Stehekin River Corridor

River Mechanics Concepts

Stream Dynamics

Wood Debris & Sediment Impacts

Management Options

By

Dr. Donald R. Reichmuth, P.E.

President, Geomax, P.C.

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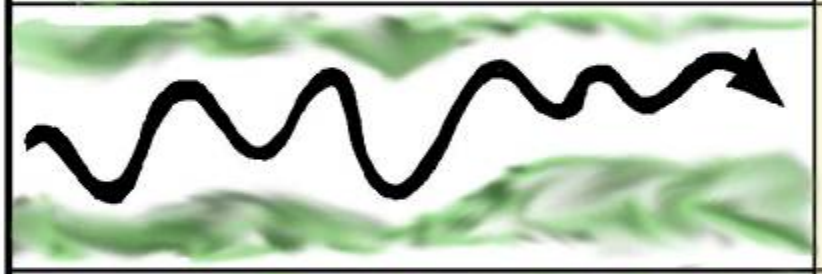
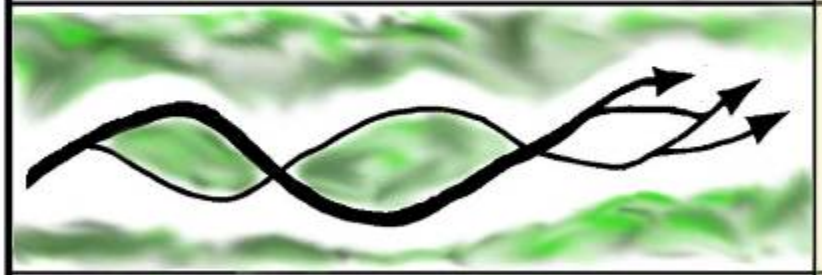
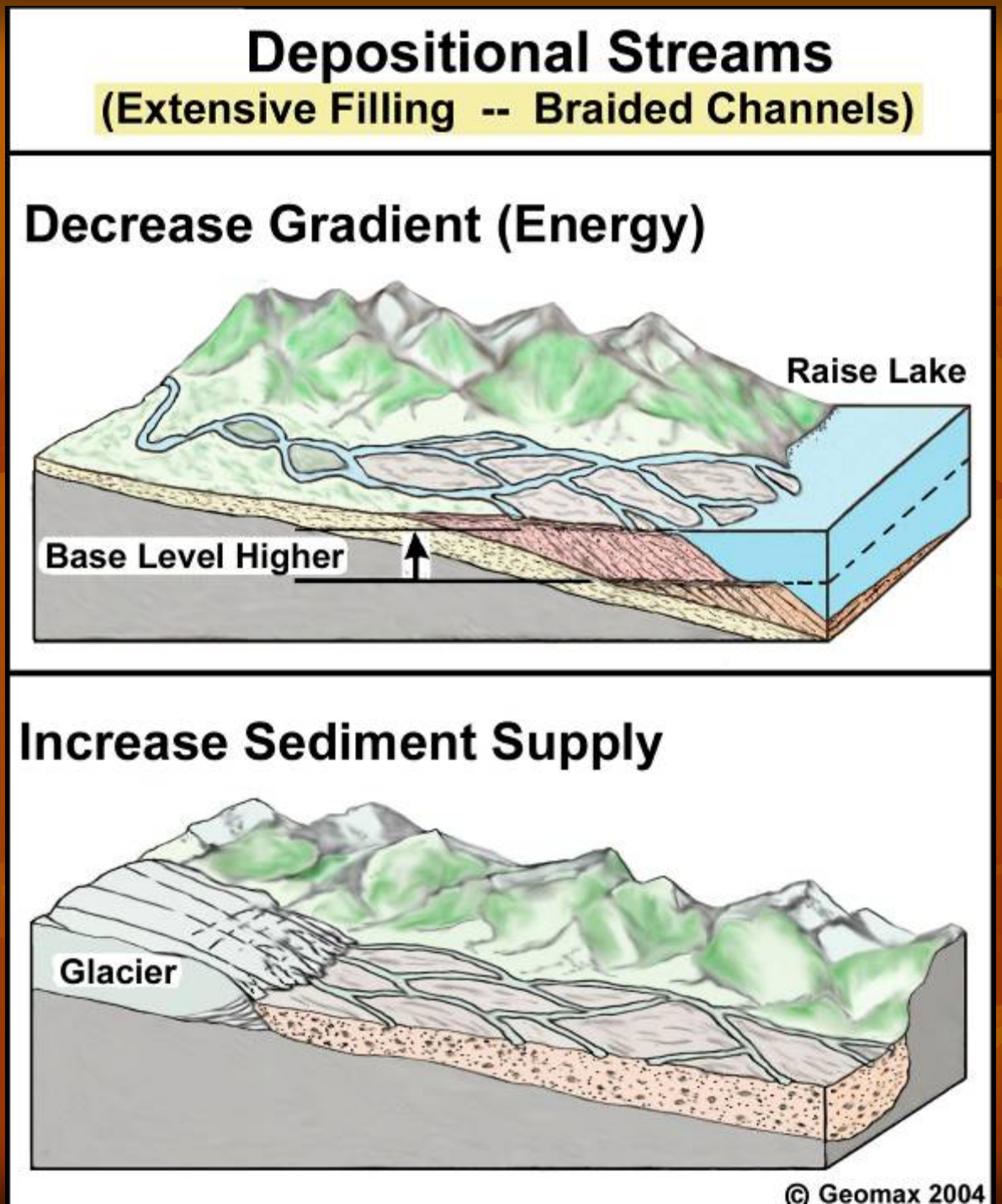
Stream Characteristics

Diagnostic Stream Pattern	Vertical Behavior	Horizontal Behavior	Stream Response
	Erosional (Degrading)	Structurally Controlled "V" Shaped Valleys Minor Shifting	More Erosional Increase Peak Flows
	Stable	Flat-Bottomed Valleys Slowly Shifting Meanders	Increase Gradient (Energy)
	Transitional (Slight Filling)	Double Channels One Dominant Short Reach Stable Islands	Decrease Sediment Supply
	Depositional (Extensive Filling)	Flat-Bottomed Valleys Shallow, Unstable Braided Channels	

