

The background features a gradient from green at the top to blue at the bottom. On the left side, there are several concentric circular patterns and a scale with numerical markings (140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260) that curve around the edge. Faint, stylized circular arrows are also visible, suggesting a sense of rotation or flow.

FLUVIAL GEOMORPHOLOGY: SEDIMENT TRANSPORT AND GRAIN SIZE

ZACH HILGENDORF

OBJECTIVES

- Understand Different Grain Sizes
- Understand Basic Sediment Transport Concepts

The geo-nerd currently talking...



INTRODUCTION TO GRAINS

- No two grains are the same



Grains from a beach in southern California, USA

INTRODUCTION TO GRAINS

- No two grains are the same
- Grains described by:
 - Composition



Banks of Henrieville Creek, Utah, USA.
Photo Credit: A. Hilgendorf

INTRODUCTION TO GRAINS

- No two grains are the same
- Grains described by:
 - Composition
 - Shape

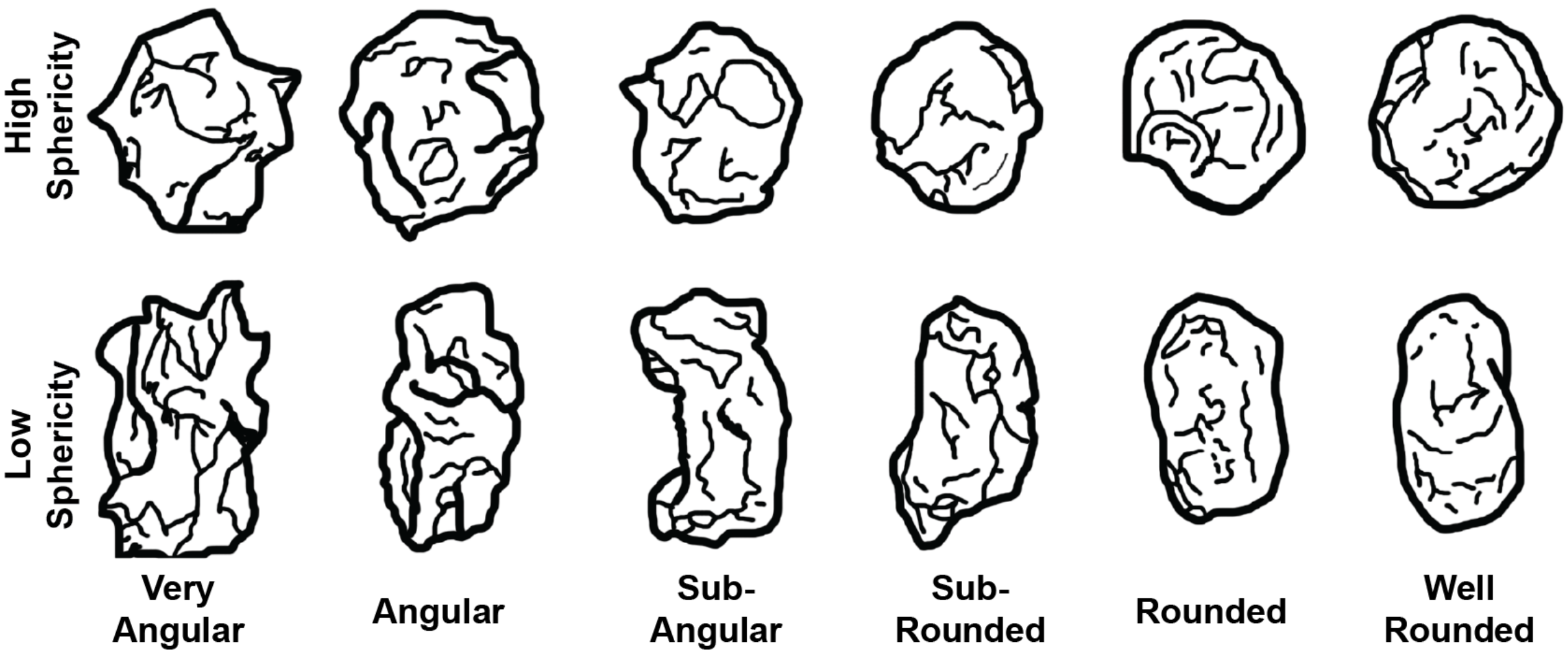


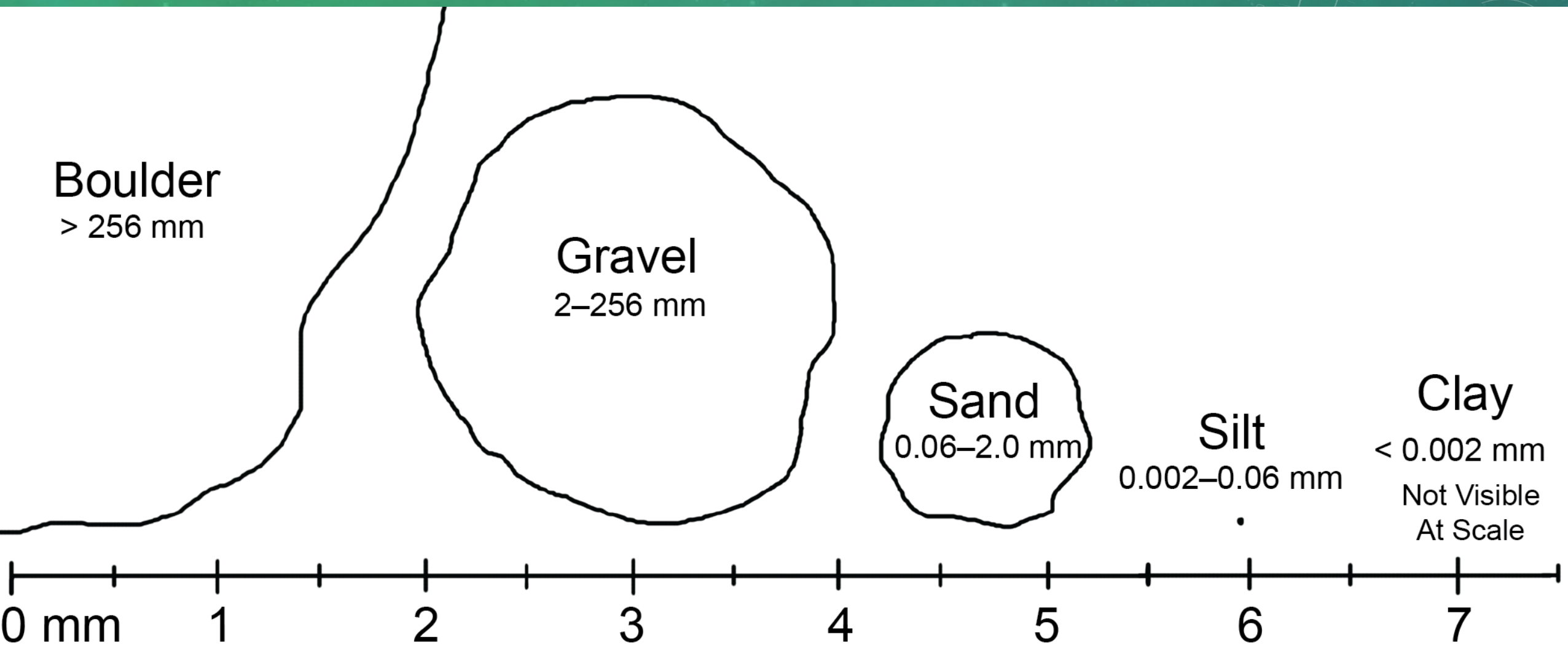
Banks of the Little Missouri River, North Dakota, USA

