



A Retrospective Look at Two Colorado Flash Floods:
Big Thompson 1976
Front Range 2013



July 31, 1976: Big Thompson flood killed 140 + people.



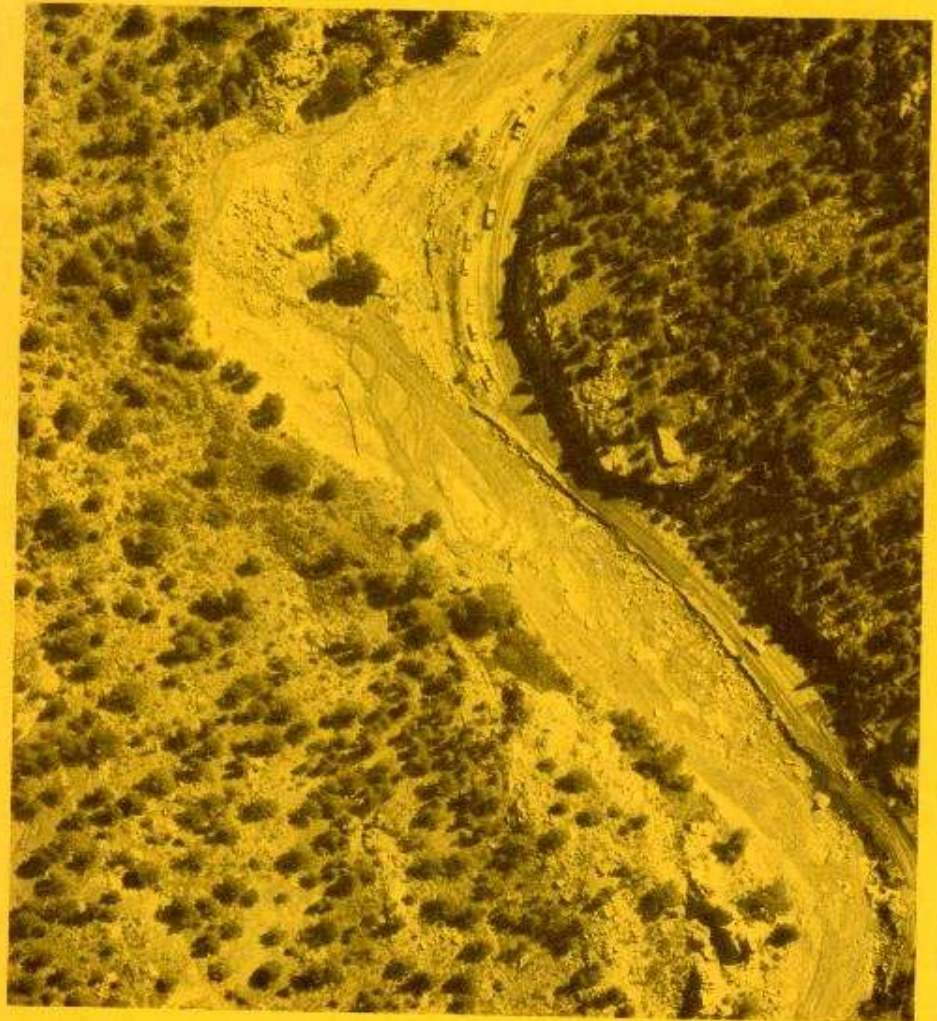
September 11 – 15, 2013: Front Range floods killed 10 people.

Big Thompson Canyon Flash Flood of July 31-August 1, 1976

A REPORT TO THE ADMINISTRATOR



- The Big Thompson, Rapid City and Johnstown flash floods galvanized NOAA.
- The feeling was:
NEVER AGAIN.
- The **NWS Modernization** was initiated to improve weather warnings.



The radar remote system was not working:

Reproduction of the WSR-57 radar's PPI scope presentation, plus operator annotations, are provided to WSFO Denver by means of a facsimile system known as WBRR (Weather Bureau Radar Remote). The WBRR system was not operating on July 31, 1976. This equipment was logged out of operation at 3:30 p.m. on Friday, July 30, and was restored to service at 1:00 p.m. on Sunday, August 1.

No reports of the disaster reached the NWS forecaster until too late.

There were many such potential observers in the Big Thompson Canyon early in the evening of July 31. Numerous eyewitness accounts of downpours and flooding were later reported in newspapers. Not one of these reports reached the forecaster in WSFO Denver in time to refine his warning and reflect the disastrous events in the canyon. Shortly after 8:00 p.m., law enforcement dispatchers had indications of rocks blocking a section of U.S. Highway 34, but this information was not given to WSFO Denver until about 9:30 p.m.

