



# High-resolution Stratigraphic Correlation by Using Global Sea- level Curve

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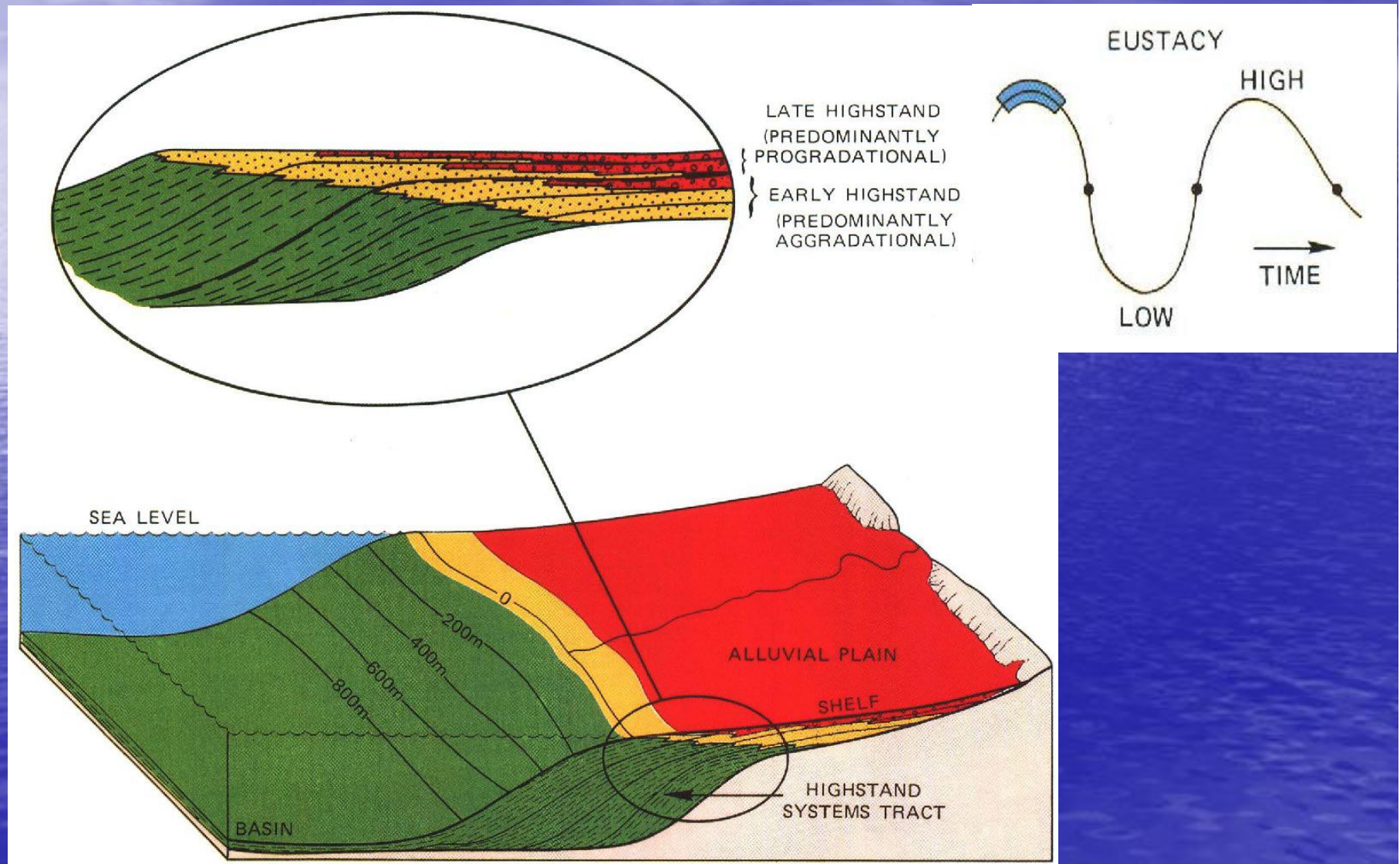
# Outline

- Sequence stratigraphy
- Application to well-log correlation
- Eustacy
- Eustacy and well-logs from western Taiwan
- Method
- Result
- Discussion
- Conclusion
- Acknowledgements
- Reference

