

Climograph

Steven Black

Project home: <https://github.com/StevenBlack/climographs>

Introduction

The motivation for this repository is, given a location, create its climograph.

See: <https://en.wikipedia.org/wiki/Climograph>.

This Wolfram community forum question was very helpful: <https://community.wolfram.com/-groups/-/m/t/1599725>

In[85]:=

```
ClearAll[climograph];

Options[climographx] = {
  "StartDate" → {1980, 1, 1}
  , "EndDate" → {2022, 12, 31}
  , "TemperaturePlotRange" → {-30, 40}
  , "PrecipitationPlotRange" → {0, 100}
  , "Background" → White
  , "Frame" → True
  , "FrameStyle" → Gray
};

climograph[location_Entity, opts : OptionsPattern[climographx]] := (
  Return[climographx[location, opts]];
);

climograph[locations_List, opts : OptionsPattern[climographx]] := (
  Return[climographx[#, opts] & /@ locations];
);

climographx[location_, OptionsPattern[]] := (
  startDate = OptionValue["StartDate"];
  endDate = OptionValue["EndDate"];

  tempByMonth =
    WeatherData[location, "MeanTemperature", {startDate, endDate, "Month"}];
  tempGroupByMonth =
    GroupBy[tempByMonth["DatePath"], DateValue[First[#], "MonthNameShort"] &];
  tempMinMaxMean = {Min[Map[Last, #]], Max[Map[Last, #]], Mean[Map[Last, #]]} & /@
    tempGroupByMonth;
```

```

ptemp = BoxWhiskerChart[
  tempMinMaxMean,
  Joined → True,
  Frame → {{True, True}, {None, True}},
  PlotTheme → "Detailed",
  PlotRange → OptionValue["TemperaturePlotRange"]
];

precipByMonth = DeleteMissing[WeatherData[location,
  "TotalPrecipitation", {startDate, endDate, "Month"}]];
precipGroupByMonth = GroupBy[
  precipByMonth["DatePath"], DateValue[First[#], "MonthNameShort"] &];
precipMeanByMonth = Mean[Map[Last, #]] & /@precipGroupByMonth;
precipMinMaxMean =
  {Min[Map[Last, #]], Max[Map[Last, #]], Mean[Map[Last, #]]} & /@
  precipGroupByMonth;
pprecip2 = BoxWhiskerChart[
  precipMinMaxMean,
  ChartLabels → Automatic,
  Joined → True,
  Frame → {{True, True}, {True, None}},
  PlotTheme → "Detailed",
  PlotRange → OptionValue["PrecipitationPlotRange"]
];

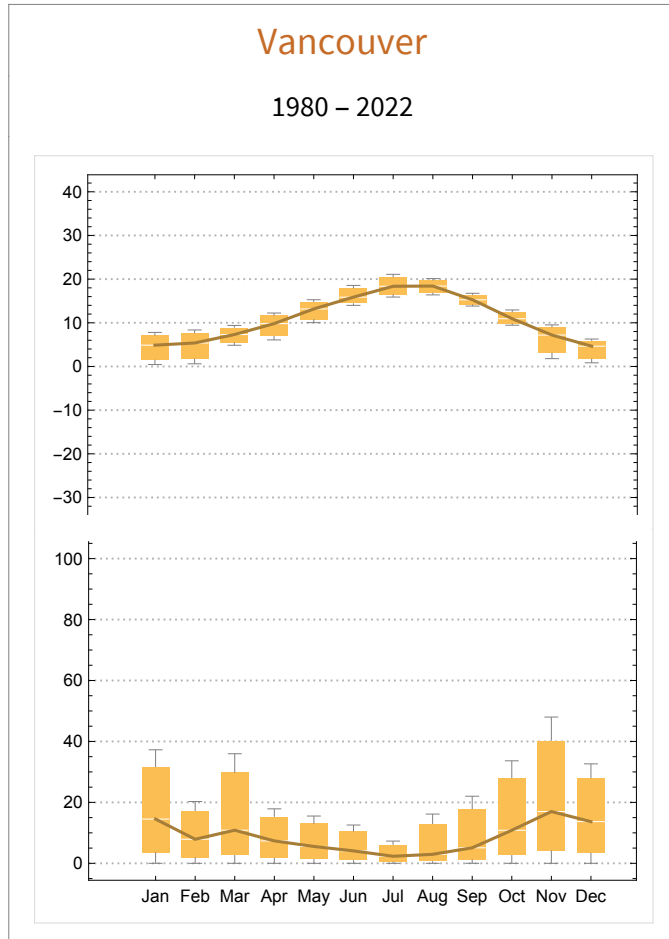
Return[
  GraphicsColumn[
    {TextCell[location["Name"], "Subsection"],
      TextCell[
        ToString[startDate[[1]] <> " - " <> ToString[endDate[[1]]], "Text"],
        GraphicsColumn[
          {ptemp, pprecip2},
          Frame → True,
          FrameStyle → LightGray,
          Background → White
        ]
      ],
    },
  Frame → OptionValue["Frame"]
  , FrameStyle → OptionValue["FrameStyle"]
  , Background → OptionValue["Background"]
]
]
);

