

# NWS – WFO Input: Urban Flooding in the U.S.

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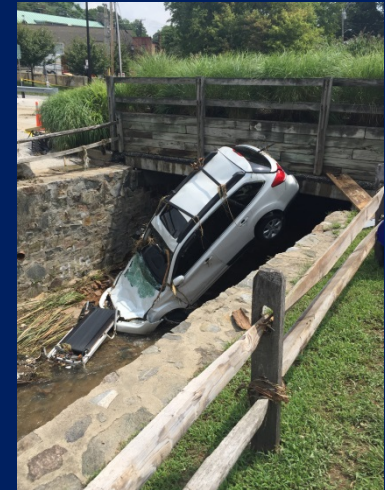
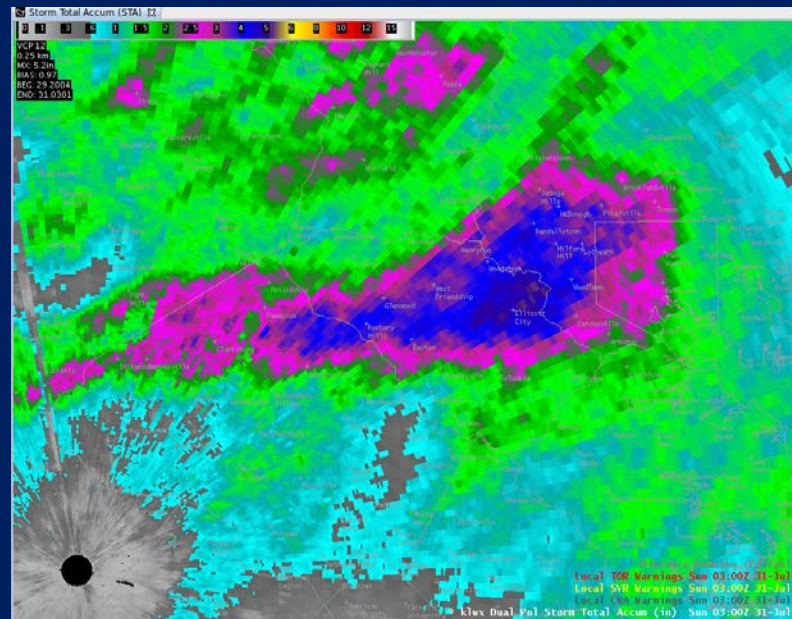
***NAS Meeting: Urban Flooding in the United States  
February 6, 2017  
Washington, DC***





# Questions to Address

- ▶ Brief overview on an urban flood event
  - Ellicott City, MD, 30 July 2016
- ▶ Address committee questions

