Streams & Floodplains:

explaining stream behavior to landowners

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Common Questions:

1. Why do streams meander?
2. How can I manage flooding?
3. Why is my bank eroding?

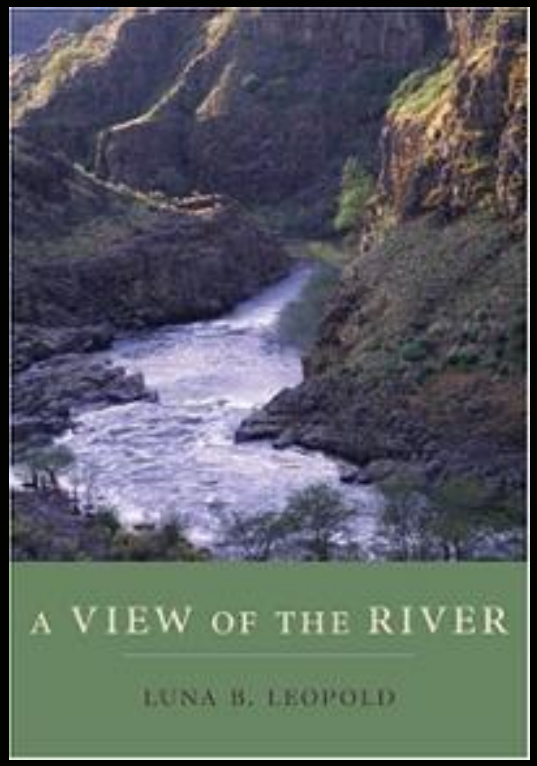
Presentation Outline:

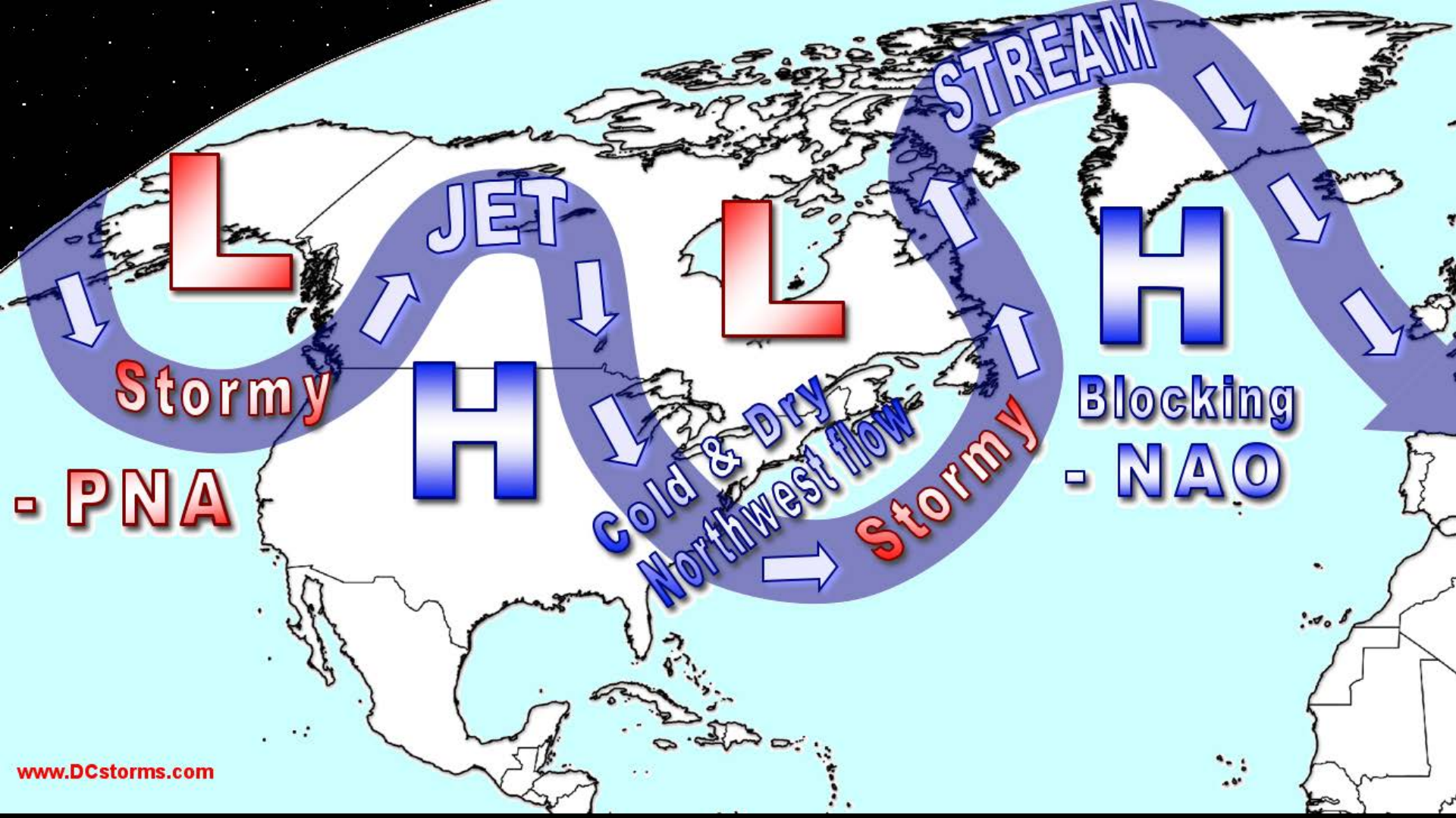
1. A Meandering Example
2. Why Streams Meander
3. Flooding vs. Erosion
4. Stream Energy