```

Examples

```
In[90]:= climograph[ Vancouver CITY ]
```

```
Out[90]=
```

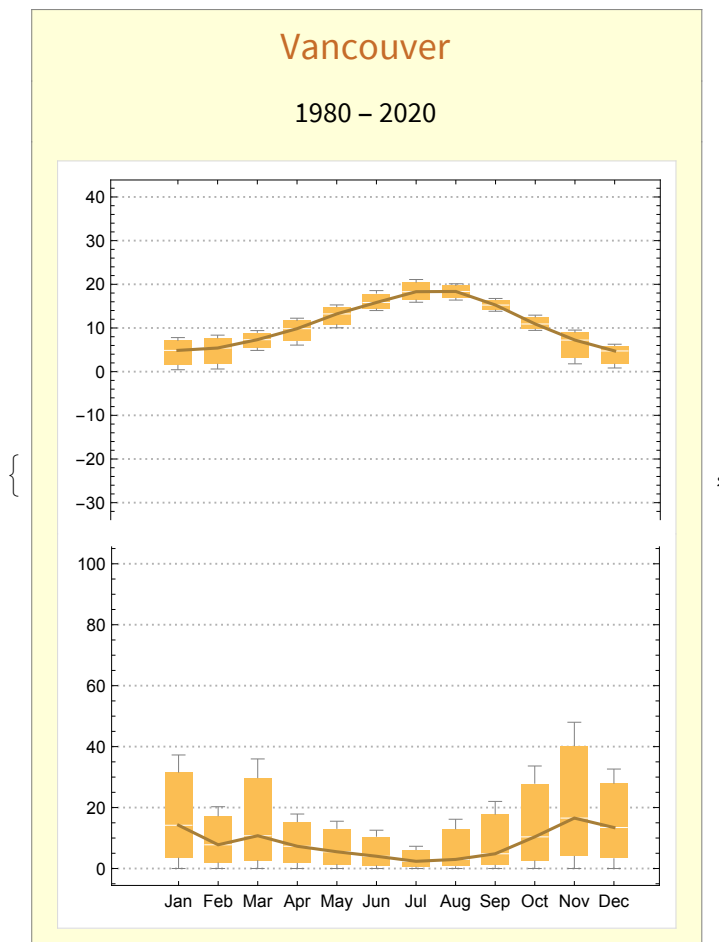


```

In[94]:= climograph[{
  Vancouver CITY
, Edmonton CITY
, Calgary CITY
, Winnipeg CITY
, Toronto CITY
, Ottawa CITY
, Montreal CITY
, Quebec City CITY
, Halifax CITY
}, {
  Background → LightYellow
, EndDate → {2020}
}]

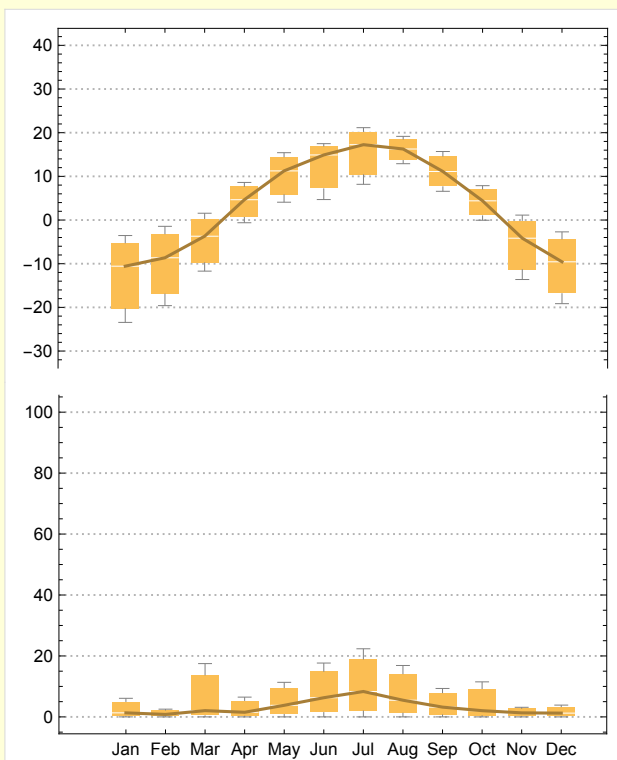
```

