IODP Expedition 378: South Pacific Paleogene Climate

Week 1 Report (3–11 January 2020)

Operations

Port Call Activities

IODP Expedition 378 began in Lautoka, Fiji, at Queen's Wharf at 0800 h on 3 January 2020. The vessel had been tied up at Queen's Wharf for a maintenance period and to complete repairs on the pipe racker skate and derrick. The Co-Chief Scientists, Expedition Project Manager (EPM), and IODP JRSO technical staff boarded the vessel and began port call activities, including IODP JRSO crew change and crossover and Co-Chief Scientist orientations. The Expedition 378 science party boarded the vessel on 4 January and began expedition preparation, including orientations on life at sea and safety. The science party continued safety training and received introductions to the laboratories during the rest of the port call.

During the three-day port call, the ship crew change was completed, and derrick repairs continued through 5 January. The welded areas of the derrick were inspected and painted and rig down of equipment was completed on 5 January. Two trucks of fresh produce were also loaded aboard the vessel.

The vessel was readied for departure and the pilot came aboard at 0656 h on 6 January. The last line was released at 0720 h to start the transit to Site U1553 (proposed Deep Sea Drilling Project [DSDP] Site 277). The vessel remained underway at full speed until 10 January when speed was reduced to allow a storm to pass. At the end of Week 1, the vessel had transited 1477 nmi in 137.7 h, with an average speed of 10.7 kt.

Expedition Scientific Objectives

The aim of Expedition 378 is to recover the sediment sequences from a site south of New Zealand, which was previously drilled during DSDP Leg 29. The sequences of this site are critical to scientists' understanding of high-latitude environmental conditions, ocean circulation, and wind patterns during the Paleogene. The expedition will target sediments deposited during the very warm Late Paleocene and Early Eocene, including the Paleocene–Eocene boundary, as well as the Eocene–Oligocene transition, to investigate how the Eocene Earth maintained high global temperatures and high heat transport to the polar regions, despite receiving near modern levels of solar energy input. Due to incomplete derrick repairs, the sole operational objective of the expedition is to recover sediments at DSDP Site 277, which was previously incompletely drilled.

Science Results

The Expedition 378 science party includes scientists from 12 IODP member countries and three Outreach Officers from the USA, New Zealand, and China. The first week on board included presentations from curation, operations, publications, and the EPM to introduce the science party to onboard resources and expectations for the expedition. Members of the science party provided presentations on stratigraphic correlation and previous work accomplished on cores from DSDP Site 277. Additional training and orientations were provided in each of the laboratories, and all groups worked on the Methods sections for the expedition *Proceedings* volume that will be published postcruise.

Lithostratigraphy

The scientists received training from technical staff on the Section Half Multisensor Logger, Section Half Imaging Logger, core description and handling, and data entry into the core description software (DESClogik). Additional preparations included training in smear slide preparation and microscope use. The lithostratigraphy group also began coordination with the geochemistry and physical properties groups regarding sampling intervals and methodology for X-ray imaging.

Biostratigraphy

The scientists completed orientation and training in core flow, description software (DESClogik), and microscopes. Processing methods for paleontological methods were tested and practiced, and an inventory of laboratory equipment was completed.

Paleomagnetism

The scientists completed training in the operation of the superconducting rock magnetometer (SRM) and special laboratory software. Introductions to equipment and instruments for the measurement of discrete samples, such as the spinner magnetometer and alternating field demagnetizer, were also provided by the technicians.

Geochemistry

The scientists began planning strategies for shipboard sampling of interstitial water, headspace gas, and sediments. Additional training in the use of laboratory equipment and software was provided by the technicians, including sample collection, preparation, and analytical methods.

Physical Properties and Downhole Measurements

The scientists received training on the Whole-Round Multisensor Logger (WRMSL), the Natural Gamma Radiation Logger (NGRL), the Thermal Conductivity Meter, the *P*-wave velocity bayonet/caliper, and the shear-strength tools. Laboratory technicians also gave an introduction on the measurement of moisture and density on discrete samples.

