



Status report on the current and future satellite systems by NOAA

Presented to CGMS-51 Plenary session, Agenda item 2

Presented by: Dr. Stephen Volz, NOAA Assistant Administrator for Satellite & Information Services

Executive summary

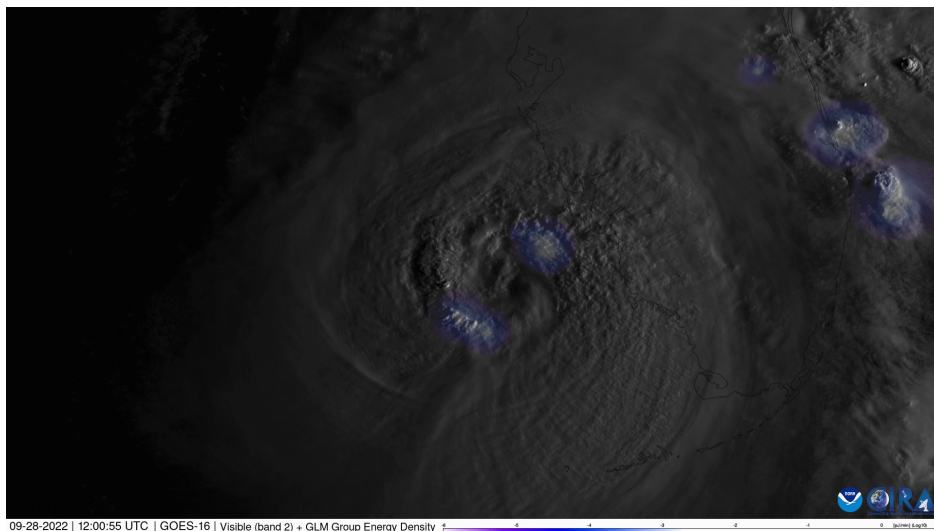
- NOAA provided updates on its current and future GEO, LEO and Space Weather missions as well as its commercial weather data program, its first of its kind enterprise cloud system and organizational updates.
- NOAA's GOES-East (GOES-16) and GOES-West (GOES-18) satellites are operating well, and GOES-17 is the on-orbit spare. NOAA will launch and commission GOES-U, the final satellite in GOES-R Series (April 2024) which will also include a space weather instrument, the compact coronagraph (CCOR). Geostationary Extended Observations (GeoXO) will continue and expand observations provided by the GOES-R Series and add new capabilities to address emerging environmental issues and challenges.
- NOAA's polar-orbiting satellites are operating well, and NOAA-21, currently providing provisional data, will be declared operational in July 2023. NOAA continues to develop JPSS-3 and JPSS-4, and its Near Earth Orbit Network (NEON) will continue and expand observations provided by the Polar Weather Satellites using instruments on small, lower-cost, proliferated satellites and partner data to improve weather forecasting, aid disaster management, and monitor climate.
- NOAA's DSCOVR Mission is operating well. NOAA's Space Weather Next (SW Next) will sustain, improve, and mitigate potential gaps in observations while working with partners to support NOAA's space weather forecast operation.
- NOAA will foster and expand interagency, commercial, and international partnerships to complement and supplement NOAA data to meet its mission. Also, NOAA will exploit information technology, such as cloud and artificial intelligence, via Common Ground Services to expand NOAA's user community and accelerate product service delivery to meet today's customer and climate service needs.

OVERVIEW – Planning of NOAA Satellite Systems

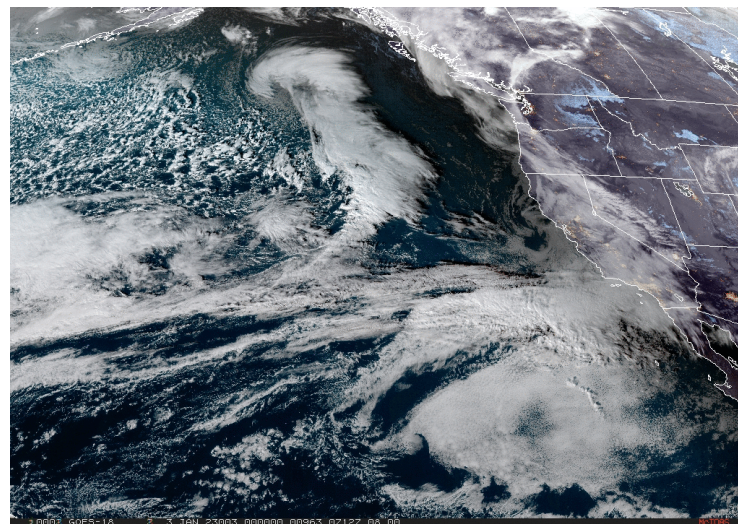


CURRENT GEO SATELLITES

- 4 January 2023: GOES-18 became GOES-West!
- GOES-16: Operational as GOES-East since December 2017.
- GOES-17: Now in Storage mode at 105° W
- Working to bring new products into operation:
 - GeoColor
 - GLM Flash Extent Density
 - ABI Flood
 - Solar Insolation
 - Enterprise versions of L2 data products



Hurricane Ian Landfall in Florida, GOES-16 Band 2 GLM Group Energy Density (CIRA)



