Soluciones a Problemas de Ingenieria de Rios

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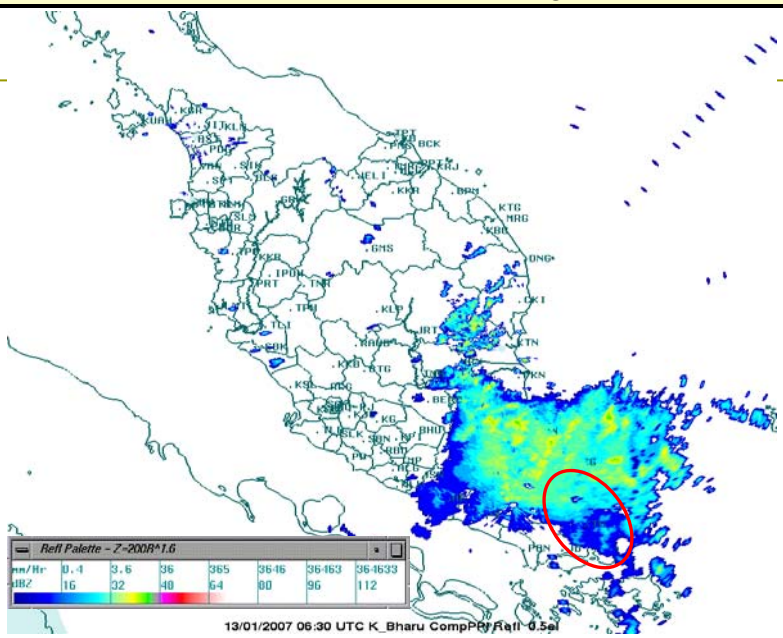
Jiutepec, Mexico

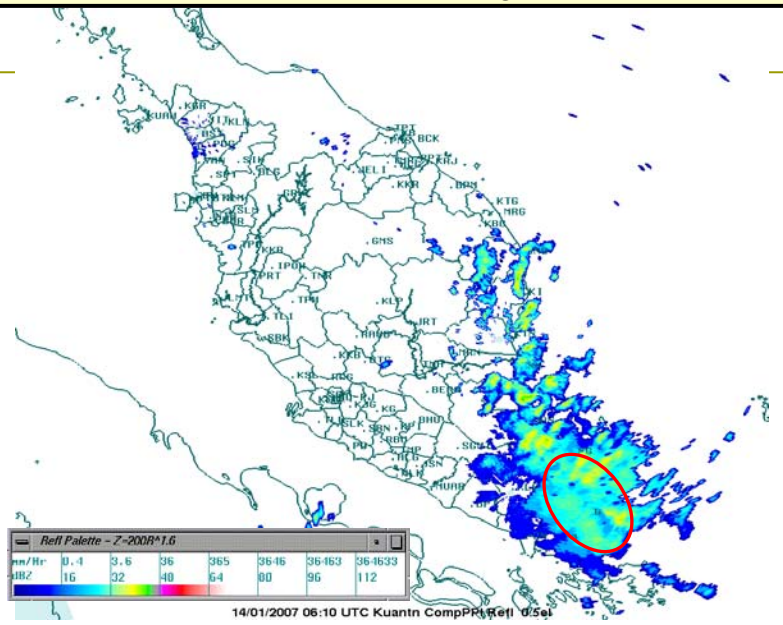
Presentation Overview

1. Flashflood in Malaysia
2. Upland Erosion Control
3. Riverbed Degradation
4. River Engineering
5. Sedimentation
6. Flashflood in Venezuela

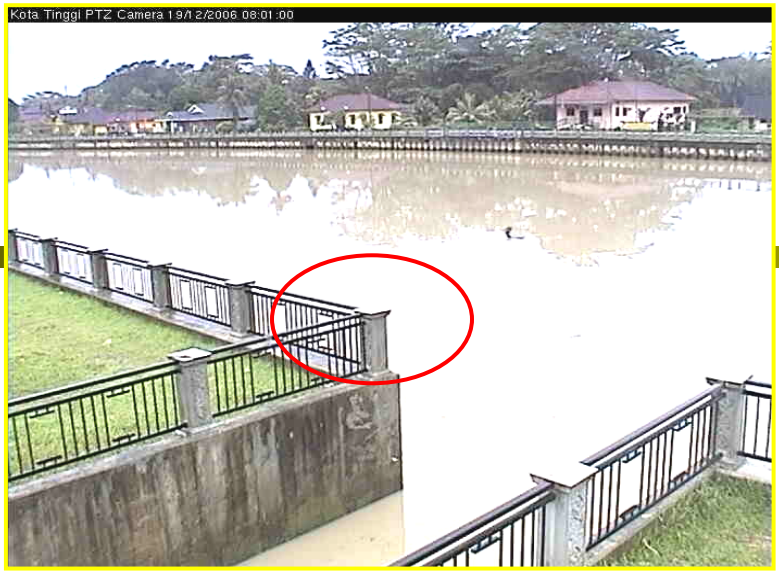
Gema Radar Cuaca Pada Jam 2.30 Petang, 13 Januari 2007



Gema Radar Cuaca Pada Jam 12.40 tengahari, 14 Januari 2007



December 18, 2006



December 19, 2006

December 20, 2006

December 21, 2006


Kota Tinggi
Pustaka Seri Pun
PUSAT PERMIASAN
RIKA
MAJLIS MESYUARAT KOTA TINGGI
Merrybrown
SONY
Haier
SHARP
JVC
TOSHIBA

