FLUVIAL GEOMORPHOLOGY: SINUOSITY

ZACH HILGENDORF

OBJECTIVES

- Understand What Sinuosity Is and What it Tells Us
- Understand How to Calculate Sinuosity

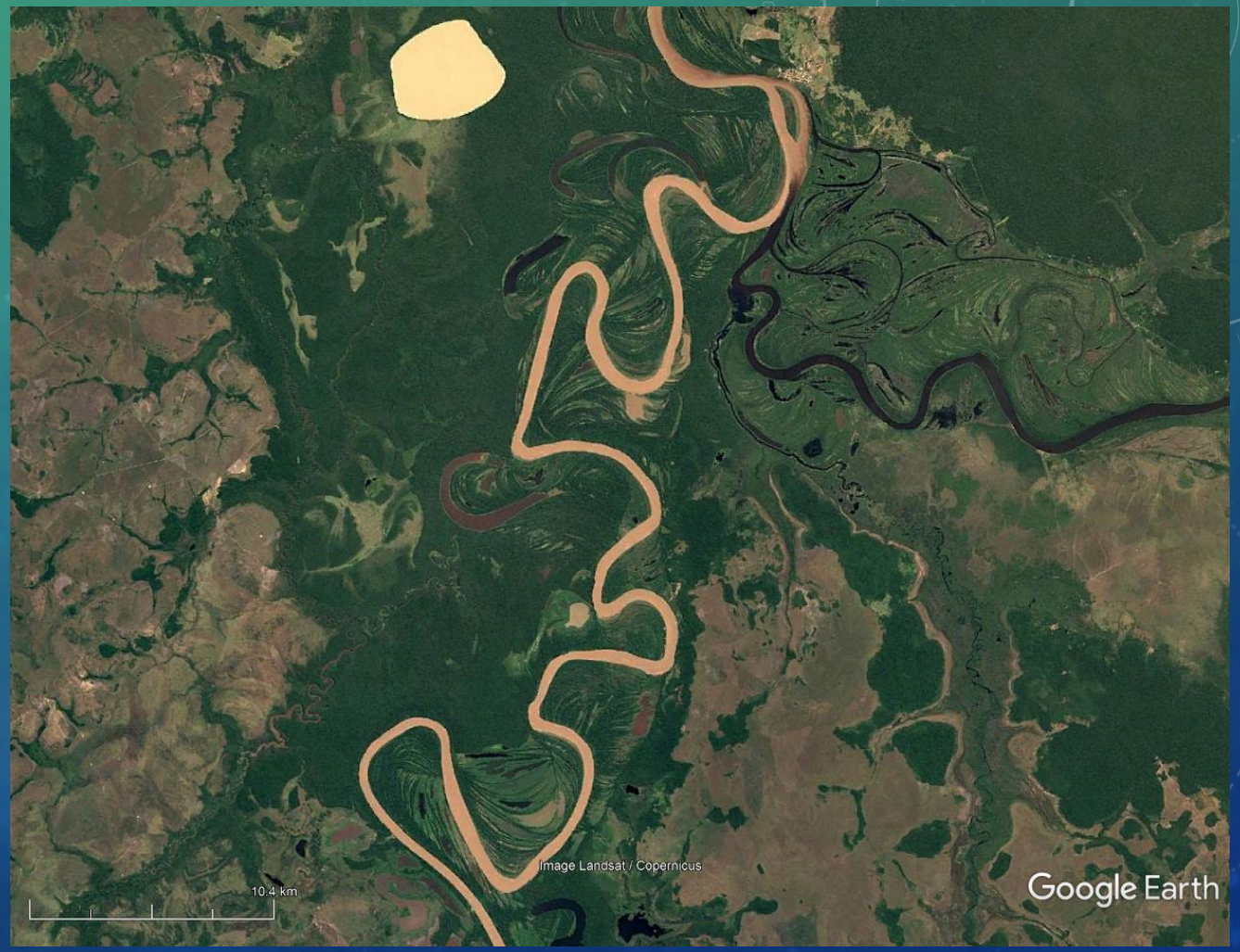
The geo-nerd currently talking…

WHAT IS SINUOSITY?

- A ratio that tells us how “curvy” a river is
- $Sinuosity = \frac{Channel\ Length}{Valley\ Length}$

WHAT IS SINUOSITY?

- A ratio that tells us how “curvy” a river is
- $Sinuosity = \frac{Channel\ Length}{Valley\ Length}$



WHAT IS SINUOSITY?

- A ratio that tells us how “curvy” a river is
- $Sinuosity = \frac{Channel\ Length}{Valley\ Length}$

WHAT IS SINUOSITY?

