CoCoRaHS

GUIDE

CoCoRaHS

Community Collaborative Rain, Hail & Snow Network

Climate Resources for Master Gardeners

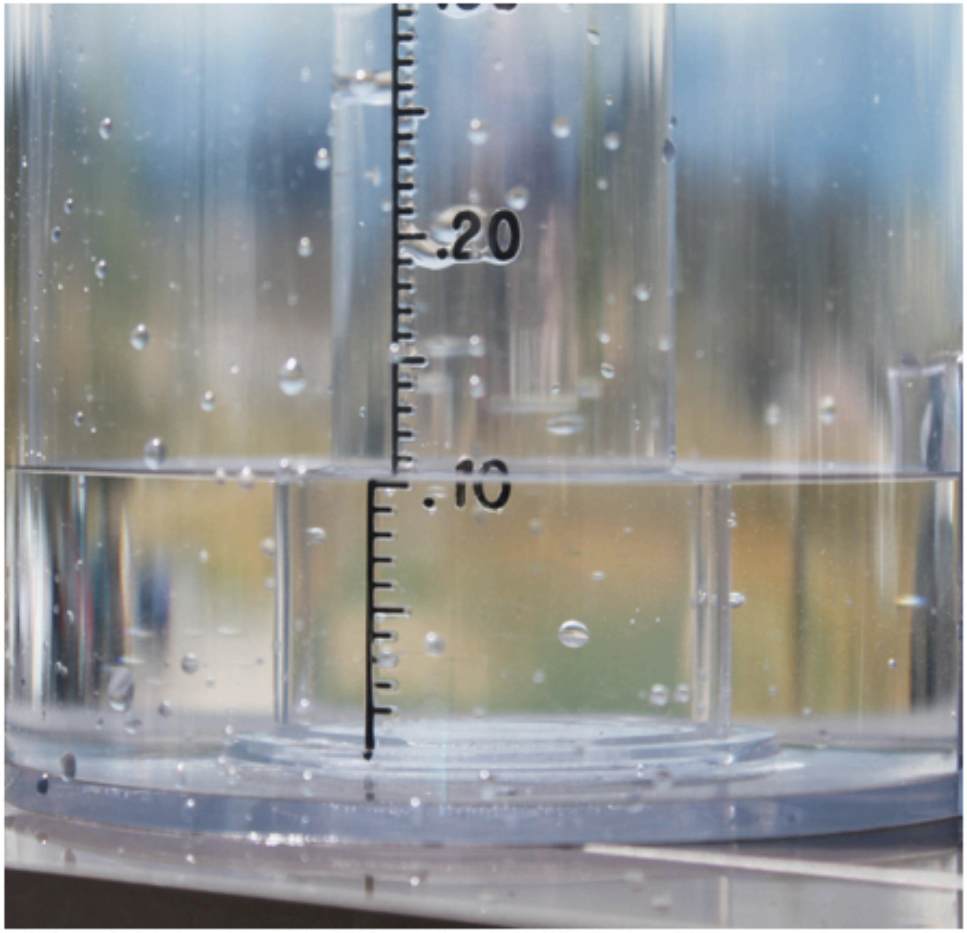
Version 1.4

Welcome

This guide is brought to you by CoCoRaHS and NOAA's Office of Education.

"Thousands of volunteers across the nation, measuring precipitation right in their own backyards!"

CoCoRaHS



rain

Hail

snow

"Precipitation measurements in your own backyard!"

CoCoRaHS: Who are we?

CoCoRaHS: Rainfall data for all

CoCoRaHS is the Community Collaborative Rain, Hail and Snow Network. It is a grassroots, non-profit network of volunteers of all ages who measure precipitation right in their own backyards! CoCoRaHS has observers in all fifty states.

Many gardeners are involved in CoCoRaHS all across the country. Knowing how much precipitation falls on your lawn and garden is always helpful.

CoCoRaHS started at Colorado State University in 1998. Master Gardeners make use of CoCoRaHS rainfall data and help introduce new gardeners to the network.

More on CoCoRaHS at the end of this presentation

Current and past CoCoRaHS volunteer precipitation observations are posted daily on the Web and freely available to the public at www.cocorahs.org

Date	Time	Station Number	Station Name	Total Precip .ins
5/19/2011	6:40 AM	MO-BS-1	Rich Hill 4.9 SE	3.25
5/19/2011	7:40 AM	MO-VR-3	Nevada 3.4 NE	2.59
5/19/2011	7:00 AM	MO-CD-5	El Dorado Springs 0.6 NNW	2.57
5/19/2011	8:55 AM	MO-HC-9	Flemington 7.4 ENE	2.54
5/19/2011	9:30 AM	MO-CD-14	El Dorado Springs 0.9 SSW	2.51
5/19/2011	7:00 AM	MO-CD-2	Stockton 2.5 NNE	2.44
5/19/2011	7:00 AM	MO-CD-10	El Dorado Springs 0.9 SSW	2.15
5/19/2011	7:40 AM	MO-HC-6	Wheatland 5.0 SE	1.93
5/19/2011	7:00 AM	MO-PL-13	Bolivar 9.0 N	1.80
5/19/2011	7:30 AM	MO-PL-14	Dunnegan 2.4 NNW	1.78

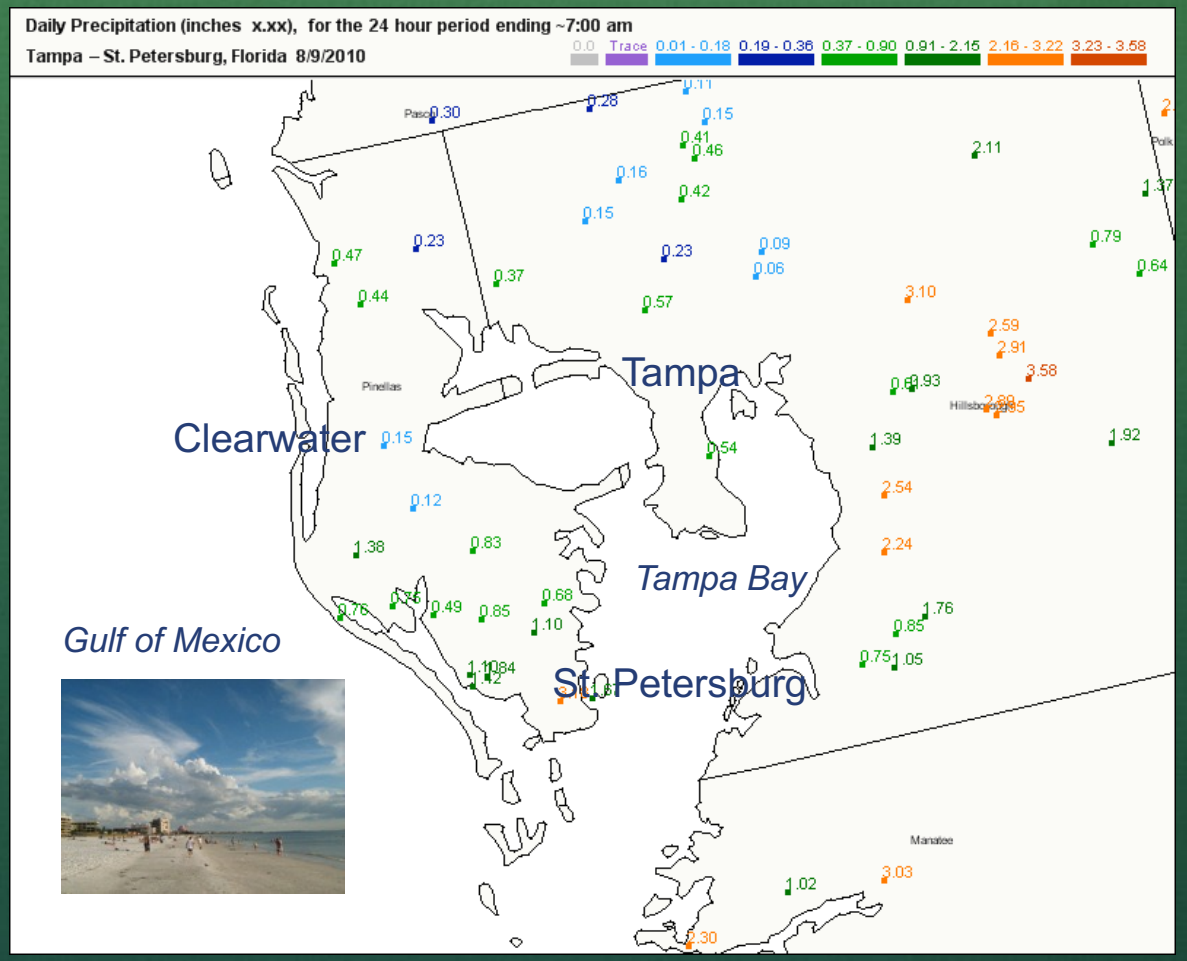


Table of Contents

This climate guide introduces elements of climate important to gardeners. An overview of natural climate patterns and differences are shown. Links to local climate information are provided.

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8. Climate Resources
9. Climate Change
10. CoCoRaHS: An opportunity for gardeners

Section One: Introduction - Climate and Gardening

CLIMATE

arid

Marine

tropical

"I like the climate . . . it suits my garden well"

An Amazing and Diverse Climate

- The U.S. Climate consists of deserts, rainforests, semi-arid grassland, tropics, and everything in between.
- Climate differences result in diverse vegetation across the country . . . Pineapples grow well in Hawaii, but what about on Cape Cod? Copious amounts of rain produce giant spruce trees on Washington's Olympic Peninsula, while Yucca plants send down deep roots in New Mexico's deserts in search of water.
- Tomatoes begin to ripen on the vine in South Carolina at the same time it is finally safe to plant them without the threat of frost in the Rockies.

"What we grow in our gardens across the country and what insects, weeds and diseases our gardens encounter all depend on your specific climate"

What Controls our Climate?

There are four primary factors that control and define climate at any location:

1. Latitude
2. Elevation
3. Proximity to Oceans or Large Lakes
4. Topography

Latitude

Twenty Seven degrees north

45N

Polar Regions
Mid-Latidutes
Tropics

The equator is 0º and the poles are 90ºN and 90ºS respectively. Most of the land surface of the earth is in the Northern Hemisphere while most of the Southern Hemisphere is covered by Oceans.

Latitude controls sun angle and day length -- both very important factors for gardeners. In the absence of other variables, temperatures are hottest and most consistent near the equator and cool as you go towards the poles. Seasonal cycles become larger and larger as you move towards the poles.

Most of the United States lies in what we call the "Mid Latitudes" approximately half way between the North Pole and the Equator. This is a zone where seasonal cycles are very obvious every year. Winters are cold and most plants go dormant, but summers are hot. The mid latitudes are also known for frequent clashes of air masses from the warm tropics and the cold polar regions. This is especially true over the middle of the continent far from the moderating effect of oceans.

Elevation

5,280 ft above sea level

SEA Level

Pikes Peak
Key West
Death Valley

Temperatures generally cool and precipitation often increases as you go up in elevation. Very large climate differences occur over very short distances thanks to changes in elevation.

Proximity to Oceans and Large Lakes

The Gulf of Mexico

Lakes

Oceans

Puget Sound
Sebago Lake
Hilo Bay

Oceans and large lakes increase the humidity of the air and provide a moderating influence on temperature.

Topography

Rocky Mountains

HILL

Valley
Cliff
Slope

Subtle features in the local landscape such as valleys, ridges, depressions, slopes and the distance and direction from mountain ranges all work together to help shape the climate. Valleys and depressions may be hot during the day, but there may be frost pockets at night. Nearby hillsides may be cooler in the day, but milder at night.

Climate and Gardeners

Gardeners appreciate the benefits and challenges that climate presents. Many aspects of climate are important to plants and gardeners.

Micro-climates

Occurring naturally in many places

Nature provides remarkable local climate variations know as “Micro-Climates”

Example: Colorado’s orchards and vineyards can only grow well in a few specialized areas where wind and temperature are favorable.

Micro-climates

Gardeners creating their own micro-climates

- Gardeners can actually influence their own climate rather easily.
- Local factors like shading, slopes, proximity to buildings, sprinkler systems, etc. can have huge effects on influencing your backyard climate.

Section Two: Sunshine

Sunshine

sunny

Overcast

Pt. Cloudy

"Providing the power to grow our gardens"

Sunshine and Clouds

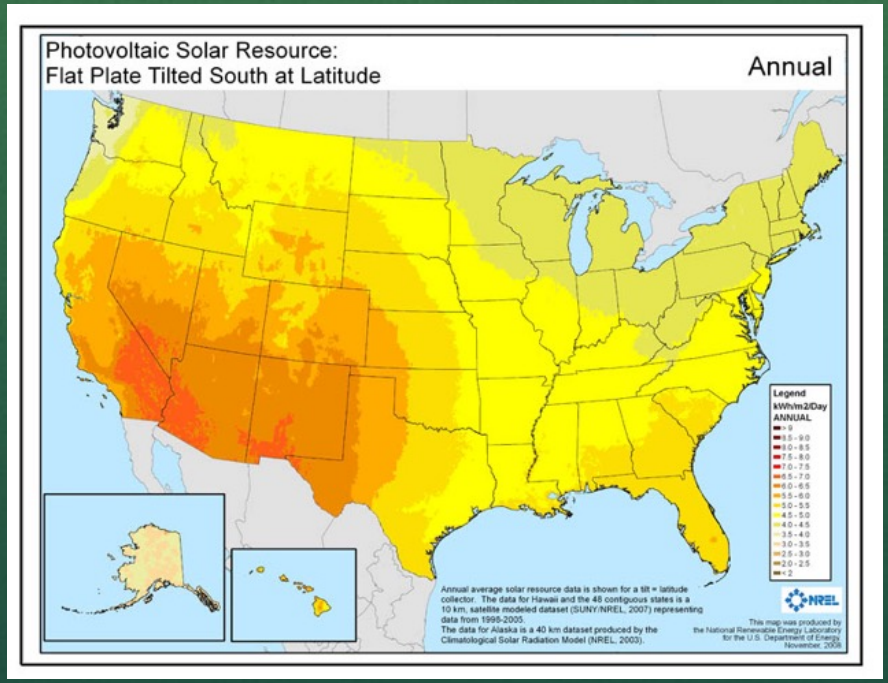
Sunshine provides the energy essential for photosynthesis and plant growth.

The cloudier the days are and the shorter the day length, the less energy plants receive to grow!

Paying attention to the amount of sunshine also gives an idea of watering needs of plants. The more sun, the more water loss to evapotranspiration.

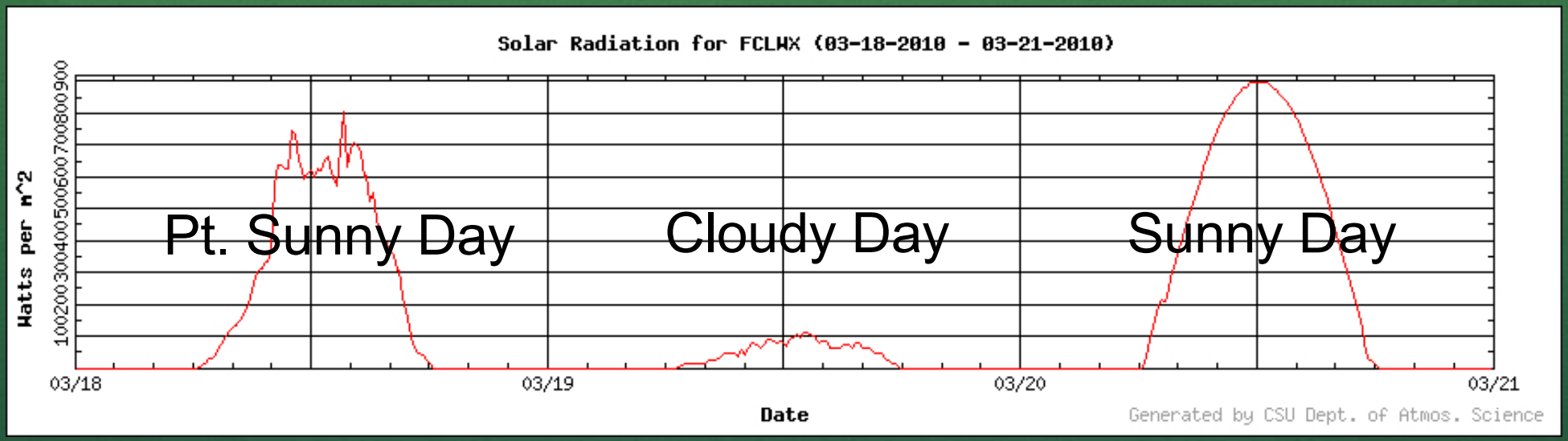
Annual Average Solar Radiation

Solar radiation is greatest in the Desert Southwest. It is least near the Great Lakes, over the Appalachian Mountains, as well as parts of New England and the Pacific Northwest



National Renewal Energy Laboratory: www.nrel.gov

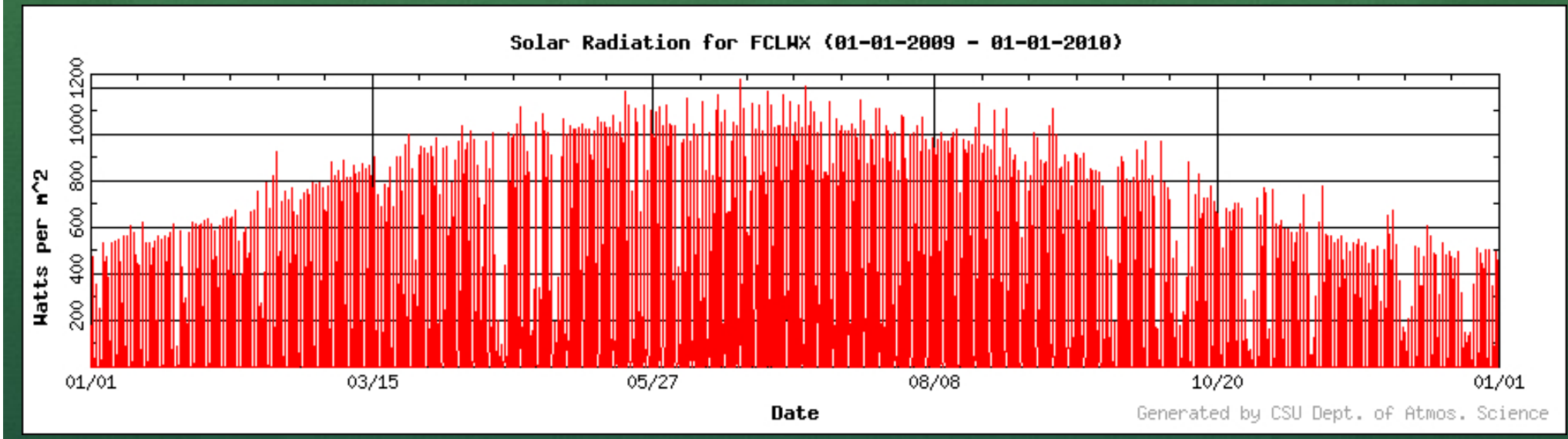
Daily Solar Radiation



The amount of daily solar radiation varies with the seasons and from day to day.

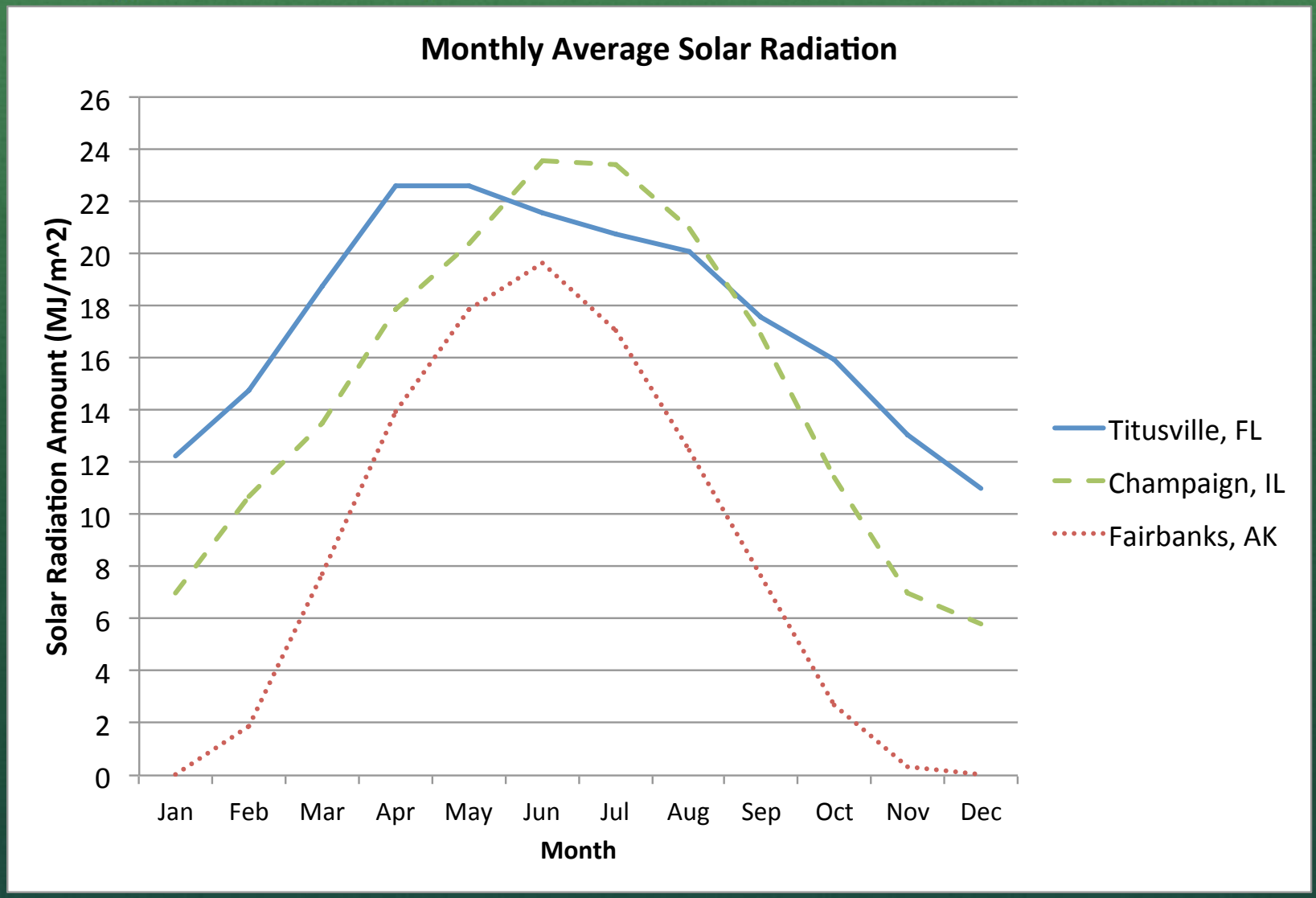
The above example shows a graph of three consecutive days with varying amounts of sunlight for Fort Collins, Colorado.

Annual Solar Radiation



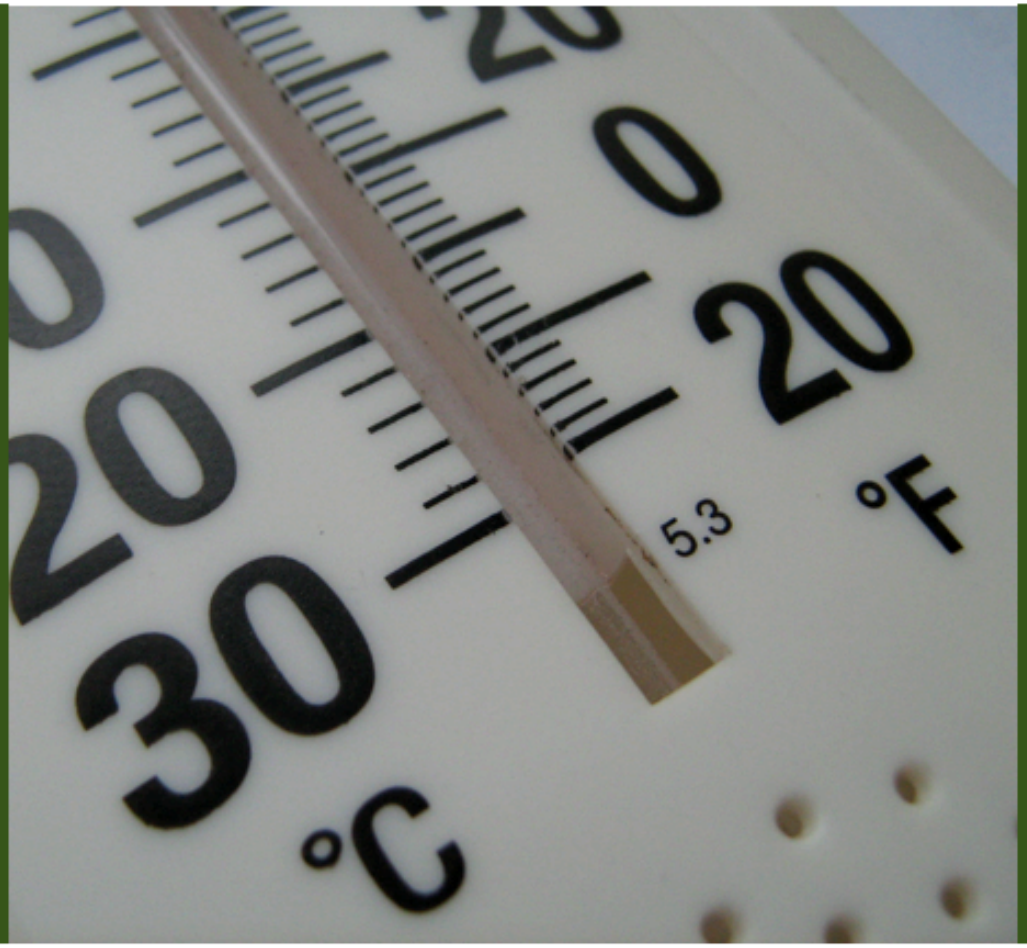
Above is a look at the amount of solar radiation received at one particular location over a year (http://ccc.atmos.colostate.edu/). Solar energy is highest in June when day length is longest and the midday sun is nearly overhead.

Solar Radiation varies across the nation



Section Three: Temperature

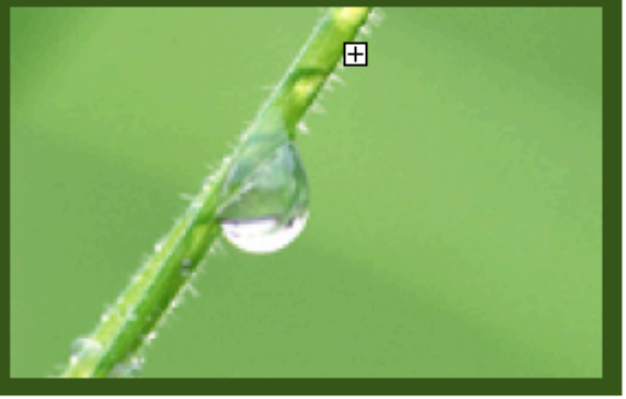
Temperature



below zero

Freezing

100°F



"Highs, lows and a lot of in-between"

Temperature

- Webster's Dictionary defines temperature as: *"the degree of hotness or coldness measured on a definite scale"*.
- Here in the United States we use the Fahrenheit Scale invented by Daniel Fahrenheit back in 1753.
- 32º Fahrenheit (F) is the freezing point of water. Most of the rest of the world uses the Celsius (C) scale, where water freezes at 0º C. Water boils at 212º F and 100º C.
- Some sample conversions: 10º C = 50º F, 20º C = 68º F, 30º C = 86º F, 40º C = 104º F, 50º C = 122º F.