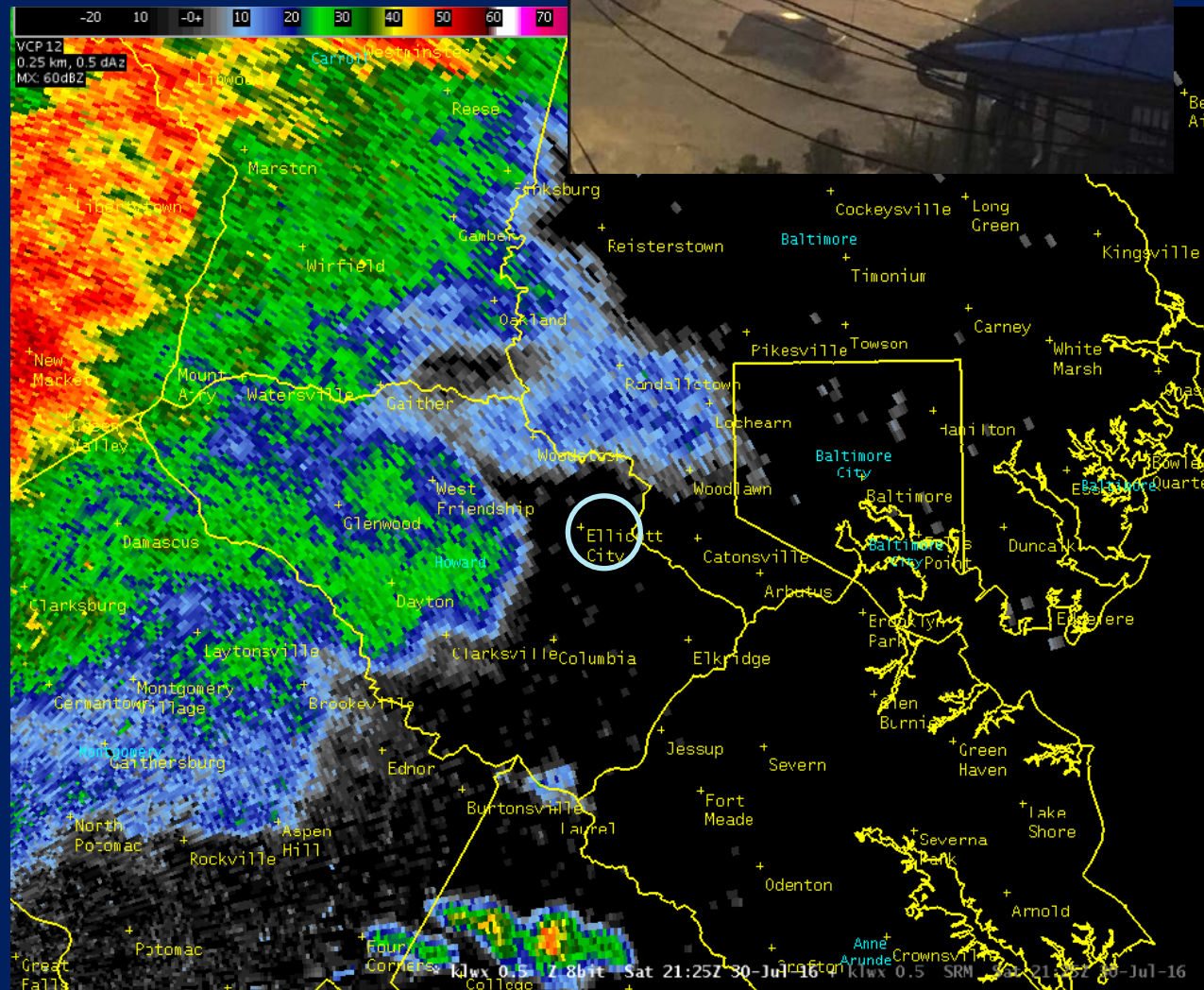




# Overview

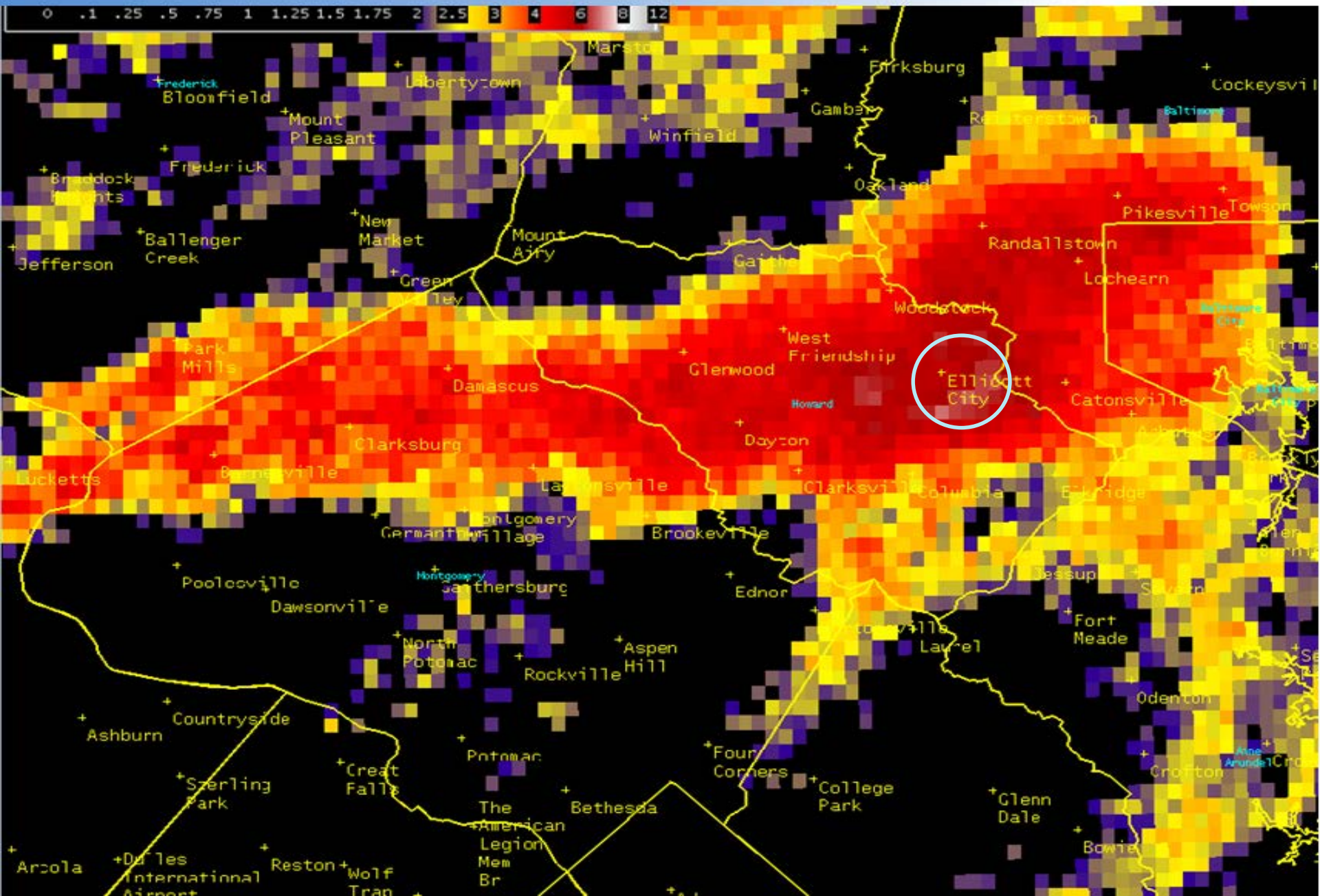
On the evening of July 30, 2016, heavy rain formed into a persistent band affecting a small multi-county area in central Maryland.

