The Lands Department has set up the web-based Data Dissemination System (DDS) as part of the data-sharing framework within the e-Government. The DDS facilitates the management and distribution of remote sensing data among Government departments, through its support in importing, manipulating, and integrating the data. Furthermore, such data, while enjoying copyright protection, are also "used by other public and private organizations as a common . . . reference for end-users and for value-adding users."[39] The public can, through the DDS, enjoy the e-government services for the searching, browsing, ordering, and delivery of the data. In this way, the Lands department, through its DDS, is able to provide quality services to the government departments, private entities and individuals.

Licensing agreements have become a preferred means of control over the use and reproduction of spatial databases by suppliers around the world.[40] Hong Kong is no exception in this regard. A license agreement will be reached between data owners and data users through a data agent concerning the use of relevant data.[41] Relevant conditions, especially the copyright issue, data privacy, and sensitivity, will be put down in the agreement.[42] Since data owners are basically government departments, the copyright of the data automatically belongs to the Hong Kong Government. Different government departments might have different practice in this regard. Some "adopt a loosen [sic] approach releasing data freely" used by the user some are "more stringent . . . requiring the data [be used] for a specific purpose."[43]

As far as fees are concerned, we may also refer to the Code on Access to Information, which requires that "[a]ny charges levied on requests for information will reflect the cost of provid-

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[39] Cheong & Tak, *supra* note 34, at 3.

[40] Smith & Doldrina, *supra* note 24, at 31.

[41] DDS of Lands Department, *Supplementary Feasibility Study Report, User Catalogue*, *Ref. No.: T122*, at 2.2-7 (June 2004) *available at* http://www.landsd.gov.hk/mapping/en/news/frs22.pdf.

[42] Final Report, *supra* note 14 at (1-2).

[43] Cheong & Tak, *supra* note 34 at 9-10.

ing the information."[44] The policy of open access in Hong Kong requires that charges for information be simple and inexpensive; as further explained in the Guidelines to the Code on Access to Information, successful applicants for access to information should only be charged for the cost of reproducing the required documents, etc. at the current standard charge where one exists.[45]

V. CASE STUDY: GOOGLE'S MOVE FROM MAINLAND CHINA TO HONG KONG

After more than two months' negotiations with the Chinese Government, Google decided to redirect its Chinese Internet search operations from censored mainland China to an uncensored site based in Hong Kong (google.com.hk) on March 23, 2010.[46] This move has aroused heated discussions on various implications to the mainland citizens.

Under its WTO Commitments, China has opened its telecommunications services market to the extent as defined its undertakings: foreign entities can invest up to fifty percent of the joint ventures on value-added telecommunications services; as defined in the list of commitments, value-added services include online information and/or data processing (including transaction processing).[47] Naturally, Internet services belong to value-added services and fifty a percent cap applies to foreign investments in setting up joint-ventures. In spite of the above WTO commitments, China retains the sovereignty to set the laws within its territory as to the content regulation.[48]

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[44] Code on Access to Information, *supra* note 16, at § 1.24.

[45] Code on Access to Information: Guidelines for Departments, 25, *available at* http://www.access.gov.hk/guidelines.pdf.

[46] Miguel Helft & David Barboza, *Google Shuts China Site in Dispute Over Censorship*, N.Y. TIMES (March 22, 2010), *available at* http://www.nytimes.com/2010/03/23/technology/23google.html.

[47] *Trade in Services, The People's Republic of China: Schedule of Specific Commitments*, GATS/SC/135 (Feb. 14, 2002), *available at* http://docsonline.wto.org/DDFDocuments/t/SCHD/GATS-SC/SC135.doc.

[48] Rachel Perkins, *Google vs. China*, VANDERBILT J. ENT. & TECH. LAW, JETLaw Blog, Mar. 30, 2010, http://jetl.wordpress.com/2010/03/30/google-vs-china/.

As such, Google entered the Chinese market with its Chinese search engine (google.cn) in January 2006. Upon entering the Chinese market, Google accepted the policies to censor its search results and signed "a licensing agreement that it will not circulate content on certain taboo subjects."[49] Now Google has withdrawn from the Chinese market on account of cyber attacks and censorship.[50]

While examining the issues of cyber attacks and censorship in mainland China lies well beyond the research of the current paper, it would be interesting to see the access of Google map and relevant remote sensing data/information available to mainland citizens. As a general practice, Google provides remote sensing data freely on its website. Users can access to the information for their daily use. By moving its search engine to Hong Kong, Google relieves its obligation to censor online contents, leaving the task of censorship to mainland's powerful Great Firewall;[51] as such, mainland users can still largely make use of Google's services. And more importantly, as suggested by one commentator, "[a]ny searches conducted on google.com.hk within China, will be filtered and it will likely produce the same filtered results that a search on google.com would produce if performed in China."[52] At the moment, Google's map and other services are still available to mainland citizens.[53]

Furthermore, although Hong Kong enjoys a high degree of autonomy from mainland China, "the Chinese government could potentially take steps to block Google servers."[54] There is no clear indication about whether the Hong Kong-based services

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[49] Elizabeth M. Lynch, *Google & China: Full of Sound & Fury, Signifying Nothing?*, CHINA LAW & POLICY, Mar. 24, 2010, http://chinalawandpolicy.com/2010/03/24/google-china-full-of-sound-fury-signifying-nothing/.

[50] Michael Wines & Jonathan Ansfield, Google's Troubles in China are Just Beginning, *The International Herald Tribune*, Mar. 24, 2010, at 1.

[51] "The Great Firewall is a protective mechanism that filters search results before they enter mainland China." Lynch, *supra* note 49. No doubt all the information from Hong Kong will be subject to the Great Firewall. *Id.*

[52] *Id*.

[53] Stefan Geens, *Google Maps: Still Doomed in China*, Oct. 26, 2010, http://ogleearth.com/2010/10/google-maps-still-doomed-in-china.

[54] Michael B. Farrell, *Google ends Internet Censorship, Dares China to make next move*, THE CHRISTIAN SCIENCE MONITOR, Mar. 22, 2010, http://www.csmonitor.com/USA/2010/0322/Google-ends-Internet-censorship-dares-China-to-make-next-move/.

would remain available in the mainland. As such, what will be the legal consequence by blocking the access of those services? This is one legal issue among many others.

By denying complete access to Google services, mainland Government could be in a position to encourage other Internet enterprises to provide similar services as long as such remote sensing data/information does not violate Chinese law. In case substitute services are not available in the mainland, mainland users might revert to Google's Hong Kong branch for such services. As discussed above, Hong Kong takes a liberal attitude in access to remote sensing data; the companies are free to decide on transactions of remote sensing data on market value. Under such circumstances, Google's Hong Kong existence shall have no problem in supplying its Google map services and remote sensing data to mainland consumers, possibly again free of charge. Even if Google does not wish to give away its valuable remote sensing data freely to its competitors in the mainland market, the fees charged for the transaction of such data will reflect market prices and be affordable to consumers.

In this regard, one noteworthy point is the influence on mainland China of the ongoing trend of lifting local restrictions on access to remote sensing data. It is said that "the present global trend of increasing informal e-mail exchanges between individuals and access to relevant Web Sites will undoubtedly help to improve information exchange on a regional scale. However, the information made available on Web Sites may still be subject to restrictions in the absence of formal agreements to the contrary."[55] The event of Google's retreat from the mainland market also directly affirms the two different regimes in mainland China and Hong Kong for public access to remotely sensed imagery.

The importance of the right of individuals to freely choose their sources of information has been recognized worldwide. The right has been well put down in important international human rights documents. The Universal Declaration of Human Rights, adopted in 1948 by the General Assembly of the United Nations,

[55] Hubert George, *Developing Countries and Remote Sensing: How Intergovernmental Factors Impede Progress*, 16 SPACE POLICY, 267, 268 (2000).

has clear wordings that "[e]veryone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers."[56] This document, while not a treaty and binding on the States, has been claimed to constitute customary international law and thus shall be strictly followed by the States.[57] The above right has been further elaborated in the International Covenant on Civil and Political Rights.[58] Although not yet a member, China has signed the document and thus shall act, in good faith, "not to defeat the object and purpose" of the Covenant.[59] This Covenant reiterates the individual's right to freedom of expression and provides that "the right to freedom of expression . . . include[s] freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, in the form of art, or through any other media of his choice."[60] Certain restrictions have been identified in this Covenant, which include the circumstances for "respect of the rights or reputations of others," and/or "for the protection of national security or of public order, or of public health or morals;" but these restrictions shall only be "such as are provided by law and are necessary."[61] The media mentioned in the above two international documents obviously covers satellite and Internet. Correspondingly, the right of access to Internet information or remote sensing data lies within the scope of the above documents. As a result, Google's move from mainland to Hong Kong has no doubt serious implications to the mainland citizens' right concerning their choice of information.

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[56] Universal Declaration of Human Rights, G.A. Res. 217A, Art. 19, U.N. GAOR, 3d Sess., 1st Plen. Mtg., U.N. Doc. A/810 (Dec. 12, 1948).

[57] *See* Lisa L. Turner & Lynn G. Norton, *Civilians At the Tip of the Spear*, 51 A.F. L. REV. 1, 75-76 (2001).

[58] This document is adopted and opened for signature, ratification and accession by General Assembly resolution 2200A (XXI) of Dec. 16, 1966; it entered into force on Mar. 23, 1976.

[59] Vienna Convention on the Law of Treaties, art. 18, May 23, 1969, 1155 U.N.T.S. 331.

[60] International Covenant on Civil and Political Rights, pt. III, art. 19(2), Dec. 19, 1966, 999 U.N.T.S. .

[61] *Id.* at pt. III, art. 19(3).

At the moment there are no clear rules on the issue of access to remote sensing data in mainland. We may refer to the cooperative framework set up by the Brazil and China for the *CBERS* Application System. Under the framework, *CBERS* data is only available for free for all the Latin American countries and some African countries.[62] The downlink data is available to other countries on per-minute fee basis.[63] Domestically, we may refer to the Interim Measure on the Use of Aero-Remote Sensing Data during the Earthquake Relief Period (the Measure).[64] The use of remote sensing data is restricted to relevant departments under State Council and People's Government in the disaster area.[65] The users should specify the purpose and applicable scope of the data in advance.[66] The users are required to sign confidentiality agreement for the use of secret data.[67]

The above practice shows that remote sensing data are strictly controlled by the Chinese government. Commercialization of remote sensing data has been on the track internationally; however, domestically, the government exerts strict rules on accessing the remote sensing data. On both circumstances, the most prominent restriction lies in the protection of state secrets.

According to the Law on Guarding State Secrets,[68] state secrets include those "concerning major policy decision on state affairs; . . . in the building of national defence and in the activities of the armed forces; . . . in diplomatic activities and in ac-

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[62] National Institute for Space Research, *China-Brazil Earth Resource Satellite Announces the End of the CBERS-2B Operations*, May 12, 2010, http://www.inpe.br/ingles/news/news_dest118.php.

[63] JOANNE IRENE GABRYNOWICZ, THE LAND REMOTE SENSING LAWS AND POLICIES OF NATIONAL GOVERNMENTS: A GLOBAL SURVEY (2007), *available at* http://www.spacelaw.olemiss.edu/publications/noaa.pdf.

[64] Interim Measure on the Use of Aero-Remote Sensing Data during the Earthquake Relief Period, May 16, 2008, http://vip.chinalawinfo.com/newlaw2002/SLC/SLC.asp?Db=chl&Gid=105198 (last visited Jan. 25, 2011).

[65] *Id.* at art. 2.

[66] *Id.* at art. 4.

[67] *Id.* at art. 6.

[68] Law on Guarding State Secrets (promulgated by the Standing Comm. Nat'l People's Cong., Sept. 5, 1988, effective May 1, 1989) (P.R.C.), art. 8, translated at Selected Legal Provisions of the People's Republic of China Affecting Criminal Justice, http://www.cecc.gov/pages/newLaws/protectSecretsENG.php.

tivities related to foreign countries as well as to be maintained as commitments to foreign countries; . . . in national economic and social development; concerning science and technology; . . . concerning activities for safeguarding state security and the investigation of criminal offences; and other matter classified" by the state secret-guarding department.[69] State secrets are further classified into three categories: "most confidential, classified and confidential."[70] Anyone who "intentionally or negligently releases state secrets shall bear criminal liability."[71]

To strengthen the protection of state secrets, the National People's Congress is reviewing for possible amendment to the twenty-year-old Law on Guarding State Secrets. The latest version of the draft amendment, according to the report, "in addition to requiring telecom and Internet operators to detect, report and delete information that disclose State secrets, also stipulates the clear obligation for them to work with relevant authorities on investigations."[72] It is obvious that the Chinese government is stepping up the control of state secrets in the era of information technology, which has potentially profound implications to access to remote sensing imageries in future.

While Google's Hong Kong existence has no problem in providing relevant remote sensing data to mainland users, there are further concerns over the mainland regime in controlling the flow of such data. Indeed according to recent reports, "Google suggests [mainland] customers use VPNs, secure shell tunneling, and proxy servers for access;" no matter whether this suggestion is feasible or not, the sole fact of bypassing censorship in mainland will entail legal risks for the mainland customers.[73] For example, the 2006 Regulations on the Protection of the Right to Network Dissemination of Information provides

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[69] *Id.* at art. 8.

[70] *Id.* at art. 8.

[71] Criminal Law,(promulgated by the Standing Comm. Nat'l People's Cong., July 1, 1979, effective Jan. 1, 1980, amended Mar. 14, 1997) (P.R.C.), art. 398, http://www.cecc.gov/pages/newLaws/criminalLawENG.php.

[72] Wang Hauzhong & Wang Xing, *Police to work with phone, Internet providers,* CHINA DAILY, Apr. 27, 2010, at 4.

[73] Thomas Claburn, *Google Helps Users Cope with Censorship*, INFORMATIONWEEK, Mar. 29, 2010, at 17.

that anyone who purposely avoids or damages the adopted technical measures shall assume civil liabilities and where any crime is constituted, the violator shall be subject to criminal liabilities.[74] "Whoever unlawfully obtain[s] state secrets by stealing, spying or buying" shall also possibly be held criminally liable."[75]

VI. CONCLUSION

Remote sensing, a great efficient source for data acquisition,[76] is increasingly important to daily life. The 1986 UN Remote Sensing Principles is meaningful in the sense that it is the only official document providing general guidelines for remote sensing activities in the international arena. As a UN resolution, the Remote Sensing Principles does not have binding effect; as general guidelines, the Remote Sensing Principles leaves broad discretionary power to the Member States.

"The basic human right of Freedom of Information concerns both the right to obtain information and the freedom to disseminate the acquired data."[77] While there is no uniform ap-

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[74] *See* Ordinance on the Protection of the Right to Network Dissemination of Information (promulgated by the State Council, May 18, 2006, effective July 1, 2006), art. 18. Article 18 of the Ordinance on the Protection of the Right to Network Dissemination of Information provides:

> Where anyone violates the present [Regulations] by committing any of the following infringement, he shall, in light of the severity of the situation, assume such civil liabilities as stopping the infringement, eliminating the negative impacts, making an apology and compensating for the losses occurred. In case the public security is injured, the administrative department of copyright may order it to stop the infringement, confiscate the illegal proceeds and may impose thereupon a fine of 100,000 Yuan. In the event of any serious circumstances, the administrative department of copyright may confiscate such facilities as computers that are mainly applied to providing network services. Where any crime is constituted, the violator shall be subject to criminal liabilities according to law: . . . (2) Purposely avoiding or damaging the adopted technical measures . . . .

Id.

[75] Criminal Law, *supra* note 71, at art. 282. *See also*, *id.* at art.287.

[76] Yi-Ping Chen & Ming-Der Yang, *Legal Issues on Public Access to Remote Sensing Data in Taiwan*, 2005 IEEE International Geoscience and Remote Sensing Symposium, 264 (2005) (on file with author).

[77] H. Priyatna Abdurrasyid, *The Application of Remote Sensing in Indonesia*, 5 SINGAPORE J. INT'L & COMP. LAW 139, 146 (2001).

proach in dealing with data access issue around the world, the Hong Kong Government is laudable in taking a liberal approach in guaranteeing their citizens' right to information and knowledge. And indeed, one of Hong Kong's key rationales as a financial center is its freedom of information.[78] Remote sensing activities have proven to be successful in the past years to the satisfaction of the users despite the lack of remote sensing law in Hong Kong. It is expected the remote sensing data will have broader applications within society, and we can optimistically expect that the Hong Kong Government will continue its established approach in sharing and disseminating remote sensing data for the betterment of the Hong Kong society.

[78] *See* Frederik Balfour & Josh Fellman, *Google Faces No Hong Kong Censors After China Retreat*, BUSINESSWEEK, Mar. 23, 2010, http//www.businessweek.comnews/2010-03-23 /google-faces-no-hong-kong-censors-after-china-retreat.html.

COMMENTARIES

ENVIRONMENTAL MONITORING COOPERATION PAVES THE WAY FOR COMMON RULES ON REMOTE SENSING ACTIVITIES AMONG THE PACIFIC RIM

Ikuko Kuriyama[*]

I. INTRODUCTION

The increased speed in technological advancement is one of the major social phenomenons in today's era of globalization. Satellite remote sensing is no longer a technology which only super powers can enjoy; it is now getting diffused among states around the globe, including emerging and developing ones. The Pacific Rim is not an exception. Now various countries are engaging in satellite remote sensing activities according to their needs, priorities, and interests and pursuing further benefit from its activities within their capability. Ample examples have already proven that remote sensing technology is useful for various applications, including environmental monitoring and assessment, and has now become indispensable for our daily life. On the other hand, it has been repeatedly pointed out that the proper national and international legal framework to regulate the technology is still missing. The challenge is to move forward beyond the status quo. What kind of measures can be taken in order to facilitate the use of remote sensing for the benefit of the Pacific Rim? The purpose of this paper is to provide the author's observation on the status of remote sensing activities in the Pacific Rim presented at the Earth Observation, the Environment, Space, and Remote Sensing Law in the Pacific

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Rim Meeting (the Meeting),[1] while giving a general synopsis, and to discuss the challenges and possible options for future, as a reviewer of the Meeting.

II. OVERVIEW OF THE STATUS OF SATELLITE REMOTE SENSING ACTIVITIES IN THE PACIFIC RIM

The status of the satellite remote sensing activities in the Pacific Rim is diverse and dynamic. To begin with, the author touches upon some key properties in order to describe the current status of the satellite remote sensing activities in the Pacific Rim based on the information provided at the Meeting.

The first property relates to access to remote sensing capabilities, namely whether a country possesses their own remote sensing capability or not. While most of the Pacific Rim countries are more or less using satellite data, they can be divided into two groups: "the provider countries" which possess their own remote sensing satellites and "the user countries" which rely on foreign remote sensing capabilities. Based on the presentation at the Meeting, China, Japan, Korea, and U.S.A. are the countries falling into the former category and Australia, Hong Kong, and South American countries[2] are the examples of the latter. Among the provider countries, the active efforts of China and Korea to own more advanced remote sensing capabilities is noteworthy.[3] The global community will increase its interest in cooperation and opportunities with both countries. A surprising fact is that the above distinction is not necessarily related to the economic status and remote sensing needs of the country, rather it is the matter of the policy choice. For example,

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[1] Earth Observation, the Environment, Space, and Remote Sensing Law in the Pacific Rim: Meeting and Live Blogcast, presented by the National Center for Remote Sensing, Air, and Space Law (Otani Hotel Honolulu, Hawaii, USA, June 14-16, 2010), http://www.spacelaw.olemiss.edu/event_Pacific%20Rim%202010.html [hereinafter the Meeting].

[2] For the purpose of the Meeting, five countries: Chile, Colombia, Ecuador, Mexico and Peru.

[3] *See generally*, Yan Ling, *Remote Sensing Data Distribution and Application in the Environmental Protection, Disaster Prevention, and Urban Planning in China*, 36(2) J. SPACE L. 435 (2010), and Jae Gon Lee, *Remote Sensing Issues as They Relate to Korea*, 36(2) J. SPACE L. 415 (2010).

Australia and Hong Kong who both use remote sensing data heavily and seem to be relatively capable of having their own remote sensing satellites, do not have any. So far, satellite remote sensing is an enterprise which requires a great deal funding, but it is difficult to make profits. States whose interests put more emphasis on commercial side of the benefit from space technology rather than on other objectives, such as national security or technology development, may choose a more practical approach toward the national autonomy of remote sensing capability. In any case, the situation of the Pacific Rim shows that the accessibility to remote sensing capabilities, that is satellite technology, is not equal to the accessibility to remote sensing data that is the results of satellite technology. Further, we notice that the accessibility issue is not as simple as countries who have or do-not-have satellites, but it is a rather complicated problem in reality.

The second property is the countries' approach to the use and access of the remote sensing data. There are roughly two different approaches regarding the data handling conditions in the Pacific Rim. One approach is to try to maintain control over data use and access by establishing more restrictions. The other is to grant the public free use and access to the data with less restriction. Perhaps the Chinese approach is the typical example of the first category and the U.S. approach with its full and open policy is the second. Other countries can be positioned in between the two countries reflecting their culture, philosophy, and institutions behind.[4] Both approaches have pros and cons. More restriction on data use and access can increase the possibility for coping with the case of misuse of data and can enhance the protection of privacy and national security, but it may also hamper the expansion of data use and sacrifice the cost-effectiveness of data control and freedom of information.[5] While

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[4] *See* Yun Zhao, *Regulation of Remote Sensing Activities in Hong Kong: Privacy, Access, Security, Copyright, and the Case of Google*, 36(2) J. SPACE L. 547 (2010). The discussion that two different policies of data access co-exist in China refereeing to the Google case is insightful as to the influence of social system on the data policy.

[5] *See, e.g.*, James T. Mahoney, NASA's Earth Science Data & Information Sharing in 2010 -- Law, Policy and Practice in the Pacific Rim (2010) (unpublished manuscript, on file with author), and Zhao, *supra* note 4.

both approaches have respective legitimacy, the author views that the latter approach is preferable for the future remote sensing, because it may bring more remote sensing activities and relevant discussion to society. Of course, the data handling policy may vary according to the kind of data (i.e. high resolution land imagery, physical quantity data) and to the purpose for use (i.e. humanitarian aide, scientific research, military) even within a country. In addition, countries are often involved in extensive data policy coordination and are required to compromise in order to agree on a common data policy when implementing a cooperative project (i.e. joint satellite development).[6]

The last property is the status of legal framework for the remote sensing activities which is closely related to the second property. As for the domestic framework, while the U.S. is a unique exception, most countries are still lacking a so-called "remote sensing law" that is generally applicable for the remote sensing activities. In this case, instead of the application of a unified law or regulation, the legal conditions for remote sensing activities are guided by the aggregated interpretations of existing laws and rules in relevant fields. For example, the conditions for handling remote sensing satellite data can be inferred based on the provisions in the laws regarding information, national security, copyright, environment protection, and Geographic Information System (GIS). Under such regulatory conditions in the Pacific Rim, data policy is rarely defined by law but in most cases by agency level documents or contractual bases, while some countries, such as Korea, develop detailed Ministry level rules and regulations for particular side of data use.[7] Policies and rules for data use outside the country are generally underdeveloped compared to the domestic use, which needs to be improved. In general, the author views that the existence of the explicit policy and regulation or law is preferable for expanding business and international cooperation on remote sensing since it can reduce the transaction cost and risk by boosting predictability and stability. However, the author also

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[6] *See* Mahoney, *supra* note 5.

[7] *See* Lee, *supra* note 3 (Korea has regulations for satellite data in terms of national security).

observes that countries seldom develop laws and regulations without the awareness of pressing needs. It is worthwhile to keep in mind that market based management, namely a non-regulatory approach, of satellite data is still workable and effective under certain condition as shown in the Hong Kong case.[8] Regarding the international legal framework of remote sensing such as the United Nations Remote Sensing Principles (the Remote Sensing Principles) its legal status and applicability is often a major issue to be discussed though detailed discussion is beyond the scope of this paper. According to the presentation at the Meeting, basically all countries seem to recognize the applicability of the Remote Sensing Principles such as "non-discriminatory" and "reasonable cost" access to data, though their practices are not clear. Under some legal system, however, it is pointed out that the lack of proper national registration raises the question of applicability of international obligations on remote sensing.[9] It is observed that now the call for the revision or replacement of the Remote Sensing Principles is increasing due to the dramatic change in the environment for remote sensing (i.e. the enrollment of new countries and sensing technology advancement).[10] But such a call is not likely to be addressed quickly. Whether domestically or internationally, sufficient support and strong motivation to convince public or global community to adopt new rules on remote sensing is necessary but seems to be missing.[11]

III. CHALLENGES OF SATELLITE REMOTE SENSING IN THE PACIFIC RIM AND POSSIBLE RESPONSES

In light of the current status shown above, the challenges of remote sensing activities in the Pacific Rim, in the author's

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[8] *See* Zhao, *supra* note 4.

[9] Ricky J. Lee, speech at the Meeting (manuscript on file with author).

[10] Sylvia Ospina, South America: The Other Edge of the Pacific Rim (June 14, 2010) (unpublished manuscript, on file with author).

[11] This observation is based on the author's personal experience at the 45th session of the Scientific and Technical Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space, February 11-22, 2008. While some delegates raised the reconsideration needs of the Remote Sensing Principles at the session, the Committee did not take up the issue as the agenda item for the future session.

view, are 1) progress in remote sensing application with more coordinated and operational mechanisms for enhancing the remote sensing capability of the entire Pacific Rim and 2) corresponding development of laws and regulations regarding remote sensing activities.

To coordinate various observation capabilities for the operational use for the benefit of society is a common challenge for the entire Earth observation community today. To the author's knowledge, though no attempt has ever been dedicated to the entire Pacific Rim, various efforts are already being implemented in international, regional, and bilateral basis to demonstrate the benefits of Earth observation applications with a more coordinated and operational approach. These examples include the Global Earth Observation System of Systems (GEOSS) led by Group on Earth Observation (GEO),[12] a European initiative, Global Monitoring for Environment and Security (GMES),[13] and a space agencies international initiative, International Disaster Charter.[14] As we know from the presentation in the Meeting, we have already heard sufficient records to prove the effectiveness of remote sensing for individual cases in a particular country. It is time to consolidate all the remote sensing efforts in the Pacific Rim to provide the utmost benefits for the region. The exchange and sharing of information on national remote sensing activities is an important and necessary step. However, in response to the first challenge, we should now move our focus on to more concrete actions on the basis of shared necessity and motivation amongst the countries in the region.

The response to the second challenge is closely interrelated to the first one as it is assumed that the development of law and regulations usually follow after the advent of issues to be urgently addressed (i.e. the expansion of observational data use). In this regard, some new initiatives may be required to mobilize

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[12] *See* Group on Earth Observations, http://www.earthobservations.org/index.html#WhatIsGEO (last visited Jan. 20, 2011).

[13] *See* GMES Info, http://www.gmes.info/ (last visited Jan. 20, 2011).

[14] *See* Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters, Rev.3 (Apr. 25, 2000), *available at* http://www.disasterscharter.org/charter_e.html.

governments' motivation to have new rules or regulations on remote sensing both domestically and internationally. In particular, for initiating international discussion shared issues or awareness to respond is imperative in order to overcoming the differences among states in their needs and capability.

The author views that the discussion on a cooperative project to build operational satellite environmental monitoring system for the Pacific Rim could be one possible starting point. There are two examples where shared objectives among the parties and their active engagement in concrete discussion are expected. One is application of the remote sensing data for implementing particular international treaty obligations, and the other is international cooperative project with focused goal. Since application of satellite remote sensing to treaty implementation has a relevant discussion forum under a respective treaty system,[15] the author focuses the discussion here on a later example. Today environmental monitoring and assessment is the common necessity that all governments generally share, particularly in the case for urgent response to climate change (i.e. mitigation of and adaptation to climate change). Needless to say, the Pacific Rim is an area widely spread over a vast ocean; using satellite remote sensing technology is particularly useful and relevant for this area. An ambitious cooperative project to realize the operational satellite environmental monitoring systems through coordination among the contributed observational and relevant capabilities in the region for specific common needs would stimulate concrete internal and international discussion on the use of remote sensing and its rule in the Pacific Rim. It is because much interaction among the participating countries and also vast discussion within a country are both required for responding the project (e.g. definition of common data products and data policy for the system) and the process for success involves not only space agencies but also wide range of actors such as policymakers, user agencies, and various experts. In a way, such a cooperative project could work as an institu-

[15] For example, the Subsidiary Body for Scientific and Technological Advice (SBSTA) for the United Nations Framework Convention on Climate Change.

tional base for enhancing common ground and momentum for the progress in remote sensing activities and laws in the region.

IV. ISSUES AND CONDITIONS TO BE CONSIDERED FOR THE COOPERATION

If a cooperative environmental monitoring project is a possible option for promoting satellite remote sensing activities in the Pacific Rim, what are the conditions for success in terms of legal point of view? This section discusses conditions for some key issues to be considered in planning the environmental monitoring project in the Pacific Rim with reference to the discussion at the Meeting.

The first important issue concerns the rules on handling of provided data. In light of the discussion so far, seeking a data policy with minimum restriction on provided data seems to be a recommended approach for participating countries to take for the purpose of the cooperative project. In coordinating the data policy, we certainly need to respect countries' diverse approaches toward the handling of satellite data. In addition, the protection of privacy, national security, and copyrights is important. On the other hand, a country could avoid such concerns by the careful selection of data to provide for the project. Therefore, a free redistribution policy is desirable in terms of efficient data control and promotion of data use.[16] In parallel, the exception of liability for any use of provided data needs to be explicitly indicated. The discussion in the major international forum such as GEO can be a reference for the consideration of data policy.

The second issue is the formality of the cooperative project. The author views that a non-legally binding base and in-kind contributions from the participating countries are the preferable principles for the implementation of the cooperative project. A voluntary approach would be more workable for the project among the countries with diverse remote sensing capability and

[16] Mr. Mahony of NASA mentioned in his presentation that "the "user registration" and "no re-distribution" policies have raised the most questions and concerns from the user community regarding full and open data sharing. Many users do not understand what "re-distribution" means. This confusion leads to lots of questions to be fielded by the DAAC personnel. It also is adverse publicity." *See* Mahony, *supra* note 5.

needs, while it is sometimes at the cost of stable and steady implementation. Stated differently, flexible conditions which do not undermine the countries' motivation to participate in the project are desirable. On the other hand, to enhance the ownership of the project, every party needs to have some contributions to the project depending on its capability regardless of whether it is remote sensing user countries or provider countries. Furthermore, the endorsement of the cooperative project at high official or political levels is recommended wherever possible in order to encourage participating counties to mobilize their recourses and make commitment for the project.

The third issue is the applicable laws and regulations for the project. It is obvious that the cooperative project should follow the provisions and principles of international and domestic space and remote sensing law and regulations. In addition, environmental law is a field necessary for consideration because the project objective is the environmental monitoring and assessment.[17]

V. CONTEXT OF EARTH OBSERVATION ACTIVITIES IN CURRENT JAPANESE POLICY AND RELEVANT PROJECTS

For the purpose of the discussion on the cooperative monitoring project, it is perhaps worth to introduce the context of Earth observation activities in current Japanese policy and relevant project.[18] The recent policy papers in Japan assigned new roles for Earth Observation as the tools for "implementing space diplomacy" and "verification of green innovation."[19] These policy calls for optimizing Japan's Earth observation technology in solving regional issues and global issues such as climate

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[17] Mr. Fermín Romero Vazquez of Mexican Ministry of Foreign Affairs discusses environmental law as a regulatory framework for remote sensing applied to environmental monitoring and protection in his presentation. *See* Fermín Romero Vázquez & Sergio Camacho Lara, *What Lawyers Need to Know About Science to Effectively Make and Address Laws for Remote Sensing and Environmental Monitoring*, 36(2) J. SPACE L. 365 (2010).

[18] *See generally*, Setsuko Aoki, *Japanese Law and Regulations Concerning Remote Sensing Activities*, 36(2) J. SPACE L. 335 (2010) (for the details of the Japanese policy and law).

