



Fossil Indicators of Age, Environment, and Correlation

GEOL1602 Historical Geology Lab 7

Previously

- ❖ Fossil

“the remains or evidence of the existence of organisms that lived in the geologic past”

- ❖ Trace fossil, “ancient trace preserved in lithified sediment”.



Photo credit: Tripadvisor.com
Mammoth Site of Hot Springs, South Dakota

Woolly Mammoth



Photo credit: Maya Wei-Haas
Smithsonianmag.com

Previously

- ❖ Fossil

“the **remains** or **evidence** of the existence of organisms that lived in the geologic past”

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- ❖ Fossil fuel

- ❖ petroleum (marine or lacustrine organics)

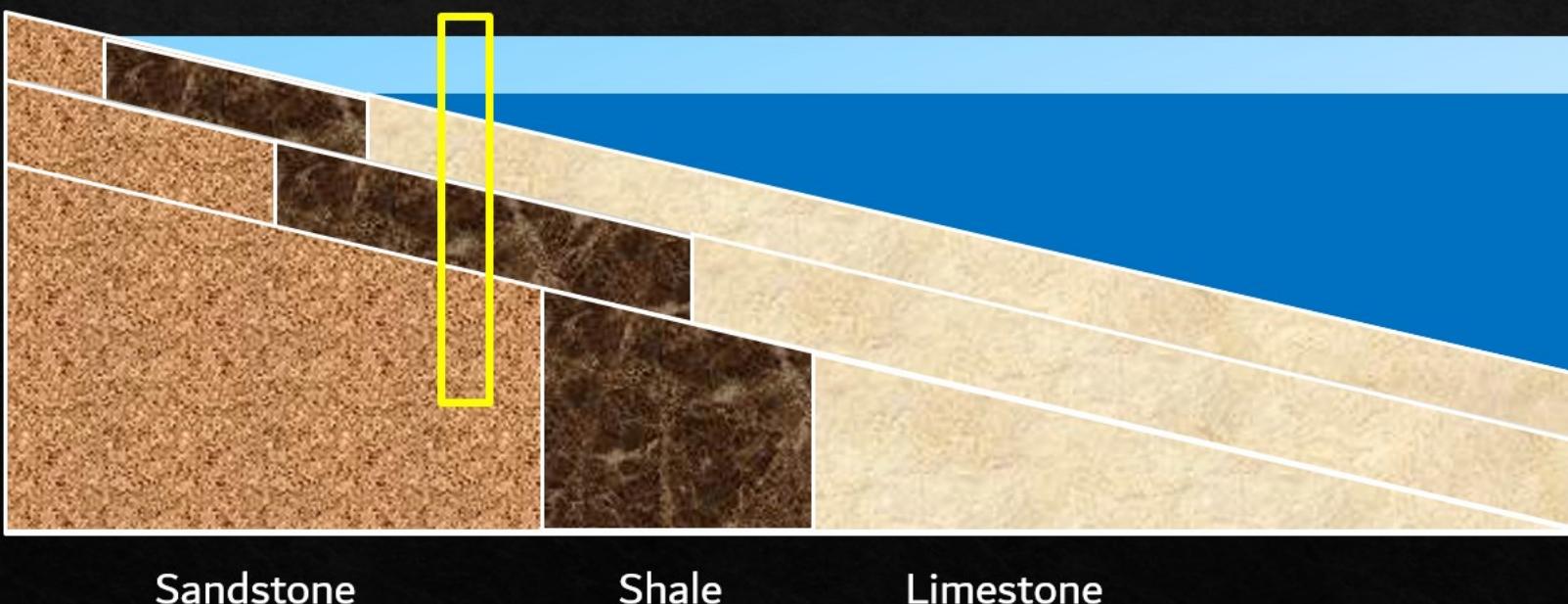
- ❖ coal (terrestrial plant, esp. swamp)

