Weather Outlook "for Agriculture"

S. Elwynn Taylor

Iowa State University Extension Climatologist

Agronomist

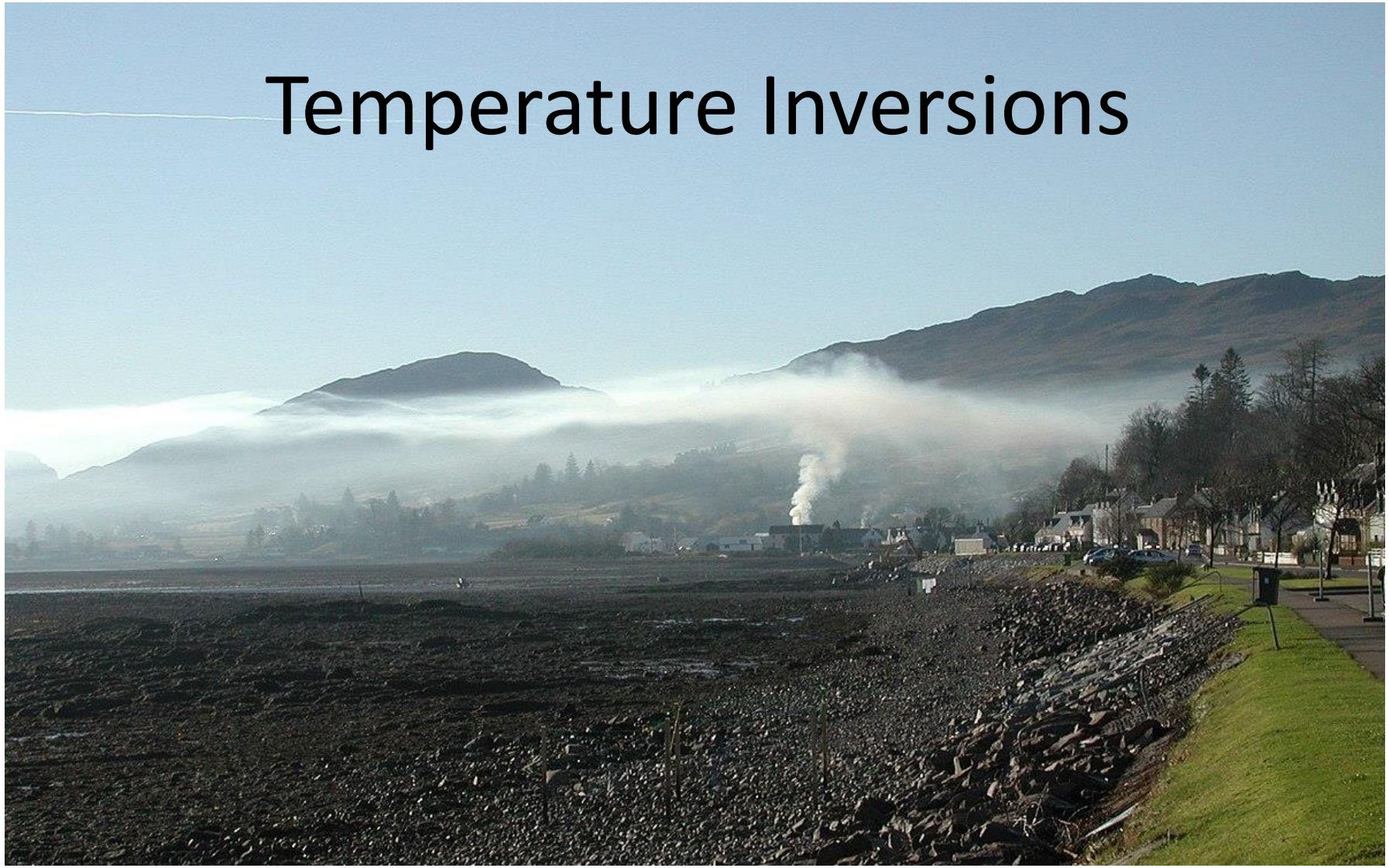
Garden of the Gods & Pike's Peak

For every 1000 ft the temperature drops 5 degrees F (lapse rate)

Frost sensitive fruit trees on upland slope

In some cases *(Inversion)* the air is warmer with increased altitude.

Temperature Inversions



https://upload.wikimedia.org/wikipedia/commons/thumb/b/b9/SmokeCeilingInLochcarron.jpg/1200px-SmokeCeilingInLochcarron.jpg

Inversion

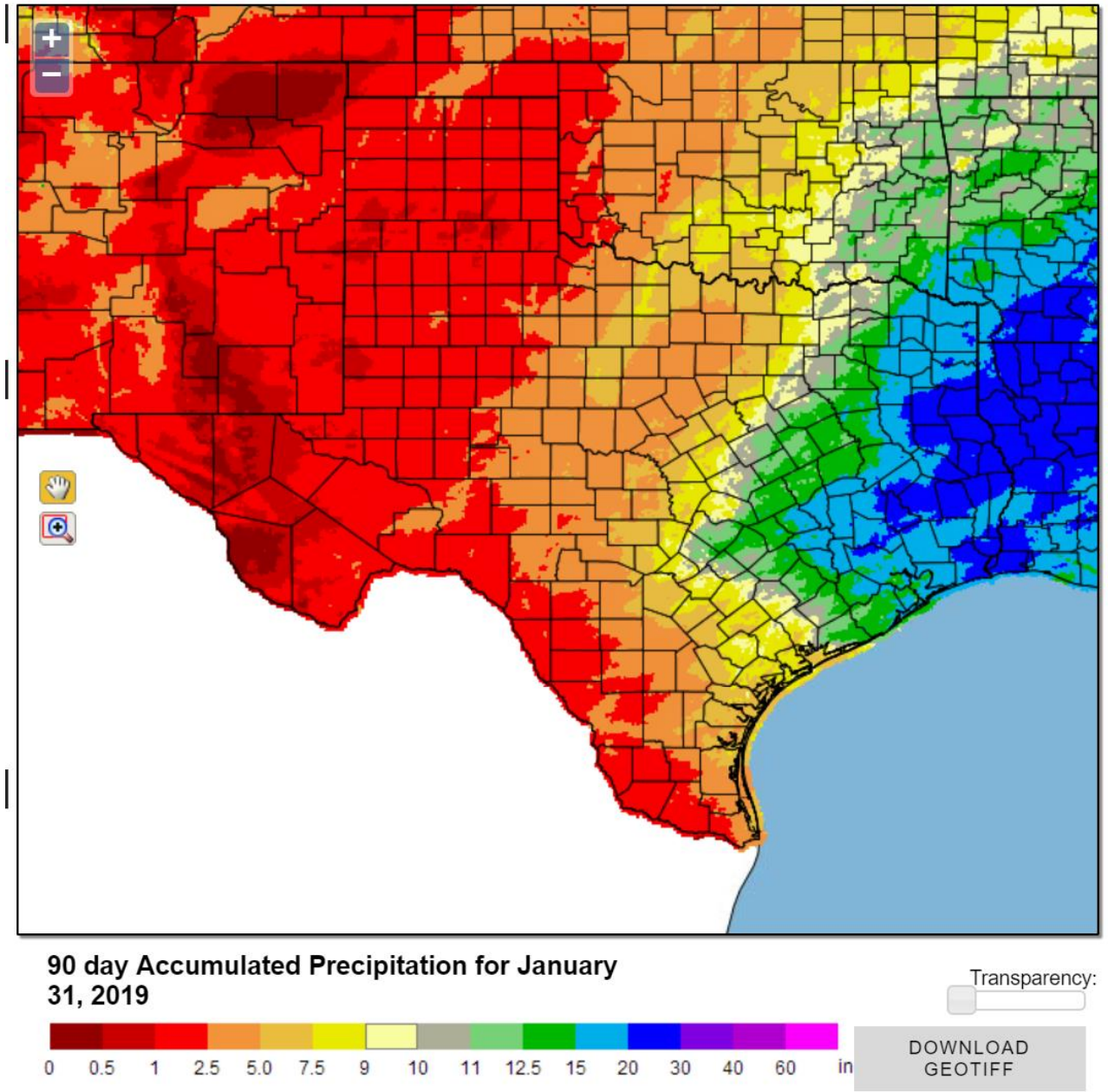
- the Texas Department of Agriculture. It says that as of Aug. 8, there have been five dicamba drift complaints and 13 complaints for 2,4-D across all types of crops — not just grapevines.

"Forestry Suppliers" for example

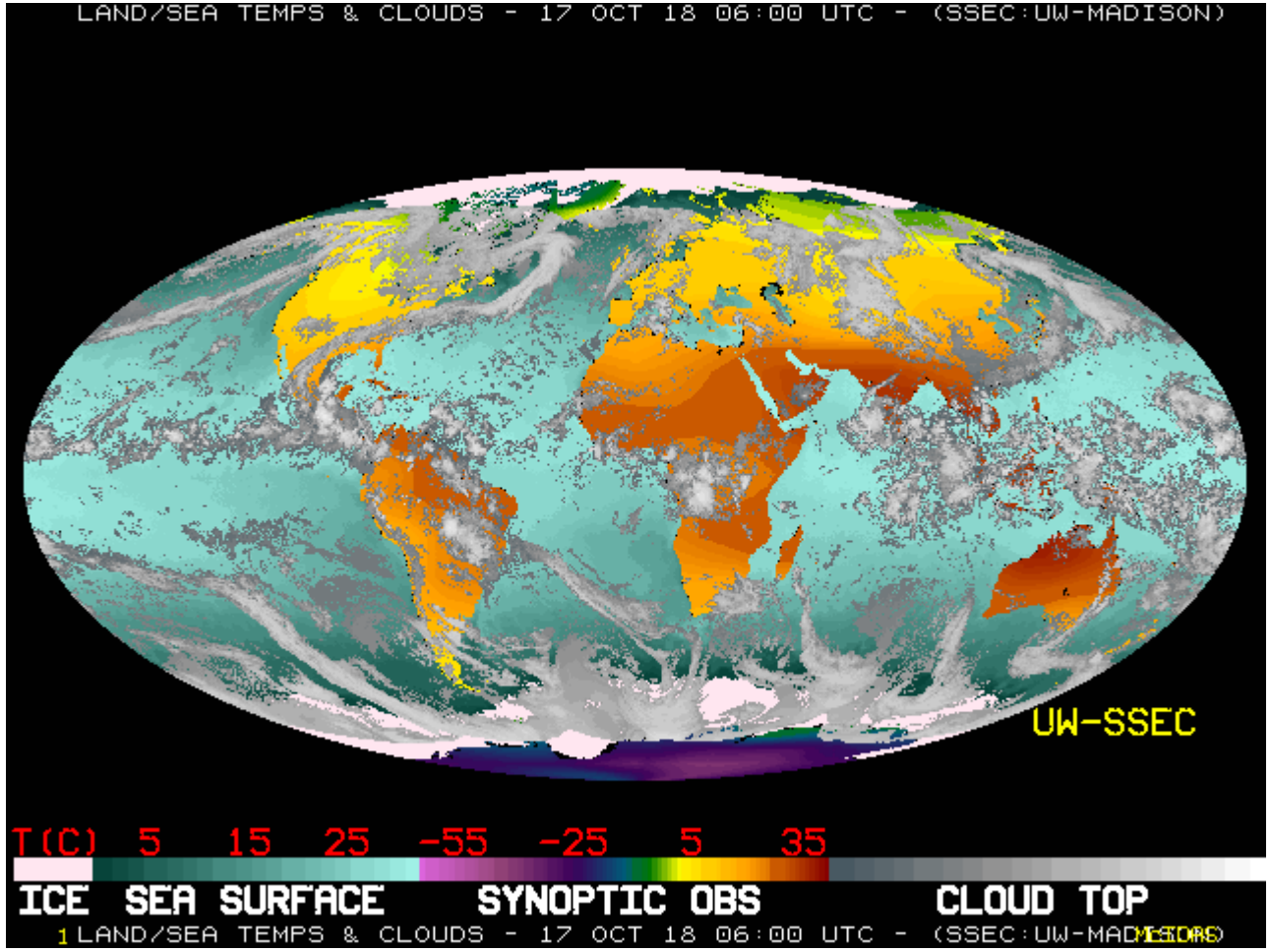
Bobby Cox, who owns a 30-year-old vineyard in Lubbock, Texas, has seen many of his vines destroyed by herbicide drift.

