Potato Suitability Analysis

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# Potato Growing Days

## Data Source

The Potato Growing Days (PGD) were derived from historical data supplied by Environment Canada from 1987 to 2016. The raw data can be downloaded from [Environment Canada's Historical Data Site](http://climate.weather.gc.ca/historical_data/search_historic_data_e.html). The following stations were used for this analysis:

* Alma;
* Aroostook;
* Bathurst;
* Bouctouche;
* Causapscal;
* Charlo;
* Edmundston;
* Fredericton;
* Gagetown;
* Grand Manan;
* Juniper;
* Kouchibouguac;
* Lyons Brook;
* Mactaquac;
* Miramichi;
* Miscou Island;
* Moncton;
* Nappan;
* Riviere Bleue;
* Saint John;
* St. Leonard;
* St. Stephen;
* Summerside;
* Sussex; and
* Woodstock

In cases where weather stations had been relocated in the same area, the newest position was used as the location and the data combined to arrive at the values.

## Formula

To find the number of PGD, to find the start date in the spring of each year, the start of growing season was determined to be the first date when the average daily high temperature for a seven day period was equal to or greater than 10°C. The end of the season was then determined to be the first date in the fall when the minimum daily temperature is less than or equal to 0°C. The values were than averaged to arrive at the 30-year average for Potato Growing Days for each station. Values were then derived for the entire province using a [regularized spline](http://pro.arcgis.com/en/pro-app/tool-reference/3d-analyst/how-spline-works.htm). These values were than classified into the following groups:

|  |  |
| --- | --- |
| Potato Growing Days | Value |
| < 90 | 1 (Red) |
| ≥ 90, < 110 | 3 (Yellow) |
| ≥ 110 | 5 (Green) |

# Slope

The percent slope was calculated from the Province of New Brunswick 10 metre digital elevation model and classified based on the following criteria:

|  |  |
| --- | --- |
| Percent Slope | Value |
| ≤ 2% | 5 (Green) |
| > 2%, ≤ 5% | 3 (Yellow) |
| ≤ 9% | 1 (Red) |
| > 9% | Land unusable |

# Depth to Water Table

Depth to water table was used as a measure of the drainage of the soil within an area. The depth is the measured depth to the water table at the end of summer. The data was classified as follows:

|  |  |
| --- | --- |
| Depth to Water Table | Value |
| ≤ 10 cm | Unusable wetland |
| > 10 cm, ≤ 25 cm | 1 (Red) |
| > 25 cm, ≤ 50 cm | 3 (Yellow) |
| > 50 cm | 5 (Green) |

This data was supplied to AAF as part of the research carried out by Dr. Paul Arp and Jae Ogilvie of the University of New Brunswick in 2010. Please contact them for more information about this data.

# Final Analysis

The categorized values from the previous sections were then combined to arrive at a final classification of sites via the formula

$$V=\left(0.9\*D\right)\*\left(0.1\*S\right)\*PGD$$

Where

$D∶=Depth to Water Table$

$S∶= Slope$

$PGD∶=Potato Growing Days$

The resultant values were than classified based upon the following criteria:

|  |  |
| --- | --- |
| Value | Classification |
| < 2.43 | Poor (Red) |
| ≥ 2.43, < 4.05 | Fair (Yellow) |
| ≥ 4.05 | Good (Green) |

Finally, the following areas were removed from the results because the land would not be available for agriculture under any circumstance:

* National and Provincial Parks;
* Protected Natural Areas;
* Military Bases;
* Federal Land; and
* First Nations Communities.