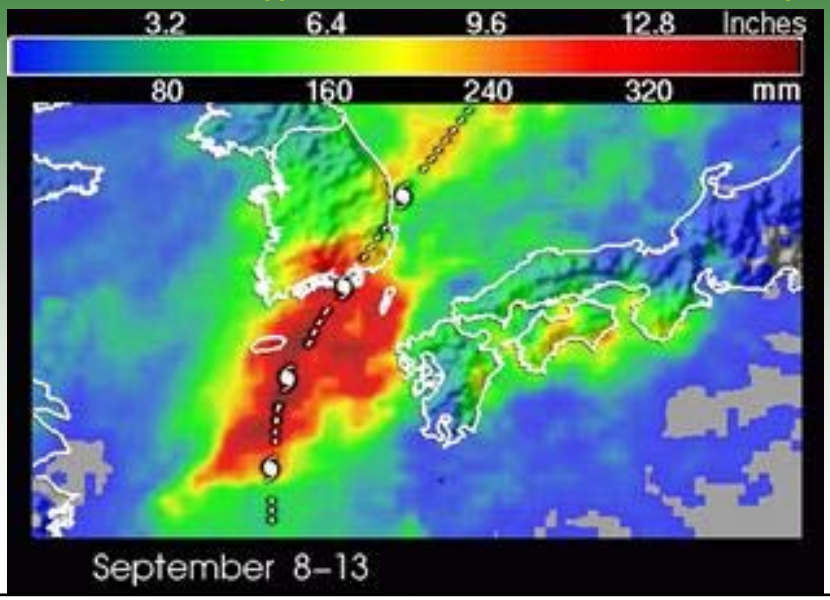

FIREFLY


in 2007
FLOOD LEVEL 9-1-48
in 1948

2. Upland Erosion Control

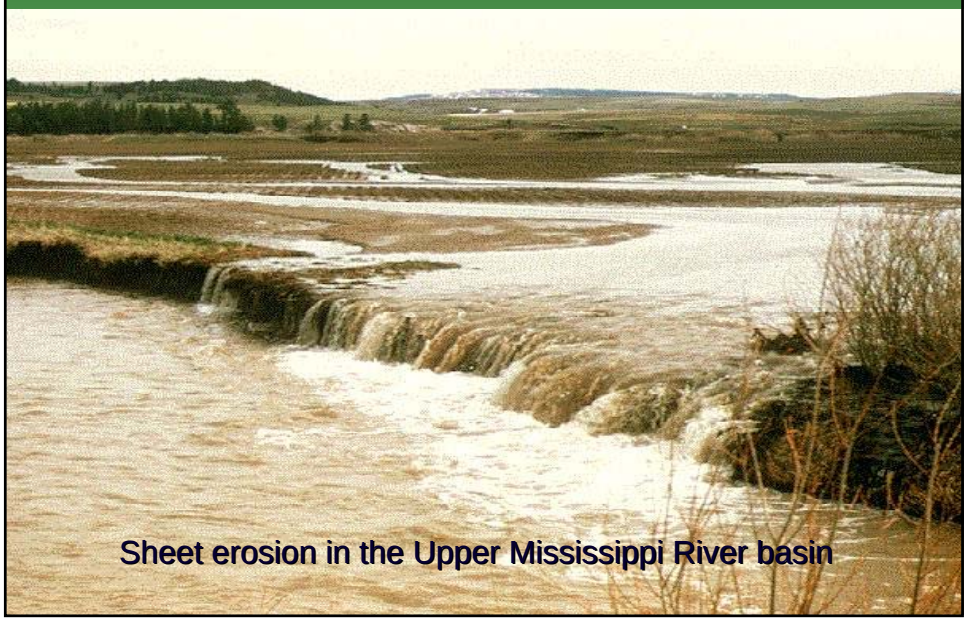
South Korea

Total rainfall of Typhoon Maemi from 9/8/2003 to 9/13/2003)



Mangun mountain, South Korea

Upland Erosion (continued)



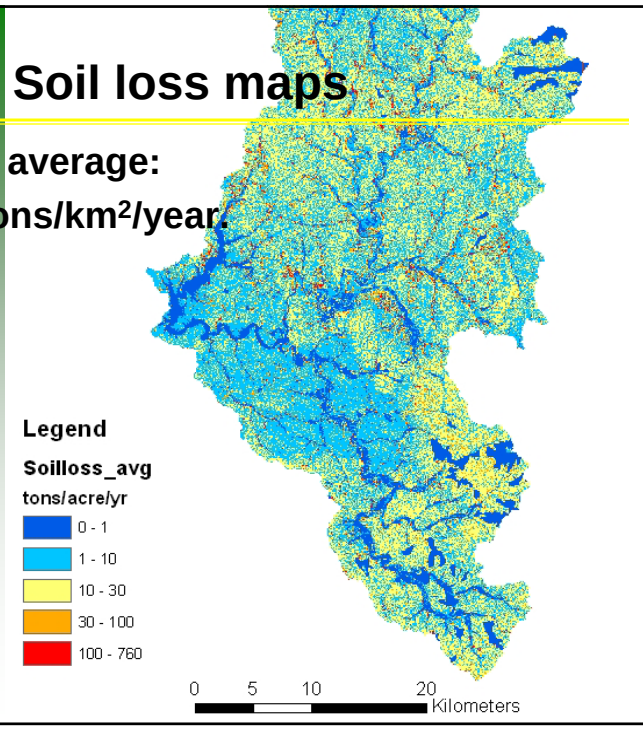
Sheet erosion in the Upper Mississippi River basin

Crop field area of the Imha watershed, S.K.