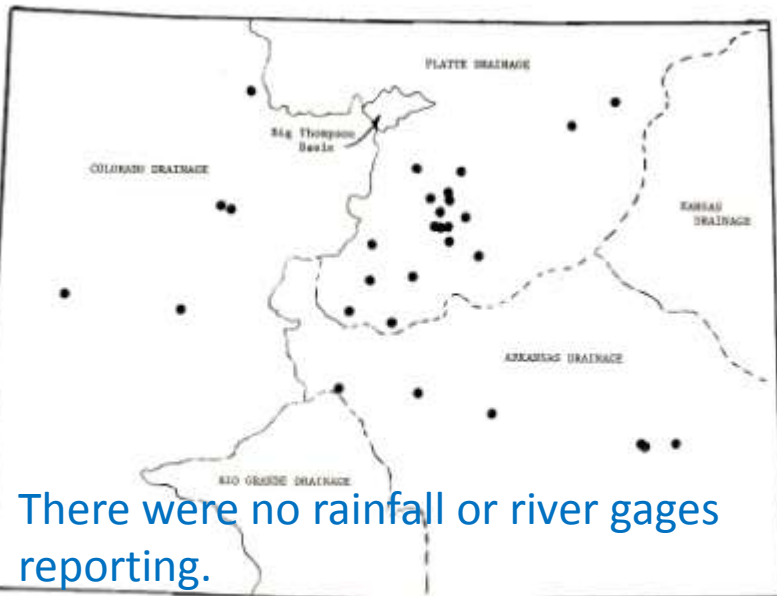


Figure 4. River Stage Reporting Points.

There were no rainfall or river gages reporting.

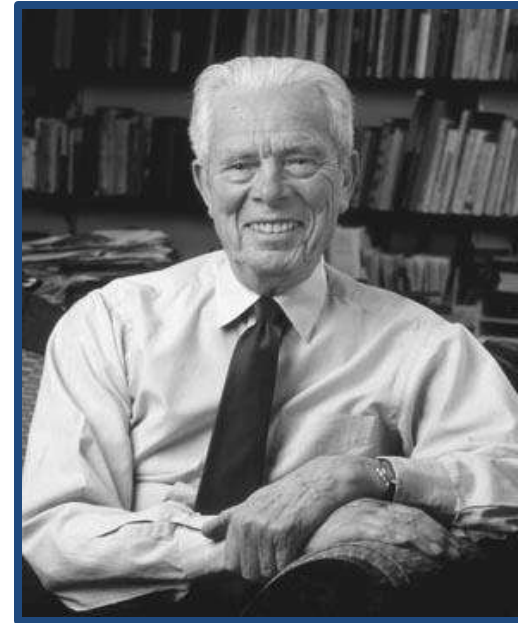
The satellite image location was 15 to 20 miles off.

The post-analysis also revealed a gridding error in those images received at WSFO Denver between 6:00 and 7:00 p.m. This error was within the prescribed accuracy limits and had no impact on events the evening of July 31. However, errors of 15 to 20 miles, if not noticed, could adversely affect determination of storm location or motion, especially where more precise location information is not available from weather radar as it was for the Big Thompson area on July 31.

People who changed the effectiveness of public warnings:



Richard E. Hallgren, NWS Director
Douglas Sargeant – NWS
Joe Friday - NWS



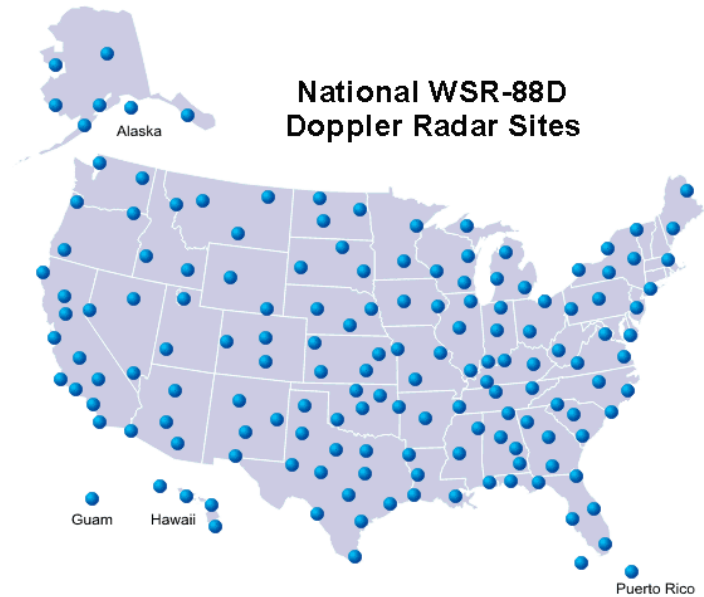
Gilbert F. White, Univ. of Colorado
Donald Beran – NOAA OAR
Gordon Little - NOAA OAR



The NWS Modernization was how NOAA improved its weather warnings.



