



Promoting Cooperative Solutions for Space Sustainability

Trends in Commercial Space Situational Awareness

Brian Weeden, Ph.D.

Director of Program Planning

Secure World Foundation

Space Situational Awareness: Strategic Challenges
for India
Bengaluru, India, June 14-15 2018

swfound.org
@SWFoundation



Promoting Cooperative Solutions for Space Sustainability

Space Data Association (SDA)

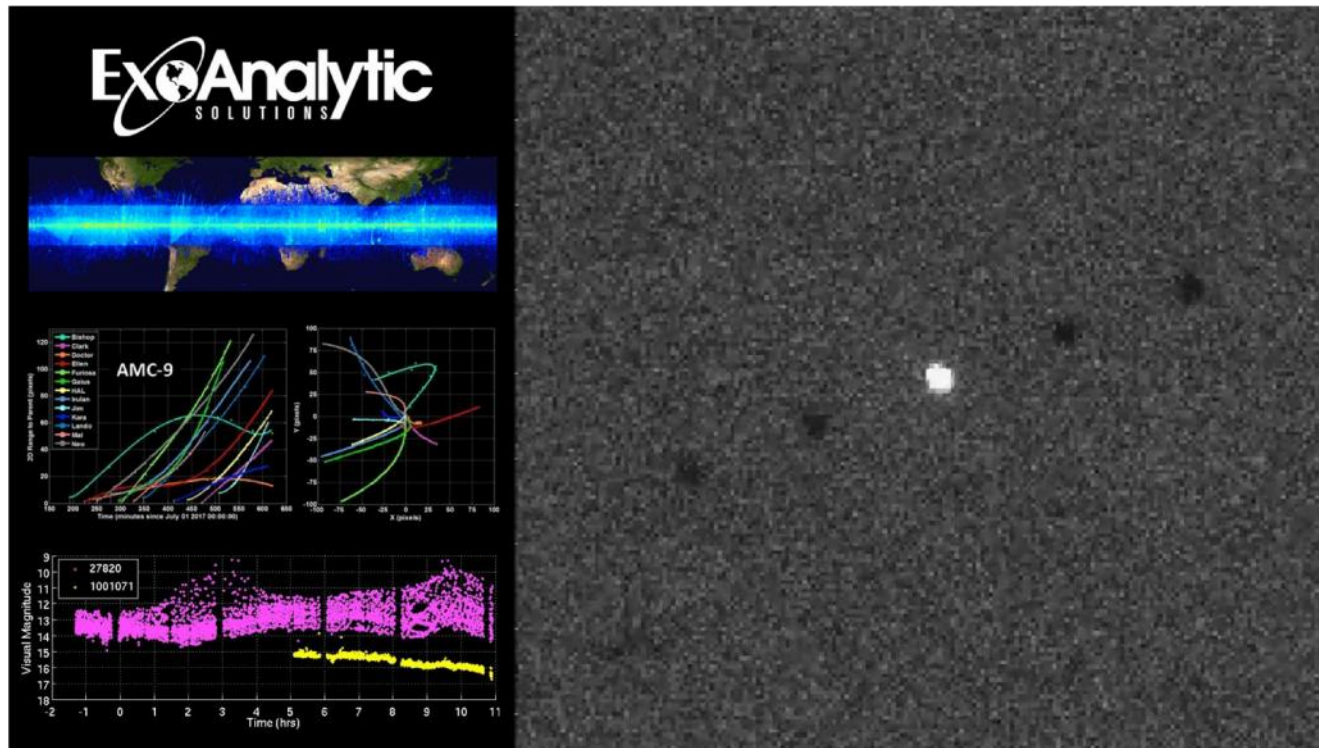
- Improving Our Vision (2006-2010)
 - Set of conferences and workshops to discuss SSA and relationship between US military and satellite operators
 - Growing frustration by satellite operators over lack of “customer service” from the US military
- SDA formally created in 2009
 - Intelsat, SES, Inmarsat, and Eutelsat as founding members
 - “Added value” conjunction screenings for members
 - Radio Frequency Interference (RFI) geolocation
- SDA 2.0 announced in 2017
 - Using commercial SSA data to feed their own catalog
 - Moving towards being completely independent from US military data and services



