JAPAN CONTRIBUTION TO THE IGCP 2012

(International Geoscience Programme)

ACTIVITY REPORT in 2012

January 2013

Japan National Committee for IGCP
1. Japan National Committee for IGCP

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Dr. Kiichiro Kawamura (585)
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Prof. Katsumi Ueno (589) (since October 2012)
Prof. Shigeki Hada (past Chairman: until October 2012)

The committee consists of Chairman, Secretary, national representatives of participating IGCP projects, and guest members of related organizations.

Activities in 2012
The business meetings of the national committee in 2012 were held at the Science Council of Japan, Tokyo on February 25 and September 28. The meetings reviewed activities of the year, discussed future plans, and approved new proposal. These activities were reported from a newsletter of the Geological Society of Japan (vol. 118, no. 9, p. 6–9, 2012). All our activities and reports will be appear in our home page: http://www.yg.kobe-wu.ac.jp/wu/igcp/
2. National Participation in IGCP Projects


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Achievements in 2012:
The IGCP-559 project focus on that part of planet Earth that has the most significance for the world’s communities, namely the Earth’s crust and upper mantle. The project makes available to communities-at-large a wealth of information and seismic imaging that is commonly only available to research workers but yet has a profound effect on how we think of the landscapes, natural environments and their controlling geological processes and tectonic influences. This information allows an understanding of crustal architecture and tectonic processes that is fundamental to any appreciation and understanding of landscapes, surface geology and natural hazards at a local, regional and global scale. The IGCP-559 project will continue to develop the web site started by IGCP-474 that gives ready access to information on crustal architecture principally determined by seismic methods. The project sponsor and support symposia focused on deep seismic profiling and imaging techniques aimed at further enhancing our knowledge of crustal architecture.

The “15th international symposium on ‘Deep Seismic Profiling of the Continents and their Margins; SEISMIX-15” conference was held at Beijing, China in 2012, with joint organizations of IGCP-559, the National Nature Science Foundation of China, Chinese Academy of Sciences, and other organizations. The website www.earthscrust.org.cn was supported from IGCP-559. The SEISMIX-15 was successfully held from 16th to 25th September 2012, in northern part of great Beijing city, followed by the post-symposium excursion to Sichuan with disastrous Wenchuan Earthquake and Three Georges. A total number of 128 participants gathered from Europe, North America, Russia, Asia and Australia continents. A lot of significant seismological results regarding the structure and evolution of the continents were presented in many international journals with a large number of international collaborators. Target oriented DSS in several specified area, as well the widely distributed broadband seismic arrays across the continents have revealed the excellent architecture of the crystalline crust and clear images of the underlying upper mantle. The most remarkable points were an accumulation of the classic transect compiled by the IGCP-559 project (by Dr. B. Goleby).

The IGCP-559 held several sessions of the 34th IGC conference in 2012, Brisbane, Australia. IGCP-559 also became a sponsor for a session on Crustal Architecture and Images: structural controls on landscapes, resources and hazards. Coordinators of the session were selected from IGCP-559
working group members. A symposium joint with the other science bodies (African Geophysical Meeting, IASPEI and AOGS) are planned in near future. As for the Classic Transect program, majority of the data from Australia and Russia have been compiled but the contribution from the other nations is relatively small, then it is recommended to gather the data from involved countries.

**Participation countries (for project leaders only):**

Australia, USA, UK, Canada, New Zealand, Germany, France, Russia, Finland, Spain, Netherlands, Japan, China, South Africa, India

**Publications:**


Toyokuni, G., H. Takenaka, M. Kanao, D. A. Wiens and A. A. Nyblade, 2012, Comparison of global synthetic seismograms calculated using the spherical 2.5-D finite-difference method with observed long-period waveforms including data from the intra-Antarctic region, Polar Science, 6, 155-164, doi:10.1016/j.polar.2012.06.001.


National Working Group Leader:
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Main object of the project, and target of the national working group of this year:
We will progress the knowledge on the palaeoearthquakes by using the seismic damage in the archaeological relics same as the evidence in the geological method. Through this project, four workshops will be held at the archaeological sites in the Dead Sea Region, Greece, Iran and India. Japanese working group can contribute to this project with a compiling the huge numbers of archaeoseismological data in Japan.

