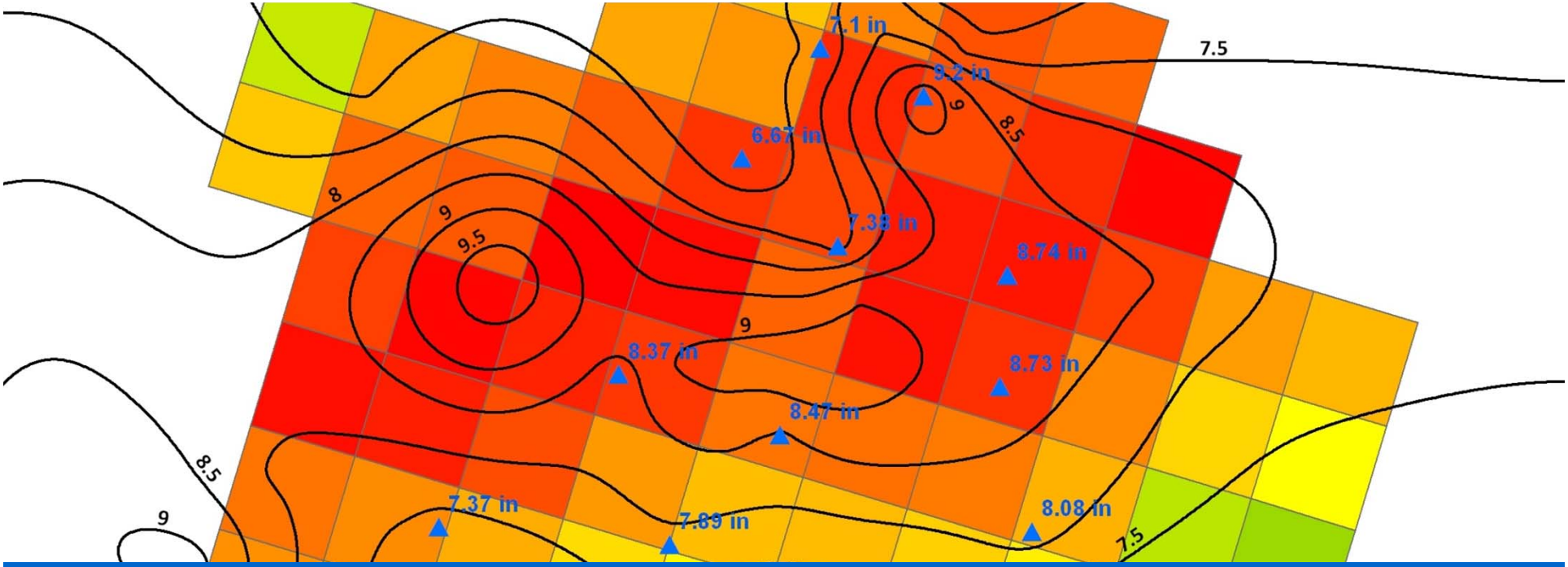


Using NEXRAD Rainfall Data for Model Calibration in DuPage County

A collaborative effort by:

Paminder Parmar, PE, CFM - Parmar Engineering
Tom Price, PE, CFM - CDF, Inc.
Lee von Gynz-Guethle, PE, CFM – AECOM
Eric Loucks, PhD, PE, CFM – CDM

With generous input from:

