

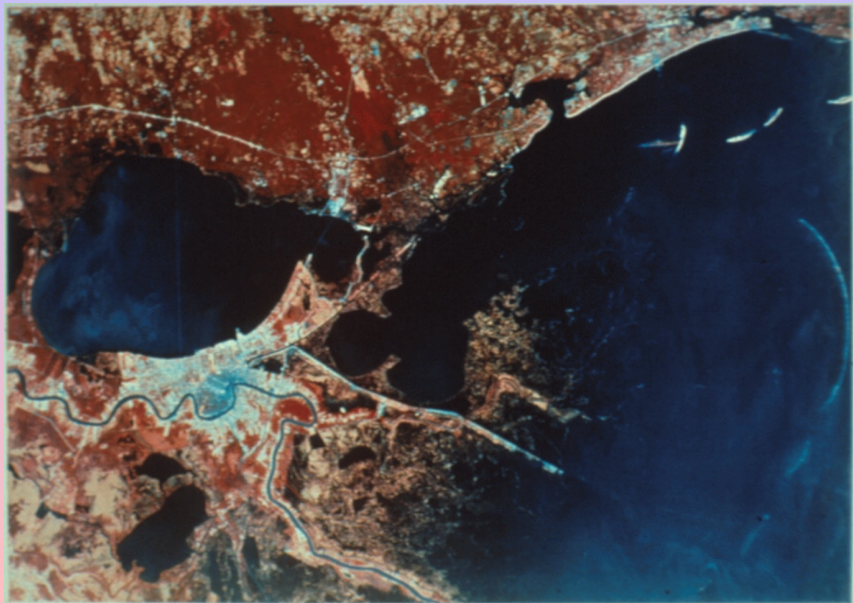
# Communicating Local Climate Data

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University of Dubuque



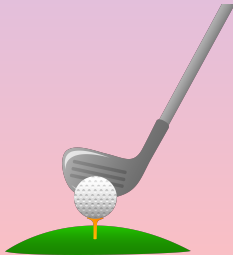
# Start with a story



# How do we explain disasters?

“Hurricane Katrina was, in fact, the judgment of God against the city of New Orleans.”

“New Orleans had a level of sin that was offensive to God,” [Pastor John] Hagee said, because “there was to be a homosexual parade there on the Monday that the Katrina came.”



# Really?

“Hurricane Katrina was, in fact, the judgment of God against the city of New Orleans.”

“New Orleans had a level of sin that was offensive to God,” Pastor John Hagee said, because “there was to be a homosexual parade there on the Monday that the Katrina came.”

## The facts:

- Both seminaries in New Orleans were destroyed
- Approximately 900 churches, synagogues or mosques were destroyed
- Nearly 85 percent of those killed were older than 51, 60 percent older than 65 and almost half were older than 75.

# Link to climate change



YALE  
Climate  
Connections

ARTICLES ▾

RADIO PROGRAM ▾

TOPICS ▾

ABOUT ▾

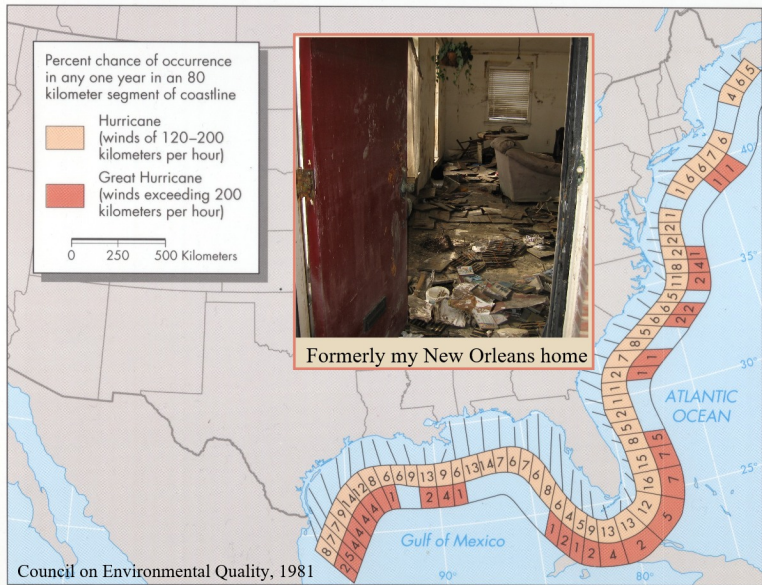
CONTACT ▾

CLIMATE EXPLAINED

## How climate change is making hurricanes more dangerous

*Stronger wind speeds, more rain, and worsened storm surge add up to more potential destruction.*

