# Miocene Teleost Fish From Chino Hills: Preliminary Results From The Vila Borba Project, San Bernardino County, California*

**Benjamin Scherzer**[1]

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## Abstract

The Vila Borba Project is a 336-acre residential and commercial development in the city of Chino Hills, San Bernardino County, California. Phase I began in early 2014, with archeological and paleontological monitoring provided by DUKE Cultural Resources Management. Phase I involved the northwest portion of the project, an area roughly bisected by the northwest-southeast trending Chino Fault. This area has been previously mapped as comprising the late Miocene (Late Luisian to Delmontian) Puente and Sycamore Canyon Formations. In five months of monitoring, over 160 fossils specimens were found, including teleost fish, chondrichthians, bivalves, marine and land plants, coprolites, and burrows. Preliminary investigation of the teleost fish specimens identified Chauliodus sp. (viperfish), Etringus sp. (round herring), Laytonia sp. (halosaur), Rhythmias sp. (sheepshead), Clupeiformes (herring and anchovy), and Myctophiformes (lanternfish). The sedimentology of the bedrock and the presence of fossils were distinctly different on either side of the Chino Fault. East of the fault (footwall), sediments were dominated by pebble to boulder conglomerates and sandstones, and relatively few fossils were observed. West of the fault (hanging wall), sediments were exclusively mudstones to very fine-grained sandstones, and the majority of fossils were encountered. The difference in fossil exposure in sedimentology on either side of the Chino Fault may reflect taphonomic differences within the same formation, or may signify a more complex geology in the project area than is currently mapped. Further phases in the Vila Borba Project may clarify the local geology and their respective fossil deposits.

## References Cited

Critelli, S., P.E. Rumelhart, and R.V. Ingersoll, 1995, Petrofacies and provenance of the Puente Formation (middle to upper Miocene), Los Angeles Basin, Southern California; implications for rapid uplift and accumulation rates: Journal of Sedimentary Research, v. 65/4a, p. 656-667.

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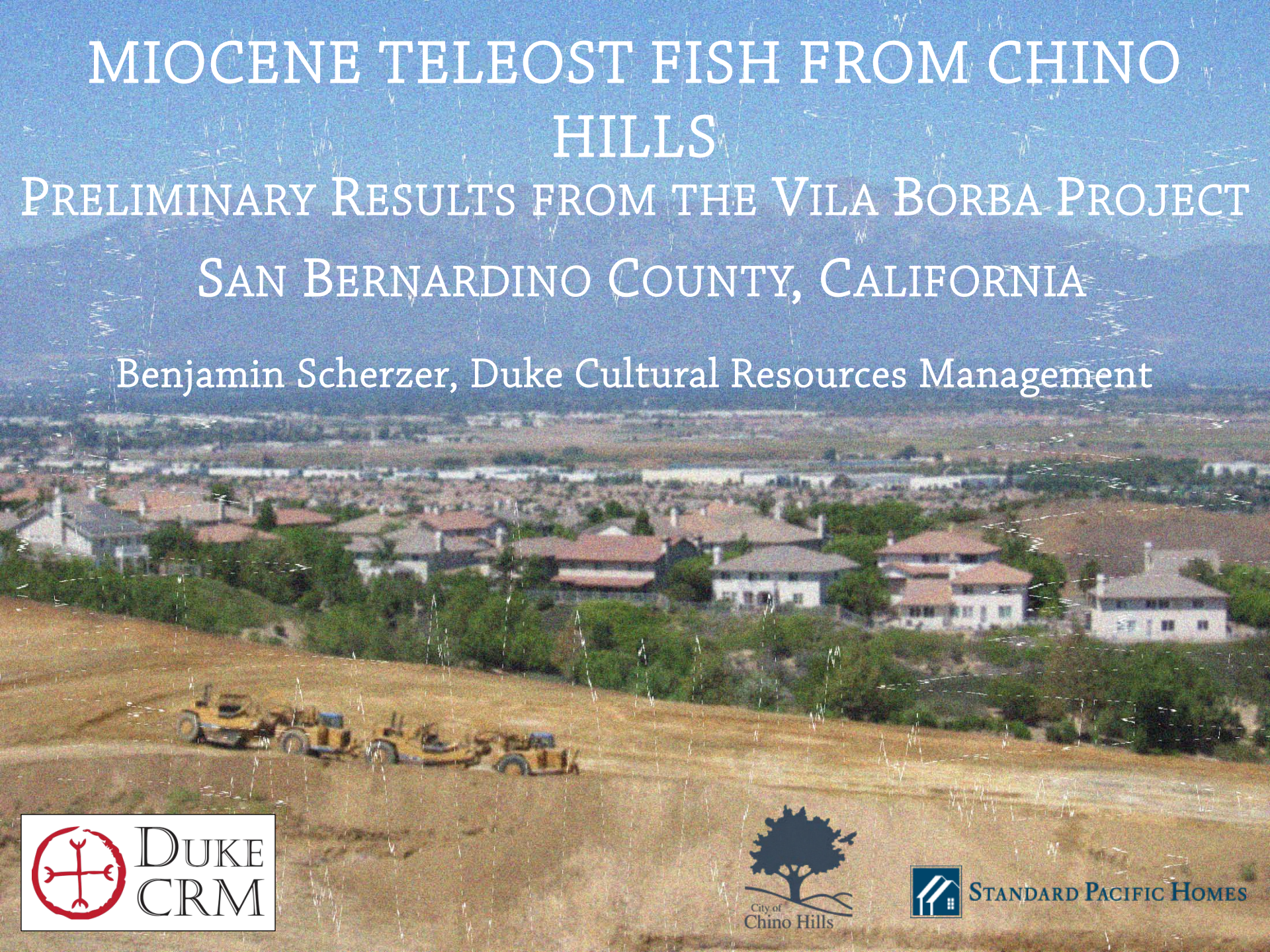
# Miocene Teleost Fish from Chino Hills

## Preliminary Results from the Vila Borba Project

## San Bernardino County, California

Benjamin Scherzer, Duke Cultural Resources Management

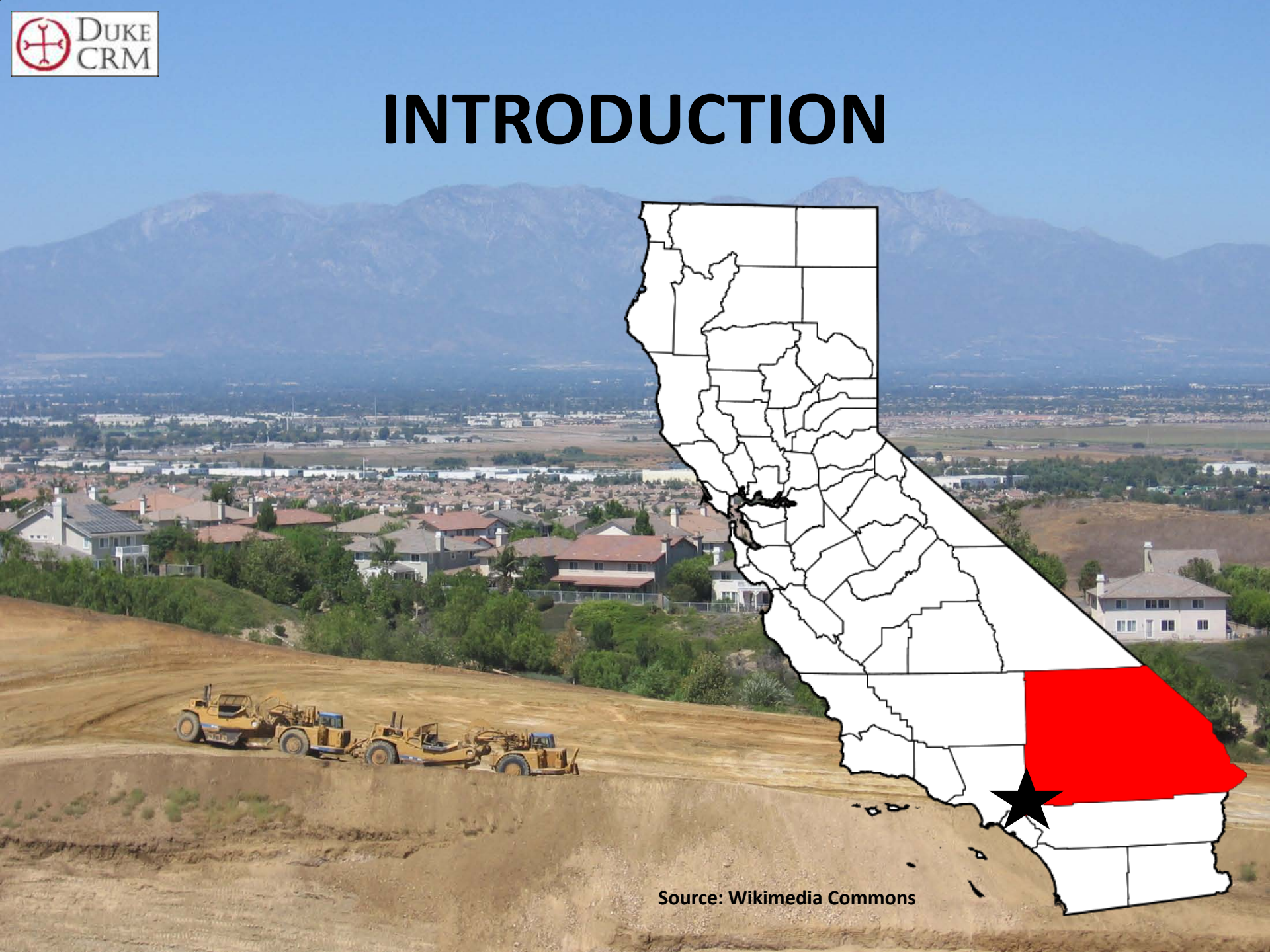


Duke CRM

City of Chino Hills

Standard Pacific Homes

# INTRODUCTION



Source: Wikimedia Commons

# INTRODUCTION


- 336 acres
- Residential & Commercial

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- Residential & Commercial
- Phase I: complete
- Phases II, III: preliminary excavation

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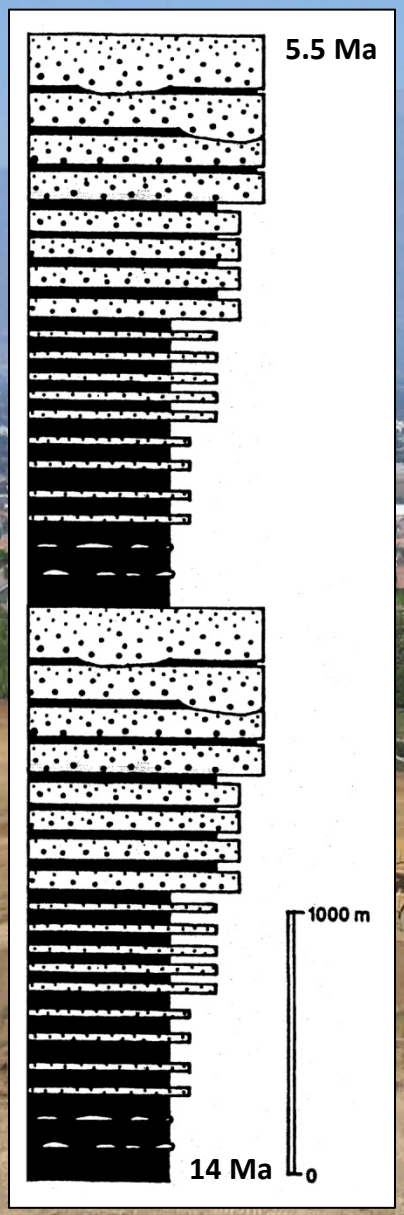