Temperature's Impacts

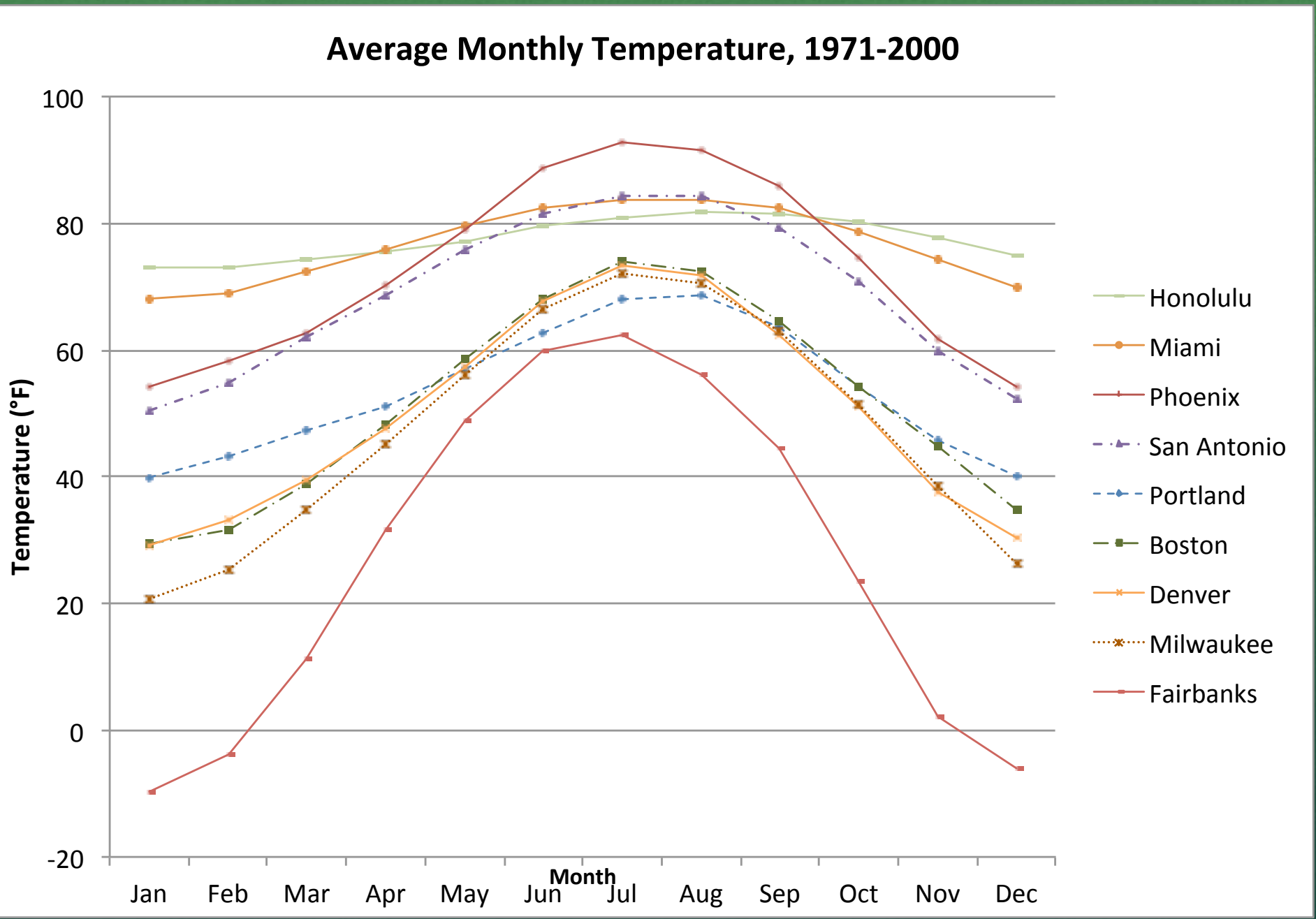
- Temperature has a variety of impacts on your garden. Some plants grow best in hot weather while other prefer it cool.

- Temperature also controls the development of certain diseases and insects.

Average Temperature

- The average daily temperature and its pattern through the year is essential information for the gardener. Gardeners can use temperature data to select plant varieties and schedule planting times though the year.
- The following slide shows a sample of average monthly temperatures for selected cities across the country.

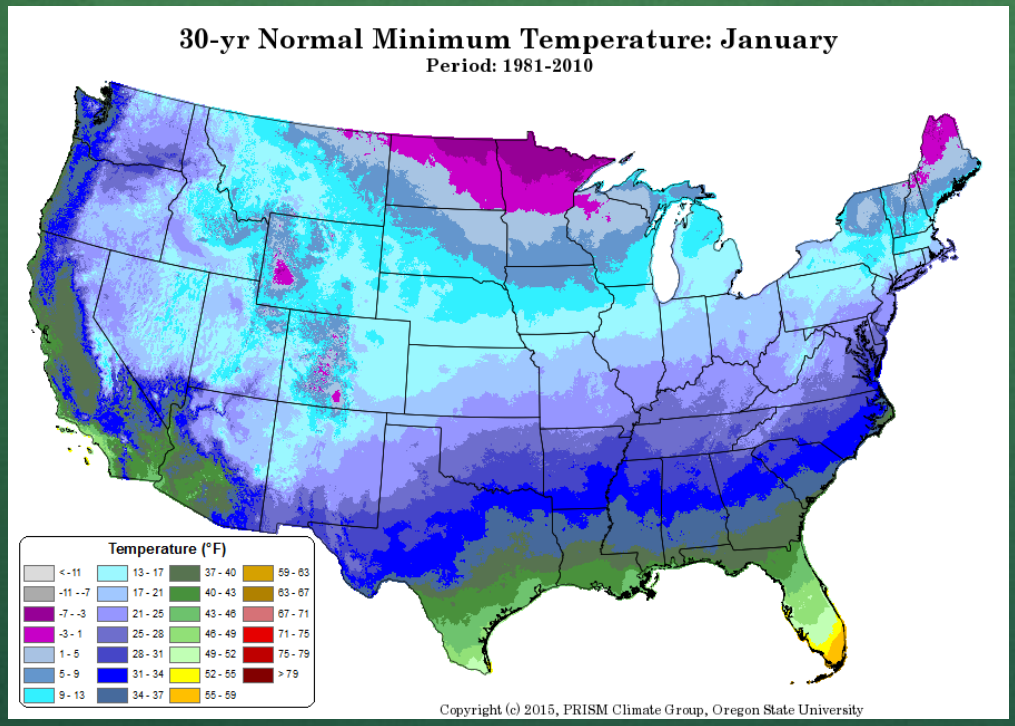
Average Monthly Temperature for selected cities, 1971-2000



The previous graph shows that the largest seasonal cycles of temperature occur in the middle of the country and in Alaska.

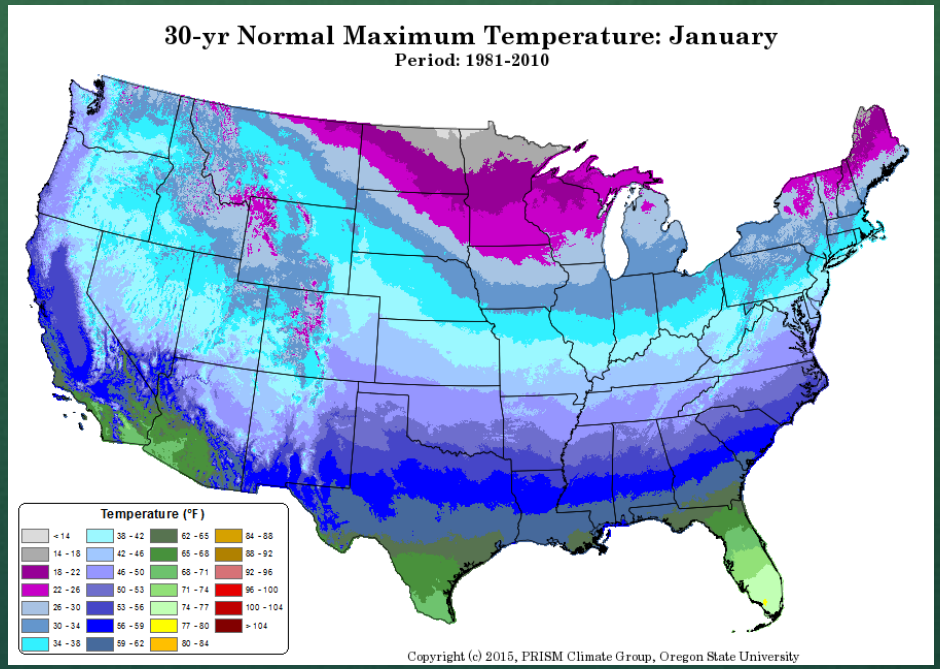
Variations in temperature between winter and summer are only a few degrees in places like Miami and Honolulu.

Average **Winter** Temperatures

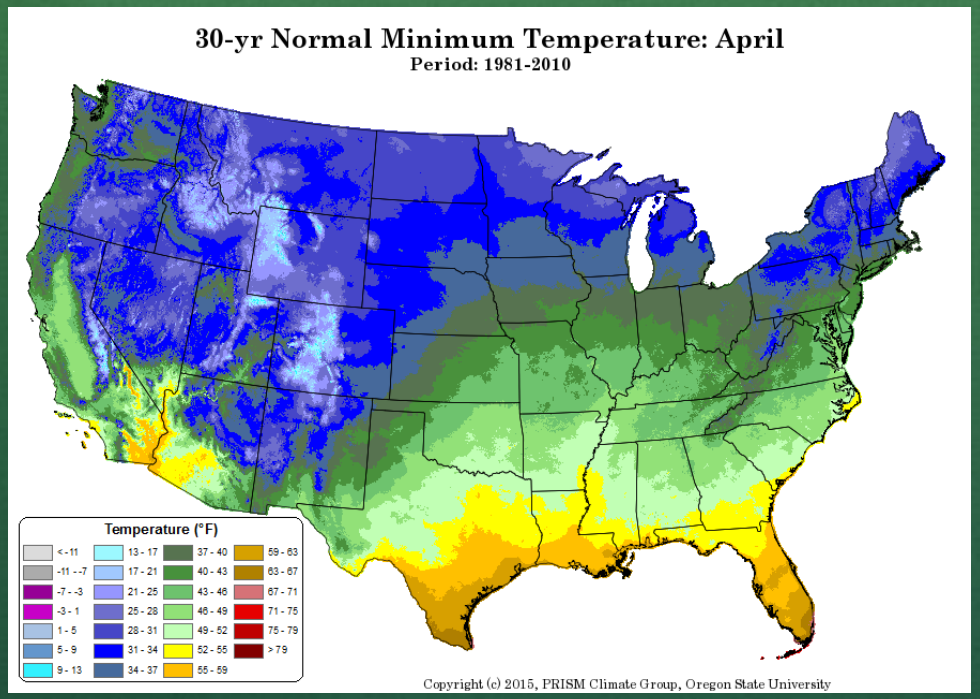


January Average Min.

January Average Max.

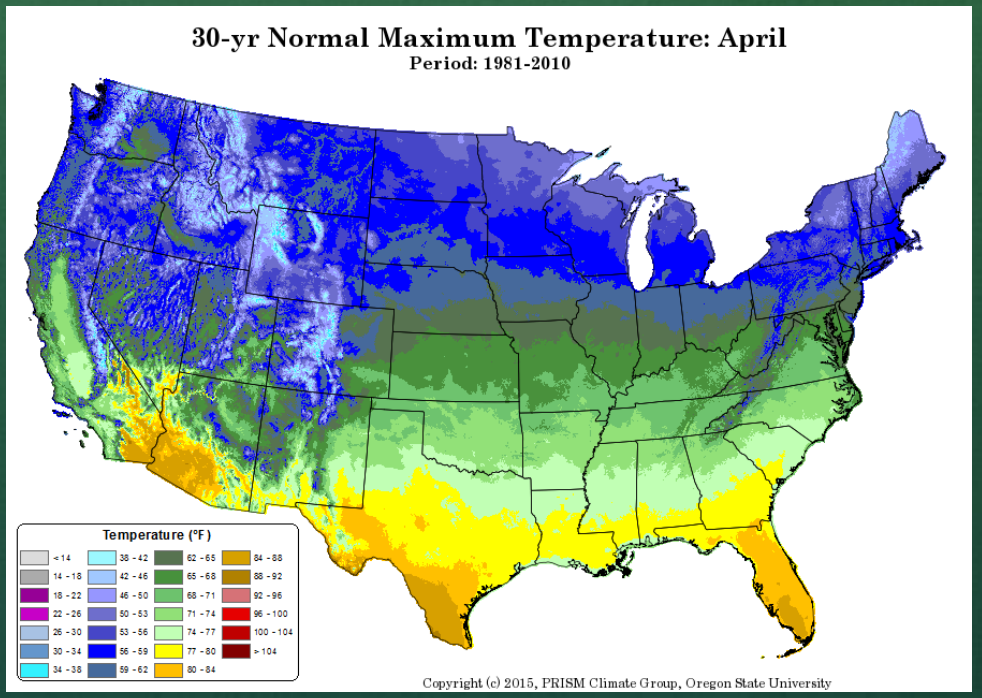


Average Spring Temperatures

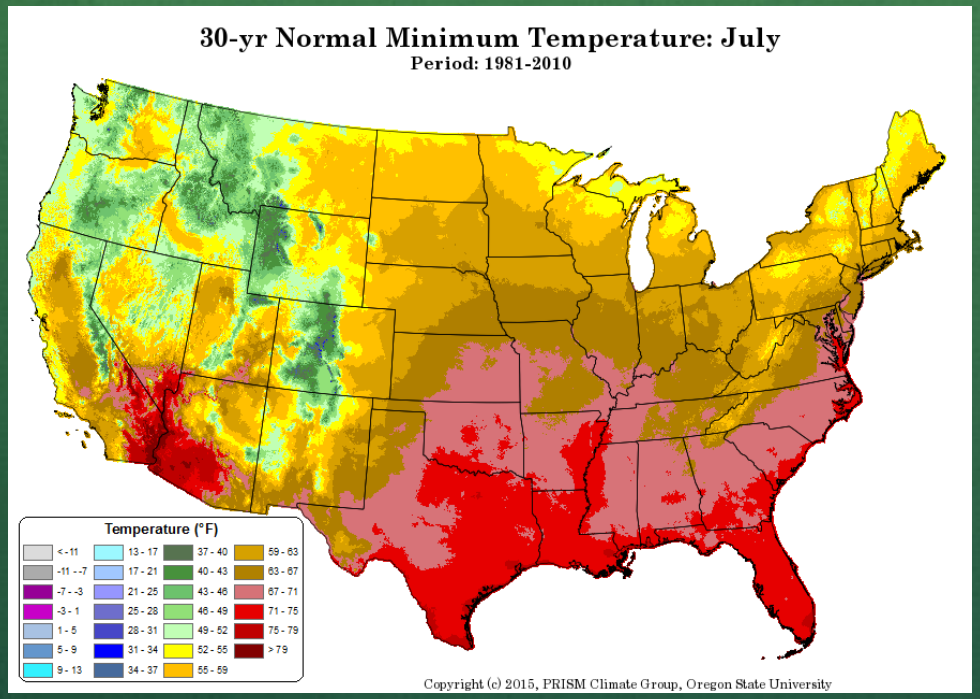


April Average Min.

April Average Max.

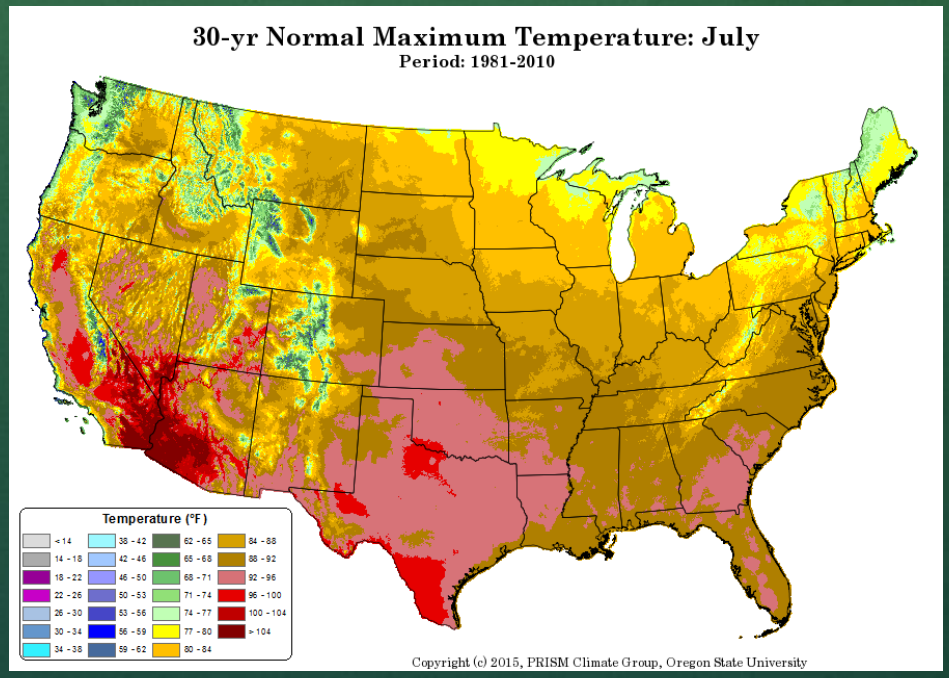


Average **Summer** Temperatures

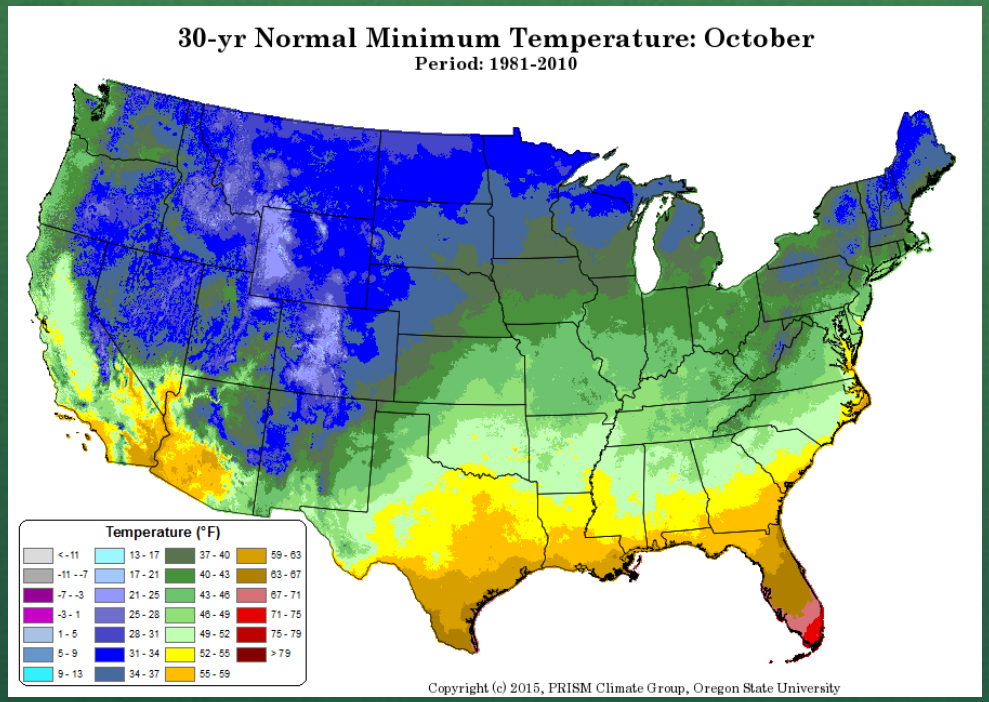


July Average Min.

July Average Max.

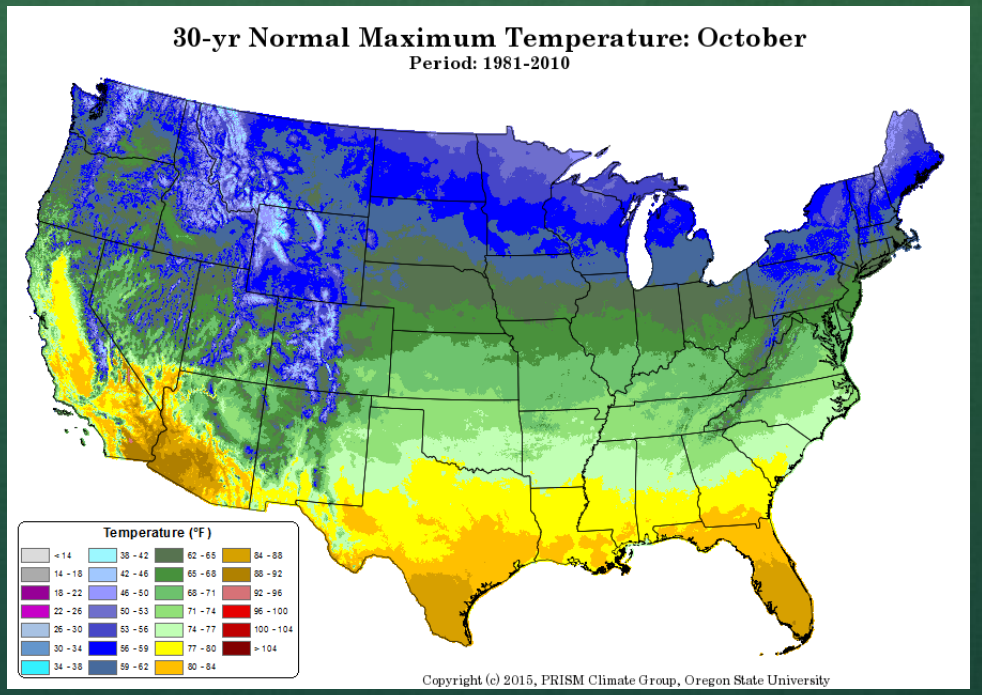


Average **Autumn** Temperatures



October Average Min.

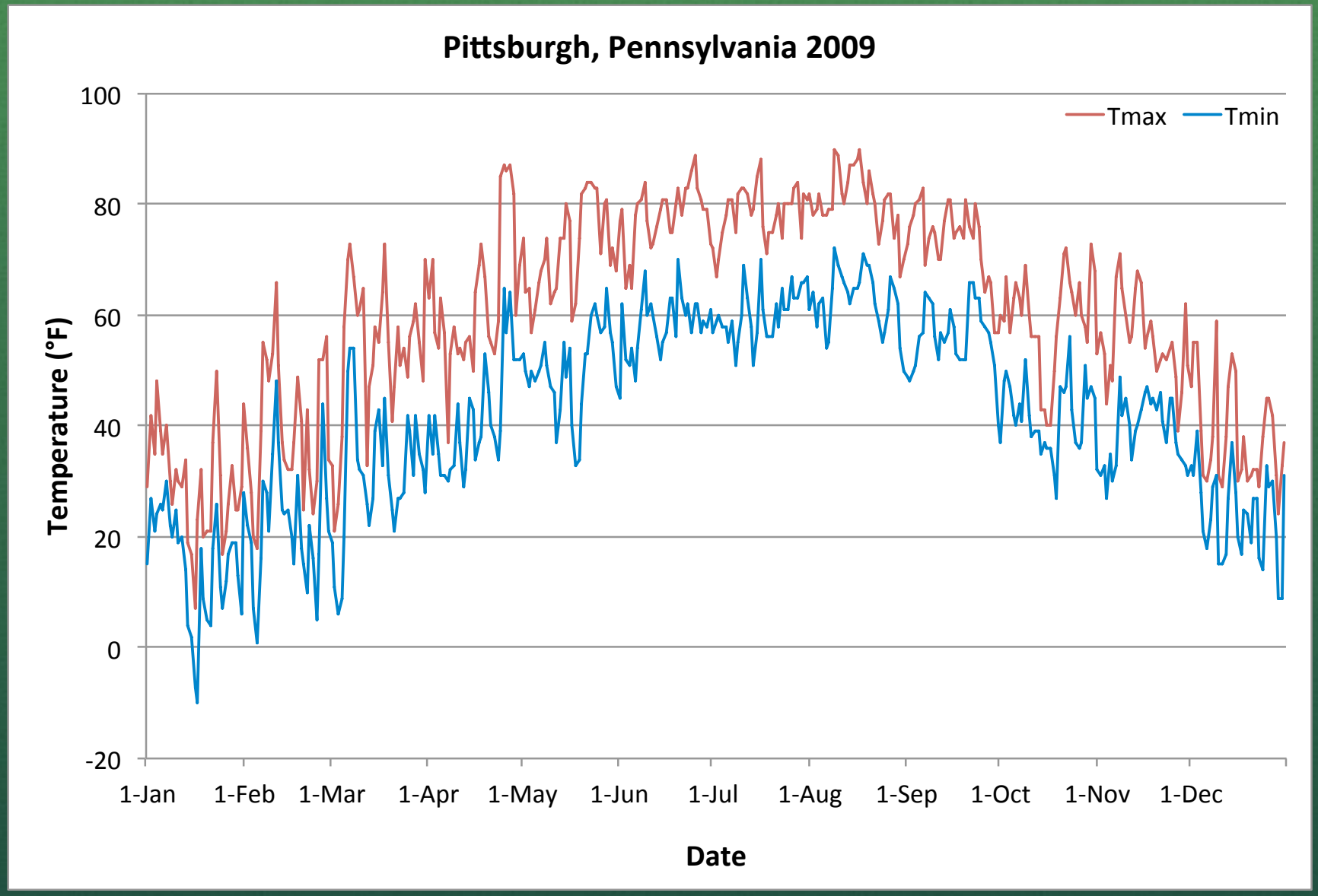
October Average Max.



