"Pure Data" or How Remote Sensing Results Can Be Used in the Litigation?

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Abstract

Remote sensing satellites are applying in different fields for a long time. The last two decades have shown a growing trend towards an application of the remote sensing results in the litigation. In territorial, maritime and other disputes parties start using images acquired by remote sensing satellite as an evidence. Unfortunately, not all international judicial institutions take the remote sensing results into account in its decisions. One of the main obstacles is probability of providing falsified information by the numerous service providers in the remote sensing area. On the one hand remote sensing technologies are available to everyone, on the other hand, quality of such images or credibility can be challenged by the disputing party or by the Court itself.

To resolve this problem a special universal independent organization-provider of the "pure data" can be created. Also, international space law is silent about possible ways how to share of the remote sensing data or whether it is necessary to establish a special fund. By contrast, States have already started to make governmental funds of remote sensing results at the national level.

This paper attempts to suggest the best way of the consolidating results which have been made by the governmental, international non- and intergovernmental organizations for creating the world fund of remote sensing data. The article consists of 3 parts: analysis of the case study, forms of international cooperation of the States and organizations on the sharing/buying of the remote sensing date and international legal aspects of this issue.

Acronyms/Abbreviations

ITU – the International Telecommunication Union/

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OST – the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies 1967.
UN OOSA – the United Nations Office for Outer Space Affairs.
UN COPUOS – the United Nations Committee of the Peaceful Use of Outer Space.

Introduction

Remote sensing and remote sensing of the Earth today is one of the most popular XXI century's technologies applied by the humanity in economic use. Remote sensing technologies are actively used in different fields of our life: agriculture, climate monitoring, hydrography, geology, mineralogy, land use, safely providing information about locations that are too difficult or dangerous to access directly.
Notion of the remote sensing of the Earth means the use of satellites to search for and collect information about the earth (Oxford Dictionary). The other meaning is that the remote sensing is the science of gathering data about objects or areas from a distance (the official web site of the UN OOSA[1]). At the same time, remote sensing technologies can be used not only in satellites, but in drones, airplanes, CubeSats, stratospheric balloons and other special vehicles. In the framework of the article, firstly, the results of remote sensing of the Earth by satellites will be analysed. Moreover, using and application of the remote sensing's pictures in the litigation at the national and international levels will be estimated.
It is important to underline that there are different similar in context researches of this topic, for instance of Hodge,[2] Slonecker, Shaw and Lillesand[3] or Wolfinbarger.[4] Some chapters of the handbooks deal with the regulation of the remote sensing technologies as Dunk and Tronchetti[5] or Hobe.[6] However, there was not any attempt to suggest the creation of a

1 The official web site of the UN OOSA. Remote Sensing, https://www.unoosa.org/oosa/en/ourwork/topics/remote-sensing.html, (accessed 31.08.20).
2 Sh. Hatch Hodge, Satellite Data and Environmental Law: Technology Ripe for Litigation Application, Pace Envtl. L. Rev 14 (1997) pp.691–731.
3 E. Terrence Slonecker, Denice M. Shaw, Thomas M. Lillesand, Emerging Legal and Ethical Issues in Advanced Remote Sensing Technology, J. of Photogrammetric Engineering & Remote Sensing 64 (6) (1998) 589–595.
4 S. Rae Wolfinbarger, People Make the Pixels: Remote Sensing Analysis for Human Rights-Based Litigation, Dissertation for the Degree Doctor of Philosophy, the Graduate School of The Ohio State University, 2012.
5 F. Tronchetti, Legal aspects of satellites remote sensing, in: F. von der Dunk, F. Tronchetti, Handbook of Space Law, Edward Elgar Publishing, Cheltenham, 2015, pp.501–553.
6 S. Hobe, Space Law, first ed., Nomos, Baden-Baden, 2019.

special international organization which could be responsible for the gathering the remote sensing data and providing it to all parties concerned.

1. Legal Aspects of Remote Sensing

Remote sensing is regulated at international (international space law and international telecommunication law) and national (national space and telecommunication legislation and policy) levels. Both levels are interrelated and will be analysed below.

1.1. International Law and Remote Sensing

International space law is a separate branch of the international public law, regulating the use and exploration of the outer space, including the Moon and other celestial bodies and provides basic principles which can be applied to remote sensing.

Firstly, it is the OST 1967 which stipulates that "the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development" (para 1, article I), and provides the principle of *freedom of exploration and use* of outer space on the basis of equality (para 2, article I) as well as *international co-operation principle* (para, article I, IX). The OST 1967 enshrines the international responsibility for national space activities (article VI) and international liability for the damage caused by a space object "on the Earth, in air space or in outer space, including the Moon and other celestial bodies" (article VII). According to the Treaty state, which has registered a space object, "*shall retain jurisdiction and control over such object*" and ownership, which "*is not affected by their presence in outer space or on a celestial body or by their return to the Earth*" (article VIII).

Secondly, there are the Convention on International Liability for Damage Caused by Space Objects 1972, which specify the article VII of the OST 1967 on the international liability, and the Convention on Registration of Objects Launched into Outer Space 1976, stipulating the requirements to the registration procedure of space objects (holding a national registry and providing information to the Register[7]), etc.

Another block of international treaties is the ITU documents. These documents include charter documents (the Constitution and the Convention) and the Radio Regulations which are aimed at using of the radio-frequency spectrum and satellite orbits (*the Radio Regulations 2020*). The specialists of international telecommunication law note that:

> *the mission of ITU in the field of radiocommunications, which includes satellite telecommunications, can be described as ensuring*

7 The UN OOSA is responsible for the Registry.

> *rational, efficient, economical, and equitable use of the radio-frequency spectrum and associated satellite orbits in the interference-free environment*.[8]

To regulate the radio-frequency spectrum and satellite orbits ITU has special international regime, which includes: allocation of bands of the radio-frequency spectrum, allotment of radio frequencies and registration of national assignments.

The interesting example of the remote sensing regulation is the Convention on Transfer and Use of Data of Remote Sensing of Earth from Space 1978 which was signed pro-Soviet States and has (had) regional force. It is considered that it does not work in practice.

Finally, there is a soft law document drafted by UN COPUOS in 1986 and titled "Principles Relating to Remote Sensing of the Earth from Outer Space" (hereinafter – the Principles 1986). The Principles 1986 is the most interesting document as it is entirely devoted to remote sensing. Unfortunately, it is not binding from the legal value but States-drafters try to follow the Principles in practice (at the national level) as a *comitas gentium*.

The Principles 1986 consists of 15 principles including definitions: remote sensing, primary data, processed data, analyzed data and remote sensing activities.

It is important to underline the following principles:

- "Remote sensing activities shall be carried out for the benefit and in the interests of all countries" (principle II);
- Conformation to international law (principle III);
- Full and permanent sovereignty of all States and peoples over their own wealth and natural resources (principle IV);
- International cooperation (principle V);
- The protection of the Earth's natural environment (principle X);
- The protection of mankind from natural disasters (principle XI);
- The access to the primary data, the processed data and the available analysed information of the sensed State on a non-discriminatory basis and on reasonable cost terms (principle XII).

All these documents regulate the activity on remote sensing of the Earth from outer space. But none of these documents do not contain provisions on the using images in litigation. Only the principle VI of the Principles 1986 contains prescription:

8 E. Morozova, Y. Vasyanin, International Space Law and Satellite Telecommunications, in the Proceedings of the round-table discussion "Current Issues of International Space Law" of the XVII Annual Blischenko Congress. April 13, 2019, p.124.

> *to establish and operate of data collecting and storage stations and processing and interpretation facilities in particular within the framework of regional agreements or arrangements wherever feasible in order to maximize the availability of benefits from remote sensing activities.*

One of the examples in that area could be the International Charter Space and Major Disasters that came into operation in 2000. Today this non-binding charter gathers 17 members including space agencies proving its satellites (61 satellites) for collecting and sharing of the information in the event of major disasters on the free humanitarian and charitable basis.

At the national level States shall follow the article VI of the OST in the context of international responsibility for their national activities carried out by governmental or non-governmental entities or through international organizations to which such States are parties and assure that such activities are conducted in accordance with these principles and the norms of international law, irrespective of whether such activities are. This provision is reiterated in the principle XIV of the Principles 1986.

1.2. National Law and Remote Sensing

States draft and enact special national legislation both for space activities' regulation and in the context of the using of remote sensing results in litigation. Both regulations are important. Firstly, regulation of remote sensing of the Earth from outer space which contains requirements for licensing, operation, foreign access to commercial remote sensing space capabilities or use the commercial results by government. Secondly, it is the regulation of using the images in litigation. The special provisions of such use could be contained in the national codes of procedure. In accordance with the caselaw, disputing parties can use remote sensing images as an evidence but in the complex of all evidences.

For instance, such provisions can be found in the Arbitration Code of Procedure of Russian Federation (art. 64 "Evidences"), the Civil Code of Procedure of Russian Federation (art. 71 "Written evidence" – annexes to the protocols of procedural actions (diagrams, maps, plans, drawings)) etc.