INTRODUCTION TO GRAINS

- No two grains are the same
- Grains described by:
 - Composition
 - Shape
 - Size





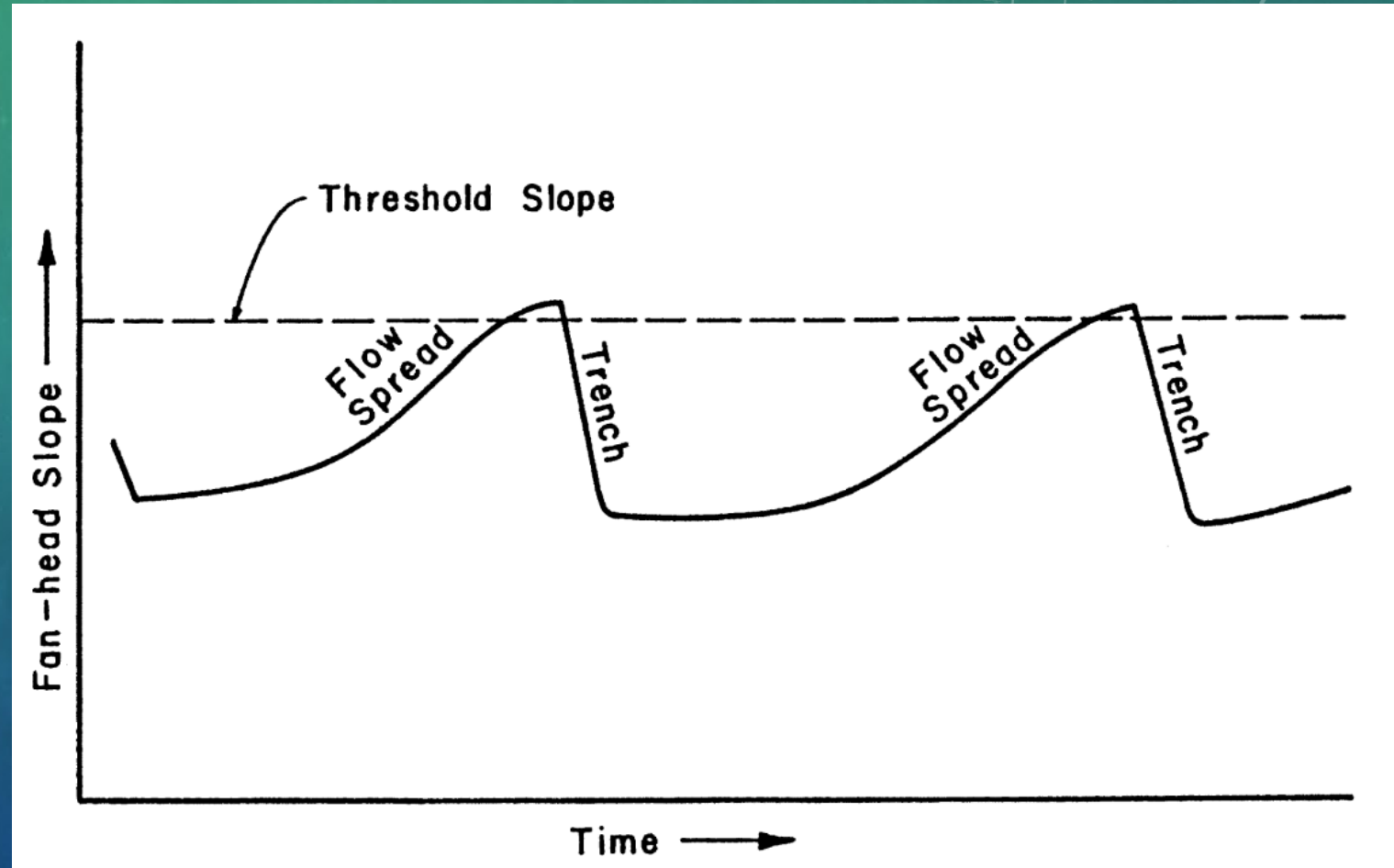


INITIATION OF MOTION



BASIC CONCEPTS

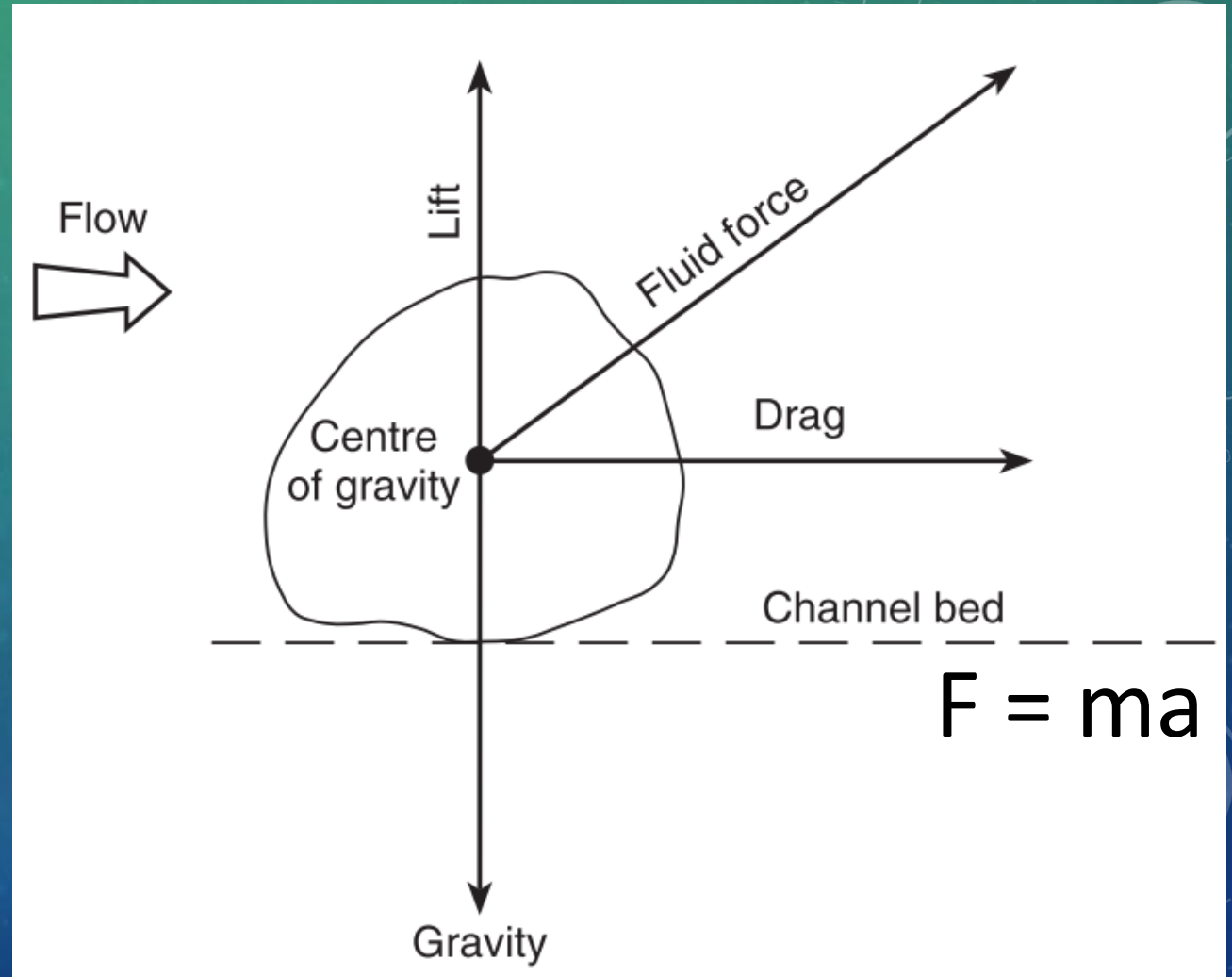
- Thresholds



From Schumm (1979)

BASIC CONCEPTS

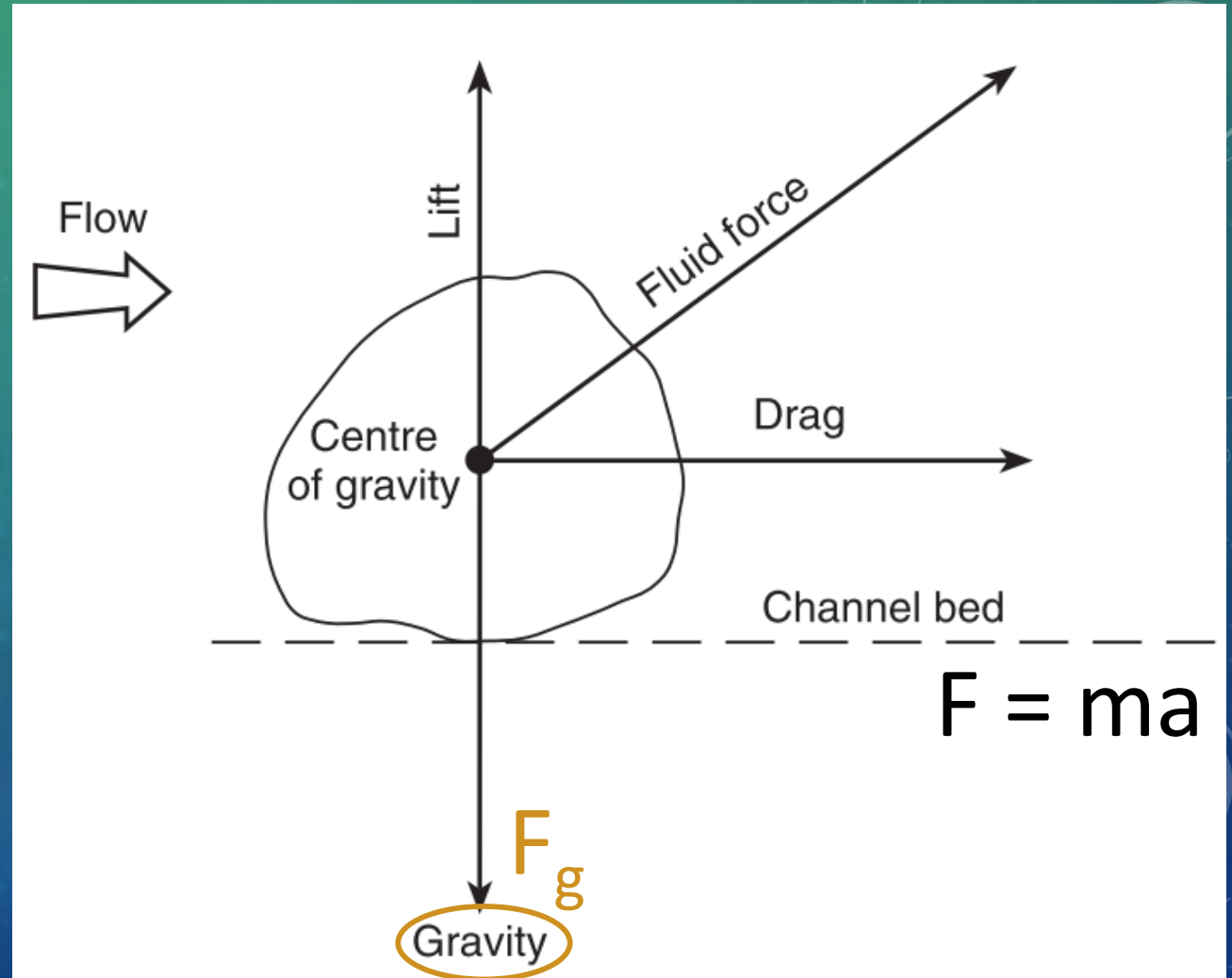
- Thresholds
- Initiation of Motion



From Charlton (2008), Adapted from Morisawa (1985)