- A ratio that tells us how "curvy" a river is
- $Sinuosity = \frac{Channel\ Length}{Valley\ Length}$
- Higher values = Higher sinuosity
- Anabranching, Braided, and Straight Rivers = Lower Sinuosity

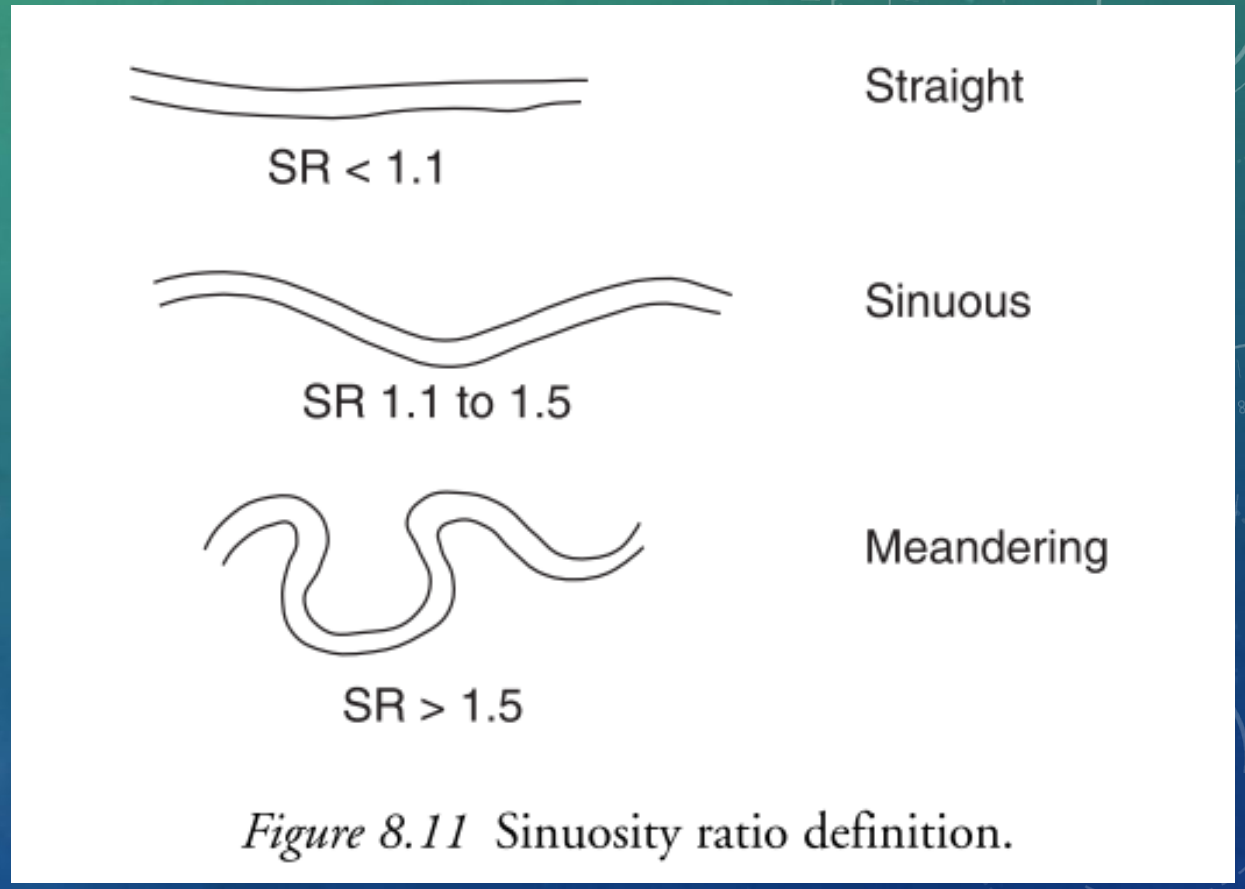


Figure 8.11 Sinuosity ratio definition.

Charlton (2008): *Fundamentals of Fluvial Geomorphology*

WHAT IS SINUOSITY?

- A ratio that tells us how “curvy” a river is
- $Sinuosity = \frac{Channel\ Length}{Valley\ Length}$
- Higher values = Higher sinuosity
- Anabranching, Braided, and Straight Rivers = Lower Sinuosity

