



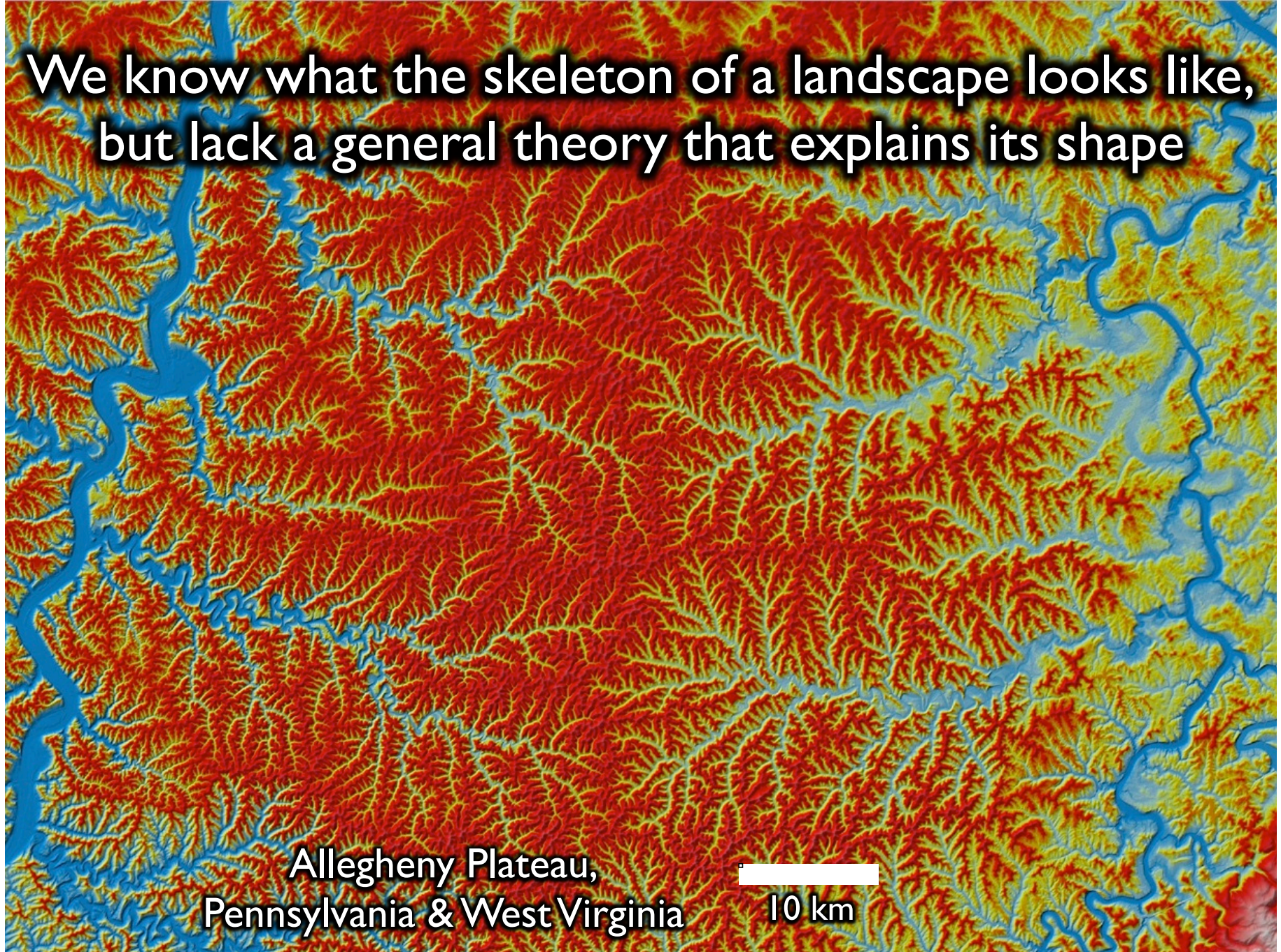
Rivers

12.001 – November 14, 2012

Courtesy of Taylor Perron. Used with permission.