Merrit Kennedy/NPR

TEXAS Rain 90-Days



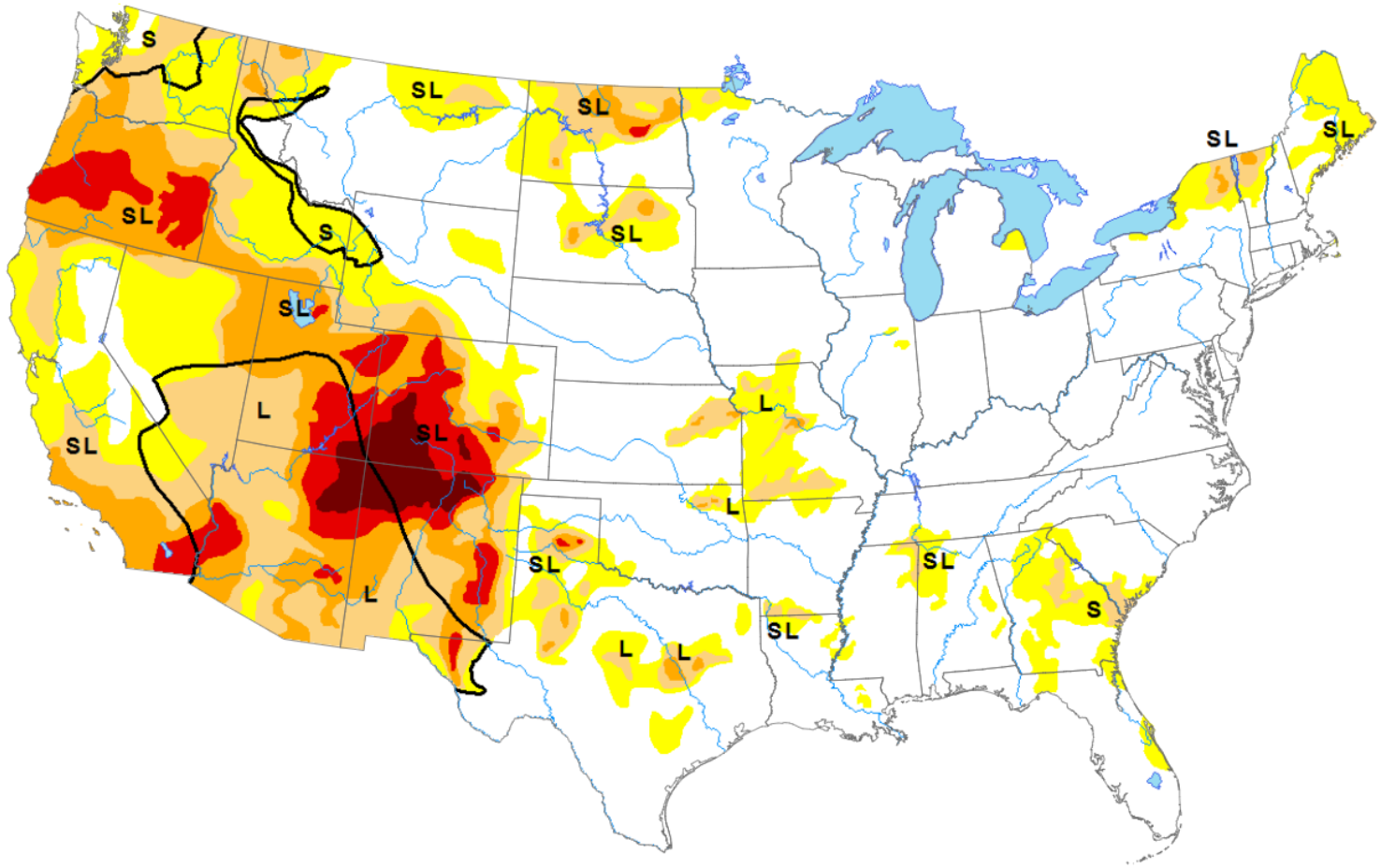
http://climatexas.tamu.edu/drought/maps/index.html



The 2019 “Water Year” began Oct 1, 2018

Map released: October 11, 2018

Data valid: October 9, 2018 | Author: Richard Tinker, NOAA/NWS/NCEP/CPC, Brad Pugh,



droughtmonitor.unl.edu/

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TEXAS STATE CLIMATOLOGIST
COLLEGE OF GEOSCIENCES

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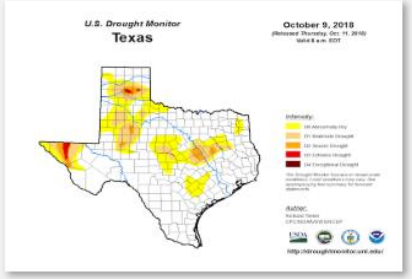
Southern Plains Drought Webinar Series



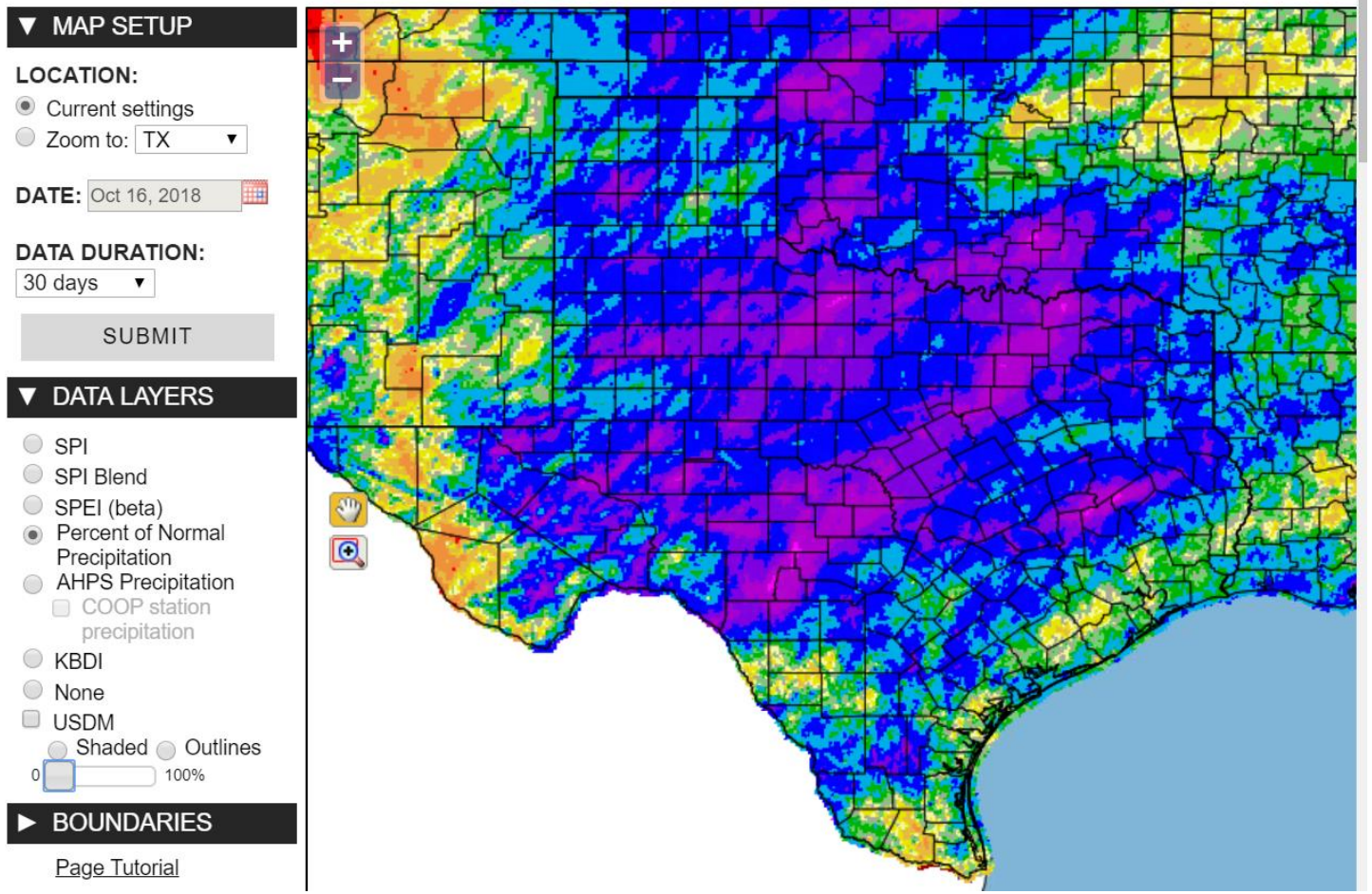
Drought Portal

Support the College of Geosciences

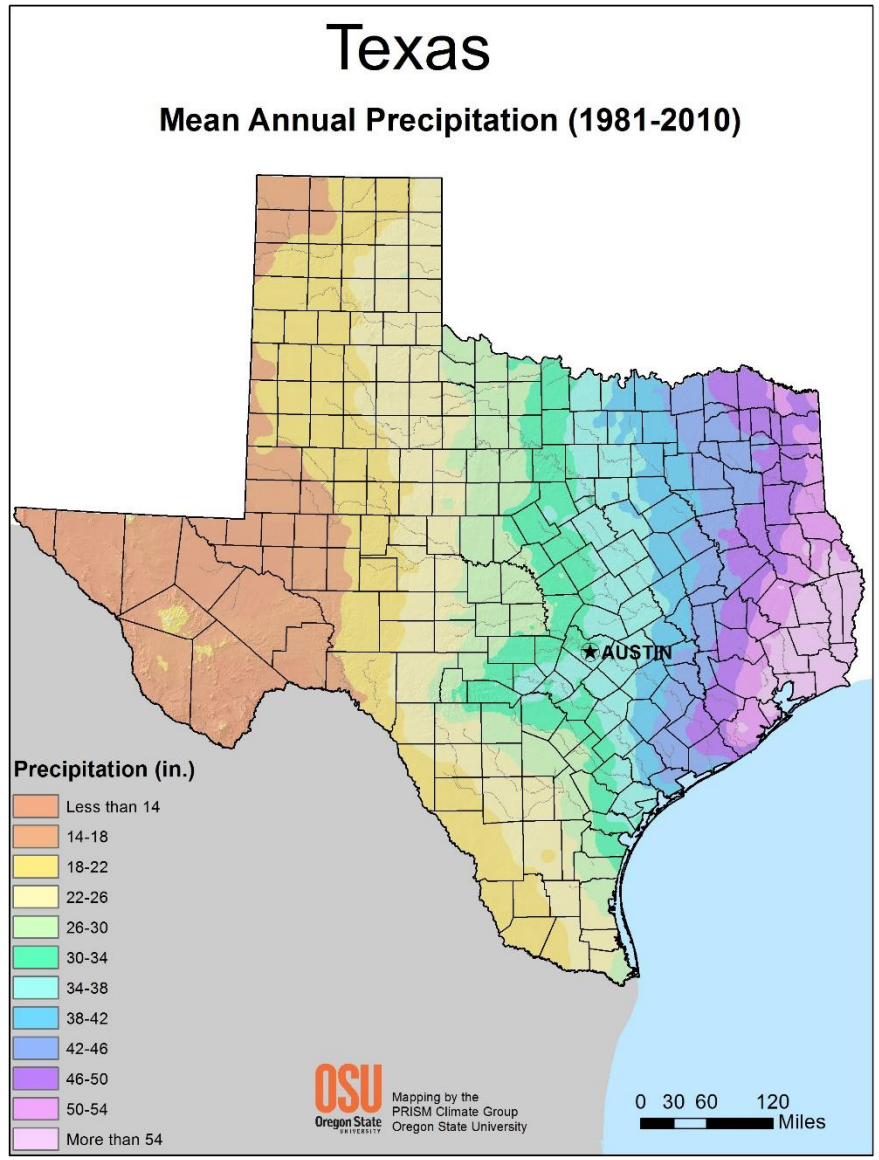
climatexas.tamu.edu/index.html

Drought Maps

Due to a university-wide security update, our site's interaction with external pages and images might be affected. We're currently working on a fix for this, but can still access our drought maps here at the bottom of the page. If you're looking for the interactive SPI blend map tool and it is unavailable below, that is administered by the North Carolina State Climate Office, and can be found at http://climate.ncsu.edu/drought/map. We're sorry for the inconvenience.