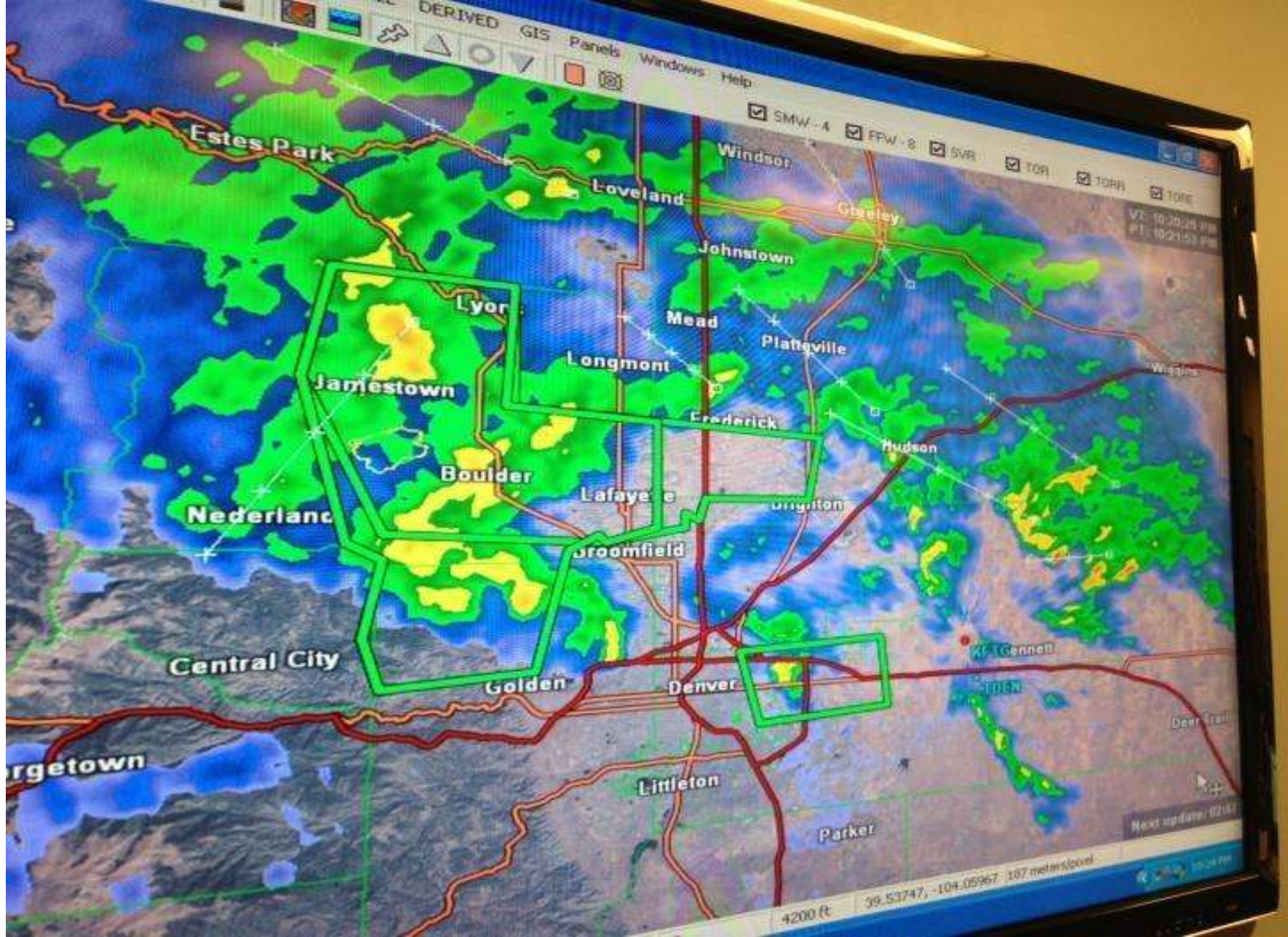
AWIPS, the nerve center of the modernized NWS, was developed in cooperation between OAR (ESRL GSD) and NWS.



The Doppler radar network was developed by NWS and OAR NSSL.

The NWS Modernization:

- Reduced severe weather deaths by about 40%.
- Commenced in 1980, completed in 2000.
- Observing: WSR 88D Doppler radar network, GOES satellite.
- Management: TROIKA of NWS, OAR and NESDIS Assistant Administrators, met at least twice a year for two days for 20 years.
- Advanced Weather Interactive Processing System:
 - Integrated all of the data.
 - Improved communication with emergency community.
 - Developed simple and speedy warning generation.



2013: Numerous warnings, emergency officials and public well informed.

September 13, 2013 – My subdivision was flooded by Lefthand Creek.



My neighbor, Nick Johnson, was awakened at 3:30 am by a **Reverse 911 call**, and warned that his house would be flooded. He stalled a little while, then evacuated.

Protection of our people . . .

The most sacred responsibility of government . . .

A job in which NOAA plays a crucial role.

