

Drought Challenges Midwest Grain Production

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What You Do Best

- **Past Climate 10,000BP: pioneer Vegetation: Nitrogen fixing legumes, C4 grasses.**
- **No better soils on Earth**
- **Current Climate: Improving for Corn in the Dakota, MN, IA, NE zone.**
- **Best for corn: Washington, for Soy: Missouri**

Crop Water Requirement

- **Average yield: 20 inch**
- **Sufficient for record yield: 25 inch**
- **Soil “field capacity”: 10 inch**
- **Average rooting depth**

What is the average corn rooting depth in Iowa?



Photo C Gannon/Des Moines Register 2010

Drought

- **By Law**

- **Qualifying: county yield decimated**
- **Duration: may not exceed 10 years**

Begins in East (S Carolina)

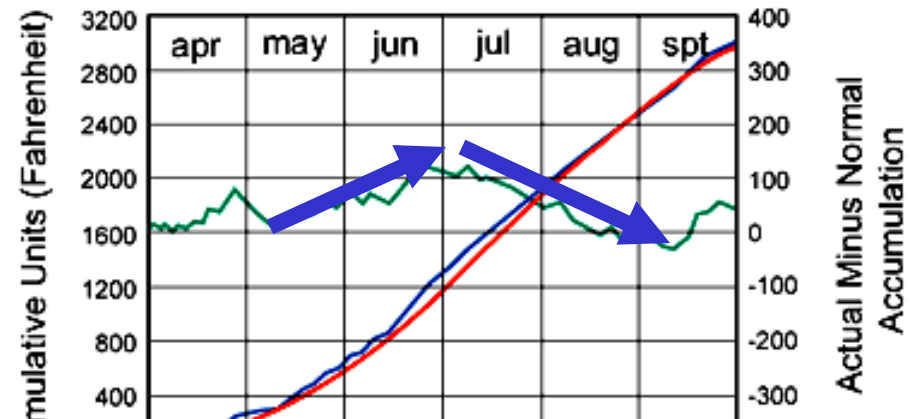
I-35 delineates climate zone

Night Warming

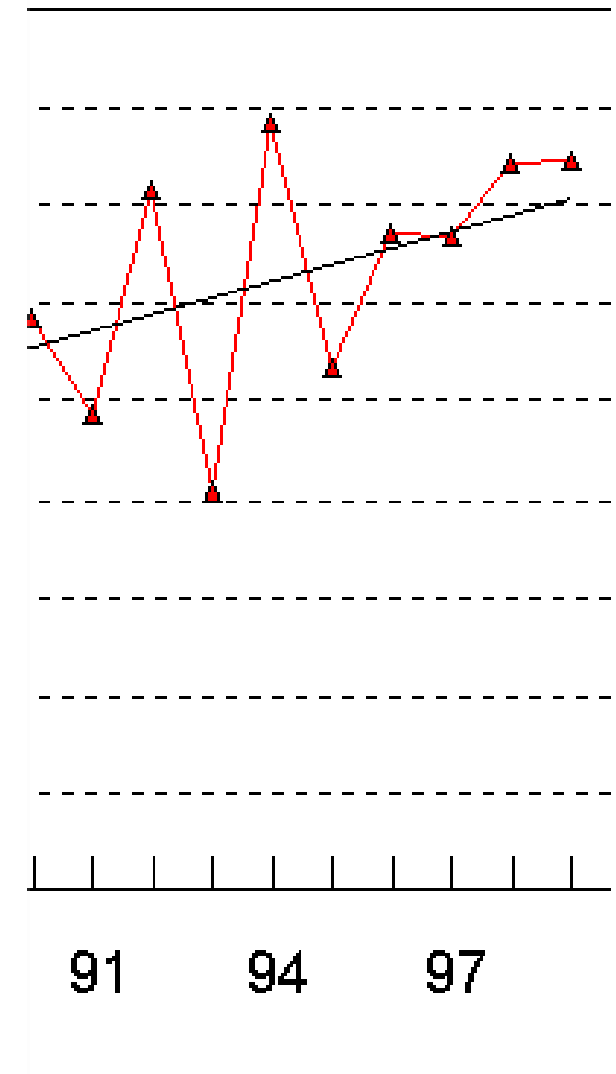
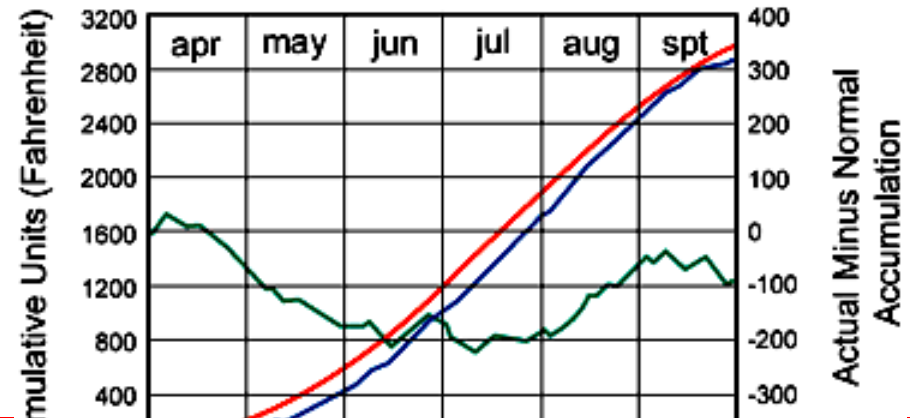
- **The overlooked yield reduction**

