

Determining Sedimentary Sources and Environments: Applications in a Secondary Science Classroom

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Overview

Researching Sediment Sources & Environments

- Background
- Problems
- Methods
- Results

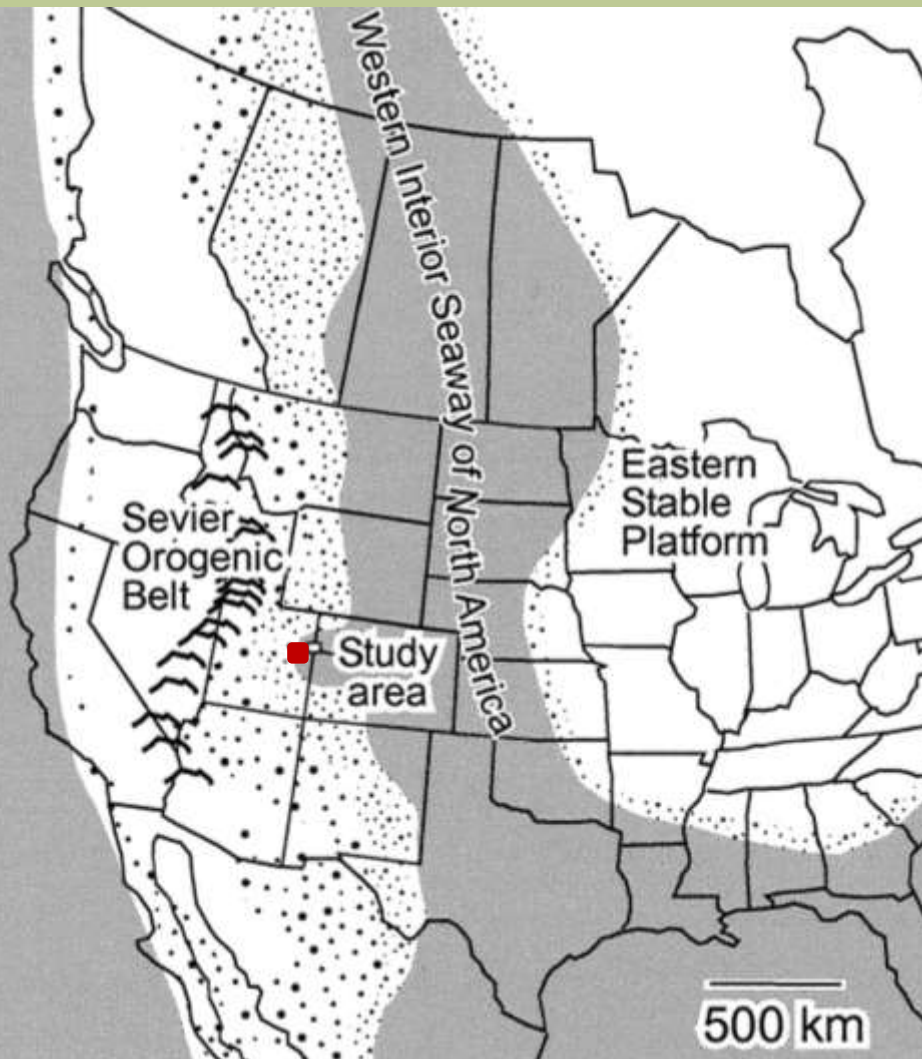
Applications in the Secondary Science Classroom