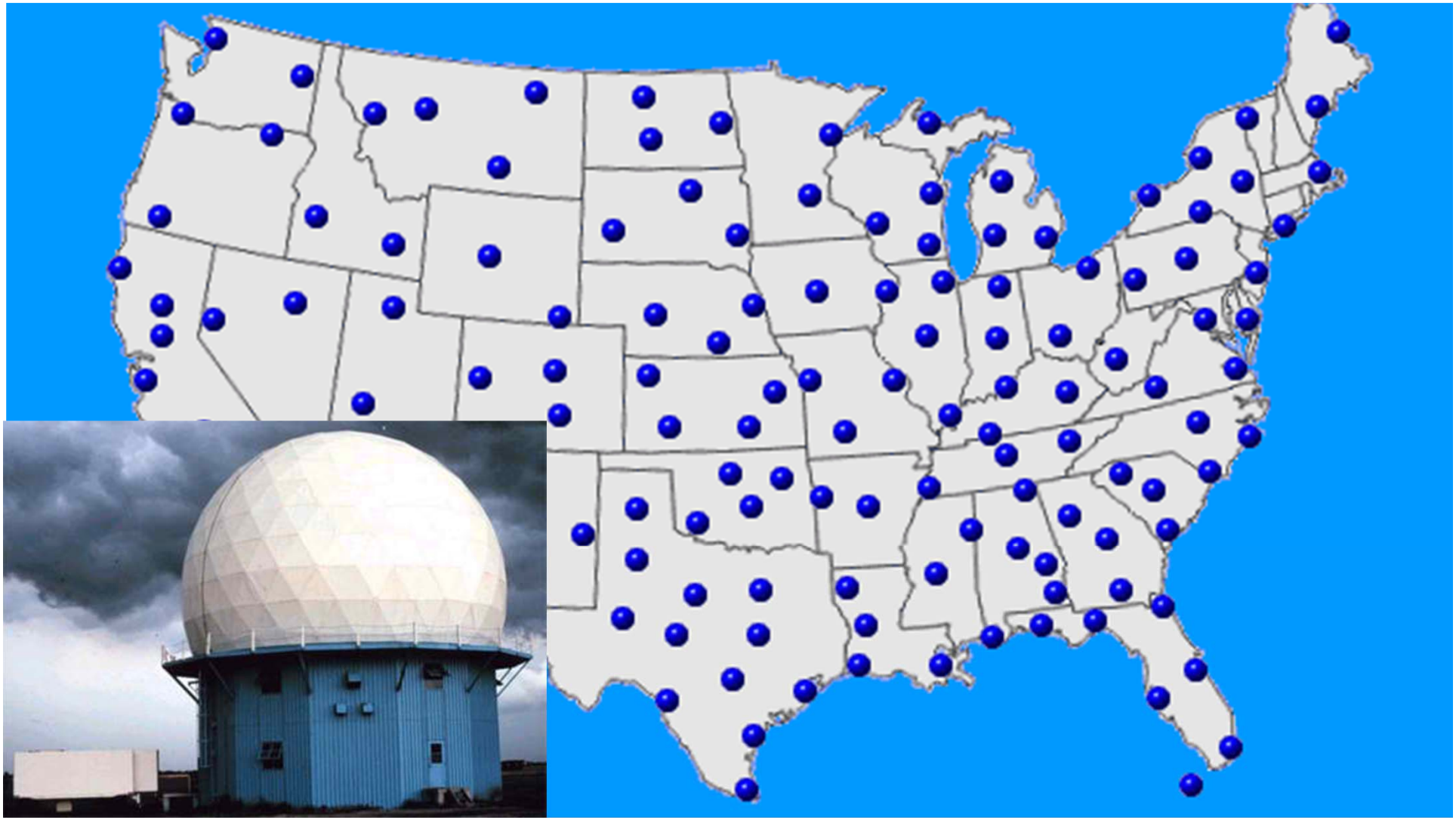
DuPage County

IAFSM 2011

Using NEXRAD Rainfall Data for Model Calibration in DuPage County

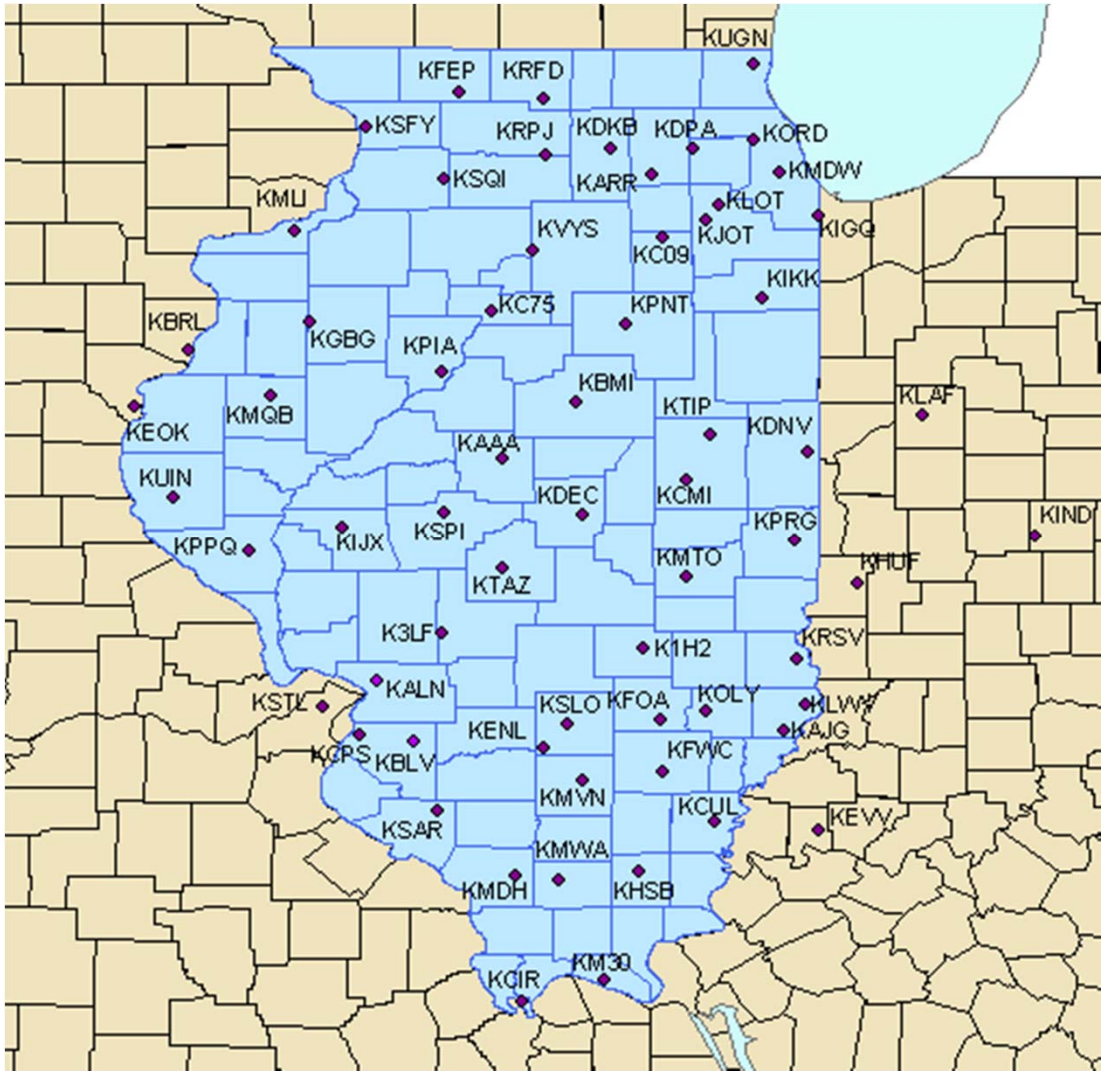
- A simple case study of One Storm, One Watershed using NEXRAD rainfall data instead of traditional gages
- This is not an exhaustive study on whether NEXRAD data is applicable for project use in Illinois
- Conducted because we thought it would be "interesting"

Comprised of 159 DOPPLER high resolution radars operated by the National Weather Service

