STORM/FLOOD

Orange County's 510,000 acres include both mountain terrain (on the northeast and southeast) and floodplain (in the central and western section). Due to the County's rapid change in recent years from a largely agricultural community to an urban one, its flood problems have changed from control of large flows from the mountains and hills to control of the additional runoff produced by development of the plain. Although there is a county-wide system of flood control facilities for control of storm runoff, the majority of these are inadequate for conveying runoff from major storms, such as the Standard Project Flood or the 100-year flood.

Further, the County's flood menace tends to be obscured by the infrequent occurrence of very large floods. Storms that could be labeled severe have occurred in less than 10 of the past 175 years. These storms have tended to be particularly disastrous by reason of the false sense of security derived from long periods of mild semi-arid years.

The major flooding threat in Orange County is the Santa Ana River. In 1938, the Santa Ana River flooded parts of Anaheim, Santa Ana, and Garden Grove, reportedly killing more than 50 people. The flood and its damage were a catalyst for construction of Prado Dam, developed as part of the U.S. Army Corps of Engineers flood control protection plan.

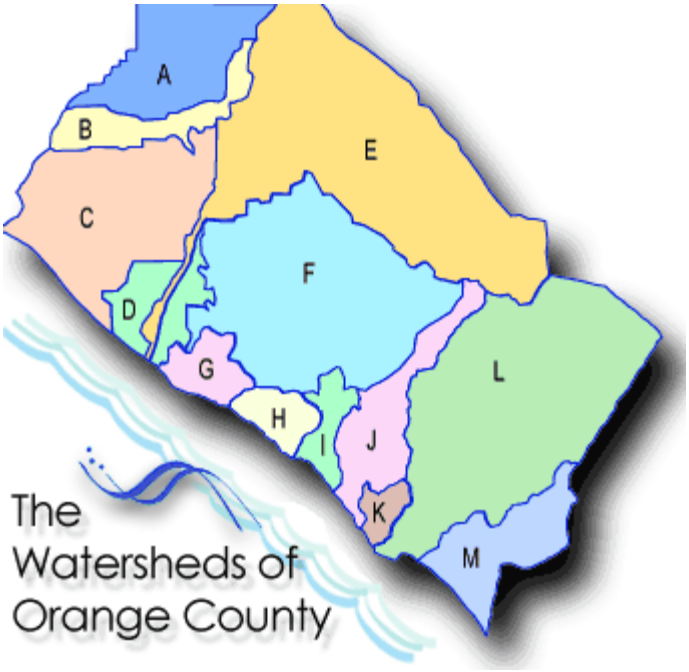
If the County wasn't protected and the 1938 flood hit today, government officials estimate that 3,000 people would die and damage would top $25 billion. More than 110,000 acres would be flooded with 3 feet of water, and 255,000 structures would be damaged (S. Gold, LA Times, 1999).

Despite the Corps extensive efforts at flood control protection, it appears that the river is inadequate to handle the Standard Project Flood or even the lesser intensity storms (100-year event). In fact, the U.S. Army Corps of Engineers is currently undertaking a project to increase the level of protection at Prado Dam, from the current 70-year level of protection to a 190-year level of protection. Project completion is not expected until January of 2009 (see: http://www.spl.usace.army.mil/Pradodam/pradodam.htm). Further, those portions of the County that would not be inundated by the river overflow during the 100-year event could be subject to flooding from overflow of storm water drainage facilities that are presently inadequate for carrying the 100-year discharge.

In addition to the Santa Ana River, other areas subject to flooding during severe storms include the area adjacent to Atwood Channel, Brea Creek Channel, Fullerton Creek Channel, and Carbon Creek Channel. In the central portion of the County areas adjacent to Santiago Creek and Collins Channel may be inundated. Large portions of the San Diego Creek watershed in the City of Irvine and unincorporated area of the County are also subject to inundation. In the southern part of the County, the flooding is mostly confined to the canyon areas; however, these areas are also of concern since their development is expanding. Figure 13 provides a map of the various watersheds located throughout Orange County, and Figure 14 provides a map of FEMA Q3 flood data

