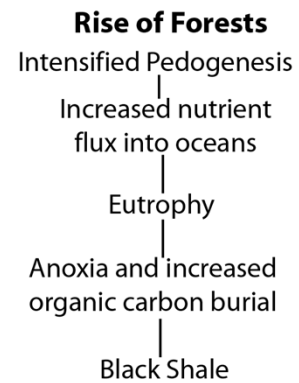
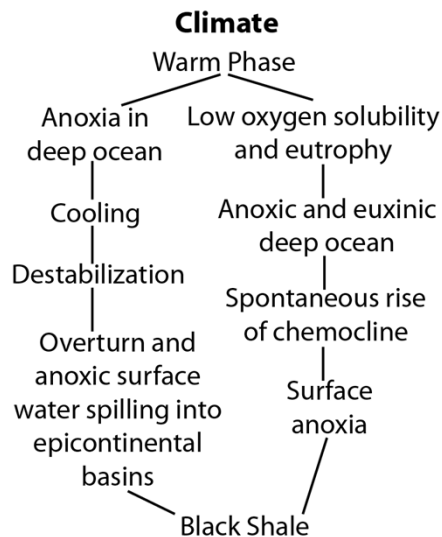
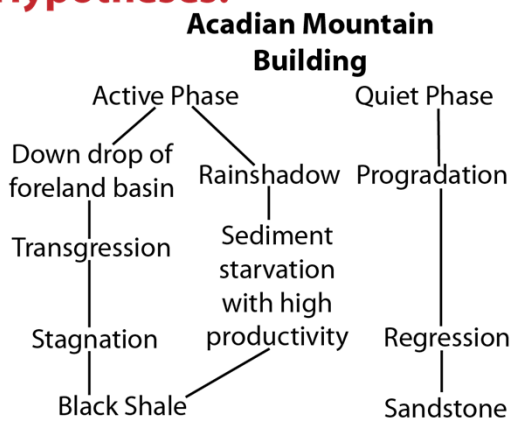


Testing Hypotheses of Black Shale Deposition in the Late Devonian Catskill Basin, Watkins Glen State Park, New York

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Hypotheses:



Predictions:

1. Transgression-regression cycles under tectonic control and independent of eustatic sea level change.
2. Black shale intervals uncorrelated with events (e.g., Kellwasser) outside of the basin.
3. No $\delta^{13}\text{C}$ excursion.

Ocean overturn

4. Evidence of climate cooling.

Chemocline rise

5. Evidence of continuous warm climate.
6. Loss of diversity among H_2S sensitive marine organisms.
7. Loss of diversity and/or indications of stress among terrestrial organisms.
8. Positive excursion in $\delta^{13}\text{C}_{\text{carb}}$.
9. Positive excursion in $\delta^{13}\text{C}_{\text{org}}$ of same magnitude as $\delta^{13}\text{C}_{\text{carb}}$.
10. Black shale intervals correlated with global events (e.g., Kellwasser).

11. Positive excursion in $\delta^{13}\text{C}_{\text{carb}}$.
12. Larger positive excursion in $\delta^{13}\text{C}_{\text{org}}$.
13. High and continuous diversity of land plants.

Observations & Preliminary Conclusions:

No positive excursions were observed in $\delta^{13}\text{C}_{\text{org}}$ suggesting that the mechanism producing black shales during the Kellwasser and related oceanographic events did not produce black shales in the Catskill Basin. Furthermore, the absence of a positive excursion in $\delta^{13}\text{C}_{\text{org}}$ suggests that fertilization by land plants did not produce black shales.

Continuing Investigation:

Palynofacies analysis will assess the degree of terrestrial sedimentary input throughout the section. If black shales are produced in local down-drop basins produced by regional tectonic activity, we expect to see a negative correlation between terrestrial input and organic carbon burial.