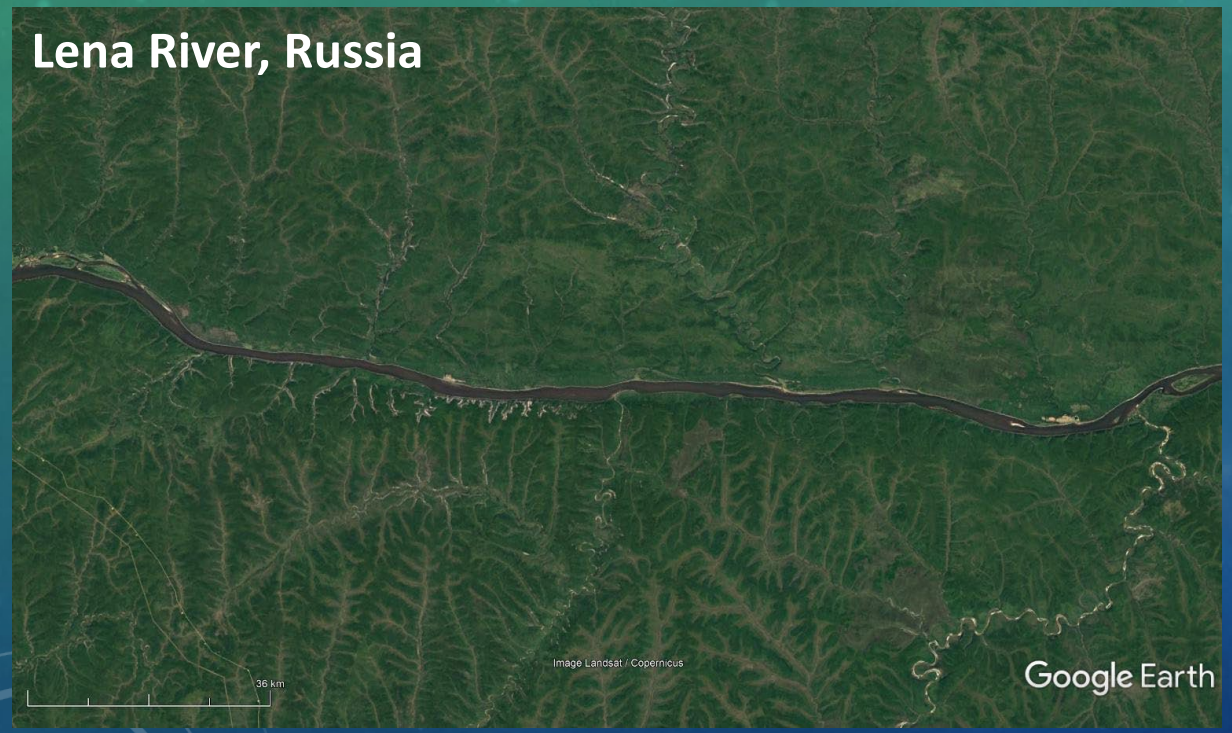

S. A. SCHUMM *U. S. Geological Survey, Denver, Colo.*

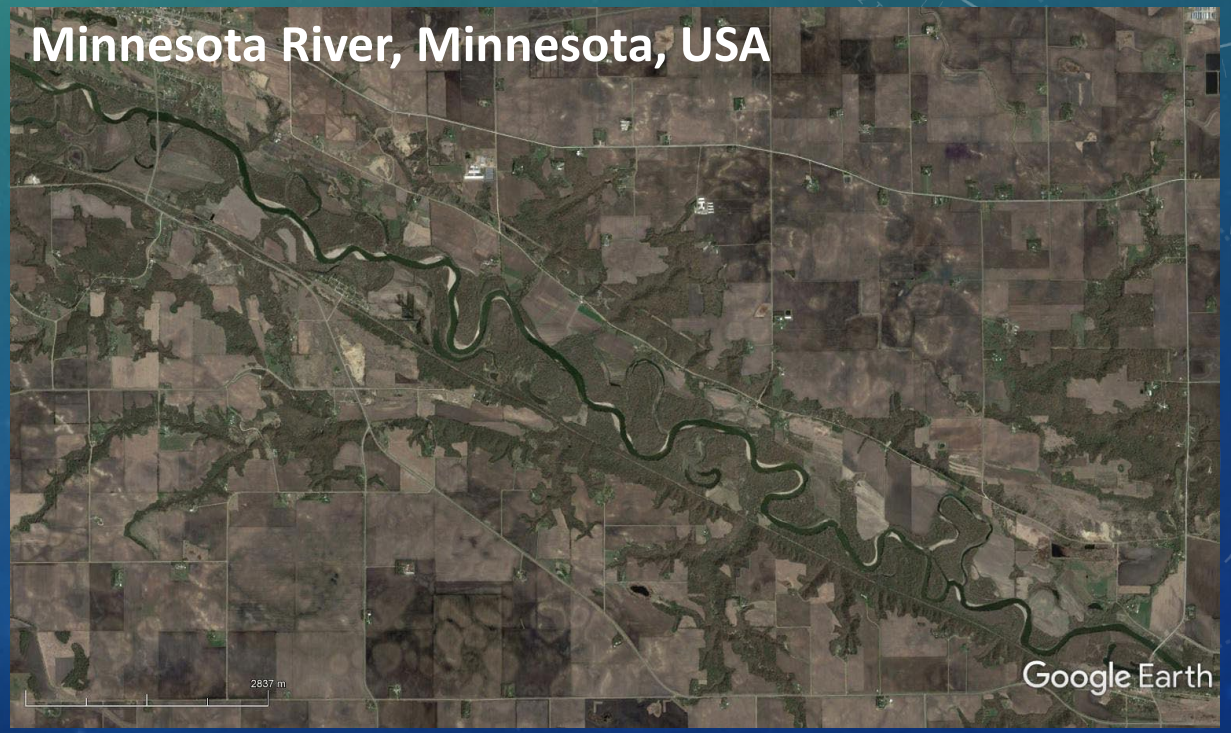
Sinuosity of Alluvial Rivers on the Great Plains

EXAMPLE CALCULATIONS

WHAT IS SINUOSITY?

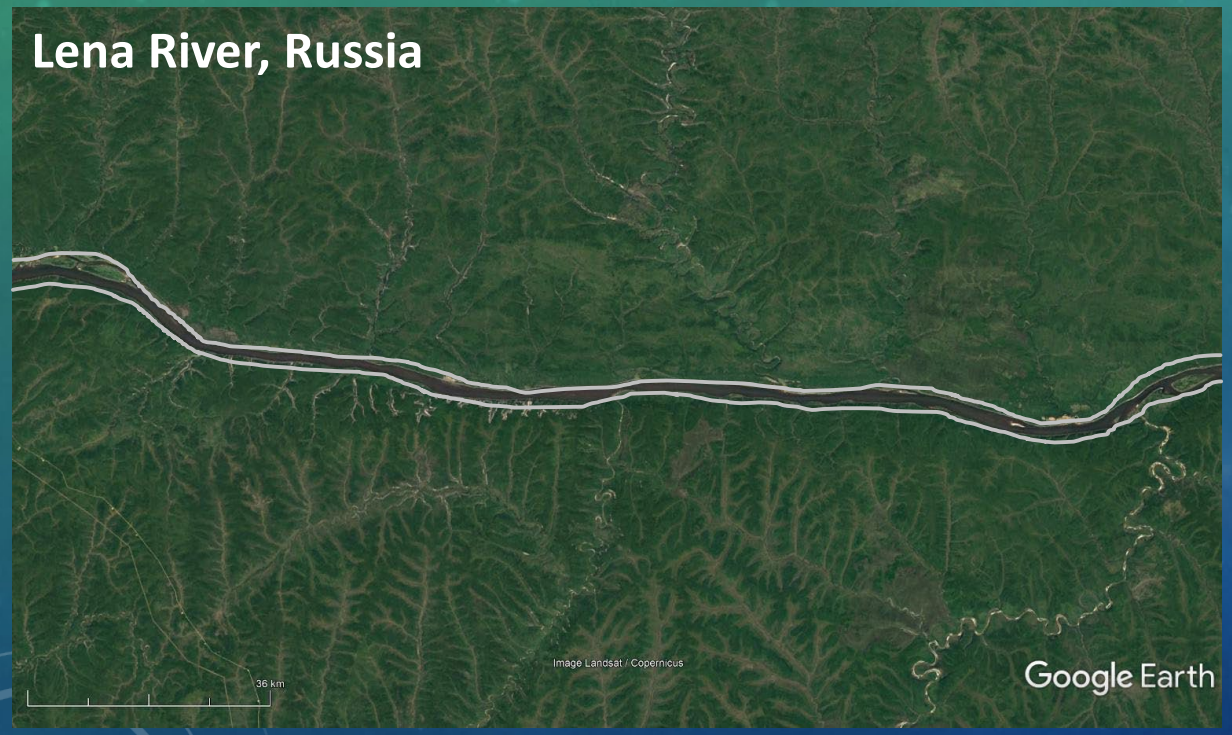
- Sinuosity = Channel Length / Valley Length





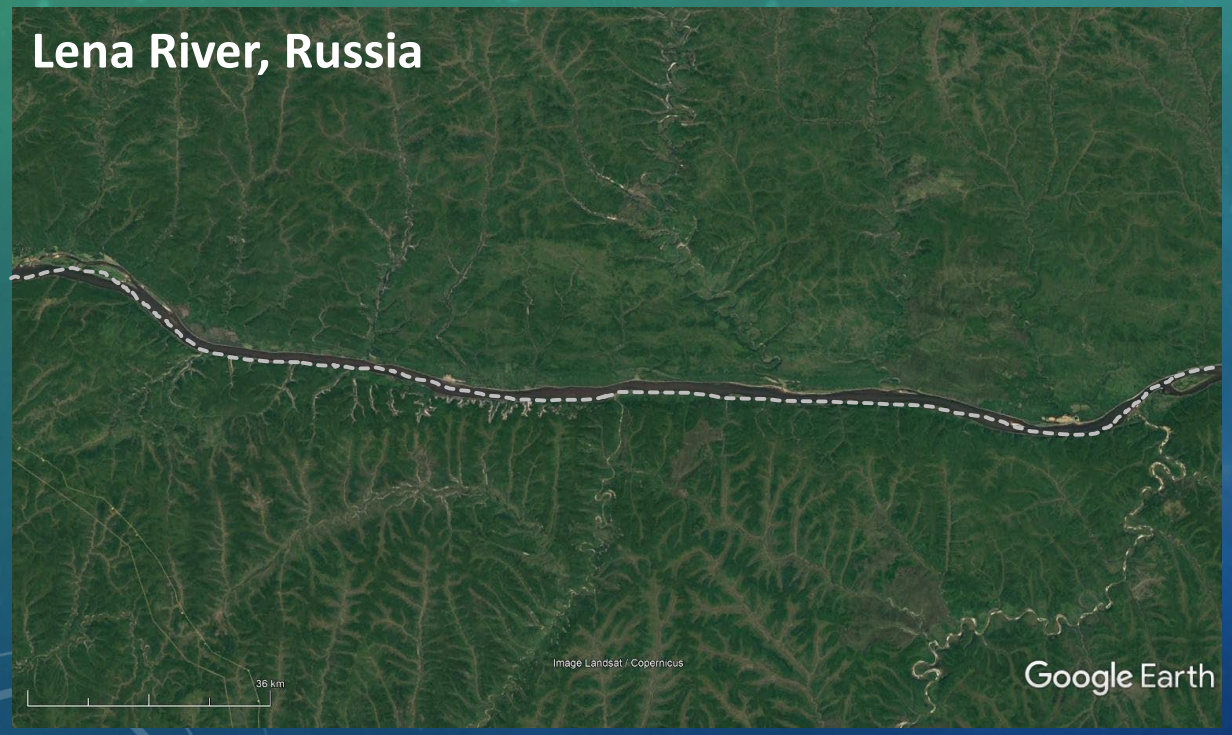
WHAT IS SINUOSITY?

