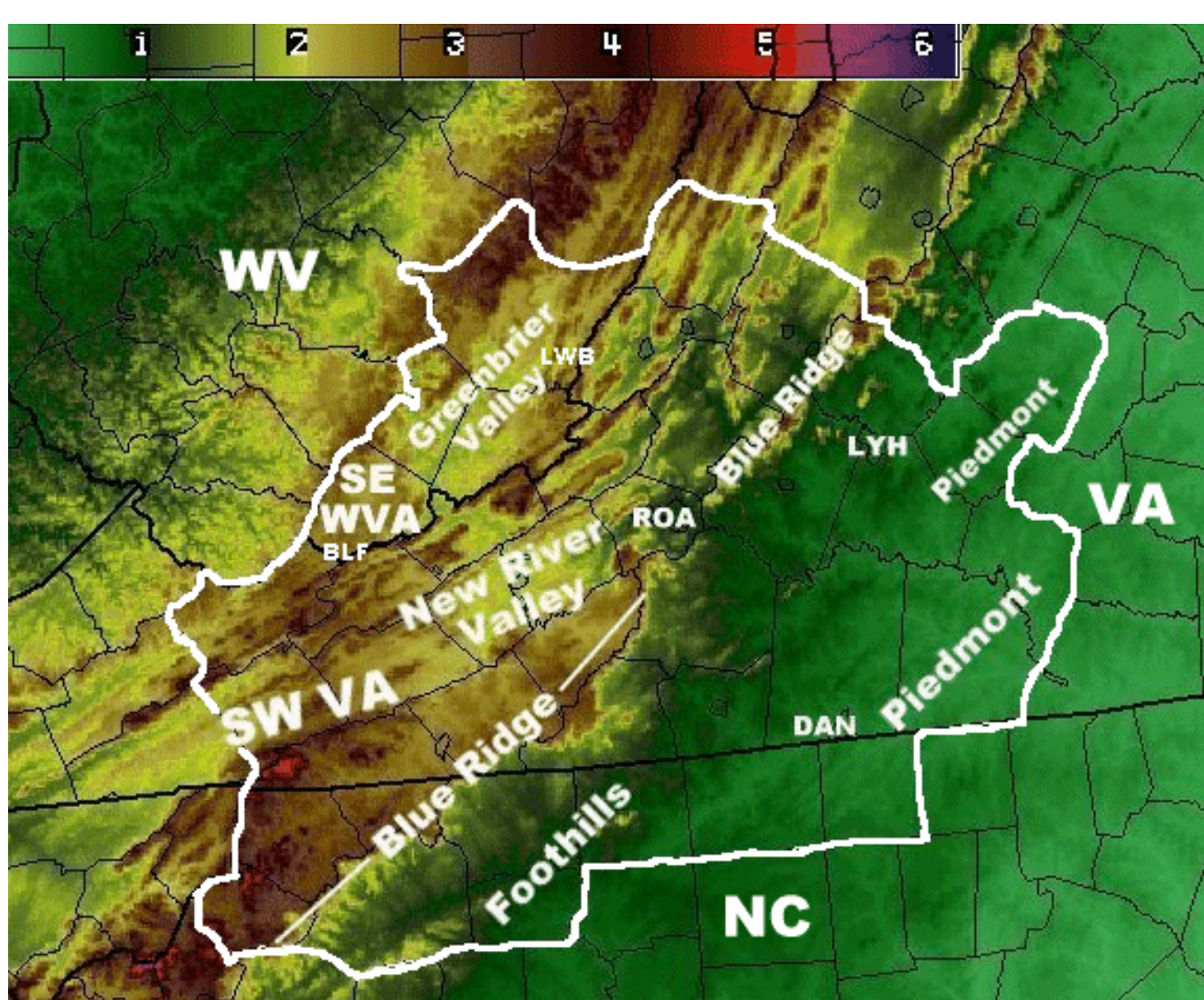


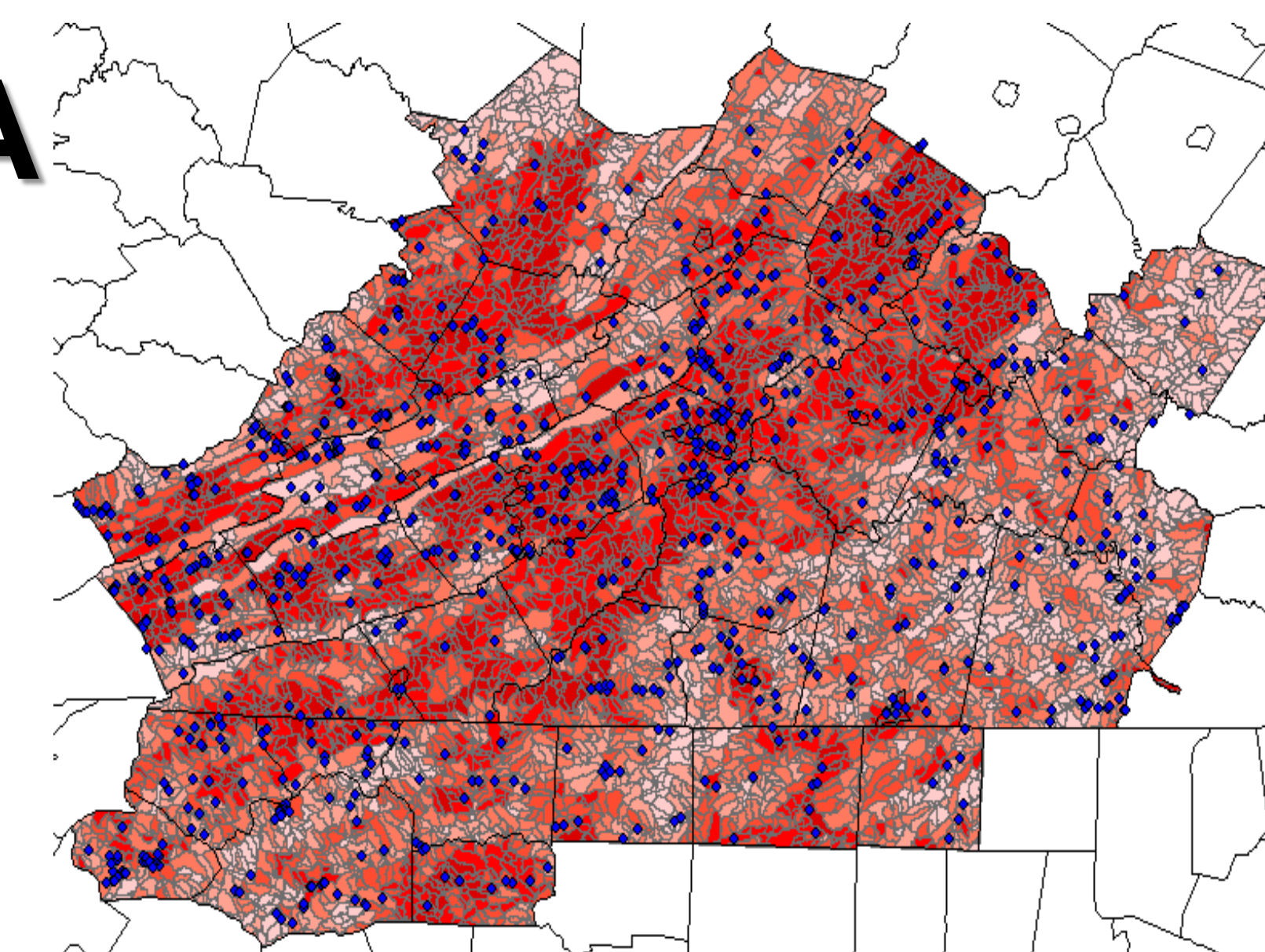
AN ABBREVIATED FLASH FLOOD CLIMATOLOGY (1994-2007) FOR THE WFO BLACKSBURG, VIRGINIA COUNTY WARNING AREA

Robert Stonefield and Jan Jackson
National Weather Service Forecast Office
Blacksburg, Virginia

<http://www.werh.noaa.gov/SSD/erps/tm/tm104.pdf>



NWS Blacksburg County Warning Area



Experimental "Flash Flood Potential Index" (FFPI) with local historical flash flood reports.

Introduction:

Fourteen years of flash flood (766) events from 1994 to 2007 for the WFO Blacksburg County Warning Area (CWA) were studied. The purpose of the study is to provide forecasters with an improved understanding of the frequency, severity and geographical distribution of seasonal and diurnal flash flood events across the CWA.