[19] *Id.* at B.2 and Appendix.

change. To respond to such policy objectives, the "Land and Ocean Observing Satellite System to contribute to Asia and other regions" and "Global Environmental Change and Weather Observing Satellite Systems" are defined by the Basic Plan for Space Policy[20] as the measure to be taken. Therefore it could be said that the concept of a project to build satellite environment monitoring system in the Pacific Rim through cooperation among countries in the region is generally endorsed by the Japan's policy documents.[21] Moreover, space diplomacy promotion policy requires the space agency to work with the Ministry of Foreign Affairs and the development aide agencies in consideration of the regional needs, which leads to more effective utilization of Earth observation data in the region.

Japan also has much experience to share in relation to implementing the cooperative environmental monitoring project since Japan has been engaging in the cooperative initiatives in the Asia-Pacific region, as well as launching satellites for environmental monitoring. In particular, the activities promoted under the auspice of the Asia-Pacific Regional Space Agency Forum (APRSAF)[22] would provide a model for cooperation regarding environmental and disaster monitoring in the Pacific Rim.[23] Sentinel-Asia is a project to share disaster information including Earth observation data in the region through the Internet.[24] As of January 2010, 65 organizations including 56 space or disaster prevention agencies from 22 countries and 9 international organizations (i.e. UN/ESACP, UN/OOSA) are

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[20] The first national comprehensive strategy of Japan defined in June 2009. *See* Strategic Headquarters for Space Policy, *Basic Plan for Space Policy – Wisdom of Japan Moves Space* (June 2, 2009), http://www.kantei.go.jp/jp/singi/utyuu/basic_plan.pdf.

[21] *See* Aoki, *supra* note 18.

[22] An international grouping of space agencies in the Asia-pacific region to promote cooperation in space founded in 1993 by Japan's initiative. See APRSAF, http://www.aprsaf.org/ (last visited Jan. 20, 2011).

[23] *See generally*, Japan Aerospace Exploration Agency (JAXA), Linking Asia to Tackle Disaster and Environmental Issues, Achieving Safety and Security in Asia through cooperation, Disaster/Environmental Monitoring and Engineer Training Projects at JAXA, http://www.jaxa.jp/article/special/asia/ishida01_e.html (last visited Jan 20, 2011).

[24] For more information on Sentinel-Asia, see also, JAXA, About Sentinel Asia, https://sentinel.tksc.jaxa.jp/sentinel2/MB_HTML/About/About.htm (last visited Jan. 26, 2011).

participating into the project.[25] The main aim of Sentinel-Asia is to platform emergency satellite observation when a natural disaster strikes, and to provide data from these observations to help assess the situation and take necessary measures. Other than that, the monitoring system for wild fires and floods is also being developed under the project. Launched in 2006, it is already being used regularly by disaster management organizations across Asia. Currently data from Japan's satellite *DAICHI* (the *Advanced Land Observing Satellite*: *ALOS*) and an Indian satellite are mainly used in the Sentinel-Asia with additional data from Thailand and Korea planned. In 2008, based on the experience of Sentinel-Asia, APRSAF started a new initiative, called SAFE, Satellite Application for Environment, which means environmental monitoring through space technology.[26] Its goal is to investigate how satellite data or space technology can be used to solve local environmental problems such as water resource and forest management, land utilization, and to encourage cooperation among related organizations. Currently, some prototypes activities are under development for water resource and forest management. The discussion of the possibility to expand SAFE to the Pacific Rim or to link it to the similar initiative in America, if any, may be an option worth investigating. In this regard, it is noteworthy to touch upon some important lessons learned from APRSAF to promote international Earth observation cooperation in this region. The high-cost of some Earth observation data and lack of capacity in infrastructure, humans, and institutions are examples of major obstacles found in the Asia-pacific region.[27] Therefore the cooperative project needs to include measures to solve these problems (i.e. capacity building segments). In sum, Japan is standing in the

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[25] *See* Kazuya Kaku, Sentinel Asia JPT Secretariat, JAXA, Overall Status of Sentinel Asia Step 2, presented at APRSAF-16, Bangkok (Jan. 28, 2010), http://www.aprsaf.org/data/aprsaf16_data/D3-1400_AP16_SA-1_Kaku.pdf.

[26] For more information on SAFE, *see also*, SAFE, http://www.eorc.jaxa.jp/SAFE/ (last visited Jan. 20, 2011).

[27] Personal correspondence from Mr. Chu Ishida, Director, Space Cooperation Office for Asia Pacific Region, Space Applications Mission Directorate, JAXA to author (on file with author).

right position to take initiative by bringing its accumulated experience.

IV. CONCLUSION:

From the discussion in the Meeting, the author finds the promotion of the coordinated and operational application of remote sensing capabilities and associated development of remote sensing law and regulations as two challenges for enhancing remote sensing activities in entire Pacific Rim. The discussion on building the Pacific-Rim satellite environment monitoring system through cooperation could be the first step for addressing these challenges. No wonder, for realizing such a project, is easy to say but hard to do. In particular, most countries are currently suffering from budgetary deficits which is always a concern. However, there are some positive signs for the promotion of such a project. In today's world of high inter-dependence, global environmental issues, especially climate change, become high political priorities for all countries to tackle regardless of whether they are a developing or developed one. Recently, new policies and laws have been enacted in some countries (i.e. U.S., Korea, Japan) to support Earth observation activities for environmental application. Accompanying the growth in economy, more countries are expected to enter into the remote sensing activities in the Pacific Rim, especially in Asia as the growth center in 21st Century. These facts show that more active and dynamic remote sensing activates are expected in the Pacific Rim and the momentum of cooperation for satellite environmental monitoring system is stronger than ever. Concrete discussions on such a monitoring project could provide the opportunity to demonstrate more coordinated and operational satellite observations for the benefit of the Pacific Rim and enhance the mutual understanding thereby, gradually shaping the foundation for future discussion on international data policy and legal framework for remote sensing activities.