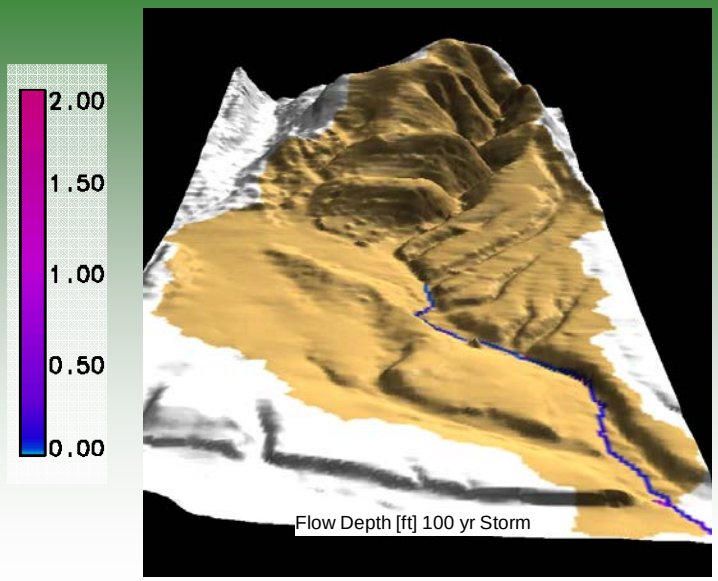
Soil loss maps

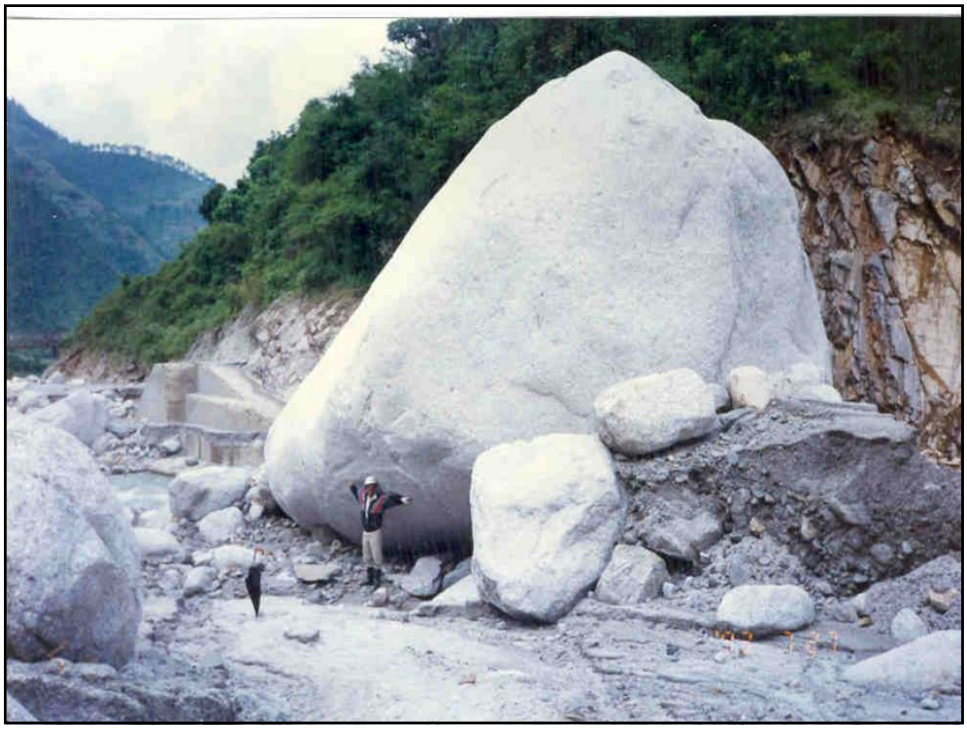
Annual average:

3,450 tons/km^2/year.