BASIC CONCEPTS

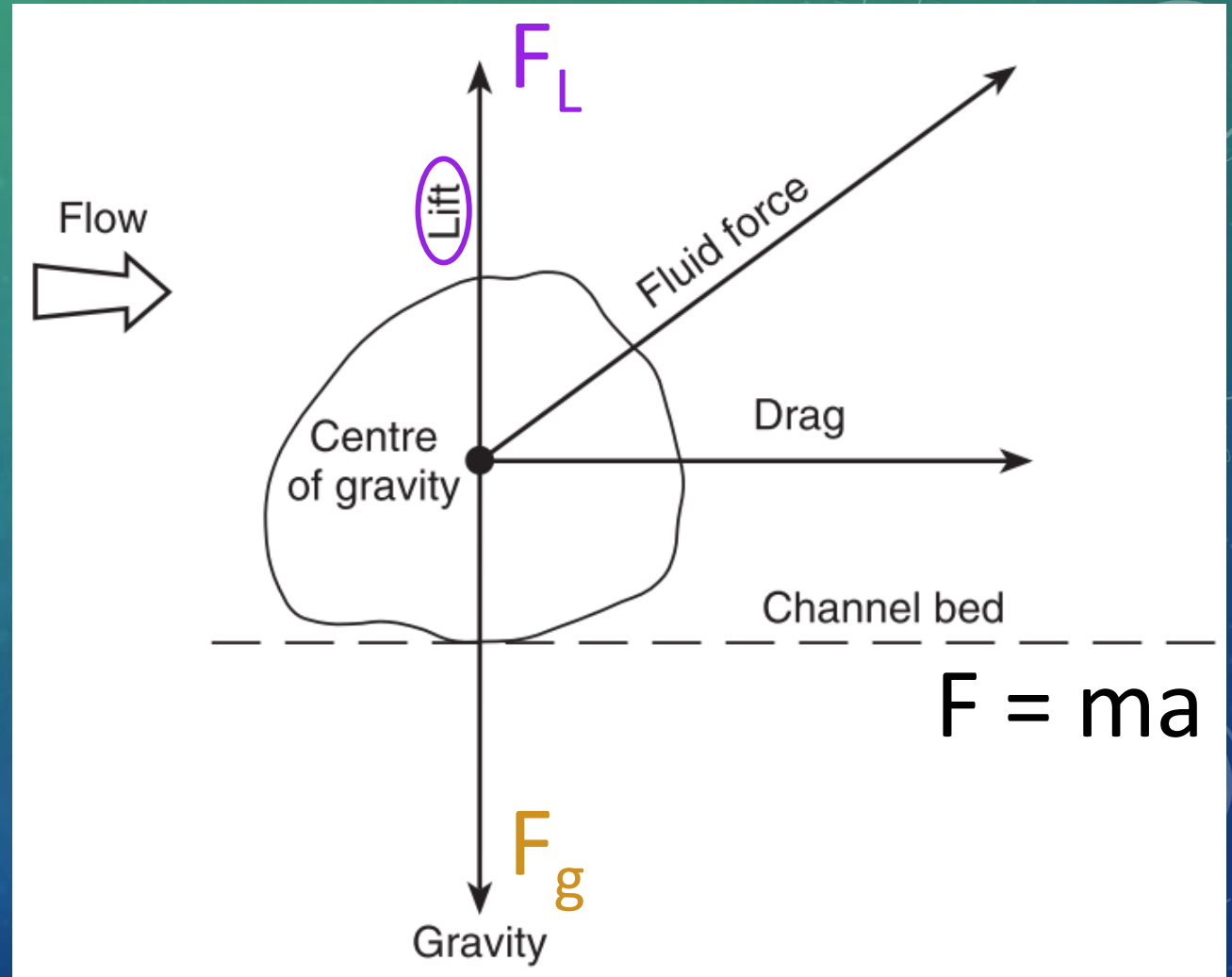
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From Charlton (2008), Adapted from Morisawa (1985)

