Climate Trends In the Mountains of Colorado

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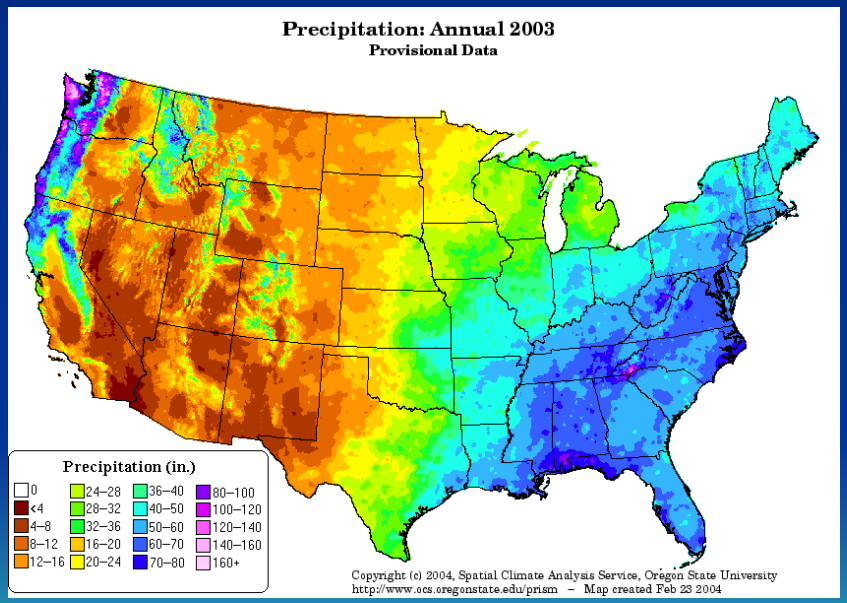
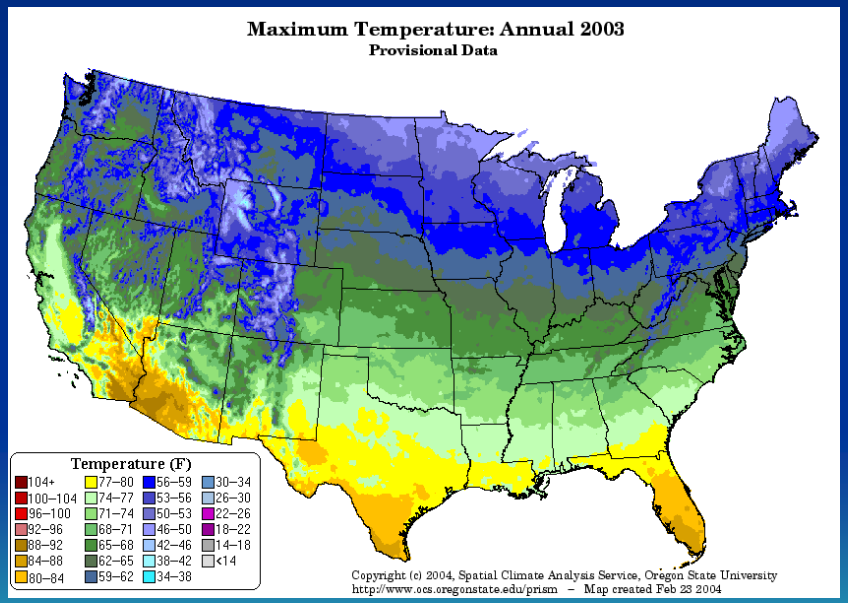
http://ccc.atmos.colostate.edu

High Altitude Revegetation Conference, Fort Collins, CO, March 3, 2004
Prepared by Odie Bliss

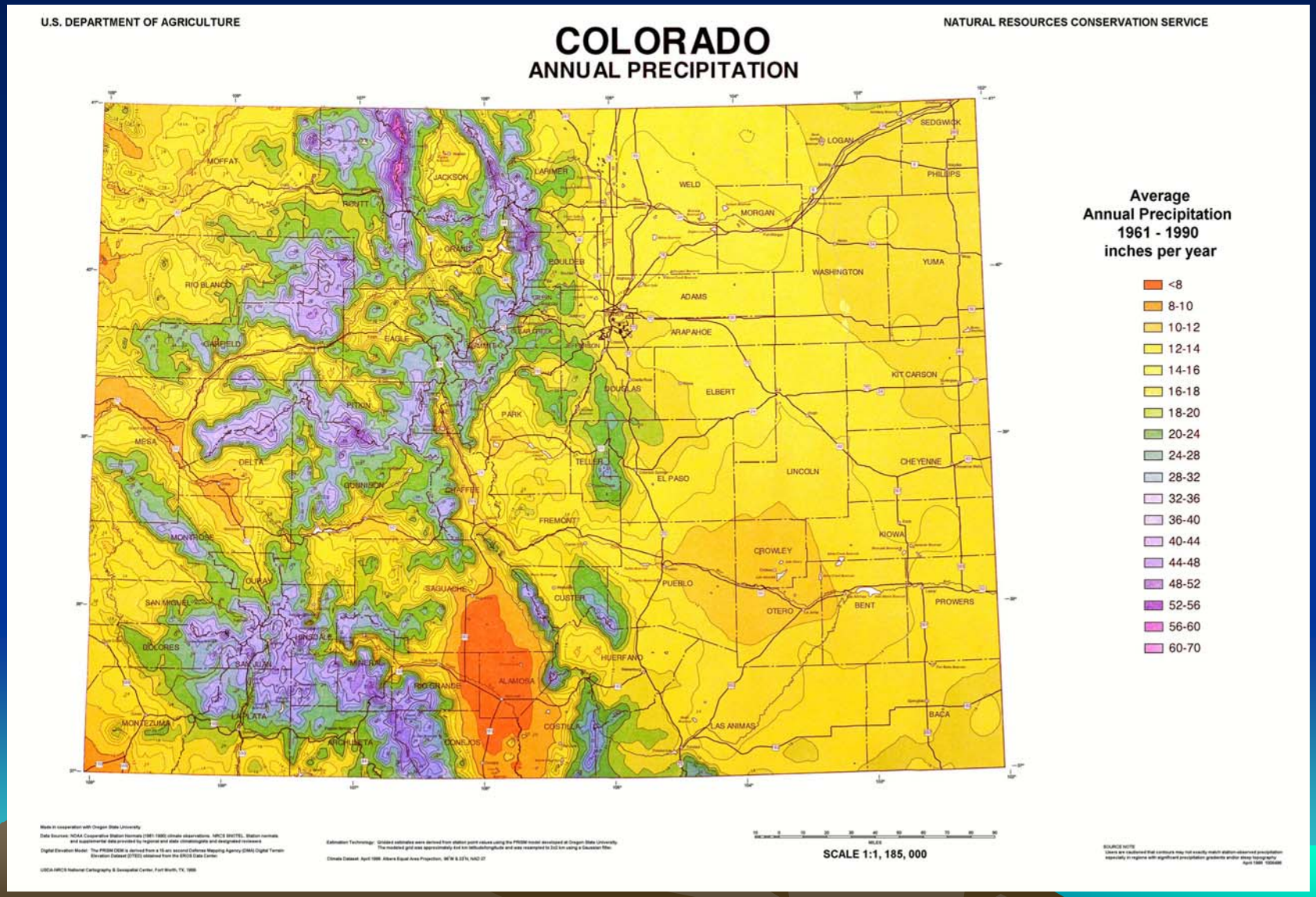
Key Features of Colorado Climate

Some will apply to other states

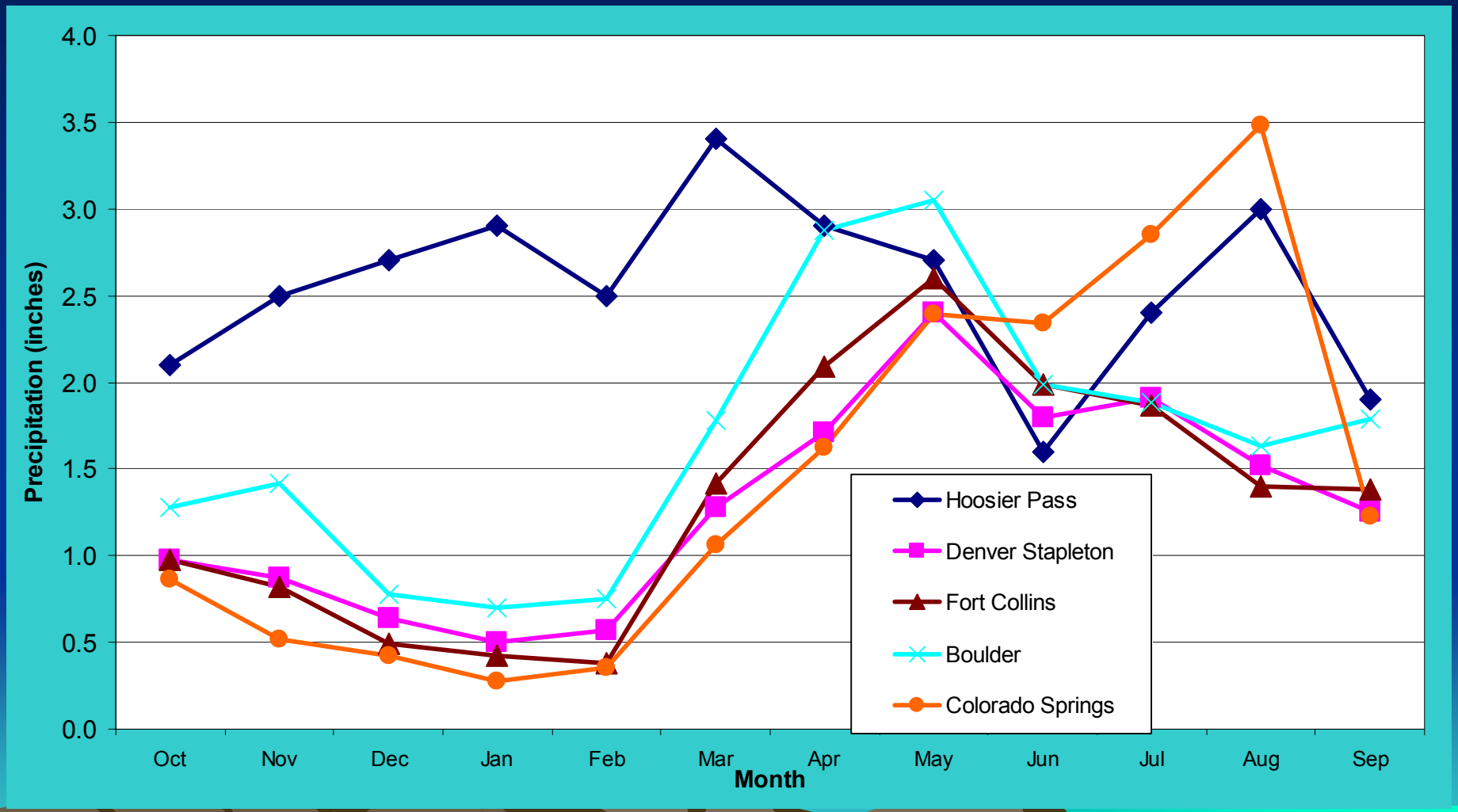




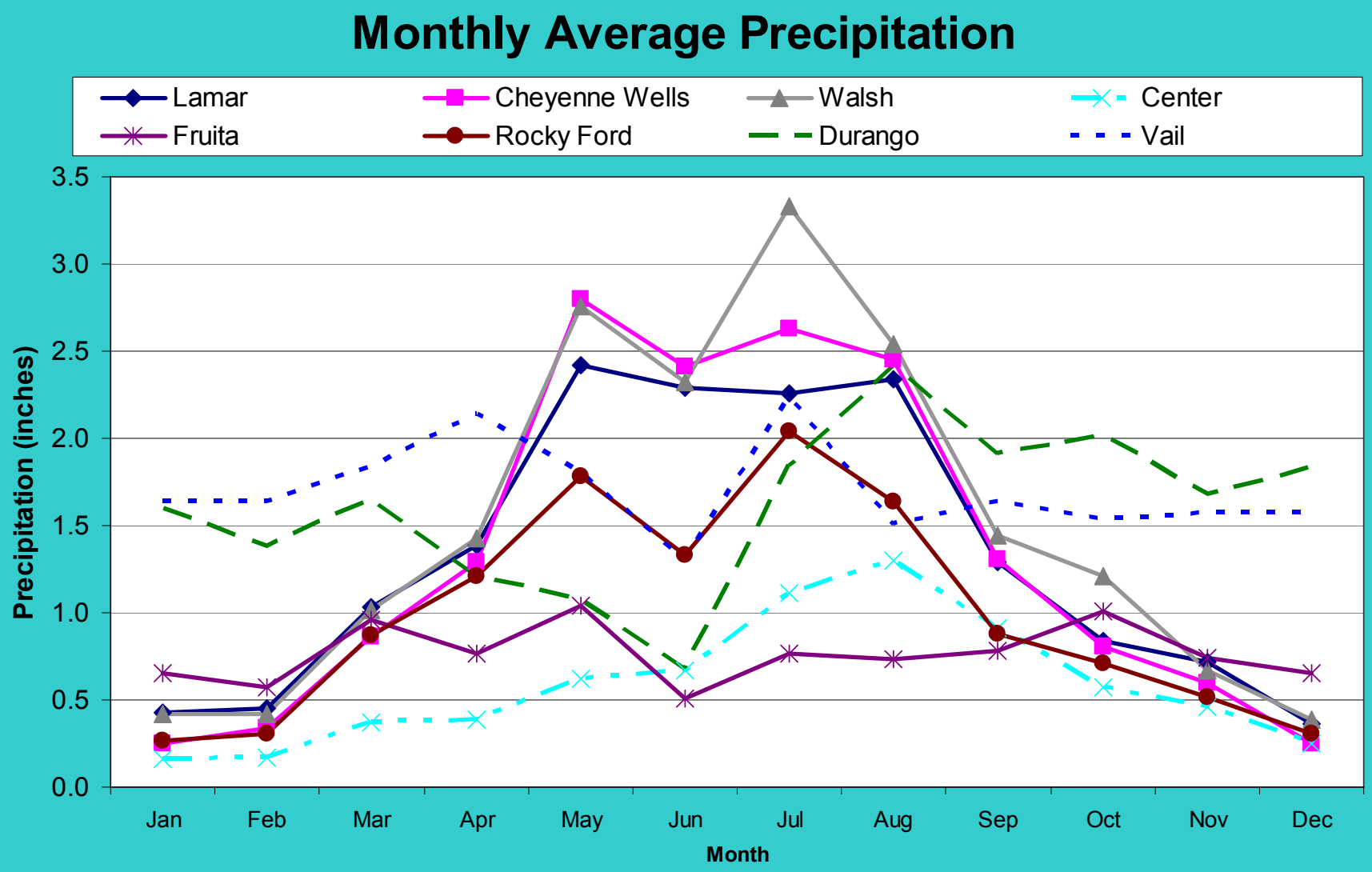
Spatial patterns of precipitation



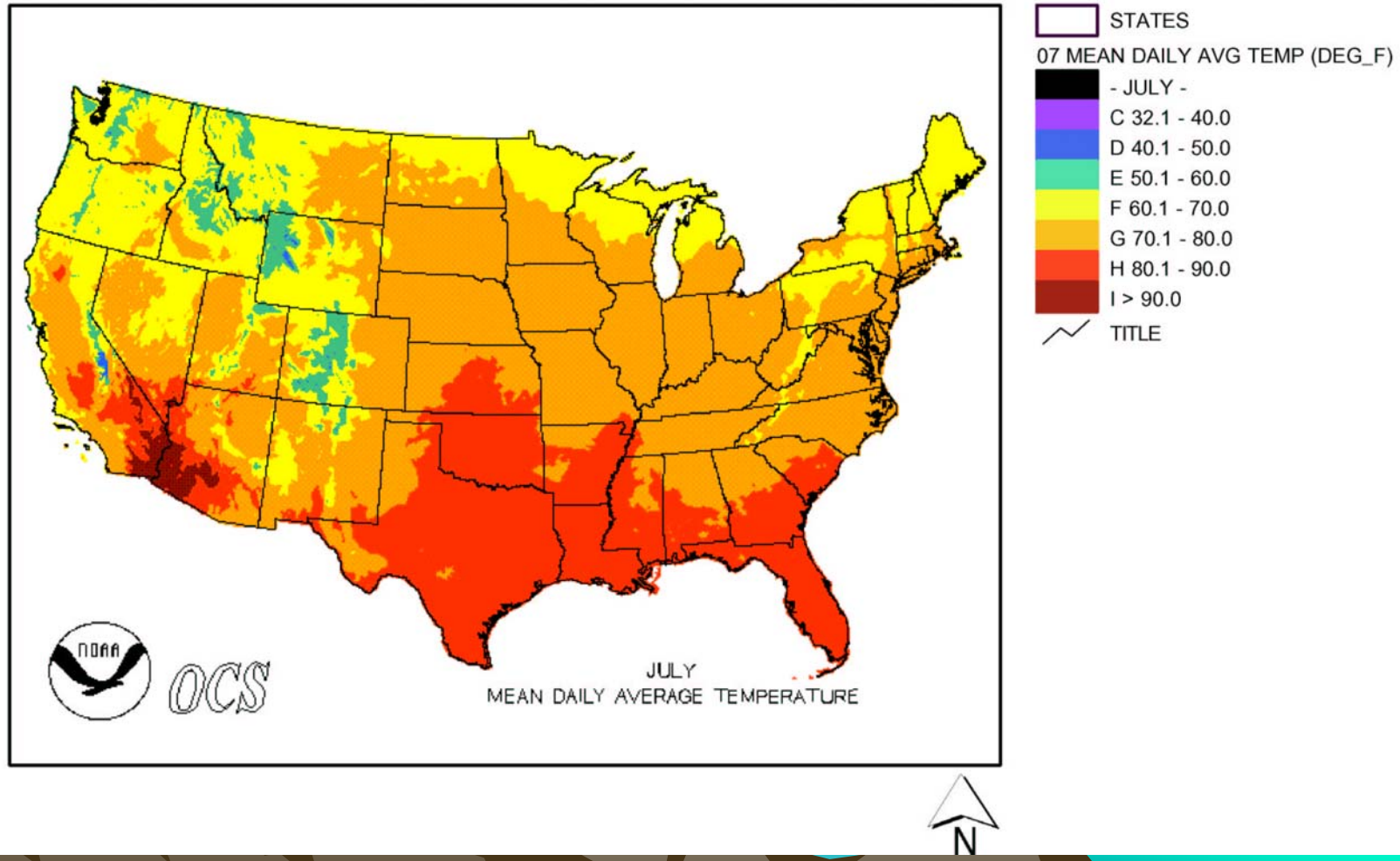
Front Range Monthly Average Precipitation