- Inquiry unit development
- Implementation
- Outcomes
- Future plans



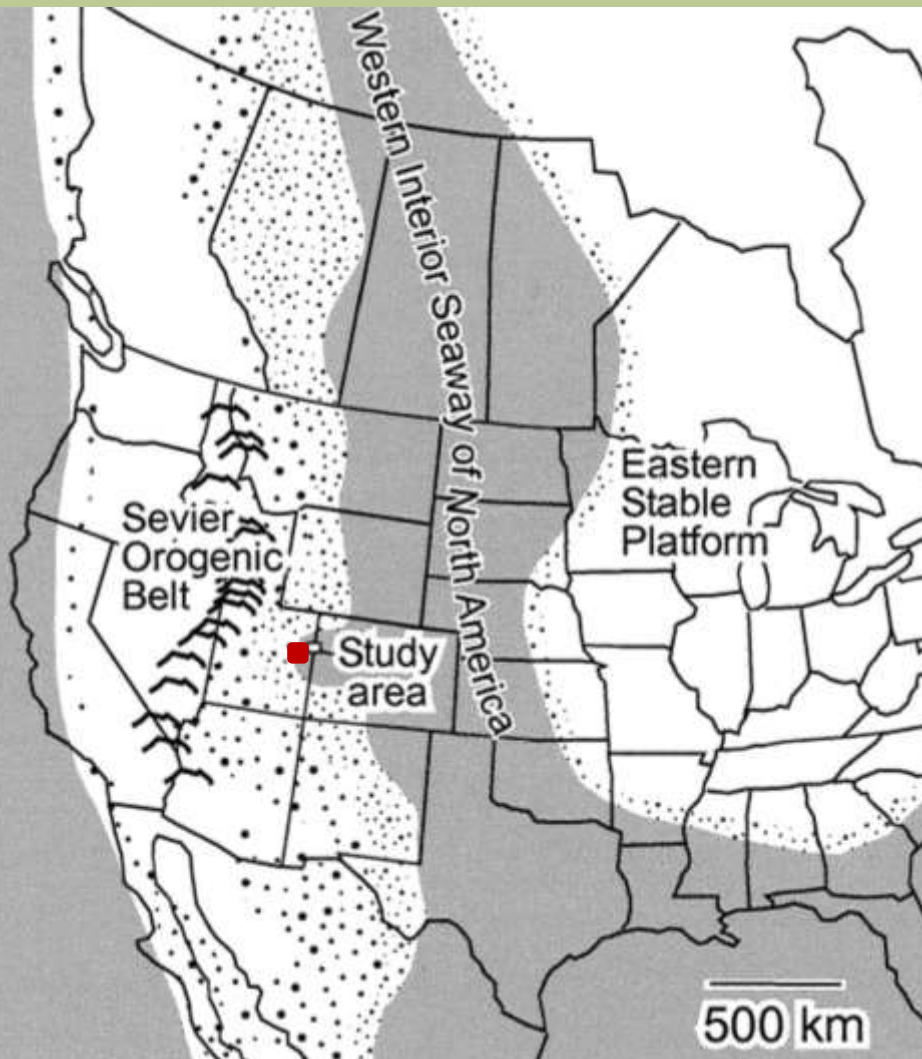
Determining Sedimentary Sources and Environments

Background – Sego Sandstone



- Tidally-influenced environment
- Deposited ≈ 76 million years ago

Research Problems



- Specific depositional environment?
- Source of the sediment?
 - Sevier vs. Laramide