San Juan River, Argentina

We know what the skeleton of a landscape looks like,
but lack a general theory that explains its shape

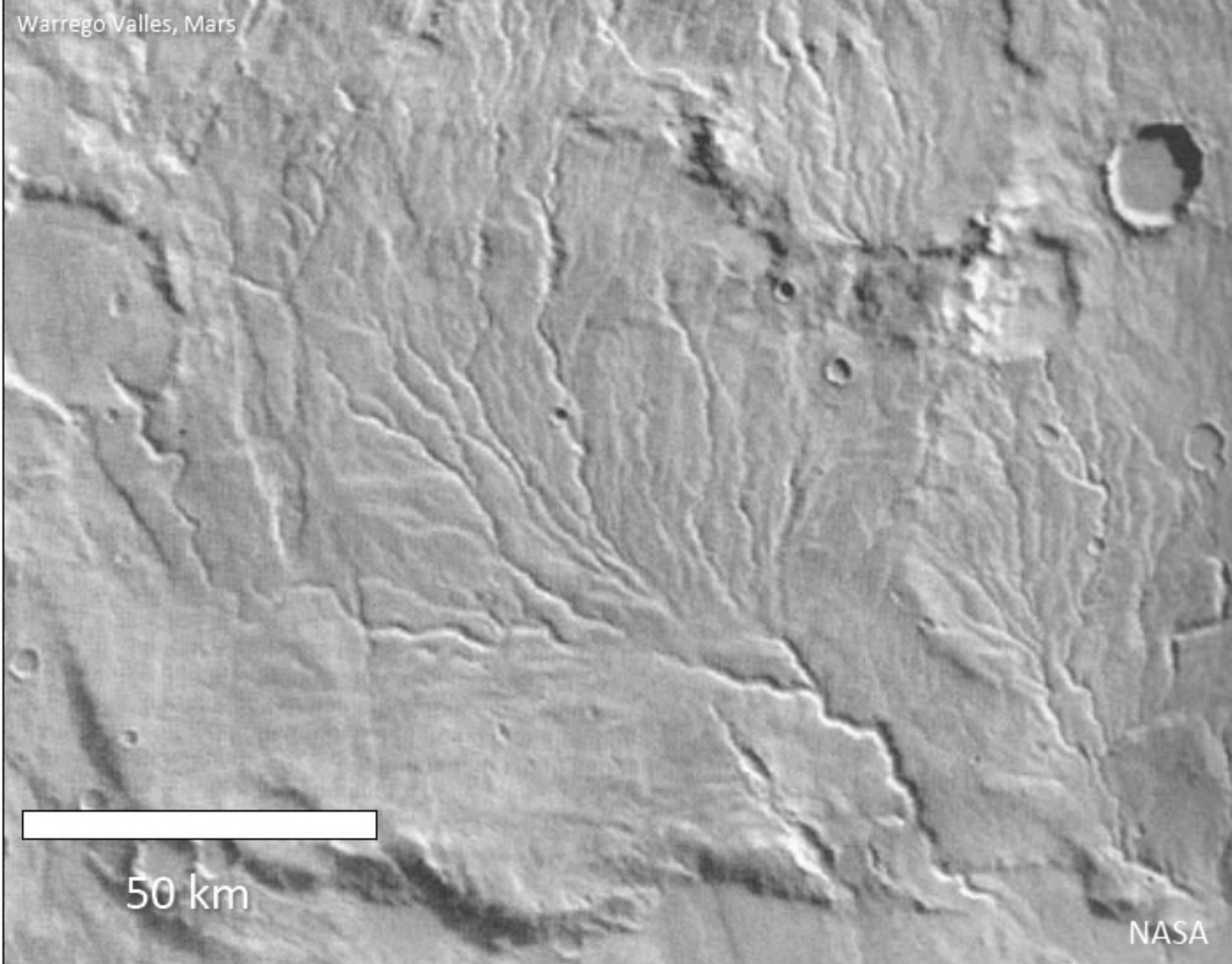


Allegheny Plateau,