GDD & Yield

Growing Degree Days (50-86)
Ames, Iowa 1994

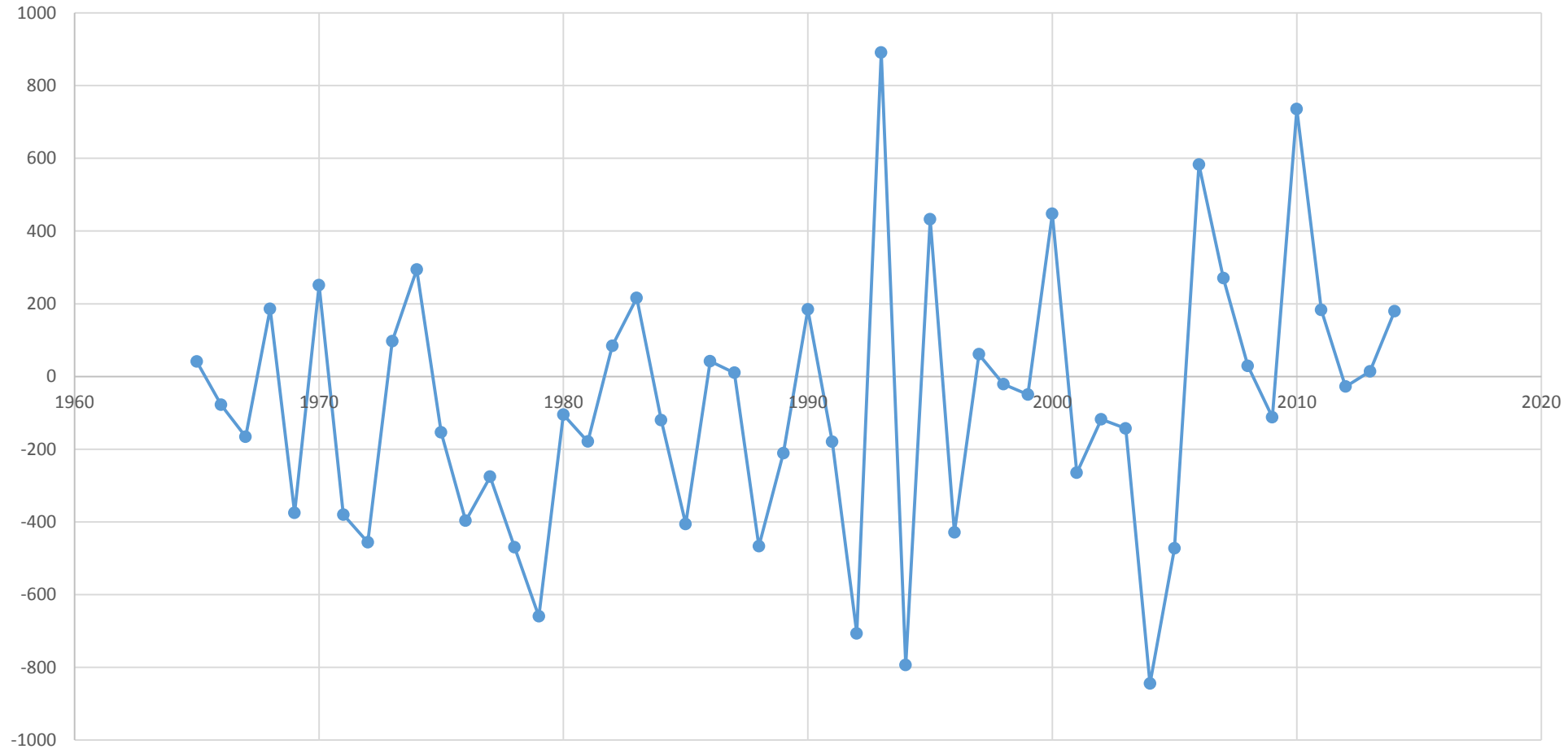


