INFORMATION REQUEST RESPONSE

EA No: 0809-001 **Information Request No: NSMA #13**

Date Received:

February 28, 2011

Linkage to Other IRs:

Date of this Response:

May 31, 2011

Request:

Please provide more detailed information on historic climate trends, and especially changes in temperature and precipitation. Can this data be graphed, with the x axis being zero mm, so that the variability of the data, as well as the proportional change can be understood?

Reference to DAR (relevant DAR Sections):

S.7.3.2.4 Historic Climate Trends

Reference to the EA Terms of Reference

S. 3.2.3 (11) Description of Existing Environment

Response:

Climate data from Yellowknife Airport weather station (Environment Canada) was used to present the historical climate trends for the site. Monthly data was used to calculate the annual mean, maximum and minimum temperature and the annual total rainfall and total precipitation for the years 1943 to 2010 and displayed in the following section.

The annual mean of daily mean temperature, daily maximum and minimum temperature at Yellowknife Airport is shown in Figure 1. There is an increasing trend in all three parameters over the 68 years of record.

The average climatic conditions of a particular location are usually presented by Climate Normals, produced by Environment Canada and updated at the completion of each decade. The Climate Normals temperature for the 30-year period (1971-2000) for Yellowknife Airport station[1] were subtracted from the annual average of daily mean temperature and presented as annual mean temperature anomaly in

In Figure 2, a positive anomaly presents the value above the Climate Normals, while a negative anomaly means the value below the Climate Normals.

Figure 3 shows the annual total rain and total precipitation data at Yellowknife Airport. Both parameters show an increasing trend over the 68 year period.

The annual total precipitation anomaly from the Climate Normals 1971-2000 is calculated by subtracting the Climate Normals from the annual total precipitation for each year during the period 1943 to 2010 and is shown in Figure 4.

The most recent available Environment Canada Climate Normals are for the period 1971 to 2000. In order to see the climatic changes in the last decade, SENES used daily data for Yellowknife Airport from Environment Canada to calculate the Climate Normals for the period 1981 to 2010[2].

Figure 5 shows a comparison of monthly mean temperature averaged over the different Climate Normals periods. During winter months (December to March) the mean temperature is warmer for the period 1981 to 2010, while the summer months show no change.

The monthly total precipitation averaged over the different Climate Normals periods is shown in Figure 6. There is no consistent change between the two periods.

[1] http://climate.weatheroffice.gc.ca/climate_normals/results_e.html?StnID=1706&autofwd=1
[2] Note that this data has only undergone preliminary quality checking

Fig 1 - Annual Mean Temperature at Yellowknife Airport (1943-2010)

