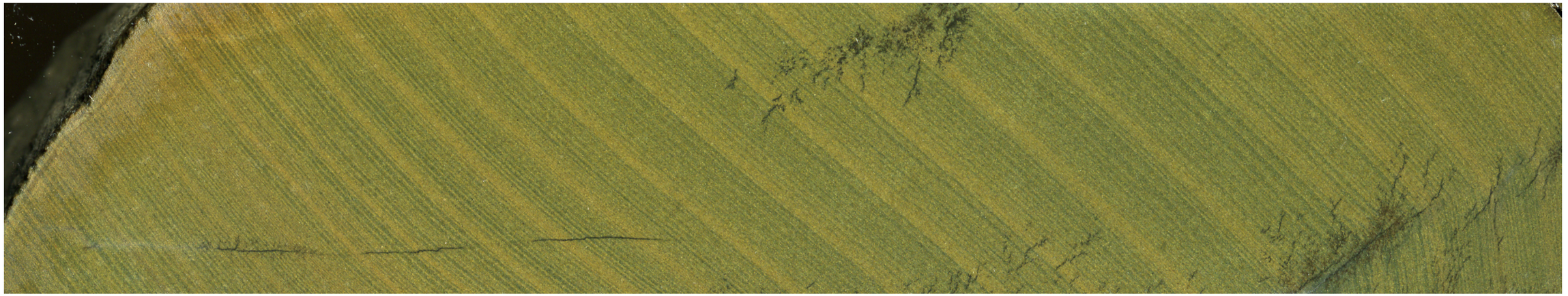


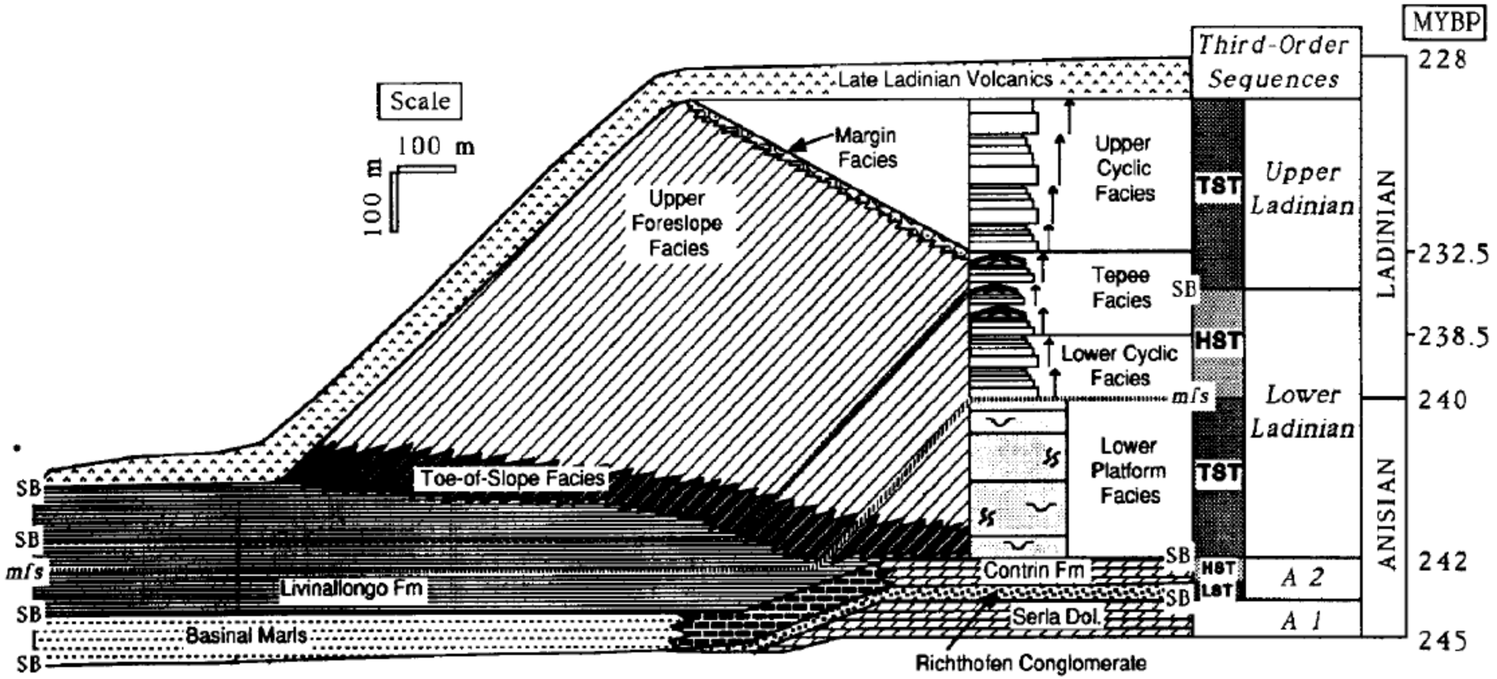
Lecture 11: Discussion of Hinnov and Goldhammer (1991)

