

IODP Expedition 385: Guaymas Basin Tectonics and Biosphere

Week 1 Report (15–21 September 2019)

The first week of the International Ocean Discovery Program (IODP) Expedition 385, Guaymas Basin Tectonics and Biosphere, comprised entirely the port call activities in San Diego, USA. All times in this report are in ship local time (UTC – 7 h).

Operations

Expedition 385 started at 1500 h on 15 September 2019 when Expedition 385T ended with the first line ashore at the B-Street Pier Terminal in San Diego. After clearing US customs and immigration, port call activities immediately started with offloading of freight. At 0815 h on 16 September the Co-Chief Scientists and IODP JRSO technical staff boarded the vessel. The JRSO staff conducted crossover activities with the offgoing staff who departed in the late afternoon. Prior to that, all technical staff attended a radiation safety training course. The Co-Chief Scientists got their computer network connections set up and were given a tour of the ship. Other port call activities included handling of offgoing and incoming freight, such as loading of drill pipe (150 joints) and casing (20 joints). Also, third-party instruments and supplies shipped by the Expedition 385 science party were received. The Department of Energy van was loaded and placed on the Core Tech Shop roof, enabling implementation of microbial stable isotope studies at sea.

On 17 September, the majority of the Expedition 385 science party boarded the vessel at 0830 h. At 1300 h, after another nine scientists had boarded the vessel upon obtaining their Mexican cooperation visa documents, the science party was given a short introductory talk and presentation on information technology aboard the *JOIDES Resolution*. The initial orientation talks were then concluded with presentations about life at sea and general safety. This was followed by a general ship safety tour. Port call activities included the arrival of the oncoming Siem Offshore crew that crossed over with their offgoing counterparts. Loading and unloading of cargo continued throughout the day, including discharge of Expedition 379T cores and staging of casing and core winch line shipments for loading. By the end of the day, almost 1000 metric tons of fuel were bunkered.

Routine port call activities continued on 18 September, including loading of casing and food, as well as starting a derrick inspection. Another science party member boarded the vessel at 1530 h. On 19 September, port call activities continued with loading of hardware and supplies, such as food and lube oil. In the afternoon, the Captain, Ship's Doctor, Offshore Installation Manager, First and Second Mates, and the Camp Boss met the science party and new JRSO technical staff, and gave a presentation on environment and safety of the vessel. The unloading of offgoing shipments was completed on 20 September. The loading of freight proceeded, including all

hazardous material shipments. The routine inspection of the derrick concluded. Another ~1000 metric tons of fuel were bunkered by the end of the day. On 21 September, we completed loading of freight, offloaded trash prior to sailing, and secured all equipment for our transit. Our departure was postponed one day to 22 September to avoid tropical storms and potentially high seas on our sea passage to Guaymas Basin in the Gulf of California.

Science Results

IODP Expedition 385 plans to core and log seven sites in the Guaymas Basin to investigate the effects of sills that have intruded organic-rich sediments, aiming to decipher the long-term relationship of tectonics, magmatism, sedimentation, carbon cycling, and microbial activity. In doing so, Expedition 385 seeks to advance our understanding of the conditions that limit life in the deep biosphere. We expect to recover more than 5,000 m of sediment and rock.

On 18 September, introductions of the Expedition 385 science party and IODP JRSO technical staff took place. This was followed by a talk on the expedition science objectives by the Co-Chief Scientists and a presentation of the expedition work plan by the Expedition Project Manager (EPM). In the afternoon, the scientists were introduced to core handling and sampling by the Curatorial Specialist, followed by core flow tours conducted by the EPM. At the end of the day, the Geochemistry and Microbiology Laboratory team convened for an initial meeting with technical staff to learn their laboratory and start the preparation of the complex geochemical and biogeochemical studies planned in Guaymas Basin. On 19 September, the scientists presented their individual research objectives and plans. Subsequently, all laboratory teams met with technical staff to learn their working spaces and start preparing instruments. This included an introduction of the descriptive information system to the core describers. In the morning of 20 September, the science party received an orientation on IODP terminology. Then, all laboratory groups met in their corresponding laboratories to continue preparations and start drafting their laboratory methods. This was followed by two presentations with overviews of (1) coring operations by the Operations Superintendent, and (2) downhole measurements by the EPM. On 21 September, one sedimentologist who has sailed on several *JOIDES Resolution* expeditions gave a seminar on sediment core description to the entire science party. Then, all laboratory teams continued preparing their laboratories and methods. In the early afternoon, the EPM and Publications Specialist introduced the science party to IODP publications, as well as their obligations during the expedition and afterwards. Scientists were given the rest of the afternoon off in light of the last evening in port.

Outreach

The first week of Expedition 385 consisted of several outreach activities taking place both aboard the vessel and on shore. In the afternoon of 16 September, the “Expedition to Guaymas Basin” Science Symposium was held at Scripps Institution of Oceanography (UC San Diego) in La Jolla with ~160 people in attendance, including science party members of the pioneering DSDP Leg 64 that first drilled Guaymas Basin more than 40 years ago. On board, numerous tours of the ship were given to various audiences, such as US and Mexican student groups, Scripps Institution of Oceanography staff, local media, dignitaries from both Texas A&M University and the National Science Foundation, and friends and families of IODP staff. In total, more than 180 visitors came to the ship over four days from 17 through 20 September.

