***First scientific Riser Ocean Drilling***

We came onboard of Chikyu on June 4th by the helicopter. We are 11 scientist from different countries assembled together on the drilling vessel to contribute to the understanding and monitoring of the seismogenic zone responsible for the numerous earthquakes in Japan. All the people were excited to see from the helicopter approaching enormous vessel, where we would pass the next 44 days. Chikyu is the first scientific Deep Sea Drilling Vessel equipped with riser. The riser system consists of the outer pipe which surrounds drill pipe. This allows the drillers to maintain pressure balance within the borehole by circulating drilling mud, and thereby preventing collapse of the hole. This gives the opportunity to drill up to 7000 m below sea floor. A blowout preventer (BOP) prevents gas and fluid from escaping the drill-hole. During the first ship tour, we had a unique chance to see the BOP before it was immersed to 2000 m below the sea level and the drilling started. See attached photograph. It will be the first time in the history of the scientific ocean drilling that we will drill a riser hole. The hole will be drilled through the sediments of the Kumano Bassin into the accretionary prism above the seismogenic fault.

***First days of work***

Waiting for the beginning of the riser drilling we worked with cores from the upper 65 m of sediments. The core is initially passed through the X-ray CT (computerized tomography) scan. This is the scan which is normally used in hospitals to make X-ray CT scan of the human body. The obtained image allows us to see the internal structures of the core, as well as features due to mineralization, bioturbation, changes in lithology in three dimensions. Then the core is split into two halves, a working half and archive half. From the working half the samples for on-board analyses and the samples for post-cruise scientific research are taken. The archive part is passed through Image Line Scan to obtain a high resolution photo and then used for the visual description of the lithology. There are three sedimentologists to describe the lithology, sedimentary structures, and drilling disturbance in the core. Under the microscope, we observe the variations in abundance and size of different minerals.

At the beginning we worked together to describe the core, in order to be consistent later, when we will work alone in shifts of twelve hours. We discussed the strategy of sampling the core for the on-board analyses, because from each core of nine meters we can take only three samples for mineralogical and chemical analyses. The lithologic observations coupled with mineralogical, geochemical, structural and geophysical studies could allow us to obtain some answers about the development and evolution of the Kumano bassin and clarify the evolution of tectonic processes around Japan in the past.

***Cuttings***

What are the cuttings? All the people were so curious about it! How big will be the chips of rocks? Which information we can extract from it?

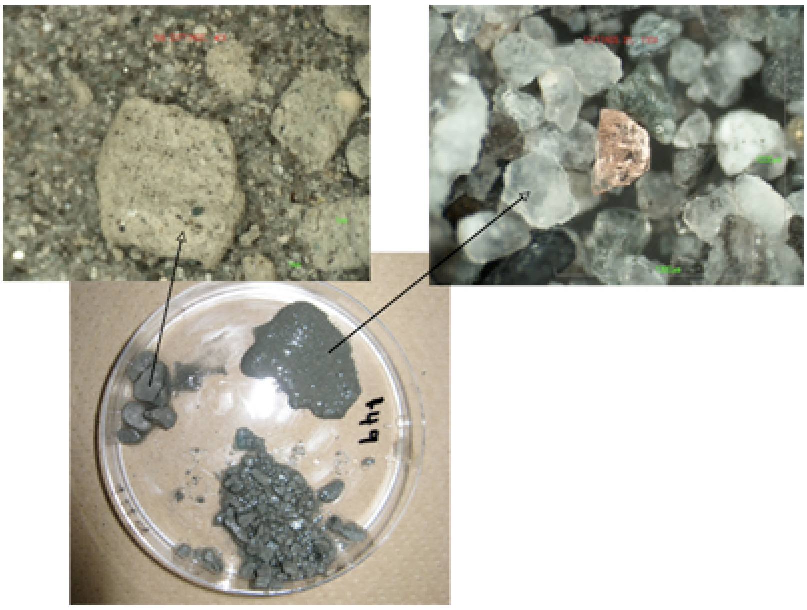
Cuttings are the pieces of rock crushed during the drilling, and these pieces are brought at the surface with the drilling mud from hundreds of meters below sea floor using the riser system (see previous report). We observed the first cuttings after weeks of waiting. It was mud, just mud with sand, without any chips of the rock...

Sedimentologists can see cuttings in the bottles of 1l on the core cutting area, where they determine if cuttings are soft or hard. In the case, cuttings are hard (are composed of the hard chips of rocks), they should be washed from the drilling mud using the sieve of 0.25 mm. First cuttings were soft. We obtained about 30 cm3 of mixture drilling mud - sand for lithological description.

