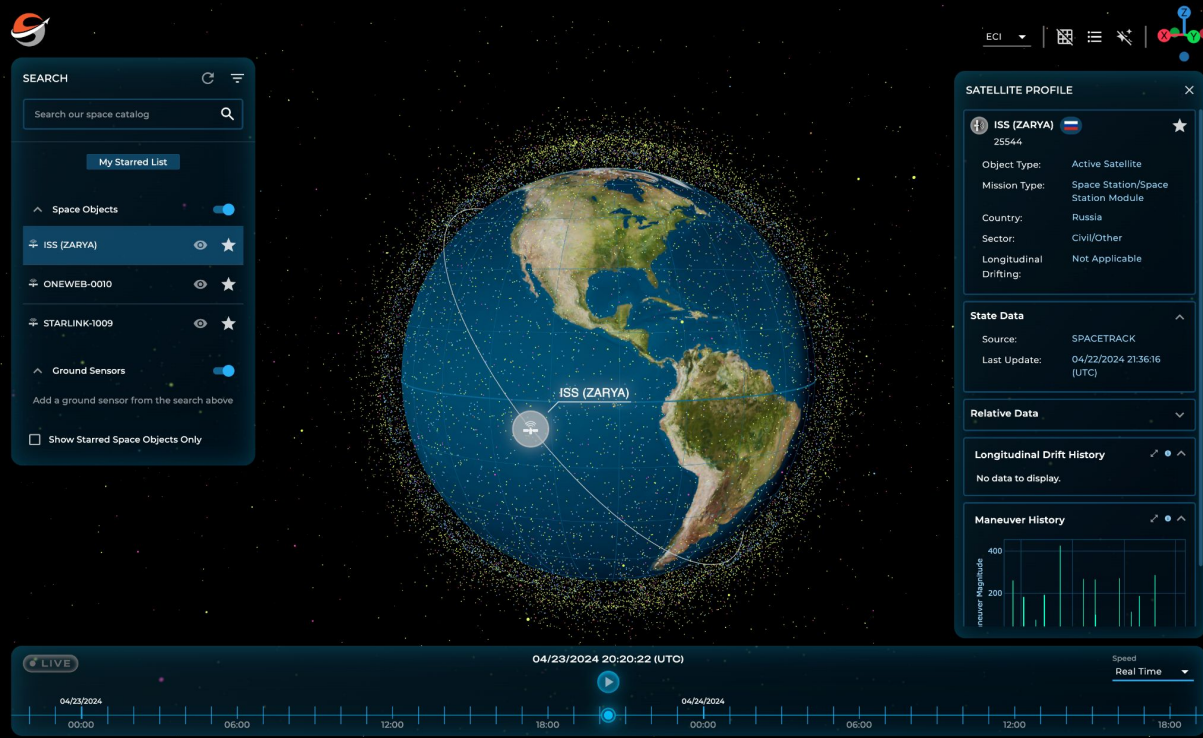# Characterizing Space Activities

Audrey Schaffer
Vice President, Strategy & Policy

Most Comprehensive, Accurate, & Actionable
Common Operating Picture of Space

Multi-Source, Multi-Orbit, Day & Night Space Object Tracking

Astrodynamics Models & Machine Learning Models

Accessed through Software Platform with Open Interfaces

LEO-to-xGEO Space Situational Awareness Insights from the Slingshot Global Sensor Network

- Routine, Advanced, and Event-Based Tracking

- Accurate, Low-Latency Astrometric & Photometric Data

- Continued LEO-Focused Network Expansion

- Full space object catalog across GEO/MEO/GEO/LEO

- 500+ million observations collected to-date

- Supporting government and private sector spacecraft owner/operators and oversight agencies

200+ Day/Night Optical Sensors

20+ Global Sensor Sites

24-7-365 Space Domain Awareness

3

Space Object Status

- Ground-based telescopes observe the brightness of a space object over time

- Light curves can reveal space object attitude control - stable vs tumbling

- Attitude control is one indicator of whether a space object is functional or not-functional


27942 Light Curve

14780 Light Curve
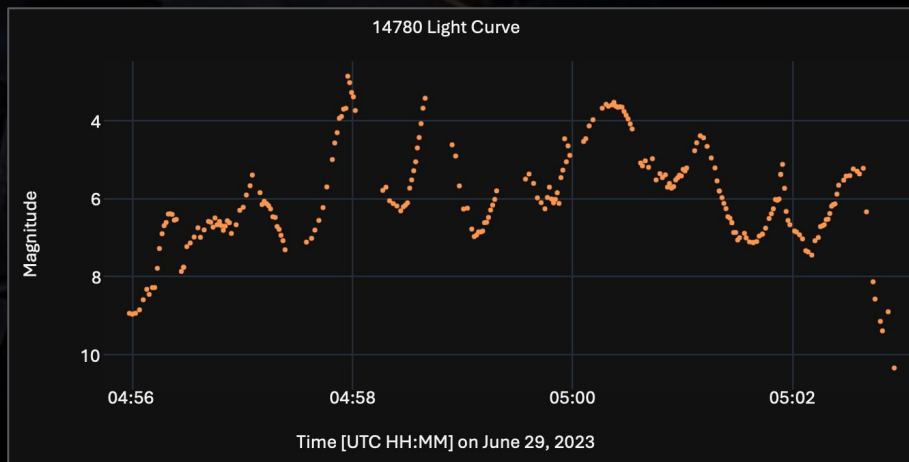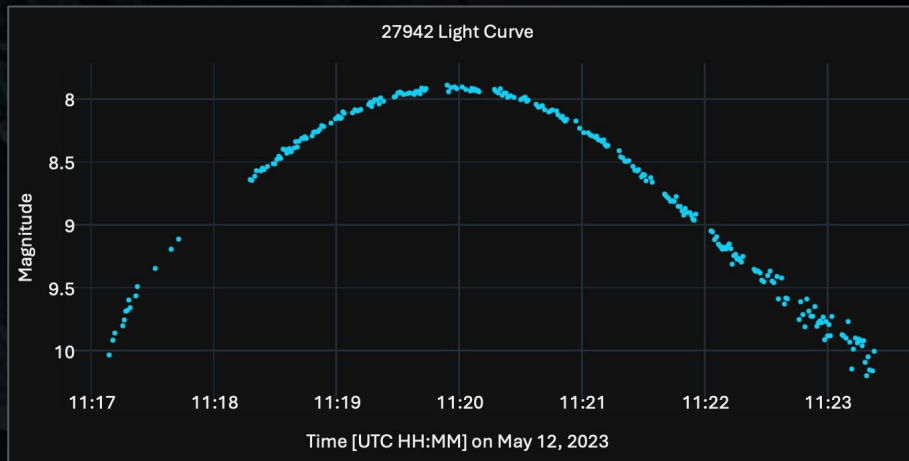
SPACE INSIGHTS

# Pattern of Life (Stationary)

- Ground-based telescopes observe the position of a space object over time

- Large changes to position can be detected with observational data → pattern of life

- Pattern of life can inform analysis of function of space object

- Different patterns of life are most readily apparent when comparing objects in Geostationary Orbit (GEO)

Longitude Stations for 42662

Longitude Stations for 29155
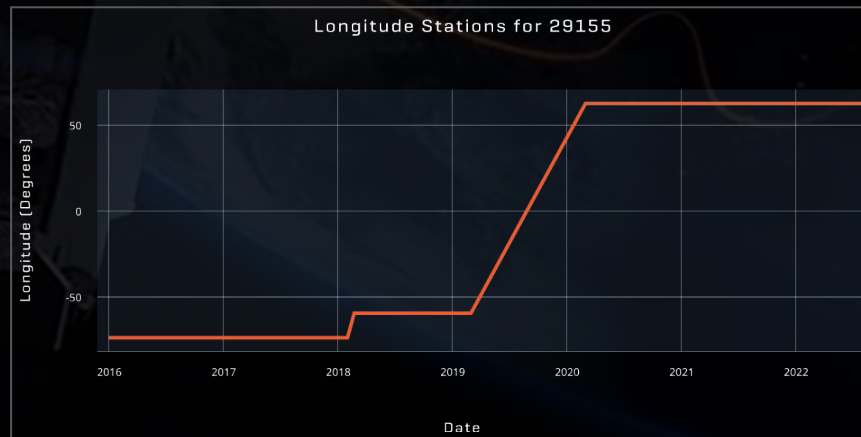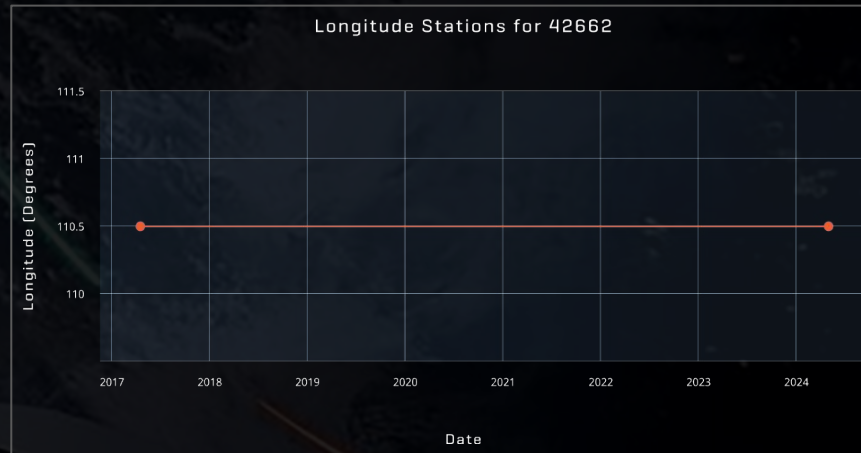
SPACE INSIGHTS

Pattern of Life (Dynamic)

- Some space objects in GEO change their positions more frequently than others

- When assessing pattern of life, can look at frequency of positional changes AND other potentially-affected space objects

- Nearby space objects can inform analysis of whether spacecraft is performing cooperative or uncooperative activities
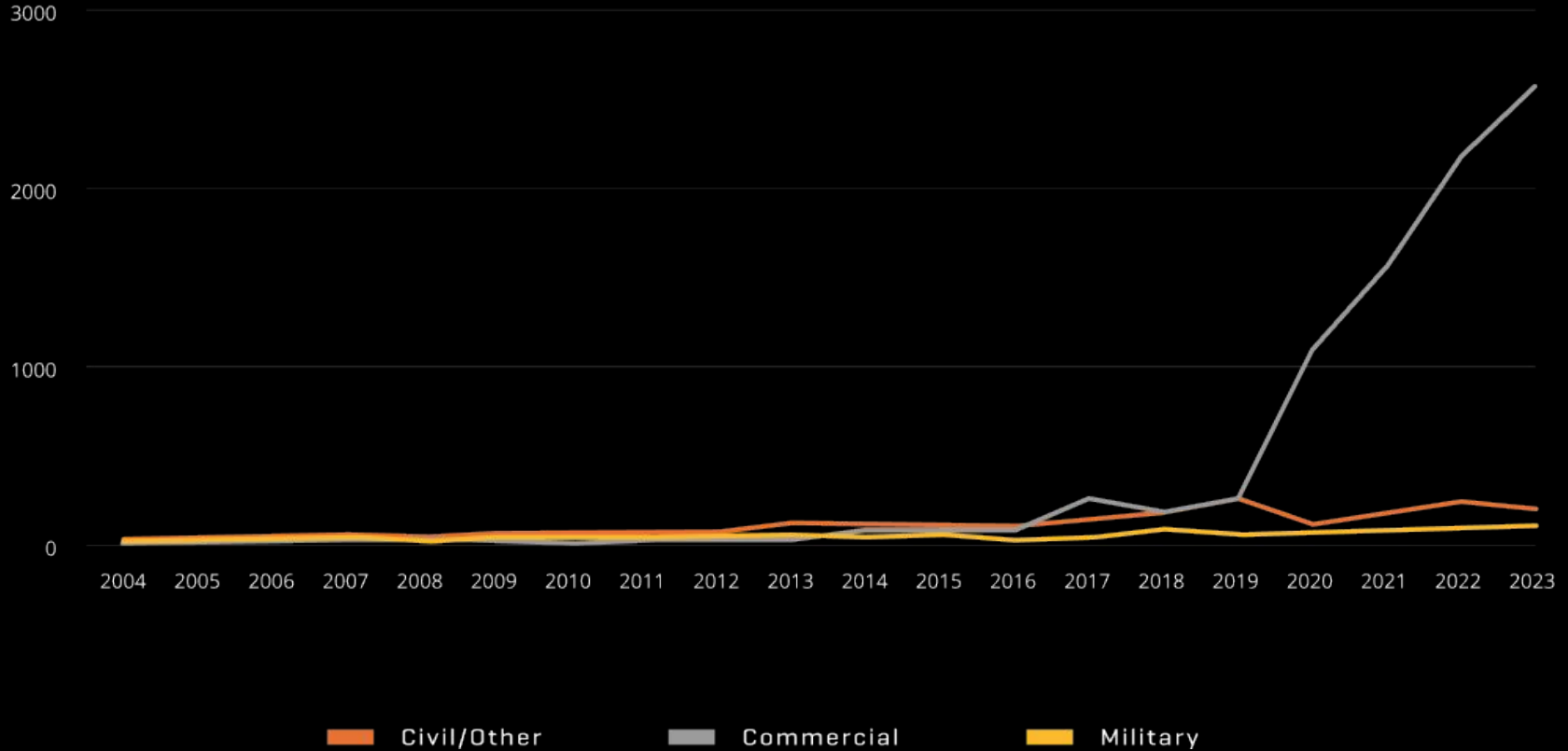
SLINGSHOT AEROSPACE
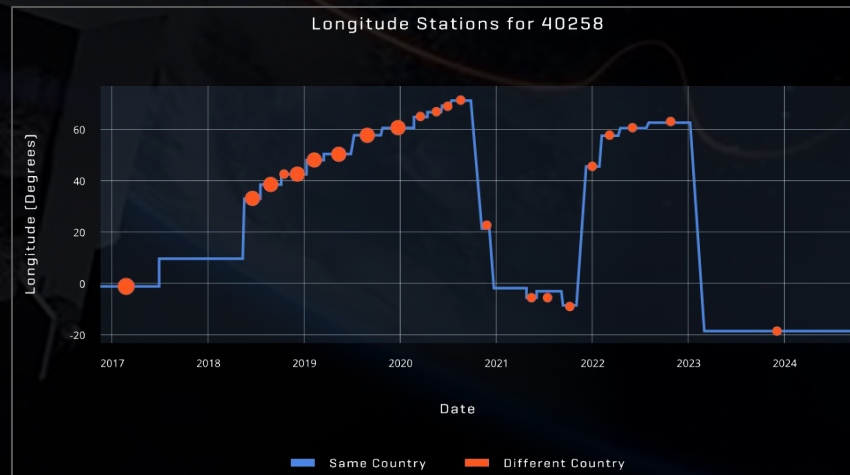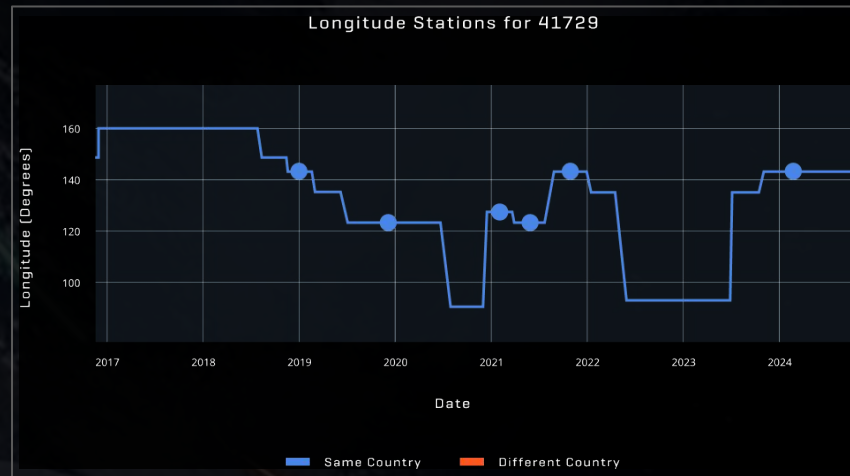
Thank you!

Spacecraft Annual Deployments by Sector

AI & ML-Powered Analytics

Pattern of Life Insights

Slingshot's Pattern of Life Insights analytic combines satellite descriptors, orbital characteristics, and maneuver detection to offer detailed and actionable insights into a spacecraft's behavior.

Neighborhood Watch Insights

The Neighborhood Watch Insights analytic provides near real-time information about clusters of satellites in the GEO belt by evaluating the general characteristics of grouped satellites ("neighborhoods") and monitoring for changes in those groups.

Outlier Spacecraft Insights

Whether trying to understand the impact and operation of orbital neighbors or maintaining awareness of suspected threats, machine learning algorithms identify anomalous behaviors and provide near real-time monitoring of active constellations.

RF Signal Insights

Slingshot's Radio Frequency (RF) Signal Insights enable partners to identify, track, and characterize ground- and space-based RF sources including jammers, spoofers, and unexpected sources using GNSS data.