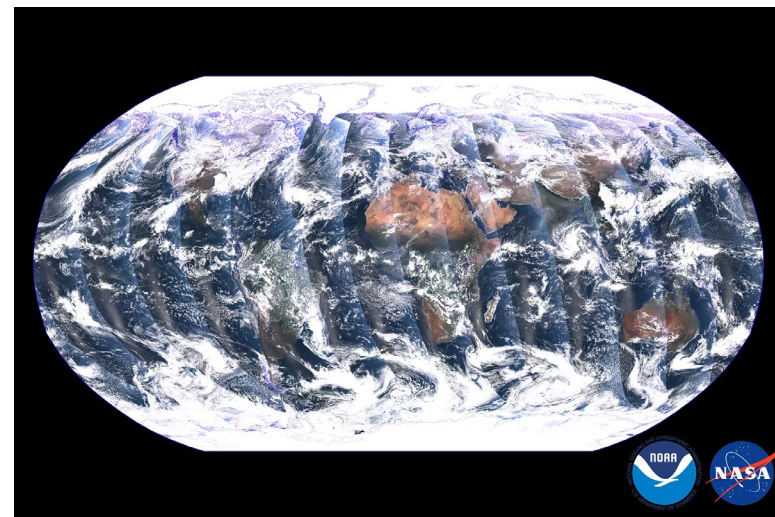
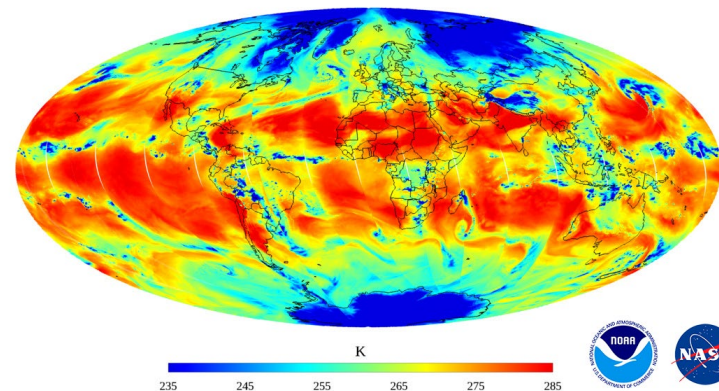
Atmospheric River Causes California Flooding, GOES-18 GeoColor

CURRENT LEO SATELLITES



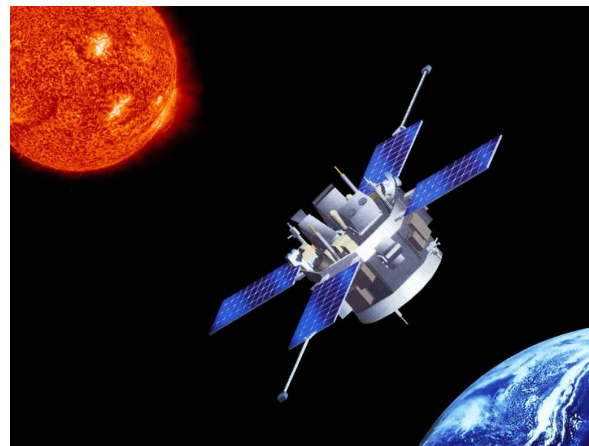
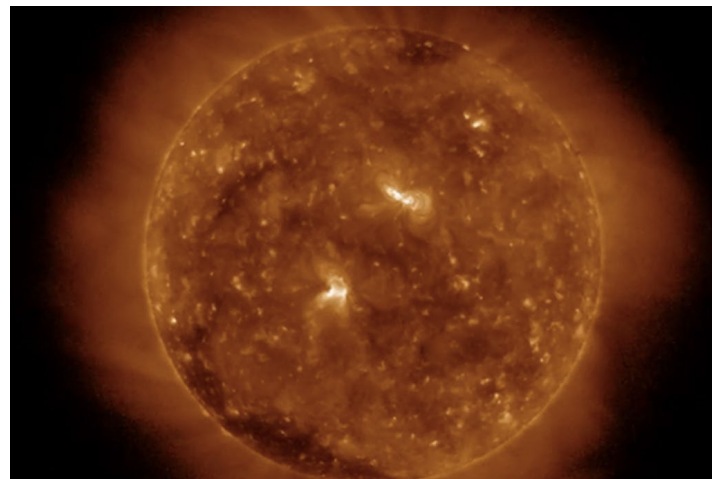
- NOAA-20 remains prime
- NOAA's Joint Polar Satellite System-2 (JPSS-2) mission, now NOAA-21, launched from the Vandenberg Space Force Base in Lompoc, California on November 10th, 2023.
- NOAA-21 is currently providing provisional data. Expected to be declared operational in July 2023.

NOAA-21 ATMS Sensor Brightness Temperature
Ch.18 183.311±7.0 GHz QH-POL
22 Nov 2022



CURRENT SPACE WEATHER SATELLITES

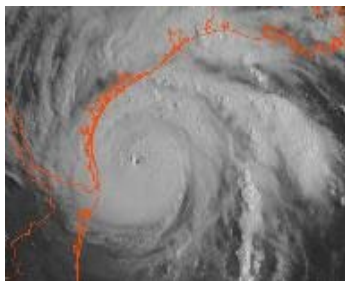
- **GOES–R series**
 - Magnetic Field and Energetic Particles
 - SEL Solar UV and X-ray Irradiance Imaging
 - SEL Coronagraph on GOES-U (2024)
- **COSMIC-2 and Commercial RO**
- **DSCOVR (Deep Space Climate Observatory)**
 - DSCOVR Magnetometer (MAG)
 - Faraday Cup
- ***Continued Reliance on Research Missions in Extended Operations***
 - Advanced Composition Explorer (ACE) (NASA)
 - Solar and Heliospheric Observatory (SOHO) (NASA)



