



Advancing NOAA's Next- Generation Earth Observation & Data System Capabilities

104th AMS Annual Meeting

National Environmental Satellite,
Data, and Information Service

Jan. 29, 2024

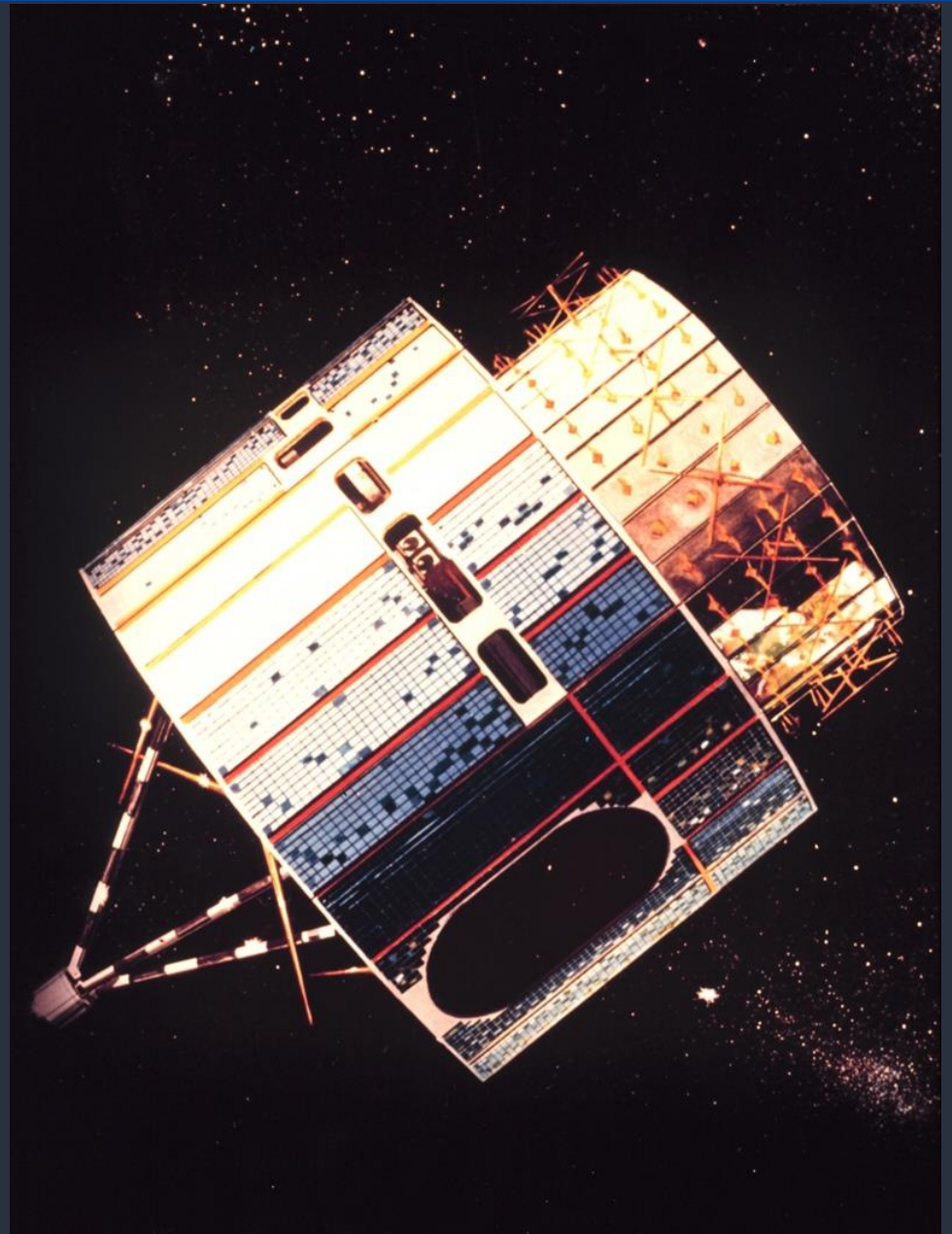
Edward Grigsby, Director
Office of Systems Architecture and Engineering (SAE)

Yesterday's Space Architecture

Since inception more than 50 years ago, NOAA has served as our nation's leader of operational Earth observations

Synchronous Meteorological Satellite
Forerunner of the GOES satellites

Graphic concept, circa 1972
Source: NOAA




NOAA's Current Satellite Missions



SWFO
SWFO-L1 - Launches fiscal year 2025



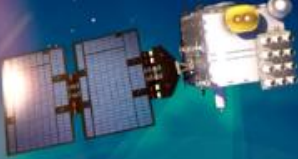
DSCOVR
Operational July 27, 2016



COSMIC-2
Operational Feb. 25, 2020



Jason-3
Operational July 1, 2016



GOES-R Series
GOES-16 - Operational Dec. 18, 2017
GOES-17 - Operational Feb. 12, 2019
GOES-18 - Operational Jan. 4, 2023
GOES-U - Launches fiscal year 2024



Sentinel-6 Michael Freilich
Operational Nov. 22, 2021



JPSS Series
Suomi-NPP - Operational May 1, 2014
NOAA-20 - Operational May 30, 2018
NOAA-21 - Launched Nov. 10, 2022
JPSS-3 - Launches fiscal year 2033
JPSS-4 - Launches fiscal year 2028

NOAA's Next-Gen Observation Strategy

Integrated, Adaptable, and Affordable: Orbits, Instruments & Systems

LEO

Maintain critical global observations & partnerships yielding high accuracy long-range forecasts, including storms, floods & fires. New systems will use next-gen instruments launched on single payload satellites, embracing agile, "new space" commercial processes.

GEO

Continuous real-time observations supporting warnings and watches of severe weather and hour-by-hour changes. Monitoring of oceans, atmosphere and climate to improve productivity and health outcomes.

Space Weather

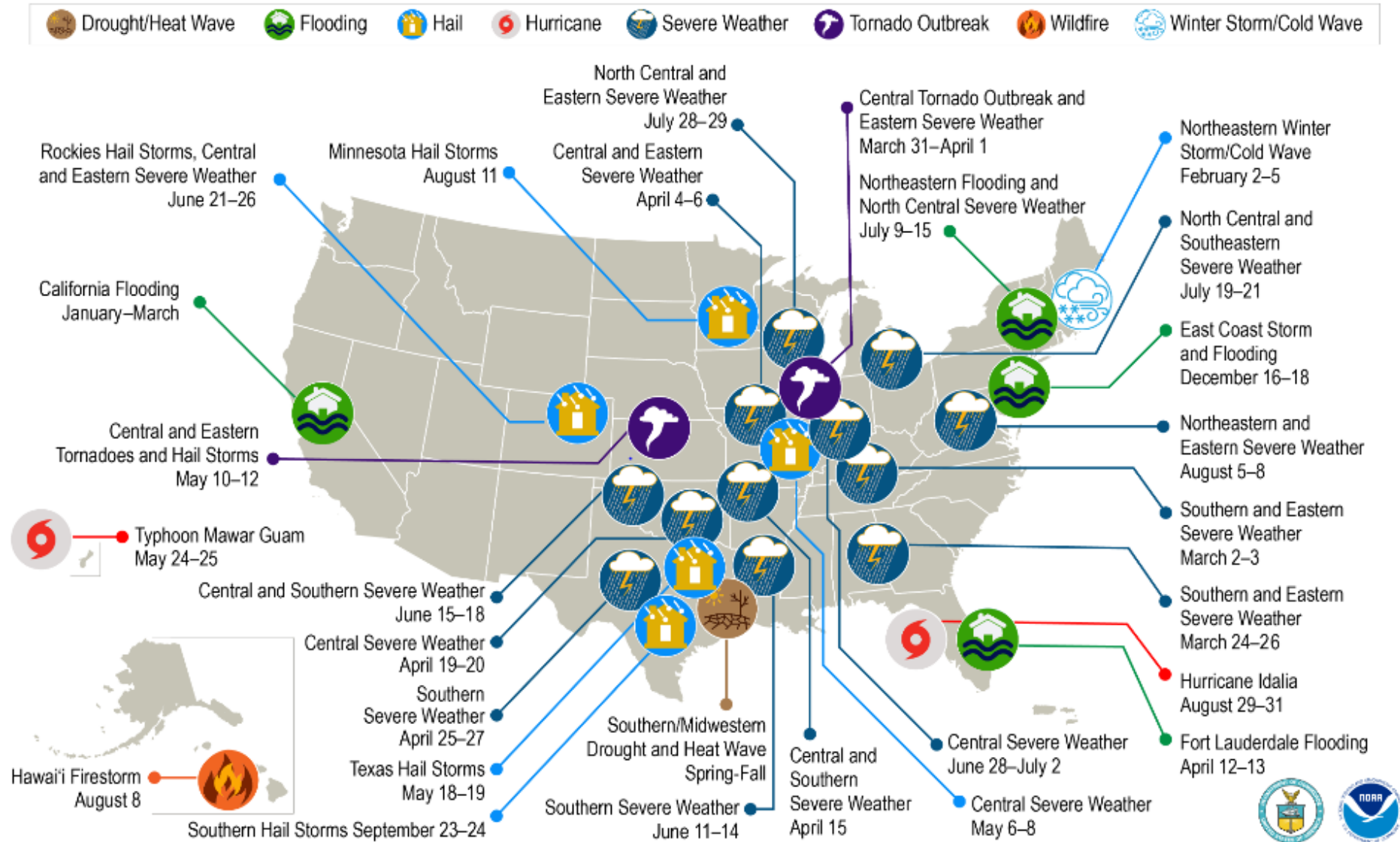
Reliably monitoring coronal mass ejections from L1, GEO and LEO can protect the nation's valuable but vulnerable infrastructure. New capabilities at L5 and high earth orbit can provide additional insight & improve forecasts.

