

California Department of Water Resources



Alluvial Fan Floodplain Evaluation and Delineation Project (AFFED)

Southern California Climate Change Workshop

January 31, 2012

WHY AFFED?

- AFTF finding: “Insufficient Understanding of Alluvial Fan Flooding and Flood Hazards
- California’s high growth areas are in Counties with extensive alluvial fan environments
- Land use planners need better data and tools to make more sustainable decisions

Complexity of Alluvial Fan Flooding and Flood Hazards

- Flashy/unpredictable flood flows
- More severe consequences of flooding: erosion, sedimentation and debris impacts
- Not all alluvial fans are subject to flood hazards
- All alluvial fans are highly likely to be subject to other hazards including wildfires, mudslides and extreme rainfall events

Climate Change and AFFED

- Climate change is projected to increase severity of storms, extreme heat and prolonged drought, wildfires, flooding, mudslides and landslides
 - 2009 California Climate Adaptation Strategy Discussion Draft, CA Resource Council
- Combination of increases in both storm severity and wildfire frequency on alluvial fans and their upstream contributing areas is a worst case scenario
- Multiplying effect on potential flooding and sediment transport

FloodSAFE
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FloodSAFE

CALIFORNIA



FloodSAFE

CALIFORNIA



AFFED Project Background

- Project of the California Department of Water Resources
- Component of the FloodSAFE Initiative
 - Inform and assist communities on flood risk management
 - Reduce the chance and consequence of flooding
 - Sustain economic growth, enhance ecosystems, promote sustainability
- Recommendation of the Alluvial Fan Task Force
 - Study all ten counties in Southern California

