

# Environmental Applications of Remote Sensing Technology

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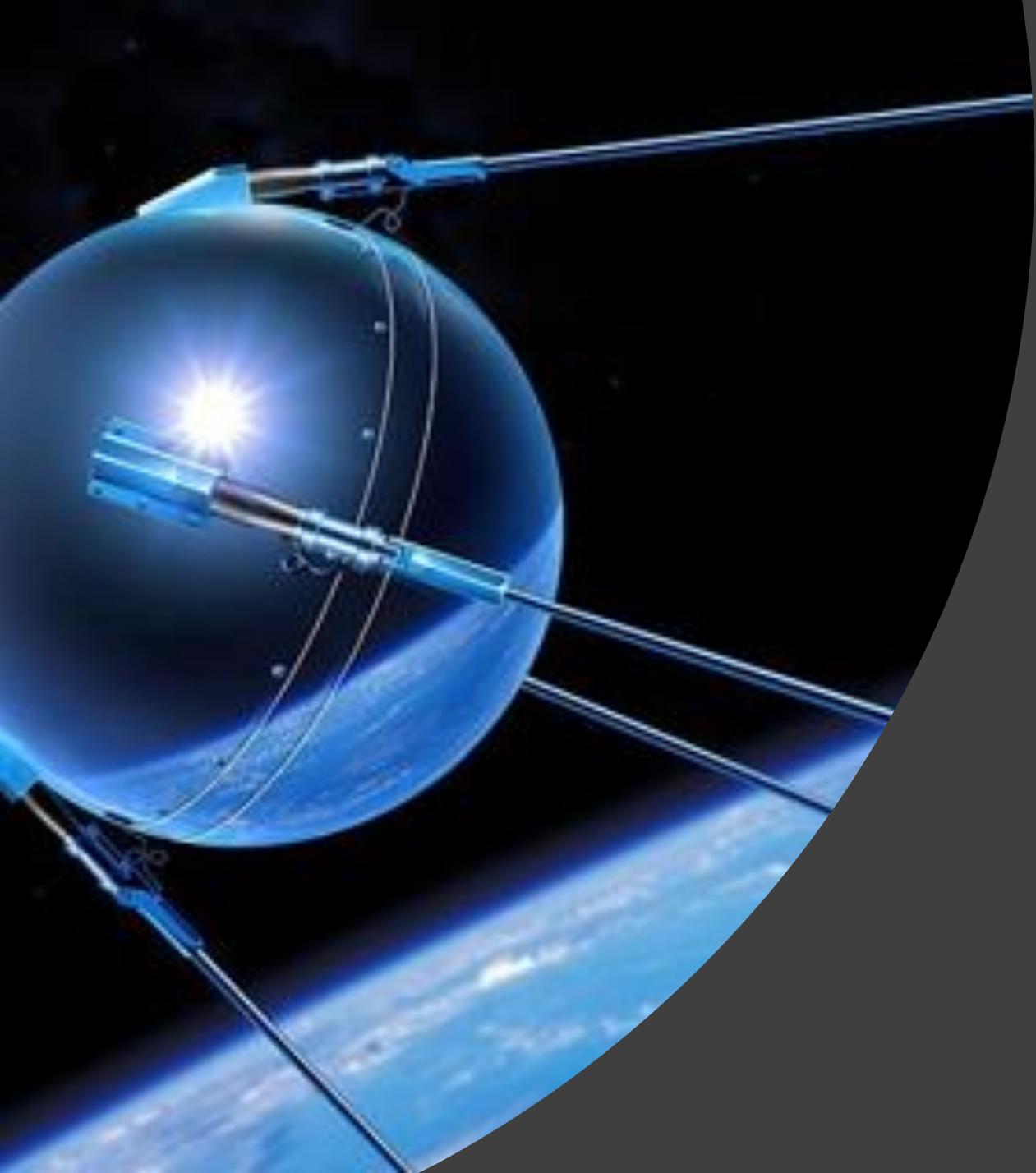
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Launch of Sputnik (4 October 1957)

UNISPACE 1 (14-27 August 1968)

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

Working group was formed



- ◇ 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.

## Proposals & Working Papers

# 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



Principles Relating to Remote Sensing of the Earth From Outer Space (1986)

# Principles Relating to Remote Sensing of the Earth from Outer Space

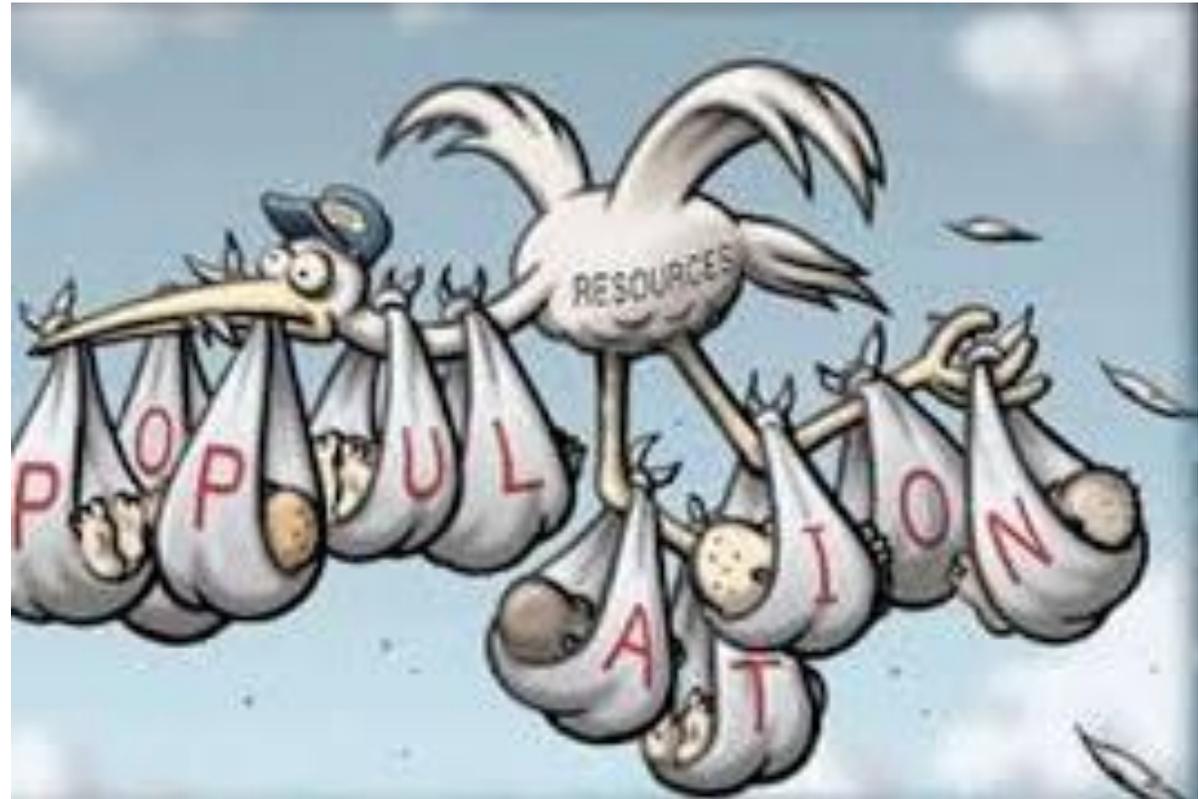
**Principle 1 :** The term "remote sensing" means the sensing of the Earth's surface from space by making use of the properties of electromagnetic waves emitted, reflected or diffracted by the sensed objects, for the purpose of improving natural resources management, land use and the protection of the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

