Access to satellite-based remote sensing data
Overview of rules and practices

Gérard Brachet
Space Policy Consultant
Former CEO of SPOT IMAGE (1982-1994)
Former Director General of CNES (1997-2002)
Former Chair of COPUOS (2006-2008)
Access to satellite-based remote sensing data
Overview of rules and practices

A few basic principles:

- Collecting remote sensing data from outer space is allowed under the Outer Space Treaty of 1967 (Article I and II).

- UNGA Resolution 41/65 of 1986, “Principles Relating to Remote Sensing of the Earth from Outer Space”, does not include any restriction on collecting remote sensing data from outer space.

- But it states that remote sensing activities shall be conducted on the basis of respect for the sovereignty of States and peoples. (Principle IV).
Access to satellite-based remote sensing data
Overview of rules and practices

Other key aspects of UNGA Resolution 41/65 of 1986:
- International cooperation is encouraged (Principles V, VI, VII and VIII)
- Protection of natural environment is a key objective of remote sensing from space (Principles X and XI)
- Access by a sensed State to information resulting from remote sensing data is guaranteed on a non-discriminatory basis (Principle XII)
Access to satellite-based remote sensing data
Overview of rules and practices

UNGA Resolution 41/65 was established in 1986, at a time when civilian remote sensing satellites produced 10 to 15m ground resolution imagery (Landsat, SPOT, IRS-1), far worse than military reconnaissance satellites.

Image of the Chernobyl nuclear plant collected by SPOT-1 on May 6, 1986.

Expert meeting "Heritage from Space for Peace", UNESCO, 7 June 2022
Access to satellite-based remote sensing data
Overview of rules and practices

Analysis of the SPOT-1 image of the Chernobyl nuclear power plant collected on 6 May 1986

*Crédit CNES et SPOT IMAGE*
Access to satellite-based remote sensing data
Overview of rules and practices

However, it was clear then that technology advances would continuously increase the performance of remote sensing satellites in terms of ground resolution and agility (for imaging satellites) and in terms of sensitivity and accuracy for sounding instruments.

During the following years, launch of radar imaging satellites ERS-1, Radarsat) confirmed this trend.

...And in 1998, the launch of Ikonos (0,8m ground resolution) by Space Imaging opened the era of very high-resolution imaging satellites.
Access to satellite-based remote sensing data
Overview of rules and practices

Image resolution is not the only parameter to consider. Multiple oblique viewing leads to stereoscopic observation and to 3D description of areas of interest.

Illustration: High resolution oblique imagery of Mont St Michel from the Pléiades-1A satellite, 2012 ©CNES
Access to satellite-based remote sensing data
Overview of rules and practices

Another illustration: The Coliseum, Rome, as seen from space. Image taken by one of the Airbus D&S Pléiades-Neo satellite in May 2021 ©Airbus D&S
Access to satellite-based remote sensing data
Overview of rules and practices

In terms of international cooperation, a significant step forward was the establishment of the International Charter Space and Major Disasters in 2000. This initiative was introduced by CNES and ESA at the UNISPACE III Conference in Vienna, July 1999. Today, 17 space agencies and organizations have signed the Charter and actively contribute. The International Charter aims at facilitating access of rescue forces to satellite-based services when major disasters happen. Its satellite imaging component is widely used.
Access to satellite-based remote sensing data
Overview of rules and practices

Crisis situation mapping following the destruction of New Orleans by Hurricane Katrina on September 2, 2005

SPOT-5 images
Image analysis performed by SERTIT
Access to satellite-based remote sensing data
Overview of rules and practices

Impact map of a major explosion in the Port of Beirut (Lebanon) on 4th of August 2020

Pléiades-1A satellite images, 8 May and 5 August 2020, ©CNES, Distribution Airbus D&S
Image analysis performed by SERTIT

Source: ESA web site
https://www.esa.int/Applications/Observing_the_Earth/International_Charter_for_disasters_20_years_on
Access to satellite-based remote sensing data
Overview of rules and practices

Flood in Germany and Belgium along the rivers Rhine and Meuse, July 2021
Flooded areas are in red (comparing Sentinel 1 radar images collected on 3 and 5 July 2021)

Source: ESA web site
https://www.esa.int/Applications/Observing_the_Earth/International_Charter_Space_and_Major_Disasters
Access to satellite-based remote sensing data
Overview of rules and practices

Flood in Germany and Belgium along the rivers Rhine and Meuse, July 2021
Flooded areas are in red (combining Sentinel 1 radar images collected on 3 and 5 July 2021)

Source: ESA web site
https://www.esa.int/Applications/Observing_the_Earth/International_Charter_Space_and_Major_Disasters
Access to satellite-based remote sensing data
Overview of rules and practices

Synthetic Aperture Radar imagery, used in the differential interferometry mode, can also provide unique information on terrain displacement following an Earthquake.
Access to satellite-based remote sensing data
Overview of rules and practices

The Charter calls for « free of charge » delivery of images by Charter signatories to rescue organizations.

This is easy to implement for government-sponsored satellites such as Landsat in the United States or the Copernicus satellites in Europe.

However, this commitment does not apply to commercial operators.
Access to satellite-based remote sensing data
Overview of rules and practices

Today there are many private operators of remote sensing satellites, operating mostly very-high-resolution imaging satellites (less than 1 or 2 meters), a market segment that is considered 100% «Commercial».

Access to imagery collected by these commercial satellites require contractual arrangements with their owners which may (or not) include certain discounted prices, particularly for images that are not current.

Another road to access these very-high-resolution images at low price is to have them sponsored by certain national authorities.
Access to satellite-based remote sensing data
Overview of rules and practices

Thank you for your attention