# APPENDIX A

## JACKSON/PINEDALE REGION
## WEATHER DATA
## Biological Years 2004 - 2006

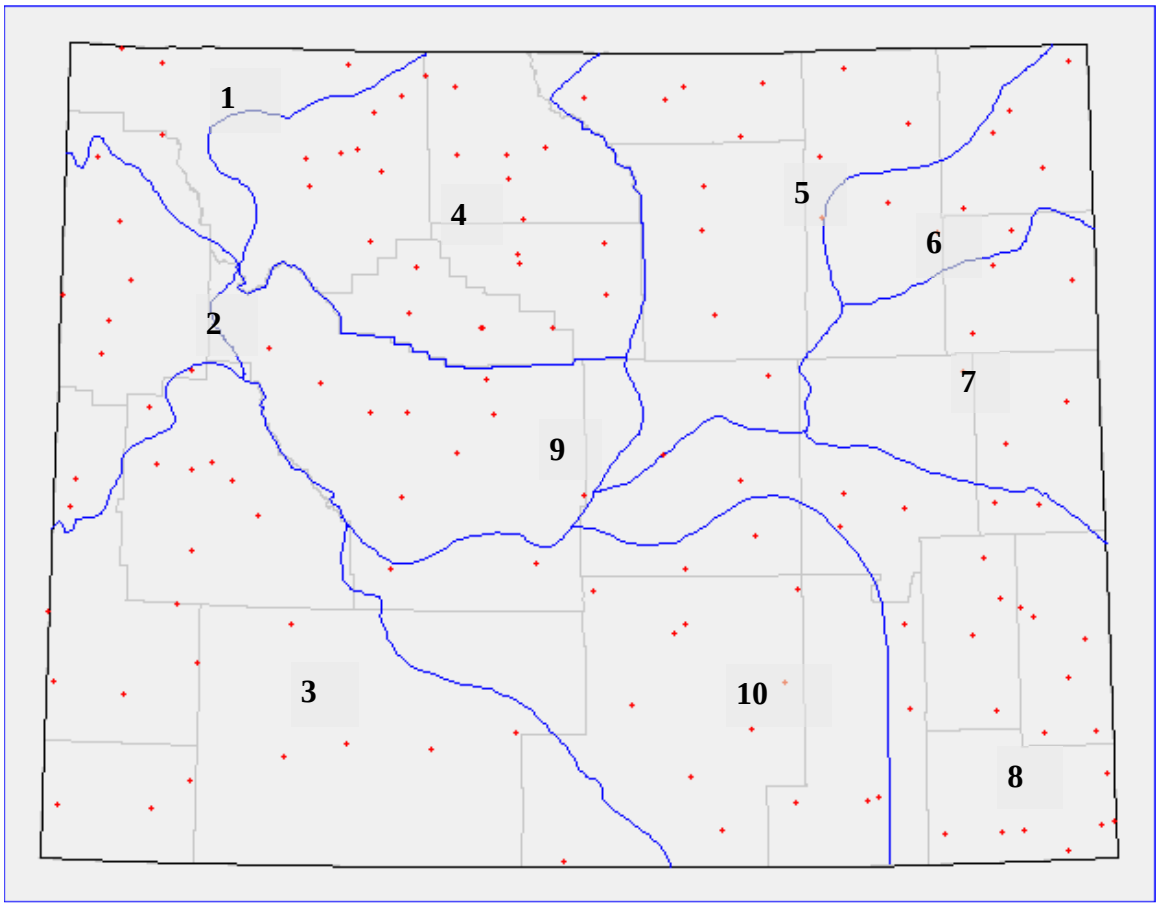
National Climate Data Center/National Oceanic and Atmospheric Administration (NCDC/NOAA ) has divided Wyoming into 10 climatic divisions for the purpose of weather data recording (Figure 1). These divisions correspond to major watersheds within the state and include: Zone 1 – Yellowstone Drainage Basin, Zone 2 – Snake Drainage Basin, Zone 3 - Green and Bear Drainage Basin, Zone 4 - Big Horn, Zone 5 - Powder, Little Missouri, and Tongue Drainage Basin, Zone 6 - Belle Fourche Drainage Basin, Zone 7 - Cheyenne and Niobrara Drainage Basin, Zone 8 - Lower Platte, Zone 9 - Wind River, and Zone 10 - Upper Platte. Climatic data for these divisions can be found at the NCDC/NOAA web site: http://www.ncdc.noaa.gov/oa/ncdc.html.

