Growing Degree Day

CMSC 6950 - Computer Based Research Tools and Applications

Project Report

Submitted by

Dawei Wang
Ajay Vijayakumar
Demarey Baker
Haqqani Gulam

Memorial University of Newfoundland
St. John's, Canada.

1 Introduction

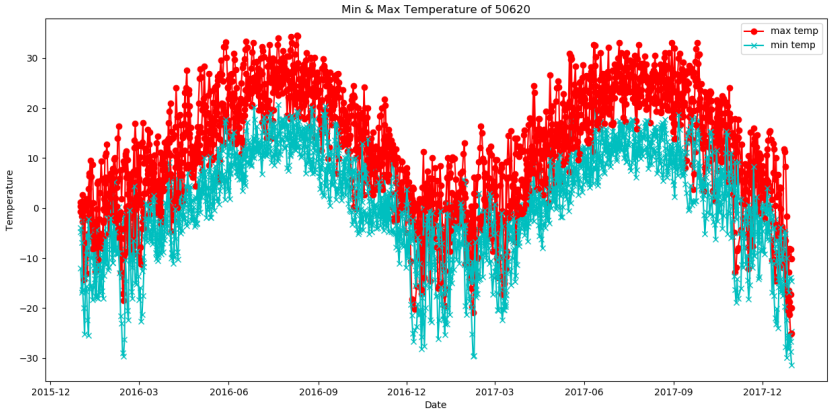
For this project, we have selected three cities from Canada, namely: Halifax, Ottawa and Calgary, for which we calculated and visually analysed the growing degree days for years 2016 and 2017.

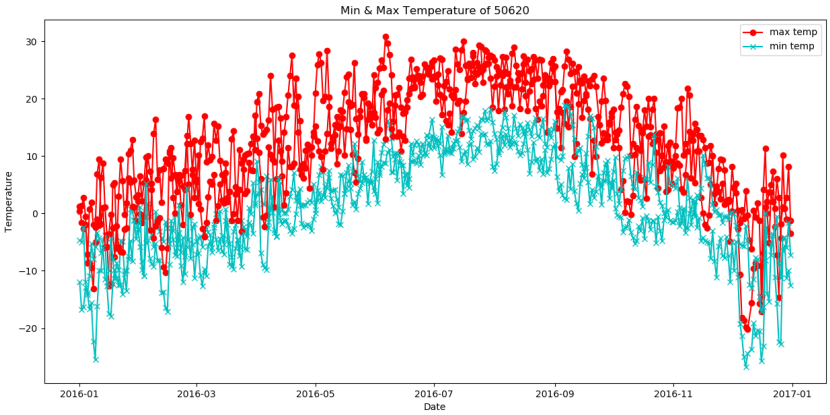
2 Core Tasks

The weather data was downloaded for the three cities and different plots were generated after calculating the GDD for those cities.