Promoting Cooperative Solutions for Space Sustainability

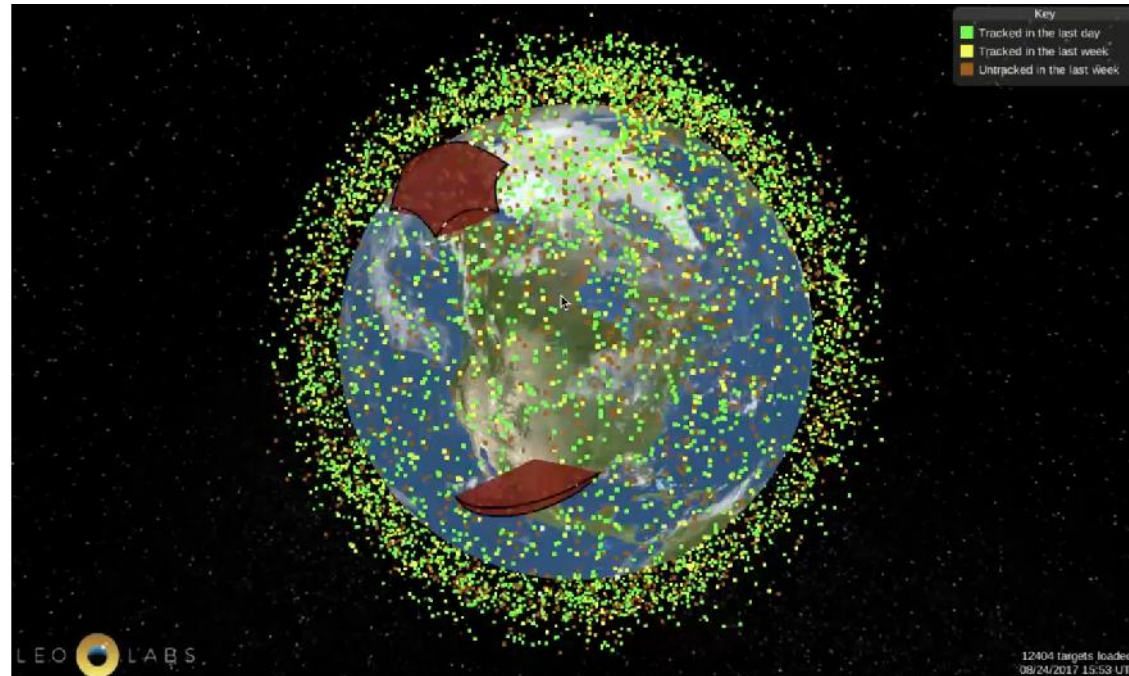
The Beginnings of Commercial SSA

- Commercial software and analysis tools have been around for decades
- September 2013, Advanced Maui Optical and Space Surveillance Conference
 - Deputy Assistant Secretary of Defense for Space Policy Doug Loverro
 - “We need help from industry, we’re not doing his well”
- March 2014, AGI announces the Commercial Space Operations Center (ComSpOC)

