

# The Impact of Sedimentation

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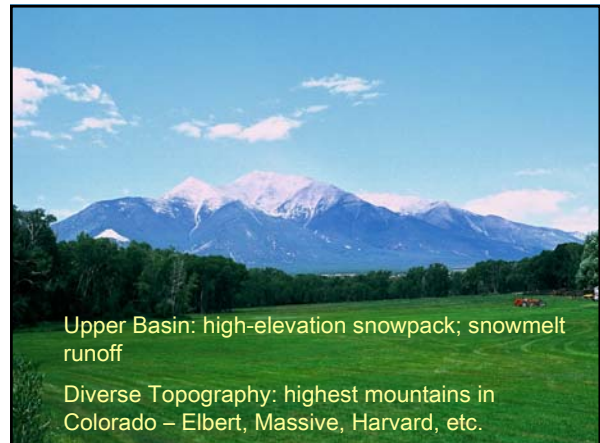
UNITEN-TNBR Short Course  
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## Objectives

Brief overview of Erosion Processes,  
Sediment Sources and Sediment Impact:

1. Upland Sediment Sources;
2. Instream Sediment Sources;
3. Sediment Problems (Examples);
4. Case Studies: Venezuela;
5. Case Studies: Haiti.

## 1. Upland Sediment Sources

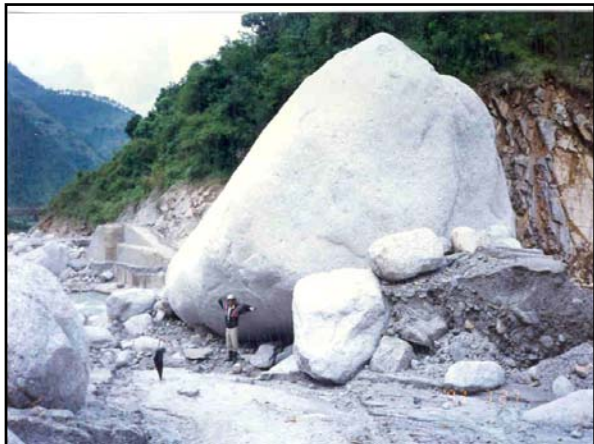


### Lesser Himalayan Area



Gullying on valley wall slopes along the Duth Kosi, in the Lesser Himalaya.