1. Geological setting
2. Cycles in the Latemar Limestone (**space**)
3. Potential origin of the Latemar cycles (**time**)
4. Testing the hypothesis: the data
5. Testing the hypothesis: the analysis

We acknowledge and respect the lək^{w}əŋən peoples on whose traditional territory the university stands and the Songhees, Esquimalt and W̱SÁNEĆ peoples whose historical relationships with the land continue to this day.

Geological setting

- why would a platformal setting be especially senstive to sea level changes?



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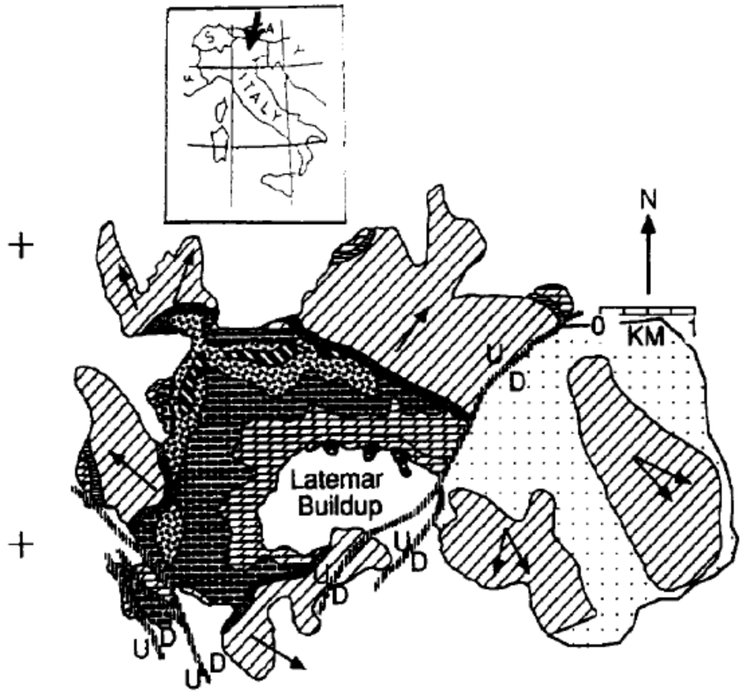
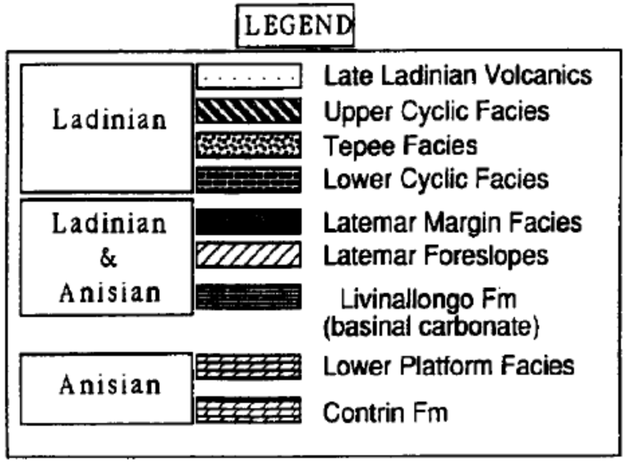
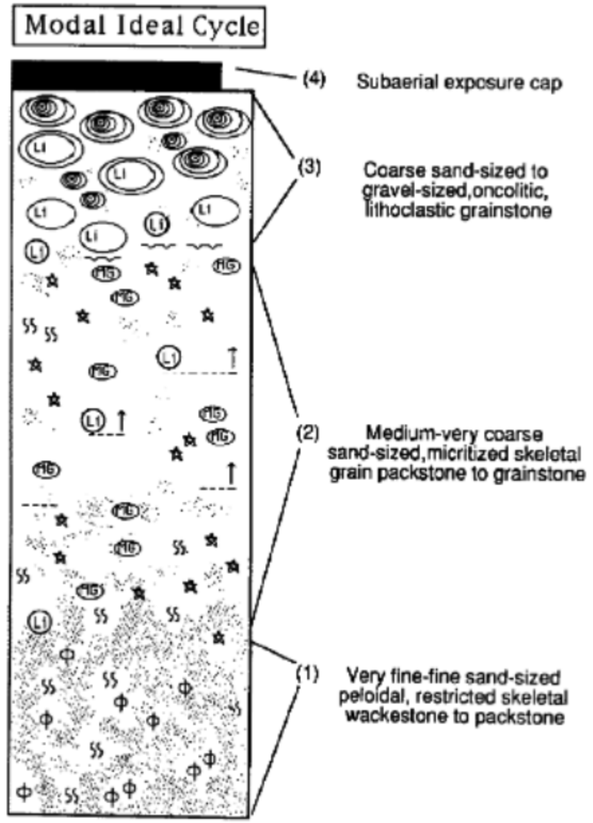
Geological setting