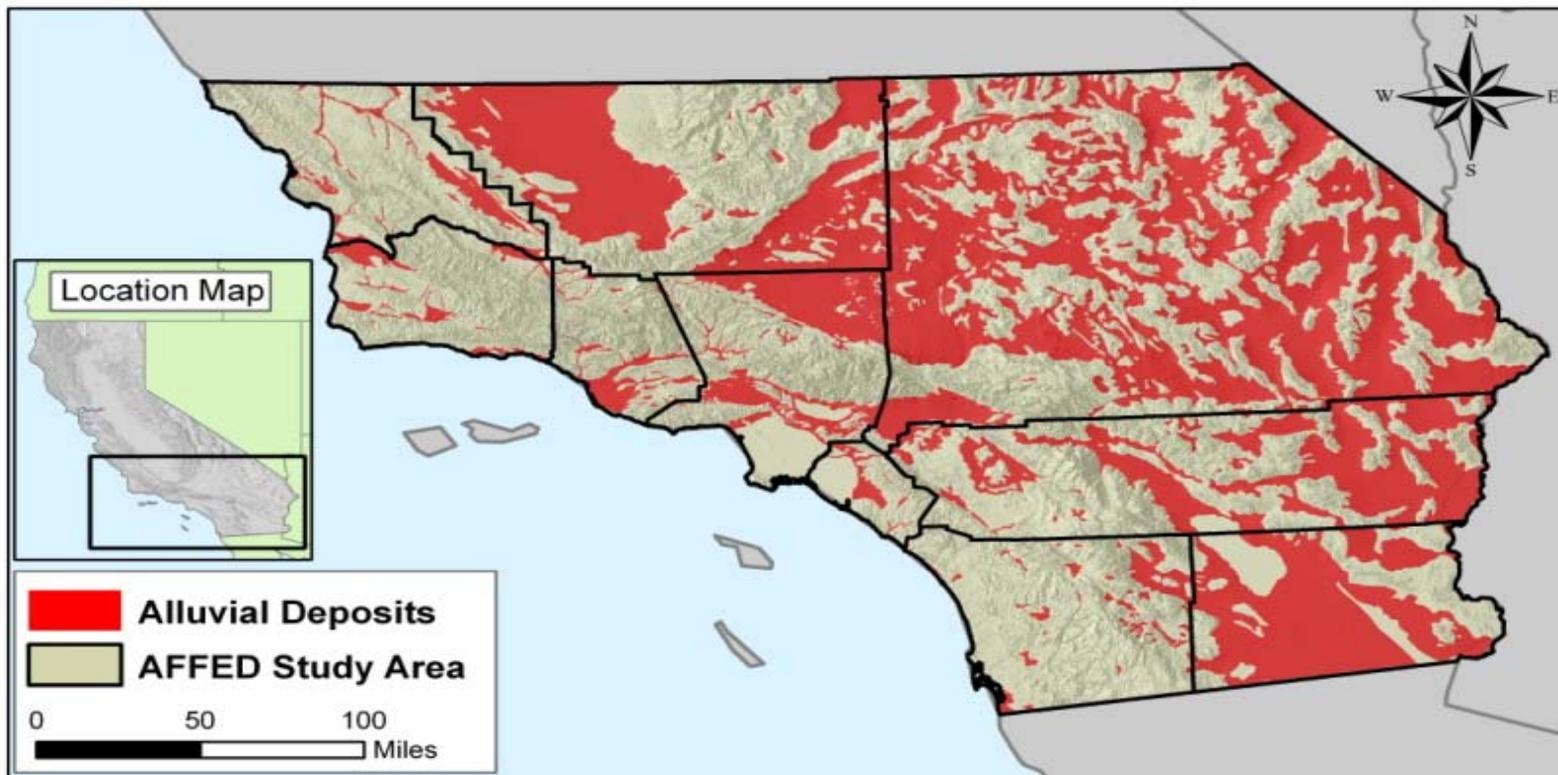
AFFED Goals

- Advance the understanding of alluvial fan flooding and flood hazards
- Identify preliminary hazard areas for local land use and multi-hazard planning
 - Flood hazard – based on flooding depth
 - High hazard – based on depth-velocity product
- Target alluvial fan areas that are projected to develop over the next 25 years
- Mapping products similar to those of the Awareness Floodplain Mapping Project
 - Non-regulatory riverine floodplain mapping

AFFED Scope and Products

- **Scope**
 - Conduct Pilot study for Riverside County
 - Develop Quaternary maps for 10 county study area
 - Coordinate and collaborate with local governments
- **Products**
 - Preliminary alluvial fan flood hazard areas
 - Preliminary alluvial fan high hazard areas
 - Quaternary Geologic Mapping of Southern California Communities (CGS)

