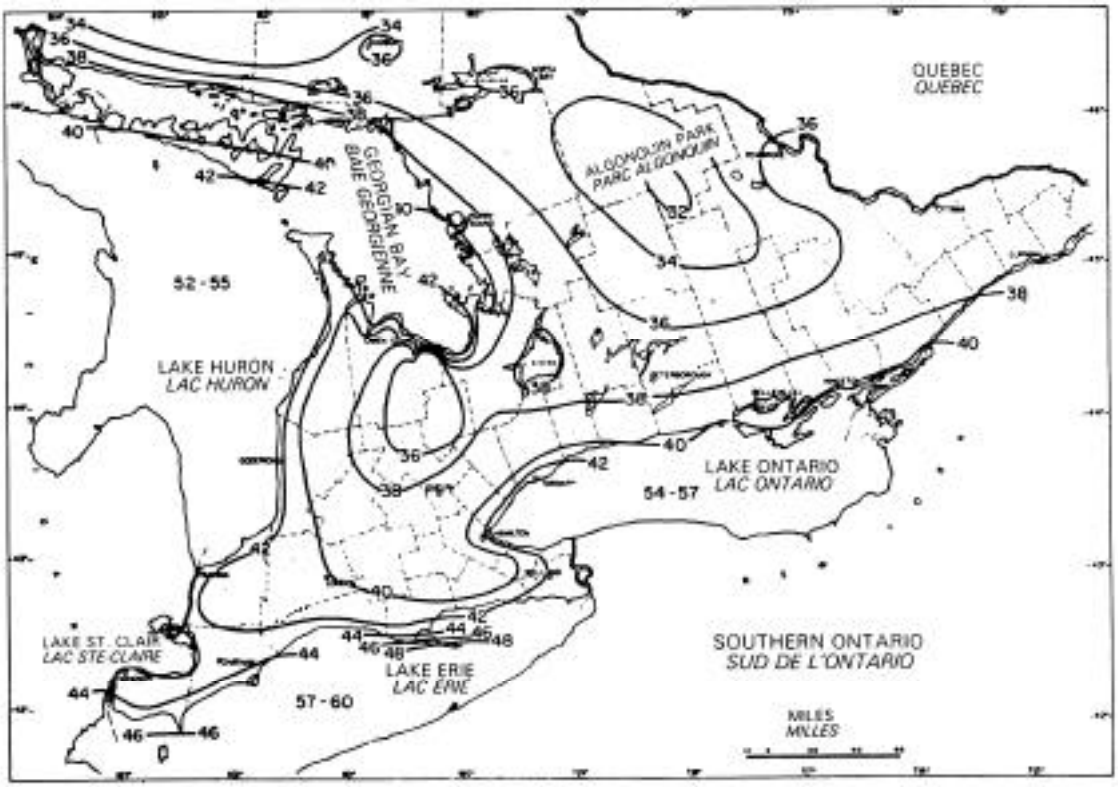


Figure 14: Mean daily minimum temperature (ºF) for October

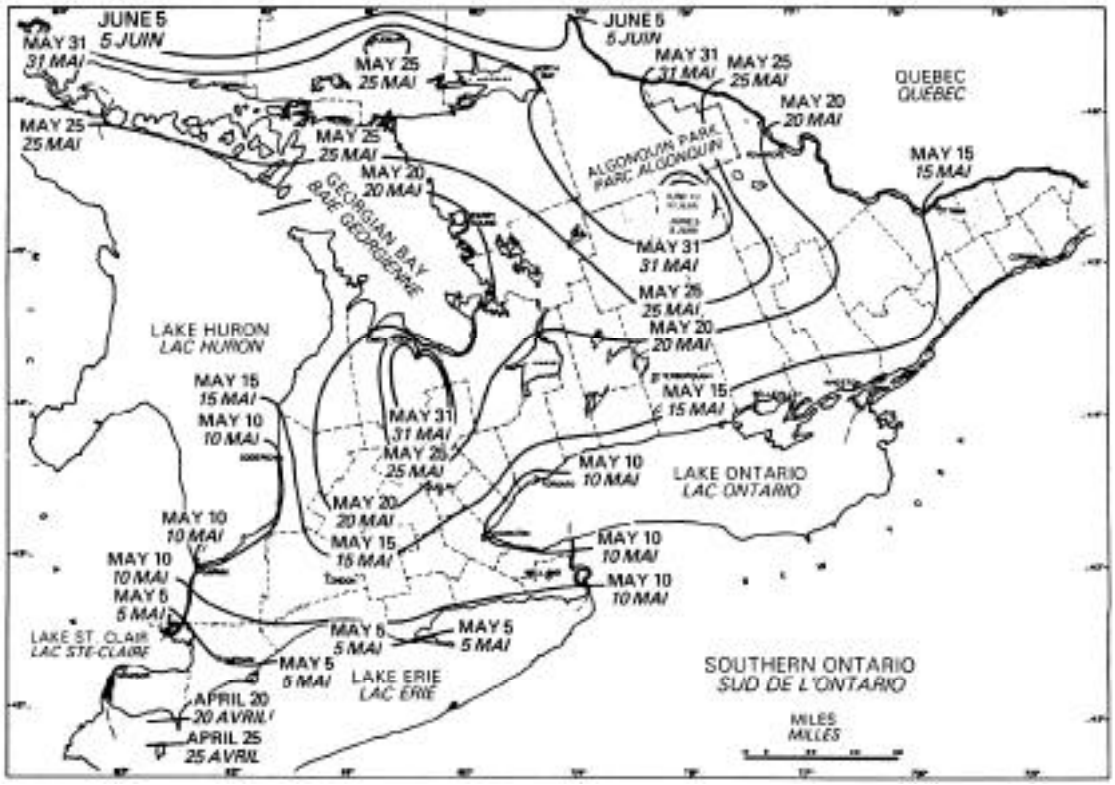


Figure 15: Mean date of last occurrence of 32ºF in Spring

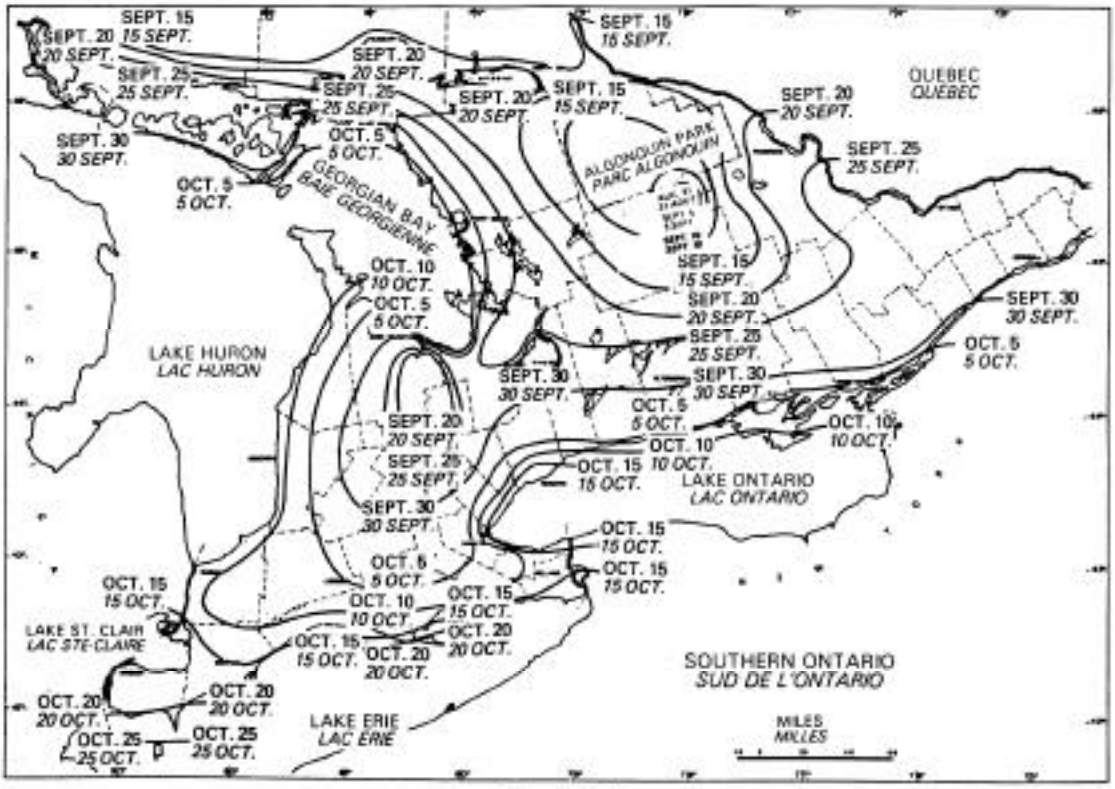


Figure 16: Mean date of first occurrence of 32ºF in Fall

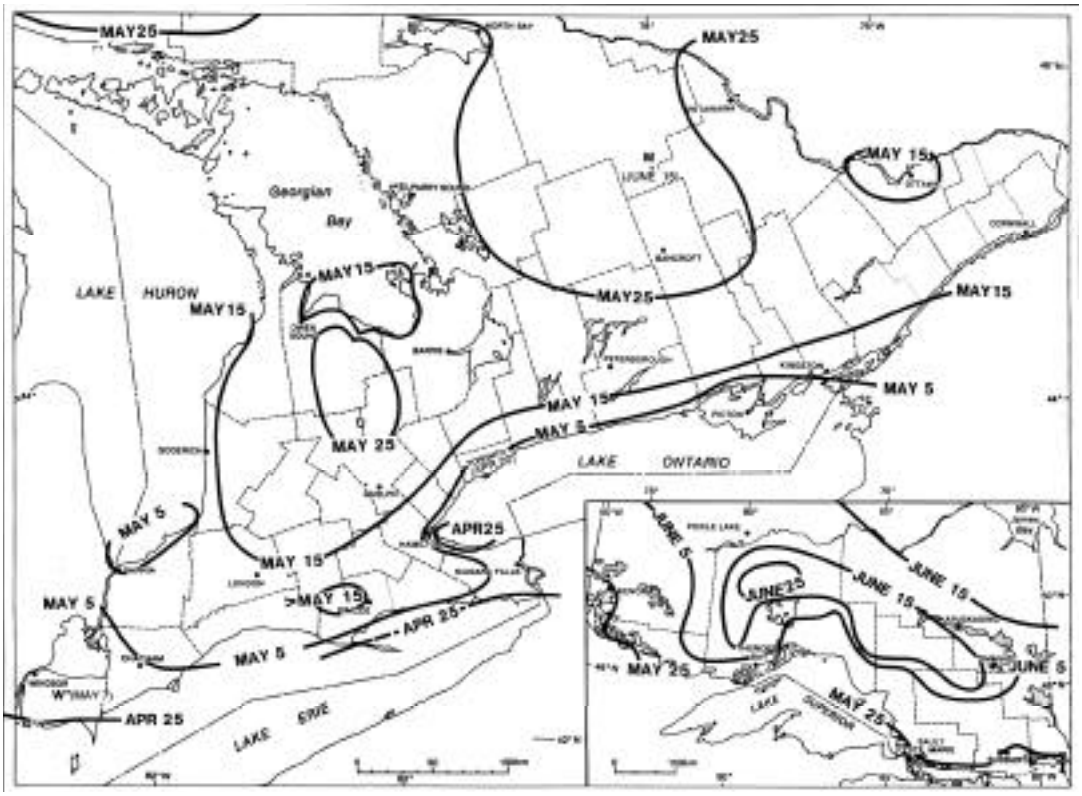


Figure 17: Average date of last Spring frost (oºC) for Ontario

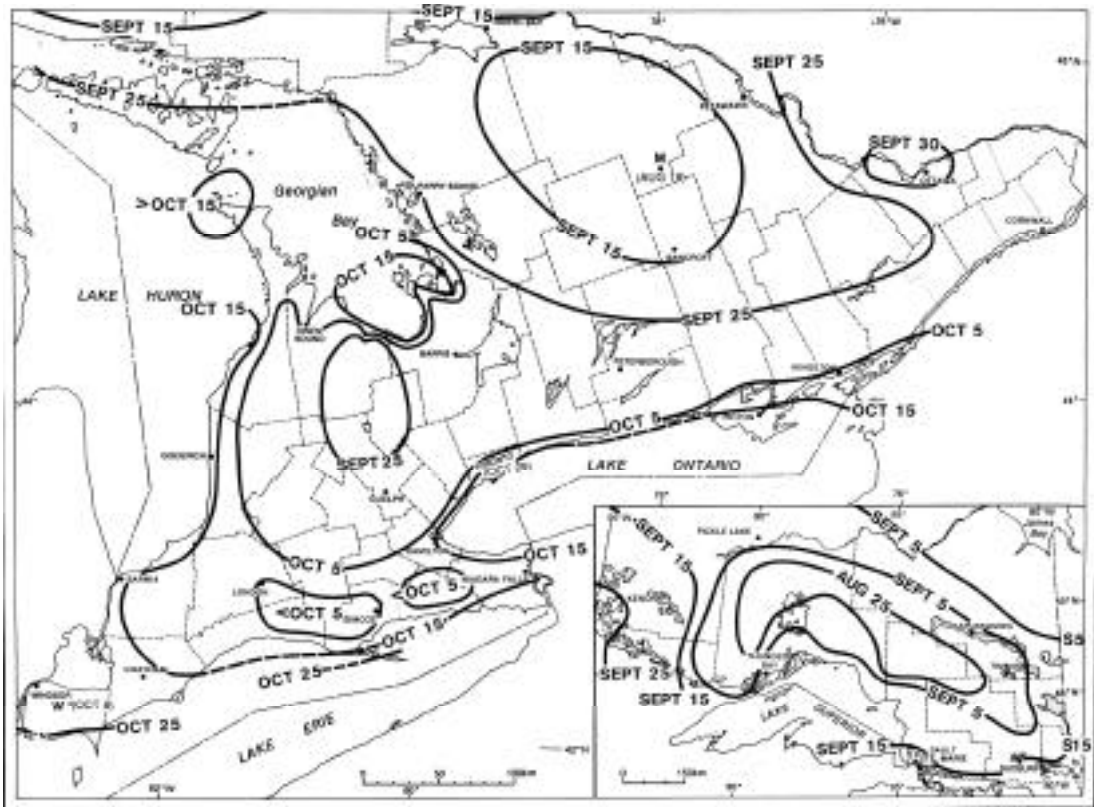