Methods: Depositional Environment

Bed Structure



Grain Size

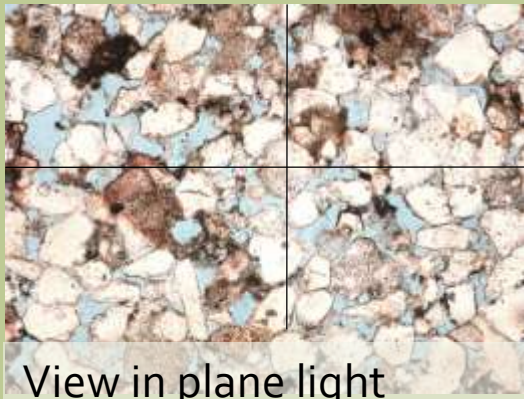


Methods: Source of Sediment

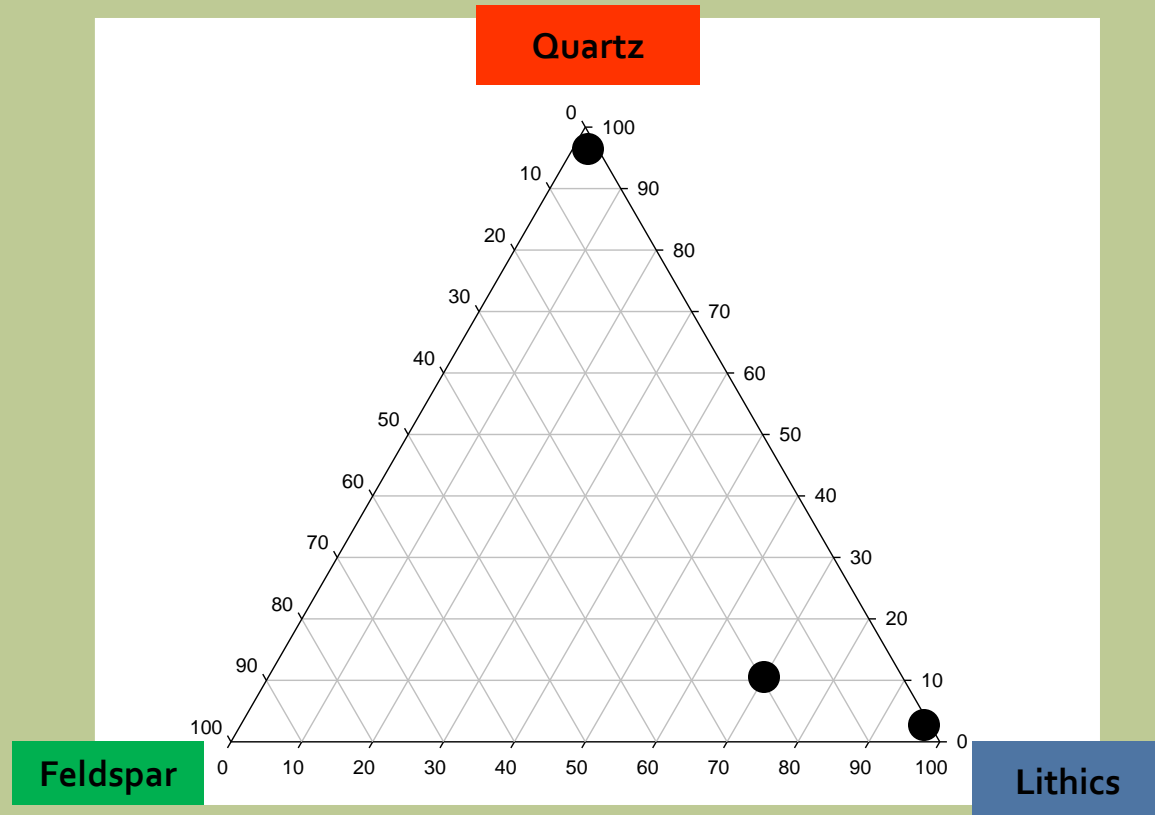
Sediment Mineral Composition



Point Count Method



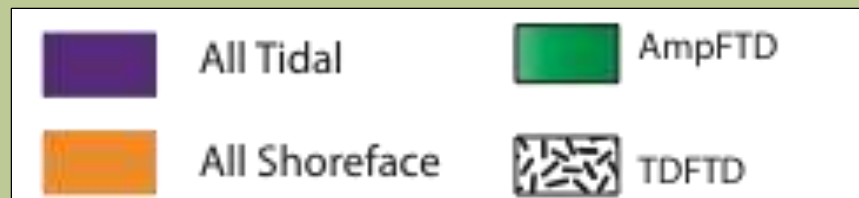
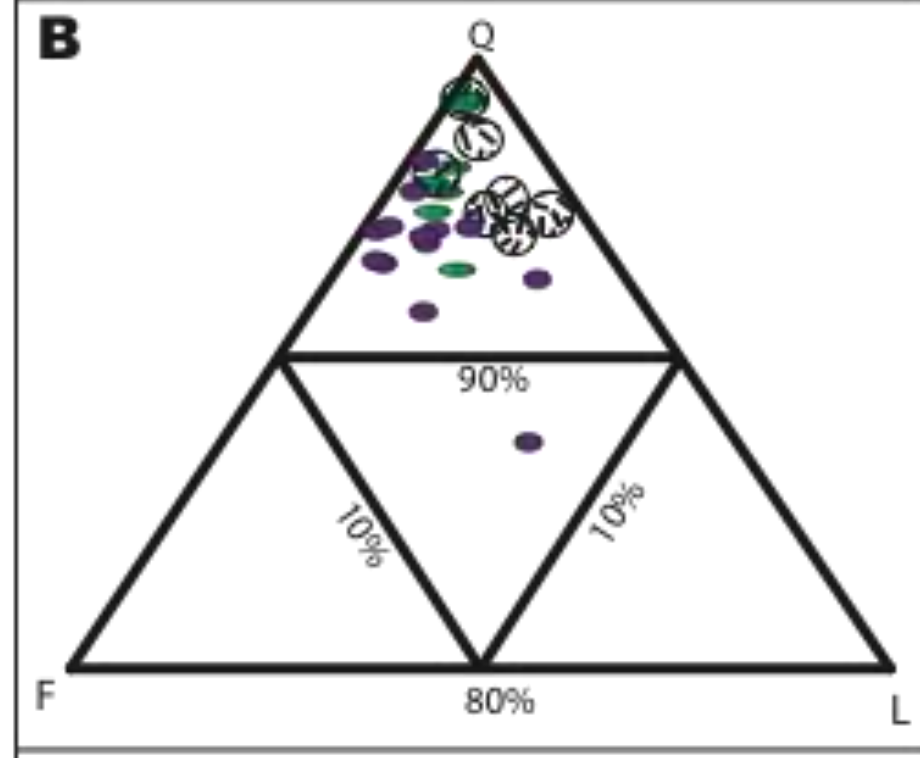
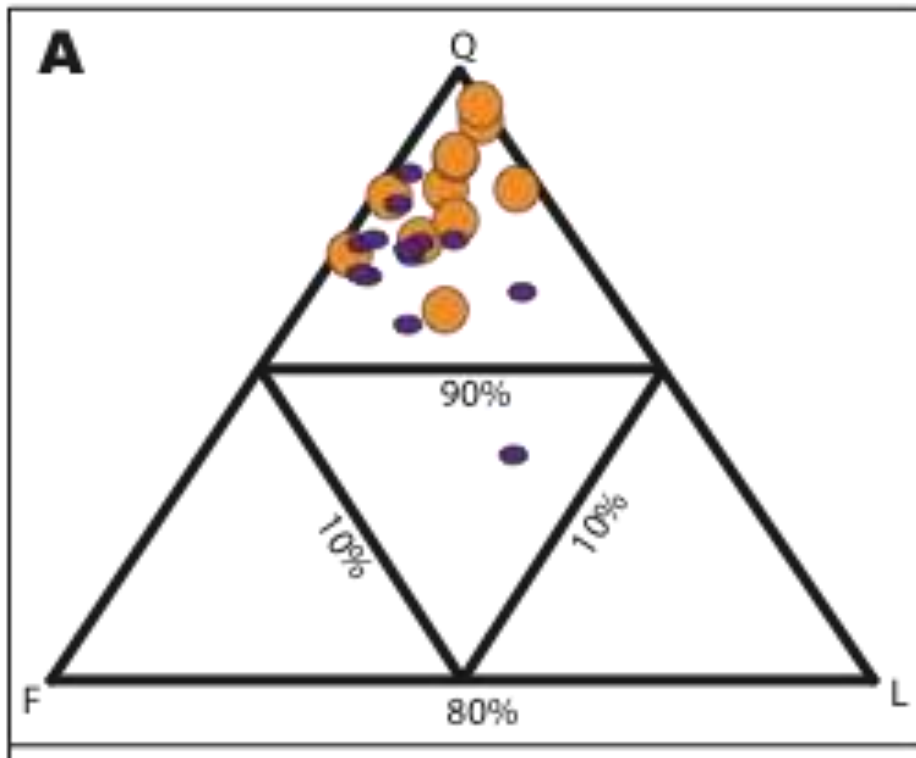
View in plane light