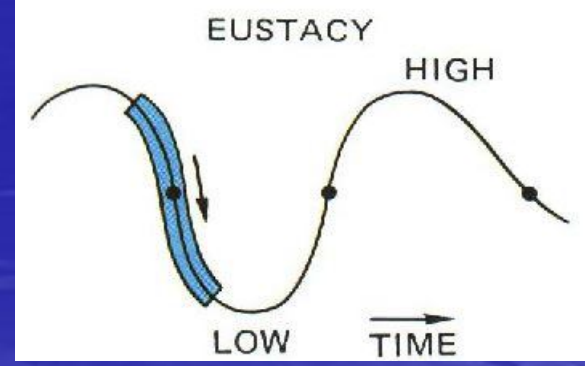
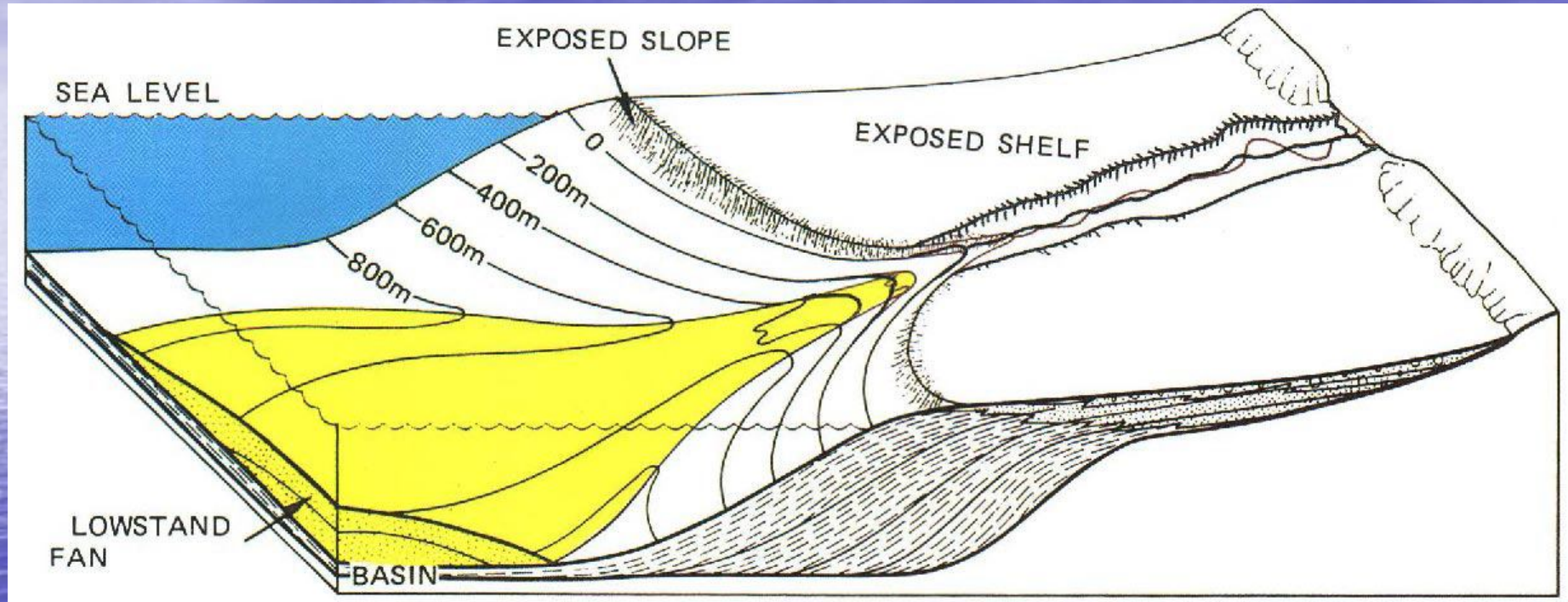
# Sequence stratigraphy

- Highstand Systems Tract
- Lowstand Systems Tract
  - Lowstand Fan
  - Lowstand Wedge
- Transgressive Systems Tract