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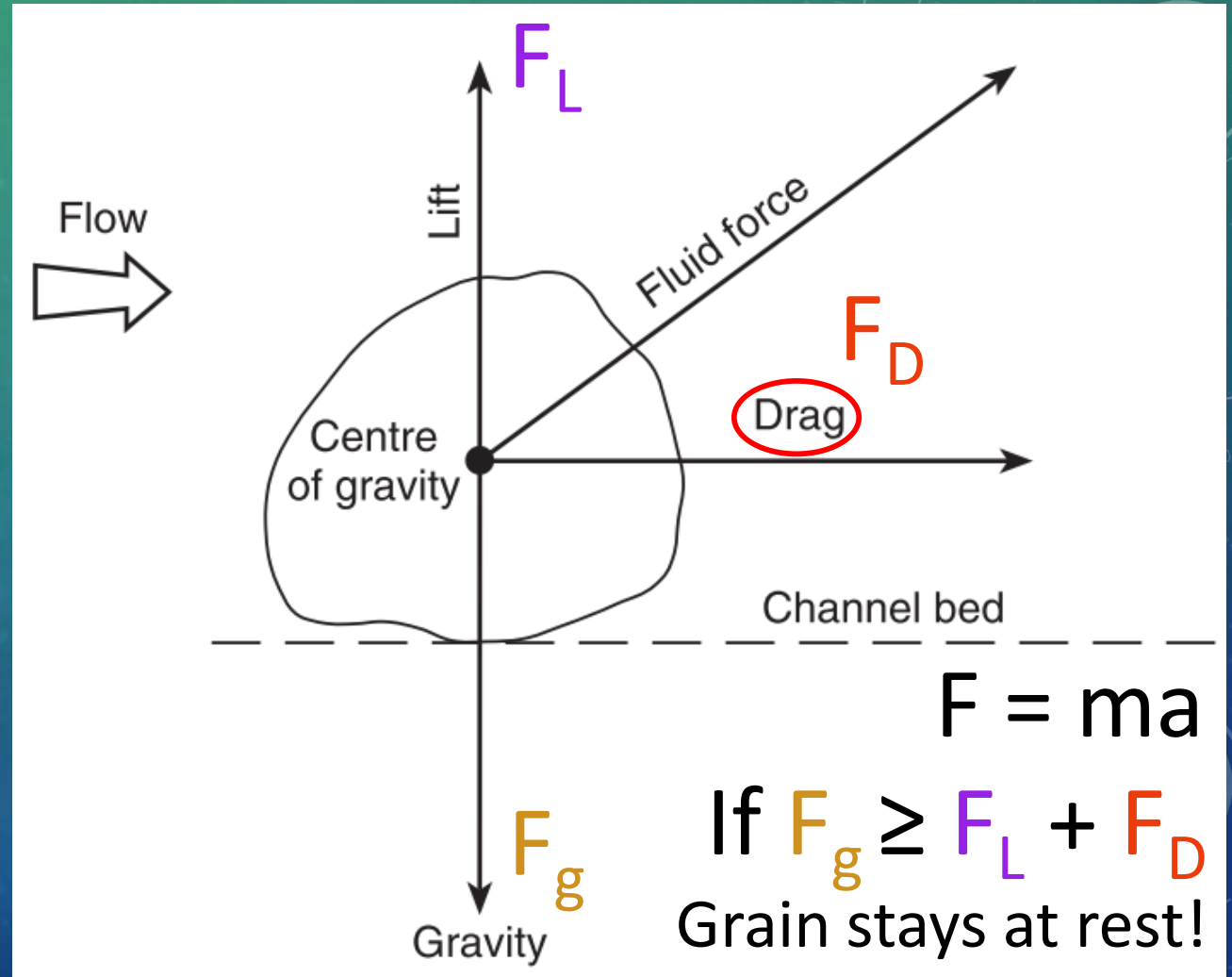
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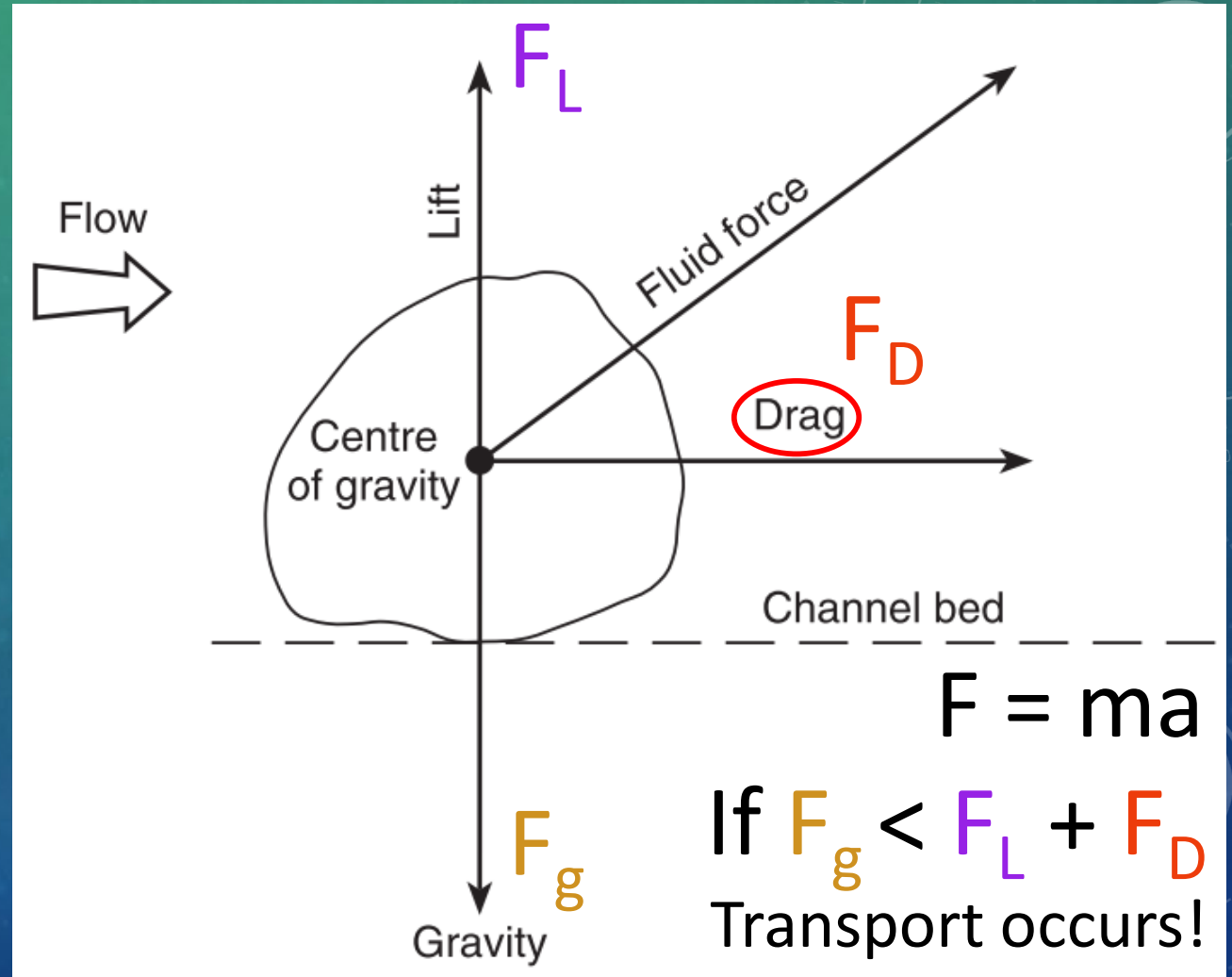