- ❖ Transgression & regression sequences

- ❖ Fault

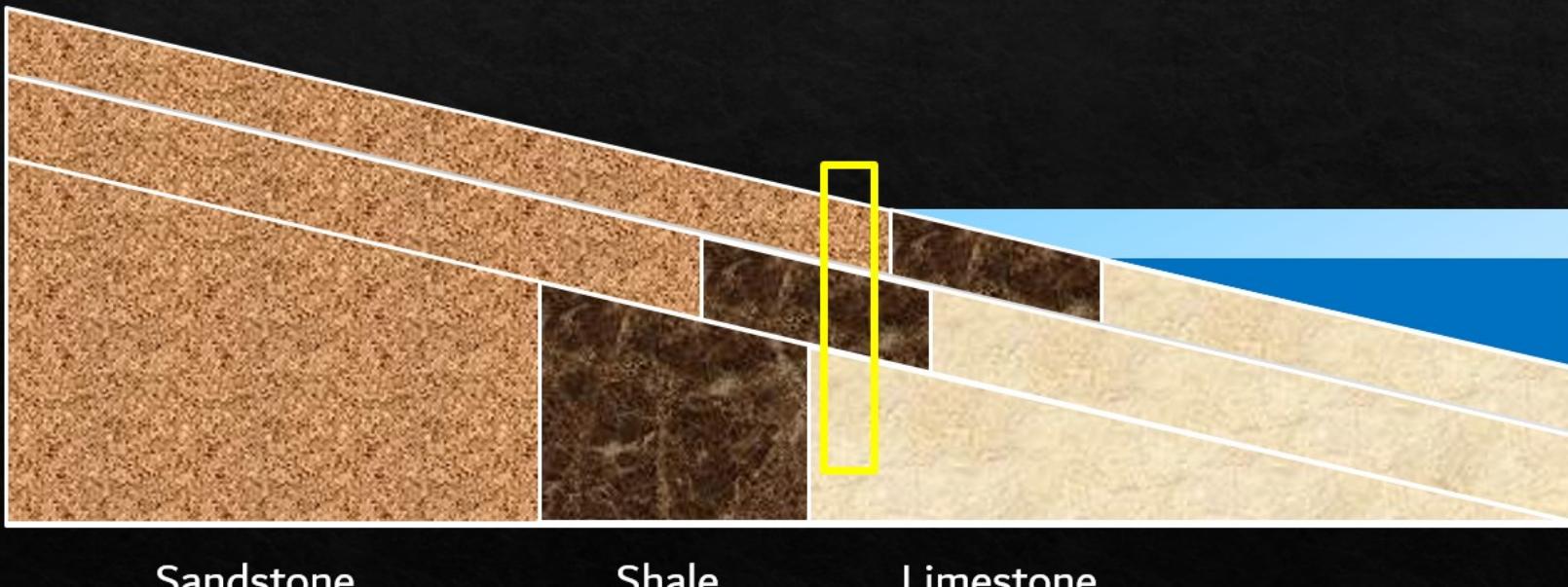
Transgressive Sequence

- ◊ Grain size fines upward
- ◊ Sea level deepens upward



Regressive Sequence

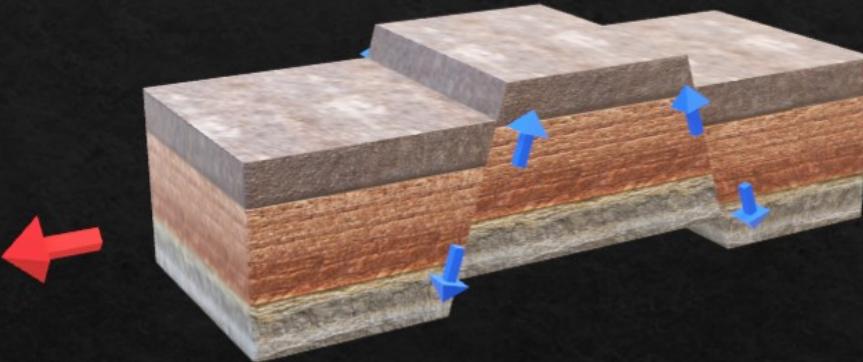
- ◊ Grain size coarsens upward
- ◊ Sea level shallows upward