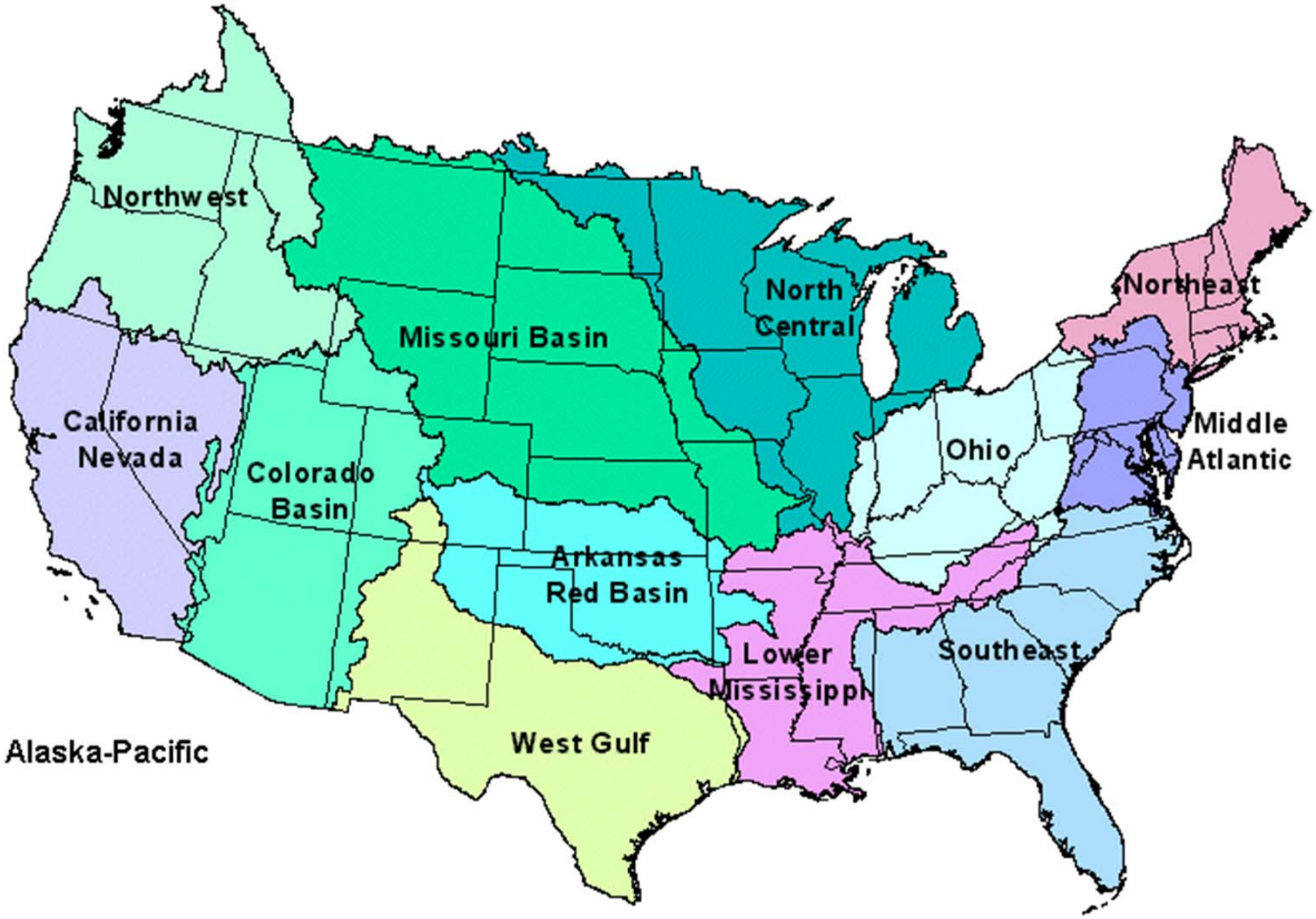


1,450 ASOS sites Nationwide and

60 ASOS sites in Illinois to ground truth data



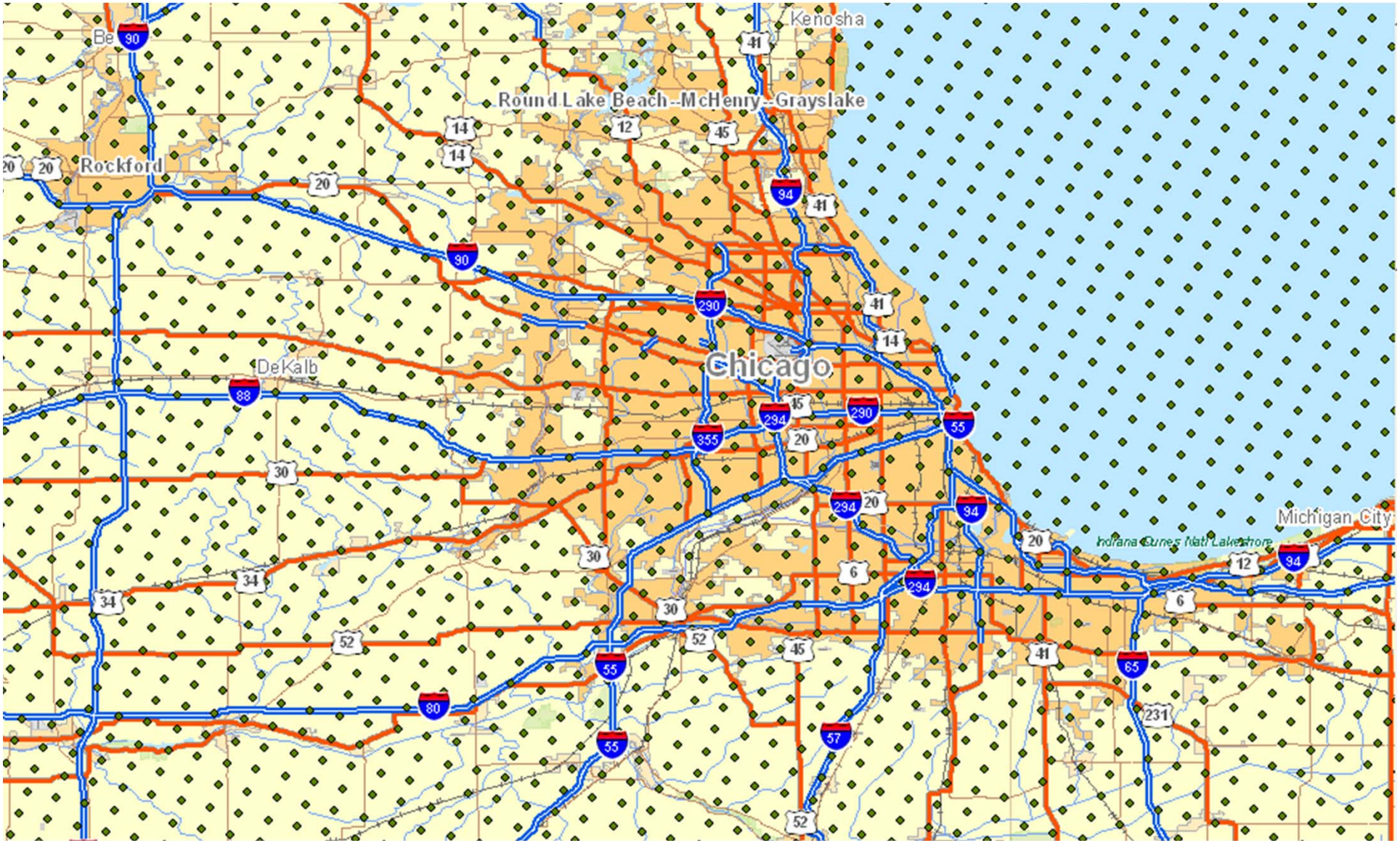
What's NEXRAD? A gridded rainfall product derived from the River Forecast Centers



