

IODP expeditions are supported by carrying out a set of standard measurements at sea on all materials drilled and recovered, and if so required by the science party, these can be supplemented with additional measurements either collected at sea or during the IODP moratorium period.

JOIDES Resolution Standard Measurements



The JOIDES Resolution Facility Board approved these guidelines on May 17, 2017

JOIDES Resolution Standard Measurements

Approved by *JOIDES Resolution* Facility Board: 17 May, 2017

Latest Revision: 28 April, 2017

(1) General Purpose

To facilitate meeting all science objectives of an IODP expedition, during each expedition a set of standard measurements is made at sea, and if so required by a science party, these measurements can be supplemented with additional measurements either collected at sea or during the IODP moratorium period afterwards.

The latest version of the *JOIDES Resolution Staffing Procedures* always can be downloaded from <http://iodp.org/jr-facility-policies-procedures-guidelines>.

(2) Standard Measurements

JOIDES Resolution (JR) standard measurements are those that should be made on all JR expeditions if practical for the material being drilled, cored or recovered. Deviations from standard measurements should be identified in the Scientific Prospectus. In addition, the *JOIDES Resolution* Science Operator (JRSO) may require additional measurements to meet safety requirements and protocols.

2-1 Core Characterization and Measurements

1. Core orientation (APC only)
2. Headspace gas analysis (sediments)
3. Pore water chemistry (e.g., nutrients, pH, alkalinity, sulfate, chloride, major and trace elements)
4. Borehole depth scale
5. Thermal conductivity (both whole core and pieces)
6. Core logging
 - a. Whole Round
 - i. Natural gamma ray
 - ii. Gamma ray attenuation
 - iii. Magnetic susceptibility
 - iv. *P*-wave velocity

- b. Split Core
 - i. Digital imaging
 - ii. Reflectance spectroscopy and colorimetry
 - iii. Natural remnant magnetism (NRM) with step-wise demagnetization
- 7. Moisture and density/porosity (discrete samples)
- 8. *P*-wave velocity (discrete samples)
- 9. Biostratigraphy
- 10. Visual core description
- 11. Smear slides and/or thin sections
- 12. Carbonate analyses (sediments)
- 13. Bulk carbon-hydrogen-nitrogen-sulfur (CHNS) analyses
- 14. Whole rock major and trace elements (hard rock).

2-2 Downhole Logging and Measurements

The following measurements are made once per drill site, as practical:

- 1. Natural gamma ray
- 2. Spectral gamma
- 3. Density
- 4. Porosity
- 5. Resistivity
- 6. Sonic
- 7. Borehole imaging
- 8. Caliper
- 9. Formation temperature

2-3 Rig Floor Measurements

- 1. Driller depth
- 2. Heave compensation
- 3. Weight on bit
- 4. Penetration rate
- 5. Mud pressure
- 6. Mud logging (important for Expeditions with Microbiology component)
- 7. Pump rate

(3) Supplemental Measurements

Supplemental measurements are defined as additional measurements that may be needed to meet expedition objectives, and are conducted where possible and scientifically justified. Supplemental measurements are collected either at sea or following an IODP expedition, but within the moratorium period.

3-1 Core Characterization

1. Anhyseretic Remanent Magnetization (ARM) and Isothermal Remanent Magnetization (IRM) with step-wise acquisition and demagnetization
2. Shear strength
3. Cell counts
4. Contamination testing
5. Microbial activity measurements using radiotracers
6. Whole rock major and trace elements (sediments)
7. Rock maturity analysis
8. X-ray diffraction
9. Micro-imaging
10. Whole round core digital surface photography (hard rock)

3-2 Downhole Logging and Measurements

1. Magnetic susceptibility
2. Borehole temperature
3. Vertical seismic profile or check-shot (requires permitting)
4. Magnetic field
5. Formation pressure
6. Logging and measurement while drilling
7. Packer tests

3-3 Onshore Moratorium Measurements

1. XRF scanning (in JRSO Gulf Coast Repository analytical facilities)