LEARNING OUTCOMES

• Identify scour and stream instability problems at bridges

• Describe how HEC-18, HEC-20, and HEC-23 provide a set of analysis procedures for stream instability and bridge scour problems
BRIDGE SCOUR

A WIDESPREAD PROBLEM

- 484,546 bridges over water
- 26,472 scour critical
- 86,133 unknown foundations
- As of April 2003
STREAM INSTABILITY AND BRIDGE SCOUR

• Scour and stream instability problems at bridges at various locations in U.S.

• Scouring of material from bridge foundations is the most common cause of bridge failures

• Slides illustrate the extent of the problem
COMPREHENSIVE METHODOLOGY
ANALYSIS PROCEDURE

HEC-20
ANALYSIS PROCEDURE

HEC-18
ANALYSIS PROCEDURE

HEC-23
HEC-23 DESIGN GUIDELINES

• Design Guideline 1 – Bendway Weirs/Stream Barbs

• Design Guideline 2 – Soil Cement

• Design Guideline 3 – Wire Enclosed Riprap Mattress

• Design Guideline 4 – Articulated Concrete Blocks

• Design Guideline 5 – Grout Filled Mattresses

• Design Guideline 6 – Concrete Armor Units
HEC-23 DESIGN GUIDELINES

• Design Guideline 7 – Grout/Cement Filled Bags
• Design Guideline 8 – Rock Riprap at Abutments & Piers
• Design Guideline 9 – Spurs
• Design Guideline 10 – Guide Banks
• Design Guideline 11 – Check Dams/Drop Structures
• Design Guideline 12 – Revetments
PARTICIPANT EXPECTATIONS

• At the end of the course, what do you expect to have achieved?
LEARNING OUTCOMES

- Identify scour and stream instability problems at bridges

- Describe how HEC-18, HEC-20, and HEC-23 provide a set of analysis procedures for stream instability and bridge scour problems