Pennsylvania & West Virginia

10 km

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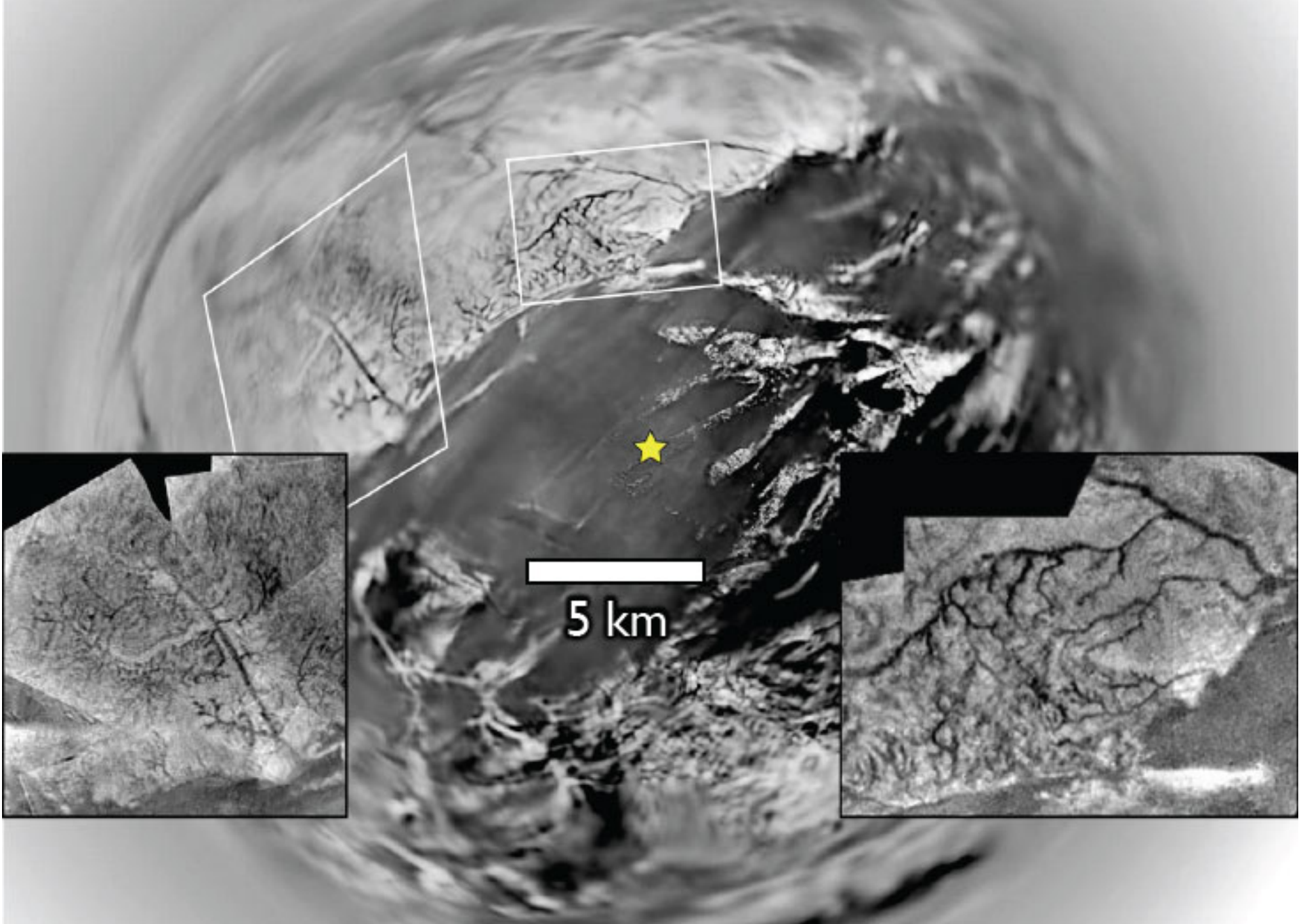
Warrego Valles, Mars



50 km

NASA

Courtesy of NASA. Image in the public domain.