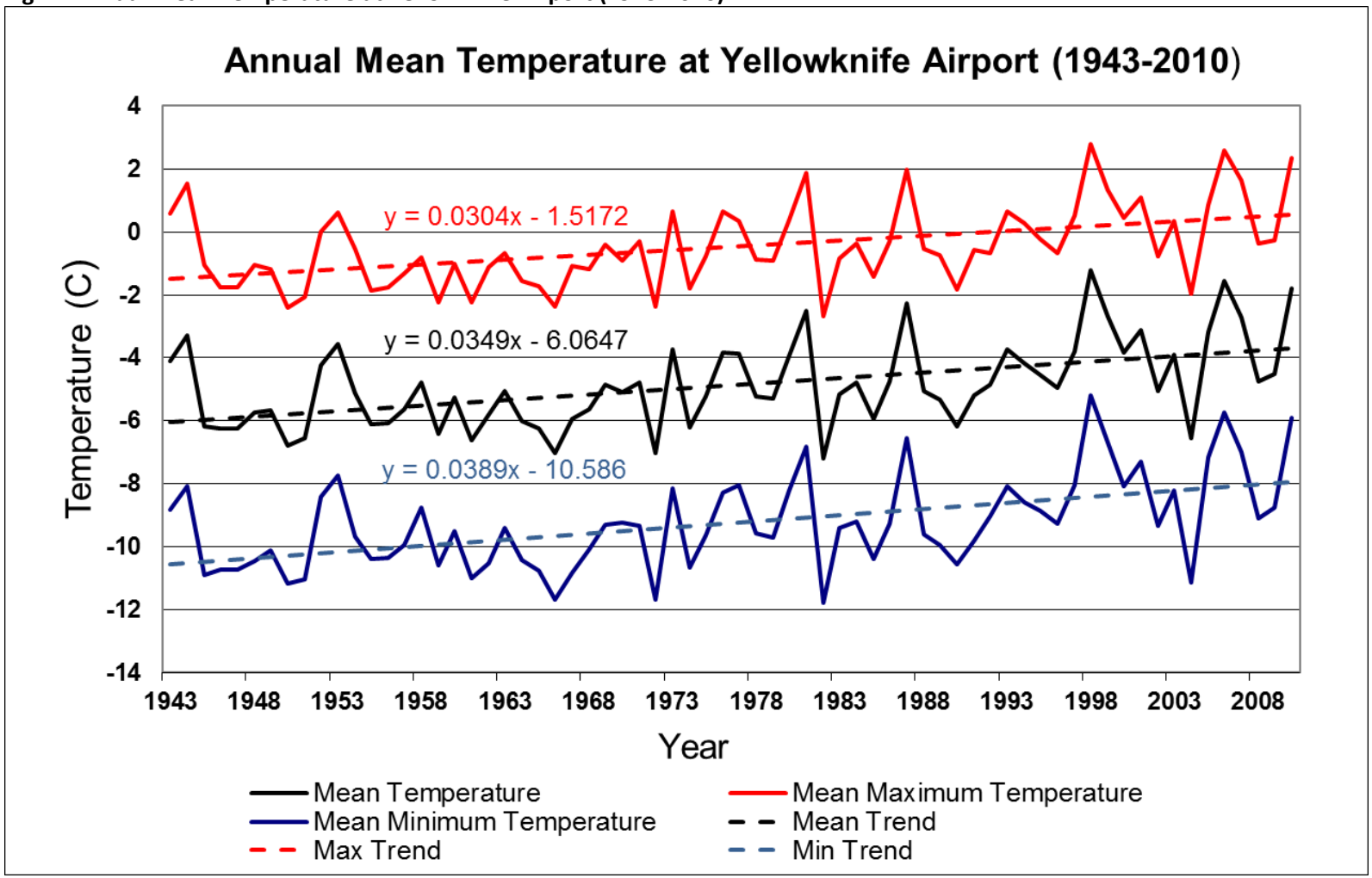

Fig 2 - Annual Mean Temperature Anomaly from Climate Normals (1971-2000) at Yellowknife Airport (1943-2010)