CSU Watershed Model TREX






Tala HE Project


Upland Erosion of the Loess Plateau
of the Yellow River Basin

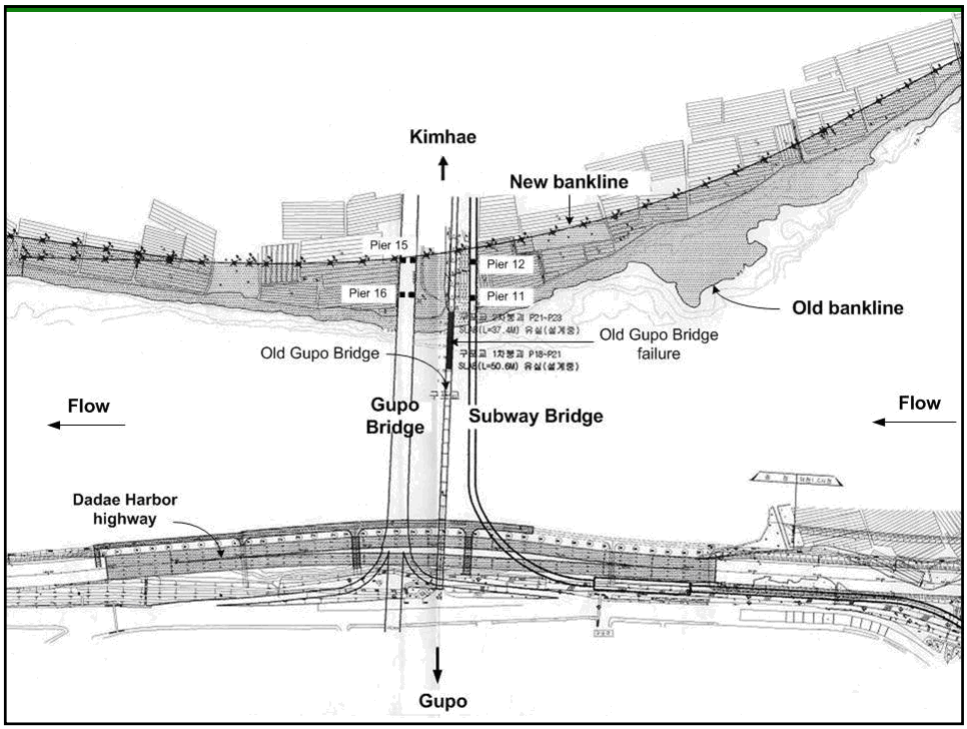
3. Riverbed Degradation

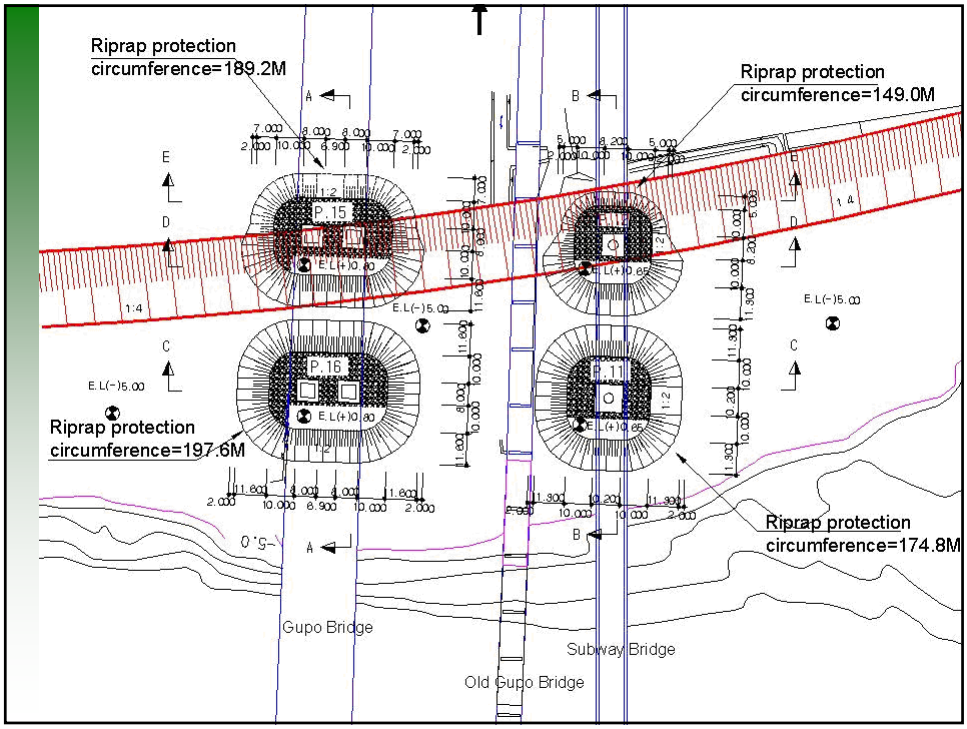
Channel Sediment Sources


AMERICAN

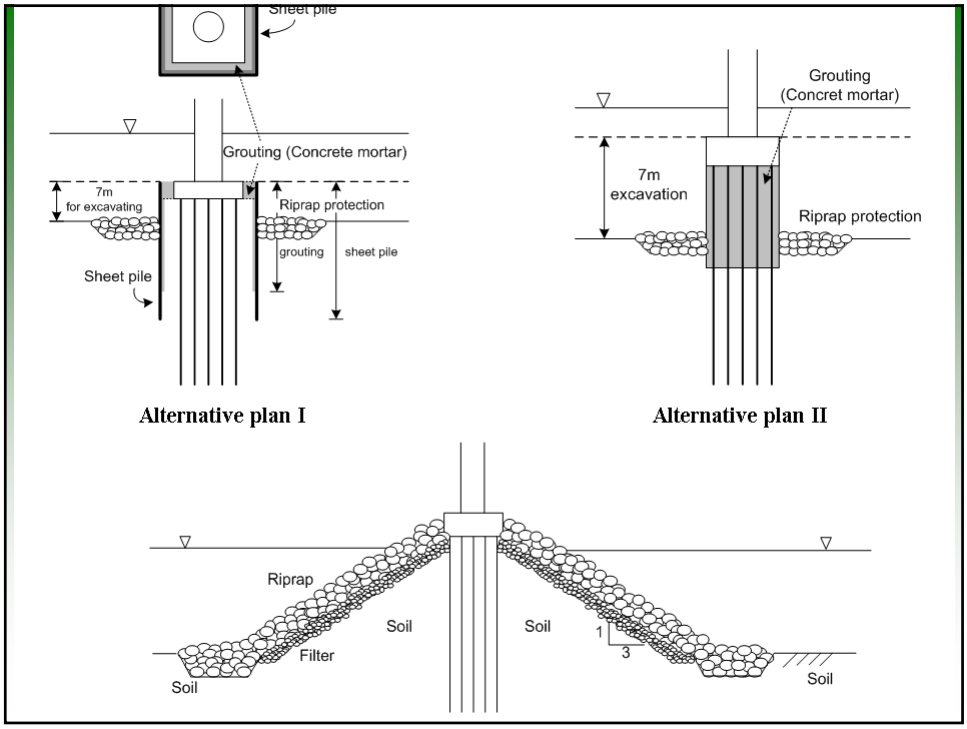

Nakdong River and NREB
Unsteady modeling for the upstream of NREB
Nakdong River
Gupo bridge
Pusan city
NREB


P10


Kimhae
New bankline
Pier 15
Pier 12
Pier 16
Pier 11
Old bankline
Old Gupo Bridge
failure
Old Gupo Bridge
Flow
Gupo
Bridge
Subway Bridge
Flow
Dadae Harbor
highway
Gupo


Riprap protection
circumference=189.2M
Riprap protection
circumference=149.0M
Riprap protection