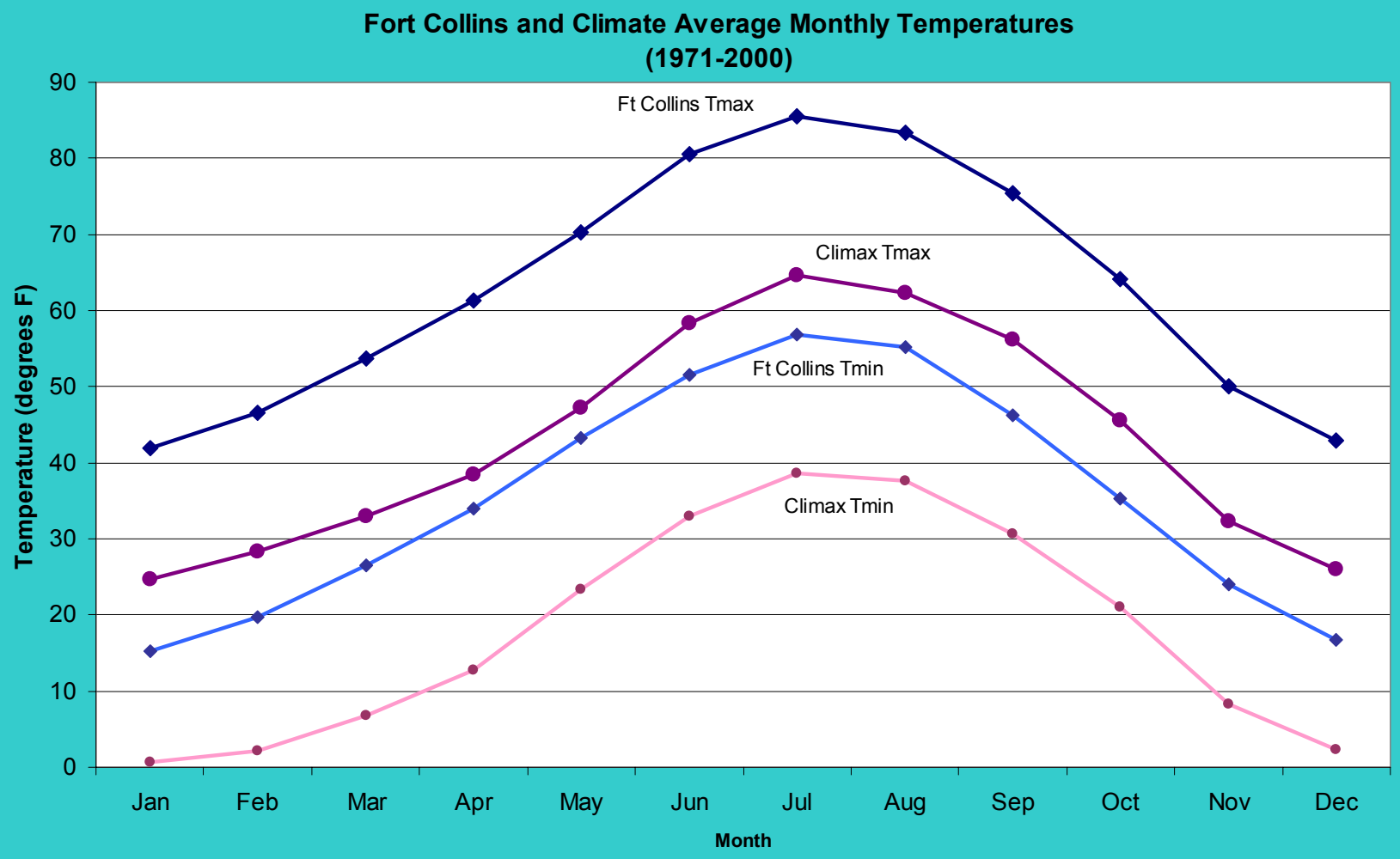
Seasonality of Precipitation



Spatial patterns of temperature

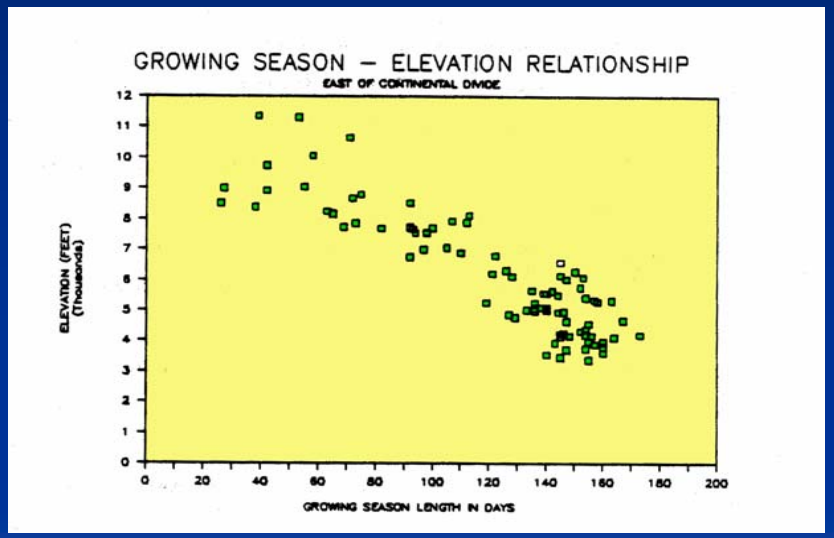


Seasonality of Temperature

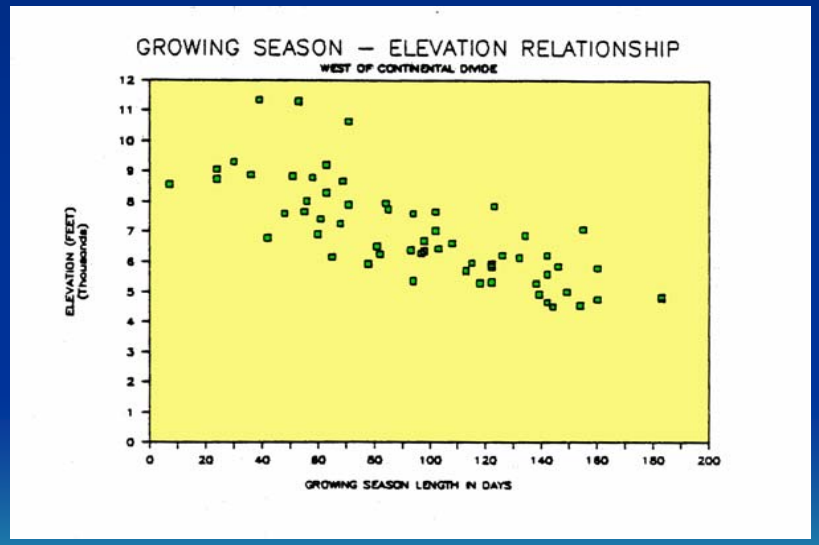


Growing Season and Growing Degree Days

- Important for vegetation applications



East of Continental Divide

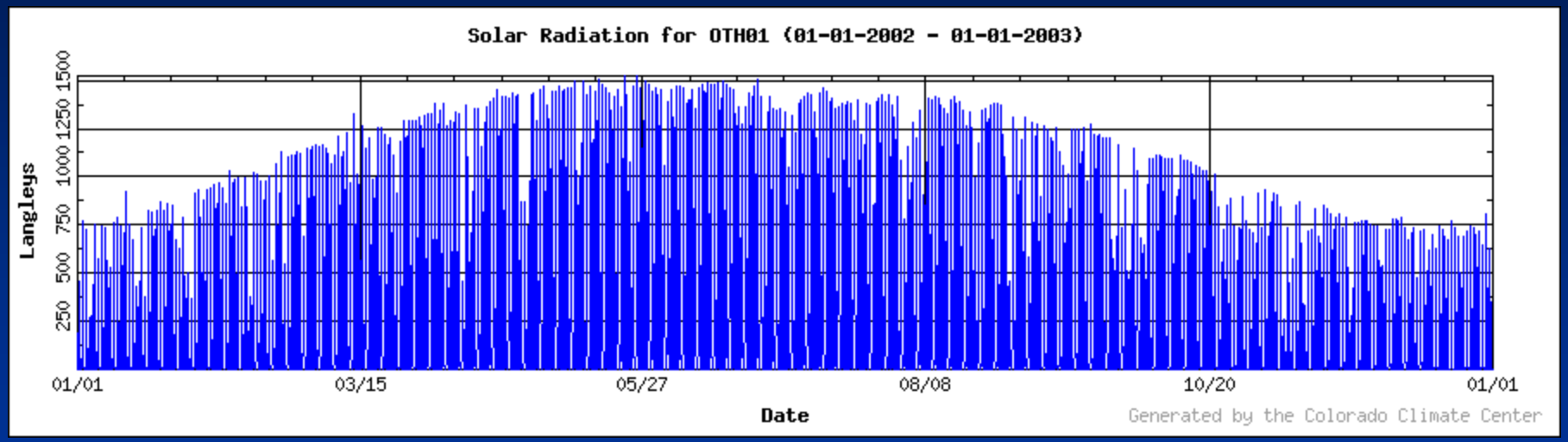


West of Continental Divide

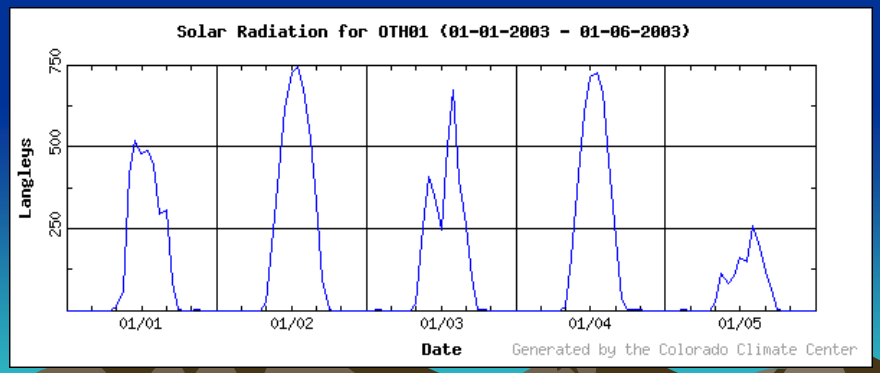
Other Key Elements

Solar radiation

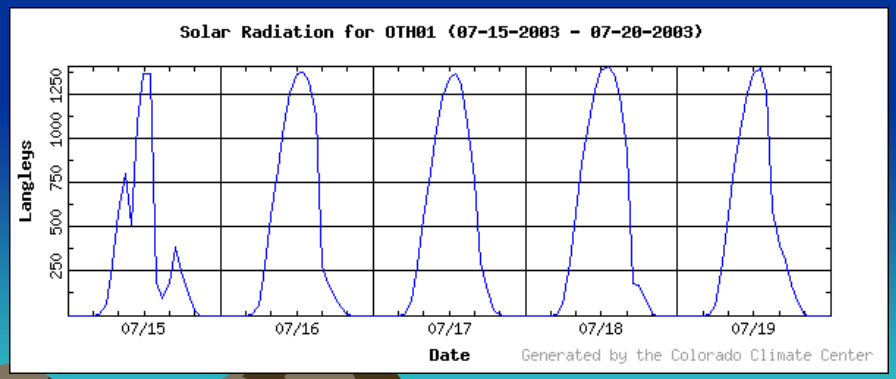
Olathe - 365 days



Winter Period

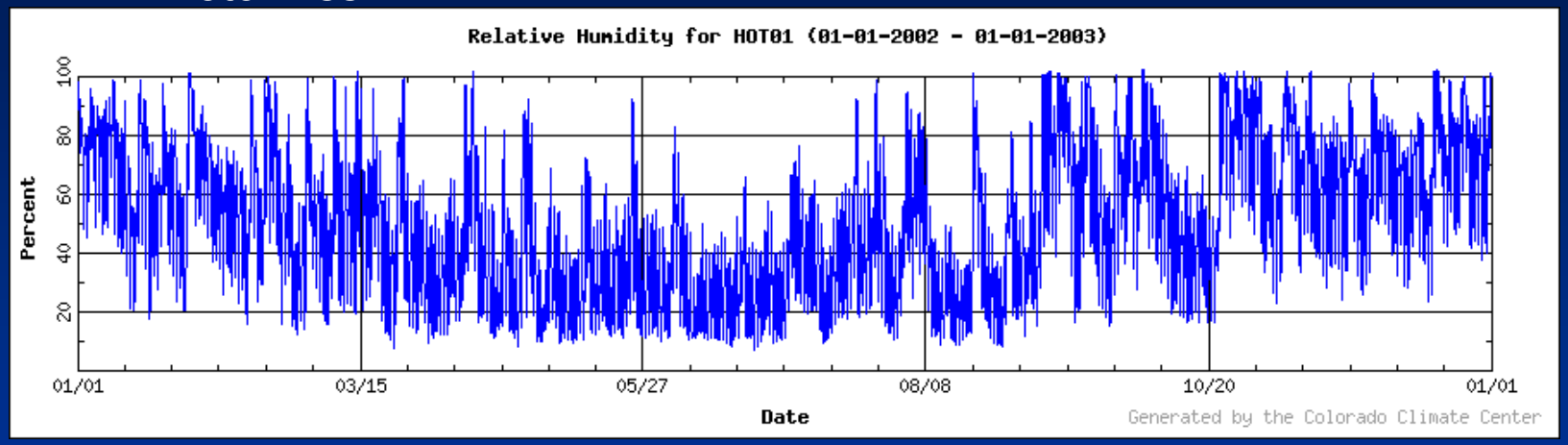


Summer Period