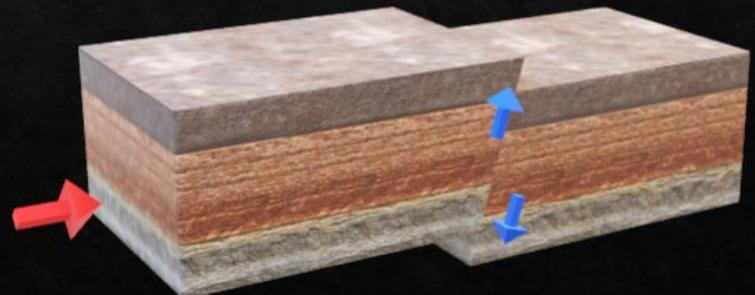
Faults



Strike-slip fault (lateral)



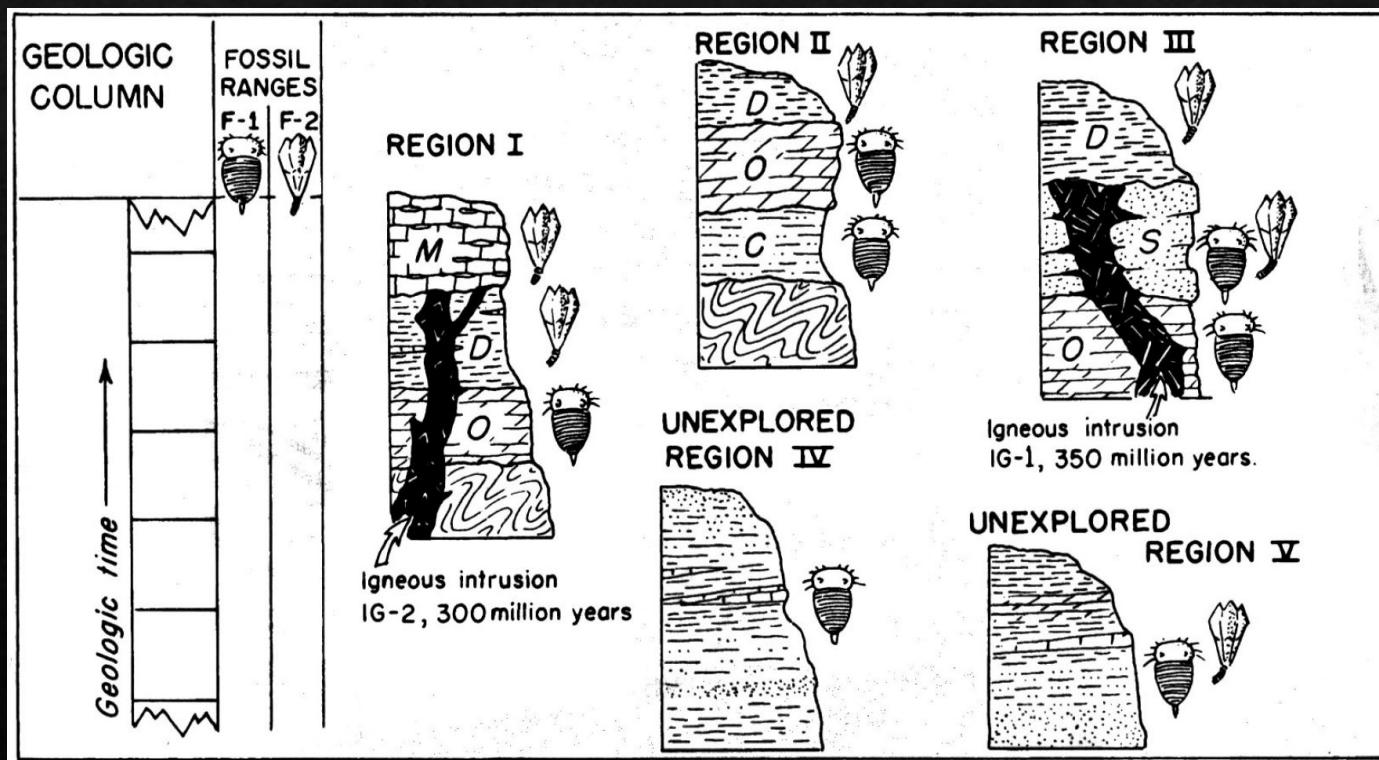
Normal faults (expansional)



Reverse fault (compressional)

1. Fossils in Age Determination

- ❖ Geologic range: the geologic time span between the first and last appearance of an organism.
- ❖ Example: F1 fossil (430 – 500 Ma), F2 (250 – 440 Ma). The age of region S is 430 – 440 Ma.