*KLWX Radar loop from 2125 UTC 30 July to 0102 UTC 31 July*





# Precipitation Estimates – July 30, 2016





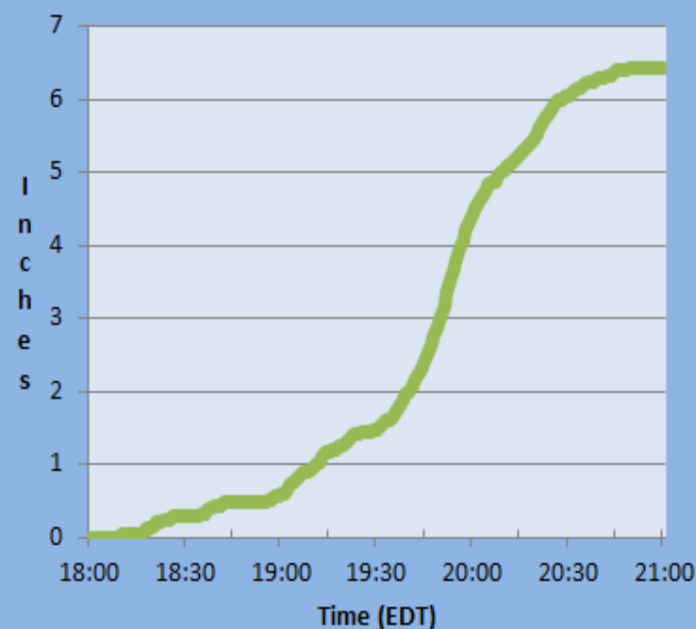
# Extreme Precipitation

## Historic Rainfall in Ellicott City, Maryland – July 30, 2016



Duration	Max Rainfall in Duration	Time of Occurrence
1 minute	0.20"	7:52pm-7:53pm
5 minutes	0.80"	7:50pm-7:55pm
10 minutes	1.44"	7:50pm-8:00pm
15 minutes	2.04"	7:46pm-8:01pm
20 minutes	2.44"	7:44pm-8:04pm
30 minutes	3.20"	7:36pm-8:06pm
60 minutes	4.56"	7:30pm-8:30pm
90 minutes	5.48"	7:00pm-8:30pm
2 hours	5.96"	6:50pm-8:50pm

