

# Flood Warning Response and Notification

*Public Works – Engineering July, 2008*

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## Background

Seven creeks and streams, draining the 80-square-mile Upper Dry Creek Basin pass through and join within the city limits of Roseville. Because of this geographic fact, portions of the city lie within flood hazard areas, as was evidenced by the 1986 and 1995 floods. The potential for flooding is present during every rainy season. In response to the 1986 flood, the City of Roseville has developed a flood warning system to monitor the creeks and streams located within the Upper Dry Creek Basin.

## The Flood Warning System

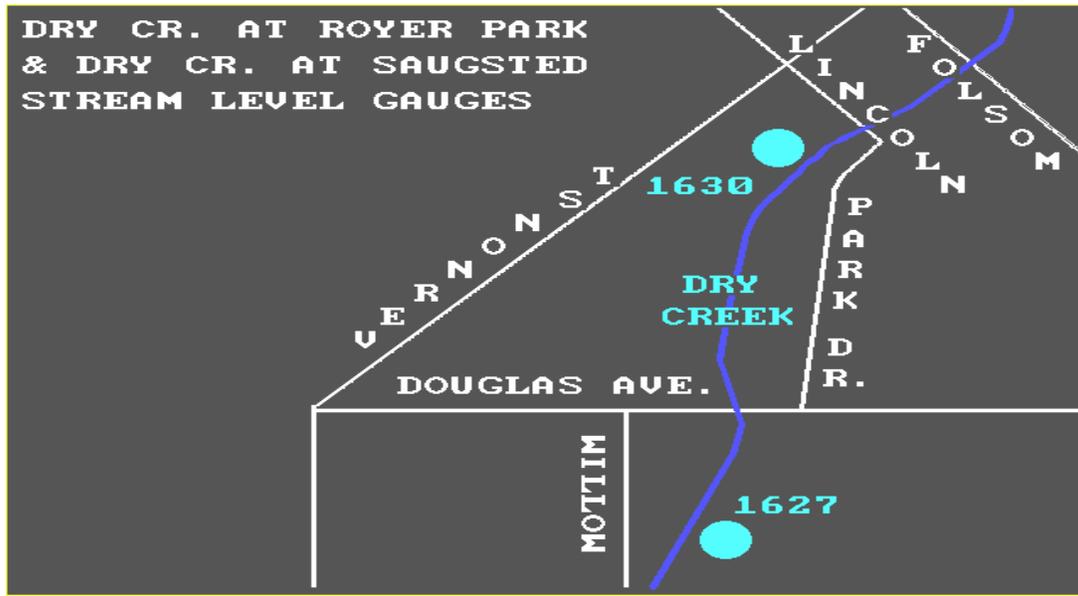
The City of Roseville's flood warning system consists four ways of warning the public of the flooding problems in the City.

- A comprehensive graphical display broadcast on Channel 14 or 73 of the stream levels with the static of the warning.
- The “**Stream Level**” link on the City of Roseville home web page ([www.roseville.ca.us](http://www.roseville.ca.us)),
- An automatic telephone dialing system to the problem areas.
- Flooding static broadcasted on radio station 530 AM

Numerous stream flow and rain gauges form our stream monitoring system for the Upper Dry Creek Drainage Basin. These stations are placed at strategic locations throughout the drainage basin. For example, one is mounted on the floodwall just upstream from the pedestrian bridge that crosses between Tina Way and Marlin Drive and another is location on Dry Creek at the Vernon Street Bridge. Each station transmits information via radio antenna to a central computer. Stream level information from five(5) of the most critical stream level gauges is then broadcast on cable Channel 14 / 73 and on the City's web page during significant storm events to keep residents informed (see attached city map). City staff uses this information to help staff in making the decision whether to have emergency personnel (the Fire and Police Department) advise residents to evacuate an area due to a possibility of flooding. Our goal is to provide up to three hours advance warning. The continuously changing variables of precipitation, stream levels, and forecasts have a major effect on meeting this goal.

The display shown on cable Channel 14 / 73 consists of three basic display formats shown in 15 second intervals. The first format, which is shown only once for every complete cycle, reveals a City of Roseville map that includes major roadways (Vernon Street, Douglas Boulevard, Cirby Way, etc.), the three major streams (Dry Creek, Linda Creek, and Cirby Creek) and the five stream level gauge locations. Following this display, a more specific map identifies a single stream level gauge's location in relation to nearby roadways and streams (see Figure 1).

Figure 1: Example of Channel 14/73 Map Display



The third screen displays the current stream depth and the stream depth over the past six hours. This display is shown for each of the following stream level gauge locations:

1. Dry Creek at Royer Park
2. Dry Creek at Saugsted Park
3. Cirby Creek at Tina Way
4. Linda Creek at Woodlake Dr. footbridge
5. Linda Creek at Champion Oaks Drive

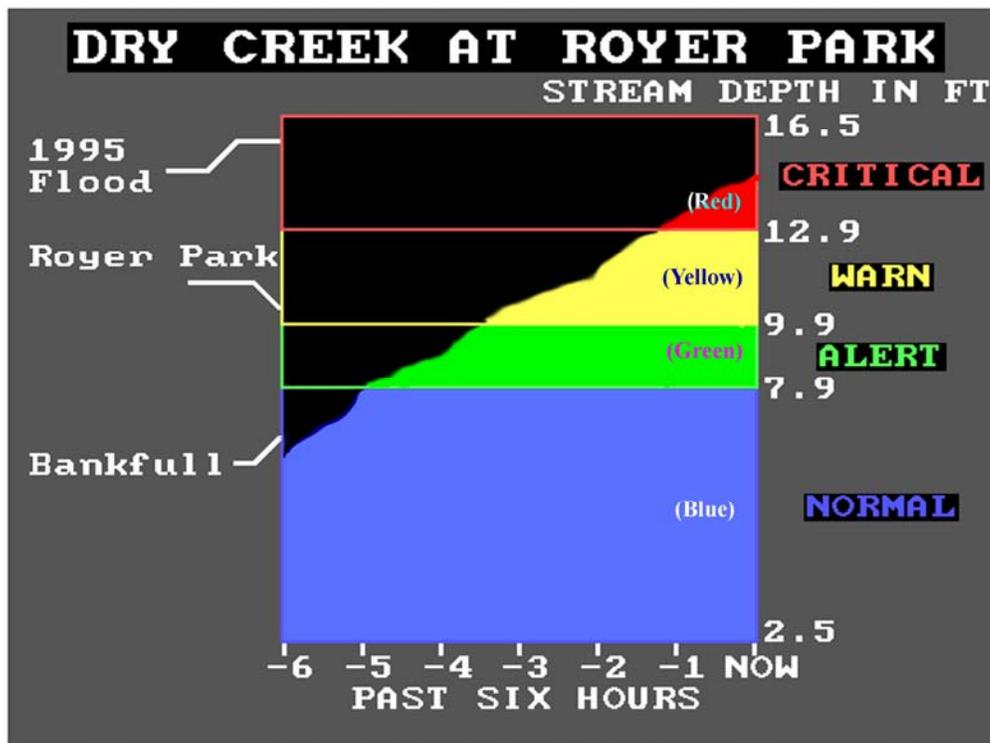
As a concerned resident living within a designated floodplain, you should first determine from the five (5) stream level gauges listed above, which gauge best represents your neighborhood. Once this is established, it is important to focus on how the streams are reacting to the weather conditions. Transmitted information from the stream level gauges is processed and then presented in a useful visual formats that include the current stream depth and the stream depth over the past six (6) hours. This Stream Level Graph is divided into four (4) colored categories of flood depth stages. Descriptions of the Flood depth stages and their corresponding color codes are identified below:

<u>Stage</u>	<u>Color</u>	<u>Description</u>
<b>NORMAL</b>	<i>blue</i>	Stream level conditions are normal and safe.
<b>ADVISORY</b>	<i>green</i>	City staff is continuously monitoring creek levels and weather conditions. Residents should be closely watching for further information about flooding in their area.
<b>WARNING</b>	<i>yellow</i>	There may be a possibility of flooding in this area. Necessary precautions need to be taken to secure personal property and safety.
<b>CRITICAL</b>	<i>red</i>	Flooding appears imminent in this area. Residents should evacuate their homes.

The numeric values of the stream depths associated with the above stages are also shown on the vertical bar graph for all five(5) of the stream level gauges. However, these stream depths would not be nearly as useful, unless a reference point is provided. Thus, reference stream levels are identified for each stream level gauge location. For example, the stream level during the 1995 flood is marked for each location. Also identified are other reference points such as roadway surface, bridge and/or top of berm levels. This enables you, the viewer, to identify and understand the present stage of the stream in relation to these known benchmarks.

The graph line is color coded to correspond with the four flood level stages described above. This graph is extremely effective in displaying the six (6) hour stream level trends. An example of the TV or web broadcast graphic display is shown below in Figure 2.

Figure 2: Example of Stream Gauge Graphic Display



The Channel 14 or 73 graphic display was designed using residents' comments following the January 1995 flooding event to provide the most understandable and useful design in a flood event.

## Automated Telephone Dialing System

The City of Roseville also has an automated telephone dialing system. During significant storm events, this system will be used to phone residents and businesses within the floodplain and provide recorded messages containing important information. The message to be played will depend on the flood threat to your area at that time **ADVISORY**, **WARNING**, or **CRITICAL**. Shown below are examples of the messages. Other messages may be sent to better describe the situation in your area.

### **ADVISORY PHASE:**

*This is the City of Roseville with a recorded message regarding water levels in creeks. City staff is continuously monitoring creek levels and weather conditions. Check cable channel 14 or 73 for creek level information. If conditions worsen, a warning phone message will be attempted. To hear this message again, press three.*

### **WARNING PHASE:**

*This is the City of Roseville with a recorded message regarding water levels in creeks. Conditions are now in the warning phase as there may be a possibility of flooding in your area. Take necessary precautions to secure your property and personal safety. Check cable channel 14 or 73 for creek level information. If conditions worsen, an evacuation message will be attempted. To hear this message again, press 3.*

### **CRITICAL PHASE:**

*This is the City of Roseville with a recorded message regarding water levels in creeks. Conditions are now in the critical phase as flooding appears imminent in your area. You should evacuate your home now. This may be your only evacuation warning. To hear this message again, press 3.*

Roseville's current warning system provides residents with a very comprehensive and dependable advance warning system. Residents will be informed if additional modifications or improvements are made to the system. Please contact the City of Roseville's Engineering Department, phone number 746-1300, if you have any questions regarding the warning system.

