

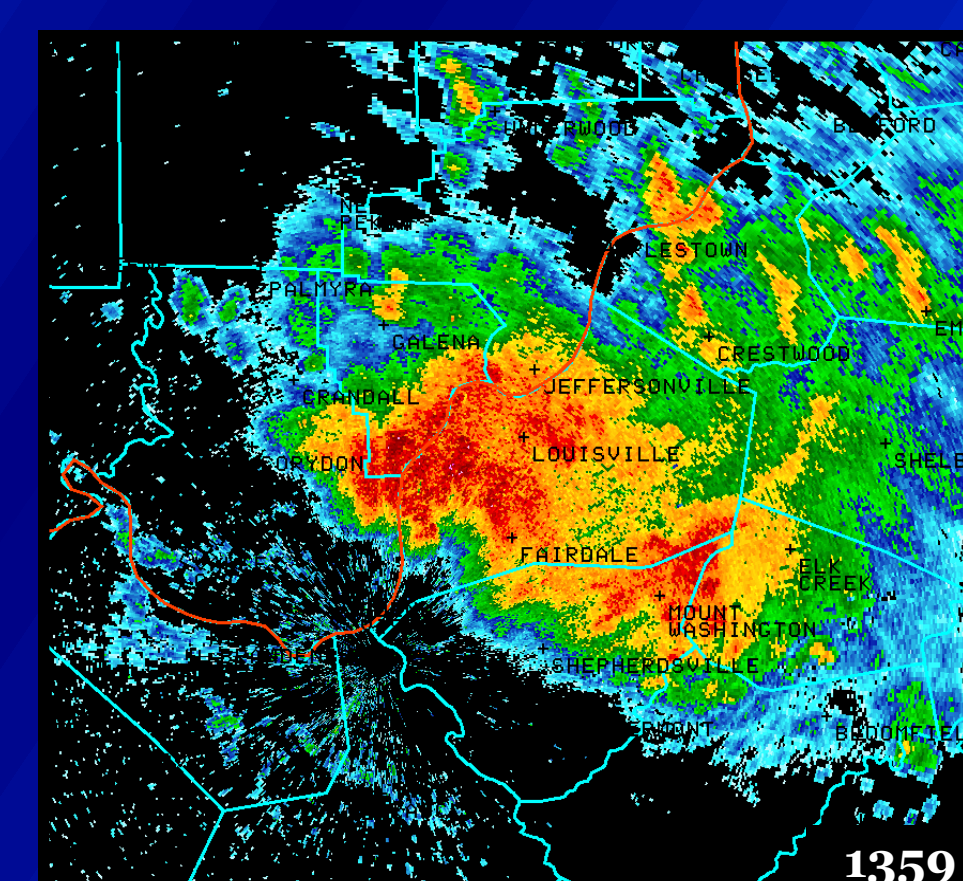
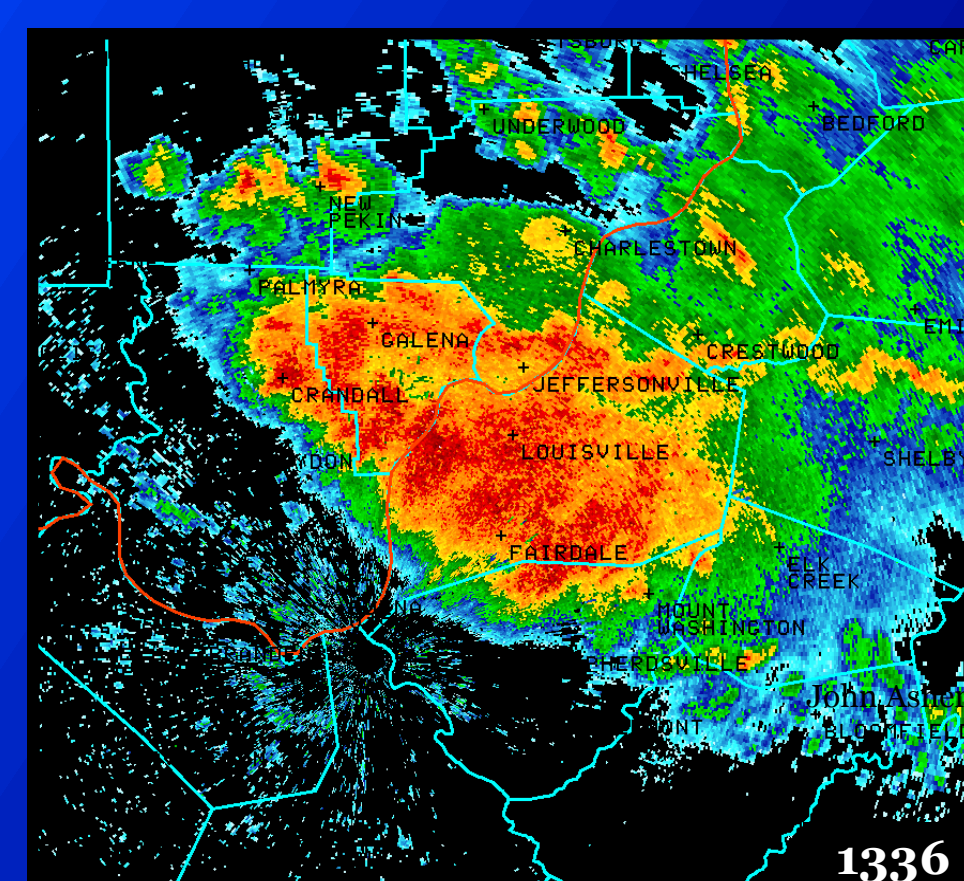
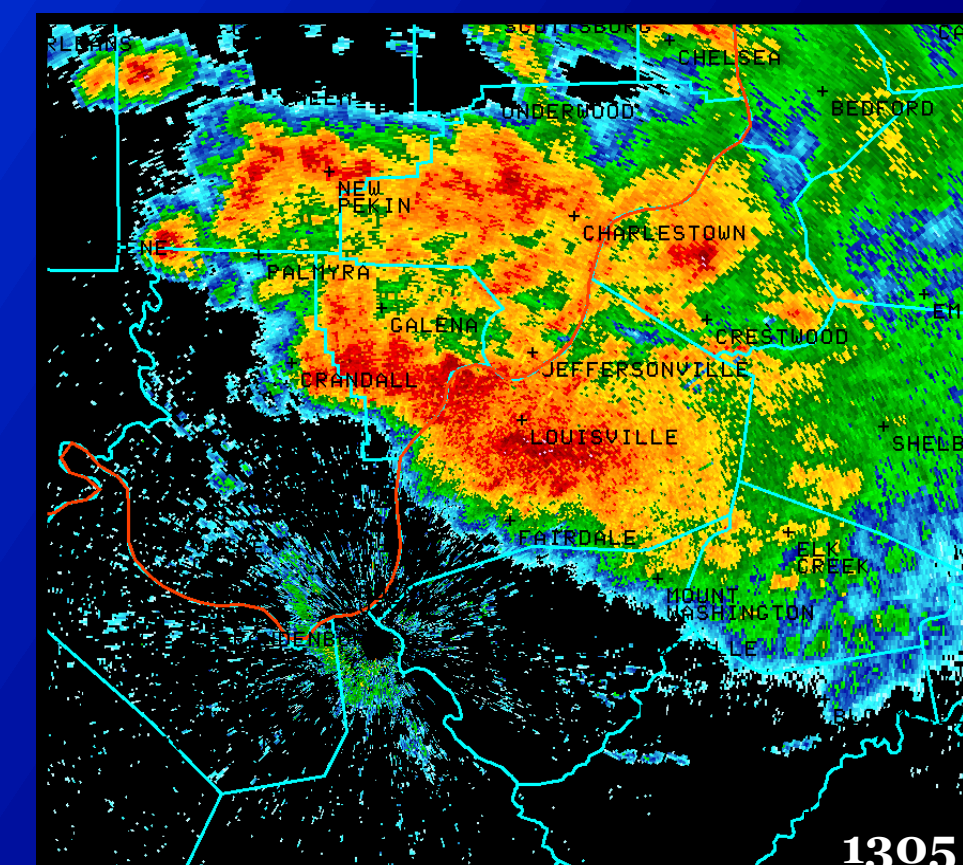
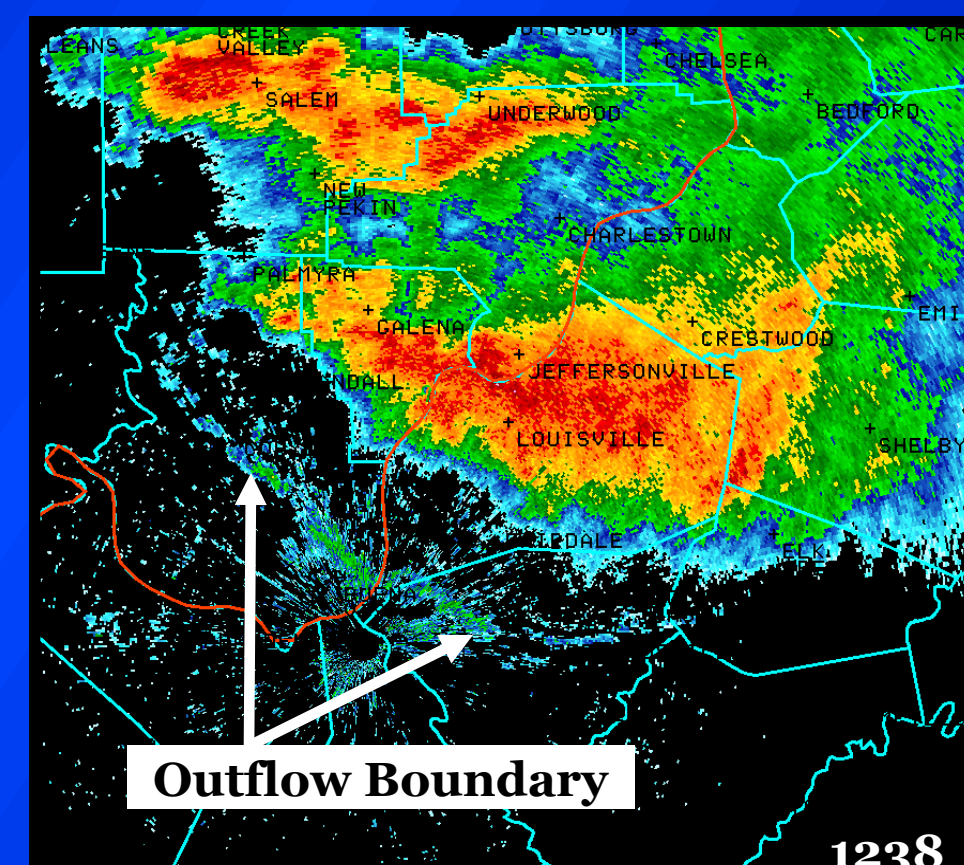
