

# Core Section Curation

## Background

Upon recovery from the drill floor, each section of a core must be identified and catalogued. A detailed curation system was developed for identification purposes and to maintain the integrity of the core samples. Every piece of core retrieved from the ocean floor must be labeled and listed. It must also remain in the orientation in which it was formed. Once the core pieces are checked and verified, the core is cut lengthwise into two halves, the archive half and the working half. The archive half is kept intact, while the working half is used for sampling and testing purposes. Both halves are equally important and every possible effort is put forth to protect them. Through proper curation techniques, many individuals can study the core for years to come.

Curation and on-board testing should be completed by the time the ship returns to shore, when both core halves are sent to a repository for storage. These facilities provide a climate-controlled environment that allows for the accountable and safe protection of all core sections.

## Learning Objectives

Students will be able to:

- Use their prior knowledge, plus the guides and materials provided, to catalogue and label one or more core samples.

## National Science Education Standards

Standard D: Earth and Space Science

Standard G: History and Nature of Science for grades 9-12

## Ocean Literacy Principles

1. Earth has one big ocean with many features.
2. The ocean and life in the ocean shape the features of Earth.
7. The ocean is largely unexplored.

**Target Age:** Grades 9-12, undergraduates

**Time:** One class period

## Materials

- Expedition 309 poster with color core photos (*The "Hole" Story About Ocean Cores*)
- Labeling instructions

- Report sheets (see page 4)
- Markers/pens
- Tape
- Sections of broken rock (optional)

## Vocabulary

Use your textbook, the information provided above, and/or geological dictionaries to define the following terms:

- curation
- orientation

## What To Do

1. Choose a core section (photo) to label. The more intact the core is, the fewer labels you'll need to make. Align a report sheet with the core you are processing. Use extra sheets (taped together) as needed to sketch the entire core. Be sure to include every piece.
2. Using the labeling instructions, number and label each piece in the core section on the labels provided (small rectangles) on the report sheet. (Note: Assume your core is a working half.)

3. Place arrows along the left side of your drawing to indicate the direction of orientation. The arrows should point toward the top of the core section. (The top of the poster is the top of your core.)

### Analysis

1. Why is it important to label core sections before their use in scientific research?
2. Why must the core remain in the formation orientation before, during, and after the curation process?

### Extensions

1. Use the broken rock provided by your instructor to complete the following:
  - a. Carefully (without breaking them) lay out the pieces so that all are visible.
  - b. Examine, make a rough sketch, and number each piece in the space provided on a new report sheet.
  - c. Reassemble the rock if necessary.
  - d. Imagine that your rock has been cut in half for curation, and decide which will be your working and archive halves. Sketch what your archive half would look like in the space provided.
  - e. Create curation labels for your pieces. What information should/can be included on these labels?
2. Learn more about the Gulf Coast Repository at <http://iodp.tamu.edu/curation/gcr/index.html>.

## Labeling

All hard rock pieces are labeled with the Integrated Ocean Drilling Program standard identifier:

Expedition, Site, Hole, Core, Core type, Section, Piece (and Sub-piece number), an “Up” arrow if the piece is oriented, and a “W” or an “A”, indicating whether the piece is from the working or archive half.

Each piece should be numbered consecutively from the top of the section down. Every section should begin with piece number 1, even if a piece is continuous between sections. Sub-pieces (i.e., the pieces which fit together between liner dividers collectively to form a piece), should be consecutively alphabetized from the top of the piece to the bottom of the piece. When the CUT FACE of the WORKING HALF is facing up, the sub-piece to the right, relative to the stratigraphic top of the section, is sub-piece A (see Figure 1).

Whenever possible, sections should be divided between pieces. Remember that curated section lengths may be shorter than the average 150 cm length, however the cut liner should remain 150 cm with “EMPTY” written in the blank space at the bottom.

Please ensure that hard rock cores are curated so the assigned piece and sub-piece numbers are the same in both the archive and working halves. Should there be one piece in the archive half that has broken into two pieces in the working half, then each unit in the working half would be assigned a single piece number (No sub-piece numbers would be assigned).