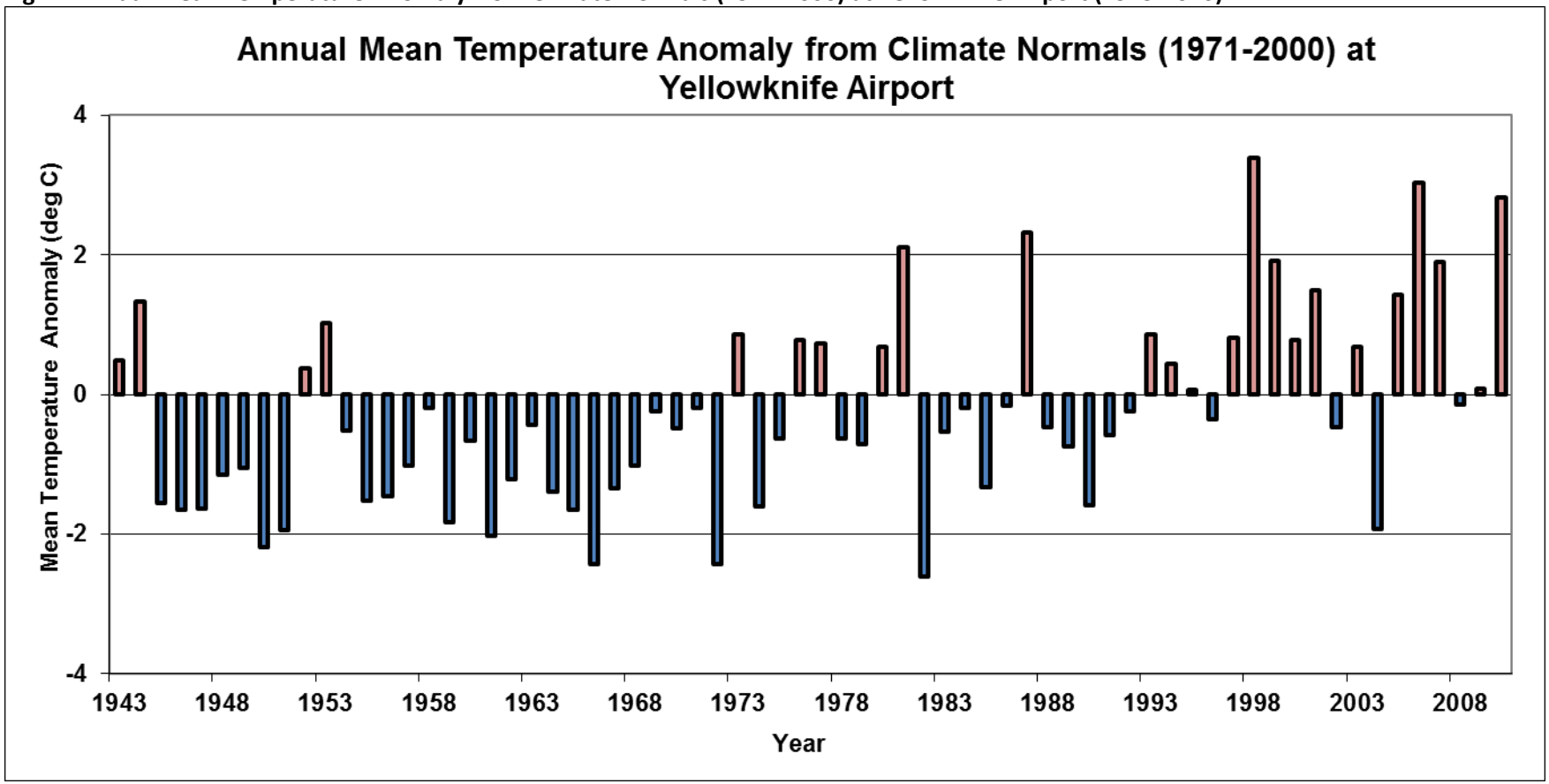

Fig 3 - Annual Rainfall and Annual Total Precipitation at Yellowknife Airport (1943-2010)