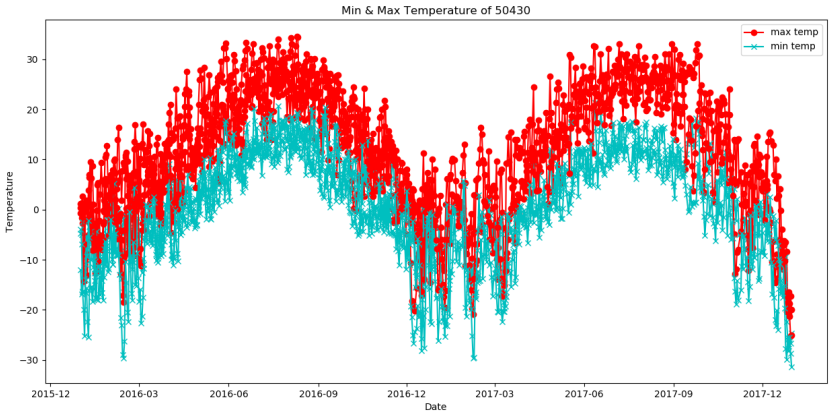
2.1 Min/Max Plots

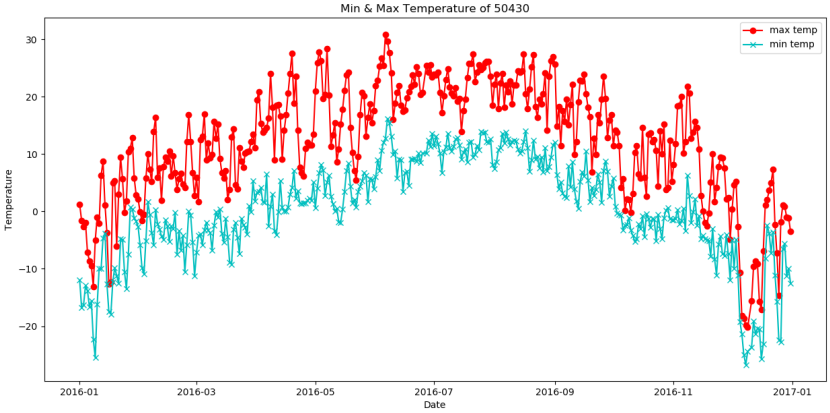
2.1.1 HALIFAX



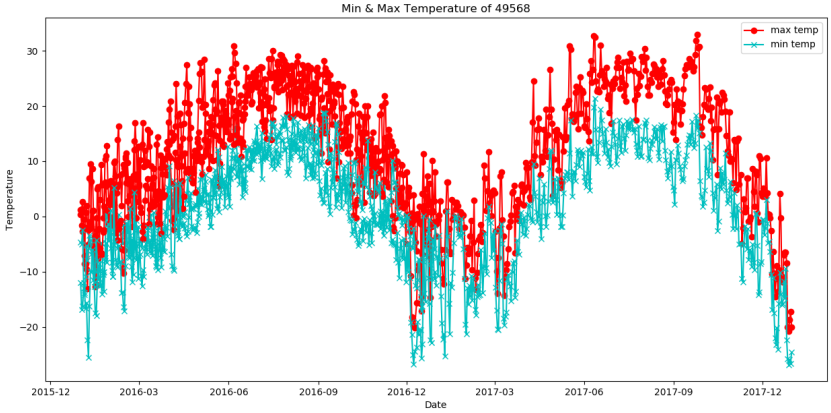

Min & Max Temperature of 50620
max temp
min temp
Temperature
Date
30
20
10
0
−10
−20
2016-01
2016-03
2016-05
2016-07
2016-09
2016-11
2017-01

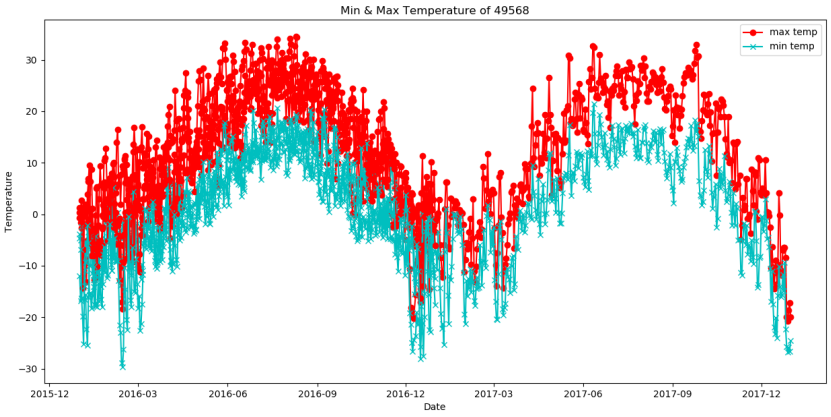
2.1.2 CALGARY


Min & Max Temperature of 50430
max temp
min temp
Temperature
Date
30
20
10
0
−10
−20
−30
2015-12
2016-03
2016-06
2016-09
2016-12
2017-03
2017-06
2017-09
2017-12