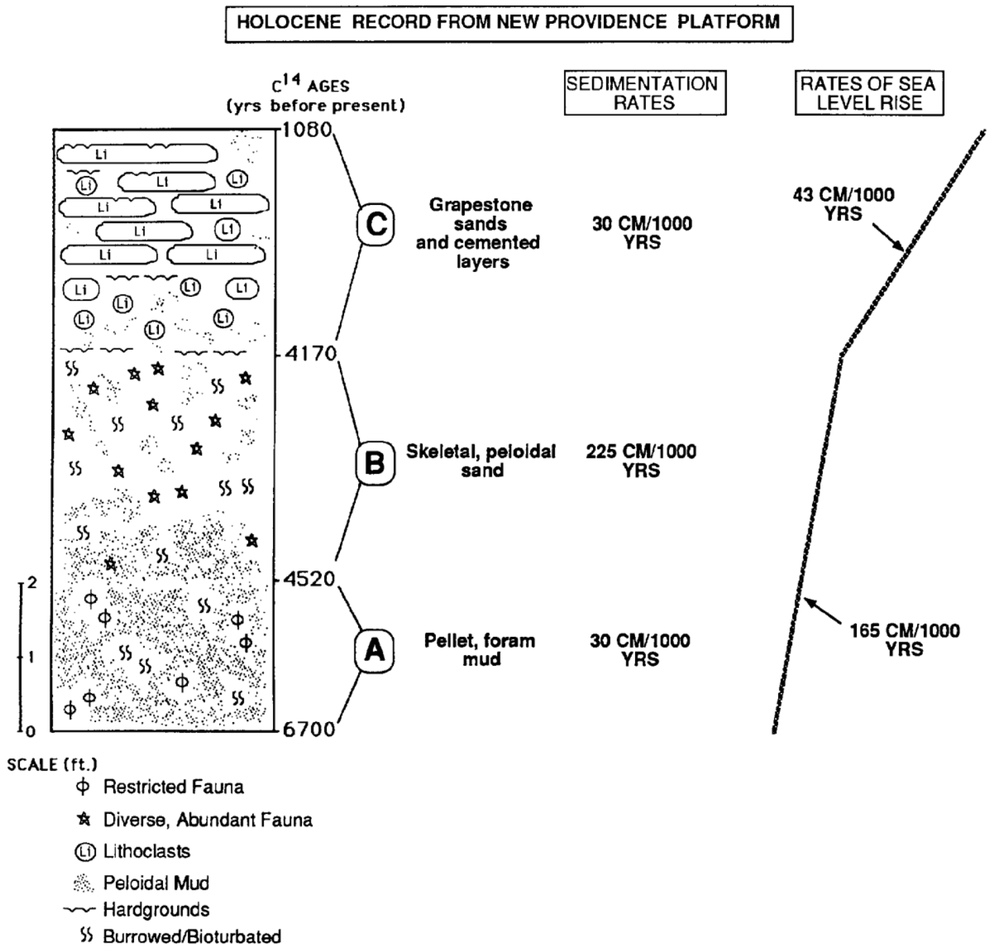
An ideal cycles in the Latemar Limestone

- what do the authors think is happening to sea level during deposition?
- "*The absence of features indicating peritidal deposition between the subtidal member and vadose cap is conspicuous throughout the formation.*"



