Building a More Flood Resilient Iowa

Bill Peterson
Executive Director, Iowa State Association of Counties
bpeterson@iowacounties.org

Witold Krajewski
Director, Iowa Flood Center—University of Iowa
witold-krajewski@uiowa.edu

Justin Glisan
State Climatologist, Iowa Department of Agriculture and Land Stewardship
Justin.Glisan@iowaagriculture.gov

Joyce Flinn
Director, Iowa Homeland Security & Emergency Management
Joyce.flinn@iowa.gov
Flooding in Iowa

Witold Krajewski
Director, Iowa Flood Center
witold-krajewski@uiowa.edu
Flooding cripples Des Moines; entire city without water
Downtown may lack electricity for a week
Winter 2008, 2019:
Upper Midwest receives lots of snow
Direct property losses from flooding total $13.5B
Direct crop losses from flooding total $4.1B.
DIVISION VI

Sec. 15. NEW SECTION. 466C.1 IOWA FLOOD CENTER

1. The state board of regents shall establish and maintain in Iowa City as a part of the state university of Iowa an Iowa Flood Center. In conducting the activities of this chapter, the center shall work cooperatively with the department of natural resources, the department of agriculture and land stewardship, the water resources coordinating council, and other state and federal agencies.

2. The Iowa flood center shall have all of the following purposes:
   a. To develop hydrologic models for physically based flood frequency estimation and real-time forecasting of floods, including hydraulic models of flood plain inundation mapping.
   b. To establish community-based programs to improve flood monitoring and prediction along Iowa’s major waterways and to support ongoing flood research.
   c. To share resources and expertise of the Iowa flood center.
   d. To assist in the development of a workforce in the state, knowledgeable regarding flood research, prediction, and mitigation strategies.
Flood Monitoring
Flood Mapping
Hydrography

Hydraulics

Mapping

Hydrology
Waverly

**River:** Cedar River
**Flood Level:** 12 ft

**View Maps by**
- **River Stage**
- **Return Period**
- **Real-time Stage Values**

**Flood Map Controller**
- **Stage:** 13 ft
- **Discharge:** 30000 cfs
Flood Forecasting
Flood Information Dissemination
IOWA FLOOD INFORMATION SYSTEM

The Iowa Flood Information System (IFIS) is a one-stop web-platform to access community-based flood conditions, forecasts, visualizations, inundation maps and flood-related information, visualizations and applications.

LAUNCH IFIS

IFIS Widget  Video Tutorial  Flood Alerts

INUNDATION MAPS  FLOOD ALERTS  STREAM CONDITIONS  RIVER COMMUNITIES

ABOUT  FEATURES  TOOLS  RESOURCES

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http://ifis.iowafloodcenter.org/ifis/en/
Flood Frequency Estimation
Thank You!
Iowa Weather: Climatological Trends and Extreme Behavior

Justin Glisan, Ph.D.
State Climatologist of Iowa
Iowa Department of Agriculture and Land Stewardship
Climatology Bureau
Presentation Highlights

• Recent and Long Term Trends
  – Temperature
  – Precipitation
• Precipitation Extremes
• Trends to Projections
• Extremes Summary
Precipitation and Temperature Trends

Historical

30-Year
Iowa Temperature Trend Since 1895

Iowa, Average Temperature, January-December

- Avg Temperature
- 1901-2000 Mean: 47.5°F
- 1895-2018 Trend +0.1°F/Decade

8/21/19
2019 ISAC Annual Conference
Iowa Precipitation Trend Since 1895
30-Year Trends
Iowa 30-Year Temperature Trend

Iowa, Average Temperature, January-December

- Avg Temperature
- 1995-2000 Mean: 47.5°F
- 1988-2018 Trend +0.3°F/Decade


47.8 °F 48.6 °F
Iowa 30-Year Precipitation Trend

Iowa, Precipitation, January-December

- 1895-2000 Mean: 32.01”
- 1988-2018 Trend +2.24”/Decade

31.5” 37.8”
Trend Summary

• Long-term and 30-year trends show an increase in temperature and precipitation across Iowa
• Higher intensity events are on the increase
• Spring season rainfall is increasing and occurring earlier in the season
• Summer rains are on the decline, right when crops need them most
• Autumn rainfall is becoming more pronounced, especially during harvest in some locations
Precipitation Extremes
Precipitation Extremes

• A typical coop station will experience 1-2 days with 2” or more rainfall annually
• Over the last two decades, these events are becoming more numerous and more intense
• These events have impacts on:
  – Urban/sub-urban storm water and flooding
  – Agricultural run-off and soil loss
  – Large-scale downstream flooding
24-Hr Precipitation Events
Central Iowa (CDs 2, 5, & 8)

Frequency [%]

Precipitation Threshold [inches]

Historical
20-Years

8/21/19
2019 ISAC Annual Conference
Trends to Projections
Projected Precipitation Change by Season
Extreme Precipitation

Contiguous U.S. Extremes in 1-Day Precipitation (Step 4*)
Annual (January-December) 1910-2016

Upper Midwest Extremes in 1-Day Precipitation (Step 4*)
Annual (January-December) 1910-2016
Extremes Summary

• Both the frequency and intensity of precipitation events is increasing

• The threshold of an extreme event has changed:
  – Higher rainfall rates over a shorter time frame
  – Wider spatial coverage of higher intensity events

• With increasing intensities and current trends, the probability of flood events has increased
  – Seasonal floods (March 2019)
  – Urban flash floods
Thank you

Justin.Glisan@IowaAgriculture.gov

Tel: 515-281-8981

https://iowaagriculture.gov/climatology-bureau
Working Together – Partnership in support of people

Joyce Flinn
Iowa Department of Homeland Security and Emergency Management
Director / Homeland Security Advisor
Joyce.flinn@iowa.gov
Where we fit.....

- As you’ve heard my co-presenters say:
  - Events are becoming more frequent
  - Events are becoming more severe
  - We can likely expect more of the same....

Over the past year......
June 1, 2018 to June 1, 2019

- Rain
- Rain
- Rain
drain derailment
- Rain
tornado
- Rain
tornado
- Rain
- Rain
- Rain
Results

- 3 Presidential Disaster Declarations
  - June 6, 2018 – July 2, 2018
  - July 19, 2018

- Numerous state, local, federal and private sector partners were, and continue to be, engaged in these efforts

- Truly a team effort with plenty of work for all
Presidential Disaster Declaration
DR-4421, Public & Individual Assistance
Severe Weather/Flooding - March 12, 2019 and Continuing

Public & Individual Assistance
Public Assistance

July 22, 2019
Governors’ meetings with the Corps

COORDINATION
Citizens are an important partner

- Government can’t do it all—citizens have a role to play
- Stay aware—in a disaster, knowledge is power
- Make an emergency plan—what to do, where to go, include pets and seniors
- Build an emergency kit—include essentials for three days
Disaster Reminders / Lessons Learned

- No one of us is as smart as all of us
- The “norm” isn’t always the norm
- Ongoing reminder from the Governor to think outside the box
  - Look at things differently
  - Are there ways to speed processes to ensure timely recovery?
- Are there technology solutions we can utilize?
- It’s a team effort. I’ve got a great team!
In Closing –
Never forget what it’s all about