Divisional monthly temperature, precipitation, and Palmer drought severity data were obtained from: http://lwf.ncdc.noaa.gov/oa/climate/onlineprod/drought/ftppage.html. Graphs portraying Palmer Drought Severity Index data over time were created for each climatic division (Figures 2, 9, 16, 23, 30, 37, 44, 51, 58, 65). Graphs were also generated comparing divisional monthly and 30-year normals temperature (Figures 3-5, 10-12, 17-19, 24-26, 31-33, 38-40, 45-47, 52-54, 59-61, and 66-68) and precipitation data (Figures 6-8, 13-15, 20-22, 27-29, 34-36, 41-43, 48-50, 55-57, 62-64, and 69-71) for bio-years 2004, 2005, and 2006. A bio-year (or biological year) is defined as June – May. A climatic normal is the arithmetic average of a meteorological element over a 30-year period (generally, three consecutive decades). Monthly divisional temperature and precipitation normals are calculated by adding the yearly values for a given month and then dividing by the number of years in the period.

The Palmer Drought Severity Index was developed in the 1960s (http://www.drought.noaa.gov/palmer.html). The index uses temperature and precipitation data to determine dryness. It is most effective in determining long-term (several months) drought. Another index, the Crop Moisture Index (CMI) is more sensitive to short-term conditions. On the Palmer scale, zero is normal, -2 is moderate drought, -3 is severe drought, and -4 is extreme drought. Positive numbers indicate wetter than normal time periods. The Palmer Index is standardized to local conditions. Since this index does not reflect snow moisture, it typically works best for areas east of the Continental Divide.

Additional contact information for NCDC can be found at the following web address: http://lwf.ncdc.noaa.gov/oa/about/ncdccontacts.html.

**Figure 1. NCDC/NOAA, State of Wyoming Climate Division Map. http://www.wrds.uwyo.edu/wrds/wsc/normals/normalmap.html**




## Climatic Division 2 – Snake Drainage Basin

Palmer Severity Indices indicate that from 1995-1999 the Snake Drainage Basin climatic division experienced wetter than normal conditions, with some years being extremely moist (Figure 9). However, the division entered drought conditions in 2000, becoming moderate to severe until 2004. Conditions have moderated in recent years. During bio-years 2004, 2005, and 2006, temperatures were generally normal (Figures 10, 11, & 12). Precipitation was generally below normal in bio-years 2004 and 2006 (Figures 13 & 15). However, precipitation most months in bio-year 2005 was higher than normal (Figure 14).