Stratigraphic Correlation

The scientists became familiar with the latest version of the Correlator software and Correlation Downloader. Test runs of "fast track" measurements were made on two example core sections to prepare for the anticipated short timespan between cores at the beginning of the first hole. Discussions were also held with the physical properties scientists about core flow.

Outreach

The following outreach activities took place during Week 1.

Social Media

Platform	Number of posts	Analytics	Notes
Facebook	14	20 new page likes, 22 new followers, 567 page views, 9,601 page reach	55 comments on #wronganswersonly
Instagram	5 feed posts; 16 stories	36 new followers; Reach 5,677; Impressions 19,014; Actions 294	Great story interaction on immersion suit posts
Twitter	17 tweets; 22 retweets, 8 with comment	36 new followers; 701 engagements; (605 likes, 82 retweets, 14 replies)	

Ship-to-Shore Broadcasts

Group	Number of people	Notes
Escola Secundaria de Loule (Portugal)	29	Portuguese speaking

All officers have done test calls with shore, and a script for ship-to-shore broadcasts has been developed. Email templates were created to ensure consistent communication with shore requests. Future Zoom tests and a broadcast schedule were mapped out and presented to the science party, although some requests are still being submitted.

Website/Blogs

- Update of expedition webpage.
- Share/link of Co-Chief Scientists' blogs.
- Three blog posts to "All Aboard" (Otago Museum blog page).

Other

- Radio NZ Sunday Morning show interview.
- COSI (Center of Science & Industry) Instagram story.
- COSI (Center of Science & Industry) Q&A videos.
- Podcast episode development underway.

Technical Support and HSE Activities

The following technical support activities took place during Week 1.

Laboratory Port Call and Transit Activities

- Crossover with offgoing IODP JRSO technical staff completed on 3 January.
- Daily staff meetings held during port call and new IODP JRSO technical staff training in assigned laboratories.
- Science party introduced to laboratories by technical staff, and laboratories and instrumentation prepared for coring.
- Troubleshooting recurring problems with the SHMSL QEPro spectrometers.
- A cone point in the AVS was found to have broken off. There are no spares so the cone point was reinstalled and glued into place. Continuing to troubleshoot inconsistent results from vane shear measurements after the mechanical fix was performed.

Application Support Activities

- MUT—MegaUploadaTron: code changes underway to handle data validation errors.
- Torvane: Modified component table and LORE report to include new field for Raw Measurement.
- Correlation: Reloaded Correlator "Database" after crashes on startup. Crashes related to startup looking for files not present on the machine. Provided training on Correlator Downloader.
- Launcher Issues: Multiple computers with Launcher issues, where the old version or launcher had to be manually removed to resolve the issue. One computer required disabling "Smart Screen" because it is not connected to the internet.
    - SEM Station is Windows 7 OS and not compatible with Launcher. Code for SEM loaded on machine by programmers to resolve the issue. SampleMaster was rebuilt and loaded manually as well.
- Java 11 upgrade:
    - Rewrite of L2E continues.
    - Penetration Strength (Penetrometer) Application will have to be rewritten for Java-11. Short term solution is to use Spreadsheet Uploader to load data.

- Drill Report:
    - Core Line length after slip and cut not carried to next day. Issue resolved after discussion with drillers.
- BOX (Beginning of Expedition) Process:
    - Purged Expedition 385 and 378T data from Database.
    - Set up jr_programmer email to add Expedition 378 programmers ship-based email addresses.
    - Removed old Science LIMS logons and added news ones. Gave base Auther privileges.
    - Configured Expedition 378 project information in LIMS.

IT Support Activities

- Scientists set up on network.
- Worked with Siem Offshore and packaged a request for UPS installation in UWGL rack for aft dome. Received general agreement to proceed. UPS in process of installation.
- Sent request to Marlink to improve SmartWeb interface to satellite equipment. Marlink made improvements and SmartWeb performance has been improved.
- Incurred a couple of satellite outages during the week. Resolved quickly by Siem Offshore.

HSE Activities

- Conducted ship and laboratory safety orientations for science party and new IODP JRSO staff.
- Abandon ship drill and additional lifeboat training for science party.
- Safety shower and eye wash stations tested.
- New fire extinguisher familiarization provided to staff.
- Laboratory inspection conducted by Laboratory Officer.