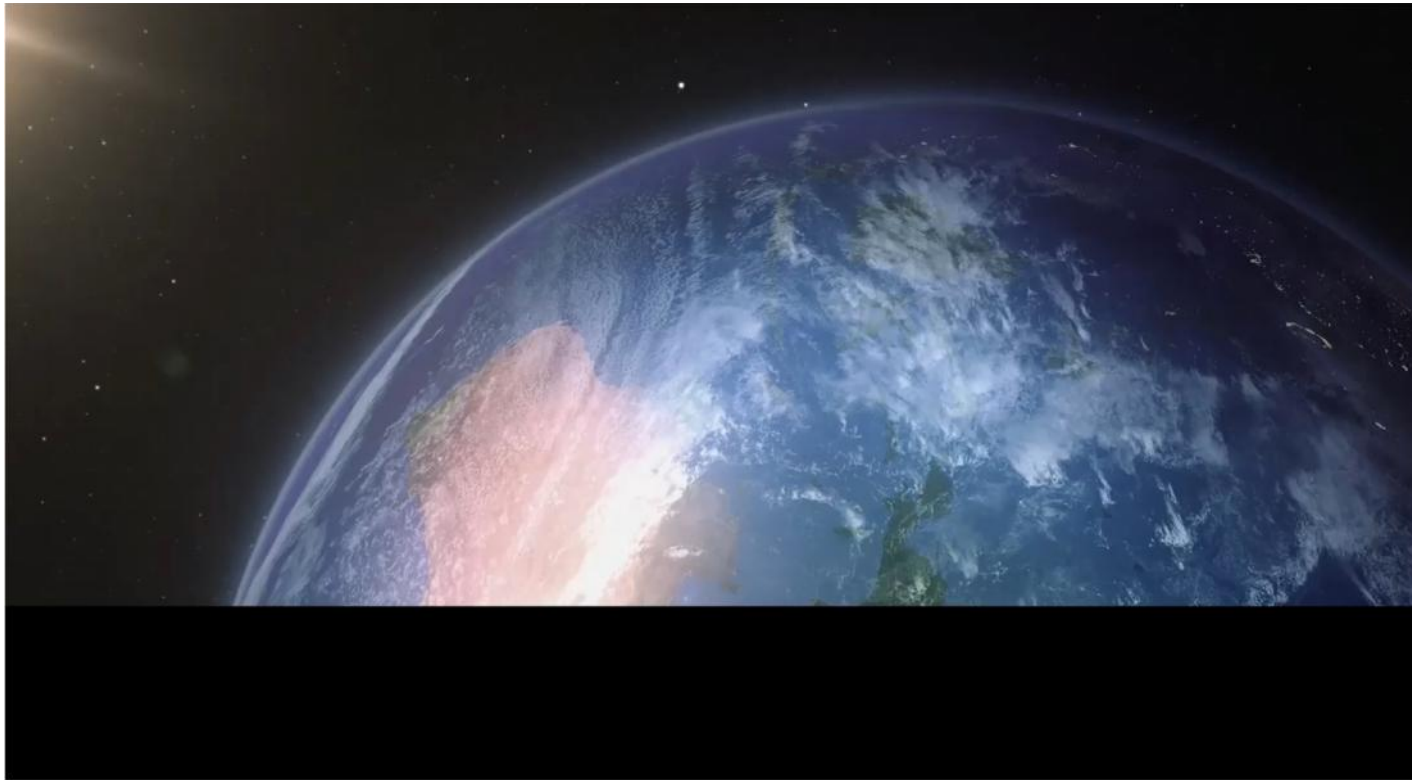


AMC-9 Anomaly

- More than 170 telescopes (~10 cm) deployed worldwide
- Tracking nearly all objects >10 cm in GEO, can also do photometrics and persistence



- Ground-based phased array radars for tracking LEO space objects
- Currently operating radars in Alaska and Texas
 - Tracking 13,500 objects
 - <https://platform.leolabs.space>
- Plan to roll out next-gen of S-Band radars globally



- Canadian start-up company
- Plan to do LEO constellation for Earth remote sensing and space-based optical SSA

Commercial Deep Space Radar

- In May 2018, AGI announced partnership with Thoth Technologies to develop commercial deep space radar
- Installed transmitter in the 46-meter antenna at the Algonquin Radio Observatory in Ontario, Canada
- Can track objects out to distances of 50,000 kilometers, and can detect objects about two meters across on GEO



Algonquin Radio Observatory



Promoting Cooperative Solutions for Space Sustainability

Current Status

- Private sector is developing capabilities across the full spectrum of SSA operations
 - Raw data (ground and space-based, multi-phenomenology)
 - Data fusion
 - Analytics
 - Decision-making tools
- Currently have as good (or better) GEO catalog as the US military, likely to have as good (or better) LEO catalog within 5 years



Promoting Cooperative Solutions for Space Sustainability

Big Policy Questions

- Should the government continue to develop its own SSA capabilities or purchase commercial services?
- Where do we want the commercial innovation to occur?
 - Example: weather data
- How to incent continued creation of public goods?
 - Open access to SSA data for scientific research
 - Public access to data for transparency
 - Open algorithms and standards



Promoting Cooperative Solutions for Space Sustainability

Thank you. Questions?

bweeden@swfound.org