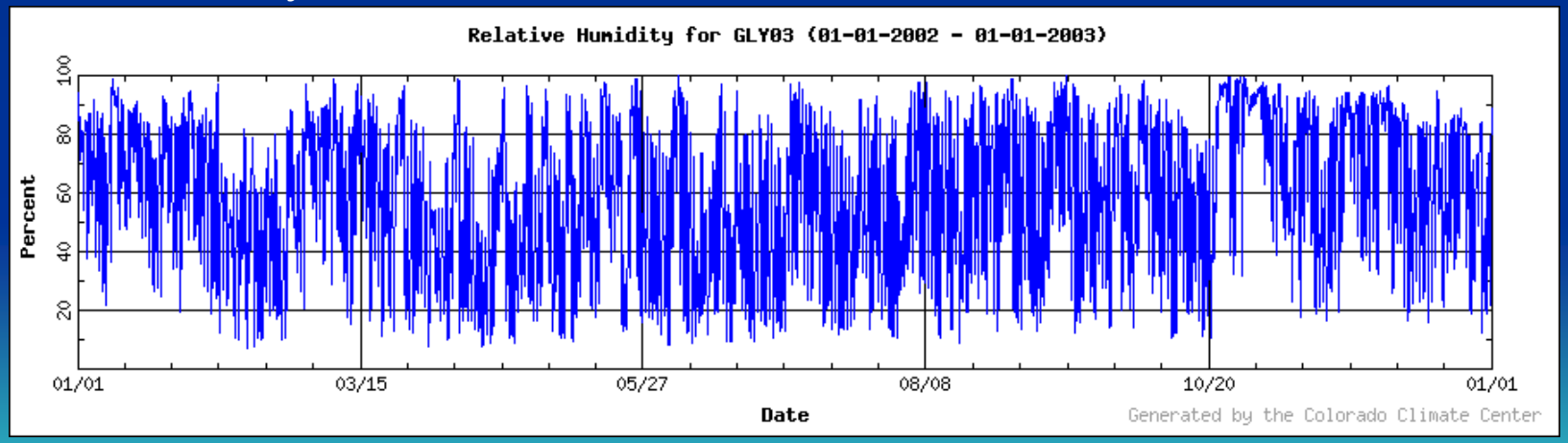


Humidity

Hotchkiss

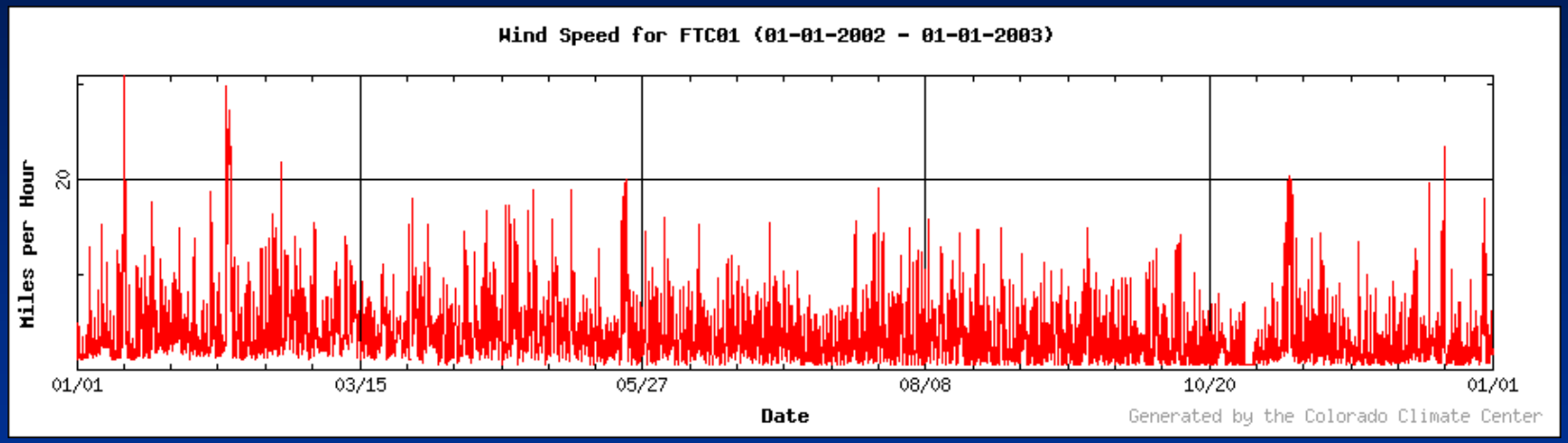


Greeley

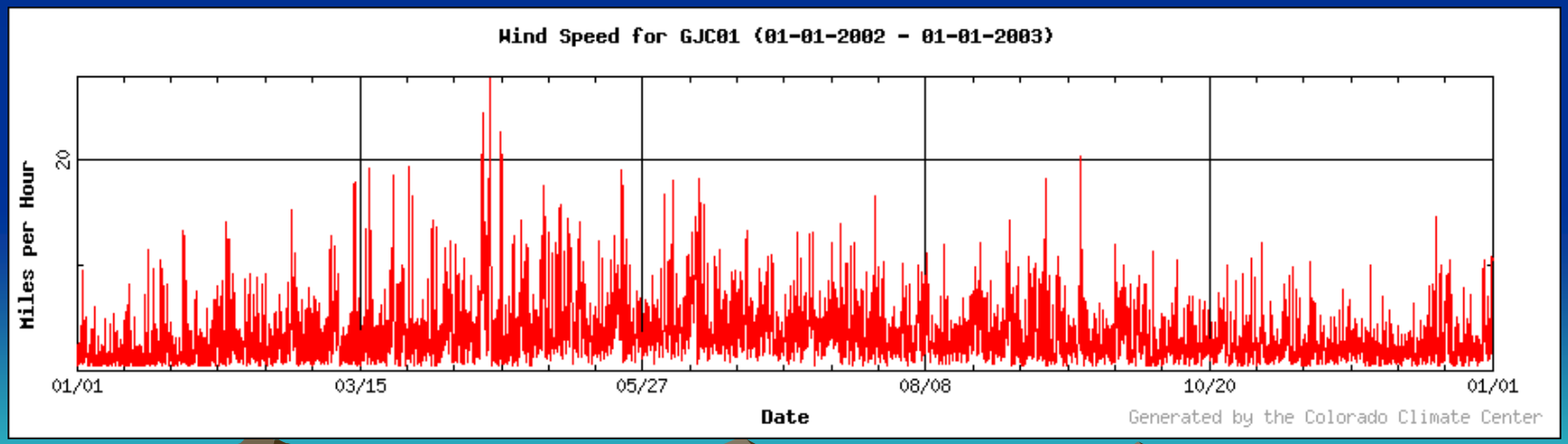


Wind

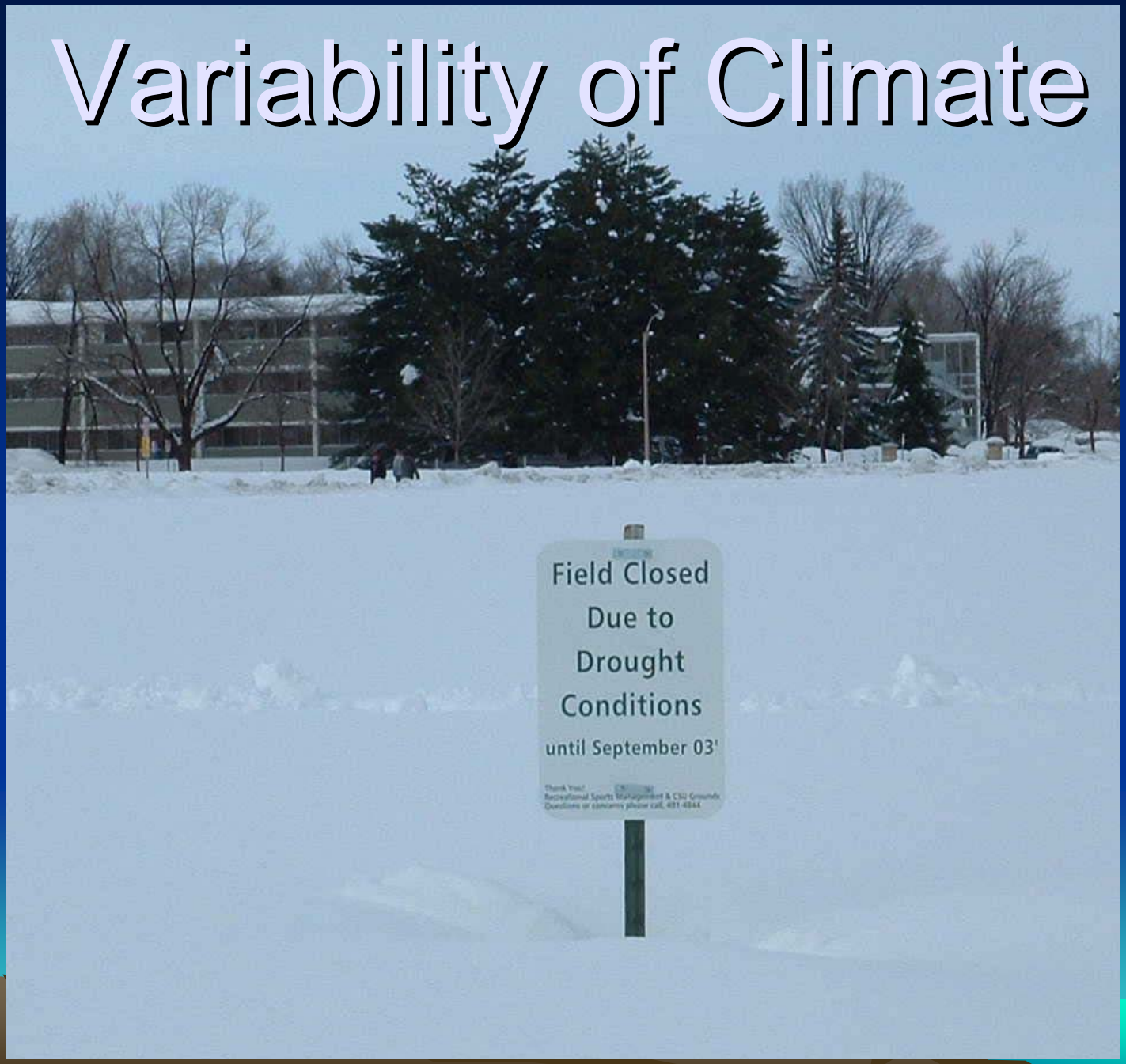
Fort Collins



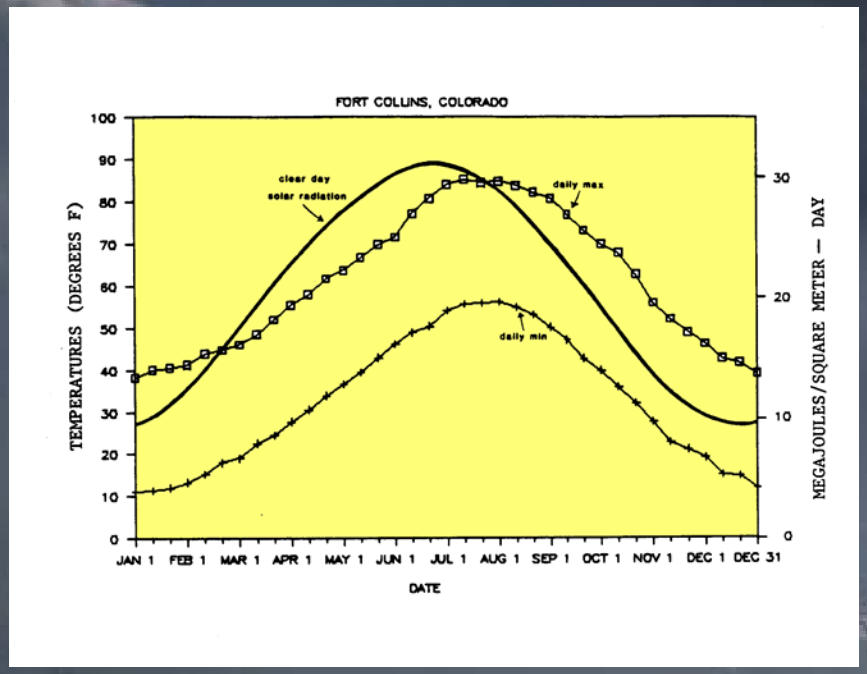
Grand Junction



Variability of Climate

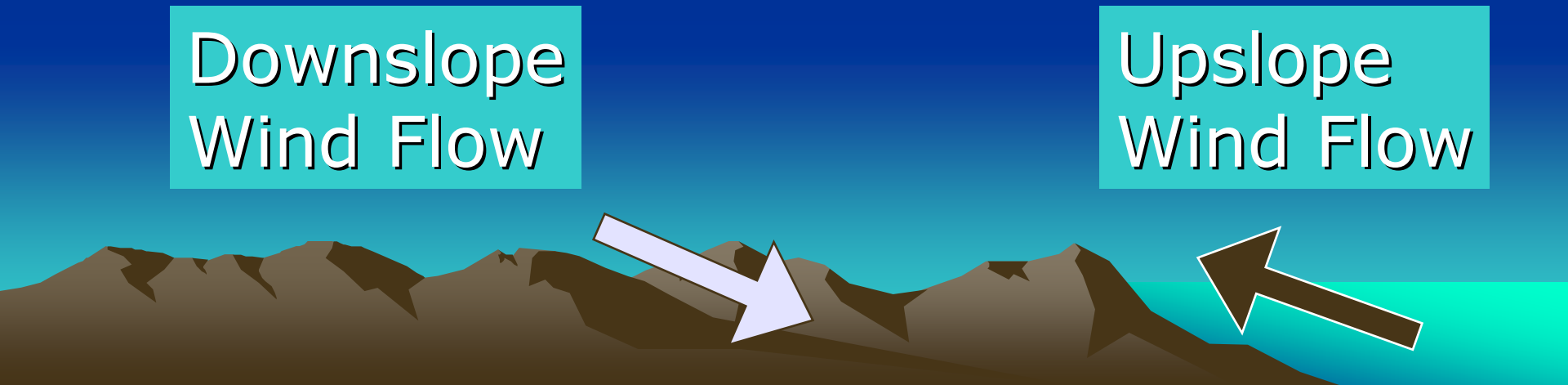


Solar – Very Stable



Wind

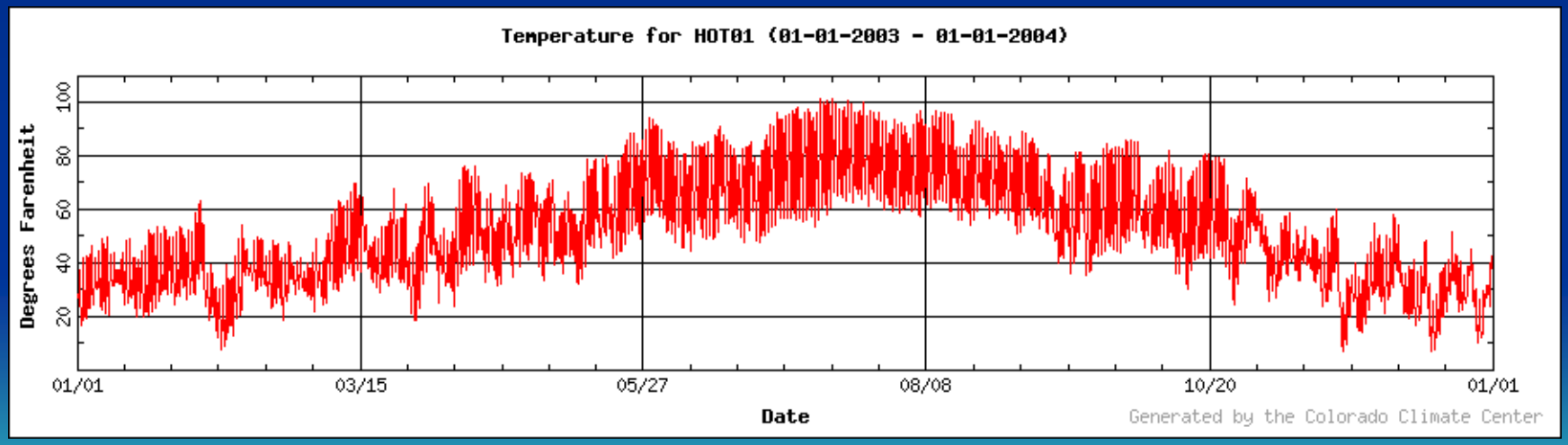
- Variable on a daily basis, but quite stable when averaged
- Mountain induced wind patterns



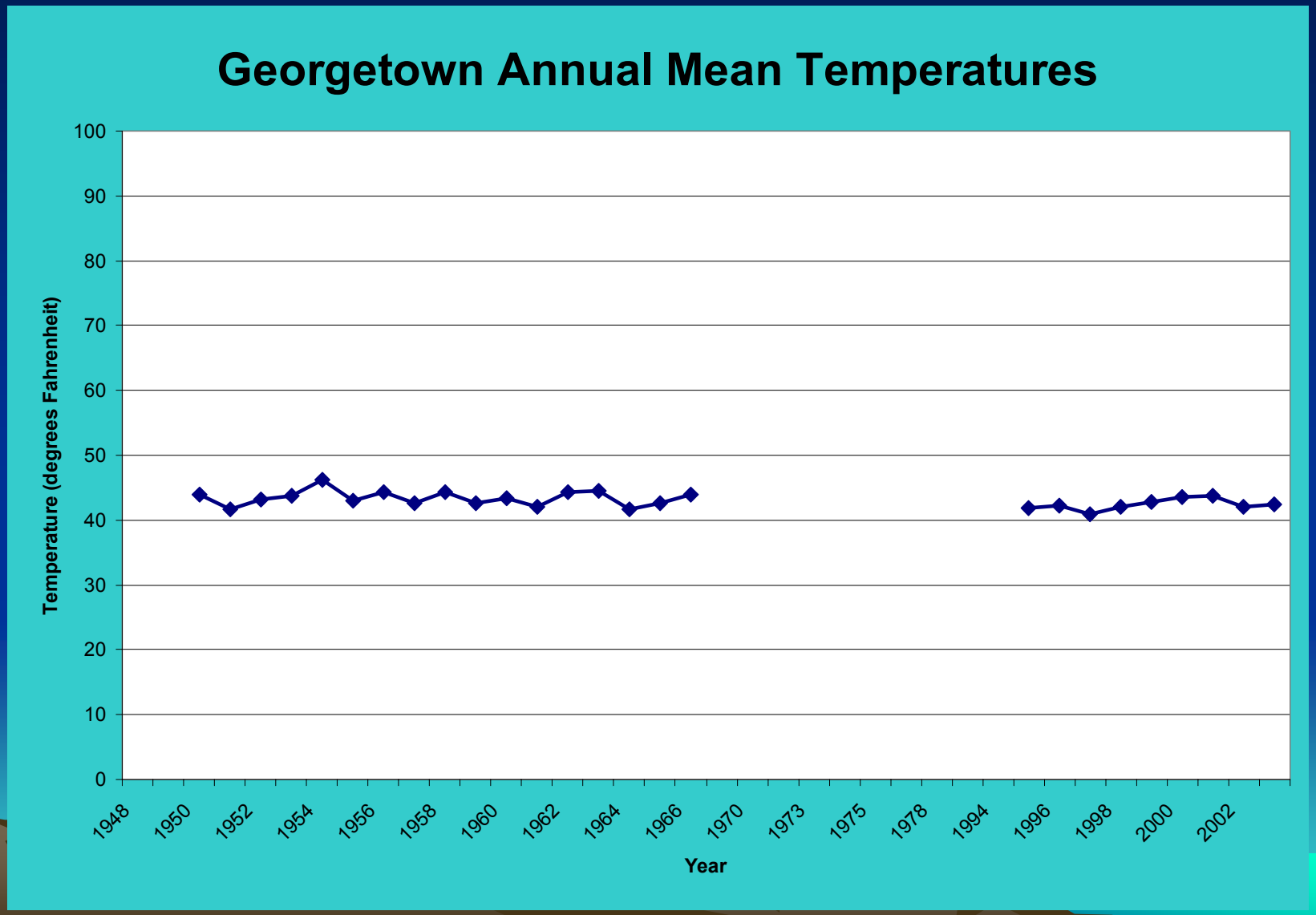
Temperature

- Also highly variable on a daily basis but surprisingly stable when averaged.