**Figure 9. Drought severity trend from 1982 – 2007, Wyoming Climate Division 2.**

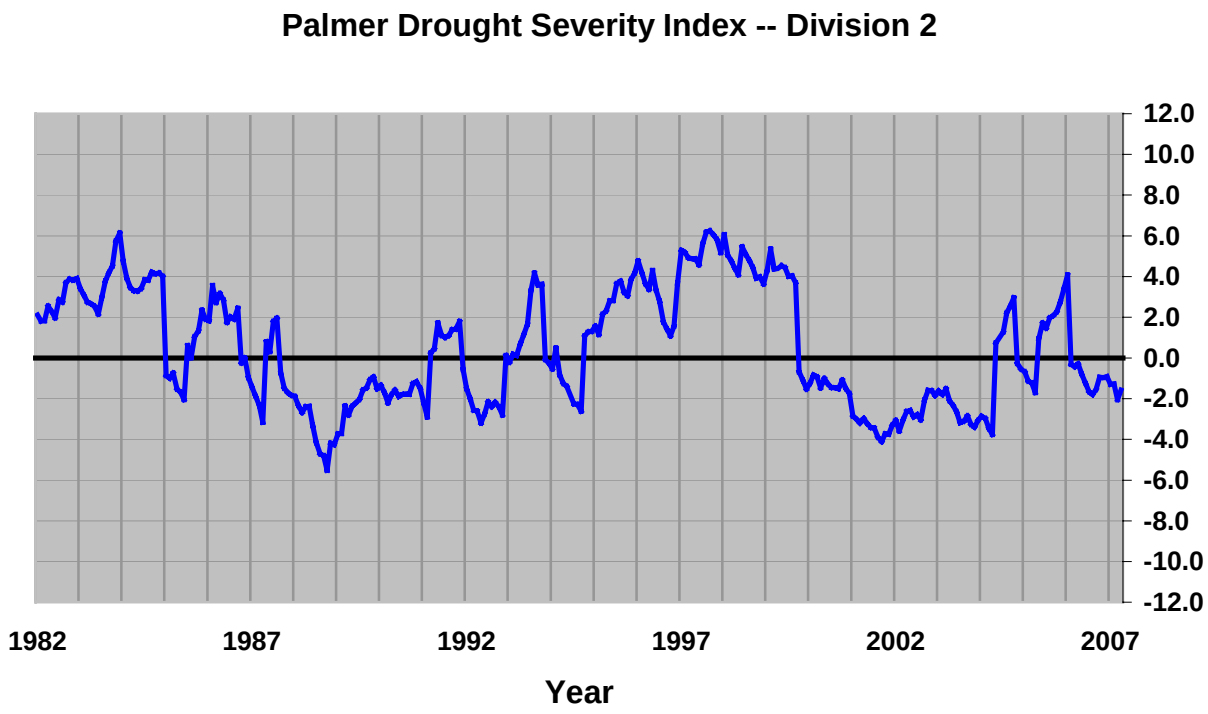



**Figure 10. 2004 Bio-Year: Monthly temperature data ($^{o}$F), Wyoming Climate Division 2.**

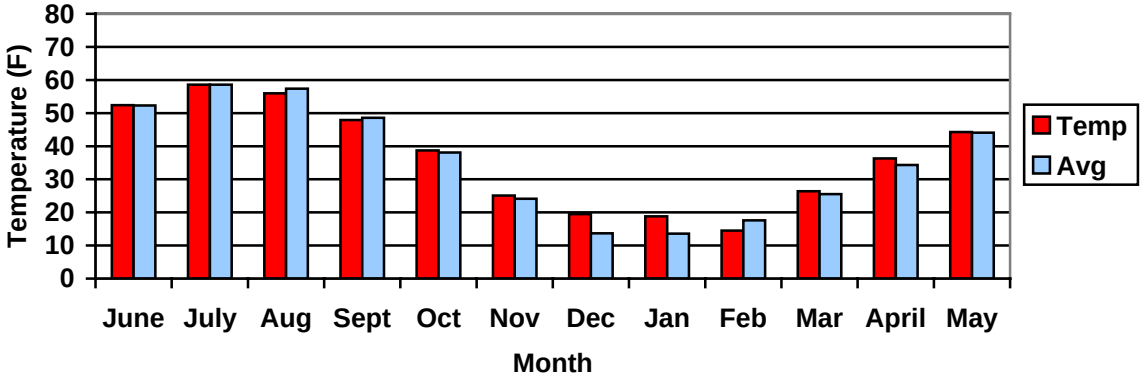


**Figure 11. 2005 Bio-Year: Monthly temperature data (°F), Wyoming Climate Division 2.**

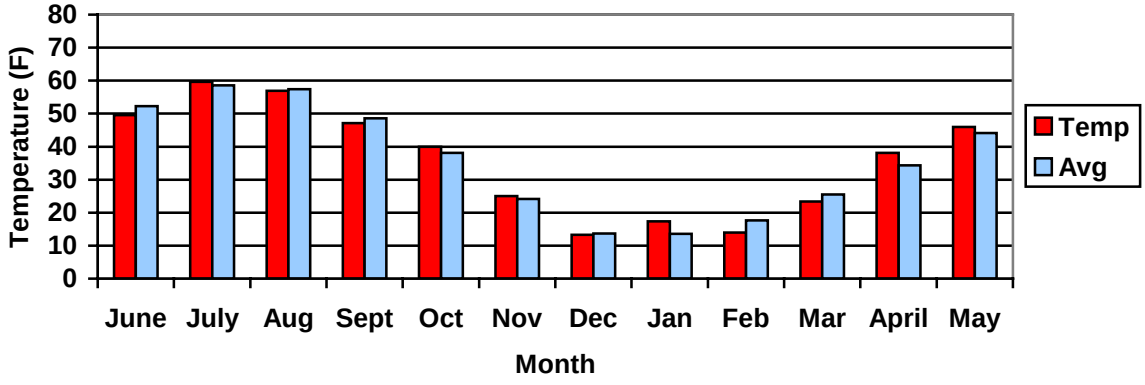



**Figure 12. 2006 Bio-Year: Monthly temperature data (°F), Wyoming Climate Division 2.**

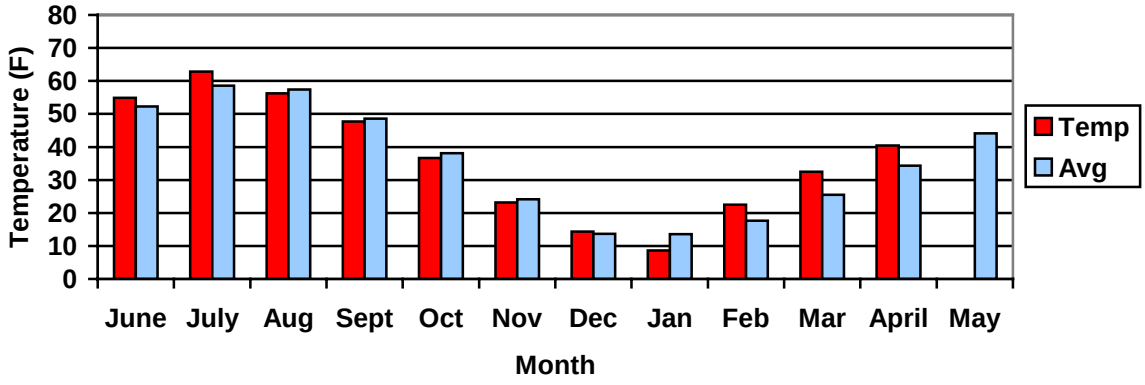