AFFED STUDY AREA



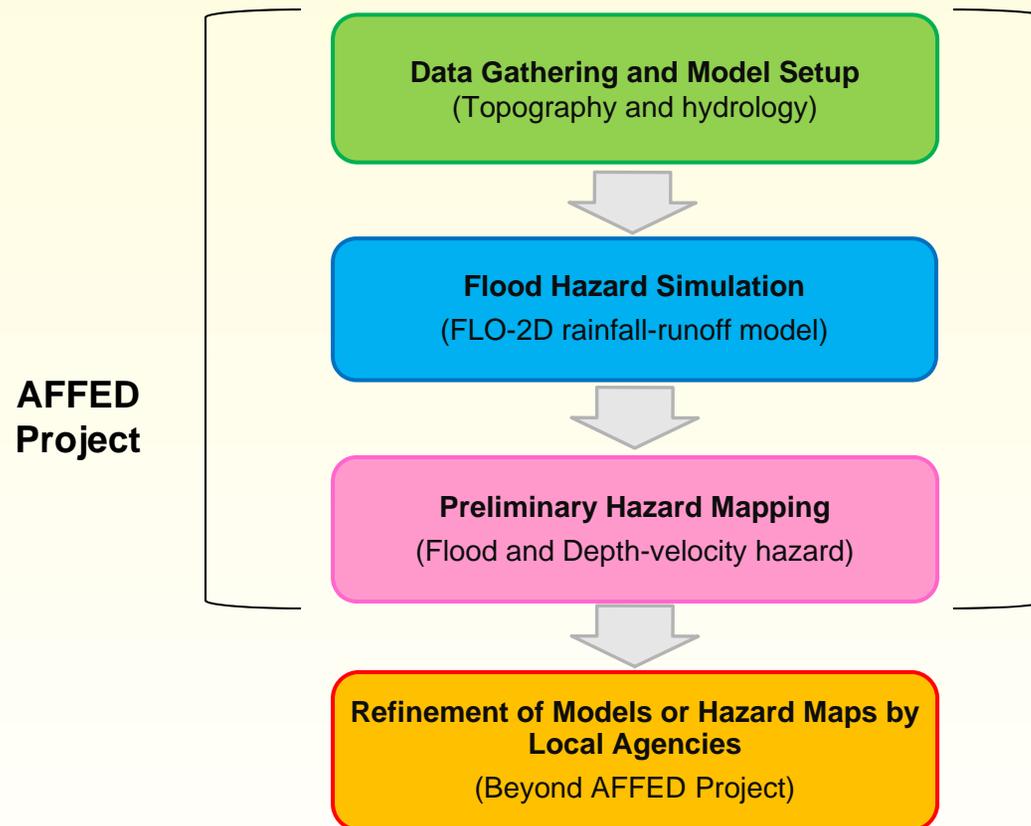
AFFED Relationship to FEMA

- AFFED analysis will be conducted for areas not mapped by FEMA
 - Unless specifically requested by communities
- Data may serve as a starting point for future FEMA analysis
- The AFFED approach, which is different from the FEMA approach may be used for planning purposes in undeveloped alluvial fan areas, where no Flood Insurance Rate Maps (FIRMs) exist
- Ultimately, communities that require regulatory maps should be based on the 100-year flood hazard boundary utilizing the FEMA process

AFFED Methodology

- Multi-disciplinary approach
- Hydraulic Analysis
 - FLO-2D (two dimensional model) simulation
 - Rainfall runoff simulation
 - 100-year return interval
 - 24-hour storm duration
- Geomorphic Analysis
 - Topography
 - Aerial photographs
 - Soils data