Actual Temperatures

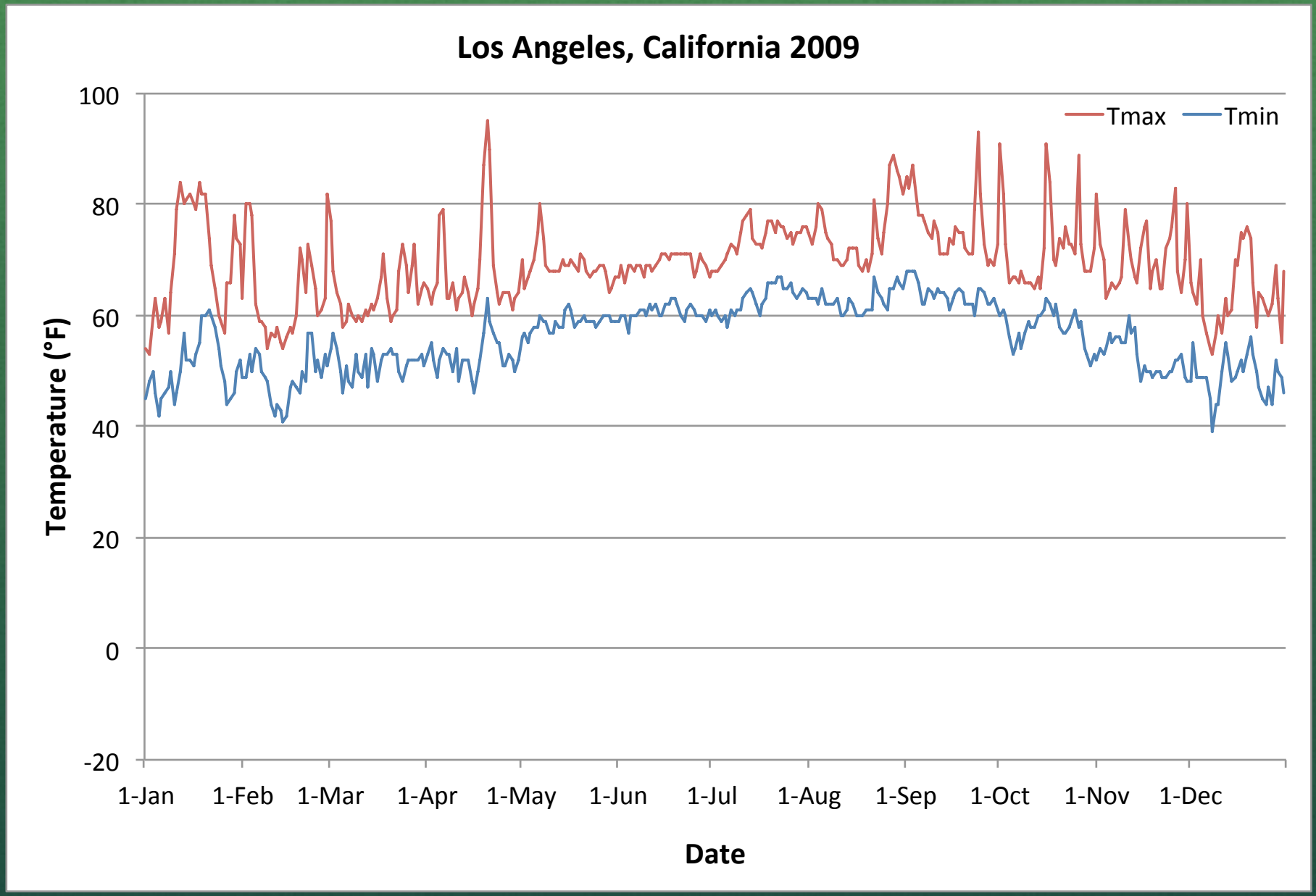
- Average temperatures (based on historical data) tell you what you can probably grow. Actual temperatures show the variation in your climate due to changeable daily weather and will effect how well your plants actually grow in a given year.

A year's worth of temperature for Pittsburgh, PA



In most parts of the country, day to day changes in temperature are common year round as air masses move and fronts pass by.

A year’s worth of temperature for Los Angeles, CA



Notice that there is little variation in daily temperature swings during the summer.

Temperature Records

What is the coldest or warmest temperature ever recorded in your state? Our next slides show the records for each state.

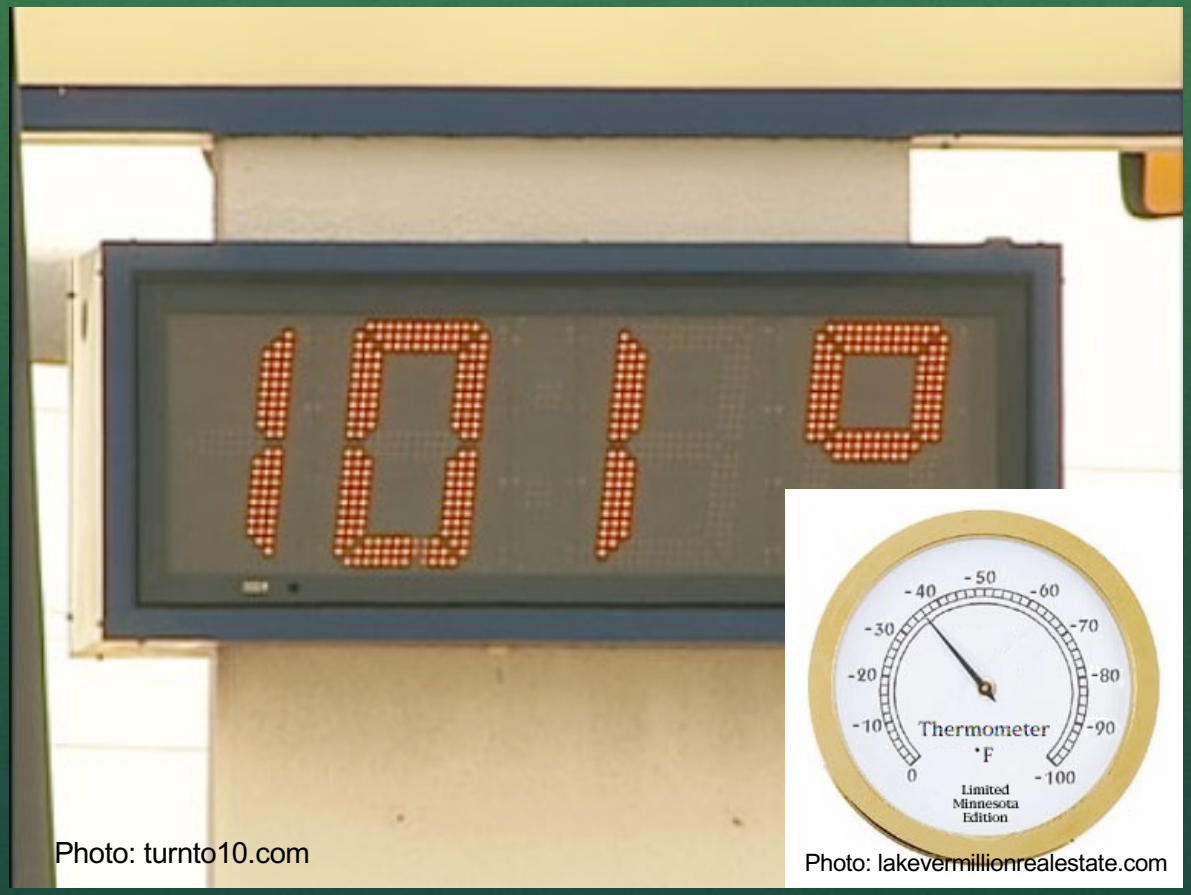
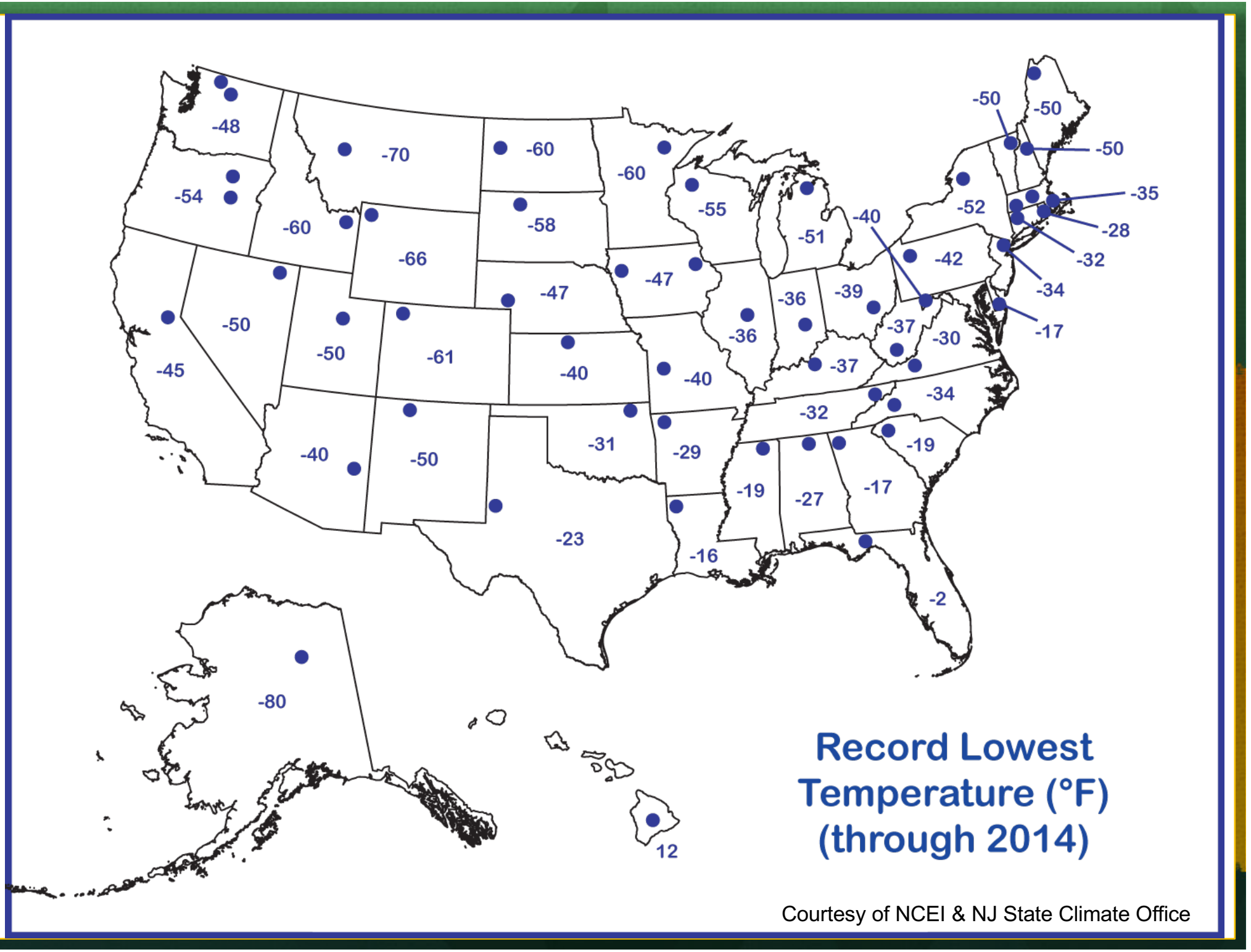
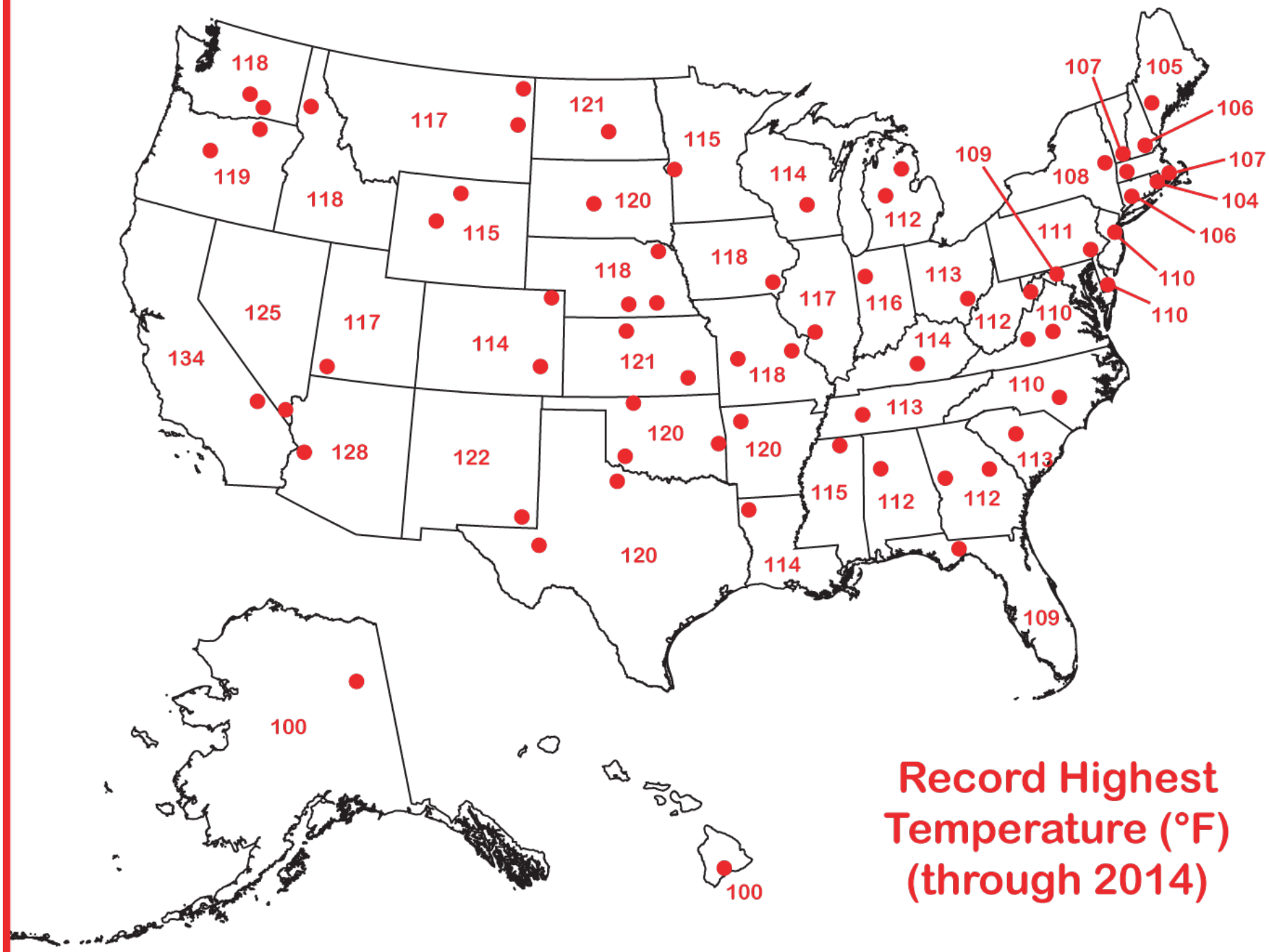


Photo: turnto10.com

Photo: lakevermillionrealestate.com



Courtesy of NCEI & NJ State Climate Office

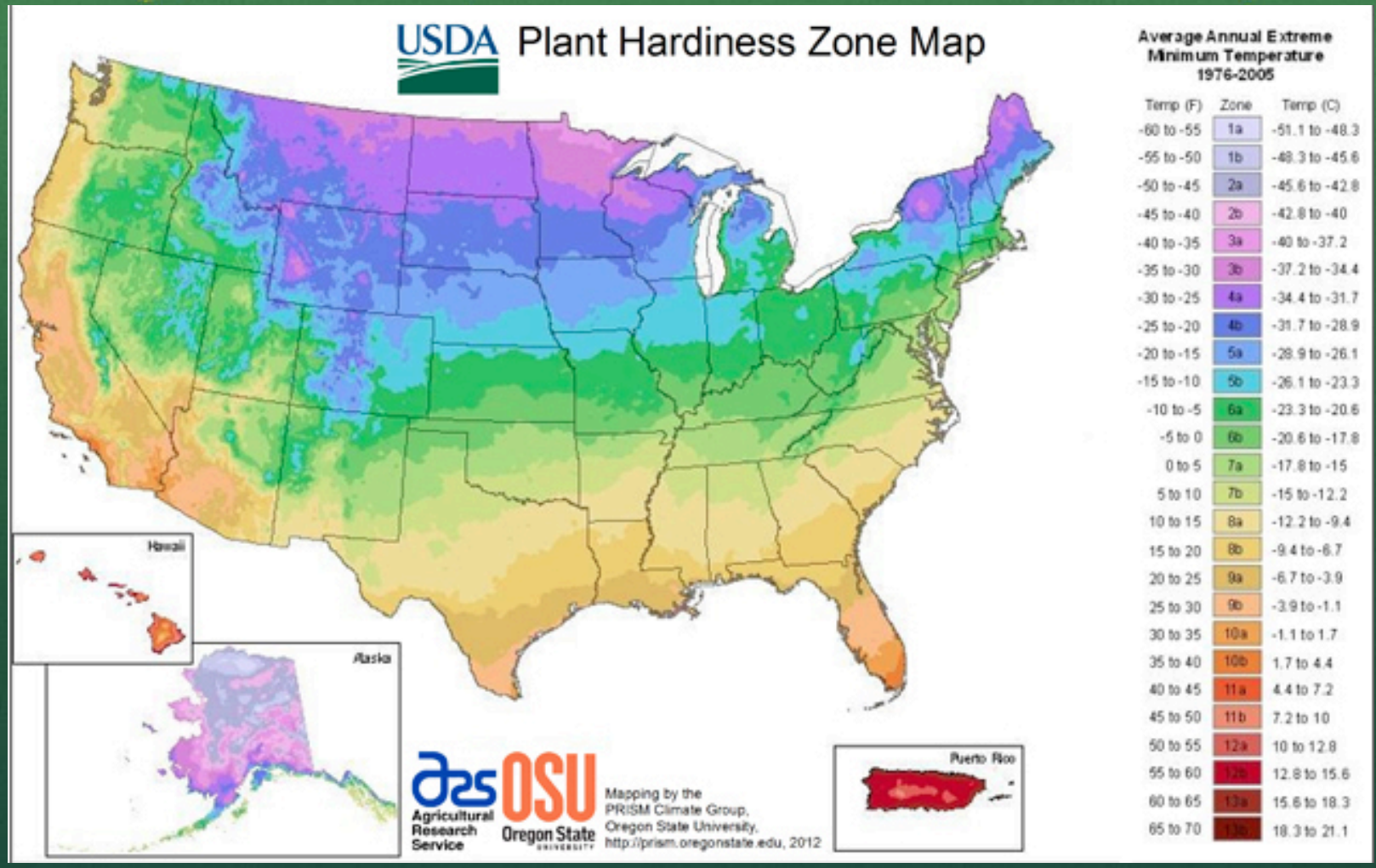


Courtesy of NCEI & NJ State Climate Office

What is best to plant?

Hardiness zones give a guideline of what to plant in your area

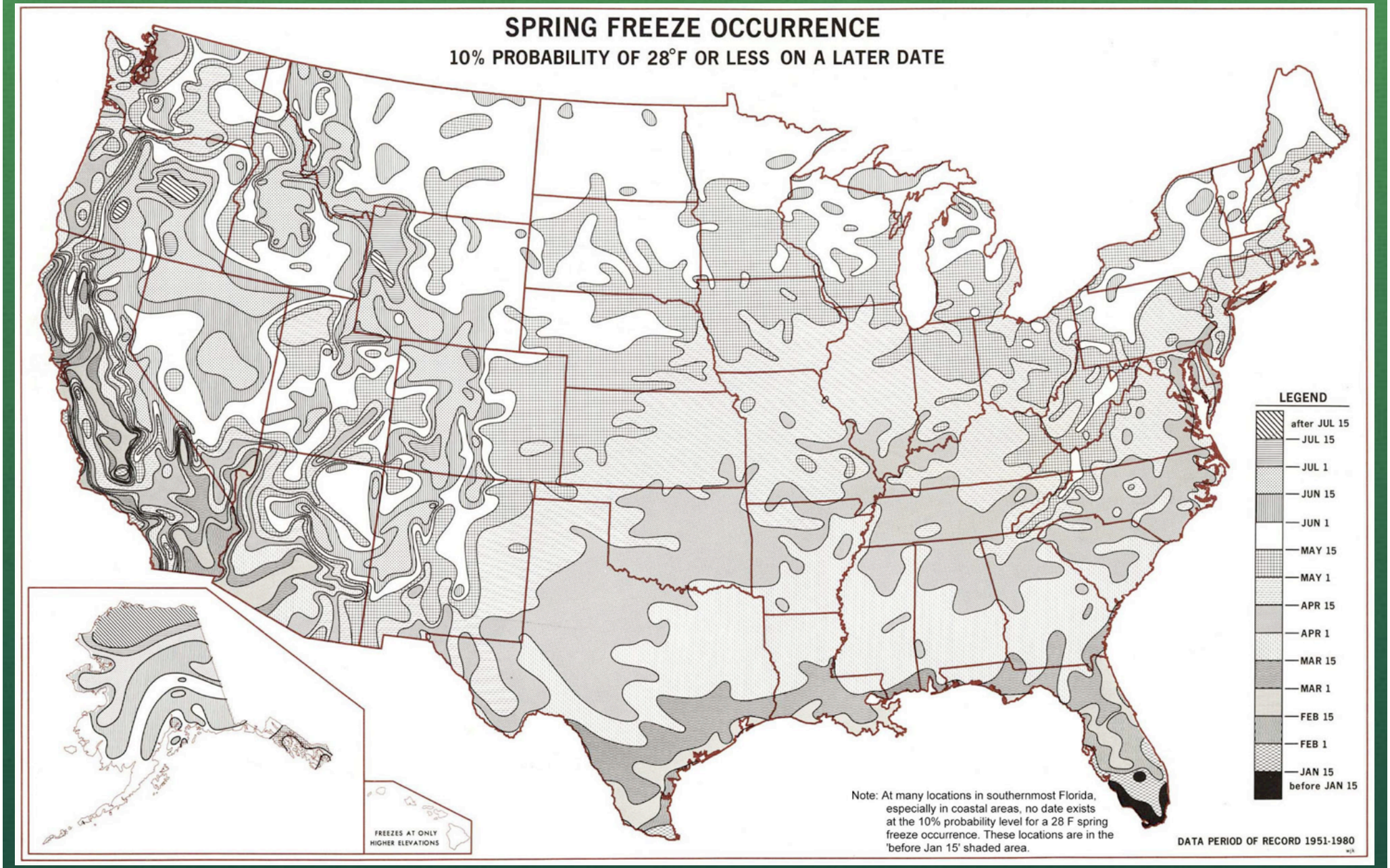
U.S. Hardiness Zones



Hardiness zones are based on the average of the coldest temperatures observed each year.

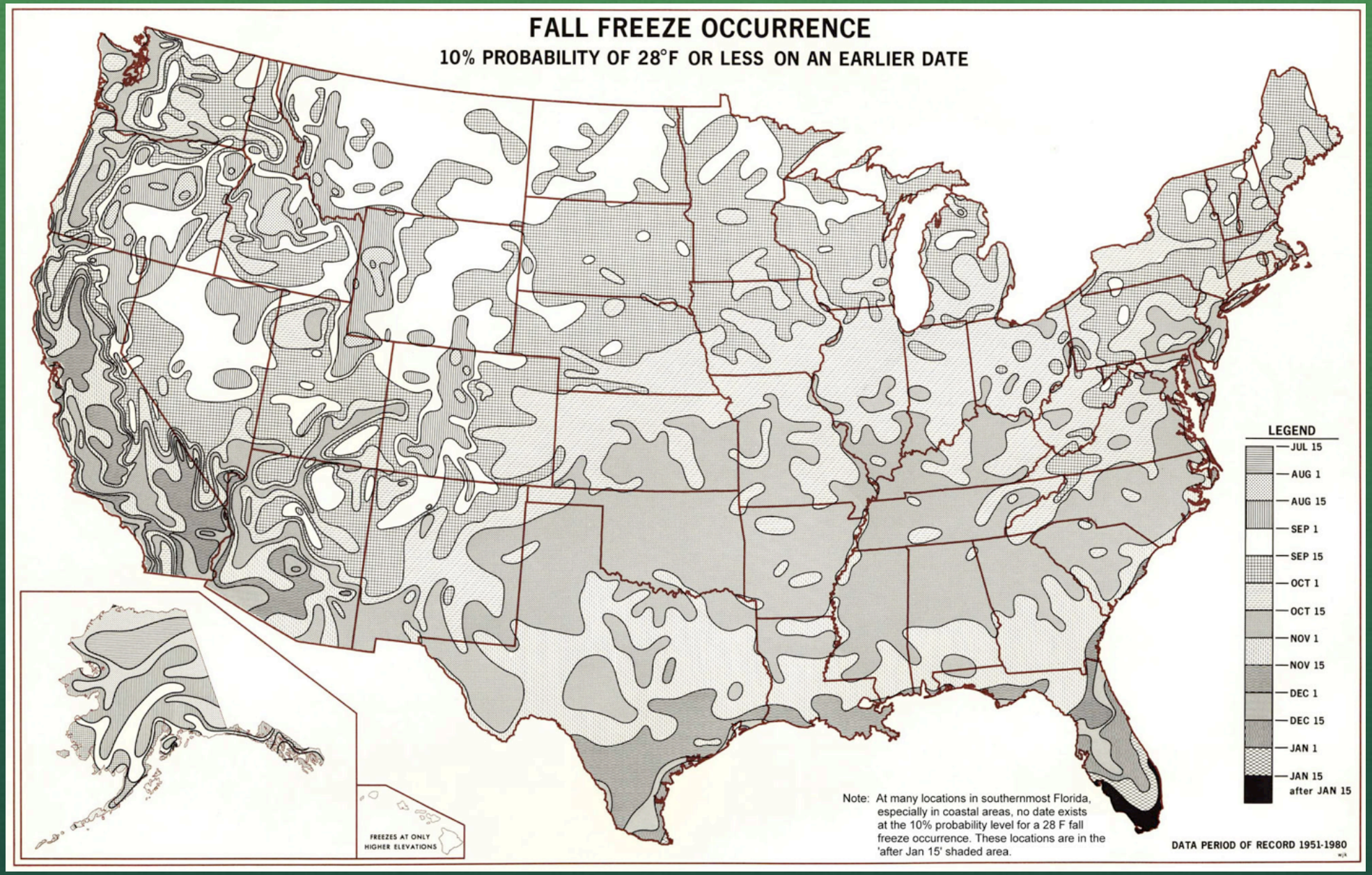
Frost/Freeze

Frosts and Freezes occur at different times in different areas of the country. Here are the average dates.



Courtesy of NCEI

Spring Freeze Occurrence

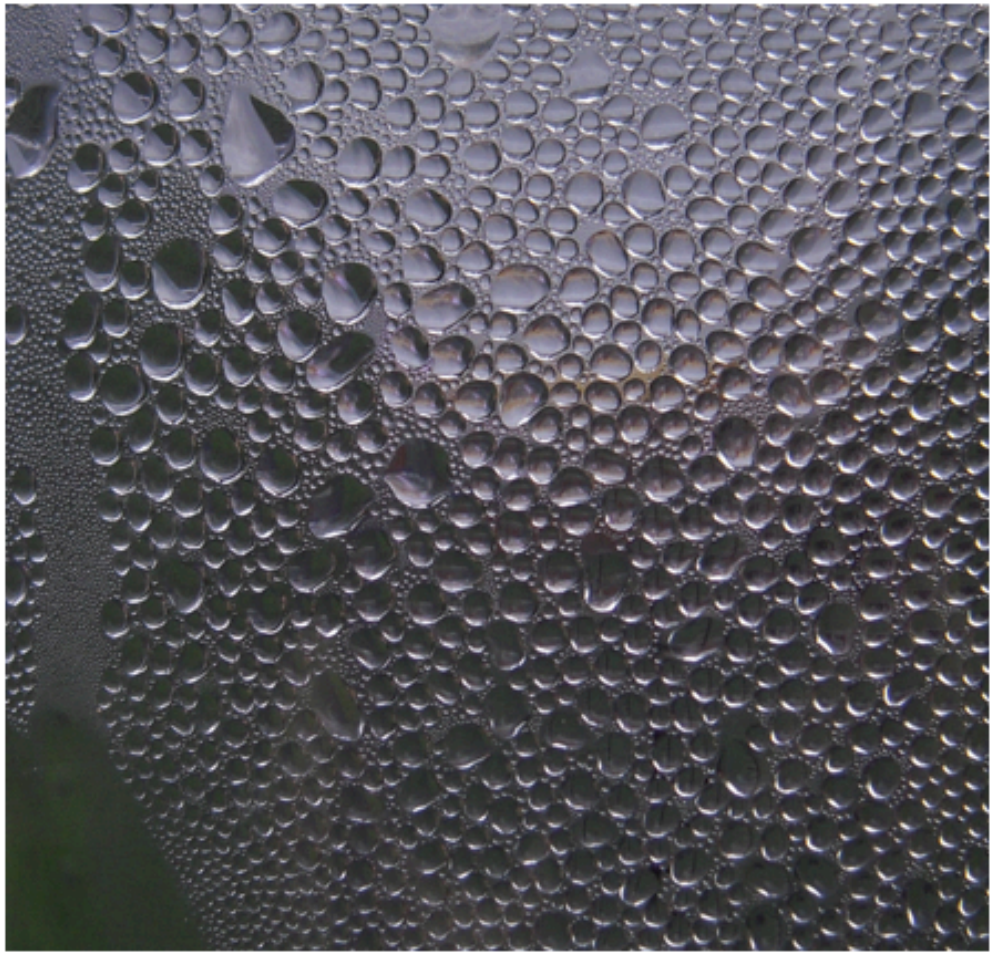


Courtesy of NCEI

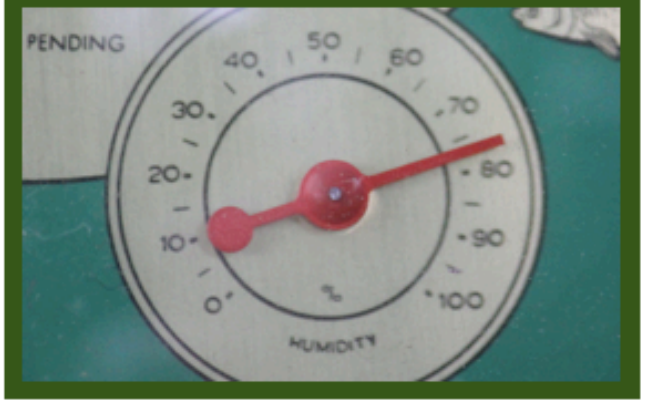
Fall Freeze Occurrence

Section Four: Humidity and Dew Point

Humidity
Dew Point



RH
WET BULB
Psychrometer



"It's not the heat, it's the humidity"

Relative Humidity (RH)

"RH is a percentage of the amount of water vapor in the air compared to what it could potentially hold at a certain temperature."

- At higher temperatures the atmosphere is capable of holding much more water vapor than at colder temperatures.
- Normally the highest relative humidity occurs in the early morning, during the coolest part of the day. Plants transpire most during the warmest part of the day (usually afternoon) when the relative humidity is lowest.

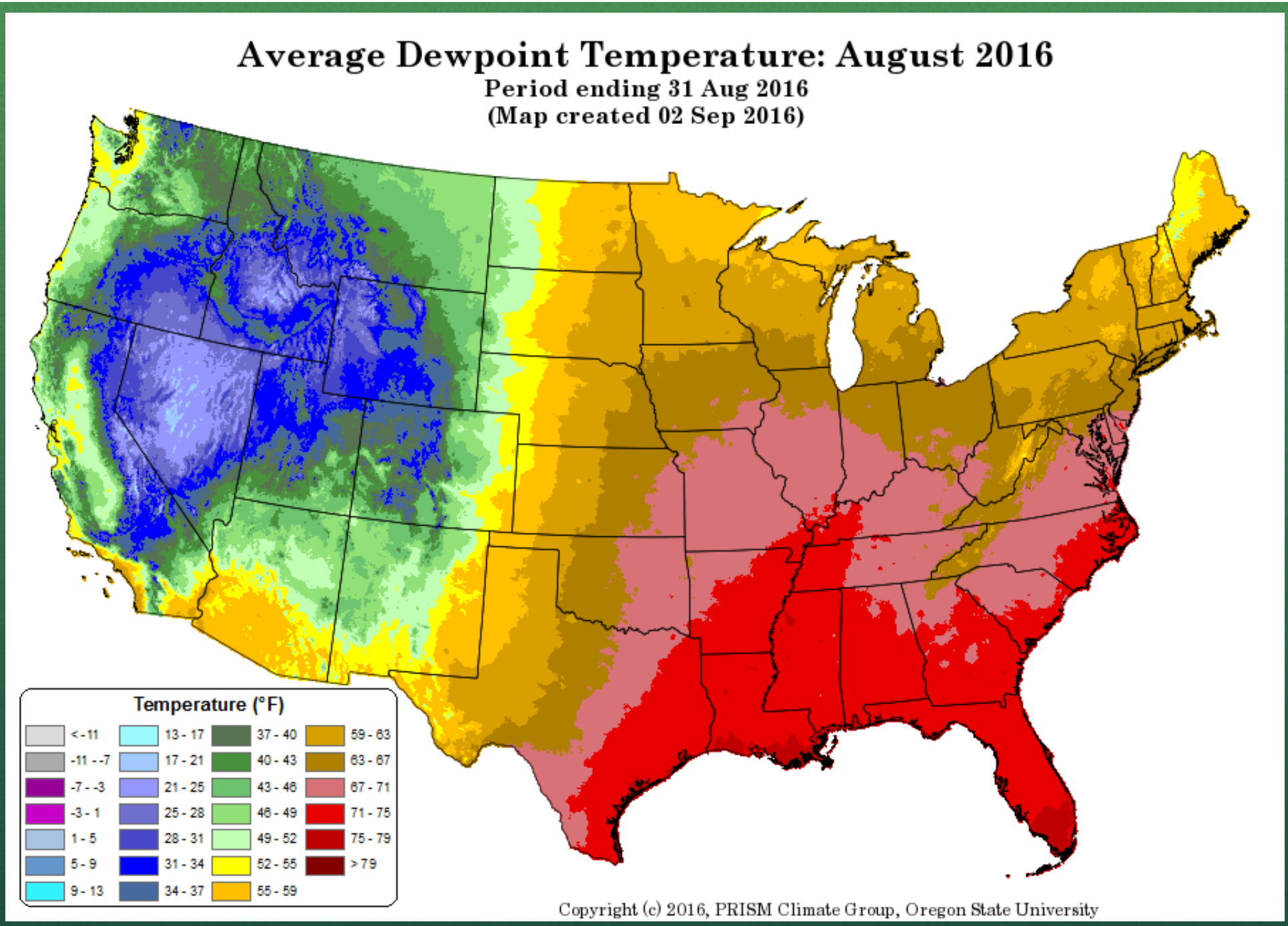
Relative Humidity (RH)

- RH has a direct effect on a plant's ability to transpire which affects its growth.
- Most plants grow best with higher RH. At persisting low RH many plants struggle to grow without irrigation.

Dew Point

"The temperature to which a given air parcel must be cooled at constant pressure and constant water vapor content in order for saturation to occur." - AMS Glossary of Meteorology

- High dew points may affect plant growth and may favor certain pests and diseases.
- The gardener may start to feel rather uncomfortable when the dew point reaches 65º F and above. Dew points in the 70's really feel uncomfortable, especially when you are working hard in your garden.

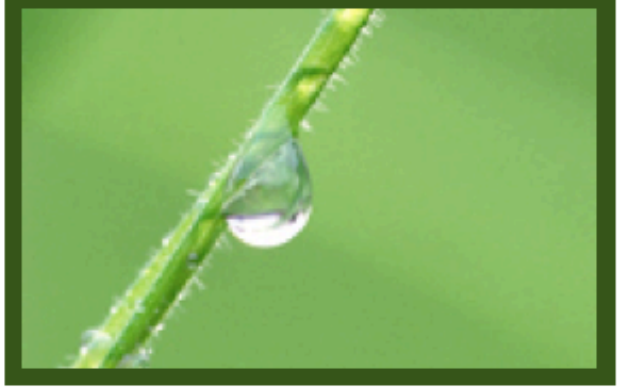


Here is a sample of typical summer dew point temperatures

Section Five: Precipitation

Precipitation

rain
hail
snow

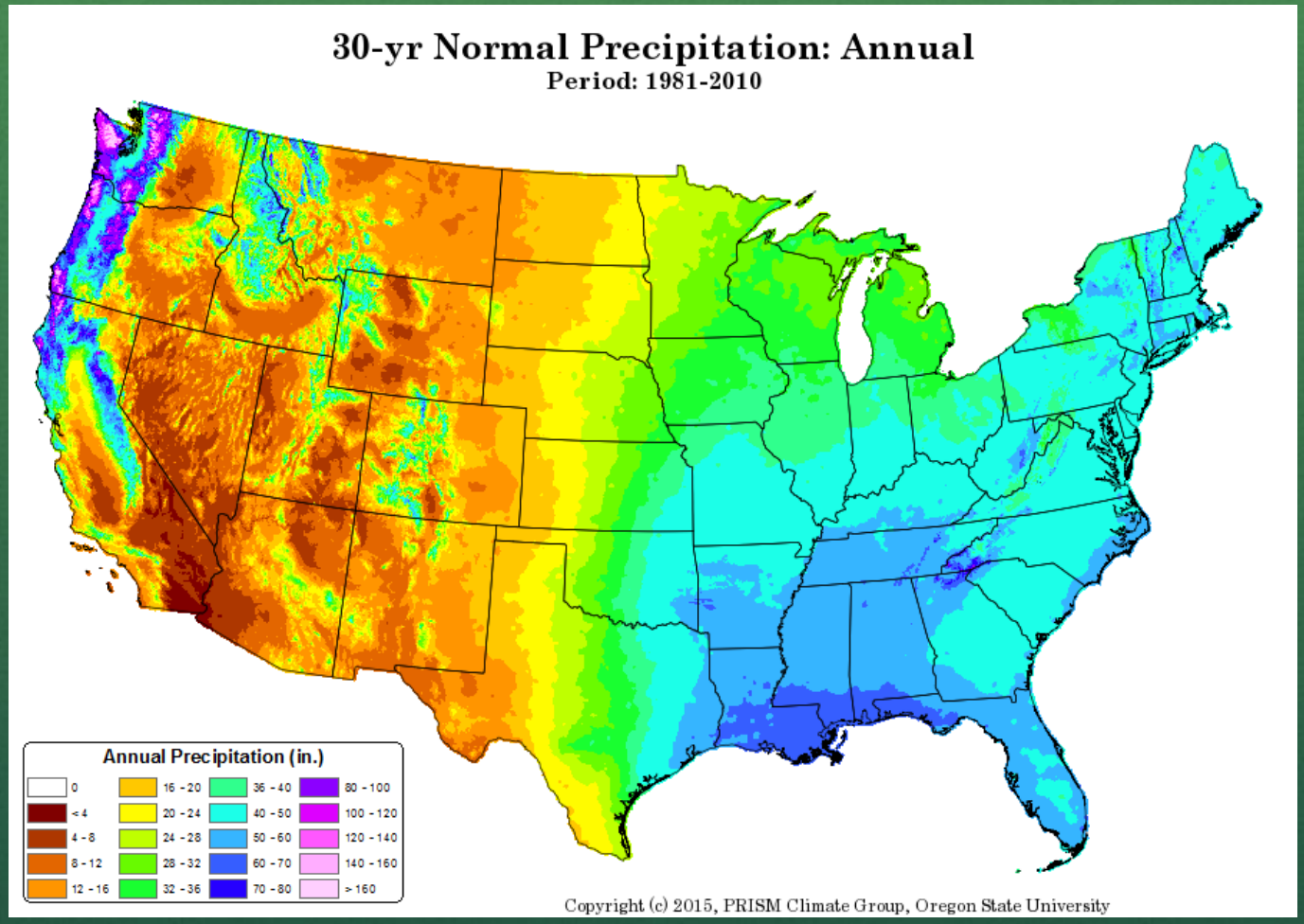


"Without it our gardens would be just dust in the wind"

Precipitation Potpourri

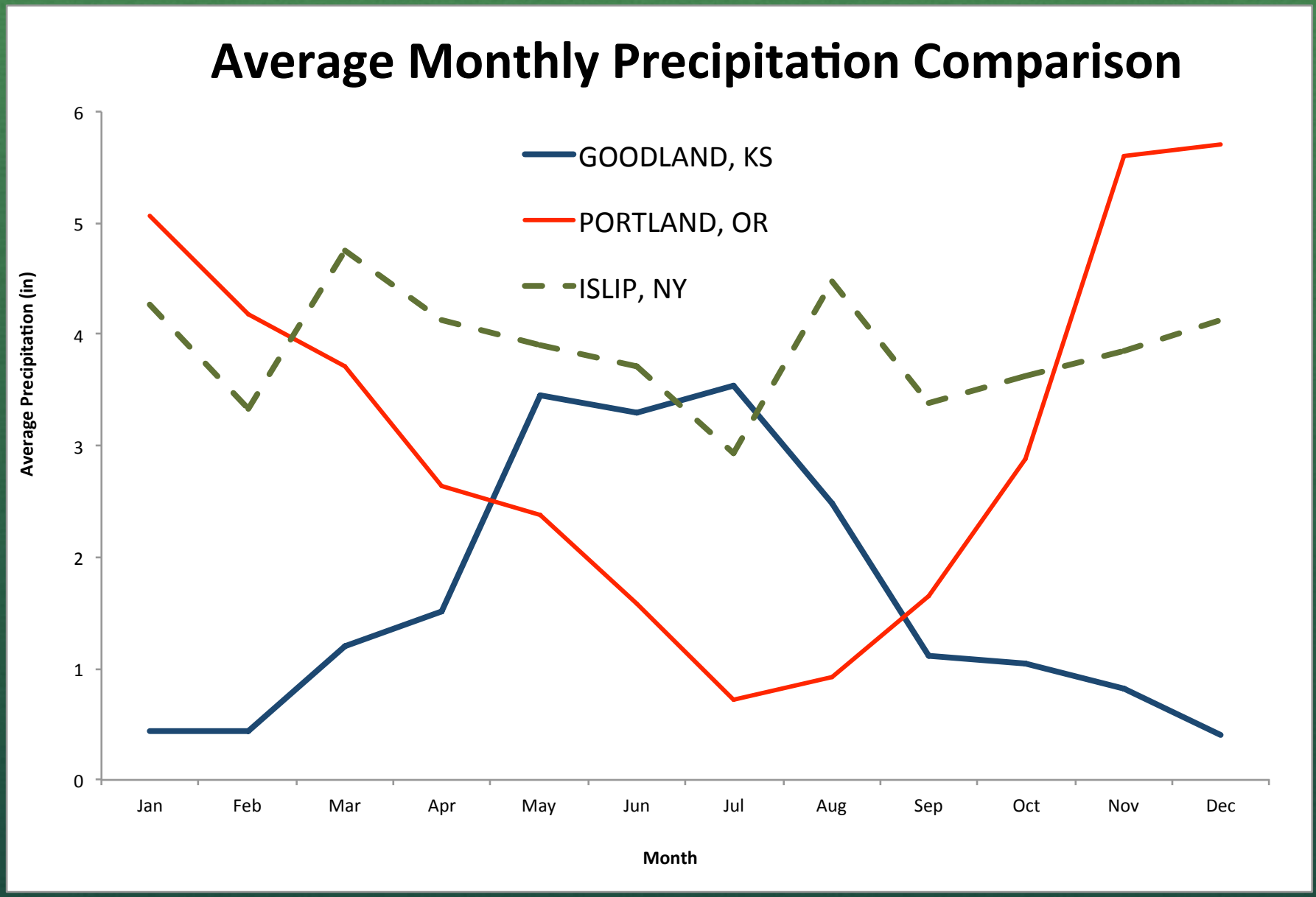
Precipitation can be a tricky thing for your garden to depend on. That cloud which looks dark and threatening may give you two or three drops or it could give you three inches of rain in thirty minutes. It could surprise your garden with golf ball size hail! You may experience rain for two weeks straight and then not again for two months. Some gardens get a tropical shower every afternoon, others just get the hose.

Average Precipitation

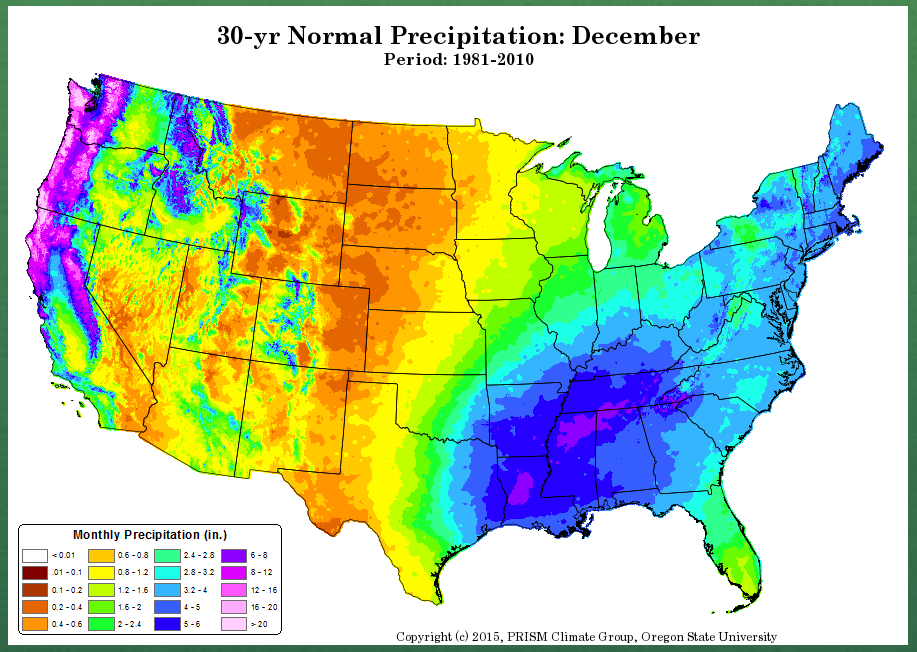


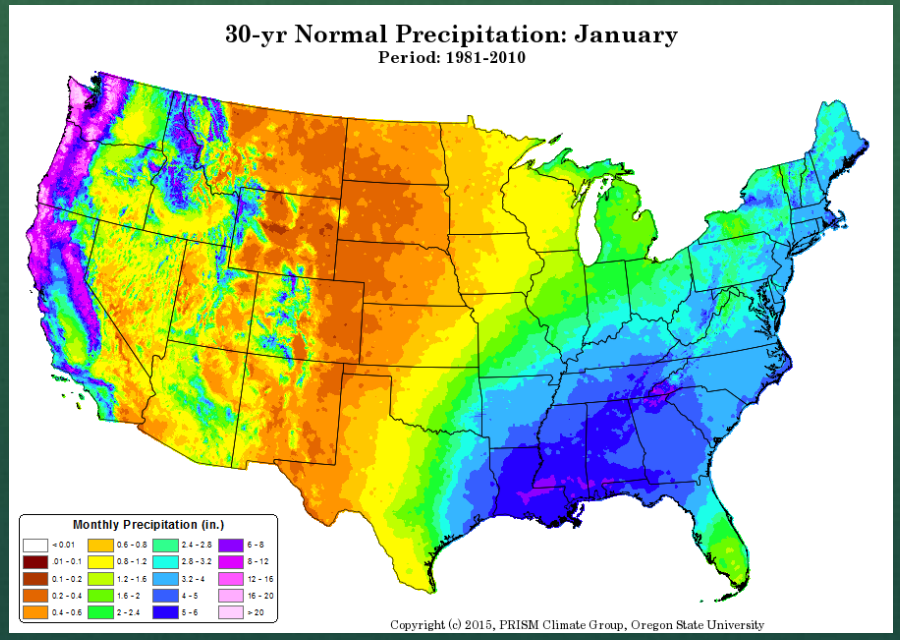
Average precipitation across the United States varies from less than four inches per year in the deserts of the Southwest to over 160 inches in the Olympic Mountains of Washington. Once you go west of the Mississippi River, precipitation becomes less and less until you reach the West Coast.

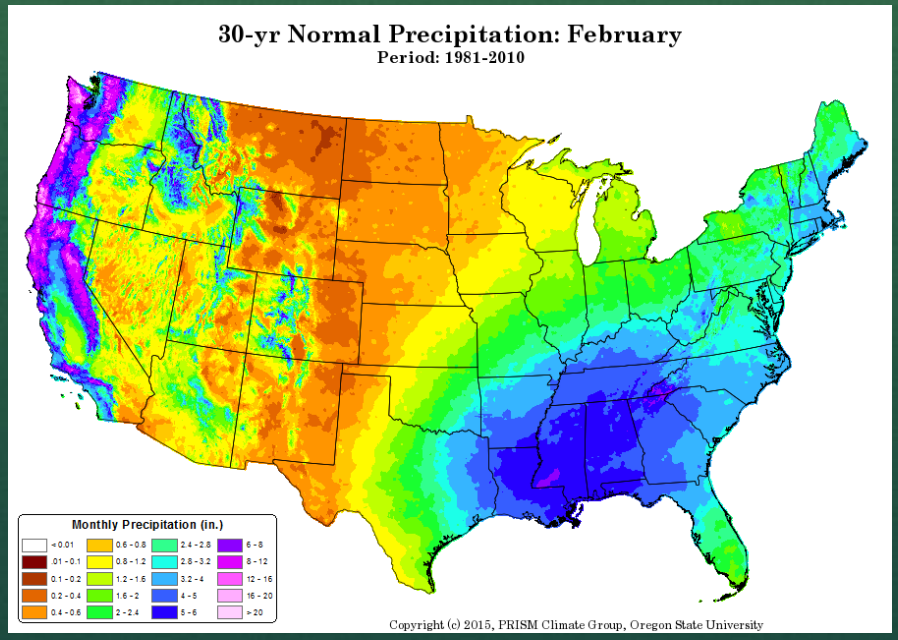
West Coast (Portland, Oregon) – Wet Winters, Dry Summers
Great Plains (Goodland, Kansas) – Dry Winters, Wet Summers
East Coast (Islip, New York) – Fairly Even Year Round Precipitation