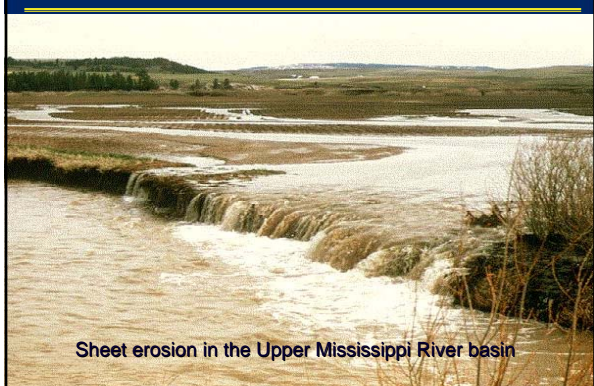
**Mangun mountain, South Korea**



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

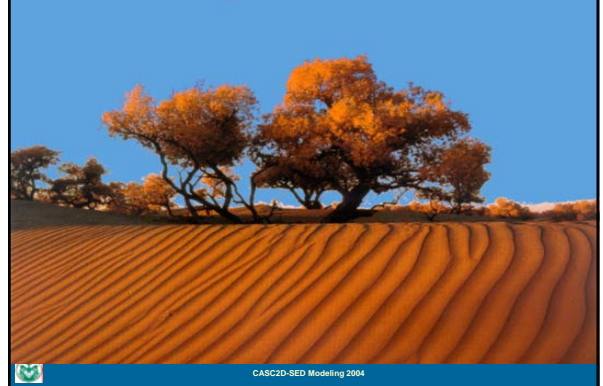


**Upland Erosion (continued)**



Sheet erosion in the Upper Mississippi River basin

**Wind erosion**

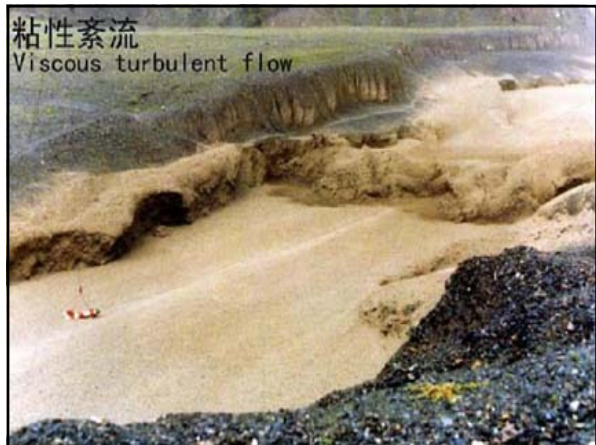


CASC2D-SED Modeling 2004



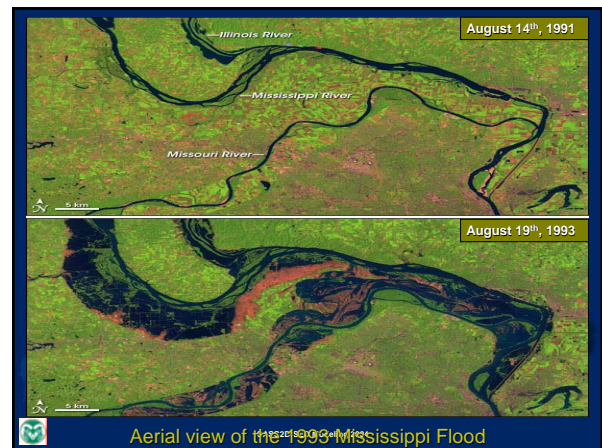


## 2. Instream Sediment Sources

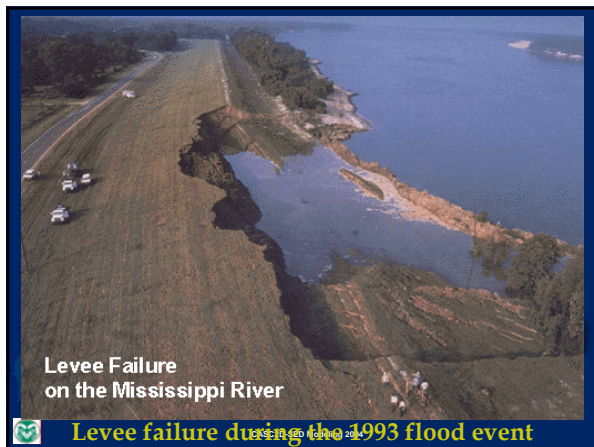




## Channel Sediment Sources



Aerial view of the 1993 Mississippi Flood



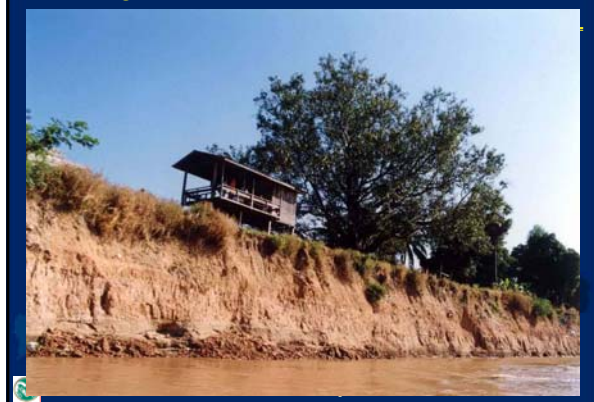
Levee Failure  
on the Mississippi River

Levee failure during the 1993 flood event

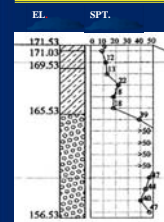


CASC2D-SED Modeling 2004

## Mekong Riverbank Erosion around Vientiane, Laos



## Wat Sibounheuang Site, Mekong River



LEGEND  
 SILTY CLAY  
 SANDY SILT  
 CLAYEY SANDY GRAVEL



Typical layer	Depth(m)	Unit Weight (kN/m <sup>3</sup> )	Friction Angle (°)	Cohesion (kP)	Permeability(c m/s)
SANDY SILT	3-4	2.08	28.4 <sup>(6.8)</sup>	13.9 <sup>(3)</sup>	7.9x10 <sup>-7</sup>
	5-6	2.04	29.0	16.3	
CAYEY SANDY GRAVEL	7.5-10	-	-	-	2.0x10 <sup>-5</sup>