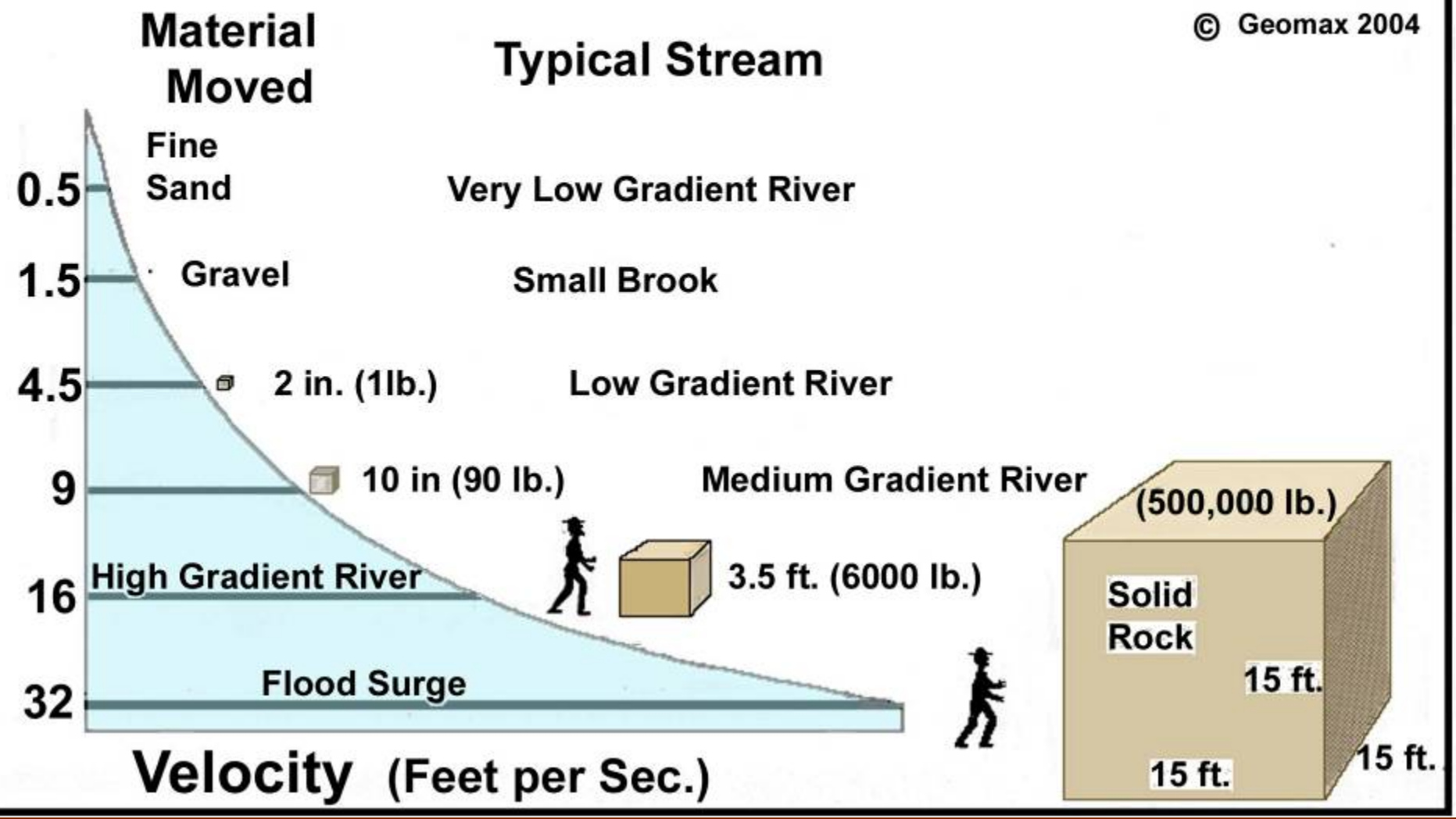


Deposition

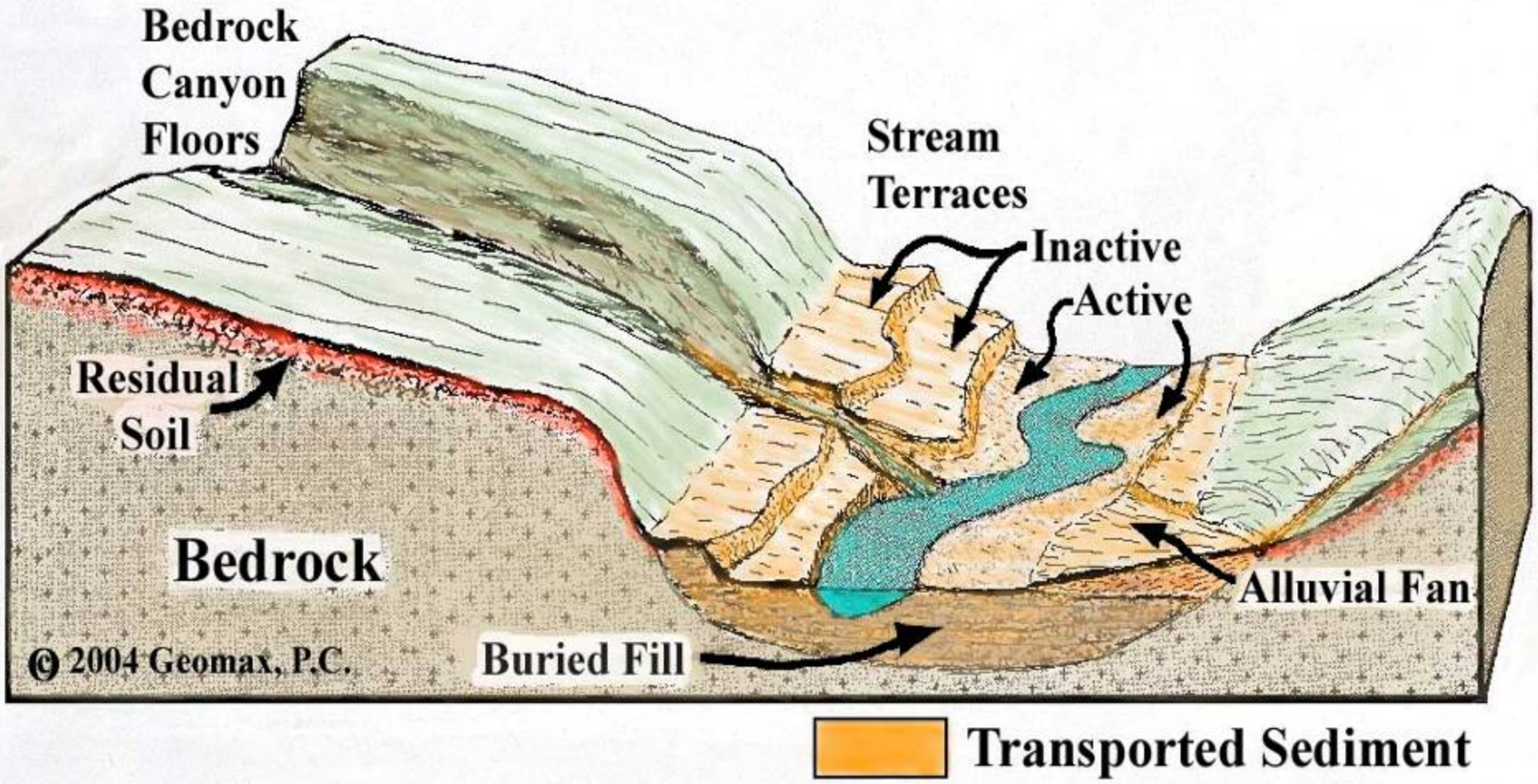
Some Common Causes