**Figure 13. 2004 Bio-Year: Monthly precipitation data (in), Wyoming Climate Division 2.**

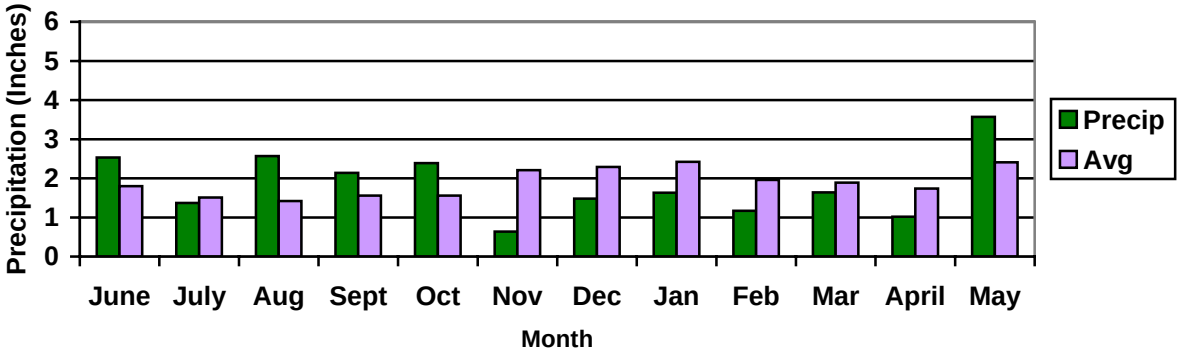


**Figure 14. 2005 Bio-Year: Monthly precipitation data (in), Wyoming Climate Division 2.**

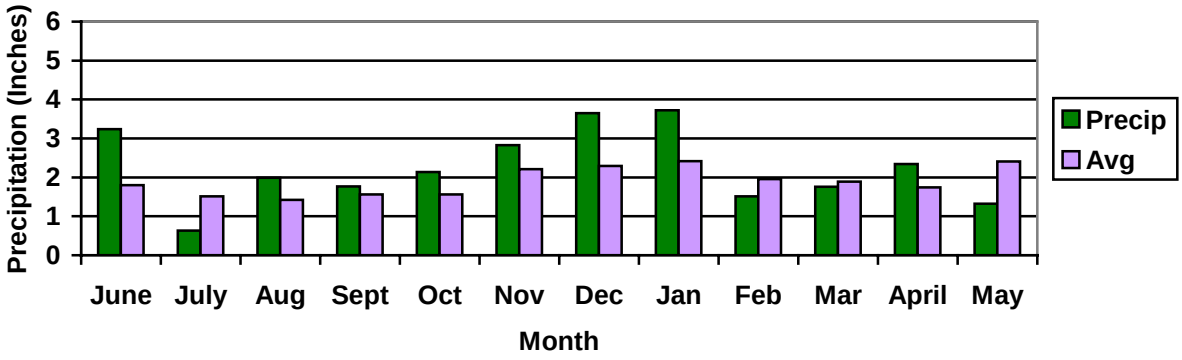
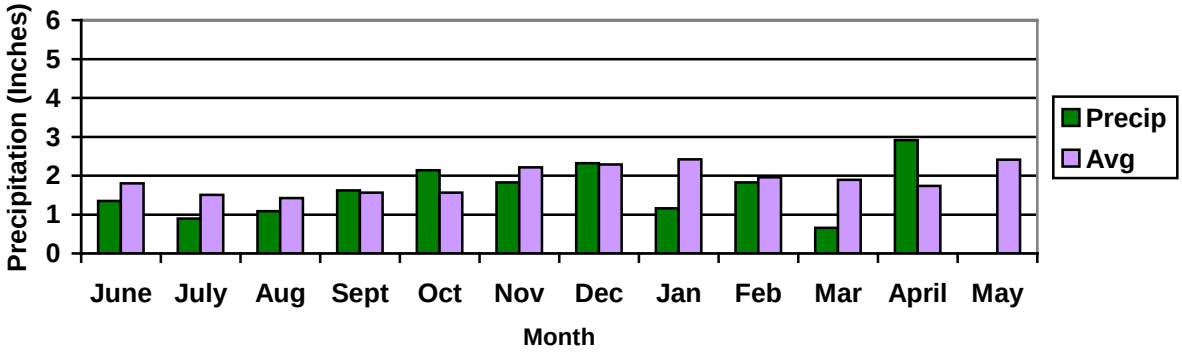



**Figure 15. 2006 Bio-Year: Monthly precipitation data (in), Wyoming Climate Division 2.**




## Climatic Division 3 – Green and Bear Drainage Basin

Palmer Severity Indices indicate that from 1995-1999 the Green and Bear Drainage Basin climatic division generally experienced wetter than normal conditions (Figure 16). However, the division entered drought conditions in 2000, with conditions becoming extreme until 2004, then again in 2006 and leading into 2007. During bio-year 2004, temperatures were generally normal (Figure 17). However, temperatures were generally above normal during bio-years 2005 and 2006 (Figures 18 & 19). Bio-year 2004 saw above normal precipitation, while bio-years 2005 and 2006 were well below normal (Figures 20, 21, & 22).