circumference=197.6M
Riprap protection
circumference=174.8M
P.15
P.16
P.11
E.L(+)0.80
E.L(+)0.65
E.L(-)5.00
Gupo Bridge
Subway Bridge
Old Gupo Bridge


P15


Sheet pile
Grouting (Concrete mortar)
7m
for excavating
Riprap protection
grouting
sheet pile
Sheet pile
Alternative plan I
Grouting
(Concret mortar)
7m
excavation
Riprap protection
Alternative plan II
Riprap
Soil
Soil
Filter
Soil
1
3
Soil

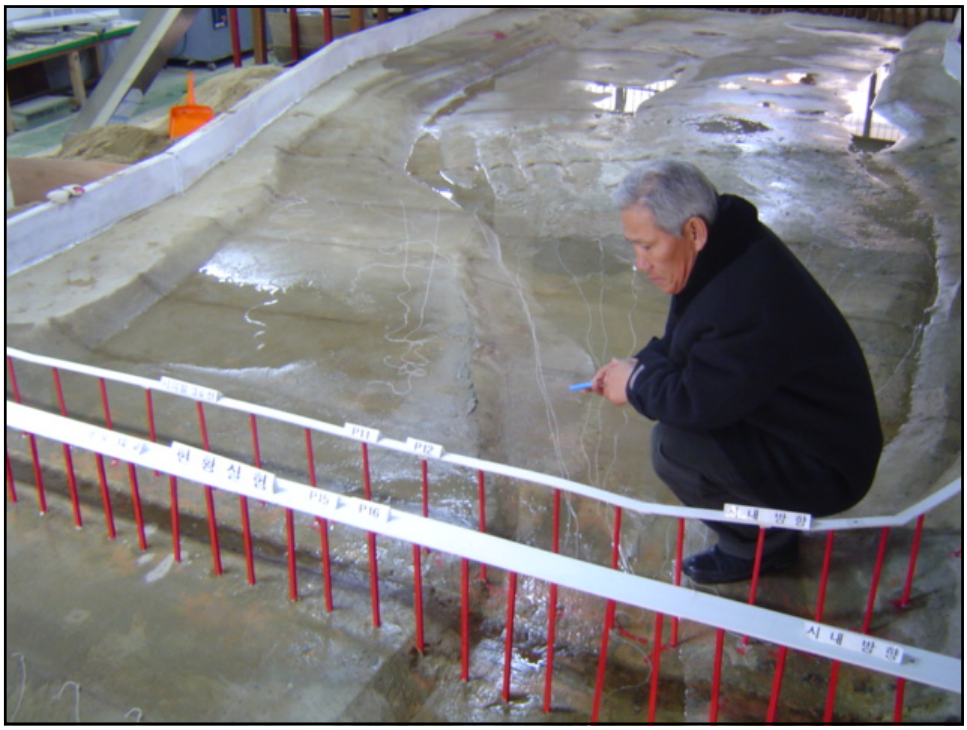
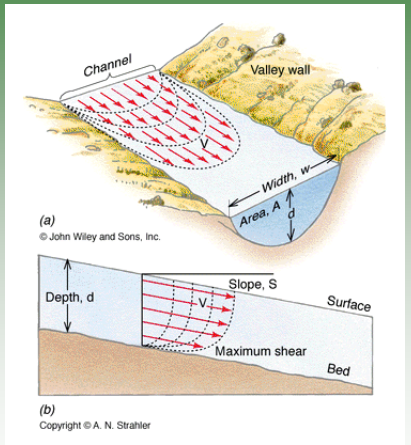


Figure 12. Experiment results with synthetic filters

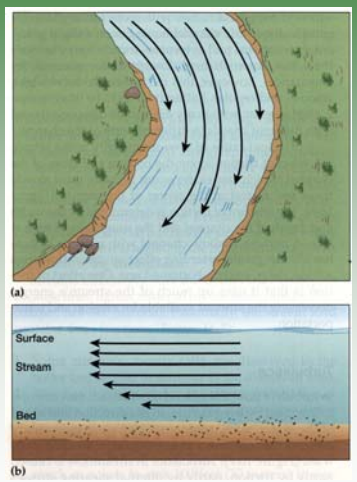
Figure 14. Gupo and Subway Bridge Piers before and after retrofitting construction