# We could have been prepared.



# It has to be personal



## EGRAPH HERALD

High 84° Low 65° Sunny, 6B

FRIDAY

July 29, 2011 • Dubuque, Iowa • 75 cents



Cathy Davis walks along U.S. 52 after fleeing her flooded home, north of Dubuque, on Thursday morning. The tri-state area was rocked by a storm

that dumped as much as 15 inches of rain in 12 hours. Dubuque's official total of 10.74 inches shattered the previous 24-hour record of 8.95 inches in 2002.

JEREMY PORTEZ • *Telegraph Herald*

### Storm totals

Rainfall amounts (in inches) received in tri-state cities:

**15.1**

**Dubuque**  
(4 miles southwest)

**14.5**

**Dubuque**  
(4 miles southeast)

**13.45**

**Galena, Ill.**

**10.74**

**Dubuque**  
Regional  
Airport

**10.11**

**Sinsinawa, Wis.**

**9.52**

**Elizabeth, Ill.**  
(1 mile southwest)

**7.5**

**Holy Cross, Iowa**

**3.44**

**Guttenberg, Iowa**

**2.97**

**Elkader, Iowa**

**1.75**

**Platteville, Wis.**

Source: National  
Weather Service

# UNPRECEDENTED

'I have never witnessed anything like what we have seen in the last 12 hours'

# Where to start?

## Know where the data is stored.



Figure: Climate data main page - NOAA





# Where to start?


## Find your personal data.


■ Climate Data Online Search


Start searching here to find past weather and climate data. Search within a date range and select specific type of search. All fields are required.


Select Weather Observation Type/Dataset 


Daily Summaries 

Select Date Range 

2021-01-01 to 2021-07-12 

Search For 

Stations 

Enter a Search Term 

Dubuque

SEARCH

Figure: Search engine - NOAA

# Where to start?

## Think local.

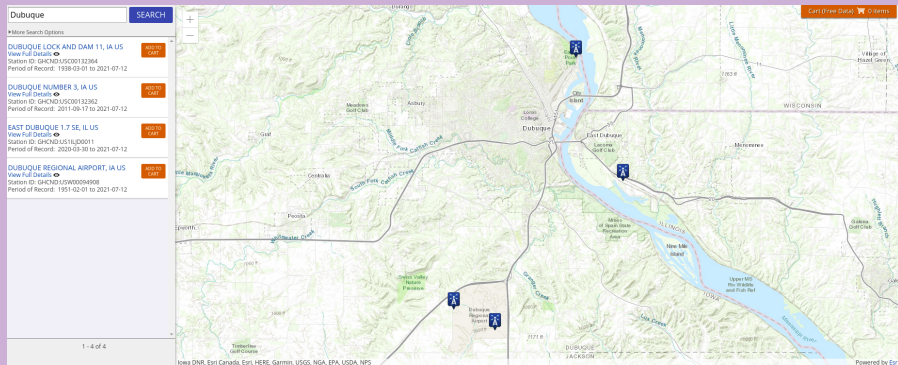
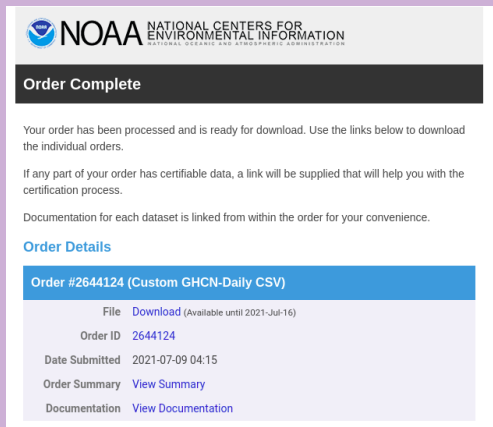