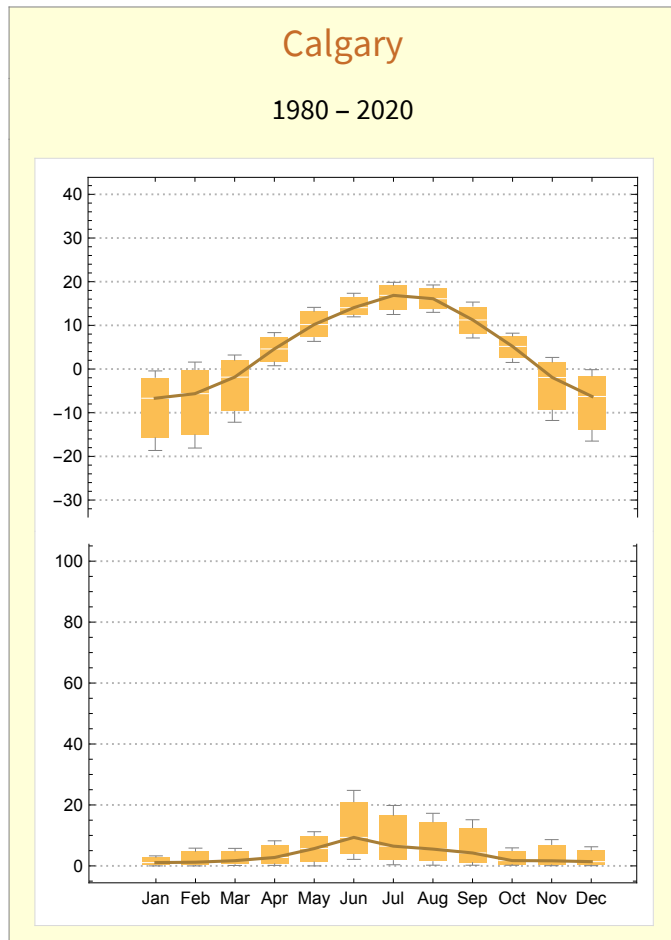
Out[94]=



Edmonton

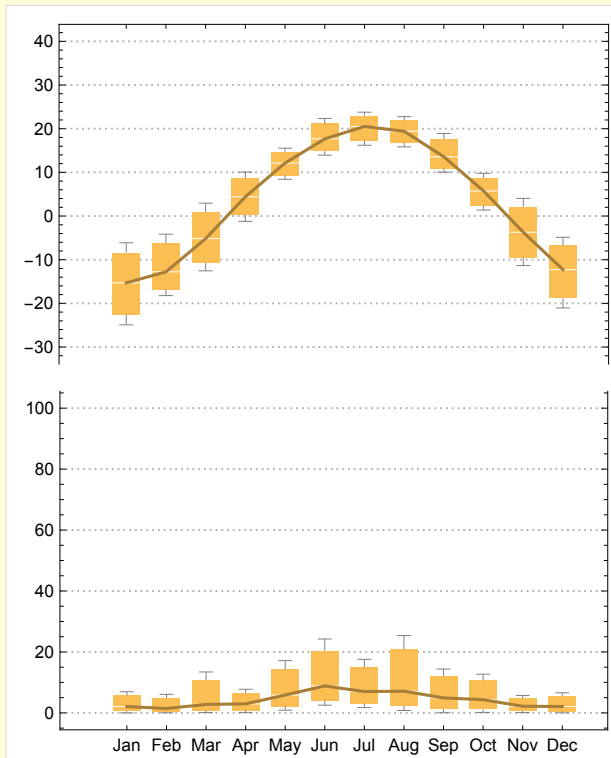
1980 – 2020

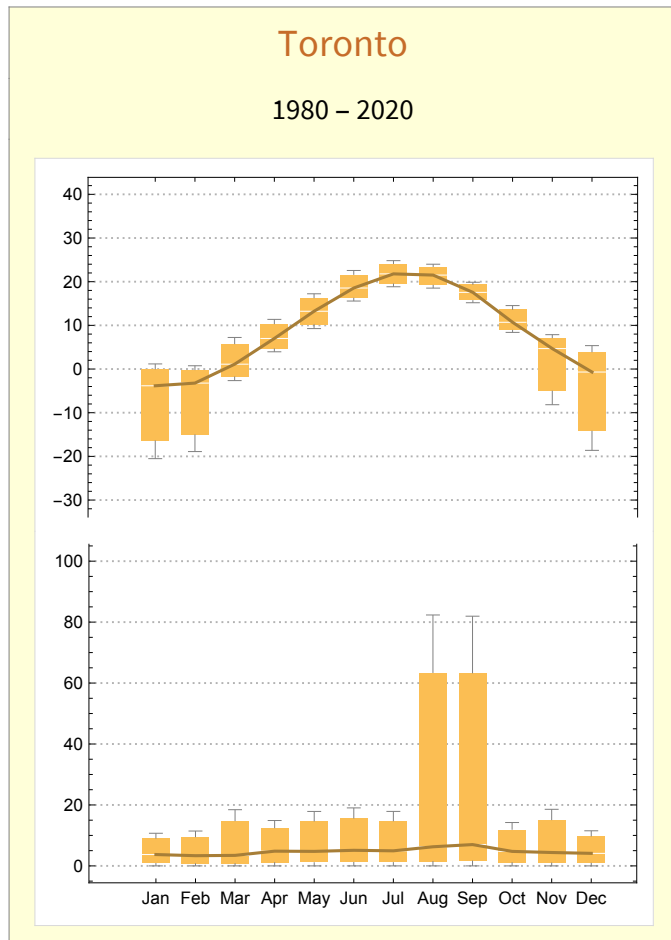




Winnipeg