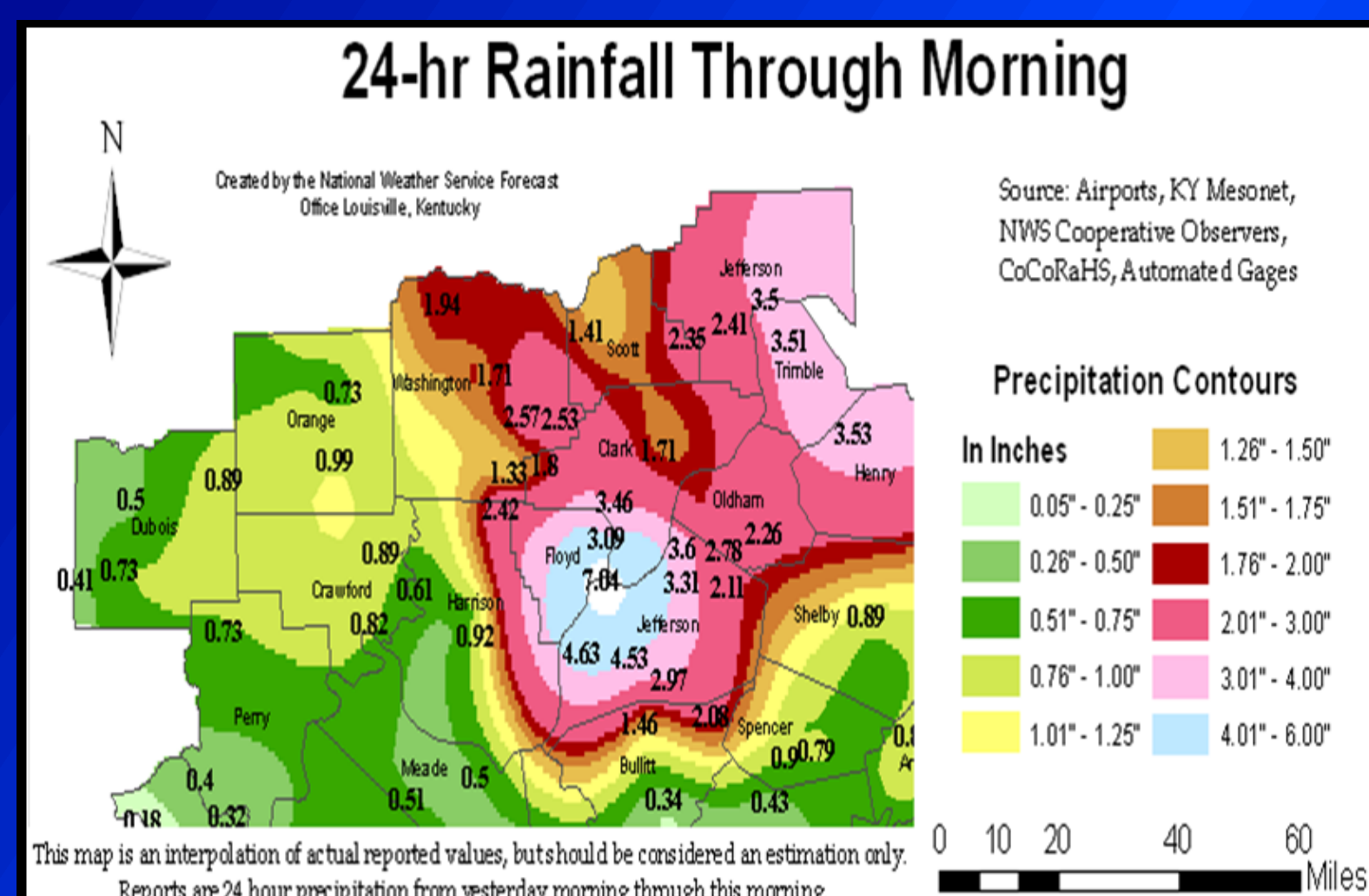