Figure: Dubuque stations - NOAA

# Where to start?

## As simple as that...



The screenshot shows an email from NOAA. At the top is the NOAA logo and the text 'NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION' and 'NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION'. Below this is a dark grey header with the text 'Order Complete'. The main body of the email contains three paragraphs of text, followed by a blue link 'Order Details'. Below the link is a blue header with the text 'Order #2644124 (Custom GHCN-Daily CSV)'. This is followed by a table with four rows of information.

**Order Complete**

Your order has been processed and is ready for download. Use the links below to download the individual orders.

If any part of your order has certifiable data, a link will be supplied that will help you with the certification process.

Documentation for each dataset is linked from within the order for your convenience.

[Order Details](#)

**Order #2644124 (Custom GHCN-Daily CSV)**

File	<a href="#">Download</a> (Available until 2021-Jul-16)
Order ID	<a href="#">2644124</a>
Date Submitted	2021-07-09 04:15
Order Summary	<a href="#">View Summary</a>
Documentation	<a href="#">View Documentation</a>

Figure: Data delivery email - NOAA

# A simple lesson in Excel.

## Change the file type.

AutoSave Off Decorah Testing

File Home Insert Page Layout Formulas Data Review View Help Acrobat

Clipboard Font Alignment Number

Calibri 11 A A

B I U [Grid] [Color] [Text Color]

Wrap Text Merge & Center

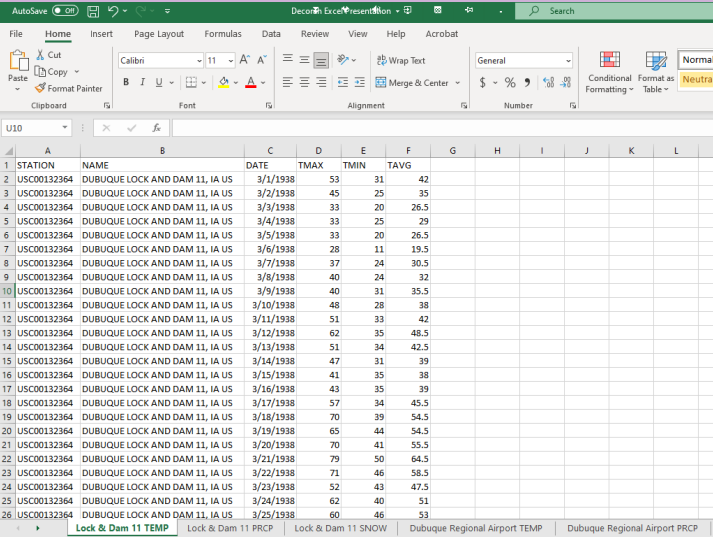
General \$ % [Decrease Indent] [Increase Indent]

N14

	A	B	C	D	E	F	G	H	I
1	STATION	NAME	DATE	PRCP	SNOW	SNWD	TMAX	TMIN	
2	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/1/1951	0	0	6	-1	-21	
3	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/2/1951	0	0	6	9	-23	
4	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/3/1951	0	0	6	27	9	
5	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/4/1951	0	0	6	28	14	
6	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/5/1951	0	0	6	29	7	
7	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/6/1951	0.23	2.3	8	34	-5	
8	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/7/1951	0	0	8	1	-10	
9	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/8/1951	0.14	1.4	9	-1	-11	
10	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/9/1951	0	0	9	8	-16	
11	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/10/1951	0.01	0.1	9	34	8	
12	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/11/1951	0	0	6	43	32	
13	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/12/1951	0.45	3.2	6	36	18	
14	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/13/1951	0.1	1.1	9	18	1	
15	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/14/1951	0	0	9	18	-10	
16	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/15/1951	0.02	0	9	30	0	
17	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/16/1951	0.21	0	8	34	28	
18	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/17/1951	0	0	8	33	29	
19	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/18/1951	0.38	0	7	39	29	
20	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/19/1951	0	0	4	36	29	
21	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/20/1951	0	0	4	33	28	
22	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/21/1951	0	0	3	35	22	
23	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/22/1951	0	0	2	31	24	
24	USW00094908	DUBUQUE REGIONAL AIRPORT, IA US	2/23/1951	0	0	2	33	25	