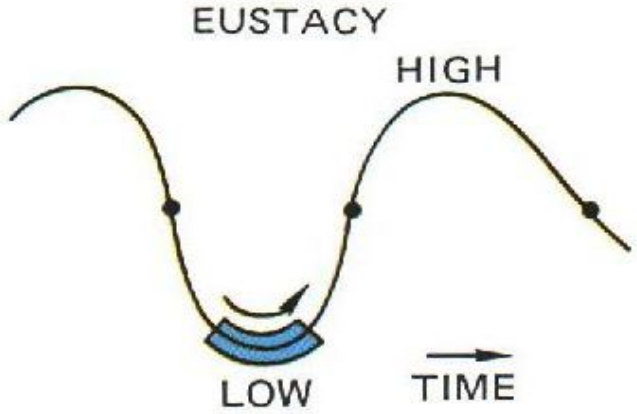
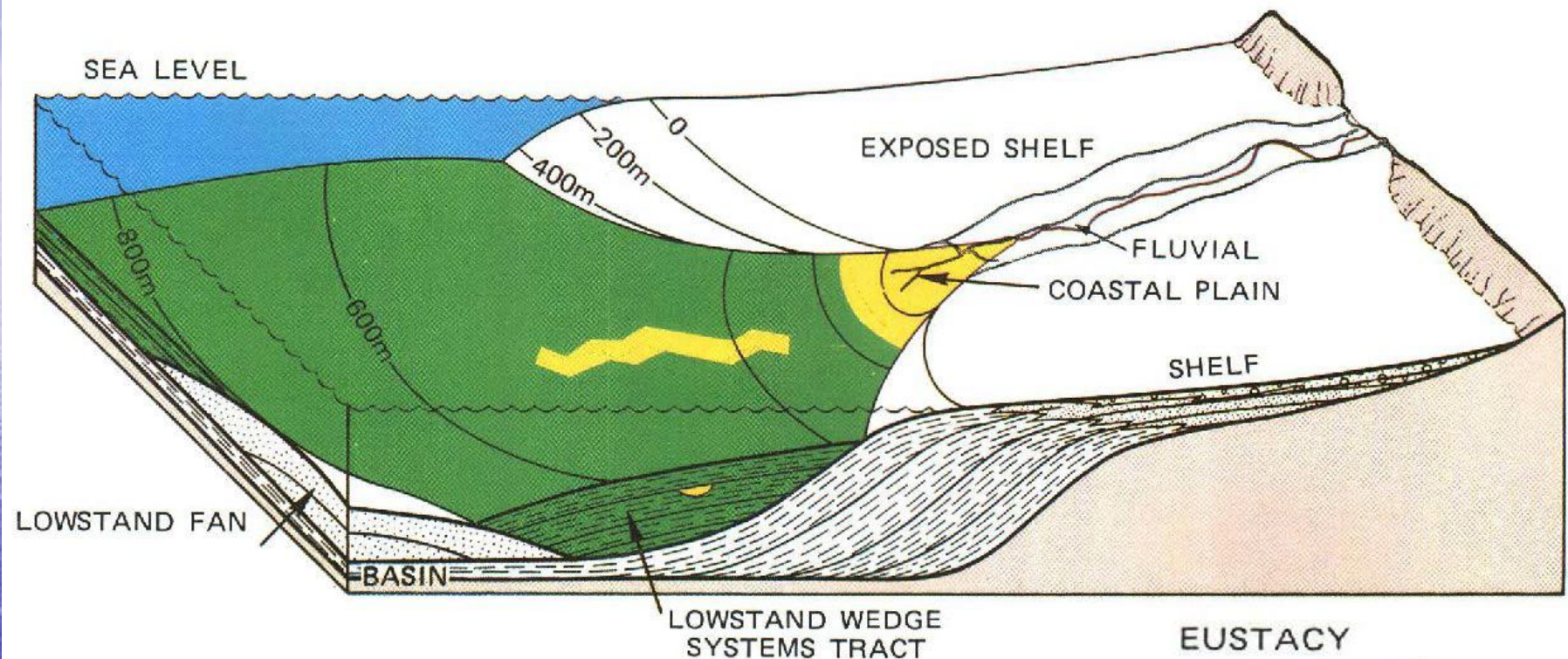
# Highstand Systems Tract



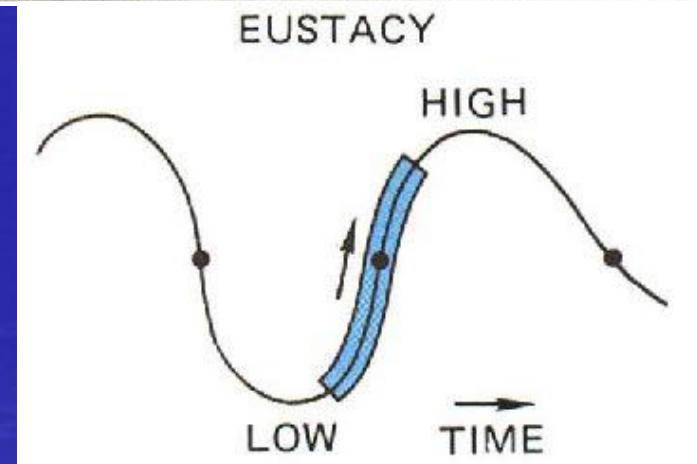
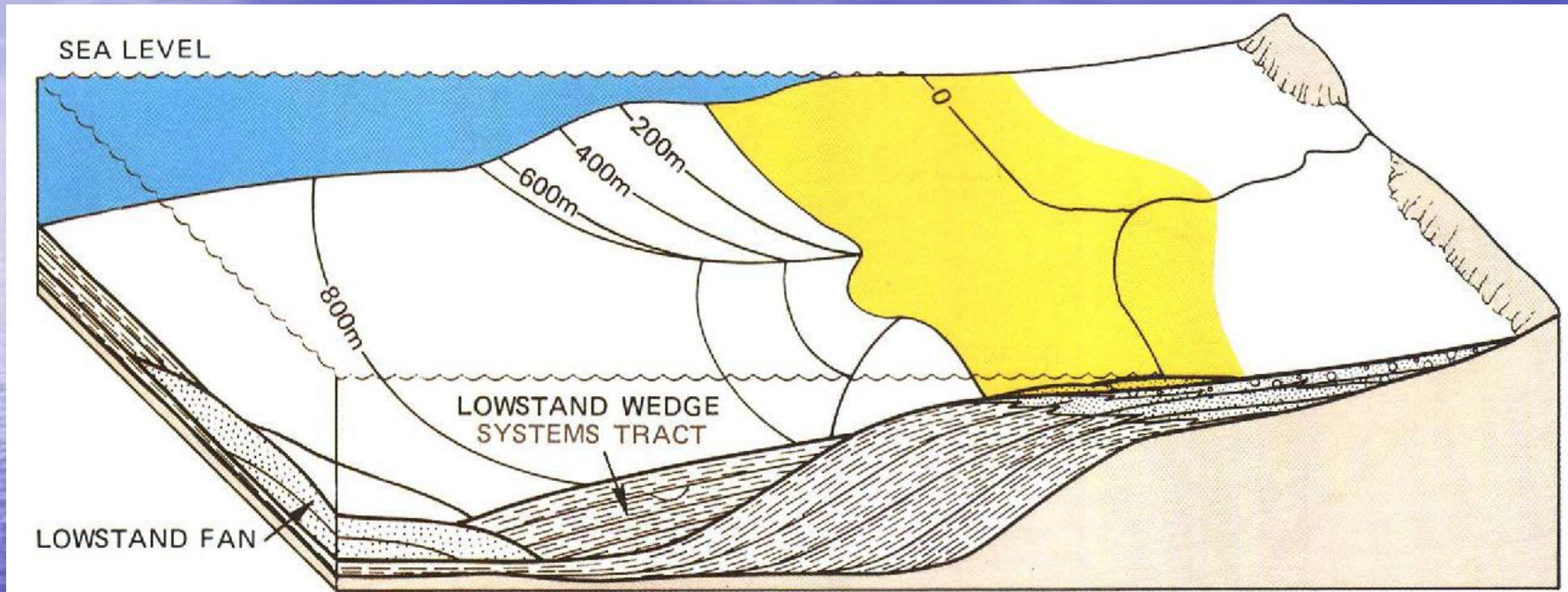
# Lowstand Fan