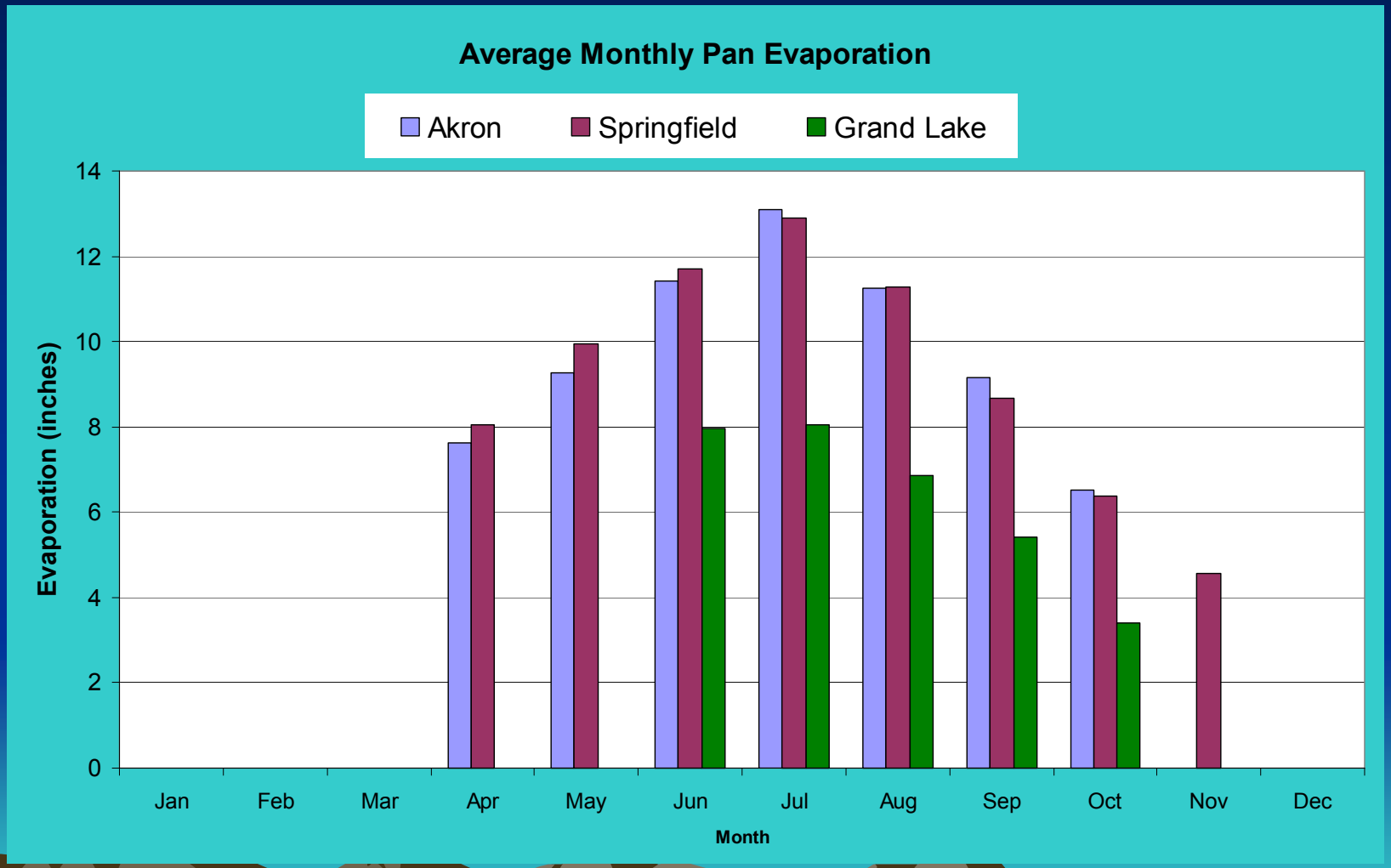
2003 Daily Maximum and Minimum Temperature for Hotchkiss



Mean Annual Temperatures

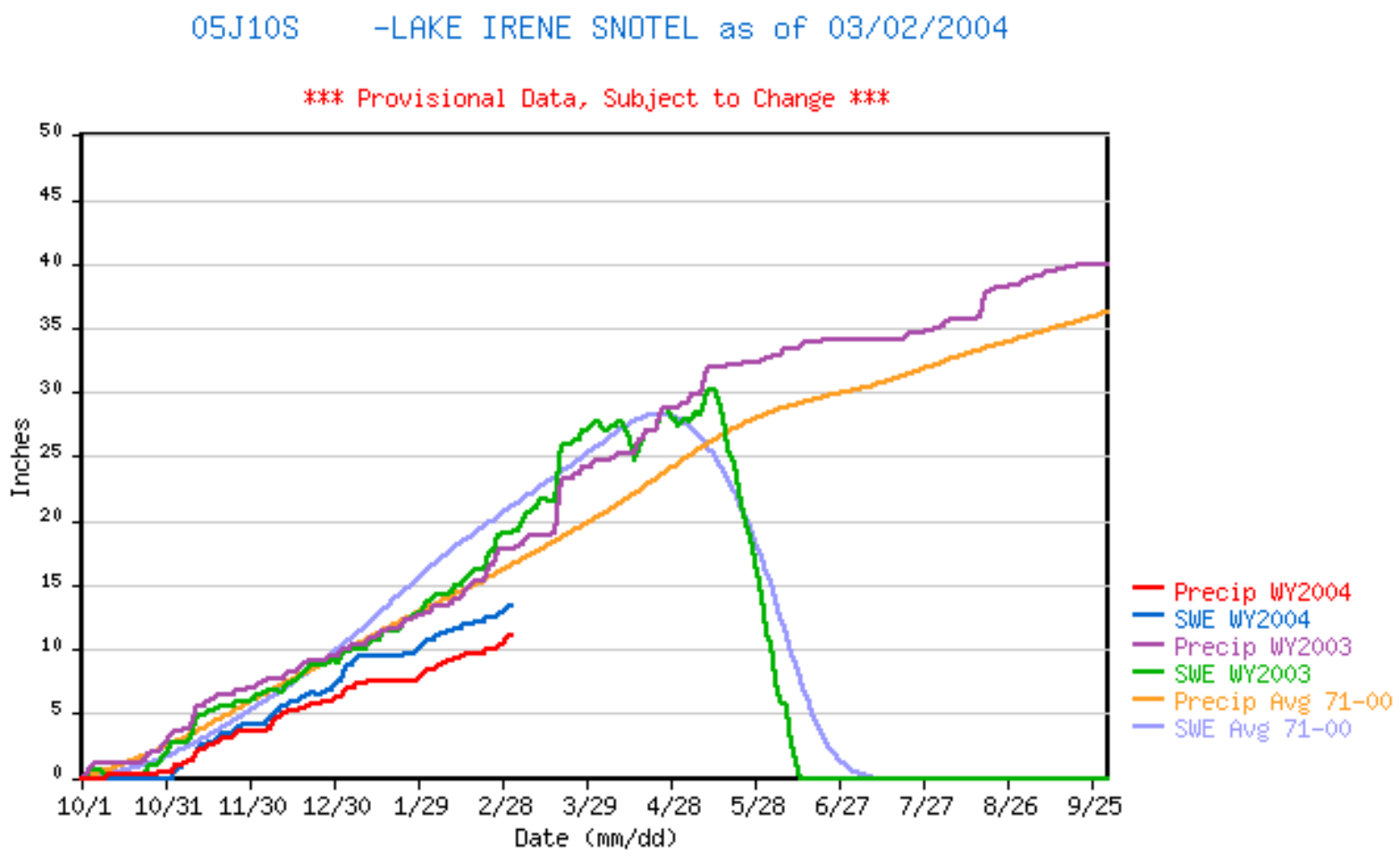


Monthly Average Pan Evaporation

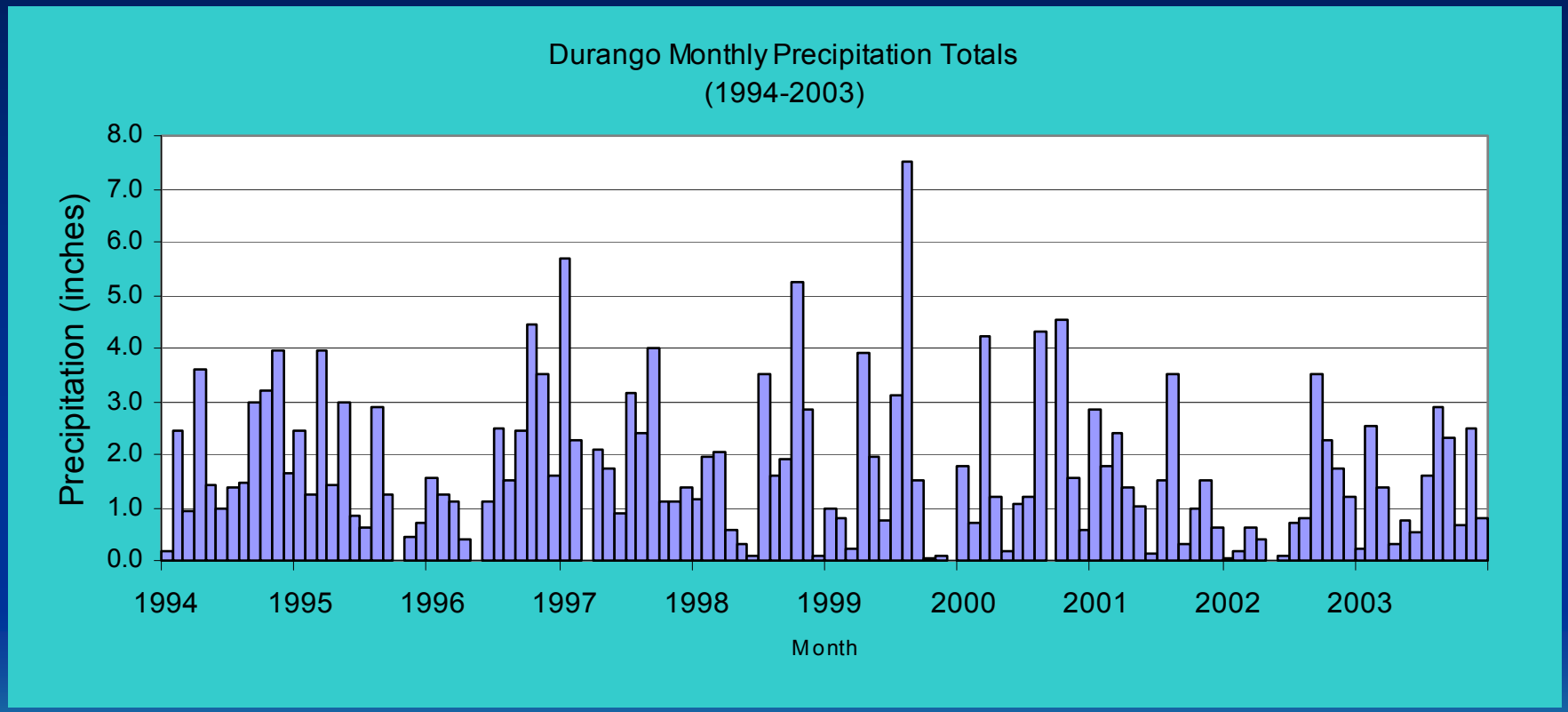


And, then the Daddy of them all – PRECIPITATION!