Growing Degree Days (50-86)
Ames, Iowa 1995

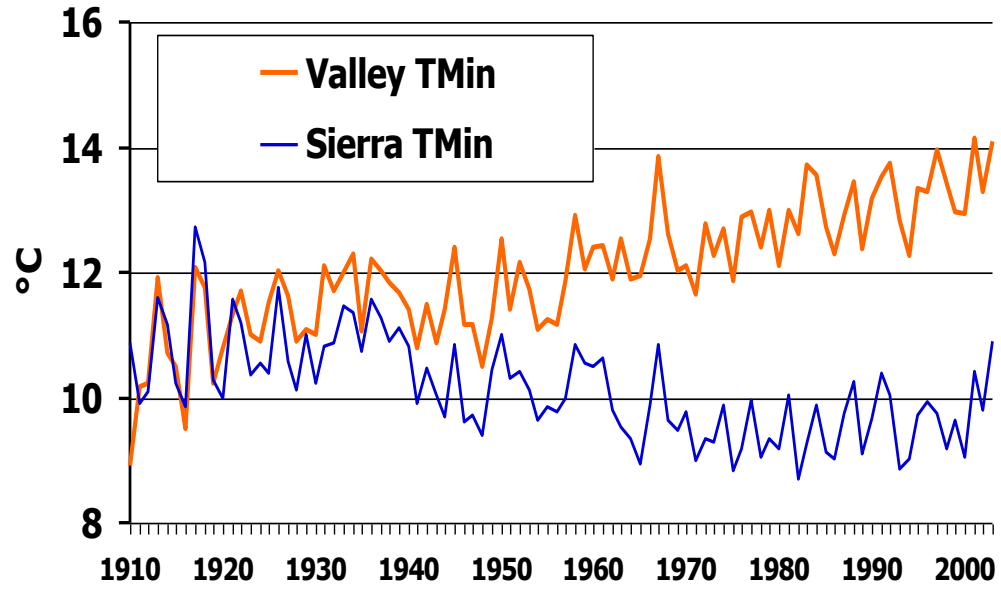


September Corn Yield estimate

Chart Title

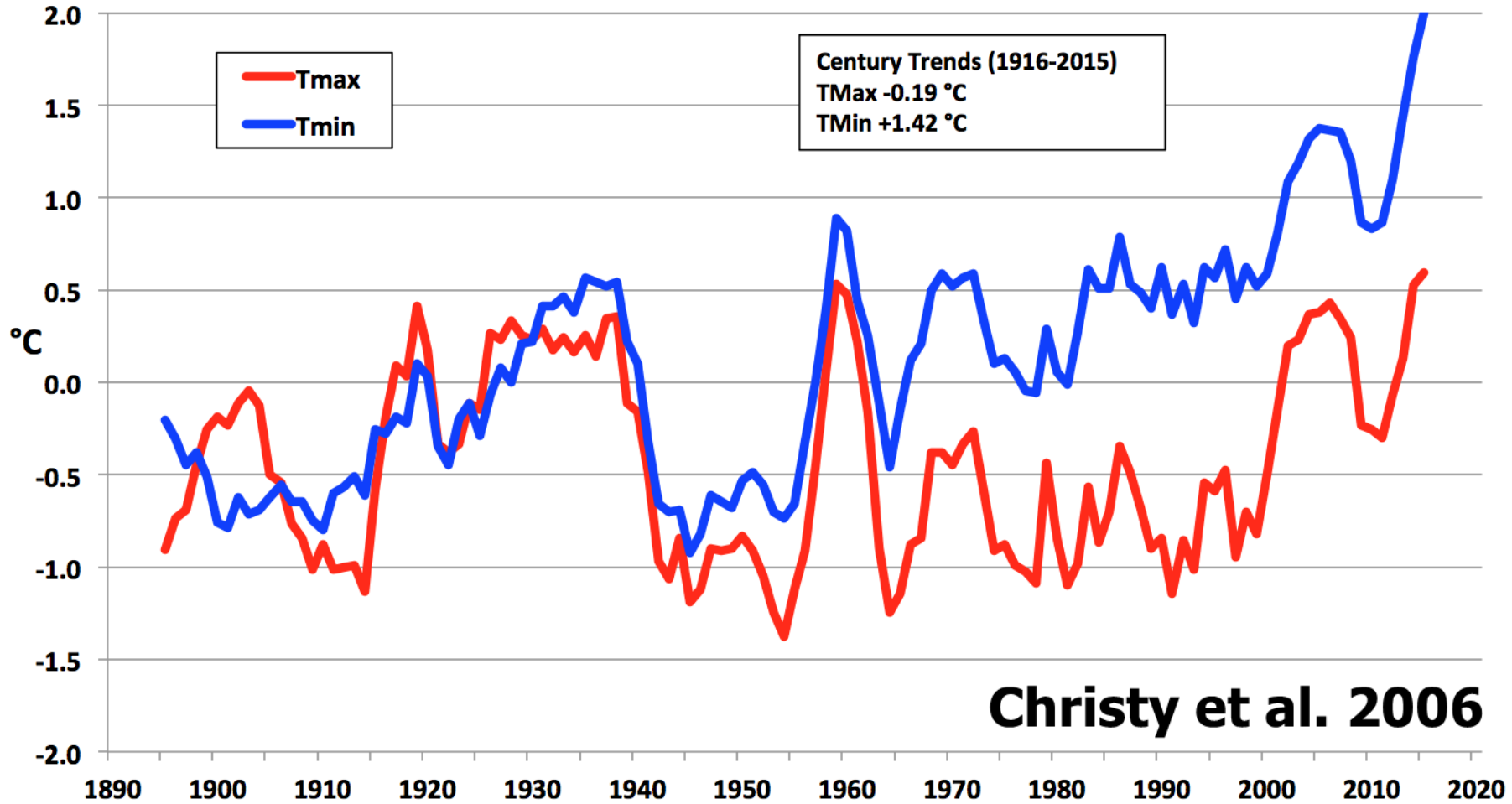