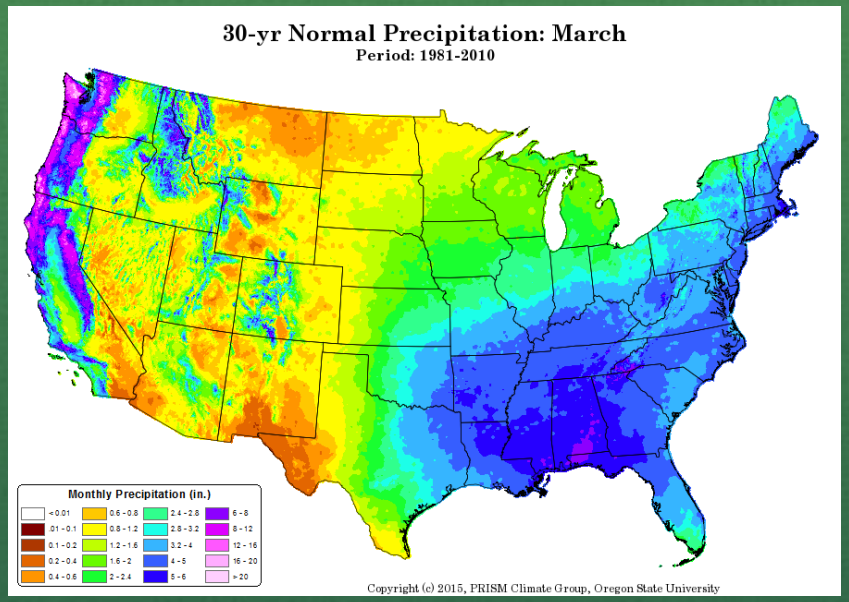
Average Winter Precipitation

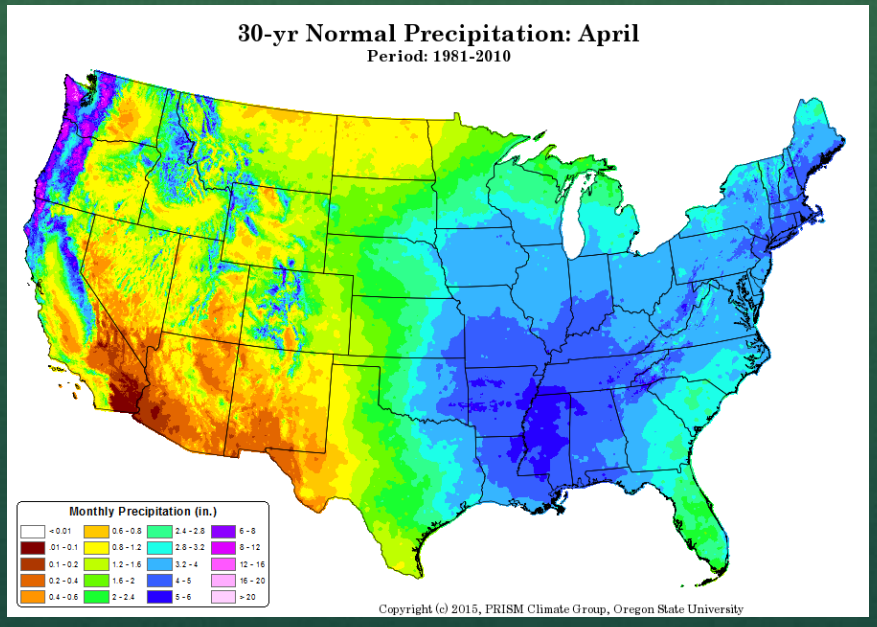


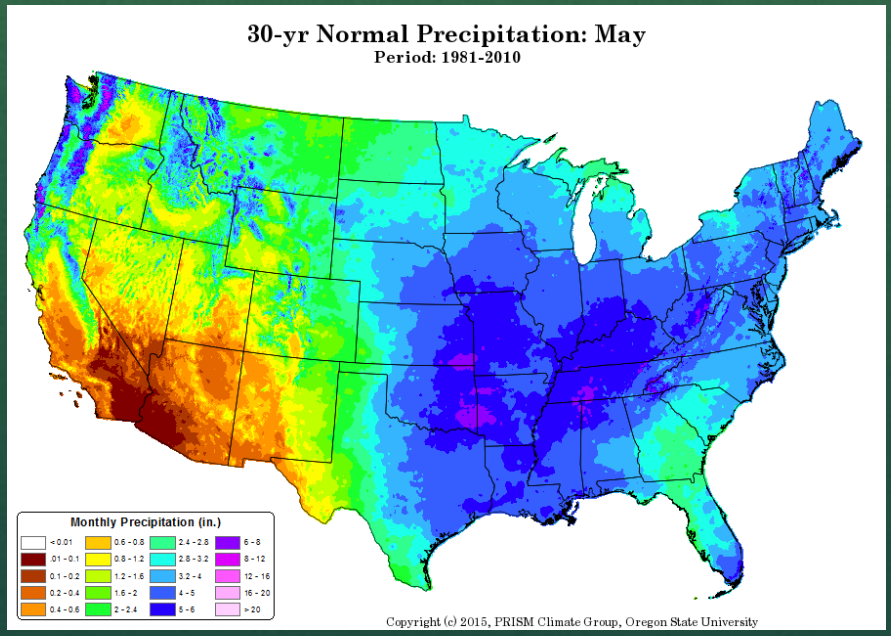




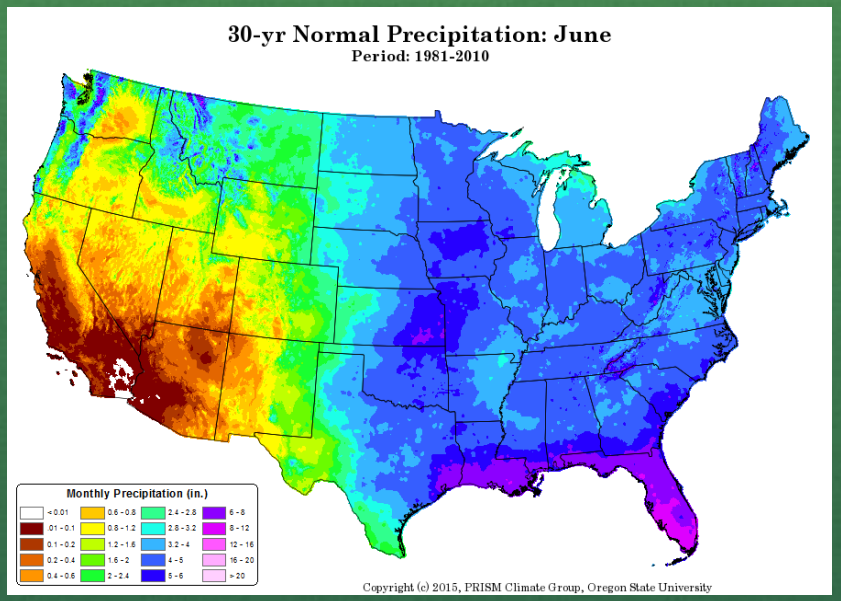
Average Spring Precipitation

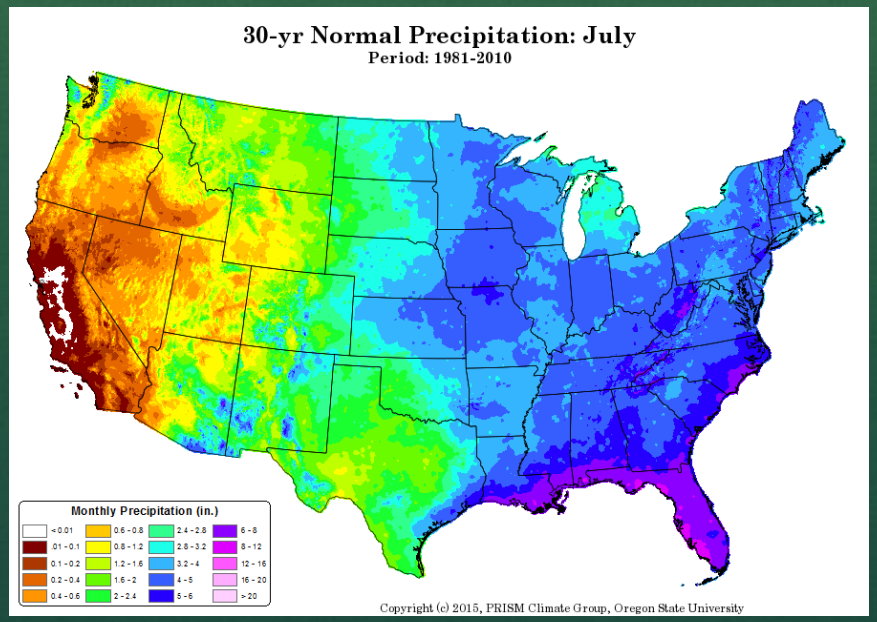


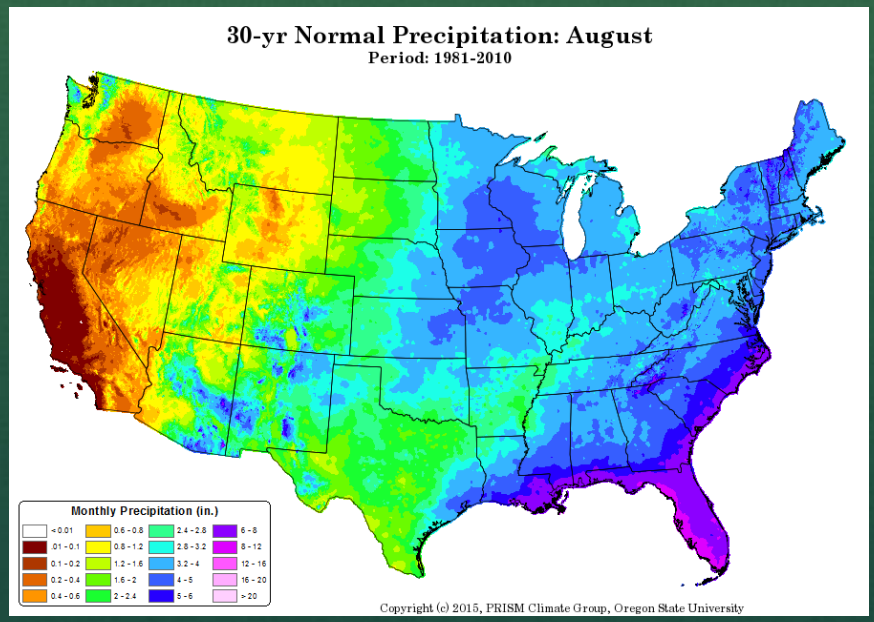




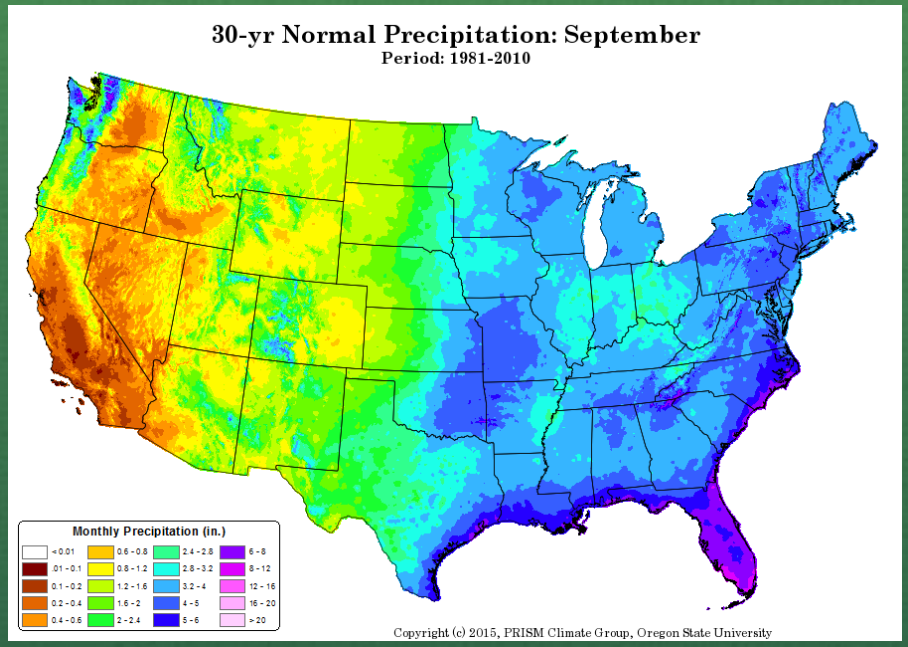
Average Summer Precipitation

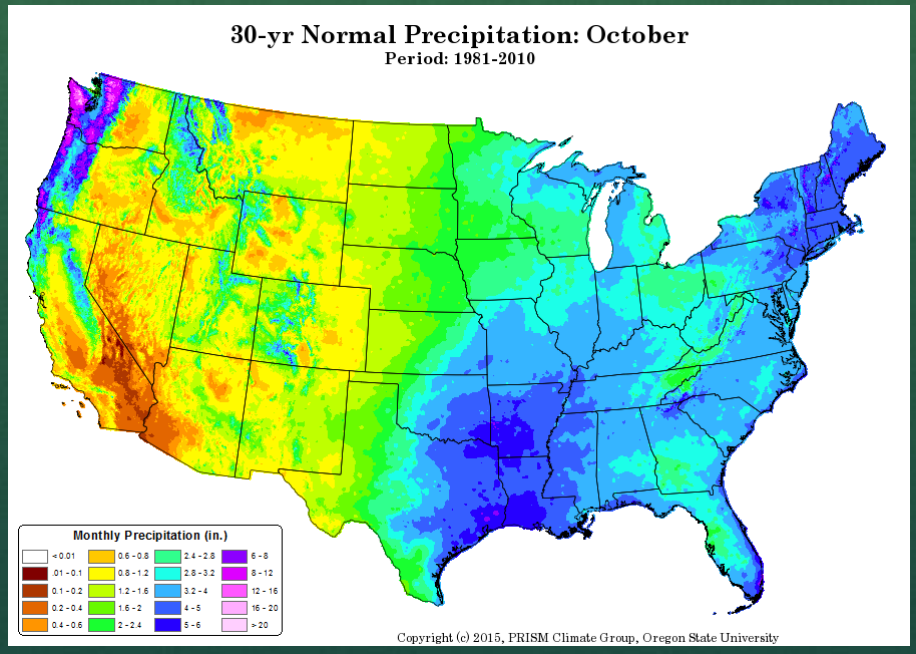


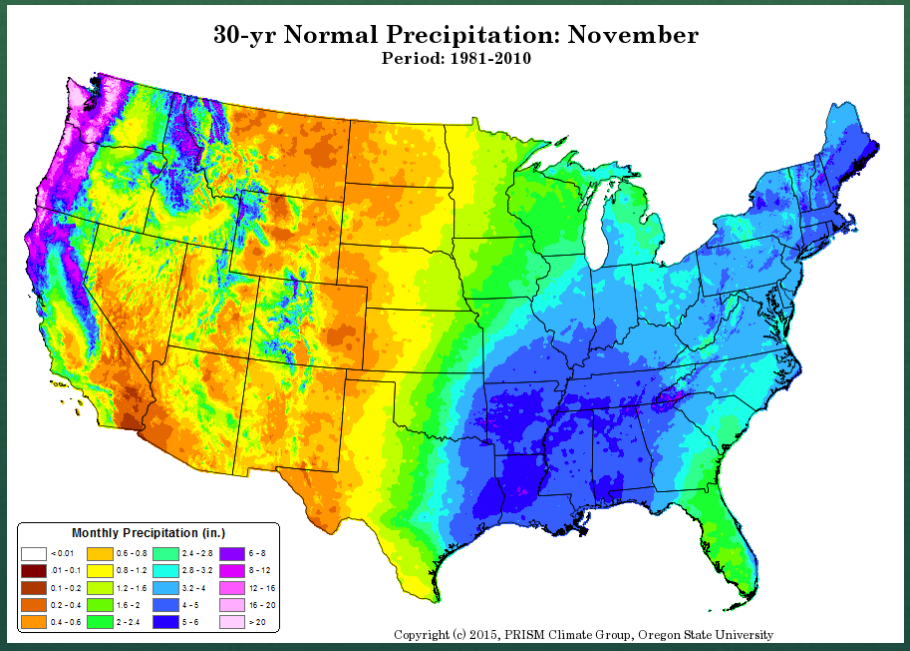




Average Autumn Precipitation





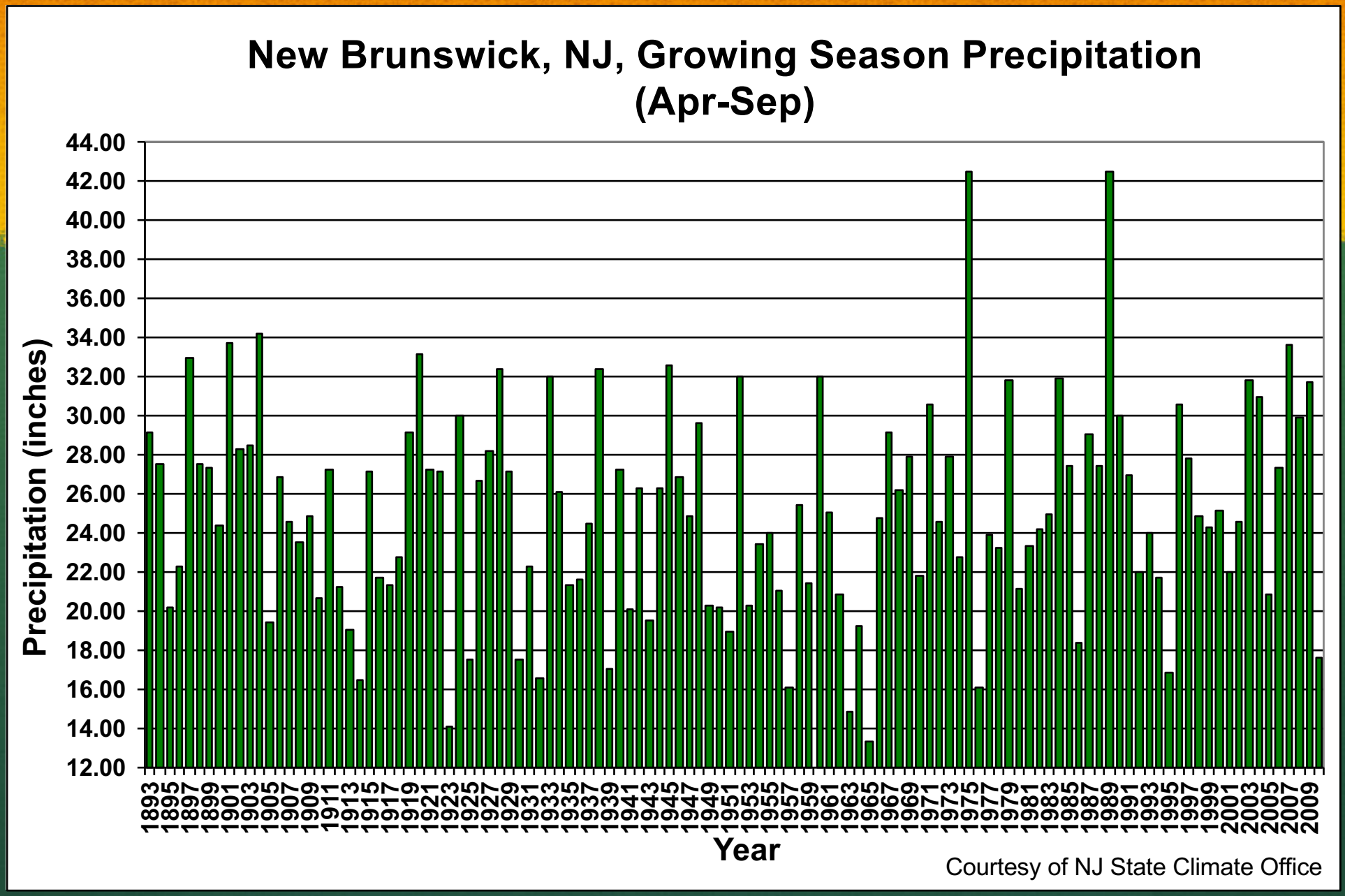


Local precipitation can vary significantly by year and location

What about in your community ?

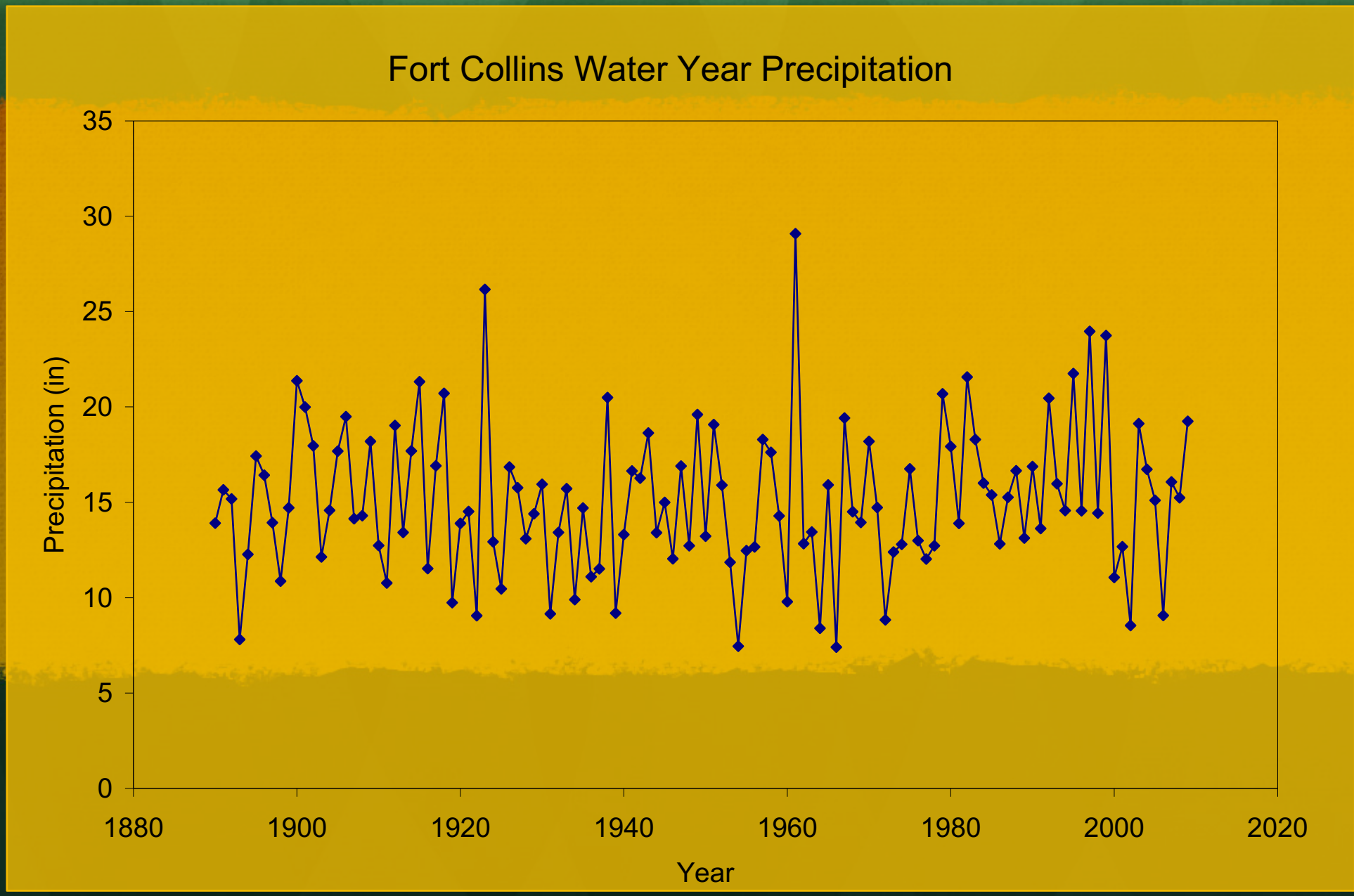
Yearly Variability: Each year is different

- When it comes to precipitation every year is different and those differences may greatly affect your garden. What grows successfully one year may struggle the next.



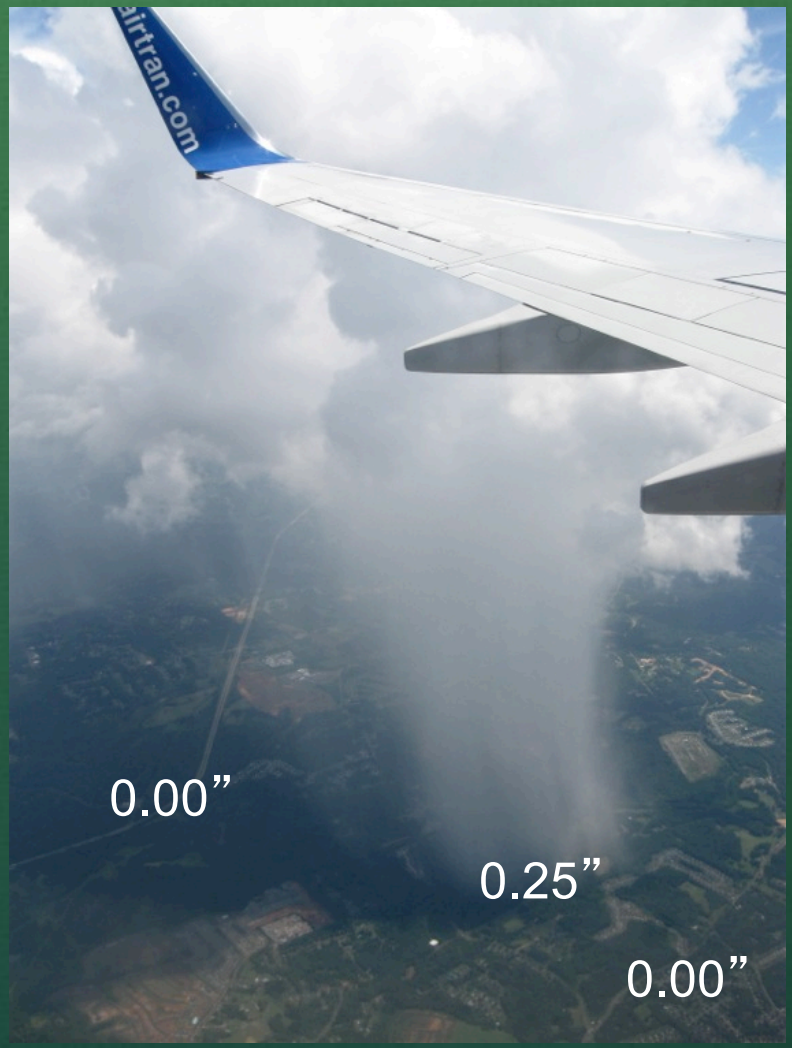
All parts of the country experience yearly variations in precipitation

In semi-arid parts of the U.S. precipitation may vary by more than 100% from one year to the next.



Local Precipitation Variability

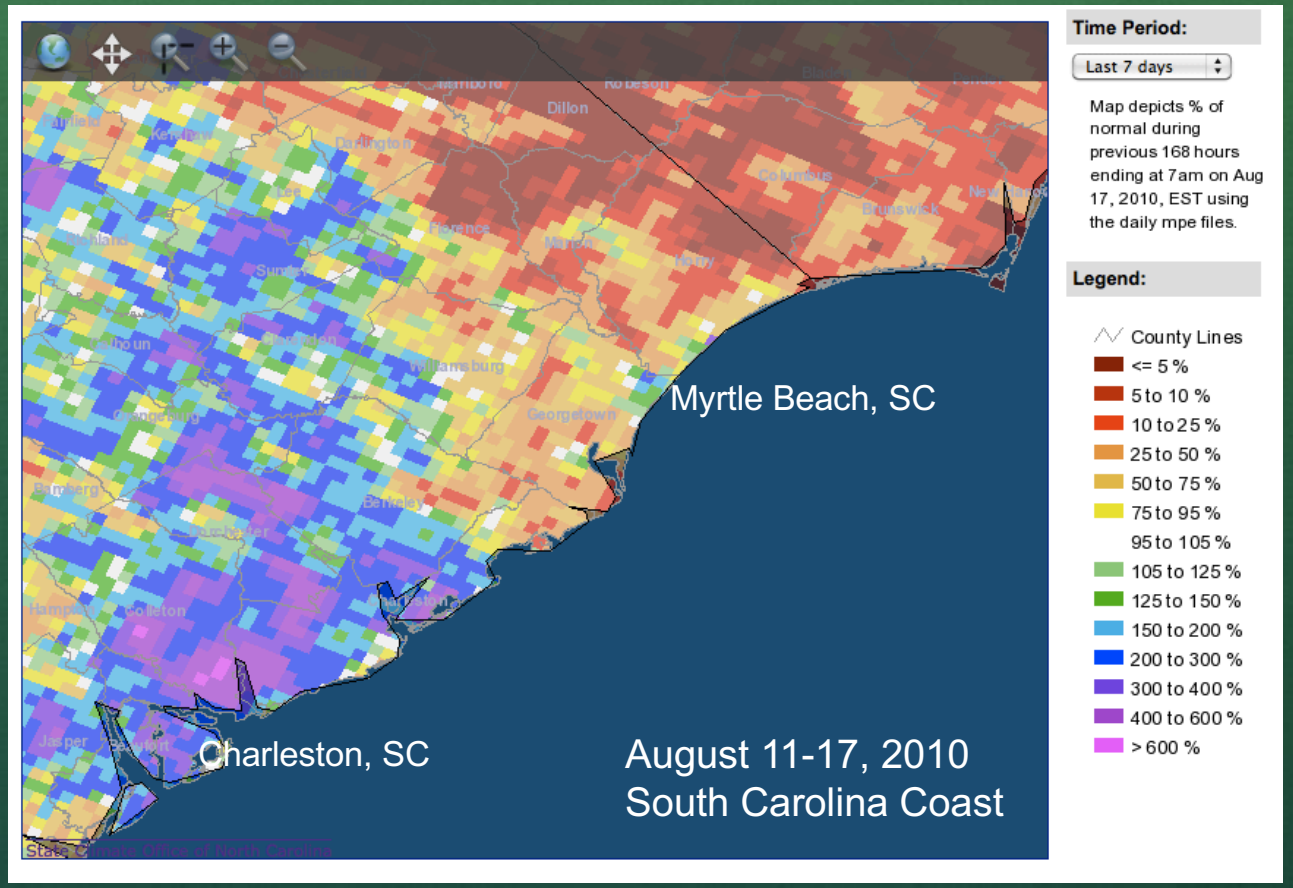
Precipitation from one storm can vary from neighborhood to neighborhood. What falls in your yard may not fall in the next. The next time it rains see how the precipitation amounts differ in parts of your community.



Large local variations in summer precipitation are common

Summertime convective storms can dump heavy rains over one area and leave other nearby spots completely dry.

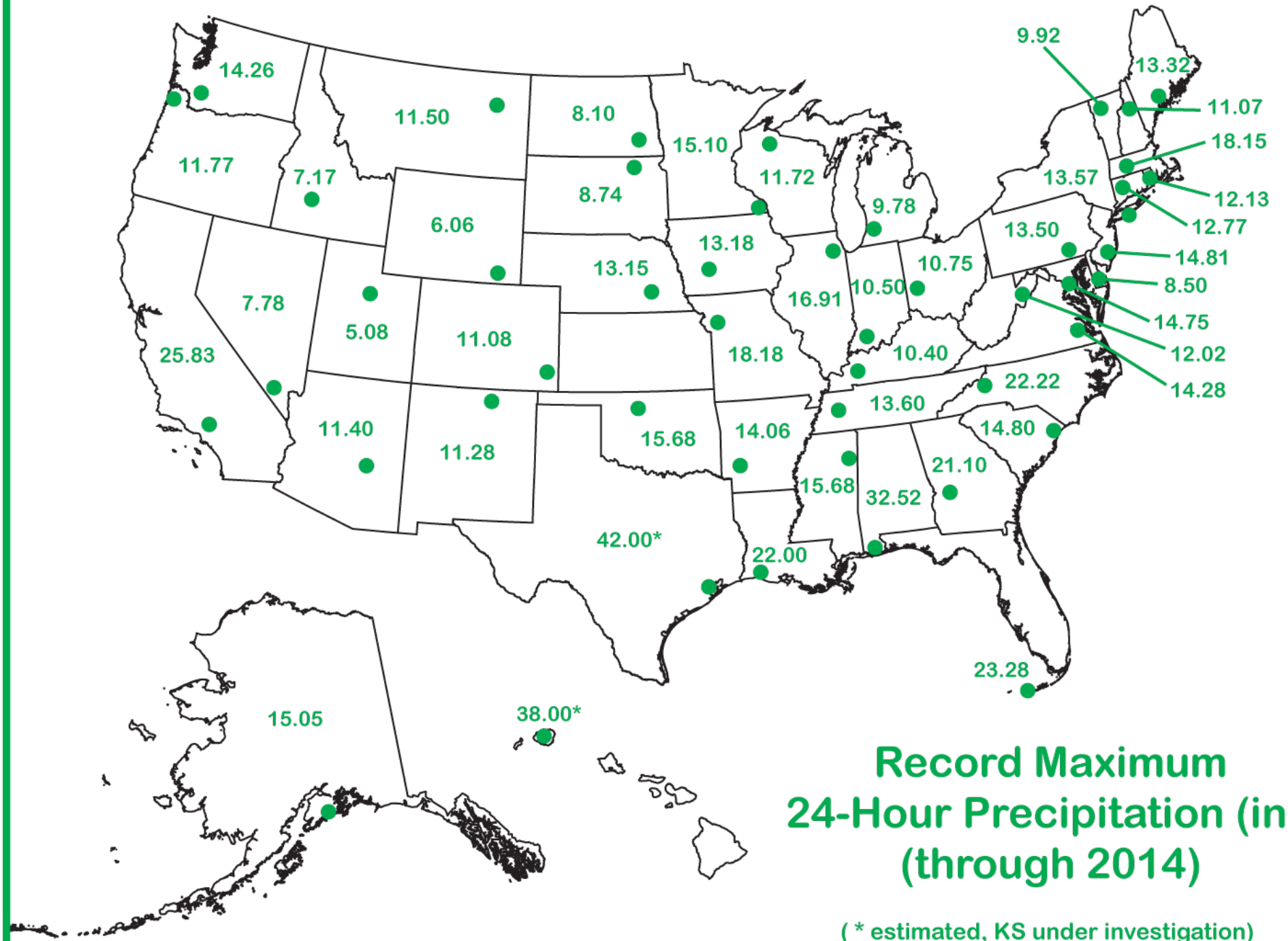
This map by the State Climate Office of NC shows the % of normal precipitation that has fallen over the South Carolina coast during the last seven days. Note where it has rained and where it has not.