2. Index fossils

- ❖ Most Common index fossils

- ❖ Foraminifera:
 - ❖ single-celled plankton with hard calcareous shells

- ❖ Ammonites: late Paleozoic and Mesozoic

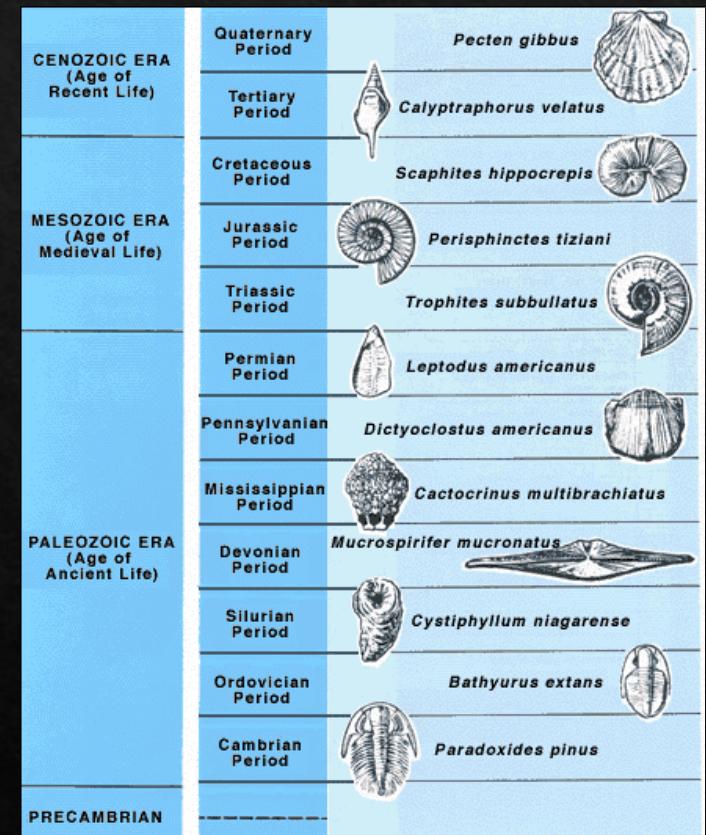
- ❖ Typically hard shells

- ❖ Index fossil: define and identify geologic periods

- ❖ distinctive or easily recognizable

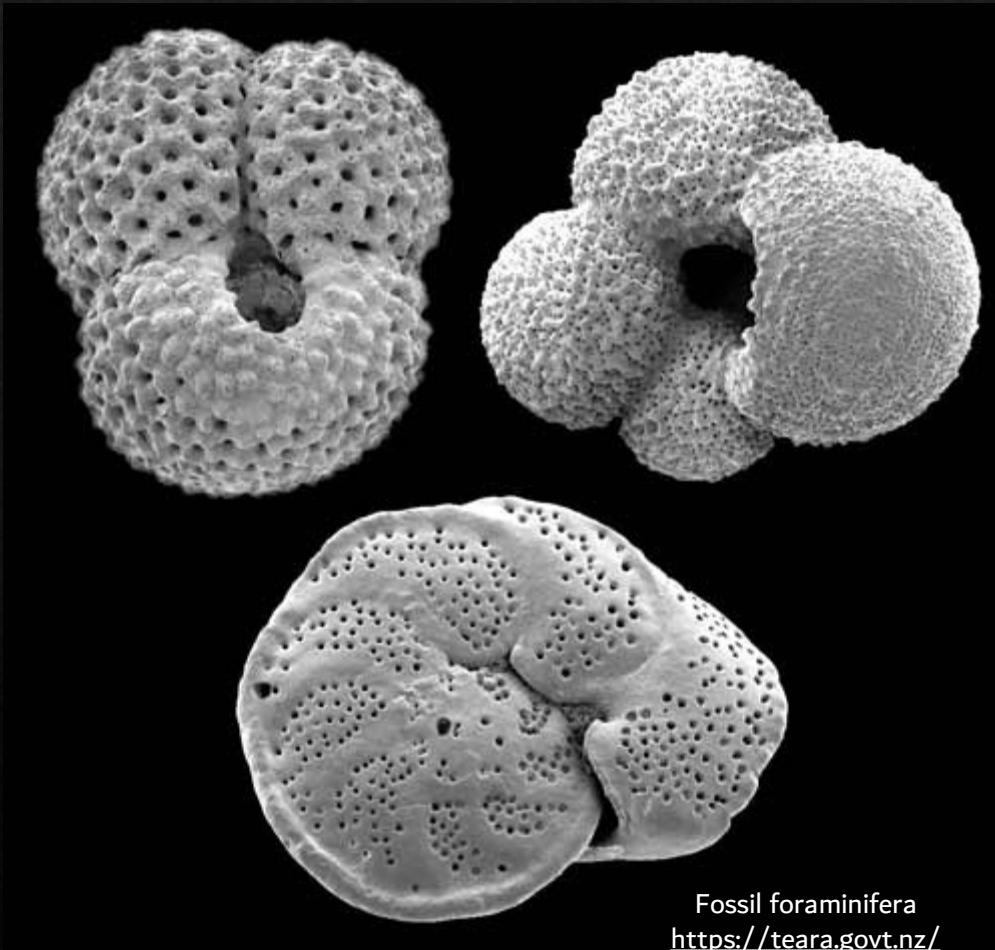
- ❖ abundant and wide geographic distribution

- ❖ a short range through time (a short vertical range)