# Lowstand Wedge



# Transgressive Systems Tract



# Application to well-log correlation

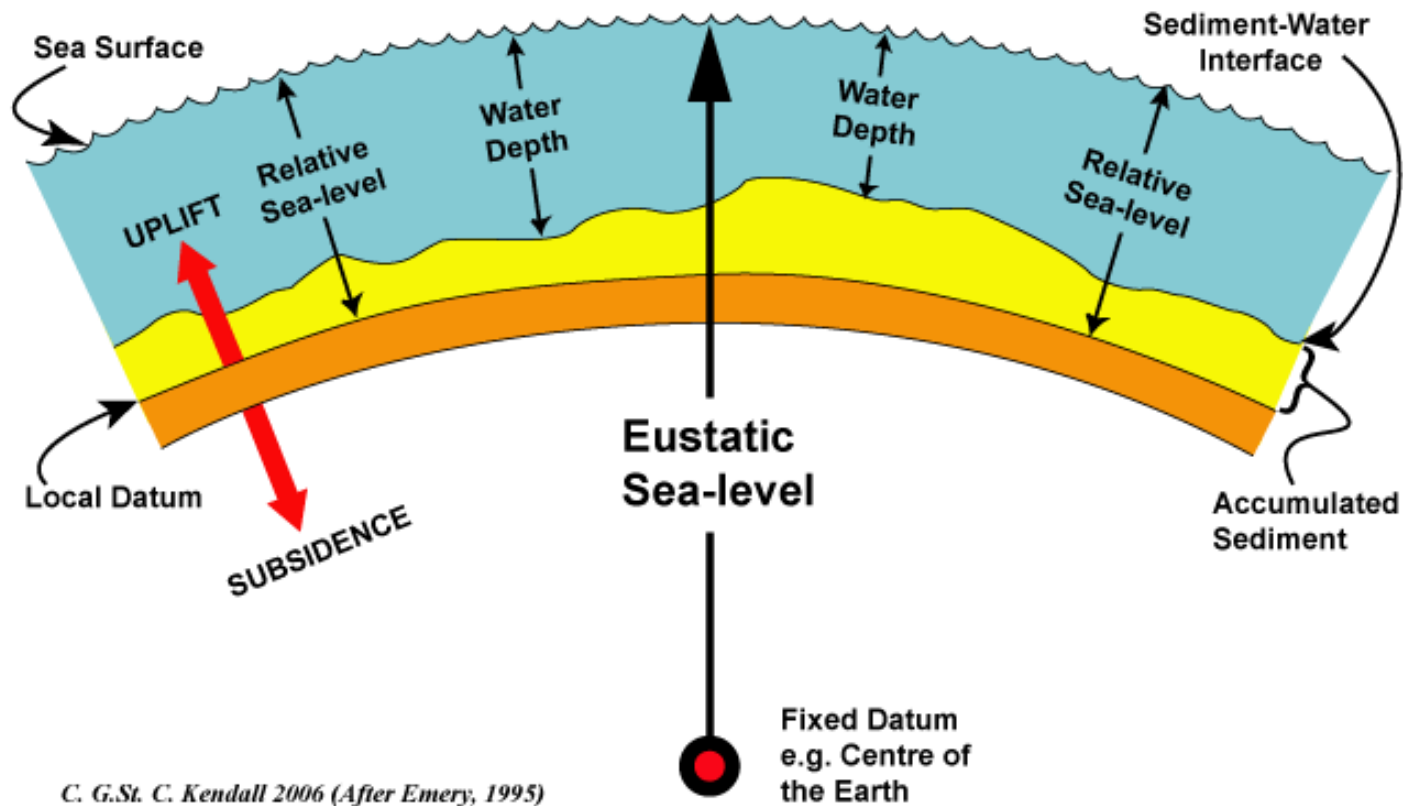
- A good indicator
- Record depth and data
- The most basic study inside the earth
- So many methods
- Spontaneous potential
- Resistivity log
- Gamma-ray log
- Sonic log
- Porosity logs
- Caliper log
- Dipmeter log