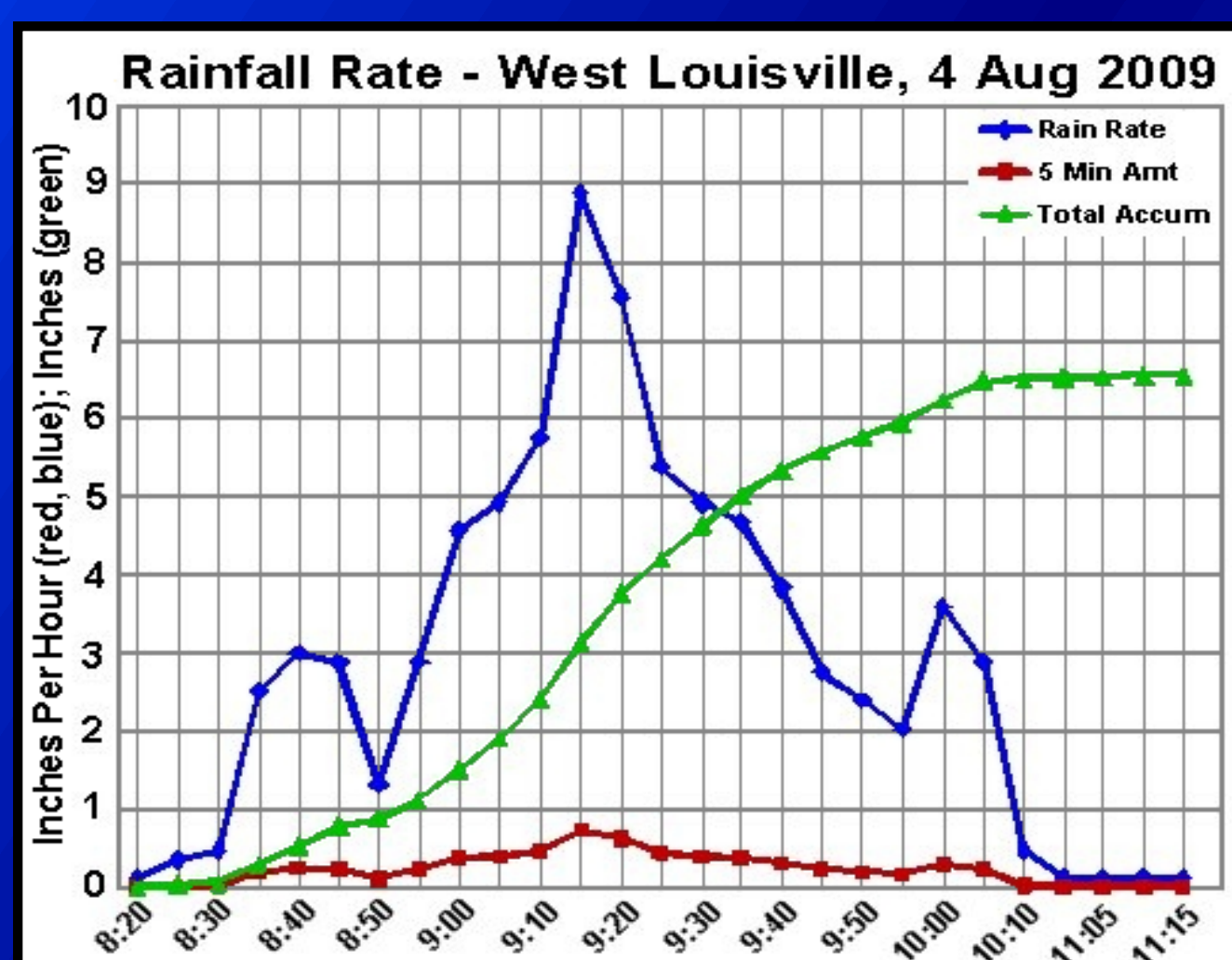
RISING WATERS

Louisville, Kentucky Flash Flood

August 4, 2009

The Science

On the morning of August 4, 2009, very high atmospheric moisture content (precipitable water values over 2 inches), strong instability, 25 kt westerly inflow at 850 mb, and northwest flow at 500 mb combined to produce optimal conditions for very heavy rain in the Ohio Valley. A high precipitation (HP) supercell formed in Indiana and moved south into Louisville. Once over the city, the storm slowed as new cells regenerated rapidly along its own outflow boundary, creating a seemingly unmoving storm complex. Over 7 inches of rain fell in just 2 to 3 hours, with rainfall rates up to 8.8 inches per hour! This caused historic flash flooding, prompting the National Weather Service in Louisville to issue its first ever Flash Flood Emergency.



NWS Louisville Doppler radar from 1238 to 1359 UTC. Regenerative cells are evident on the storm's northwest side, producing the effect of a stalled storm complex.

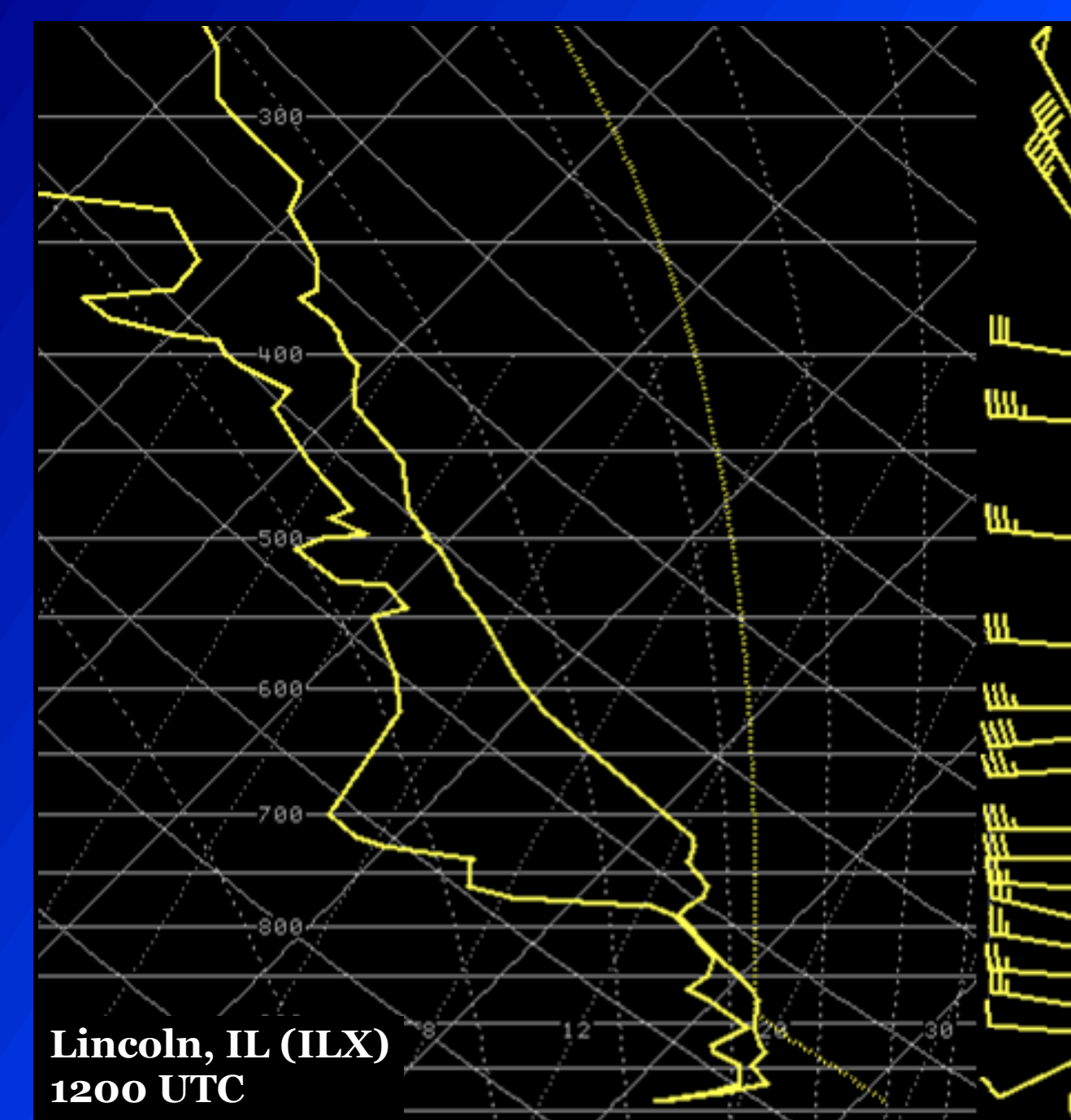
The graph at left highlights the unbelievable rainfall rates this storm produced: 8.8" per hour during the most intense period. The total rainfall map shows the west end of the city receiving an unprecedented 7.04" during the event.

The Impacts

- Largest flash flood event in Louisville's history
- 200 people rescued from the tops of submerged cars and houses
- 50 people rescued by boat at the University of Louisville
- About 20 University of Louisville building flooded
- Major flooding at Churchill Downs Racetrack
- Thousands of books destroyed at the Louisville Public Library
- \$5.5 million in damage
- Interstates 65 and 264 closed impacting travel and commerce

"This is the worst flooding the University of Louisville has ever seen in anyone's memory."

-Mark Hebert, Director of Media Relations, University of Louisville



Synoptic environment was characterized by strong instability (steep mid-level lapse rates), deep moisture, and west-northwest flow aloft.



Eastern Parkway and 3rd Street intersection during and after the flood. The clearance under the bridge is 11'8". Below is another bridge on East Brandeis Avenue with a clearance of 15'8".



Historic Churchill Downs Racetrack with flooding in the paddock (left) and front entrance (right).

"This is enjoyable. How often do I get to sail down my street in Old Louisville?"

-Britt Singer, in an inflatable boat by the University of Louisville



Jenna M. Mackin, Geoffrey L. Segó, and Timothy E. Dowling
University of Louisville, Louisville, Kentucky