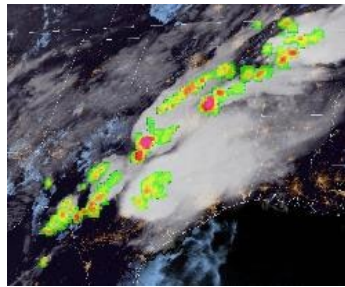
FUTURE GEO SATELLITES



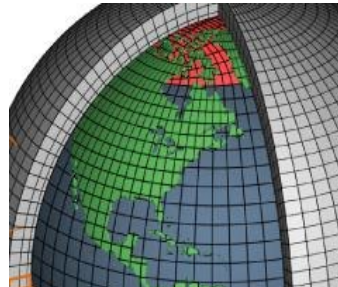
Vis/Near-IR Imagery



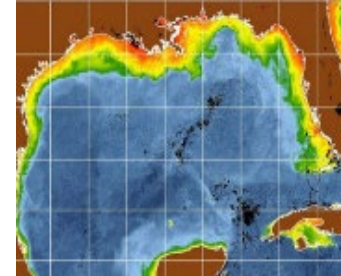
Lightning Mapping



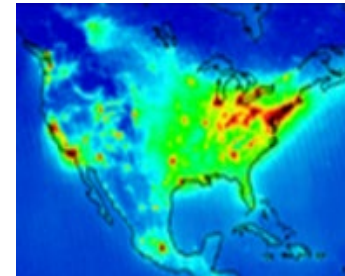
IR Sounding



Ocean Color



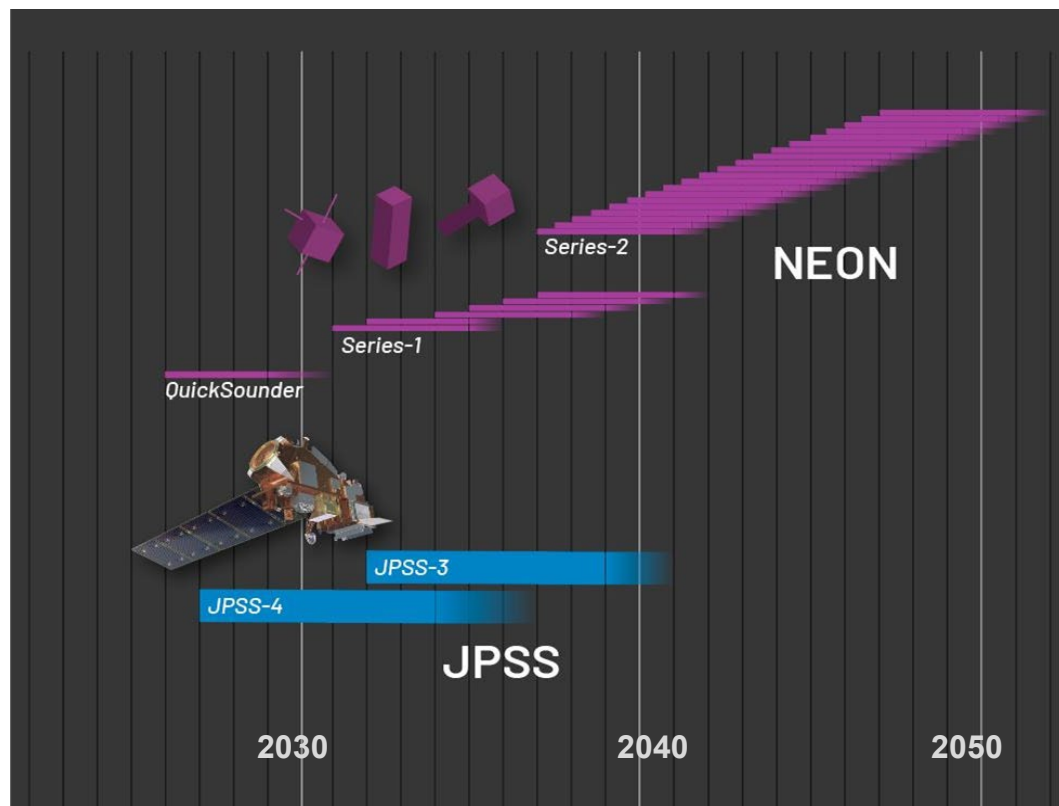
Atmo. Composition



FUTURE LEO SATELLITES

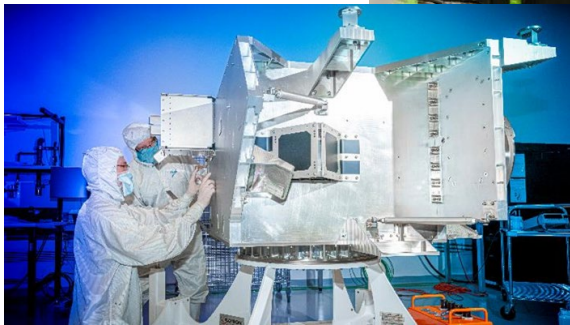
Strategic investments include:

- Implementing the QuickSounder demonstration mission to understand how best to **exploit “New Space”**
- Initiating phased acquisition of the **next generation instruments to extend measurements** from LEO based on need
- **Development schedule is phased** in anticipation of when capabilities are needed, are most impactful, and can be accommodated.
- Capabilities may include:
 - Microwave Sounder
 - Infrared Sounder
 - VIS/NIR Imager
 - Ocean surface vector winds
 - Ozone Monitor
 - Ocean Color Imaging
 - Radio Occultation
 - 3D Winds



FUTURE SPACE WEATHER SATELLITES

Space Weather Follow On (SWFO)