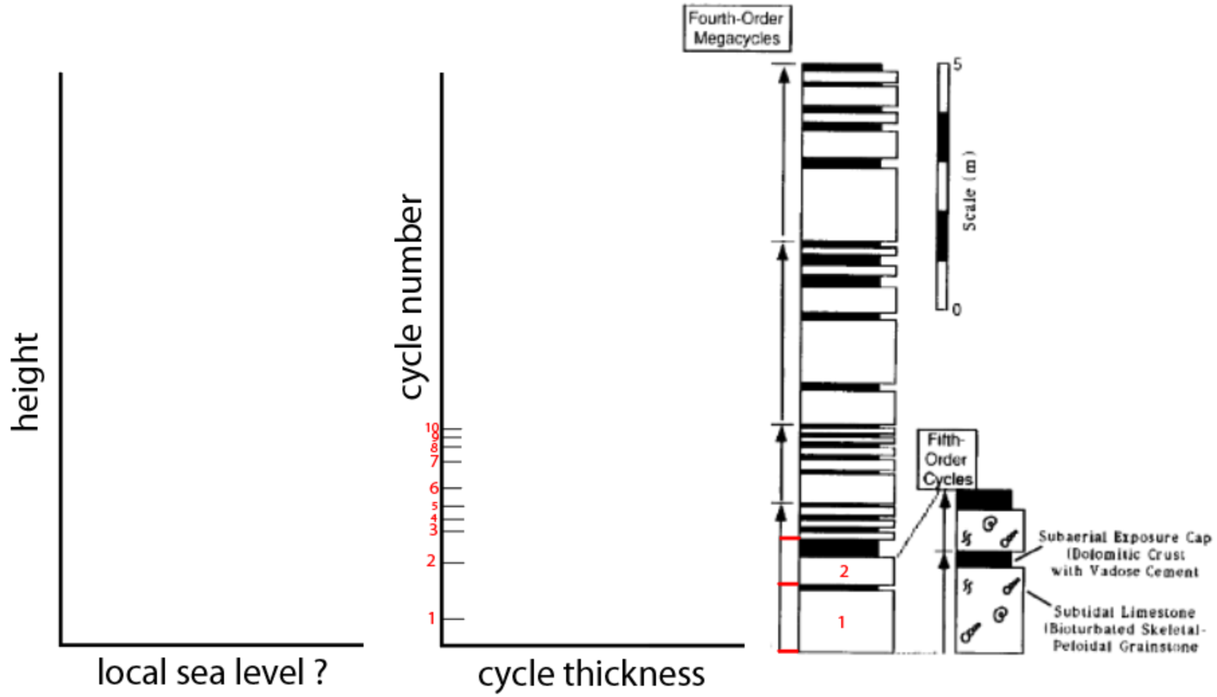
Holocene parasequence

- why do the authors discuss the Holocene?
- given your own work on (para)sequences anything odd about this holocene data?



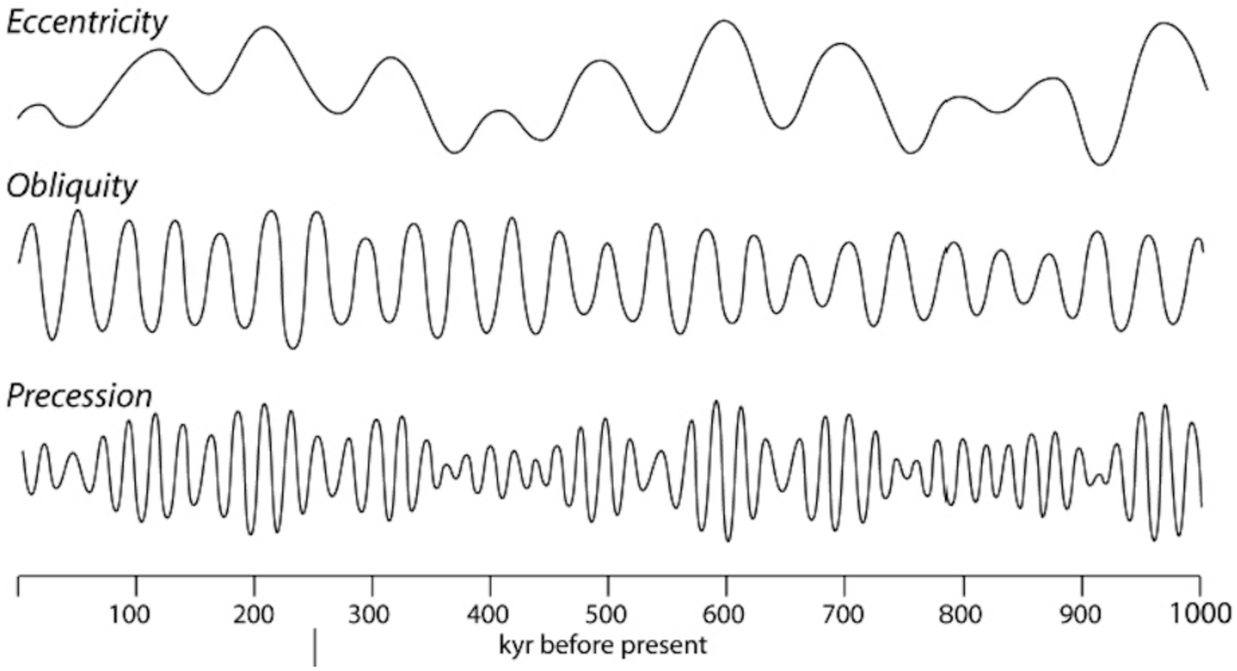
Nested cycles in the Latemar Limestone

- where is the *ideal Latemar cycle* on this plot?
- what is happening to **cycle thickness** up section?
- what do the authors think is happening to sea level?