Results: Multiple Environments

- Tidal
- Shoreface
- Flood Tidal Delta

Results: Sevier Orogeny Sources



Q = Quartz

F = Feldspar

Lt = Lithics



**Application in an 8/9 Geology
Classroom, UW Lab School**

Conceptual Change Model

Problem:

In what type of environment was the sediment deposited?

CCM Steps:

1. Commit to an Outcome
1. Expose Beliefs
1. Confront Beliefs
1. Accommodate the Concept
1. Extend the Concept
1. Go Beyond

Students:

- Make predictions
- Share predictions
- Perform research
- Make conclusions
- Relate to studies
- Develop more Q's

Clues: Depositional Environment

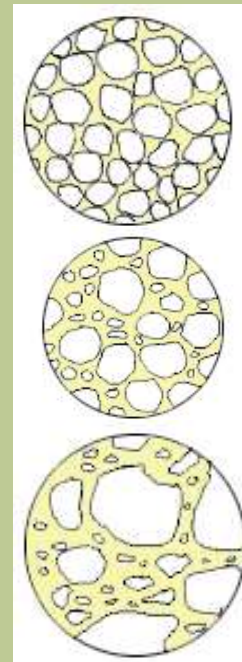
Size



Shape



Sorting



Structure



Student Inquiry in Action

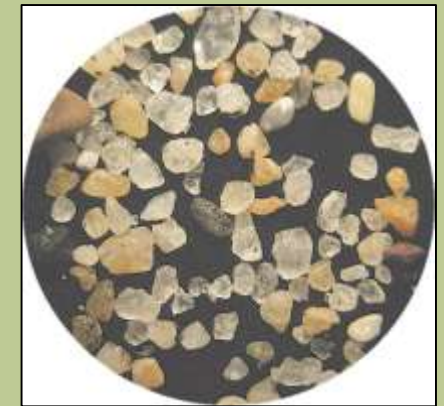
Observations & Predictions



Field Data Collection



Lab Data Collection



Outcomes

Students demonstrated:

- Content knowledge
 - Environments change over time
 - Sedimentary rock can record environmental history
- Science skills
 - Use of evidence to support or refute a hypothesis
 - Interest in investigating further questions

Future Plans

- Continue using Conceptual Change Model
- Additional work teaching science skills
- Vary levels of inquiry based on student needs

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