Spacecraft assembly

Image: Ball Aerospace



CCOR-1 integration onto GOES-U

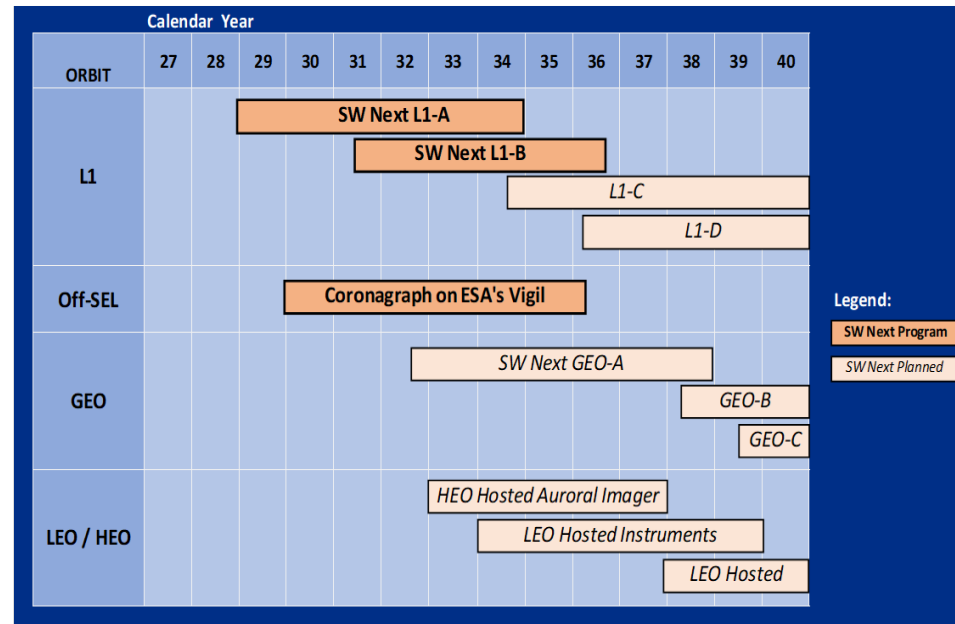
Image: Lockheed Martin

- **Development underway for:**
 - SWFO-L1 Observatory
 - Instruments (CCORs, MAG, SWiPS, STIS)
 - Ground Segment (C2, SAN, and PGD)
- **On track for launches in 2024 (CCOR on GOES-U) & 2025 (SWFO L1 Mission)**

Coordination Group for Meteorological Satellites

Space Weather Next (SW Next)

- Planning for **sustainment and augmentation of observations** from (first launch):
 - L1 (2028) & L5 (2029)
 - Geostationary Orbit (GEO) (2032+)
 - Low Earth Orbit (LEO) (2032+)
 - Highly Elliptical Orbit (HEO) (2032+)
- Expanding Ground Segment for Support



Key issues of relevance to CGMS:

- New Data Sharing Licenses for NOAA's Commercial Weather Data Radio Occultation contracts.
- In August 2022 NOAA/NESDIS announced a First-of-its-Kind Enterprise Cloud Award
- Name Changes in NESDIS Organization

Past or Current		New as of Summer 2023	Program Content
JPSS	➡	LEO	Low Earth Orbit operations, with two programs: JPSS and NEON
OSAAP	➡	SAE	Systems Architecture and Engineering
OSGS	➡	OCS	Office of Common Services, developing ground and IT systems
OPPA	➡	SWO	Space Weather Observations, including SWFO and SW Next



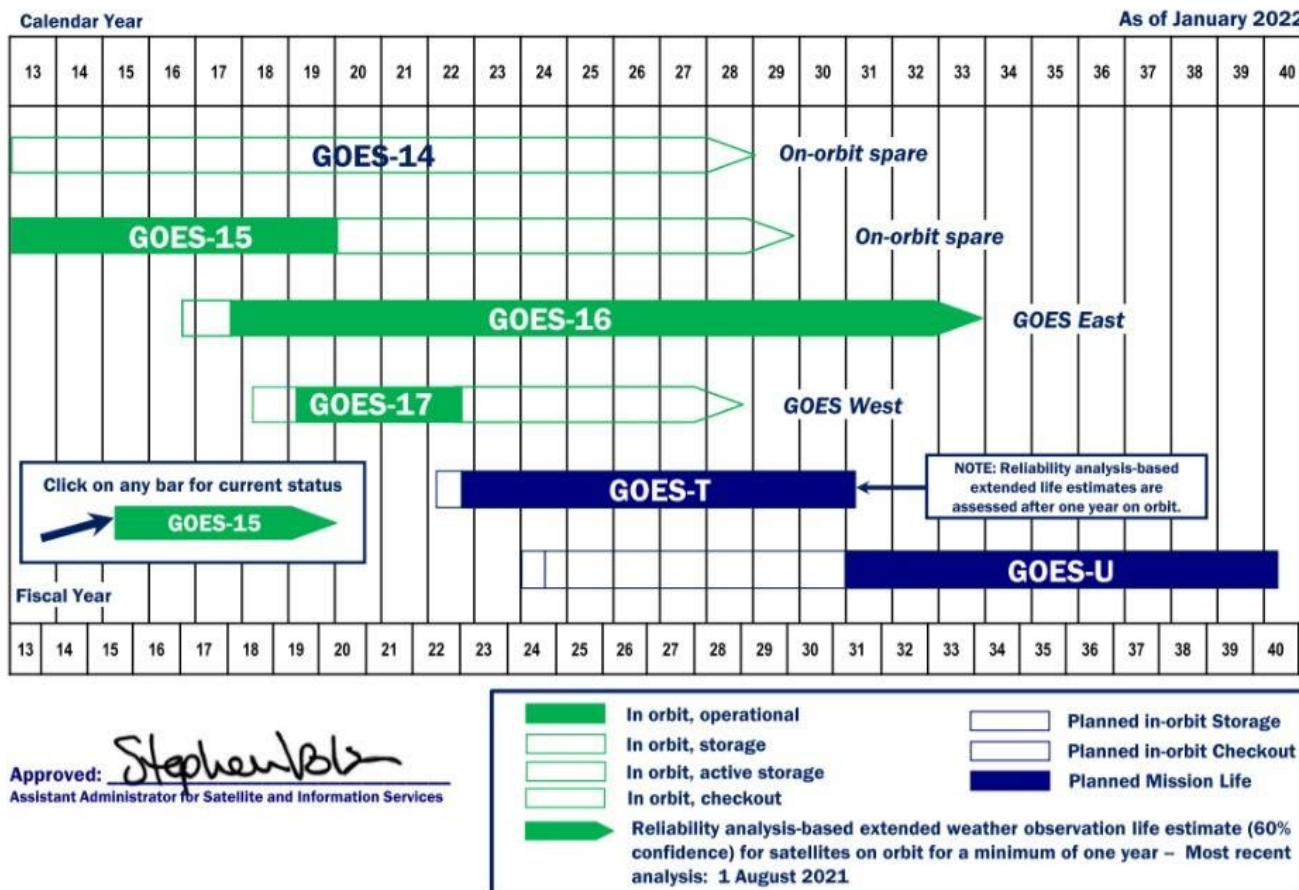
Thank You.