What is the propesed driver of cyclicity?

- what is driving an *ideal cycle*?
- what is driving the *bundling of cycles* into groups of five?



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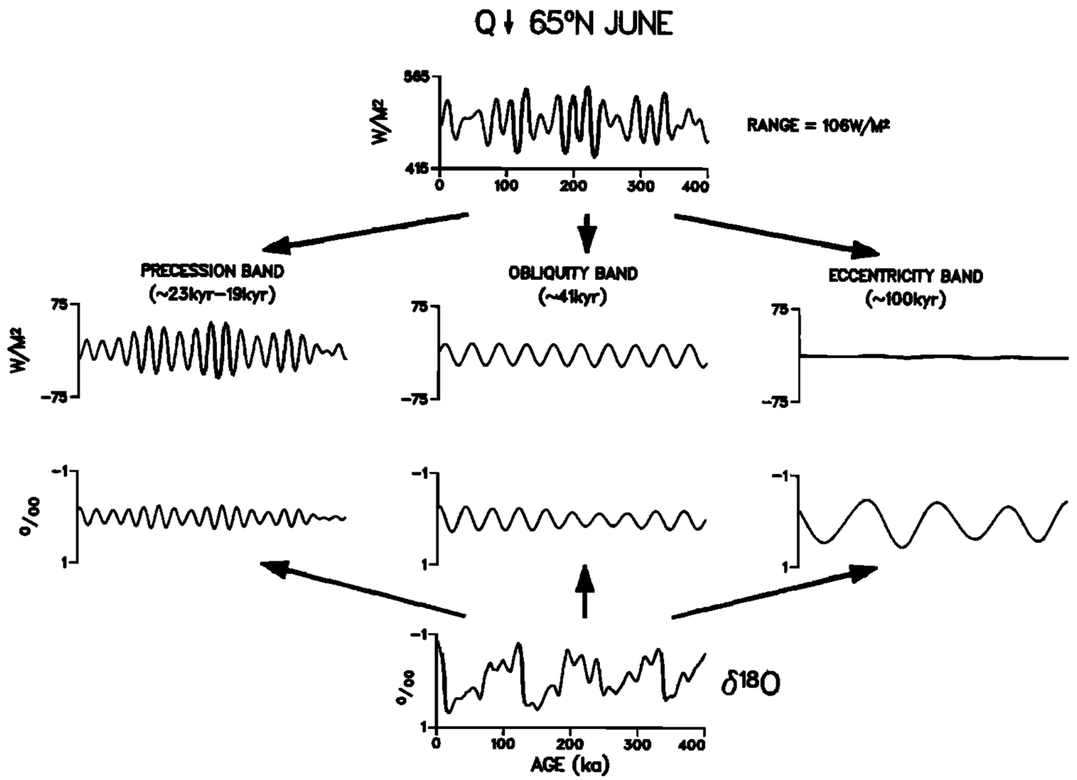
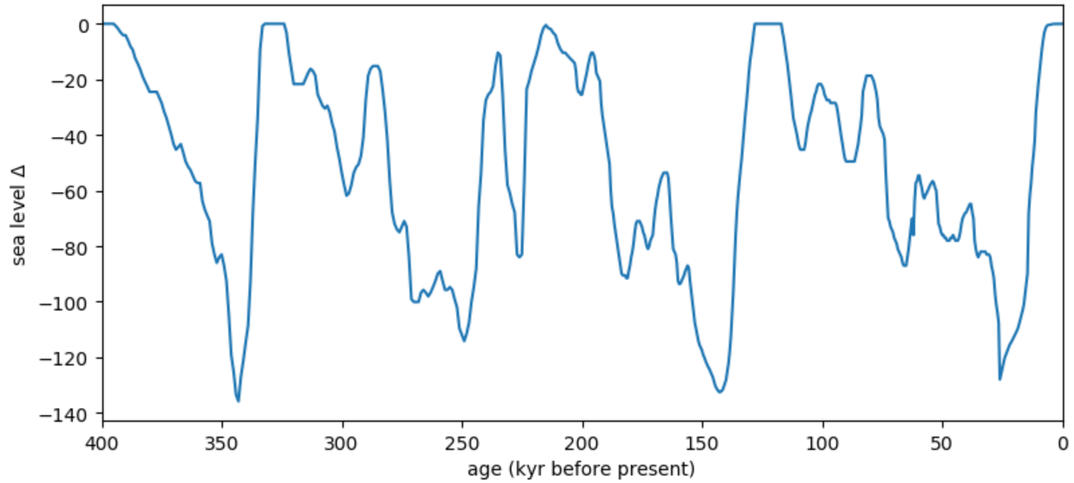