EARTH OBSERVATION, THE ENVIRONMENT, SPACE, AND REMOTE SENSING LAW IN THE PACIFIC RIM: MEETING AND LIVE BLOGCAST PRESENTED BY THE NATIONAL CENTER FOR REMOTE SENSING, AIR, AND SPACE LAW HONOLULU, HAWAII, USA JUNE 16-18, 2010

REVIEWER'S COMMENTS

Masami Onoda, GEO Secretariat[*]

1. What Lawyers Need to Know About Science to Effectively Make and Address Laws for Remote Sensing and Environmental Monitoring: A presentation by Fermín Romero, Director para Asamblea General y Organismos Internacionales Dirección General para la Organización de las Naciones Unidas Secretaría de Relaciones Exteriores

Comments:

This paper discusses the important subject of how to address the needs of science by policy or law-making, which relates to the emerging discipline of studies on the relationship between scientific knowledge or information and policy. The reviewer's question is how specifically this could be done, and how the scientific issues could be approached from the side of policy.

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[*] Masami Onoda is a Scientific and Technical Officer at the Group on Earth Observations (GEO) Secretariat, seconded from the Japan Aerospace Exploration Agency (JAXA). She has been engaged in international relations for Earth observation satellite programs, and more recently in a small satellite development program and technology transfer programs at JAXA. Dr. Onoda holds a Ph.D. (2009) and Master's degree (2005) of Global Environmental Studies from Kyoto University, and a BA in international relations from the University of Tokyo (1995). The views expressed in this article are those of the author and do not represent those of the organizations to which she belongs.

In this regard, it is important to note the difference between the aspect of space law as regulations, for instance in the field of debris, licensing, or liability, and the aspect of the treaty framework being a "user" of space technology, such as in the case of environmental law which calls for the need of improved information on various features of the Earth's environment as the scientific basis of the regulatory measures provided by the treaty, in forms such as monitoring or verification. It is also important to note whether the scientific information is needed in the context of compliance, effectiveness, or to assess the general state of the environment.

2. The Increasing Need for Australian Regulation of Remote Sensing Activities: A presentation by Dr. Ricky Lee, Senior Associate, Schweizer Kobras, Sydney NSW

Comments:

This paper examines the existing laws and regulations relating to satellite remote sensing applications in Australia. It particularly points out the absence of statutes or regulations concerning remote sensing activities and the need to enact legislation to address issues that may pose significant legal and policy concerns, including the lack of control over the use of remote sensing data, the possibility of breaches and contraventions of international law, and overlapping arrangements between Australian government agencies and data providers. Nevertheless, despite these legal concerns there is a lack of required legal instruments. This seems to suggest that perhaps the reasons for the absence of such a legal basis for remote sensing activities in Australia might be political rather than legal.

3. Sensing a Change? The Re-Launch of Australia's Space Policy and Some Possible Legal Implications: A presentation by Prof. Steven Freeland, Professor of International Law and Associate Head of School (Research), School of Law, University of Western Sydney

Comments:

This paper was highly interesting to the reviewer, partly as the reviewer has stayed in Woomera (in the ELDO Hotel) for three weeks in 1996 during her first international assignment. The rich heritage of space activities by the ELDO organization in the 1960-70s was still alive in the people's hearts in Woom-

era. In the GEO community, Australia is a strong advocate and leader of the Forest Carbon Tracking initiative, which is a project to utilize Earth observation data to monitor forest carbon, with the future goal of establishing an operational system that would possibly contribute to the UN REDD (Reducing Emissions from Deforestation and Forest Degradation) framework. Perhaps there is a disconnect between the environmental sector and the space sector, but Australia, as a country, is very active in the Earth Observation arena in this regard. Finally, concerning the statement that space is expensive, this situation is rapidly changing today with the emerging new technologies. Depending on how to do it, of course, it is possible to have high resolution small satellite capabilities at an affordable price, and that is how many emerging actors in space are acquiring their own satellites.

4. Remote Sensing Data Distribution and Application to Environmental Planning and Protection in China: A presentation by Prof. Yan Ling, Faculty of International Law, China University of Political Science and Law

Comments:

This is a very informative paper on overall Chinese remote sensing activities, and legal instruments and policies. In GEO, lead by the Chinese Meteorological Agency, China is playing an active role on the issue of data sharing. With the numerous ministries involved, the reviewer would like to know more about the actual decision-making process, and who are the driving forces for policy and law making in the field of remote sensing.

5. Legal Issues in the Regulation of Remote Sensing Activities in Hong Kong: A paper by Dr. Yun Zhao, Associate Professor, Faculty of Law, the University of Hong Kong

Comments:

The paper addresses the issue of regulations on remote sensing activities in Hong Kong, applying the case of Google. It is intriguing that the regulation is left completely to the market, and that this seems to lead to a reasonable market price of remote sensing data; whereas, many countries have struggled to somehow regulate the price to an affordable level. In discussing Google in this context, however, one should note that Google, at least at present, is not a business model to actually sell remote