Environmental Applications of Remote Sensing Technology

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Launch of Sputnik (4 October 1957)

UNISPACE I (14-27 August 1968)

COPUOS recommended the issue to be placed on the agenda of legal subcommittee

Working group was formed
Proposals & Working Papers

- June 1974 – France & U.S.S.R.
  (local / global data, prior consent with the exception of disaster management and environmental protection)
- October 1974 Argentina & Brazil (prior consent of the sensed state)
- February 1975 U.S.A.
✧ Outer Space Treaty (Art. 1/prg. 2)
Outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies.

✧ Universal Declaration of Human Rights (Article 19)
“Everyone 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.”

✧ “We expect to have access to and to use data about the natural environment of this Earth in any case. We believe that it is strongly in the interests of other states that we and other collectors of this data share it rather than being in effect asked not to”. Ronald F Stowe.
1978 Moscow Convention on Transfer and Use of Data of Remote Sensing of Earth From Space (Cuba, Czechoslovakia, the German Democratic Republic, Hungary, Mongolia, Poland, Romania, Soviet Union)

1981 Mexico

1982 Brazil

Principle 1: The term "remote sensing" means the sensing of the Earth's surface from space by making use of the properties of electromagnetic waves emitted, reflected or diffracted by the sensed objects, for the purpose of improving natural resources management, land use and the protection of the environment;

Principle 2: Remote sensing activities shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic, social or scientific and technological development, and taking into particular consideration the needs of the developing countries.

Principle 3: Remote sensing activities shall be conducted in accordance with international law, including the Charter of the United Nations, the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies and the relevant instruments of the International Telecommunication Union.
2050: According to United Nations the human population will be 9.7 billion

Principle 10: Remote sensing shall promote the protection of the Earth's natural environment.

To this end, States participating in remote sensing activities that have identified information in their possession that is capable of averting any phenomenon harmful to the Earth’s natural environment shall disclose such information to States concerned.
Deforestation

2003 – Launch of DETER (real time deforestation detection) by INOE (The Brazilian Space Research Institute). New monitoring system based on the data gathered by PRODES a GIS based on orbital remote sensing.

Illegal deforestation fines increased from 26 in 2004 to 2159 in 2008

75% drop in yearly illegal deforestation
Water Management

- 25 September 2015 General Assembly of United Nations have adopted the resolution A/Res/70/1
- 2030 Agenda for Sustainable Development and its 17 Sustainable Goals.
- Goal number 6 is to ensure availability and sustainable management of water and sanitation for all.
Protection of Ozone Layer


- Following the Vienna Convention its protocol – Montreal Protocol on Substances That Deplete The Ozone Layer was adopted in 1987.
Climate Change

- 3-14 June 1992 The United Nations Conference on Environment and Development (UNCED) (informally known as World Summit) the United Nations Framework Convention on Climate Change was negotiated.

- 11 December 1997 the Kyoto Protocol was adopted and entered into force on 16 February 2005.

- 2015 196 parties came together and signed the Paris Agreement.
Charter On Cooperation To Achieve The Coordinated Use of Space Facilities In The Event of Natural Or Technological Disaster (Disaster Charter)

- Initiated by ESA and CNES after UNISPACE III in 1999 and then Canada has signed it on 2000.

- Includes both natural and technological disasters
  - Situation of great distress involving loss of human life or large scale damage to property, caused by a natural phenomenon, such as a cyclone, tornado, earthquake, volcanic eruption, flood or forest fire, or by a technological accident, such as pollution by hydrocarbons, toxic or radioactive substances

- Works on a voluntary basis and no funds being exchanged between
EMERGENCY ON-CALL OFFICER (ECO)
Processes information received from the On-Duty Operator. Identifies timeliest and most appropriate satellite resources. Prepares draft plan. Contacts Project Manager and appropriate Charter members.

ON-DUTY OPERATOR (ODO)
Verifies identity of the AU and sends checked URF to an Emergency On-Call officer.

AUTHORIZED USERS (AU)
Calls the On-Duty Operator and submits the User Request Form (URF). The AU can also submit requests on behalf of an End User.

PROJECT MANAGER

EMERGENCY ON-CALL OFFICER

AUTHORIZED USER

DISASTER

END USER (EU)
Final products are delivered to the End User.

CHARTER MEMBERS
Charter members task their resources according to the plan *ESA, CNES, CSA, USGS, NOAA, DMCIU/KSA, JAXA, CNSA, CONAE, ISRO, INPE, DLR, KARI, EUMETSAT, ROSCOSMOS, ABAE, UAESA/MBRSC.

PROJECT MANAGER (PM)
Contacts the Emergency on-Call Officer if required. Obtains further information on requirements. Liaises with the AU with regard to data acquisition planning, solicits the AU feedback concerning the utility of the Charter for the call.

VALUE-ADDING SPECIALIST
Further processes and interprets data, and delivers to AU/End User via the Project Manager.

VALUE-ADDING (VA) SPECIALIST
CHARTER IN NUMBERS
(According to Charter’s Website)

- 620 Activations
- 125 Countries
- 17 Charter Members
- 61 Contributing satellites
Fire In Bolivia

- Throughout August there were more than 2700 fires in Bolivia
- Media reports suggest deforestation and burning was the primary cause of the uncontrolled fires
- Bolivia activated the Charter and received the satellite data.

### Event: Bolivia

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CONCLUSION

We're at war with nature.
If we win it, we're lost.

- Hubert Reeves