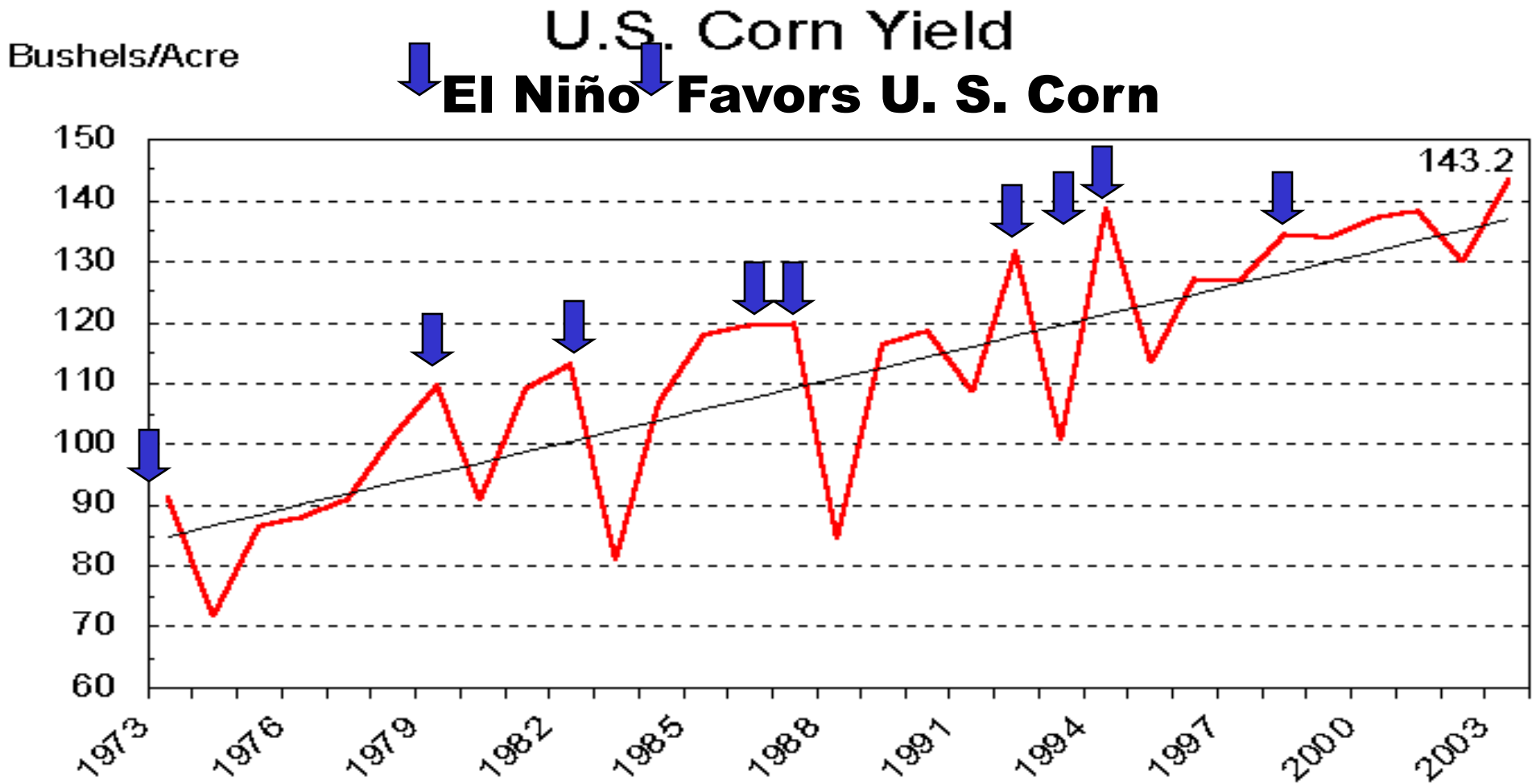
CA Valley and Sierra (Jun-Nov) 1910-2003