climatexas.tamu.edu/drought/maps/index.html

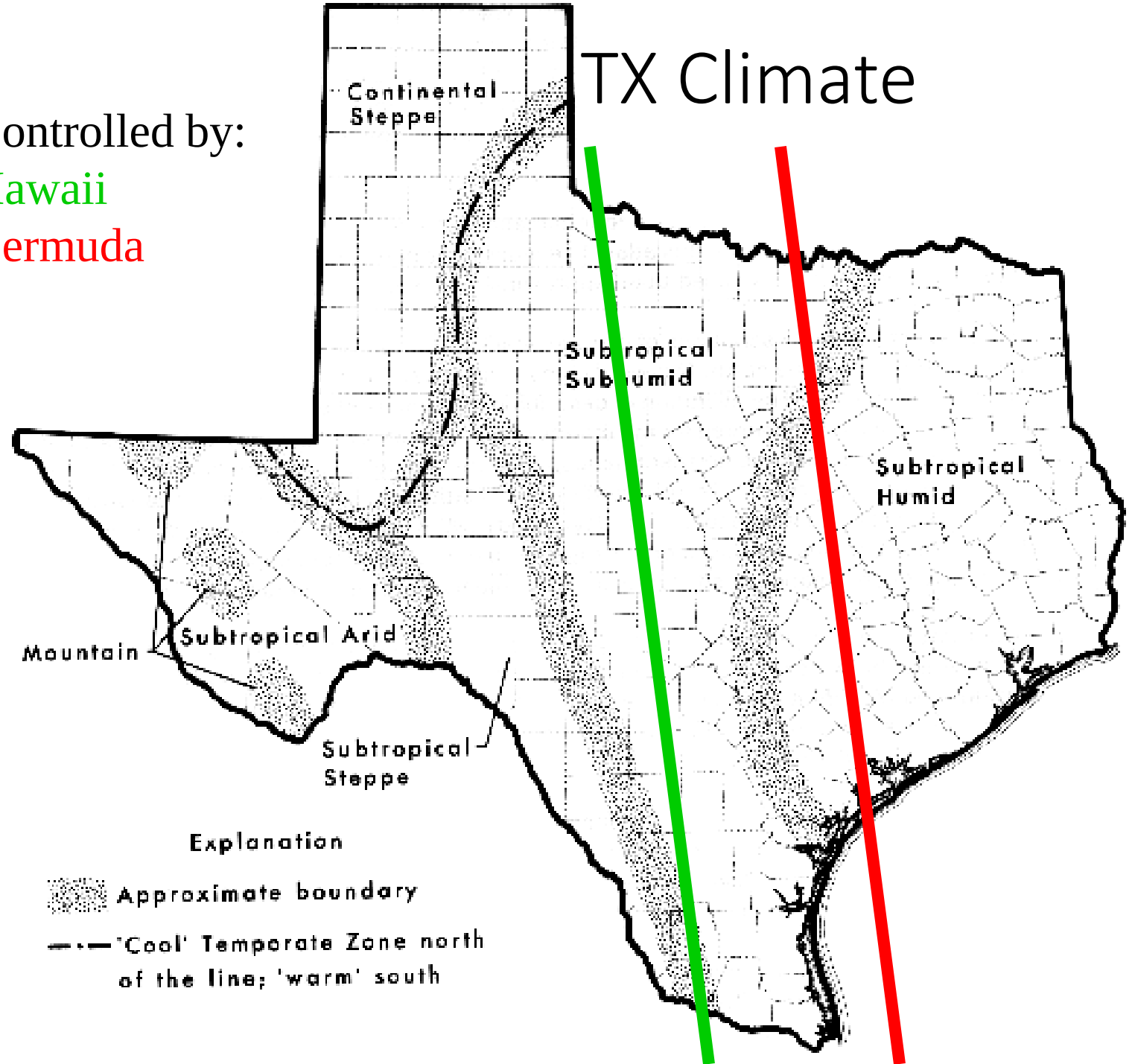

Texas
Mean Annual Precipitation (1981-2010)
AUSTIN
Precipitation (in.)
Less than 14
14-18
18-22
22-26
26-30
30-34
34-38
38-42
42-46
46-50
50-54
More than 54
OSU
Oregon State University
Mapping by the
PRISM Climate Group
Oregon State University
0 30 60 120
Miles

TX Climate

Controlled by:

Hawaii

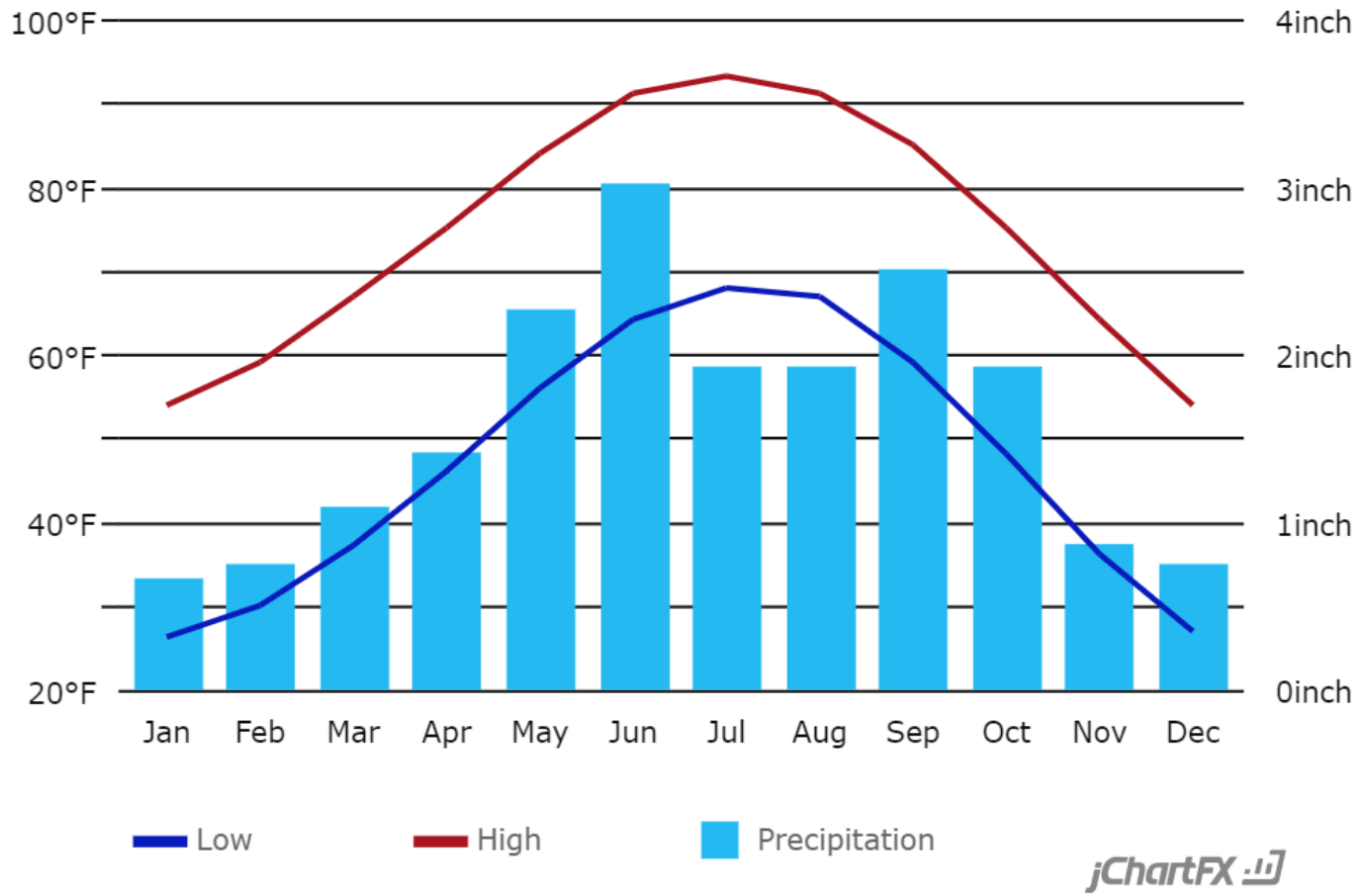
Bermuda



www.yourweatherservice.com/climate/lubbock/united-states/ustx2745

Climograph Lubbock

19.18 inch



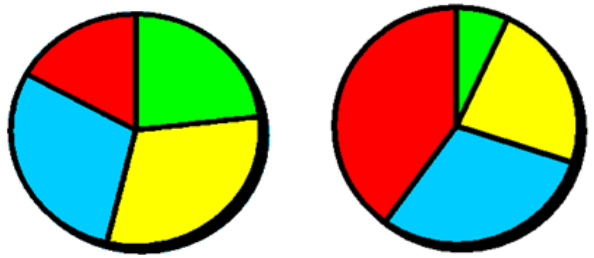
Tele-connections and Iowa Crop Yields

Objective

- Establish statistical impact of large scale, persistent features such as ENSO, PDO, NAO on Midwest crop production.
- Determine impact of anomalous patterns and relationships on production associated risk

Probabilities of high yield (>110% of trend, Green) , favorable yield (>trend, Yellow), below trend (blue), drought (<90% of trend, Red).

Normal **La Niña**



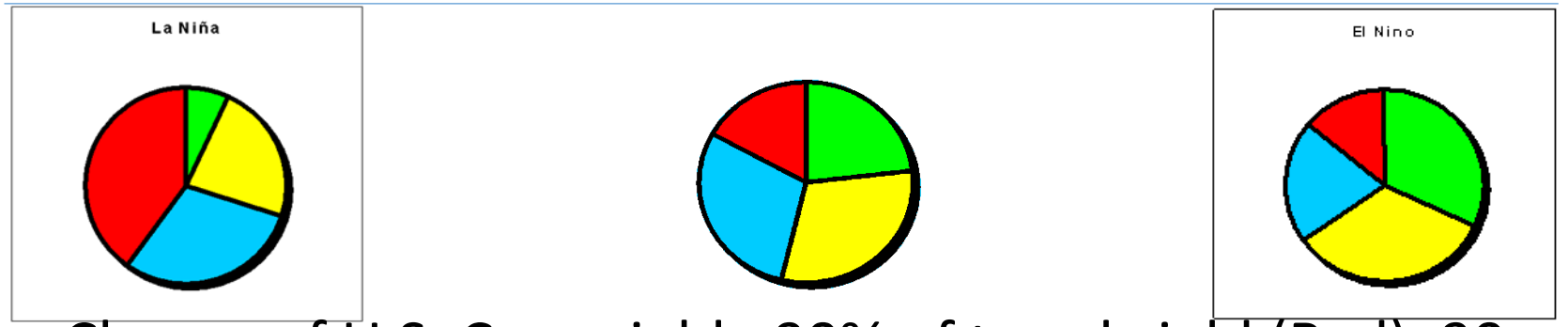
Approach

- Crop yields will be evaluated as annual deviation from yield trends.
- Deviation in crop yield will be categorized according to magnitude and frequency of occurrence for all combinations of persistent features.

