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Subcommittee on Space and Science
"Landsat at 50 & the Future of U.S. Satellite-based Earth Observation"

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Chairman Hickenlooper, Ranking Member Lummis, full Committee Chair Cantwell and Ranking Member Wicker, and esteemed Members of the Subcommittee on Space and Science:

Thank you for holding this hearing to discuss the important topic of Earth observation in honor of 50 years of Landsat. My name is Dan Jablonsky, and I am the President and CEO of Maxar Technologies, a role in which I have served in since January 2019. I have been a part of the remote sensing industry for the past decade and before joining the private sector, I was a surface warfare officer and nuclear engineer in the U.S. Navy. I am honored to be a part of this hearing today.

About Maxar

Maxar is a leader in commercial Earth intelligence and space technology solutions and a trusted, end-to-end partner to the U.S. government and the commercial industry. As a U.S. company with locations across the country, Maxar designs, manufactures, and operates communications and Earth observation satellites; space exploration spacecraft; solar electric propulsion systems; on-orbit satellite servicing vehicles; and robotics for ongoing space operations and exploration.

In 1993, the U.S. Department of Commerce granted WorldView Imaging Company, later known as DigitalGlobe, a legacy Maxar company, the first license for commercial Earth observation from space. Maxar's Earth observation satellites have provided imagery to support critical national security and disaster response missions ever since. Most recent examples include intelligence related to the war in Ukraine and damage assessments to support recovery efforts related to Hurricanes Fiona, Ian, and Nicole. We are proud to serve as a trusted partner to the U.S. government—providing data-driven insights, analysis, and recommendations, delivering current, high-resolution satellite imagery, and enabling 3D data for analysts and decision makers to better monitor, understand, and respond to current events, deter threats, and ensure national and global security.

For more than 60 years, Maxar has supported U.S. leadership in space, manufacturing more than 280 spacecraft, supporting numerous civil space missions including the National Aeronautics and Space Administration's (NASA) upcoming Tropospheric Emissions: Monitoring of Pollution (TEMPO) mission.

Additionally, we operate, and for the past 20 years have operated, the most advanced constellation of commercial Earth imaging satellites in the world. We are headquartered in Westminster, Colorado, and have a dedicated workforce of over 4,000 across the country including at our facilities in California, Florida, Michigan, Missouri, Virginia, and Puerto Rico.

Landsat at 50

We are here today to mark the 50th anniversary of the launch of the first satellite in the Landsat series by the U.S. Geological Survey (USGS) and NASA in 1972. The fifty-year archive of Landsat observations has supplied invaluable, empirical evidence that has helped build confidence in Earth observation technology and created a shared understanding of how the Earth is changing. Since that time, Earth observation technology and the U.S. space industrial base have advanced rapidly.

As we celebrate this important milestone and look to the future of U.S. satellite-based Earth observation, I would like to discuss three important topics today:

- The value Earth observation technology provides to society and how Earth observation technology can be harnessed to solve some of the biggest problems facing humanity.
- The important role the commercial space sector plays advancing U.S. leadership in space.
- The steps industry and Congress should take to help ensure America continues to lead on Earth observation technology.

Earth Observation Technology Helps Solve Complex Problems

Earth observation technology is key to solving some of the biggest problems facing humanity and enables a better understanding of the world around us. Earth observation capabilities help identify, monitor, and address problems that threaten the security and economic well-being of every American, and aid in the improvement of the lives of people across the globe.

In order to most effectively use Earth observation data to address today's issues, and issues that will arise in the future, Maxar uses innovative artificial intelligence, machine learning, and algorithm techniques to extract answers quickly in order to assist decision makers. The amount of information coming from space is best used by applying these techniques to get actionable information. We all know the danger of overgrown trees near powerlines and the impacts a downed line can have. However, we have applied unique algorithms which can tell the height of vegetation based off data we obtain from our Earth observations which can then be used for utility corridor monitoring – helping customers understand when vegetation near powerlines needs to be trimmed.

Extreme Weather and Disaster Response

Each year, thunderstorms, floods, tornadoes, hurricanes, and other weather-related events, cause an average of approximately 650 deaths and $15 billion in damage in the U.S. About one-third of the U.S. economy — some $3 trillion — is sensitive to weather and climate.[1] Earth observation provides decision makers and first responders with essential information to help them protect lives and property when extreme weather events occur. Not only is imagery essential, but technologies like Shortwave Infrared (SWIR) on Maxar's WorldView-3 satellite help first responders identify where wildfires are most active.

Other applications like our Open Data Program provide critical and actionable information to assist response efforts. Associated imagery and crowdsourcing layers can provide information to the front lines at high speed. Using machine learning and satellite imagery, the government has been able to help forecast potential damage and point on-the-ground response teams to areas that have been damaged by hurricanes.

[1] https://www.noaa.gov/weather

Maxar's 20+ year imagery archive provides a digital history of our planet that allows change assessment over time. With our extensive archive and our ability to detect change over time, our data is regularly used to track droughts, glacial melt, and as with response efforts, the damage caused by wildfires, floods, hurricanes, and other natural disasters. For example, our imagery and automated algorithms were used to map new standing bodies of water after the Hunga Tonga Hunga Ha'apai volcano eruption and subsequent tsunami.

Maxar's WeatherDesk helps anticipate and mitigate the changing weather conditions by accessing global weather forecasts and observations that support better business, mission, and operations decision-making. Recently, Maxar developed an award-winning high performance computing solution using NOAA's weather forecasting model in the cloud and our WeatherDesk team collaborated with Amazon Web Services, Inc. to optimize this solution and deliver a detailed global weather forecast 58 percent faster, reducing a 100-minute process to roughly 42 minutes.

Agriculture and Food Security

Agriculture is a multibillion-dollar industry that contributes a total of $1.053 trillion of national Gross Domestic Product and 11 percent of employment when derivative industries (e.g., food services, textile production) are considered.[2] Earth observation technology plays a critical role in supporting the agriculture industry by supplying farmers with information about when to plant crops and their estimated yields. It also plays an important role in food security, providing an early warning when food supply may be at risk. For example, earlier this year, Maxar's WeatherDesk was used to predict a significant decline in Ukrainian crop harvest, which typically helps to feed parts of the world facing food scarcity, due to the war.

Critical Infrastructure

Earth observation technology supports critical infrastructure. Maxar's Precision3D Telco Suite enables 5G radio network providers to plan telecommunications networks by accurately mapping terrain to avoid signal disruptions. This is possible due to Maxar's use of imagery data, artificial intelligence, and automation. Maxar also provides insight to analysts on critical energy infrastructure projects in the oil and gas sectors, helping to preserve finite resources. Our satellite images also provide critical data for mobility and logistics operations across the U.S.

National Security

Over the last two decades, Maxar has been a trusted partner to the U.S. government, providing commercial Earth observation capabilities in support of national security, including the response to the ongoing war in Ukraine—ensuring that policymakers have uninterrupted access to time sensitive, actionable satellite imagery. The transparency provided by satellites showed the world the buildup of Russian troops along the border of Ukraine, tracked the early days of the invasion, and have been used to document atrocities carried out by the Russian military.

Maxar is also helping the U.S. government to harness commercial capability in support of warfighters with its ability to transform 2D satellite imagery into 3D models and precision point clouds, a set of data points in space which create a 3D model. This allows us to provide more

[2] https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/ag-and-food-sectors-and-the-economy/

information to intelligence analysts, as well as highly accurate and sophisticated geolocation data to warfighters. As a result, Maxar's 3D data and capabilities are helping to usher in a new era of insight, simulation, and modeling.

Advancing U.S. Leadership in Space

Maintaining a robust domestic commercial space industrial base and ensuring the U.S. government is harnessing the full breadth of commercial capability — including advanced Earth observation capabilities — is fundamental to advancing American strategic interests in space. Commercial satellites increase America's overall resiliency in space, providing the U.S. government with greater capacity and capability for civil space and national security space missions.

The National Space Policy recognizes this strategic imperative, stating in part that "a robust, innovative, and competitive commercial space sector is the source of continued progress and sustained U.S. leadership in space."[3] Leaders in the intelligence community (IC) have called the commercial sector not "just a priority, [it's] a must," and, "part of [the IC's] infrastructure," and affirmed the importance of making sure the U.S. industrial base is and remains competitive.[4]

Fortunately, the partnership between domestic commercial providers and the U.S. government is only getting stronger. Recently, the U.S. government increased its acquisition of commercial imagery across several U.S. industry providers to meet the growing demand for imagery and data across the U.S government. The commercial sector has also made big investments of its own and is working to harness its new and developing capabilities for the benefit of U.S. government customers. Programs like NOAA's GeoXO satellite system and NASA's TEMPO satellite instrument stand to benefit from these leading-edge technologies, including the use of artificial intelligence and machine learning, which reveal useful patterns in massive amounts of data–helping customers reduce resources while increasing scale and speed.

At Maxar, we're looking forward to the enhanced capacity coming online soon from our next-generation WorldView Legion satellites, which will more than triple Maxar's capability to collect 30 cm-class resolution imagery and enable up to 15 revisits per day — providing unrivaled commercial capability, including even greater persistent monitoring of priority areas of interest, accelerated change detection, and timely analysis at scale.

These are just some examples of how the U.S. industrial space base is helping to provide America with a technological edge in space.

Overcoming Challenges to Sustained U.S. Leadership in Space

Today, there are more than 4,500 active satellites and millions of other space objects orbiting Earth.[5] Despite the growth of commercial capabilities, commercial Earth observation providers face a space environment that is increasingly complex, making the challenge of preserving the space environment through responsible space traffic and debris management all the more urgent. Human-made objects traveling in Earth's orbit — including the debris caused by recent Chinese and Russian anti-satellite tests — pose a serious risk to satellites, spacecraft, and the people on board.

[3] https://www.space.commerce.gov/policy/national-space-policy/
[4] https://www.nro.gov/Portals/65/documents/news/speeches/2021/7Oct21_GEOINT_Symposium.pdf
[5] https://sia.org/commercial-satellite-industry-growing-as-it-continues-to-dominate-expanding-global-space-business-sia-releases-25th-annual-state-of-the-satellite-industry-report/

In 2016, Maxar's own WorldView-2 satellite was hit by a small piece of untracked debris. Fortunately, this had no impact on WorldView-2's ability to operate, but it provides a stark example of the dangers posed by space junk zipping around the world at 17,000 miles per hour: any collision could impact our ability to access the technological advancements we take for granted today, including GPS, weather monitoring and prediction, satellite imaging, satellite communications, and more. All these technologies rely on safe access to low Earth orbit.

Maxar has long been a proponent of limiting space debris and harnessing commercial technologies, such as propulsion, to support responsible space traffic management. To do our part, Maxar joined a group of global commercial space companies in signing on to the World Economic Forum's Space Industry Debris Statement, which encourages companies to "work together to inform and help governments create a practical set of regulations for the sustainable use of space."[6] We are also testing a new commercial solution from LeoLabs to help monitor and track space debris.

However, the U.S. government is best positioned to set an example for the rest of the world to follow. Just as it did thirty years ago when Congress passed the Land Remote Sensing Policy Act to establish rules of the road for the then-nascent commercial satellite-based Earth observation industry, America can help build a global framework for responsible operations in space. The Administration has been an important leader in this work, bringing key government and industry leaders together to understand how we can collaborate to create enforceable policies. And, I want to recognize and thank Subcommittee Chairman Hickenlooper (D-CO), Ranking Member Lummis (R-WY), and full Committee Chair Cantwell (D-WA) and Ranking Member Wicker (R-MS), and the rest of the Subcommittee and full Committee for their leadership on the importance of protecting and maintaining a sustainable space environment through the introduction of the Orbital Sustainability (ORBITS) Act. We support the ORBITS Act and we look forward to continuing to work with the Committee and Congress to develop solutions that will make space sustainable and maintain American leadership. There's still much work to do, but U.S. leadership is critical in bringing the rest of the world along.

Conclusion

Despite these challenges — as the Landsat program demonstrates — America can achieve great feats in space when we work together toward a common goal. The Landsat program has provided observations for 50 years, changing how we see and understand our planet. Thanks to the ingenuity of the commercial sector, and our strong partnership with the U.S. government, I am excited and optimistic for what the next 50 years will bring.

But that future will not be realized unless stakeholders across government, industry, and the research community work together to preserve the space environment by developing clear rules that govern space debris and space traffic management.

Maxar stands ready to do its part to help build a sustainable space environment and usher in the next 50 years of Earth observation advancements. Thank you to the Subcommittee for holding this hearing and the opportunity to speak on this important topic. I'm happy to answer any questions you may have at this time.

[6] https://www3.weforum.org/docs/WEF_Space_Industry_Debris_Statement_2021.pdf