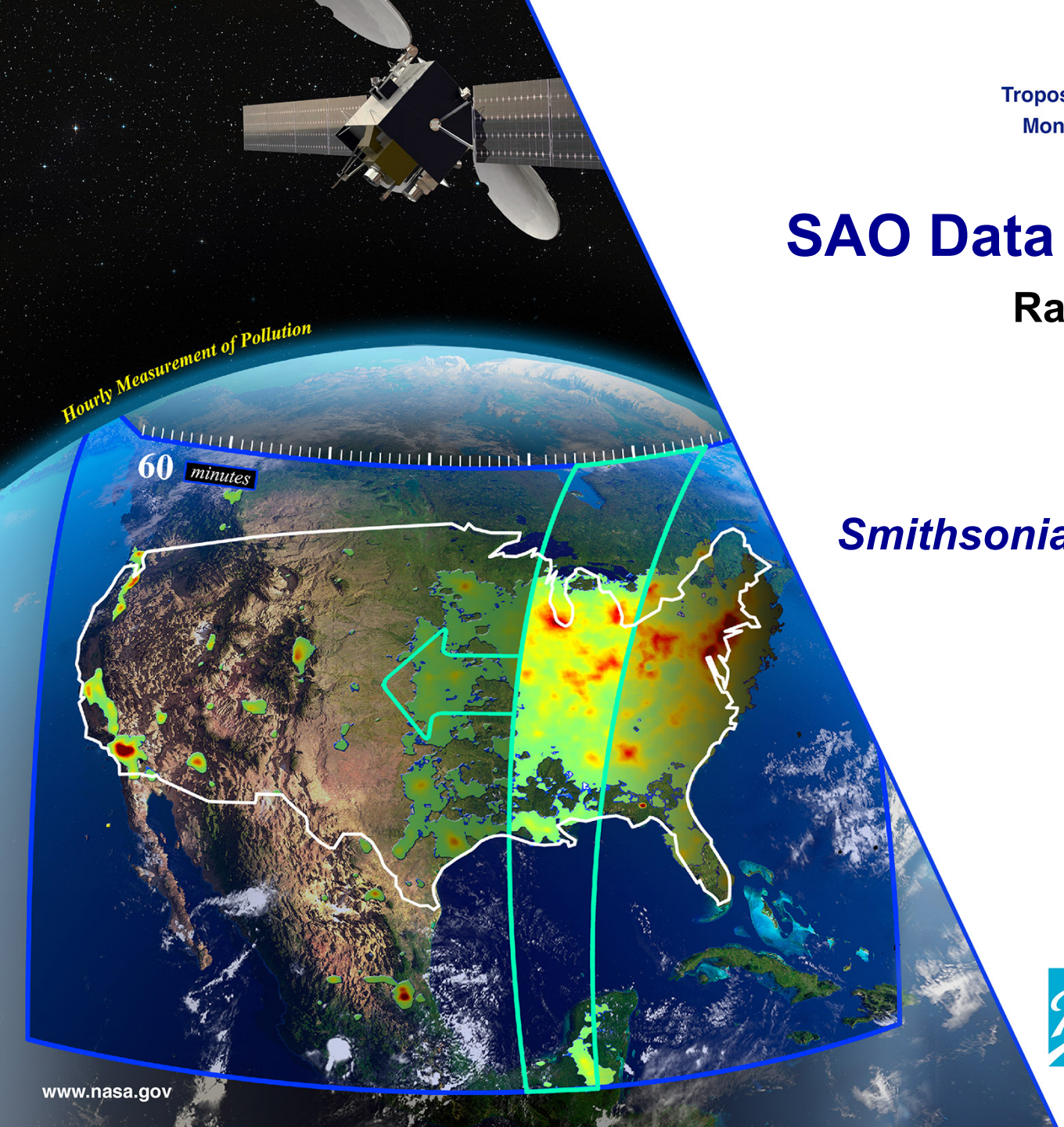

Tropospheric Emissions:
Monitoring of Pollution

TEMPO

SAO Data Distribution

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Outline

- ***Baseline science requirements***
- ***Threshold science requirements***
- ***TEMPO data products***

Baseline Science Requirements

Retrieve estimated geophysical products with temporal revisit as shown in Table 1 across Greater North America (to include all of the contiguous lower 48 United States and Canada at **latitudes below 57.5°N**, all of **Central America above 19°N**, the **Caribbean islands north of 19°N and west of 72.75°W, and the Pacific Ocean north of 19°N and East of 120°W**) on urban-regional spatial scales (**≤ 60 km² at the center of the Field of Regard** (FOR)) to resolve diurnal changes in pollutant distributions in cloud-free scenes with a geo-location **accuracy** of at least **4 km** and for twenty **(20) months** subject to instrument availability as defined in Section 4.3.