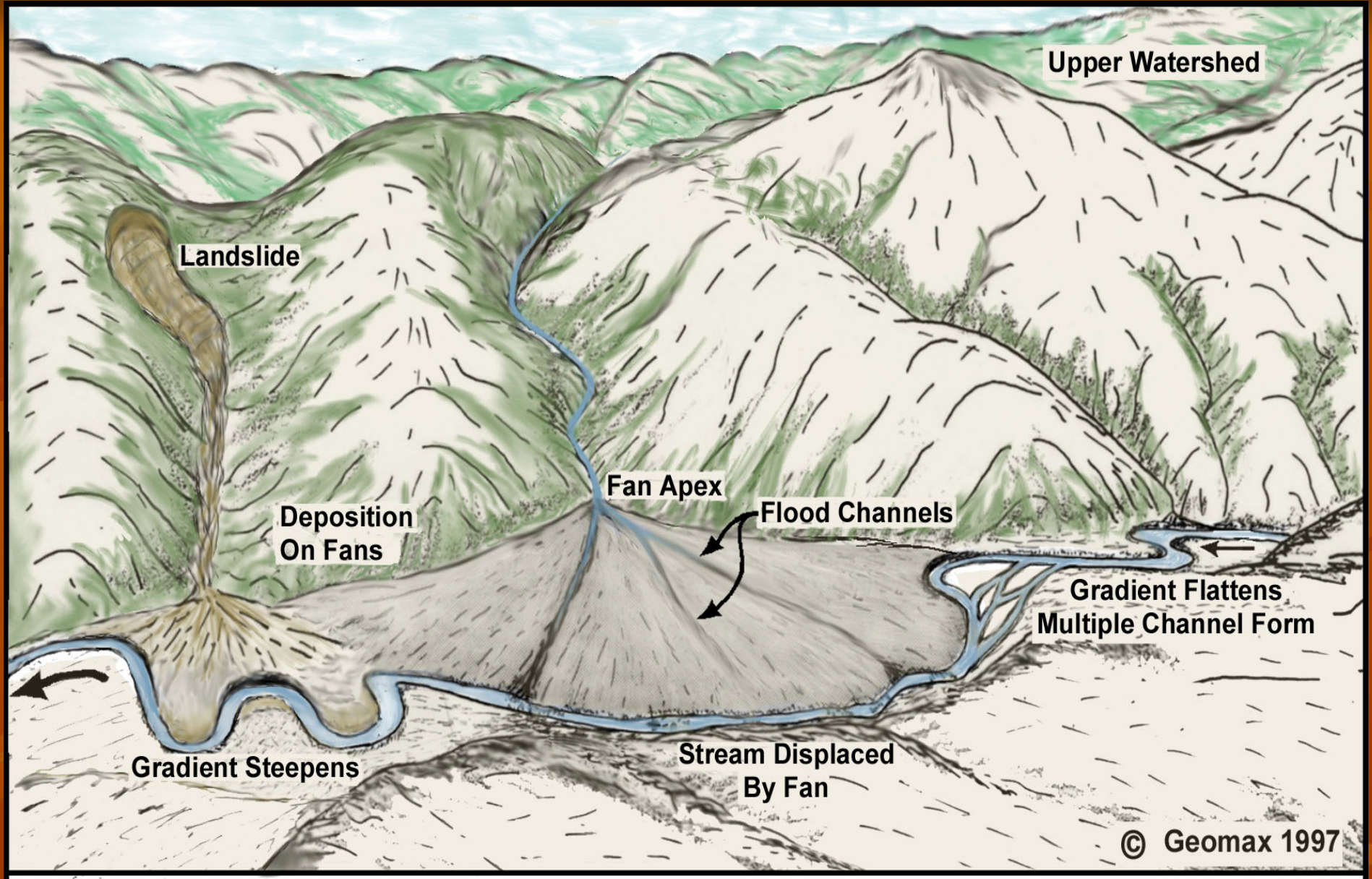
Sediment Transport

(Highly Sensitive To Local Flow Velocity (Turbulence)