We have one Outreach Officer sailing on this expedition, who is a Mexican science journalist based in the United States. He presented his outreach plans for the expedition to the science party, and spent the week preparing for upcoming live events, including setting up and testing the videoconferencing equipment, maintaining and establishing contacts with schools, arranging scientists for next week’s ship-to-shore events, and collecting images for social media and educational activities.

One goal of the expedition’s outreach activities is to engage effectively with media and the public in Mexico. Following the precruise distribution of information on the expedition to a network of science journalists in Mexico, Expedition 385 had good coverage in Mexican media with five features in television, radio, and print. In addition, local San Diego media published three news articles.

In terms of social media (Facebook [<https://www.facebook.com/joidesresolution>], Instagram [http://instagram.com/joides_resolution], and Twitter [<https://twitter.com/TheJR>]), eight posts on Facebook produced 3,187 engagements and 54 new followers. On Twitter, five tweets produced 46 new followers and 173 engagements. We took over the AGU Instagram account on 20 September as planned and posted one post with six photos about our port call in San Diego and one post with four photos addressing the orientation and training of the science party. In total, both posts generated 262 likes.

An overview of media coverage is provided below.

Mexico

- Expedition 385 scientist Ligia Pérez Cruz was interviewed by Televisión Educativa: <https://www.facebook.com/TvEducativaMx/videos/1650485971749369/UzpfSTI3OTQ2MDkyOTY1OjEwMTU2NTU3Nzg0MDk3OTY2/>
- Expedition 385 scientist Manet Peña Salinas was interviewed live for “La ciencia que somos:”

<https://www.facebook.com/LaCienciaQueSomos/photos/a.1937335836589937/2448219088834940/?type=3&theater>

- The Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE) published a press release:
<http://todos.cicese.mx/sitio/noticia.php?t=texto&stat=Cmt&n=1371>
- El Universal, the largest Mexican newspaper, published a cover story:
<https://www.eluniversal.com.mx/ciencia-y-salud/mexicanos-perforan-golfo-para-estudiar-la-tierra>
- Also republished in La Vanguardia: <https://vanguardia.com.mx/articulo/mexicanos-perforan-el-golfo-de-california-para-estudiar-la-tierra>

USA

- abc10News: <https://www.10news.com/news/local-news/renowned-research-ship-docks-in-san-diego>
- KPBS: <https://www.kpbs.org/news/2019/sep/19/research-vessel-s-sailed-world-lands-san-diego-ahe/>
- Times of San Diego: <https://timesofsandiego.com/tech/2019/09/18/unique-scientific-ship-docks-in-san-diego-before-gulf-of-california-expedition/>

Technical Support and HSE Activities

The first week focused on unloading and loading of freight (including several third-party shipments of instruments and supplies from the science party), conducting laboratory crossover with the offgoing IODP JRSO technical staff, and providing safety and laboratory orientations for the expedition scientists.

Laboratory Activities

- Crossover with offgoing IODP JRSO technical staff completed on 16 September.
- Daily staff meetings held during port call.
- Expedition 379T/385T core, surface, and temperature-controlled shipments offloaded.
- Loaded and distributed Expedition 385 supplies and third-party equipment.
- Radiation (RAD) Van small A/C unit installed by a local contractor.
- Installed new PANalytical Aeris X-ray Diffractometer (XRD) instrument.
- Vendor service calls performed for the Bruker XRD, Agilent Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES), and Zeiss microscopes.
- Prepared the Department of Energy (DOE) Van and RAD Van.
- New IODP JRSO technical staff trained in assigned laboratories.
- Science party introduced to laboratories by IODP JRSO technical staff.

- Preparation of Microbiology and Geochemistry Laboratories ongoing.

IT Support Activities

- Expedition 385 scientists welcome and setup on network.
- Internet service was disrupted for about 36 h due to an equipment failure in Houston.
- Worked with XRD service tech to install and configure new XRD and software. Instrument had to be configured on VLAN 40 using DHCP because it was not capable of being configured for a static Internet Protocol (IP).
- There are only five licenses for the new XRD software. According to the service technician, it cannot be unassigned and reallocated later so workstations have to be assigned wisely.
- Assisted with various issues related to the Rigwatch application.
- Fixed drop to DOE van so that it has network access.

Application Support Activities

- Fixed some problems with Coulometer and Cahn Balance software that were left from previous expeditions.
- Fixed a problem with DESClogik that was discovered on the previous expedition.
- Internet and shipboard network were down for 2 d. Used the time to test the behavior of our software when the network is down and fixed minor problems there.
- Worked on the new Catwalk application, part of the SampleMaster replacement project.
- Assisted technicians and scientists with the use of various applications.
- Set up Cahn balances (both hardware and software) in both the RAD and DOE vans. Minimal testing performed to ensure that the software came up and communicated with the devices.

HSE Activities

- Conducted ship and laboratory safety orientation for science party and new IODP JRSO technical staff.
- Texas A&M University (TAMU) Environmental Health and Safety (EHSD) representatives conducted safety audit of shipboard laboratories.
- Hazardous Communication, Radiation, and Laser Safety training given to all IODP JRSO technical staff by TAMU EHSD representatives.