Geography:

- Warning responsibility for 40 counties across SE WV, SW VA, and NW NC.
- Elevation increases from less than 500 ft (Piedmont), to 3200-5000 ft in mountainous terrain of the Blue Ridge and Appalachians.
- CWA is comprised of mainly rural farmland or is heavily forested with only a few moderately populated cities.

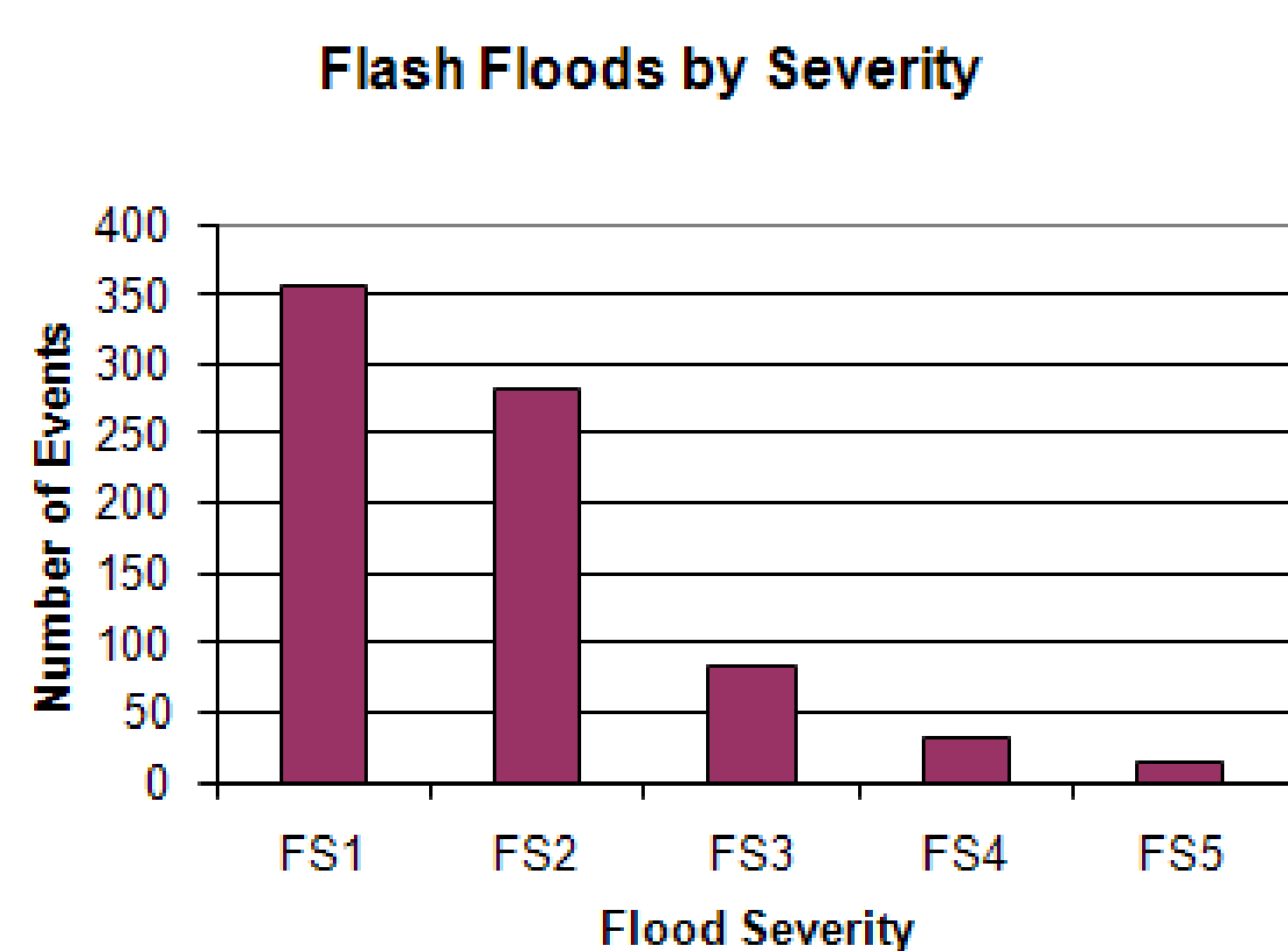
Data:

- Data collected from Local Storm Data publications and the National Climatic Data Center (NCDC) Storm Events database.
- A flood severity scale was developed to help distinguish significant flash floods from all others.