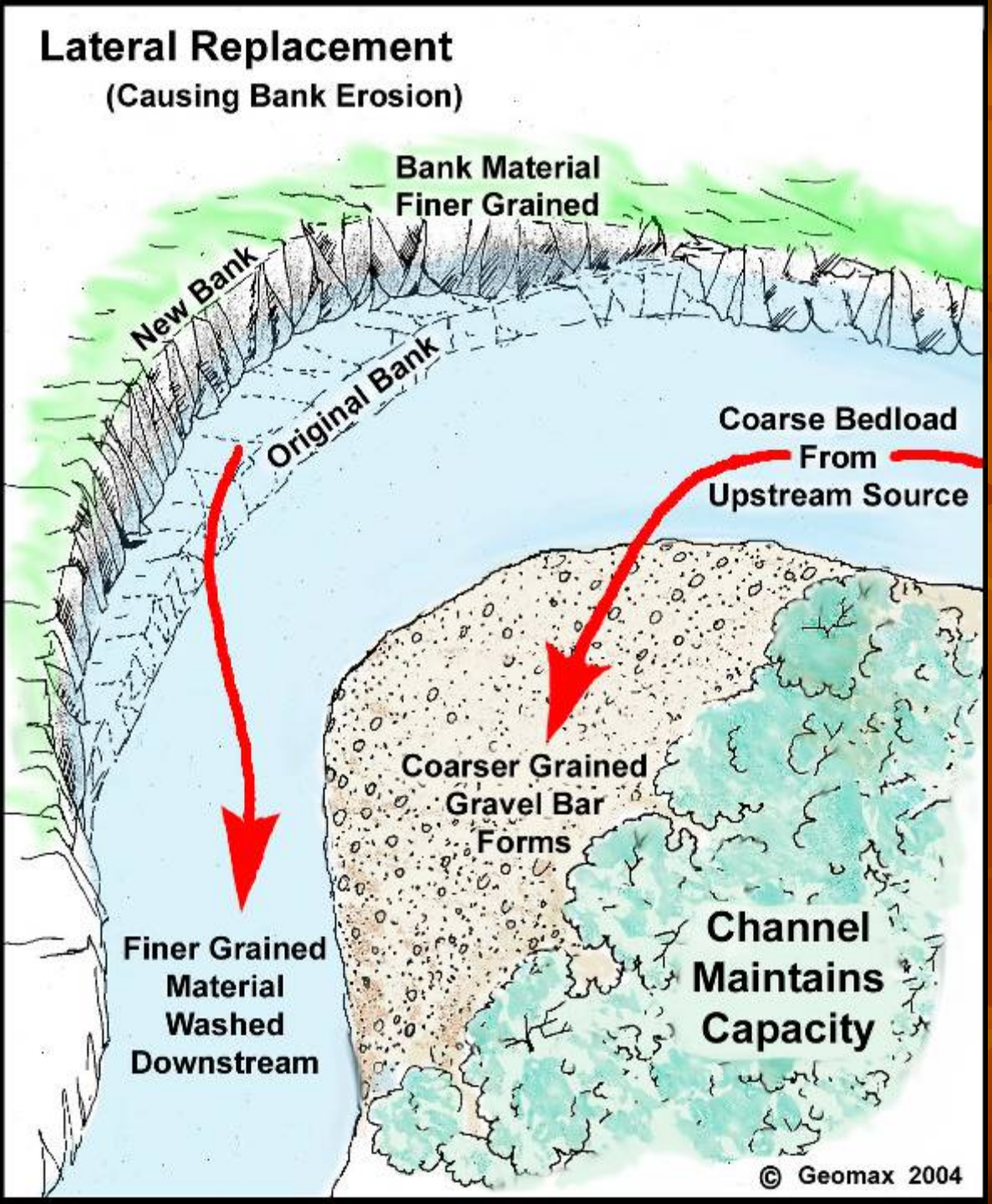
Surface Material Types





Alluvial Fan Development

(Sediment Loads Exceed Stream Transport Potential)