Achievements in 2012:
Activity of this project is introduced on the website of the Natural Science section of UNESCO, with the tile of “Tales set in Stone: learning from ancient earthquake” (http://www.unesco.org/new/en/natural-sciences/about-us/single-view/news/tales_set_in_stone_learning_from_ancient_earthquakes/).

Meetings held during this year or Japanese participation in the project meeting:
We organized a one-day field trip on the tsunami deposits and tectonic movement on the coastal area along the Nankai Trough, leaded by Osamu Fujiwara (AIST) and Takashi Azuma (AIST) on 13th August, 2012. The course of this field trip started from Kakegawa, Shizuoka Prefecture and visiting to 1) the Motojima archeological site, where has been subsided during interseismic period and covered with several layers of tsunami deposits, and 2) the Holocene marine terraces in Omaezaki. 27 people attended to this event and discussed on the identification method of the tsunami deposits and coastal tectonic models related to occurrence of huge earthquake in this area.

3rd INQUA-IGCP-567 International Workshop on Active Tectonics, Earthquake Geology, Archaeology and Engineering was taken place from 19 to 24, November 2012 in Morelia, Mexico. This workshop was organized by Victor Hugo Garduno Monroy (Michoacan University, Mexico), Miguel Angel Rodriguez Pascua (Geological Survey of Spain, Spain), Pablo G. Silva (Universidad de Salamanca, Spain), and Klaus Reicherter (RWTH Aachen Univesity, Germany). Two researchers attended to this workshop from Japan.

A thematic Session of “Natural hazards and ancient societies” was held in the 34th International Geological Congress (IGC) in Brisbane, Australia, from 2nd to 10th, August 2012. This session focused on the multidisciplinary approaches to understanding natural hazards and human culture
change during recent millennia, and convened by Patrick Nunn (Australia), Bruce McFadgen (New Zealand), Iain Stewart (U.K.) and Manuel Sintubin (Belgium).

**The number of Japanese working group members:**

We act with 4 members.

**Activities planned in 2013 or later (Forthcoming events of the project and/or training facilities):**

Although the period of this IGCP project is until 2012, we are planning an international workshop on October 2013 in Aachen, Germany. Additional two workshops in Korea (2014) and Italy (2015) are also proposed.

**Publications:**

None
The activities in 2012 were the annual symposium in Hyderabad, India combined with the field excursion in the Himalayan foot land in Nepal proposed by Dr. S. Masood Ahmad of the Council of Scientific & Industrial Research (CSIR) - the National Geophysical Research Institute (NGRI), India and Prof. Subodh Sharma of Kathmandu University, Nepal. The numbers of participants from Japan to these activities were four for the symposium and four for the excursion. Summaries and contributions to the symposium and excursion by the Japanese participants are described below.

**Annual symposium:**

The 3rd Annual Symposium of IGCP 581 on “Response of Asian rivers to climate change – past, present and future scenario” was held on 14 – 16 November, 2012 at CSIR - NGRI, Hyderabad, India. The symposium consists of 6 keynote lectures, 25 regular oral presentations, and 33 poster presentations. The keynote lectures gave comprehensive information for the evolution and sedimentary records of the Asian large river systems such as Ganga and Yangzte, the tectonic evolution of the South China Sea, and the technical and geochemical aspects in the reconstruction of river hydrology in the past. Fluvial sedimentation and their geological records of Asian large rivers such as the Yellow, Yangtze, Pearl, Red, Salween, Ganges, and Indus Rivers were major topics and discussed both from land sections and marine sediment records.

On the other hand, it was noteworthy that we had a number of participation by Indian researchers who introduced the dynamics and chemistry of small rivers in India such as the Narmada, Mandovi, Zuari, Kallada, and Ithikkata Rivers in the western coast, and the Godavari, Krishna, and Penna Rivers in the eastern coast. These small rivers tend to show rapid responses to precipitation event and water shed contamination, which has large influence on human life there. More attentions might be paid also to such high-relief, small, and rapid rivers in other area of Asia when considering material budget along river system in monsoon Asia.