Figure 18: Average date of first Autumn frost (oºC) for Ontario

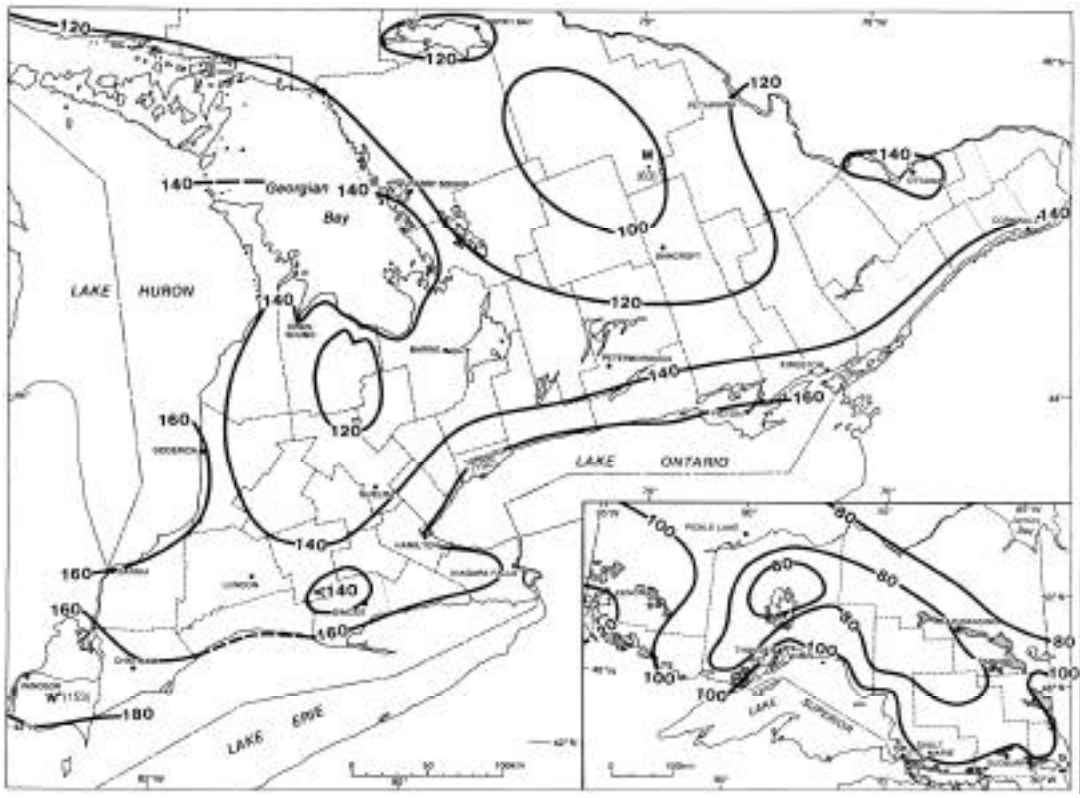


Figure 19: Average length of the frost-free period (above oºC) for Ontario

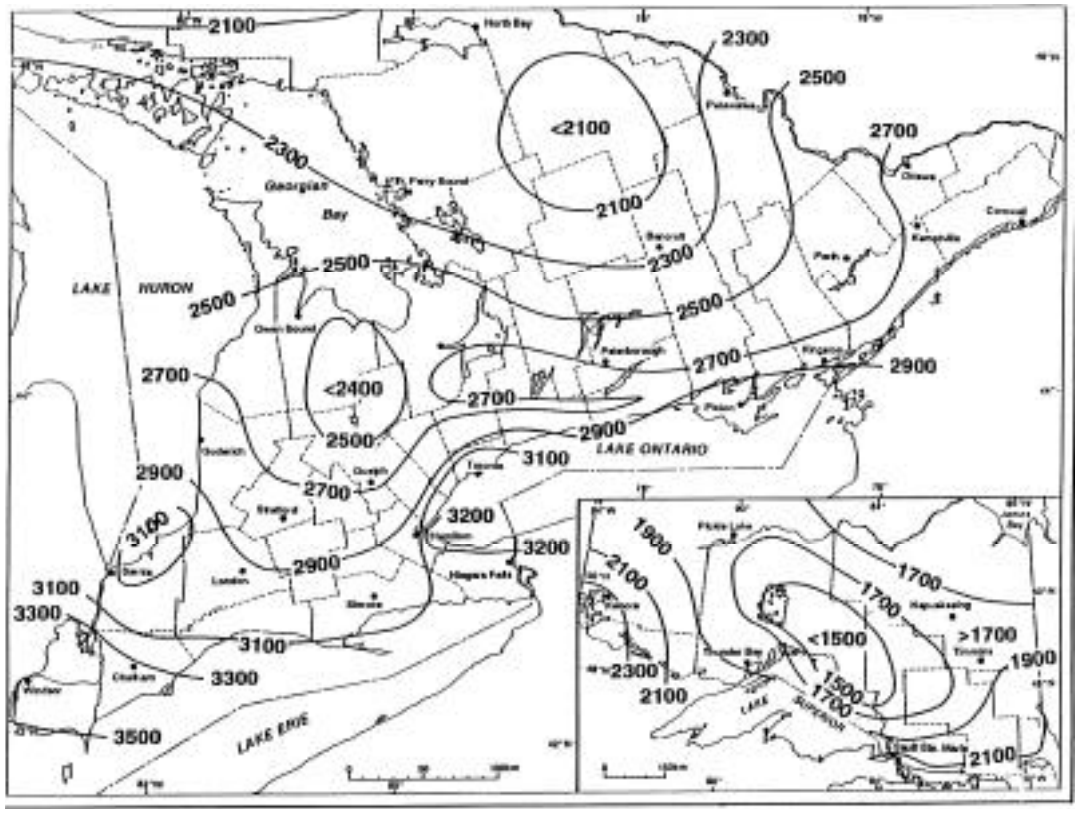


Figure 20: Average accumulated Crop Heat Units (CHU) available for warm-season crops in Ontario

final item to study thoughtfully is the reprint of R.A Treidl's Climactic Aspects of the Niagara Fruit Belt in Appendix A, carefully looking at the patterns of freezing on Lake Ontario.