Moreover, the Law of the Russian Federation "About Space Activity" states that the Russian Federation ensures the creation and maintenance of the federal data fund (article 31). This article was enacted in 2018 and in 2019 the Resolution of the Government of the Russian Federation "On the determination of the operator of the federal fund of data for remote sensing of the Earth from space and his powers" with "the Rules for Interaction of the Federal Fund for Earth Remote Sensing Data from Space with Other State Funds" were drafted. Unfortunately, these resolutions are criticized because of the proposed archaic procedure of the sharing of data.

In the USA there are number of special national legislation and policy concerning remote sensing. For instance: Land Remote Sensing Commercialization Act of 1984, Land Remote Sensing Policy Act dated

October 28, 1992; U.S. Commercial Remote Sensing Policy dated April 25, 2003. For instance, in the last document it is said that:

> *The fundamental goal of this policy is to advance and protect U.S. national security and foreign policy interests by maintaining the nation's leadership in remote sensing space activities, and by sustaining and enhancing the U.S. remote sensing industry.*[9]

The USA is not a single state having the remote sensing legislation and policy. This list includes Canada, France, Japan, India, China, Germany, as well as the European Union.

2. Forms of International Cooperation of the States and Organizations

Co-operation between government/State(s), court and specialized organization depends on different factors and parties of the litigation.

The easiest procedure is at the national level. The court should be guided by the provisions of the procedural law. There could be civil, criminal, arbitration processes. Case law also should be taken into account, that is typically for common law jurisdictions.

> *Through the Land Remote Sensing Policy Act of 1992, the U.S. Congress directed the Department of the Interior to establish a permanent Government archive containing satellite remote sensing data of the Earth's land surface and to make this data easily accessible and readily available.*[10]

If we talk about inter-States disputes the situation is to become more complicated. First of all, every court has its own rules of procedure where it is said what kind of evidence it can except. Moreover, it seems hardly likely that such kind rules of procedure of statute of the court will have the list of authorized organizations or entities which can give the true images of the remote sensing. Obviously, that each party will try to present evidence by itself, and a court will decide on the base of its statute, may be expertise and research of the images and *ex aequo et bono*.

To resolve any dispute parties must know where they can buy data. Often there are different providers of the remote sensing data - governmental and non-governmental. A good example – the U.S. practice. The Secretary of Commerce is authorized by statute to license commercial remote sensing satellite operations, and this authority has been delegated to NOAA's

9 U.S. Commercial Remote Sensing Policy dated April 25, 2003. URL: https://www.nesdis.noaa.gov/CRSRA/files/Commercial%20Remote%20Sensing%20Policy%202003.pdf (accessed 31.08.20), p.2.

10 Official website of the National Satellite Land Remote Sensing Data Archive. URL: https://www.usgs.gov/centers/eros/science/national-satellite-land-remote-sensing-data-archive?qt-science_center_objects=0#qt-science_center_objects (accessed 31.08.20).

Commercial Remote Sensing Regulatory Affairs Office.[11] Another platform (approach) is the National Satellite Land Remote Sensing Data Archive which resides at the U.S. Geological Survey's (USGS) Earth Resources Observation and Science (EROS) Center.

At the same time growing of space actors leads to the establishment of the new international commercial companies. One of the sources, analyzing the remote sensing data from different technical tools, calls the following companies suggesting its services for the agricultural sector: Geosys, Planet Labs, Astro Digital.[12] Google use the satellite data for its maps and many other companies all over the world. In our opinion, if for the personal use and for the economy this situation is considered very well, for the tough litigation processes it is not good.

3. Case Study

Even though the case law of inter-States disputes faced with the application of remote sensing images in numerous cases till the end of the XX century international courts did not like to use it. The abovementioned point of view can be confirmed by case law of international judicial organizations.

Mali and Burkina Faso case was the first where the satellite imagery was used as an evidence before the International Court of Justice (hereinafter – the ICJ) in 1986.[13] "The Court held that maps are not title of territoriality until both parties assent to it".[14]

In the case "Cameroon v. Nigeria" (2002)[15] the ICJ used the satellite imagery as conclusive evidence on the territoriality dispute of Tispan village. Cameroon interpreted the same data differently to establish the reverse.

Another practice includes: case concerning Kasikili / Sedudu Island between Botswana v. Namibia (a boundary dispute, in which the ICJ did not rely on the satellite imagery so much),[16] "Qatar vs Bahrain" (2001),[17] and "Eritrea/Yemen" (1999), "Nicaragua v. Honduras" (2007) or "South China

11 Official website of the NOAA's Commercial Remote Sensing Regulatory Affairs Office. URL: https://www.nesdis.noaa.gov/CRSRA/ (accessed 31.08.20).