1. A Meandering Example

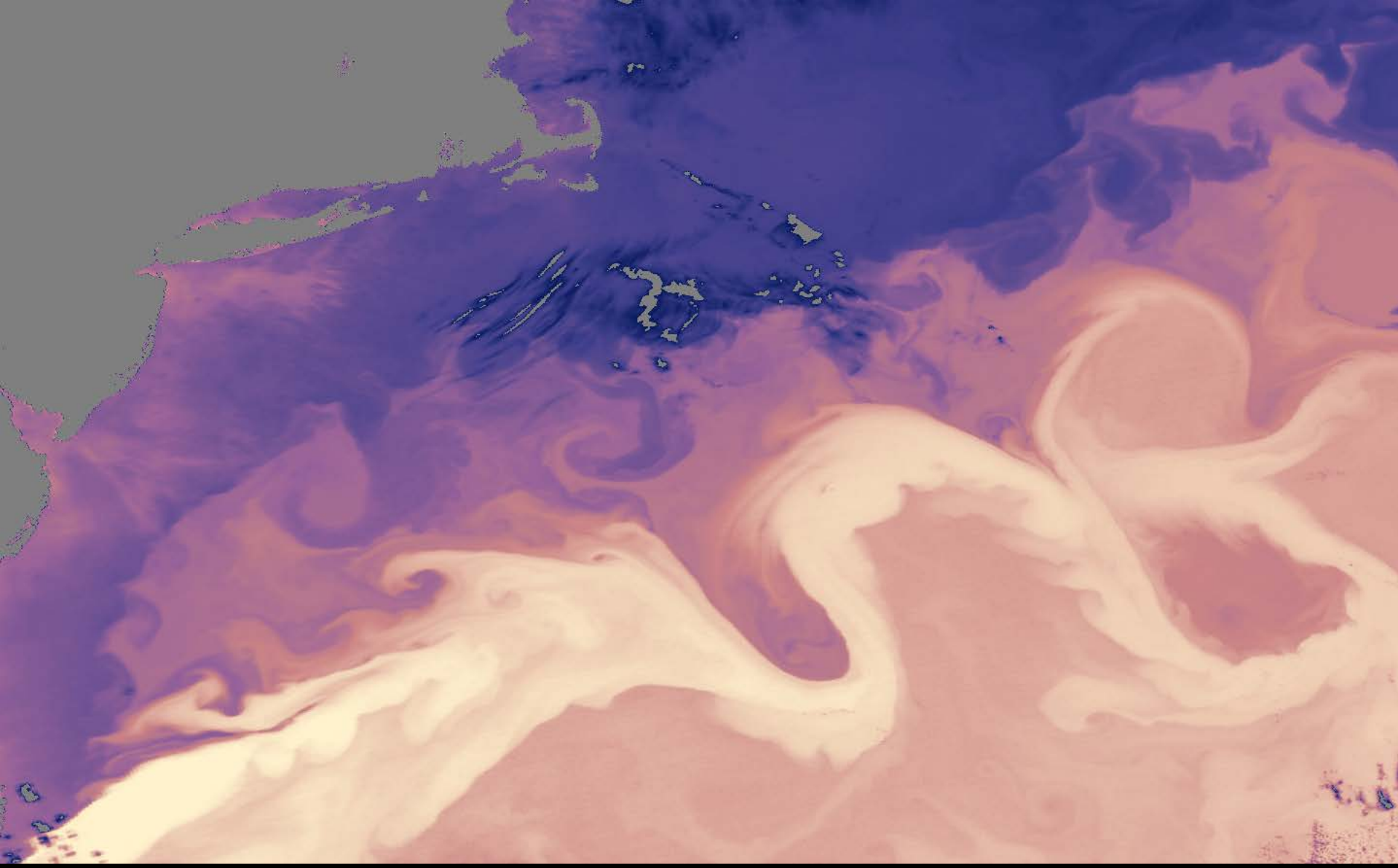
Google
Walla Walla River Road, Milton-Freewater, OR