# A simple lesson in Excel.

## Copy, seperate, and delete excess data.



The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H	I	J	K	L
1	STATION	NAME	DATE	TMAX	TMIN	TAVG						
2	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/1/1938	53	31	42						
3	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/2/1938	45	25	35						
4	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/3/1938	33	20	26.5						
5	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/4/1938	33	25	29						
6	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/5/1938	33	20	26.5						
7	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/6/1938	28	11	19.5						
8	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/7/1938	37	24	30.5						
9	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/8/1938	40	24	32						
10	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/9/1938	40	31	35.5						
11	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/10/1938	48	28	38						
12	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/11/1938	51	33	42						
13	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/12/1938	62	35	48.5						
14	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/13/1938	51	34	42.5						
15	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/14/1938	47	31	39						
16	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/15/1938	41	35	38						
17	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/16/1938	43	35	39						
18	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/17/1938	57	34	45.5						
19	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/18/1938	70	39	54.5						
20	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/19/1938	65	44	54.5						
21	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/20/1938	70	41	55.5						
22	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/21/1938	79	50	64.5						
23	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/22/1938	71	46	58.5						
24	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/23/1938	52	43	47.5						
25	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/24/1938	62	40	51						
26	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/25/1938	60	46	53						

The bottom of the screenshot shows the worksheet tab bar with the following tabs: Lock & Dam 11 TEMP, Lock & Dam 11 PRCP, Lock & Dam 11 SNOW, Dubuque Regional Airport TEMP, and Dubuque Regional Airport PRCP. The 'Lock & Dam 11 TEMP' tab is currently selected.

# A simple lesson in Excel.

## Drop missing data.

The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H	I	J	K
	STATION	NAME	DATE	TMAX	TMIN	TAVG					
1	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/1/1938	53	31	42					
3	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/2/1938	45	25	35					
4	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/3/1938	33	20	26.5					
5	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/4/1938	33	25	29					
6	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/5/1938	33	20	26.5					
7	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/6/1938	28	11	19.5					
8	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/7/1938	37	24	30.5					
9	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/8/1938	40	24	32					
10	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/9/1938	40	31	35.5					
11	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/10/1938	48	28	38					
12	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/11/1938	51	33	42					
13	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/12/1938	62	35	48.5					
14	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/13/1938	51	34	42.5					
15	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/14/1938	47	31	39					
16	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/15/1938	41	35	38					
17	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/16/1938	43	35	39					
18	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/17/1938	57	34	45.5					
19	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/18/1938	70	39	54.5					
20	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/19/1938	65	44	54.5					
21	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/20/1938	70	41	55.5					
22	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/21/1938	79	50	64.5					
23	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/22/1938	71	46	58.5					
24	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/23/1938	52	43	47.5					
25	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/24/1938	62	40	51					
26	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/25/1938	60	46	53					

The status bar at the bottom shows: Average: 40.03316151 Count: 29101 Sum: 1164965. The active sheet is 'Lock & Dam 11 TEMP'.