Christy et al. 2006

**Anomalies of TMax and TMin JJA (summer)
California San Joaquin Drainage
1895-2015 nClimDiv (NOAA/NCEI)**



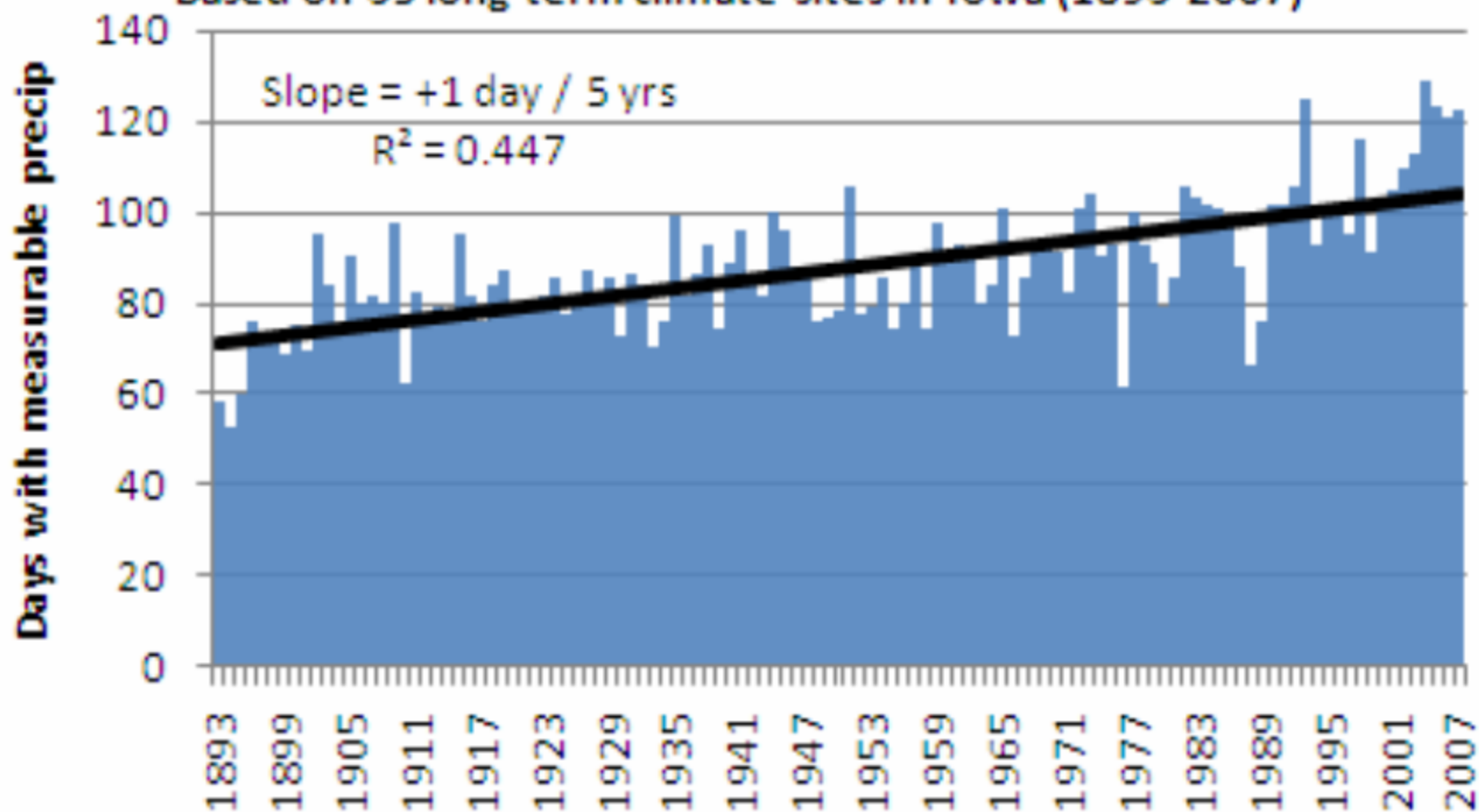


USDA-NASS
11-12-03