Common Ground Services

Secure ingest of data in different formats from different partners requires a flexible, scalable platform. Common Services approach integrates Cloud, AI, and machine-learning capabilities to verify, calibrate, and fuse data into new and better products and services.

Why: Growing Demand for Climate & Data Services

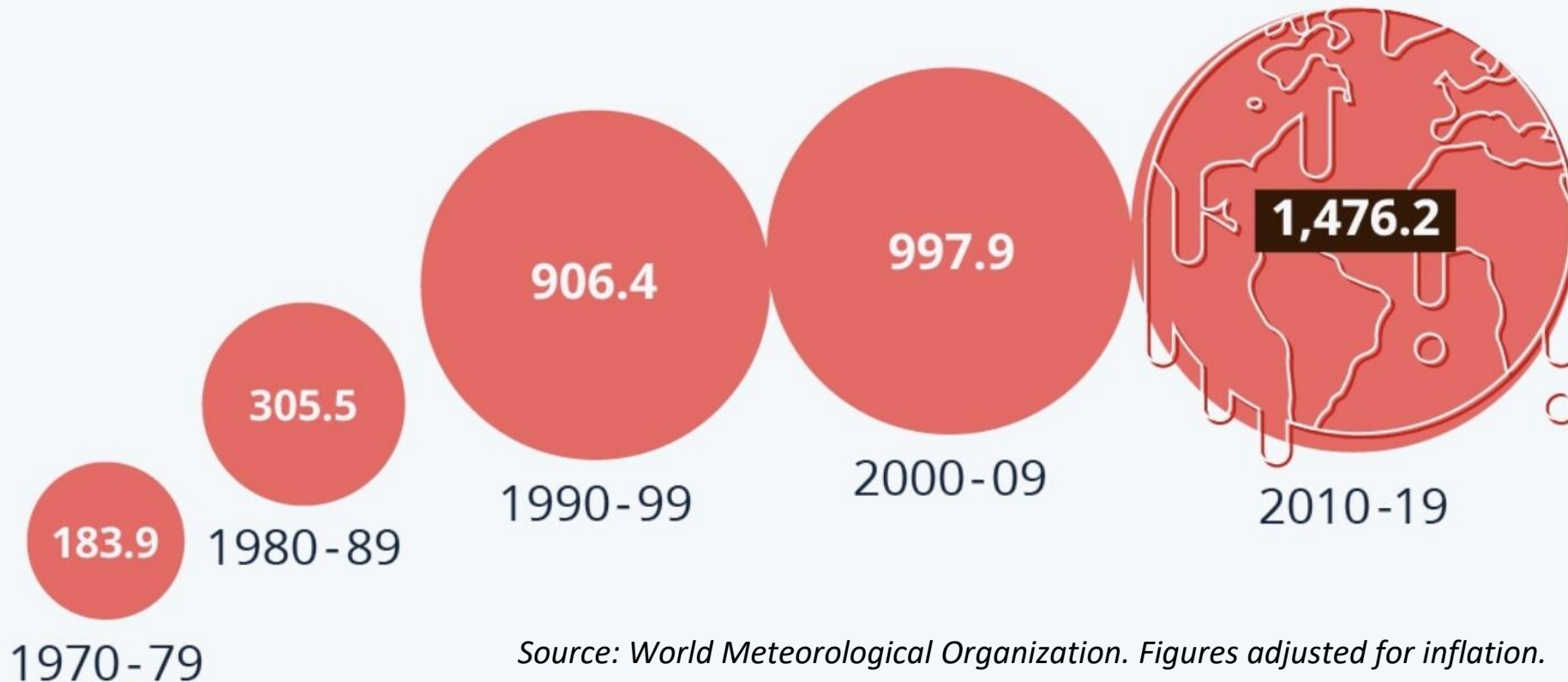
U.S. 2023 Billion-Dollar Weather and Climate Disasters