# A simple lesson in Excel.

## Drop missing data.

The screenshot shows the Microsoft Excel interface with the 'Home' tab selected. The ribbon includes options for Clipboard, Font, Alignment, Number, Styles, Cells, Editing, and Analysis. The active cell is E1, which contains the text 'TMIN'. The data table below has columns A through N. Column A contains row numbers 1 through 25. Column B contains the text 'STATION'. Column C contains the text 'NAME'. Column D contains the text 'DATE'. Column E contains the text 'TMAX'. Column F contains the text 'TMIN'. Column G contains the text 'TAVG'. The data table is as follows:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	STATION	NAME	DATE	TMAX	TMIN	TAVG								
2	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/1/1938	53	31	42								
3	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/2/1938	45	25	35								
4	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/3/1938	33	20	26.5								
5	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/4/1938	33	25	29								
6	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/5/1938	33	20	26.5								
7	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/6/1938	28	11	19.5								
8	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/7/1938	37	24	30.5								
9	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/8/1938	40	24	32								
10	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/9/1938	40	31	35.5								
11	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/10/1938	48	28	38								
12	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/11/1938	51	33	42								
13	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/12/1938	62	35	48.5								
14	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/13/1938	51	34	42.5								
15	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/14/1938	47	31	39								
16	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/15/1938	41	35	38								
17	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/16/1938	43	35	39								
18	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/17/1938	57	34	45.5								
19	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/18/1938	70	39	54.5								
20	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/19/1938	65	44	54.5								
21	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/20/1938	70	41	55.5								
22	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/21/1938	79	50	64.5								
23	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/22/1938	71	46	58.5								
24	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/23/1938	52	43	47.5								
25	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/24/1938	62	40	51								

The 'Go To Special' dialog box is open, showing the 'Blanks' option selected under the 'Formulas' category. The 'OK' button is highlighted.

# A simple lesson in Excel.

## Drop missing data.

The screenshot shows the Microsoft Excel interface. The ribbon is set to 'Home'. The active cell is E26. A context menu is open over cell E26, showing options: Cut, Copy, Paste Options, Paste Special..., Smart Lookup, Insert..., Delete..., Clear Contents, and Quick Analysis. The data table below shows a list of records with columns A through J. Column E contains numerical values, with some cells highlighted in green.

	A	B	C	D	E	F	G	H	I	J
22	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/21/1938	79	50	64.5				
23	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/22/1938	71						
24	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/23/1938	52						
25	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/24/1938	62						
26	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/25/1938	60						
27	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/26/1938	52						
28	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/27/1938	63						
29	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/28/1938	61						
30	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/29/1938	73						
31	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/30/1938	67						
32	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	3/31/1938	50						
33	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	1/1/1941	41						
34	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	1/2/1941	42						
35	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	1/3/1941	32						
36	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	1/4/1941	24						
37	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	1/5/1941	11						
38	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	1/6/1941	21						
39	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	1/7/1941	28						
40	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	1/8/1941	35						
41	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	1/9/1941	35						
42	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	1/10/1941	39						
43	USC00132364	DUBUQUE LOCK AND DAM 11, IA US	1/11/1941	35						



# Begin to play around!

[illegible]

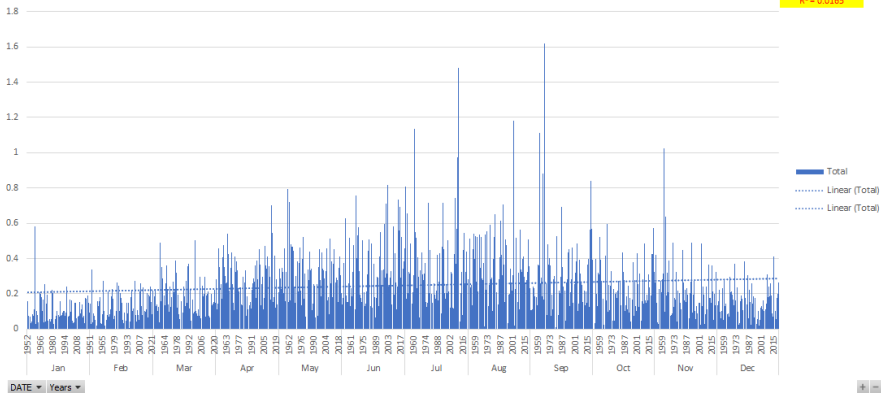
# A simple lesson in Excel.

