LEARNING OUTCOMES

• Introduce Participants and Instructors
• Establish expectations and ground rules
• Outline course goals and schedule
• 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
COURSE GOALS

• Identify stream instability and scour problems at bridges

• Define problems caused by stream instability and scour

• Estimate the magnitude of scour at bridge piers and abutments and in the bridge reach
LEARNING OUTCOMES

• Classify a stream, identify potential instability problems, and conduct a qualitative analysis of stream response

• Estimate long-term degradation quantities

• Calculate the magnitude of general and local scour at bridge piers and abutments
LEARNING OUTCOMES

- Plot and evaluate the total scour prism at a bridge
- Determine the need for a Plan of Action for correcting stream instability and scour problems
COURSE SCHEDULE

- Lesson sequence
- Modules A and B
- Breaks
- Ground rules
END OF COURSE EVALUATION

- IACET requirement
- Basis for CEU’s
- Objective test
- Passing score (70)
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

HEC-20

HEC-18

HEC-23
ANALYSIS PROCEDURE

HEC-20
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