Impact

- Delineation of risk enables producers to make production decisions based on probability of favorable/unfavorable cost to return ratios.
- Yield risk factors enable marketing risk management associated with increasing or diminishing production.

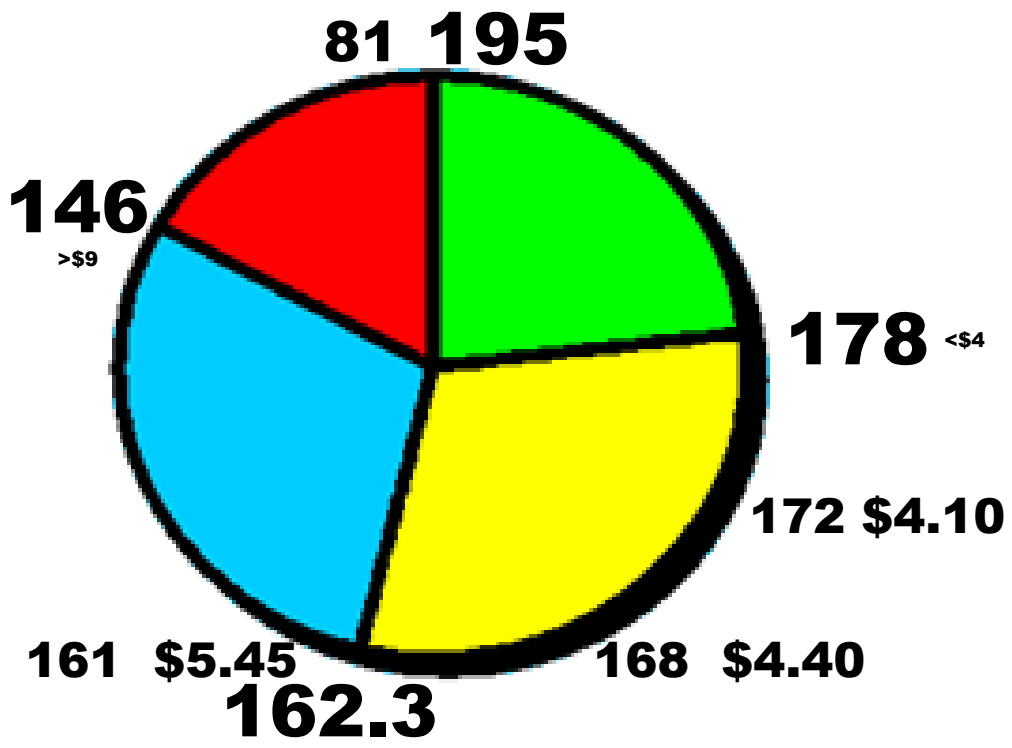
Risk Wheel Decision Tool



- Chance of U.S. Corn yield <90% of trend yield (Red), 90-100% (Blue), 100-110% (yellow), >110% (Green) for (left to right) La Niña, neutral, El Niño summers.
- Like analysis was done for ENSO+PDO+NAO combinations.
- Corn buyers/sellers can manage the risk of crop yield exceeding or falling below government determined demand levels.

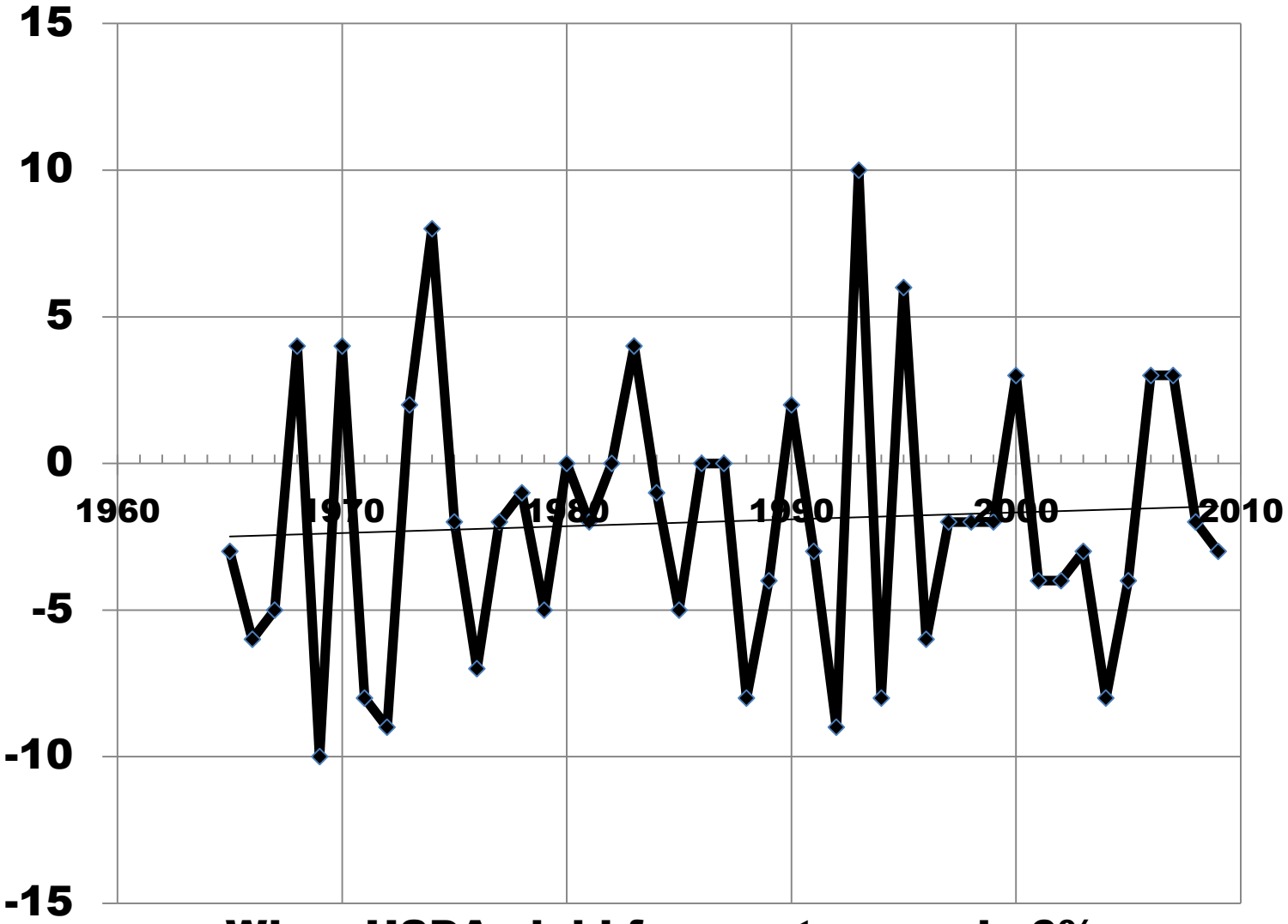
2015 Corn Risk as of 2-17-2015

Wisner



Example Yield-Price “Risk Wheel”

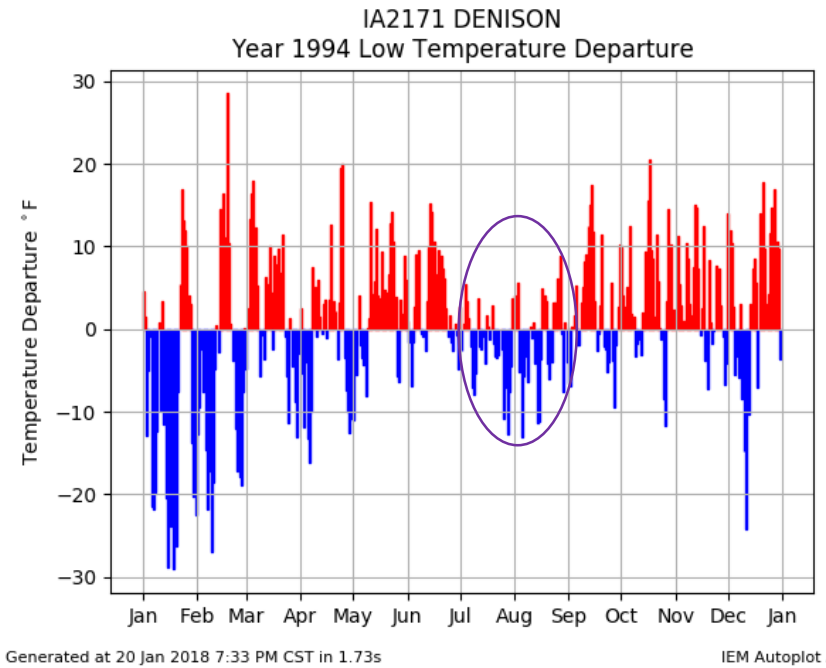
Sep US Corn Yield (% Error)

