This handout contains the following:

- A core material key for identifying the composition and condition of corals and coralline algae in a core.
- Digital images representing the three cores. Each set of images represent coral-reef conditions at 1,500–1,000 yr BP, 4,000–2,000 yr BP, and 5,000–4,000 yr BP. The photographs are labeled to identify the individual cores, and the time periods within the cores are shown.
- A core analysis grid.
- Glossary of terms.
- List of internet resources.
Core Material Key

(a) Two examples of *Pocillopora* in good and poor taphonomic condition. Intervals in cores during which *Pocillopora* skeletons dominate and are in good condition represent times of good coral growth and active reef development. Example of (b) coralline algae and (c) core constituents from an interval representing good, intermediate, and poor taphonomic conditions of *Psammocora stellata* skeletons.
Core #1

1,500–1,000 yr BP

4,000–2,000 yr BP

5,000–4,000 yr BP

Gravinese et al., 2020, https://doi.org/10.5670/oceanog.2020.113
Core #3

1,500–1,000 yr BP

4,000–2,000 yr BP

5,000–4,000 yr BP
### Core Analysis Grid

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Gravinese et al., 2020, https://doi.org/10.5670/oceanog.2020.113
GLOSSARY OF TERMS

**Calcification.** The process of deposition of calcium carbonate (CaCO$_3$).

**El Niño–Southern Oscillation (ENSO).** A naturally occurring oceanic–atmospheric cycle of trade-wind circulation that results in the cyclical warming and cooling of the sea in the eastern Pacific Ocean.
Garrison (2013) and https://www.esrl.noaa.gov/psd/enso/education/

**Geochemistry.** The study of the chemical composition of and chemical changes in the solid matter of the Earth or a celestial body; the related chemical and geological properties of a substance.
https://www.merriam-webster.com

**Paleoclimatology.** The study of past climate.
https://www.merriam-webster.com

**Taphonomy.** The study of the biological, chemical, and physical processes that occur after the death of an organism as they become fossilized
https://www.merriam-webster.com

INTERNET RESOURCES

**Florida Tech — Marine Paleocology Laboratory**
Website summarizing research in the eastern tropical Pacific being conducted by investigators at the Florida Institute of Technology.
http://research.fit.edu/marine-paleolab/

**NASA — Global Seawater Oxygen-18 Database**
US government database containing over 26,000 seawater oxygen-18 values since 1950 (Schmidt et al., 1999).
https://data.giss.nasa.gov/o18data/

**NOAA Climate.gov — El Niño & La Niña (El Niño-Southern Oscillation)**
US government website describing the climatic changes that occur during El Niño events.
https://www.climate.gov/enso

**NOAA — El Niño**
US government website providing educational materials about ENSO.
https://www.noaa.gov/education/resource-collections/weather-atmosphere-education-resources/el-nino

**NOAA National Centers for Environmental Information — Paleoclimatology Data**
US government website describing paleoclimatology data from tree rings, ice cores, corals and ocean and lake sediments. Other educational resources are also available.
https://www.ncdc.noaa.gov/data-access/paleoclimatology-data

**NOAA National Ocean Service — What Is Coral Bleaching?**
US government website explaining coral bleaching.
https://oceanservice.noaa.gov/facts/coral_bleach.html

**University of Exeter — Reef Budget**
Provides additional resources and descriptions of methods used to calculate carbonate production in coral reefs.
http://geography.exeter.ac.uk/reefbudget/