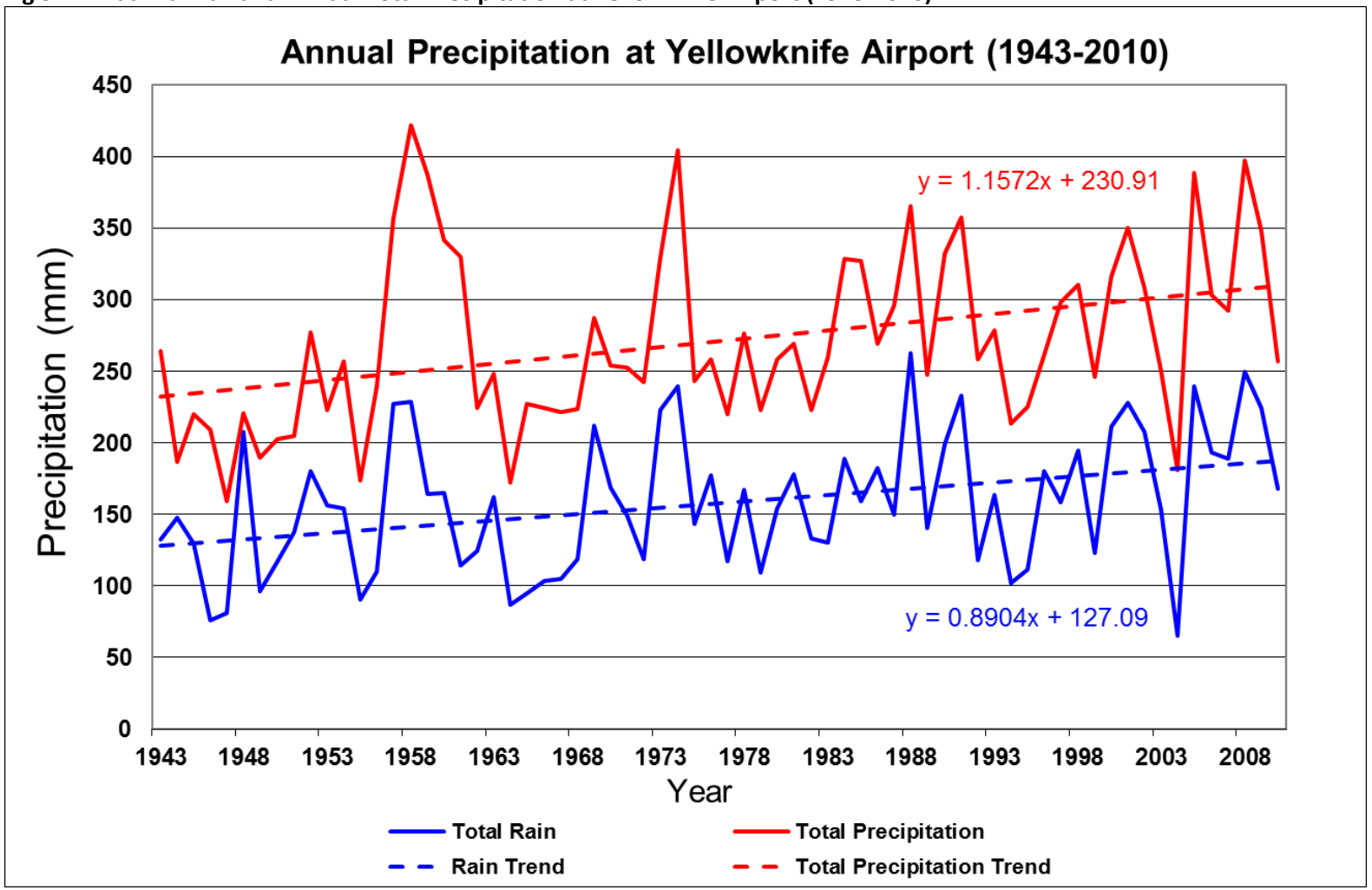

Fig 4 - Annual Total Precipitation Anomaly from Climate Normals (1971-2000) at Yellowknife Airport (1943-2010)

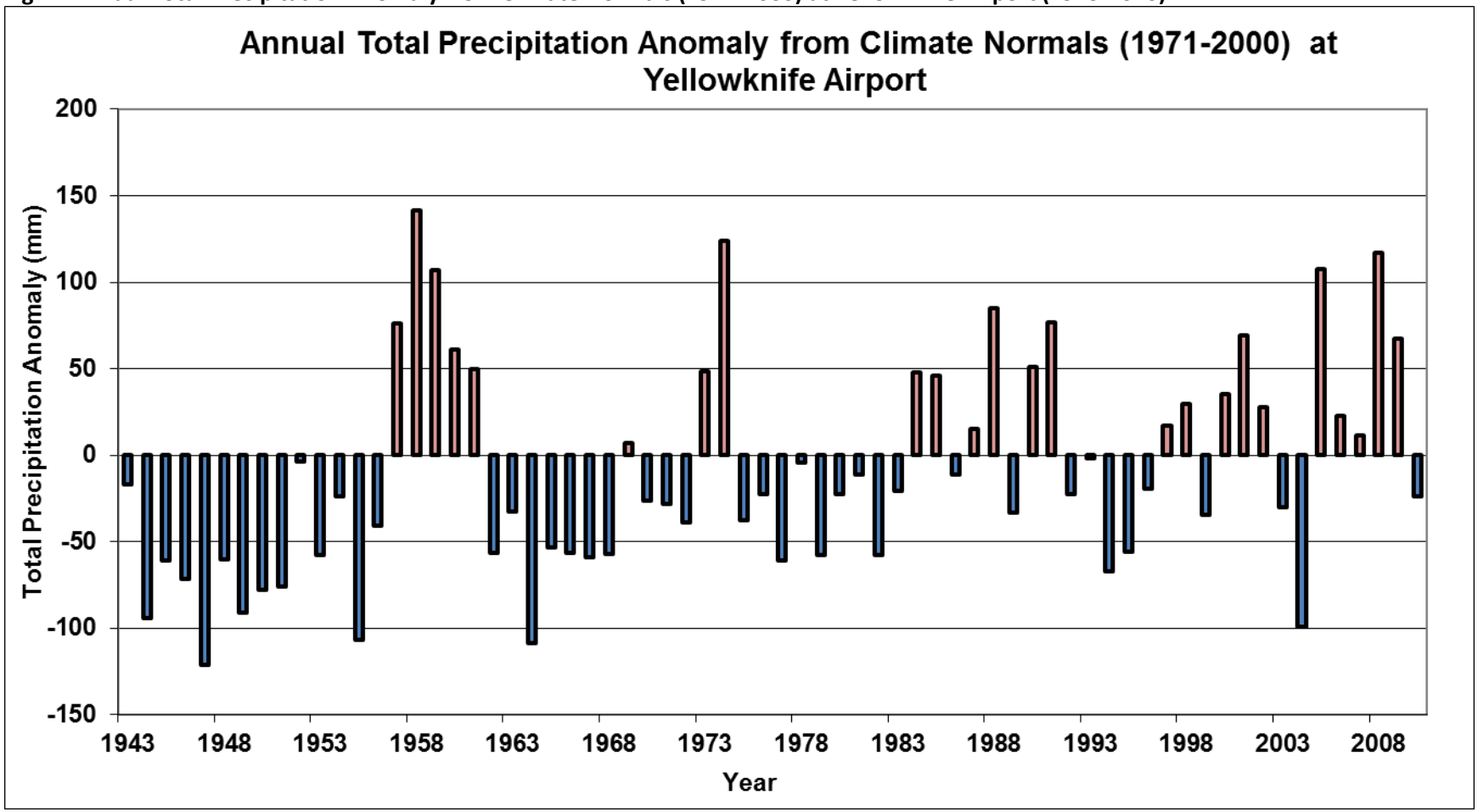

Fig 5 – Comparison of Climate Normals (1971-2000 and 1981-2010) Monthly Mean Temperature at Yellowknife Airport