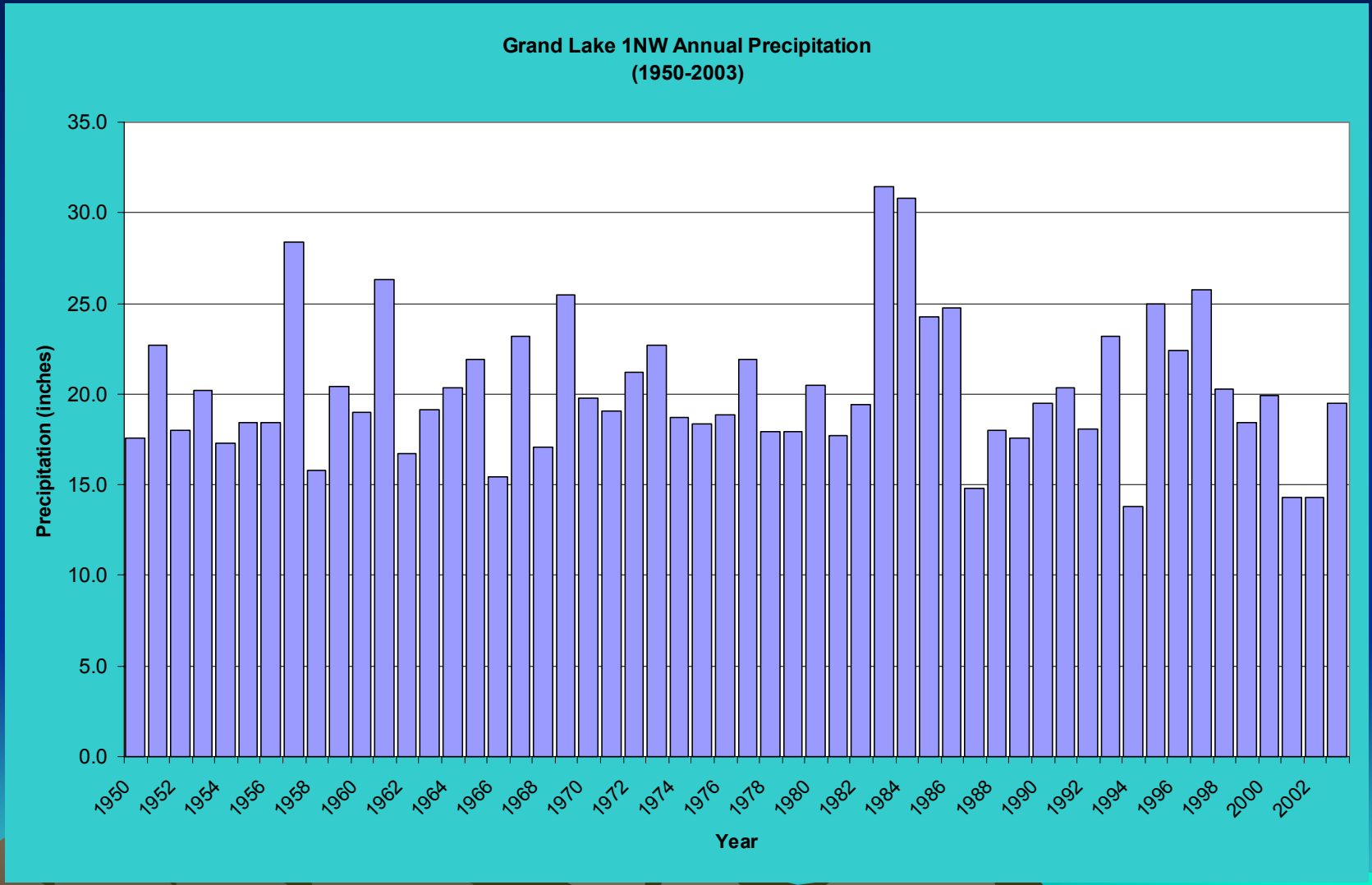
SNOTEL Accumulated Precipitation



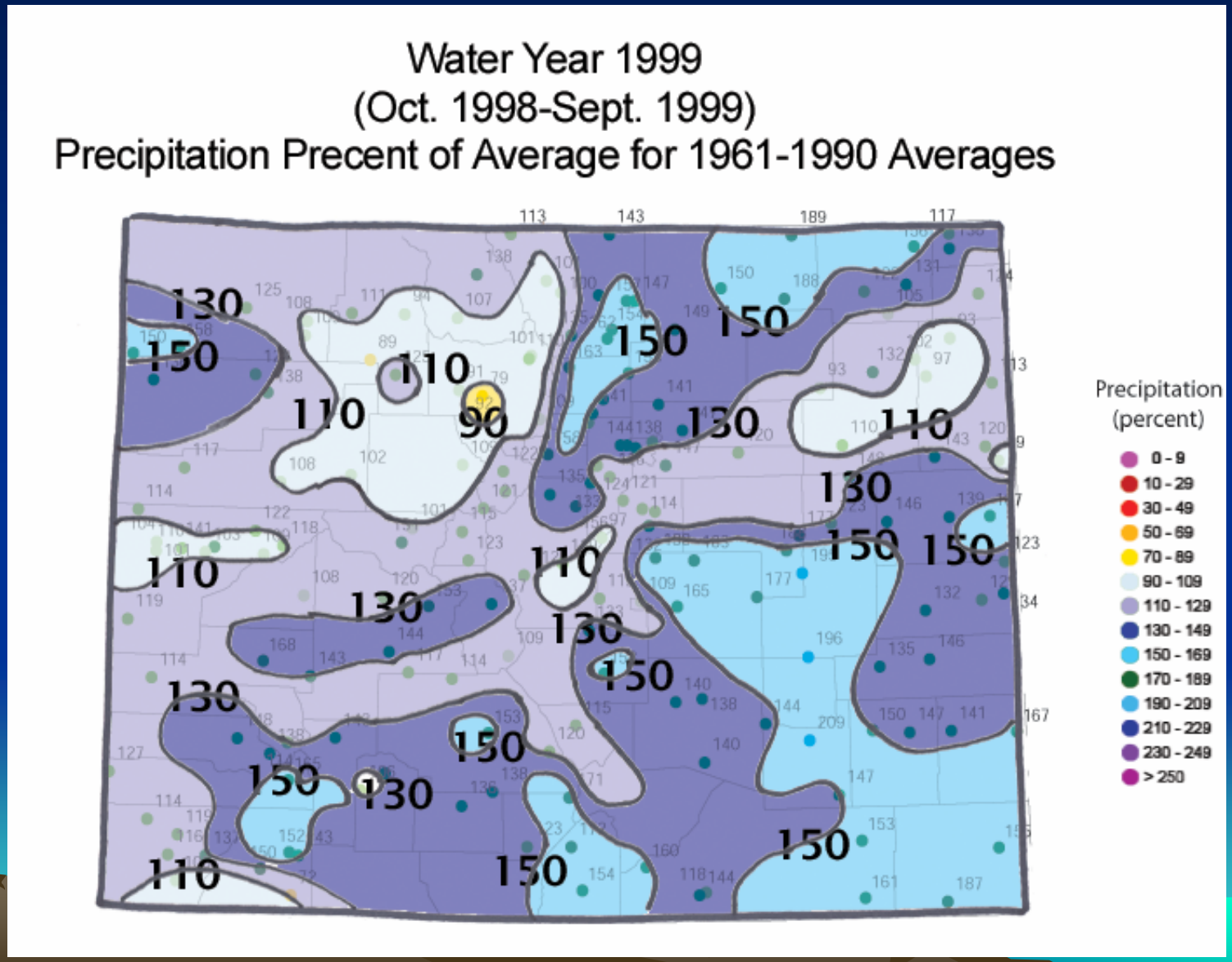
Monthly Precipitation



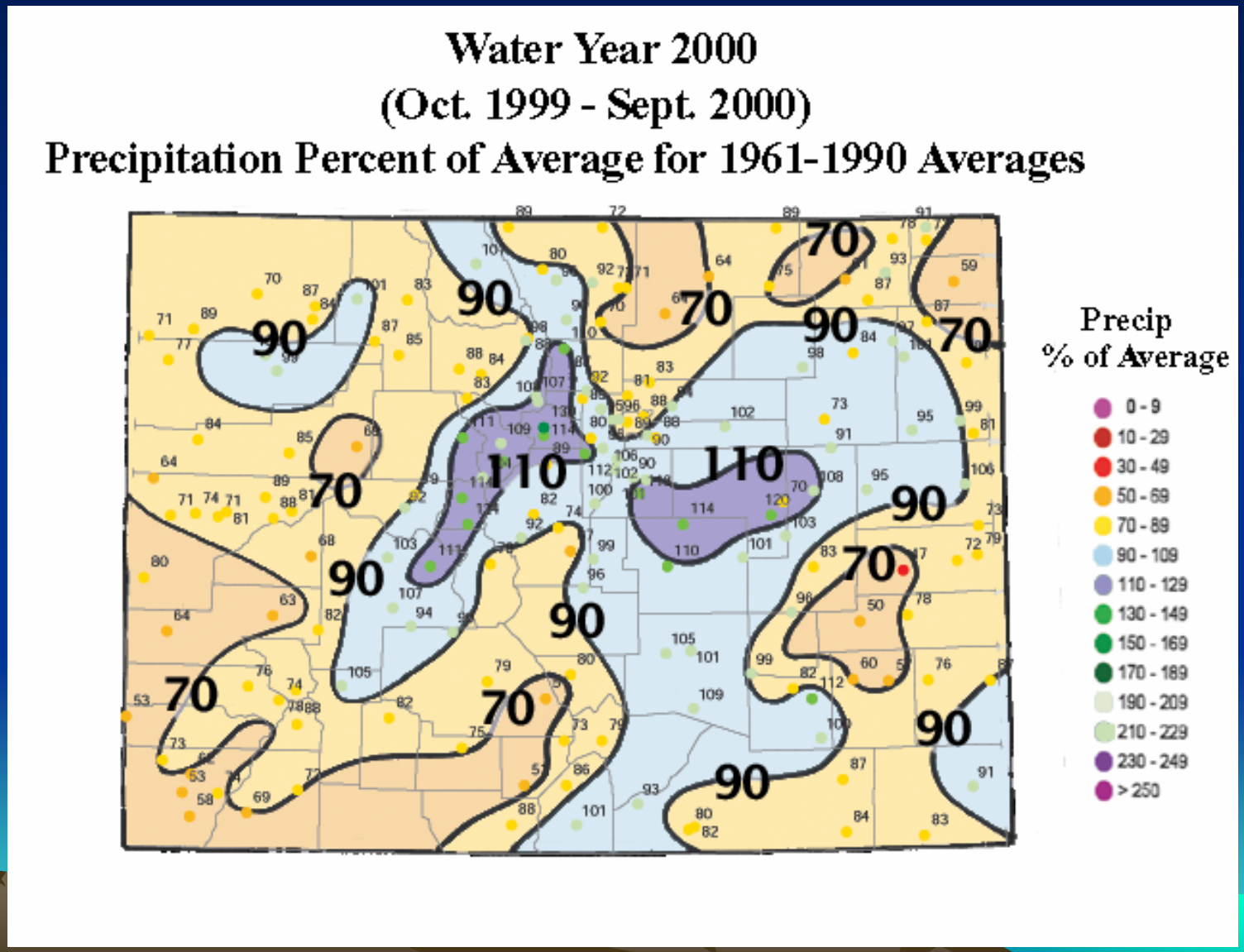
Annual Precipitation



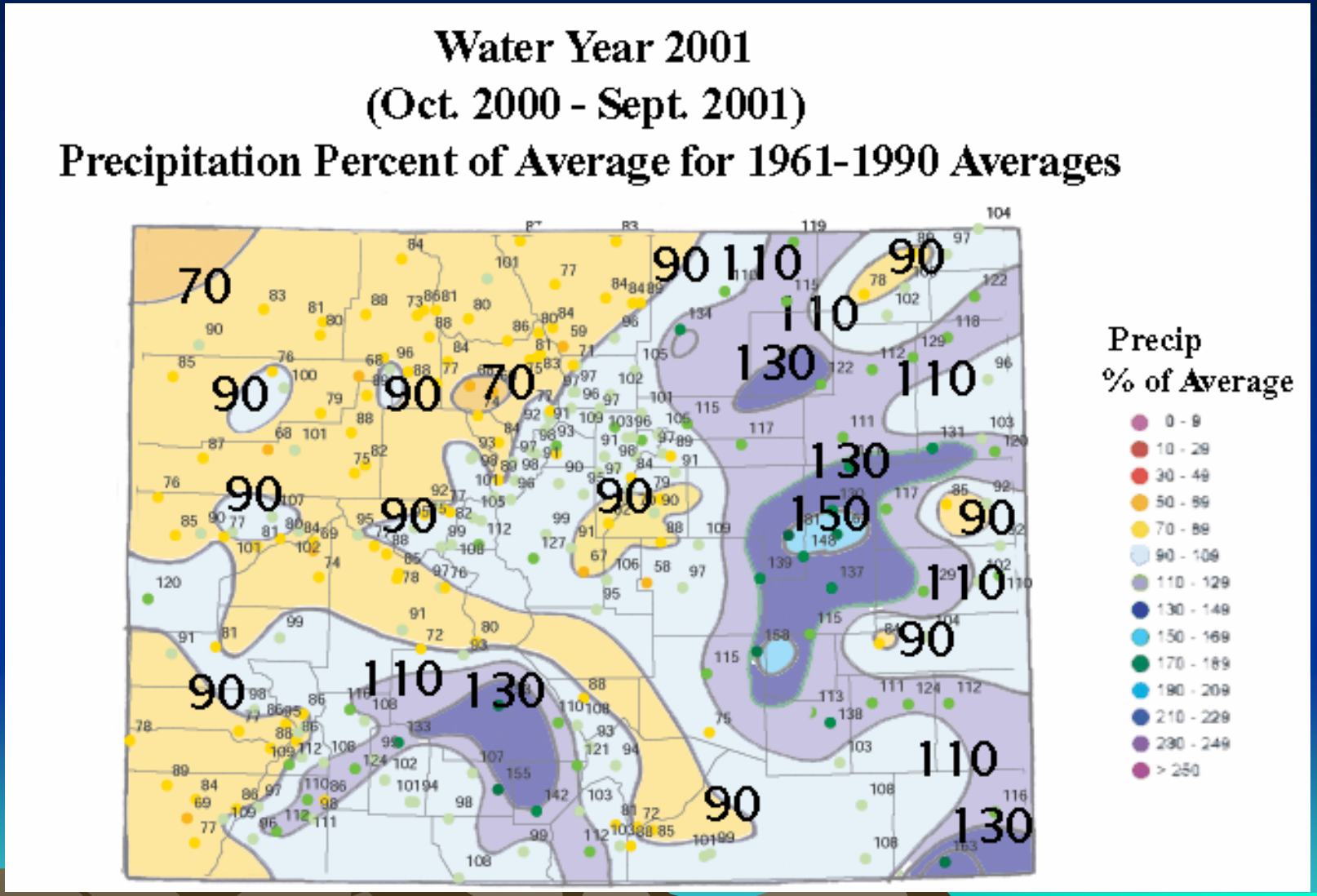
1999 Water Year Precipitation



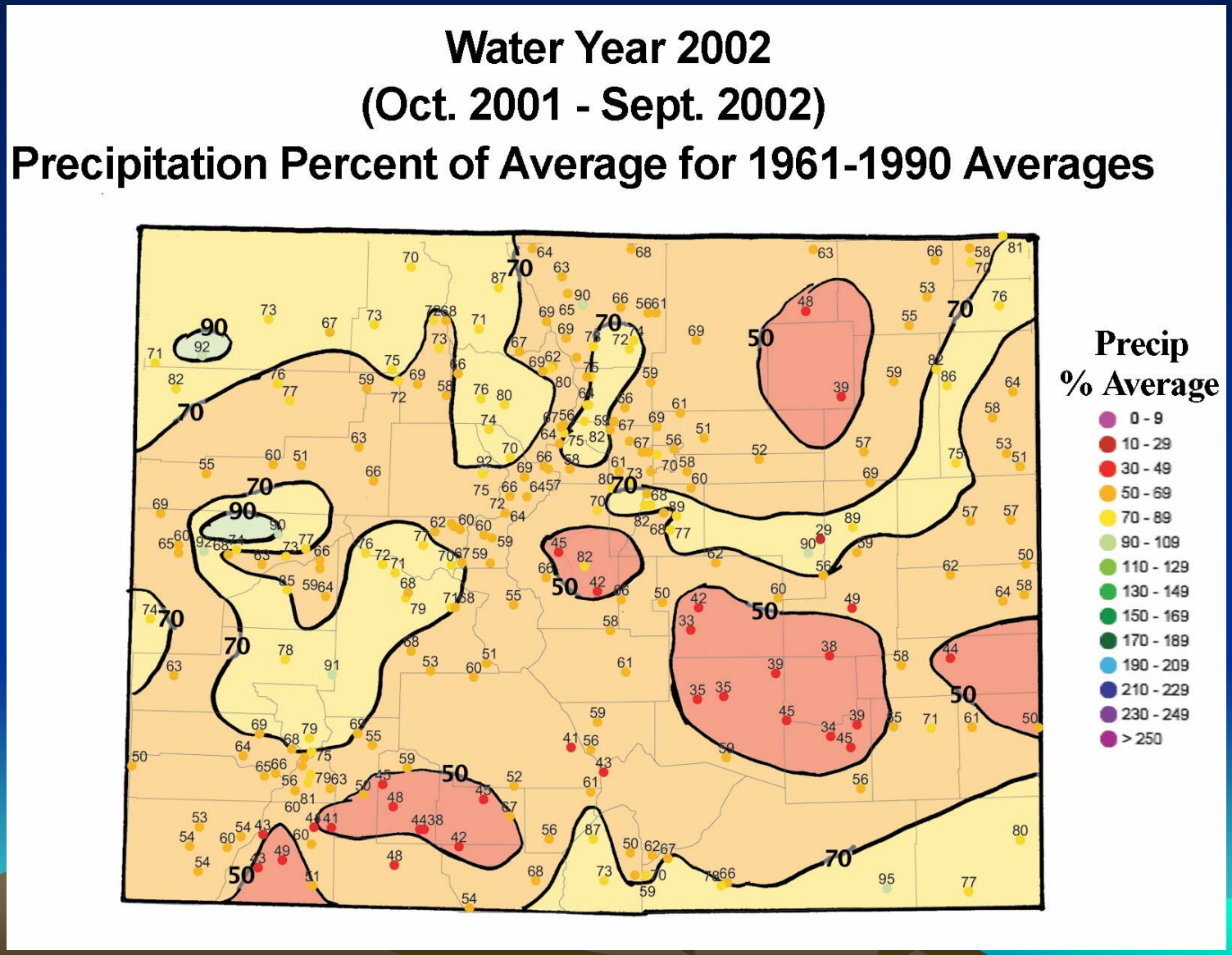
2000 Water Year Precipitation



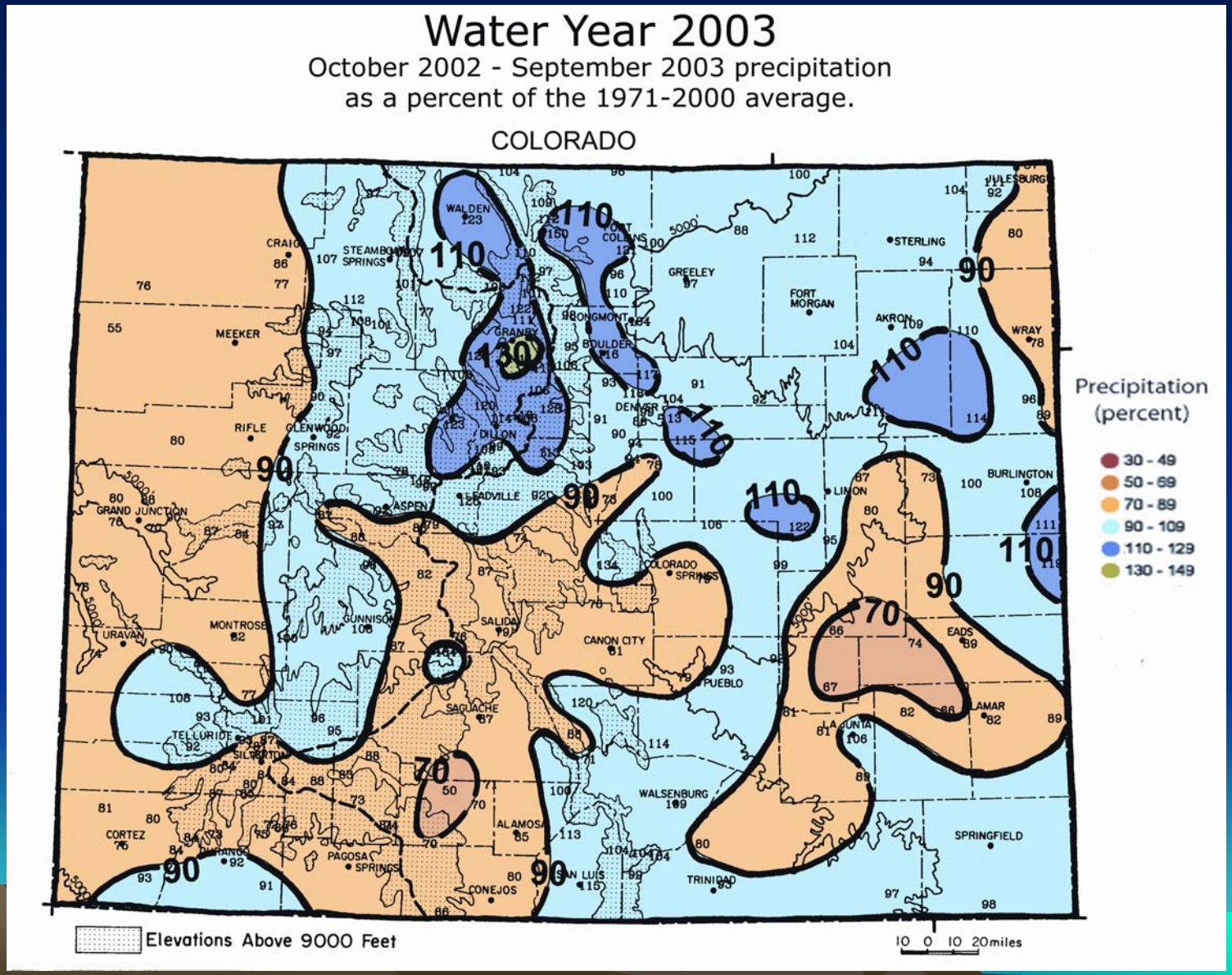
2001 Water Year Precipitation



2002 Water Year Precipitation

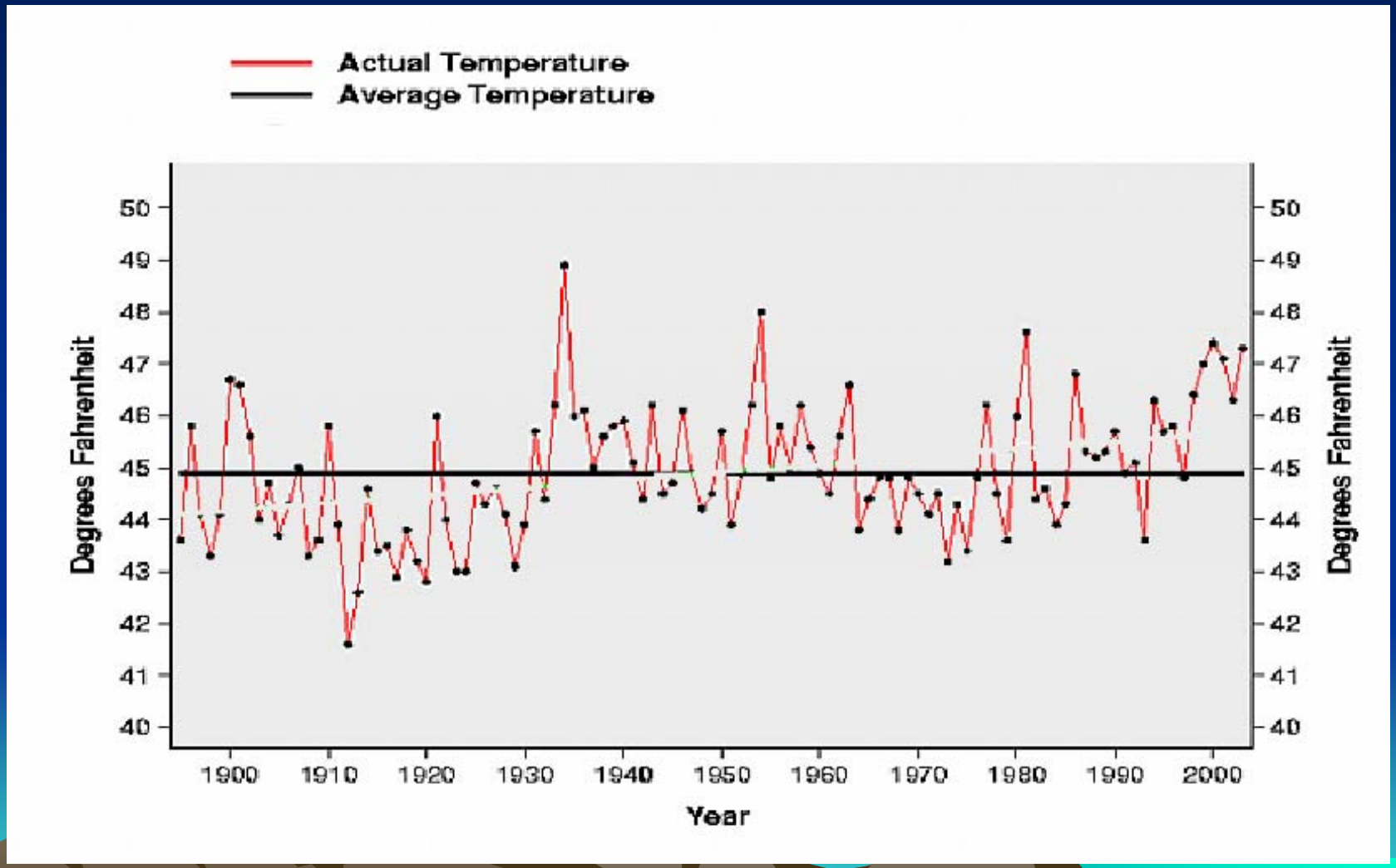


2003 Water Year Precipitation

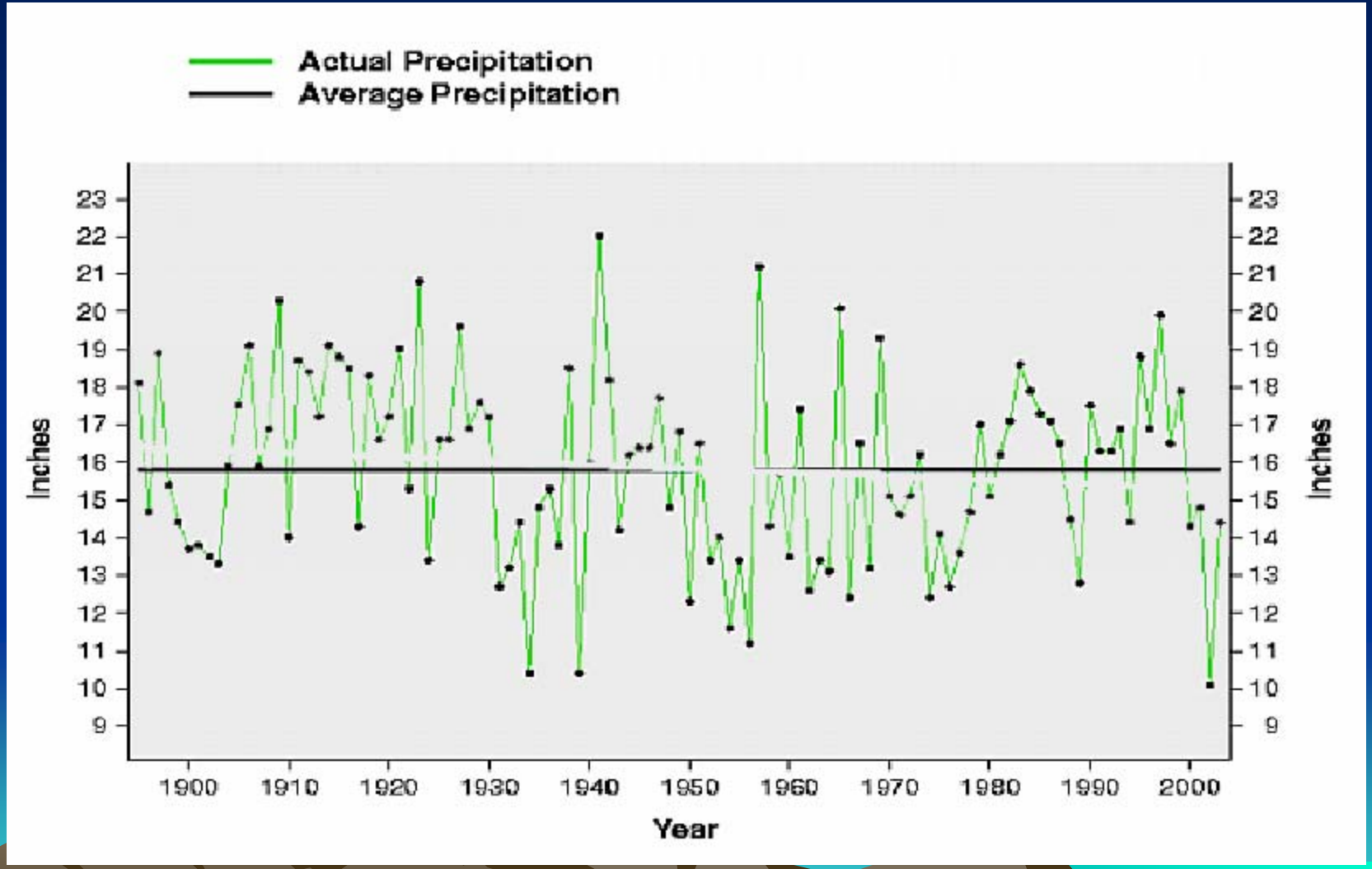


So, where is our climate headed?