Background Documents

OVERVIEW – Planning of NOAA Satellite Systems (1 of 2)



NOAA Geostationary Satellite Programs Continuity of Weather Observations

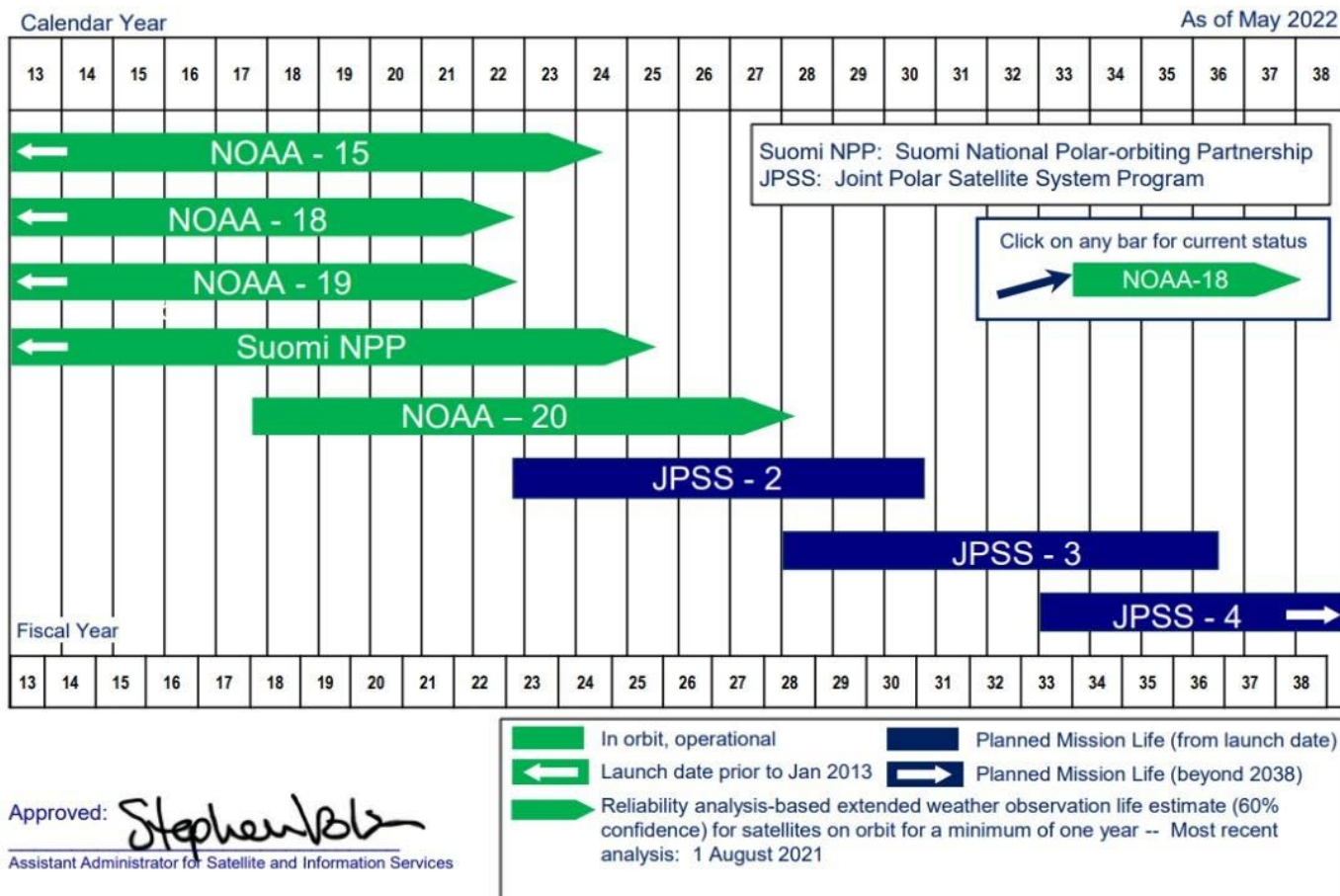


Approved: *Stephen B. [Signature]*
Assistant Administrator for Satellite and Information Services