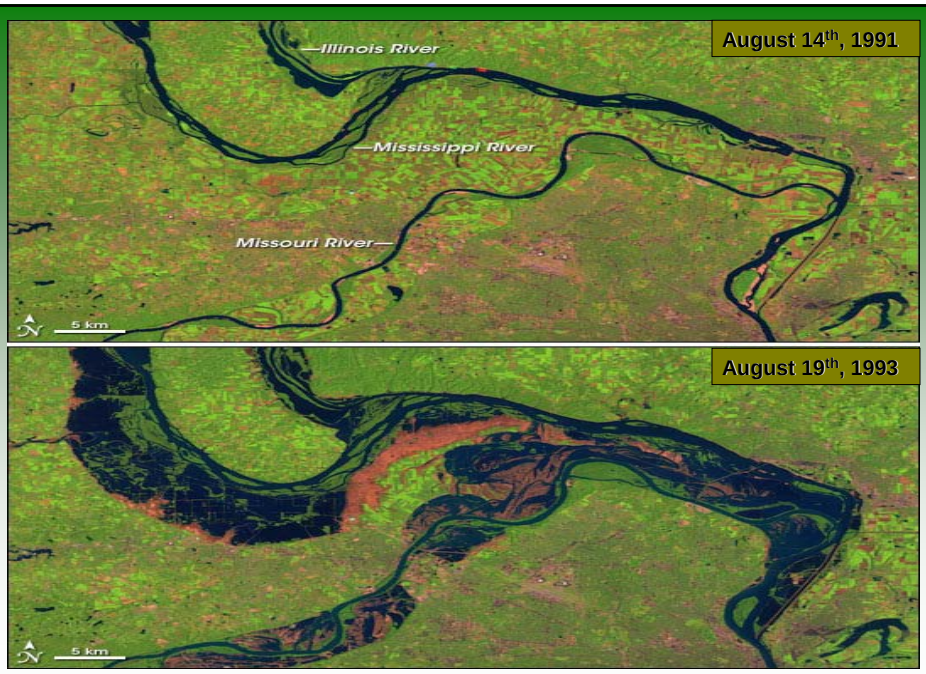
4. River Engineering

Logarithmic Velocity Profile



$$\frac{v_x}{u_*} = \frac{1}{\kappa} \ln \frac{z}{z_o}$$

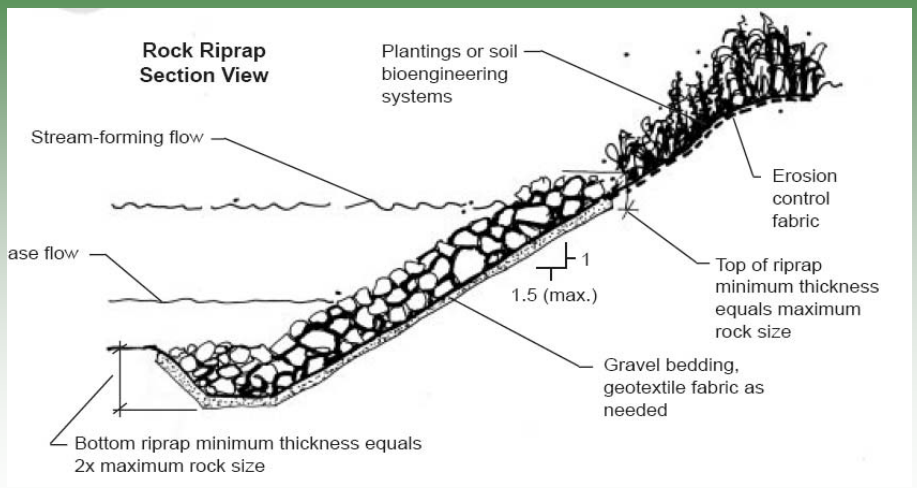




Aerial view of the 1993 Mississippi Flood

- Levee failure during the 1993 flood event

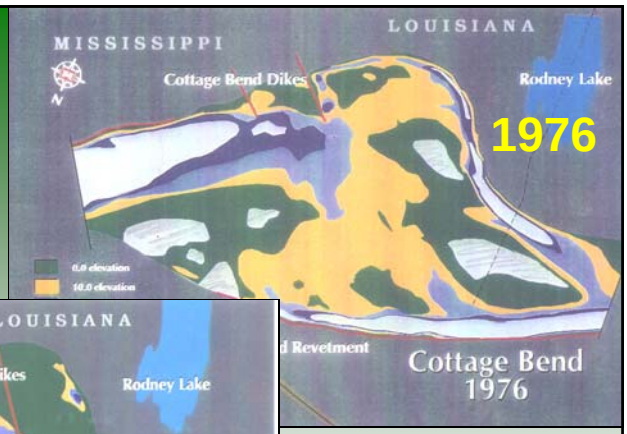
Riprap Design

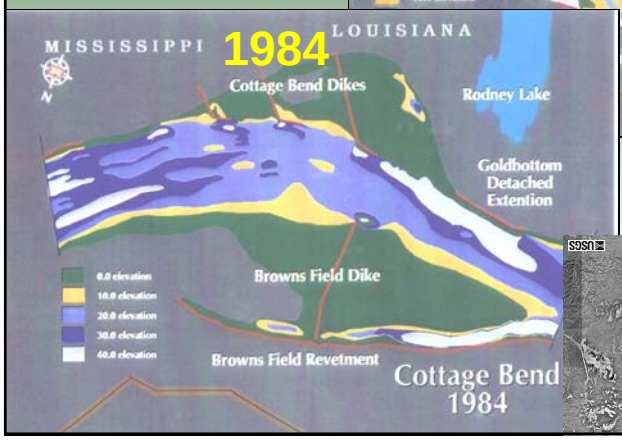