Species/Products	Required Precision	Temporal Revisit
Tropospheric O_3	10 ppbv	1 hour
0-2 km O_3 Selected scenes	10 ppbv	2 hour
Total O_3	3%	1 hour
Tropospheric NO_2	1.0×10^{15} molecules cm^{-2}	1 hour
Tropospheric H_2CO	1.0×10^{16} molecules cm^{-2}	3 hour

Threshold Science Requirements

Retrieve estimated geophysical products with temporal revisit as shown in Table 2 across Greater North America (**19°N to 55°N near 100°W, 67°W to 125°W near 42°N**) on urban-regional spatial scales (**≤ 300 km^2 at the center of the FOR**) to resolve diurnal changes in pollutant distributions in cloud-free scenes with a geo-location accuracy of at least **4 km** and for twelve **(12) months** subject to instrument availability as defined in Section 4.3.

Species/Products	Required Precision	Temporal Revisit
Tropospheric O_3	10 ppbv	1 hour
Total O_3	3%	1 hour
Tropospheric NO_2	1.0×10^{15} molecules cm^{-2}	1 hour
Tropospheric H_2CO	1.0×10^{16} molecules cm^{-2}	3 hour

TEMPO Data Products

- The TEMPO Instrument Project shall produce the standard science data products above Level 0 that are listed in Table 3.

- The SDPC shall perform public distribution of these standard science data products, along with the scientific source code for algorithm software, coefficients, and ancillary data used to generate these products, for use by the scientific community during the mission according to latencies expressed in Table 3.

- Public release of these data shall conform to the NASA Earth Science Data and Information Policy. There shall be no period of exclusive access.

- The L0 reconstructed, unprocessed instrument data shall be delivered to the NASA SMD/ESD-assigned DAAC and to the TEMPO IOC. The TEMPO PI will coordinate with the DAAC to provide all appropriate information and documentation necessary to enable the scientific community to access and use the L0 instrument data.

TEMPO Data Products

- The L0 reconstructed, unprocessed instrument data shall be delivered to the NASA SMD/ESD-assigned DAAC and to the TEMPO IOC. The TEMPO PI will coordinate with the DAAC to provide all appropriate information and documentation necessary to enable the scientific community to access and use the L0 instrument data.

- Science algorithms used to generate the standard science data products listed in Table 3 shall be documented in Algorithm Theoretical Basis Documents (ATBDs).

- All original observation data and standard science data products listed in Table 3, along with the scientific source code for algorithm software, coefficients, and ancillary data used to generate these products, shall be delivered to the designated NASA SMD/ESD-assigned DAAC within six months of completion of the prime mission.

- The TEMPO Instrument Project shall coordinate with the NASA SMD/ESD-assigned DAAC regarding the release of product versions to ensure completeness and accuracy of quality information, validation status, and metadata of the TEMPO science data products.

- The TEMPO Instrument Project shall coordinate with the NASA SMD/ESD-assigned DAAC on the data and information to be transferred at TEMPO closeout.

TEMPO Data Products Latency

Data Product	Description	Time beyond On-Orbit Checkout (OOC) to deliver initial data	Maximum data latency after first release for ≥ 80% of products
Level 0	Reconstructed, Unprocessed Instrument Data	2 months	Within 2 hours of receipt at SAO
Level 1b	Calibrated, Geolocated Radiances	4 months	Within 3 hours of Level 0 and ancillary data receipt at SAO
Level 2	Derived Geophysical Data Products	6 months	Within 24 hours of production of Level 1 at SAO
Level 3	Derived Gridded Geophysical Data Products	6 months	1 month after completion of data accumulation required for individual geophysical products


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