Flood severity	Flood category	Description
FS1	Nuisance	Few road closures, creeks/streams out of their banks. (Little or no damage)
FS2	Minor	Numerous road closures and creeks/streams flooding, basement flooding, mudslides (Light Damage <\$100K)
FS3	Moderate	Some rescues, evacuations, few houses/businesses flooded. (Considerable damage \$100K-<\$500K).
FS4	Severe	High Threat to Life/Property, several rescues, evacuation. Damage to several homes/businesses (Major Damage \$500K-<\$2M).
FS5	Catastrophic	Very High Threat to Life/Property, numerous rescues, evacuations and/or damage to homes/businesses, (Catastrophic Damage ≥\$2M).

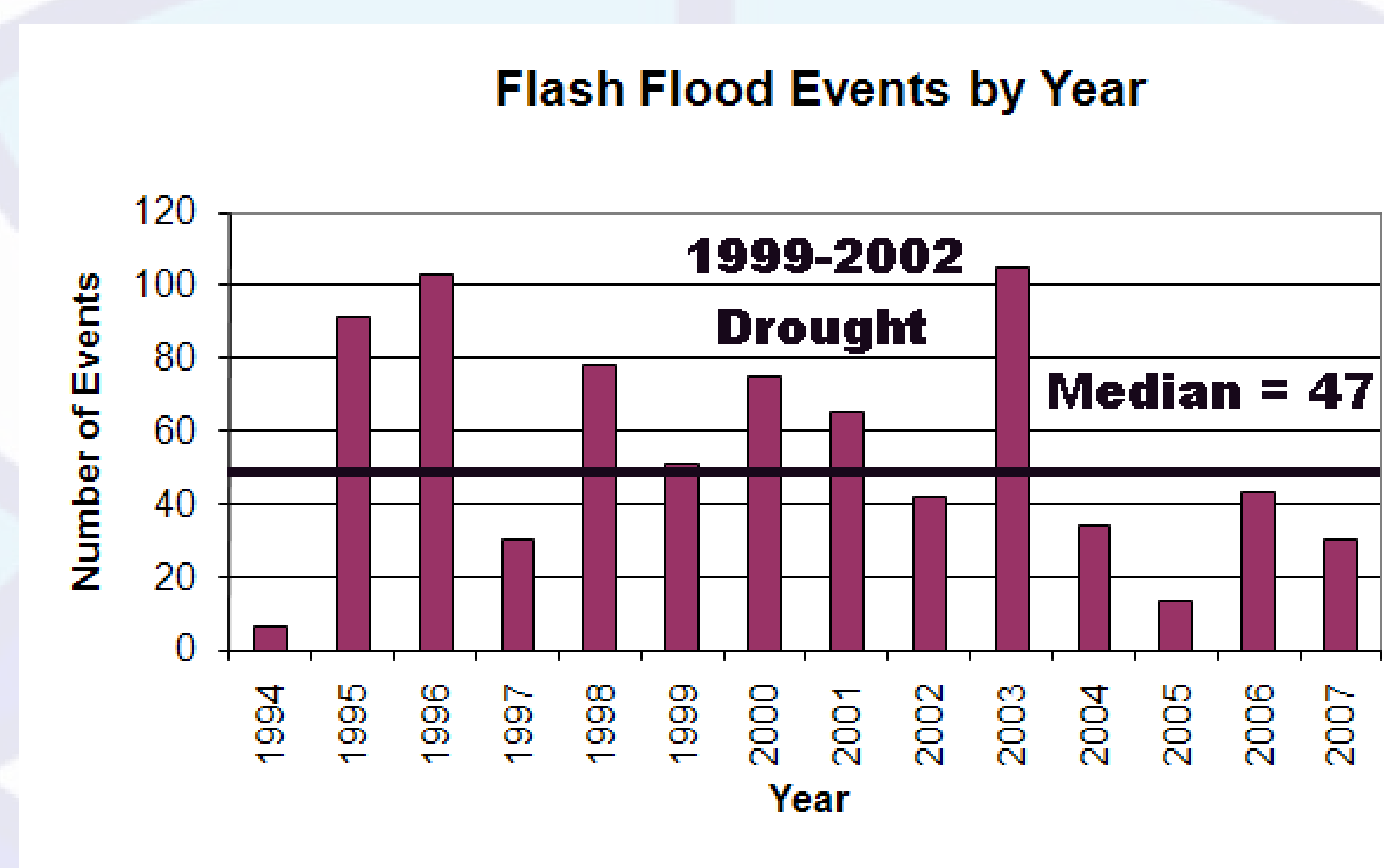
Magnitude:

- 17% of all flash floods were significant events (FS≥3).