This map denotes the approximate location for each of the 28 separate billion-dollar weather and climate disasters that impacted the United States in 2023.

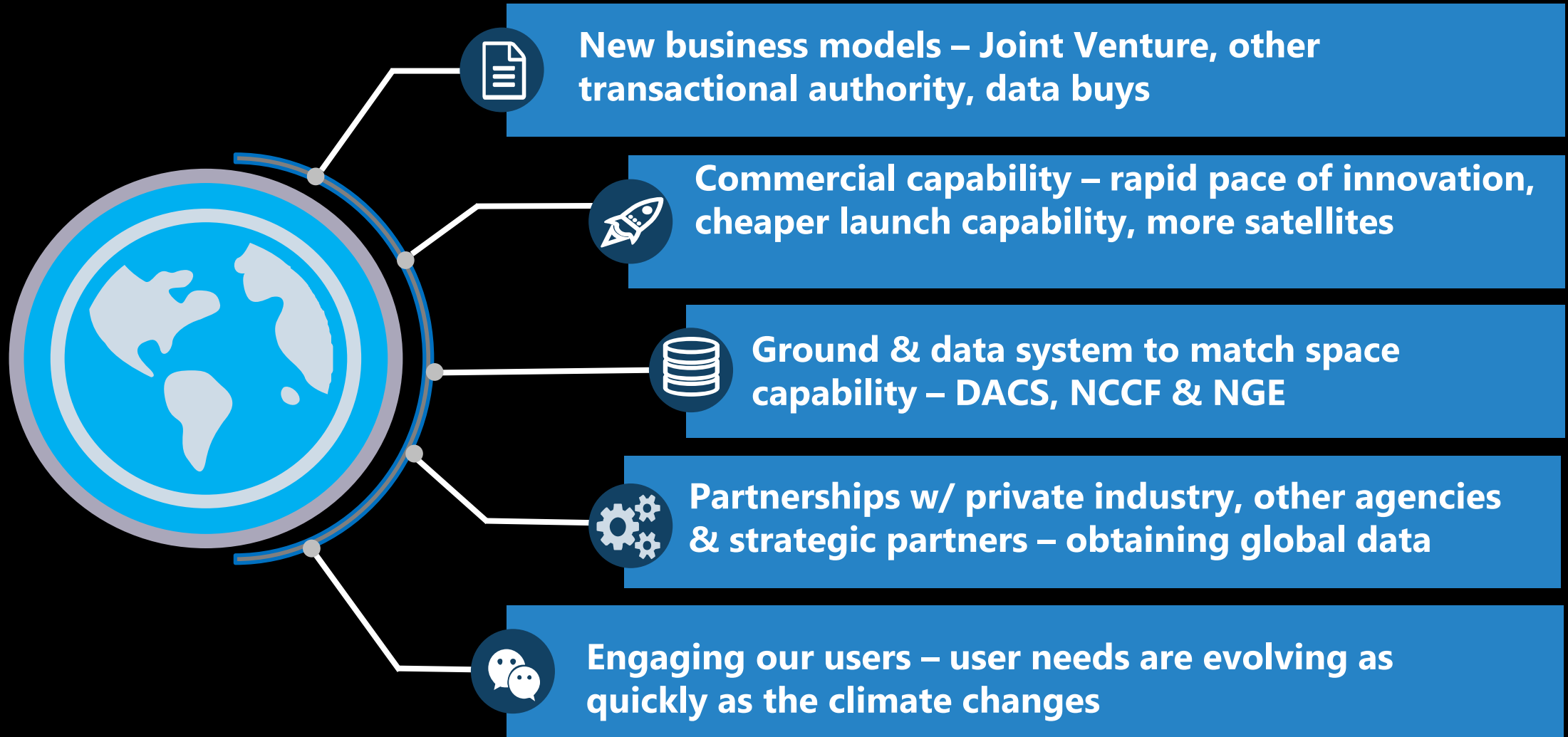
The Soaring Cost of Climate Change

Global reported economic losses attributed to weather, climate and water extremes (in billion U.S. dollars)



Source: World Meteorological Organization. Figures adjusted for inflation.

Trends Shaping Our Next-Gen Architecture



SAE Develops NESDIS Level Requirements to Support NOAA's Mission & Inform Program Requirements



PROGRAM REQUIREMENTS

Program Requirements shaped by NESDIS Level Requirements and Strategic Objectives

NESDIS LEVEL REQUIREMENTS

Guided by user needs, federal policies and international agreements