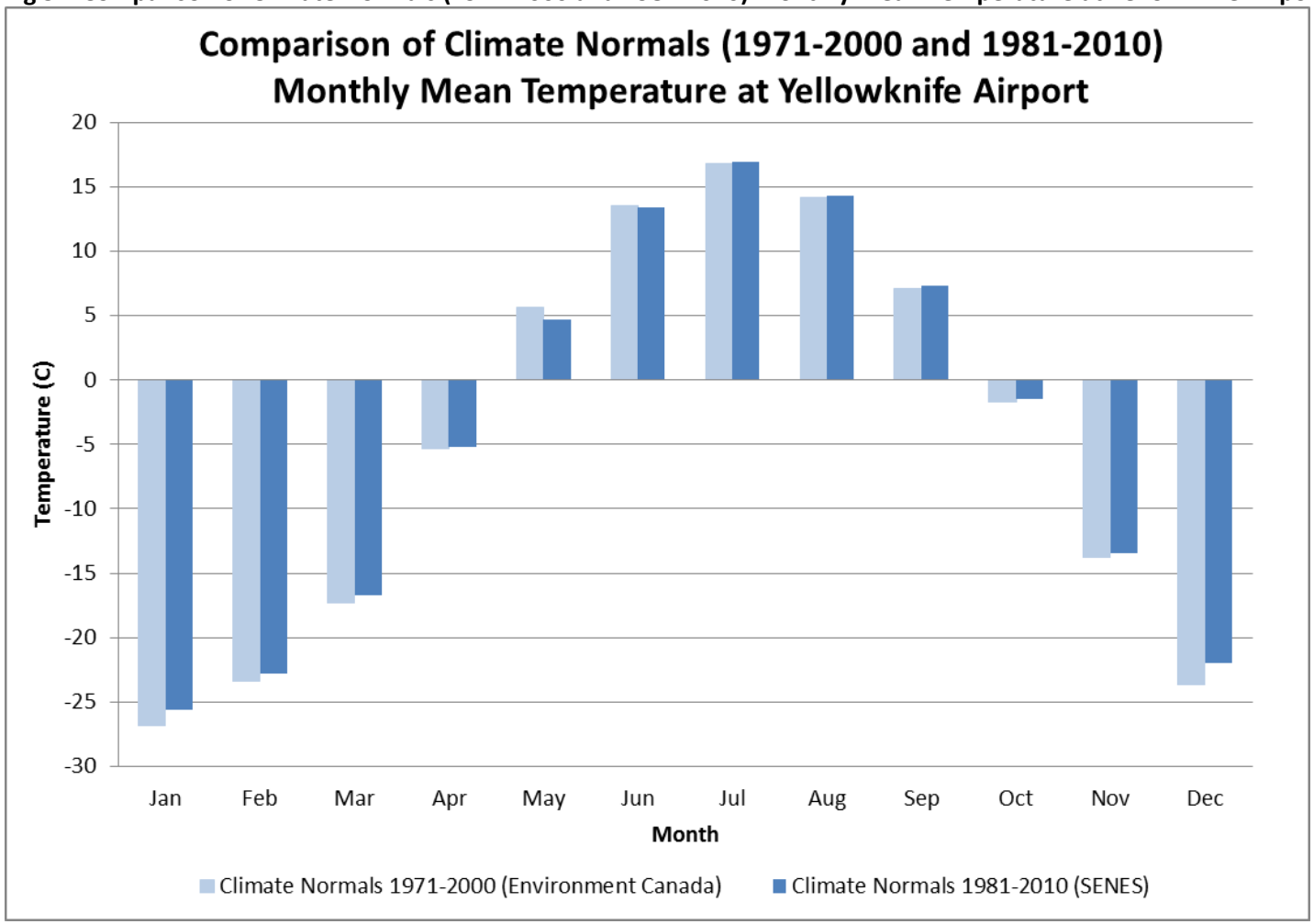

Fig 6 – Comparison of Climate Normals (1971-2000 and 1981-2010) Monthly Mean Total Precipitation at Yellowknife Airport