Modified from
Shanmugam and Moiola, 1991

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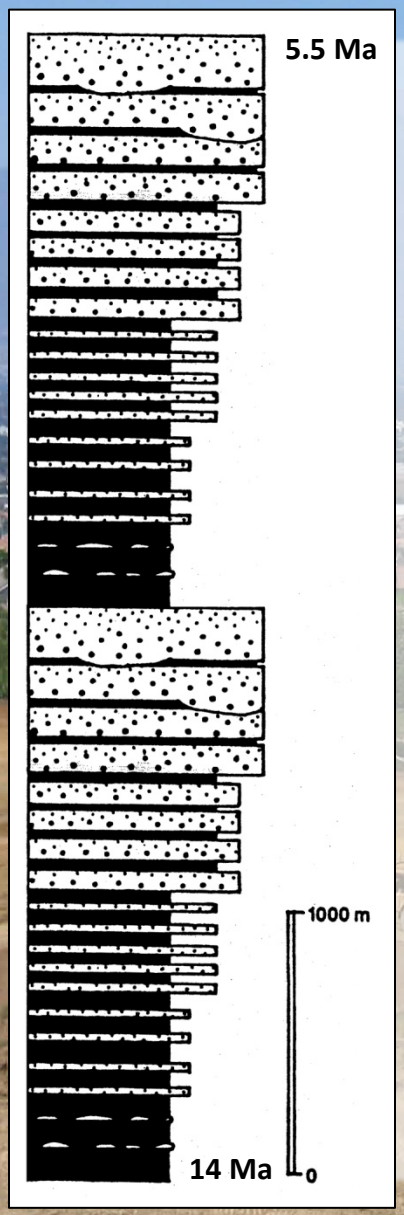


*"Puente Formation"*

- Sycamore Canyon Member
- Yorba Linda Member
- Soquel Member
- La Vida Member

Modified from
Shanmugam and Moiola, 1991

- Two main upward-thickening and -coarsening megasequences reflecting submarine fan progradation.
  (Critelli et al., 1995)

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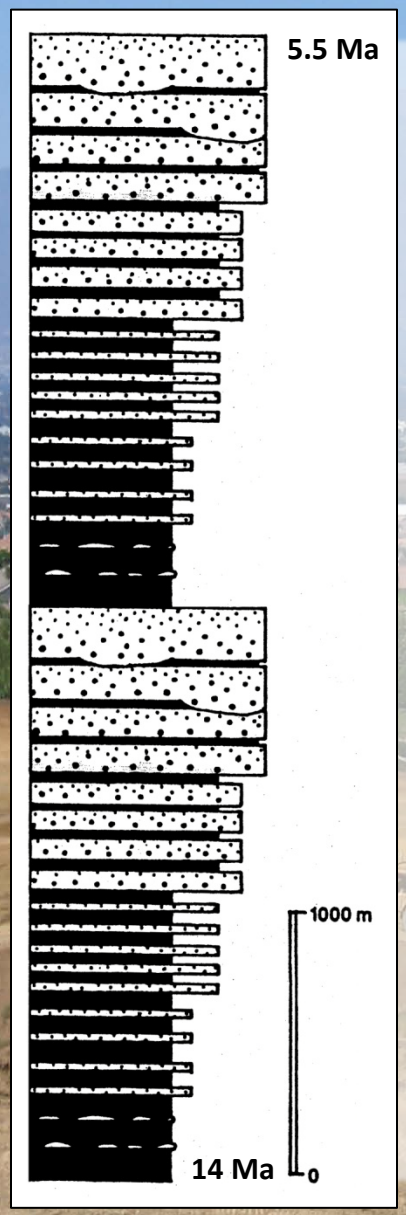


*"Puente Formation"*

SYCAMORE CANYON MEMBER ~~F o r m a t#!*@ No!~~

YORBA LINDA MEMBER

SOQUEL MEMBER

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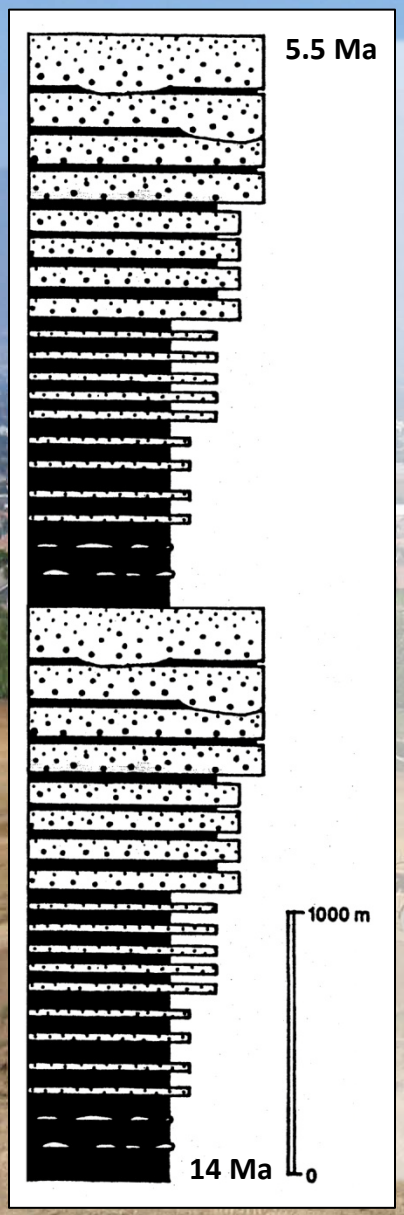


SOQUEL MEMBER

LA VIDA MEMBER

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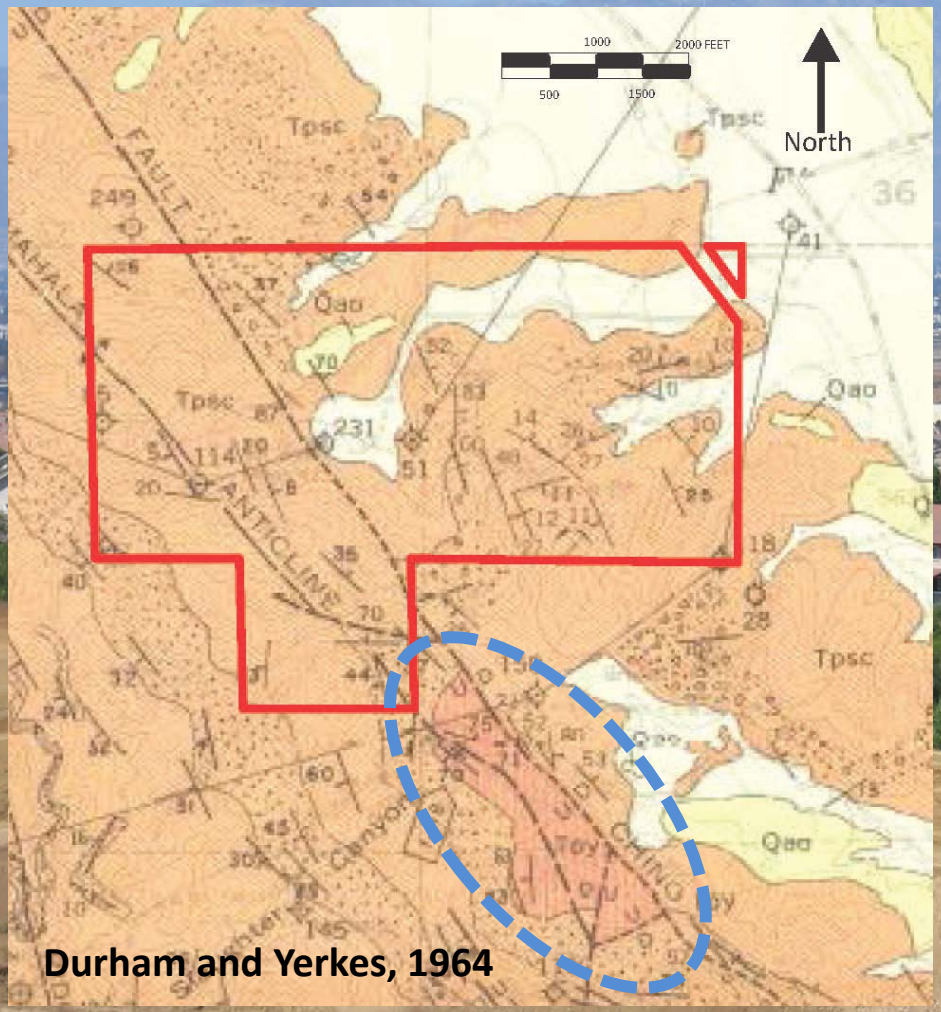
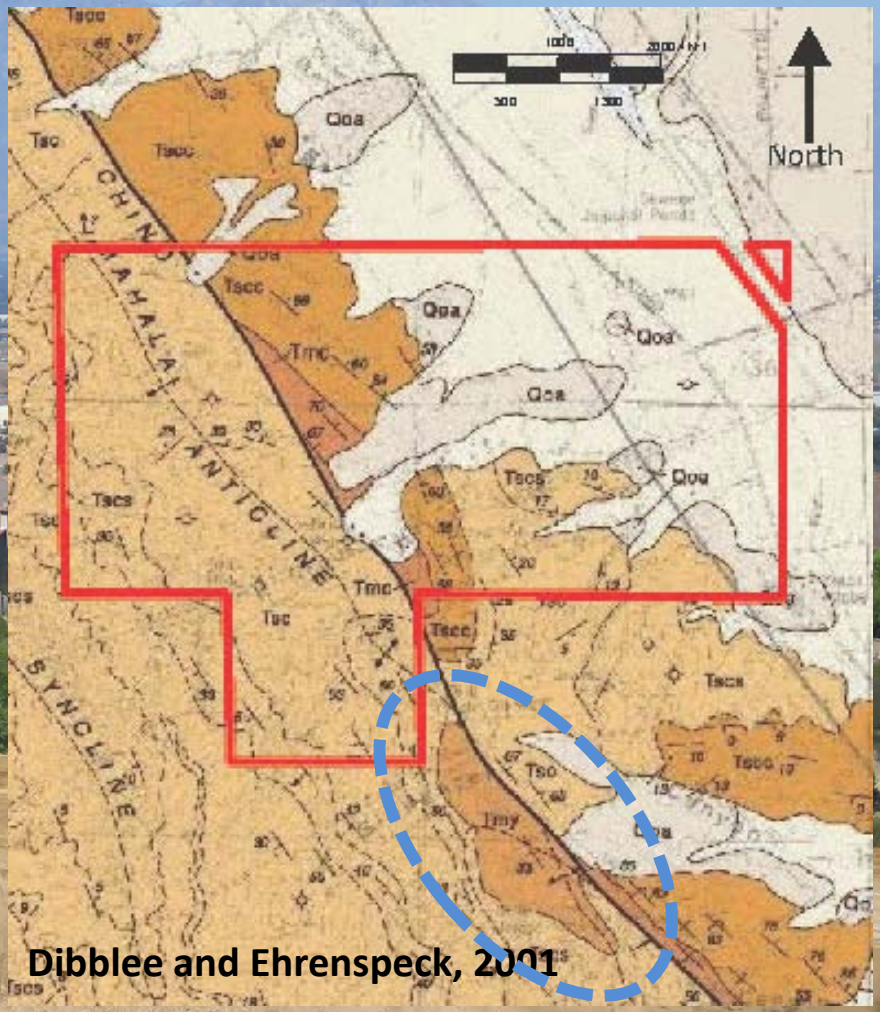
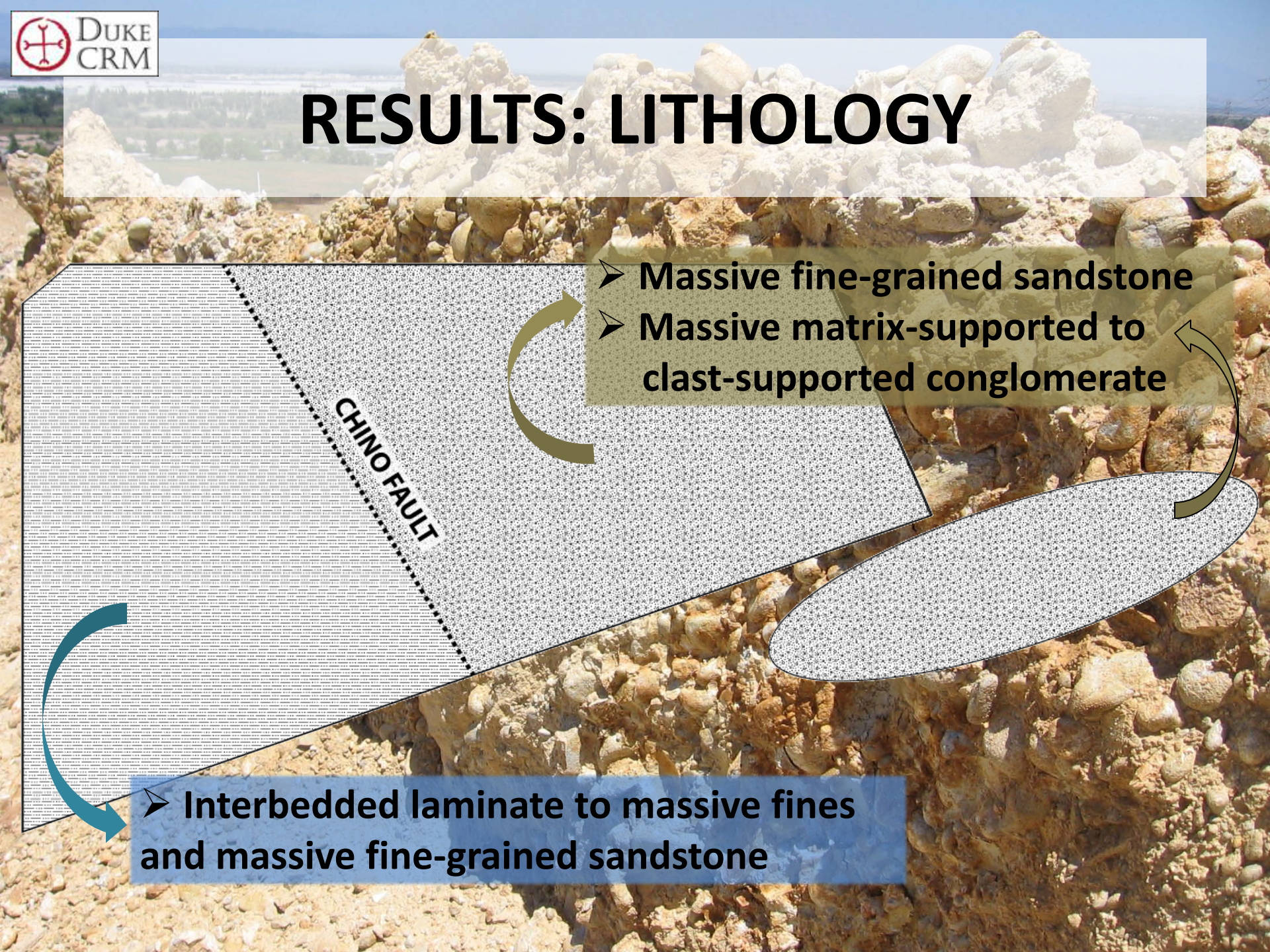