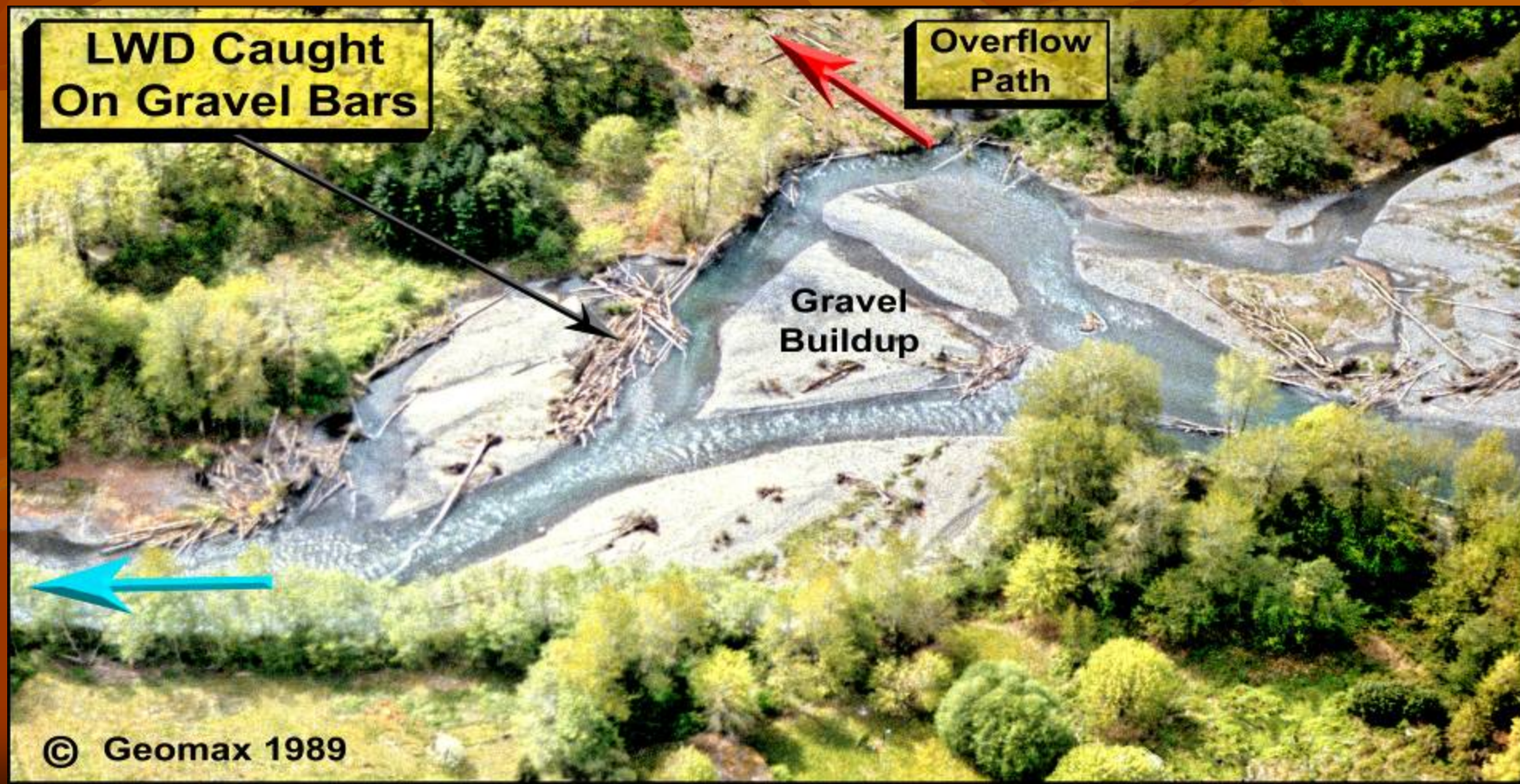


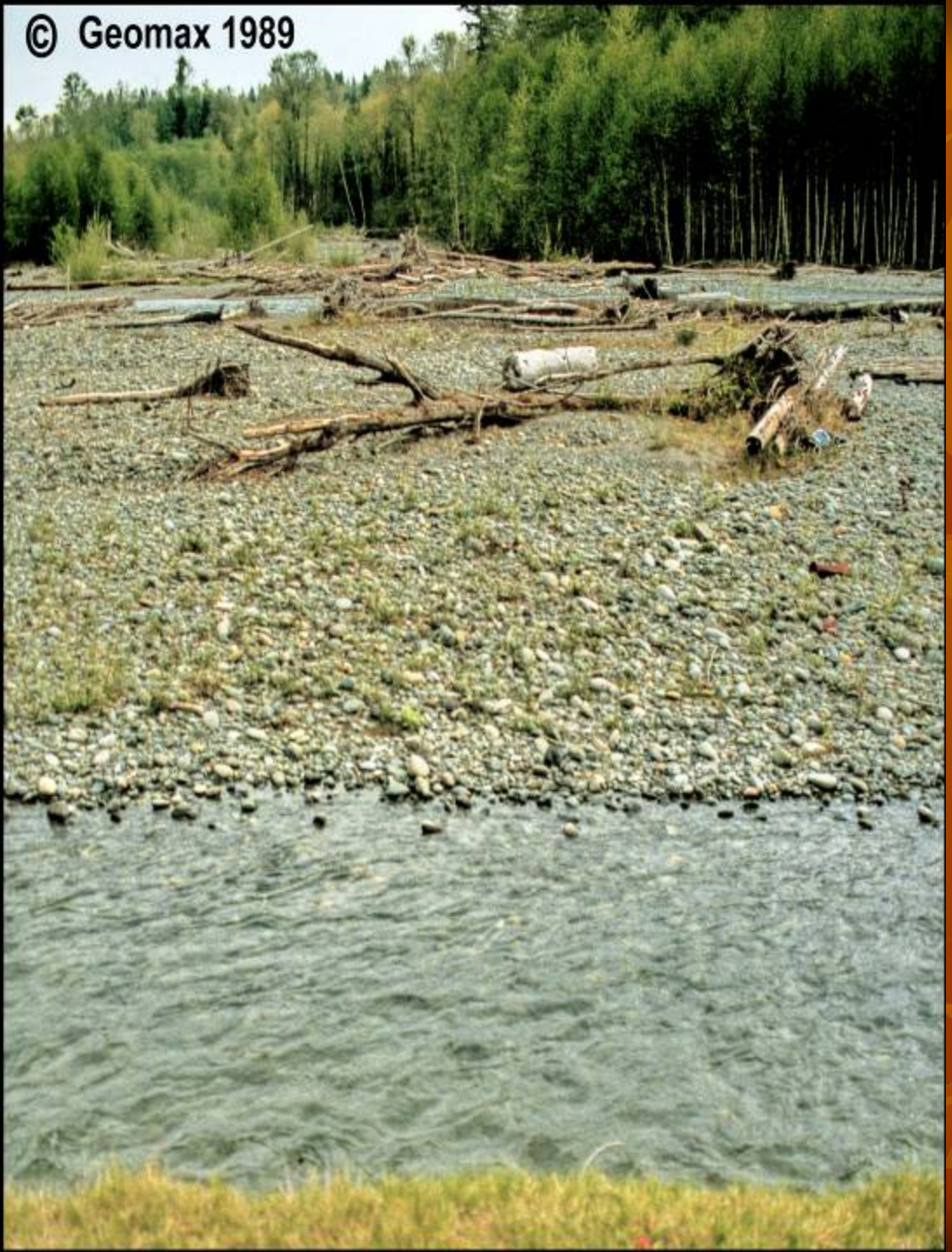
Sediment Deposition

Potential Impacts

Lateral Replacement Example

Channel Carries Considerable Large Woody Debris (LWD) & Bedload





Log Jams

Large Woody Debris (LWD)