From Japan, four participants;

- Ryuji Tada, Professor, Univ. Tokyo, ryuji@eps.s.u-tokyo.ac.jp
- Tomohisa Irino, Assistant Professor, Hokkaido Univ., irino@ees.hokudai.ac.jp
- Akinori Karasuda, Master course student, Univ. Tokyo, karasuda@eps.s.u-tokyo.ac.jp
- Yoshiaki Suzuki, Master course student, Univ. Tokyo, yoshiaki_suzuki@eps.s.u-tokyo.ac.jp

have attended the symposium and presented their recent results for the Asian river basins. R. Tada gave one of the keynotes and explained about a provenance discrimination using electron spin resonance (ESR) and crystallinity index (CI) of quartz grains contained in the Yangtze River sediments and its application to the reconstruction of past monsoon change. Same technique has been applied to the sedimentary records in the Tarim Basin by A. Karasuda in his poster, who revealed the timing of desertification in the Taklimakan in relation to the mode of the Karakoram and Kunlun Mountains’ uplift. Y. Suzuki re-evaluated the erosion rate in the upper Yangtze Basin using $^{10}$Be records with an aid of GIS considering a topographic trapping of eroded
material in his poster. The seasonal variability of suspension transport of the eroded materials in the Yangtze River channel and effects from its main branches have been examined using oxygen isotope ratio and suspension load of the water by T. Irino in his oral presentation. These presentations contributed to the community efforts to quantify the erosion, transport, and deposition through Asian river systems under the influence of active tectonics and monsoon variability, and played significant roles in the main concern of this project.

Title of presentations given by these Japanese participants are;


**Excursion:**

Nine days field excursion from 19 to 27 November, 2012 had been planned by Prof. Subodh Sharma of the Kathmandu University. The aims of the excursion were 1) understanding the distribution of major geologic bodies such as high Himalayan crystalline rocks, lesser Himalayan metasediments, and the “Siwalik” fluvial sequence distributed in the Himalayan foothill of the central Nepal, 2) observation of current situation of erosion and transport of sediments in the river valleys in relation to the landscapes of river basin and vegetation in the area, and 3) sampling of end-member materials potentially useful for provenance studies in the future. Total 10 researchers from China, Japan, Australia, and US with Prof. Sharma and two Nepali guides joined the excursion. From Japan;

- Ryuji Tada, Professor, Univ. Tokyo, ryuji@eps.s.u-tokyo.ac.jp
- Tetsuya Kusuda, Professor, Univ. Kitakyushu, kusuda@env.kitakyu-u.ac.jp
- Tomohisa Irino, Assistant Professor, Hokkaido Univ., irino@ees.hokudai.ac.jp
- Yoshiaki Suzuki, Master course student, Univ. Tokyo, yoshiaki_suzuki@eps.s.u-tokyo.ac.jp

participated for their own interests. R. Tada and Y. Suzuki tried to collect sand material in river beds as well as rocks providing sandy materials to the rivers in order to examine the ESR and CI of quartz grains. T. Irino collected river water samples and some Miocene paleosols to discriminate the source of water provided to the river channels. T. Kusuda hoped to understand the water usage and its quality of urban and agricultural conditions in the mountainous and high precipitation region.
Day 1 (19 November, 2012)

The party left from Kathmandu for Pokhara. Sampling of sand and water from the Mehash Khola flowing only in the high Himalayan rocks, the Trishuli Nadi and the Marsyangdi Nadi flowing through both high and lesser Himalayan rocks was conducted. Stayed at Pokhara.

Day 2 (20 November, 2012)

Trip to Lumle Agricultural Research Station to observe the vegetation landscape. Sand and water were sampled at Seti Nadi. Water distribution system for human life in the mountainous area was also insightful for civil engineering. Stayed at Pokhara.

Day 3 (21 November, 2012)

The party went up along the Seti Nadi to look at typical high and lesser Himalayan rocks. The sediments and channel erosion of the Seti Nadi due to flooding and debris flow on 17 May, 2012 were also observed. Sand and water were sampled at the site buried by the debris flow. Stayed at Pokhara.