Durham and Yerkes, 1964




Dibblee and Ehrenspeck, 2001

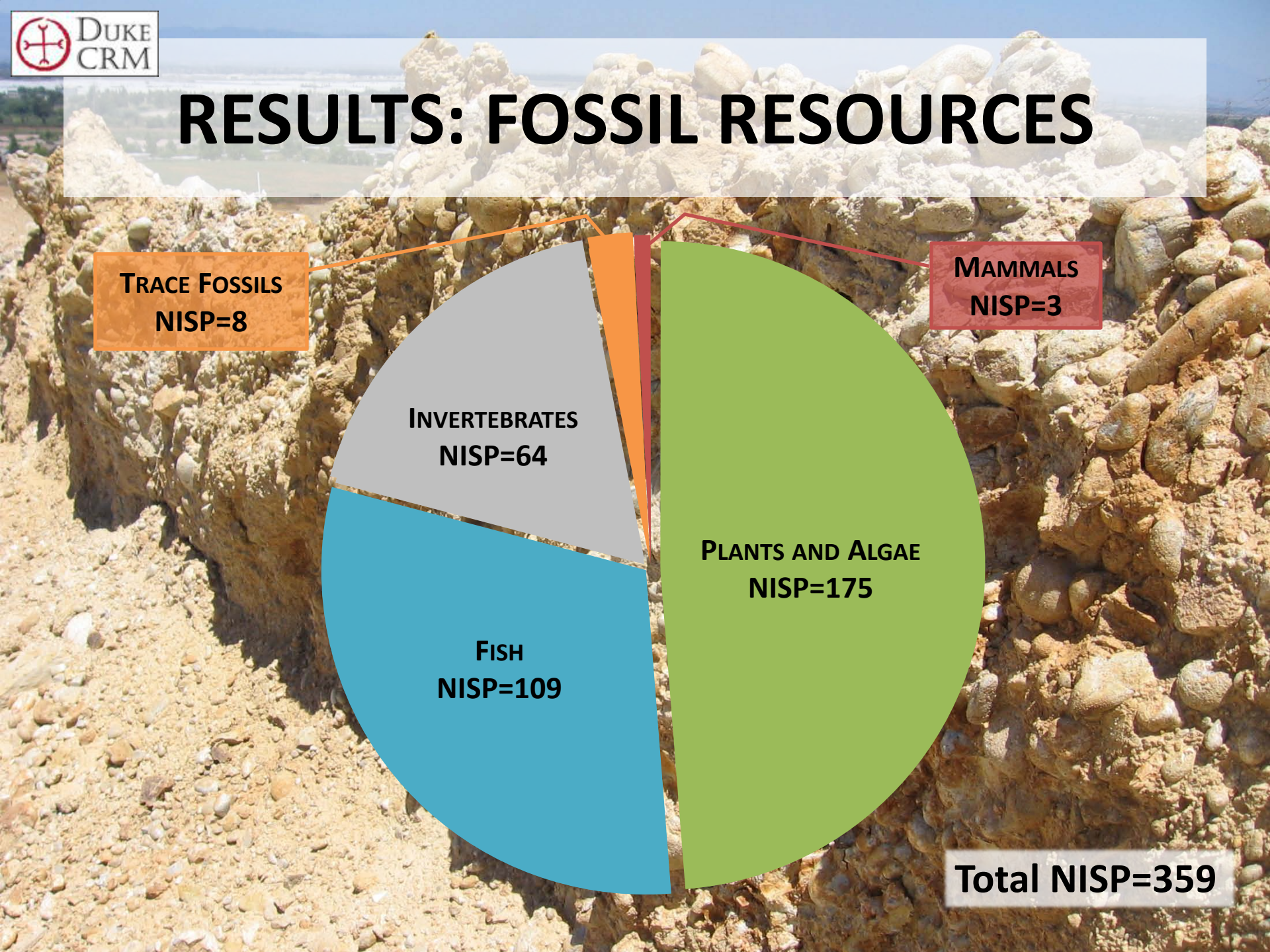
# RESULTS: LITHOLOGY




- Massive fine-grained sandstone
- Massive matrix-supported to clast-supported conglomerate

- Interbedded laminate to massive fines and massive fine-grained sandstone

# RESULTS: FOSSIL RESOURCES



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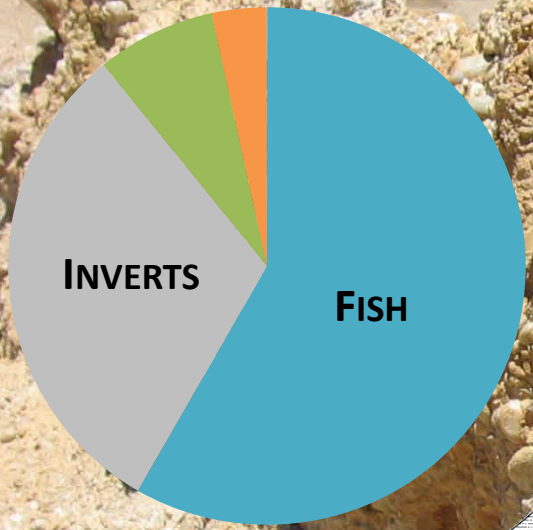


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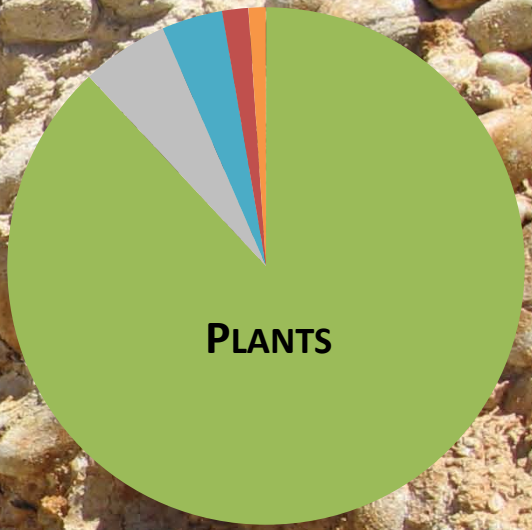


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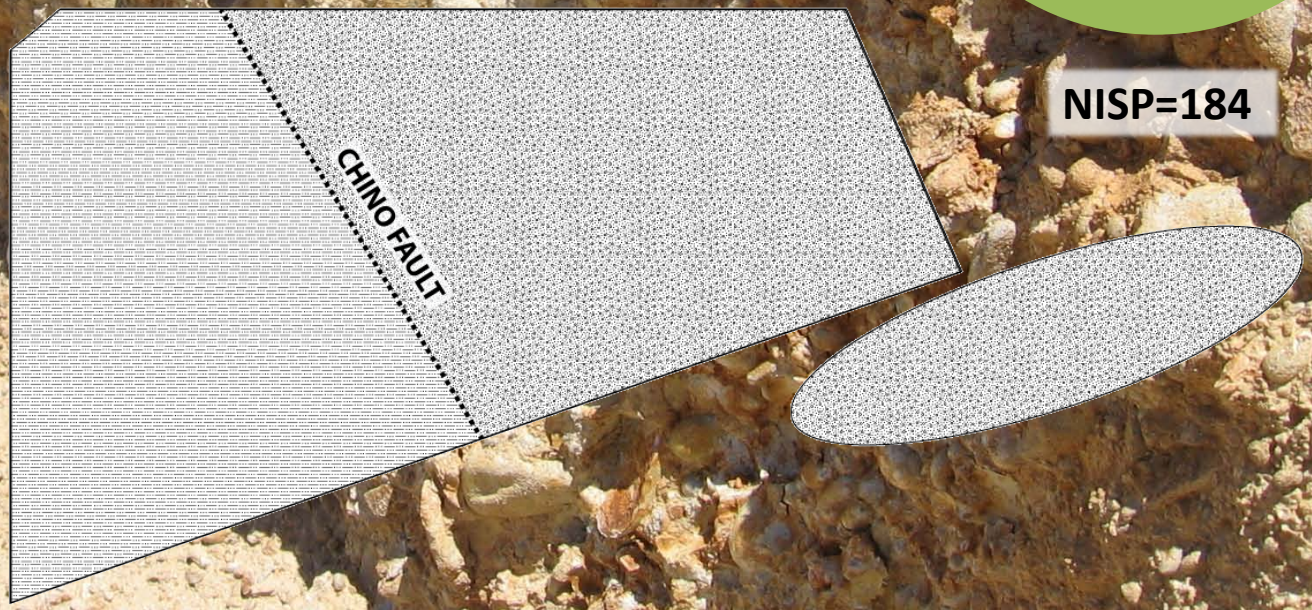
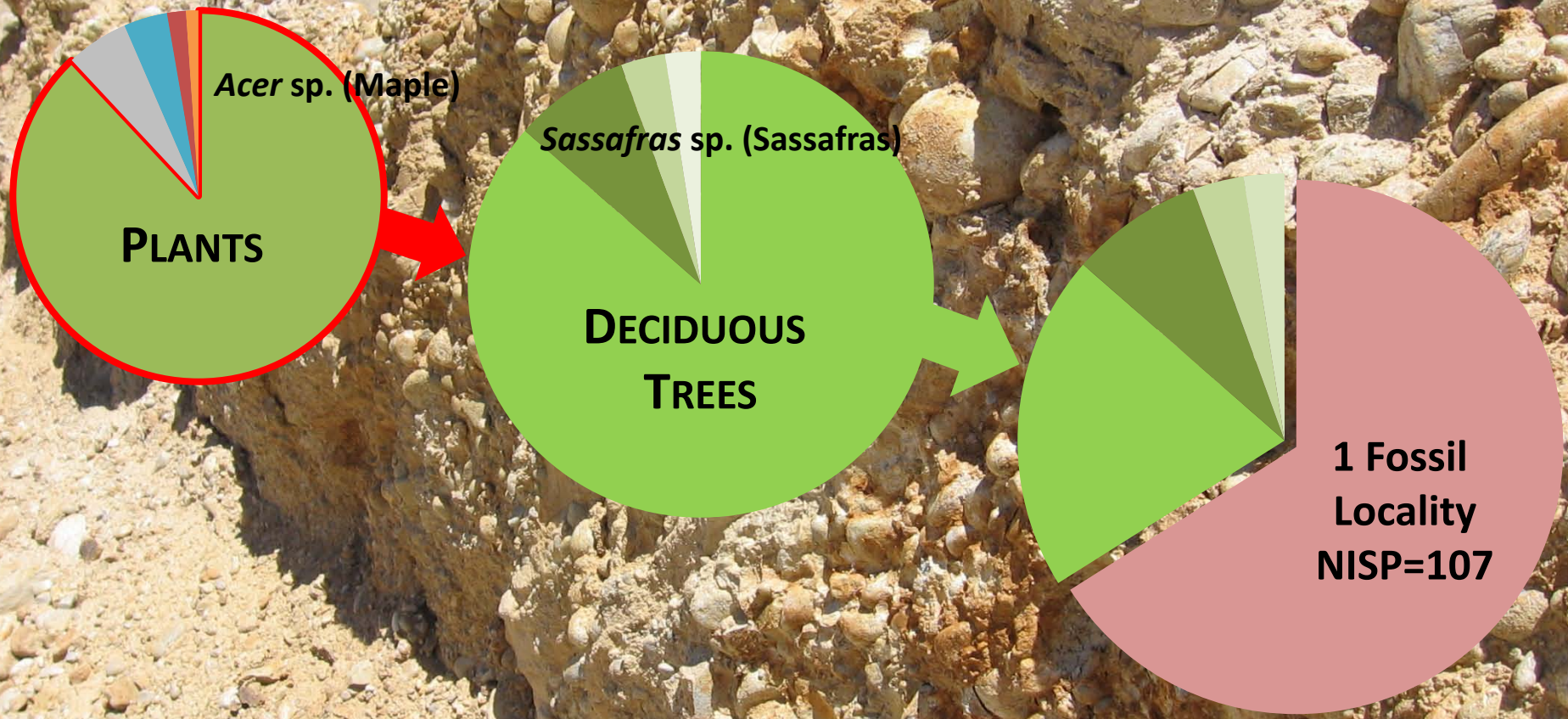


