Final Report of
IGCP-476 Third International Symposium joint with RSEG-VII
“Tectonics and climate evolution of Asia and its impact on East Asian marginal seas during Cenozoic”
at V.I. Il’ichev Pacific Oceanological Institute, Vladivostok, Russia
From September 20th to 23rd, 2005

Report on the symposium:

Third international symposium of IGCP-476 “Tectonics and climate evolution of Asia and its impact on East Asian marginal seas during Cenozoic” was held as a joint symposium with VIIth meeting of Regularities of the Structure and Evolution of Geospheres at Pacific Oceanological Institute [POI], Vladivostok, Russia from September 20th to 23rd, 2005. More than 40 participants from 7 countries including Russia (20), Japan (10), Korea (6), P.R. China (2), UK (2), Thailand (2), and Taiwan (1) participated in the symposium. Twenty three talks including three talks in plenary session and twenty two posters were presented in the symposium.

Theme of the symposium is “Tectonics and climate evolution of Asia and its impact on East Asian marginal seas during Cenozoic”, which is composed of the following three sessions.

Session 1: The tectonic evolution of the East Asia and its marginal seas during Cenozoic,
Session 2: The paleoclimatic and palaeoceanographic evolution of the East Asia and its marginal seas during Cenozoic
Session 3: The monsoon evolution and tectonic-climate linkage in the East Asia and NW Pacific

In the plenary session on 20th, Goldberg gave a talk about high-resolution study of U and Th isotopes with which he discussed millennial-scale variation in river run-off during the last 140 ka. Takahashi talked about paleoceanography of Bering Sea and then about preliminary result of IODP Arctic drilling and history of sea ice formation in the Arctic Ocean. Tada talked about impact of Asian monsoon on the late Quaternary paleoceanography of the Japan Sea.

In session 1 in the morning of 21st, Bezverkhny talked about geological structure of Okhotsk Sea region and explained that continental crust under the Okhotsk Sea is composed of as many as nine island arc fragments of Jurassic to Late Cretaceous age. He also introduced the presence of paleo-Amur Delta on the shelf area. Golozoubov reviewed existing models of the Japan Sea opening and stressed possible importance of
large fault movement along Hokkaido-Sakhalin region. Harris discussed about timing and extent of the uplift area of Tibet based on paleobotanical and paleontological evidences and suggested that south Tibet was 5 km high by 15 Ma and Tibet grew northward subsequently. Zhu talked about sedimentation in the Yellow Sea and shoreline evolution.

In session 2 in the afternoon of 21st and morning of 22nd, Min Te Chen talked about Late Quaternary East Asian monsoon variability in the South China Sea based on his study of IMAGES cores. He demonstrated orbital-scale changes in surface water circulation pattern and stressed the importance of interhemispheric heat transport. Takahashi reported signals of the Dansgaard-Oeschger Cycles [DOC] in the North Pacific and its potential impact on the North Pacific Intermediate Water formation. Gorbarenko reported DOC signal in the Okhotsk Sea recorded in Mn, CaCO3, and d13C. He also compared paleoceanographic condition of Okhotsk and Bering Seas during the Last Glacial Maximum [LGM] and found that productivity decreased in Okhotsk Sea whereas increased in Bering Sea. Sakamoto also reported DOC signal in the southwestern part of Okhotsk Sea recorded in Ice-Rafted Debris [IRD], alkenone SST, and C. davisiana, and argued possible linkage between Amur River discharge and IRD formation. Goldberg demonstrated the result of high-resolution analysis of a sediment core retrieved from Okhotsk Sea using synchrotron XRF [SRXRF] which is capable of measuring minor elements such as U, Mo, and Ba. He conducted principal component analysis using the result and extract components representing IRD, biogenic carbonate, biogenic silica, and possible Amur River input, which show millennial-scale oscillations. Ikehara compared alkenone SST with d18O of during Holocene for a sediment core from Okhotsk Sea and argued that subsurface water temperature changed drastically in millennial time scale. Jordan reported the result of preliminary study of meromictic Mecherchar Jellyfish Lake, Palau, demonstrating the possibility that the lake record high-resolution record of ENSO covering the last 1000 years. Zhai examined detrital grain size variation in the Japan Sea sediments and argued that it reflect millennial-scale changes in westerly jet intensity. Clift first presented a new field survey result on Holocene evolution of Indus fan. He then moved the topic to river capture story of Red River, arguing that river capture probably occurred during late Oligocene to early Miocene based on Nd isotope data and sediment thickness in Yinggehai Basin. Kazansky reported magnetic properties of loess deposits in Alaska and Siberia showing that magnetic susceptibility of Alaskan loess-paleosol has a trend opposite to Chinese loess-paleosol with lower susceptibility in paleosol, whereas Siberian loess-paleosol trend is intermediate. He further argued that this pattern basically reflects climatic regime. Ponomarev presented 20 century temperature trend in Asia. He demonstrated clear winter warming trend
whereas summer warming trend is restricted in ocean area and inland area tends to show cooling trend. Consequently, East Asian summer monsoon became weakened. Trusenkova talked about numerical model simulation of the Japan Sea and demonstrated the importance of fresh water input from Russian Rivers on SSS pattern of the Japan Sea. Hyun talked about cold event during MIS 6 based on analysis of 2 cores retrieved from Korea Plateau. Brief introductions of posters were made by those who want to give introduction.