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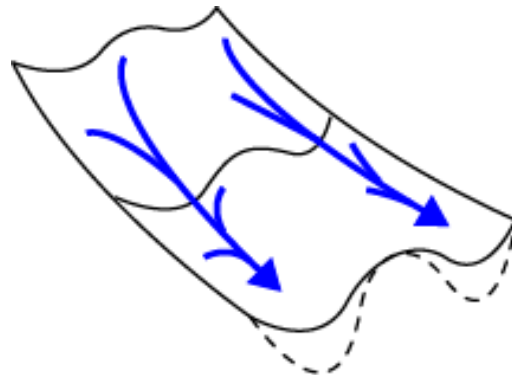
Gabilan Mesa, CA

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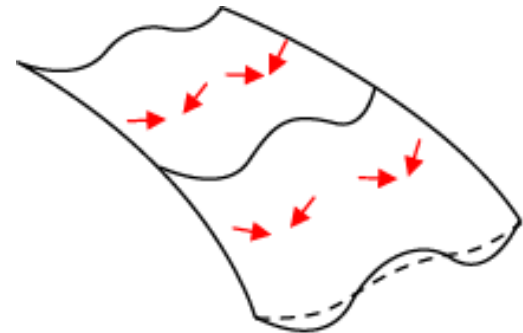


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erosion = river incision + soil creep