Lake Ontario is the prime influence in Prince Edward County, as it is in Niagara, The Golden Horseshoe, and all along the north shore. The Lake moderates both winter temperatures by a mere handful of critical degrees, and takes the peaks off Summer temperatures. The Lake Effect, justifiably famous in the Niagara region, is not as pronounced nor effective in Prince Edward County. Niagara enjoys its position between Lakes Erie and Ontario and the Niagara River. Lake Ontario is very deep in front of the region, and the escarpment and the north winds blowing across the open water create much more beneficial wind patterns on the coldest nights. Finally, and something that has to be remembered (though it won't be in any of the pamphlets advertising the climate and terroir of Niagara) ... the area does now benefit even more from the urban heat of Toronto and the Horseshoe corridor, and the insulating blanket of smog.

Prince Edward County benefits from the fairly steady south-southwest-west to north-northeast-east pattern of winds – where the breezes will move across open water from Hamilton until they hits us. The Bay of Quinte, many of the large County bays, and the Lake around the long peninsulas on the east section of the County all provide moderation, but these bodies of water freeze each year, and so offer no protection in the Winter. Lake Ontario in most years will freeze from the North and South Marysburgh shores, east to Kingston and the St. Lawrence, and south to Oswego. In years where more of this area stays open, the greater the Winter moderation, but consulting the pattern of freezes, this can't be depended on. However, these same bodies of water that freeze can offer extra weeks of growing season in the Fall because of moderation, provided frosts are localized and radiative, rather than a pan-region advective pattern. Some vineyards, with beneficial, highly localized patterns of Lake Effect air movement, may even escape the worst ravages of these events. However Winter moderation, once freeze-up happens, is non-existent, and Spring budbreak may be delayed (beneficially in some years of mid-May frost) by a week or two because of cold winds and breezes from the thawing or recently thawed Lake.

The infrequent yet dark days the whole province fears – Niagara included – are the ones when Lake Ontario freezes over completely. 1933-4, 1978-9, 1980-1 and 1993-4 are all Winters when this happened, and combined with a rapid plummet in temperatures and other climactic stresses through those years in question, the result was widespread death and terrible injuries in vineyards and orchards all around the Lake. Phil Mathewson says the 1980-81 Winter produced what was called the Christmas Massacre, when after a long, lingering Fall, and ground without any snow cover, temperatures suddenly plunged down to -36 C degrees on Christmas Eve. Even wild vines and Montmorency Cherries were killed in the County; temperatures went to -33 C in Geneva, N.Y., and a frightening -25 or -26 C in Niagara. Then it happened again a few weeks later. It was all followed by a very warm spring, and finally in April it dipped unexpectedly to -13 C.

In 1993, with Lake Ontario frozen over again, temperatures plummeted to -33 C on Mathewson's farm overlooking South Bay, and ranged from -35 C in Picton, -34 C in Wellington, to -32 C on Indian Point (County sites with weather stations monitoring at the time).

There is something to keep in mind, outside of the general pattern of County Winters and local variations: it is possible that other microclimates exist, and have not been identified yet. A case in point would be Jamie Brauer's vineyard, which was known as Clay Ridge when he and Mike Peddlesden were still partners. I remember discussing Winter with Jamie one night for hours, expressing my fears for that location so far to the north, just southeast of Belleville. By the end of the conversation, I became somewhat convinced he might have found a blessed little microclimate, benefiting from the heat generated by the swamp encircling him as well as a fairly steep slope. Brauer also noted there were numerous deer on his property in Winter; sure enough, the area was identified in County planning maps as a deer yard during the Winter months (the data has since been deleted). If I was looking for property outside the likely areas of Lake moderation, I'd look for established Winter deer yards, as the creatures like to gather in the warmer areas for the cold months.

To summarize the data, the southern half of the

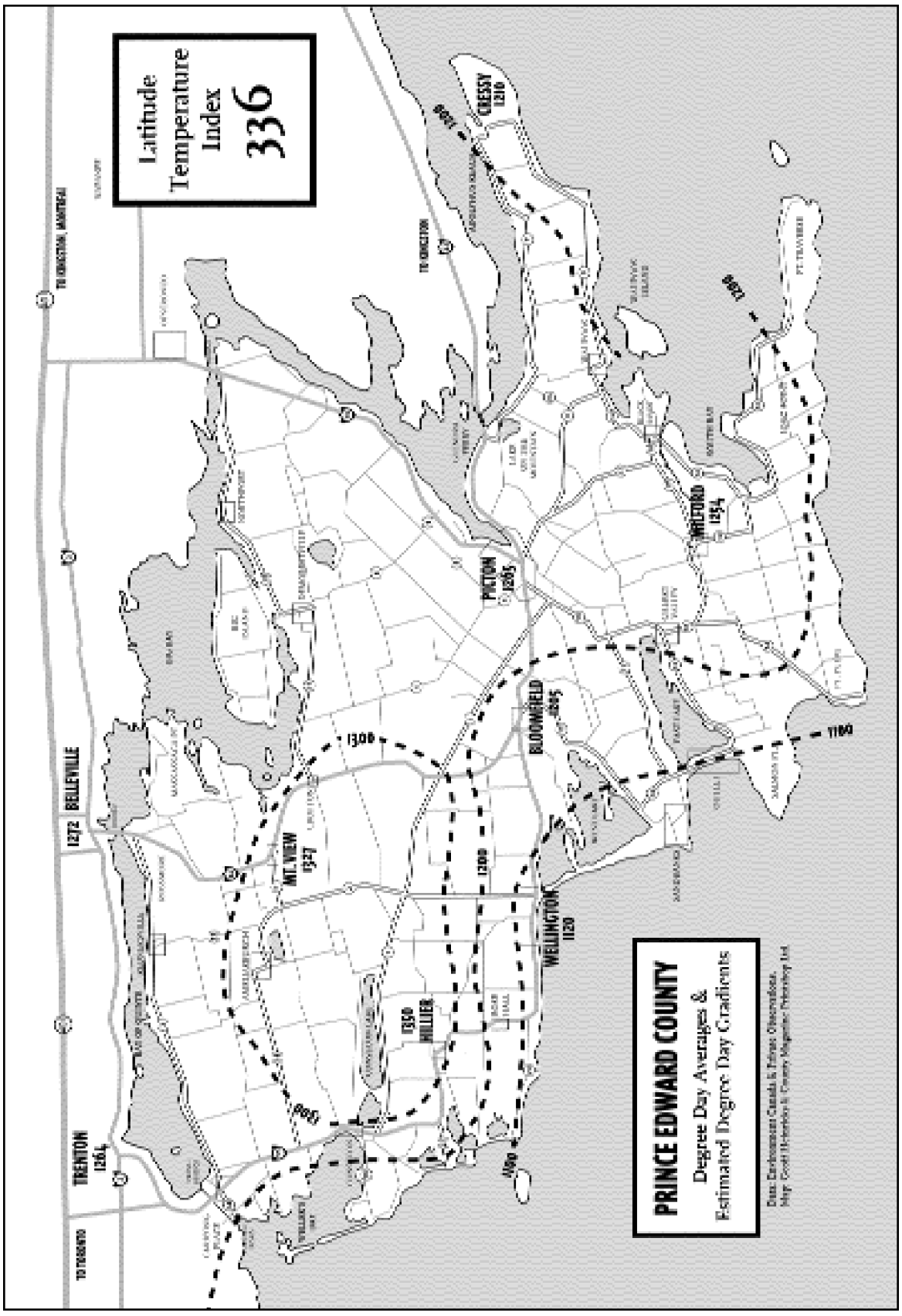


Figure 21:
Degree Day Acerages & Estimated Degree Day Gradients

County, roughly the part below the 44th parallel south of Consecon Lake and running along Scoharie Road (County Road 1), enjoys an average of 160 frost-free days a year. The Northern half usually sees a few days to a week or more shaved off that. Sites close to Lake Ontario seem to start a week or two later in the Spring than a few miles inland, and yet may make up for it with an extra week or two (or even 3 or 4) in the Fall.

The average last Spring frost is May 5, with the average first Fall frost falling about October 15. Degree days [the average daily temperature after subtracting 10, calculated daily over the growing season April to October] for Prince Edward sites range from 1100 to 1350. The Latitude-Temperature Index [mean temperature of the warmest month X (60-latitude of the vineyard)] for Prince Edward is in the 300 to 340 range. There is a lot of academic dissatisfaction with these grape climate models and their usefulness in identifying the true range of vine varieties suitable for a true cool climate region like Canada, and so other models are proposed to better refine them. It is much better to keep in mind the limits of our frost-free days, and focus on growing the First Epoch varieties of grapes; there is a hot enough season to ripen these, though areas immediately near the shore of Lake Ontario may have difficulty in some cool years, as they can be noticeably short of optimum heat accumulations.

Chuck Coury, one of the earliest pioneers in Oregon, drew on his meteorological training when he formulated his controversial theories in the 1960s on why winegrowing would work in Oregon: "Any variety yields its highest quality wines when grown in such a region that the maturation of the variety coincides with the end of the growing season. Or ... any variety yields its highest quality vines when grown in a region whose ecological potential to mature fruit just equals the requirements of the variety, no more or no less ... When a variety gains such an ideal adaptation to its district, when it attains ecological harmony with its environment, when it produces consistently great wines, it is eulogized and the term 'noble variety' bestowed. Its fame sweeps the earth." To properly choose grape varieties, the exact parameters of a region's climate has to be grasped.