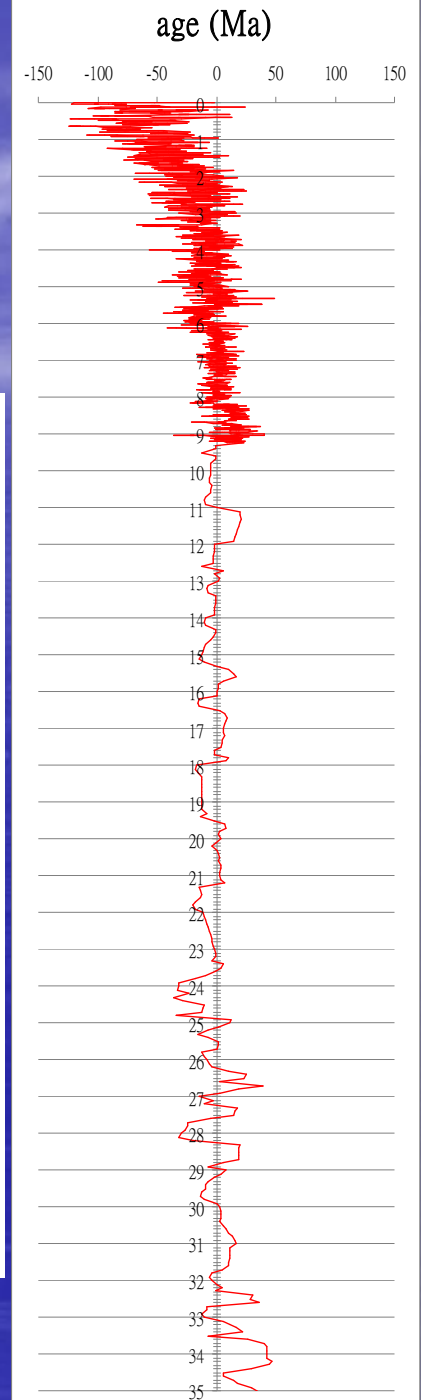
# Gamma-ray log

- Which is discharge  $\gamma$  -ray naturally.
- Potassium exists in clay mineral usually.
- Distinguish shaliness and cleanness.
- The concentration of radioelement is getting higher with compaction.

# Eustacy (Miller et al.)

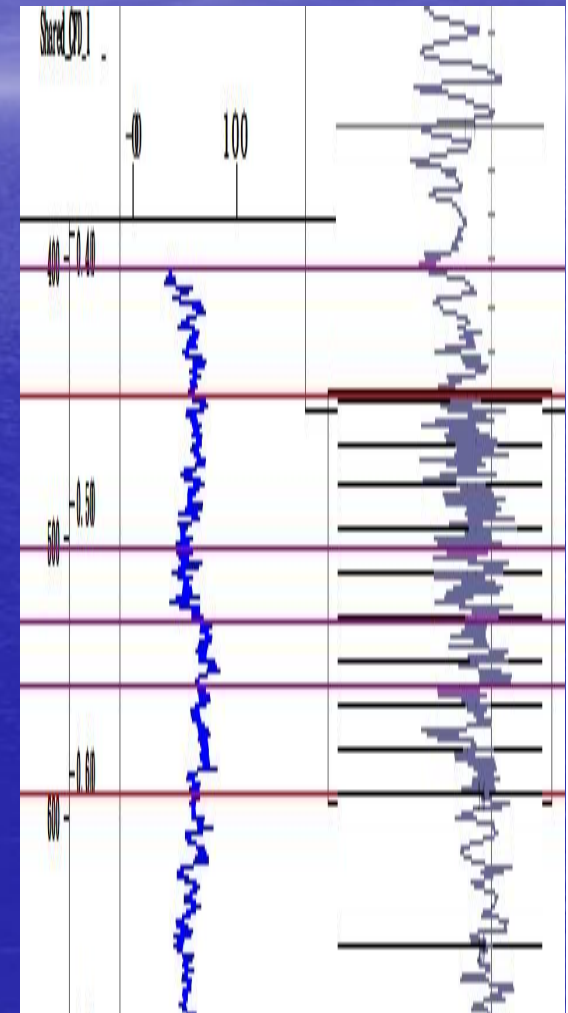


C. G. St. C. Kendall 2006 (After Emery, 1995)



# Eustacy and well-logs from western Taiwan

- A region and global
- The same or different
- And why...