- Sinuosity = Channel Length / Valley Length



WHAT IS SINUOSITY?

- Sinuosity = Channel Length / Valley Length

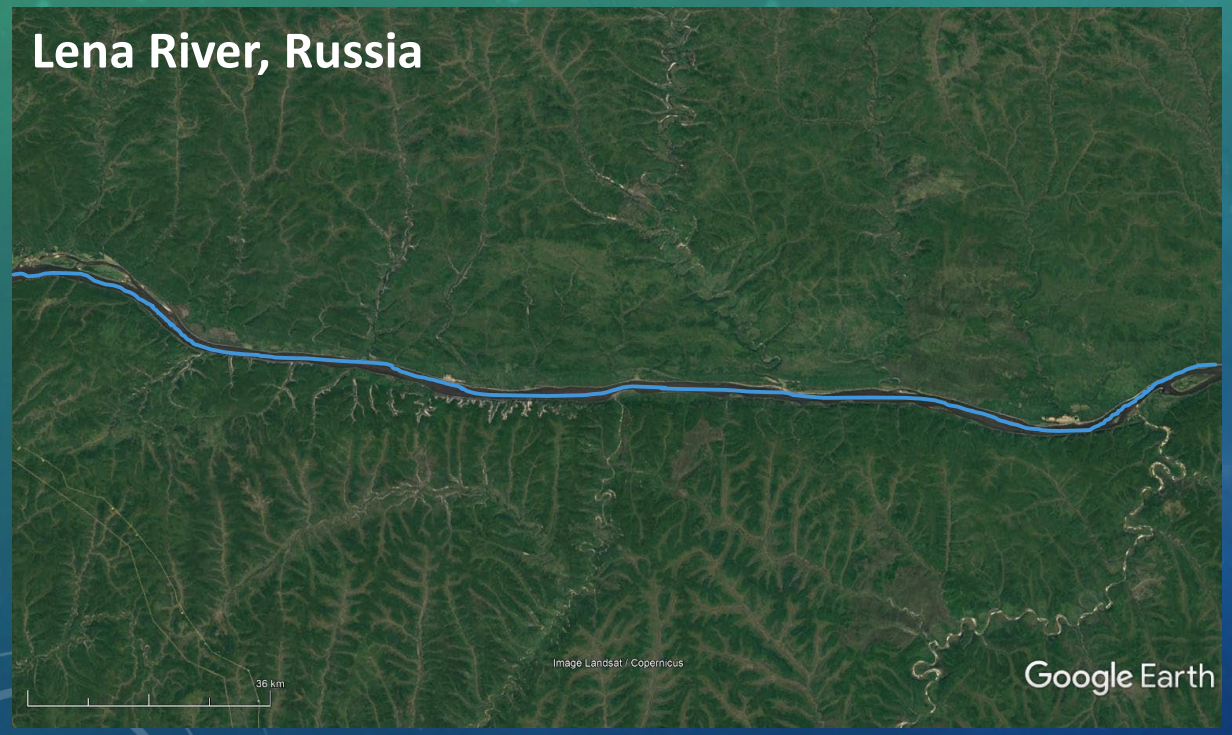


Valley Length: 187 km
Channel Length:

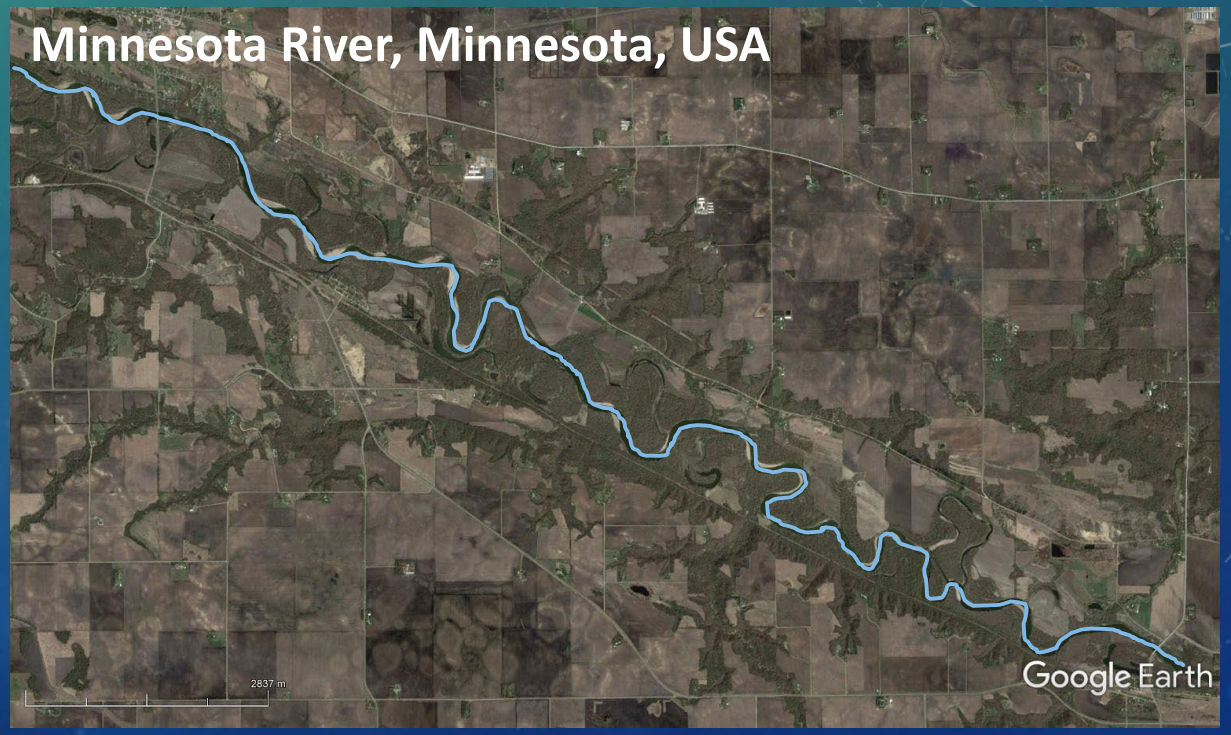
Valley Length: 12.3 km
Channel Length:

WHAT IS SINUOSITY?

- Sinuosity = Channel Length / Valley Length



Valley Length: 187 km
Channel Length: 188 km

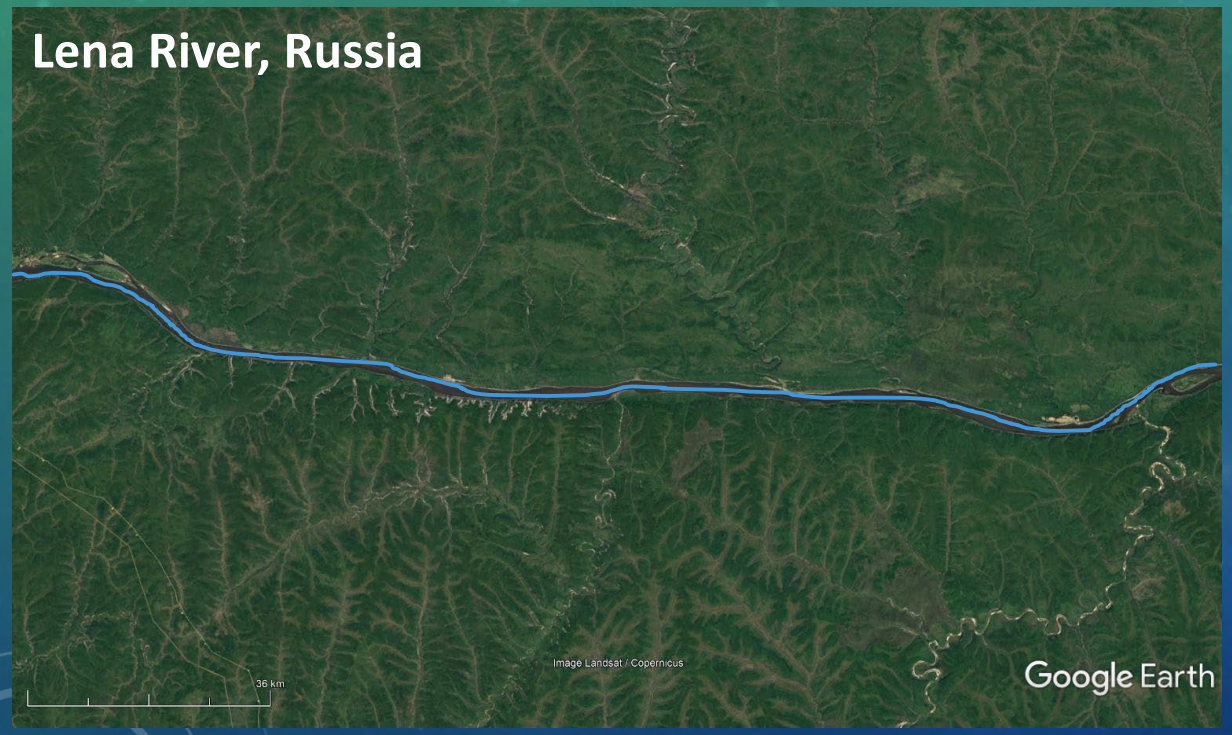


Valley Length: 12.3 km
Channel Length: 18.2 km

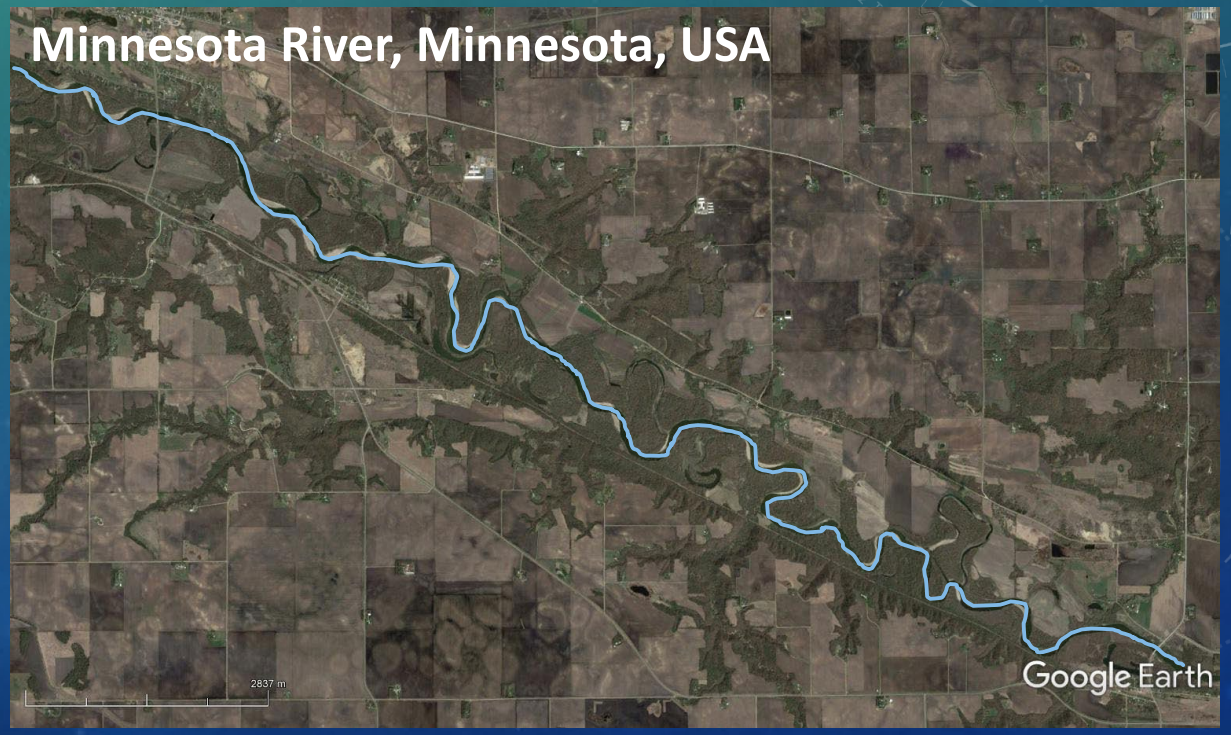
WHAT IS SINUOSITY?

- Sinuosity = Channel Length / Valley Length

PAUSE



Valley Length: 187 km
Channel Length: 188 km



Valley Length: 12.3 km
Channel Length: 18.2 km

WHAT IS SINUOSITY?