Example of RAW NEXRAD (Stage 1 – 3) directly from the River Forecast Centers

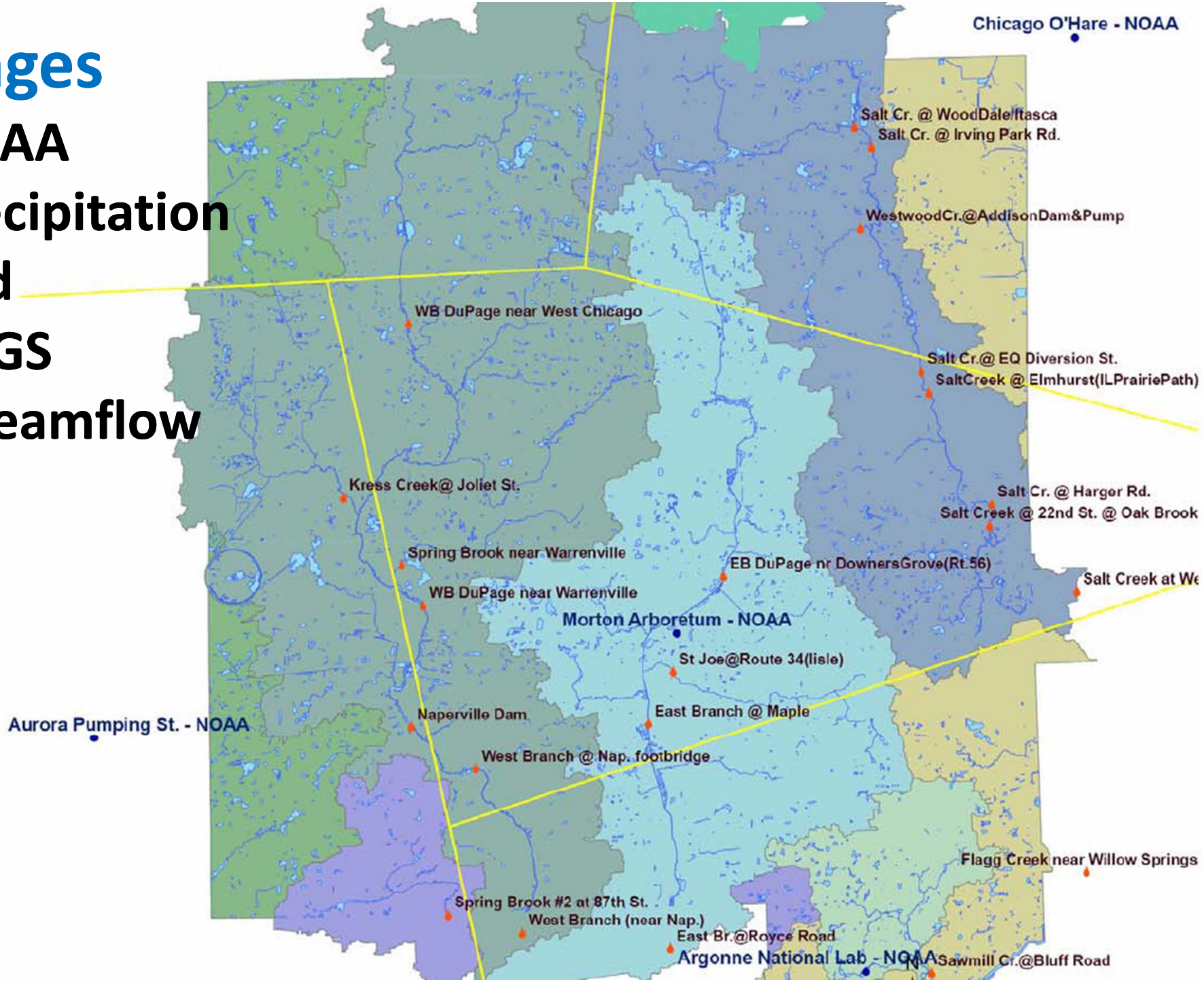
Availability of Stage 4 NEXRAD data

Coverage within North Eastern Illinois



Gages

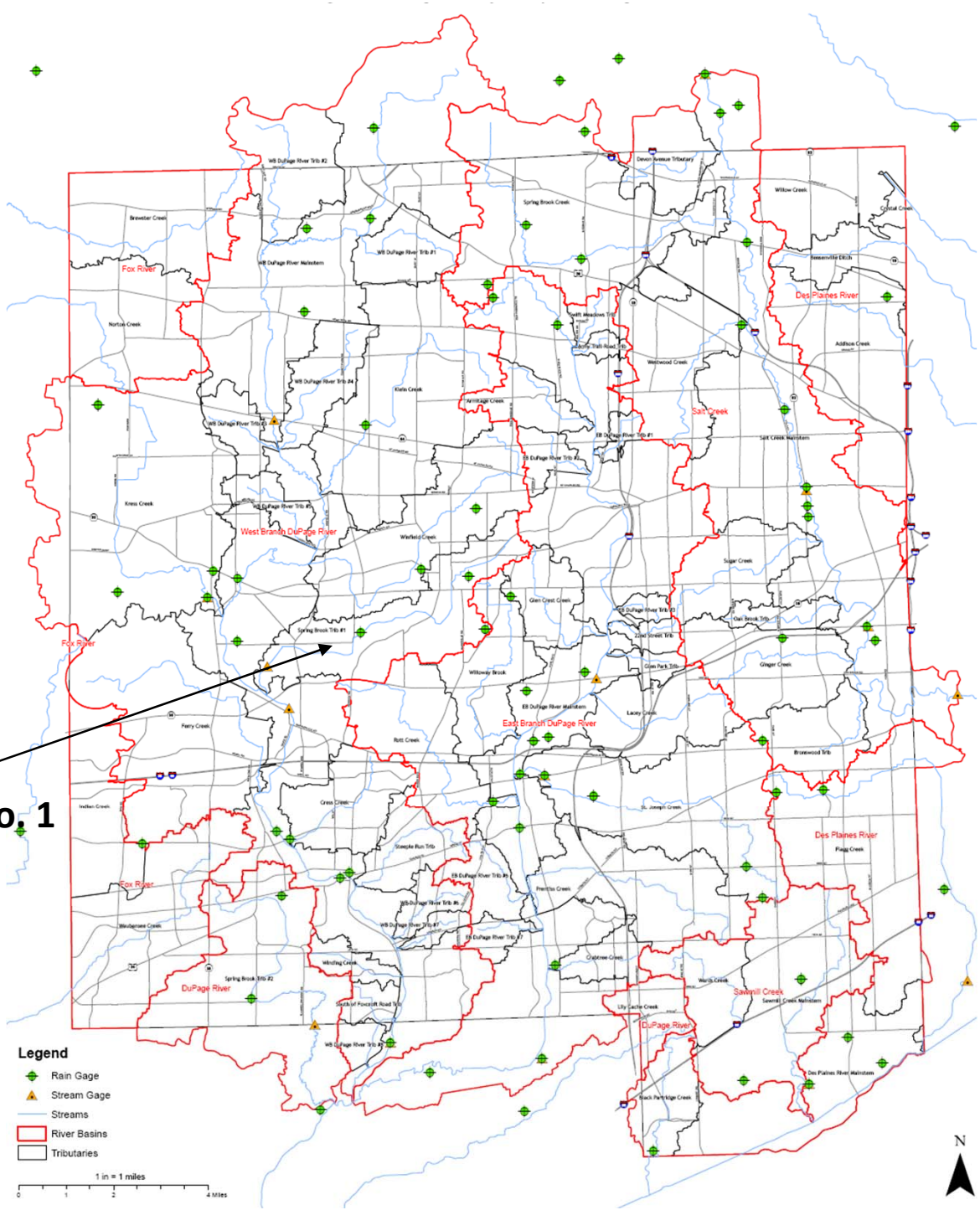