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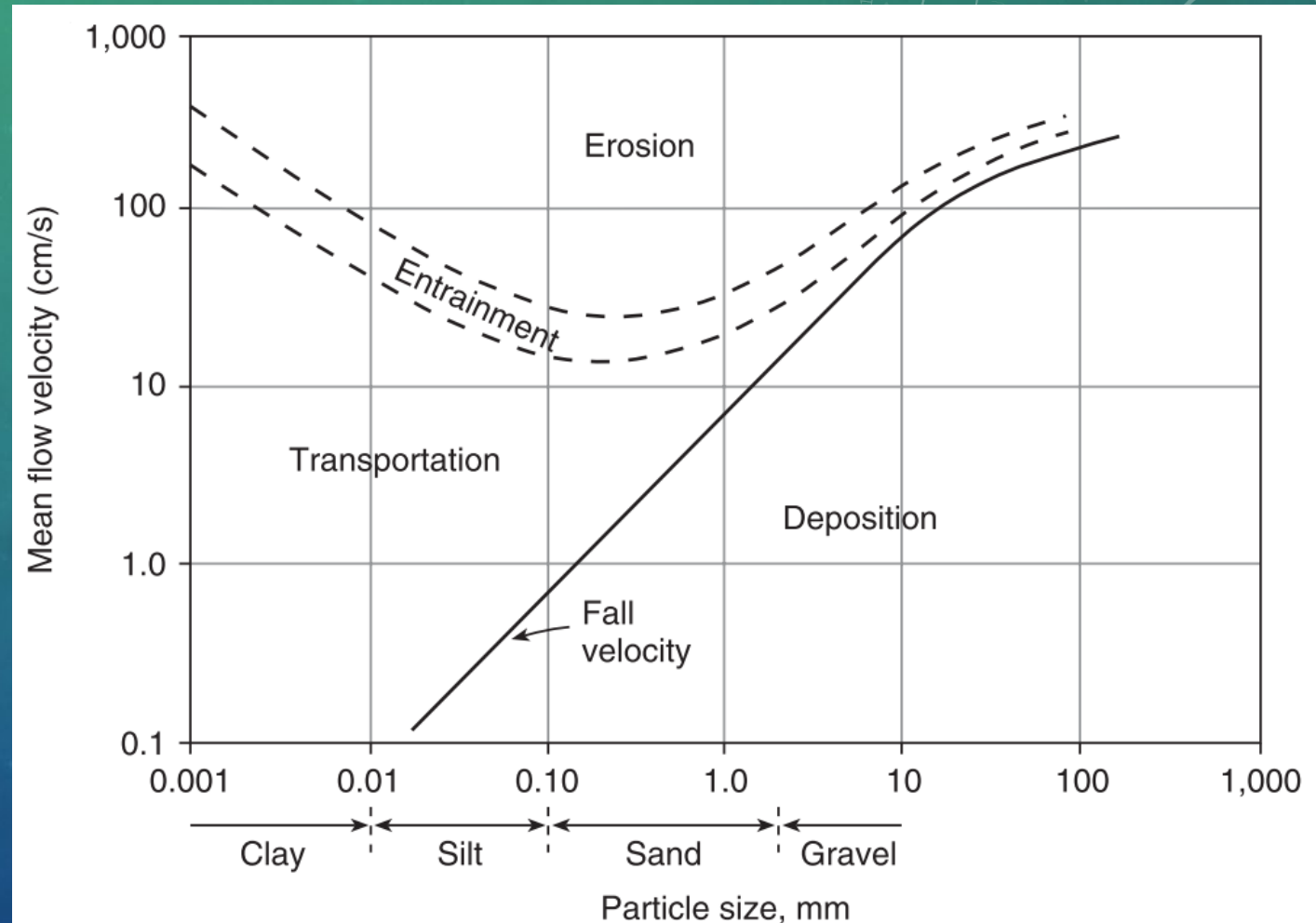
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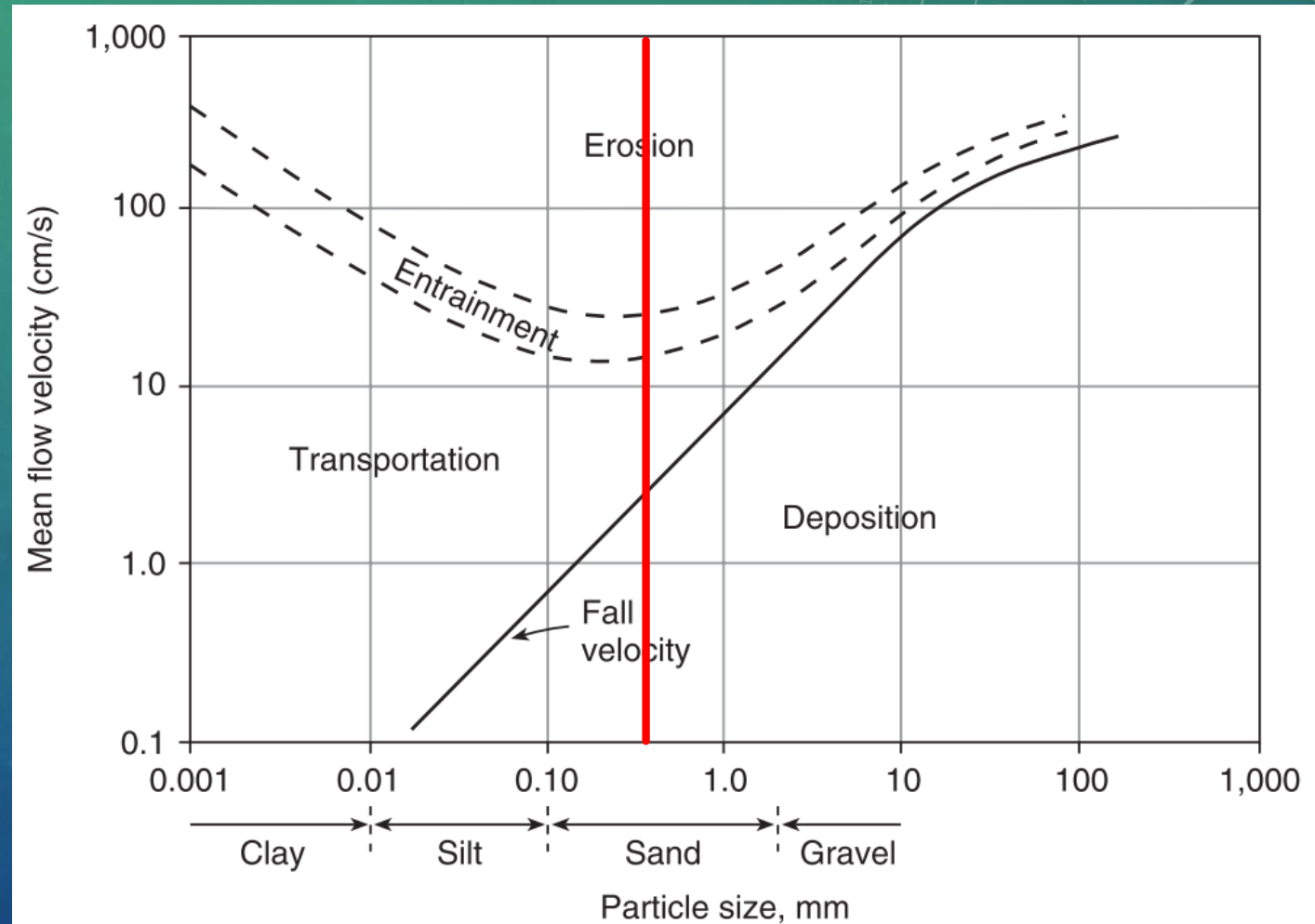
- Thresholds
- Initiation of Motion
- Hjulström Curve (1935)