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 - ❖ Foraminefera:
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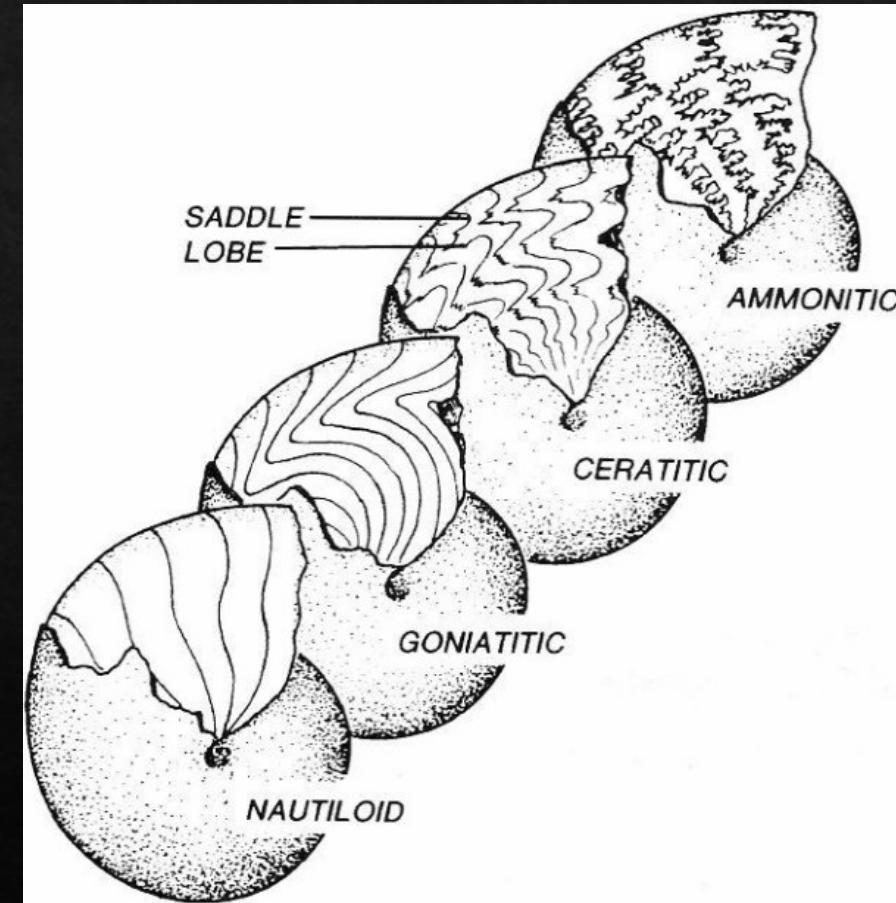
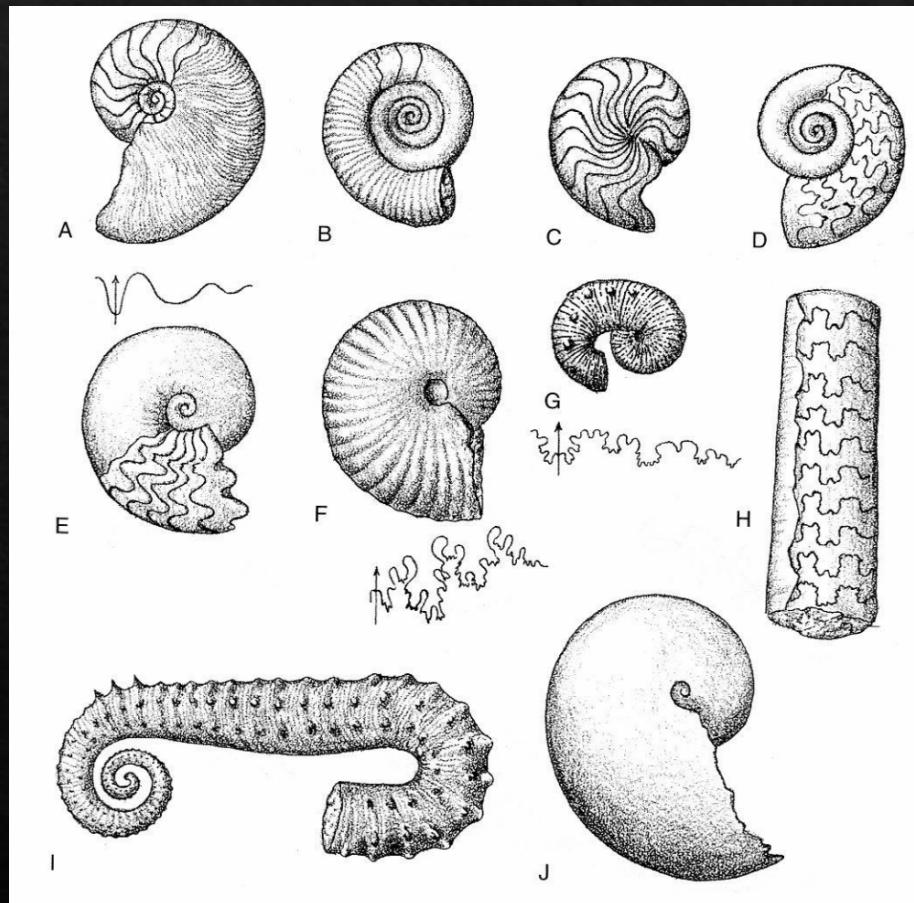
Fossil foraminifera
<https://teara.govt.nz/>