### Total Rain in Ellicott City (ELYM2)

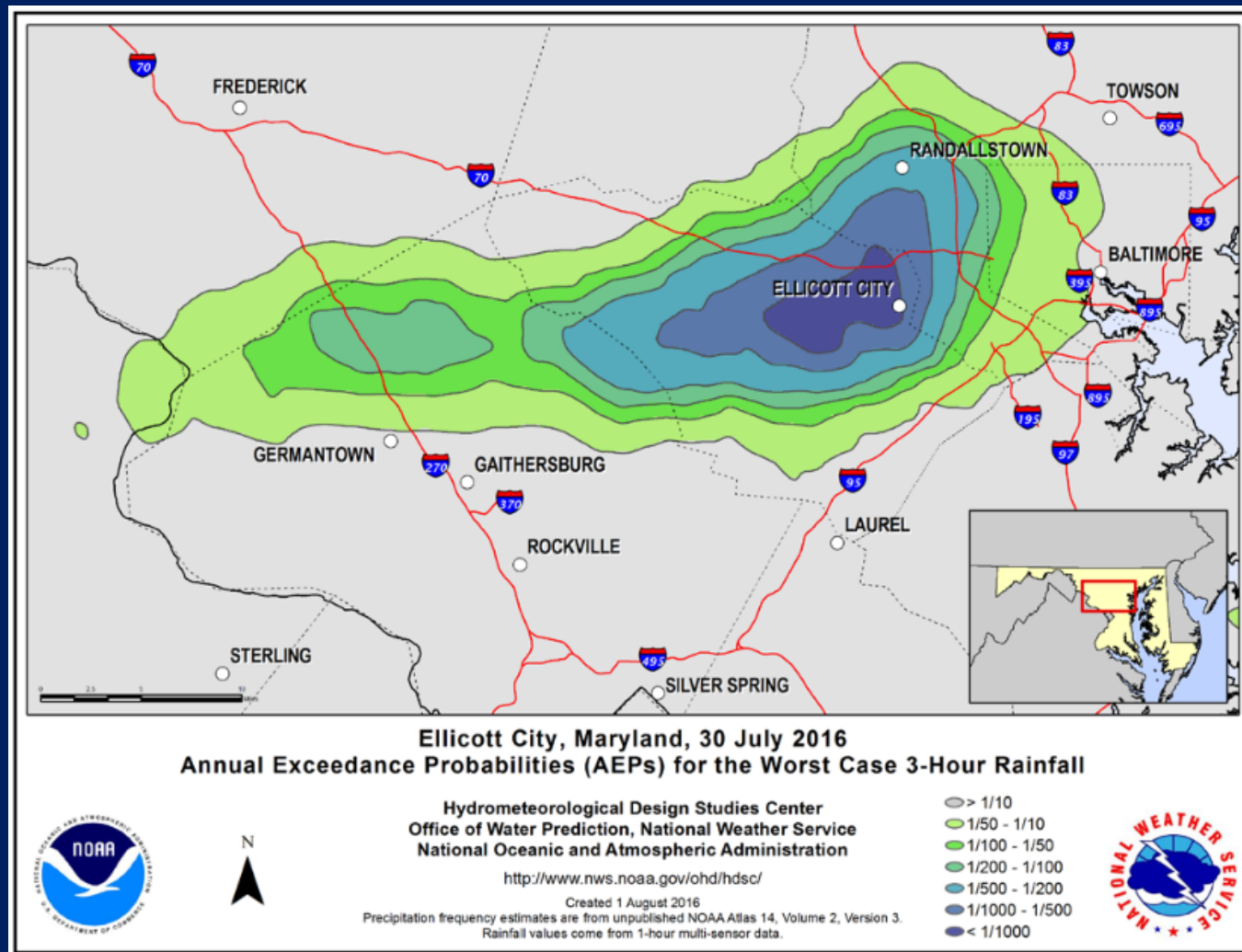


**Storm Total Rainfall: 6.60 inches**

*Information obtained from the Ellicott City (ELYM2) rain gauge.  
This gauge reports in 0.04" increments.*



# Precipitation Annual Exceedance



[http://www.nws.noaa.gov/ohd/hdsc/aep\\_storm\\_analysis/](http://www.nws.noaa.gov/ohd/hdsc/aep_storm_analysis/)



# Questions to address

- ▶ 1) How do/can federal agencies work together on urban flooding issues? How do federal agencies work at local level on urban flooding?
  - NWS (WFOs/RFCs), USGS, Army CoE, FEMA; others, are involved in the "Silver Jackets" program
    - looks at interagency needs involving flood risks
    - Meets regularly
    - In nearly every state (and DC)





# Questions to address

- ▶ 2) What do agencies consider common problems and shared solutions related to urban flooding?
  - identifying flood risk areas before flooding occurs
    - FEMA flood maps starts that process, but don't identify every locale that could be at risk of flooding





# Questions to address

- ▶ 3) What do agencies see as gaps among what we know, what we communicate, and policies/actions that are in place?
  - uncertainty in forecasting heavy rainfall that causes flood/flash flooding and the ability to communicate that uncertainty to other agencies and the public
  - taking the Ellicott City rainfall pattern/area as an example, move that same area over a different urban area; what are the impacts of similar rainfall patterns on the urban area?
    - need better modeling studies of heavy rainfall over different areas.





# Questions to address

- ▶ 4) What advice do you have for this committee as it starts its study on urban flooding in the United States?
- ▶ There'll not be a "one size fits all" solution; as the variety of urban areas is tremendous
- ▶ Small scale meteorological and geomorphological variations drive what ultimately happens in flooding





# Contact

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**<http://www.weather.gov/baltimore/EllicottCityFlood2016>**



**National Weather Service Baltimore/Washington**