PGC2

Dykes

Cottage Bend

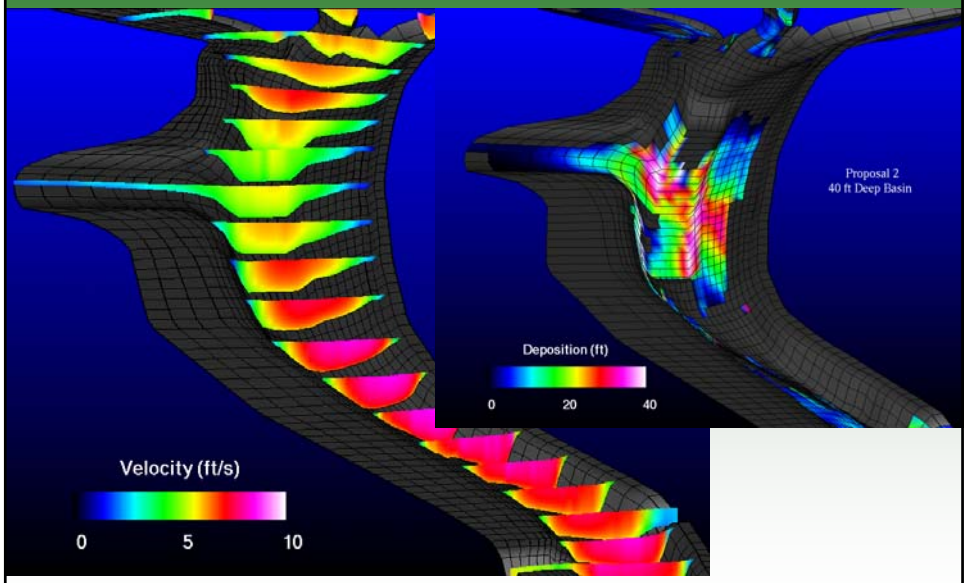




Slide 63

PGC2 Typical dike construction on the Mississippi River
Phil Combs, 8/29/2002

Example 3-D Model Mississippi

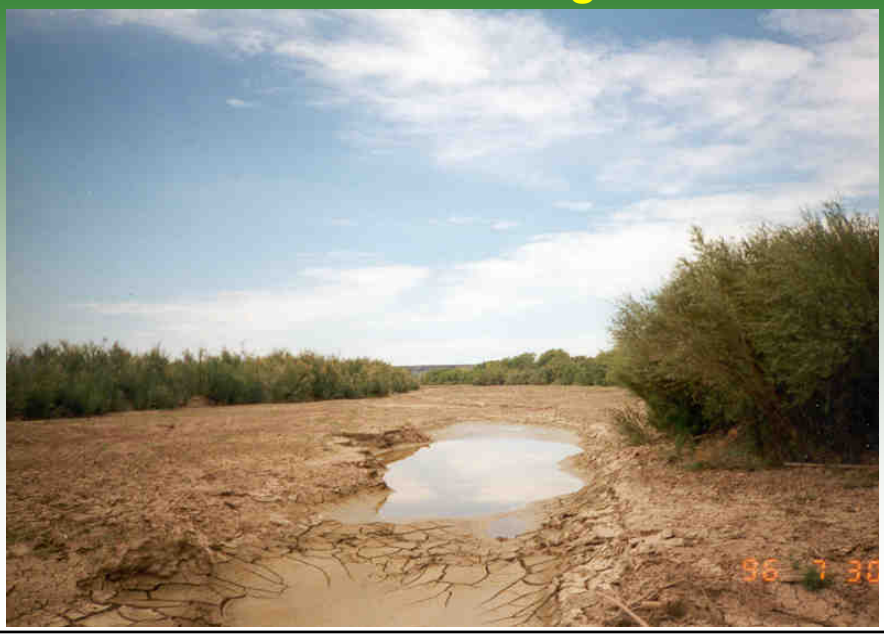


Locks and Dams

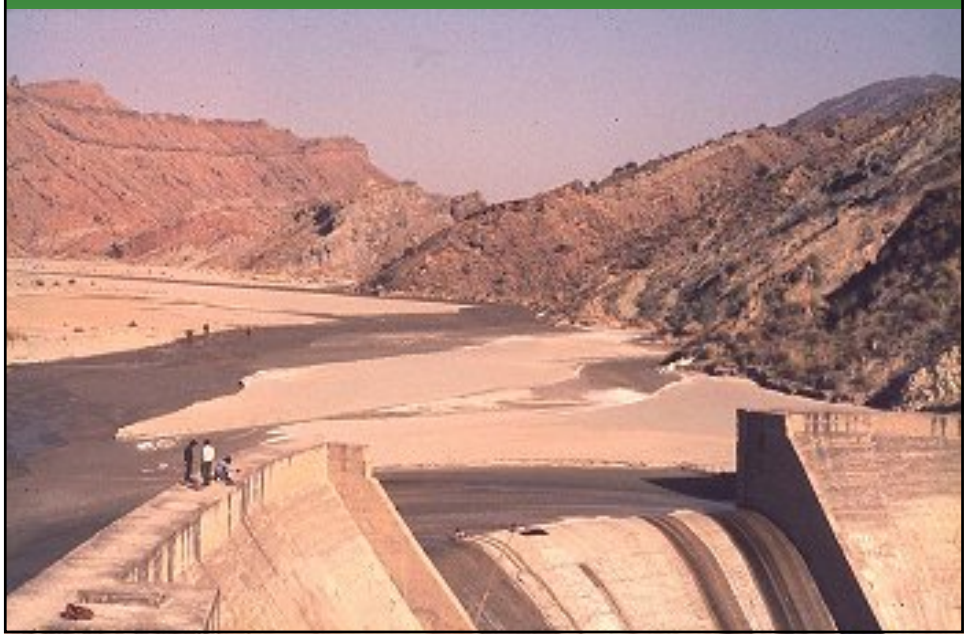

Sedimentation Problems Can Be Solved

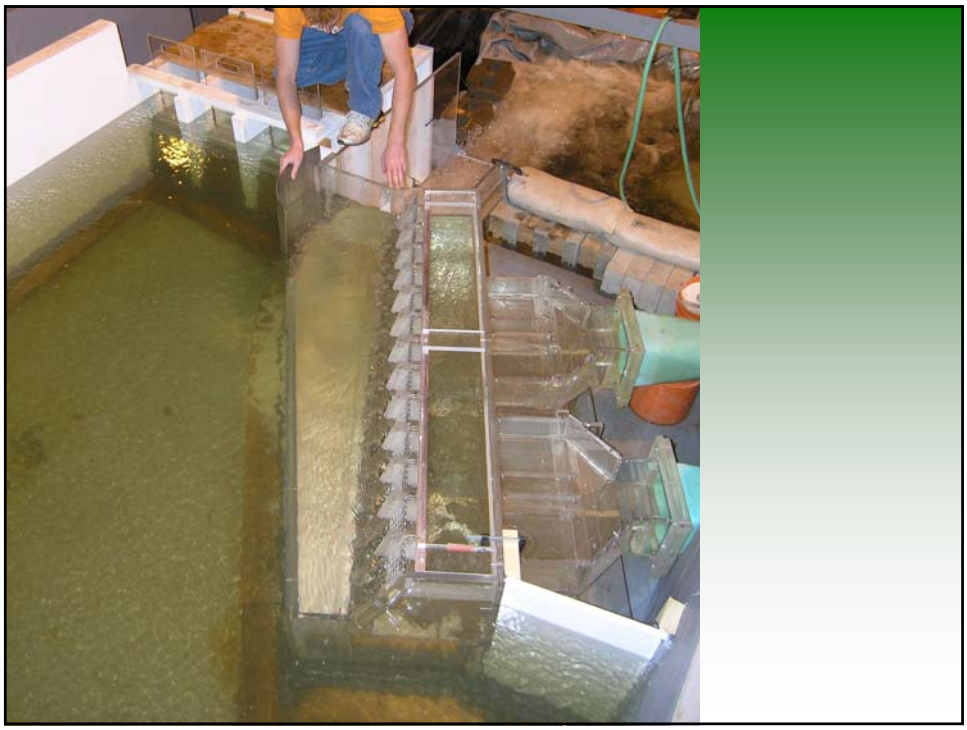
5. Sedimentation Problems