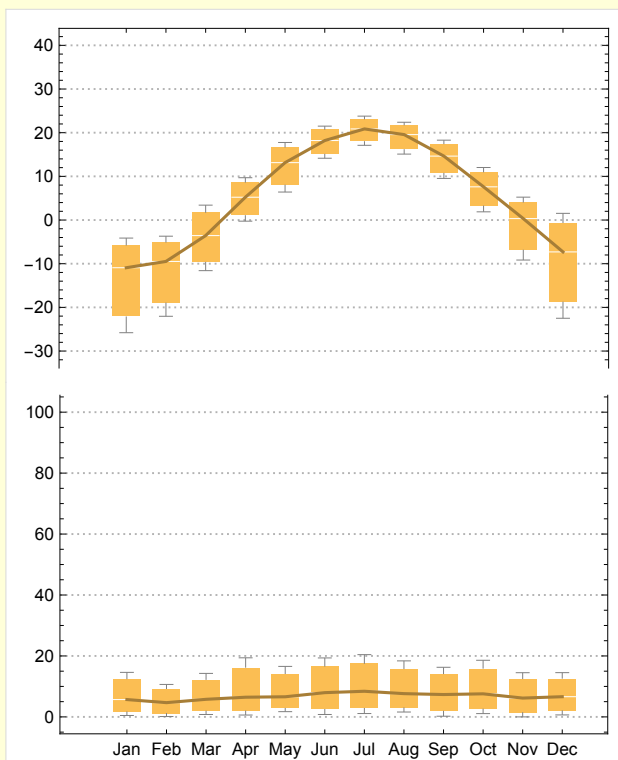
1980 – 2020





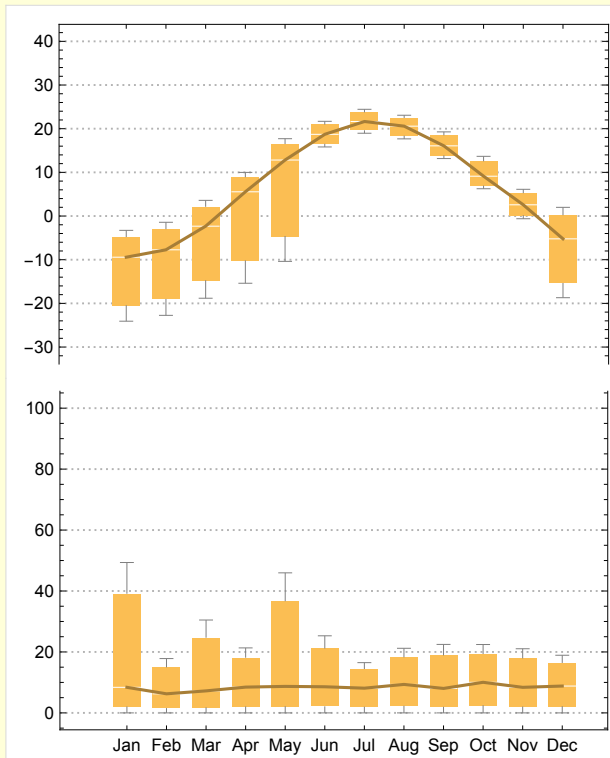
Ottawa

1980 – 2020



Montreal

1980 – 2020



Quebec City

1980 – 2020