OVERVIEW – Planning of NOAA Satellite Systems (2 of 2)

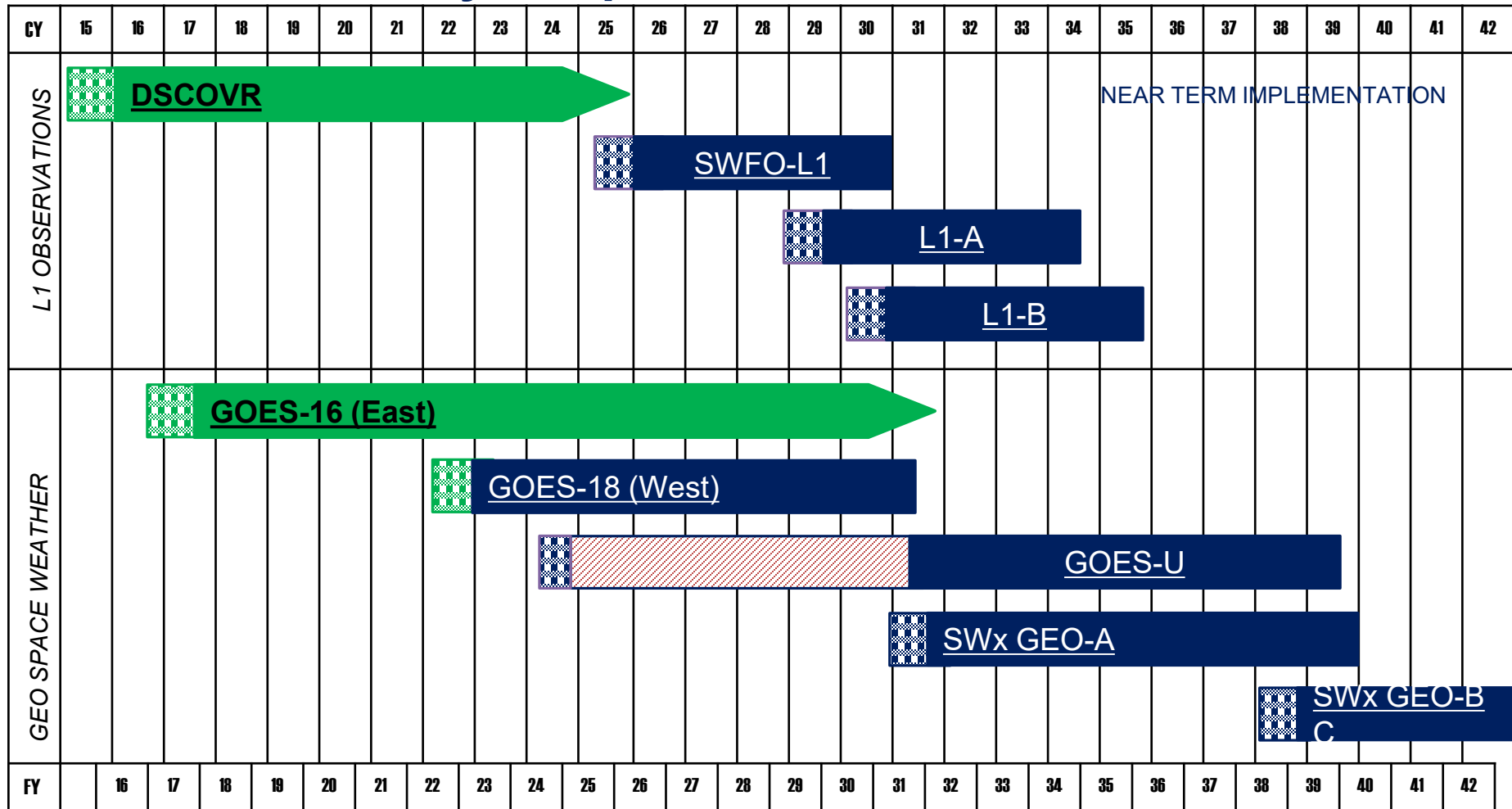


NOAA Polar Satellite Programs Continuity of Weather Observations



NOAA Space Weather Satellite Programs

Continuity of Space Weather Observations





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 Assistant Administrator for Satellite and Information Services
 Coordination Group for Meteorological Satellites

Note: Extended operations are reflected through the current FY, based on current operating health.

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 In orbit
 Transit to orbit

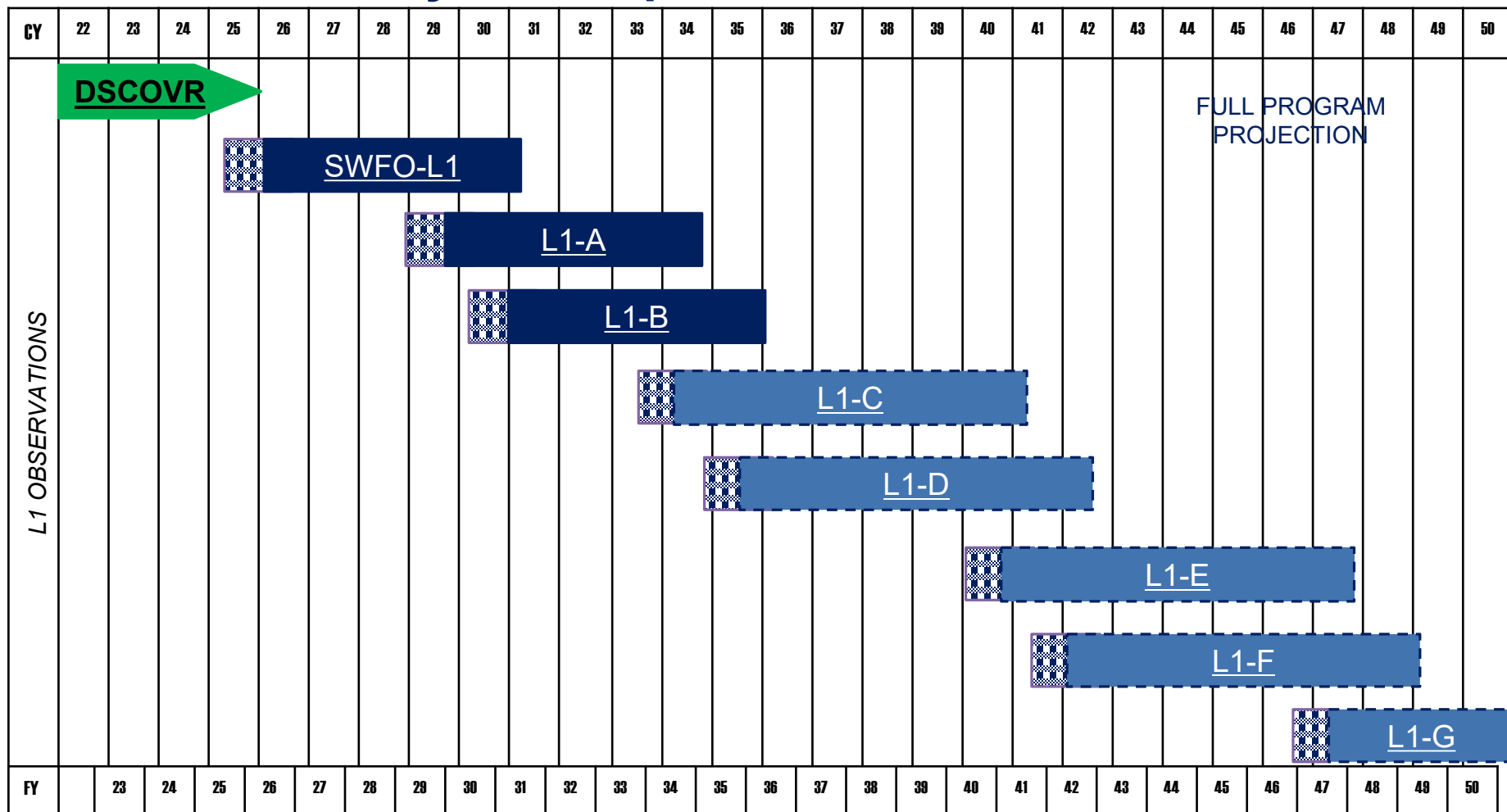
 Storage

 Planned Mission Life, from Launch Readiness Date



NOAA Space Weather Satellite Programs


Continuity of L1 Space Weather Observations



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 In orbit
 Transit to orbit

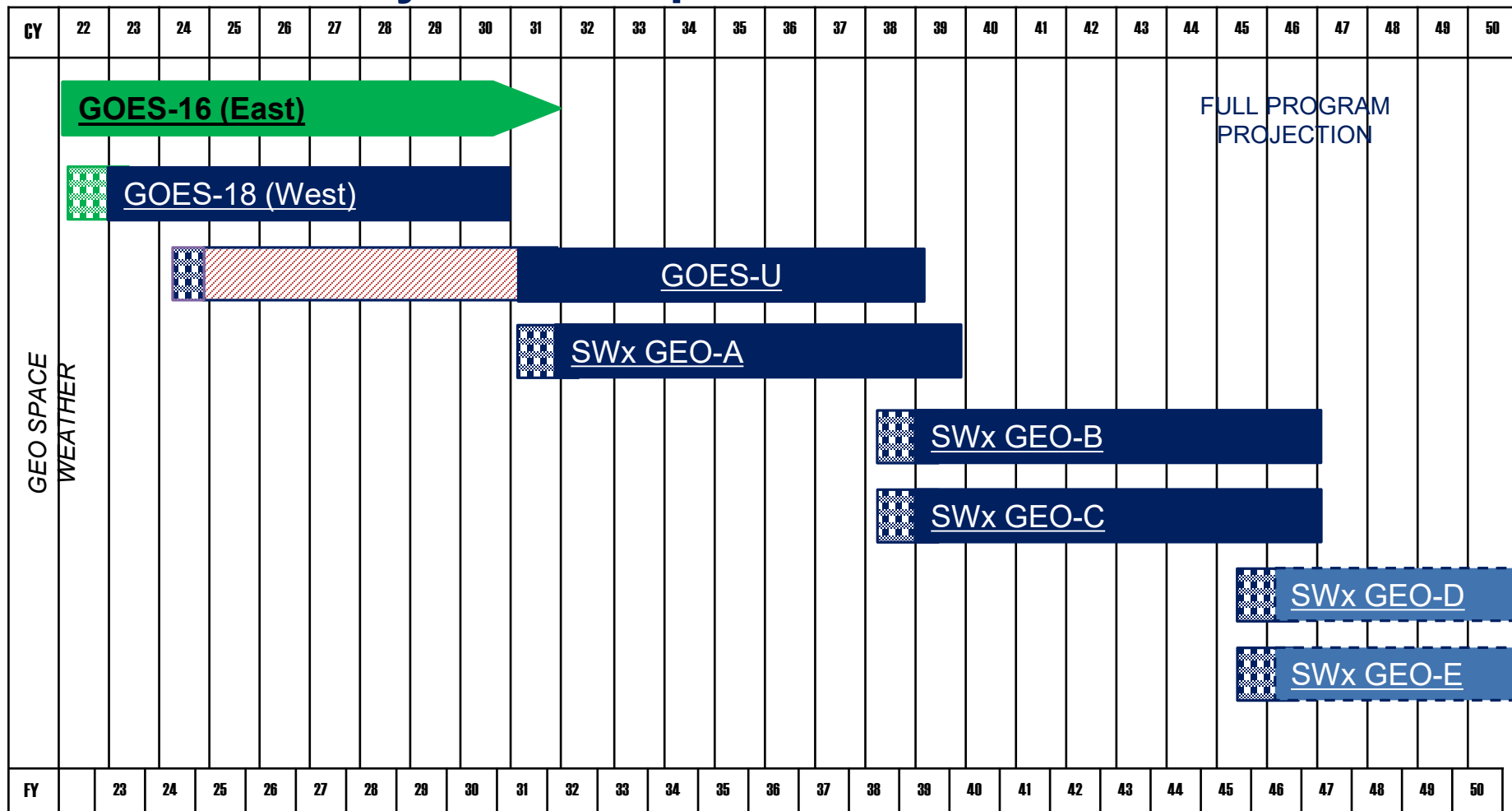
 Post Launch Test
 Planned Mission Life, from Launch