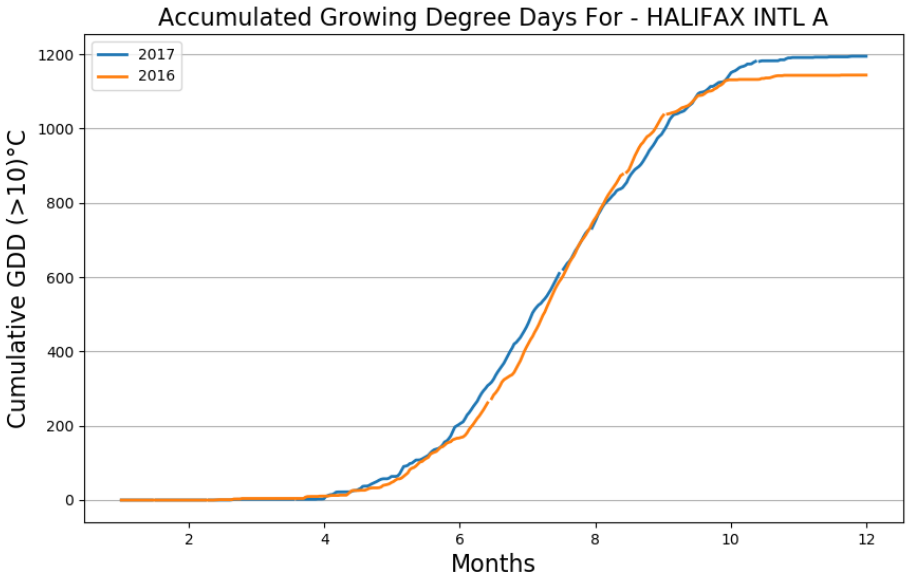

Min & Max Temperature of 50430
max temp
min temp
Temperature
30
20
10
0
−10
−20
2016-01
2016-03
2016-05
2016-07
2016-09
2016-11
2017-01
Date