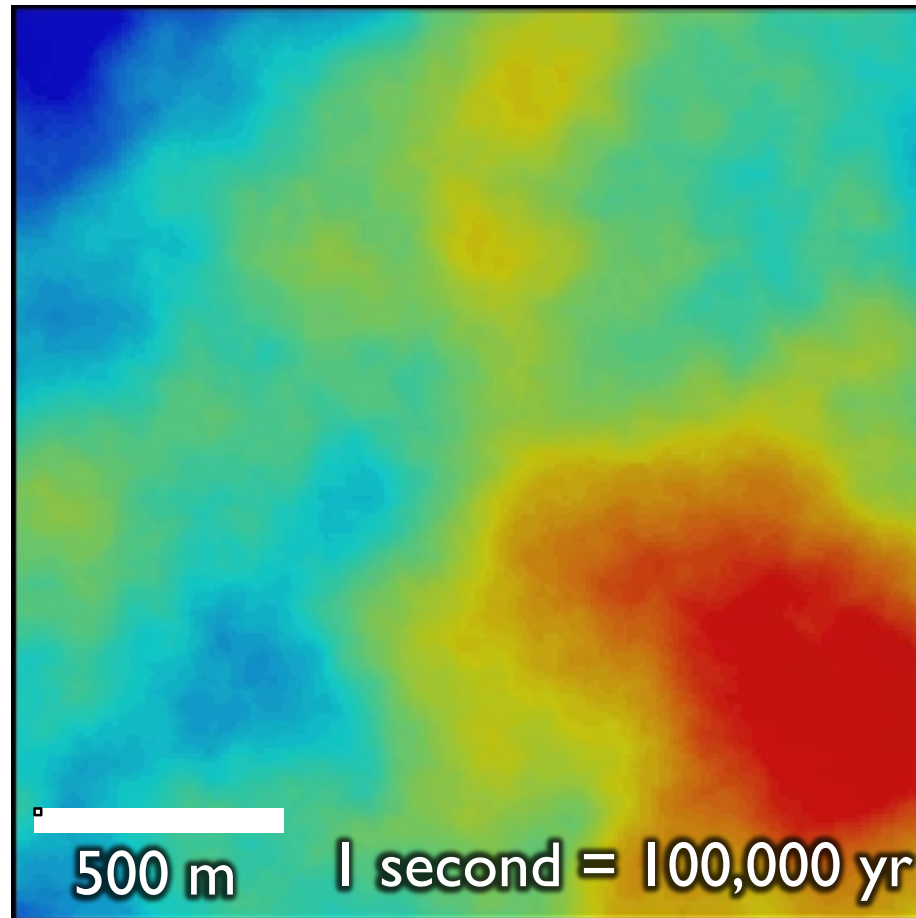
Valleys grow deeper



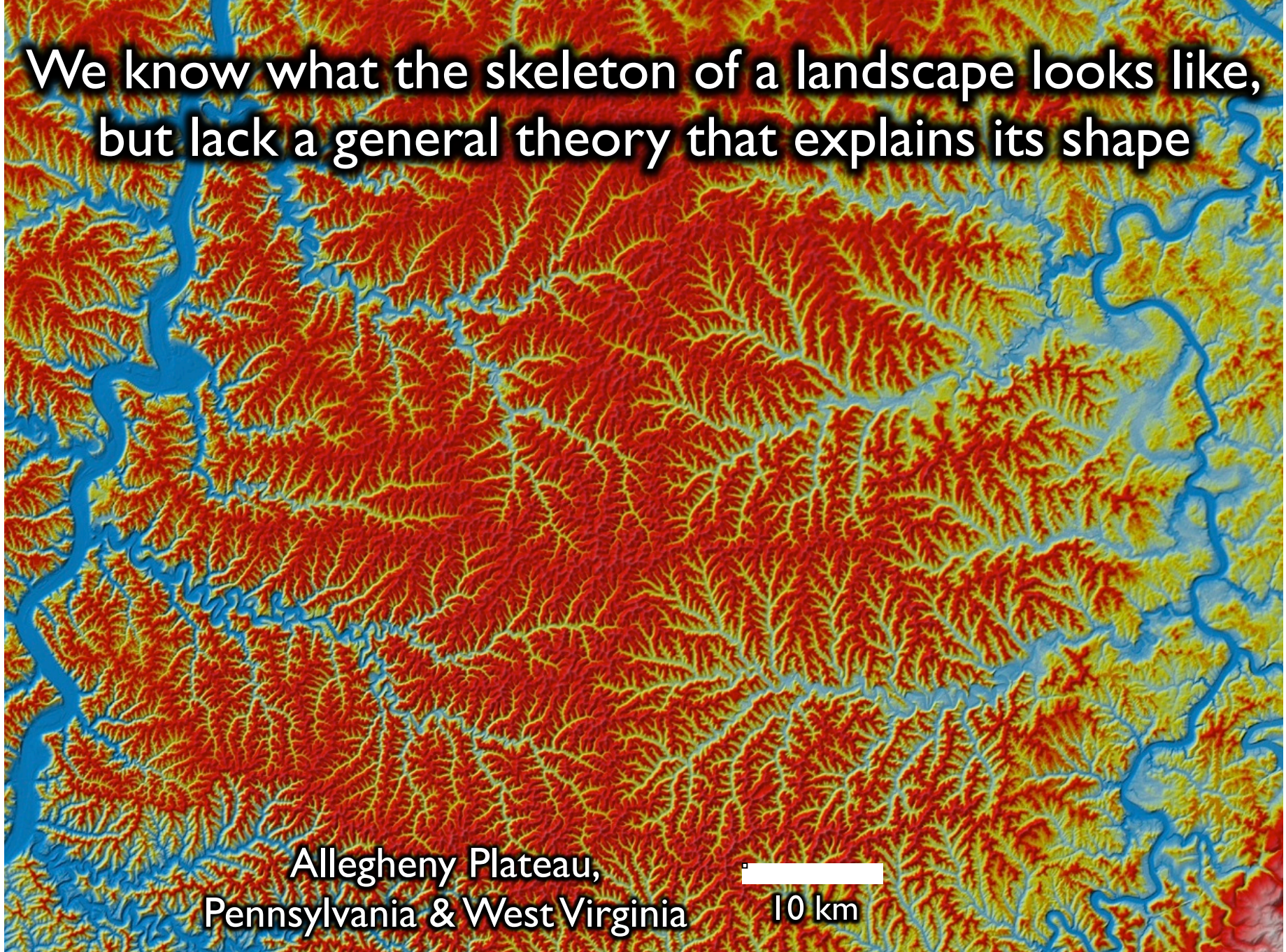
Valleys fill in

Mathematical models based on this simple competition generate dynamic, branching river networks

Warmer colors = higher elevation



We know what the skeleton of a landscape looks like,
but lack a general theory that explains its shape



Allegheny Plateau,
Pennsylvania & West Virginia

10 km

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McGeary, U. South Carolina



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Waimakariri River, New Zealand

Jane Piirto, Ashland Univ.