Courtesy of the State Climate Office of NC

Precipitation Records

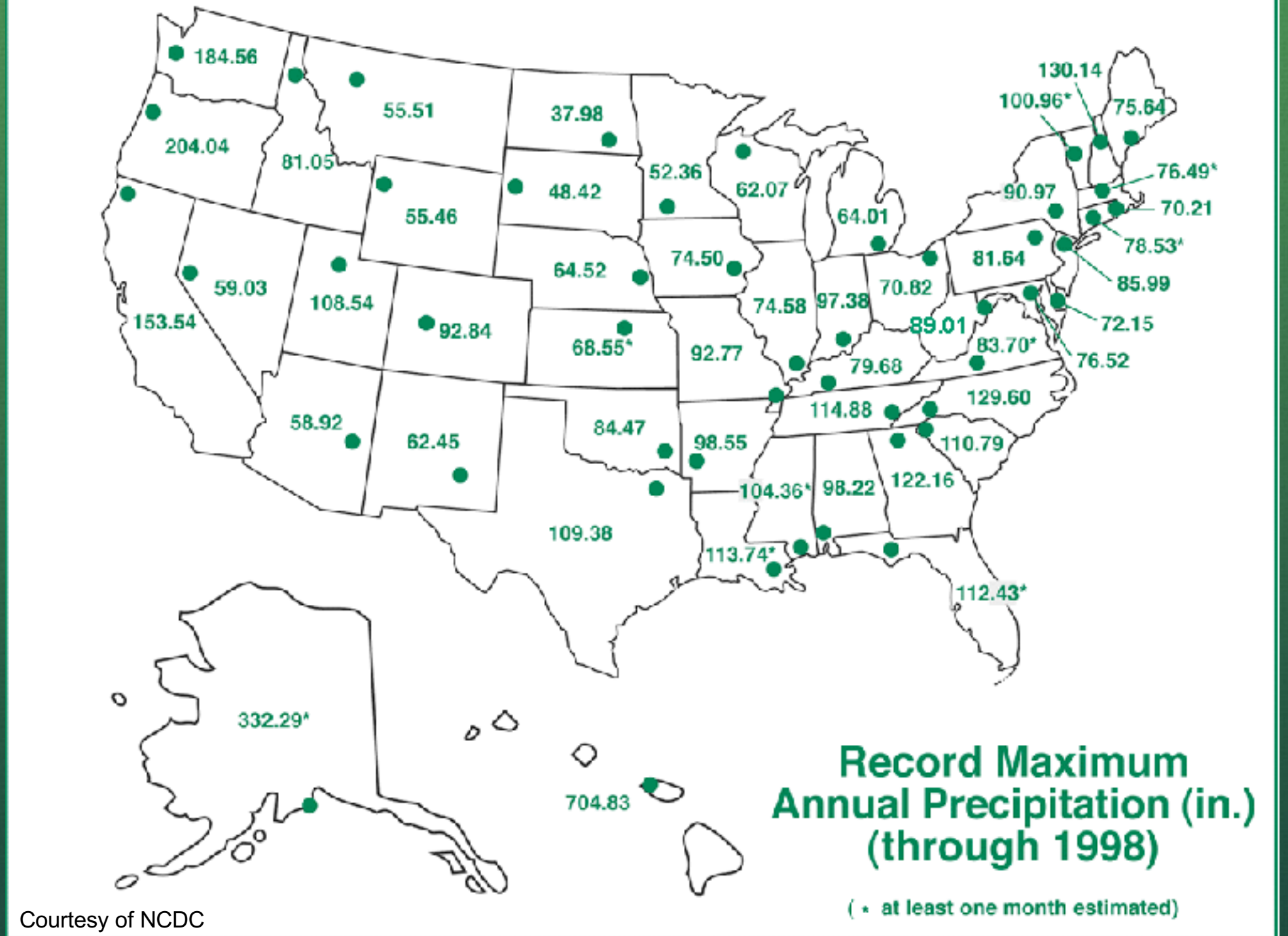
Sometimes it may seem like the rain in your area may never let up. Here are the record precipitation amounts for each state.



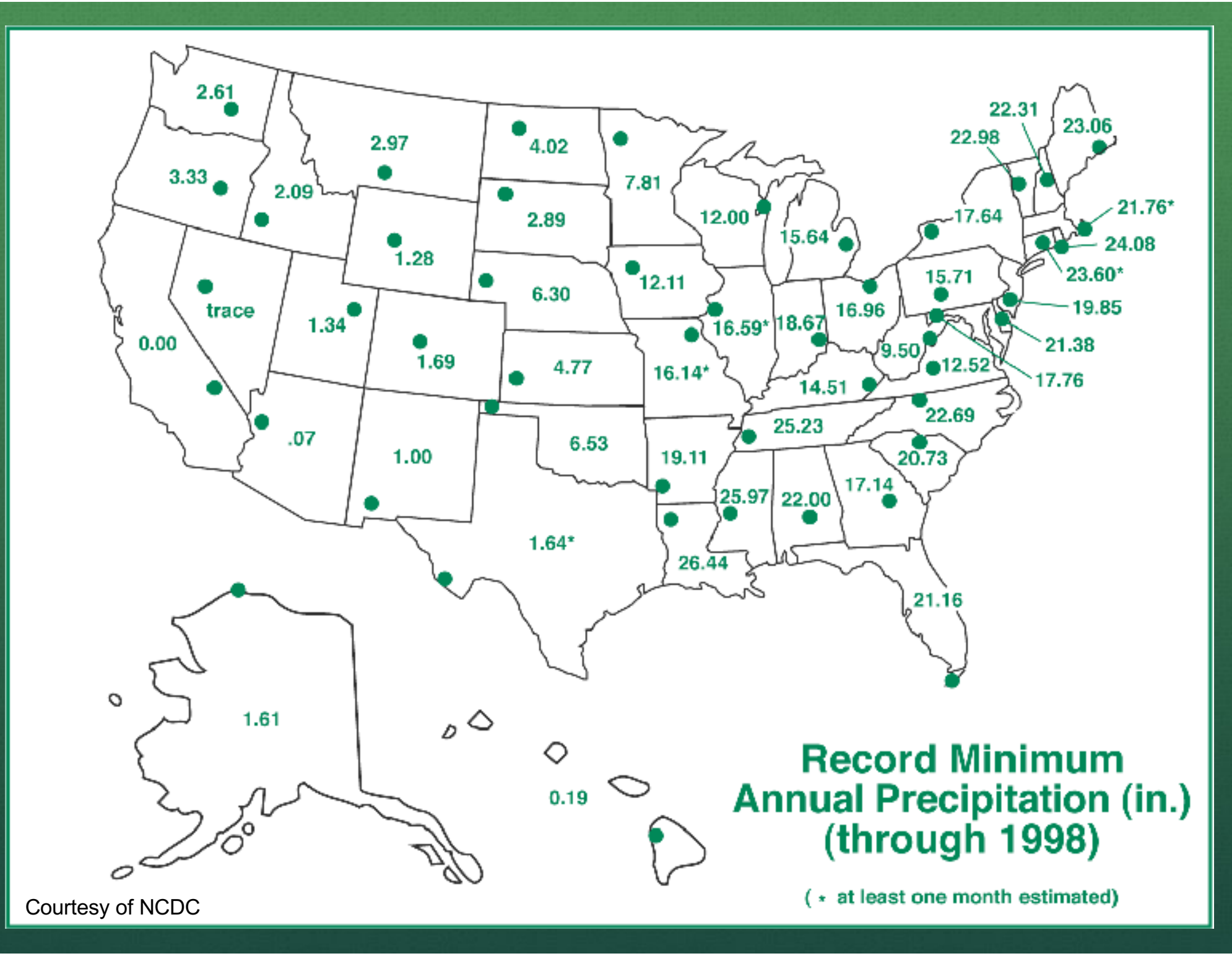
Record Maximum 24-Hour Precipitation (in.) (through 2014)

(* estimated, KS under investigation)

Courtesy of NCEI & NJ State Climate Office



Courtesy of NCDC



Courtesy of NCDC

What about Hail?

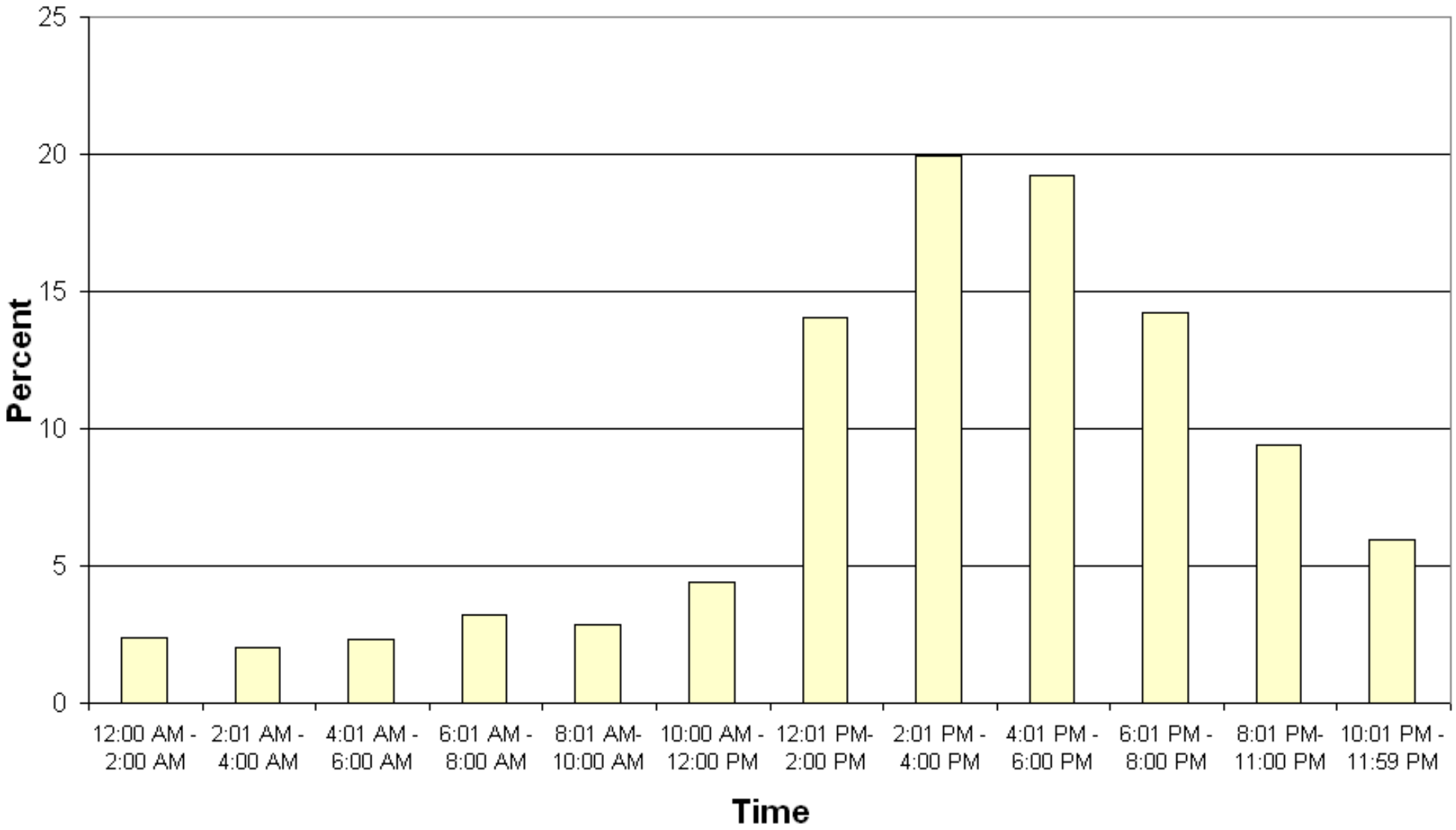
Credit: Carol Slusser

Just a few minutes of hail can bring a painful interruption or even a quick end to your garden.

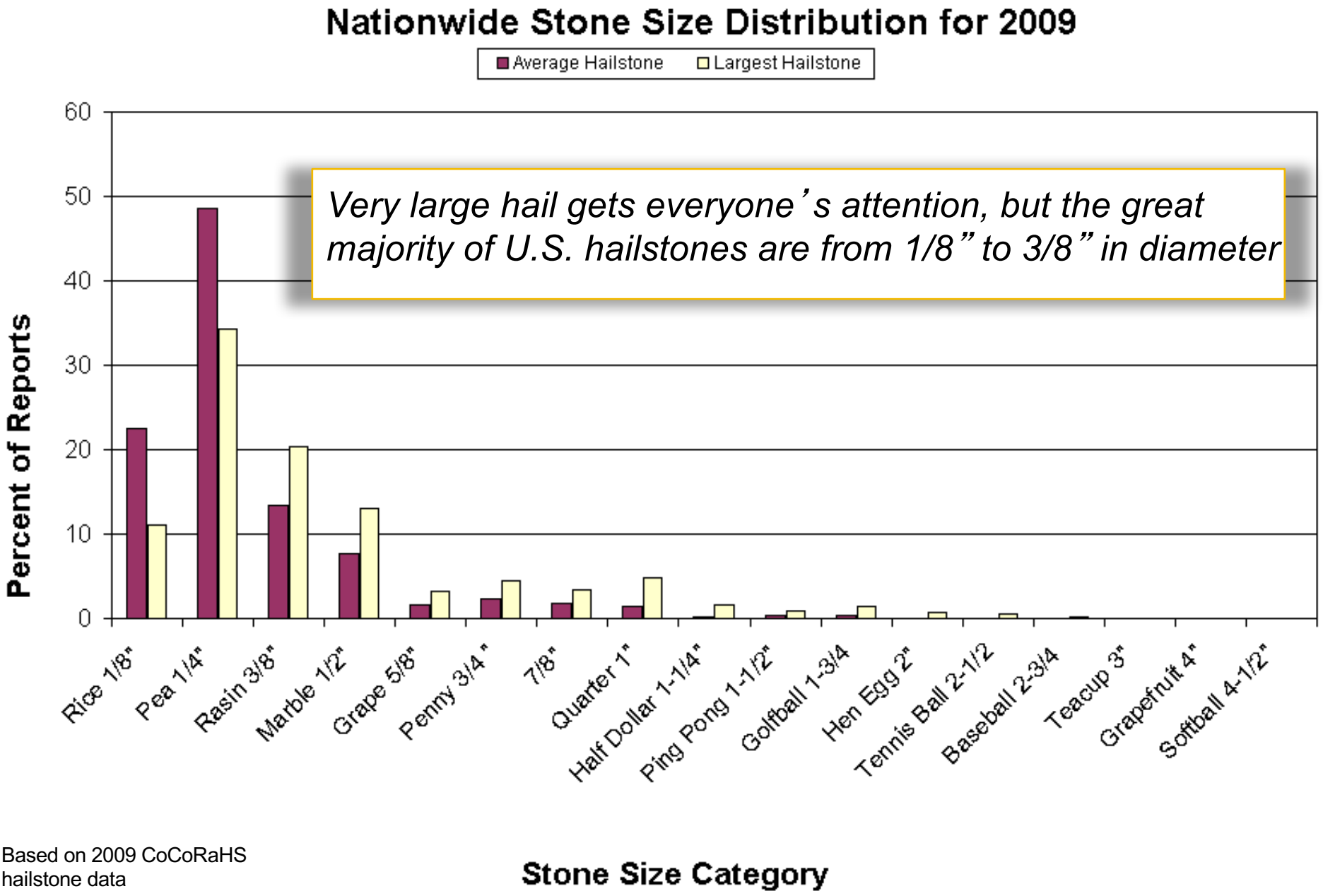
Hail and Garden Plants

Hail can occur anywhere in the country. While most stones are quite small, even small hail can damage sensitive garden plants. Pay attention to weather forecasts and be prepared to protect your most valuable plants if necessary. Do not put yourself in danger by going outdoors during hail or lightning.

Time of day when hail occurs – based on 2009 nationwide CoCoRaHS Data



Example of Hailstone Sizes on Pads



Based on 2009 CoCoRaHS hailstone data

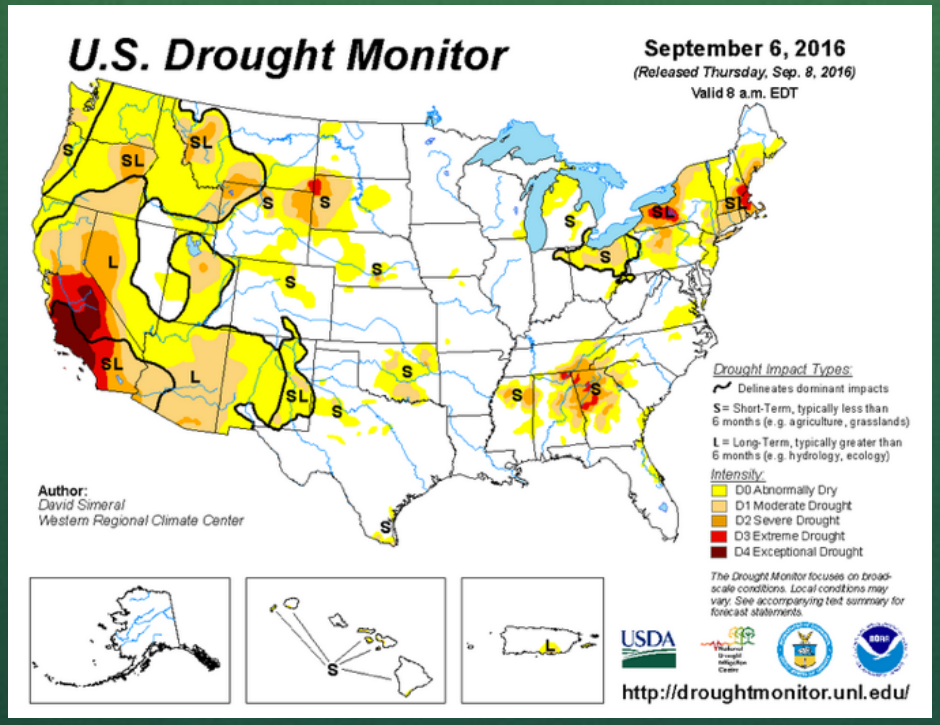
Drought

"No friend to the Gardener"

The American Meteorological Society's Glossary of Meteorology states that "*drought is a period of abnormally dry weather sufficiently long enough to cause a serious hydrological imbalance.*"

What about Drought?

At almost anytime of year some portions of the U.S. are experiencing shortages in precipitation.



http://www.droughtmonitor.unl.edu

The U.S. Drought Monitor continuously monitors precipitation and receives local advice to put the status of precipitation received into context and notify the public about the risk and severity of drought. Some cities or states put watering restrictions into place during drought conditions.

It's the "Lack-a-water"

There are many ways to enjoy gardening even in the face of drought!

- Native species may be better suited to withstand drought
- Watering in the early morning or evening
- Watering enough, but not too much
- Drip irrigation
- Xeriscape gardening

Drought Impact Reports

You can help play a part in making the nation aware of drought lurking about in your neighborhood by submitting "drought impact reports". This can be done on the CoCoRaHS Network web site at: www.cocorahs.org

The lack of precipitation can result in many effects which are associated with agriculture, as well as backyard horticulture. Some of these include insect infestation, plant disease, increased irrigation costs, supplemental water resource development (wells, dams, pipelines), damage to crop quality, reduced productivity of gardens and many other examples.

Section Six: Wind

The Wind

breeze

Calm

strong gale

"Who has seen the wind, neither I nor you . . ."

Wind

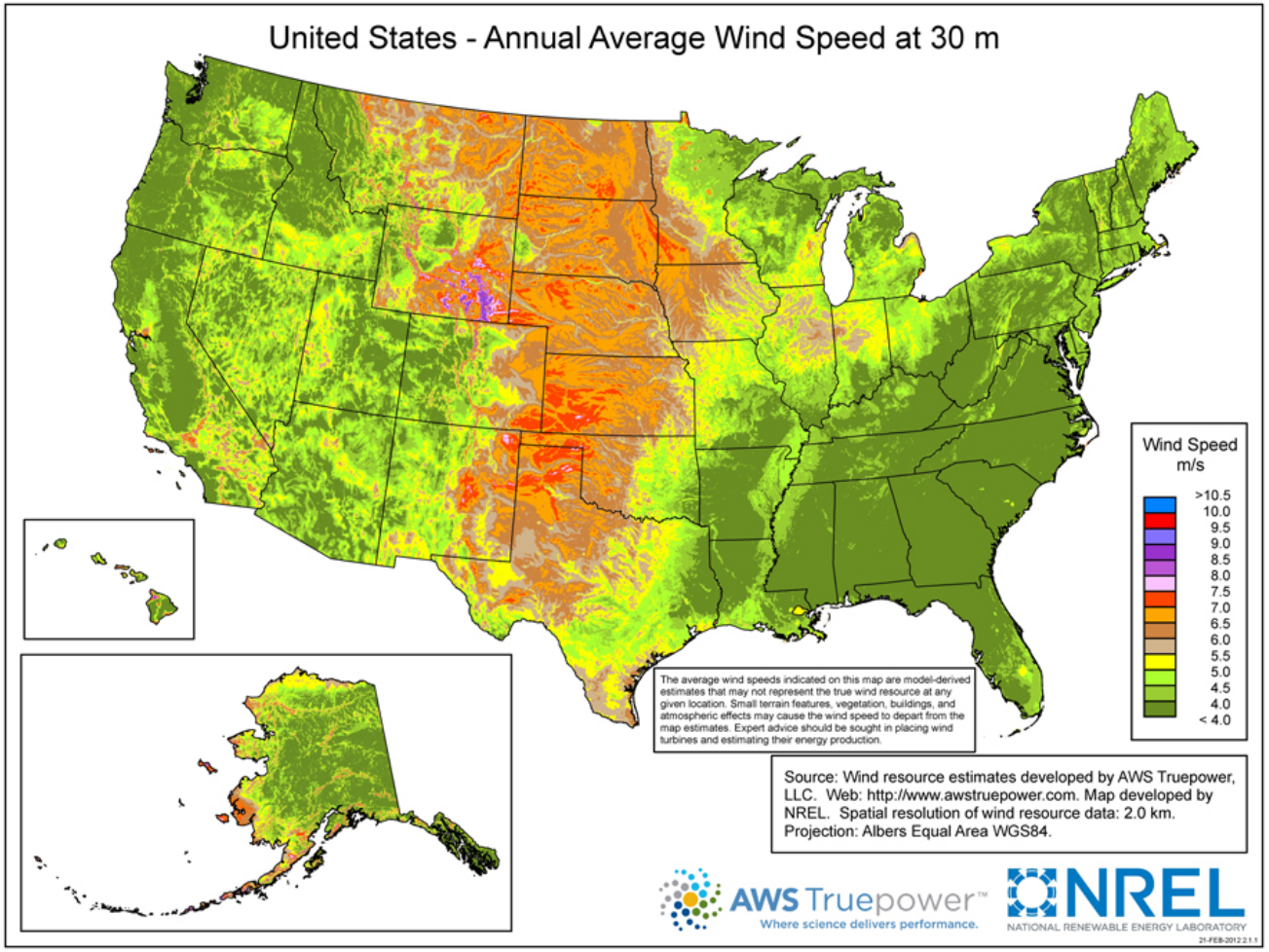
"Air in motion relative to the surface of the earth."

- AMS Glossary of Meteorology

Thar she blows!