## Begin to play around!

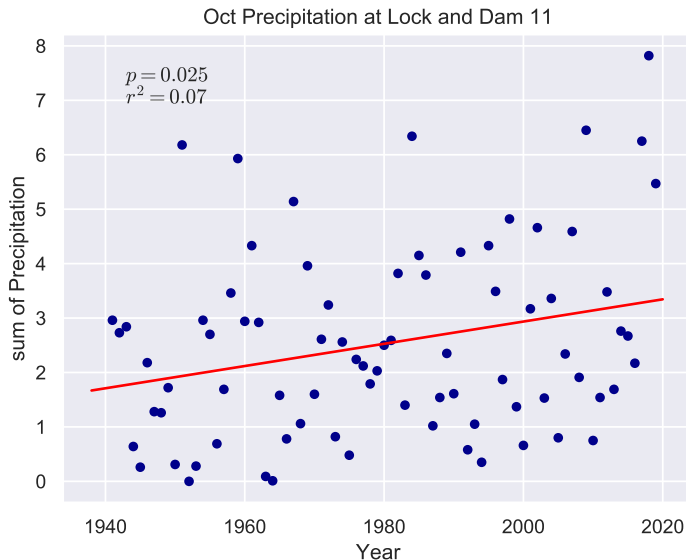
StdDev of PRCP

Standard deviation, Precipitation over all years at the DBQ Regional Airport.

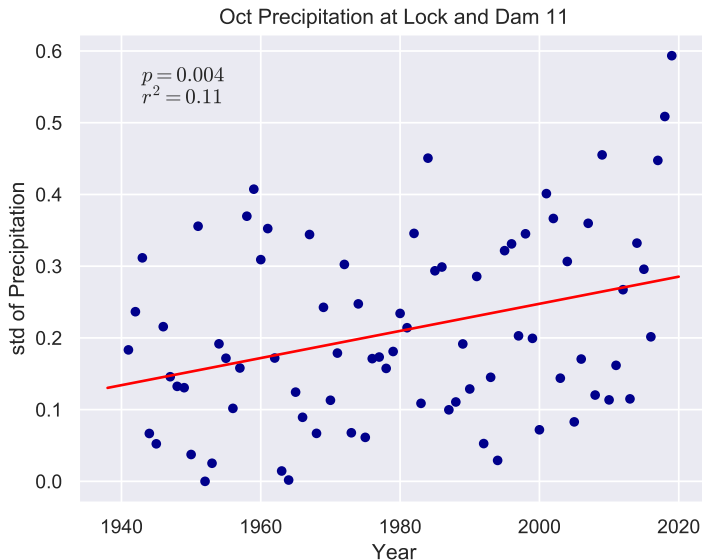
$$y = 1E-04x + 0.2066$$
$$R^2 = 0.0165$$



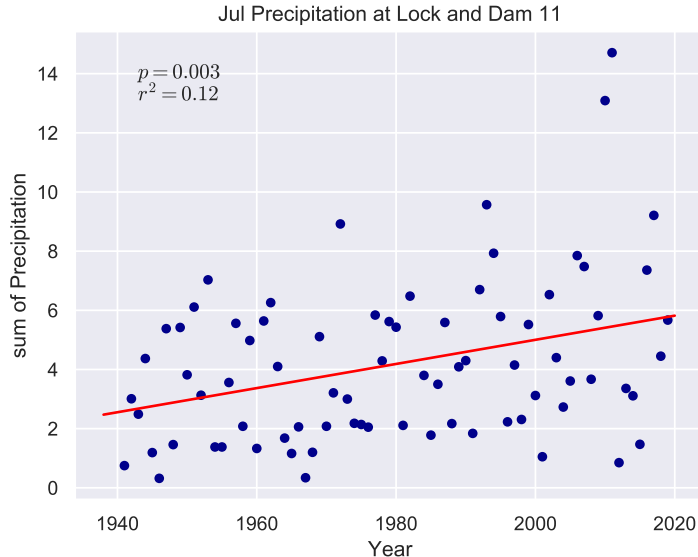
# 1. October is wetter and less predictable



