A Brief Survey of Remote Sensing Law Around the World

Prof. Joanne Irene Gabrynowicz
Editor-in-Chief Emerita, Journal of Space Law
Visiting Professor, BIT School of Law
Professor Emerita, University of Mississippi

Department of Commerce/National Oceanic and Atmospheric Administration
Advisory Committee on Commercial Remote Sensing

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• Different kinds of licenses
  – Satellite operations
  – Ground stations
  – Data use

• Space farers and emerging spacefarers
  – Shifting dichotomy
    • Spacefarers/Developed Nations and Nonspacefarers/Developing Nations
    • Some developing nations are now spacefarers
      – Algeria, Brazil, Nigeria, e.g.
Different “Drivers”: Space Segment, Ground Segment, Data Stream

- **Space Segment**
  - Cold War Driver
  - Partial Cold War Driver
- **Ground Segment**
  - Increased in Globalization Era
- **Data Stream**
  - Globalization Era Driver
Background: Kinds of Remote Sensing Law and Policy

- General, global observations
  - Disasters Charter, e.g.

- Major remote sensing nations
  - Space segment focused
    - Canada, Europe, France, India, Japan, Russian Federation, e.g.

- Non-remote sensing nations
  - Ground segment focused law
    - UK, e.g.
The Big Picture: Land Data Distribution Policies

1972 - 1984: Foreign policy

1984 - 1992: Commercial policy

1992 ~ 2004: “Commercial” and environmental policy

Why

To

By

Foreign policy

Commercial policy

“Commercial” and environmental policy

Allies and nonaligned nations

Commercial market

National security and environmental users

Government

Quasi-private

“Private” and Government

To
The Big Picture: Distribution Policies and Rationales

~ 2004 - Present
Survival of, and economic justification for, space systems. New technologies, operations could change this.

As expanded a user base as possible within increased national security restrictions. Low to medium resolution data = open access and free of cost. High resolution data = restricted and at commercial prices.

By whomever can succeed, but tendency to be some form of government world-wide. New technologies, operations could change this.
General Observations

• Driving force of legislation is compliance with treaties and international obligations

• U.S. law is apparent standard
  – Not to the "letter" but with due consideration

• Hybrid public - private environment
  – Law will not change this

• Space segment vs. ground segment
  – Satellite vs. data focus
    • U.S. vs. Europe, for example

• Growing major trend
  – medium to low res data open access and free of cost
  – hi-res data restricted and at commercial prices
• **Chinese Brazilian Earth Resources Satellites (CBERS)**

• **Serial Protocols and MOU**
  - Wide ranging provisions for implementation, operations, IP, ground stations, data commercialization criteria, training specialists, applications, dispute resolution, international cooperation, etc.

• **Data policy**
  - Governed by contract, consultations, commercial agreements, etc.
  - Can agree to distribute data free of charge
  - Timely data sharing for natural disasters
Canada

• Data Access Control Policy
  – “transactional”
• Operations license: public, private, hybrid
• Case-by-case review
  – “shutter control”
  – tasking records
  – notify re: substantial foreign agreements and change in operational characteristics
  – need permission to transfer ownership, etc.
• Very similar to U.S. law
Europe

- Operations and data inextricably intertwined
  - No private systems or licensing, per se
  - "commercial" means what is done, not who does it
  - Hybrid public - commercial systems
    - Government systems operate commercially
- Data driven, but growing focus on space segment
- Multilateral agreements on satellite-by-satellite basis, e.g., Envisat, ERS-1, ERS-2, etc.
- Maastrict Treaty, agriculture and remote sensing
Joint Principles Sentinel Data Policy

- **Objective:** maximize beneficial use of EO data and information
- **Anybody can access**
  - no difference between public, commercial, scientific, European or non-European users
- **Free data licenses**
- **Available free via a "generic" online access**
  - subject to user registration, accepting terms and conditions
- **Additional tailored access modes and conditions**
  – on the European Earth monitoring program Copernicus (previously known as Global Monitoring for Environment and Security GMES)
  – Objective: provide data and information services for environmental and security applications tailored to user requirements
• **Data Availability Directives:**
    • Continues to evolve, guidelines (2012)

• **Directives on IPR and data protection:**
  – “Copyright Directive” (2001/29)
  – “Database Directive” (96/9)

• **Metadata:** Data Specs; Data Service and Sharing; Network Services
France

- Data driven
  - Focus: return on investment of public funds
  - Open civil regime
- *SPOT* considered "privatized" not "commercialized"
- LOI no. 2008-518 du 3 juin 2008 relative aux opérations spatiales
“primary space-based data” must be declared to the administrative authority
- Determination is made that data does not harm foreign policy or defense interests
- Measures may be prescribed to safeguard these interests
- 200,000€ fine for noncompliance