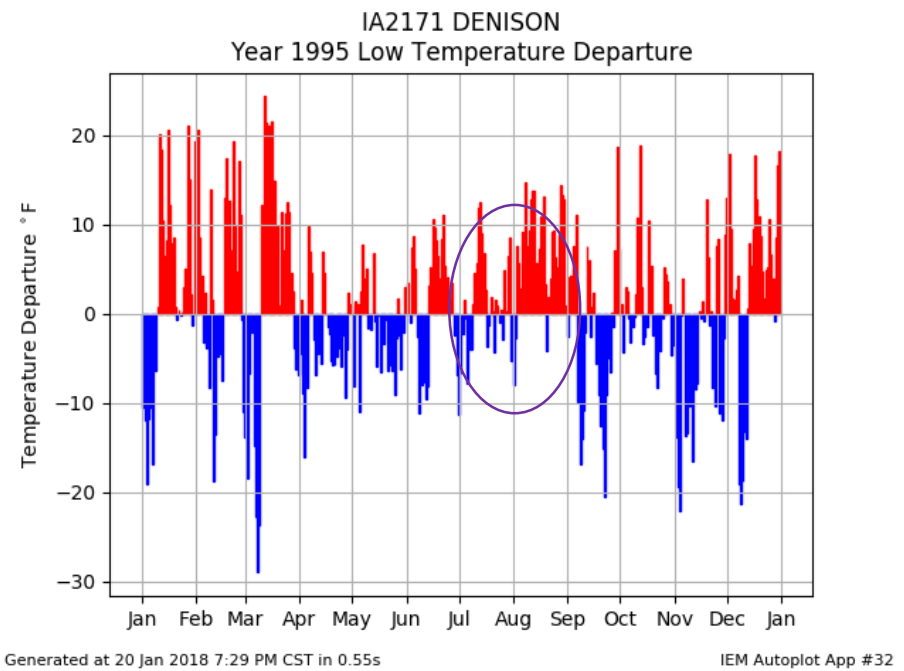


When USDA yield forecast exceeds 6%, it tends to be for the same reason

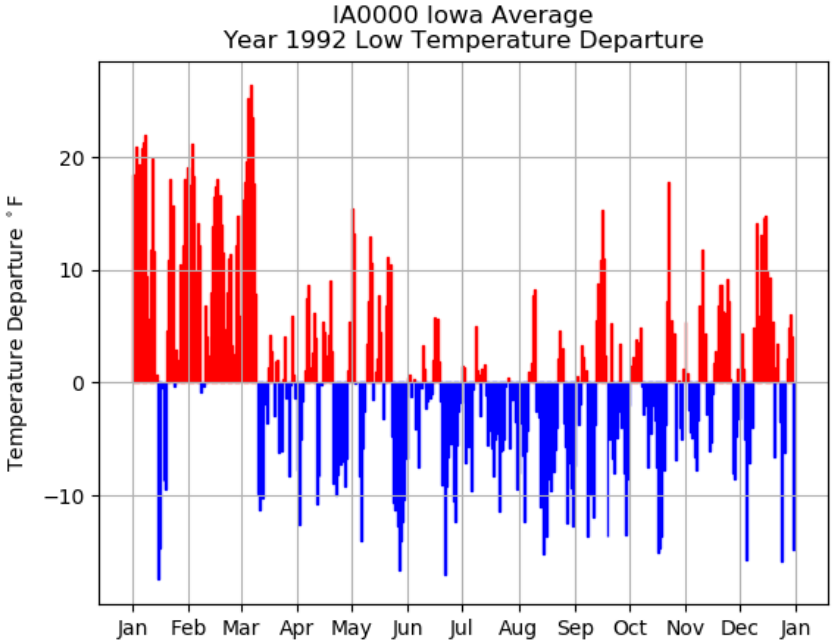
Ag Weather & Market Risk

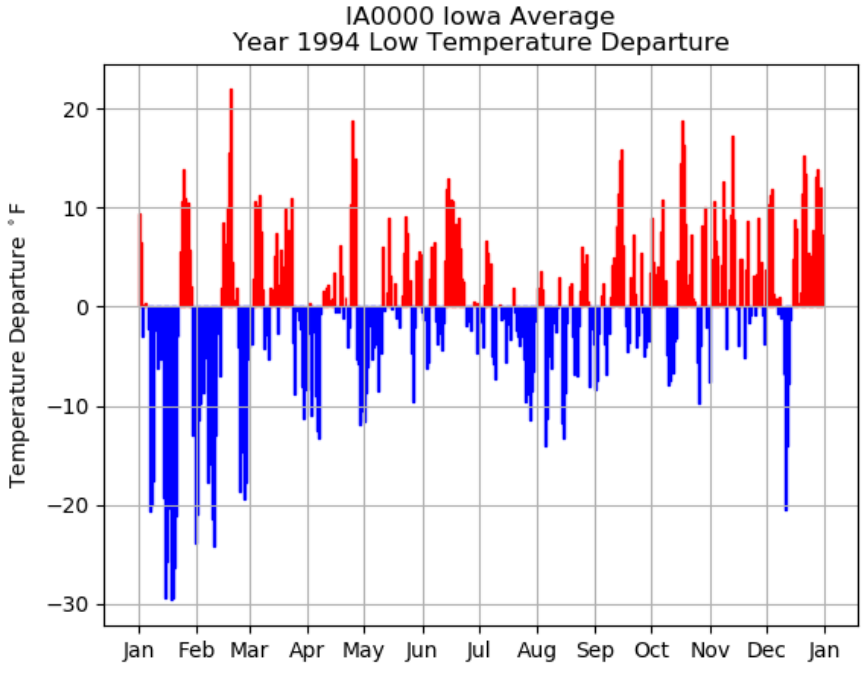
- The USDA gives weekly reports of crop progress & condition.
- The USDA issues several yield outlook reports based on observed crop condition.
- The outlook assumes that weather will be “normal” from date of observation to harvest.
- The near harvest outlook reports have higher accuracy.
- The reports influence “markets.”



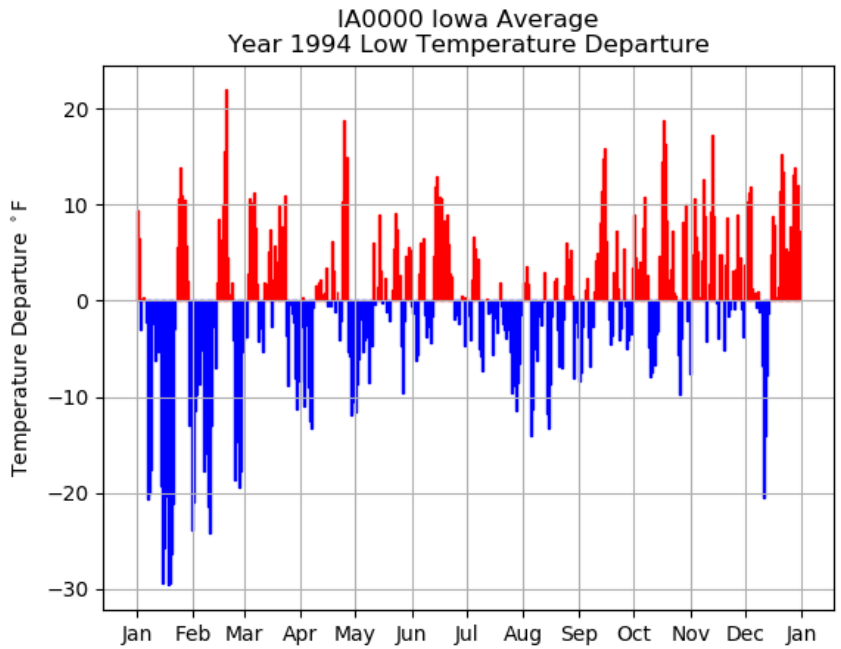


Is the USDA yield too high?
too low?
by how much?

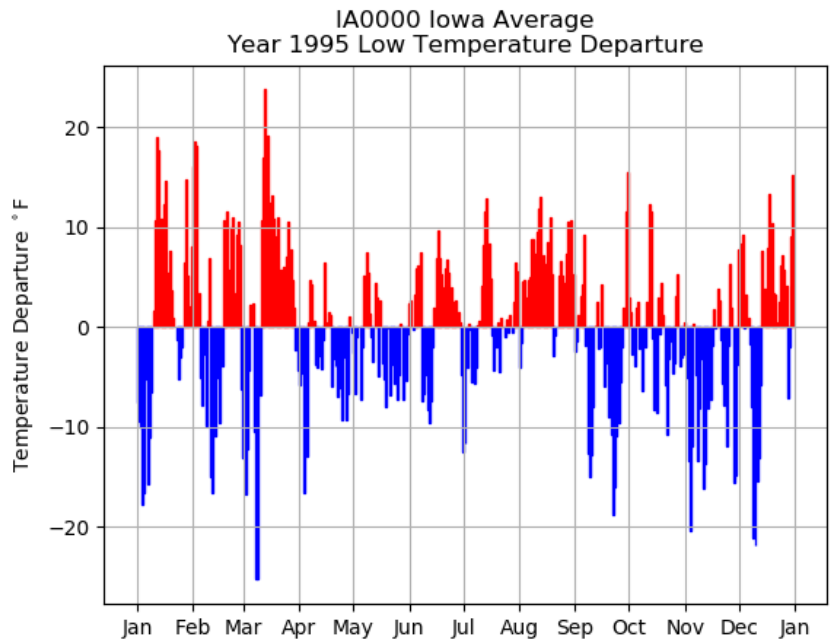




erated at 31 Jan 2019 10:29 PM CST in 1.55s IEM Autoplot App #32



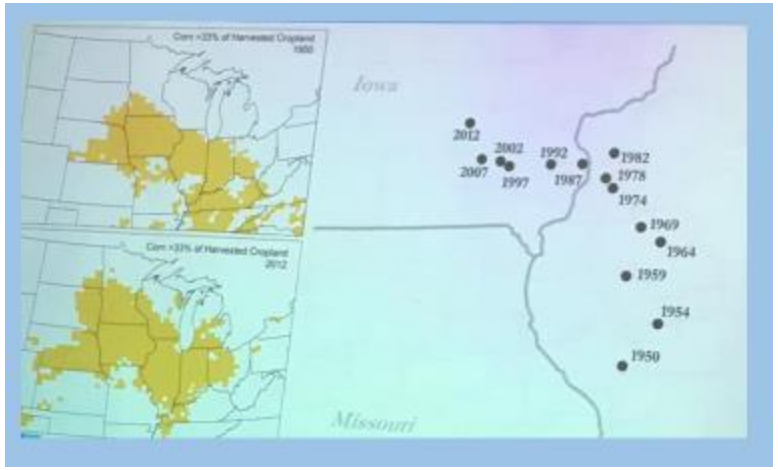
Generated at 31 Jan 2019 10:29 PM CST in 1.55s IEM Autoplot App #32



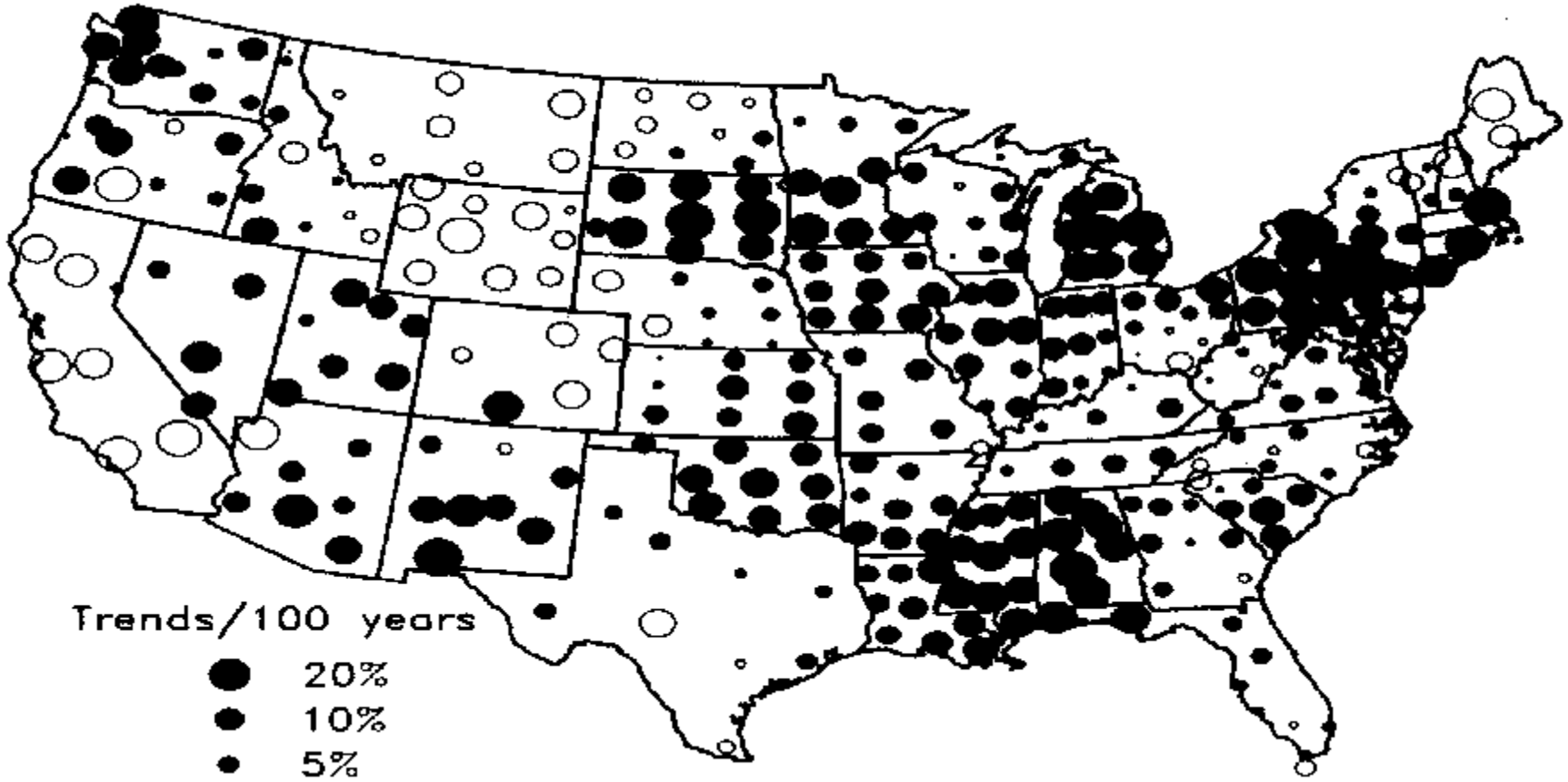
Generated at 31 Jan 2019 10:37 PM CST in 1.36s IEM Autoplot App #32

USDA too High
or
too Low?