NOAA Precipitation and USGS Streamflow



Gages

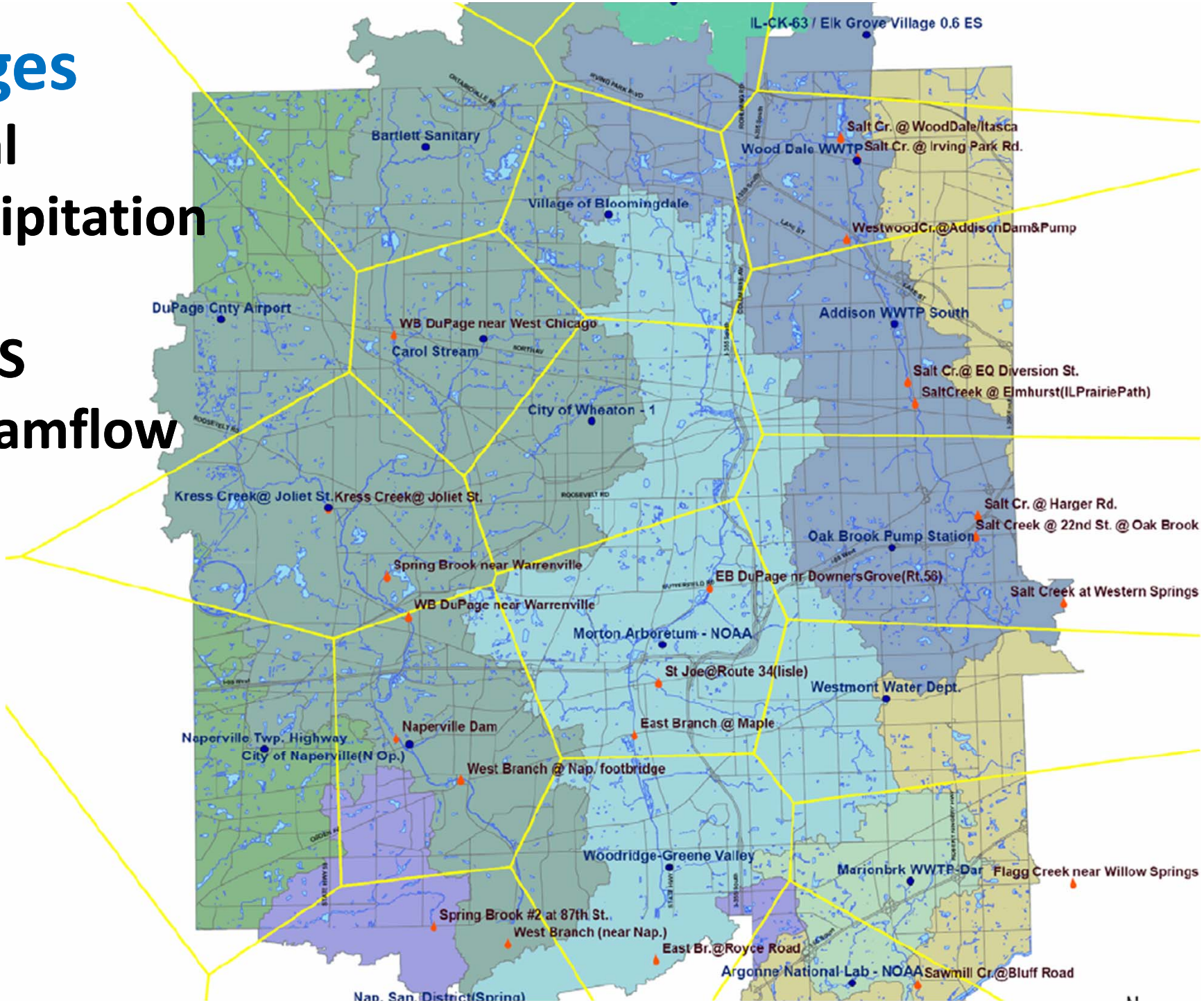
DuPage County Precipitation

West Branch
Spring Brook No. 1

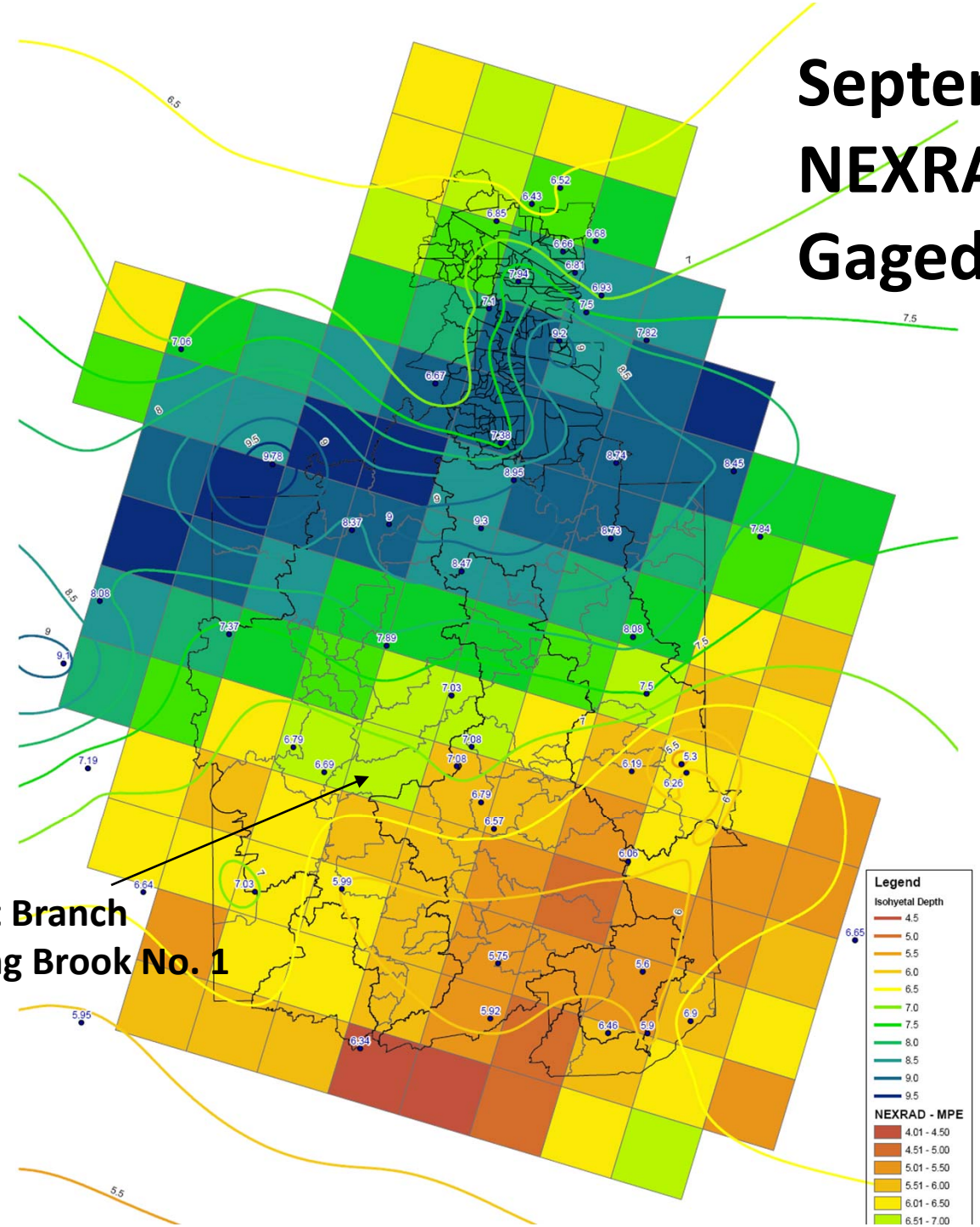


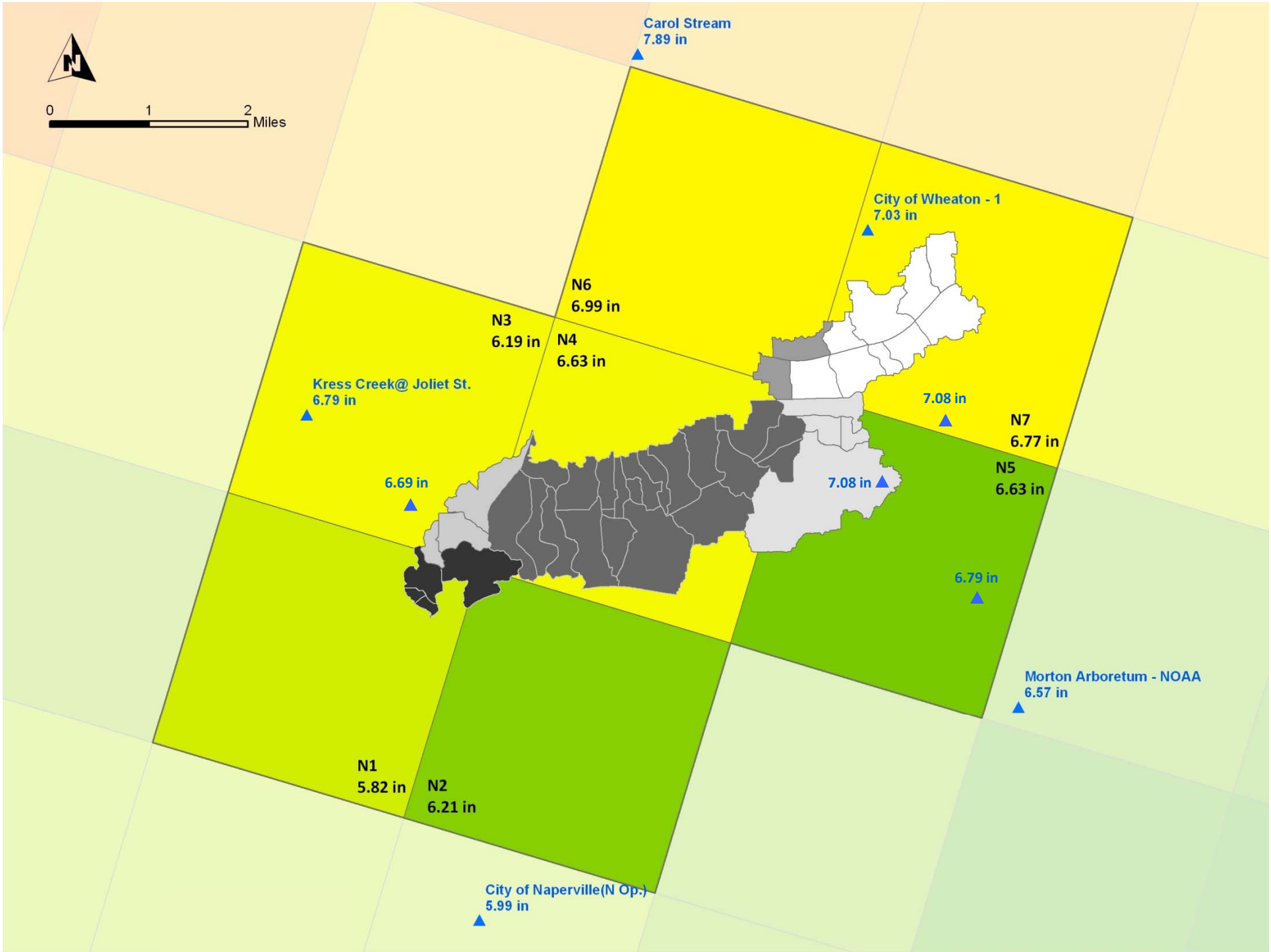
Gages