# RESULTS: FOSSIL FLORA



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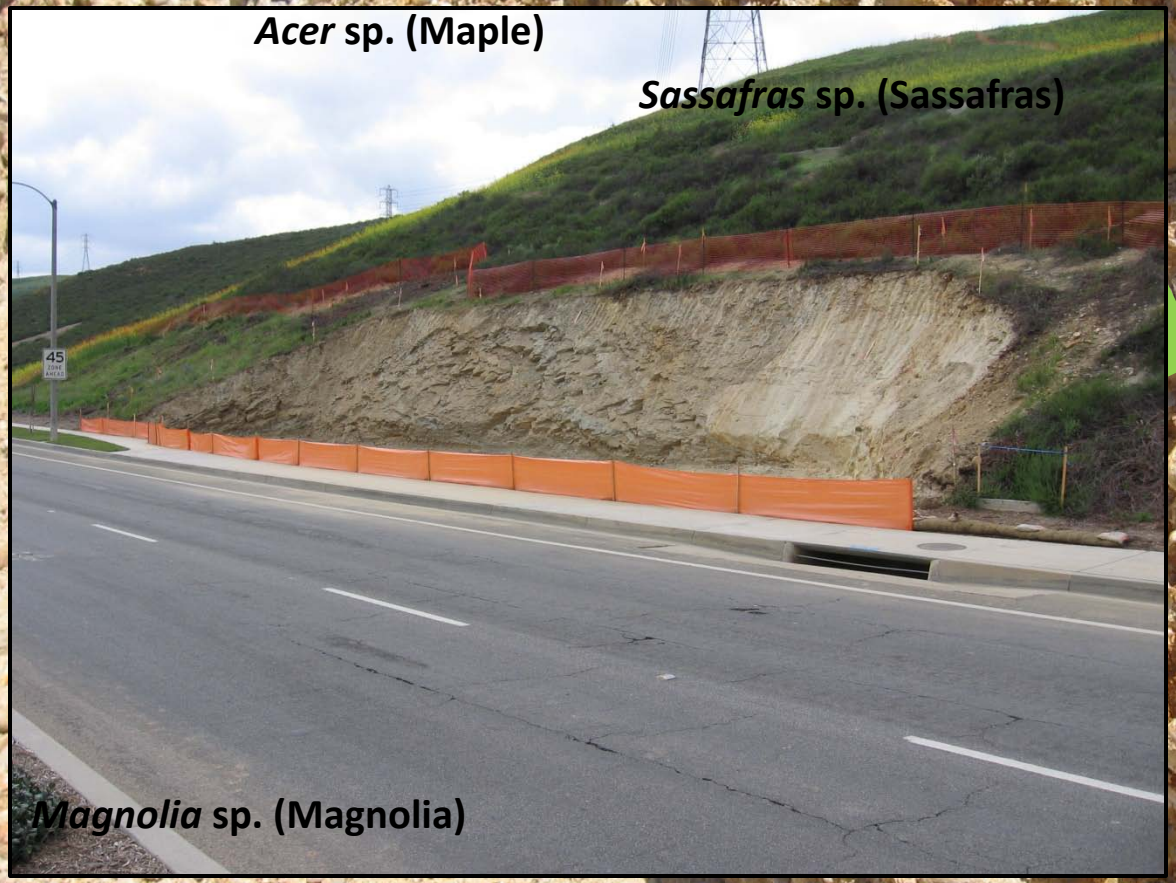


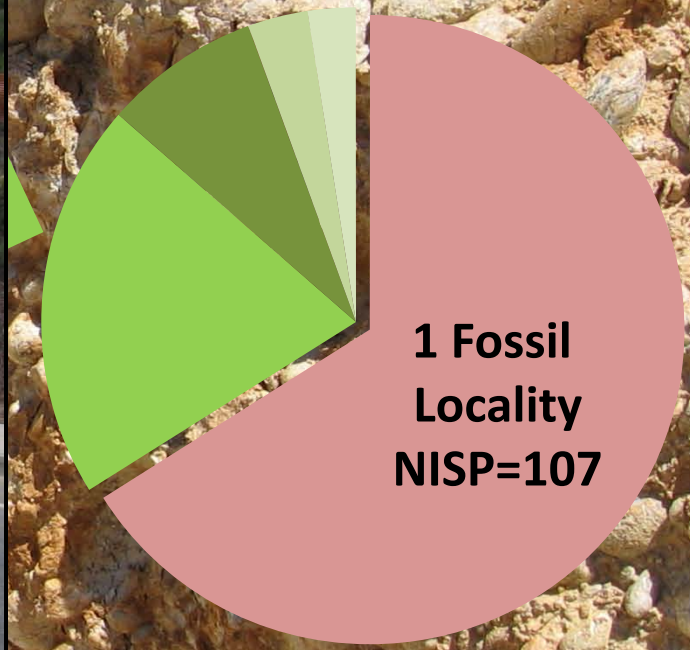

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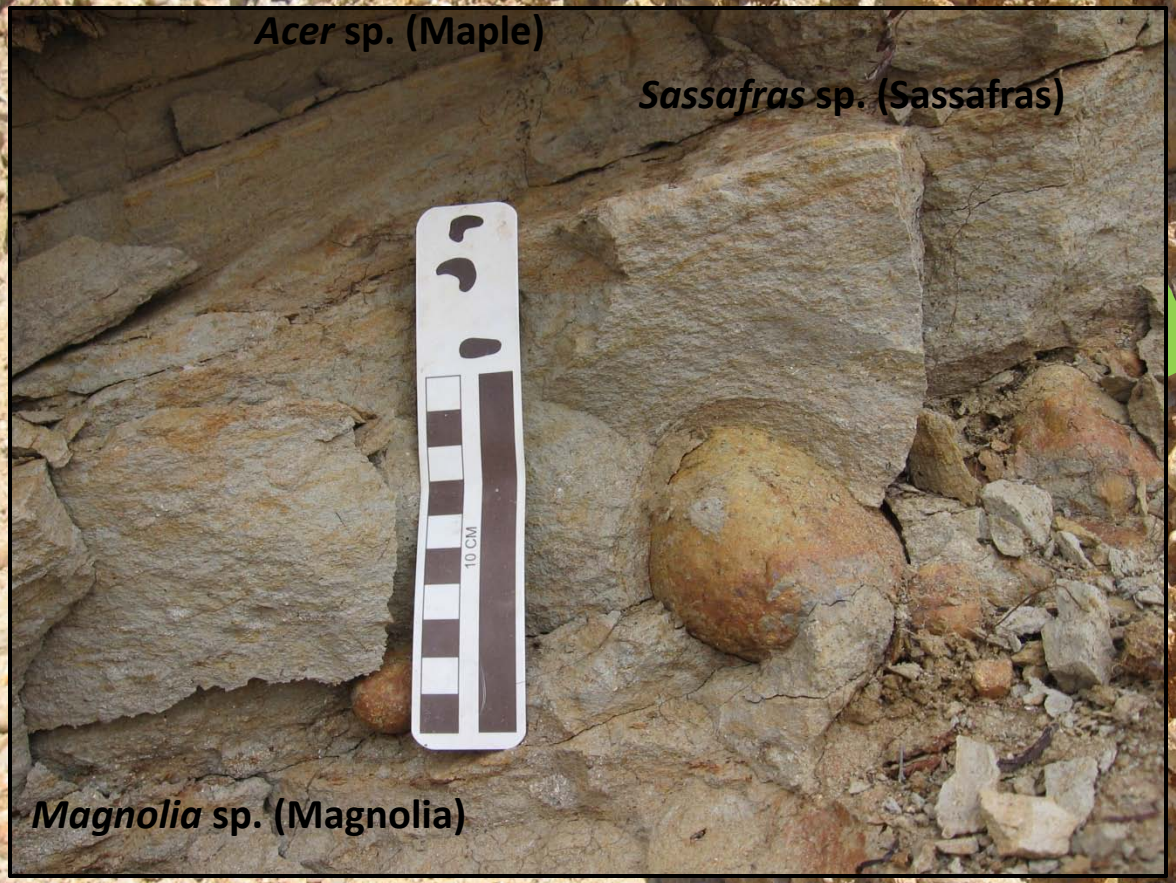


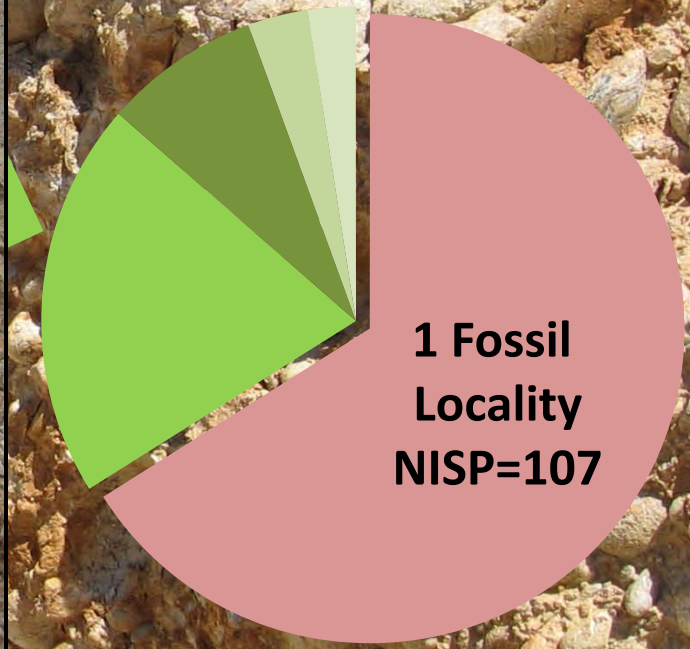

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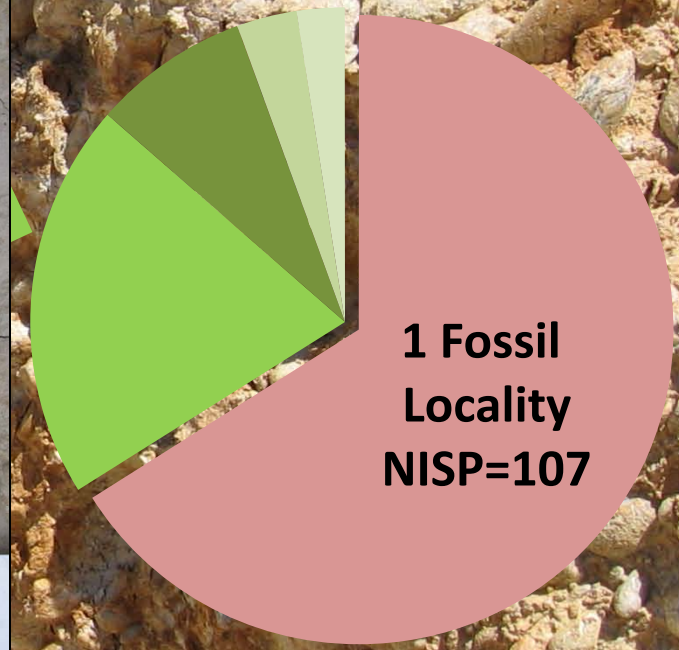
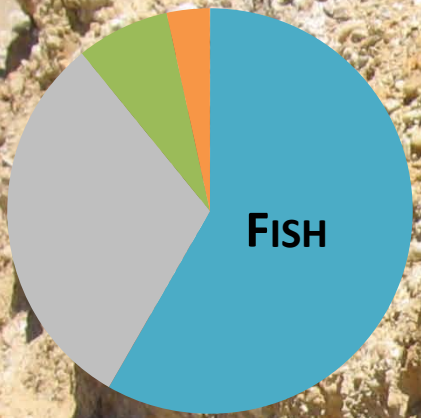


# RESULTS: FOSSIL FAUNA

Updates from Abstract!



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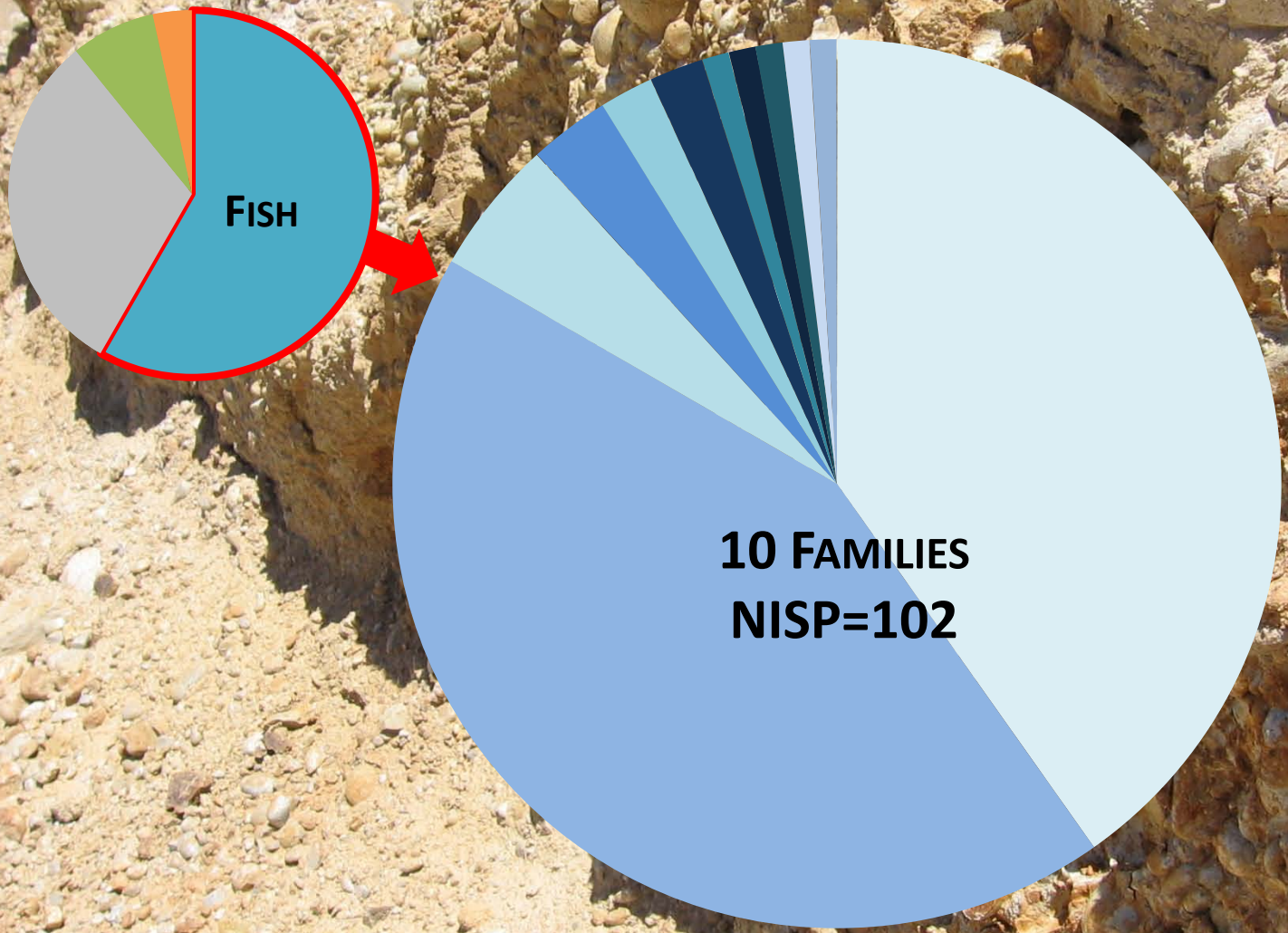

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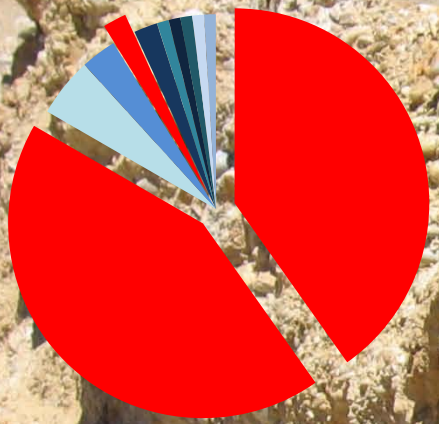
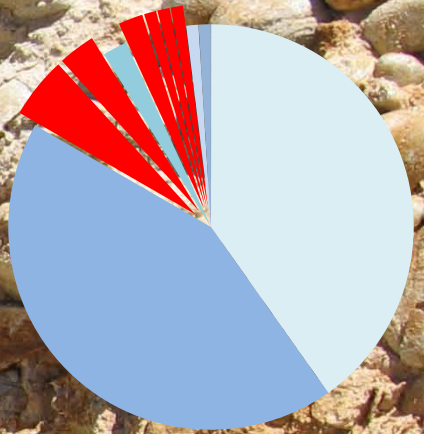


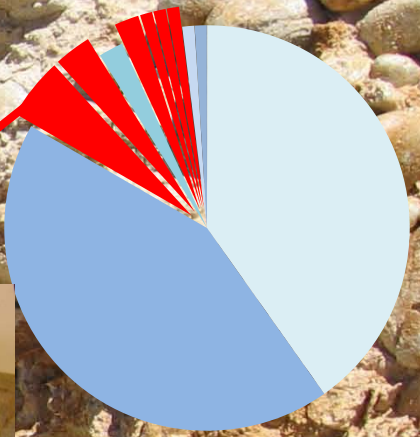


# RESULTS: FOSSIL FAUNA

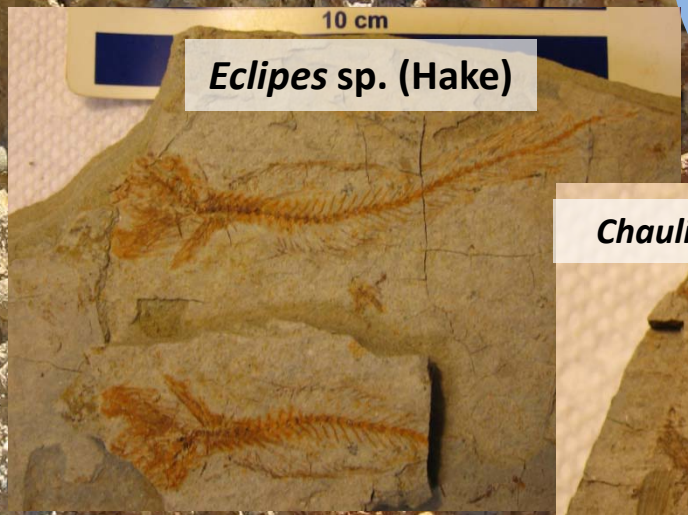
Updates from Abstract!