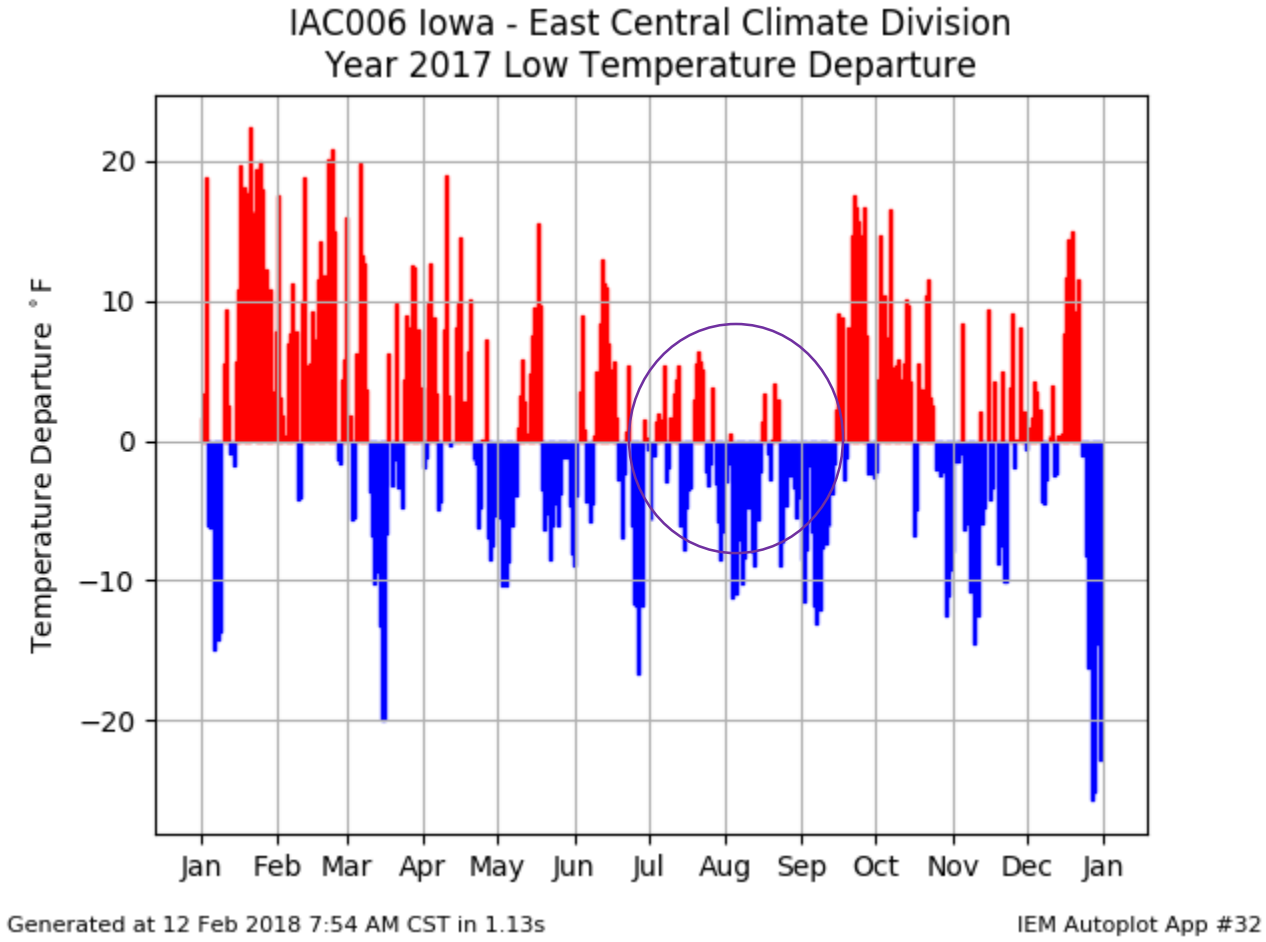
Check the center of the Corn belt.



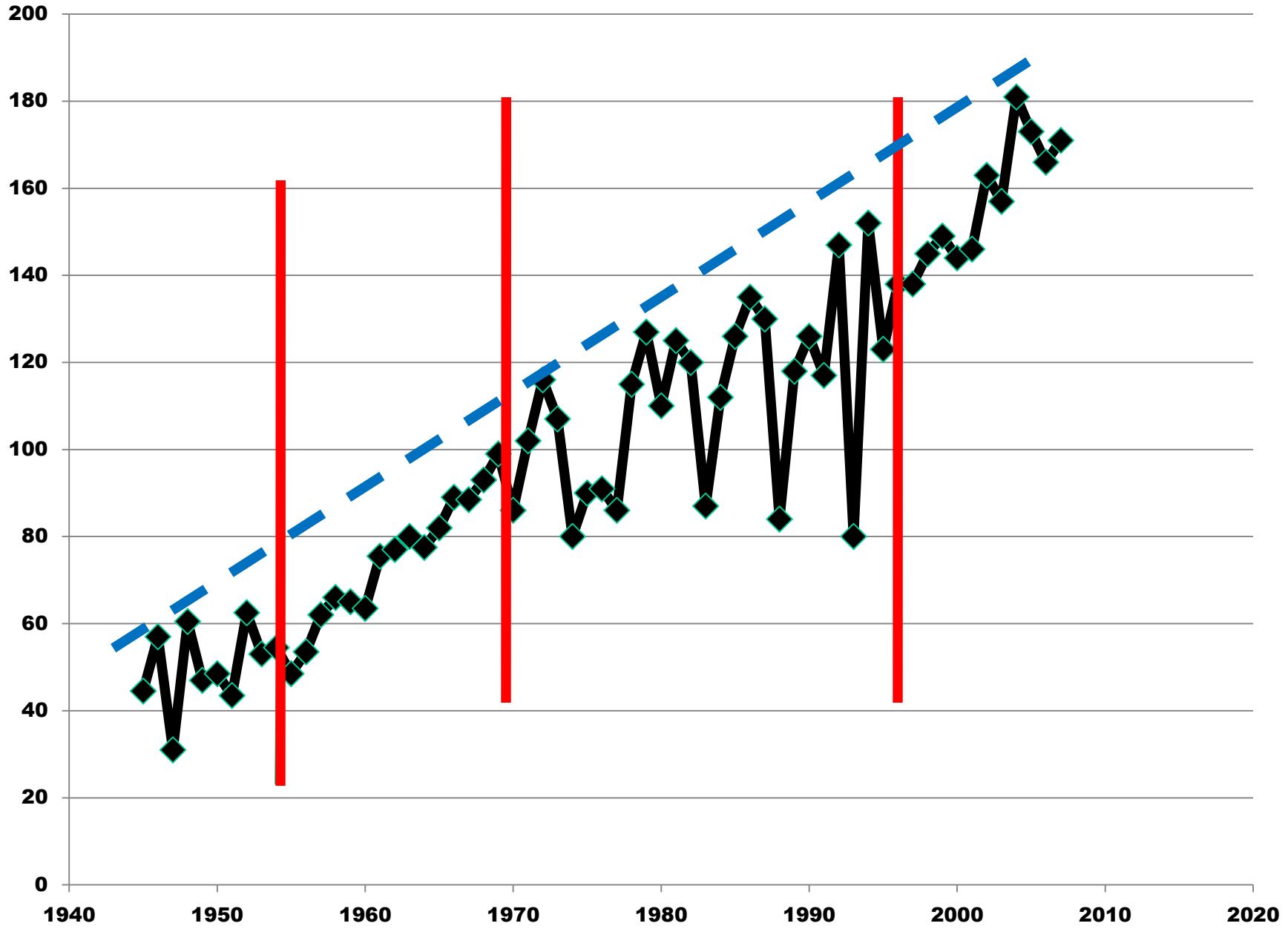
Final, Revised for: Bulletin of the American Meteorological
Society, Vol. 77, No. 2, Feb. 1996, pp 279-292.



http://www.ncdc.noaa.gov/oa/climate/gcps/papers/icc-us.pdf



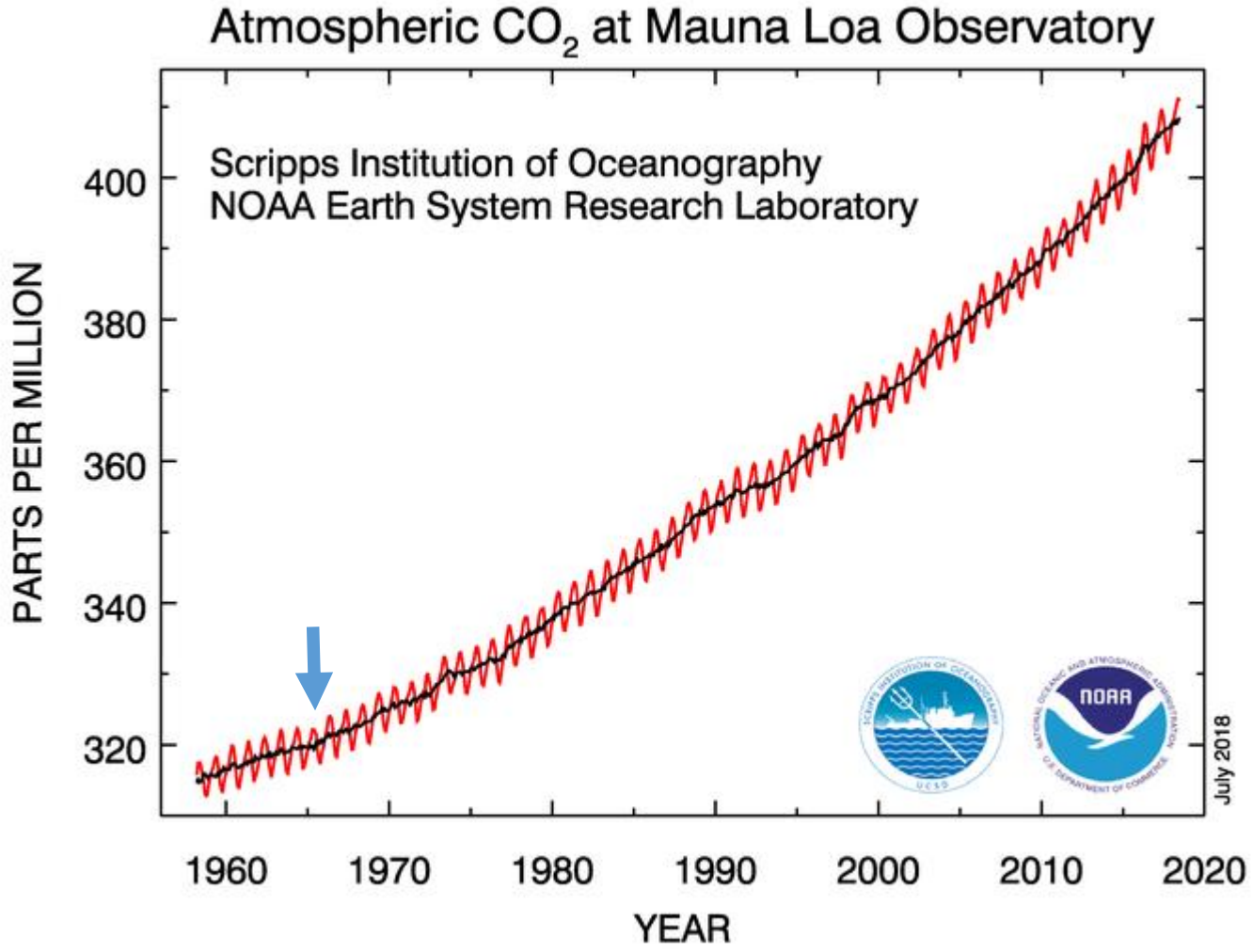
- USDA Corn Yield per Acre **is too LOW** for the center of the Corn Belt.
- Cold nights in July and Aug increase the Yield (over-looked by USDA)