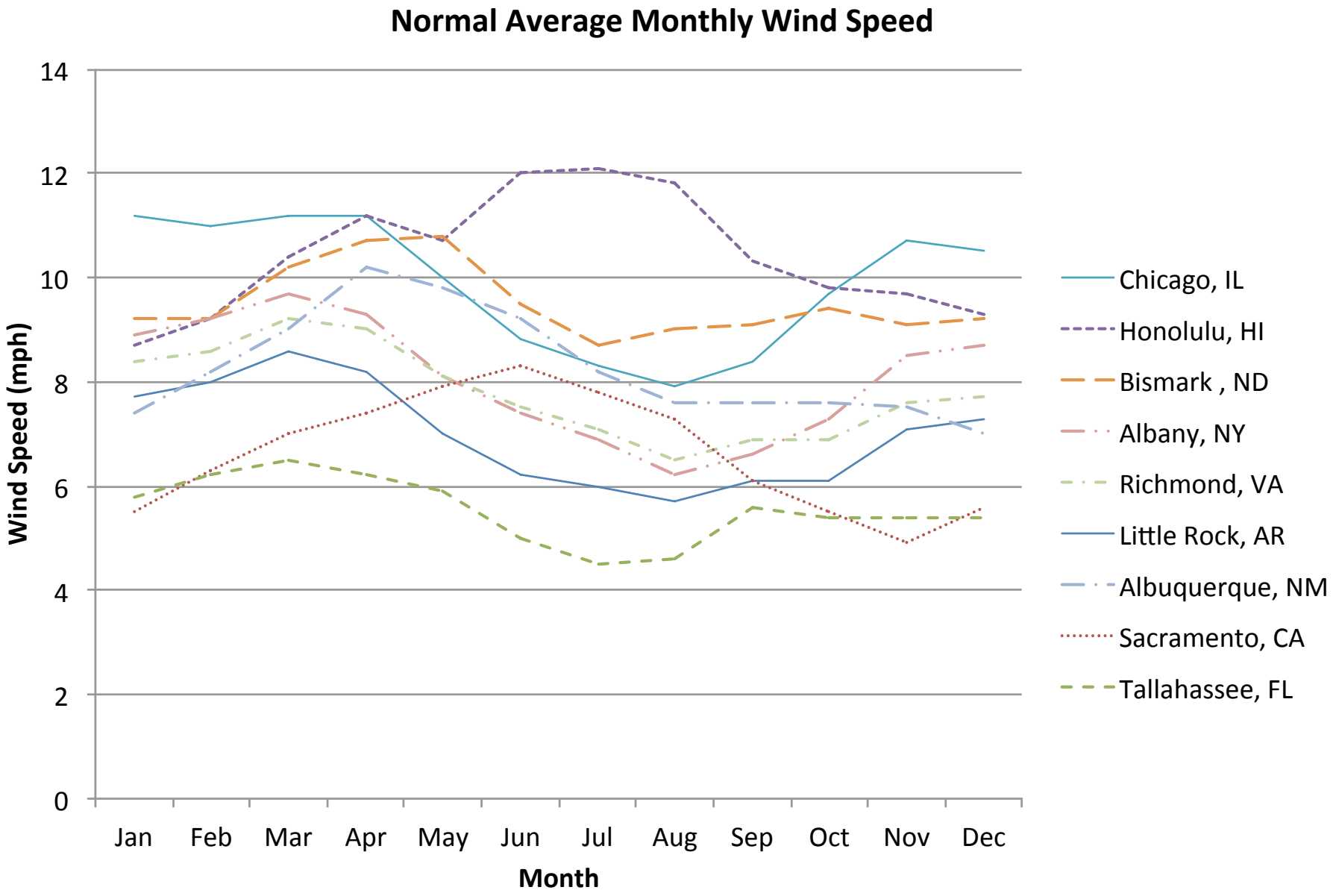
- Wind can have an affect on growing certain kinds of crops
- Wind can mix the atmosphere preventing frost on clear nights
- Wind can erode topsoil and dry out surface moisture
- Wind can damage young plants and seedlings
- Wind scatters seeds (both good and bad)
- Wind increases plant water use
- Wind may cool the gardener on a hot day

Wind Energy Atlas



The U.S. Great Plains are the windiest region of the country

Patterns of Wind



Section Seven: Evapotranspiration (ET)

Evapotranspiration

ET

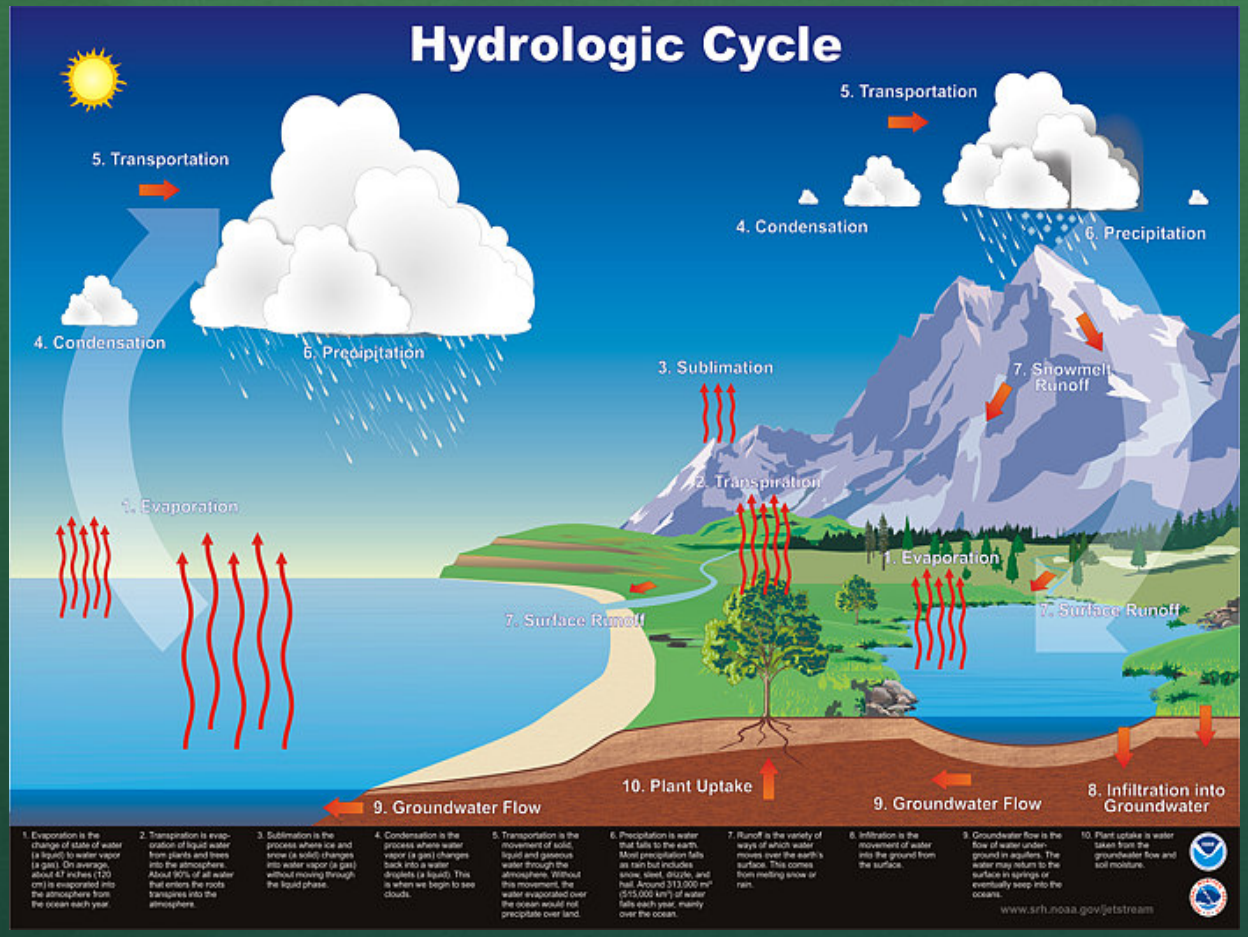
WATER

Atmometer

"The invisible side of the Hydrologic Cycle"

Evapotranspiration

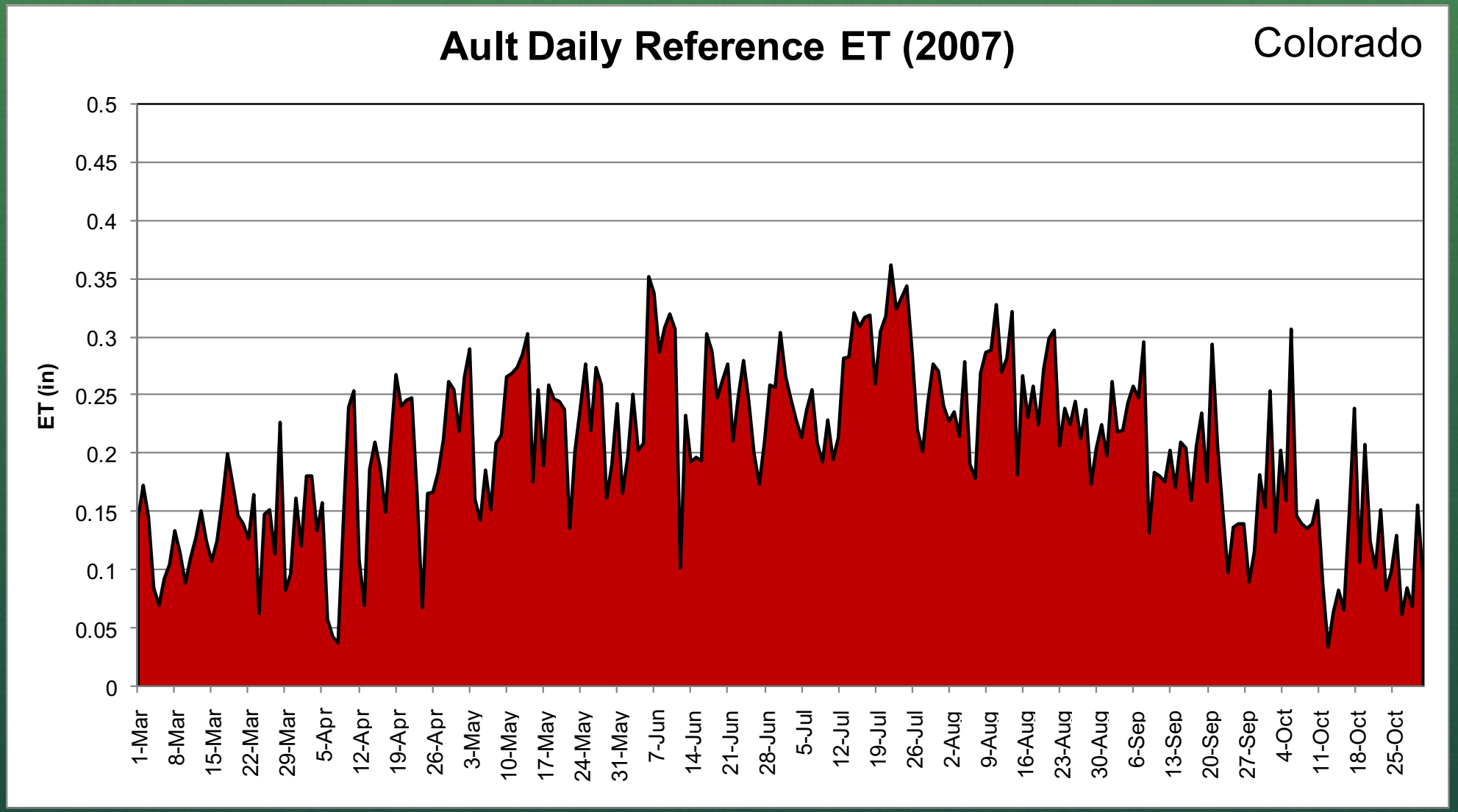
"The invisible side of the water cycle"



"The combined processes through which water is transferred to the atmosphere from open water and ice surfaces, bare soil, and vegetation that make up the earth's surface."

- AMS Glossary of Meteorology

Example of Growing Season Cycle of Evapotranspiration



What Affects Evapotranspiration?

There are several factors that affect evapotranspiration:

- Wind
- Temperature
- Relative Humidity
- Sunshine

ET and Stress on Plants

Evapotranspiration can affect plant health and cause stress on plants

Low ET = more “less stressed/healthy” plants

High ET = possible stressed plants

“Can I afford to pay the water bill this month?”

Section Eight: Climate Resources

Climate Resources

noaa
CoCoRaHS
state climate offices

"Where to go for local, regional and national info"

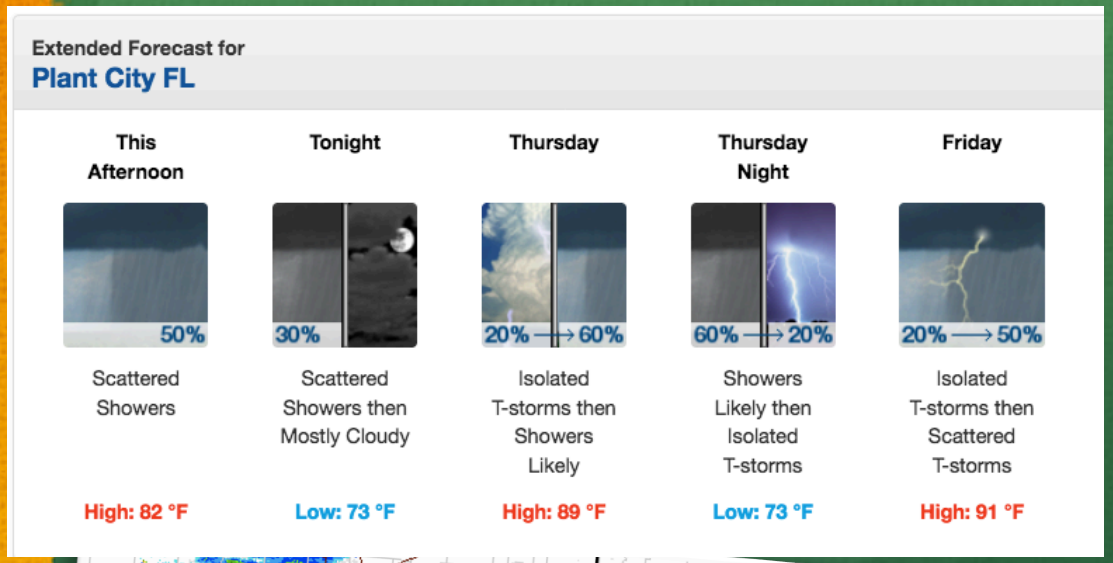
NOAA

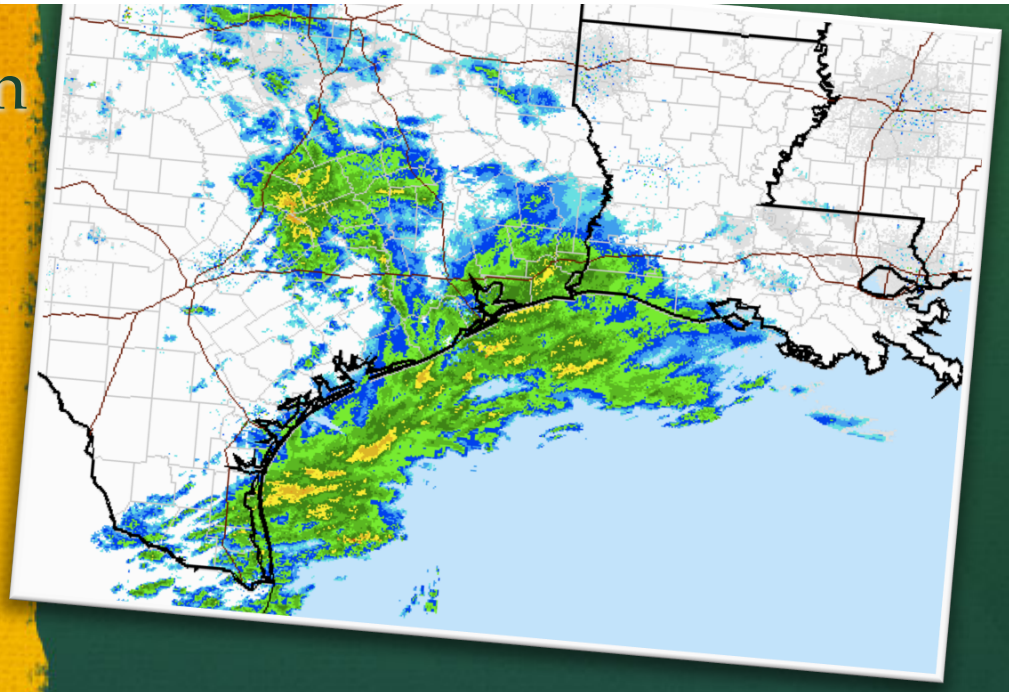
NOAA provides important weather and climate information for gardeners

- National Weather Service
- Climate Prediction Center
- National Centers for Environmental Prediction
- National Climate Services

National Weather Service

Daily Forecasts
Current Radar
Frost/Freeze Information
Climate Information

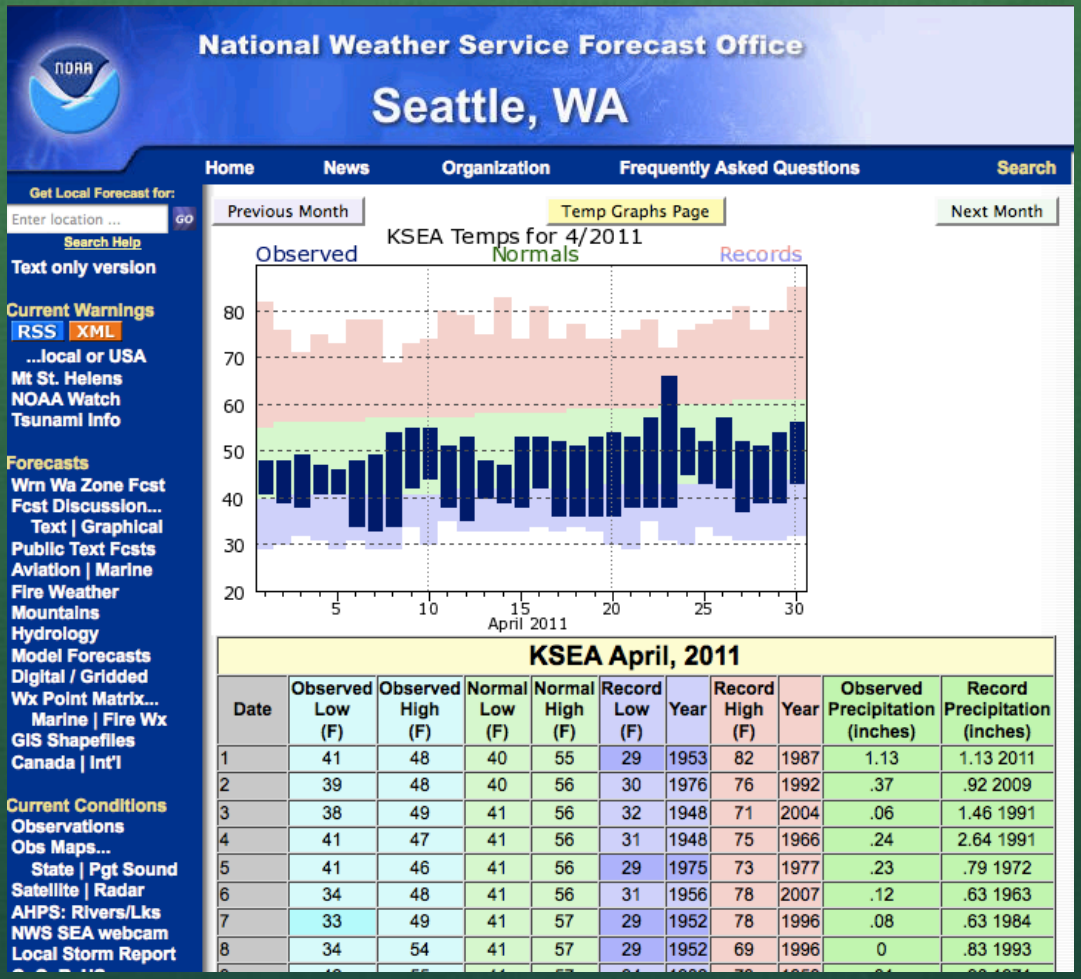




www.weather.gov/

Important Data for Gardeners

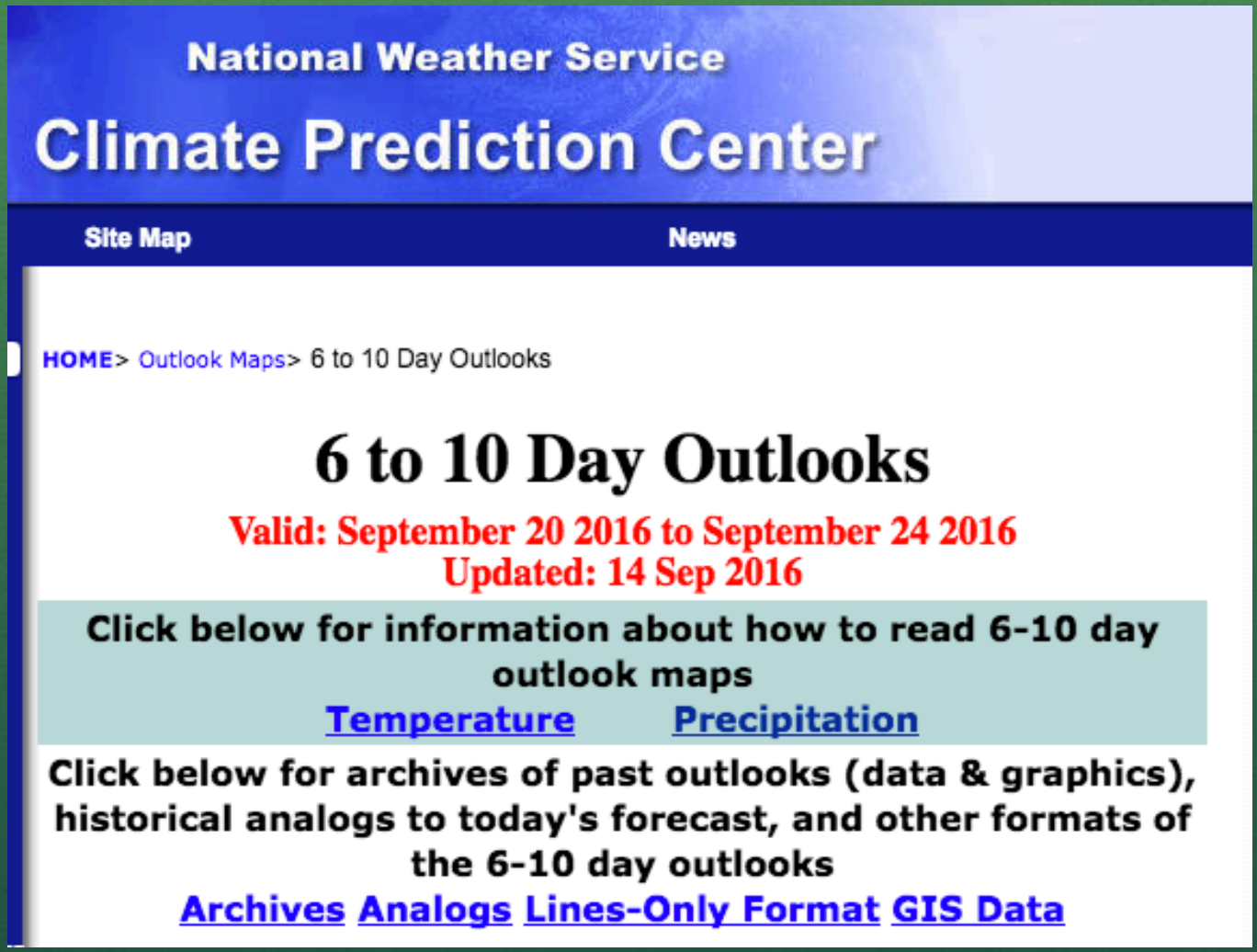
```
CLIMATE REPORT
NATIONAL WEATHER SERVICE GRAY ME
440 PM EDT MON MAY 2 2011


.....................................

...THE PORTLAND ME CLIMATE SUMMARY FOR MAY 2 2011...
VALID TODAY AS OF 0400 PM LOCAL TIME.

CLIMATE NORMAL PERIOD 1971 TO 2000
CLIMATE RECORD PERIOD 1941 TO 2011


WEATHER ITEM   OBSERVED TIME    RECORD YEAR NORMAL DEPARTURE LAST
                VALUE   (LST)  VALUE       VALUE  FROM      YEAR
                                                   NORMAL
.....................................................................
TEMPERATURE (F)
 TODAY
  MAXIMUM         57    205 PM  91    2001  58     -1        75
  MINIMUM         35    358 AM  25    1964  40     -5        52
  AVERAGE         46                        49     -3        64

PRECIPITATION (IN)
  TODAY            0.00          3.41 2006   0.13  -0.13      0.00
  MONTH TO DATE    0.00                      0.26  -0.26       T
  SINCE MAR 1     11.22                      8.66   2.56     12.74
  SINCE JAN 1     17.73                     15.89   1.84     21.83

SNOWFALL (IN)
  TODAY            0.0           T    1961   0.0    0.0       0.0
  MONTH TO DATE    0.0                       T     0.0       0.0
  SINCE MAR 1      9.3                     16.2   -6.9       0.1
  SINCE JUL 1     78.6                     66.4   12.2      37.1
  SNOW DEPTH       0

DEGREE DAYS
 HEATING
  TODAY           19                       16     3         1
  MONTH TO DATE   33                       32     1         8
  SINCE MAR 1   1606                     1666   -60      1259
  SINCE JUL 1   6551                     6873  -322      6005

 COOLING
  TODAY            0                        0     0         0
  MONTH TO DATE    0                        0     0         0
  SINCE MAR 1      0                        0     0         0
  SINCE JAN 1      0                        0     0         0
.....................................................................


WIND (MPH)
  HIGHEST WIND SPEED    14   HIGHEST WIND DIRECTION     E (80)
  HIGHEST GUST SPEED    16   HIGHEST GUST DIRECTION     S (180)
  AVERAGE WIND SPEED     5.1
```



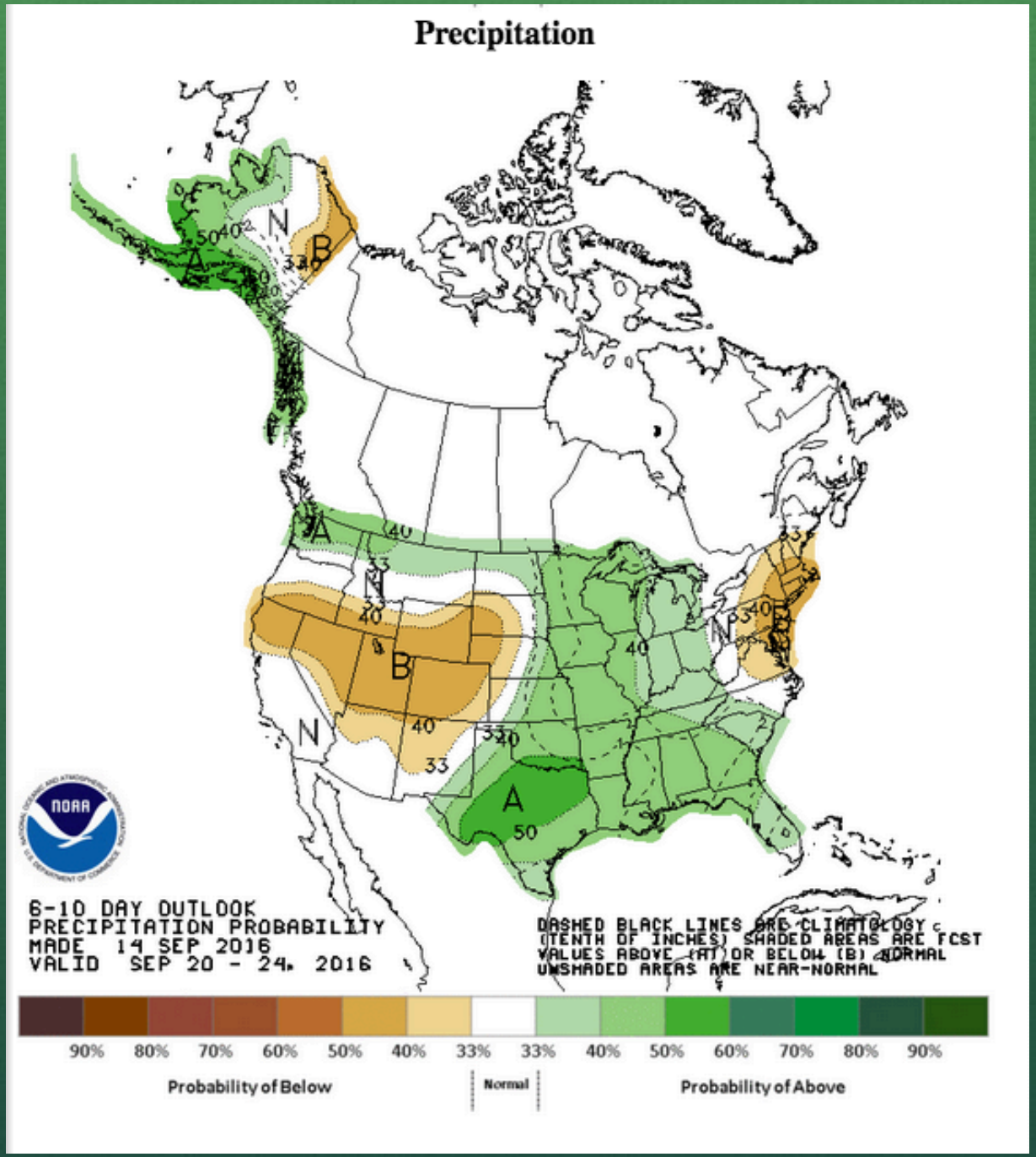
KSEA April, 2011

Date	Observed Low (F)	Observed High (F)	Normal Low (F)	Normal High (F)	Record Low (F)	Year	Record High (F)	Year	Observed Precipitation (inches)	Record Precipitation (inches)
1	41	48	40	55	29	1953	82	1987	1.13	1.13 2011
2	39	48	40	56	30	1976	76	1992	.37	.92 2009
3	38	49	41	56	32	1948	71	2004	.06	1.46 1991
4	41	47	41	56	31	1948	75	1966	.24	2.64 1991
5	41	46	41	56	29	1975	73	1977	.23	.79 1972
6	34	48	41	56	31	1956	78	2007	.12	.63 1963
7	33	49	41	57	29	1952	78	1996	.08	.63 1984
8	34	54	41	57	29	1952	69	1996	0	.83 1993