# Method

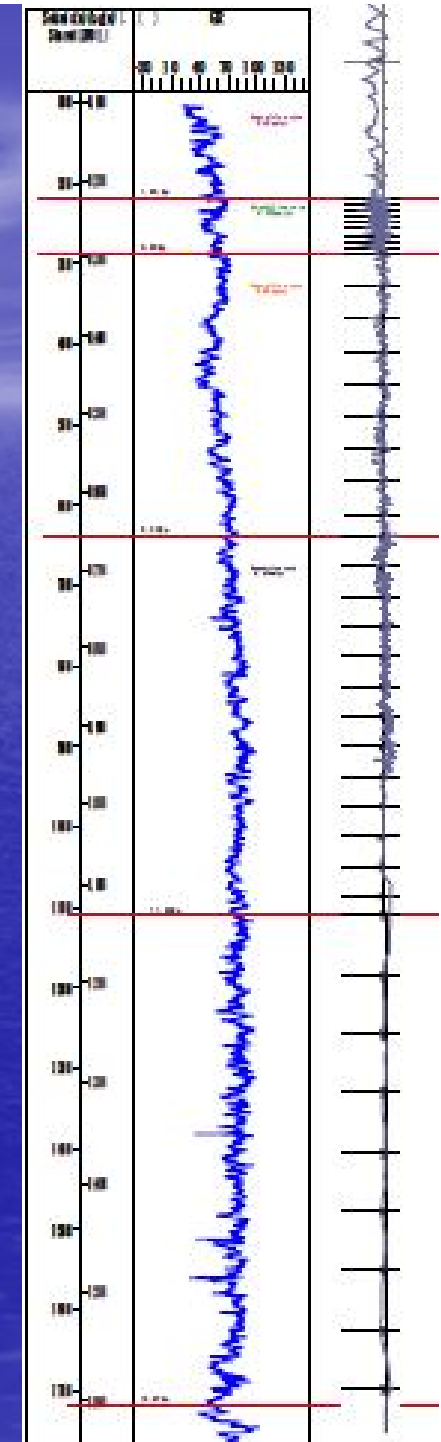
- Detect the wells
- Salinity contrasts high sea-level
- Correlate with Miller's eustasy
- Discover the different and think about it