Sediment Plug



Bengal and Indus





Sediment Flushing

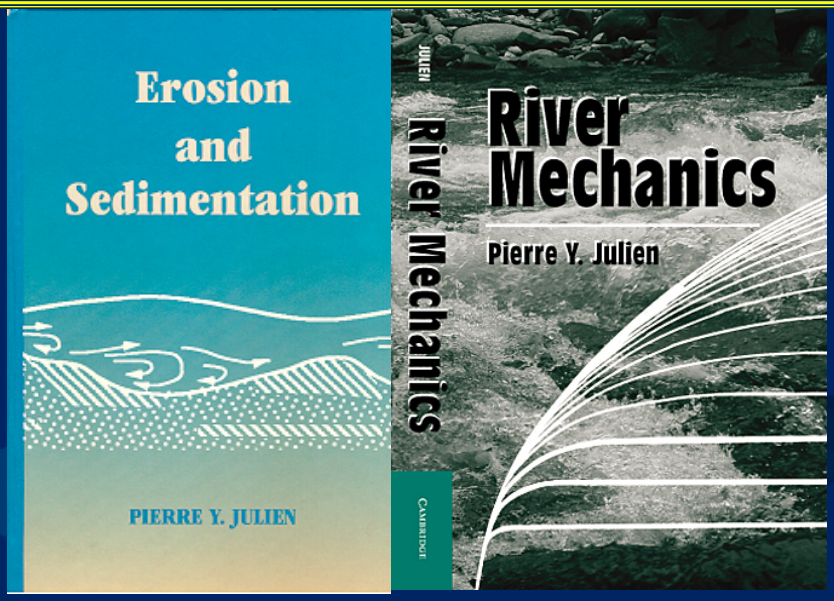
Nakdong River Estuary Barrage

6. Case Study in Venezuela: Flashflood Impact

Los Corales

Los Corales

Erosion and River Mechanics Textbooks



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- Dr. Chris Thornton (CSU)
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