CASC2D-SED Modeling 2004

### 3. Sediment Problems (Examples)

#### Impact of Sedimentation



#### Imha reservoir

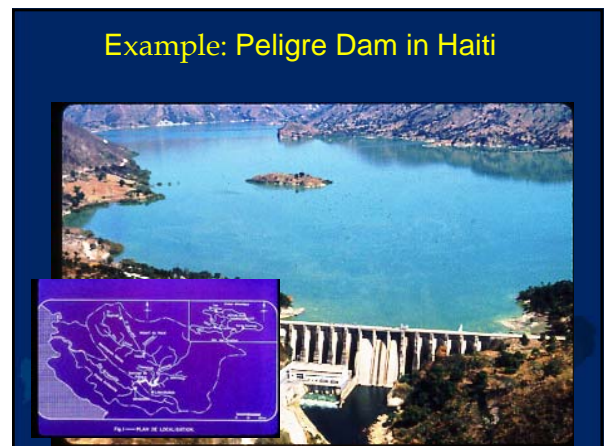
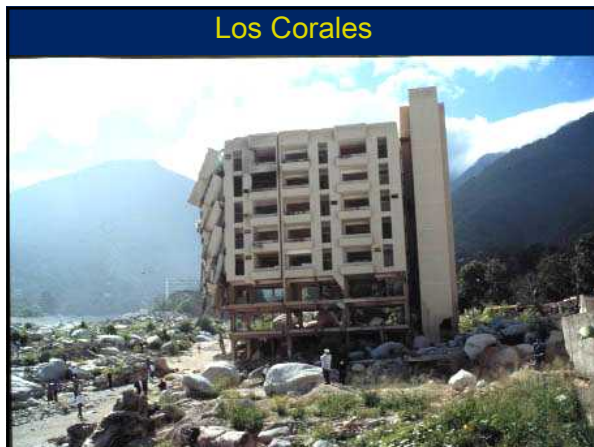






## 4. Case Studies: Sediment Impact in Venezuela









## Demographic Expansion



## Lowland Slash and Burn



## Subsistence Farming



## Farming Uphill



## Farming Hilltops?



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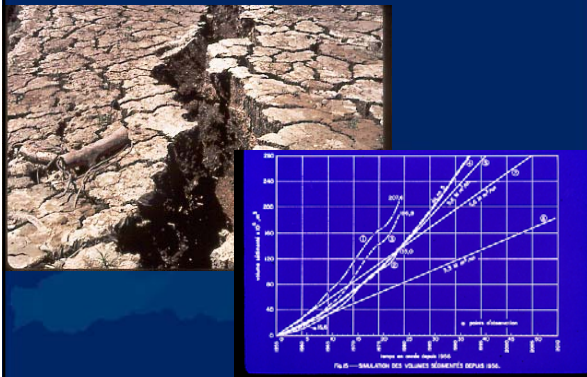
## Watershed Deforestation



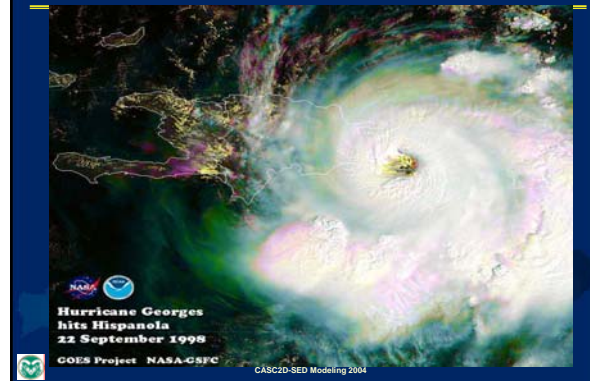
## Haiti River



## Peligre Dam (sedimentation)



## Hurricane Impact



## Emergency Spillway Operation



## Flood Damages



## Citizens Blame their Government



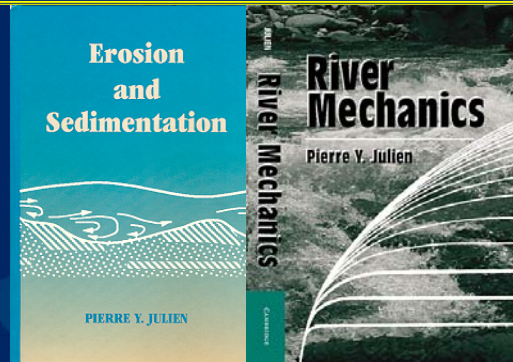
## Could this be avoided?



## Acknowledgments

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Dr. Claudia Leon, RTI

## Erosion and River Mechanics Textbooks



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THANK YOU  
for your  
attention!