There may be ample heat and growing time to just ripen a range of First Epoch grapes. Unfortunately this area is also one of the most drought prone in Ontario, with a very high evaporation rate. It may help control some diseases, but it can stress vines which – combined with magnesium deficiencies and lime chlorosis – can make determining the cause of yellowing leaves a problem. (Chlorosis may also appear at the opposite end of the moisture scale, in a very wet spring during the early stages of vinegrowth.) However the usual moisture deficit in July and August comes at a beneficial time for the vine:

"Controlled water stress after set, but before veraison (berry softening; change in berry colour from green to red) has the greatest effect for improving wine grape quality. Stress at this time has the effect of decreasing berry size, decreasing cluster size, reducing shoot growth (and vigour), reducing the first flush of root growth which occurs shortly after fruit set, and reducing malic acid in mature fruit (increasing the ratio of tartaric to malic acid). Stress at this time will also have the greatest effect on increasing anthocynanin (red skin colour) and total soluble phenolics. Wet soil conditions during this period will delay maturity, reduce skin colour in red varieties, increase vegetative growth, dilute the phenolics, increase malic acid, increase yield and maintain higher yields the following year." (B.C. Management Guide for Grapes, 1996-7)

Winters are much harder – brutal, actually – than Niagara. Most Winters can get near -30 C for at least a few hours every season. Good Winter survival strategies and field practices are a must. For that reason, and to emphasize something that has been forgotten in the recent rush of optimistic vineyard plantings, we'll deal with Winter in its own section.

Earth & Water

The array of soils in Prince Edward County are the most valuable set of baubles in our little viticultural jewel box. Where our Winters are well-fashioned to bring hardened men and women to tears, what will keep everyone at the struggle is the potential in our little patch of earth.

Though the 1948 Soil Survey No. 10 (Prince Edward County) could certainly be updated, or at least refined by new techniques and technology, we

are very fortunate in having it. The information in the accompanying booklet is invaluable for anyone looking for, or attempting to understand, our range of soils, and holds up extremely well. Though the Report went out of print shortly after I picked up my first one in the late 1980s, former MPP Gary Fox actively pushed the ministry to reprint it in 1999, after gentle prodding from Margaret Appleby at OMAFRA and, selfishly, from me (my own copy was taking a real beating and becoming more difficult to lend out without unease and worry). The one disappointment is that the original map printing plates were not found, so a copy of a previously printed map was used; the result is that some of the colours are hard to distinguish, and too often the faint contour lines are lost. [Soil maps can be purchased from OMAFRA (613) 475-5850 or Books on the Bay, Picton.]

Aside from the 1948 Soil Survey, there are other maps and publications from the provincial Ministry of Northern Development and Mines which look at the underlying bedrock and aggregate deposits for industrial use. They provide important foundational information about what lurks beneath the soil layers, complimenting the Soil Survey. In 1999 the OMNDM published an Aggregate Resources Inventory of Prince Edward County, Ontario Geological Survey Aggregate Resources Inventory Paper 172. It's not for everyone, but for those seeking even more information, there are some interesting things in both the book and maps ... though not as much as one will get from the Soil Survey.

In The Physiography of Southern Ontario, by L.J Chapman and D.F. Putnam, they write: "The area of Prince Edward County is 390 square miles, wholly underlain by Trenton limestone except for one small hill of Precambrian granite near Ameliasburgh. The highest point in the county lies between Picton and Glenora, reaching slightly more than 500 feet above sea level or more than 250 feet above the surface of Lake Ontario. Near this, the oddly located Lake-on-the-Mountain has an elevation of 415 feet above sea level, while most of the area of limestone plain has an elevation of about 350 feet or about 100 feet above Lake Ontario. Two other upland lakes worth noting are Roblin Lake near Ameliasburgh and Fish Lake near Demorestville. The shoreline is irregular because of a number of deep valleys dissecting the limestone and thus forming long bays or inlets. The surface has a slight gradient towards the southwest and the western and southern shores are very low. The inlets there are often closed by transverse bars, thus forming lagoons such as West Lake, East Lake, and other smaller bodies of water. On the other hand, the northern and eastern shorelines are of precipitous rocky bluffs rising a hundred feet or more."

Basically, the County is a rolling limestone table, with a slight north-east to southwest tilt, and numerous long, east-west gentle ridges. The rise from the Lake Ontario shore to the interior is gradual, but noticeable, at about 25 feet per mile. There are some pockets of deep soil, but most of the area has only from 1 - 3 feet.

The soils are mainly based on Cambrian limestone, from the middle Ordovician period, laid down about 430 to 500 million years ago, with some patches of glacial till, and others originating from ancient lake bed deposits. (For comparison, soils in Burgundy developed on much younger Jurassic limestone, laid down about 193 to 136 million years ago.) The soils are quite youthful in the geological time scale, "formed since the Pleistocene glaciation under climactic conditions not conductive to rapid soil formation – explain[ing] the excessive influence of the parent material. Thus calcareous till and calcareous till over limestone bedrock, the parent materials from which two-thirds of the soils of Prince Edward have developed, have given rise to soils in which soluble calcium is present over the largest part of the county in concentration of 150-200 parts per million, and in which free carbonates are found in the surface layers ..." (E.S. Dix)

Ordovician limestone was named after the Ordovices, an ancient celtic tribe of western Wales, where scientists first studied Ordovician fossils. In Hillier, where there is a lot of limestone rubble on the soil surface, it's fairly easy to find fossilized molluscs, other odd forms of ancient sea life, and even trilobites, just in walking across a field.

Over the years what used to be known as the Trenton and Black River limestones are now classified as part of the Lindsay formation. In the information on Preliminary Map P.2412 Paleozoic Geology of the Belleville-Wellington Area OMNR-OGS 1981, it describes the area's bedrock:

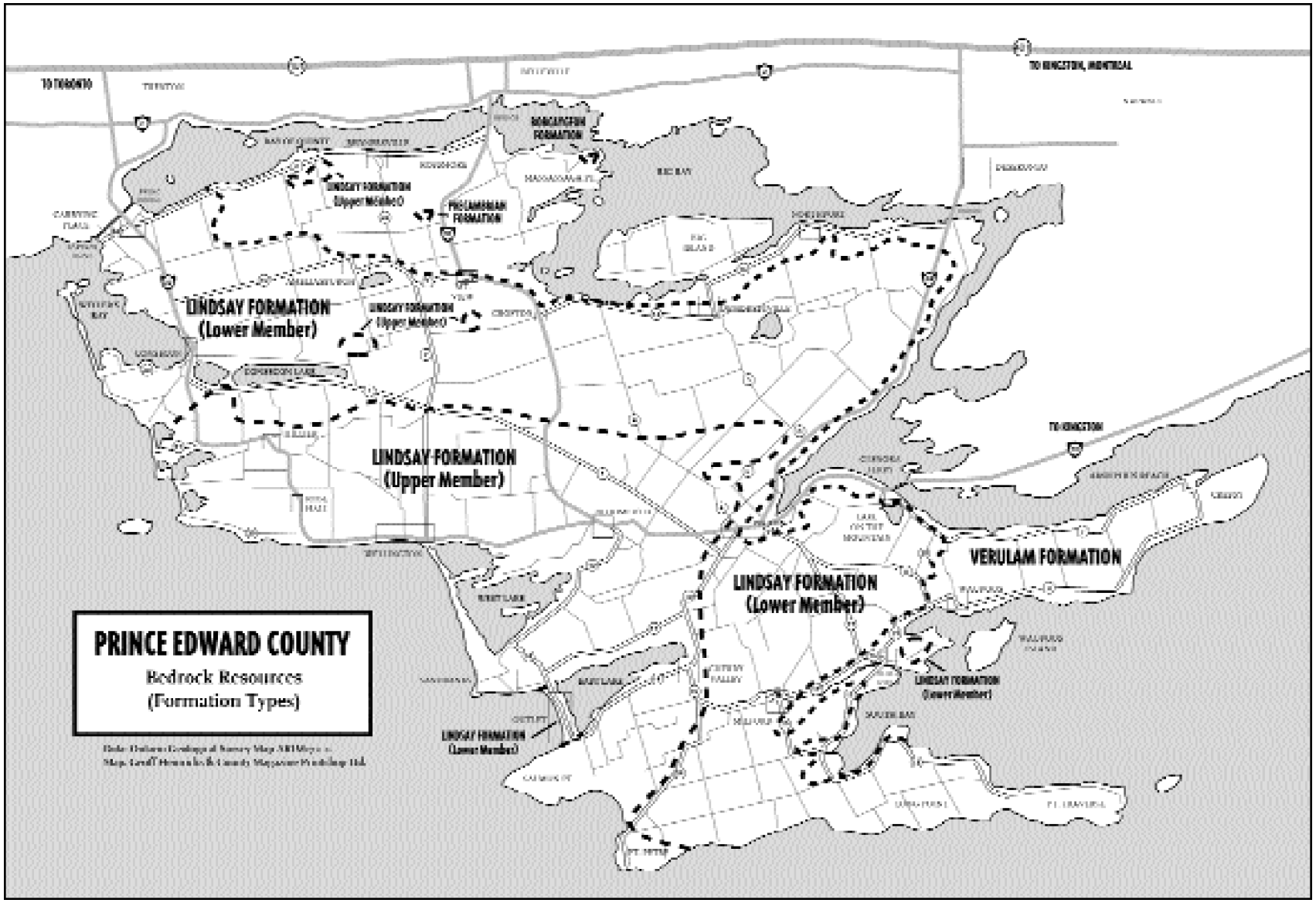


Figure 22:
Bedrock Resources (Formation Types)

"Lindsay Formation (Middle Ordovician) – The Lindsay Formation is the youngest Paleozoic unit in the map-area and underlies most of the southern half of the map-area, forming 3 to 4 m high escarpments along the south shore of Prince Edward Peninsula, and 10 to 12 m high escarpments along the northern shore of Long Point. In the present map area, the formation can be divided into two members. The lower member, approximately 30 m in thickness, consists of medium grey and bluish grey, finely to medium crystalline limestone in beds 3 to 10 cm in thickness separated by thin shaley seams and partings. These strata may locally be nodular. The upper member of the Lindsay Formation is composed of pale to medium grey, sublithographic to finely crystalline, nodular and shaley limestone. Bioclastic limestone is common. Although no complete section of the upper member of the Lindsay Formation is present in the area, Liberty (1961) estimates the thickness to be about 60 m. The contact between the two members is defined as the point where grey, medium to finely crystalline limestone is overlain by grey finely crystalline to sublithographic nodular limestone. Common fossils include brachiopods, gastropods, bryozoa, and trilobites."

