New Actors in Space and Space Policy Considerations

Brian Weeden, Ph.D.
Director of Program Planning
Secure World Foundation

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Who We Are

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

- **Our vision:** the secure, sustainable, and peaceful uses of outer space that contribute to global stability on Earth

- **Our mission**: Secure World Foundation works 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

Our Methods

- **Informing:** SWF generates research and analysis for decision-makers to promote creation of sound policy and raise awareness of key issues that may threaten the security, sustainability, and utility of outer space

- **Facilitating**: SWF convenes timely public and private meetings with stakeholders on key issues to encourage discussion and constructive dialog for next steps in support of its mission

- **Promoting:** When viable solutions or next steps become apparent, SWF formulates and disseminates policy positions that are aligned with its vision and mission in order to move them from idea to implementation

Key Focus Areas

- **Space Sustainability:** Ensuring that all of humanity can continue to use outer space for peaceful purposes and socioeconomic benefit over the long term

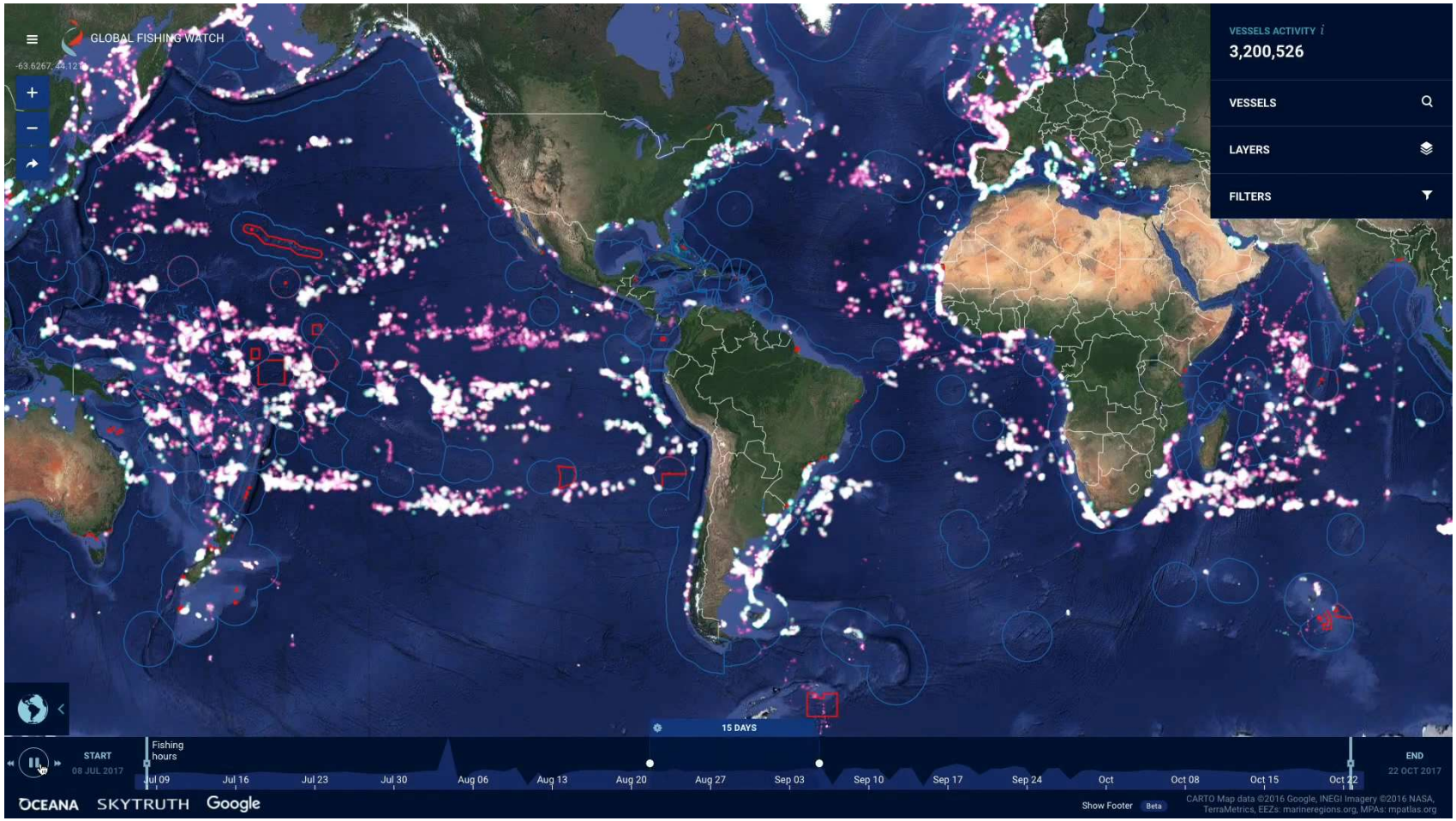
- **Space Policy and Law Development:** Promoting and assisting in the development of international and national norms, laws, and policies to foster responsible behavior by States and private sector actors

- **Human and Environmental Security:** Promoting improved governance and international cooperation in the delivery of information derived from space systems, and promoting cooperative efforts for the protection of our planet from the threat of near-Earth objects (NEOs)

NEED FOR SPACE SUSTAINABILITY

UN Sustainable Development Goals

Monitoring illegal fishing



Source: Global Fishing Watch

Human trafficking

Source: The Telegraph

Trends in space

- Space is becoming more ***globalized***
  - Growing access to space technology
  - Growing interest by many countries in utilizing space for national benefits (socioeconomic development, prestige, national security)

- Space is becoming more ***commercialized***
  - Space began as part of competition between governments (US and USSR)
  - Influx of technology, talent, and capital from other sectors (IT)

How do we manage the influx of new actors and growth in space activities to ensure long-term sustainability of space?

Human-generated space objects

Active Satellites

Total number of operating satellites: 1,738			
United States: 803	Russia: 142	China: 204	Other: 589
LEO: 1,071	MEO: 97	Elliptical: 39	GEO: 531

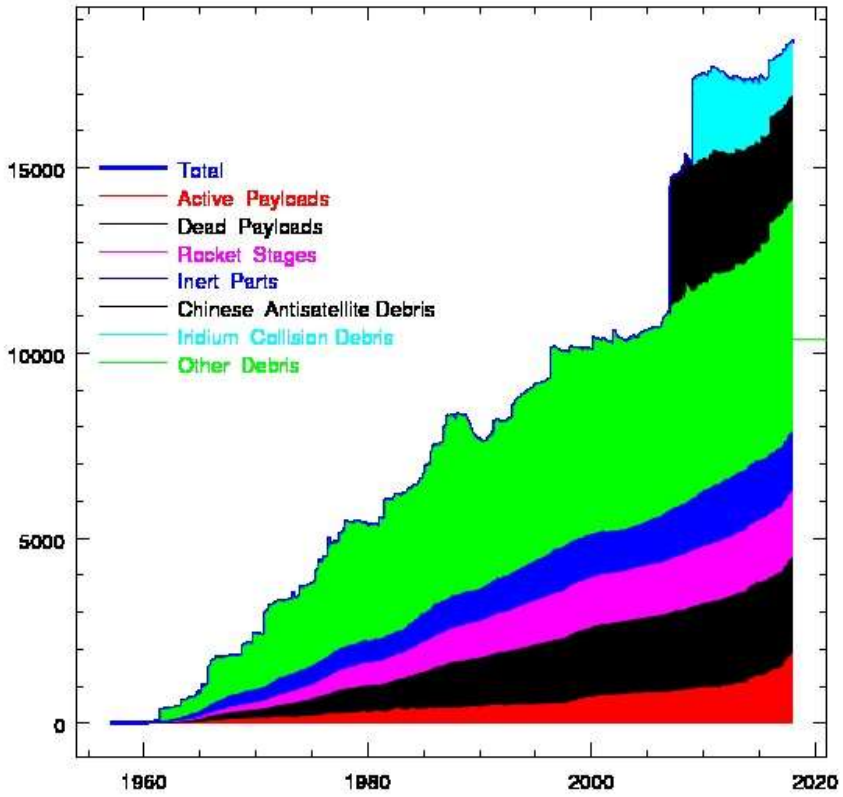
Current through 8/31/2017
Data from the Union of Concerned Scientists

Space Debris

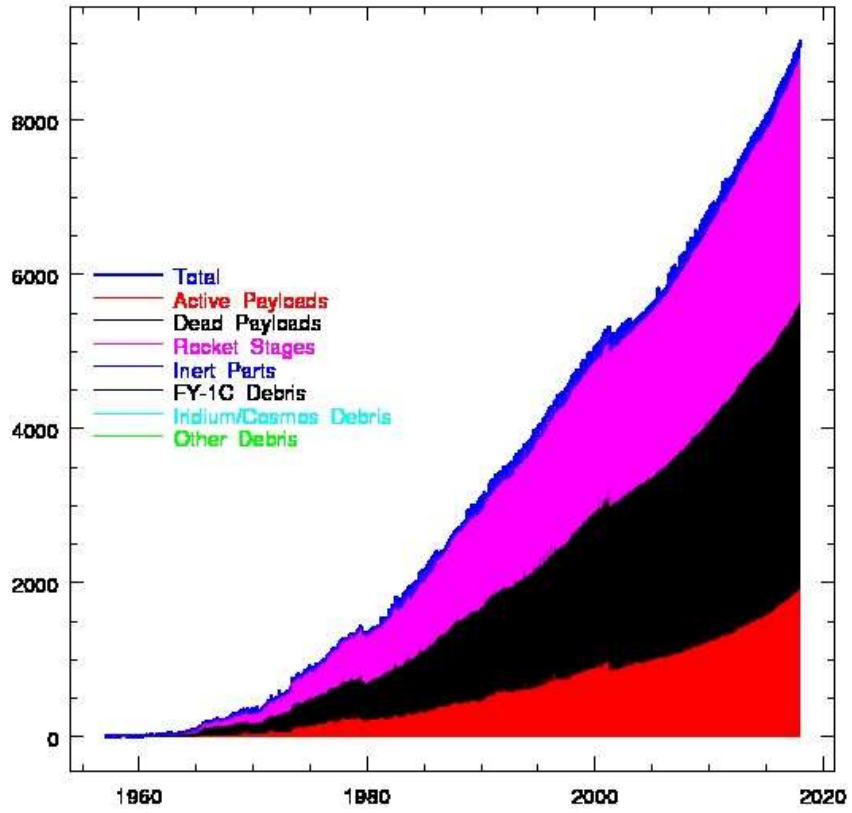
Larger than 10 cm	~21,000	Sources of new debris
Between 1 and 10 cm	~500,000	Can cause major damage
Smaller than 1 cm	Many millions	Can cause minor damage

Data compiled from U.S. Strategic Command, NASA, and ESA.

Long-term growth in space objects



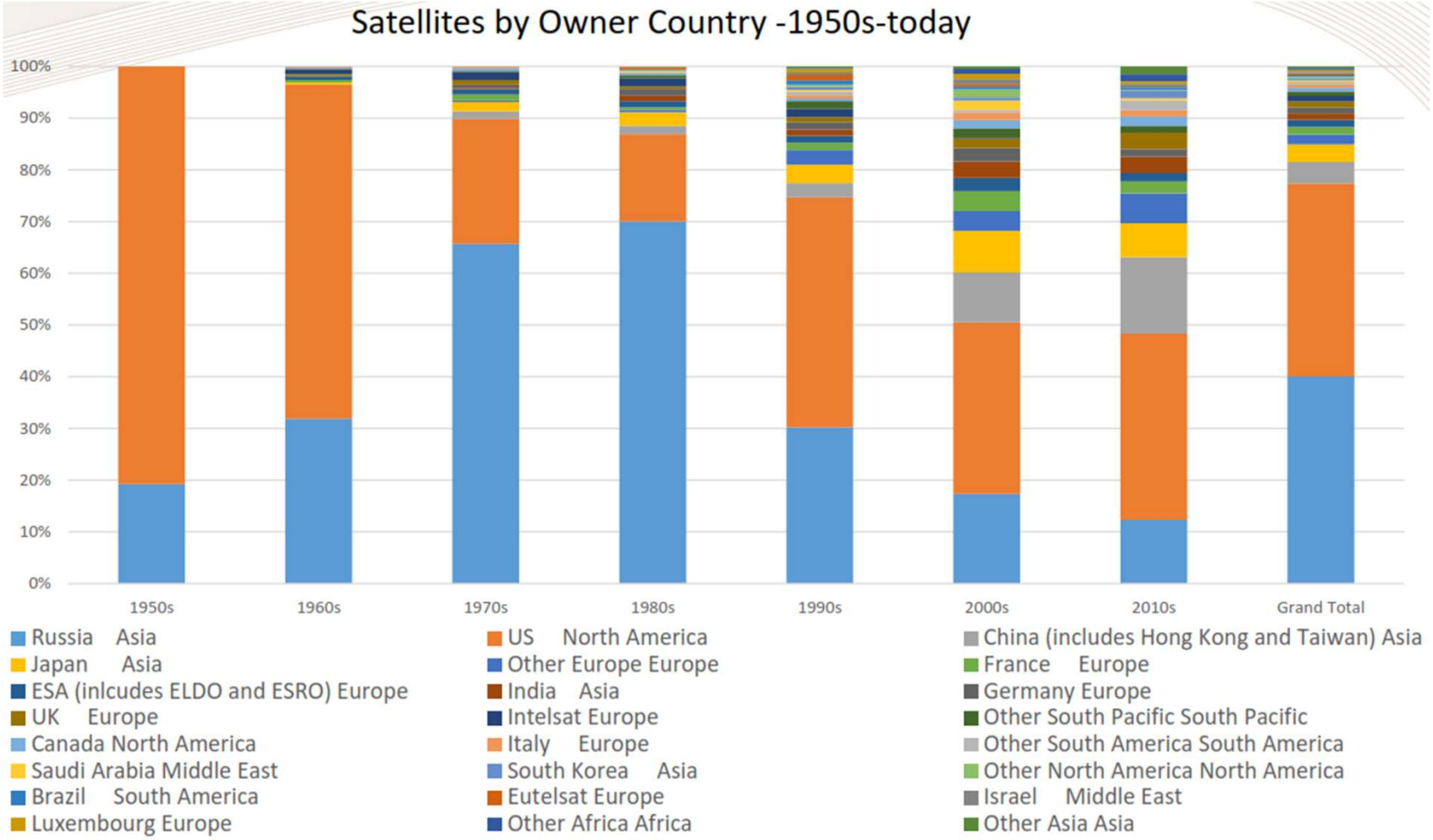
Number of objects



Mass of objects

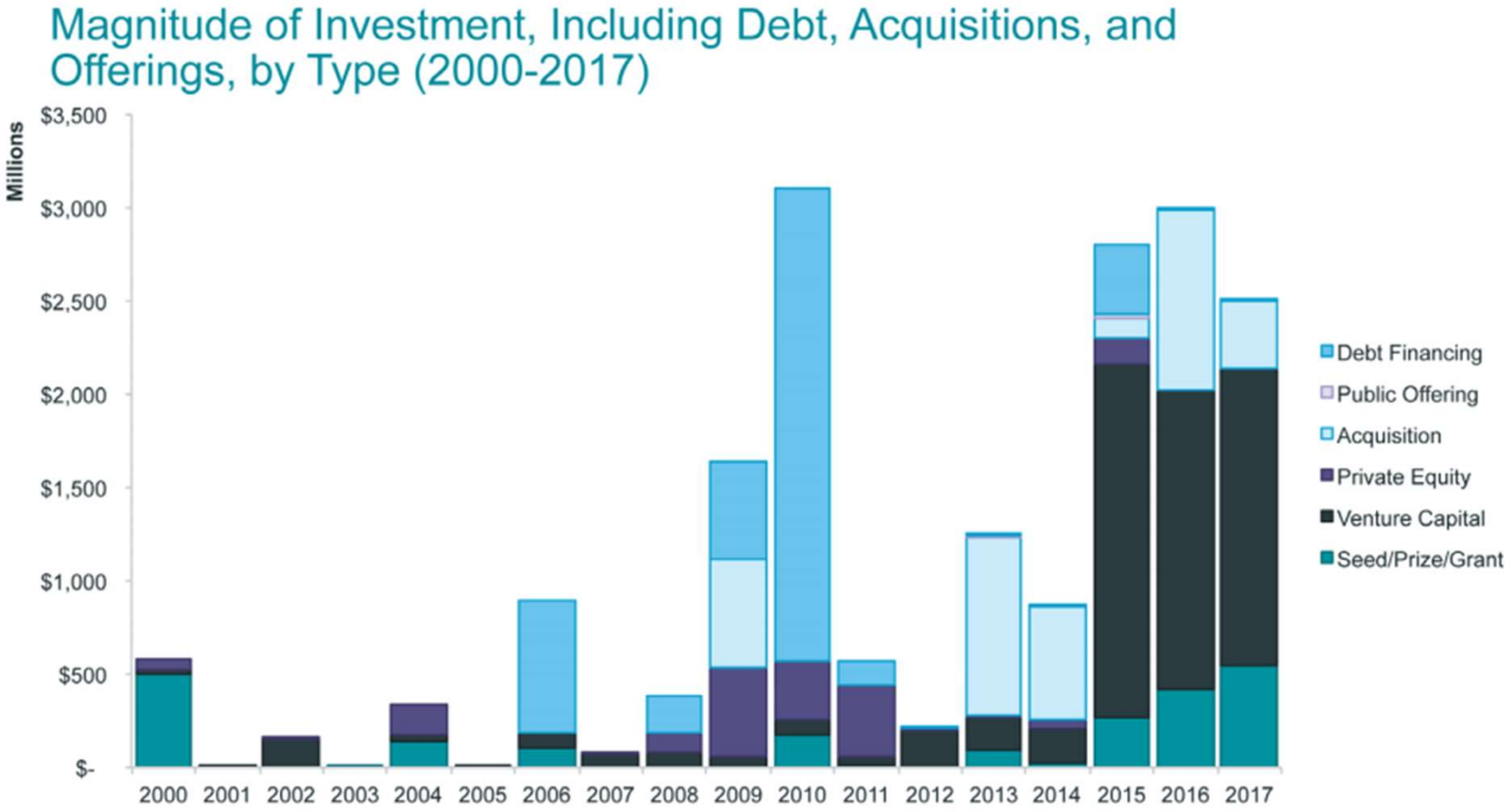
Graphs from Jonathan's Space Page
https://www.planet4589.org/space/log/stats1.html

Space is becoming more international



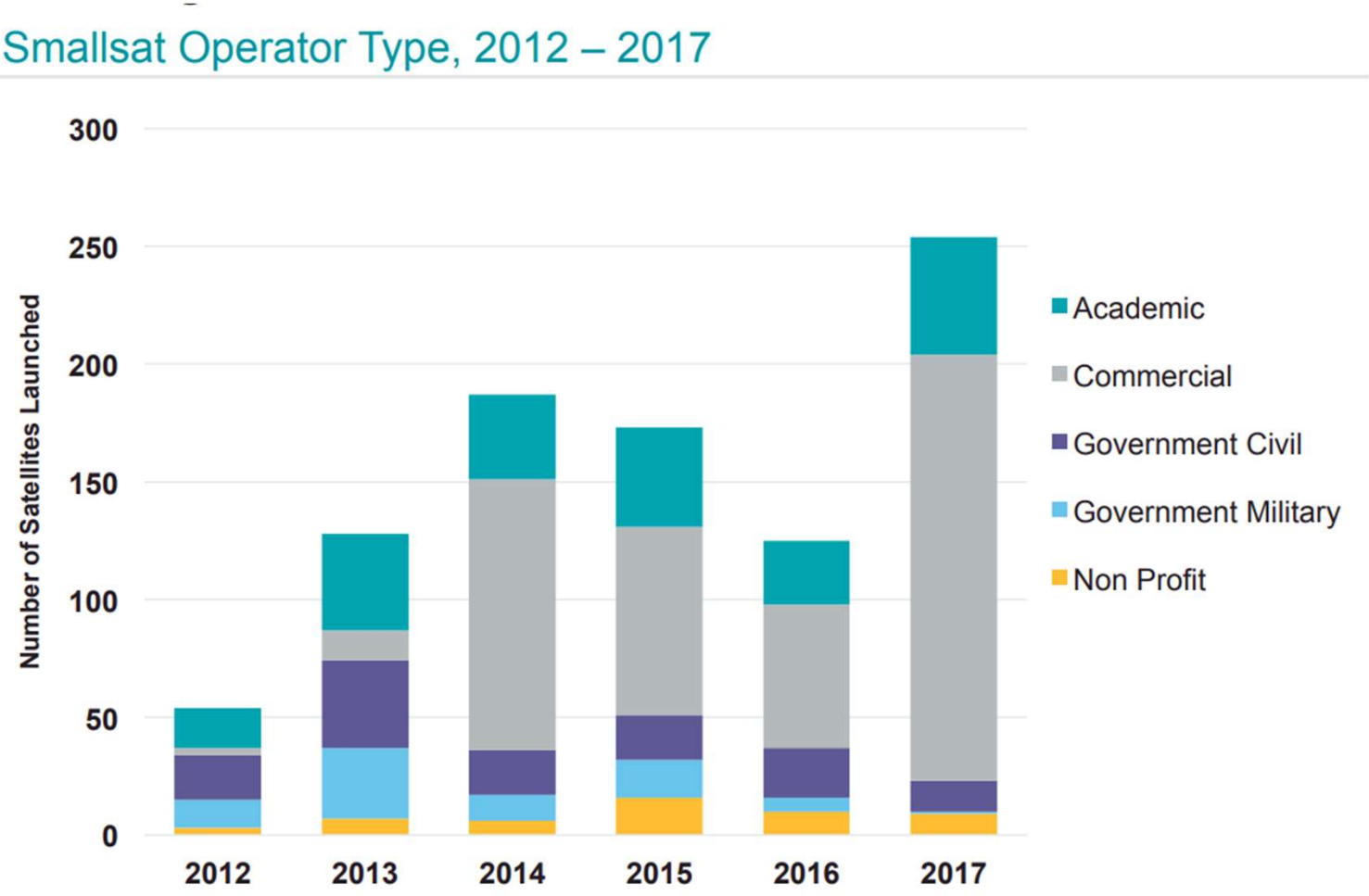
Adapted from IDA Global Trends in Civil and Commercial Space Study

Increased private sector investment in space



Source: Bryce Start-Up Space (2018)

Surge in small satellites



Source: Bryce Smallsats by the Numbers (2018)

Key challenges

- Will all these new actors experience the same "learning curve" as the legacy actors?
  - Will they make the same mistakes, or just new ones?

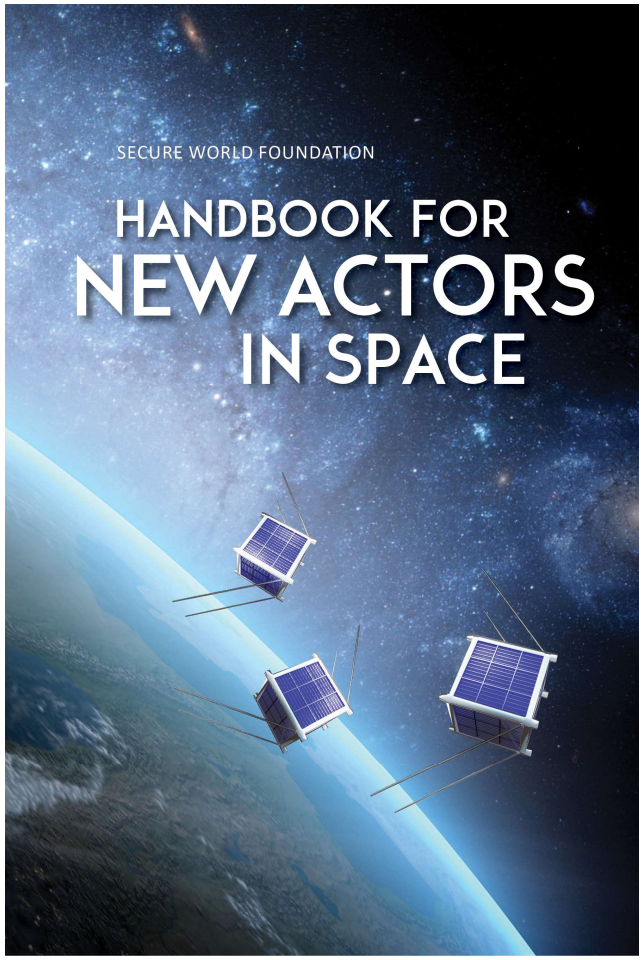
- How do new spacefaring countries develop national space policy and law?

- How do we help maximize the benefits from new actors entering the space domain while minimizing potential sustainability challenges?

SWF Handbook for New Actors in Space

- **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



Handbook Content

- Chapter 1 – International Framework for Space
  - International treaties, agreements and principles
  - Multilateral fora and initiatives

- Chapter 2 – National Policy and Administration
  - Public policy rationale, objectives, principles
  - Administrative structures and coordination
  - Licensing and regulations

- Chapter 3 – Responsible Space Operations
  - Pre-launch licensing and testing
  - Launch safety, deployment, on-orbit operations
  - Post-mission disposal

Next steps

- The Handbook was officially released in February 2017
- Electronic copies are available through the SWF website, free of charge: www.swfound.org/handbook
- Printed copies are also be available
- SWF plans to curate an electronic library of resources to accompany the Handbook
  - Looking for interested partners to help with sponsorship or contributions
    - Companies
    - Governments
    - NGOs
    - Universities

BUILDING A NATIONAL SPACE POLICY

Public policy and administration

- Public Policy
  - How, why, and to what effect governments pursue particular courses of action (or inaction)
- Public Administration
  - Implementation of policy through the organization of government bureaucracy
- National space policy and law can be broken down into both of these elements

Drivers for National Space Policy

- The United Arab Emirates
  - Diversify economy beyond oil and gas
  - Foster STEM education and workforce
- The Philippines
  - 2012 Scarborough Shoal standoff with China
  - 2013 Typhoon Haiyan/Yolanda
- The United Kingdom
  - Economic dependence on global satellite navigation systems (GNSS)
  - Economic growth
- Canada
  - Increase coordination between federal agencies
  - Provide rationale for increased space budget

Why National Space Policy

- Provides the rationale for why a state chooses to engage in space activities
  - Commercial, civil, and/or national security
  - National interpretations of space law principles
  - Boost national pollical support for space funding and resources

- Provides objectives for national space activities
  - General, such as enhancing national prestige
  - Specific, such as achieving a goal in set period of time

- Defines principles by which a state will conduct its space activities
  - Reaffirm adherence to international agreements
  - Outline national historical, cultural, or ideological principles

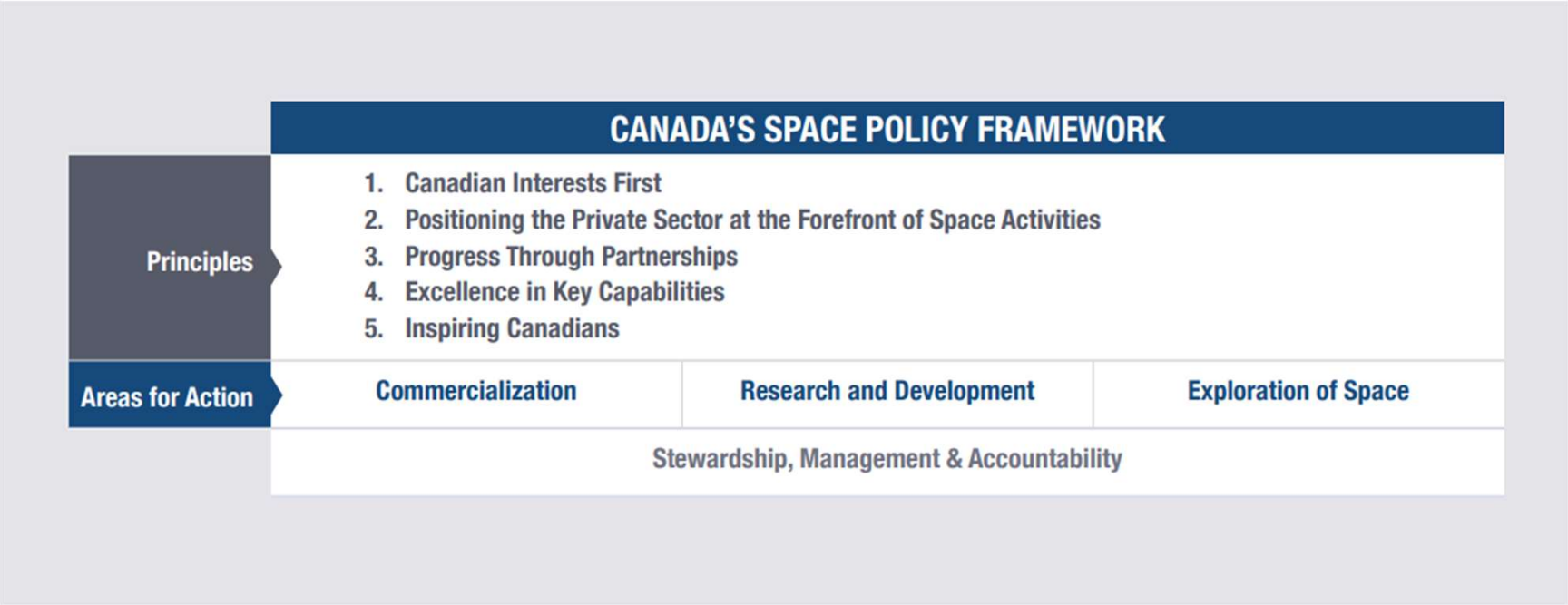
Example: UAE Mars Mission

Source: [Emirates 24/7]

Why National Space Policy (2)

- Define and delineate roles and responsibilities between government agencies
  - Assign to one agencies or several
  - Coordination between multiple different agencies
- Link space to broader science, technology, and innovation (STI) policy
  - Investment in basic science and R&D
  - Foster STEM education and workforce development
- Foster international cooperation
  - Multilateral, regional, or bilateral
  - Which agencies do the engagement, and on what topics?

Canada's Space Policy Framework



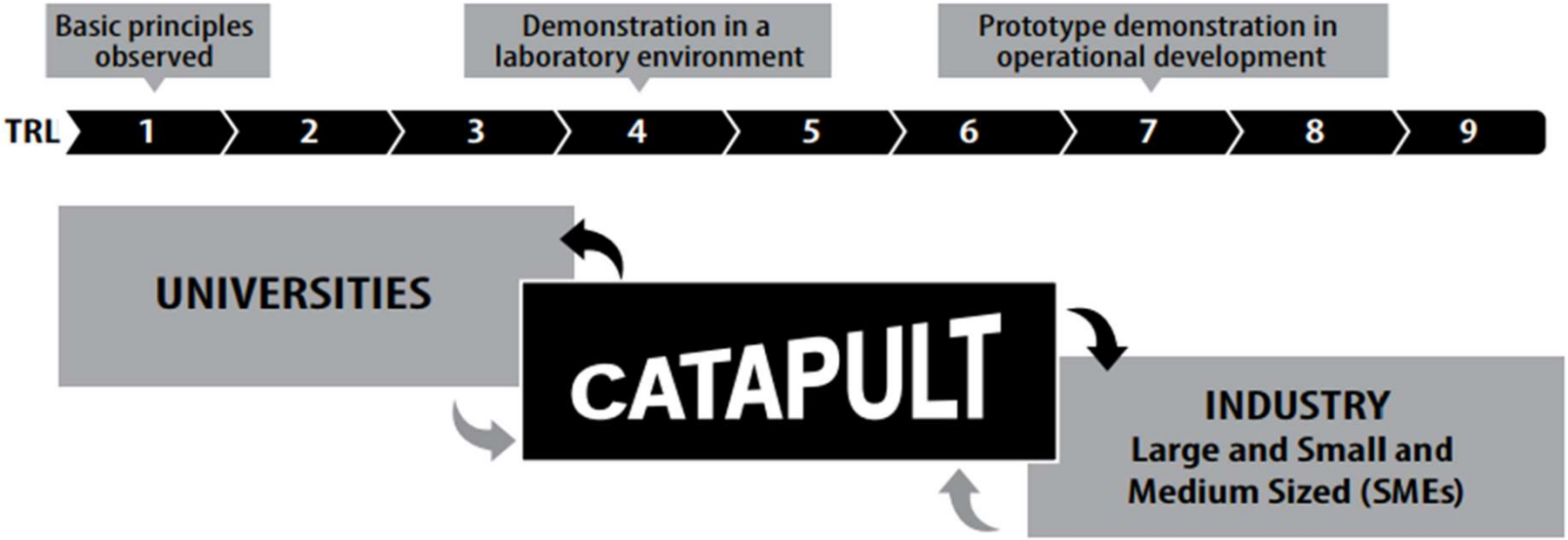
Source: Canadian Government

Why National Space Policy (3)

- Export control and technology transfer
  - Balance proliferation of militarily-sensitive technologies with commercial development and innovation
  - Support national industrial base
  - Comply with international export control restrictions

- Government relationship with the private sector
  - What role(s) will the government play in relation to private sector?
    - Regulator
    - Customer
    - Supplier (technology, resources)
    - Collaborator
    - Competitor

UK Satellite Applications Catapult



Source: Adapted from Satellite Applications Catapult Peterborough Industry Day Presentation, Feb 2015

Administration and National Oversight

- Article VI of the Outer Space Treaty:

"States Parties to the Treaty ***shall bear international responsibility for national activities in outer space***, including the Moon and other celestial bodies, whether such activities are carried on by ***governmental agencies or by non-governmental entities***, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the Moon and other celestial bodies, shall ***require authorization and continuing supervision*** by the appropriate State Party to the Treaty."

Administrative Functions

- National registries of space objects
- Radiofrequency administration
- Space debris mitigation standards
- Export controls and technology transfer
- Licensing of private sector space activities
- Space situational awareness and space traffic management

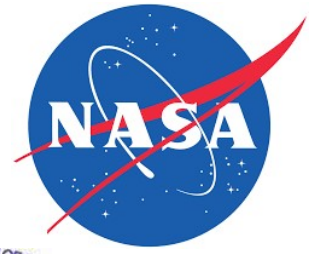
- How to organize?
  - Put it all under one agency (Ex: UAE Space Agency)
  - Divide it between multiple agencies (Ex: United States)

Current US Organization for Space

Vice President of the United States

National Space Council

Oversight of Government Space Activities



Space Situational Awareness

Oversight of Private Sector Space Activities

Future US Organization for Space?

Vice President of the United States

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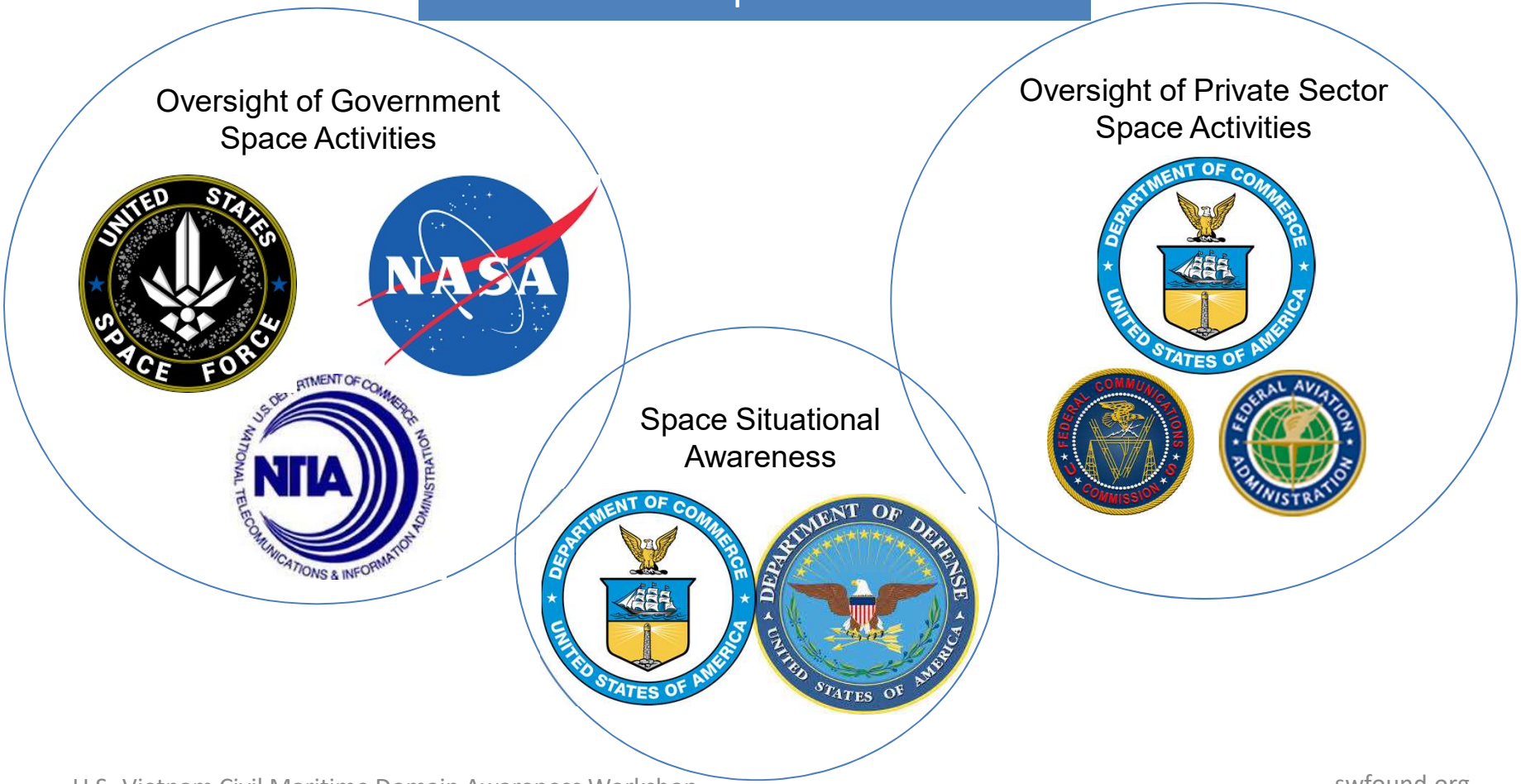
National Space Council



Process Example – The Philippines

Towards the Creation of a Philippine Space Agency

Baseline Research for Space Activities and Infrastructure (2013)	- Survey of infrastructure and human assets currently available in the country;
Crafting the National Space Development and Utilization Policy (2014)	- Analysis of foreign space programs and policies; - multi-sectoral stakeholder consultation on the proposed space policy;
Development and DIWATA Microsatellites and National Ground Receiving Station (2014~)	- first technical cooperation with Japan for the development and launch of two (2) micro satellites;
National SPACE Development Program (2015-2016)	- develop a cost-benefit analysis and establish key space roadmaps and agenda - foster international cooperation and partnerships
Legislation of the Philippine Space Agency and Policy (2016~)	-lobbying and proposing to politicians and decision-makers;

Source: Dr. Rogel Mari Sese (2017)

QUESTIONS?
THANK YOU!

bweeden@swfound.org