Q↓ 65°N JUNE
W/M²
465
415
0
100
200
300
400
RANGE = 106W/M²
PRECESSION BAND
(~23kyr–19kyr)
OBLIQUITY BAND
(~41kyr)
ECCENTRICITY BAND
(~100kyr)
75
-75
‰
-1
1
δ18O
AGE (ka)

But then why are the bundles asymmetric (according to the authors)?



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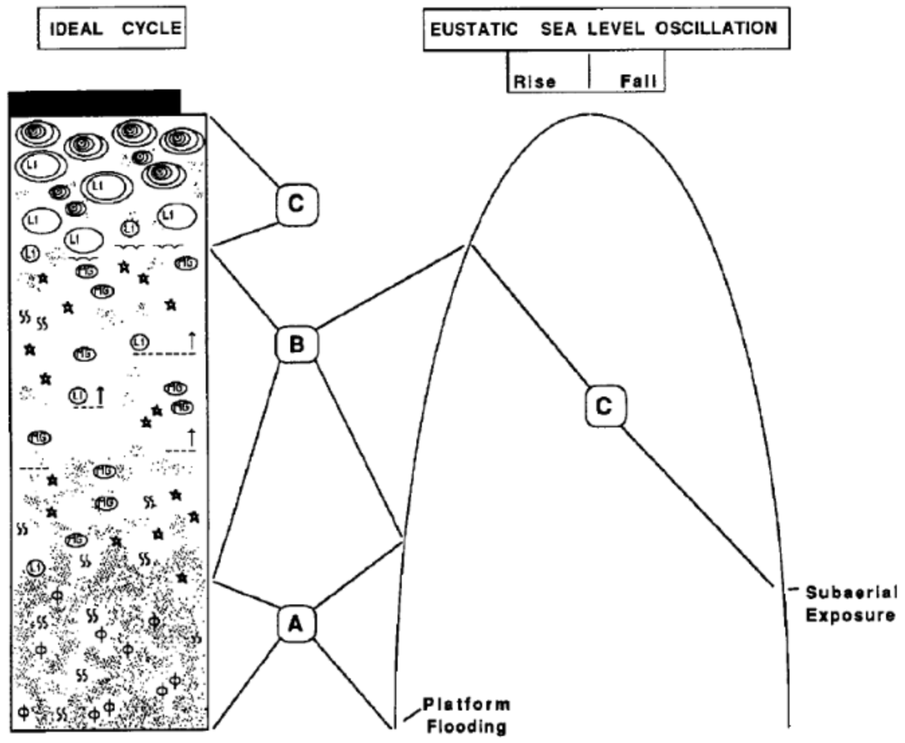
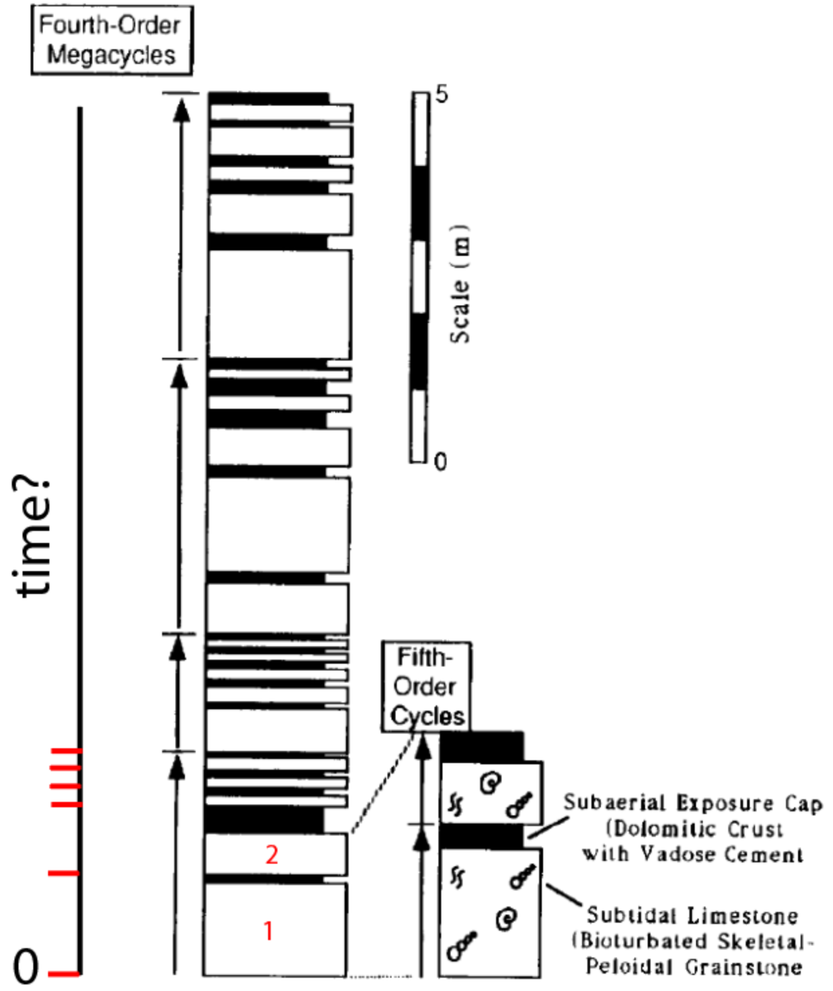
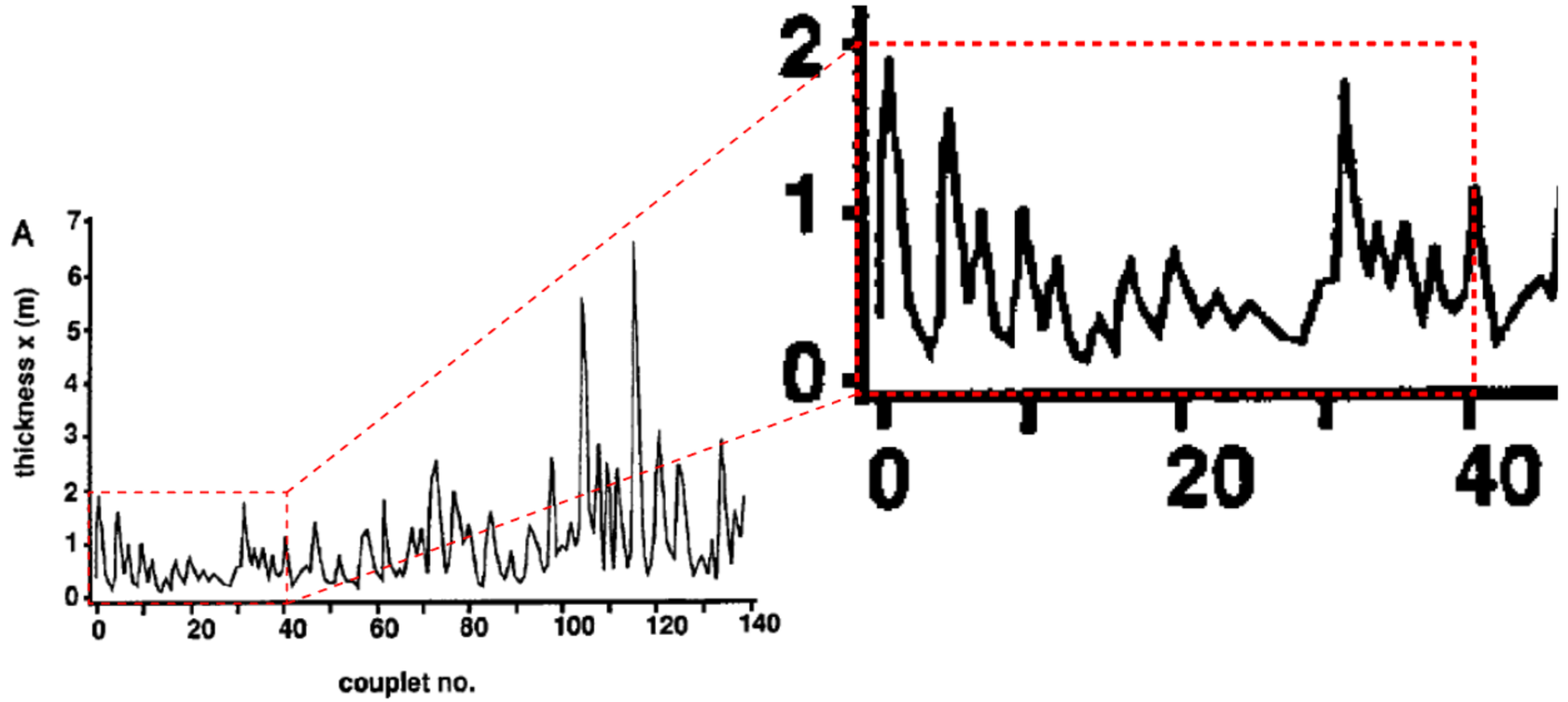
How then is time distributed in the Latemar succession?