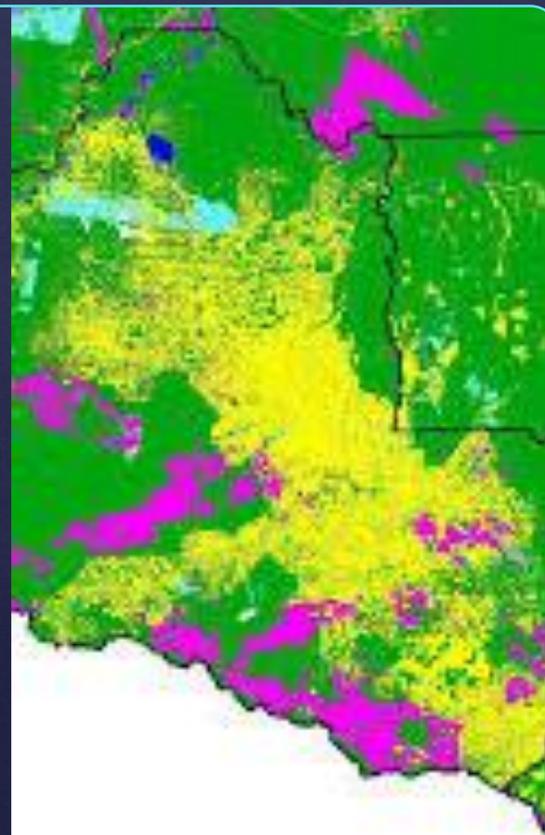


# Deforestation

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



- Public Lands
- No Information
- Conservation Units

- Boundary Amazon Biome
- Cerrado Biome
- Amazon deforestation until 2015
- Roads



## 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.



# SUSTAINABLE DEVELOPMENT GOALS

**1** NO POVERTY



**2** ZERO HUNGER



**3** GOOD HEALTH AND WELL-BEING



**4** QUALITY EDUCATION



**5** GENDER EQUALITY



**6** CLEAN WATER AND SANITATION



**7** AFFORDABLE AND CLEAN ENERGY



**8** DECENT WORK AND ECONOMIC GROWTH



**9** INDUSTRY, INNOVATION AND INFRASTRUCTURE



**10** REDUCED INEQUALITIES



**11** SUSTAINABLE CITIES AND COMMUNITIES



**12** RESPONSIBLE CONSUMPTION AND PRODUCTION



**13** CLIMATE ACTION



**14** LIFE BELOW WATER



**15** LIFE ON LAND



**16** PEACE, JUSTICE AND STRONG INSTITUTIONS



**17** PARTNERSHIPS FOR THE GOALS

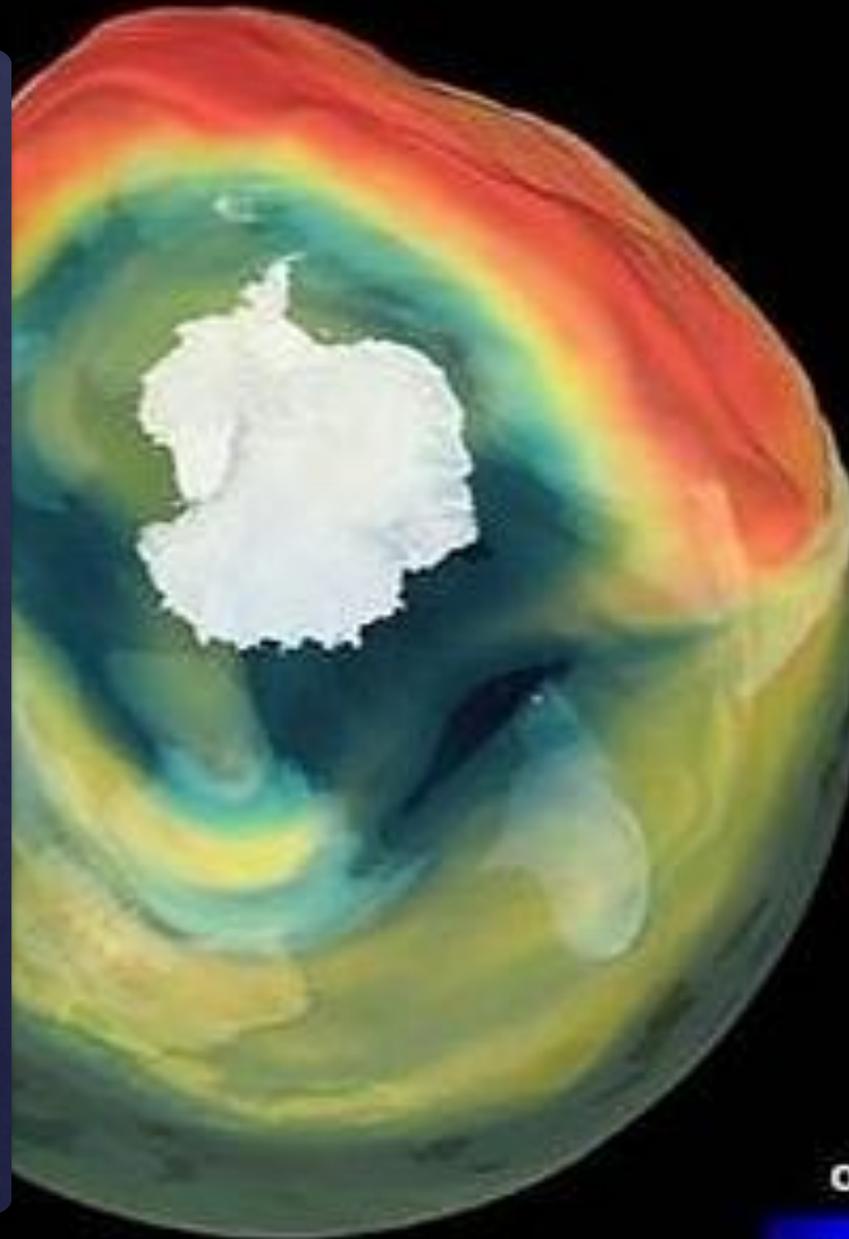


SUSTAINABLE DEVELOPMENT GOALS

1. Sep 2019

## Protection of Ozone Layer

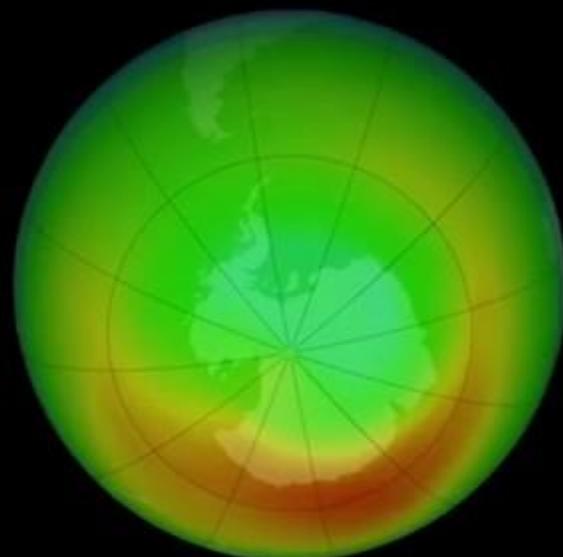
- ◇ 18-22 March 1985 : The Conference of Plenipotentiaries on the Protection of the Ozone Layer (Vienna Convention For The Protection of The Ozone Layer has been adopted).
- ◇ Following the Vienna Convention its protocol – Montreal Protocol on Substances That Deplete The Ozone Layer- was adopted in 1987.



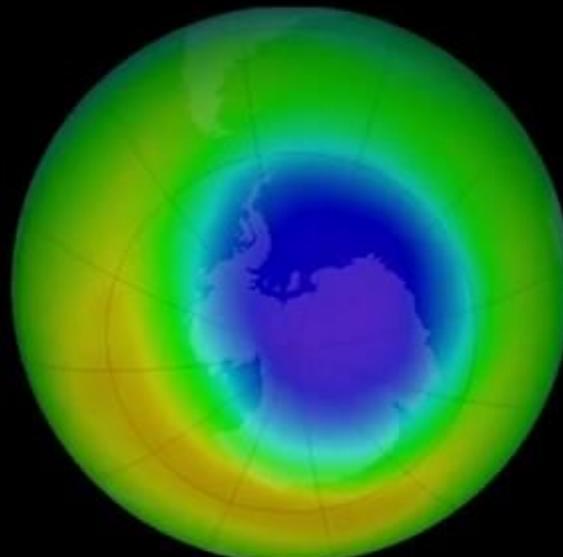
Ozone Partial Pressure (mPa)

2 6 10 14 18

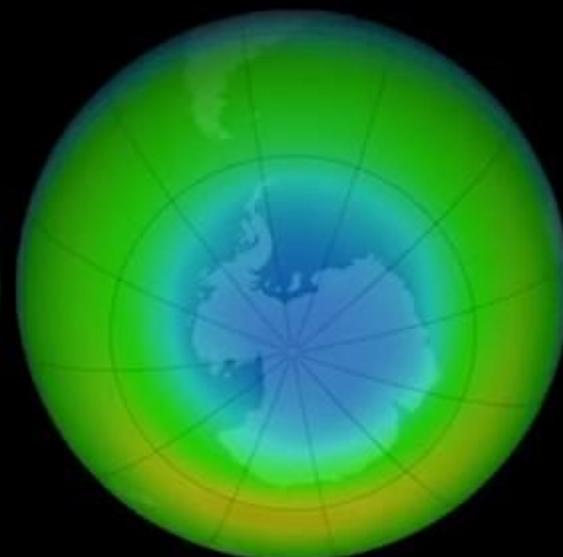
values below 1 mPa appear transparent.



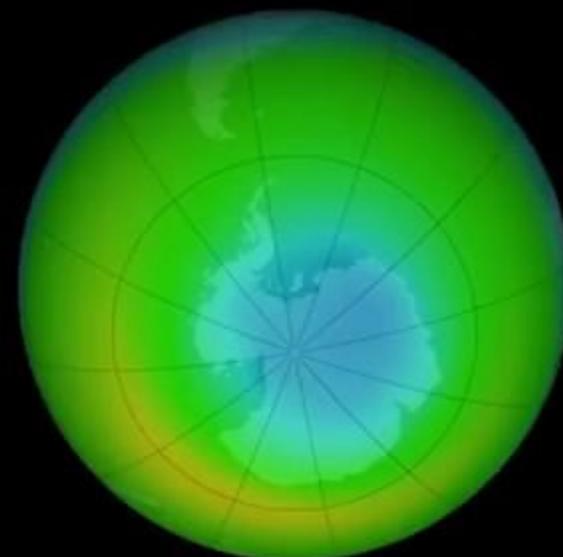
**1971**



**2017**



**2041**

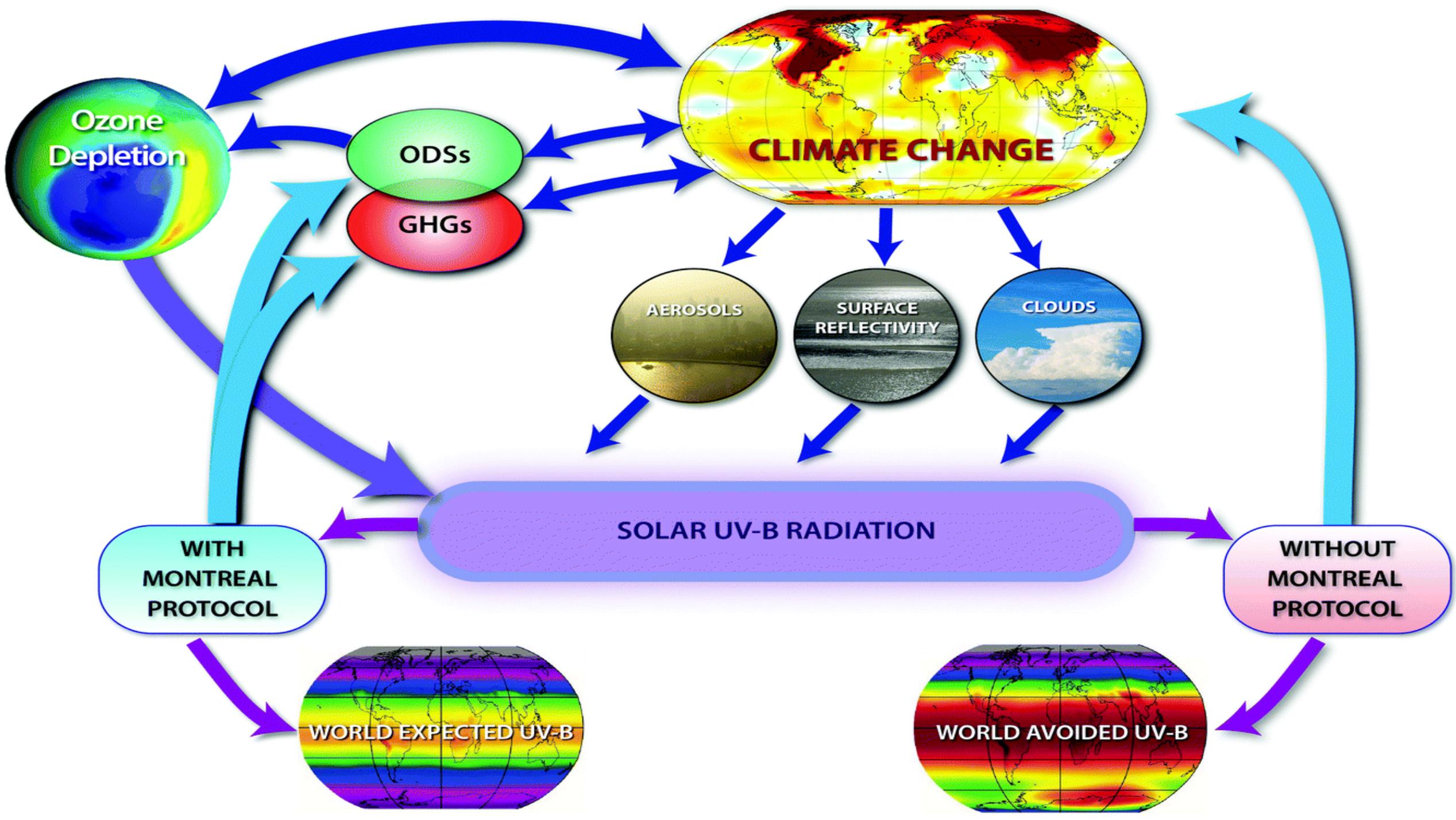


**2065**

# Climate Change

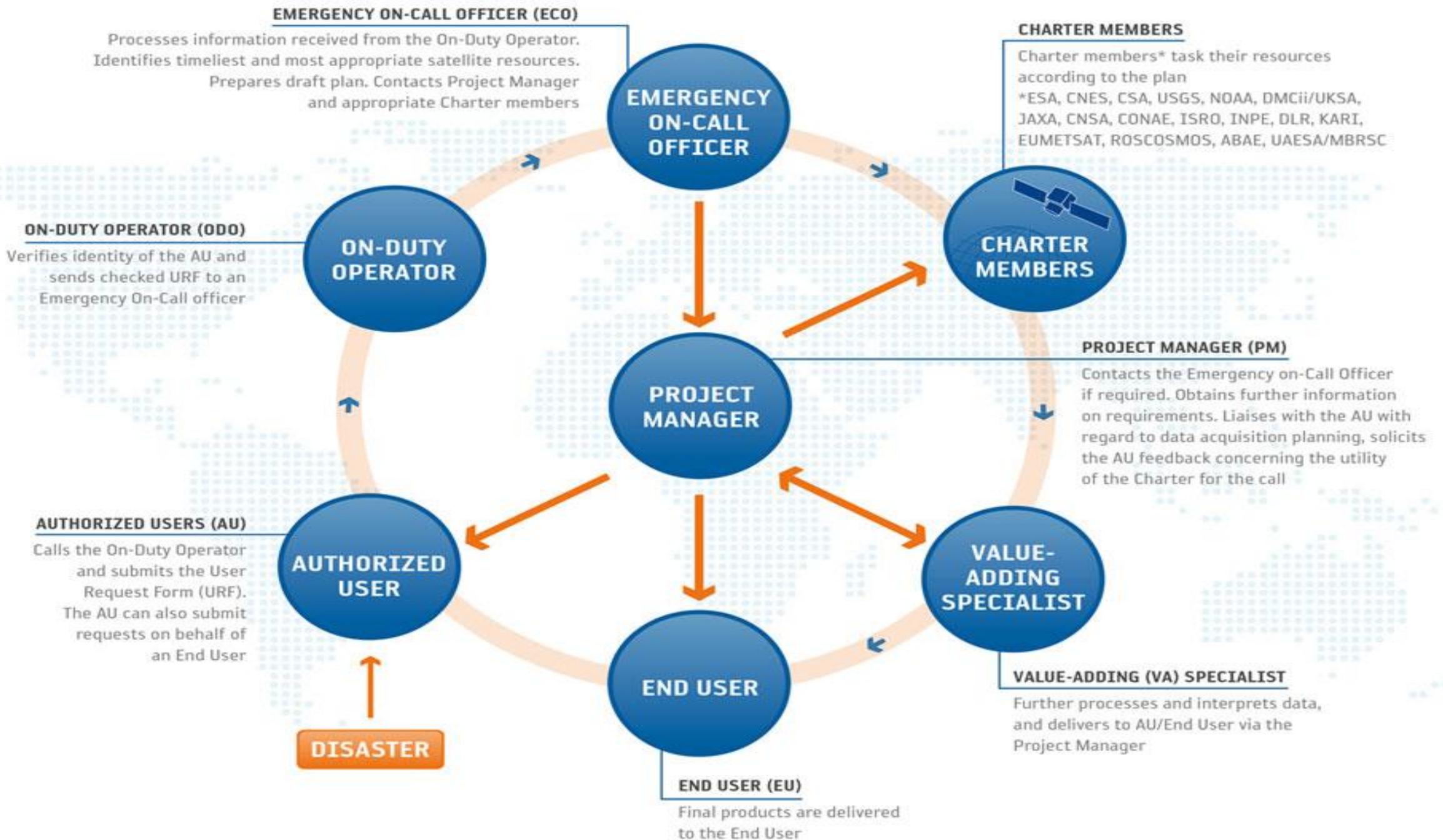


- ◆ 3-14 June 1992 The United Nations Conference on Environment and Development (UNCED) (informally known as World Summit) the United Nations Framework Convention on Climate Change was negotiated.
- ◆ 11 December 1997 the Kyoto Protocol was adopted and entered into force on 16 February 2005.
- ◆ 2015 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



# 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.

**Source:** SPOT-6  
**Acquired:** 05/09/2019

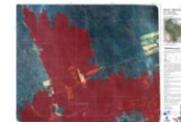
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Map produced by SERTIT



Fire extent in José Miguel de Velasco, Bolivia

**Source:** SPOT-6

**Copyright:** SPOT-7 © Airbus DS (2019)  
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Fire extent in Ñuflo de Chávez Province, Bolivia