The limestone is very important to this area, aside from being the foundation for, and in most cases donor of, the soil. The Ontario Geological Survey maps have roughly identified two types (above) of the Lindsay and one of the Verulam limestone formations in Prince Edward County, and have mapped them as they cut across the it. They've been roughly placed on the map in Figure 22, but for accuracy, the official maps are best looked at.

There are plenty of road cuts in the County, and to show the range of layers, bedding depths, and degree of nodular structure, shale layers, or solid, fairly impermeable limestone slabs, some of the more typical ones have been included here (see photos). While looking for land, it's important to find as many of the roadcuts and exposures near one's site as possible; along with map data, it'll help provide an understanding of the type of basement you'll be working with.

It seems the glacial shear of the County limestone, plus bedding differences millions of years ago, have ensured these different basement struc-

Onderdonk Hill, Ameliasburgh – Lower member of the Lindsay Formation showing friable layers ...

but thicker beds of limestone, and less shale.

County Roads 23 & 19, Ameliasburgh – Lower Member of the Lindsay Formation, with more shale layers ...

yet quickly underlain by thicker ...

and thicker, and less fractured beds of limestone.

Victoria Road, Ameliasburgh –
Pre-Cambrian inliar ...

the only visible granite bedrock in the County.

Highway 62, south of Rossmore, Ameliasburgh –
Verulam Formation, showing thick, solid slabs ...

and some layers of shale partings.

tures, though still of one family. So in Hillier, more of the thinly bedded limestone layers, well fractured vertically, and with numerous shale partings, underlies much of the area, while in areas of the soil survey marked as Farmington Loam there are quite thick slabs with very few vertical fissures. Aside from map and roadcut reading, the easiest way to get a good idea of the underlying limestone is to look at the fenceline and forest vegetation: good, moderate to high stands of healthy hardwoods means the roots can penetrate the fissures; scrub brush, juniper and cedar is a pretty certain sign of solid, nearly impermeable slabs.

On the deep clays (8 to 14 or more feet) and sands, the underlying limestone is less important an issue, although it would be better to have nodu-

Scoharie and Burris Road, Hillier – Lower member of the Lindsay Formation, this time in Hillier ...

showing the very friable surface layer, and again thicker underlayers.

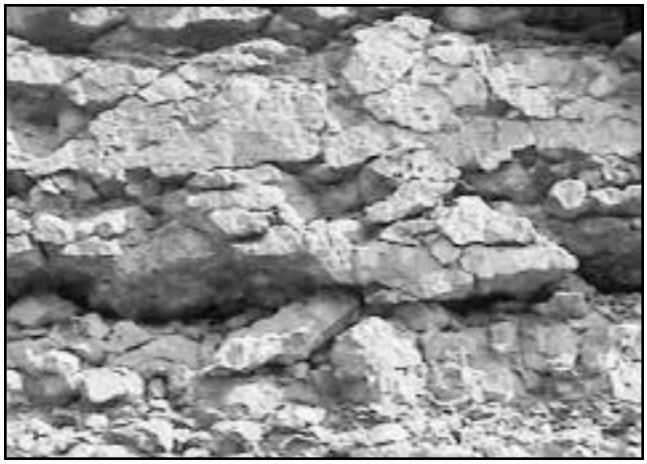
Highway 33, North of Pleasant Bay, Hillier – Upper member of the Lindsay Formation's 'basement' layers well below ...

the thick band of thinly bedded, friable limestone and shale layers.

lar, well-fissured limestone down there to help drainage, root health and growth by cutting down on water perching on the rock.

In the case of the nodular, thinly bedded limestone, the water function is different, but of prime importance. The Winter run-off and the early Spring rains drain into the limestone, settling into the crevices, fissures and layer boundaries. The roots, after the first season, can usually tap into that natural sponge, drawing enough water to grow and survive even the County's nearly annual drought. In 2001, a great part of the severity of that particular drought could be blamed on the lack of rains in April and May (as well as the lack of normal rain through the growing season), and the failure to naturally charge up that extremely important reservoir.

In Andrew Barr's book Pinot Noir, he goes into



Cressy, North Marysburgh – Verulam Formation, with a degree of fissures ...

and a fairly high, thicker 'basement'.

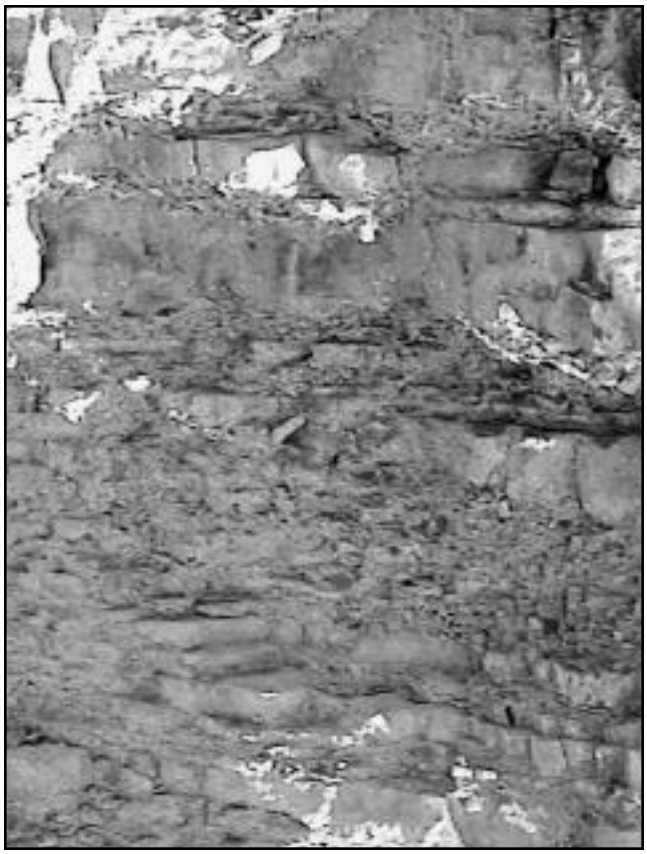
Black River, North Marysburgh –
Lower member of the Lindsay Formation, showing much the same ...

series of friable upper levels, and solid lower levels ...

as found in Ameliasburgh and parts of Hillier.

the debate on limestone, which is about as heated as is any discussion of density. Trying to find out if there is any scientific reason behind preference for limestone, he summarizes that "... it is possible to understand the advantage in planting vines on limestone subsoil, as it stops the plant from growing too vigourously and producing too many leaves and grapes. The calcium in the limestone sequestrates the magnesium need for photosynthesis, so the plant struggles and produces a small crop. This explains the difference between real burgundies and many New World Pinot Noirs ...

South Bay, South Marysburgh – Lower member of the Lindsay formation, very similar to ...



the profiles near County Roads 19 and 23, and Onderdonk Hill in Ameliasburgh

"On the other hand, some of the vine-growers outside Burgundy who have chosen to plant their Pinot Noir vines on limestone subsoil have done so not because it encourages the drainage of water but for precisely the opposite reason. Limestone can be compared to a sponge: it both drains well and retains water, releasing it slowly during the growing season. It has therefore been favoured by vine-growers such as Miguel Torres in Spain, Gary Farr at Bannockburn Vineyards in Australia and Danny Schuster at Omihi Hills in New Zealand over the alternative of irrigating their vines. The water-retaining properties of limestone have enabled Farr to close-plant a proportion of this vineyard on the Burgundian model, forcing the vines to dig deeper and thus take up more flavouring elements from the soil. It would not be possible to do this in an irrigated vineyard."

The Soil Survey gives the area's limestone as being composed of:

4.86 % Silica oxide (SiO_2)
.84 % Ferric oxide (Fe_2O_3)
1.44 % Alumina oxide (Al_2O_2)
.17 % Tri-calcium phosphate ($Ca_3(PO_4)_2$)
90.91 % Calcium carbonate ($CaCO_3$)
1.20 % Magnesium carbonate ($MgCO_3$)
99.42 % Total

The soils that are based on this limestone – less so those soils which are the result of glacial deposits – are prone to magnesium deficiencies. Especially susceptible are Hillier Clay Loam, the Ameliasburgh Loam and Clay Loam, and some of the lacustro-marine clays, all with high calcium to magnesium ratios. Magnesium foliar applications using epsom salts are a good idea, at least for the first few years. Chlorosis, or yellowing of the lower leaves can be a persistent problem, both because of the alkalinity of our soils, the free lime in the soil, and, oddly enough, by too much water in the soil at the beginning of the season which can cause the same effect.

Potassium is also something to keep an eye on in many parts of the County; its deficiency showed up quite extensively during the drought of 2001, when lack of water in the soil helped lock up what was usually available. Check your soil types listed in the Soil Survey to see the trends in your soil(s), and certainly testing can never hurt ... unless one follows the recommended adjustments blindly, without watching the vines carefully first to see if problems really are there.

A Conservative Rough Estimate of Quality Vineyard Land in Prince Edward by Soil Type

Hillier Clay Loam	1500-2000 acres
Ameliasburg Clay Loam	1000 acres
Ameliasburg Loam	1000 acres
Darlington Loam	700 acres
Brighton Gravelly Sand	>100 acres
Pontypool Sand	150 acres
Pontypool Sandy Loam	300 acres
South Bay Clay	500 acres
Brighton Sand	400 acres
Tecumseh Sandy Loam	100 acres
Percy Fine Sandy Loam	250 acres

Approximately 6000 acres prime grape-growing land

Soils Best to Avoid

Farmington Loam

Far too shallow, with thick limestone layers that are poorly fractured, so not only drought but water pooling on the surface can easily occur. Easily identified on the soil map as light pink, and in the field as large patches where only juniper and red and white cedar are growing.

Gerow Clay Loam

An imperfectly drained clay, found in the low areas near Hillier and Ameliasburgh Clay Loams, it's no deeper than those soils, so installing tile drainage would be difficult and do nothing to change the aspect of the site.