# Result

- Southern cross section
- North-South section
- Sedimentation rate

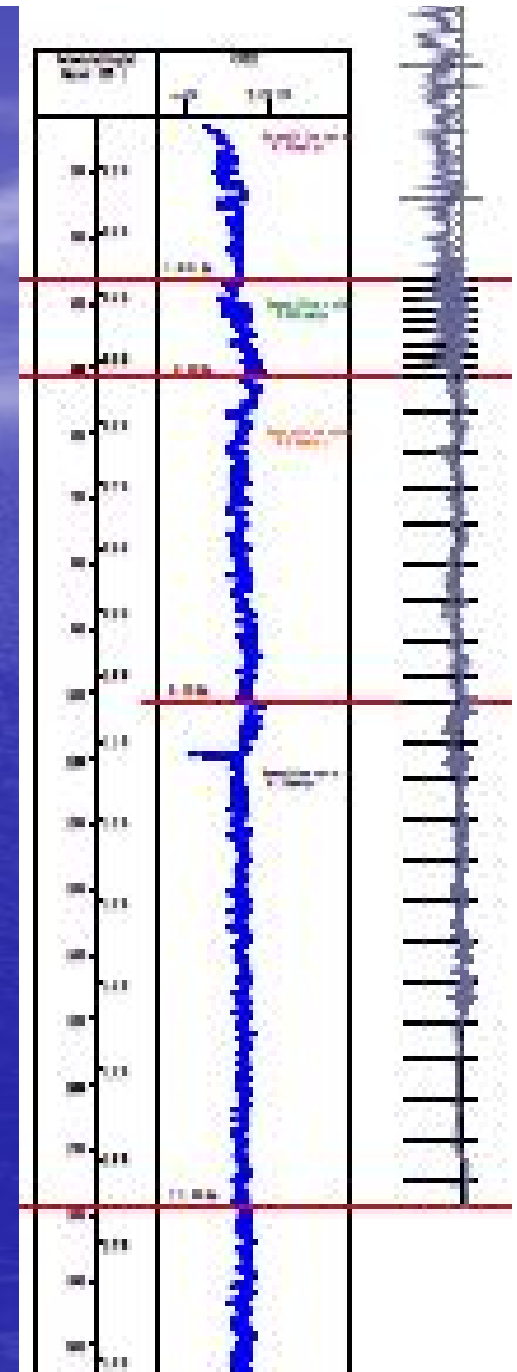
# Southern cross section

- CET well
- Cited:  $23^{\circ}32'5''$
- $119^{\circ}48'4''$
- Sedimentation



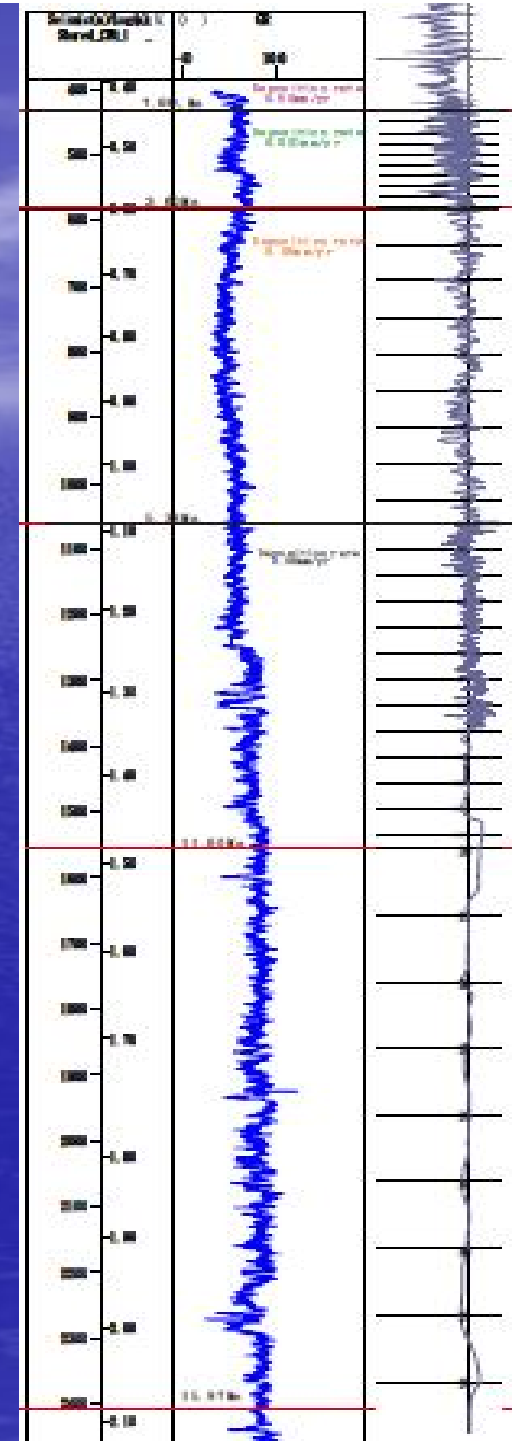
# Southern cross section

- CEP well
- Eastern of CET



# Southern cross section

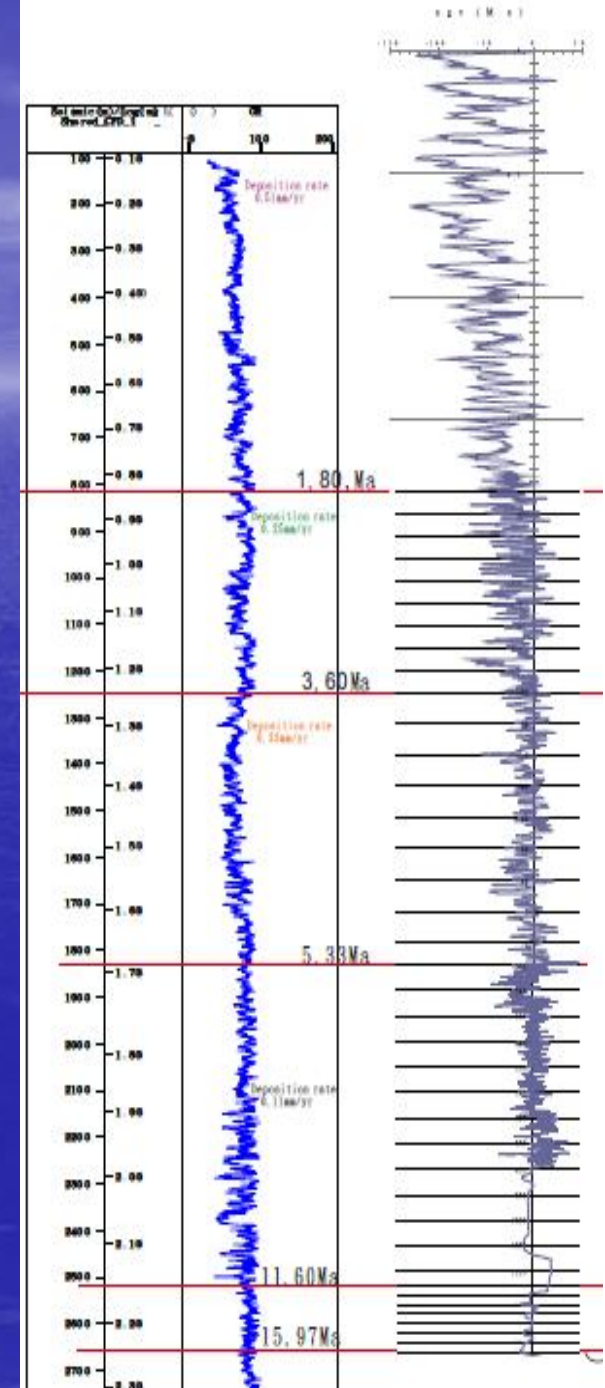
- CEC well
- Centre of crisscross





# Southern cross section

- CEJ well
- Out of Pajhang river
- Cited:  $23^{\circ}14'18.175''$  N  
 $119^{\circ}58'16.846''$  E



# Southern cross section



# North-South section

- CBE 、 CEC 、 CEY 、 CFC wells
- Off western Taiwan
- From Houlong River to southern Taiwan
- Sedimentation rate

# North-South section



# Discussion

- Orogeny? Global climate? Sediment supply?
- South China sea rift
- North to South and East to West

# Why it's correlation?

- If it's orogeny...
- If it's sediment supply change...
- If it's climate...