Day 4 (22 November, 2012)

Left from Pokhara for Tansen. Variety of rocks belonging the lesser Himalaya was observed and collected. Sand and water sample from the Andhi Khola flowing only in the lesser Himalayan rocks were also collected as well as ones from the Kali Gandaki Nadi flowing both through high and lesser Himalayan rocks. Stayed in Tansen.

Day 5 (23 November, 2012)

Left from Tansen to Butwal. Main objective of the day was observation and sampling of “Siwalik” fluvial sequence along the Tinau Khola. Sand and water samples were successfully recovered from the Tinau Khola which flowed only in the “Siwalik” rocks. Rock samples from the Miocene fluvial sequence and paleosols were also collected. Stayed in Butwal.

Day 6 (24 November, 2012)

Moved to Lumbini. At the Danu Khola on the way, sand and water samples were collected, which would be originated only from “Siwalik” source. The difficulties of sewage drainage and water quality maintenance in this region were realized from the civil engineering point of view. Stayed in Lumbini.

Day 7 (25 November, 2012)

The party left for Bharatpur. At the Binau Khola on the way, sand and water samples were collected, which would be also originated only from “Siwalik” source. Bharatpur is the area of major rivers such as the Kali Gandaki Nadi and Trishuli Nadi. After the junctions of these three rivers, the river is called the Narayani Nadi where sand and water were collected. We also visited
the junction of the Kali Gandaki and Trishuli, and sand and water from each tributary were collected. Stayed in the Chitwan National Park.

Day 8 (26 November, 2012)

Trip around the Chitwan National Park to observe the landscape of the Ganges Plain. Sand and water samples from the Rapti Nadi of the Narayani Drainage flowing from east to west was collected. Stayed in the Chitwan National Park.

Day 9 (27 November, 2012)

Went back to Kathmandu. We drove along the Trishuli Nadi and observed frequent slope failures and the landscape of the deep valley. Some rock samples of the high and lesser Himalaya which had not been collected well on the first day were recovered on the way.

After this field trip, all the photographs, sampling location and related information have been shared in the party. Preliminary measurements of collected samples would be utilized for further international cooperative studies for paleo-monsoon and the Himalayan tectonics in the future.

**Plan for the next year:**

The 2013 is the final year for the IGCP-581. Therefore, the leader Prof. Hongbo Zheng of Nanjing Normal University has proposed to hold the last international meeting either in China or Vietnam next fall. In order to fulfill the requirements raised during these 4 years activity, the field excursion will be also planned to watch some typical landscapes and outcrops indicating the drainage capturing between the Yangtze and Red Rivers.

**Achievement in 2012 year:**


Project Leader: Roger Urgeles (CSIC), David Mosher (GS Canada), Jason Chaytor (USGS), Michael Strasser (ETH Zurich)

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Main object of the project:
The aims of the project are: 1) Strengthen cooperation with deep subsurface sampling and monitoring programmes and eventually lobby within these programmes to create awareness into the topic of submarine slope failures that might lead to drilling and/or monitoring proposals being funded. 2) Provide a lobbying platform for E-MARSHAL members to national and international funding agencies to fund scientific projects in this research topic. 3) Promote the publication of scientific articles and books on this submarine geohazard that contribute to the following societally relevant problems. 4) Identification of the causes of submarine landslides and their consequences. 5) Provide advice on mitigating their impacts. 6) Provide data (e.g., frequency, magnitude) that allow probabilistic approaches to the geohazard from submarine landslides and therefore a better management of the seafloor and coastal areas. 7) Promote events that enhance the exchange of results and scientific ideas on the problems above. 8) Provide knowledge transfer to developing countries.

Improve the links between academia, industry and public administrations in order to create partnerships to address the topic of geohazards from submarine landslides and to develop methods for transferring knowledge to end-users.