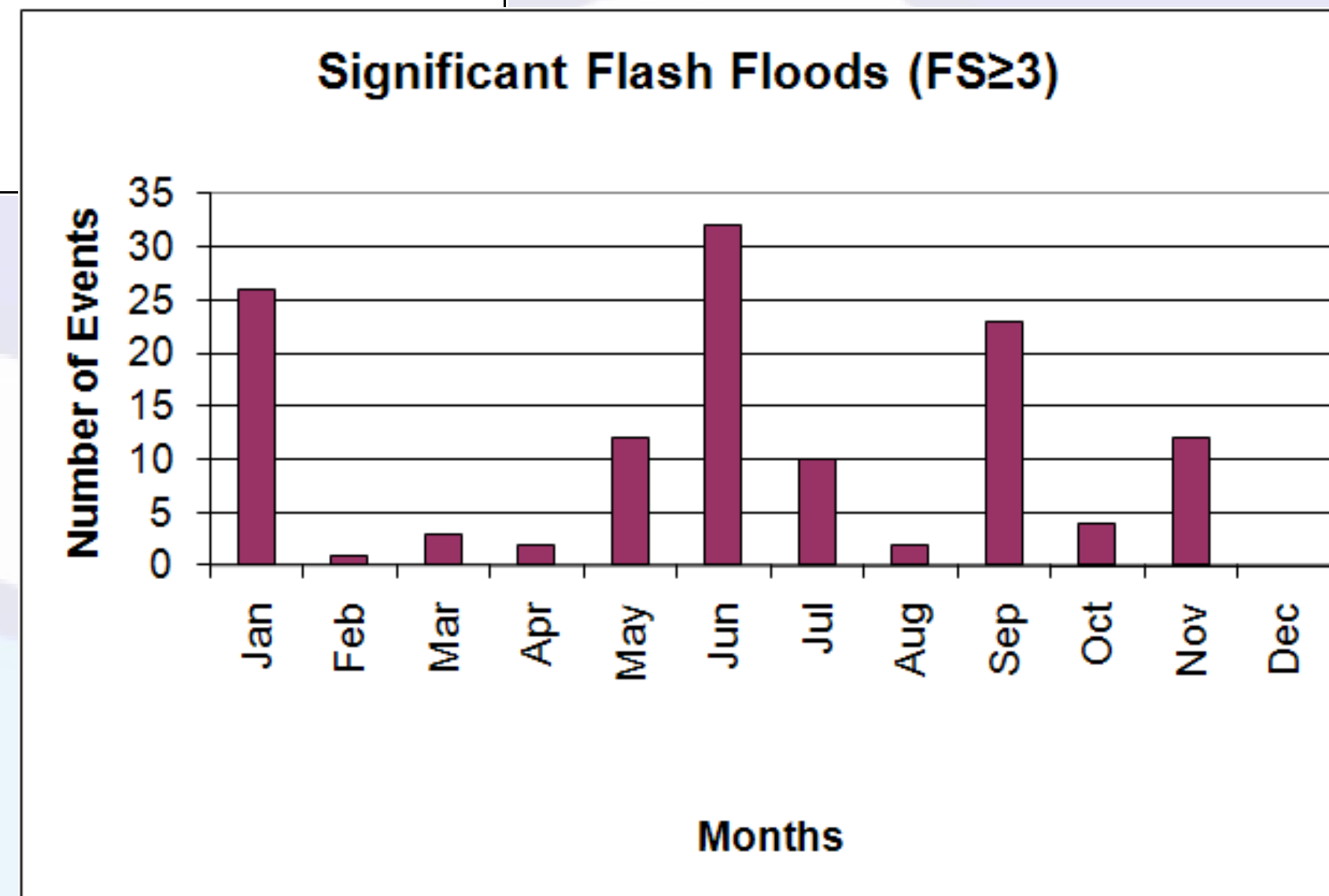