12 I. Ivanov, Remote Sensing Market Map: 20 Remote Sensing Startups and the Varied Data That Fuels Them, 2017. URL: https://agfundernews.com/remote-sensing-market-map.html (accessed 31.08.20).

13 Frontier Dispute (Burk. Faso v. Mali), 1986 I.C.J. 3 (Order of Jan. 10).

14 S. Chaturvedi, Satellite Imagery in International Human Rights Litigation. URL: https://www.aaas.org/news/satellite-imagery-international-human-rights-litigation (accessed 31.08.20).

15 Land and Maritime Boundary between Cameroon and Nigeria (Nig. v. Cameroon), 1999 I.C.J. 31 (Mar. 25).

16 Kasikili/Sedudu Island (Bots. v. Namib.), 1999 I.C.J. 1045 (Dec. 13).

17 Maritime Delimitation and territorial Questions between Qatar and Bahrain (Qatar v. Bahr.), 1994 I.C.J. 112 (July 1).

Sea Arbitration" (The Republic of the Philippines v People's Republic of China) (Award) (2016) PCA Case No 2013–19 (South China Sea).
The International Tribunal for the Law of the Sea allowed the use of satellite imagery in the case Bangladesh v. Myanmar (2012).
Chaturvedi lists more examples:

> *evidence of war crimes in Darfur, Sudan were gathered through satellite images; Human Rights Watch, Arabia, identified 340 distinct sites in Aleppo, Syria where the opposition had used barrel bombs and airborne weapons to destroy residential neighborhoods through satellite imagery, something the opposition had denied it in the press. On the basis of the said satellite imagery, the UN Security Council demanded that all parties "immediately cease all attacks against civilians*.[18]

We can see that using images of remote sensing in litigation is becoming and has become normal practice in the several types of litigation such as territorial, maritime and other disputes in comparison with first attempts to use it.

Results

The main feature of any national legislation on the remote sensing results' usage in the litigation process that a court takes remote sensing images as an evidence only in accordance with strict requirements (reliability, scientific data, the consent of the parties) and if it is required a court ask for additional expertise of the images in different governmental or non-governmental specialized entities.
Tronchetti writes that "*the use of remote sensing data as evidence in municipal and international courts has also increased, although such a practice is still the subject of controversy*".[19] Why? It depends on the following:

- different standards and requirements (F. Tronchetti);
- different providers / not good providers (if the only one);
- different interpretation of disputing parties;
- scientific expertise – dependence on a human judgment.

We can agree that one of the main obstacles here is probability of providing falsified information by the numerous service providers in the remote sensing area. The State party can change the image or asked the provider to correct

18 S. Chaturvedi, Satellite Imagery in International Human Rights Litigation. URL: https://www.aaas.org/news/satellite-imagery-international-human-rights-litigation (accessed 31.08.20).

19 F. Tronchetti, Legal aspects of satellites remote sensing, in: F. von der Dunk, F. Tronchetti, Handbook of Space Law, Edward Elgar Publishing, Cheltenham, 2015, pp.505.

the image. Moreover, there is very wide remote sensing market with lots of start-ups, which all can provide the necessary data.
Another problem is that courts at the same time do not have the specific technical requirements to such images: its size (the permissible level of resolution of satellite images) and type of enhancement a particular image undergoes.[20]
Moreover, the Court cannot bear in mind such images, from the other hand in litigation a court can try to estimate itself or to find a specialist to do it. Some authors suggest drafting special procedures in this context which national and international court will apply. But all of this will stress additionally judicial systems and courts.

Conclusion

That is why it is suggested to create a special universal independent organization-provider of the "pure data", which can be used by disputing parties. The provider should be independent: it could be international non-governmental organization like the International Charter Space and Major Disasters or consortium of the commercial space entities. Parties, which will want to provide the images to the Court, will have to pay for the image. At the same time, the Court will know that such kind of images will be veritable. This organization will be able to sell the images for other purposes and not only to States. It can also be served as the independent expert organization in reaching SDGs: for monitoring, Earth observation and scientific purposes. This organization will maintain the world fund of the remote sensing information. Bearing in mind growing number of space actors and popularity and effectiveness of the remote sensing the organization can become a good platform for governmental and governmental cooperation.

20 S. Chaturvedi, Satellite Imagery in International Human Rights Litigation. URL: https://www.aaas.org/news/satellite-imagery-international-human-rights-litigation (accessed 31.08.20).