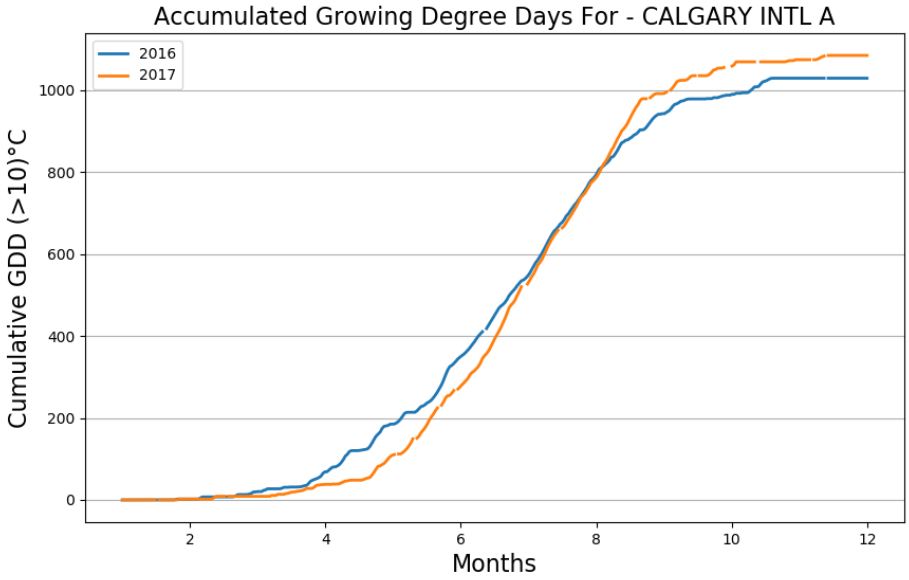
2.1.3 OTTAWA

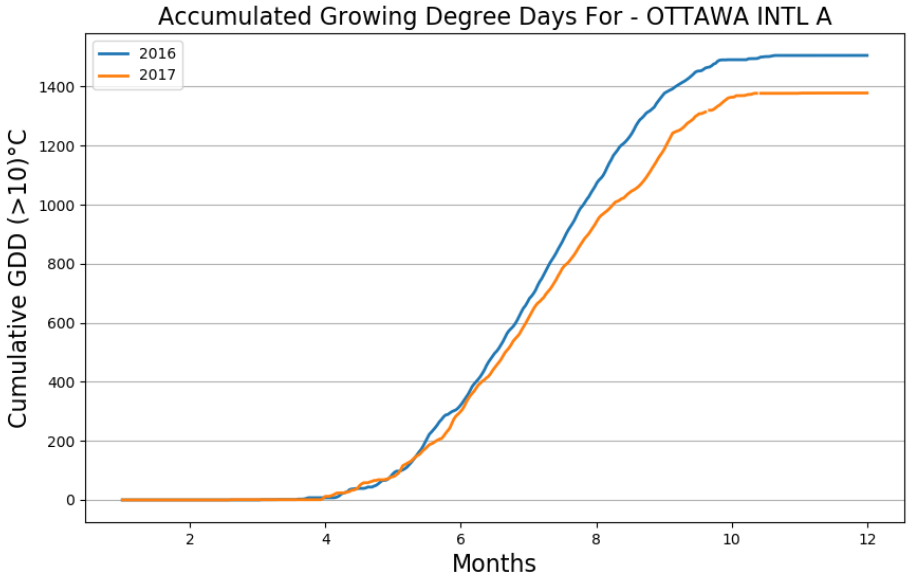

Min & Max Temperature of 49568
max temp
min temp
Temperature
30
20
10
0
−10
−20
2015-12
2016-03
2016-06
2016-09
2016-12
2017-03
2017-06
2017-09
2017-12
Date