NOAA's CORE MISSION

Implementing NOAA's mission is foundational to the purpose of NESDIS



Joint Venture: Studies, Pilots & Partnerships

Joint Venture leverages work of other government agencies and industry to exploit partner technologies

Critical step in designing new enterprise NOAA systems that meet user needs, while providing high return on investments



NOAA/NESDIS Commercial Data Program

2016: NOAA issued its *Commercial Space Policy*, a framework for commercial space-based data use

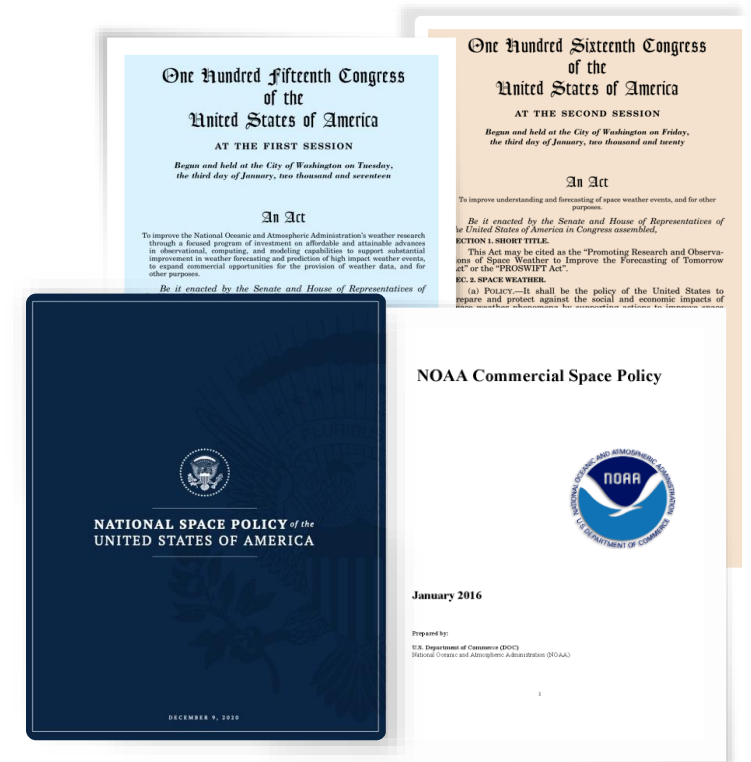
2016: NESDIS initiated **Commercial Weather Data Pilot (CWDP)** to evaluate commercial satellite data, including Radio Occultation (RO) data collected from Global Navigation Satellite Systems (GNSS)