2. Why Streams Meander

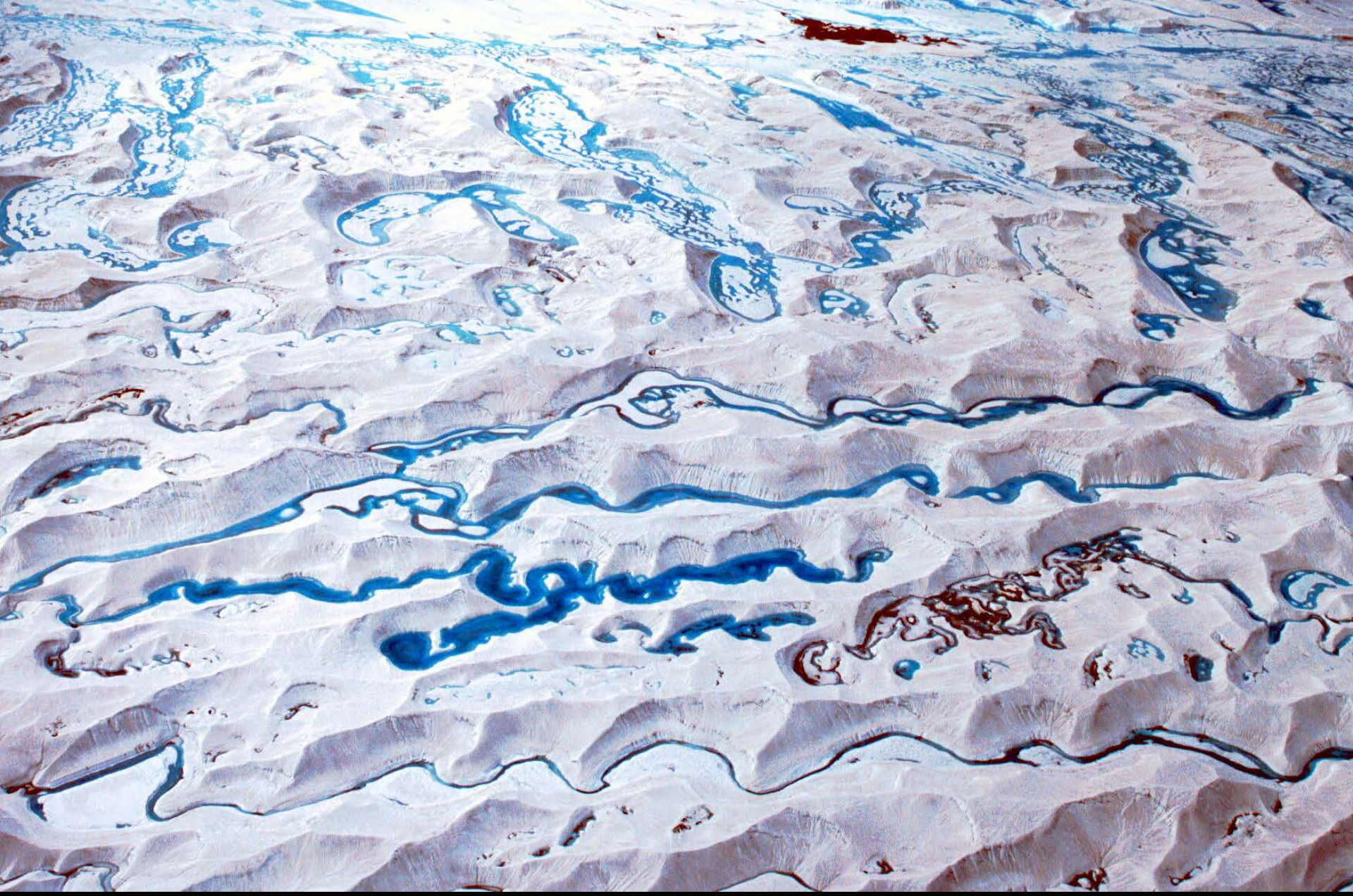

A VIEW OF THE RIVER
LUNA B. LEOPOLD



http://rses.anu.edu.au/~rich/lambertpics.htm



Gulf Stream
Photo Credit: NASA



Lambert Glacier
Photo Credit: http://rses.anu.edu.au/~rich/lambertpics.htm

3. Flooding vs. Erosion

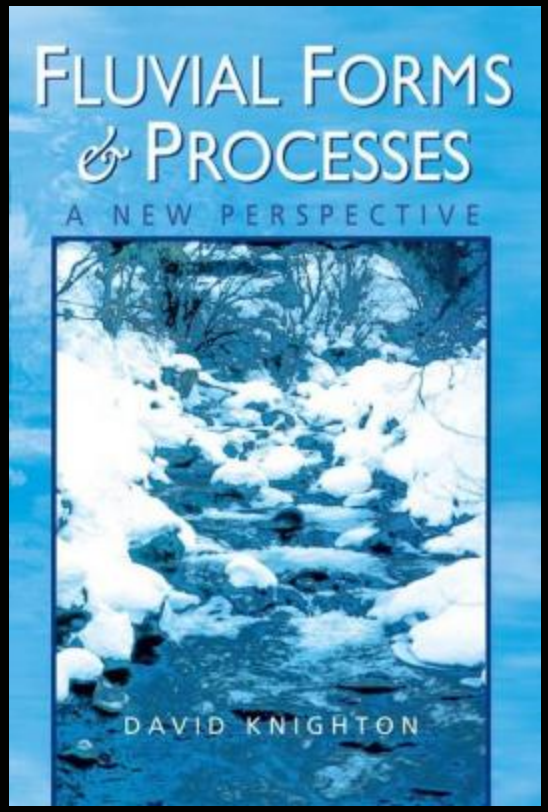
Flooding

Erosion

- Lower velocities
- More in-channel roughness
- Sediment deposition

- Higher velocities
- More “efficient” channels
- Sediment transport

4. Stream Energy


FLUVIAL FORMS
& PROCESSES
A NEW PERSPECTIVE
DAVID KNIGHTON

Total Stream Energy =

Potential (elevation) +

Kinetic (flowing water) +

Thermal (heat)

From: nurturecreek.com

How Stream Energy is Used:

(kinetic energy = mechanical work)

1. Overcoming Internal Friction
2. Overcoming Channel Boundary Friction
3. Transporting Sediment
4. Eroding the Channel Boundary

David Knighton, 1998

10/29'96

Good Answers:

1. Why do streams meander?

   Fluids on the face of the Earth flow in meandering patterns. It is a compromise between "minimum work" and "equal distribution of work". Use examples, such as the jet stream, gulf stream, and water flowing over ice.

2. How can I manage flooding?

   Give the stream more space. Often the "solution" to flooding causes other problems, such as increased erosion.

3. Why is my bank eroding?

   Some bank erosion is natural, especially on outer bends, but often it is because we have removed "roughness" and have allowed flows to accelerate. Add roughness.

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www.fws.gov/oregonfwo/ToolsForLandowners/RiverScience/default.asp

References:

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