2.2 Cummulative GDD



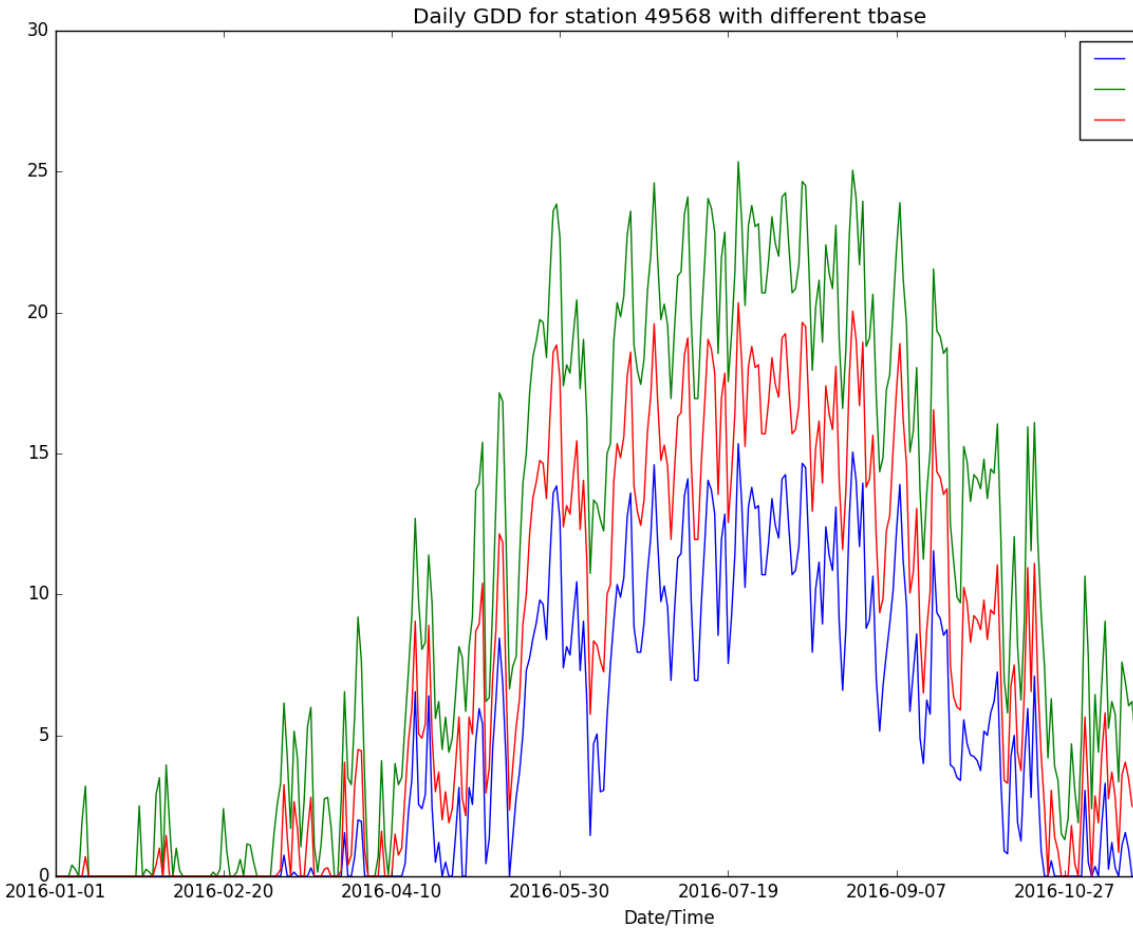

Accumulated Growing Degree Days For - CALGARY INTL A
2016
2017
Cumulative GDD (>10)°C
0
200
400
600
800
1000
2
4
6
8
10
12
Months


Accumulated Growing Degree Days For - OTTAWA INTL A
2016
2017
Cumulative GDD (>10)°C
0
200
400
600
800
1000
1200
1400
2
4
6
8
10
12
Months

