

VII. FLOOD THREAT RECOGNITION AND WARNING PROCESS

The first element of a local flood warning system is the ability to detect and evaluate a flood threat in its early stages and make the decision to warn before flood damages or deaths occur. The second element is the dissemination of the warning to the public at risk. The third element is the public response to the warning. This section deals with the first two elements relative to Ralston Creek including a step-by-step illustration of how the early flood threat recognition and warning process is intended to function.

Detection and Evaluation of the Flood Threat

The earliest recognition of a potential flood threat for the Ralston Creek basin will be a heavy precipitation forecast by a meteorologist. Henz Meteorological Services (HMS) is a private firm retained by the Urban Drainage and Flood Control District (UDFCD) to provide the meteorological support for this plan among other responsibilities. This service supplements National Weather Service (NWS) activities by focusing its support for the six-county geographically area comprising the District and tailoring communications to the individual concerns of each local government within this area. Section VI describes the meteorological support provided by HMS and NWS.

HMS forecasts are coordinated with the NWS Weather Forecast Office at Denver and provided to the Jefferson County Sheriff's Department Communications Center (JCC) for subsequent dissemination. JCC's principal contacts for Ralston Creek flood notifications are: Arvada Police Department, Fairmount Fire Protection District, Arvada Fire Protection District and Jefferson County Emergency Management. Participating organizations will take appropriate preparedness actions in accordance with respective internal procedures.

Twelve automated rain gages and eight stream gages within the Ralston Creek drainage basin will transmit rainfall data and current stream and reservoir water levels to three ALERT base stations located at HMS, NWS and UDFCD. HMS also has access other meteorological data from weather radar, satellites, upper air soundings and weather stations. HMS will use this data and the decision aids in Section III to predict flood potentials and update local officials concerning anticipated flood problems at specific locations.

The Arvada Emergency Operations Center (EOC) will be activated by the Police Department if necessary. EOC personnel will have the opportunity to analyze current ALERT data via PC/phone modem access to the UDFCD base station, interact directly with HMS, and use the decision aids in Section III. EOC personnel may also assume the primary flood prediction role in the event HMS is somehow disabled. A separate EOC in Jefferson County may also be activated by the Director of Emergency Management if needed. Local authorities and the NWS are responsible for making decisions concerning public warning.

Section VIII provides further discussion regarding procedures and general responsibilities of the principle organizations involved with this flood warning plan.

Dissemination of the Warning

Dissemination of warning information to the public will be accomplished through the electronic media and by local government officials from Arvada and Jefferson County. Dissemination by the media may be channeled through the NWS by local authorities or the media may be contacted directly. The NWS will use NAWAS,

METS, NOAA Weather Wire, NOAA Weather Radio and/or EAS at their option to issue the public warning. Section IV describes the various methods for disseminating flood warnings and advisories to the public.

Each local government has the responsibility to provide flood warnings directly to the public at risk within their jurisdiction according to internal procedures. Standardized messages to be used by local governments are included in Section IX.

Step by Step Procedure

The following step-by-step procedure is an idealized summary of how the flood threat evaluation and warning process is supposed to function. **THE USER MUST BE AWARE THAT THE SYSTEM WILL NOT ALWAYS FUNCTION AS PLANNED. THE USER MUST BE PREPARED TO FUNCTION WITHIN THE FRAMEWORK OUTLINED HERE, EVEN IF ALL STEPS LISTED HEREIN DO NOT OCCUR OR OCCUR OUT OF ORDER.**

A. Normal Operations:

1. HMS will be monitoring weather conditions on a routine basis, including appropriate coordination with the NWS. It should be noted that HMS, NWS and UDFCD have an ongoing relationship which involves forecasts of flood potential for the entire Denver metro area; and the Ralston Creek Flood Warning Plan is an add-on responsibility for meteorologists and other technical support personnel.
2. When weather conditions warrant, and after consultation with NWS, HMS will issue a MESSAGE 1 (messages are explained in detail in Section VI) by telephone to JCC. HMS may indicate urgency by stating that the MESSAGE 1 is a "**RED FLAG**" message. The term RED FLAG is used to prompt priority internal dissemination by emergency communications personnel. RED FLAG messages which affect Ralston Creek will also be issued directly to Arvada Police Communications by HMS. Section V contains details regarding weather-related communications and the flow of critical information.
3. JCC will pass the MESSAGE 1 to Arvada Police, Arvada Fire Protection District, Fairmount Fire Protection District, Jefferson County Emergency Management and other support agencies according to internal procedures. **REMEMBER THAT A MESSAGE 1 IS A FORECAST OF A POTENTIAL FOR FLOODING. IT IS NOT INTENDED FOR PUBLIC DISSEMINATION SIMPLY BECAUSE IT IS TOO EARLY TO TELL WHAT WILL ACTUALLY DEVELOP.**

