Geomorphologic Overlay

How Geomorphology Can Inform HEFR Parameters
Sabine River Near HW 12
The Real Answer

- Determine the Desired Bathymetry or Geometry
- Determine Hydrology That Created the Desired Bathymetry
- Allow a Natural - Variable Hydrology That Will Created or Maintain the Desired Bathymetry
- Diversion or Return Flows May Change Fluvial Geometry
Typical Geomorphic Study

- Define Existing Hydrology, Hydraulics and Geomorphic Parameters
- Define Future Hydrologic and Hydraulic Conditions
Existing Conditions

- Existing Hydrology
- How Has the Hydrology Changed
- How Has the Channel Responded to Hydrologic Changes
- Determine Which Changes are Natural and Which are a Result of Man’s Activities
Future Conditions

It Remains Unclear How to Adjust Observed or WAM Outputs to Reflect a Future Condition Flow with a HEFR Flow Regime Implemented
Future Conditions

It Remains Unclear How to Adjust Observed or WAM Discharges to Reflect a Future Condition Flow with a HEFR Flow Regime Implemented
How CAN Geomorphology Inform HEFR Parameters?

- Determine if the Channel is Stable at USGS Gage Station
- Use Effective Discharge Calculation
- Develop and Understanding How Base, Pulse, and Overbank Flows Fit the Hydraulics of the Stream at the Gage Station
Colorado River - Columbus

- 46,900 cfs - Overbank (Velocity Approximately 5 ft/s)
- 11000 - Spring High Pulse
- Fall High Pulse - 8630
- 4690 - Spring Low Pulse
- 8740 - Winter High Pulse
- Summer High Pulse - 4310
- 3200 - Fall Low Pulse
- 3820 - Winter Low Pulse
- 2490 - June High Base
Flow duration Curve

Flow Duration Curve
1972-2007

Flow in CFS

Percent of Time Flows equaled or Exceeded

Observed Flows
Sam output

- Hydraulics

![Graph showing discharge in CFS vs. gage height in feet, with two curves labeled 'Rating Curve 11' and 'SAM Computed'.]
Sediment Rating Curve

The graph depicts the relationship between CFS (cubic feet per second) and TONS/DAY (tons per day). The data points for different authors (ACKERS-WHITE, ENGELUND-HANSEN, COLBY, VAN.RIJN) are shown as lines on the graph.

The axes are labeled as follows:
- Y-axis: TONS/DAY
- X-axis: CFS

The scale for both axes ranges from 100 to 1000000 TONS/DAY and 100 to 100000 CFS.
Sediment Histograms

Mid-Point of Discharge Bin in CFS

Sediment Load in Tons

0 50000 100000 150000 200000 250000 300000 350000 400000 450000

1284 7146 13007 18869 24730 30592 36453 42315 48177 54038 60000 65761 71623 77485 83346 89208 95069
How Geomorphology Can Inform HEFR Parameters

- Identify Hydraulic Characteristics of the stream at gage location
- Identify critical values for sediment transport