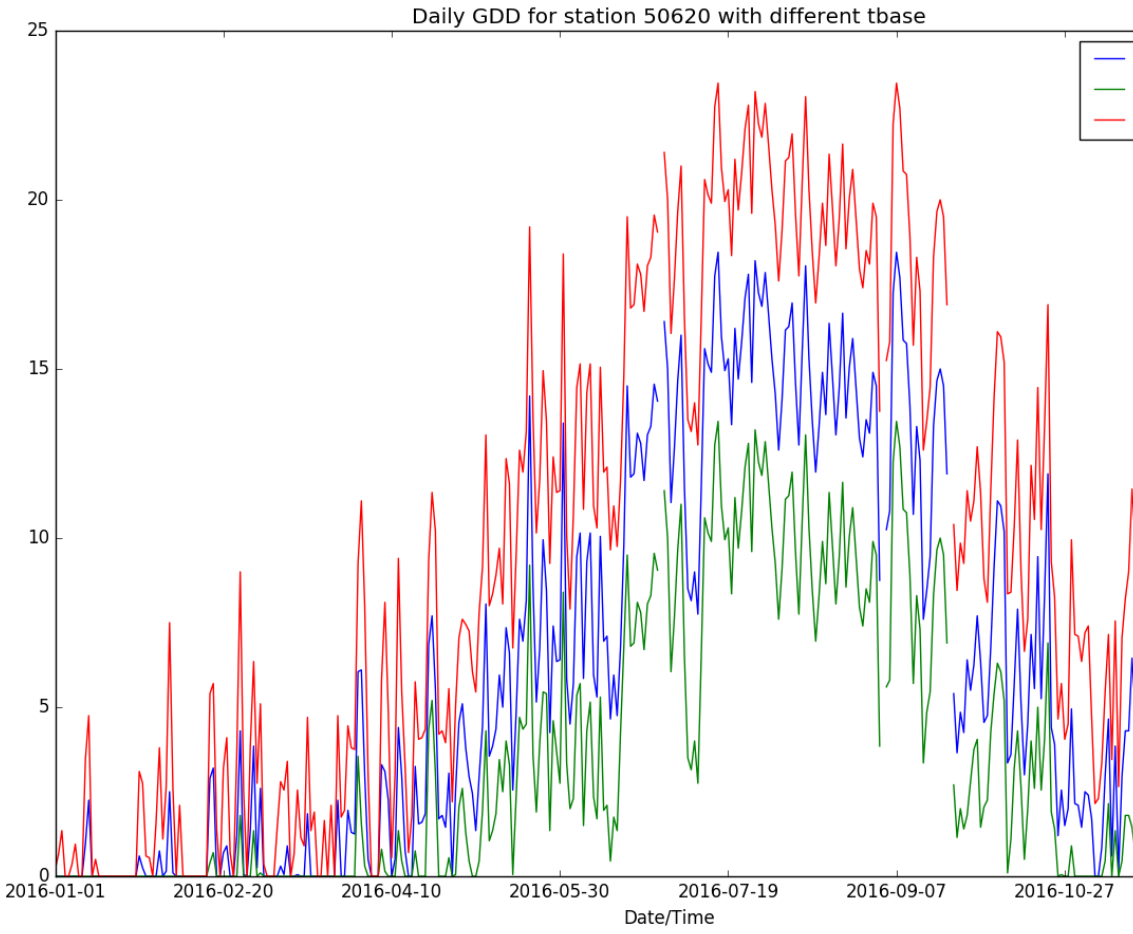
3 Core Tasks

3.1 GDD with varying Base Temperature

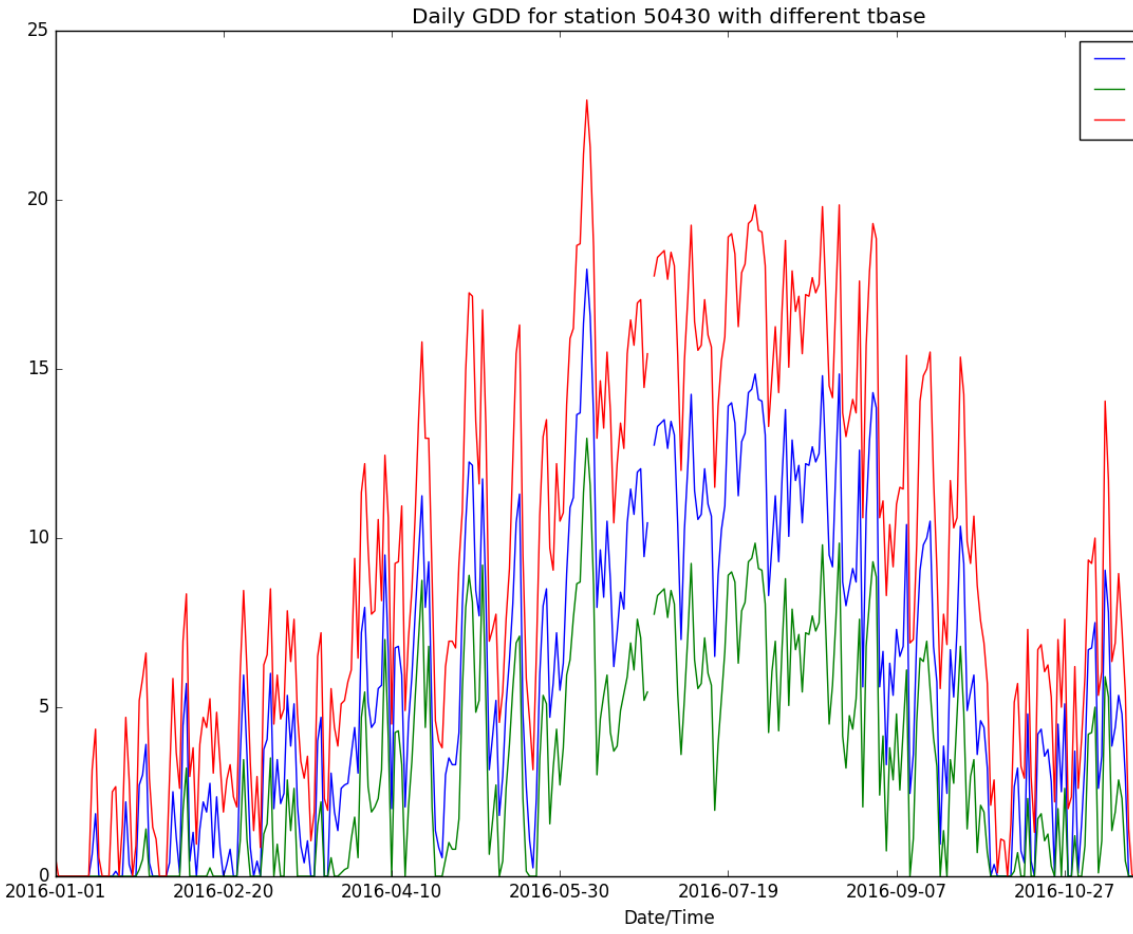
3.1.1 OTTAWA



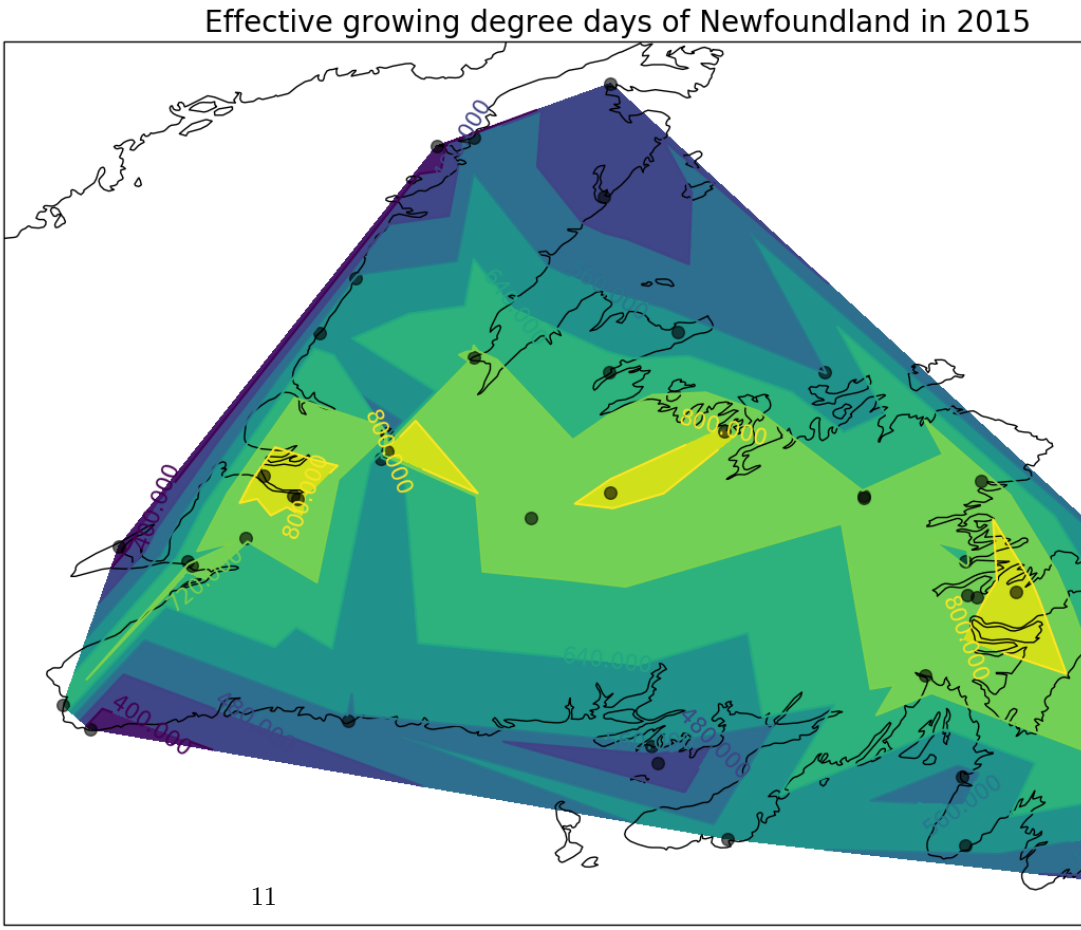
3.1.2 HALIFAX


Daily GDD for station 50620 with different tbase
25
20
15
10
5
0
2016-01-01
2016-02-20
2016-04-10
2016-05-30
2016-07-19
2016-09-07
2016-10-27
Date/Time