*Photo 1. Soft cuttings in the 1l bottle*

After we washed out all the mud and fine material (fraction less than 45 um), and observed coarser material under the binocular and microscope, it was amasing! We were able to distinguish between the different minerals that occur in sediments, observe the changes in roundness and sorting of grains, variations in abundance of fossils, wood...Appearance of meterial was not the same in samples from different depth. The grains were coarser or finer, we have seen that in some cuttings there was a lot of glauconite and wood, other cuttings shown the compositional maturity of coarse fraction.

*Photo 2. "Semi-hard" cuttings under the binocular after washing by sedimentologists*



In fact, observing cuttings we could obtain a lot of information about lithological features of rocks we were drilling. We were able to distinguish four lithologic units based on composition and grain size of sandy material in cuttings. With the depth the chips of litified rocks (silty claystone) appeared in cuttings, and they began to be described as semi-soft. The part of those "semi-soft" cuttings was washed and separated by size of chips on fractions 0.25-1 mm, 1-4mm, more than 4 mm. The fraction 1-4 mm was used for different analyses (XRD, XRF, physical properties), and it allowed us to see the changes in mineralogy, chemistry, physical properties (porosity, density, magnetic susceptibility etc.) with depth. It was so exciting to see that our subdivision on different units was consistent with observations from log data, and observations made by groups of paleontology, geochemistry, physical properties, structural geology. We realised that cuttings are great material to work with, especially when it is impossible to obtain cores. And also it is so nice just to observe it under the binocular and realise the beauty of the nature...

*Photo 3. Pyritized wood under the binocular (magnification 40X).*

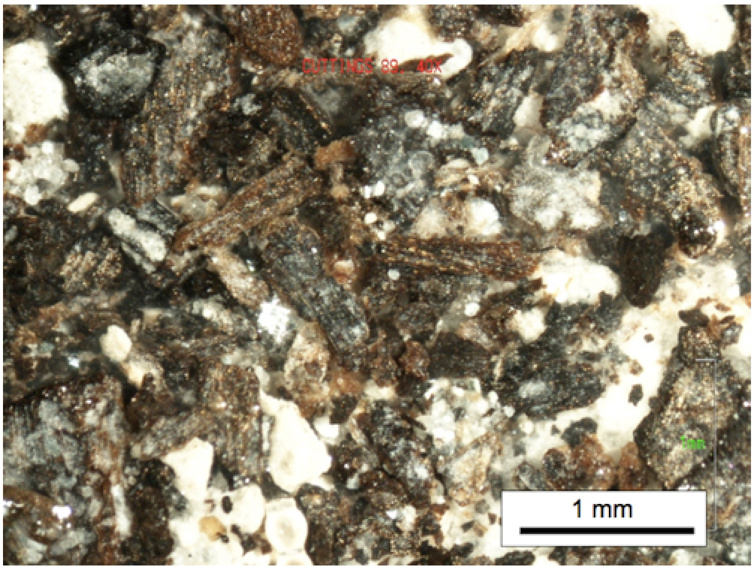
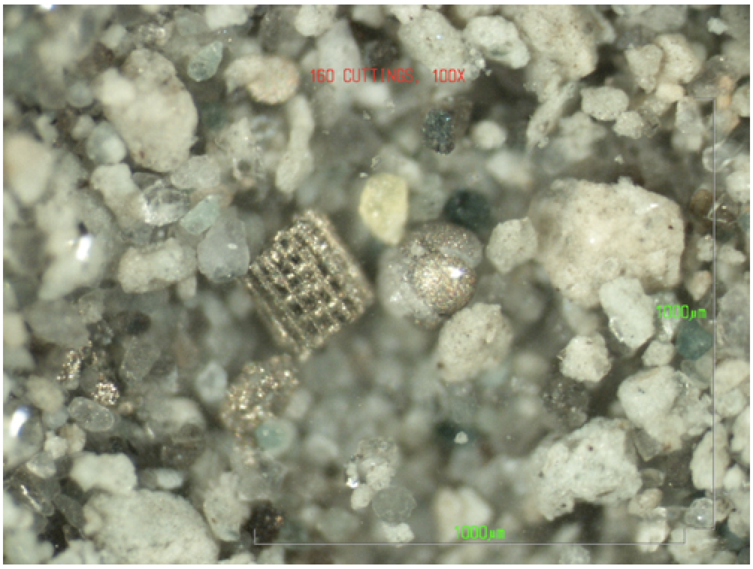



*Photo 4. Fossils filled by pyrite under the binocular (magnification 100X)*



Best Regards,
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