**Figure 16. Drought severity trend from 1982 – 2007, Wyoming Climate Division 3.**

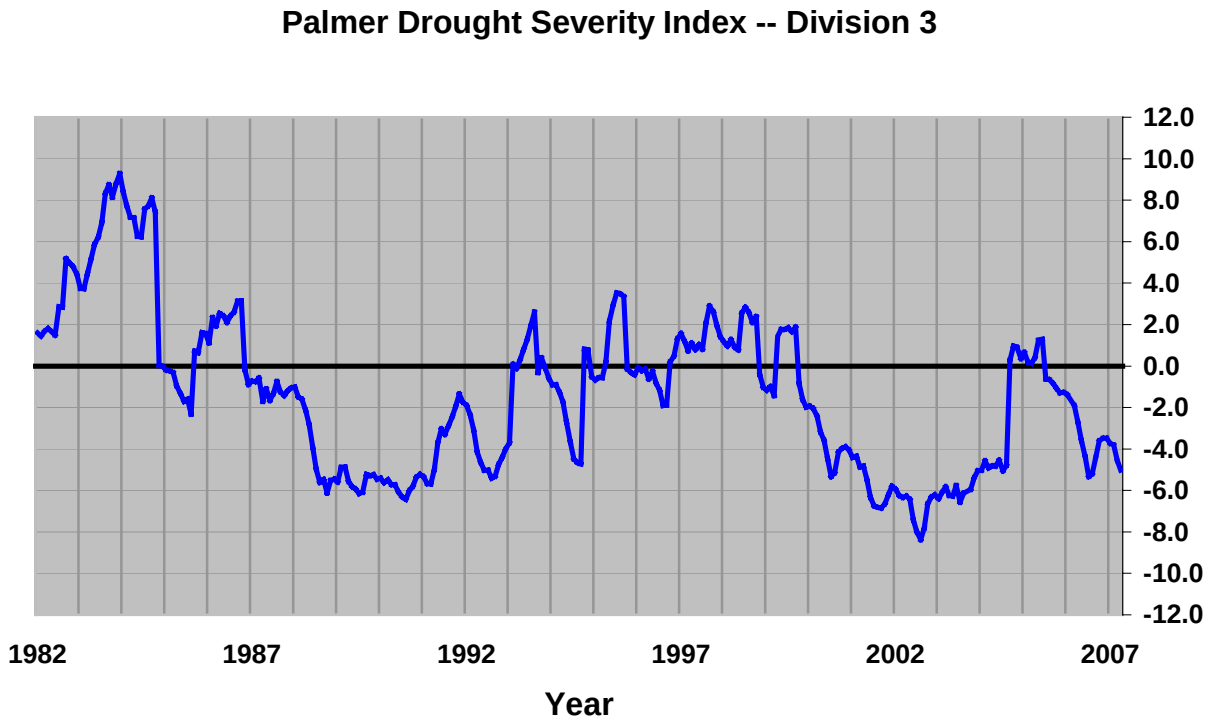



**Figure 17. 2004 Bio-Year: Monthly temperature data ($^{o}$F), Wyoming Climate Division 3.**

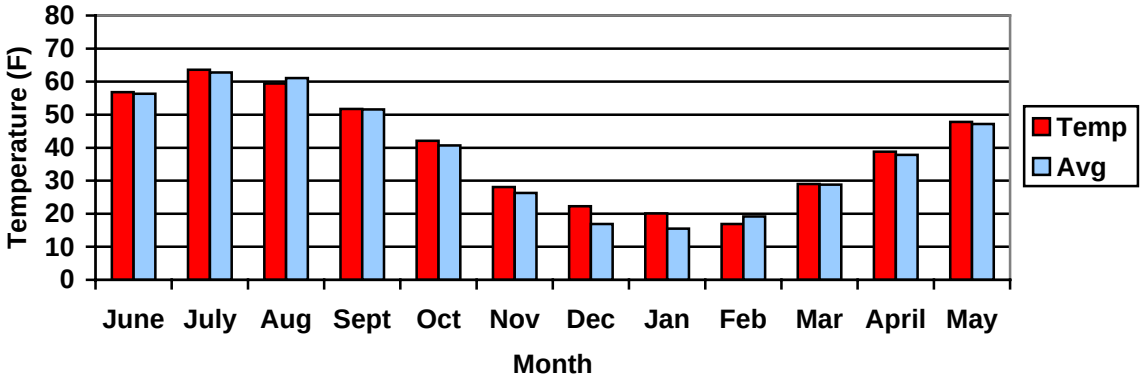


**Figure 18. 2005 Bio-Year: Monthly temperature data (°F), Wyoming Climate Division 3.**

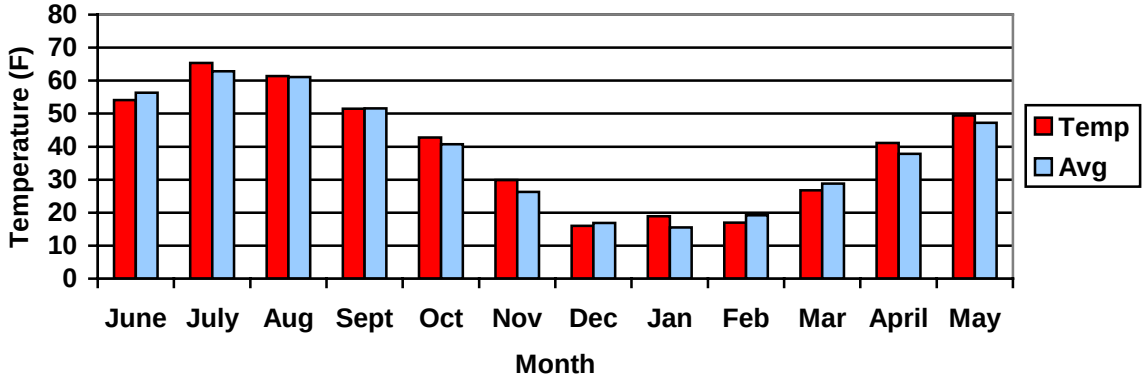