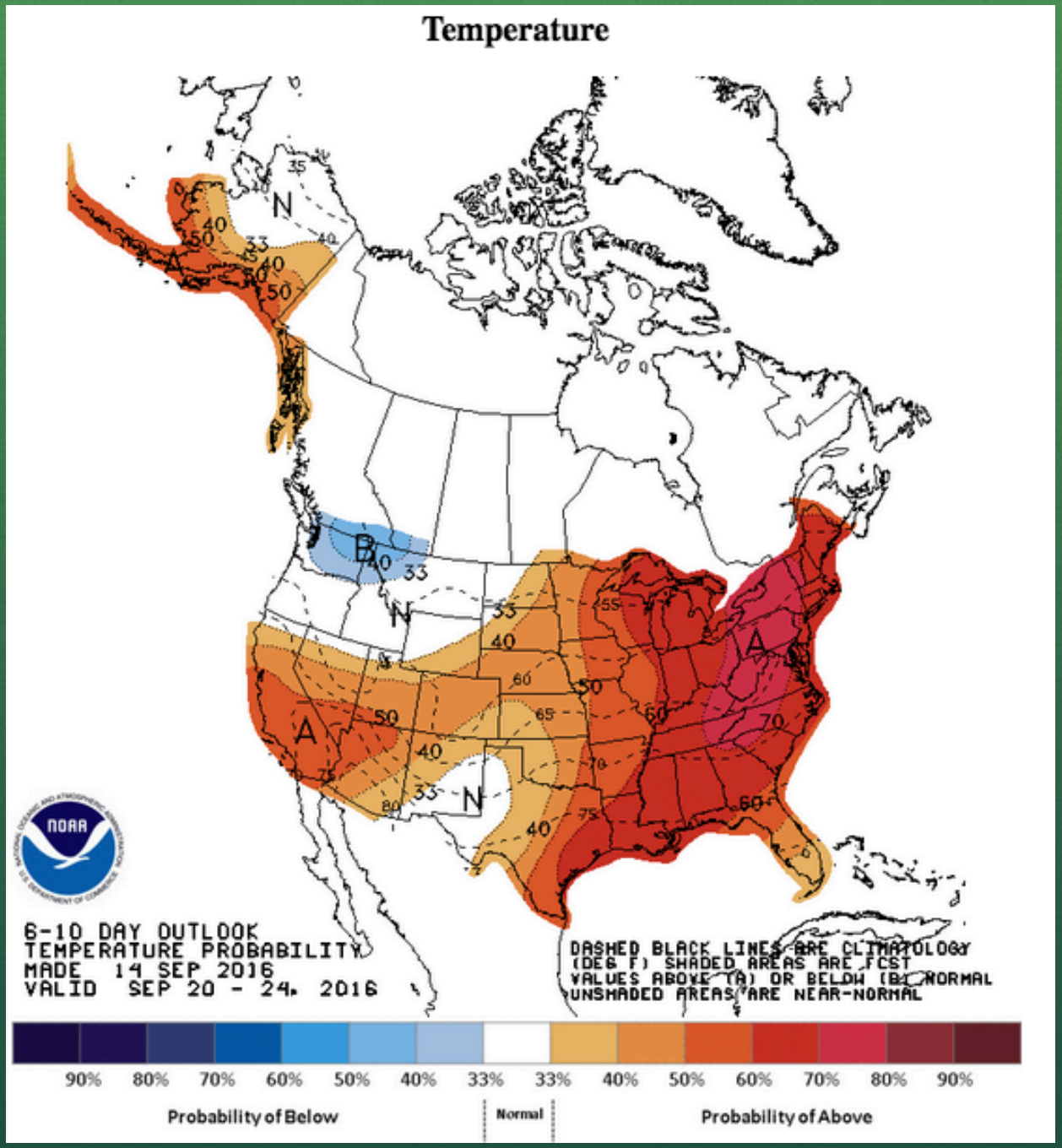
Temperature and Precipitation Outlooks



www.cpc.noaa.gov/

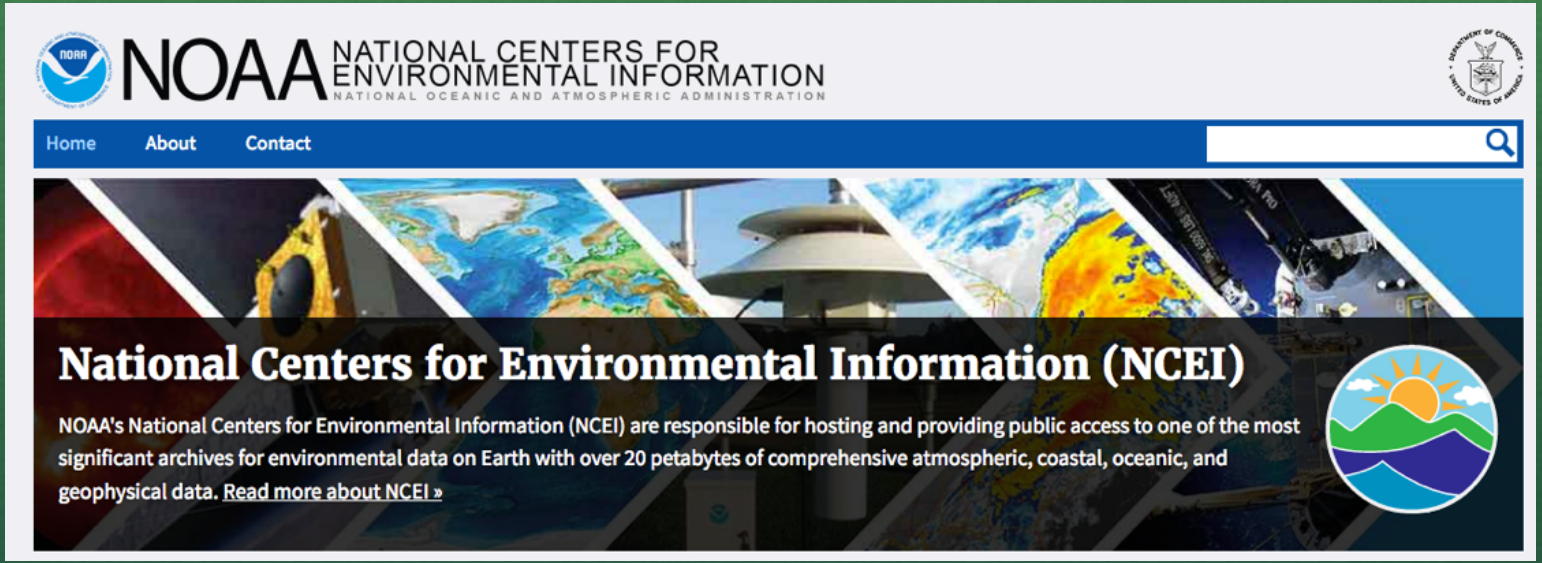


6 -10 Day Precipitation Outlook



6 -10 Day Temperature Outlook

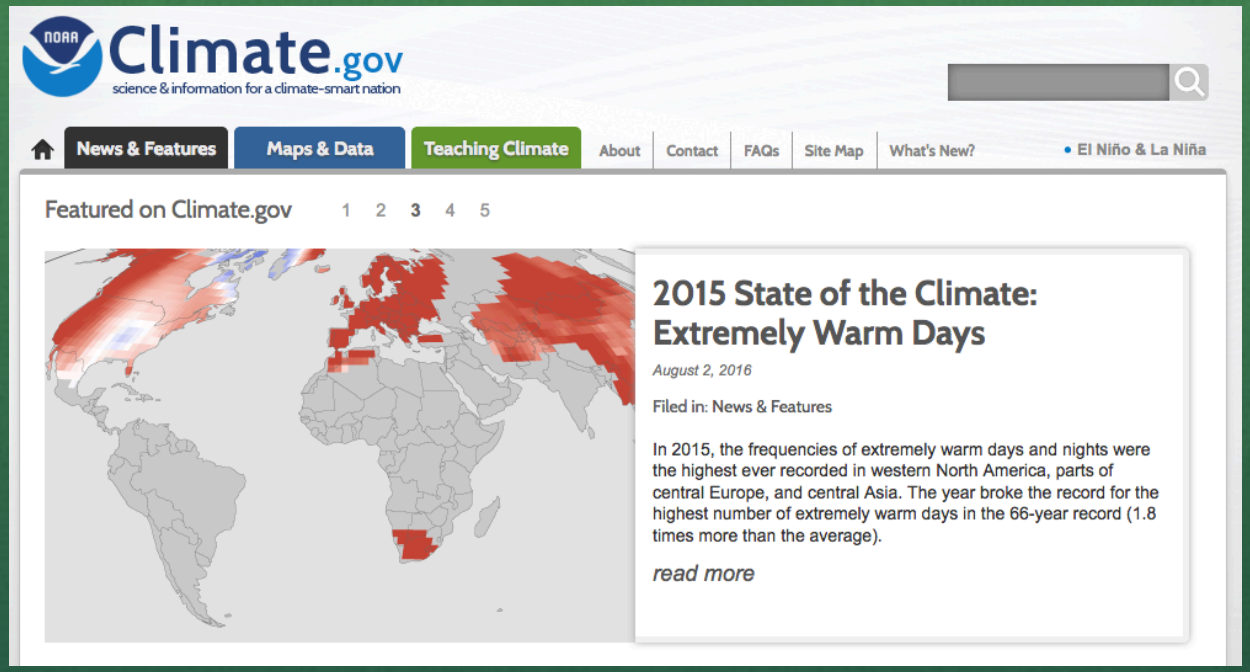
NCEI



NCEI is the world's largest active archive of weather data. NCEI produces numerous climate publications and responds to data requests from all over the world.

www.ncei.noaa.gov

NOAA's Climate Portal

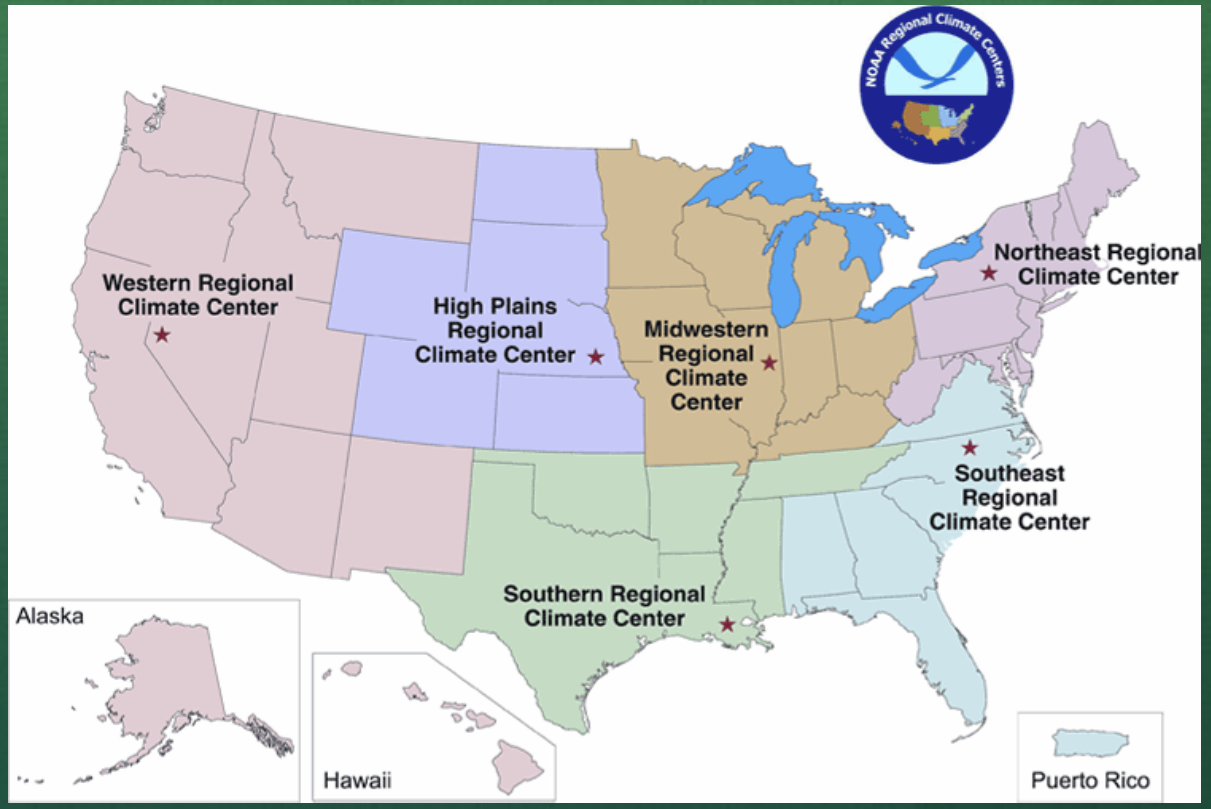


NOAA's Climate Services Portal showcases a wide breath of climate information. With the click of a mouse the user has easy access to climate data and services, timely articles and information, education resources, and tools for engagement and decision-making.

www.climate.gov

Regional Climate Centers

NOAA's Regional Climate Centers provide general and user-defined regional and local climate products and services, as well as regional and local expertise and assistance to a wide range of customers.



https://www.ncdc.noaa.gov/customer-support/partnerships/regional-climate-centers

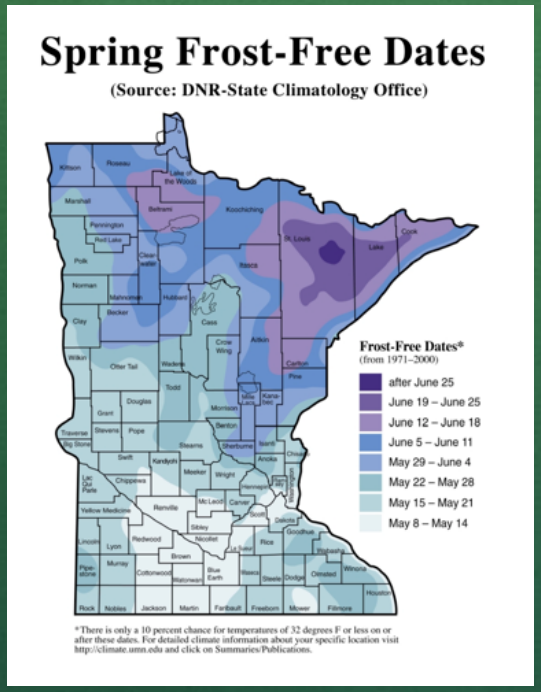
State Climate Offices

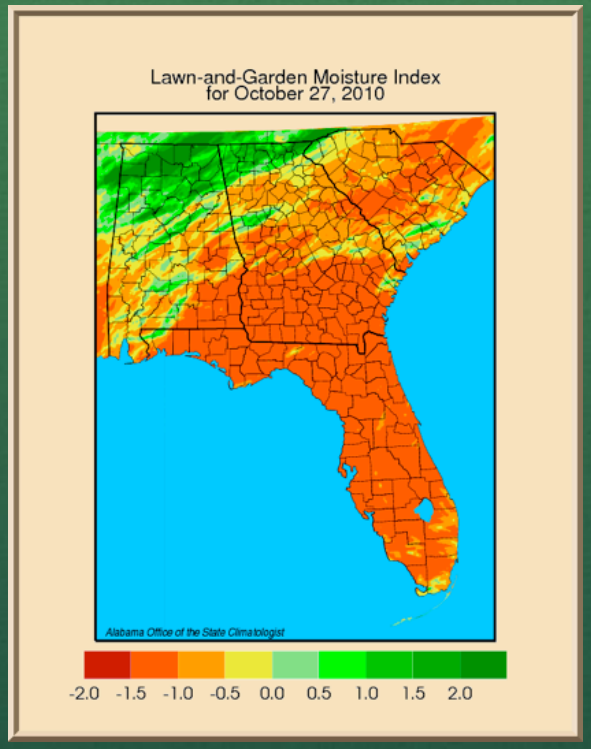
Your best resource for looking at “local climate details” in your state. Most states have a state climate office which can provide custom climate data and information.

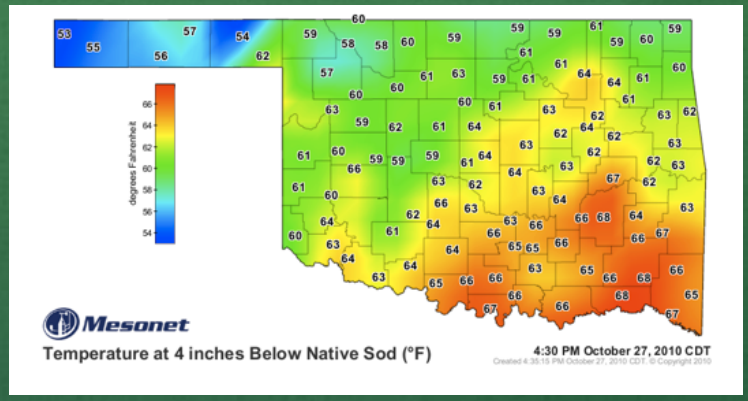
COLORADO CLIMATE CENTER

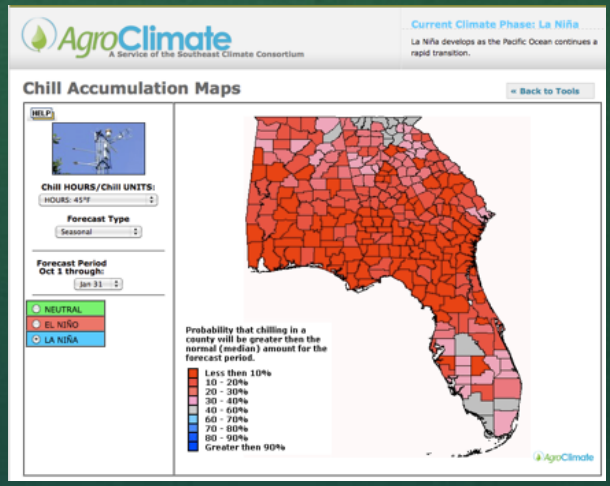
For more info visit:
www.stateclimate.org/

Examples of State Climate Products









Many state climate offices put out products that are helpful to the local gardener in many ways.

Section Nine: Climate Change

Climate Change

warming

CO_2

challenges

"What will grow where in 2075?"

The future is always uncertain, but from most scientific assessments it looks like our future climate will most likely be different from the past.

Changes in precipitation are not very certain although computer models suggest that the northern U.S. could be wetter while southwestern states may be drier.

Temperature projections are more confident with an expectation that future decades will see warmer temperatures than the 20th century.

How will this affect my garden ?

ARE FRIED GREEN TOMATOES . .
LIKELY ON THE VINE ??
Climate Change and Master Gardeners

View the IPCC report on Climate Change
at: www.ipcc.ch/

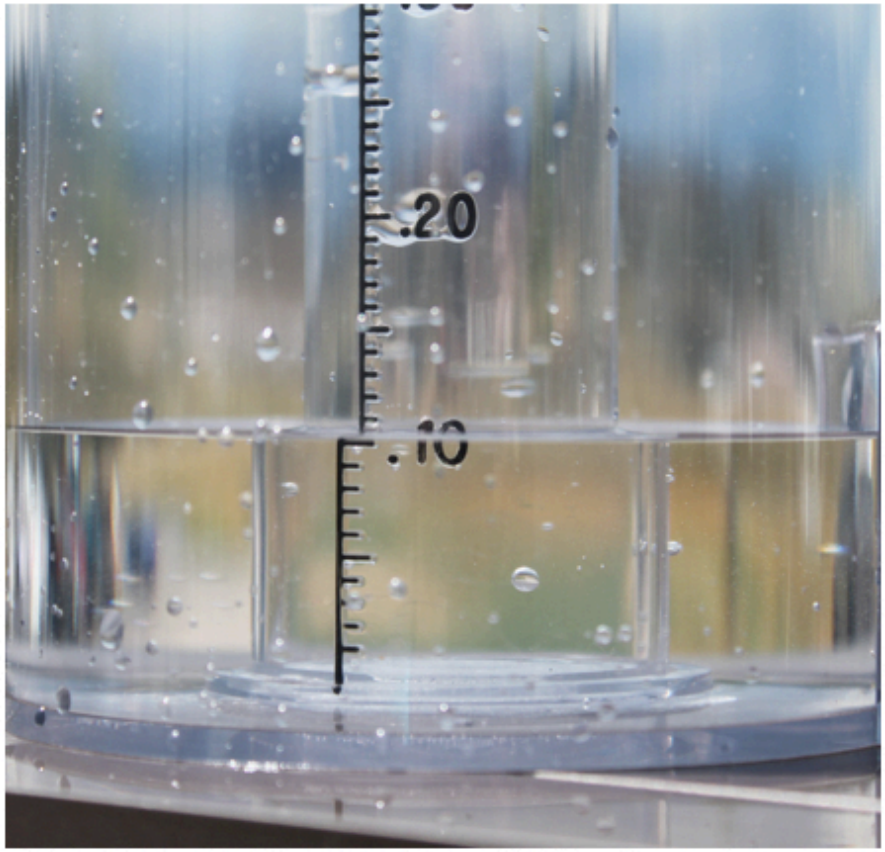
ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

Climate Change – Anticipating, Adapting, Avoiding

- Climate change may affect the type of plants we plant in the future.
- CO^2 is good for plants, so it might have a positive effect on the vigor of our gardens provided we have sufficient water. Unfortunately it is also good for weeds.
- More insects - not cold enough to kill them.
- More precipitation, less precipitation?
- New varieties in old climates.
- A challenge, an opportunity.

Section Ten: CoCoRaHS, an opportunity for gardeners!

CoCoRaHS



rain

Hail

snow

"Precipitation measurements in your own backyard!"

CoCoRaHS – an opportunity to participate

Here at the very end of our guide we want to present you with an opportunity to track the most variable element of our climate . . . The precipitation that falls on your garden. What better way to find out how precipitation affects your garden than to track it yourself! After all, every gardener should know how much rain falls in their own yard.

It's much easier than you might think, only five minutes each day. It's more affordable than you might imagine . . . just the cost of a rain gauge. We provide the website, a specific station number, great detailed maps, educational materials (such as on-line training) and user support. Plus your observations help fill in gaps across the country and are used by scientists, educators, municipalities, the National Weather Service and many more . You can make a difference while learning from the experience as well.

How Can you become part of the network?

Five easy steps

Sign-up on the
CoCoRaHS Web page
www.cocorahs.org

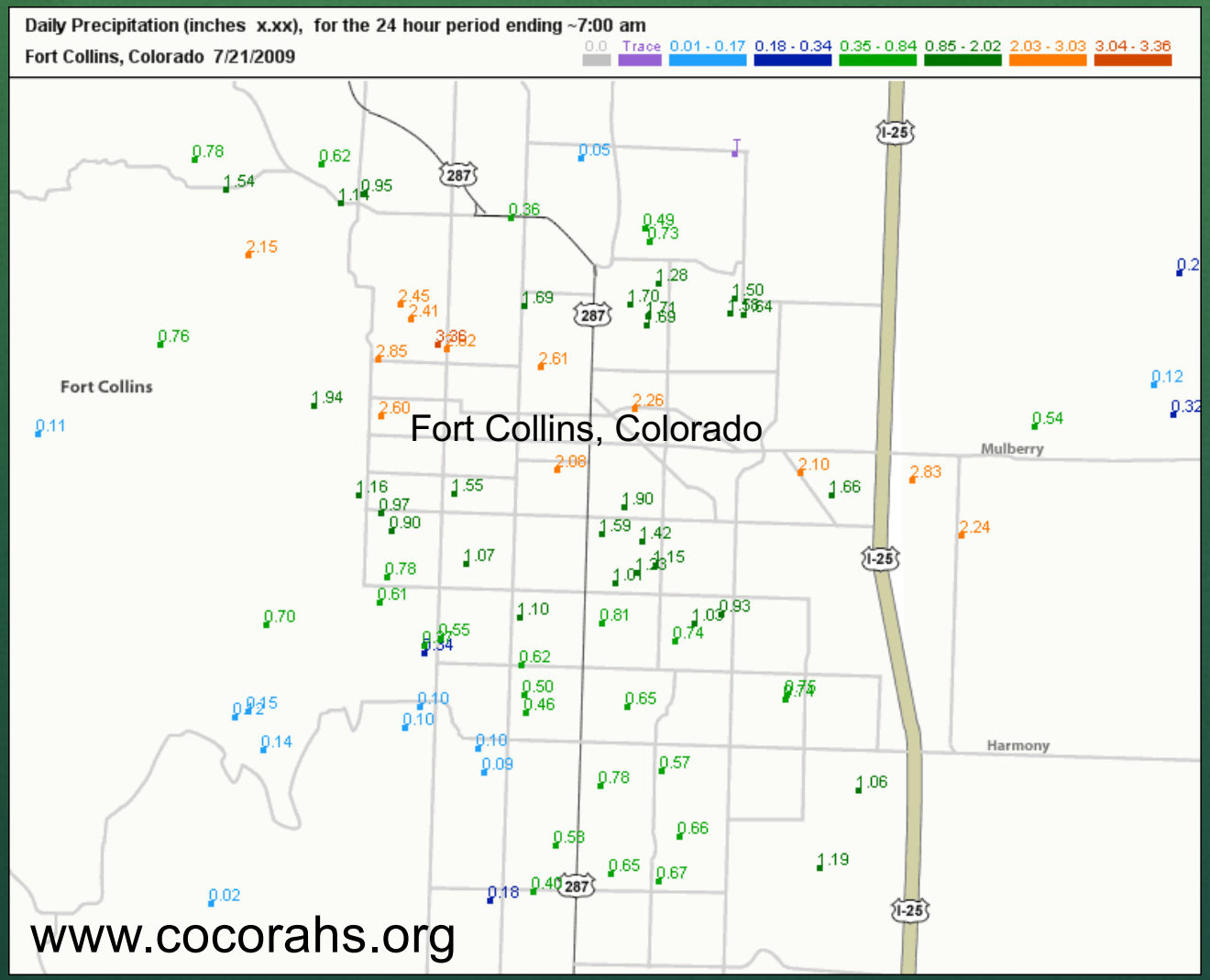
Obtain a 4” diameter plastic rain gauge
(info available on web site)

View the “training slide show” or
attend a training session

Set-up the gauge in a “good”
location in your yard

Start observing precipitation
and report on-line daily

Even if you don't participate



CoCoRaHS is a great way to find out about local precipitation even if you don't participate. All maps and education materials are free to the public.

The maps are updated everyday and are viewable on a national, statewide and county level.

Thanks for joining us!

The next time you talk about your garden with others, please mention this resource of climate information for gardeners. For more information please contact: info@cocorahs.org

Credits

We would like to thank the following organizations for providing materials and support to make this guide possible:

NOAA/Office of Education
Colorado State University
Colorado Climate Center
PRISM – Oregon State University
United States Dept. of Agriculture
NOAA/National Centers for Environmental Information
NOAA/National Weather Service
NOAA/Climate Prediction Center
National Renewal Energy Lab
American Meteorological Society
Desert Research Institute
AgroClimate – Southeast Climate Consortium
Minnesota State Climate Office
Florida Climate Center
Alabama Office of the State Climatologist
State Climate Office of North Carolina
Office of the New Jersey State Climatologist
National Drought Mitigation Center
American Association of State Climatologists

- All photos by Henry Reges unless otherwise noted