Birch Creek, Alaska

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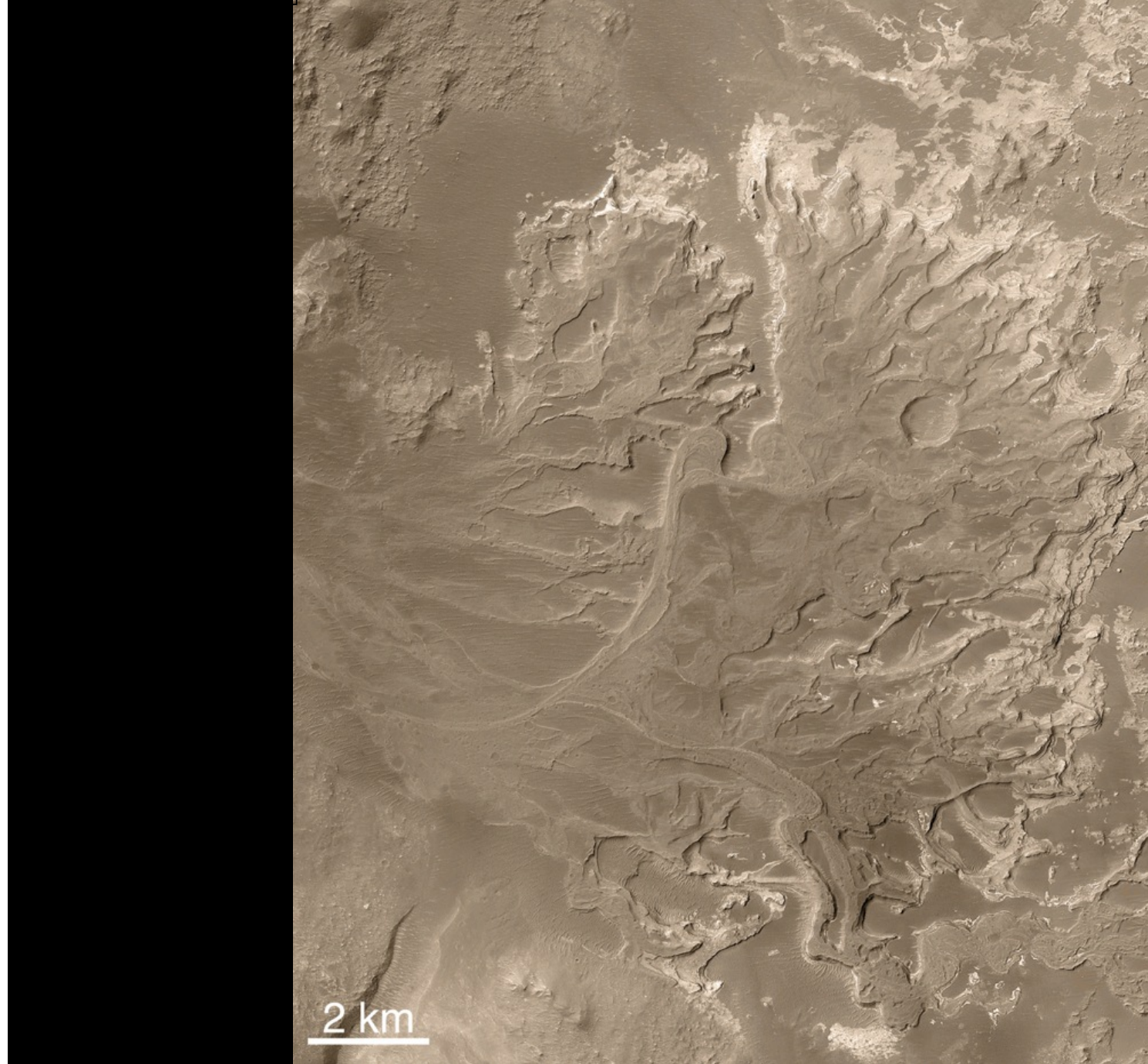
Michal Tal & Chris Paola, *Geology*, 2007

Courtesy of Geological Society of America. Used with permission.
Source: Tal, Michal, and Chris Paola. "[Dynamic Single-thread Channels Maintained by the Interaction of Flow and Vegetation.](#)" *Geology* 35, no. 4 (2007): 347-50.