From Charlton (2008), Adapted from Hjulström (1935)

BASIC CONCEPTS

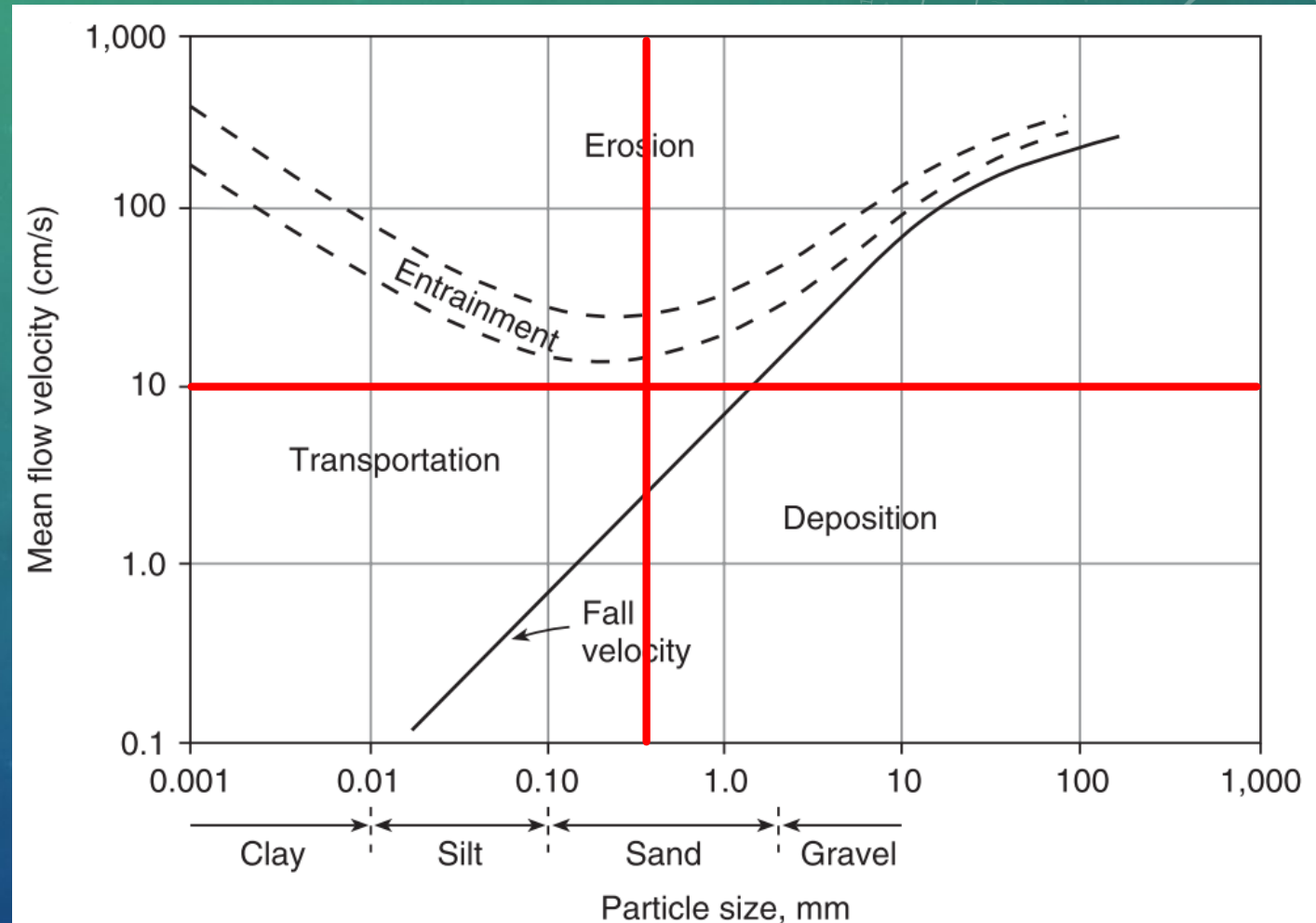
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From Charlton (2008), Adapted from Hjulström (1935)