**HEMIPELAGIC SEDIMENTATION**
**SLOW FALLOUT**

**BURIAL THANATOCENOSES**




***Ganolytes* sp. (Sardine), Teleostei**




***Eclipes* sp. (Hake)**

***Chauliodus eximus* (Viperfish)**

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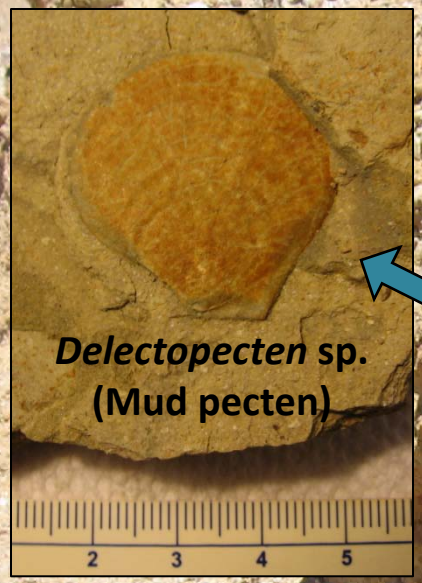
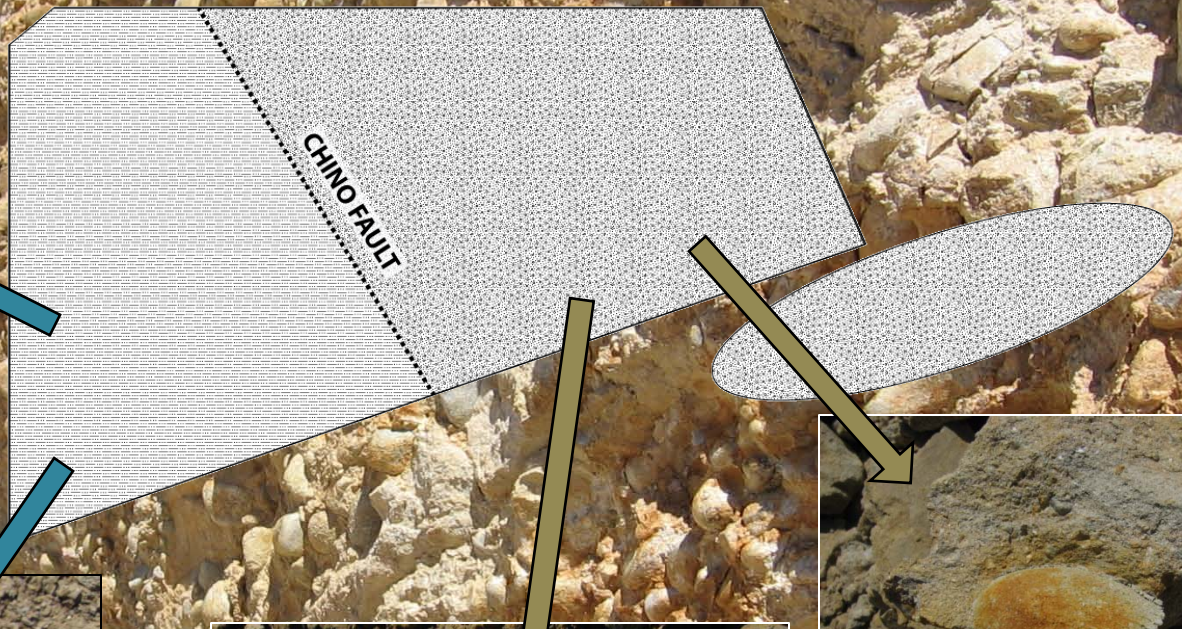
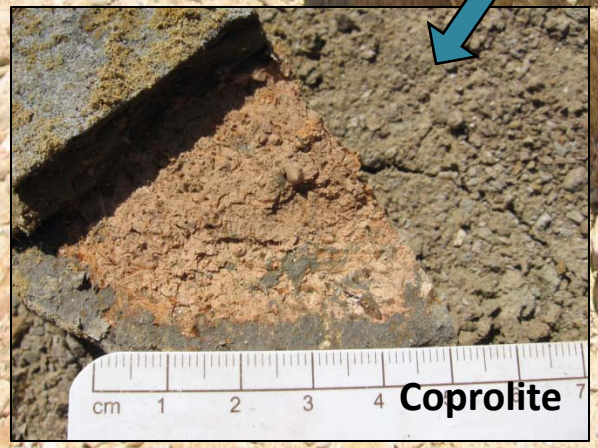
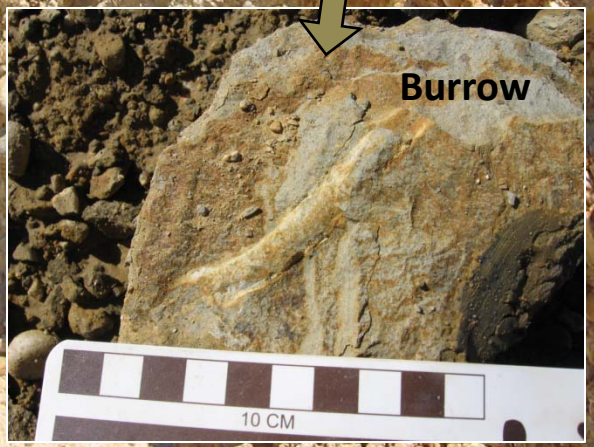
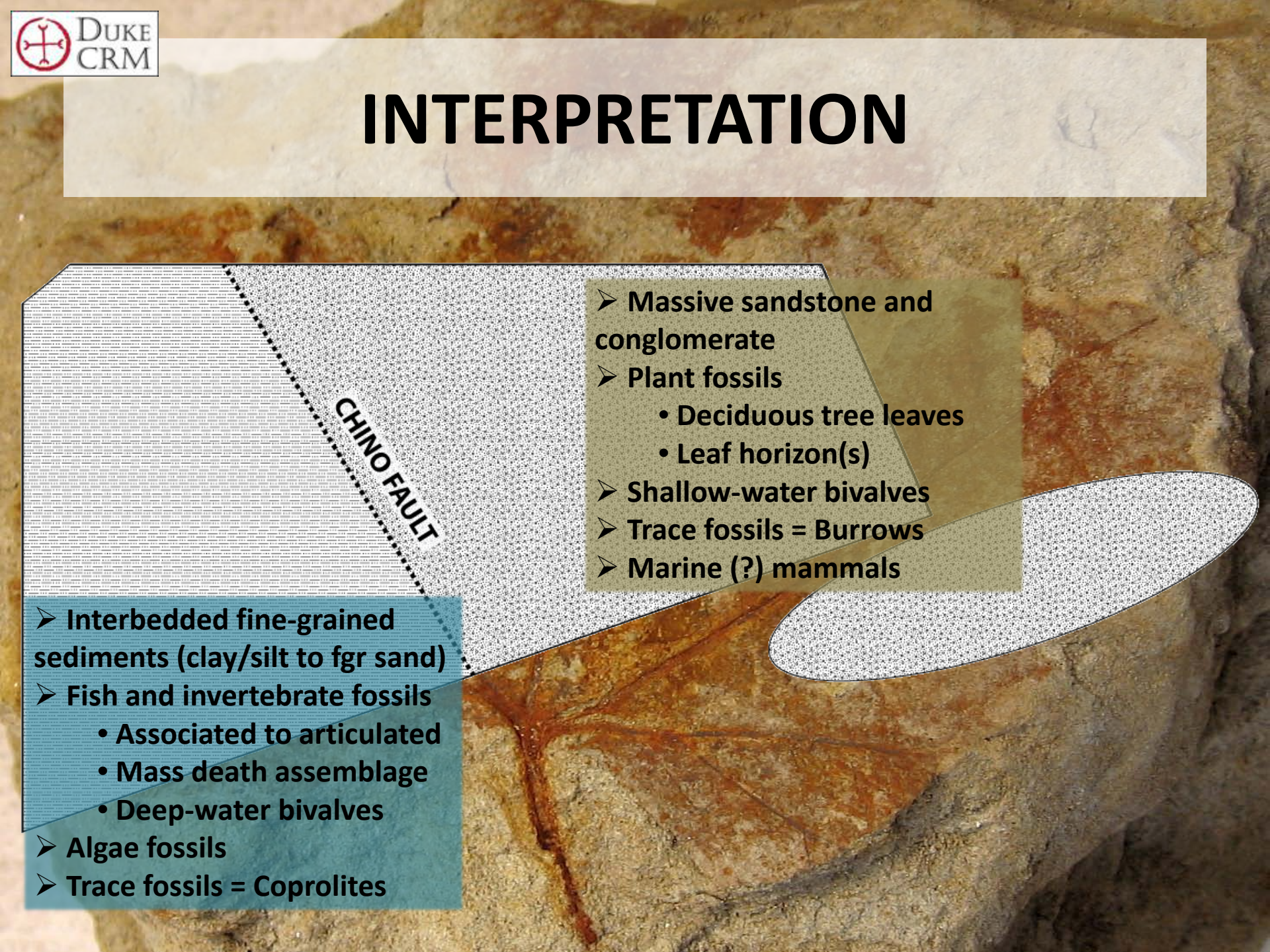


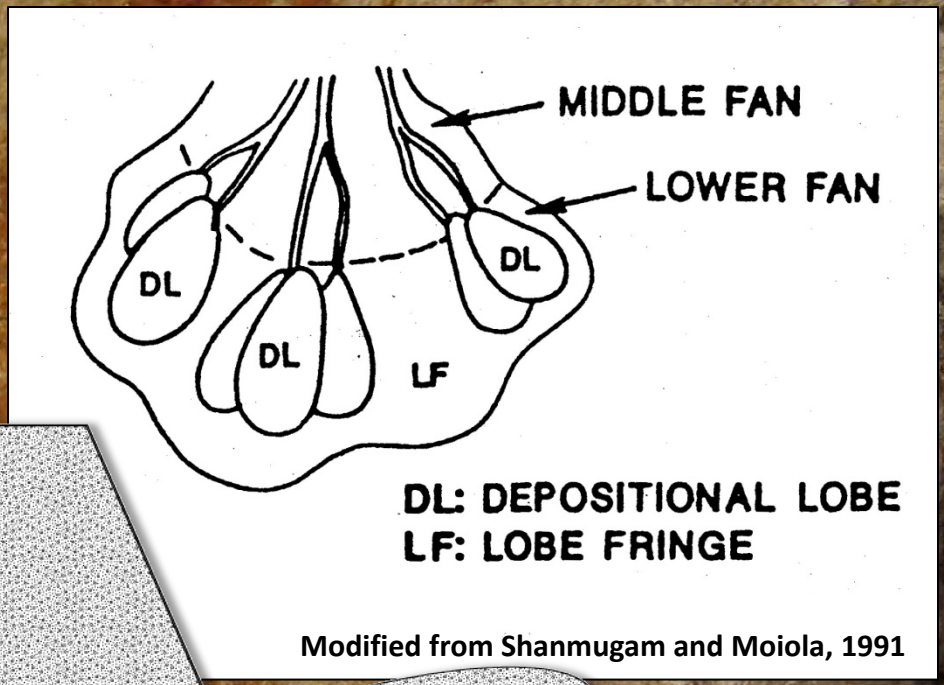

# INTERPRETATION




- Massive sandstone and conglomerate
- Plant fossils
  - Deciduous tree leaves
  - Leaf horizon(s)
- Shallow-water bivalves
- Trace fossils = Burrows
- Marine (?) mammals

- Interbedded fine-grained sediments (clay/silt to fgr sand)
- Fish and invertebrate fossils
  - Associated to articulated
  - Mass death assemblage
  - Deep-water bivalves
- Algae fossils
- Trace fossils = Coprolites

# INTERPRETATION: LOBE FACIES

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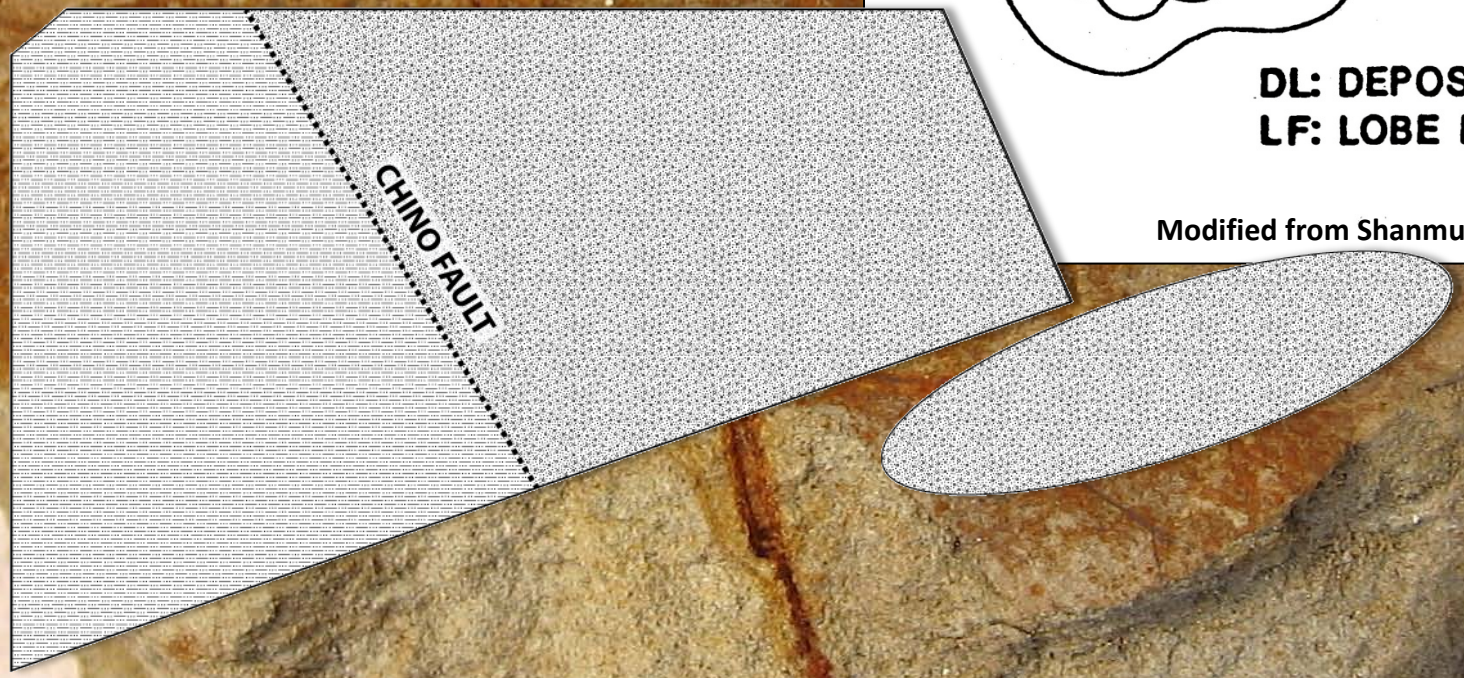

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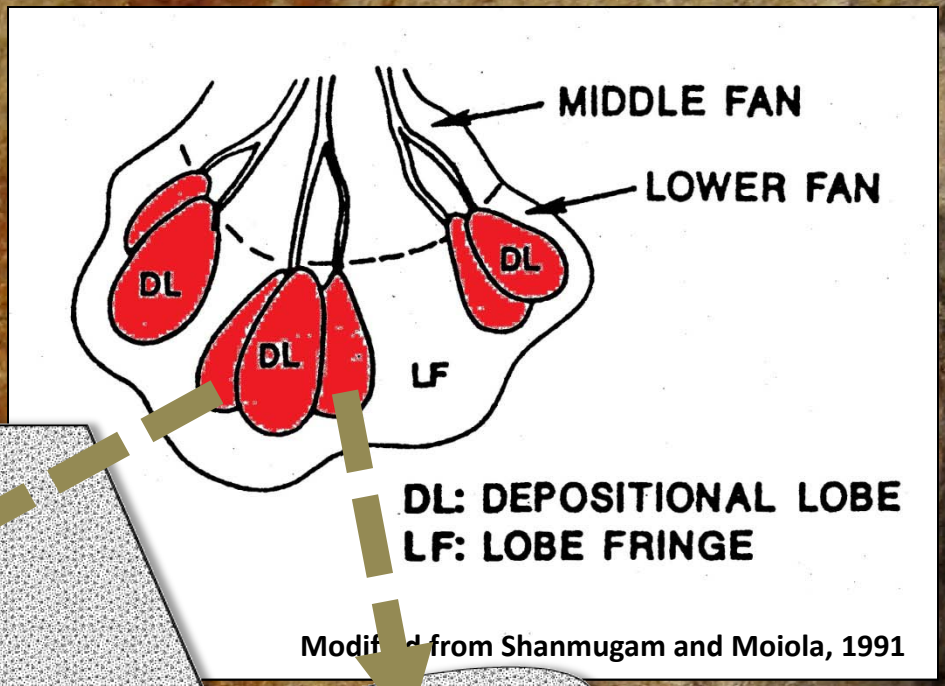