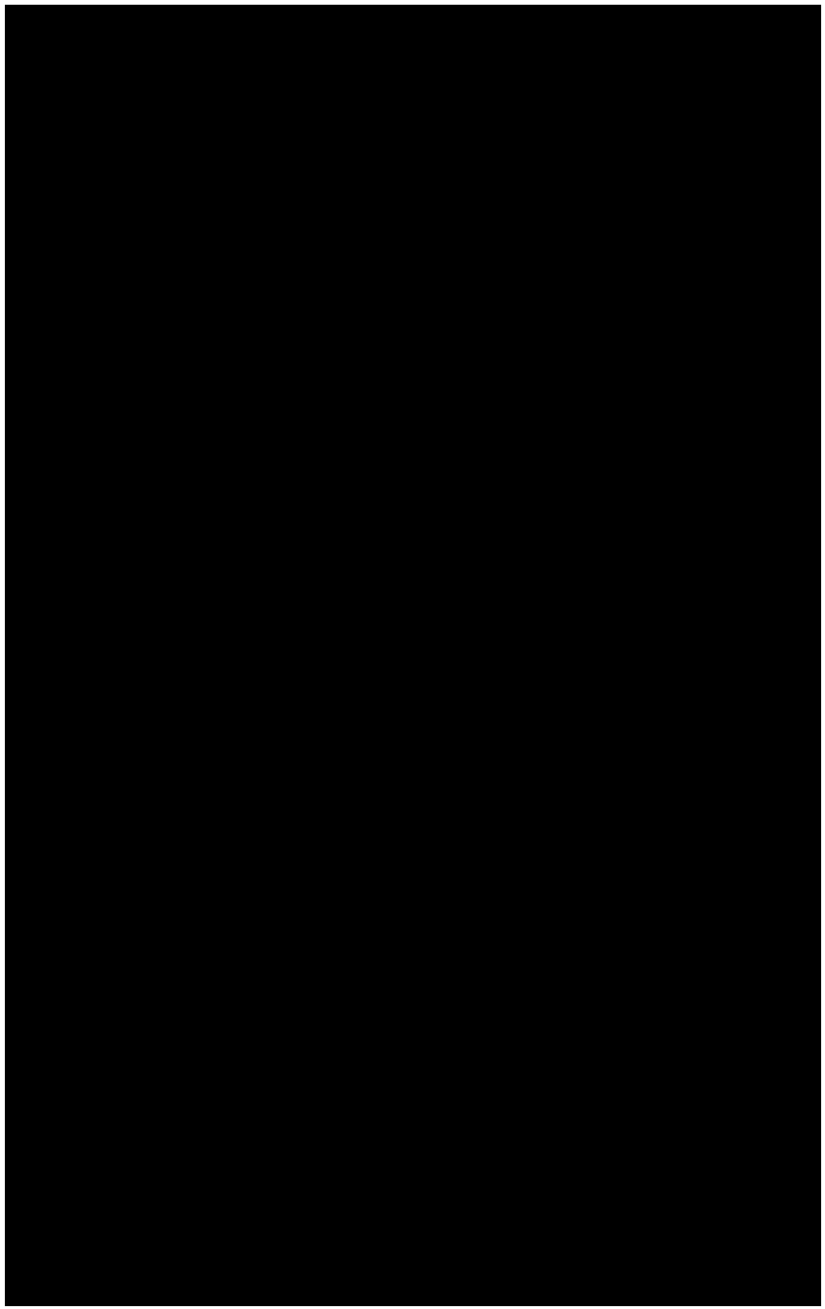
Local Precipitation and USGS Streamflow



September 12-14, 2008 NEXRAD Isohyetals and Gaged Rainfall

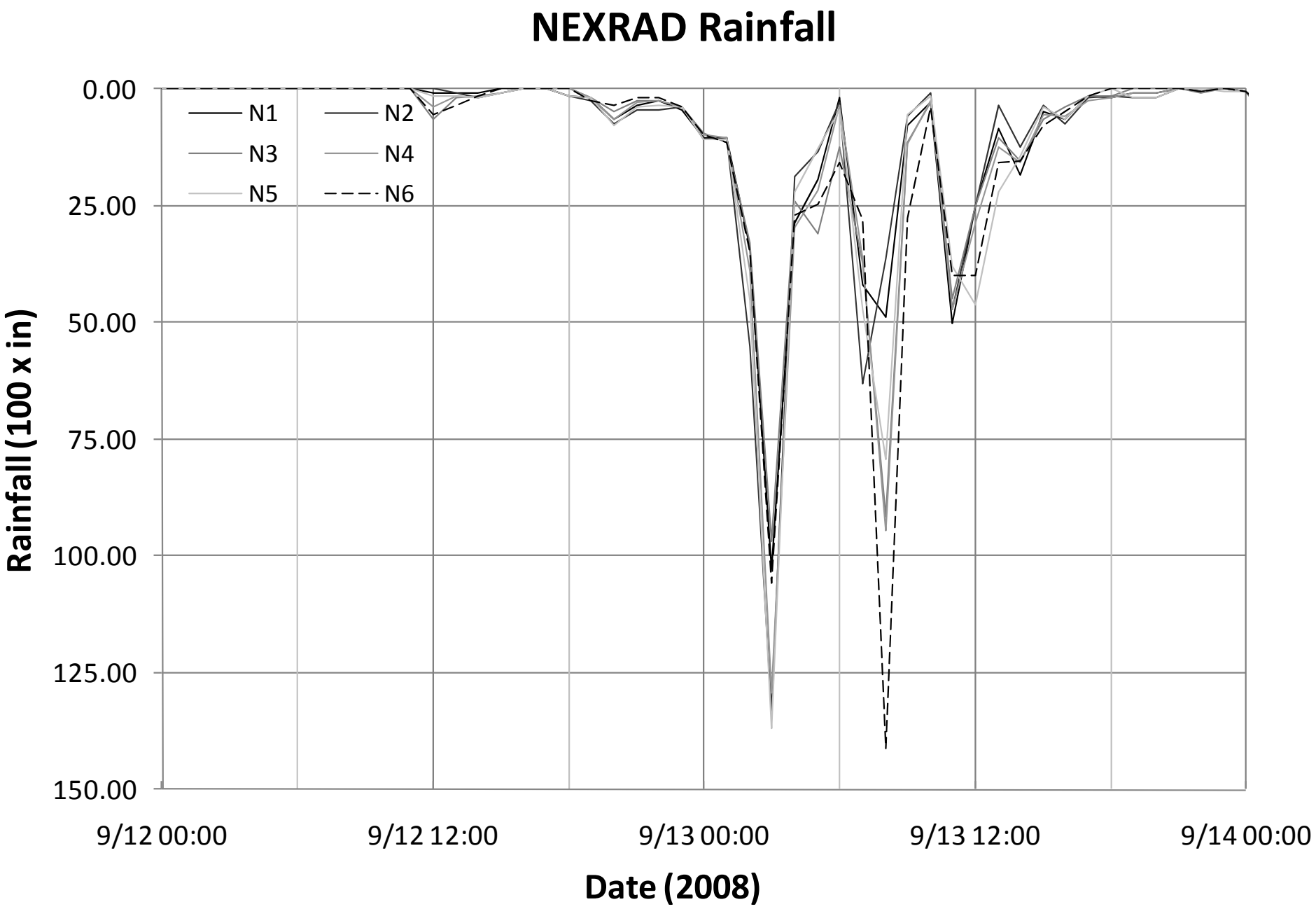


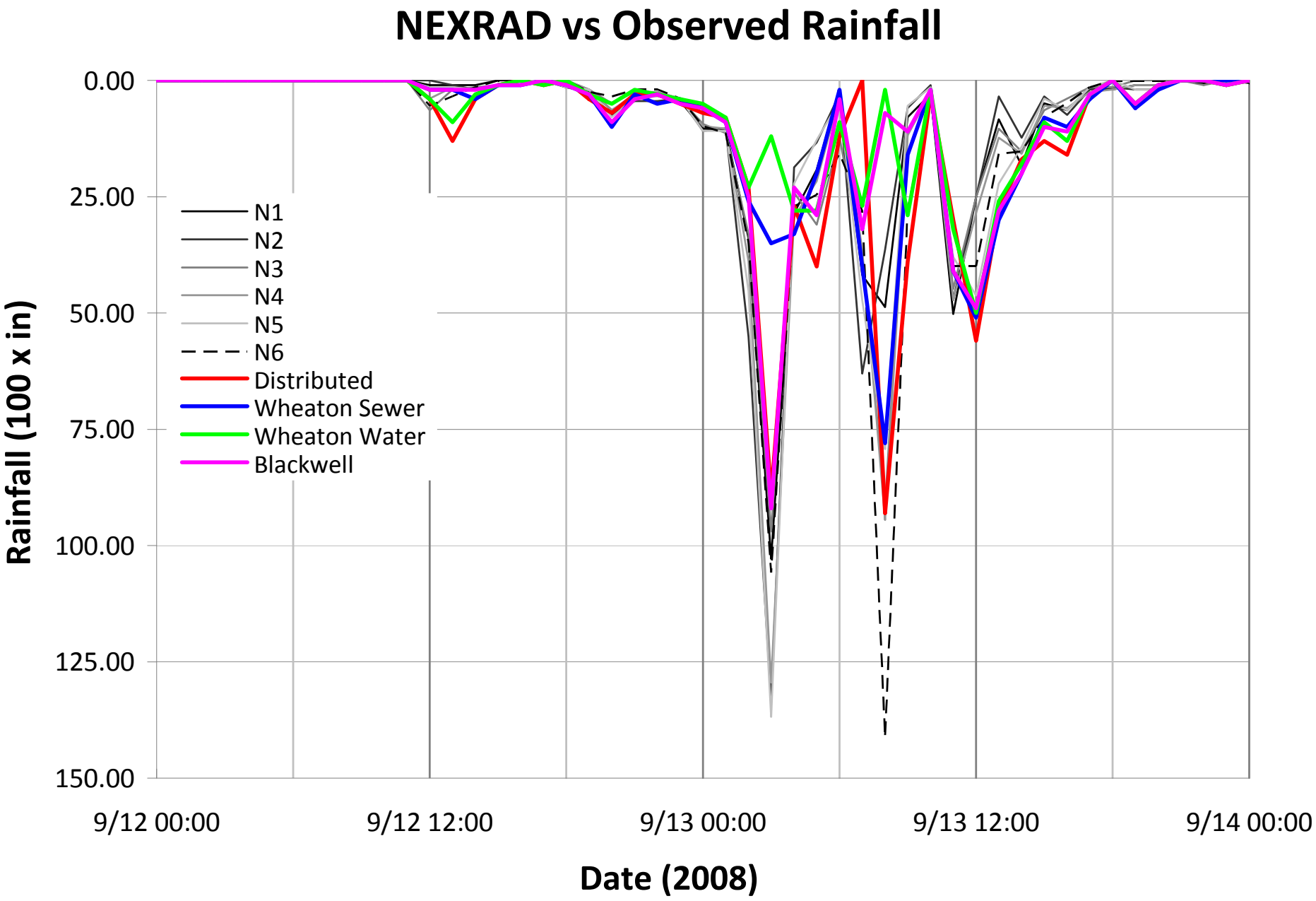

Carol Stream
7.89 in
0
1
2
Miles
City of Wheaton - 1
7.03 in
N6
6.99 in
N3
6.19 in
N4
6.63 in
Kress Creek@ Joliet St.
6.79 in
7.08 in
N7
6.77 in
N5
6.63 in
6.69 in
7.08 in
6.79 in
Morton Arboretum - NOAA
6.57 in
N1
5.82 in
N2
6.21 in
City of Naperville(N Op.)
5.99 in