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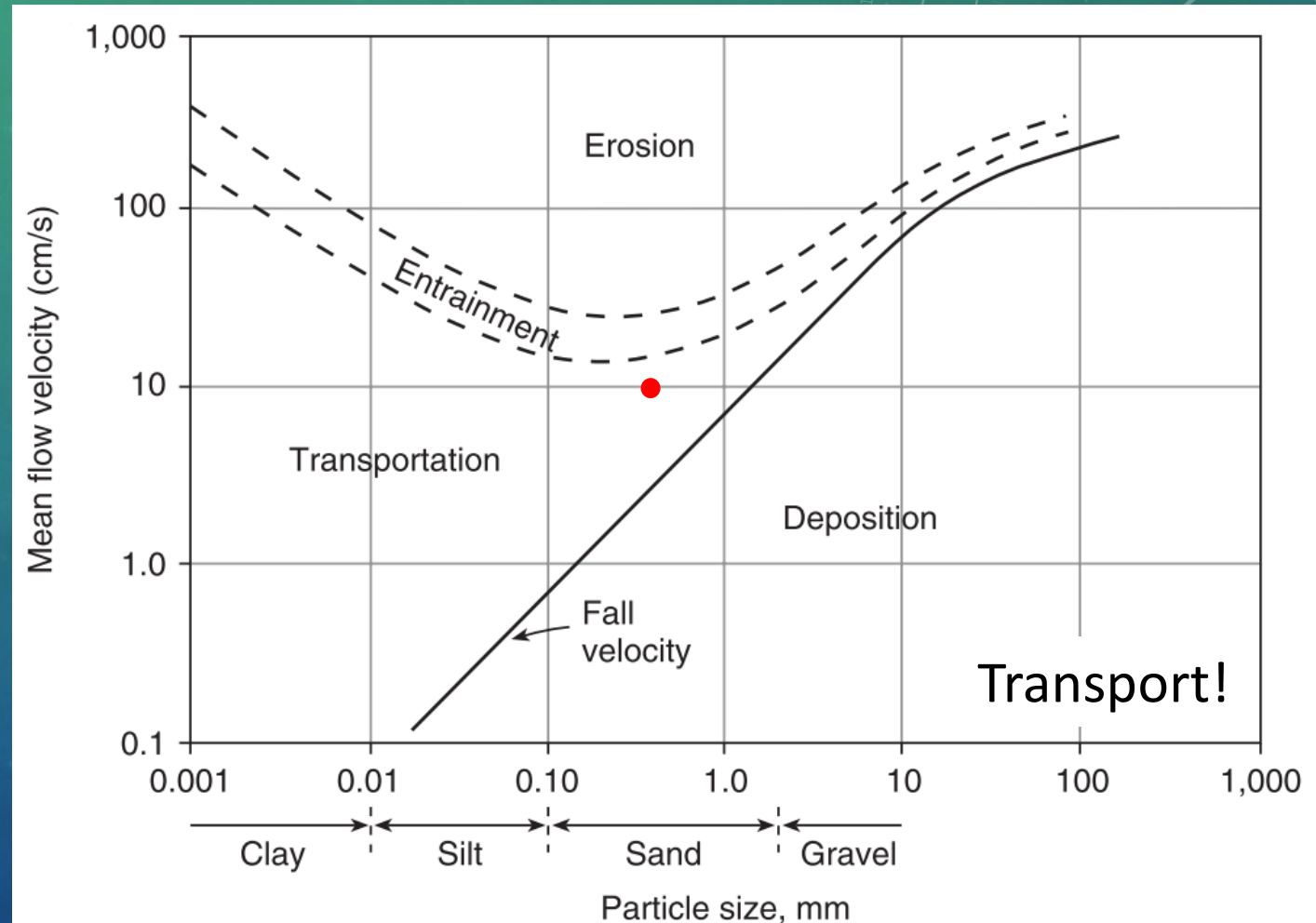
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From Charlton (2008), Adapted from Hjulström (1935)