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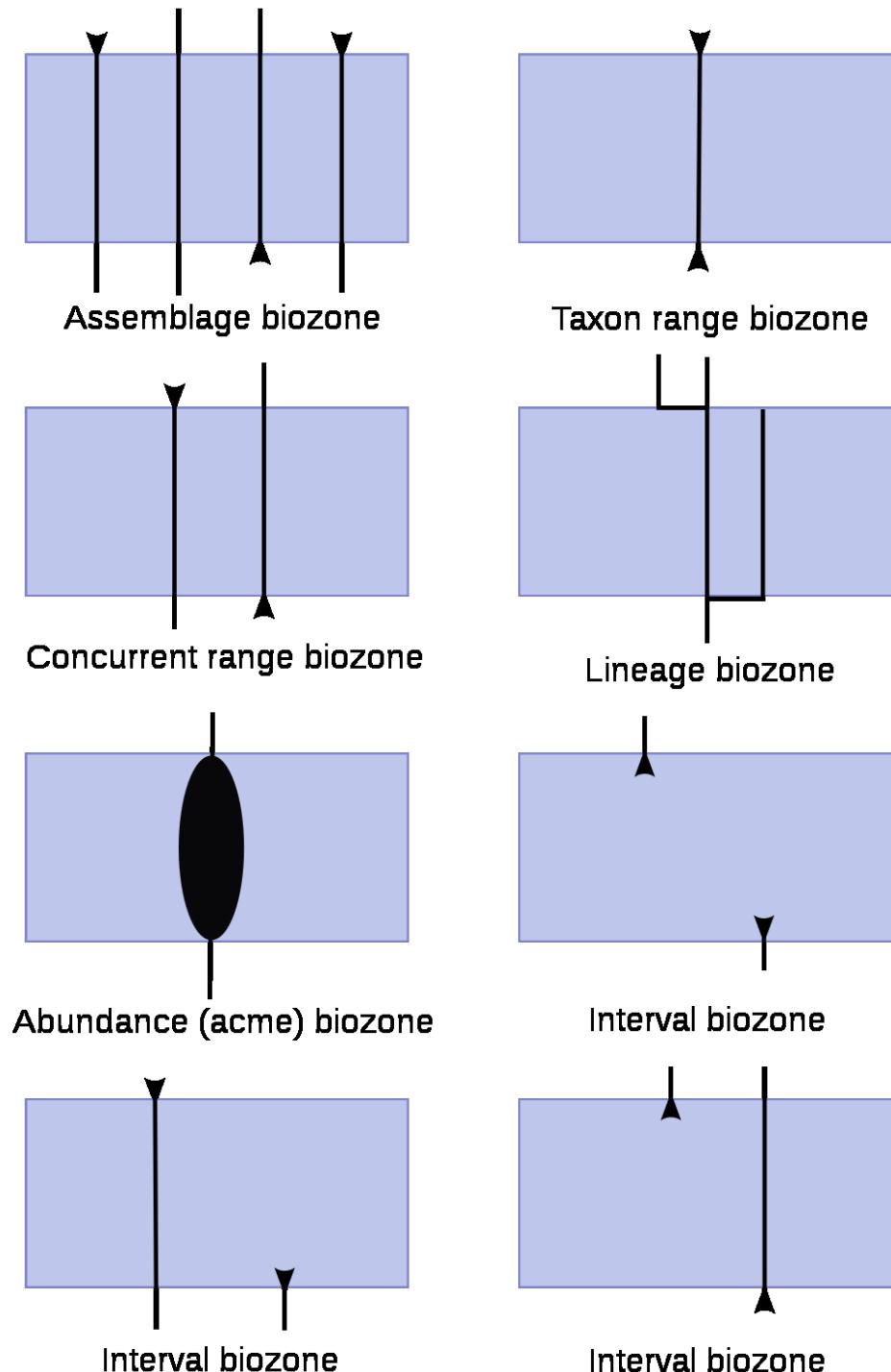
Ammonites (rapid evolution, suture pattern)



Textbook Chapter 11 Figure 11.11-12

3. Biostratigraphy

- ◊ Biostratigraphy: strata study based on fossils
- ◊ Biozone: rock body, defined by the presence, absence or relative abundance of certain species



4. Assignment

- ◊ Due by Wednesday April 1st 11:59PM CST
- ◊ Chapter 12
 - ◊ From “Fossils and age determinations”
 - ◊ (Skip) “A Graphic Method of Correlation”
 - ◊ To “Fossils and Paleoenvironments”
 - ◊ Page 149 – 153
 - ◊ Page 155 – 170