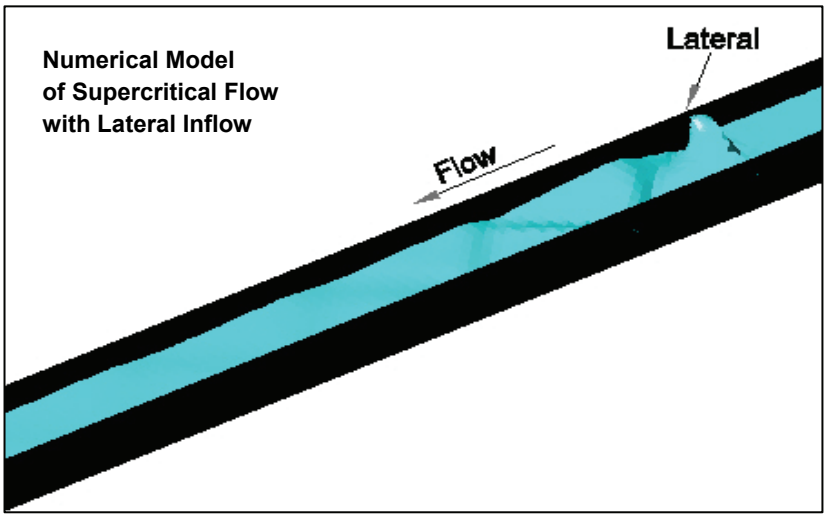
Urban Flood Demo Program & Southwest Demo Program

US Army Corps of Engineers®

Extension of Supercritical Flood Channel Design Guidance

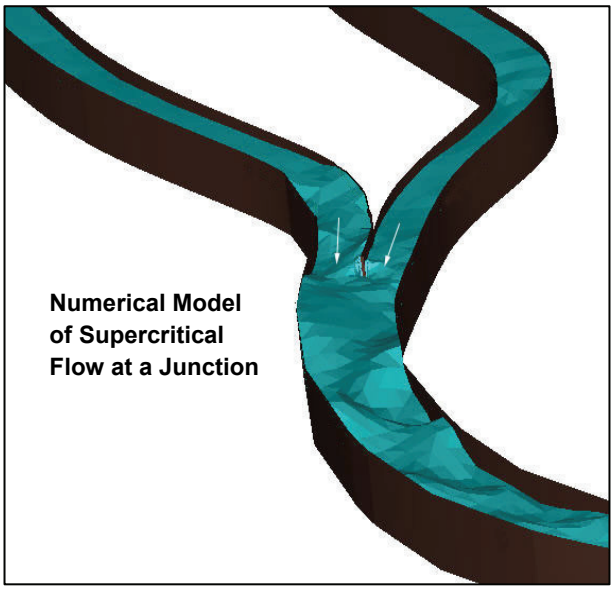


Products

Technical Report: Hydraulic design of channels conveying supercritical flow
Technical Paper: Modeling steep channels with lateral inflow
Technical Report: Lateral inflow in supercritical flow (in press)
Technical Note: Lateral inflow into high-velocity channels (in press)

Benefits

The products provided by this research will be of benefit to U.S. Army Corps of Engineers Districts in the western U.S. and Hawaii. Hydraulic design engineers in these districts are confronted with the problem of inadequate design guidance for confluences in which the tributary flow is small relative to the main channel flow. The primary mission of this research effort will be to align the Corps' design guidance with the size of problems faced by the CCRFCD so that future designs will be acceptable to both parties.



Issue

Flood-control channels in the semi-arid and arid Southwest usually have steep slopes because of local topographic settings. Flow velocity can reach 20-40 ft/sec in these flood-control channels, and Froude numbers can exceed 1.0. The Clark County, Nevada, Regional Flood Control District has pointed out that the design of

supercritical flow channels is a needed research area for flood damage reduction in the urban areas of the southwestern United States. The identified needs include the design of two supercritical flow confluences and the design of lateral inflow to the supercritical flood channel.

Description

Numerous cases of various hydraulic and geometric variables associated with lateral inflow into channels conveying supercritical flow have been modeled. These model results are being used to develop hydraulic design guidance for lateral inflow into high-velocity channels. The guidance will include analytical and empirical methods needed by field engineers to design high-velocity channels in the vicinity of lateral inflows. Lateral angles and channel wall heights will be the primary design parameters addressed.

Sponsor

Urban Flood Damage Reduction and Channel Restoration Demonstration Program for Arid and Semi-Arid Regions (UFDP).

Points of Contact

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Partners

Clark County Regional Flood Control District; Desert Research Institute; USACE, Los Angeles and Sacramento Districts.