LAB 9: USING FOSSILS IN STRATIGRAPHY

EXERCISE 9.1. USING FOSSILS FOR CORRELATION

This worksheet (pages 9-3 to 9-6) contains field notes forms for each of four cores. Refer to the Lab Manual for detailed information on how to complete them.

EXERCISE 9.2. FINAL QUESTIONS

Answer these questions after you have completed EXERCISE 9.1.

a. The top surface of the granite at the base of Cores 1 to 3 is a nonconformity because clastic sediments are deposited on top of an igneous rock.

   i. What is the age of the time-stratigraphic unit on top of the granite?

   ii. Where was the deepest part of the depositional or sedimentary basin during this time? How do you know?

   iii. What happened to water depth between this time-stratigraphic unit and the one above it? (that is, between the first two units above the nonconformity)? How can you tell?

   iv. In which direction did the shoreline move between the first two units above the nonconformity? (Left or right?)

b. What major change in sedimentary rock type occurred between the second-oldest and third-oldest rock units? What does this say about any change in climate at this location?

c. Where was the shoreline during the Mesozoic? (Is it represented in a particular core, to the right, to the left, etc.) Explain your reasoning.

d. Where was the shoreline during the most recent time unit? (Is it represented in a particular core, to the right, to the left, etc.) Explain your reasoning.

CORE 1

Depth Interval	**Lithology and Facies**	**Fossils**
1-F Surface to 120 m	*Hummocky, crossbedded, medium-grained sandstone with abundant fossils.* *Facies: Storm-dominated Shelf*	Taxon: Taxon Range: Peak: Env. Range: Taxon: Taxon Range: Peak: Env. Range: Taxon: Taxon Range: Peak: Env. Range: Additional Fossil Mentioned on Label: Time Dating Given: Concurrent Range:
1-E 120m to 250m	*Facies: Marine shelf.*	Taxon: Kingdom Protista - Diatoms Taxon Range: Peak: Env. Range: Taxon: Kingdom Protista - Coccoliths Taxon Range: Peak: Env. Range: Concurrent Range:
1-D 250m to 280m	*Descr.: white, gypsum, algal laminates.* *Facies: Supra-Tidal*	None
1-C 280m to 360m	*Descr.: Dark grey micrite and biomicrite.* *Facies:Lagoon or Sub-tidal*	Taxon: Taxon Range: Peak: Env. Range: Taxon: Taxon Range: Peak: Env. Range: Taxon: Taxon Range: Peak: Env. Range: Concurrent Range:
1-B 360m to 430m	*Facies: Beach at the end of a short transport system.*	None
1-A 430m to bottom of core	*Igneous bedrock (granite).*	None

CORE 2

Depth Interval	**Lithology and Facies**	**Fossils**
2-L Surface to 120 m	*White sandstone with gently dipping beds and Skolithos trace fossils* *Facies: Beach*	Taxon: Taxon Range: Peak: Env. Range: Taxon: Taxon Range: Peak: Env. Range: Concurrent Range:
2-K 120m to 250m	*Facies: Marine Shelf*	Taxon: Taxon Range: Peak: Env. Range:
2-J 250m to 320m	*Facies: Subtidal zone with patch reefs.*	Taxon: Taxon Range: Peak: Env. Range: Taxon: Taxon Range: Peak: Env. Range: Taxon: Taxon Range: Peak: Env. Range: Concurrent Range:
2-I 320m to 375m	*Dark grey micrite and biomicrite.* *Facies:Lagoon or Subtidal zone*	Taxon: Taxon Range: Peak: Env. Range: Taxon: Taxon Range: Peak: Env. Range: Concurrent Range:
2-H 375m to 450m	*Descr.: Red, poorly sorted, poorly rounded, low sphericity, sand sized grains, grains are mostly feldspars: arkose* *Facies: Beach*	None
2-G 450m to bottom of core	*Igneous bedrock (granite).*	None

CORE 3

Depth Interval	**Lithology and Facies**	**Fossils**
3-R Surface to 120 m	*Descr.: grey, well rounded, moderate sphericity, poorly sorted conglomerate (grains up to gravel sized), found with immature grain-suported gravels.* *Facies: Braided River*	None
3-Q 120m to 250m	*Facies: Subtidal Zone*	Taxon: Taxon Range: Peak: Env. Range: Taxon: Taxon Range: Peak: Env. Range: Concurrent Range:
3-P 250m to 335m	*Descr.:Biolithite (coquina), massive mounds of coral* *Facies: Reef*	Taxon: Taxon Range: Peak: Env. Range: Taxon: Taxon Range: Peak: Env. Range: Concurrent Range:
3-O 335m to 400m	*Facies: Proximal Shelf*	Taxon: Taxon Range: Peak: Env. Range: Taxon: Taxon Range: Peak: Env. Range: Concurrent Range:
3-N 400m to 475m	*Decr.: Grey, interbedded mud and sand with symmetric cross beds* *Facies: Subtidal*	Taxon: Taxon Range: Peak: Env. Range: Taxon: Taxon Range: Peak: Env. Range: Concurrent Range:
3-M 475m to bottom of core	*Igneous Bedrock (granite)*	None

CORE 4

Depth Interval	**Lithology and Facies**	**Fossils**
4-W Surface to 120 m	*Descr.:Massive deposits of pink, poorly rounded, moderate sphericity, poorly sorted breccia (up to gravel sized clasts)* *Facies: Alluvial Fan*	None
4-V 120m to 250m	*Rock sample collected. Descr.:off white, calcite cement, ooids, some sparry cement but dominantly micrite: Oomicrite* *Facies: Intertidal*	Taxon: Taxon Range: Peak: Env. Range: Taxon: Taxon Range: Peak: Env. Range: Concurrent Range:
4-U 250m to 350m	*Green to brown pelmicrite, interbedded with shales and silts.* *Facies:carbonate shelf*	Taxon of sample mentioned on label : Taxon Range: (hint: from lectures/textbook) Peak: None Env. Range: Subtidal to abyssal
4-T 350m to 440m	*Facies: Deep Shelf*	Taxon: Taxon Range: Peak: Env. Range:
4-S 440m to bottom of core	*Facies: Subtidal Zone*	Taxon: Taxon Range: Peak: Env. Range: Taxon: Taxon Range: Peak: Env. Range: Concurrent Range: