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All Japan Chapter: Activities and Prospects

I. RENEWED JAPAN CHAPTER

The original Japan Chapter of IEEE Geoscience and Remote Sensing Society (GRSS) was established in 1982. At that time in Japan, all the IEEE society chapters belonged to IEEE Japan Council, rather than sections, differently from ordinary section–chapter structures. In 2013, however, the Japan Council started resolving this irregular form. The GRS Japan Chapter is the first one to have completed the move. Japan presently has nine sections as shown in Table 1. The newly established GRSS All Japan Chapter, centered at national capital area (Tokyo-Yokohama area), covers all the nine sections. It may develop further into multiple chapters to reflect future population and activities.

Fig. 1 shows the number of recent IEEE GRSS All Japan Chapter members. As of 2014, we have 176 members. Several years ago, we experienced a decrease mainly due to Japan's recession. But recent years, we are successful in gradual increase.

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II. BASELINE ACTIVITIES AND PROJECTS

The All Japan Chapter globally serves the academic and industry communities worldwide by holding conferences and technical meetings in the field of fundamentals and applications of remote sensing as well as geosciences. It also supports cooperative research and development (R&D) among industry, government and academia. The chapter promotes the science and technology in cooperation with the Institute of Electronics, Information and Communications Engineers (IEICE), in particular with Technical Committees on Space Aeronautical and Navigational Electronics (SANE) and Electromagnetic Theory (EMT), the Society of Instrument and Control Engineers (SICE) Remote Sensing (RS) Technical Committee, The Remote Sensing Society of Japan (RSSJ), International Union of Radio Science (URSI) Commission F and other societies.

Fig. 2 is an example schedule of the chapter activities. We hold multiple technical meetings on regular basis solo or in co-sponsoring with the above listed societies. Fig. 3 presents snapshots showing a special

Chapter's Corner



It is a great pleasure for me to report that many GRSS Chapters all around the world are very active, far beyond my expectations. As a proof, we had a very interesting set of presentations in Quebec City, a few weeks ago, during the Technical Committees and Chapter Chairs' Dinner. This event, organized every year during the IGARSS conference, was particularly

attended in 2014. Let's hope this trend will be validated next year in Milan during IGARSS 2015!

Additionally, and in order to let everybody appreciate the activities by our Chapters, I am glad to report that, starting this issue of the Geoscience and Remote Sensing Magazine, we will feature in this Corner a long list of Chapter reports. The first ones are by those from the All Japan and Eastern North Carolina Chapters.

It is worth recalling that, besides showcasing the great activities by our members, these

reports are meant to suggest to members in other regions to start their own Chapters. Please refer to the revamped GRSS Chapter web page (<http://www.grss-ieee.org/community/chapters/>) to check the up to date information about how to start a Chapter.

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lecture given by Dr. Leo Ligthard of Delft University of Technology on February 27, 2014, in the Remote Sensing Forum 2014 co-sponsored by the All Japan Chapter and SICE-RS and the following walk visit to Akihabara, the electronics town in Tokyo. In technical events such as the Forum and IEICE Technical Meetings, we award student paper awards and young researcher awards to excellent presenters. This activity encourages young people and invites them to GRSS. We also plan to hold/host future conferences such as International Geoscience and Remote Sensing Symposium (IGARSS). As a result, we held Asia-Pacific Conference on Synthetic Aperture Radar (APSAR) 2013 Tsukuba successfully on September 23–27, 2013 [1]. Many researchers worldwide gathered in Tsukuba, Japan. Most of participants expressed their satisfaction in the deep technical discussion they experienced. A banquet photo is shown in Fig. 4.

Fig. 5 presents the photos of annual chapter meeting we held in parallel to APSAR 2013. Dr. Hiroshi Kimura, the Chapter Chair at that time, reported annual activities and future plans, and Dr. Yasuishi Yamaguchi, the Chapter Vice-Chair and RSSJ President, presented recent progress in hyperspectral remote sensing technology followed by diverse questions and discussion.

III. IGARSS 2011 SENDAI MOVED TO VANCOUVER FOR THE EARTHQUAKE, AND OUR CONTRIBUTION TO THE POST-DISASTER SOCIETY

The Great East Japan Earthquake and Tsunami on March 11, 2011, attacked Northeast Japan extremely seriously. The tsunami claimed 15,000 lives. IGARSS 2011 Sendai was forced to move to Vancouver. All the chapter members are obliged to Canada researchers and the AdCom members for their great support, which resulted in a big success. In the aftermath of the Great Earthquake and then on, ALOS (Advanced Land Observation Satellite) of Japan Aerospace Exploration Agency (JAXA) and Pi-SAR (Polarimetric and Interferometric Airborne Synthetic Aperture Radar) of JAXA and National Institute of Information and

TABLE 1. NEW STRUCTURE OF THE IEEE GRSS ALL JAPAN CHAPTER, SECTIONS AND COVERING AREAS IN JAPAN.

| CHAPTER | SECTION | GEOGRAPHICAL AREA |
|-----------|-----------|---------------------------------------|
| All Japan | Sapporo | Hokkaido area |
| | Sendai | Tohoku area |
| | Tokyo | Kanto area centered at Tokyo-Yokohama |
| | Shin-etsu | Shin-etsu area |
| | Nagoya | Tokai and Hokuriku area |
| | Kansai | Kansai area |
| | Hiroshima | Chugoku area |
| | Shikoku | Shikoku area |
| | Fukuoka | Kyushu including Okinawa area |

Communications Technology (NICT) started land observation to quantify the damage and support relief activities highly effectively.

It has been three years presently, and restoration rolls forward steadily. However, we still suffer from various problems. In Sendai, for example, there were almost no serious damages on buildings and city infrastructures. But,

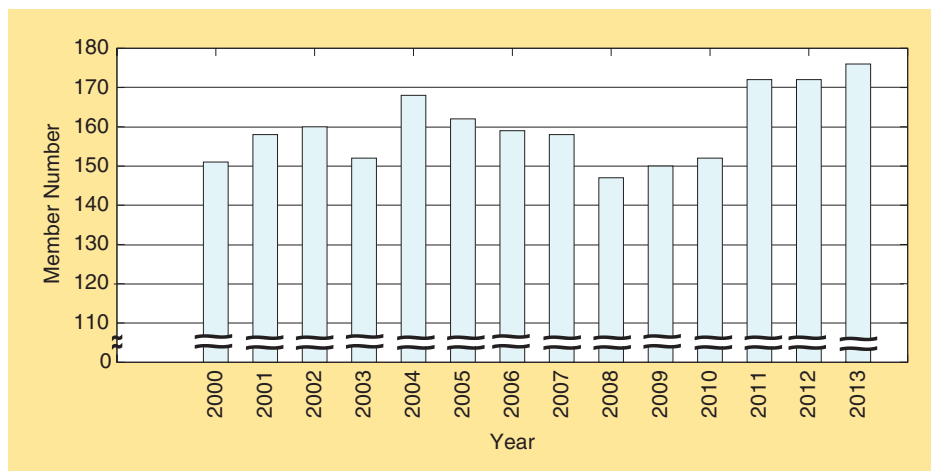


FIGURE 1. Number of recent IEEE GRSS All Japan Chapter members.

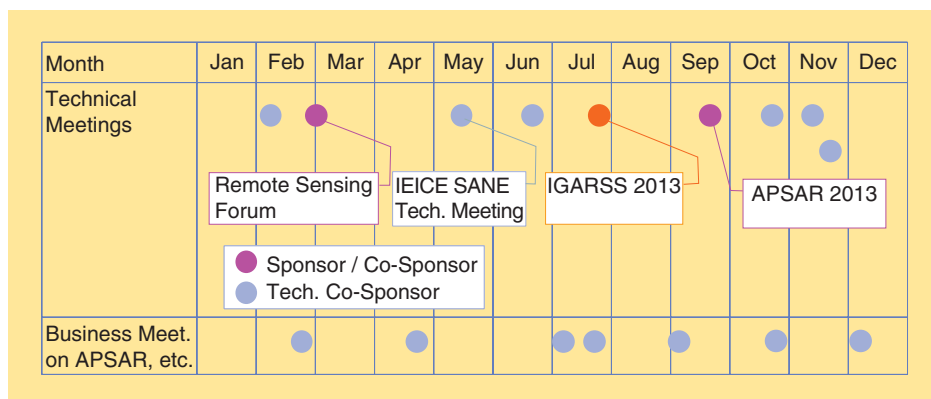


FIGURE 2. Example schedule of the chapter activities (year 2013).



FIGURE 3. (a) Special lecture in Remote Sensing Forum 2014 and (b) the following walk visit to Akihabara electronics town in Tokyo (Dr. Ligthard and Dr. Sato).



FIGURE 4. The "Kagami-wari" event at the banquet in APSAR 2013 Tsukuba co-sponsored by the All Japan Chapter and IEICE Electronics Society (Dr. Shimada, Dr. Kwag, Dr. Boerner, Hirose (the author), Mr. Triharjanto and Dr. Zink).

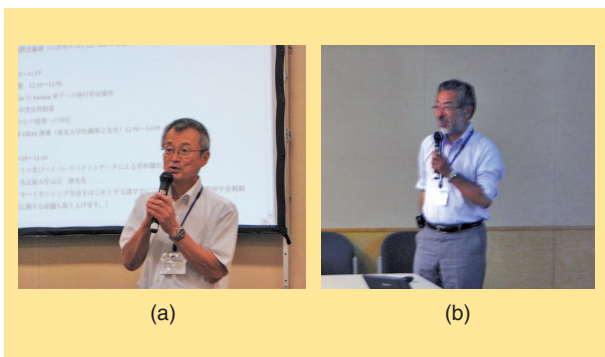


FIGURE 5. Annual Chapter Meeting 2013: (a) Dr. Hiroshi Kimura, the Chapter Chair at that time, reporting annual activities and future plans and (b) Dr. Yasushi Yamaguchi, the Chapter Vice-Chair and RSSJ President, presenting recent progress in hyperspectral remote sensing technology.

since many people were killed by tsunami on the seashore, the Japanese government decided to restrict new housing areas to offshore uplands. As is often the case in Japan, such areas retain archeological objects which, according to local regulations, have to be surveyed before development. This process causes heavy delay in the re-establishment of houses and towns.



FIGURE 6. GPR system "Yakumo" newly developed to accelerate archeological survey required for re-establishing towns on offshore uplands. Courtesy of Tohoku University.

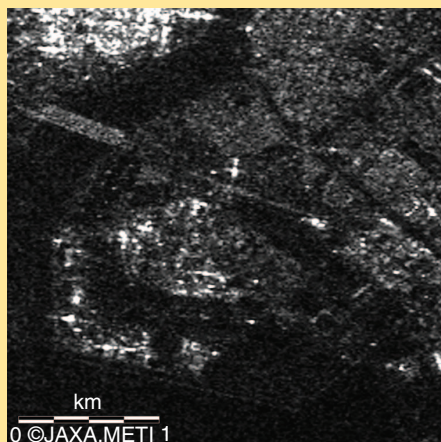
To accelerate the archeological survey, Tohoku University in cooperation with Mitsui Engineering & Ship-building Co. Ltd. developed a new array-antenna ground penetrating radar (GPR) system, named "Yakumo" meaning eight rising clouds. Fig. 6 shows the field survey using the system. Yakumo employs a newly developed relatively low-frequency (under 1GHz) wideband array antenna to observe scattered wave with the stepped-frequency continuous-wave method for deep and stable visualization.

The Fukushima nuclear power plant still has many problems. Though 20 km area around the plant is under entrance restriction, local people are now coming back to their home locations. A lot of information sources have been facilitated to inform the people of the environmental status for scientific and objective understanding. There the GRSS-related science and technology plays important role.