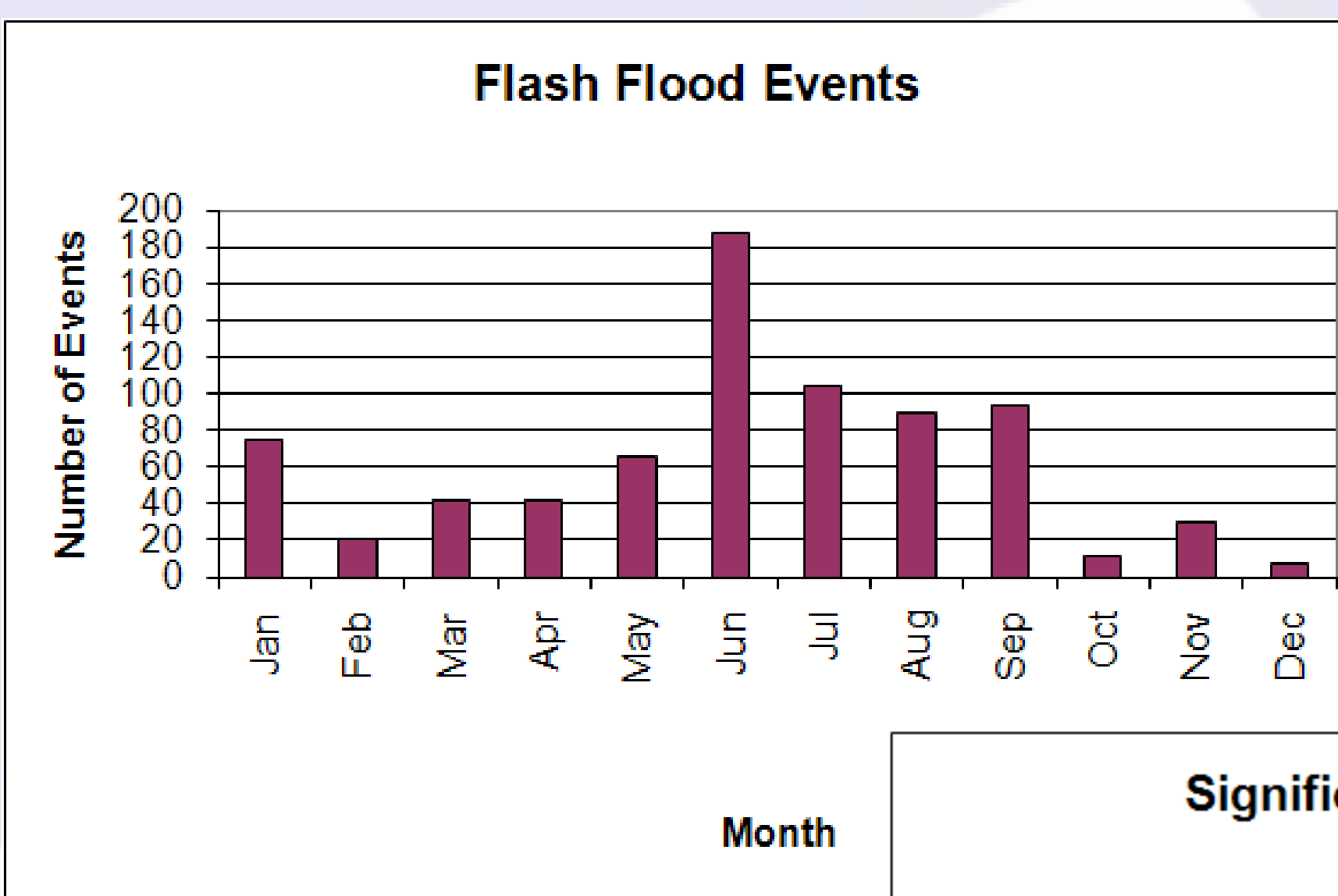
Annual Frequency:

- Flash flooding in the 1999-2002 drought was above the 14 year median.
- Tropical storms or remnants caused flash flooding in 6 of the 14 years.



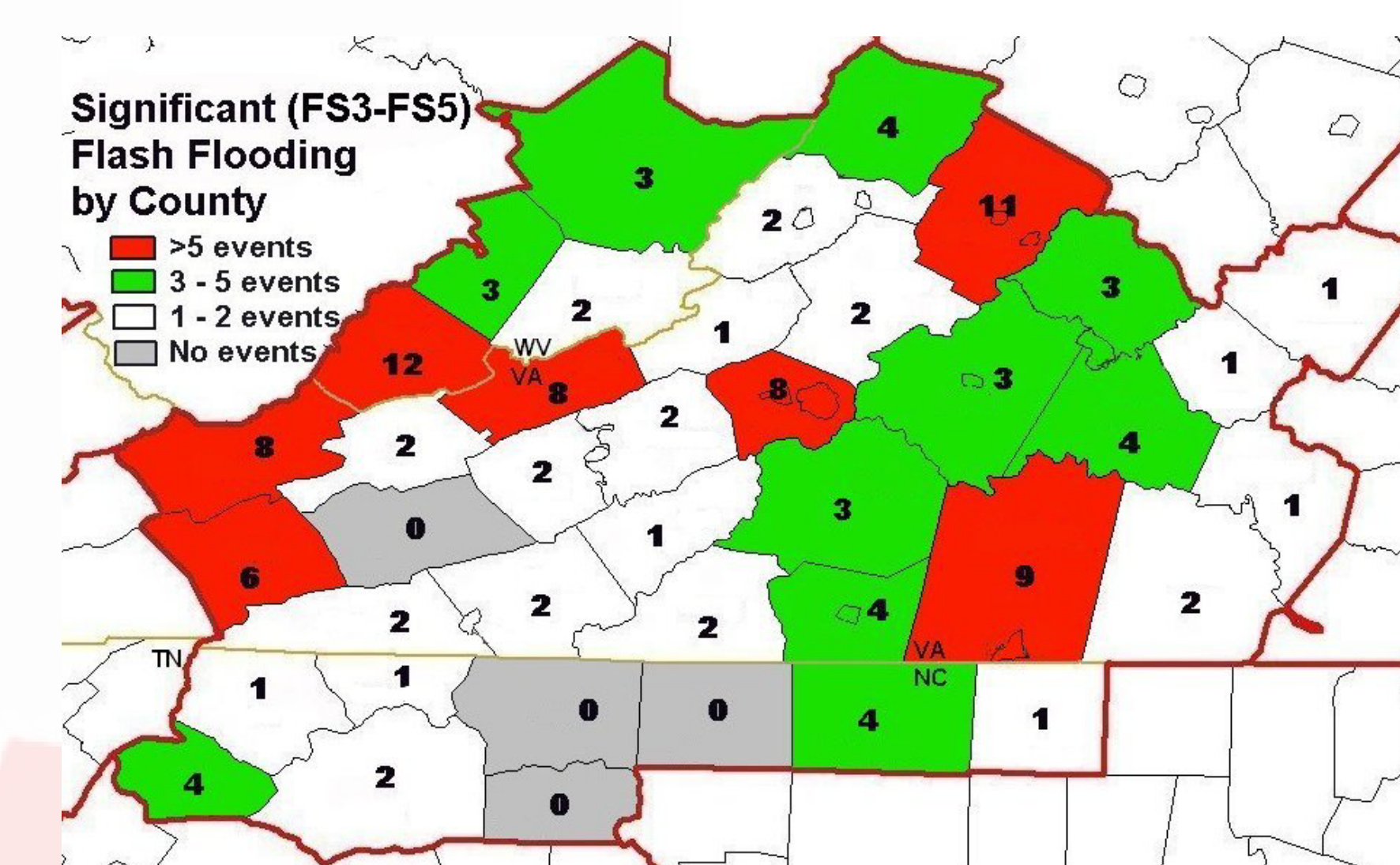
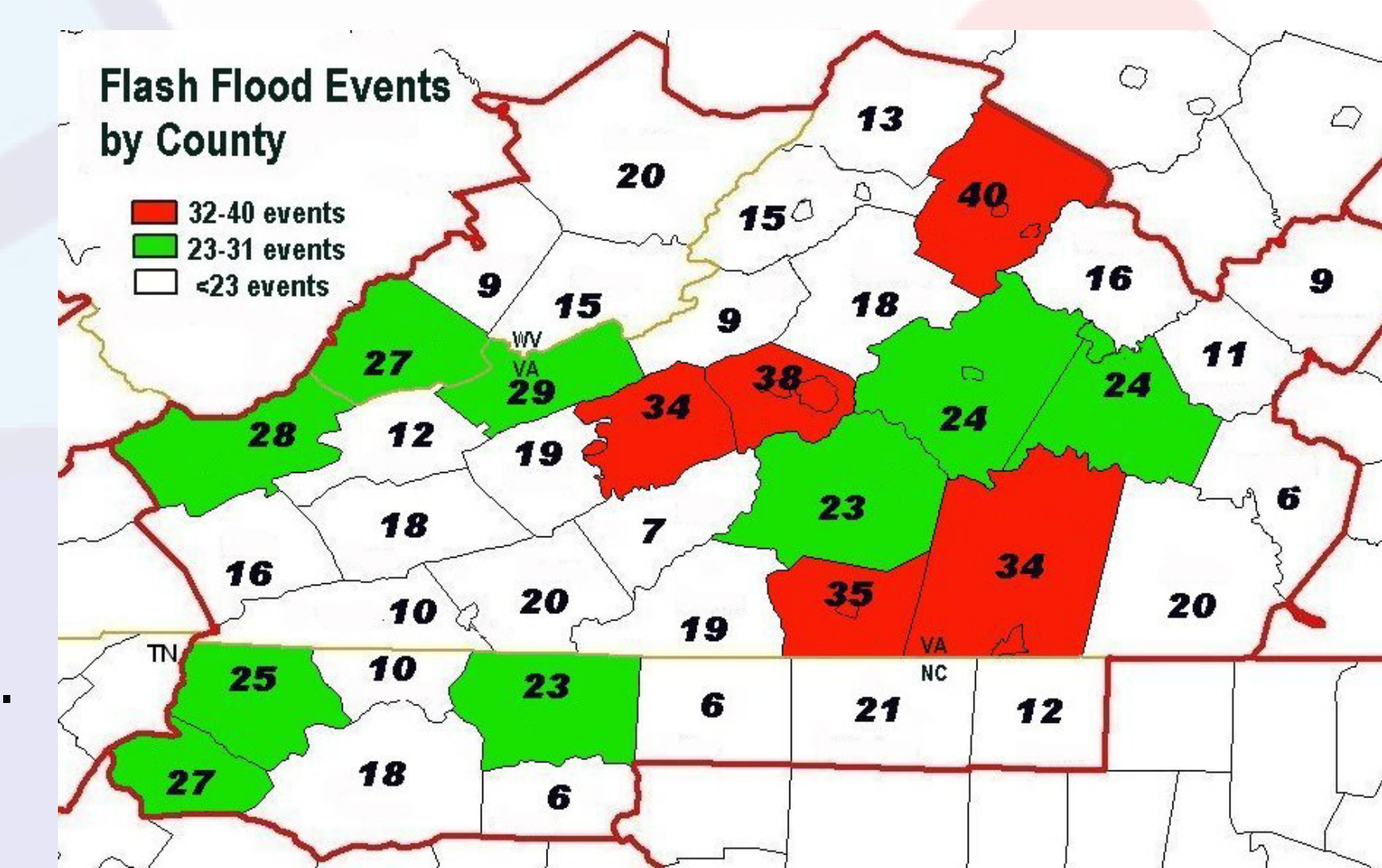
Monthly Frequency:

- The peak is June with elevated numbers from July through September.
- The cool season peak is January.
- Significant flash flooding in January was influenced by synoptic scale storms.
- Significant flash floods (FS≥3) in Sept. were influenced by tropical systems.



County Distribution:

- Flash floods have occurred in all 40 counties.
- Urban land use is the main factor that contributes to flash flooding.
- Topography plays an increased role with significant flash flood events (FS≥3).



Conclusions:

- Flash flooding occurred in each of the 12 months, with a maximum in June, and minimums in October and December.
- June is the peak for significant flash flooding (FS≥3), as it is also the peak for all flash flooding, representing nearly 25% of the total.
- Significant flash flood events occurred in every month of the year except Dec.
- The majority (76%) of significant flash floods occur in multiple county events associated with large scale systems.
- Two significant flash flood zones emerge from large scale systems (see below).

Hourly Distribution:

- Flash flood events occurred at all hours of the day.
- 1/3 of all events occurred between 3p-9p (peak heating/runoff).