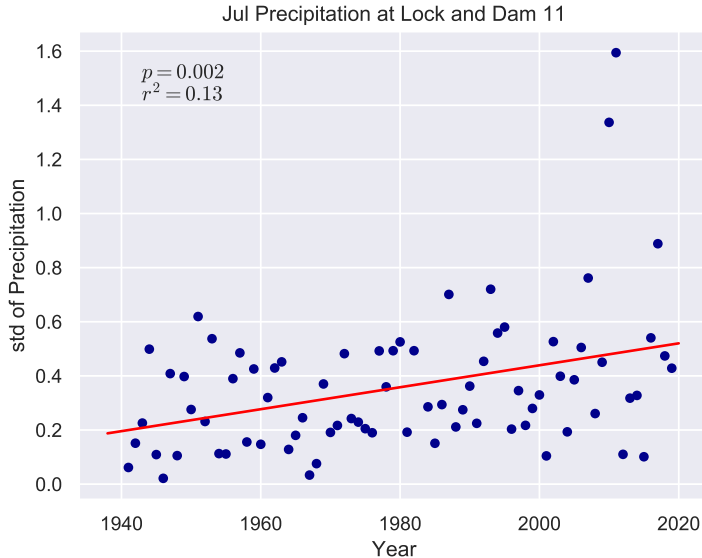
# 1. October is wetter and less predictable



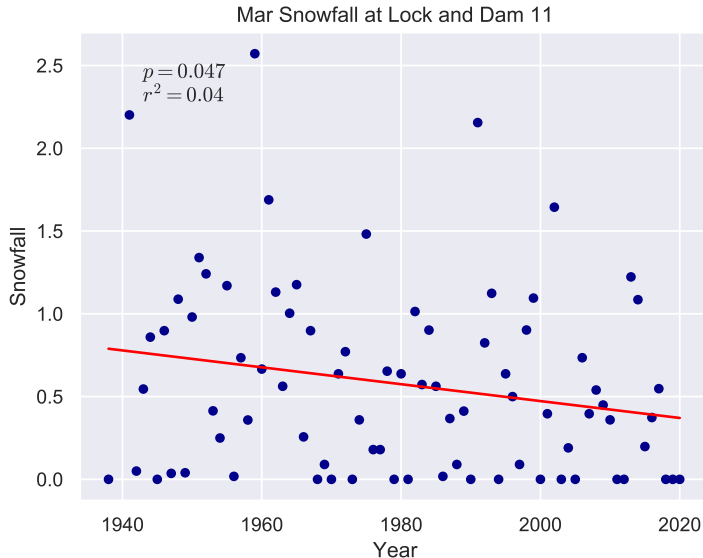
## 2. July is wetter and less predictable



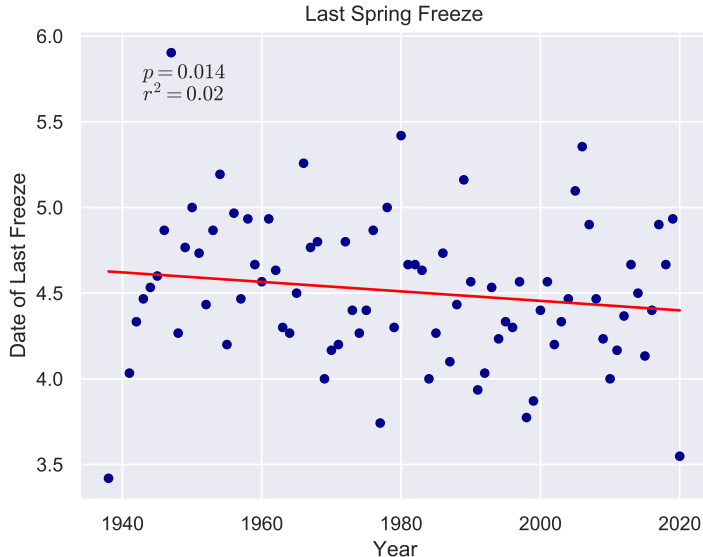
## 2. July is wetter and less predictable