Meetings held during 2012 or Japanese participation in the project meeting:
There was no annual meeting in 2012. A scientific symposium is planned at GEOMAR in Kiel, Germany on 23–25 September 2013. The 2nd circular is released on 3rd December 2012 (http://www.igcp585.org/6th-issmmtc/2nd-circular). Dr. Yasuhiro Yamada of Kyoto University is working in the international advisory board.

The number of Japanese working group members:
Japanese working group of IGCP-585 is not officially organized. We are planning to make a mailing list to address related international and domestic meetings.

Activities planned in 2013 or later:
We will hold a session of submarine landslides at the Japan Geoscience Union annual meeting in May 2013. The conveners are Dr. Sumito Morita of Geological Survey of Japan and Dr. Kiichiro Kawamura of Yamaguchi University.

Publications:

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Main object of the project:
This project focuses on the impact of humans on coastal landscapes at different timeframes. The project comprises three themes; (1) Catastrophic events, (2) Sea-level "fingerprints" and their implications for future coastal change, and (3) Sea-level changes over geological timeframes - investigating the role of humans. The aim of this project is to not only examine the past and present coastal dynamics and evolution, but to also incorporate predictive modeling of the coastal response to changing climates, anthropogenic impacts and natural hazards.

Meetings held during this year or Japanese participation in the project meeting:
There was a participant as a keynote speaker for an annual business meeting in Kiel, Germany, from September 5th to 10th including a 3-day field trip to Sylt-Island.

In addition to the annual meeting, other related scientific meetings were held during the 34th International Geological Congress in Brisbane, Australia, the AOGS-AGU (WPGM) Joint Assembly in Singapore, 2012 GSA annual meeting in Charlotte, USA, and AGU fall meeting in San Francisco, USA. In these meetings, oral and poster presentations were provided by three Japanese researchers (two of them were invited).

The number of Japanese working group members:
Japanese working group of IGCP-588 is not officially organized.

Activities planned in 2013 or later:
The IGCP-588 plans to have a business meeting at India in May. Other related scientific meetings are proposed during the Regional Conference of the International Geographical Union in Kyoto, and AOGS annual meeting in Brisbane, Australia.

Publications:


Project co-Leaders:
Jin Xiaochi (Institute of Geology, Chinese Academy of Geological Sciences),
Katsumi Ueno (Fukuoka University, Japan),
Graciano Yumul Jr. (University of the Philippines),
Pol Chaodumrong (Department of Mineral Resources, Thailand)

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Main object of the project:
This project is aimed at promoting multi-disciplinary geological investigations in various areas of Asia, to find out more constraints on the interpretation of the development of the Asian Tethyan Realm and to contribute to elucidate the history of the Tethys. In specific, the following topics are focused in this project: regional extension and property of suture zones and other structural lineaments; stratigraphic successions and magmatic series on continental blocks; paleobiogeographic evolution of the Tethyan Realm; timing and process of continental blocks rifting from large cratons; Sizes of oceanic basins and the positions of continental blocks at different times; timing and process of the suturing of continental blocks; validity of the one Tethys model, the Paleo-Tethys + Neo-Tethys model, and the Paleo-Tethys + Meso-Tethys + Neo-Tethys model; recent analogues of tectonic environments in the Tethyan Realm; and geological background for hydrocarbon and mineral resource formations.

Meetings held during this year or Japanese participation in the project meeting:
In this year, we had two official meetings related with this IGCP project. One is “Geological processes of the construction of Asia” held as Symposium 34-1 at the 34th International Geological Congress (34 IGC) in Brisbane, Australia in August, 2012. Five Japanese members participated in this symposium. The other is “First International Symposium of IGCP-589” held in Xi’an, China in late October–early November, 2012. In this conference, a post-symposium excursion going to the Qinling Orogen, which is the collisional zone between North and South China, also took place. Totally seven Japanese members were joined in this symposium and excursion.

Activity plan in 2013:
We are planning the Second International Symposium of IGCP589 in the Philippines in October or November, 2013. One of co-leaders, Graciano Yumul Jr. and his colleague Carla B. Dimalanta will organize the symposium.

The number of Japanese working group members:
There are 45 members currently listed in the Japanese working group of IGCP-589.

Publications:


