**Plenary 6**
**Democratizing Space Data**

# Democratizing Space Data: Key Issues

*Krystal Wilson, Director of Space Applications Programs*
*Secure World Foundation*
*Global Space Applications Conference*
*Montevideo, Uruguay*
*May 23, 2018*

# Secure World Foundation

Secure World Foundation is a ***private operating foundation*** that promotes cooperative solutions for space sustainability

- Why **space sustainability**? Increasing reliance on space assets coupled with potentially destabilizing trends

- **Our mission**: To work with governments, industry, international organizations, and civil society to develop and promote ideas and actions to achieve the secure, sustainable, and peaceful uses of outer space benefiting Earth and all its peoples

# What We Do

- The Foundation acts as a **research body, convener and facilitator** to examine key space policy topics
  - To promote **international cooperative governance** for increased space sustainability
  - To increase **human and environmental security** by promoting improved governance of the delivery of information gathered from space systems in ways that promote its utility
  - To assist in the **development of effective national and international space policies and laws** both in established and emerging space nations

- Offices located in Broomfield, CO & Washington, DC with 10 staff members

# Activities and Partners


UNITED NATIONS
Office for Outer Space Affairs

INTERNATIONAL ASTRONAUTICAL FEDERATION

GEO GROUP ON EARTH OBSERVATIONS

CSSMA

WMO

esri

NOAA

ORF OBSERVER RESEARCH FOUNDATION

CEOS

SPACE GENERATION ADVISORY COUNCIL

# Data Democracy

- CEOS description of (Space) Data Democracy =
  1) Data Access
  2) Software Tools
  3) Data Dissemination
  4) Capacity Development

- What are some of the biggest barriers/challenges to dramatic increase in the use of Earth observation data by new actors, in additional sectors or in innovative ways?

# Taking the first step

**Awareness and use of Earth observation and other space-dervived technology is increasing but wide-spread adoption is still slow**

- Lack of technical knowledge or training
- Focus on traditional areas of application
- “Intertia”
- Donor skepticism
- Government skepticism
- Time and money
- Data set integration concerns including privacy
- Too much data

# Sustainable Development Goals & Space

*Promoting Cooperative Solutions for Space Sustainability*

GEO GROUP ON EARTH OBSERVATIONS

UN-GGIM UNITED NATIONS COMMITTEE OF EXPERTS ON GLOBAL GEOSPATIAL INFORMATION MANAGEMENT

**EARTH OBSERVATIONS AND GEOSPATIAL INFORMATION:**

**SUPPORTING OFFICIAL STATISTICS IN MONITORING AND ACHIEVING THE 2030 AGENDA**

ESPI
European Space Policy Institute

Space for Sustainable Development

Report 59
June 2016

Stefano Ferretti
Jörg Feustel-Büechl
Roy Gibson
Peter Hulsroj
Andreas Papp
Elisabeth Veit


GLOBAL PARTNERSHIP
FOR SUSTAINABLE DEVELOPMENT DATA

# Variety of Stakeholders

- Governmental organizations
- Donor entities
- Intergovernmental/multilateral/ regional organizations
- Non-governmental organizations
- Space agencies
- Development contracting companies
- Space manufacturers and operators
- Data analytic businesses
- Non-space related companies
- Academia