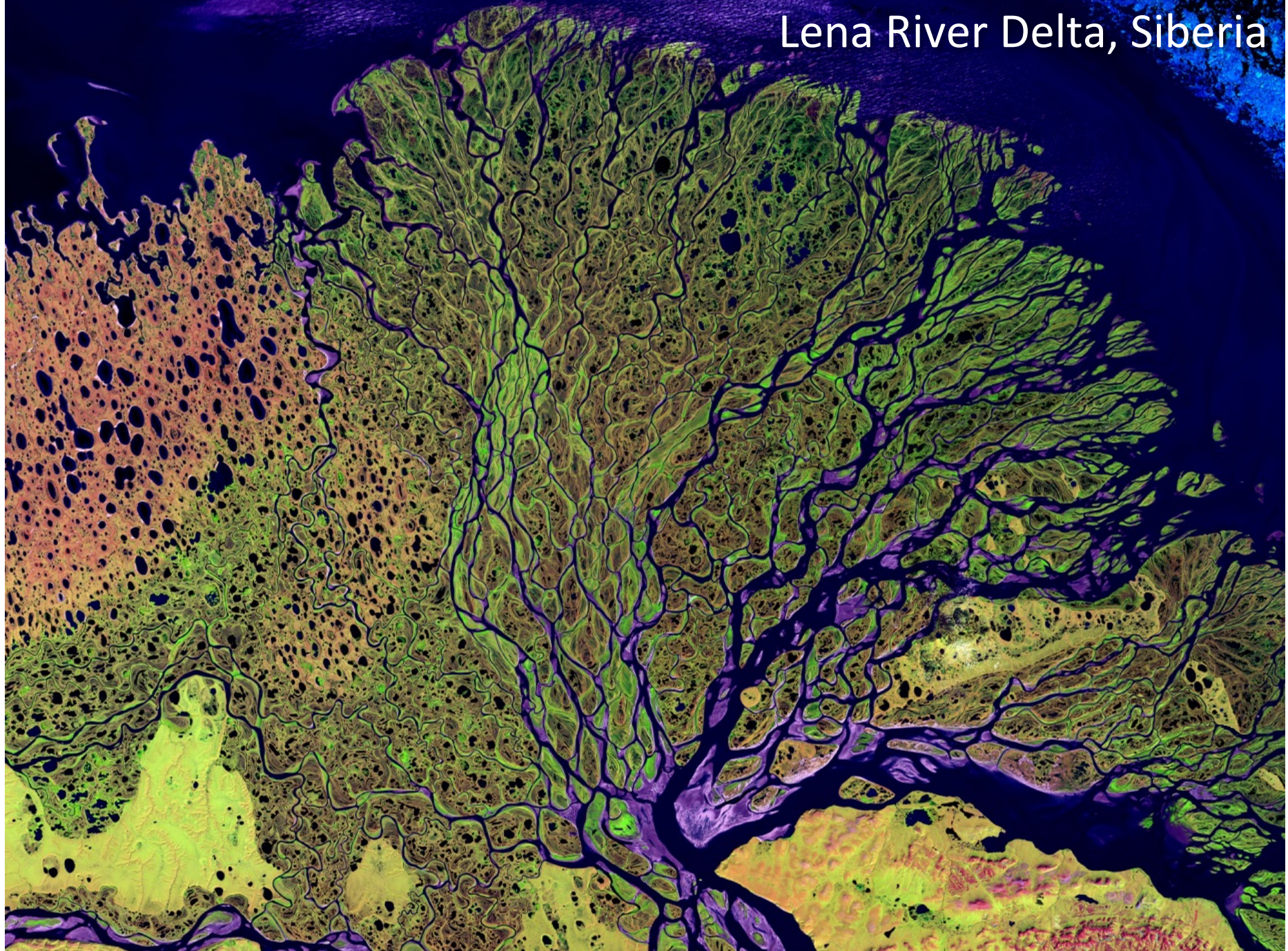
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San Juan River, Argentina



Courtesy of NASA. Image in the public domain.