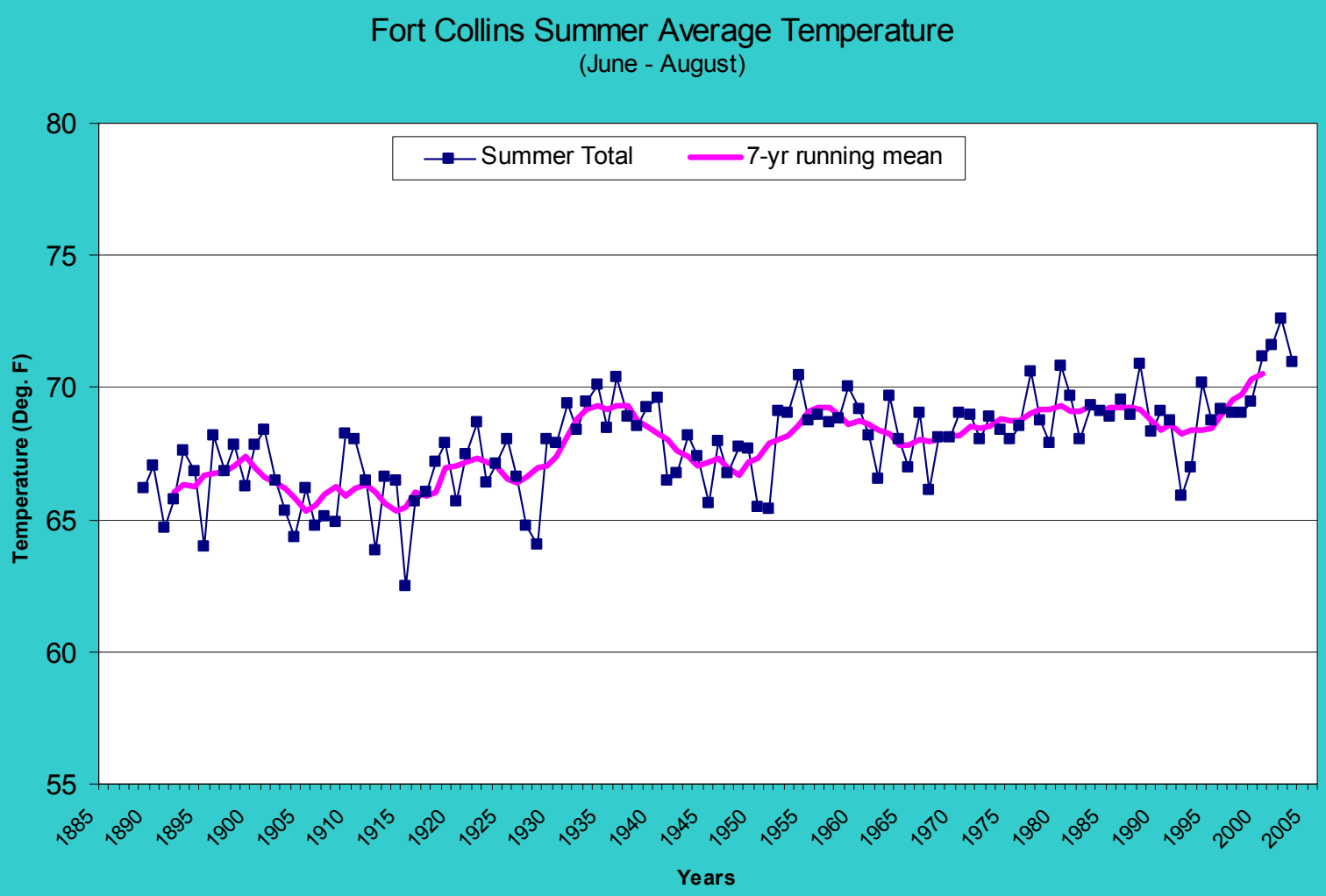
Colorado Annual temperatures



Colorado Annual Precipitation

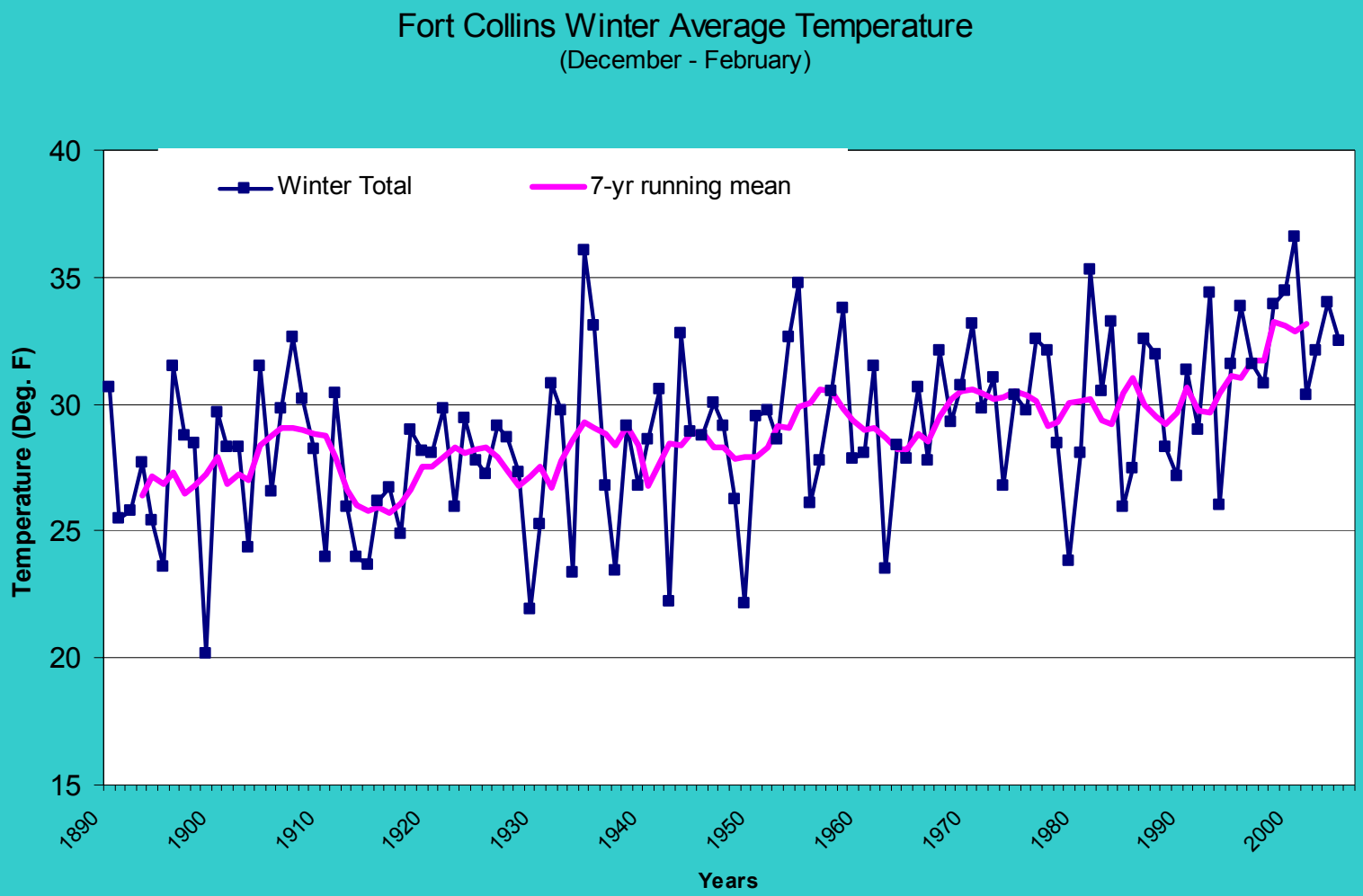


Fort Collins Summer Temperatures



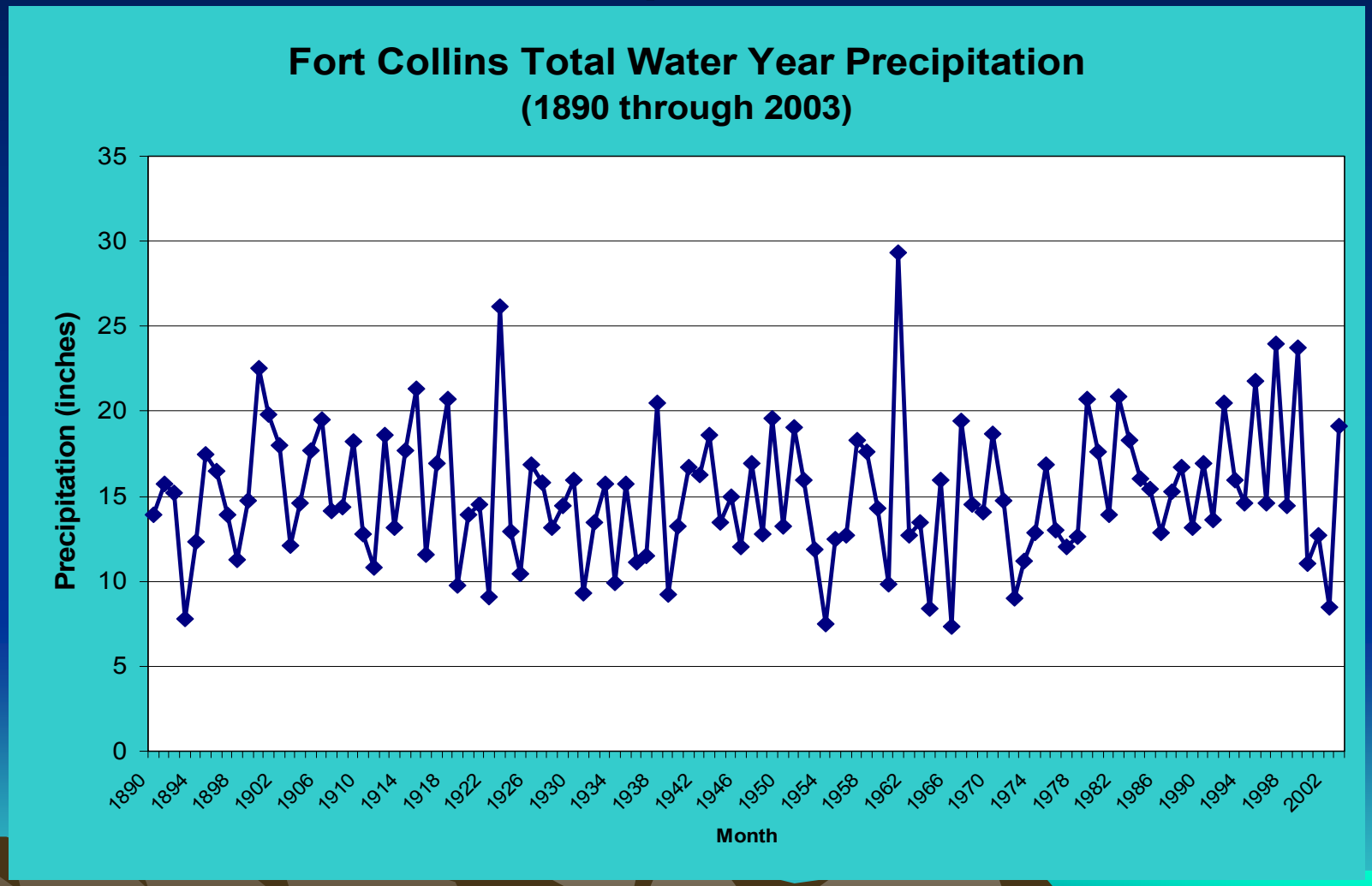
25 deg scale

Fort Collins Winter Temperature

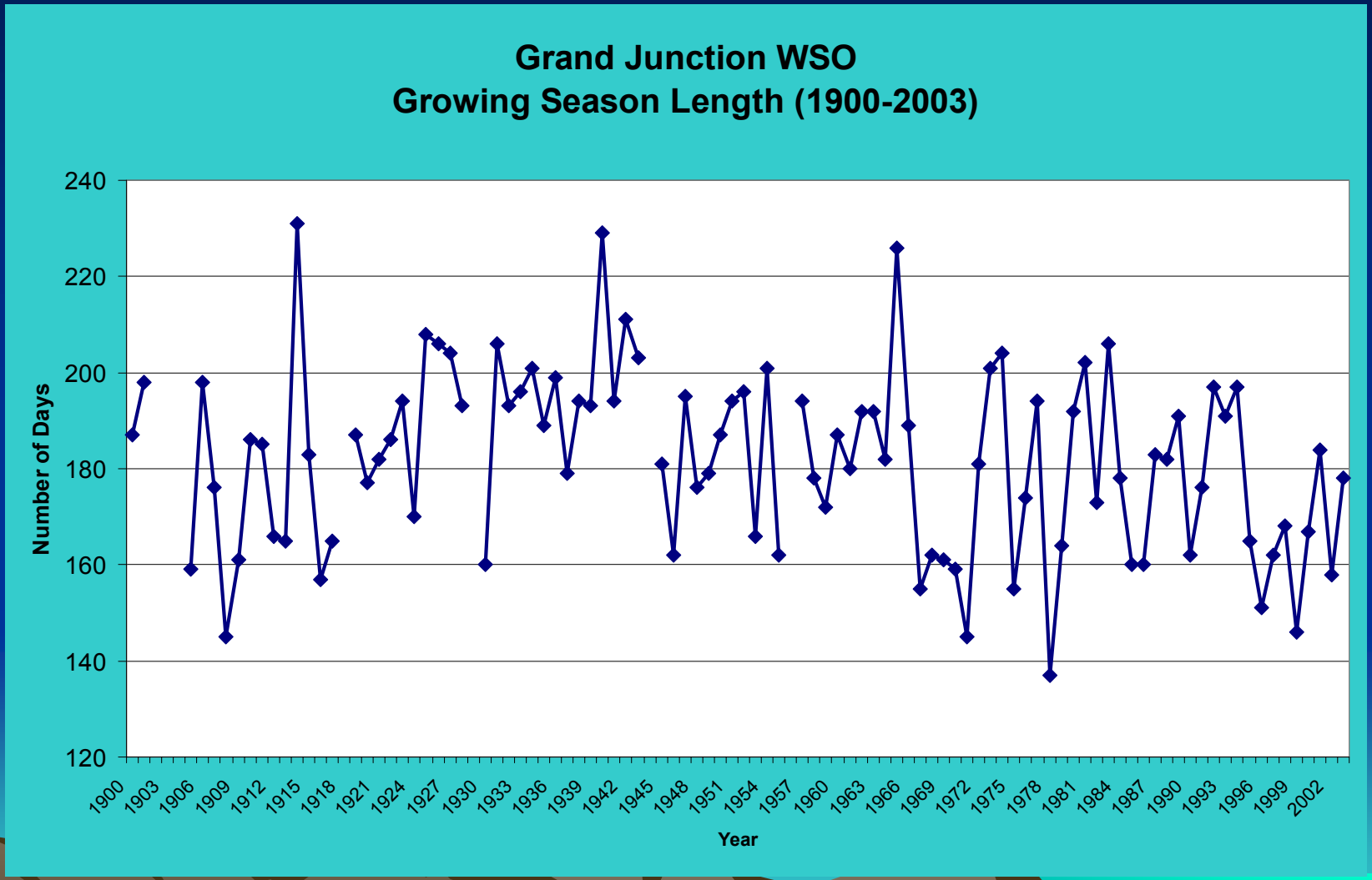


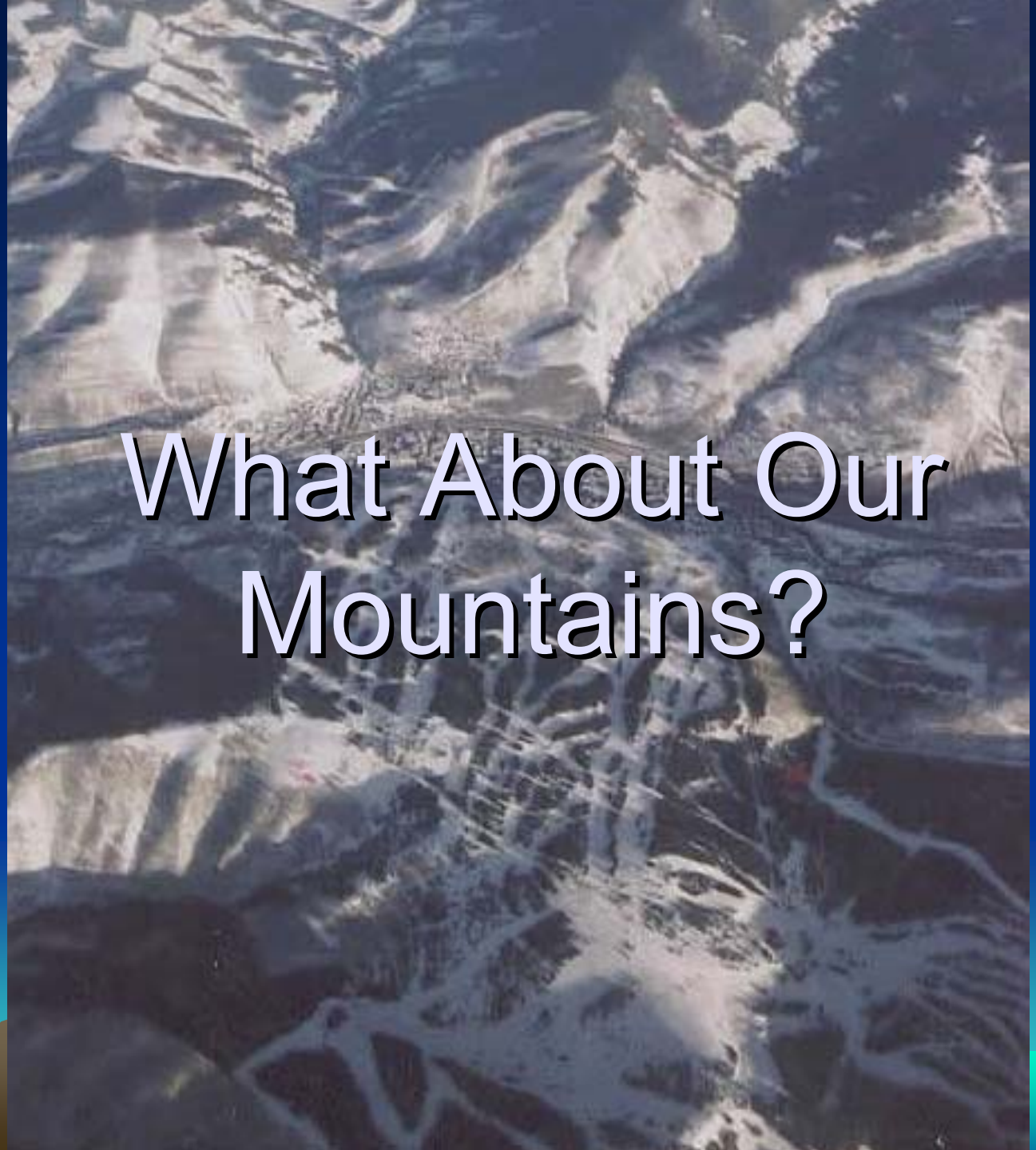
Use 25 deg scale

Fort Collins Water Year Precipitation