B. Increased Awareness:

1. HMS will continue to monitor the situation and will issue MESSAGE UPDATES (RED FLAG if warranted) to keep local officials advised of significant changes since the previous message.
2. NWS may issue a Special Weather Statement or other appropriate communication concerning heavy precipitation through normal channels (Section IV). HMS may follow this with a MESSAGE UPDATE providing a more detailed interpretation of how this affects Arvada, Jefferson County and the Ralston Creek basin.
3. JCC will forward this information and each subsequent contact should follow internal procedures for updating key pre-designated people concerning the increased flood potential.
4. Contingency plans should be established to ensure that future steps in this warning plan can be carried out if needed.

C. Flash Flood Watch:

1. As the flood potential becomes more apparent, NWS will issue a Flash Flood Watch for a geographic area. The Flash Flood Watch will be issued on NAWAS, Weather Radio and Weather Wire.
2. HMS will issue a MESSAGE 2 to JCC for relay to the other entities. HMS will also issue a MESSAGE 2 directly to Arvada Police. MESSAGE 2 will not only indicate the issuance of a Flash Flood Watch by NWS but will also attempt to provide additional information concerning severity of the threat and a

more definitive identification of areas at risk. HMS may also issue a MESSAGE 2 without a NWS issuance of a Flash Flood Watch if HMS feels the risk is high that a life-threatening flood will occur later in the day.

3. HMS will continue to monitor all available data and will initiate an analysis of potential flood peaks based on predicted rainfall and decision aids (Section III).
4. As additional data (including rainfall and stream gage data) becomes available, HMS will update rainfall forecasts and flood predictions and will provide information to JCC and Arvada Police in the form of MESSAGE UPDATES.
5. Arvada and Jefferson County should consider activating their EOCs at this time if not done previously and maintain frequent two-way communications with HMS and NWS.
6. Local officials will send rain and stream observers to pre-determined locations. Stream gage readings and field observations will be reported to HMS and NWS through JCC, Arvada Police or EOC personnel.
7. HMS will confer as needed with NWS. When rainfall measurements and flood peak predictions indicate an imminent flood danger, or when automated stream gages or field observations confirm the threat, a Flash Flood Warning will be issued by the NWS.

D. Flash Flood Warning:

1. NWS will issue a Flash Flood Warning through NAWAS, METS, Weather Radio, Weather Wire and perhaps EAS. A Flash Flood Warning means that flooding is imminent or is occurring.
2. HMS will issue a MESSAGE 3 to JCC for relay to the other entities. HMS will also issue a MESSAGE 3 to Arvada Police or the EOC, if activated. HMS may also issue a MESSAGE 3 without a NWS issuance of a Flash Flood Warning if HMS feels that a life-threatening flood is imminent.
3. Each entity should then disseminate the warning within its jurisdiction according to internal procedures using standardized messages where appropriate (Section IX).
4. HMS, NWS and stream observers will continue to monitor the situation to either confirm flooding or determine that the hazard has passed.
5. When the threat of flooding has passed (whether a flood has occurred or not), HMS will issue a MESSAGE 4.
6. If flooding has occurred, Arvada and Jefferson County will follow their respective disaster response plans.

E. Other Considerations:

1. As noted above, this is an idealized scenario. It is unlikely that any flood event would be handled exactly as outlined. Each jurisdiction must be cognizant of the probable necessity to deviate from their respective plan in order to react to the real situation.
2. NWS is the only federal agency which can officially issue a Flash Flood Watch or Flash Flood Warning to the public. In the event of a difference of opinion between NWS and HMS, HMS will advise JCC and Arvada officials of the difference of opinion as follows:
 - a) If HMS feels a watch or warning should be issued but the NWS doesn't agree, HMS will use a MESSAGE 2 or MESSAGE 3 to inform local authorities of their forecast and prompt each jurisdiction to make their own warning decision.
 - b) If the NWS issues a watch or warning but HMS doesn't feel it is warranted, HMS will still issue the appropriate MESSAGE 2 or 3, but indicate their misgivings. The standard message forms in Section VI are designed to clearly indicate either concurrence or disagreement between HMS and NWS.
3. In the event of a local decision to warn, the official in charge should immediately contact the NWS to avoid public confusion. Also, the NWS may be the quickest means of notifying the public via the electronic news media. The NWS may acknowledge the involvement of local authorities (i.e., Arvada, Jefferson County, UDFCD, etc.) when issuing their warning.

4. Flood warnings for Ralston Creek can be issued by local officials using emergency vehicle loud speakers, door-to-door notification and other methods deemed appropriate.