Lena River Delta, Siberia



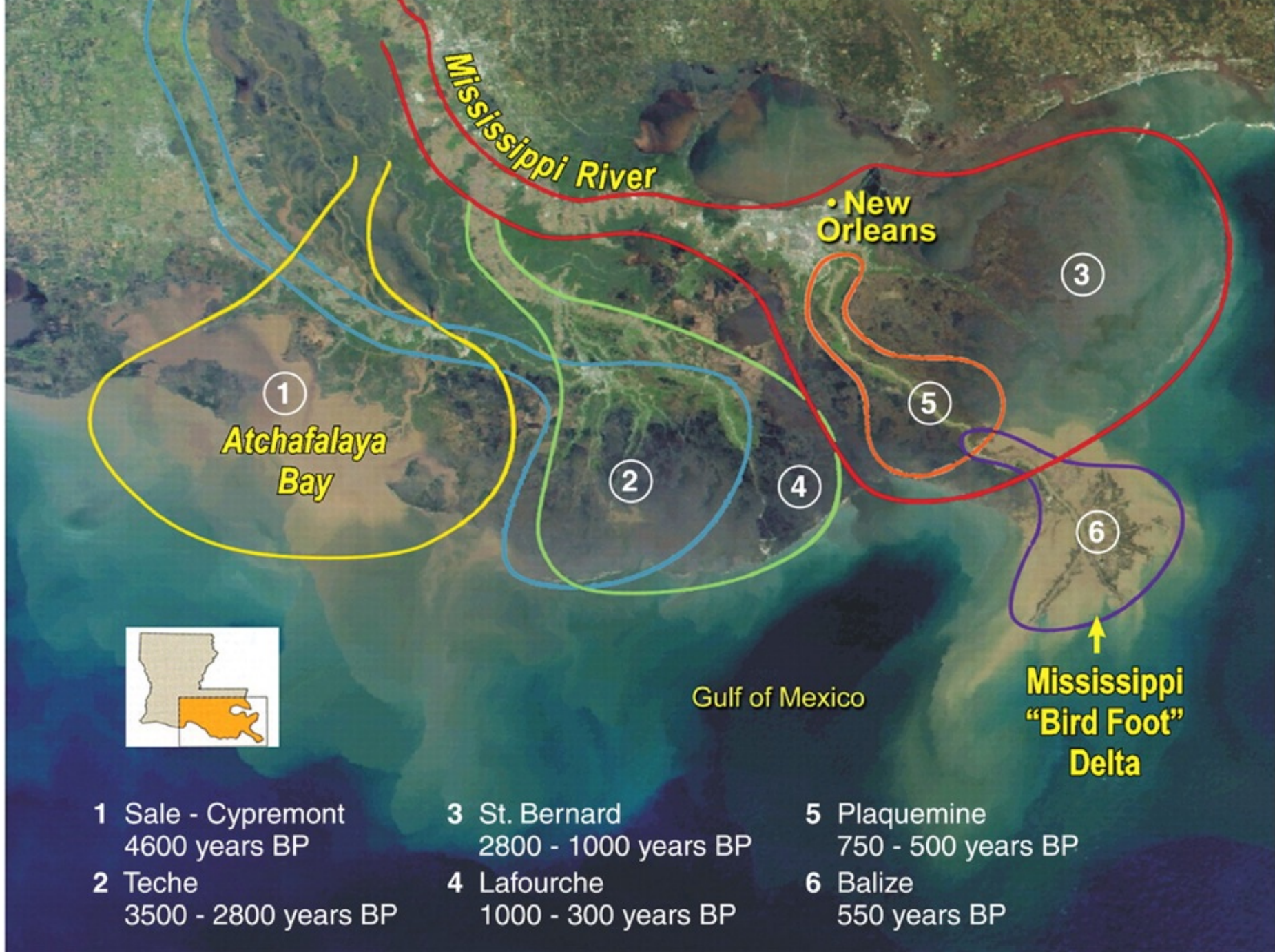
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NileDelta



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12.001 Introduction to Geology
Fall 2013

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