200
180
160
140
120
100
80
60
40
20
0
1940
1950
1960
1970
1980
1990
2000
2010
2020

Pickering, Van Allen, Von Braun

- **James Alfred Van Allen (September 7, 1914 – August 9, 2006)**
- **Based on his Polar experience, Van Allen proposed the IGY (resulting in the 1st satellite (Sputnik) launch.**

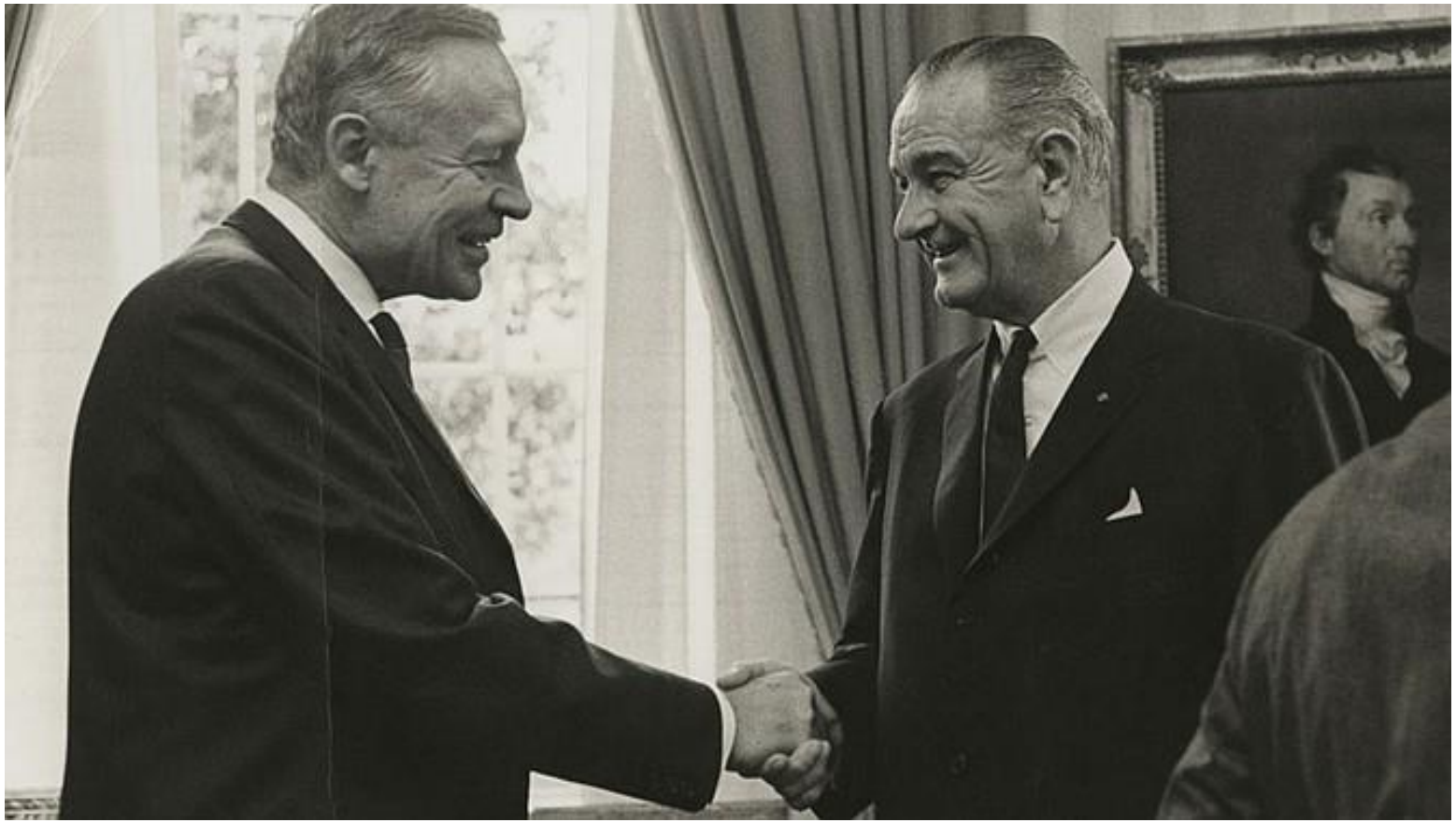
The Carbon Dioxide Observation Lab



It was soon apparent that the amount Carbon Dioxide in our atmosphere was not as constant as were most other components of our atmosphere.

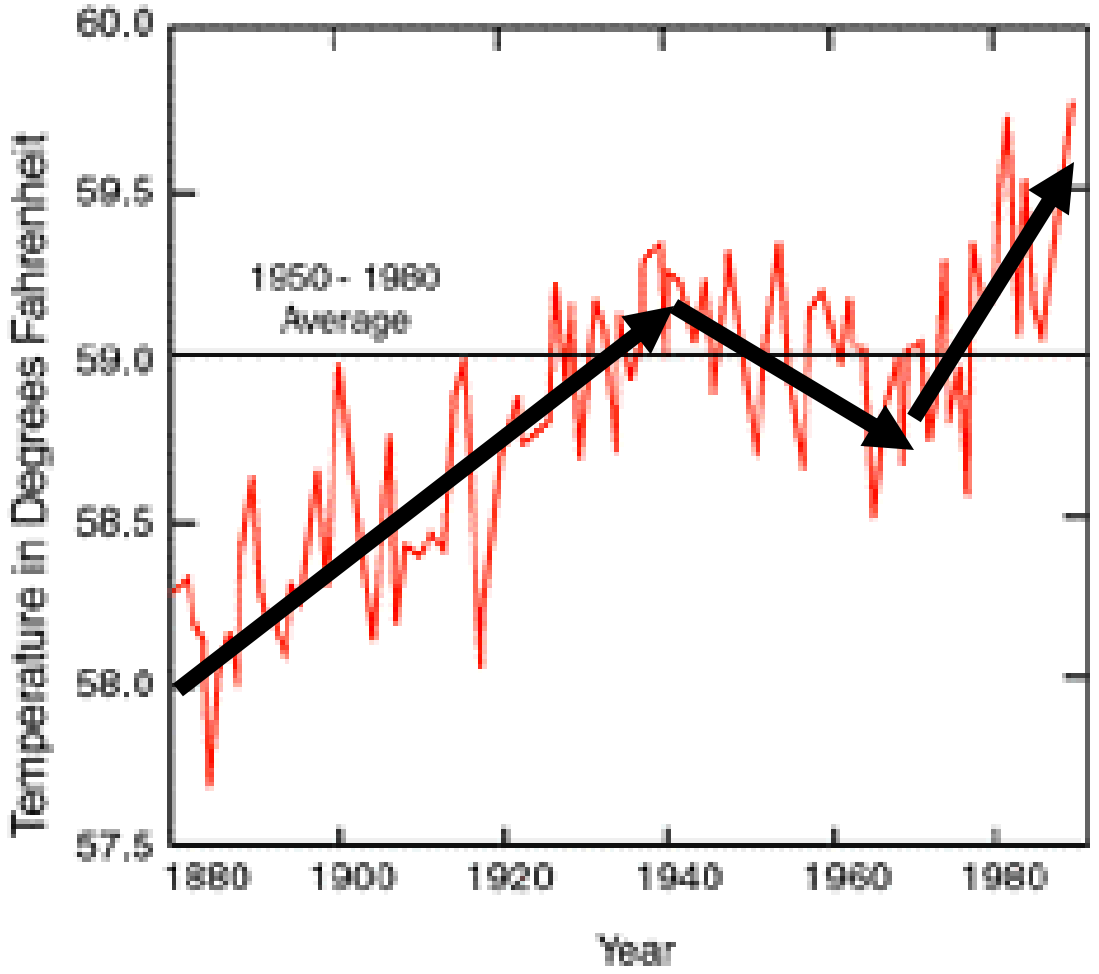
2 Disturbing observations:

- **CO2 monitoring was established in the IGY**

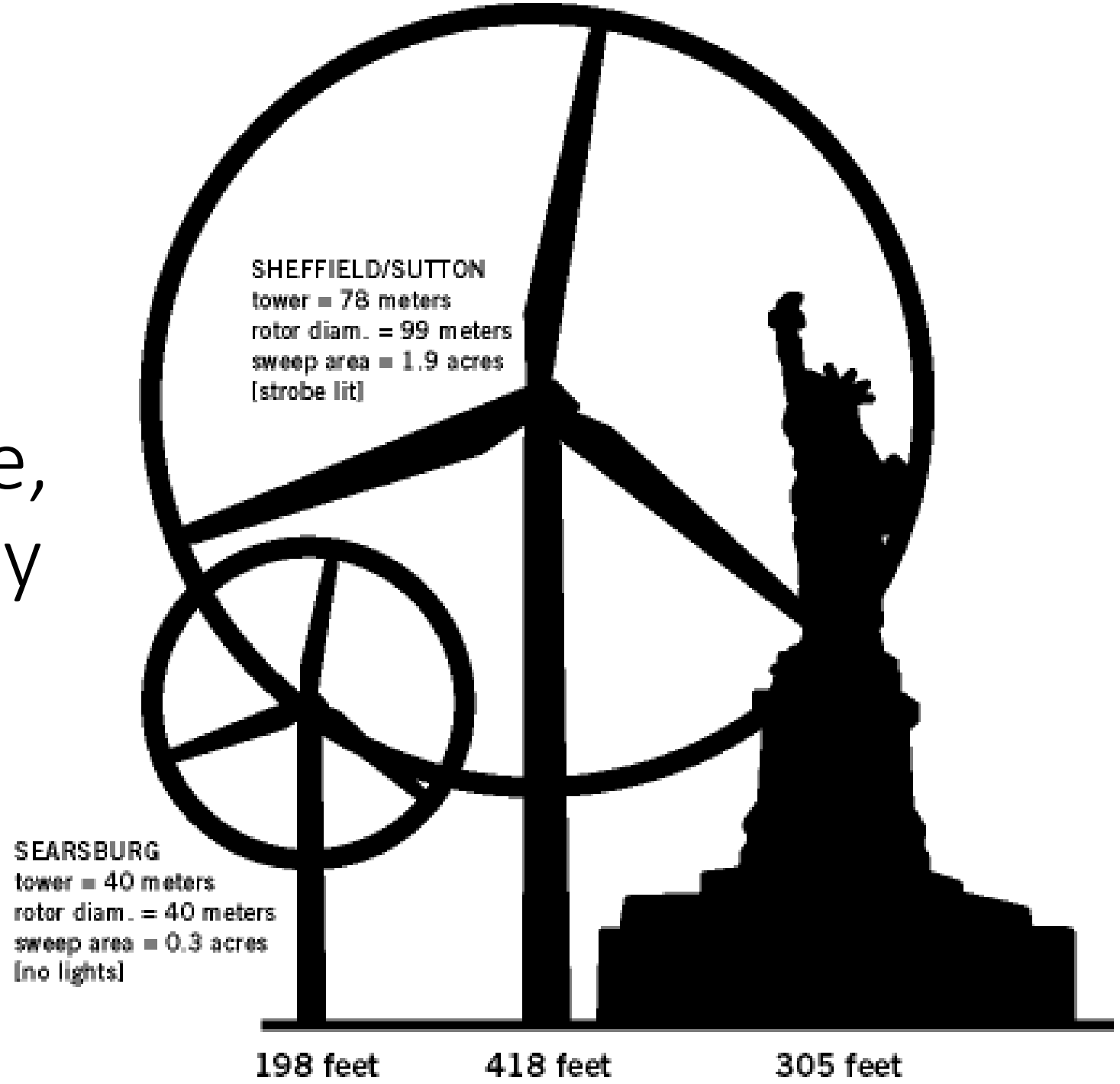


8 Feb 1965,
"The carbon dioxide of the atmosphere is increasing because we are consuming fossils for fuel faster than the Earth creates them.... Atomic fall out is observed World-wide."