# Connected to Chinese offshore

- Taiwan Strait near South China Sea
- CBE to CEC cross Penghu channel
- According wells' data...

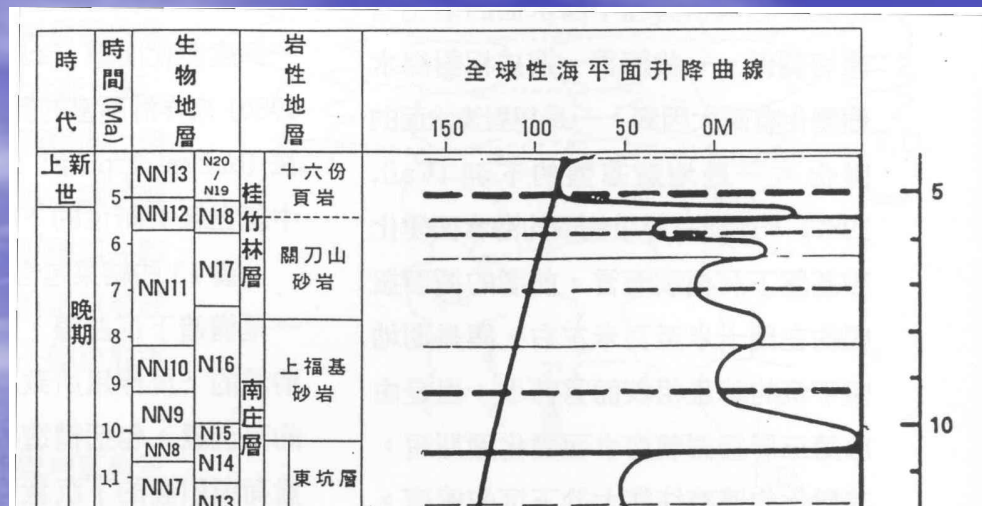
# Variation with crisscross

- The sedimentation rate
- Sequence stratigraphy
- And it implicate...

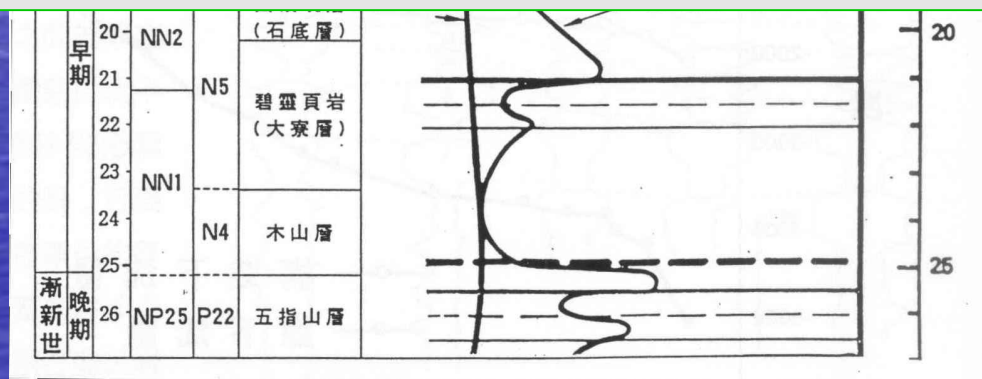


# Conclusion

- The wells' data can correlate well with the eustasy. It should be attributed to the climate.
- There is a basin in the Taiwan Strait; it can attribute that from South China Sea.
- In N-S section, the sedimentation rates of wells are constant, because they are almost on the same distance to Taiwan.
- The Taiwan basin comes into being with Taiwan Orogeny. And it also correlated with South China Sea.



- ① Global importance
- ② Cyclic nature (predictability)
- ③ Applicability to terrestrial deposits?



圖一：新第三紀全球海水面變化曲線及台灣地區地層對比圖  
(取自楊耿明和丁信修，1999)。

# Forecast

- Finding what effect these different
- Correlate the subaerial wells
- Having a theory with this discovery

# Acknowledgements

- NTNU Earth Science
- Dr. Tung-Yi Lee
- J. Bruce H. Shyu
- All my friends

# Reference

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The background is a vertical gradient of blue, transitioning from a lighter, hazy blue at the top to a deeper, more saturated blue at the bottom. A thin, white horizon line is visible in the upper third of the image, with wispy, white clouds scattered across the sky above it. The overall effect is a calm, serene seascape.

Thanks for listening