Poster session was held in early afternoon of 22nd. Twenty two posters were presented and 2.5 hours were spend for discussion.

In session 3 in the late afternoon of 22nd, Pavlyutkin talked about Tertiary floras in eastern part of Russia and the influence of the paleoceanographic changes in the Japan Sea. At the end of the symposium, Tada discussed early Pleistocene onset of millennial-scale variation in East Asian monsoon, its association with the DOC, and possible linkage with Tien Shan Mountain and northern Tibet uplift as a cause of the onset.

Report on the Workshop

Workshop was held in the morning of September 24th following the symposium. The workshop begins with reports on the present status of IODP proposals and other projects related to IGCP-476. Clift reported that IODP Indus fan proposal (#595) was approved and waiting to be scheduled. He also reported another IODP proposal to drill South China Sea (#618) is sent out for external review. Tada reported that IODP Japan Sea proposal (#605) was sent out for external review. Harada introduced Japan/Russia cooperative research project to study paleoceanography of Okhotsk Sea and northern part of the Japan Sea using R/V Mirai next summer. She also introduced following R/V cruise to Bering and North Sea and explained about possibility of cooperation with international community. Chen Min-Te talked about IODP pre-proposal of Okinawa Trough drilling and then about his plan to submit IODP proposal to drill WPWP. Sakamoto and Takahashi explained present status of IODP proposal to drill Okhotsk and Bering Seas (#477). The proposal has been already approved and waiting to be scheduled. However, still additional site survey is necessary that needs cooperation between Japan and Russia. Sakamoto also introduced updated information on IODP project and construction of Chikyu. Tulyatid reported activities related to IGCP-476 in Thailand with special emphasis on the damage from the large tsunami in Indian Ocean caused by the large earthquake off Smatra last December, asking for keeping continuous interest to this disastrous event caused by interaction between tectonism and ocean that significantly influence the regional coastal environment. He also proposed that Department of Mineral Resources in Thailand will be glad to host 5th international symposium of IGCP-476 in 2007.

Following the reports on IODP proposals and projects related to IGCP-476, Clift reported
present status of editing the special volume of paleo-3 “Tectonics, Landform Evolution and Climate Change in East Asia”. Currently 11 papers are in the final stage of review, and he hopes to finish editing process by the end of this year. **Tada** reported present status of another special volume of paleo-3 “Quaternary Paleoceanography of the Japan Sea”. Currently 12 papers are in review, and he hopes to finish editing by the end of next March.

**Next Meeting**

At the end of workshop, **Khim** introduced the plan for next (4th) international symposium and workshop of IGCP-476 in Busan in 2006. He suggested to have the symposium from September 3rd to 5th (tentative) immediately following International Sedimentological Congress [ISC] which will be held at Fukuoka from August 27th to September 1st. It is because there will be a special symposium titled “Monsoon and the Himalaya: tectonic-climate and land-ocean linkages” convened by Clift, Zheng, and Tada in ISC.

**Report on the Field Excursion**

Official field trip of IGCP-476 was held on 23rd of 2005. The excursion to loess deposit was led by Dr. Golozoubov and Dr. Beris. The field excursion started from Vladivostok and went 120 km to the NNE of Vladivostok near Uslisk. We visited Pavrovske Mine where approximately 15 m of probable loess deposit unconformably overlies latest Eocene to early Oligocene coal sequence. Participants are 6 from Russia (including 2 students), 4 from Japan, 2 from Thailand, and 1 from P.R.China.

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