September 12-14, 2008 NEXRAD animation

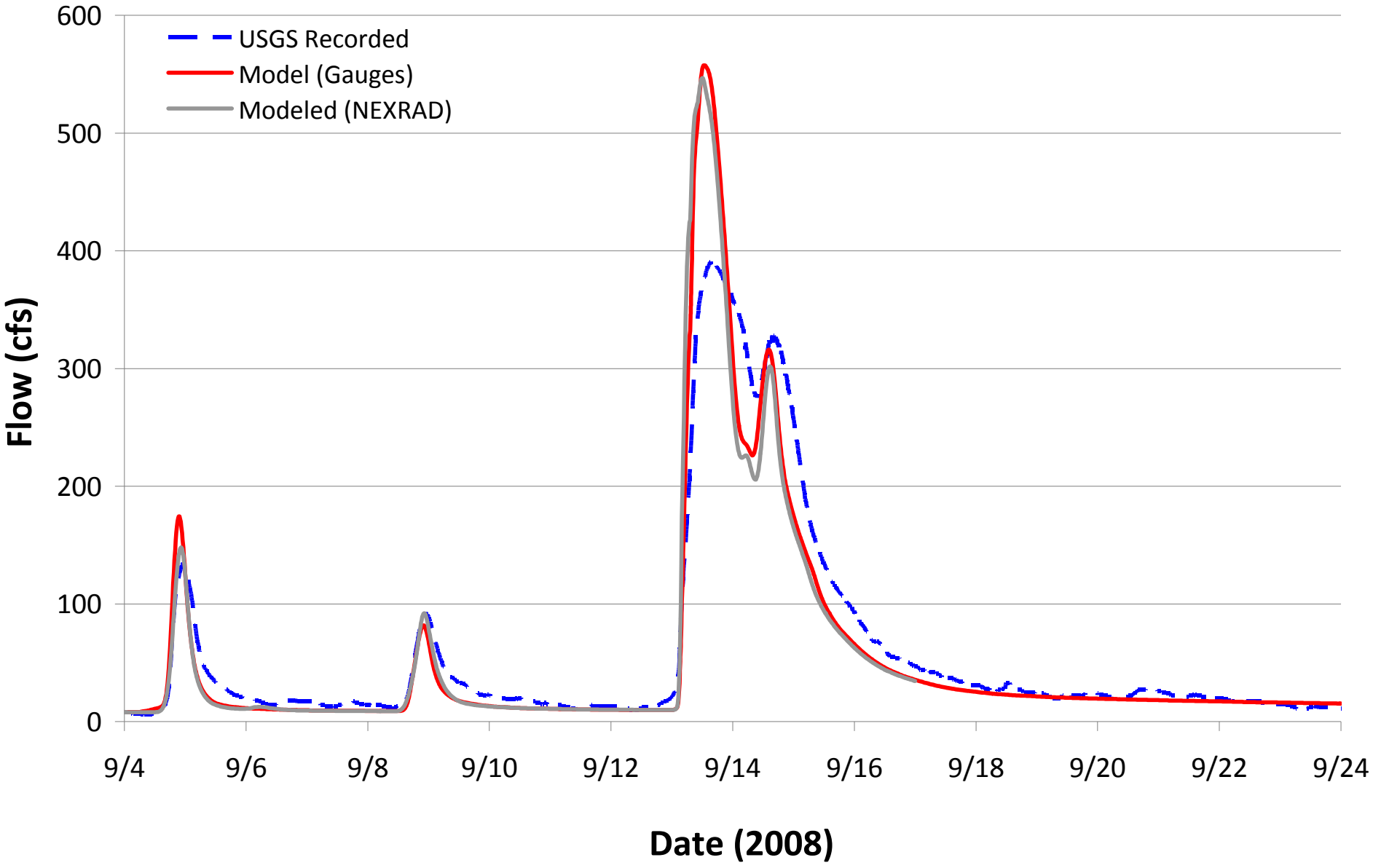
- **Narrow band on the 12th and 13th**
- **Wide band on the 14th**
- **Simple but effective way to show storm characteristics**


NEXRAD Rainfall
0.00
25.00
50.00
75.00
100.00
125.00
150.00
Rainfall (100 x in)
N1
N2
N3
N4
N5
N6
9/12 00:00
9/12 12:00
9/13 00:00
9/13 12:00
9/14 00:00
Date (2008)


NEXRAD vs Observed Rainfall
0.00
25.00
50.00
75.00
100.00
125.00
150.00
Rainfall (100 x in)
N1
N2
N3
N4
N5
N6
Distributed
Wheaton Sewer
Wheaton Water
Blackwell
9/12 00:00
9/12 12:00
9/13 00:00
9/13 12:00
9/14 00:00
Date (2008)

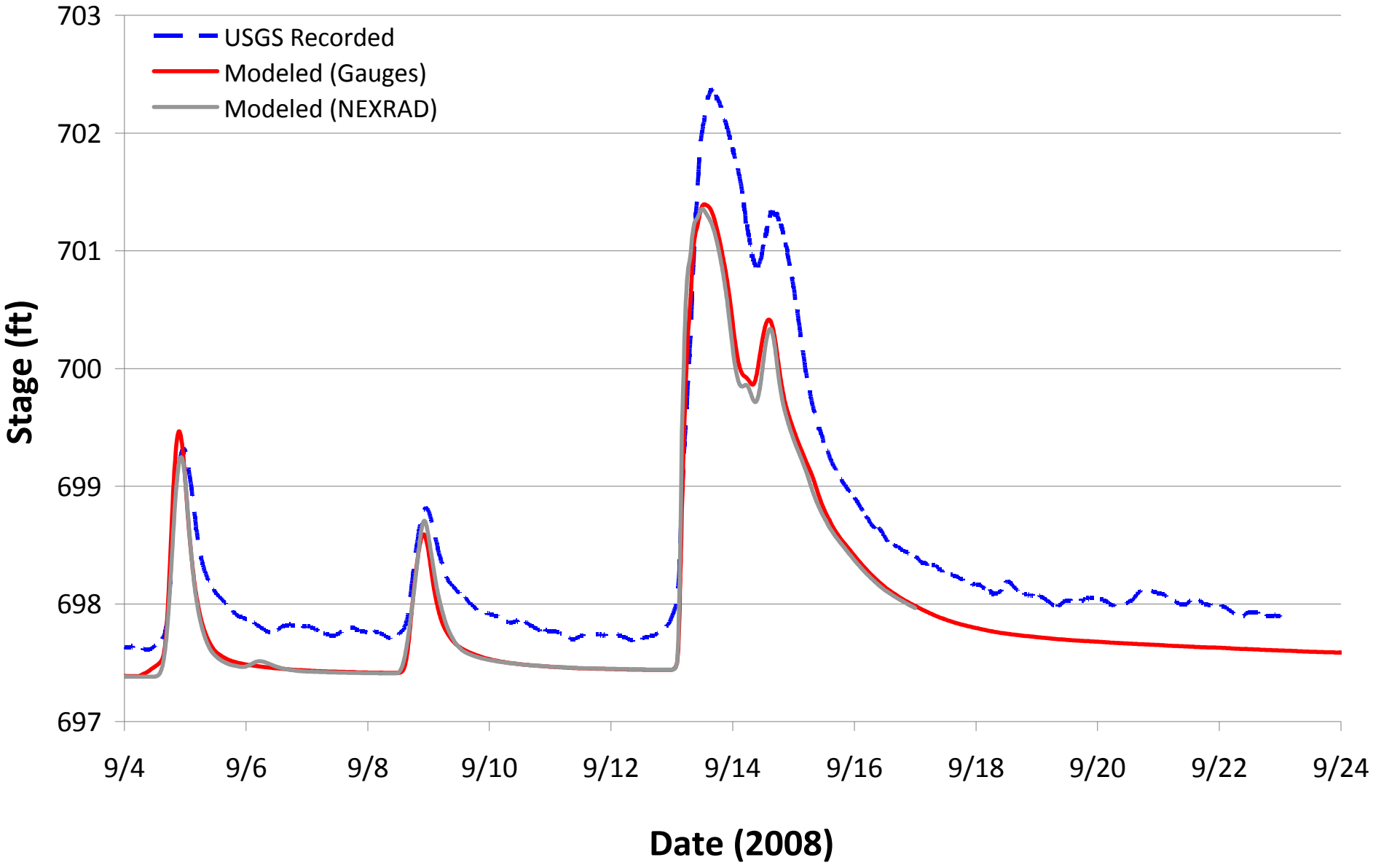
Modeled vs Observed Flow

West Branch Spring Brook at Blackwell Trail Bridge



Modeled vs Observed Stage

West Branch Spring Brook at Blackwell Trail Bridge



Using NEXRAD Rainfall Data for Model Calibration in DuPage County

- Using NEXRAD rainfall data produced similar results and
- Required less effort than using traditional gage data

However…

- Rainfall was fairly consistent throughout watershed
- Only considered One Storm, One Watershed

Thanks!

Questions?