

CONCLUSION

How should principles that have emerged from other legal systems and in other contexts apply to the allocation of the newly-discovered water ice on the moon?⁸⁸ Although a “first-come/first-served” system has been utilized in some areas to define property rights in water, most areas see that approach as inappropriate and prefer an equitable allocation system of some sort. Water is almost always seen as a public resource that should be shared.

The first to arrive at the moon to exploit its water ice resources will be from one of earth's most developed countries, and certainly some reward should attach to those who put the investment and ingenuity together to develop this resource. But they should not be able to deprive others of access to it, because the Moon itself is part of our common heritage and its important water ice resources are part of the public trust and are central to that sense of a shared heritage. It will be important to assign the task of developing the equitable principles that will govern access to the Moon's water ice to an appropriate international organization⁸⁹ so that the process of identifying these principles can begin, and the exploration of the moon can continue under the common heritage tradition.

⁸⁸ For a discussion of the challenging task of allocating the living resources of the high seas, see Jon M. Van Dyke, *Allocating Fish Across Jurisdictions*, in CONSERVATION AND MANAGEMENT OF TRANSNATIONAL TUNA FISHERIES 163-79 (Robin Allen, James Joseph & Dale Squires eds. 2010); previously published in LAW OF THE SEA, PROTECTION OF THE MARINE ENVIRONMENT AND SETTLEMENT OF DISPUTES 821-44 (Tafsir Malick Ndiaye & Rudiger Wolfrum eds. 2007).

⁸⁹ The International Seabed Authority, which has been charged with supervising the exploration and exploitation of the deep seabed minerals, might provide an appropriate model.

REGULATION OF REMOTE SENSING ACTIVITIES IN HONG KONG: PRIVACY, ACCESS, SECURITY, COPYRIGHT AND THE CASE OF GOOGLE

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I. INTRODUCTION

Satellite remote sensing, an important technological development in human history, has been playing an increasingly important role in modern society. Remote sensing makes it possible to collect data on dangerous or inaccessible areas; as such, it functions as a powerful tool in monitoring and assessing the resources of the Earth. In view of its multi-faceted functions and awesome potential, remote sensing has been applied to many different areas, such as weather broadcasting and oceanographic observation.

In recent years society has witnessed the importance of remote sensing on one other strategic area – environmental protection. “The acknowledgement of the necessity” of environmental protection “has led to a growing need for global observation; remote sensing activities, by offering precise geographical details, allow faster and more effective help in predicting natural disasters and use of natural resources.”¹ The importance of remote sensing in this area has been further evidenced in the recent United Nations Climate Change Conference in December 2009 in Copenhagen, Denmark.² By providing accurate data information, remote sensing can provide early warning of environmental pollution and further offer invaluable services in

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¹ Emmanuel Nabet, *Legal Aspects of the Use and Applications of Remote Sensing in South East Asia*, 5 SINGAPORE J. INT'L & COMP. LAW, 156, 159-60 (2001).

² COP15: United Nations Climate Change Conference, <http://www.itu.int/en/osg/activities/Pages/2009-12-cop15.aspx> (last visited Jan. 25, 2011).

prompt assessment of possible damages and coordinating measures against such pollutions.

Although not a Party to the United Nations Framework Convention on Climate Change, Hong Kong joined as members of the Chinese delegation to Conferences of Parties to the Convention. "Given its limited role in global climate talks, Hong Kong had to focus on what it could achieve on its own to reduce carbon emissions."³ One of the proposals for the emission of carbon emissions is "to strengthen the control of emissions from . . . petrol and liquefied petroleum gas (LPG) vehicles, including the use of roadside remote sensing equipment and dynamometers for emission testing."⁴ The use of remote sensing is thus placed in an important position in dealing with climate changes. Hong Kong has been applying remote sensing in many other areas, for example, in slope engineering and safety system, and landslide risk management.⁵ An overview of ongoing remote sensing activities in Hong Kong will be further discussed in Part 2 of this article.

The extensive use of remote sensing activities does not necessarily result in a so-called "remote sensing law" in Hong Kong. As one of the most liberalized economies in the world, Hong Kong leaves the regulation of remote sensing activities to the market. Nevertheless, Hong Kong does have an Outer Space Ordinance, which deals with the launching and operation of space objects and the carrying on of other activities in outer space. Part 3 of the paper will examine the regulatory regime for remote sensing activities in Hong Kong. Several important aspects of remote sensing activities will be covered in this part, including space licensing and intellectual property issue. Part 4 of the paper elaborates on the issues of open access (transaction of remote sensing products). When it comes to the issue of open

³ Chi-fai Cheung, *HK's Role Limited, Yau Says*, SOUTH CHINA MORNING POST, Dec. 11, 2009, at 9.

⁴ LEGISLATIVE COUNCIL PANEL ON ENVIRONMENTAL AFFAIRS SUBCOMMITTEE ON IMPROVING AIR QUALITY, PROGRESS OF MEASURES UNDER PEARL RIVER DELTA REGIONAL AIR QUALITY MANAGEMENT PLAN TO ACHIEVE 2010 EMISSION REDUCTION TARGETS 3, CB(1)2437/08-09(1) (Jan. 2010).

⁵ R.K.S. Chan & T.M.F. Lau, *Slope Safety System and Landslide Risk Management in Hong Kong*, http://150.217.73.85/wlfpdf/14_chan.pdf (last visited Mar. 1, 2010) (on file with author).

access, this paper discusses a recent event in which Google decided to move its search engine from mainland China to Hong Kong. This paper will look into relevant legal issues involved in this significant event and its implication to mainland China and Hong Kong in relation to remote sensing activities.

The present paper concludes that remote sensing activities are vital to the sustainable development of Hong Kong and that in view of the particular situation in Hong Kong, the current regulatory regime is sufficient for remote sensing activities in the region.

II. REMOTE SENSING ACTIVITIES IN HONG KONG

While lacking in indigenous launching capabilities, Hong Kong has been able to actively carry out space activities in recent years. Due to its small geographical area, Hong Kong has largely limited its space activities and focused on the information aspect of space: telecommunications services, remote sensing, data, and information. The extensive use of satellite-related space activities in Hong Kong serves the sole purpose of economic development and the improvement of people's livelihood.⁶

Two major satellite companies in Hong Kong provide important telecommunications services. Operating a fleet of five satellites comprising *APSTAR I*, *APSTAR IA*, *APSTAR IIR*, *APSTAR V* and *APSTAR VI*, the APT Satellite Holding Limited ('APT Group') has been providing high quality transponder utilization service, satellite communication service and satellite TV broadcasting service to the broadcasting and telecommunication operators in Asia-Pacific, Europe, and the United States since 1992.⁷ Established in 1988, the Asia Satellite Telecommunications Company Limited (AsiaSat) has three in-orbit satellites, *AsiaSat 3S*, *AsiaSat 4* and *AsiaSat 5*, which are "monitored and controlled . . . by the state-of-the-art satellite control

⁶ Industrial and Commercial Affairs, http://www.cgcc.org.hk/b5/chamber/bulletin/files/AnnualArticle_1222675178.24654_IndustrialandCommercialAffairs.pdf (last visited Jan. 25, 2011).

⁷ APT Satellite Holdings Limited Company Profile, <http://www.apstar.com> (last visited Feb. 4, 2011).

facilities in Hong Kong including the Stanley Earth Station and the AsiaSat Tai Po Earth Station.”⁸

While telecommunications services are major part of space activities, remote sensing activities have been playing an increasingly important role in various areas of social life in Hong Kong. For example, an HRPT (High Resolution Picture Transmission) station for the reception of SeaWiFS (Sea-viewing Wide Field-of-view Sensor) ocean color data was installed at the Hong Kong University of Science & Technology (HKUST) in 1994, where the Institute for the Environment/Environmental Central Facility (ENVF/ IENV) is affiliated.⁹

More importantly, the Satellite Remote Sensing Receiving Station, an important facility of the Institute of Space and Earth Information Science of the Chinese University of Hong Kong CUHK), was set up to capture and process satellite sourced remote sensing data.¹⁰ The Station is “useful in monitoring the environment and natural disasters including landslides, subsidence, earthquakes, tsunamis, floods and typhoons, thereby reducing the risk of civilian casualties and economic loss.”¹¹ The commercial practice of the Station is exemplary for the discussion of the present paper.

III. REGULATORY REGIME IN HONG KONG

Hong Kong has one ordinance specifically dealing with outer space matters. The Outer Space Ordinance came out from localization efforts during the transfer period when China resumed its sovereignty over Hong Kong. This Ordinance confers licensing and other relevant powers on the Chief Executive to ensure the compliance with international obligations of the Peo-

⁸ AsiaSat About Us, <http://www.asiasat.com/asiasat/contentView.php?section=1&lang=0> (last visited Feb. 4, 2011).

⁹ See The Honk Kong University of Science and Technology, Welcome to the HKUST HRPT Satellite Ground Station, <http://envf.ust.hk/satop/> (last visited Feb. 3, 2011).

¹⁰ Satellite Remote Sensing Receiving Station, The Chinese Univ. of Hong Kong, Introduction, <http://www.iseis.cuhk.edu.hk/groundstation/eng-background.htm> (last visited Feb. 3, 2011).

¹¹ *Id.*

ple's Republic of China.¹² It covers the launching or procurement of launching of a space object or any activity in Outer Space. Remote sensing activities are obviously covered by this Ordinance. There are no other relevant remote sensing laws and/or policies in Hong Kong besides this Ordinance. The Hong Kong government takes a liberal approach, leaving the regulation of remote sensing activities to the market. As such, we may need to fall back on certain general legislation for the protection of remote sensing data in Hong Kong. Furthermore, it is essential to look into general practice of remote sensing activities in Hong Kong for legal guidance.

A. Privacy and Security Concerns

The easy availability of remote sensing data leads to a possible concern over privacy and security. "As data availability will be purely driven by market considerations, . . . there are real threats to the rights to privacy [and security] due to possibilities of industrial espionage and the potential use of imagery by anti-social groups."¹³

As far as the concept of "remote sensing data" is concerned, one may immediately think of the Personal Data (Privacy) Ordinance, Cap. 486. Unfortunately, this ordinance does not apply in this case as it only refers to the collection, storage, and use of personal/individual data; "such data are those that describe an individual and attribute things to an individual so that others can identify a particular individual. It applies to Data Users in Hong Kong, whether they are individuals, private companies or public bodies."¹⁴ At the moment, there is no comprehensive data protection law in Hong Kong.

¹² Int'l Law Ass'n, Berlin Conference (2004), Space Law Comm., *Report on the Legal Aspects of the Privatization and Commercialization of Space Activities: Remote Sensing and National Space Legislation*, 16, available at <http://www.ila-hq.org/en/committees/index.cfm/cid/29>.

¹³ KR Sridhara Murthi, *Commercial Availability of High Quality Remote Sensing Imageries: Legal Issues*, 5 SINGAPORE J. INT'L & COMP. LAW, 149, 153 (2001).

¹⁴ Implementation of Data Alignment Measures for the Alignment of Planning, Lands and Public Works Data: Final Report, Vol. 2I, at (1-9)-(1-10) (Mar. 2004, available at http://www.devb.gov.hk/filemanager/en/content_384/frv2I.pdf [hereinafter Final Report]).

In this regard, it might be useful to refer to general policy guidance. The Security Bureau is responsible for developing policies concerning the protection and handling of confidential government information. Four security classifications exist in Hong Kong, from highest to lowest in sensitivity: top secret, secret, confidential, and restricted documents.¹⁵ The above security classification does not necessarily mean that such documents will be denied access.

The Code on Access to Information defines the scope of information available for the public.¹⁶ Part 2 of the Code provides several situations when request of information may be refused: defence and security; external affairs; nationality, immigration and consular matters; law enforcement, legal proceedings and public safety; damage to the environment; management of the economy; management and operation of the public service; internal discussion and advice; public employment and public appointments; improper gain or advantage; research, statistics and analysis; third party information; privacy of the individual; business affairs; premature requests; and legal restrictions.¹⁷

B. Copyright Protection

While there is no specific legislation in Hong Kong on the protection of intellectual property rights in remote sensing data, we can still find support in the Copyright Ordinance (Cap. 528).¹⁸ Copyright has been broadly defined in the Ordinance to subsist in “original literary . . . [or] artistic works; . . . broadcasts; . . . and the typographical arrangement of published editions.”¹⁹ Furthermore, the Ordinance contains provisions regarding the protection of copyright in broadcasting using satellite. “Broadcast” in the Ordinance includes a transmission of visual images which “is capable of being lawfully received by members

¹⁵ Federation of American Scientists, Appendix F: Equivalent Foreign Security Classifications, http://www.fas.org/irp/doddir/dod/5200-1r/appendix_f.htm (last visited Oct. 20, 2010).

¹⁶ See Code on Access to Information, §§ 1.1-1.3 (effective Dec. 23, 1996) (Hong Kong), available at <http://www.access.gov.hk/en/code.htm>.

¹⁷ See *id.* §§ 2.1-2.18.

¹⁸ Copyright Ordinance, (2007) Cap. 528.

¹⁹ *Id.* § 2(1).

of the public in Hong Kong or elsewhere.”²⁰ While not expressly written down in the Copyright Ordinance, originality and creativity are two essential requirements for a work to enjoy copyright protection. Originality requires that the work is not copied from another work. Creativity further requires that at least a minimum degree of independent skill or judgment must have been introduced into the work by the author.²¹

The question is how to define remote sensing data. In this regard, we may need to go further to examine the factor of “creativity” in remote sensing data. The UN Principles relating to Remote Sensing of the Earth from Space in 1986 (UN Remote Sensing Principles) contains three terms: primary data, processed data²² and analyzed information.²³ There is no problem in finding that processed data and analyzed information involve human creativity by processing and analyzing the primary data and, therefore, enjoy copyright protection. Plenty of scholarly works have touched on the problem of copyright barriers to open access of remote sensing data.²⁴ As far as Hong Kong is concerned, this will not be a big problem since remote sensing documents in Hong Kong are largely accessible in a transparent manner. This issue will be further discussed in Part 4.

The Copyright Ordinance further defines Government copyright. “Where a work is made by an officer of the Government in the course of his duties, (a) the work qualifies for copyright protection . . . (b) and the Government is the first owner of any copyright in the work.”²⁵ As discussed below, the Hong Kong

²⁰ *Id.* § 8(1)(a).

²¹ STEVEN L. OBERHOLTZER, *THE BASIC PRINCIPLES OF INTELLECTUAL PROPERTY LAW* 35 (Brinks Hoffer Gilson & Lione, 2006).

²² See Principles Relating to Remote Sensing of the Earth from Space, G.A. Res. 41/65, at Principle I (b), U.N. GAOR, 29th Sess., 95th plen. mtg., U.N. Doc. A/Res/41/65 (Dec. 3, 1986) [hereinafter *Remote Sensing Principles*] (defining “processed data” as “the products resulting from the processing of the primary data, needed to make such data usable.”).

²³ *Id.* at Principle I (d) (defining “analyzed information” as “information resulting from the interpretation of processed data, inputs of data and knowledge from other sources.”).

²⁴ See, e.g., Lesley Jane Smith & Catherine Doldirina, *Remote Sensing: A Case for Moving Space Data Towards the Public Good*, 24 *SPACE POLICY* 22, 22-32 (2008).

²⁵ Copyright Ordinance of Hong Kong, (1997) § 182(1) Cap.528 (H.K.). Copyright Ordinance, Section 182 (1).

Government is one major body in producing remote sensing data, which no doubt enjoys the protection under the category of Government copyright.

When it comes to primary data, reference to the UN Remote Sensing Principles is needed for the definition: “[t]he term ‘primary data’ means the raw data that are acquired by remote sensors borne by a space object and that are transmitted or delivered to the ground from space by telemetry in the form of electromagnetic signals, by photographic film, magnetic tape or any other means.”²⁶ At this stage, the primary data needs further processing to make it usable. Some scholars believe that it simply constitutes an electronically stored collection of spatial and non-spatial data and involves no human creativity.²⁷ As such, it does not satisfy the requirement of originality for copyright protection.

IV. OPEN ACCESS

The 1986 UN Remote Sensing Principles provides for non-discriminatory access by sensed States to remote sensing data on reasonable cost terms.²⁸ While copyright protection is important for the production of intellectual property work, there are concerns over the undesirable consequence of restricting the use of copyright information by allowing pricing above marginal costs.²⁹ It would be interesting to examine whether such concerns exist in Hong Kong.

A. Transaction of Remote Sensing Products between Private Parties

As mentioned earlier, Hong Kong government leaves private remote sensing activities to the market. There is no restric-

²⁶ Remote Sensing Principles, *supra* note 22, at Principle I (b).

²⁷ See Dennis.S. Karjala, *Copyright in Electronic Maps*, 35 JURIMETRICS J., 395, 395-415 (1995).

²⁸ Remote Sensing Principles, *supra* note 22, at Principle XII.

²⁹ See William M. Landes & Richard A. Posner, *An Economic Analysis of Copyright Law*, 18 J. LEGAL STUD. 325, 326-27 (1989).

tion on the access to remote sensing data.³⁰ Taking the CUHK Satellite Remote-Sensing Ground Receiving Station as an example, it has completely commercialized its products. *ENVISAT*, an advanced polar-orbiting Earth observation satellite, was launched in 2002 by the European Space Agency.³¹ The ground station receives and processes data from the satellite, and provides useful information to government and private corporations in Hong Kong, South China and neighboring regions.³² A list of product prices is reproduced below:³³

a. Basic Price (# a minimum order of 4 consecutive scenes for programming acquisitions)

Product Mode	Price (Archive)	Price (Programming)
Image Mode	HK\$4300/scene #	HK\$5800/scene #
Wide Swath Mode	HK\$4300/scene	HK\$5800/scene
Alternating Polarization Mode	HK\$4300/scene #	HK\$5800/scene #

b. Extra Programming Fee (# one programming request includes: four consecutive Image Mode images, or four consecutive Alternating Polarization Mode images, or One Wide Swath Mode image)

Programming Mode #	Extra Programming Fee
Regular: Order received 16 days in advance	No extra fee required
Priority: Order received between 9-16 days	HK\$5000/per programming request #
Emergency: Order received between 4-9 days	HK\$25000/per programming request #

³⁰ See e.g., Anthony Yeh, *Development and Applications of GIS in Asia*, <http://www.gisdevelopment.net/proceedings/gisdeco/2004/keynote/gar.htm> (last visited Jan. 25, 2011).

³¹ Satellite Remote Sensing Receiving Station, *supra* note 10.

³² *Id.*

³³ Satellite Remote Sensing Receiving Station, The Chinese Univ. of Hong Kong, *ENVISAT Data ASAR Product*, <http://www.iseis.cuhk.edu.hk/groundstation/eng-price.htm> (last visited Oct. 20, 2010).

c. Discounts for Volume Orders

Description	Discount
Order of 10-15 scenes	5%
Order of 16-50 scenes	10%
Order of more than 50 scenes	15%

d. Non-profit Making Project conducted by Universities and Research Institutes

“To promote the applications and researches on Satellite Remote Sensing, additional discounts can be offered to Universities or Research Institutes for conducting non-profit making projects.”

From the above list, it is clear that remote sensing data producers are in the sole position to decide on transaction terms with relevant customers, such terms normally being on a market basis. This rightly reflects the long-held commercial tradition in Hong Kong.

B. Remote Sensing Data Exchange within the Hong Kong Government

“Under the Digital 21 Information Technology Strategy, the Hong Kong Government has made [remarkable] progress” in recent years aiming to establish itself as “a leading e-business community and digital city” in the world.³⁴ Geographical information systems (GIS) have been extensively employed in capturing, updating, disseminating, performing query, and analyzing remote sensing data, which was frequently used by the government departments in carrying out their services.³⁵

³⁴ Kenneth So Man Cheong & Victor Ng Wai Tak, *Spatial Data Exchange within the HKSAR Government – from a Perspective of a Data Agent*, FIG Working Week 2007, at 1, available at http://www.fig.net/pub/fig2007/papers/ts_1d/ts01d_02_so_ng_1339.pdf.

³⁵ *Id.*

The Data Alignment Measures (DAM) project, led by the former Housing, Planning and Lands Bureau of the Hong Kong Government, commenced on October 16, 2002 and completed in March 2004 aims to improve the efficiency and effectiveness in the exchange of spatial data among government departments and to address the deficiencies arising from data definition, compatibility of data format, data quality, data cost and turn around time.³⁶

The Lands Department, as the primary digital map data supply agency in Hong Kong, is responsible for the related data collection, creation, conversion, integration, and dissemination. It has been assigned to be the Data Agent of the three Common Spatial Units (CSUs), namely, Building, Lot and Road Center-line.³⁷ It works closely with the Data owners in implementing the following CSU standards:

(a) Enforce the specification of CSU - Ensure the data from the Data Owners conform to specification requirements with respect to data completeness, timeliness, symbology standard and file formats standard.

(b) Prepare metadata of each CSU and submit to hosting PD of the Metadata Catalogue System.

(c) Respond to Data Owners/Data Users requests for enquiries on exchanged data.

(d) Issue and maintain CSU IDs - Issue and maintain CSU IDs for the dataset, and ensure the ID's uniqueness to allow PDs to perform translation and matching of their data with respect to the CSU dataset.

(e) Administer dataset ownership;

(f) Observe license arrangement;

(g) Resolve CSU related issues brought up by Data Users and/or Data

Owners, if possible or refer the issues to DAM Management Committee if needed.³⁸

³⁶ Implementation of Data Alignment Measures for the Alignment of Planning, Lands and Public Works Data: Final Report (Volume 1 of 3), Main Text, at 2-1 (Mar. 2004), http://www.devb.gov.hk/filemanager/en/content_384/frv1.pdf.

³⁷ *Id.* at page 1-8.

³⁸ Final Report, *supra* note 14, at (1-3)-(1-4).

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-

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

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

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.

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-

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

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 Huzhong & 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-

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.com/news/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 phenomena 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 countries² 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,

¹ Earth Observation, the Environment, Space, and Remote Sensing Law in the Pacific Rim: Meeting and Live Broadcast, 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

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 referring 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

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

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

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 role 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 countries to mobilize their resources 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

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 Policy²⁰ 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

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

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 activities 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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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

sensing data, but is more of an advertisement model. Thus, Google is not acting as a “data provider” or “data distributor” in the commonly understood meaning of the term.

6. Japanese Laws and Regulations Concerning Remote Sensing Activities: A presentation by Prof. Setsuko Aoki, Professor, Faculty of Policy Management, Keio University

Comments: The paper is a timely and highly informative paper on the latest developments in Japanese remote sensing policy, as well as related laws and regulations, and the newly released space policy of Japan by the Strategic Headquarters for Space Development. The overall trend seems to indicate a mixture of government funded programs for the public good and the desire to promote commercialization, with a strong commercialization (or Public-Private Partnership) factor at present. It would be interesting to see how these trends will converge or be balanced in potential future law or regulation on remote sensing activities in Japan.

7. Practical Implications of International Space Law for the Operation of a Satellite fleet, with particular reference to the Disasters Charter: A presentation by Ms. Donna Lawler, Corporate Counsel, SingTel Optus Pty Limited

Comments: From a viewpoint of a practitioner, this presentation gives excellent examples and lessons on experiences in private satellite projects from development to launch and operation, and the surrounding legal issues. As mentioned earlier, Australia is active in the GEO community as an Executive Committee member (from the Meteorology Bureau) and in the field of forest carbon monitoring, and there might be possibilities for future commercial (or government and industry collaboration) activities on satellite development or applications related to this field as well.

8. Remote Sensing Issues as they Relate to Korea and the Pacific Rim: A presentation by Prof. Jae Gon Lee, Professor of Law, School of Law, Chungnam National University

Comments: The paper provides an overview of the space activities in Korea with a focus on remote sensing, and the relevant laws and regulations. For its relatively new history in space development, Korea has shown a dramatic progress in space technology. It also has a suite of legal instruments con-

cerning space activities in general, as well as laws that address the use of satellite remote sensing in law enforcement, particularly for environmental investigation and survey. As one who has been involved with Korea-Japan Earth observation cooperation from the very early days, the reviewer has great interest and admiration for the developments in Korea. On the subject of remote sensing and enforcement issues, there is a group studying Earth observation as evidence, which the reviewer would like to refer to in relation to this article. The reviewer would also like to know more details on the framework for collaboration with the industry in disseminating satellite data to the public.

9. Legal Aspects of Reducing Green House Gases Emitted by Aircraft Registered In Korea: A Ripple Effect of EU Initiative: A presentation by Prof. Won-Hwa Park, Korea Aerospace University

Comments: The paper elaborates on the issue of greenhouse gas emissions by aircraft, and the international regime governing this issue. The paper in particular points out the plans by EU to expand the existing greenhouse gas (GHG) cap and trade system to the emissions of aircraft operating to and from the area of the EU. It also points out certain legal problems concerning Directive 2008/101/EC. For instance, that its domestic air operation is subject to the Kyoto Protocol, whereas the scheme involves other airlines outside the EU who are not bound by the Kyoto protocol; and secondly, that there is the issue whether “aviation activities,” as defined in the Directive, can include aviation activities conducted in the airspace of the third countries and over the high seas. The reviewer would like to know if there have been any prominent legal counter-arguments in order to justify the EU initiative on these issues from the EU side.

10. South America: The Other Edge of the Pacific Rim: A paper by Dr. Sylvia Ospina, S. Ospina & Associates – Consultants, International Telecommunications / Space Law

Comments: This was a valuable contribution focusing on the four South American “Pacific Rim” countries, providing an overview of their space activities and relevant institutional arrangements and regulations. In the reviewer’s view, multilat-

eral formal frameworks such as the International Disaster Charter, APSCO, UN-SPIDER and the many others emerging, contribute to promoting collective national action, enhanced political and public awareness, and broader international participation, while the disadvantages are often that there is more focus on administrative issues and framework rather than effectiveness, and the multilateral nature of the framework tends to cause an imbalance to the reciprocal relationship between parties. On the other hand, programs with a more technical focus such as SERVIR, Sentinel Asia and SERVIR, often based on bilateral agreements, have an advantage of being more manageable and effective at the technical level. Sometimes duplication or redundancy may not necessarily have negative consequences, but may provide more robustness to the overall international effort by different initiatives compensating with and strengthening each other.

11. NASA's Earth Science Program: A presentation by Mr. James T. Mahoney, Lead Counsel, Space Operations Missions Directorate, NASA

Comments: The NASA data policy provides full and open access in a timely manner at no more than the cost of dissemination. This is also based on the strong technical and financial foundation that NASA has, and driven by the US policy that data or information funded by the government should be a public good. A clarification should be made on the terms of agreement on ALOS PALSAR shown in the presentation: These conditions seem to originate from two different frameworks – the international ALOS DATA Node and the GEO Supersite initiative – and should be distinguished as being under separate data policy arrangements. The former allows the US Data Node to distribute data under the US data policy; the latter is a different international arrangement where PALSAR data was provided to a GEO initiative called the “Supersite” as emergency data provision at no cost to scientists who participate in this initiative.

12. Access to Water on the Moon: Lessons from the Hawaiian Experience - Law and Practice: A presentation by Prof. Jon Van Dyke, University of Hawaii, School of Law

Comments: The paper discusses potential rules to govern access to water resources on the moon, based on the principles

and rules of Earth environmental law on access to water, and the lessons that we could learn from the principles governing water rights in Hawaii. The paper takes an institutional approach and discusses a framework similar to the International Seabed Authority. However the problem might be that the Moon Treaty is not a strong enough basis for building this regime upon it. Concerning the Precautionary Principles, the reviewer is of the view that the precautionary principle (or approach), being a concept that scientific uncertainty should not be the reason to delay action, only makes sense when even stronger emphasis is placed on coupling this approach with continuous monitoring efforts to reduce such scientific uncertainties. This is how environmental law has elaborated on the technique for procedural measures to cover monitoring or supervising activities. This may be a point to be taken into account when discussing a possible new regime, or principles in guiding such a regime, for the development of resources on the Moon and other celestial bodies.

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