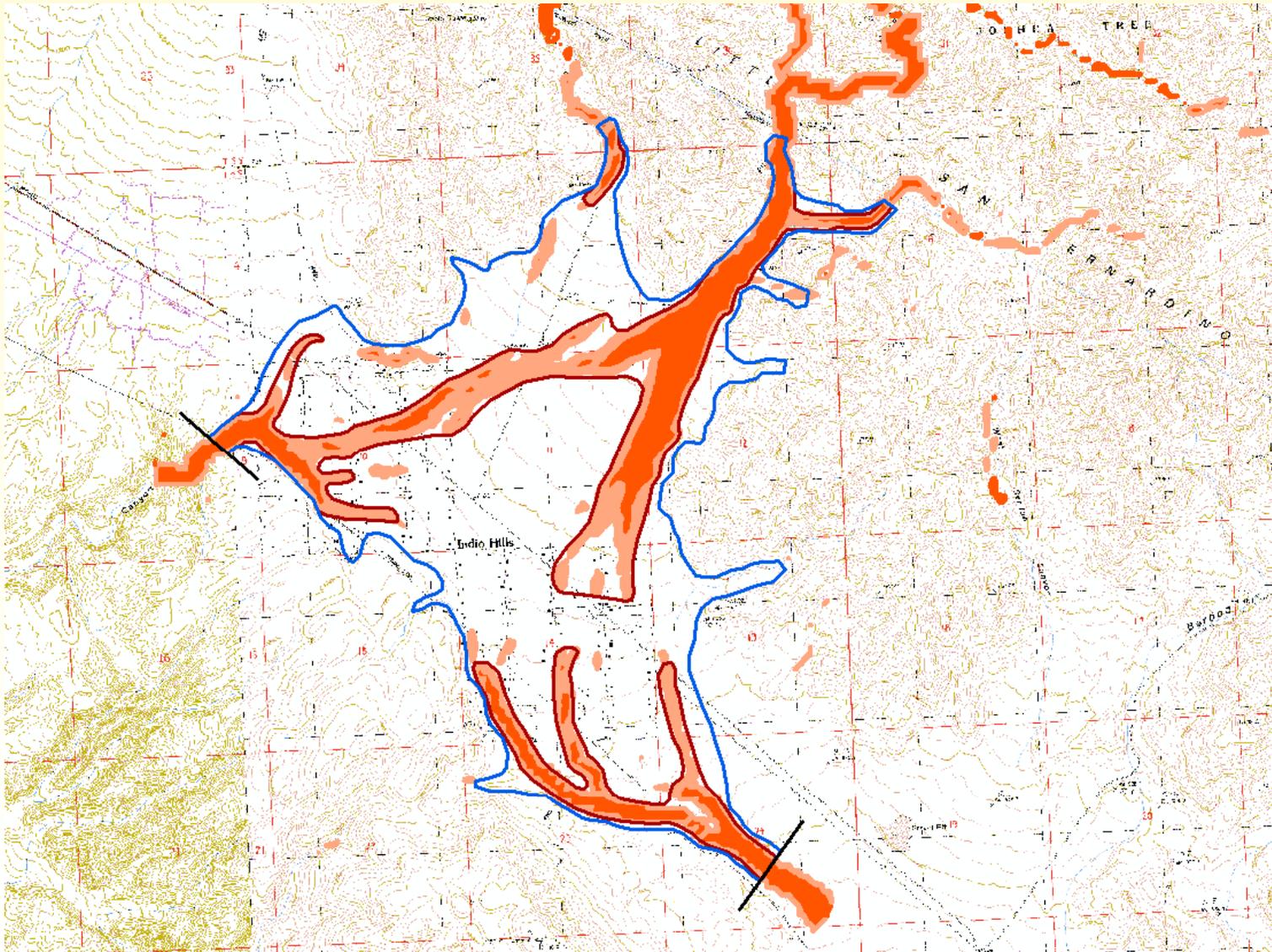
Project Approach



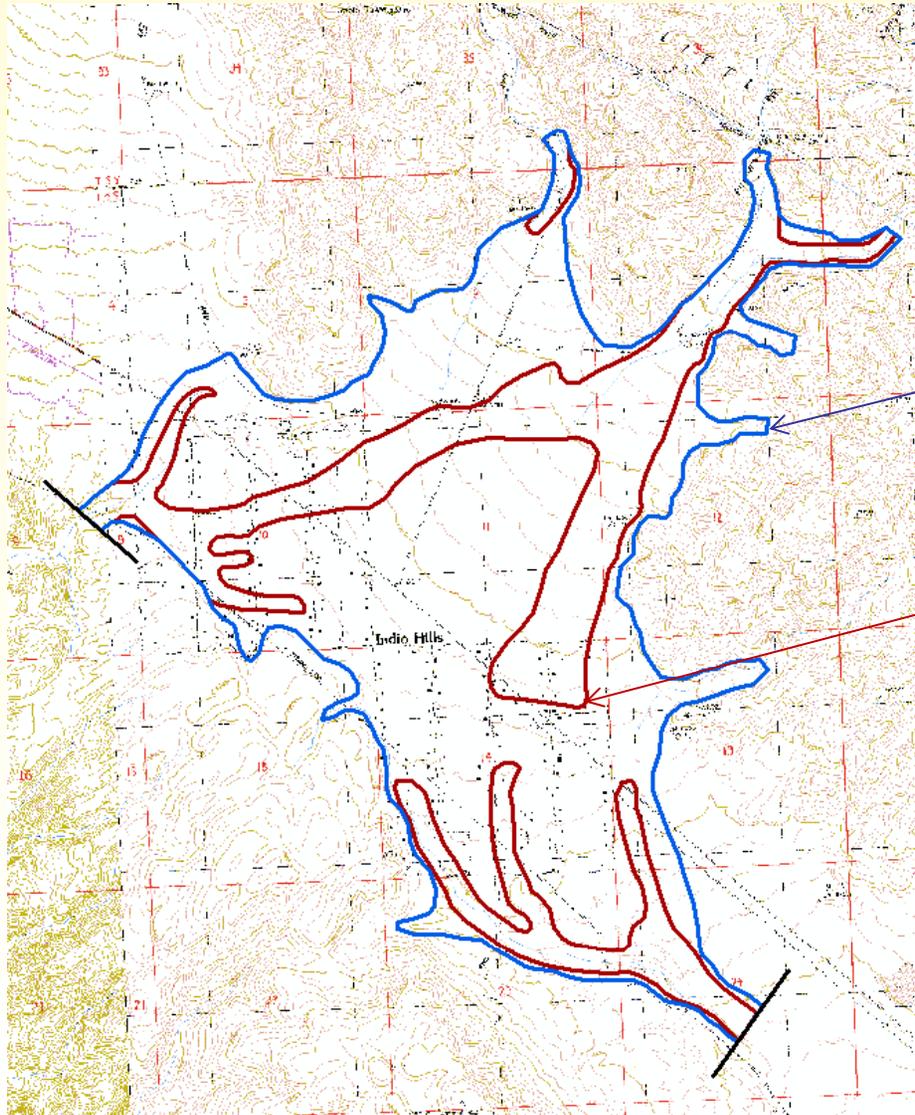
Identification of Flood Hazard Area – Indo Hills



Identification of High Hazard Area – Indo Hills



Preliminary Flood and High Hazard Boundaries



Flood Hazard Boundary

High Hazard Boundary

AFFED Summary

- Preliminary flood and high hazard areas are determined based on technical (hydraulic) analysis with an additional geomorphic component
 - Additional comparison with Quaternary Geologic Mapping (CGS)
- Hazard information is based on 100-year recurrence interval but advisory only, intended for land use and multi-hazard planning
- Identification of preliminary high hazard areas to provide information on the relative hazard as additional guidance for county planning and development personnel

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Questions and Comments