Provisions do not apply to
- Ministry of Defense activities
- Satellite operations
- Data reception
• Three kinds of licenses
  – satellite operation
  – general data distribution
  – specific data transactions
• Two-tiered “security data policy” analogous U.S.
• National security; commercial secondary
  – Data distribution mechanism creates system in which operator (“Betreiber”), distributor (“Datenanbieter”) or operator/distributor (“Betreiber zugleich Datenanbieter”) will be licensed
  – Required to implement a “geomatrix” provided by government
    • includes check list to determine transaction sensitivity
    • potential liability if a distribution mistake is made
      – Penalties may include incarceration.
2011 Revised Remote Sensing Data Policy (RSDP)

- Comprehensive; space and ground segment driven; catalyzed by availability of hi-res imagery on-line

- Low resolution data 1 meter and coarser is unrestricted
  - Distributed on “non-discriminatory” and “as requested” basis

- High resolution data 1 meter and finer is restricted
  - Still screened and cleared by appropriate agency

- No longer need clearance to use data
  - Government ministries, departments, R&D institutions, educational and academic institutions
  - public sector, autonomous bodies

- Private sector agencies supporting development
  - Need recommendation of a government agency
<table>
<thead>
<tr>
<th>Japan</th>
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<tr>
<td><strong>2008 Japan’s Basic Space Law</strong></td>
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<td>- establish data use system in 1 - 2 years</td>
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<td>- Still pending; impacted by frequent political changes and natural disasters</td>
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<tr>
<td>- Collect User Opinions</td>
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<td>- User and supplier coordination committee</td>
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<tr>
<td>- More User-Friendly Satellite Data Use System</td>
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<td>- make the most of private sector current assets and know-how</td>
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<td>- Make Standardized Data Policy</td>
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<td>- balance limits on distributable resolution and price with publicly funded data as widely as possible</td>
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<td>- “analyzed information” policy</td>
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<td>- “Guardian of the Environment” concept</td>
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| **2010 Important Measures in Space Activities: Strategic Space Policy to Promote Japan’s Growth** |
| - Promotes |
|   - use of remote sensing satellites to enhance economy and environment |
|   - increased utilization of data |
• Proposal for standalone remote sensing law not accepted until recently
• 3rd Basic Plan for Space Activities to be adopted in December 2014
  – Provisions
    • Data Policy Act
      – Catalyzed by successful launch of commercial high resolution satellite
    • Space Activities Act
• Space Activities Act will go to the Japanese Diet in 2016 at the earliest
• All subject to pending general election
Russian Federation (CIS)

- Resolution higher than 2m per pixel images of Russian territory in process of being legalized
  - “restricted areas” specially designated by military and Federal Security Service will remain classified

- Sale of high resolution satellite imagery
  - Historical conflicts between intelligence and commerce
  - Requests for lists of available images and image orders have been denied, delayed and canceled due to national secrecy
    - Particularly pre-1992

- Operations
  - Broad federal legislation
  - Licensing, certification, liability, safety, insurance and government control
  - License required, few specifics: insurance
  - Protects IP and commercial secrets of foreign entities operating under Federation's jurisdiction
  - RS includes environmental monitoring and meteorology

- Different rules over time, e.g., SPIN, ALMAZ, etc.
United Kingdom

• Ground-segment focus
  – Space segment focus follows later

• House of Lords
  – “Main effort should be ground and user segment”
  – Specialize in radar
  – National data distribution network
  – Support postgraduate education in remote sensing and digital cartography

• National legislation: Space Act
  – No specific mention of remote sensing
  – Authorizes government to require licenses
• 1992 Land Remote Sensing Policy Act
  – Public sector and environmental focus
  – Public and private distinction
  – Commerce Department licenses and regulates private systems
    • Company must disclose amount of government resources that went into launch or operation of the system
      – Fully government funded: all raw data available on nondiscriminatory basis
      – Entirely privately funded: data provided according to reasonable commercial terms and conditions. Data must be made available to a "sensed state"
      – Partial government support: some access to raw data on nondiscriminatory basis
        » Case by case basis with provisions included in license
## U.S. Remote Sensing Data Policy

### The Public-Private Spectrum for Data Access Policy

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<th>Hybrid</th>
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- **Public**
  - All Tax Money
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- **Hybrid**
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- **Private**
  - All Private Money
  - Access to sensed states only on commercial terms
Looking Ahead: New Phase?

• Commercial, Private sector
  – New technologies, operating processes
    • Near real time
      – Satellite optical and radar imagery acquired within hours of collection with agreement for first priority charges. e.g.
    • Constellations
      – 24 earth imaging satellites at 1/3+/- meter, e.g.
    • Smallsats
    • Six month review period after operations begin

• Governments
  – More bilateral agreements
    • Brazil and China, e.g.
  – IGOs
    • GEO, e.g.
  – Continuing low cost to free of cost medium to low resolution

• New data distribution policies? Rationales?
Thank you.

Questions?
Comments?