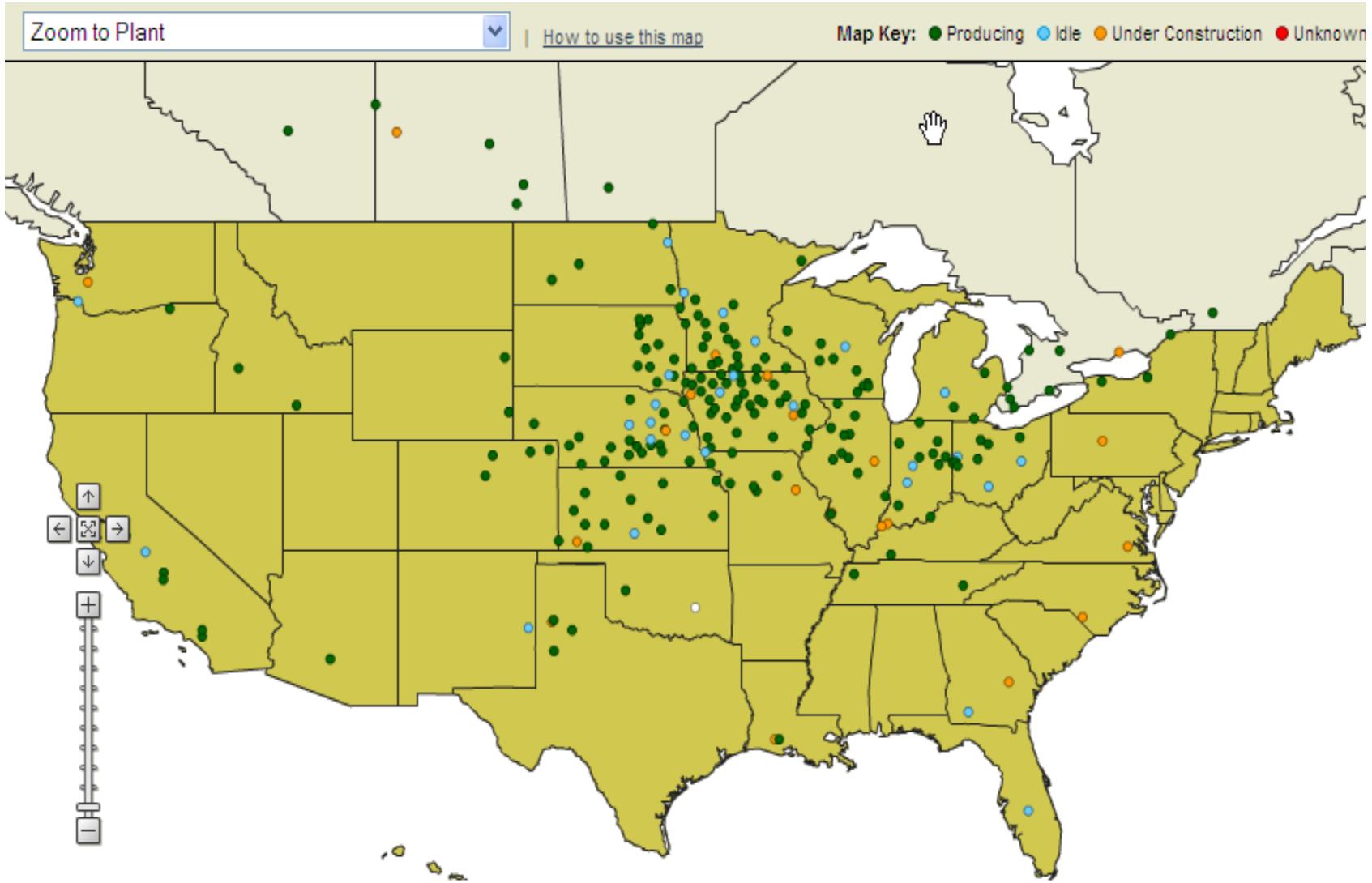
# of citrus', sandwiches, & climates change



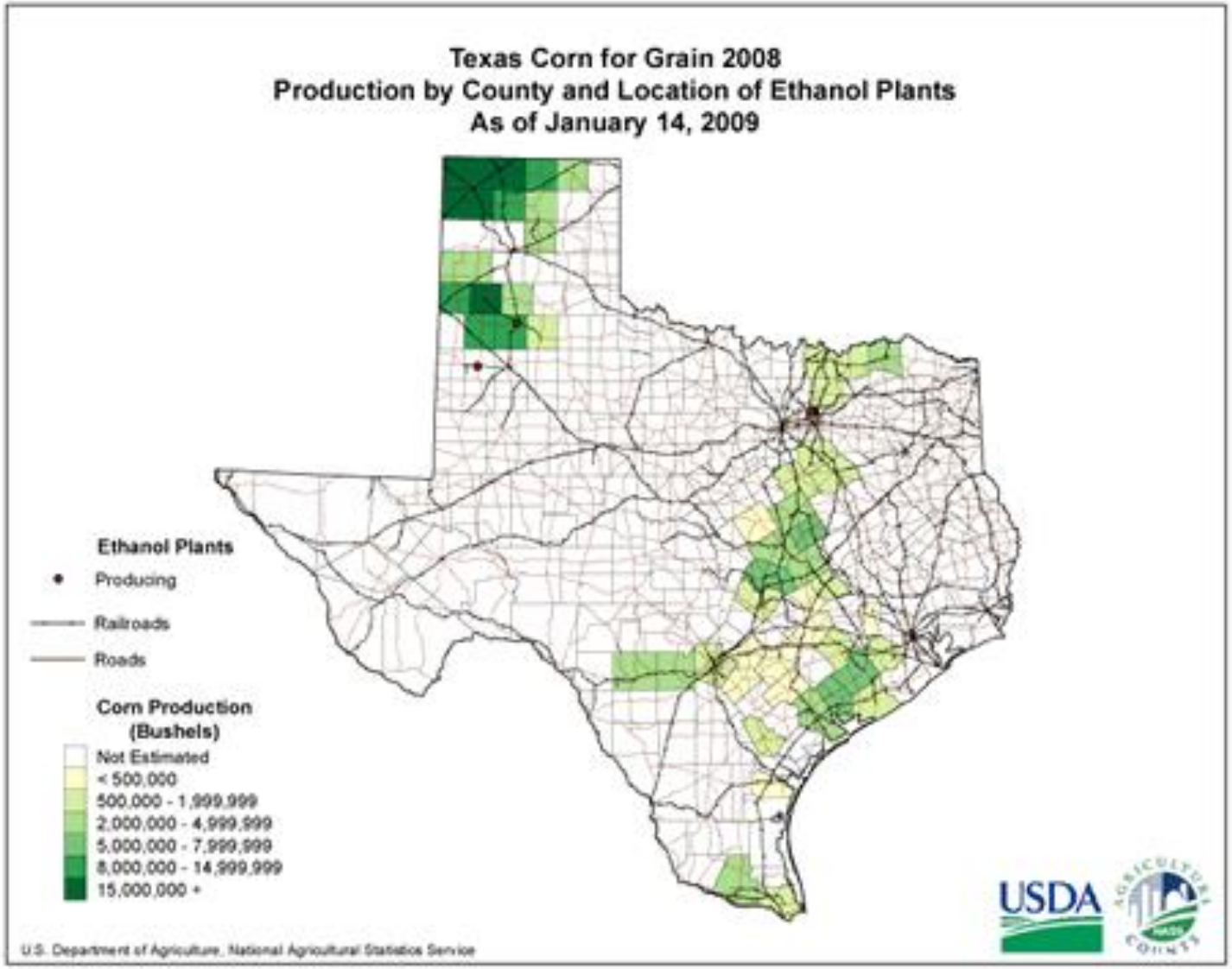
Our “Green” efforts continue, they may help



Bio-fuel

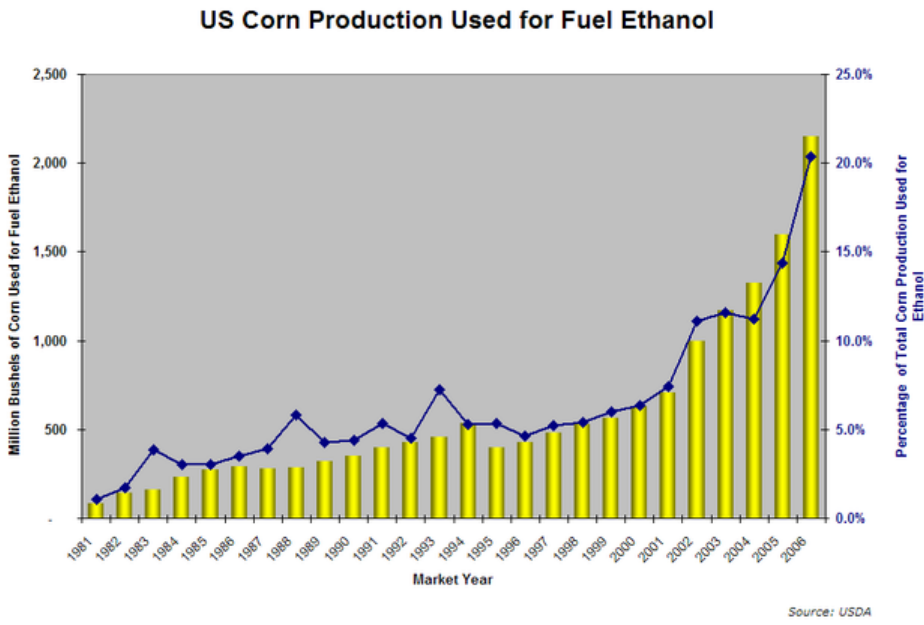


http://www.nass.usda.gov/Charts_and_Maps/Ethanol_Plants/index.asp



http://www.nass.usda.gov/Charts_and_Maps/Ethanol_Plants/Texas/index.asp

Corn & Change----



Elwynn's Horse

Volatility of Corn Price

END

Elwynn Taylor

Iowa State University

setaylor@iastate.edu

www.extension.iastate.edu

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