**Figure 19. 2006 Bio-Year: Monthly temperature data (°F), Wyoming Climate Division 3.**

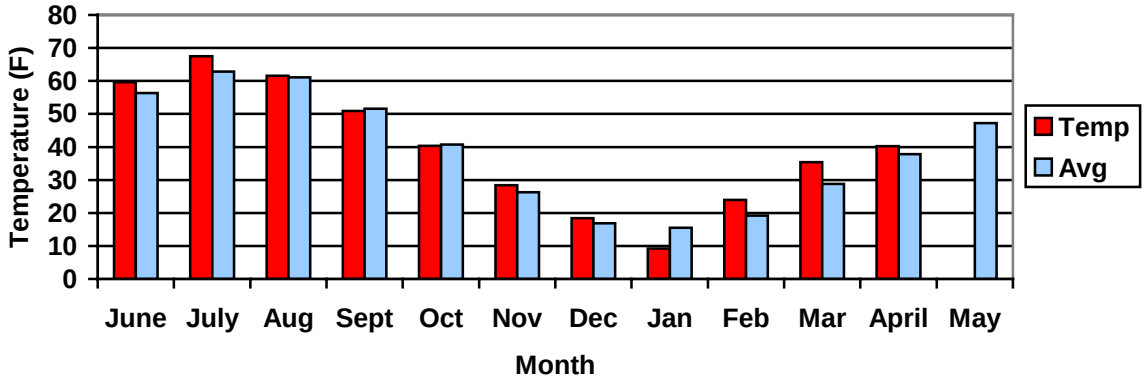



**Figure 20. 2004 Bio-Year: Monthly precipitation data (in), Wyoming Climate Division 3.**

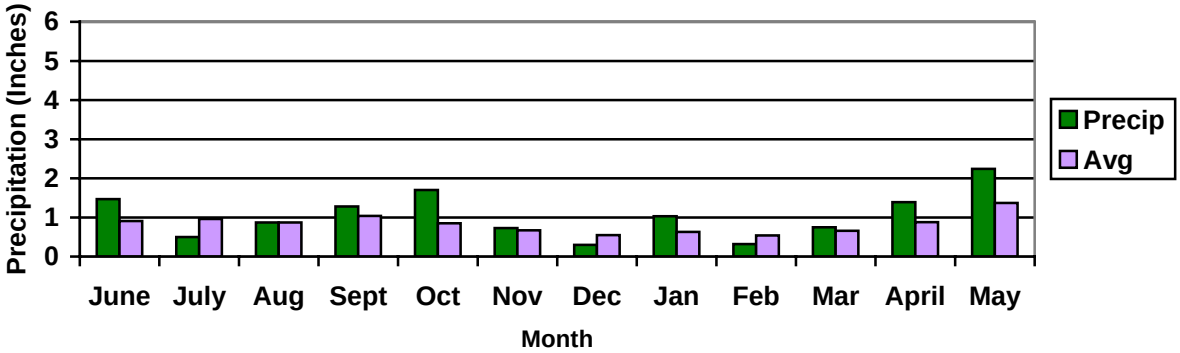


**Figure 21. 2005 Bio-Year: Monthly precipitation data (in), Wyoming Climate Division 3.**

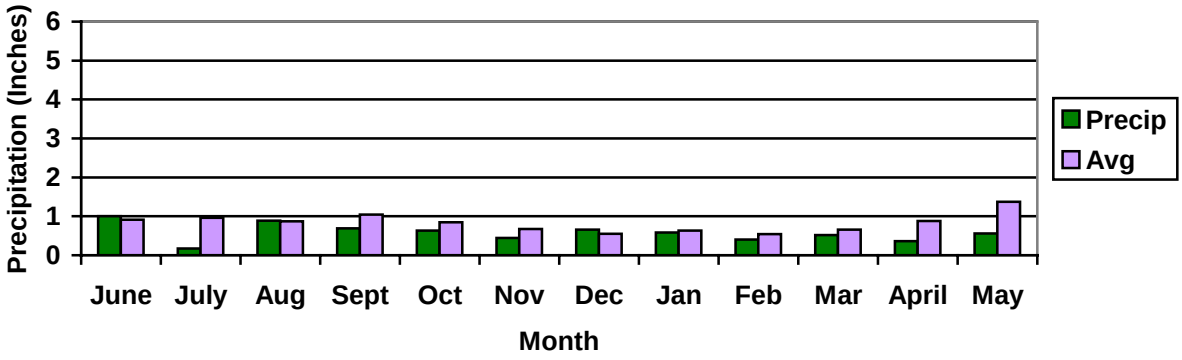



**Figure 22. 2006 Bio-Year: Monthly precipitation data (in), Wyoming Climate Division 3.**