Solmesville Clay

A deep, imperfectly drained ancient lakebed deposit. It has a high clay content, would need tile draining, and would be a cold, exceedingly fertile soil, bringing aggravating management problems.

Tecumseh Sandy Loam

Imperfect drainage and low organic matter levels are the problems with this type. Once again tile draining is needed, though once tiled it would probably warm up faster than the other problem clay soils.

Granby Sandy Loam

Usually located in low areas anyways, any gains by tile draining this soil is academic, if it even could be done effectively, given the site.

Elmbrook Clay and Clay Loam

The Clay Loam type of this soil is a better bet than the Clay, which is heavy and slow to drain. Some orchards were grown on the Clay Loam, but again tile draining, cold, slow to warm soils (a problem in our limited season) and high fertility would be real headaches.

Muck, Marsh, Bottom Land, Eastport Sand, Rock

Obvious, and needs no explanation.

Site Selection

There are no great mysteries to site selection – at least as far as the platonic ideal goes. A slight slope to the south, with clear air drainage, on well-draining, warm soil reasonably close to water for moderation. The old folk saying that vines like to have their feet dry but still be able to see water pretty well sums it up.

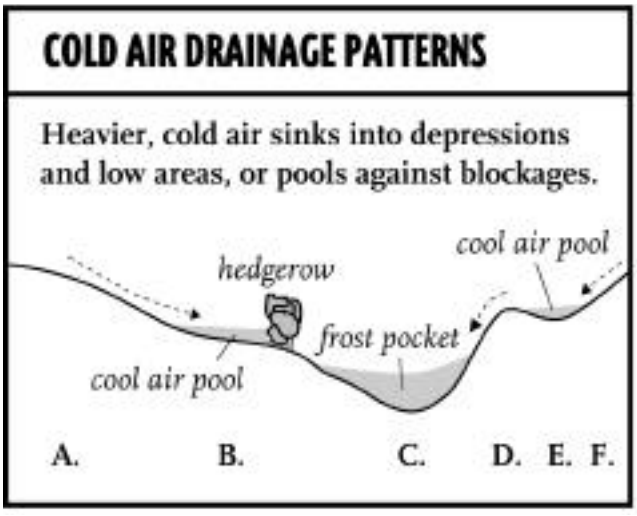
Yet there are exceptions everywhere. The southern hemisphere naturally reverses the south to a north slope; most of Niagara, for reasons of geography, has north and not southern slopes to Lake Ontario; thousands of other unruly examples can be found around the world with very little effort. But the fundamentals still apply. They just vary with the demanding particulars of the region or site in question.

In Prince Edward County, there are few dramatic south slopes. This is primarily an area of gentle 2 to 5 degree rises, in a rolling pattern that has small valleys running approximately northwest to southeast. Very slight gentle tilts can be missed sitting in

a car, and good locations can be incorrectly dismissed as flat. A few growers will admit that they had to get well out into the field to appreciate a slope that otherwise would have been overlooked. For every south facing tilt, there is a corresponding north one. There is some debate as to whether a north slope can help prevent southwest injury to vine trunks in late winter, as the sun doesn't shine so intensely on them, causing the dreaded cycle of warm wood/rapid freeze and the tissue damage that results. Yet this area, being marginal, can use all the sunshine and heat it can get, and purposely putting vines on a north slope hides ones light under a bushel. South facing slopes intercept the maximum solar radiation. An interesting exception to this could be in locating Pinot Noir, Meunier and Chardonnay on a gentle north slope to retard ripeness and hold acidity, all in the pursuit of a compelling base for sparkling wine.

A slope not only intercepts the maximum amount of sunshine, it also helps to shed cool air in the event of late Spring and early Fall frosts, and can aid in lessening the pooling of very cold air during those hours a very cold temperature threatens in the depths of Winter. Not all slopes are created equal though. It is important to recognize where the slope is in relation to the surrounding land. Figure 23 is a fairly standard diagramme in most viticultural texts, but it explains the potential difficulties of improper site selection quite well.

Figure 23



A. is a south slope. B. is the base of the slope, blocked by a dense hedge. C. is a low hollow. D. is a small level area, where air may drain either side north or south. E. is another small depression. F. is a north slope, draining into the lower sections.

A good slope, at least in Prince Edward County, needs to be reasonably close to Lake Ontario. James Lahti, with his particular charming enthusiasm, says of those intending to plant a vineyard that, "Anyone who is closer than a mile to the Lake, or further than three miles, is crazy." Phil Mathewson believes a location about a half mile from the Lake, on a good slope for drainage is about ideal. Personally, I thought I was about pushing the limit when I went in about 4 miles from the west, and 4 miles from the south of open Winter water, but others have since located a little further inland in Hillier.

The reason for some degree of distance from the Lake is to get away from the very cool breezes from the Lake, which can set vine growth back by a critical two or three weeks. We need maximum maturity in Prince Edward County, and anything given up is hard to win back in the Fall. (As Phil Mathewson put it so nicely, summing up the situation of vinegrowers: "We're so retarded.") While the Lake Effect in Winter, for vines about a half mile to open water, can certainly whittle a few dangerous degrees when the inevitable big hit comes, it has to be measured against not only a hobbled Spring start, but against the damage severe drying winds can have on the vines and soil even before Spring arrives.

Dessication will be a dangerous problem for any vineyard under the constant (though moderated) Winter winds right off Lake Ontario; it can be a problem for most of the County. That is why I prefer that vineyards in Prince Edward County keep and encourage the remaining hedgerows which, thanks to the early Loyalist surveys, run quite close together in roughly a north-south axis. These brake any exceptionally brutal Winter winds and assist in preventing severe vine dessication, stop erosion on our already thin soils, and help preserve the unique landscape and character of the County. In Summer the same hedgerows also help slow the constant Lake breezes to gentle ones, aid heat accumulation inland to a much greater degree than the immediate lakeshore region, yet at the same time allow enough air circulation to help fight fungal infection.

Constant lake winds that lessen the heat accumulation on a site are a worry for a few other reasons. In some studies, winds have a tendency to reduce the percentage of budbreak, shoot growth and cluster size, as well as elevate pH and potassium in the fruit. Vessey Point grower Ian Hanna maintains that in California winds seem to be responsible for a citrus element in fruit, even when well-ripened, that may not be desirable.

So, putting it all together: in selecting a site, the larger climate picture (macroclimate) for Prince Edward County and the range of soils are the first things to wade through. Once sites are found that meet a person's comfort of risk to benefit ratio, each can then be examined for its physical aspect, such as slope, air drainage, wind pattern, likely frost risk and pattern, and true soil depth. It is very important that sites are selected with intelligence and patience.

James Lahti said that if he was looking for a site, he'd buy a half dozen or dozen HOBO temperature data loggers, and place them in areas he was interested in to gather key information, and compare it to other sites in the County. Phil Mathewson adopted a different method, and put in apricot trees in sites he thought might be worthwhile, to see how they did over a number of years (Ian Hanna bought across from one such planting of apricots). This last method was quite similar to Dick Erath planting indicator vines in the late 1960s in Oregon to help find the best sites for vineyards.

While Lahti's idea is the quickest, all come from the knowledge that proper site selection is an important business, and is neglected at ones peril.

Prince Edward County Regions

The logical way to break down the 390 square miles of the County is by the old political divisions of townships. The seven townships and three incorporated villages – Wellington and Bloomfield, and the town of Picton – were amalgamated in 1998 into one municipality. The townships are now wards, but their names and boundaries continue to exist either officially or in the mental landscape, and likely will for a few generations, if not indefinitely, given the County character. In this section the strengths and weaknesses of each former township will be outlined, to help match the prospective grower to an area that might best fit their vineyard plans.

Ameliasburgh

The adopted home of poet Al Purdy and his fable wild grape wines, Ameliasburgh township had its municipal offices in the hamlet of the same name. One of the original Loyalist Townships (called Seventh Town at the time of its creation), it used to include what later became Hillier Township. Now it lies between Weller's Bay to the west, Consecon Lake and Hillier to the south, Sophiasburgh to the east, and the Bay of Quinte to the north.

Like Hillier, Ameliasburgh has a largish, fairly uniform area of soil, called Ameliasburgh Clay Loam and Ameliasburgh Loam. It is related to the Hillier Clay Loam, but its primary difference is a thicker limestone bedrock that is less well fractured and interbedded with shale. Above County Road 19, the soil becomes a real patchwork, down to the Bay of Quinte. The primary ones are a large area of Brighton Sand around Albury, a very large patch of South Bay Clay east of Rednersville, and a little bit of most everything else over the rest.

The larger climate picture for Ameliasburgh is worrying. There is very little moderation during Winter. The Bay of Quinte and Consecon Lake freeze, and it is also well in from any open water on Lake Ontario as Weller's Bay also freezes. As said before, Consecon Lake and Scoharie Road (County Road 1), running roughly along the 44th parallel, seems to be the dividing line for moderation and delayed frost in the County.

Mountainview, atop and nestled into the northerly cuesta of the County, is one of the warmest areas in the County, likely due to its interior location. That may make it attractive, but it has to be counter-balanced against the early frost patterns and lack of Winter moderation.

The north slope down to the Bay of Quinte, along the Rednersville Road (County Road 3) used to be a large area of orchard, especially around the hamlets of Albury and Rednersville. A few remaining orchards exist, but much of the land has been turned into large estate lots, and in effect is almost a suburb of Belleville. The pronounced slope to the Bay, and its history as a fruit growing region make it interesting, but as already noted, the Bay freezes during the winter.

The area just to the east of Weller's Bay, north of

Consecon is a better bet, as the slopes can be nice, the soil is Ameliasburgh Clay Loam, and even with Weller's Bay frozen, it's close enough to some open Lake to moderate a bit. It's almost in Hillier. Some late season frosts might be cut if the breeze is coming from the west, but spring budbreak will likely be delayed due to the cold winds coming off the Bay.

The area probably of most interest in Ameliasburgh would be the north shore of Consecon Lake, above Lakeside Drive. The 'Côte du Consecon'. Except for a large area of shallow Farmington Loam at the the east end, there is a good mix of soils up some very attractive south slopes that drain down into Consecon Lake. With no vineyards or data, it's hard to know whether the slope would drain enough cold air both during frosts and in the depths of Winter to make up for being on the other side of the 44th Parallel. Yet it is potentially a very good area, and one I've had my eye on since 1995.