**Source:** SPOT-6  
**Acquired:** 03/09/2019

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<b>Event:</b>	Bolivia
<b>Date of Charter Activation:</b>	2019-09-02
<b>Time of Charter Activation:</b>	12:30
<b>Time zone of Charter Activation:</b>	UTC+02:00
<b>Charter Requestor:</b>	Centre Opérationnel de Gestion Interministérielle des Crises (COGIC)
<b>Activation ID:</b>	619

**Source:** Pleiades  
**Acquired:** 05/09/2019

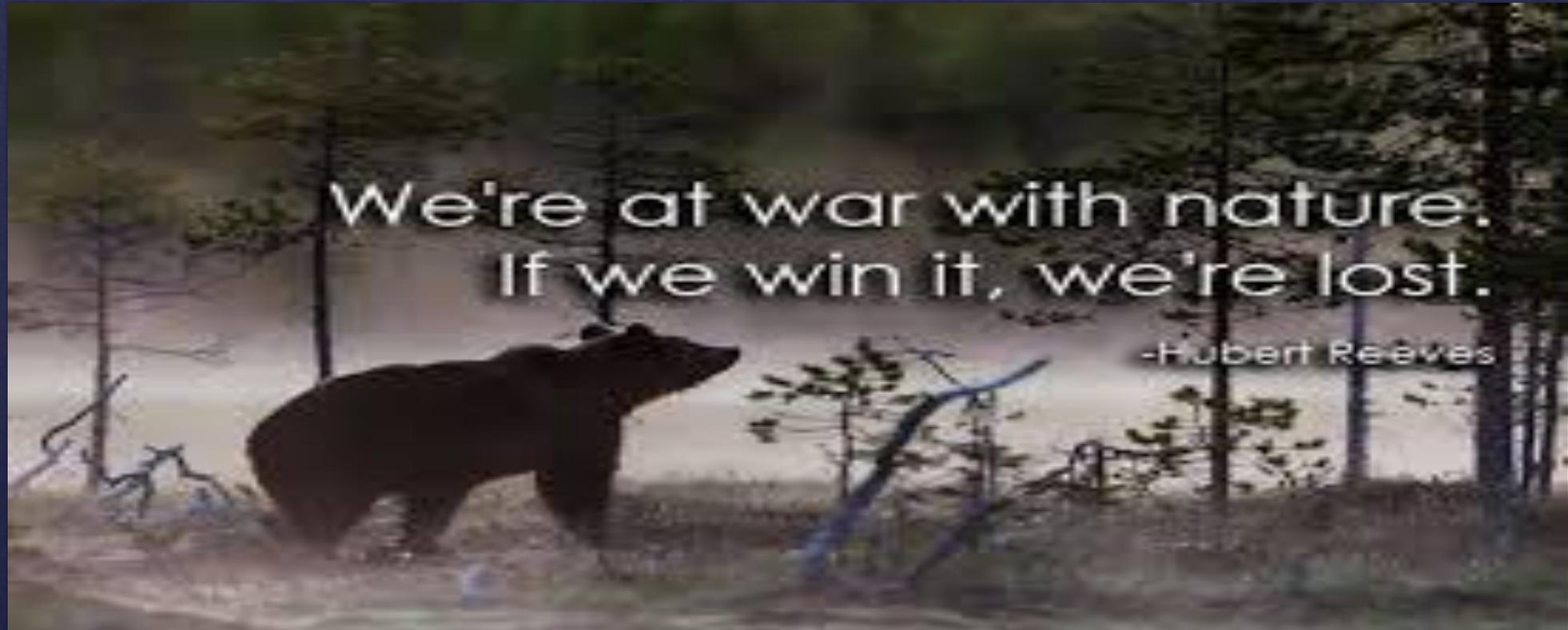
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Map produced by SERTIT



Fire extent in Chiquitos Province, Bolivia

# CONCLUSION



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

-Hubert Reeves