Provides Stream Nutrients & Cover

Types Of Log Jams

Snag Jams

LWD Catches On Obstruction

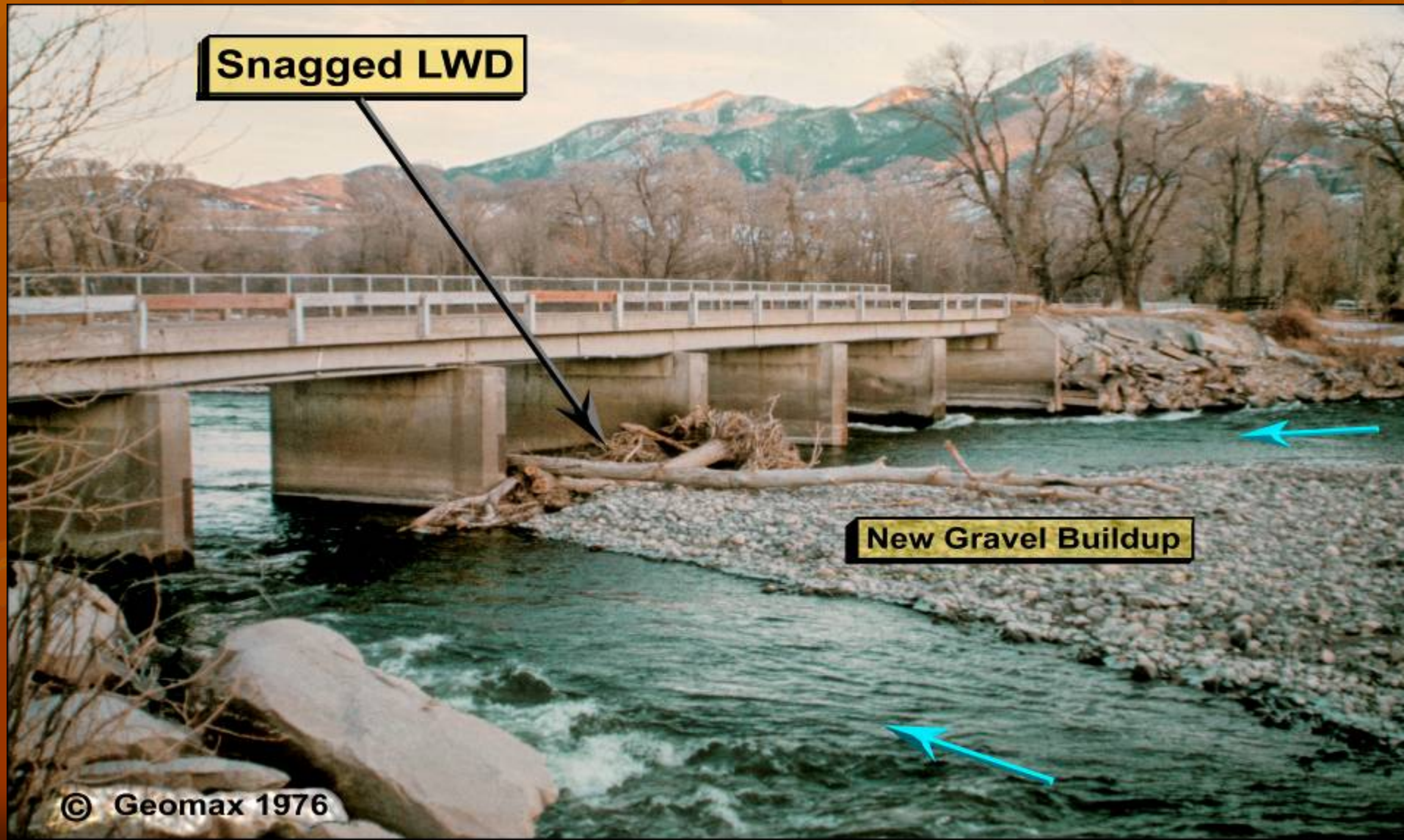
Span Jams

LWD Bridges Across Channel

Shoal Jams

LWD Catches On Shoaling Bed

Snag Jam
Causing New Gravel Bar



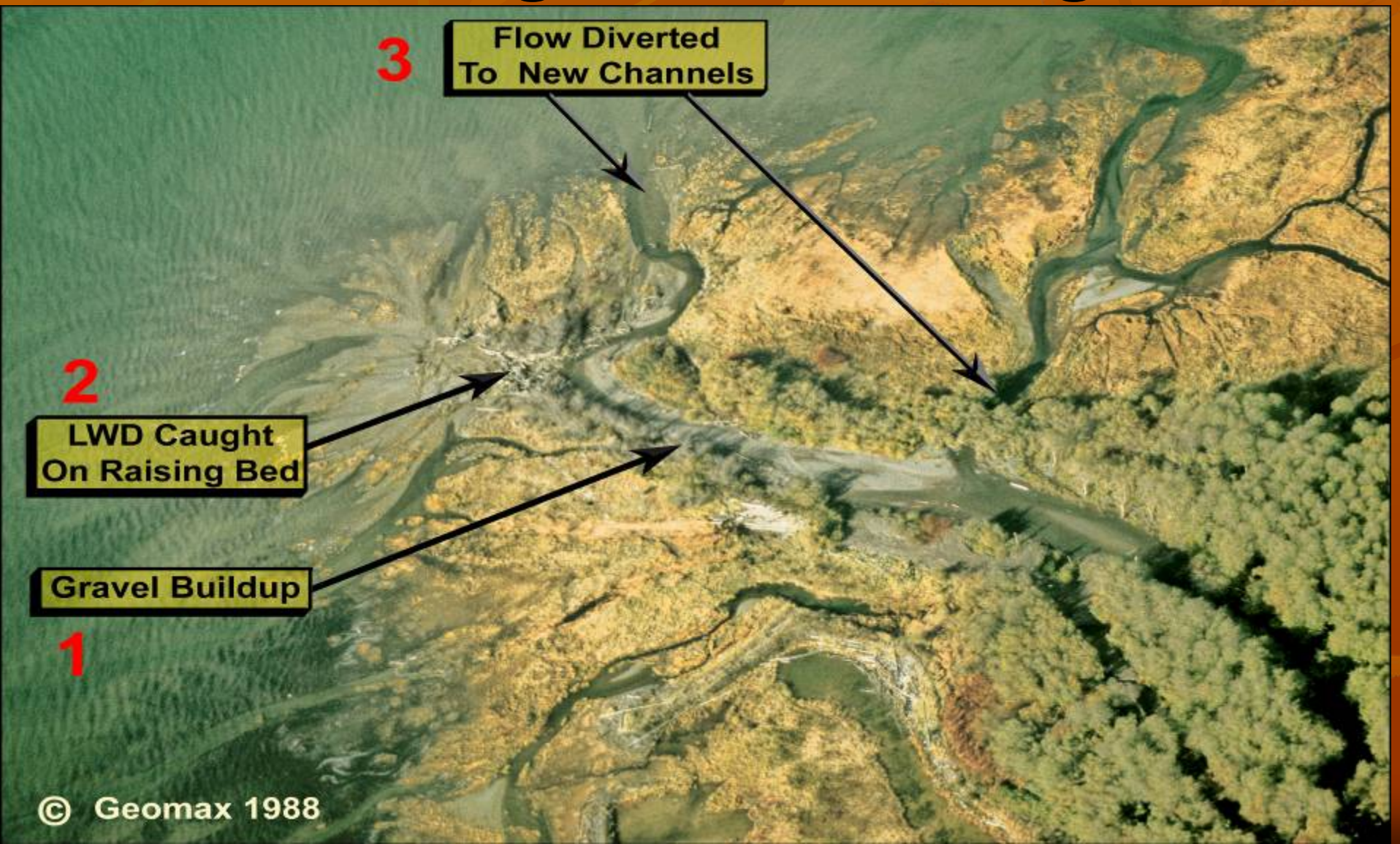
Snag Jam
Protects Island From Scour

Span Jam
Slows Flow Into Channel

Span Jam
Enlarging As More LWD Caught

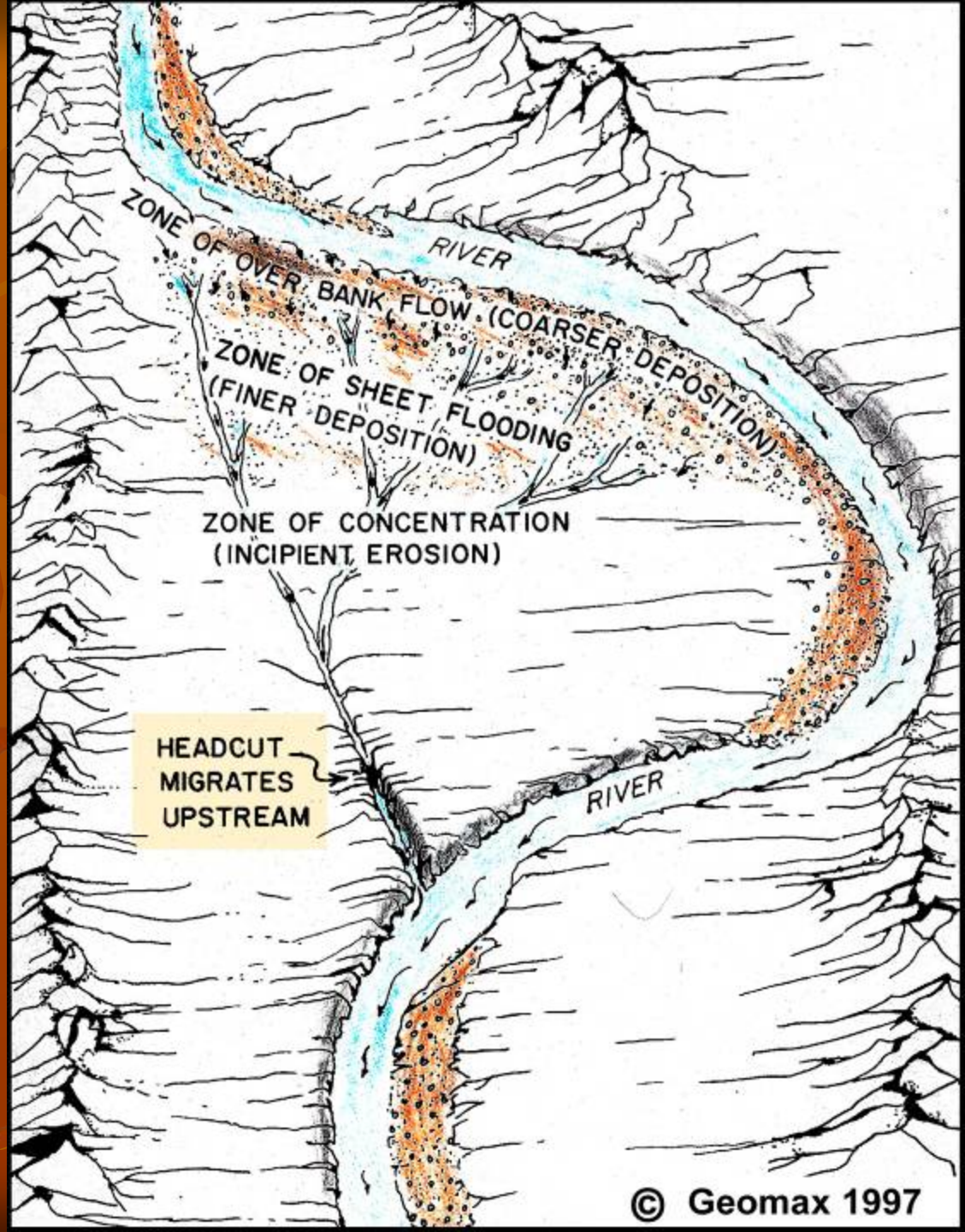
Shoal Jam
Causing Out-Of- Channel Flow

Shoal Jam
Causing Channel Change



Overland Flow

Management Considerations



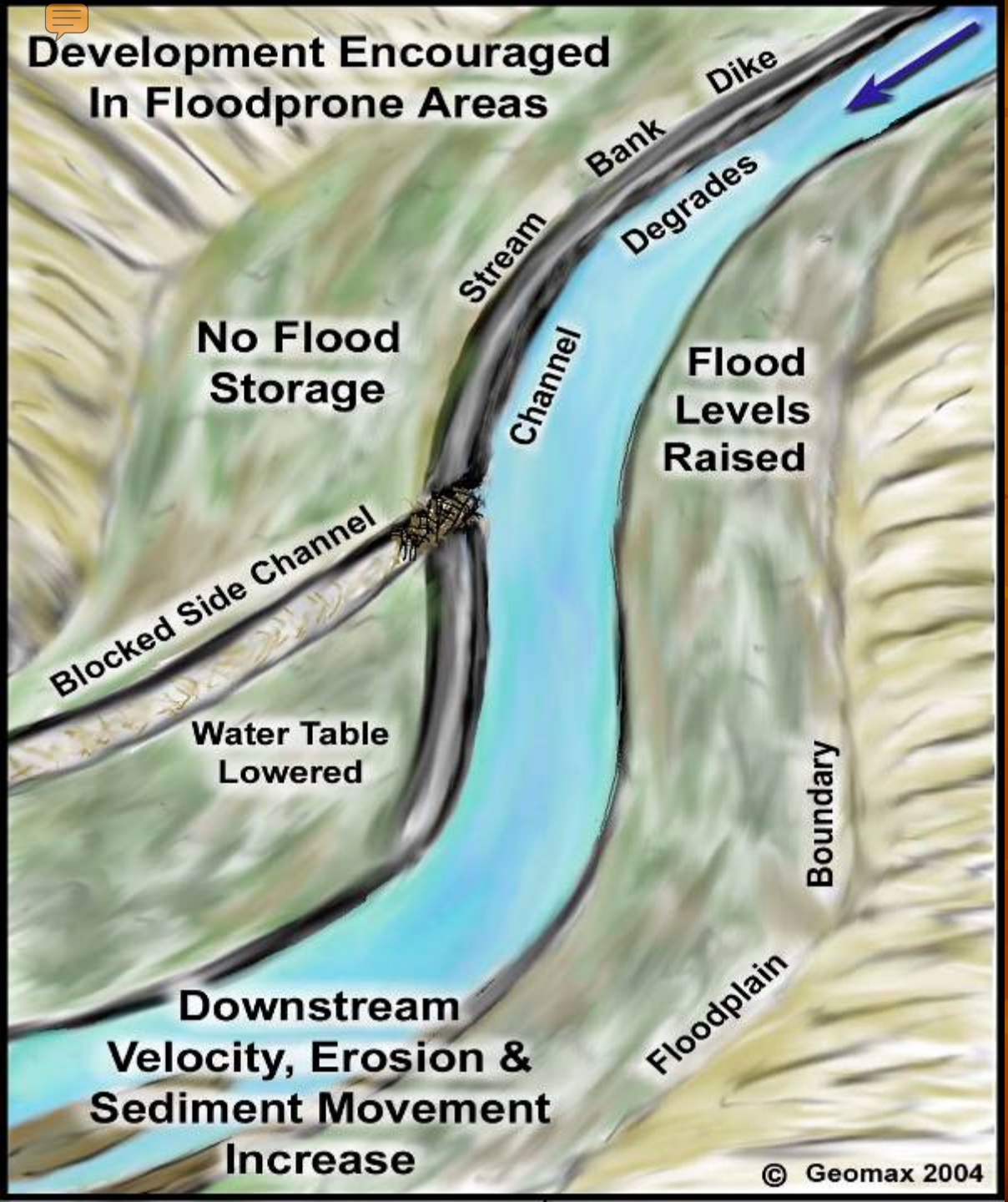