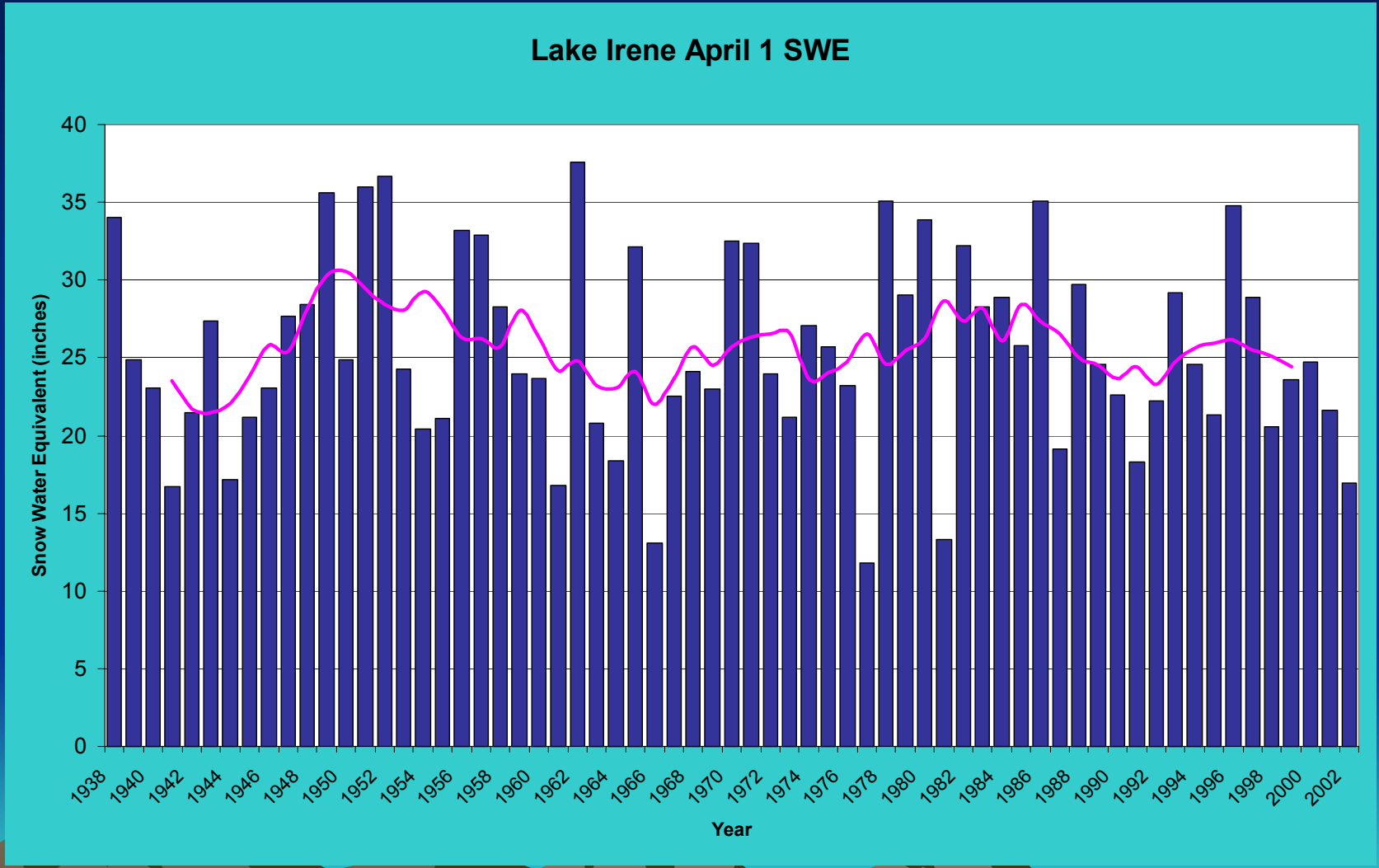
Grand Junction Growing Season





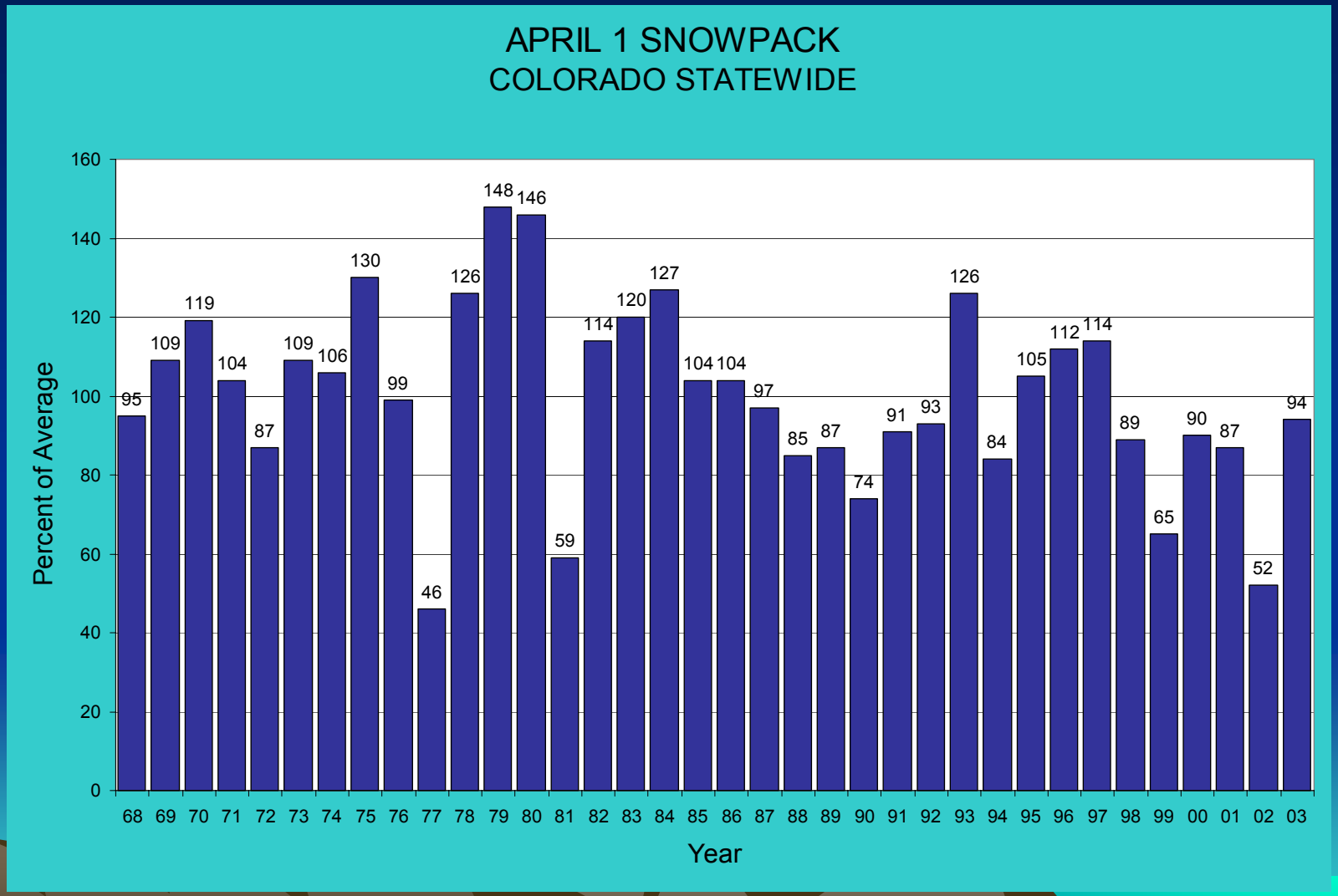
What About Our Mountains?

Lake Irene April 1 SWE



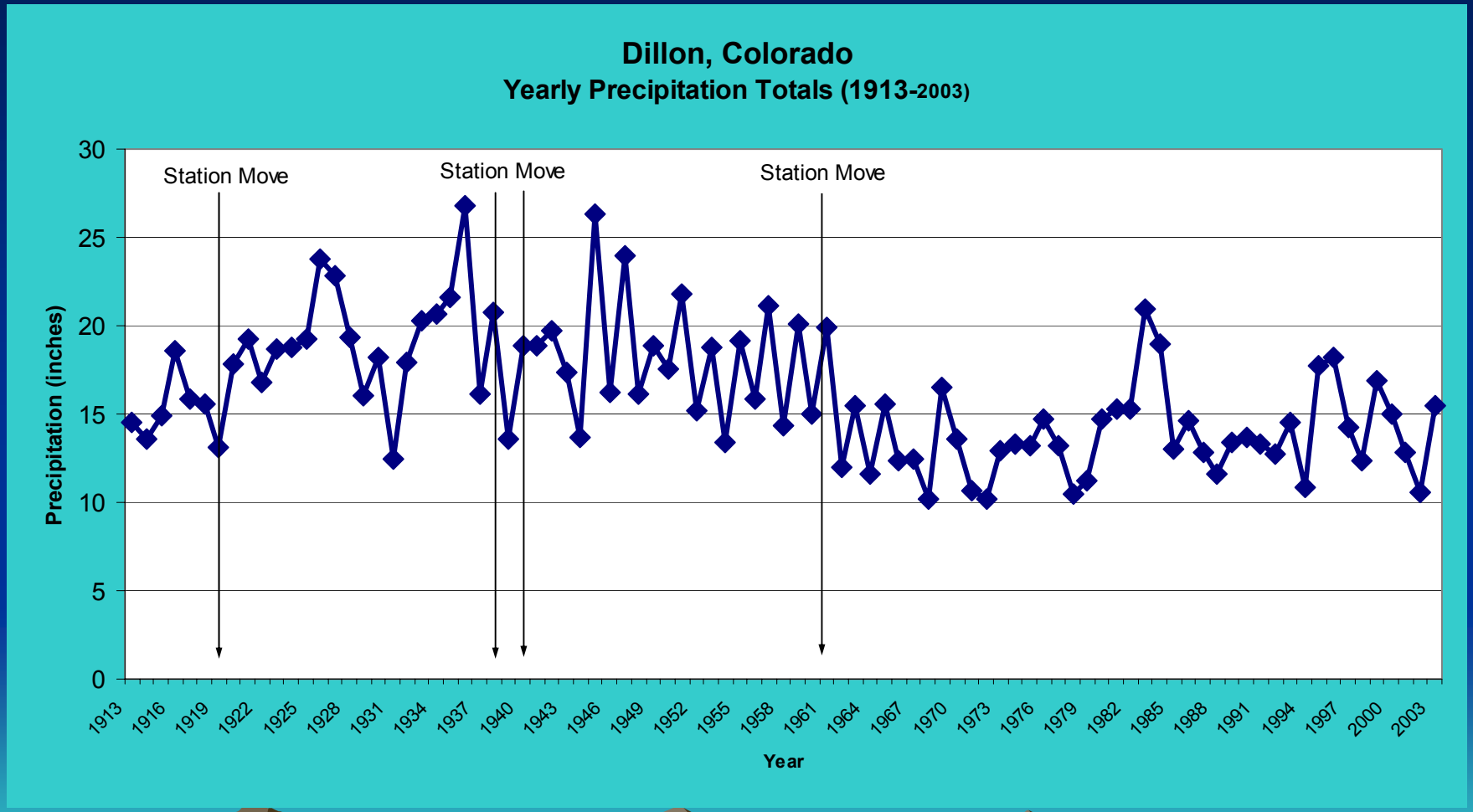
http://www.co.nrcs.usda.gov/snow/data/historic.html

April 1 Statewide SWE

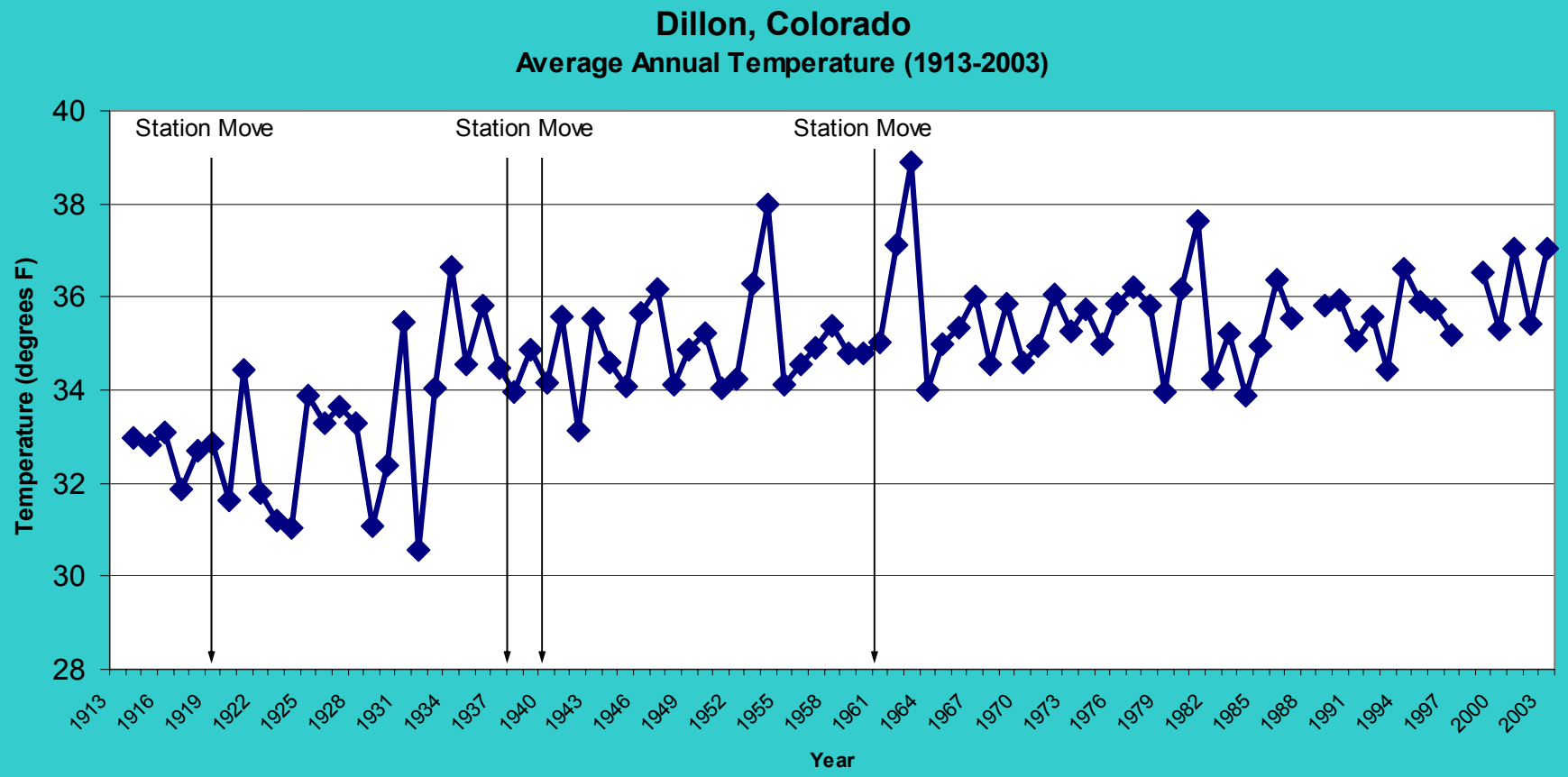


Data provided by the NRCS, Snow Survey Division.