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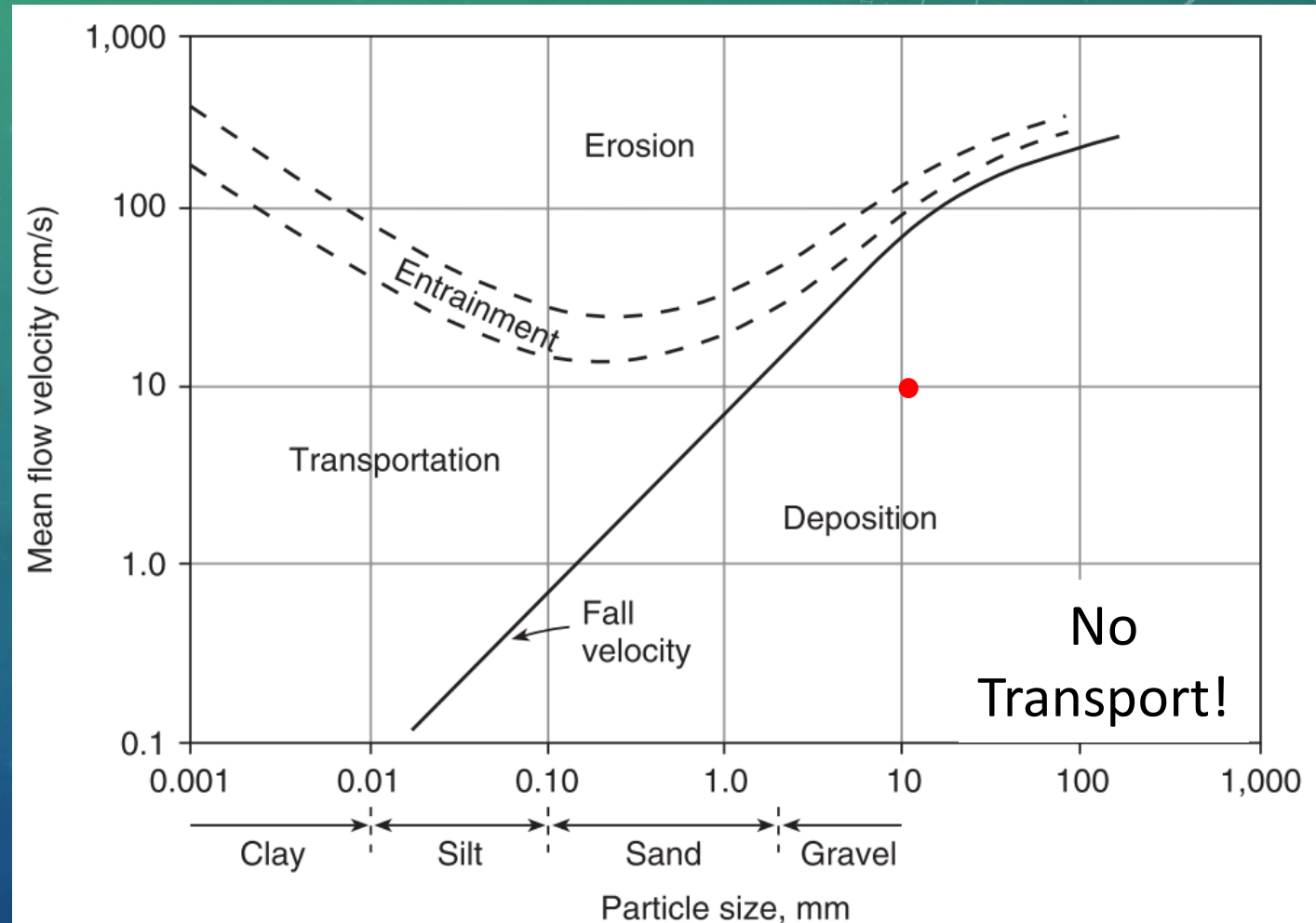
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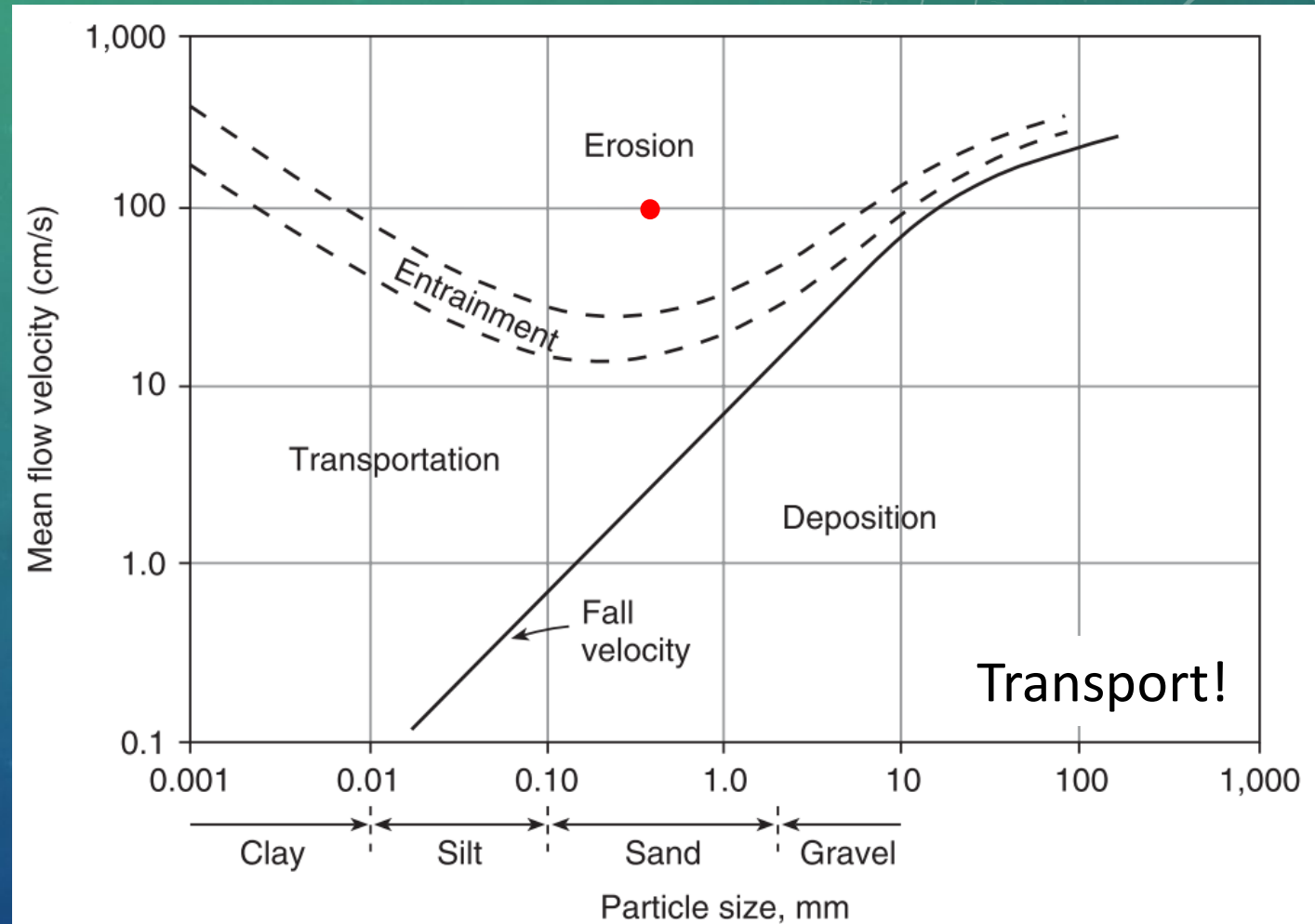
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From Charlton (2008), Adapted from Hjulström (1935)

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From Charlton (2008), Adapted from Hjulström (1935)

RECAP

- Grain Shape
- Grain Size
- Geomorphic Thresholds
- Initiation of Motion
- Hjulström Curve

Geomorphic thresholds: the concept and its applications¹

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Resistance Is Not Futile: Grain Resistance Controls on Observed Critical Shields Stress Variations

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RECAP

- Grain Shape
- Grain Size
- Geomorphic Thresholds
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