Bill & Melinda Gates foundation

DAI

DigitalGlobe

SERVIR GLOBAL

HOT Humanitarian Open Street Map Team

Harvard Humanitarian Initiative

World Food Programme

iridium

esa

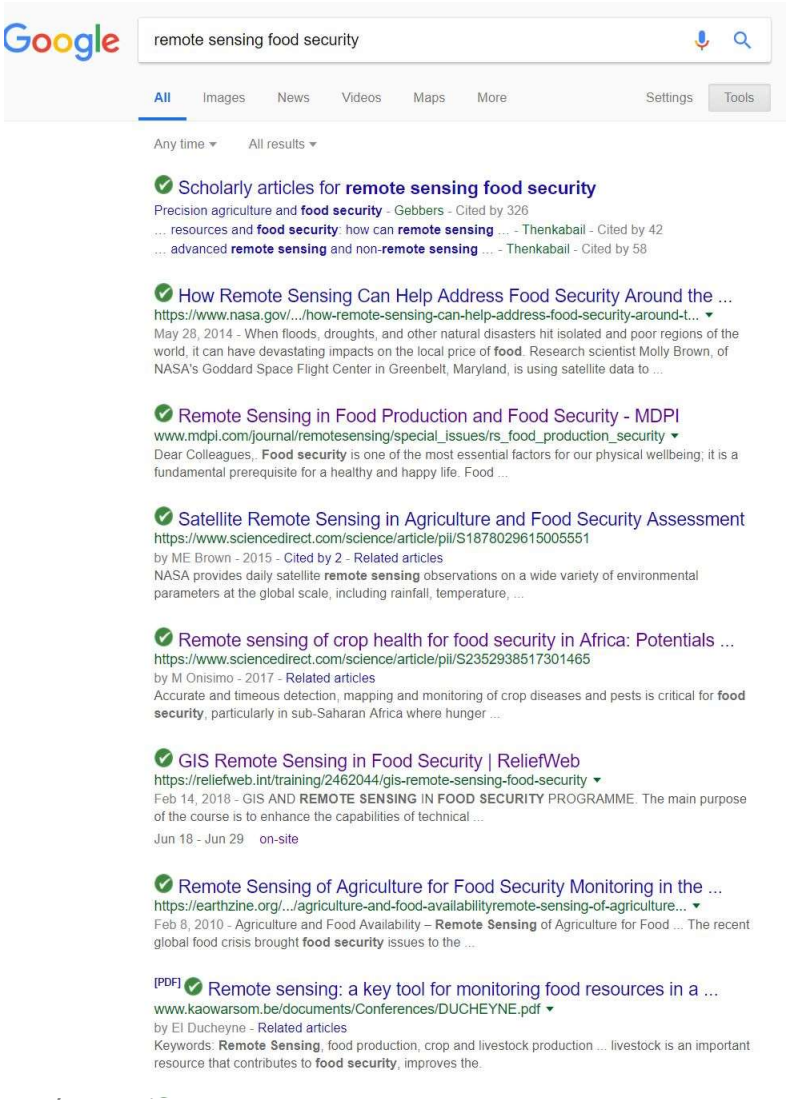
Amnesty International

# What happens when you Google it?

SECURE WORLD FOUNDATION

*Promoting Cooperative Solutions for Space Sustainability*

## Food Security



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**Scholarly articles for remote sensing food security**

Precision agriculture and **food security** - Gebbers - Cited by 326
... resources and **food security**: how can **remote sensing** ... - Thenkabail - Cited by 42
... advanced **remote sensing** and non-**remote sensing** ... - Thenkabail - Cited by 58

**How Remote Sensing Can Help Address Food Security Around the ...**
https://www.nasa.gov/.../how-remote-sensing-can-help-address-food-security-around-t...
May 28, 2014 - When floods, droughts, and other natural disasters hit isolated and poor regions of the world, it can have devastating impacts on the local price of **food**. Research scientist Molly Brown, of NASA's Goddard Space Flight Center in Greenbelt, Maryland, is using satellite data to ...

**Remote Sensing in Food Production and Food Security - MDPI**
www.mdpi.com/journal/remotesensing/special_issues/rs_food_production_security
Dear Colleagues,. **Food security** is one of the most essential factors for our physical wellbeing; it is a fundamental prerequisite for a healthy and happy life. Food ...

**Satellite Remote Sensing in Agriculture and Food Security Assessment**
https://www.sciencedirect.com/science/article/pii/S1878029615005551
by ME Brown - 2015 - Cited by 2 - Related articles
NASA provides daily satellite **remote sensing** observations on a wide variety of environmental parameters at the global scale, including rainfall, temperature, ...

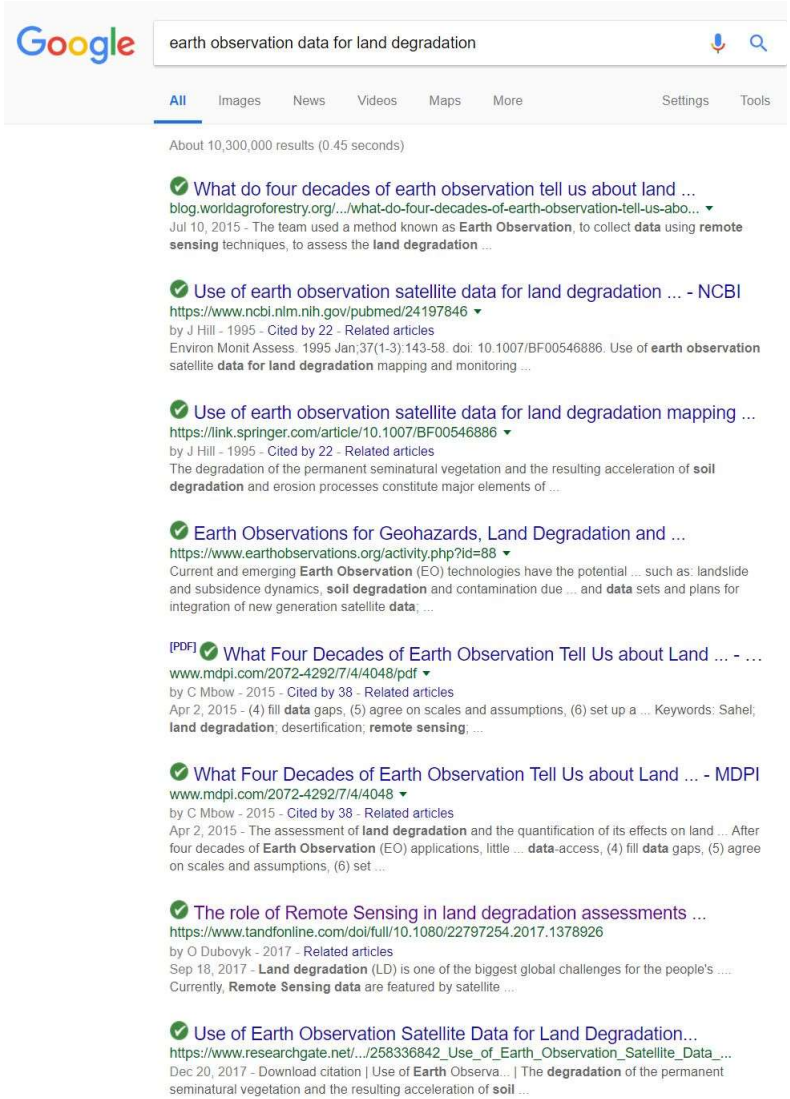
**Remote sensing of crop health for food security in Africa: Potentials ...**
https://www.sciencedirect.com/science/article/pii/S2352938517301465
by M Onisimo - 2017 - Related articles
Accurate and timeous detection, mapping and monitoring of crop diseases and pests is critical for **food security**, particularly in sub-Saharan Africa where hunger ...

**GIS Remote Sensing in Food Security | ReliefWeb**
https://reliefweb.int/training/2462044/gis-remote-sensing-food-security
Feb 14, 2018 - GIS AND **REMOTE SENSING** IN **FOOD SECURITY** PROGRAMME. The main purpose of the course is to enhance the capabilities of technical ...
Jun 18 - Jun 29 on-site

**Remote Sensing of Agriculture for Food Security Monitoring in the ...**
https://earthzine.org/.../agriculture-and-food-availabilityremote-sensing-of-agriculture...
Feb 8, 2010 - Agriculture and Food Availability – **Remote Sensing** of Agriculture for Food ... The recent global food crisis brought **food security** issues to the ...

[PDF] **Remote sensing: a key tool for monitoring food resources in a ...**
www.kaowarsom.be/documents/Conferences/DUCHEYNE.pdf
by El Ducheyne - Related articles
Keywords: **Remote Sensing**, food production, crop and livestock production ... livestock is an important resource that contributes to **food security**, improves the.

## Land Degradation



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earth observation data for land degradation

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**What do four decades of earth observation tell us about land ...**
blog.worldagroforestry.org/.../what-do-four-decades-of-earth-observation-tell-us-abo...
Jul 10, 2015 - The team used a method known as **Earth Observation**, to collect **data** using **remote sensing** techniques, to assess the **land degradation** ...

**Use of earth observation satellite data for land degradation ... - NCBI**
https://www.ncbi.nlm.nih.gov/pubmed/24197846
by J Hill - 1995 - Cited by 22 - Related articles
Environ Monit Assess. 1995 Jan;37(1-3):143-58. doi: 10.1007/BF00546886. Use of **earth observation** satellite **data for land degradation** mapping and monitoring ...

**Use of earth observation satellite data for land degradation mapping ...**
https://link.springer.com/article/10.1007/BF00546886
by J Hill - 1995 - Cited by 22 - Related articles
The degradation of the permanent seminatural vegetation and the resulting acceleration of **soil degradation** and erosion processes constitute major elements of ...

**Earth Observations for Geohazards, Land Degradation and ...**
https://www.earthobservations.org/activity.php?id=88
Current and emerging **Earth Observation** (EO) technologies have the potential ... such as: landslide and subsidence dynamics, **soil degradation** and contamination due ... and **data** sets and plans for integration of new generation satellite **data**; ...

[PDF] **What Four Decades of Earth Observation Tell Us about Land ... - ...**
www.mdpi.com/2072-4292/7/4/4048/pdf
by C Mbow - 2015 - Cited by 38 - Related articles
Apr 2, 2015 - (4) fill **data** gaps, (5) agree on scales and assumptions, (6) set up a ... Keywords: Sahel; **land degradation**; desertification; **remote sensing**; ...

**What Four Decades of Earth Observation Tell Us about Land ... - MDPI**
www.mdpi.com/2072-4292/7/4/4048
by C Mbow - 2015 - Cited by 38 - Related articles
Apr 2, 2015 - The assessment of **land degradation** and the quantification of its effects on land ... After four decades of **Earth Observation** (EO) applications, little ... **data**-access, (4) fill **data** gaps, (5) agree on scales and assumptions, (6) set ...

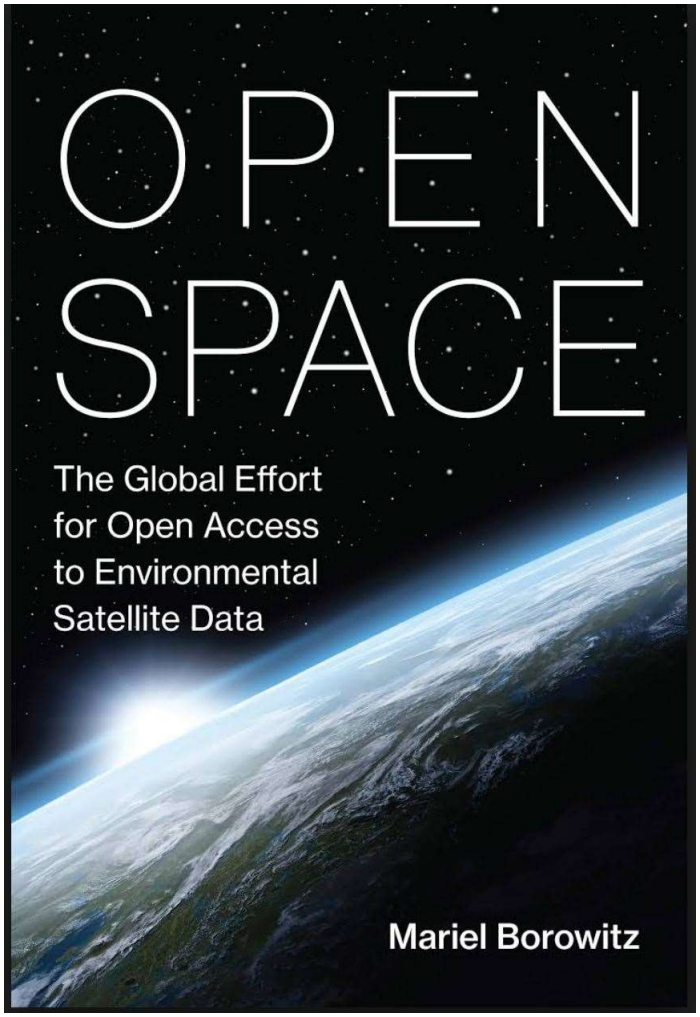
**The role of Remote Sensing in land degradation assessments ...**
https://www.tandfonline.com/doi/full/10.1080/22797254.2017.1378926
by O Dubovyk - 2017 - Related articles
Sep 18, 2017 - **Land degradation** (LD) is one of the biggest global challenges for the people's .... Currently, **Remote Sensing data** are featured by satellite ...

**Use of Earth Observation Satellite Data for Land Degradation...**
https://www.researchgate.net/.../258336842_Use_of_Earth_Observation_Satellite_Data_...
Dec 20, 2017 - Download citation | Use of **Earth** Observa... | The **degradation** of the permanent seminatural vegetation and the resulting acceleration of **soil** ...

# Moving Forward

- More general resources which outline the “what” and the “how”
- Increased colloboration among a wider range of stakeholders
- More support for sector cross-training, both academically and professionally
- Better engagement with media
- Don’t let “perfect” or “most efficient” be the enemy of “good” and “effective”

# New Research




- Published Dec 2017
- Some key considerations:
  - Looked at why some open data models have been successful and others less so
  - Determined underlying causes for why some agencies don't share their data
  - Importance of documenting benefits of open data
  - Evaluates role with commercial data

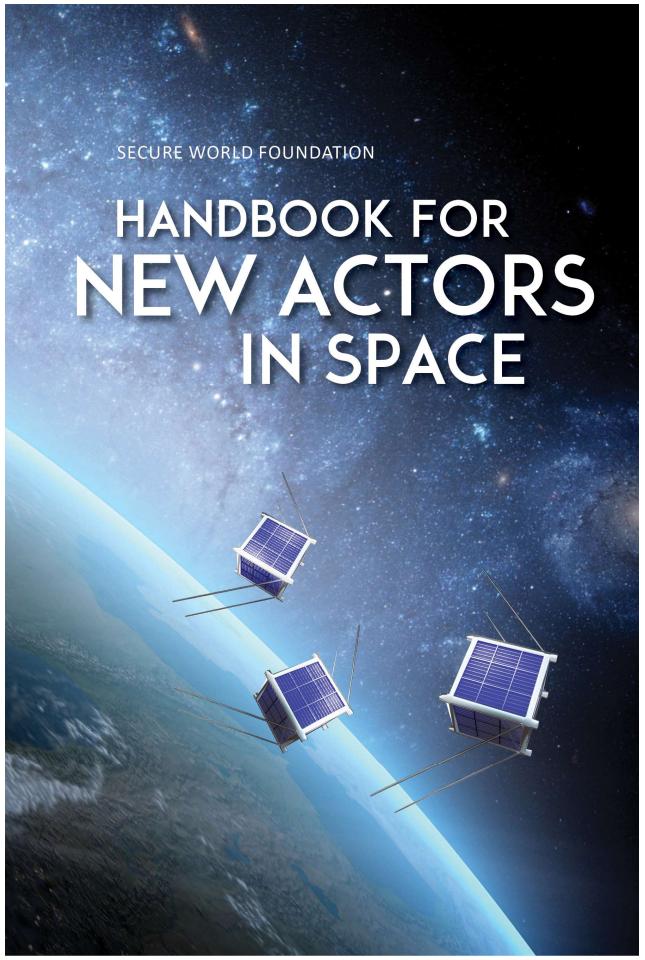
# SWF Handbook for New Actors in Space

*Promoting Cooperative Solutions for Space Sustainability*

- **Goal:** Create a publication that provides an overview fundamental principles, laws, norms, and best practices for safe, predictable, and responsible activities in space

- **Two specific audiences:**
  - Countries developing space programs and/or having to oversee and regulate their first satellites
  - Universities and start-up companies that are developing/operating satellites

- **Electronic copies** are available through the SWF website, free of charge: **www.swfound.org/handbook**

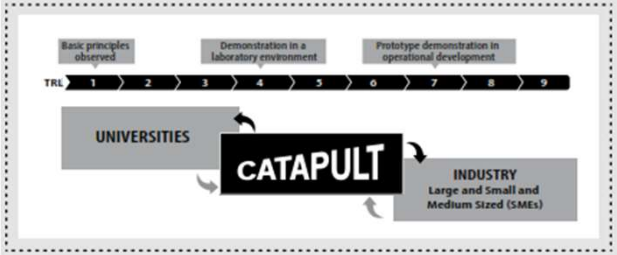


# Contents

- **Chapter 1** – International framework
- **Chapter 2** – National policy and administration
- **Chapter 3** – Responsible space operations

**Case Study:**
**The United Kingdom Satellite Applications Catapult**

The United Kingdom Satellite Applications Catapult was established by the government of the United Kingdom (UK) in May 2013 with the goal of creating economic growth in the UK through supporting the development, commercialization, and use of satellite applications. According to its Delivery Plan 2015–2020, the Catapult (Figure 8) aims to promote satellite application and technology development and to help domestic industry "bring new products and services more rapidly to market." The Satellite Applications Catapult is one of 11 "Catapults" operating in the UK, each focusing on different technologies and application areas. The Catapult operates as a private, not-for-profit research organization. It is governed by a board, which includes representation from the United Kingdom Space Agency (UKSA) and from Innovate UK—a government agency focused on fostering technology and economic development.




## IN-DEPTH ANALYSIS: REMOTE SENSING POLICY AND ADMINISTRATION

Remote sensing satellites have continually sensed Earth for more than four decades, yielding a valuable repository of data about the planet which has applications in areas as far-reaching as health, climatology, and urban planning. Given its strong linkages to socioeconomic development, space-based remote sensing is a key area of activity for new and established space actors alike. In light of this, remote sensing is a useful case study highlighting the interaction between public policy and public administration and illustrates some of the approaches different countries have taken to managing this kind of activity. Additionally, new trends in remote sensing activities, especially by non-governmental actors, illustrate larger policy transformations that are useful for new space actors to consider.

### Remote Sensing Policy

Consistent with the main elements of public policy described in the beginning of this chapter, remote sensing policies primarily seek to:

- identify objectives and priorities guiding the acquisition of data about the planet;



NATIONAL SPACE PO

# Thank you. Questions?

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