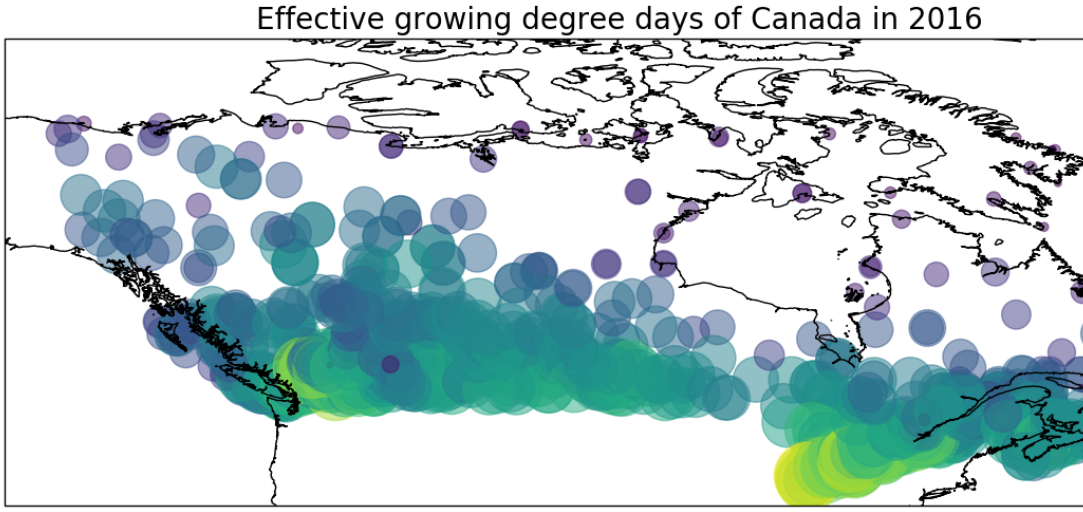
3.1.3 CALGARY

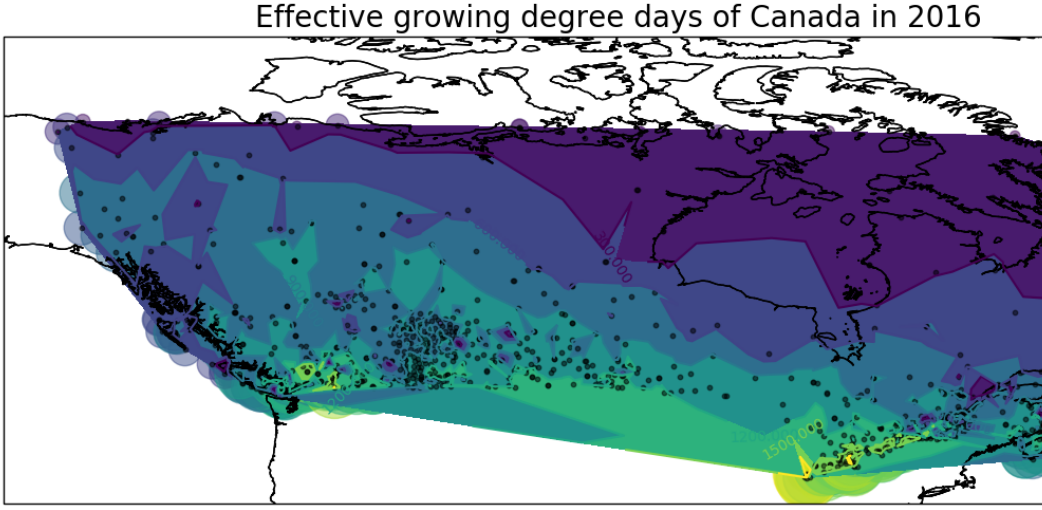

Daily GDD for station 50430 with different tbase
25
20
15
10
5
0
2016-01-01
2016-02-20
2016-04-10
2016-05-30
2016-07-19
2016-09-07
2016-10-27
Date/Time

3.2 Effective growing degree days of Newfoundland in 2015



3.3 Effective growing degree days of Canada in 2016




Effective growing degree days of Canada in 2016
1000.000
1500.000

4 Conclusion