

DESCRIPTION FOR THE GENERAL PUBLIC

In 2012, the research team from the University of Szczecin and the Guangzhou Marine Geological Survey, analyzing the results of seismic surveys carried out on the shelf of the South China Sea, discovered in the Beibu Gulf, on the south-western side of the Hainan Island, a huge structure that resembles an ancient river delta, now hidden under the sediments accumulating on the seabed by several dozen thousand years. This finding inspired authors of the project to undertake further research, which objective is to obtain information that will allow to reconstruct the changes that took place at that time in the South China Sea's shelf, and contributed to the emergence of the delta. Everything indicates that an important source of sediments that formed the delta was material from the strong weathering of rocks forming the Hainan Island. It was most likely due to increased erosion of the island, caused by extreme climatic conditions, associated with the monsoon and the tectonic uplift of the area. Undoubtedly, climate change and sea level changes have had a major impact on this event. Therefore, an important task of the project is to correlate these changes with fluctuations of the global climate during the last ice age.

The delta area is largely separated from the source of supply of deposits by the Red River, which enters the Gulf of Beibu. Therefore, the primary source of sedimentary material that built this underwater structure had to be the Hainan Island. Special mineralogical "provenance analyses" are planned to trace the sediments of the delta back to their terrestrial sources. Because of the unique chance to reconstruct environmental changes on the South China Sea during the last glaciation and correlate them with global climate changes based on the investigation of the Hainan Delta the Chinese partner of our team – the Guangzhou Marine Geological Survey (GMGS) decided to drill a well at the location of the delta in October 2015. A team of scientists and students from the University of Szczecin, the GMGS and the Chinese University of Geosciences Wuhan inspected and sub-sampled the sediment core at Guangzhou from May 16 to June 2, 2016. Measurements of sediment parameters and the correlation with seismic will allow to determine the geometry of the delta and its internal structure. This will enable to estimate the total amount of the delta sediments. To achieve the aim, it is necessary to conduct a series of analyzes of the core deposits, which will include: analysis of the particle size distribution, chemical and isotopic analysis, X-ray radiography, scanning core using the method of X-ray fluorescence analysis of diatoms, foraminifera and pollen (very sensitive indicators of environmental changes) and the dating of sediments. Multidisciplinary analysis of results of sediment core investigations, combined with the analysis of archival data, and the processed seismic data as well as results of paleogeomorphological study of the Hainan Island, will relate them to relative sea-level changes and processes that directly contributed to the delta emergence. All research results should allow to develop a synthetic "source-to-sink" model, that can be used as a reference model for the study of sediments accumulated on the shelf during forced regressive cycles of sea-level changes. The results should also provide the data for calibration of atmospheric and oceanographic models that will be useful in the explanation of global climate dynamics between 60 and 30 thousands years ago. Studies such a unique place, in collaboration with reputable institutions and foreign scientists, and the ability to publish the research results in prestigious scientific journals will have a significant impact on the development of Szczecin University as a center for marine study, thereby increasing its attractiveness for researchers and students from Poland and foreign countries.