IV. THE SUCCESSFUL ALOS-2 LAUNCH, AND THE SUPPORTING COMPANIES AND INSTITUTES ACCUMULATED IN TOKYO-YOKOHAMA AREA

On May 24, 2014, JAXA succeeded in the launch of ALOS-2, an earth observation satellite for multiple purposes including disaster quantification and damage mitigation [2]. It is an L-band fully polarimetric synthetic aperture radar system having a short revisiting interval and various observation modes that realize several classes of high-resolution or wide-area land observation. As of July 2014, the satellite is in the initial adjustment stage. Fig. 7 compares the captured images showing the Tokyo Disney Resort area on the Tokyo Bay coast observed by (a) JERS-1 in 1992, (b) original ALOS in 2006 and (c) ALOS-2 in June 2014. The resolution and signal-to-noise ratio obviously became higher. We can expect its extensive impact to interferometric SAR (InSAR), polarimetric SAR (PolSAR) and polarimetric-interferometric SAR (PolInSAR) research worldwide.

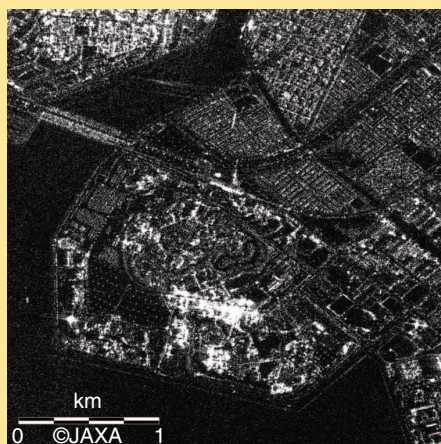
The success of ALOS-2 is greatly attributed to the heavy work done not only by JAXA but also by the electrical and



(a)



(b)



(c)

FIGURE 7. Images showing the Tokyo Disney Resort area on the Tokyo Bay coast in Tokyo-Yokohama area observed by (a) JERS-1 in 1992 with resolution of about 18m, (b) original ALOS in 2006 with 10m and (c) ALOS-2 in June 2014 with 3m, respectively. Courtesy of JAXA Earth Observation Research Center (EORC).

other companies in the vast fields such as antennas, high-frequency electronics, observation system designing, signal and information processing, and so on and so forth. Many companies and institutes concentrate and accumulate in Tokyo-Yokohama area to conduct their R&D. The GRSS All Japan Chapter also centers itself in this area to further promote the R&D activities.

Remote sensing technology and geoscience make progress based on the integration of development in wide range of fields including electrical, electronic and information engineering. The GRS importance grows rapidly and strikingly in Japan that runs in front in the dark forest of challenging issue complex including earthquakes, floods, warming, etc. Tokyo-Yokohama area is also changing rapidly to host the 2020 Olympics. It is our overarching mission to develop equipment and systems, observe the earth, and analyze the data to find solutions to the problems.

V. FUTURE DEVELOPMENT

The re-newborn All Japan Chapter continues to promote the science and technology in the field steadily, in particular with emphasis on the following points in the forthcoming years. That is, we will:

- 1) Deepen our cooperation with other chapters, in particular with Asian chapters in South-East Asian countries as well as India and Mid-East Asian countries, e.g., by utilizing the distinguished lecturer program. The GRS field deals with global problems, resulting in the necessity of both local and global cooperation.
- 2) Enhance our commitment to GRS and IEEE by holding/organizing technical events including future IGARSS.
- 3) Extend the industry-government-academia cooperation. The GRSS field covers a wide area from fundamentals to practical applications for solving human beings problems. The All Japan Chapter, centered at Tokyo-Yokohama area where many related companies and institutes accumulate, supports researchers to construct flexible and extendable R&D environment.

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REFERENCES

- [1] A. Hirose, "AP SAR 2013 Tsukuba, Japan—Report," *IEEE Geosci. Remote Sens. Mag.*, vol. 2, no. 2, pp. 83–85, June 2014.
- [2] M. Shimada, "JAXA earth observation program digest," *IEEE Geosci. Remote Sens. Mag.*, vol. 2, no. 2, pp. 47–52, June 2014.