Dry Years/Wet Years

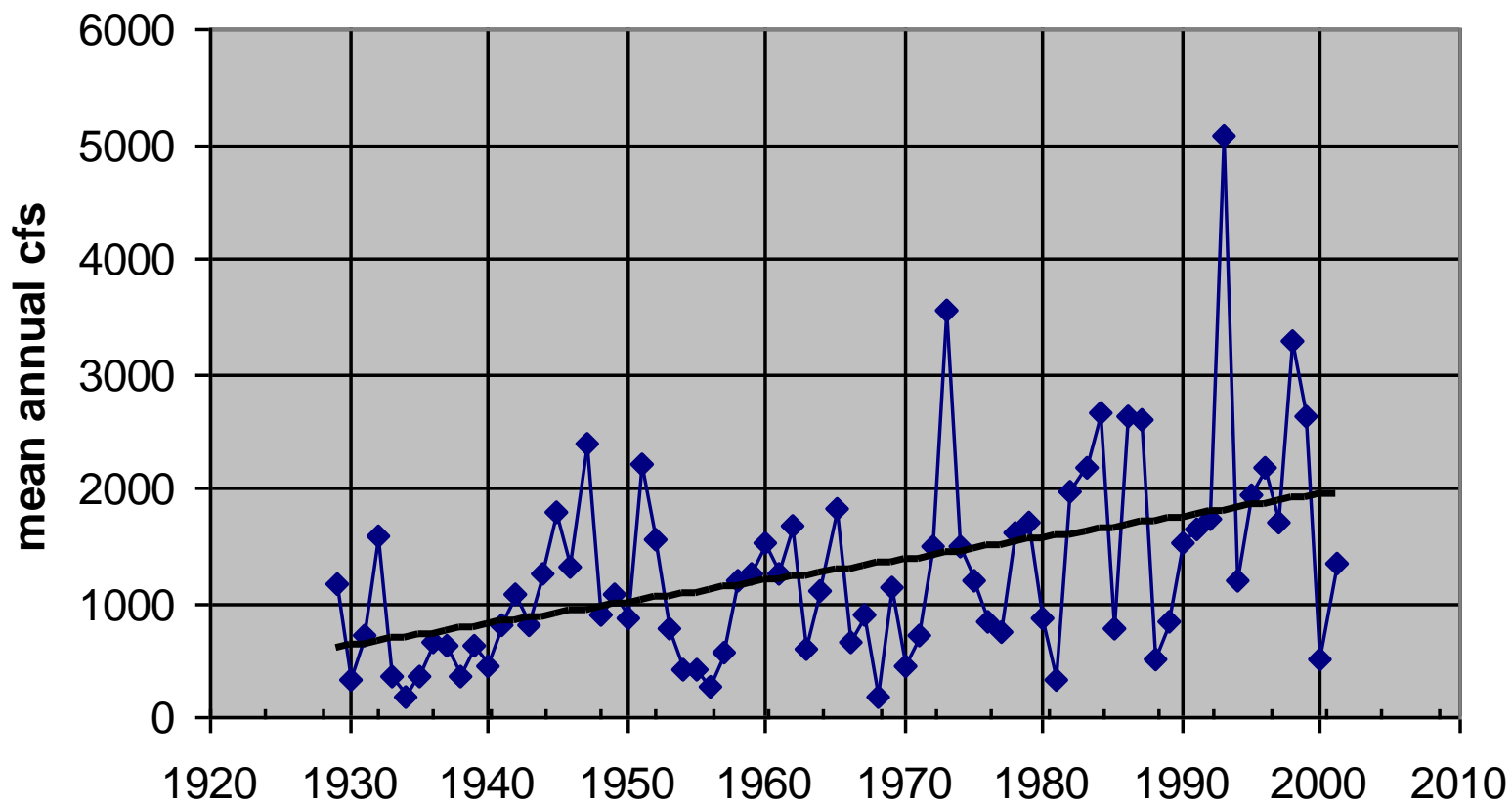
Days with Precip per Year

Based on 35 long term climate sites in Iowa (1893-2007)



Nishnabotna @Hamburg, IA

◆ Hamburg — Linear (Hamburg)