 Future Acquisitions



NOAA Space Weather Satellite Programs

Continuity of GEO Space Weather Observations



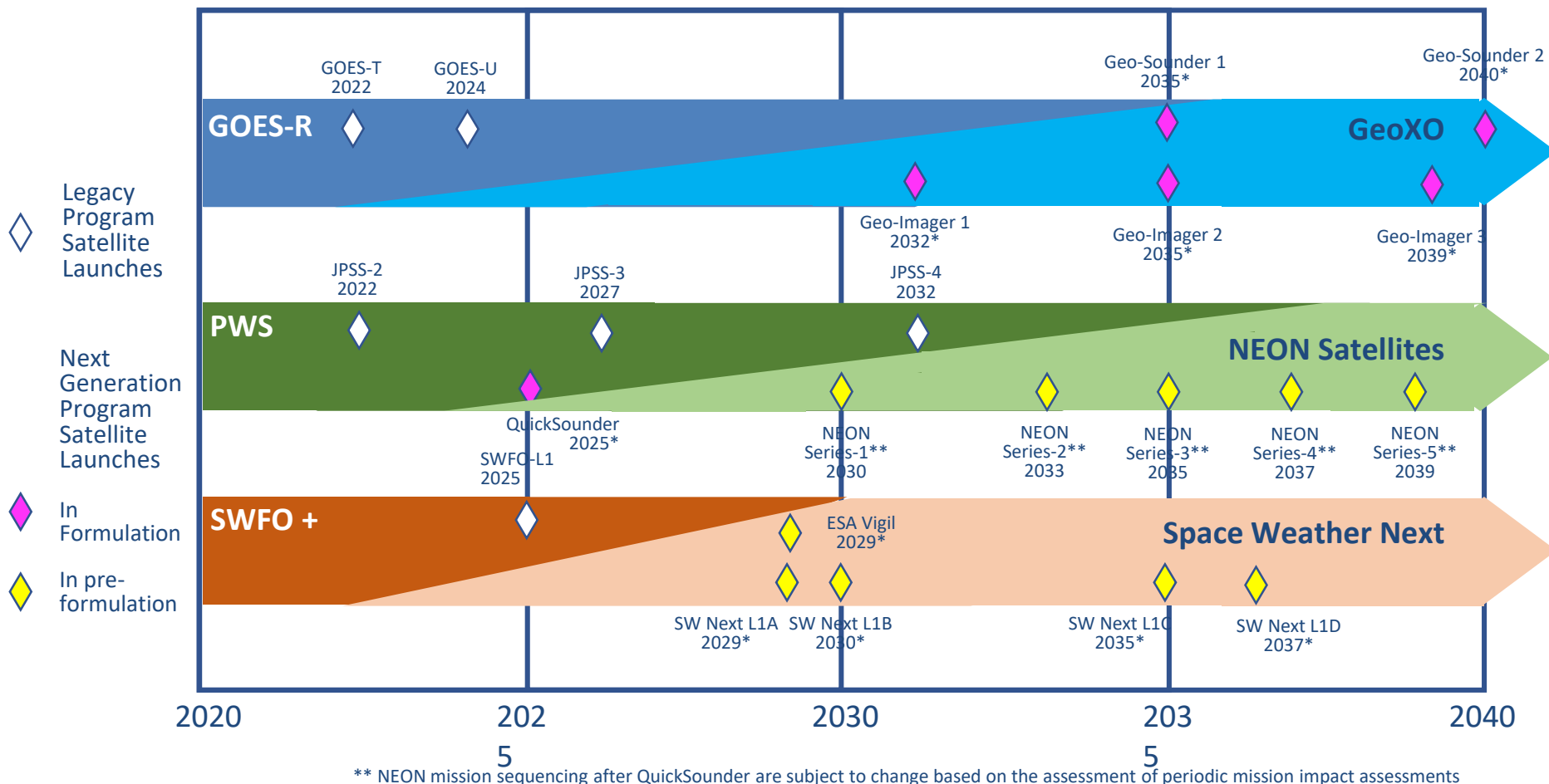
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NESDIS PLANS FOR FUTURE SATELLITES



NESDIS CLOUD-BASED GROUND ENTERPRISE STRATEGY