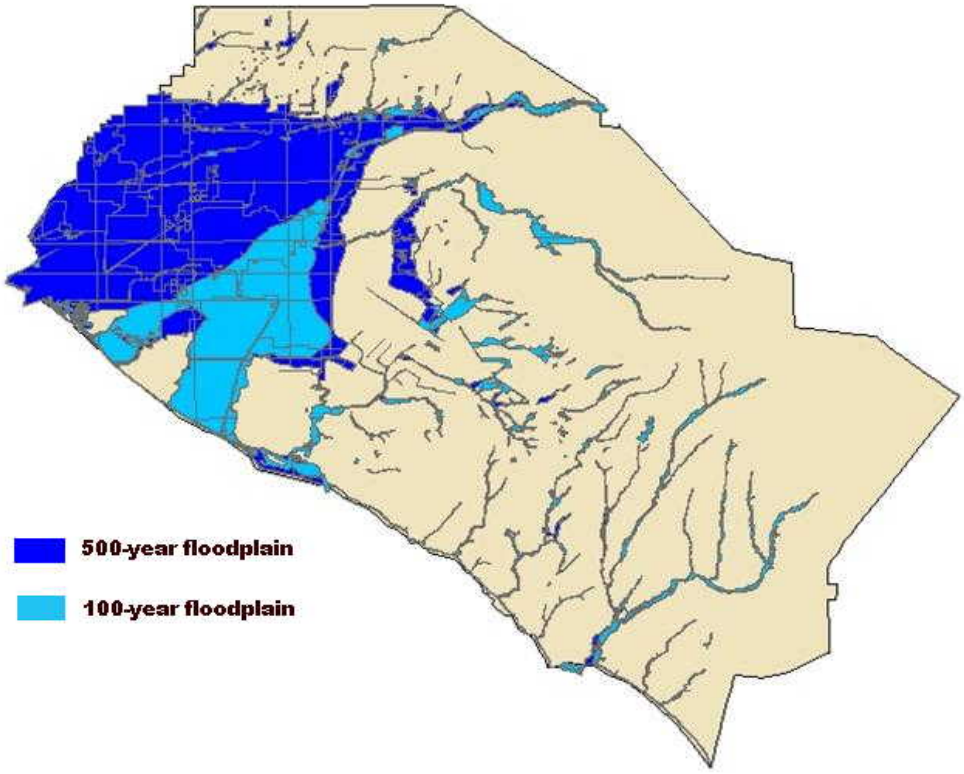
(approximate floodplain boundaries scanned from existing Flood Insurance Rate Maps) for Orange County, showing the 100-year floodplain boundary in light blue, and the 500-year floodplain boundary in dark blue.

Figure 13 – Watersheds of Orange County
(Source: Orange County Public Works, Watershed & Coastal Resources Division. http://www.watersheds.com/watersheds/ introduction.asp)



A = Coyote Creek
B = Carbon Canyon
C = Westminster
D = Talbert
E = Santa Ana River
F = San Diego Creek
G = Newport Bay
H = Los Trancos/Muddy Creek
I = Laguna Canyon
J = Aliso Creek
K = Salt Creek
L = San Juan Creek
M = Prima Deshecha/
Segunda Deshecha

Figure 14 – FEMA Q3 Flood Data for Orange County



To provide quantitative information for flood warning and detection, Orange County began installing its ALERT (Automated Local Evaluation in Real Time) system in 1983. Operated by the County's Environmental Resources Section of Orange County Public Works (OCPW) in cooperation with the National Weather Service, ALERT uses remote sensors located in rivers, channels and creeks to transmit environmental data to a central computer in real time. Sensors have been installed along the Santa Ana River, San Juan Creek, Arroyo Trabuco Creek, Oso Creek and Aliso Creek, as well as other flood control channels and basins. The field sensors transmit hydrologic and other data (e.g., precipitation data, water levels, temperature, wind speed, etc.) to base station computers for display and analysis. In addition, six pump stations (Huntington Beach, Cypress, Seal Beach, Los Alamitos, Harbor-Edinger, and South Park) regulating storm water discharge to flood control channels are also instrumented. Their monitoring system includes automated call-out of operations personnel in the event of a problem.

The Storm Center operated by OCPW is activated when heavy rainfall occurs or is predicted, and/or when storm run-off conditions indicate probable flood damage. The Storm Center monitors the situation on a 24-hour basis, and response may include patrols of flood control channels, and deployment of equipment and personnel to reinforce levees if needed. Storm Center activation and various emergency response actions are based on the following Emergency Readiness Stages:

- Stage I - Mild rainfall (watch stage)

- Stage II - Heavy rainfall or potential thereof. OCPW Storm Operations Center activated and surveillance of flood control facilities in effect.

- Stage III - Continued heavy rainfall or deterioration of facilities. County Public Works Director in charge. County personnel assume assigned emergency duties.

- Stage IV - Conditions are or are likely to be beyond County control. Board of Supervisors, or DES/OAC when the Board is not in session, proclaims Local Emergency and assumes special powers. Mutual Aid requested.

- Stage V - Damage beyond control of all Local Resources. State forces are required. Governor requested to proclaim State of Emergency.

- Stage VI - Damage beyond control of Local and State Resources. Federal forces are required. President requested to declare Major Disaster.