Athol

The forgotten, or at least often overlooked, township. Tucked in below Hallowell and South Marysburgh, Athol was created in 1848. Township offices were in Cherry Valley.

Basically Athol surrounds East Lake, stretching down from Athol Bay, Wicked Point, Soup Harbour and then Lake Ontario to Charwell Point. It contains the Outlet Beach section of Sandbanks Provincial Park, and there are a number of private campgrounds in the area.

Athol is a cooler area of Prince Edward County, in the lee of winds often going across the ice of both West Lake and East Lake in Winter and, for some distance, the Lake harbours and bays. The inland sections from Wicked Point, Point Petre and Charwell Point may receive more Winter moderation from the open waters of Lake Ontario, but the relatively flat lands can be exposed to severe desiccation from those Lake winds, especially on sandy soils. Ice formation east of Point Petre happens about one in three years, and would lock up moderation for these parts of Athol. Temperature data from the vineyard sites in Athol need to be collected and compared to see how they rate to other County data.

A large stretch of Farmington Loam runs east from Point Petre to Charwell Point, with another north and east of Cherry Valley, and is best avoided for reasons already dealt with.

Most of the area has the gentle rolls of the County, except for the more pronounced slopes down to East Lake. There are small areas from which to choose good sites, but they must be selected carefully. The soil types are a patchwork of some Ameliasburgh Loam, Darlington Loam, South Bay Clay and plenty of sands. There's a large section of Brighton Sandy Loam around Cherry Valley, and other areas of Percy Fine Sandy Loam, and a small area of Pontypool Sand.

Hallowell

Hallowell was created in 1797, out of parts of Sophiasburgh and Marysburgh. Within its boundaries were both the incorporated Town of Picton and Village of Bloomfield. It sits pretty much squarely in the centre of the County.

It is also the most land-locked of the old townships, with just some Lake Ontario frontage along the Sandbanks and Owen Point, inland shorelines along West Lake, and some high limestone cliffs on the east side of Picton Harbour. The freezing of West Lake and Picton Harbour, and the occasional build-up of ice from the Sandbanks east some Winters means that any moderation is very slight at best, and only if the wind doesn't shift from the south or southwest. Bloomfield, at almost the geographic centre of Prince Edward County, has one of the longest set of weather records on file, and it can be a sobering experience to examine the data for the Winter months.

The tongue of land projecting southwest of Picton to the Sandbanks is the most likely to enjoy some moderation from Lake Ontario, though the constant breezes across this area through the growing season, across Lake Ontario as well as West and East Lake, make heat accumulation a problem, at around the 1100 to 1200 degree day marks.

There has not been a lot of interest in vineyard establishment in Hallowell, mainly because of worries about the lack of Lake moderation. That is a concern. There are a number of acres that are potentially attractive, if perfect Winter management techniques can be found and practiced.

About a third of the County's Hillier Clay Loam

can be found in Hallowell, tucked in below Scoharie Road (County Road 1) and the Belleville Road (County Road 2), with another section on both sides of Scoharie where it intersects with Highway 62. This latter section of Hillier Clay Loam once was home to one of the largest sour cherry orchards in Ontario; now only a few acres remain, the rest being lost to massive freezes and lack of market interest. Some of the most dramatic southeastern slopes of Hillier Clay – many hundreds of acres – can be found from the west of the old hamlet of Chisholm to the other side of Highway 62; if temperature data are not as horrible as suspected, and if global warming can be guaranteed, this could be a spectacular and marvelous area for St. Laurent, Meunier, and maybe even Pinot Noir and Chardonnay.

With the same temperature fears, the areas of Brighton Gravelly Sand along the ridge going into Bloomfield, and some spectacular slopes on Pontypool Sandy Loam and Percy Fine Sandy Loam that ring the west and north of Picton are very attractive, and may one day prove some of the best sites. The deep and easy to move nature of this soil may help make covering and uncovering vines a workable approach on those dramatic slopes, though erosion would be a real worry, and would have to be planned for.

Until vineyard expansion brings in some brave souls to try those sites around Chisholm, Bloomfield and Picton, the less risky sites in Hallowell are tucked between West and East Lakes. Although cooler than other sections of the County, there is a real smorgasbord of soils to choose from, though one heavy on the sandy loams. From the large stretch of Brighton Sand of the Picton Esker on the north of Waring's Creek, to the sandy heights of the Ridge Road south of the creek, there are a lot of interesting, deep soils on offer. Though the sands come with their own problems of low organic matter and a dangerously large vine size due to ease of root movement, that can be managed. What these soils do offer is an ease of cultivation, and the ability to berm up the vines in Winter to a very good height, as James Lahti is doing in South Marysburgh, and Richard Johnston is doing west of Wellington.

Fairly good stretches of Brighton Gravelly sand also can be found on this tongue between West and East Lakes. A bit of Darlington Loam, and a decent section of Ameliasburgh Loam can also be found, though the lack of soil depth on the Ameliasburgh removes the ease of hilling the sands enjoy, and combined with the colder growing season and Winter worries, does make proper Winter planning and management a must.

There is little to avoid as far as soil types on this tongue, except for some stretches of Tecumseh Sandy Loam and patches of Elmbrook and Gerow Clays ... though physical aspect and distance from the Lake cannot be ignored.

Hillier

Hillier was created in 1824, splitting off the southern half of Ameliasburgh or the old Loyalist Seventh Town. The township office used to be in Hillier Village. The township has always had a fairly low population, and the greatest proportion of the County's A1 agricultural land is located here.

Obviously, because I chose to settle in Hillier after intensely researching both the County and most of Eastern Ontario, I have strong opinions on the benefits. But that does not mean I do not think there aren't other prime sites in different parts of Prince Edward County; it's just that Hillier was what I was looking for, given my parameters for wine-growing.

Hillier benefits from its location on the west end of the County, primarily because of Lake Ontario. It receives the first, moderating breezes from the open water when winds come from the south to west. It also benefits from an ability to warm up faster not far in from the Lake, combining the advantages of Lake moderation with the higher heat accumulations of inland areas. It may be due to the shallow, stony soils and their ability to dry and warm much quicker than the heavy, deep clays. For whatever reason, the range of heat accumulations varies most widely here, from approximately 1120 near Wellington to 1350 degrees days around Hillier Village ... or about roughly 50 degree days per mile in from the Lake. Frosts creep down from the 44th Parallel, hitting the warmer inland sites first, and then gradually extending down to the most moderated zones closer to the Lake. However, Fall moderation is not nearly as strong as along the Waupoos escarpment or South Bay areas in the east, and

those areas can often escape early October frosts that defoliate around Hillier Village. With the added heat, vines and fruit in the interior of Hillier are usually fully mature by then, so it's a trade off that tends to work. Areas further in from the Lake than four miles will likely experience earlier killing frosts, and so management decisions that will speed ripening of fruit and vines, as well as a solid Winter protection plan are a must.

Areas close to the Lake do need to take advantage of hedgerows to cut what can be a punishing wind in Winter, and in fact all of Hillier can use hedgerows to encourage snow accumulation and prevent soil erosion, as well as stop vine desiccation.

The one disadvantage, at least in very dry years, is that much of Hillier seems to be bypassed by rain, unless a large frontal system sweeps across and makes rain nearly unavoidable.

Of all the old townships, Hillier is the most uniform in soil, having all of what is called Hillier Clay Loam – apart from some which spreads into the west of Hallowell. The particularly thin beds of nodular limestone, interbedded with shale layers is what makes this soil type so attractive. Chapman and Putnam, in The Physiography of Southern Ontario, identified it as worthy of note, and wrote that, "Among farmers of Prince Edward County, they are referred to as 'clay gravel' or 'limestone gravel' depending upon the relative proportion of these constituents," and pointed out that "these soils provide better conditions for plant growth than those overlying more massive limestone formations." In fact it was the ability, identified in the Soil Survey of 1948, of this shallow, rubble strewn soil type to allow fruit tree roots to penetrate into the limestone, weather drought and thrive that caught my attention. If fruit trees (most now long gone, unfortunately) could root into the limestone in Hillier, I knew that vines would too.

The particular underlying layers of limestone in Hillier plays such an important role in both draining and yet storing water, that is one of the prime reasons I find tile draining on Hillier Clay to be silly, if not mad. A number of the deeper clays and sands in the County, of glacial or ancient lake bed origin, can benefit from tile draining. In Hillier, one robs the Spring hydration of the limestone layer with tiling, and does the same in the Fall, when rains after harvest can help rehydrate the soils, and prevent the vines from desiccation in Winter.

Apart from the Hillier Clay Loam that fill most of the township, there are some inclusions of Ameliasburgh Clay Loam, identified on the Soil Survey, and in the field by a change in tree height and types in the hedgerows. A piece of Farmington Loam also lies along much of the south shore escarpment of Consecon Lake. The rest of the soil inclusions are patches of the deep Darlington Loam, some sandy loams, and some very attractive ridges of Brighton Gravelly Sand, which mainly run in long, thin ridges just above Wellington Bay towards Huyck's Point, and out between North and Pleasant Bay. I'd say Brighton Gravelly Sand is my second favourite soil type out in Prince Edward County, and I honestly wish I had some of this remarkably rare soil to play with.

Being very conservative, there are likely 1,500 to 2,000 prime acres for vines in Hillier. Realistically, looking at the large stretches of possible land along Greer Road east towards Wellington, it wouldn't surprise me if one day the number turns out to be closer to 8 - 9,000 acres. But that will be determined over time. Until then, careful site selection is important here as in all of Prince Edward County. Be conservative and cautious.

The general topography in Hillier is one of gentle rolling hills and small valleys, mostly running northeast to southwest. That gives a lot of south slopes, and some degree of air drainage, but none of the slopes are particularly dramatic, apart from the one along the north shore of Consecon Lake above Melville, and a very nice slope where the Loyalist Parkway (Highway 33) meets Pleasant Bay. While south slopes will be used for still table wine, the number of gentle to pronounced north slopes I believe will one day be used for vines dedicated to sparkling wine production; sort of squeezing the Marne Valley and the Côte-D'Or – hundreds of miles apart in France – onto one region in Hillier.

Other potentially good sites can be found on the tongues of land between the bays on the west shore of Hillier; on Stinson Block Road; Scoharie Road at least until Benway Road (it gets extremely risky east of there); the old Danforth Road; north on Hubbs Creek Road, Benway Road, and Chase Road; and a very fine, pure agricultural stretch (no power or

phone lines) on the east side of Greer Road to its intersection with Danforth. This last vast acreage is likely a candidate for uninhabited, dedicated vineyard land. Potentially attractive land can also be found on both sides of the Loyalist Parkway (Highway 33) east of the Village of Hillier to just south of Rosehall where it meets Lake Ontario, then primarily on the north side of the Parkway into Wellington.

Immediately north of Wellington on the Belleville Road (County Road 2) there are good fields, but above the Gilead Road, the lack of Winter moderation is a worry. There are also some sites along Closson Road (and there are a few existing vineyards on this), but again the interior location means that site selection and Winter management plans are key to success in this area.

There is a sort of panhandle on the east of Hillier, beginning around Melville. Both the location and the soil types make this a very risky spot best avoided, even though Christian Road was the location of Dorland Noxon's vineyard and winery in the 1870s.

North Marysburgh

Marysburgh was originally Fifth Town in the 1780s, and covered what became the townships of both North and South Marysburgh, as well as part of Hallowell. Marysburgh was the first township in the County to be surveyed and settled; fittingly, in last few years, it was also the first to see both an estate winery and cidery established (County Cider in 1995) and the first grape winery to open (Waupoos Estates Winery in 2001). It is a beautiful part of the County, and Prince Edward County certainly wins over many hearts because of stunning view out across the Lake at Grant Howes's County Cider tasting room.

If one imagines the County to be a chicken, the boundaries of two Marysburghs make them sort of like drumsticks with part of the thighs still attached. Most of the old townships are peninsulas that jut into Lake Ontario on a northeast angle. North Marysburgh has a high escarpment forming the south shore of the Adolphus Reach section of the Bay of Quinte. The south shore is also tucked up against a slightly less severe escarpment, and overlooks Smith's Bay and the open Lake.

Adolphus Reach freezes in Winter, and so there is no moderation for the north half of the peninsula. The south shore is really the most attractive, most years enjoying a great degree of Fall moderation resulting from the water and the breezes cycling against the fairly rapid rise up to the flat lands atop the escarpment. But even here, Smith's Bay freezes in Winter, and in most years the east end of Lake Ontario from the Marysburgh's east to Kingston and down to the U.S. also freezes. When this happens, the Winter moderation can be cut severely; it can almost be eliminated if the ice arc starts further west in the County, at Salmon Point or Point Petre. In Spring, cold breezes from the Smith's Bay and the Lake can delay the start of the growing season, and so the extra days or weeks in Fall are necessary to bring fruit to maturity.

The prime area for grapes matches that for the orchards – basically the eastern section of County Road 8, beginning at Kellars Crossroads to Cressy. Up to Cape Vessey, the soils tucked in from the escarpment to the Lake can be anything from Ameliasburgh Loams to South Bay or Waupoos Clays, to Brighton Sand and Gravel, and rock. East of Cape Vessey, clays predominate, and the slope to the Lake and protecting escarpment at the back disappears. Most of the clays are quite deep, and do benefit from tile draining; the depth, fertility, and high water storage capacity can make for very large vines, and management plans to cope with getting these through the Winter cannot be neglected.

Atop the Waupoos escarpment, back from the rock outcroppings, are mainly patches of Ameliasburgh Loam and Clay Loam. Some of these, close enough to benefit from air drainage off the heights to the Lake, and to have some wind movement because of Lake convection, may well become fine vineyards too. The soil is much shallower, and so vine size will be quite different than those down on the lower bench near the shoreline. That must be considered, and densities and rootstocks must be carefully chosen. It is not clear yet how far north of the southern escarpment might work; more data and test sites need to be planted before any real guide can be given. The best advice would be to choose a physical site with air drainage uppermost in mind, within sight of the water.

There is another set of Ameliasburgh Loam

soils on the plateau on the 'chicken thigh' of the old township, down behind Lake on the Mountain along the midsection of County Road 8 and Miller Road, but the distance in from the Lake and any Winter moderation makes this a very, very risky area to look at.

South Marysburgh

This was the last of the old townships created, separating from North Marysburgh in 1871. Stretching to Long Point in the east, it is the most remote section of the County.

Prince Edward Bay and South Bay freeze over in Winter, and, like North Marysburgh, the degree of Lake Ontario freeze each Winter can vary, but most years it usually arcs from the south shore of the peninsula to the U.S. shore. Directly south of South Bay, the Lake is more likely to remain reasonably free of ice, and so moderation up to Royal Road may be provided by Winter winds ... though it can't be depended on: it may fail in the years it is most needed, due to ice or an inconvenient wind direction.

Microclimates in this slightly cooler area of the County are important, and can vary widely over very short distances. Factors from deer yards, to prevailing winds, heights and valleys can all play a part. Phil Mathewson, who has an unmatched understanding of this part of the County, points out that on his property overlooking South Bay, which freezes every year, the combination of air drainage down the steep south slope in front of him, and drainage behind him into the Black River basin keeps his place much warmer than it theoretically should be. If looking in this area, I'd consult with Phil, follow James Lahti's advice and set up data loggers on attractive sites, and speak with many of the older farmers in this area that have a lifetime of knowledge about weather patterns and site performance.

Like North Marysburgh, the area for potential vineyards is squeezed into a bracket of physical constraints, and is a fraction of the old township's size, though potentially much greater than in North Marysburgh. Basically the Black River forms the north and west boundary, down through to Milford and Maypullayn Road, back east just south of Royal Road, and then partway around the east shore of South Bay. The soils most likely to support vines are bounded within this rectangle; the vast stretches of Farmington Loam on the south of the old township will only bring frustration.

South Marysburgh, within the described rough rectangle, is heavy on the sandy Loams. Naturally, around South Bay, there is a large patch of South Bay Clay, and advice regarding tile draining, and vine size management already given applies here as well. The sandy loams, especially in the lower areas, may also need some deep drainage. The northeast to southwest banding of the soils means that any farm may have quite a number of soils on it, with varying depths to bedrock, and should be well examined and mapped before making decisions about planting and management.

The very deep sandy soils come with a major problem, and in most cases, a real benefit. The problem is vine size: the ease of root growth means, even with low fertility, a large vine can be expected; large vines ripen later, and can be more prone to both disease and Winter damage. They must be well selected, planted, and managed. The sweetener is that on the deeper sandy loams, hilling up to fairly great heights can be accomplished rather easily, as at James Lahti's Long Dog Vineyards, and provide a maximum of Winter protection both over graft unions and over reserve canes.

Sophiasburgh

This is almost the Siberia of Prince Edward County. Originally called Sixth Town in the original Loyalist surveys, it actually did have two grape growers listed in Belden's Atlas in 1878. There are a few brave souls trying to grow vinifera in the old township now, but the odds are stacked against success.

Although it borders to the north on the twists of the Bay of Quinte, the Bay freezes over in Winter, and while good for ice fishermen, takes away any moderation during the critical months. Being tucked into the northeast corner of the County, it is too far from any real benefit from Lake Ontario.

Though there is almost more of the Ameliasburgh series in Sophiasburgh than in Ameliasburgh, and there are some patches of deeper Darlington Loam, the climate worries are almost insurmountable ... although nothing is impossible, and testing, local lore, swamp moderation and the location of deer yards may come to the rescue of a few sites in this old township.

A Note About Purchasing Land

At any one time, there may not be a lot of prime viticultural land on the market. This can be frustrating, but patience is important. Don't buy it if if doesn't meet the requirements you set.

An alternative to waiting for a property to appear in the real estate listings is to locate what you'd like to purchase. Make a list of about half a dozen potential properties, and approach a good local real estate agent to see if there is any interest in selling, or in severing a large property to a manageable piece. It can be slow, and often frustrating, but there has been some success in securing good vineyard land with this method.

I also recommend viewing the properties on one's short list when and if possible during extremes such as drought, heavy Fall rains before freeze, Spring thaw and rains, or on cool, potentially foggy nights in the Fall. In cases of rather severe drought such as the Summer of 2001, the condition of hedgerows and fields help provide a very good idea of the natural drainage and water holding capacities of the bedrock. The same goes for any period (except when skewed during the months of deep ground frost) when water tends to pool for days on sections that are poorly drained. Likewise, if the peculiarities of topography in an area were not closely noted before, looking to see if it is a regular site for evening fogs can save a lot of problems later.

A Note About Soil Tests

There are different management philosophies out there. Often there is a rush to get soil tests done, as if that will tell whether the property is magic or not. For the most part, I've not seen any soil tests that had any vast differences from the averages given in the 1948 Soil Survey. And often the amounts of recommended chemical structure, and 'required' adjustments to the land tested can cause a panic. A soil test is just a snapshot of the readable composition at that moment; the results can swing wildly over the course of a growing season. Regular testing can help one understand the swings, but reacting to one test can cause tremendous problems. (In Burgundy, they are still trying to cope with the problems caused by massive potassium amendments applied decades ago after expert recommendation.)

Most soils, given modern farming practices, could benefit from good applications of well rotted, matured organic manure or humus, especially on the sandy County soils. Otherwise, waiting and watching can be a very conservative, intelligent strategy, and save costly, unneeded amendments that may be potentially harmful to quality.

One possible real benefit of a soil test, apart from having a snapshot, would be in getting a proper free lime, active lime, or IPC rating done on the soil. Some labs are prepared to do a Drouineau-Galet Method determination of active lime in the soil, and can probably be encouraged to try the IPC methodology. Both of these can be helpful in matching rootstocks to soil, something that is still in the early stages in Prince Edward County.

Apart from humus additions, a move at least as important as soil testing would be to get a detailed agricultural history of the fields you are buying, going back say five years, covering crops and sprays. That would help identify any potential problems or imbalances, if any, that may lurk in the soils.

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