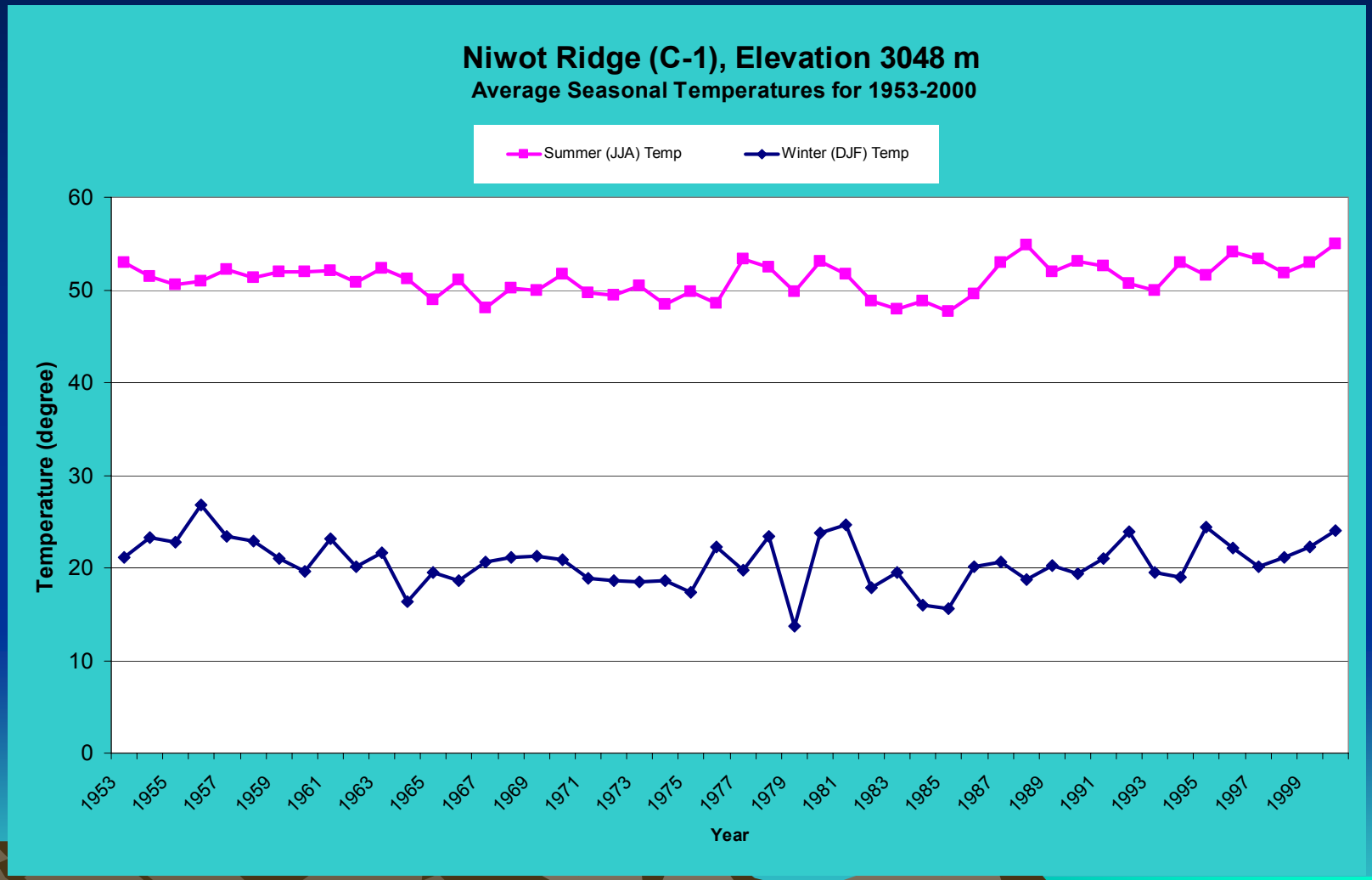
Dillon Precipitation History



Dillon Annual Temperatures

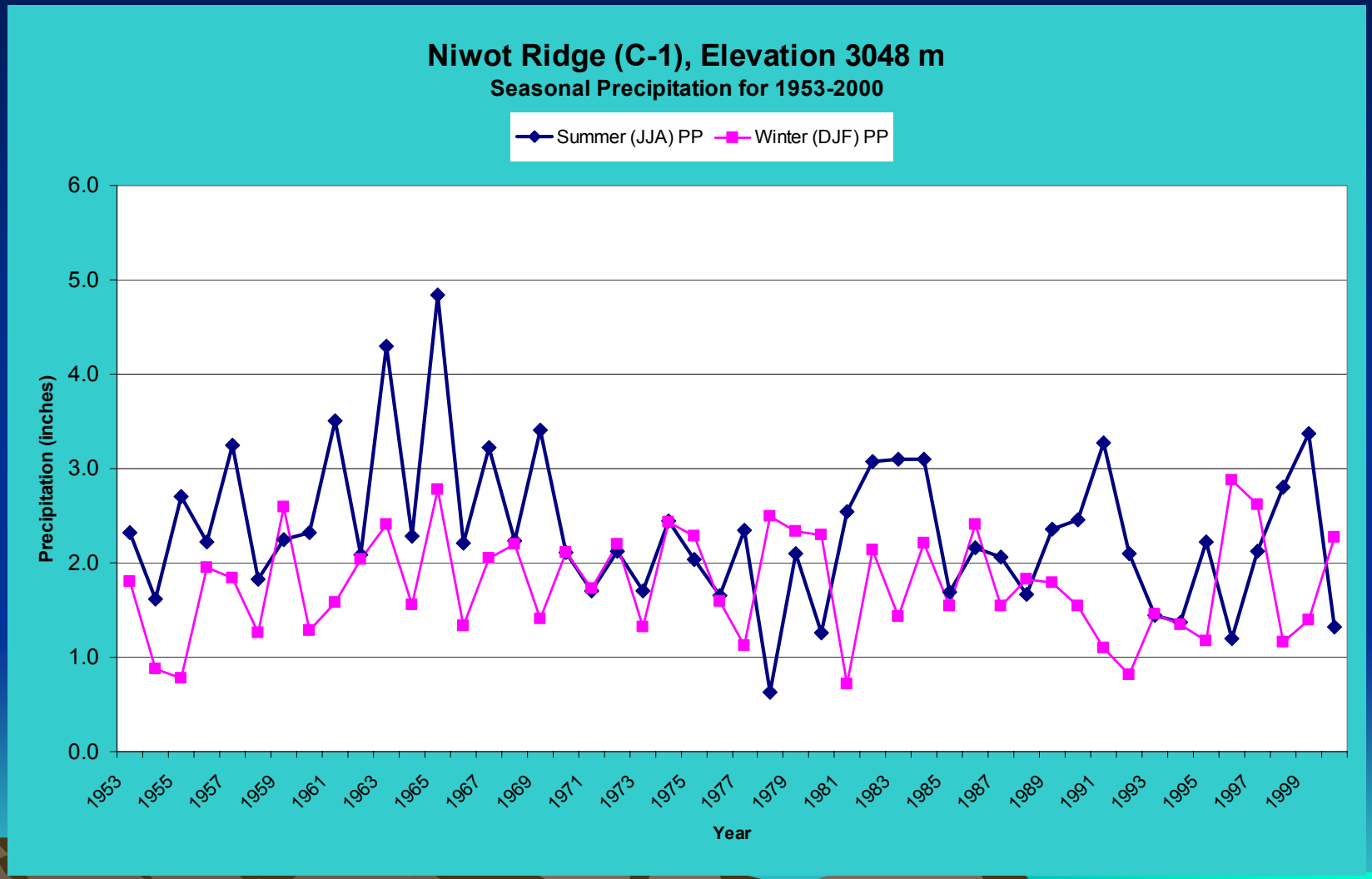


Niwot Ridge Temperature History



Data from http://culter.colorado.edu/Niwot/Niwot_Ridge_LTER_climate.html

Niwot Ridge Precipitation History



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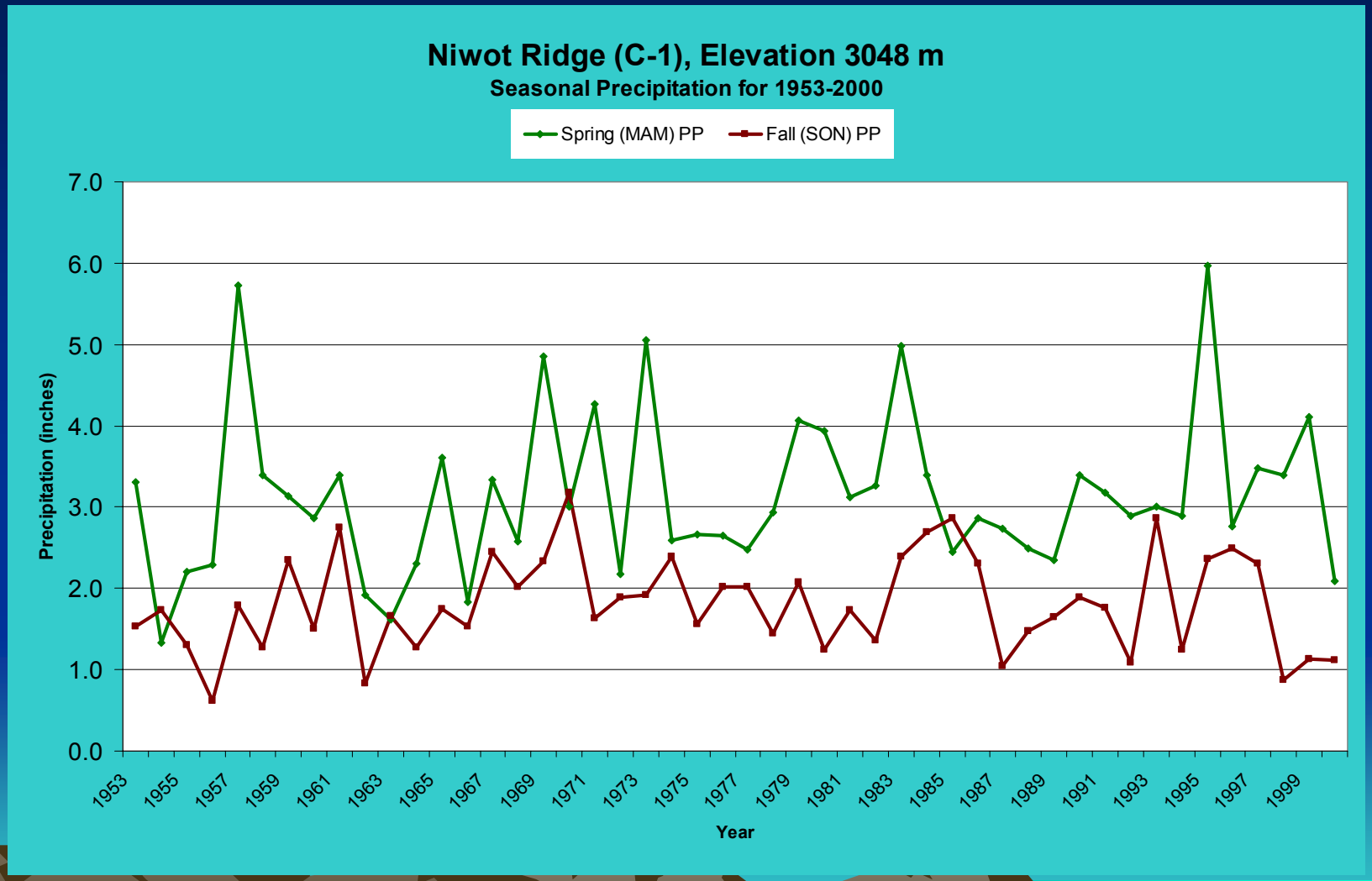
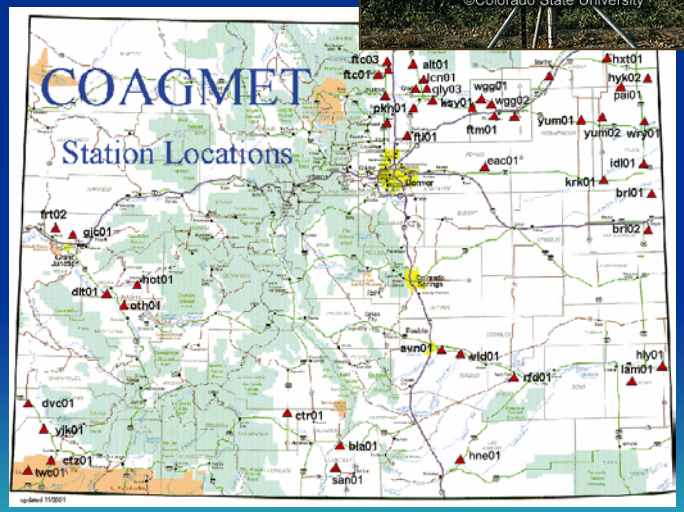
Niwot Ridge Precipitation History



Data from http://culter.colorado.edu/Niwot/Niwot_Ridge_LTER_climate.html

CoAgMet
Weather Data for Agriculture

- *Automated weather stations with daily and hourly readings of:*
  - *Temperature*
  - *Humidity*
  - *Wind*
  - *Precipitation*
  - *Solar energy*
  - *Evapotranspiration*



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CoCo RaHS

Community Collaborative Rain and Hail Study

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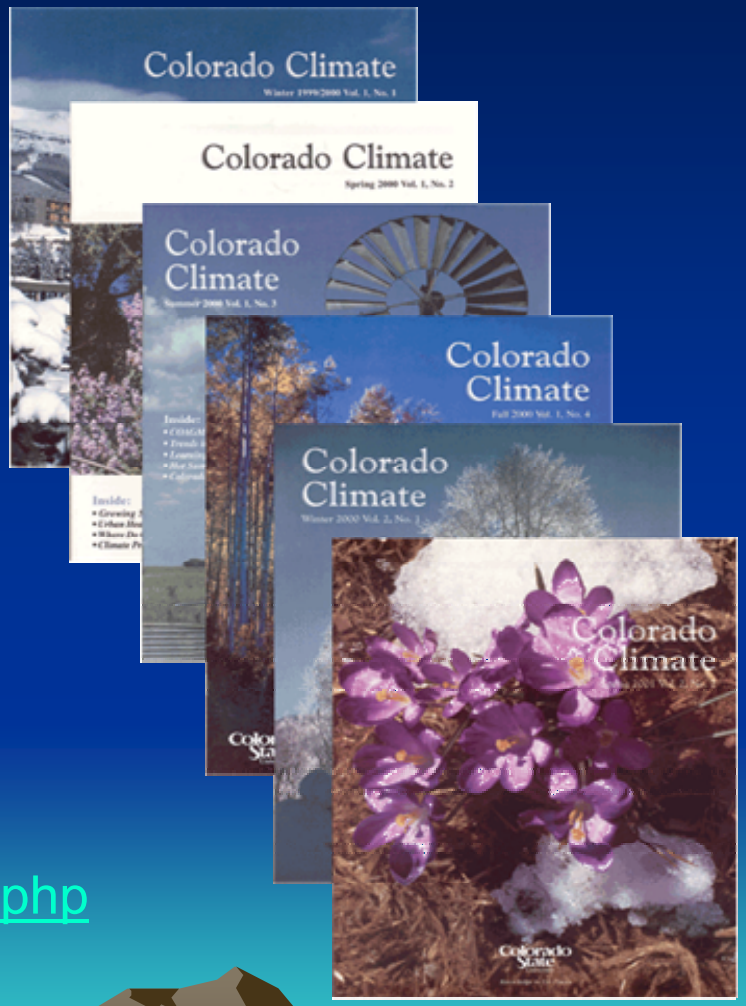
http://www.cocorahs.org

Sponsored in part by National Science Foundation

Colorado Climate Magazine

- *Good bedtime reading about the climate of Colorado -- recent and historic*
- *$15/year subscription pays printing and mailing costs*



http://ccc.atmos.colostate.edu/magazine.php

Colorado Climate Center
Colorado State University

- *Data and Power Point Presentations available for downloading*

- http://ccc.atmos.colostate.edu

  click on "Drought"

  then click on "Presentations"