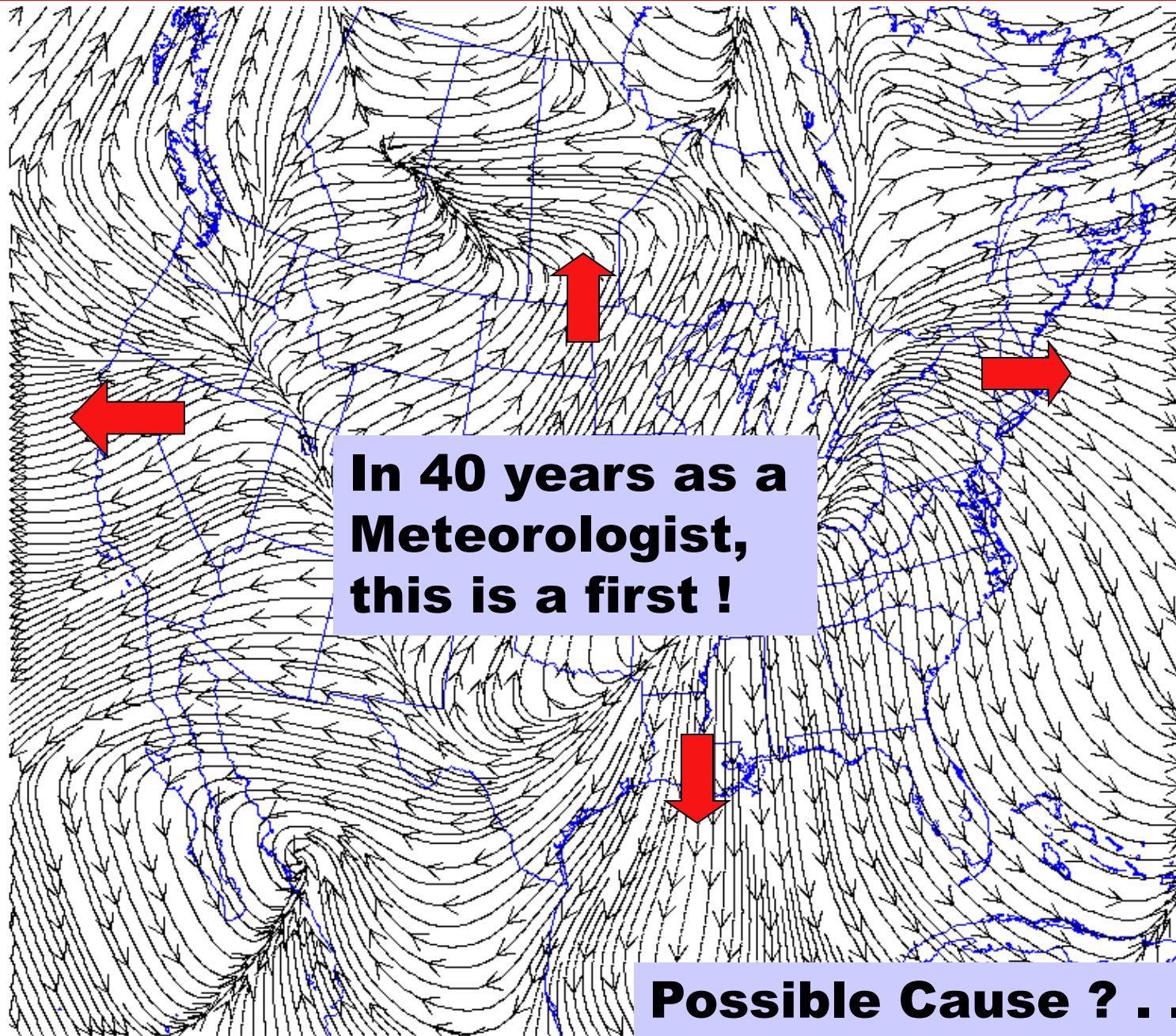


$y = 18.825x - 35716$
<http://nwis.waterdata.usgs.gov/ia/nwis/annual>

END



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Surface Streamlines 040110/1800 UTC

It was An Election Year !