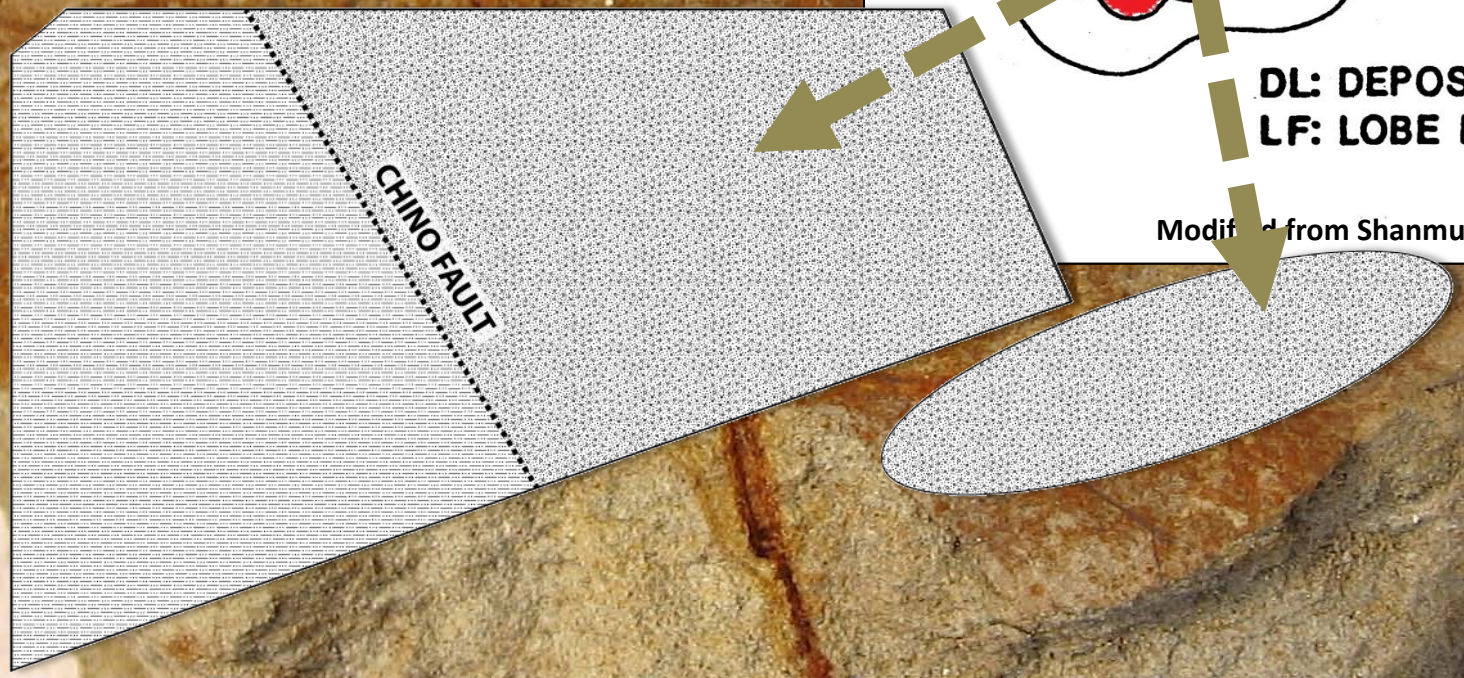

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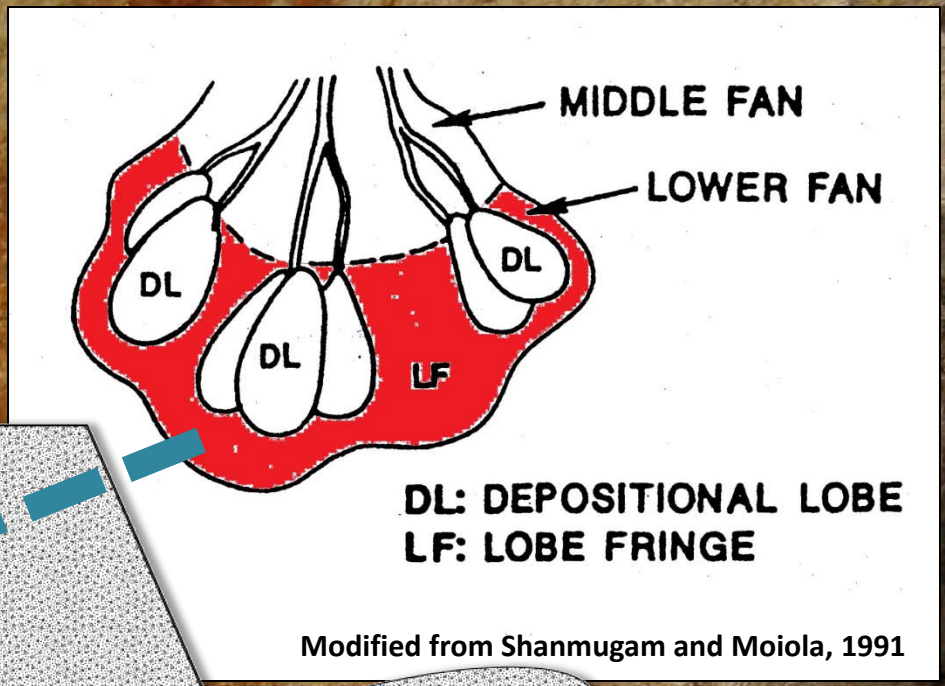


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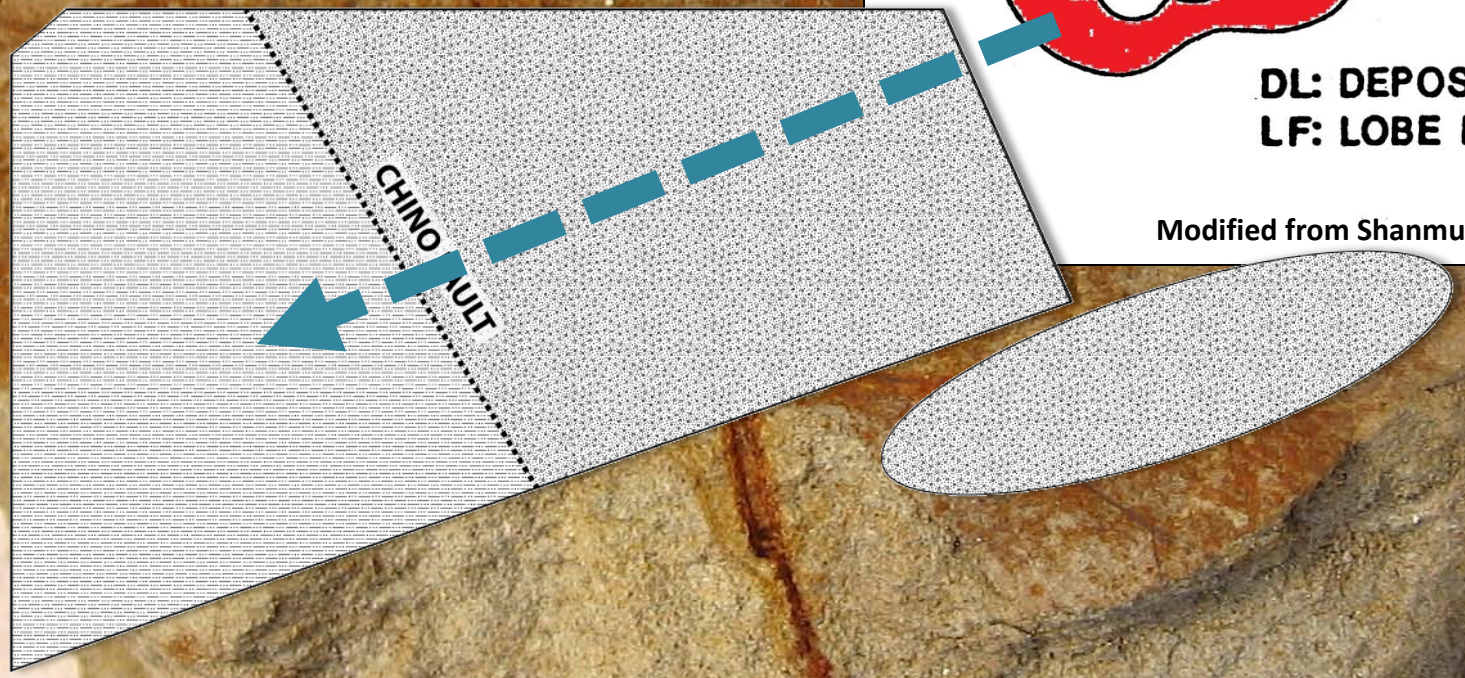

# INTERPRETATION: LEAF HORIZONS

and "Marine" Mammals?

Source: Wikimedia Commons

**"[F]lows resulting from rain storms and seasonal events in the source area."**

**(Reading and Richards, 1994)**

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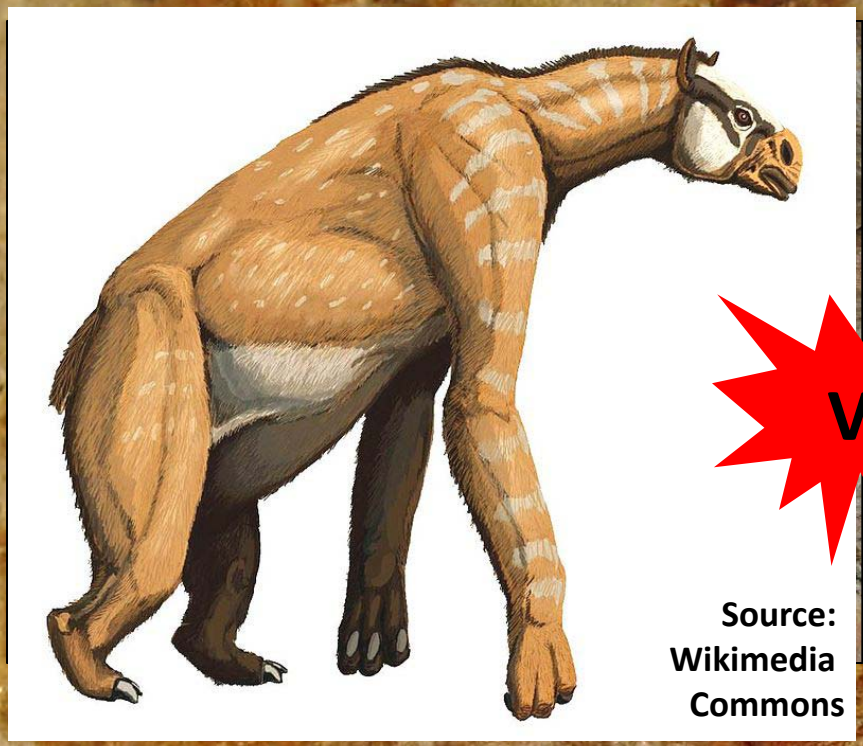