- Sinuosity = Channel Length / Valley Length

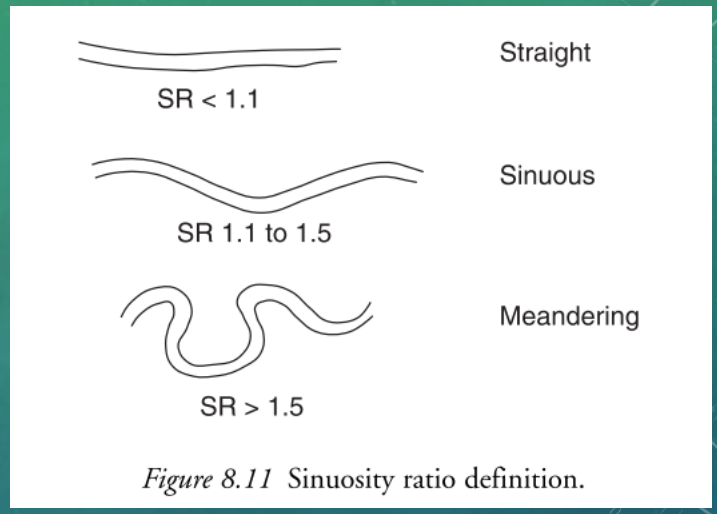
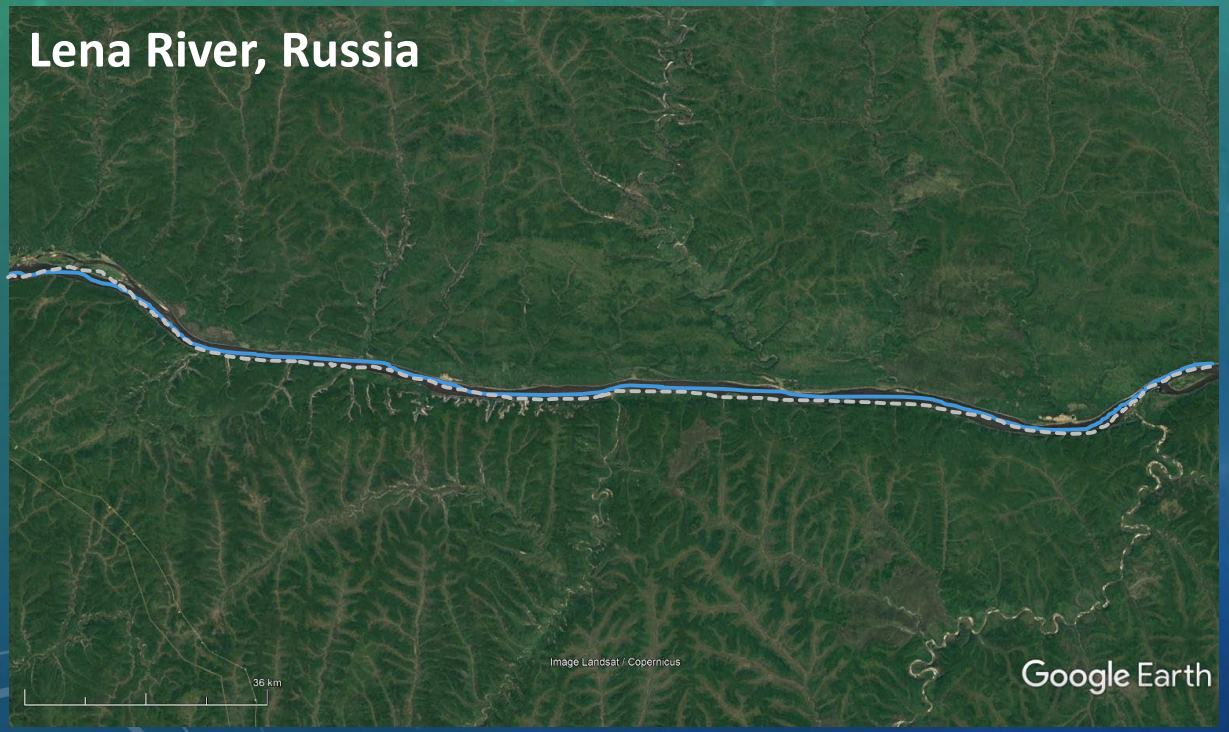
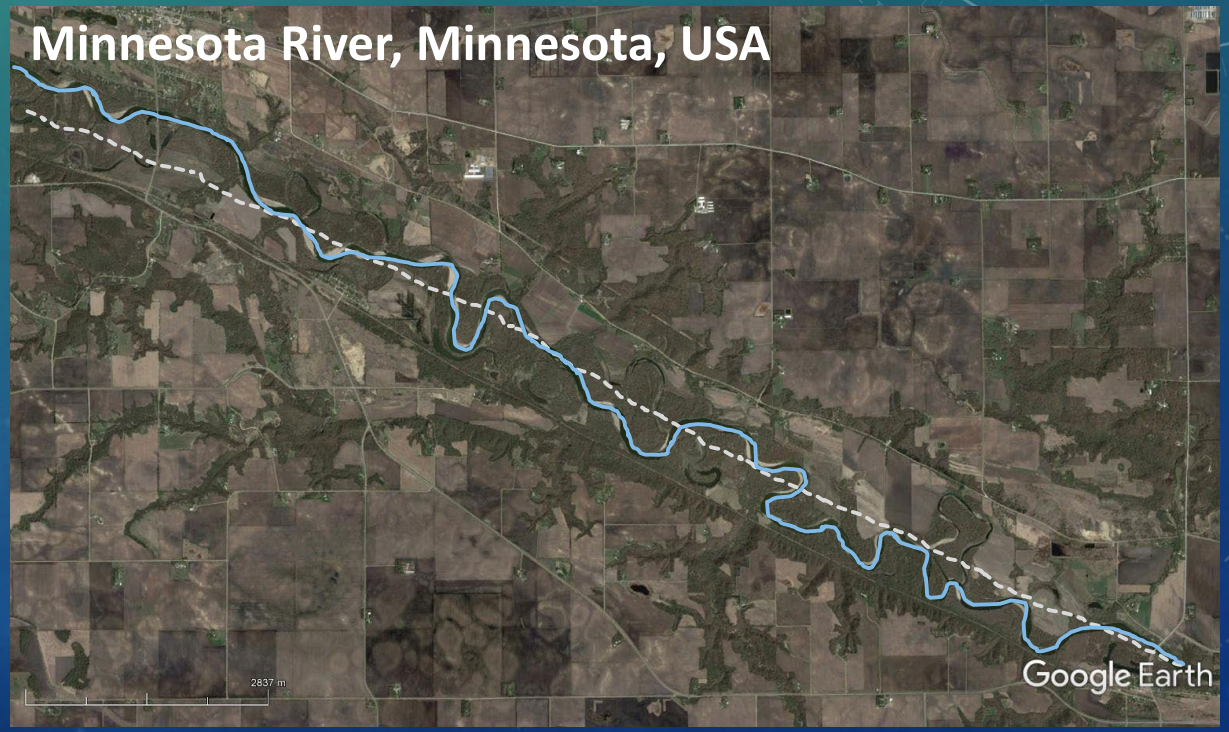


Figure 8.11 Sinuosity ratio definition.



Low Sinuosity: 1.01
Sinuosity Ratio < 1.1 = Straight Channel



High Sinuosity: 1.48
Sinuosity Ratio near 1.1-1.5 (Sinuous) and > 1.5 (Meandering)

RECAP

- What sinuosity is.
- How to calculate sinuosity.

S. A. SCHUMM *U. S. Geological Survey, Denver, Colo.*

Sinuosity of Alluvial Rivers on the Great Plains