### 3. March snow has decreased

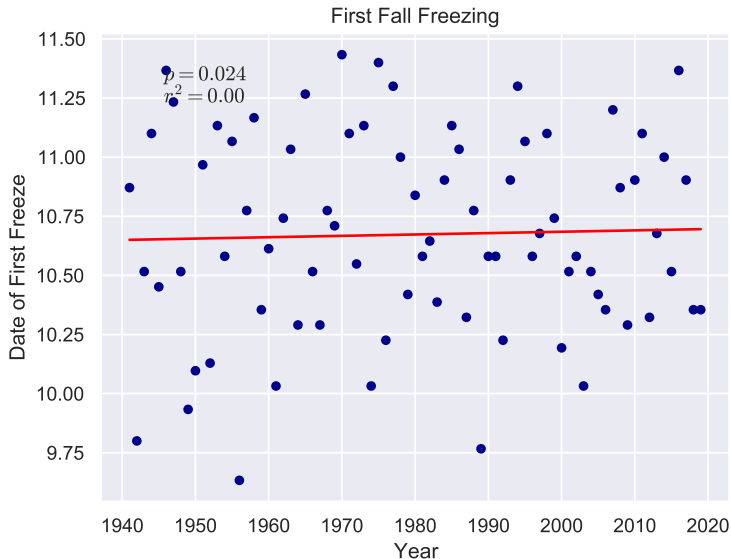


## 4. The last freeze of spring is earlier





## 5. The first freeze of fall is later



# Which do you support most?

- a. reduce alcohol-related auto accidents
- b. reduce suicides



# Do these data influence you?

## Suicide Facts & Figures:

**Iowa 2019 \***



**On average, one person dies by suicide every 18 hours in the state.**

**More than five times as many people died by suicide in Iowa in 2017 than in alcohol related motor vehicle accidents.**

The total deaths to suicide reflect a total of 10,127 years of potential life lost (YPLL) before age 65.



Suicide cost Iowa a total of **\$441,111,000** combined lifetime medical and work loss cost in 2010, or an average of **\$1,185,783 per suicide death.**

\*Based on most recent 2017 data from CDC. Learn more at [afsp.org/statistics](https://afsp.org/statistics).



### leading cause of death in Iowa

#### 2nd leading

cause of death for ages 15-34

#### 4th leading

cause of death for ages 35-54

#### 8th leading

cause of death for ages 55-64

#### 17th leading

cause of death for ages 65 & older

### Suicide Death Rates

	Number of Deaths by Suicide	Rate per 100,000 Population	State Rank
Iowa	479	15.13	29
Nationally	47,173	14.00	

# Farmer suicide

Iowa's suicide rate increased more than 35 percent in 17 years

Kim Norvell, The Des Moines Register

Published ~

, 2018

CDC: 'Farm stress,' suicides a rising rural health concern

by George Jared (gjared@talkbusiness.net)

May 14, 2019 4:17 pm 8,112 views

THE NEW REPUBLIC

## I Work With Suicidal Farmers. It's Becoming Too Much to Bear.

Mike Rosmann left seminary to become a clinical psychologist for farmers. Now, as historic flooding ravages the Midwest, he's never been more overwhelmed.

MIKE ROSMANN as told to EMILY ATKIN

April 22, 2019

Add to Po

corners of America

## Why are America's farmers killing themselves?

The suicide rate for farmers is more than double that of veterans. A former farmer gives an insider's perspective on farm life - and how to help

• I wrote about farmers' suicides - and the reaction has been overwhelming

by Debbie Weingarten

# The connection to climate change?

## **\$7.5 billion and counting: August derecho that slammed Iowa was most costly thunderstorm in US history, data shows**

**Andrea May Sahouri** Des Moines Register

Published 5:01 p.m. CT Oct. 17, 2020 | Updated 5:08 p.m. CT Oct. 17, 2020



# We've had some successes

- Acid rain
- CFCs and ozone
- Mental health support for farmers

## Baldwin, Ernst introduce bill to prevent farmer suicides

Source: WBAY

***Apr 19 2018***

WASHINGTON (WBAY) - A new, bipartisan bill was introduced in the U.S. Senate aimed at preventing farmer suicides.

## Wall Street Journal

Ozone Hole Above Antarctica Shrinks to Smallest Size on Record

Oct. 23, 2019

# Finishing the story



When the Levees Broke