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VS

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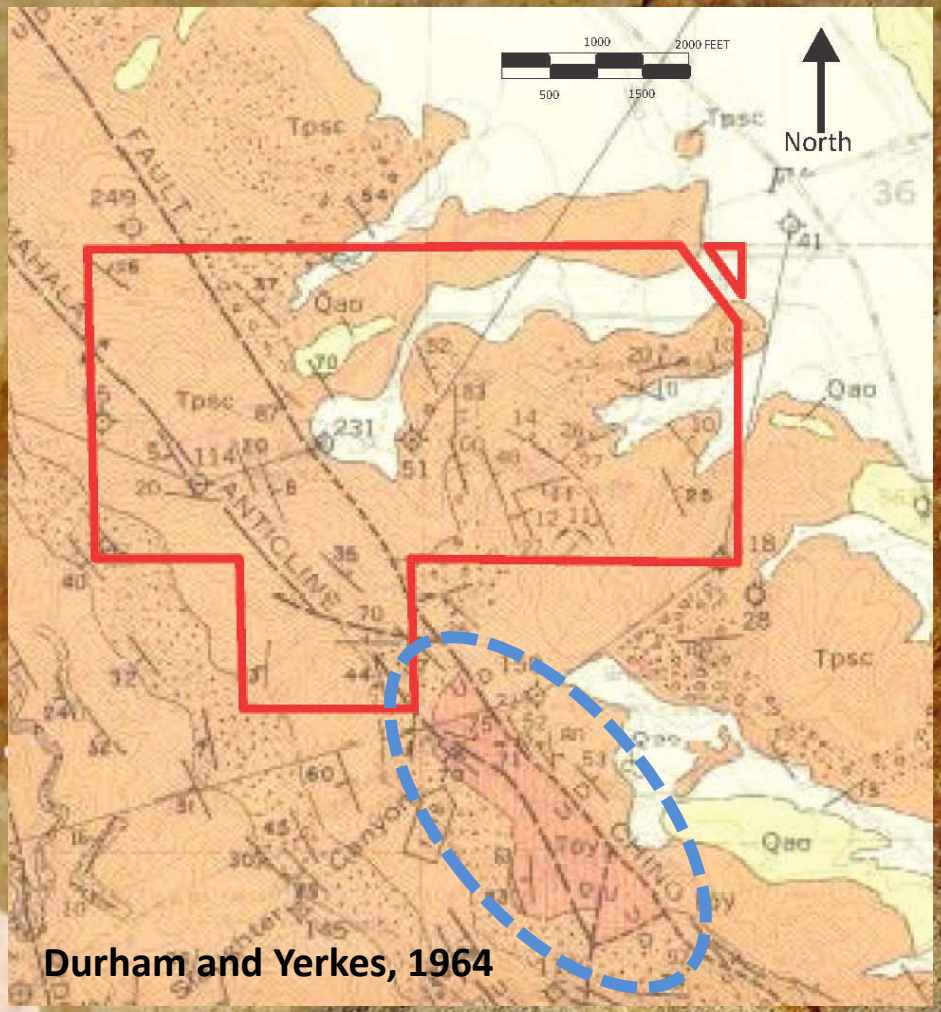
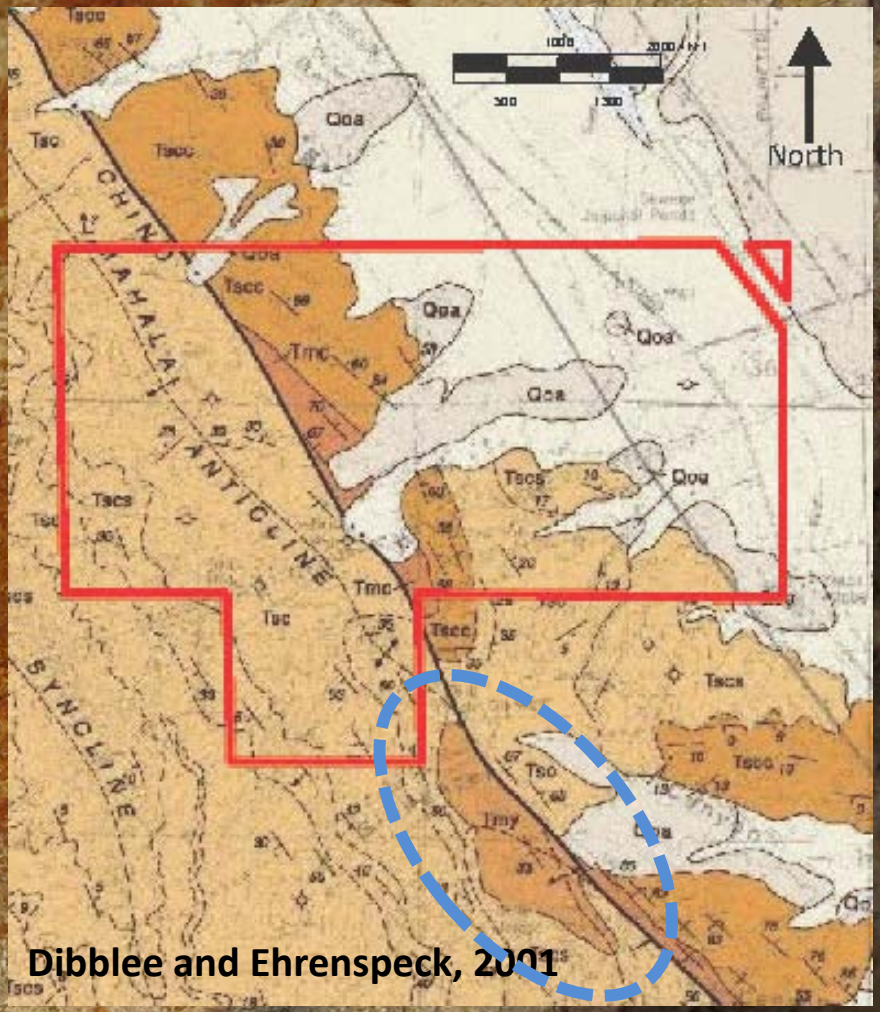
# INTERPRETATION: FORMATIONS




Durham and Yerkes, 1964

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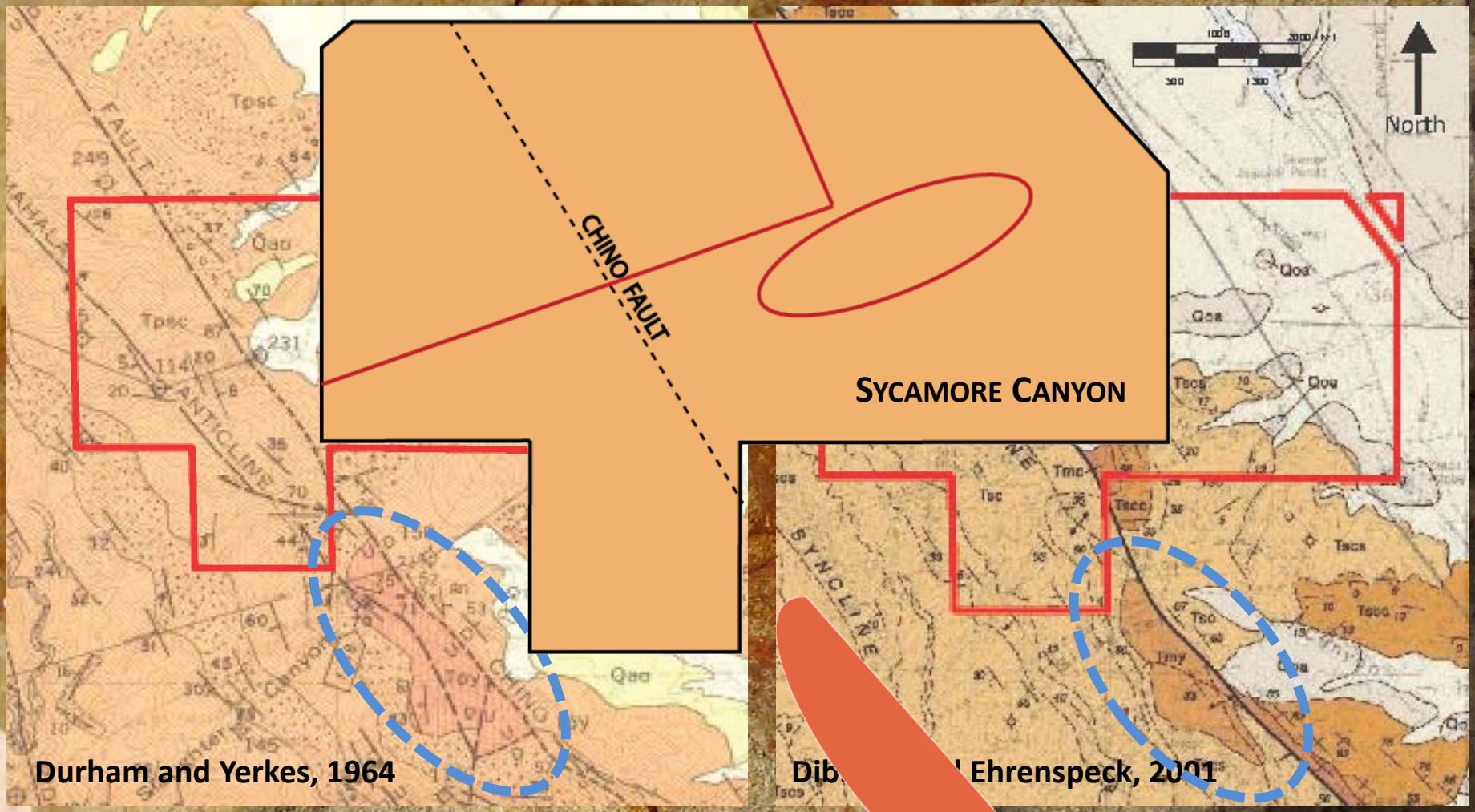

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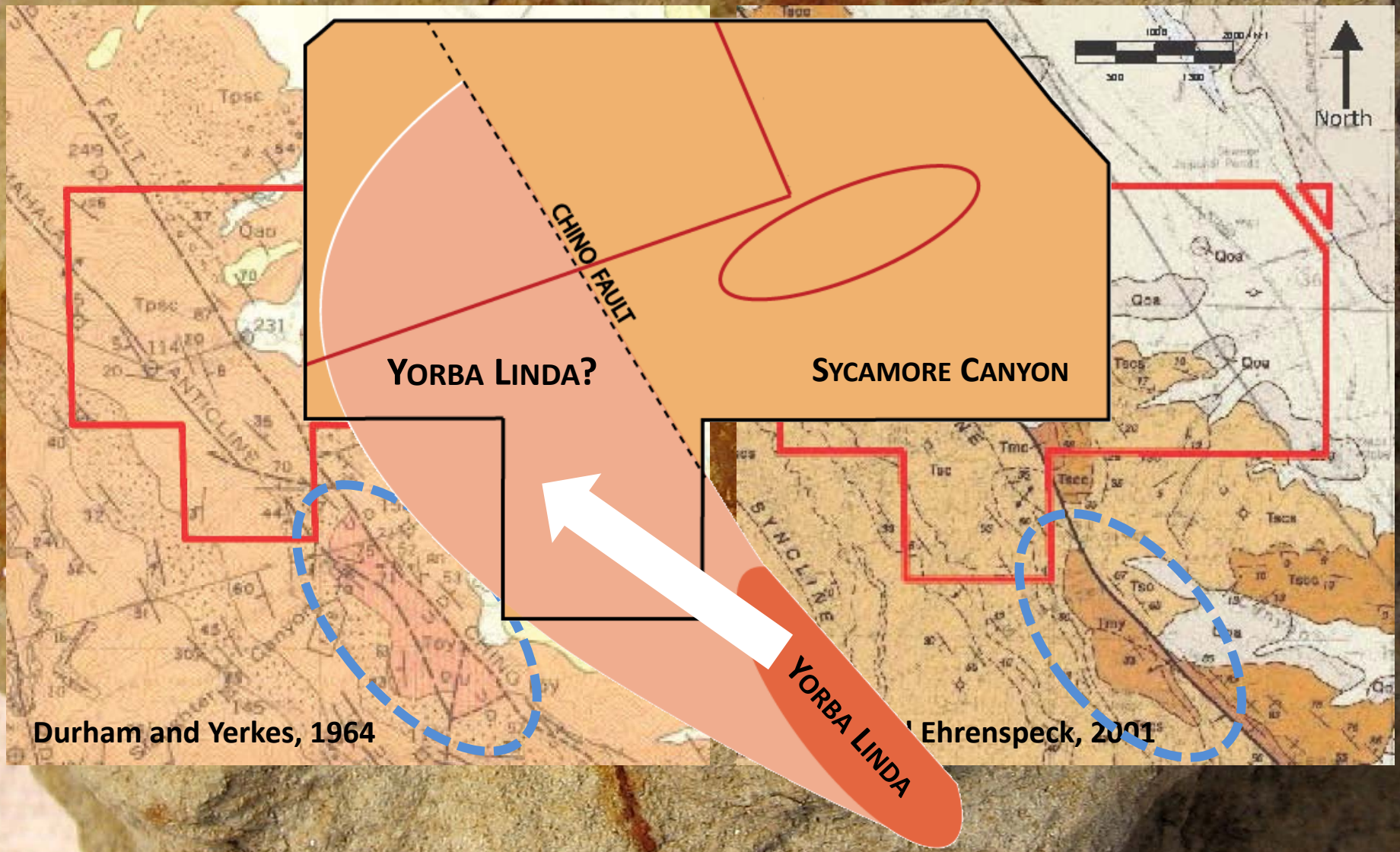

# Watch this space!

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# REFERENCES


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# ACKNOWLEDGEMENTS


Duke CRM field monitors:

Brady Long

Matthew Stever

Vanessa Brierty

Richard Huddleston,
Scientific Research Systems

City of Chino Hills

Standard Pacific Homes

Duke CRM