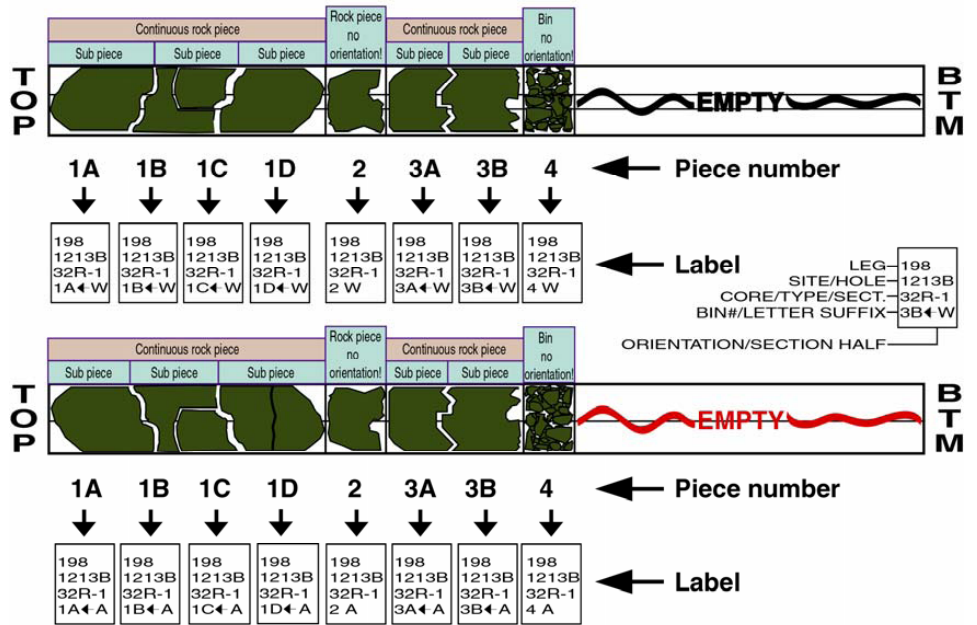
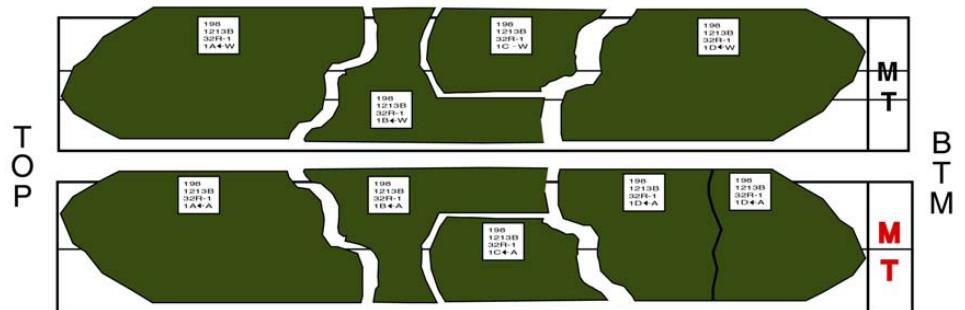


Figure 1 - Numbering system for hard rock labels



- To identify and distinguish between individual sub pieces of a continuous rock piece, they need to be lettered with suffixes. Mark the sub pieces that fit together or have contiguous features at the bottom and draw connecting lines between them with a red wax pencil. This should be done previous to the labeling when receiving the core on the catwalk and/or when the core is reconstructed in the splitting room.
- In the example from Figure 2 all the individual sub pieces of the continuous rock piece have the same bin number: 1, but to distinguish between them, different letter suffixes: 1A, 1B, 1C and 1D.
- All individual sub pieces within a continuous rock piece having a reasonable size must be separated by letter suffixes with the exception of rules I and II:
  - If a rock or sub piece is broken in only one of the section half's they should be labeled with the same letter suffixes. See the sub pieces labeled 1D.
  - If the pieces broke while splitting on the saw.

Figure 2 - Labeling hard rock pieces with letter suffixes

# Core Labeling Report Sheet

Circle one: core photo, broken rock

Four horizontal lines for notes.

Large central rectangular area for drawing or additional notes.

Four horizontal lines for notes.

Four horizontal lines for notes.

Four horizontal lines for notes.

Four horizontal lines for notes.

Four horizontal lines for notes.

Four horizontal lines for notes.

Four horizontal lines for notes.