- How long does one cycle last? How about 5 cycles?





Testing the hypothesis: how are they going to do it?

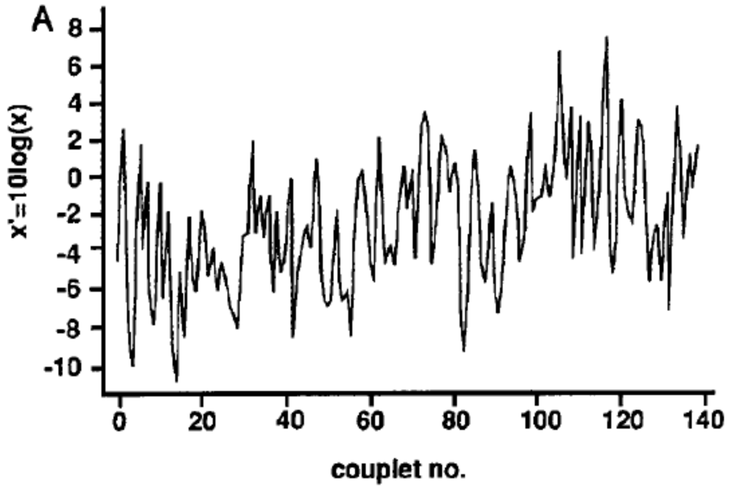


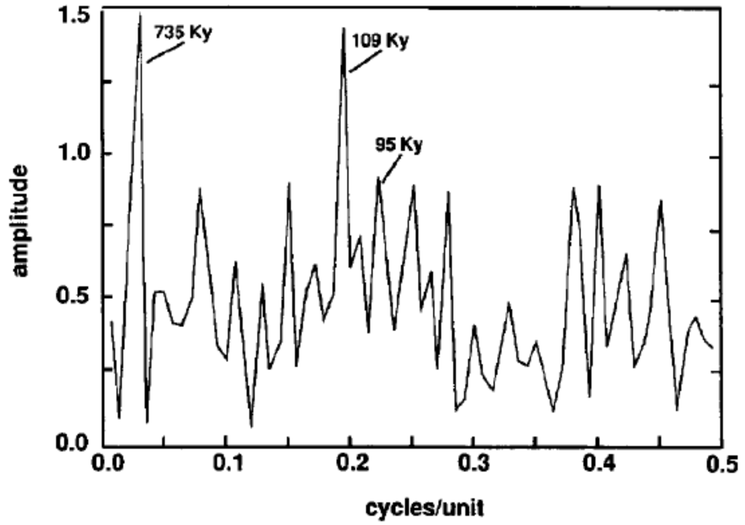
class

Testing the hypothesis: the analysis

Authors need to accomplish two things:

- show that a 5:1 bundling of cycles is a signicant feature of the data **(easier)**
  - in other words, are there cycles in space?
- make the case that 1 bundle = precession and 5 bundles = eccentricity **(way, way harder)**
  - do the cycles require a **cyclic (in time)** forcing?





Testing the hypothesis: the analysis

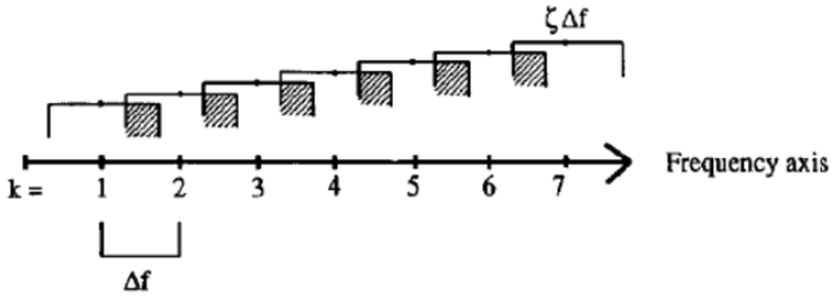


FIG. 12.—Illustration of correlation between adjacent frequency estimates comprising a smoothing window of $K = 7$, and modified by a spectral window of bandwidth $\zeta\Delta f$. The shaded regions indicate regions of correlation; the sum of frequency spaces indicated by the unshaded areas equals $(K - 1)(\zeta - 1) + 2$.