Overbank Flow

Shallow, Low Velocity Often Beneficial

Floodplain Management

Sheet Flow Is Manageable
Big Wood River Flood -- June 1986

Stream Corridor Management Philosophy



Quick Flush

Poor Management Technique

Shifts Problems To Others

Encourages Unsound Development

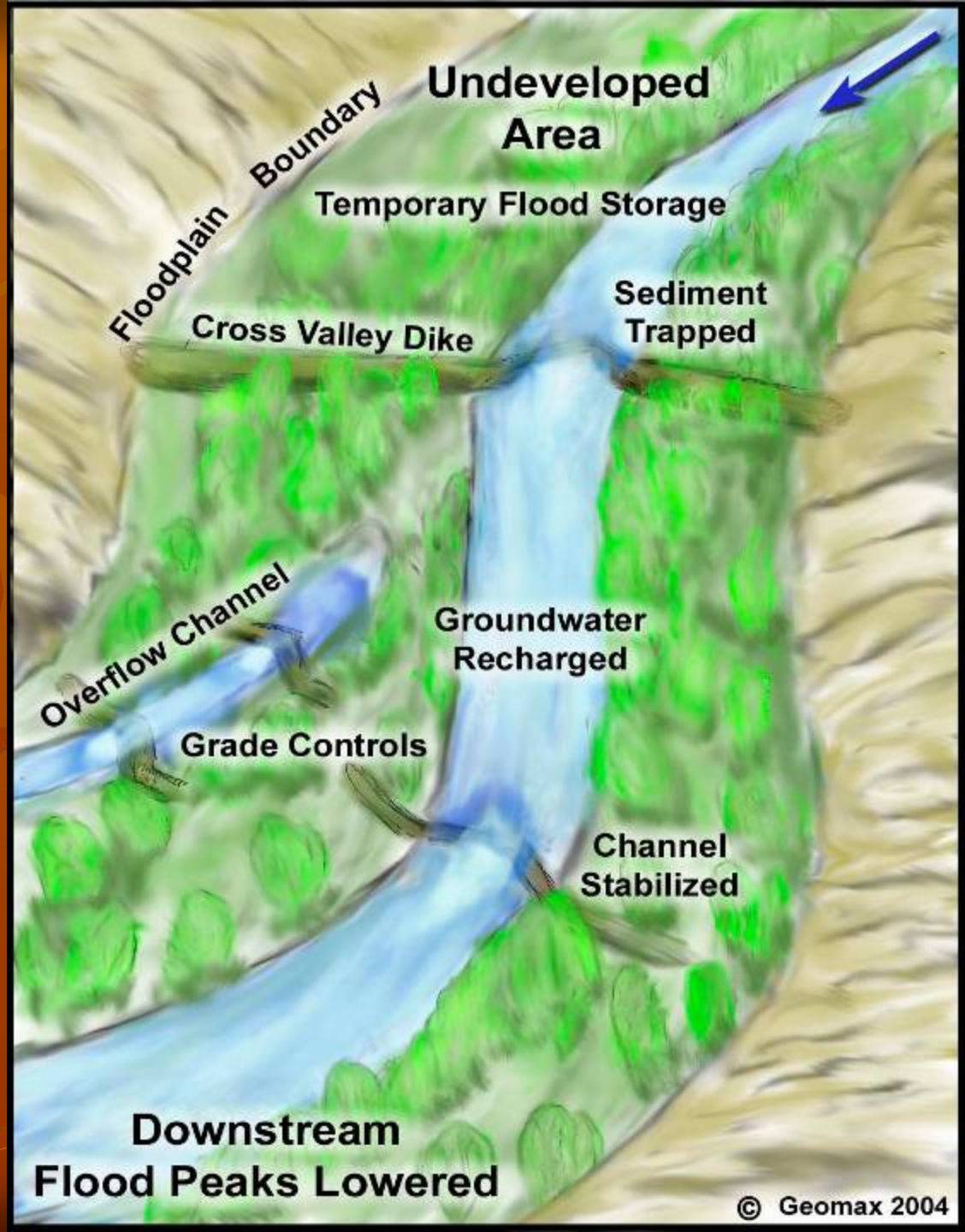
Floodplain Utilization

Good Management Technique

Helps Protect Downstream Reaches

Increases Base Flow

Encourages Sustainable Development



Long Range Floodplain Management Goals

Competing Approaches

Quick Flush

- Higher Downstream Flood Peaks
- Stream Channelized
- High Stream Velocities
- Heavy Bank Armoring
- Sediment Flushed Downstream
- Low Water Table
- Minimum Overbank Flow
- Floodplain Dryed
- Base Flow Diminished
- Sparce Floodplain Vegetation

Floodplain Utilization

- Lower Downstream Flood Peaks
- Stream Develops Pools & Riffles
- Moderates Stream Velocities
- Grade Control In Steep Sections
- Sediment Movement Minimized
- Stabilize Or Raise Water Table
- Frequent Overbank Flow
- Wetlands Maintained
- Base Flow Stabilized Or Increased
- Considerable Riparian Vegetation

?? Best Path For Community Development ??