- *NOAA study recommended government backbone of 5,000 daily ROs, augmented by commercial data of up to 20,000 daily ROs*

2020: NESDIS initiated **Commercial Data Purchase Program (CDP)** to acquire commercially sourced data, including RO data; two contracts awarded

2023: NESDIS issues second CDP RO data buy with two awards, also seeking optional space weather data buy

2023/4: NESDIS issues General RFI for potential commercial data sources that expands the CDP scope to include potential innovation on public/private partnerships



NESDIS User Engagement: Identifying the Data Products and Services End Users Need

By engaging our end users, NOAA can develop the products and services those users require to inform climate and weather-related actions and decisions.

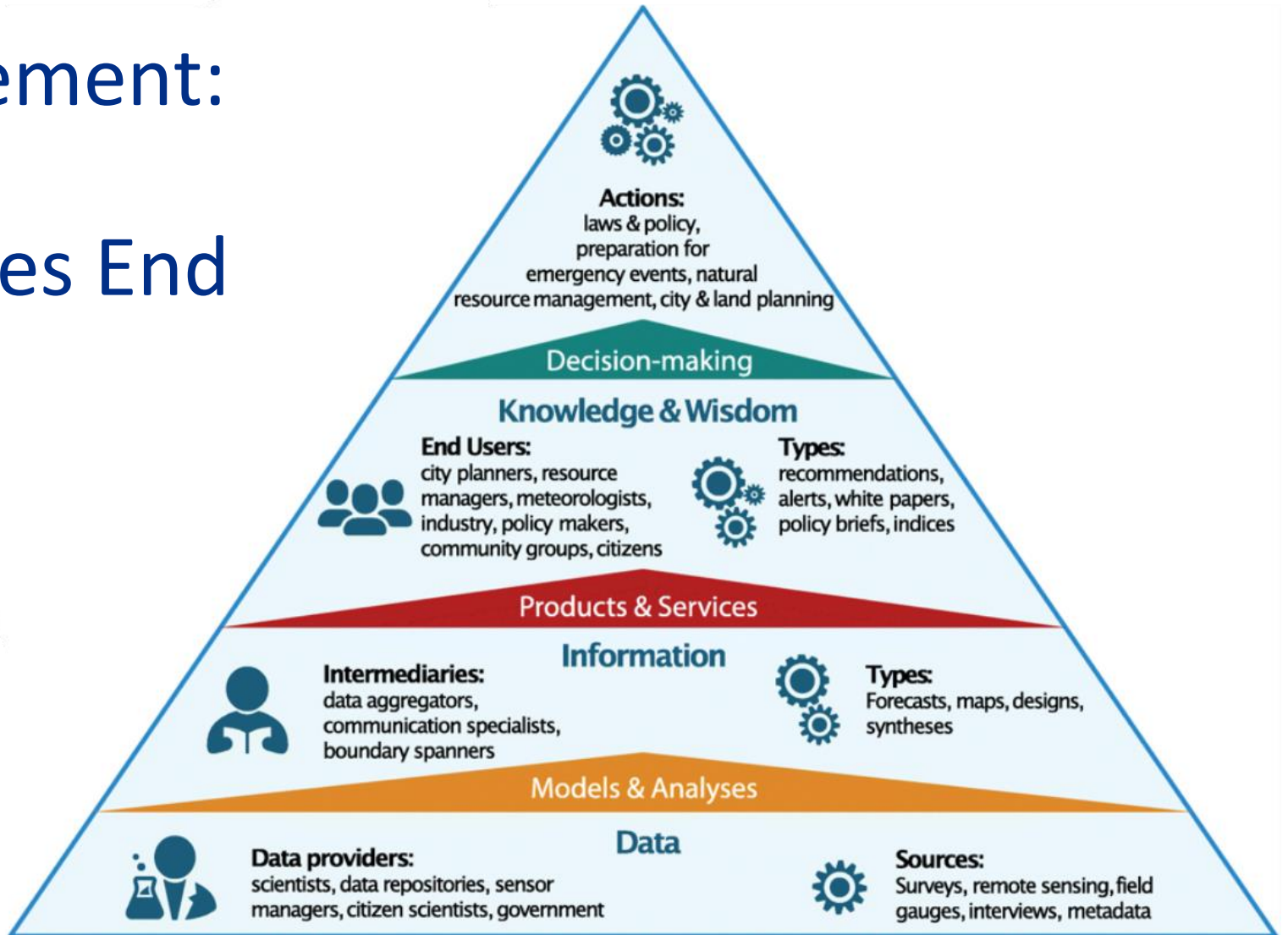
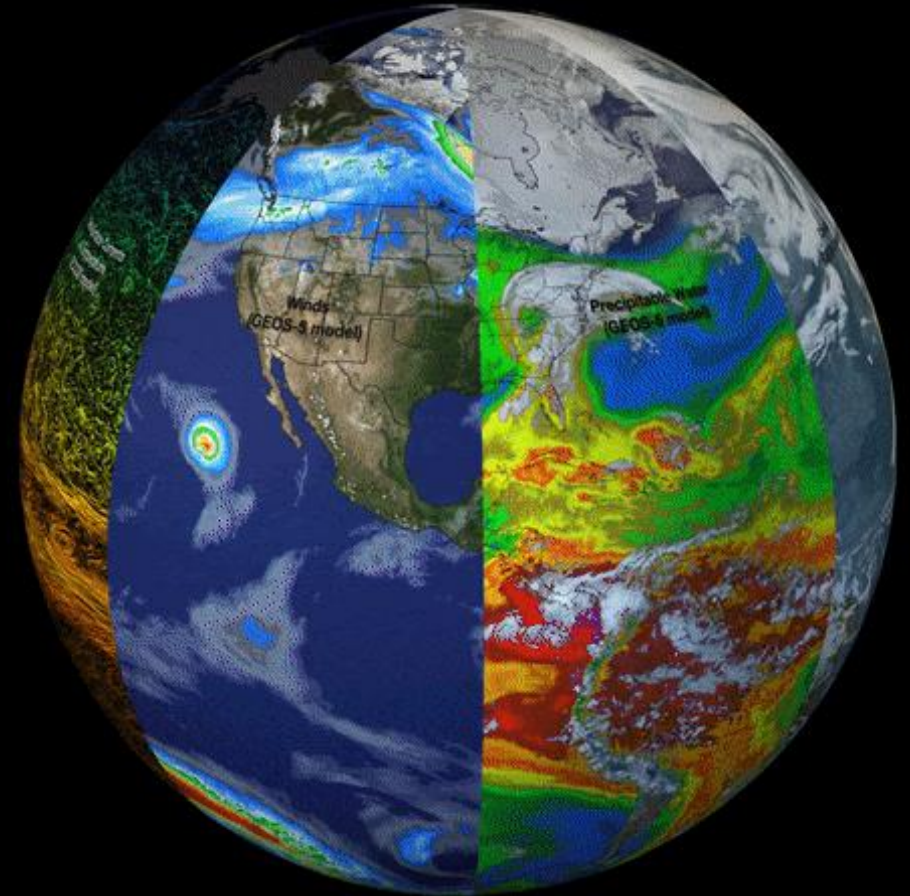


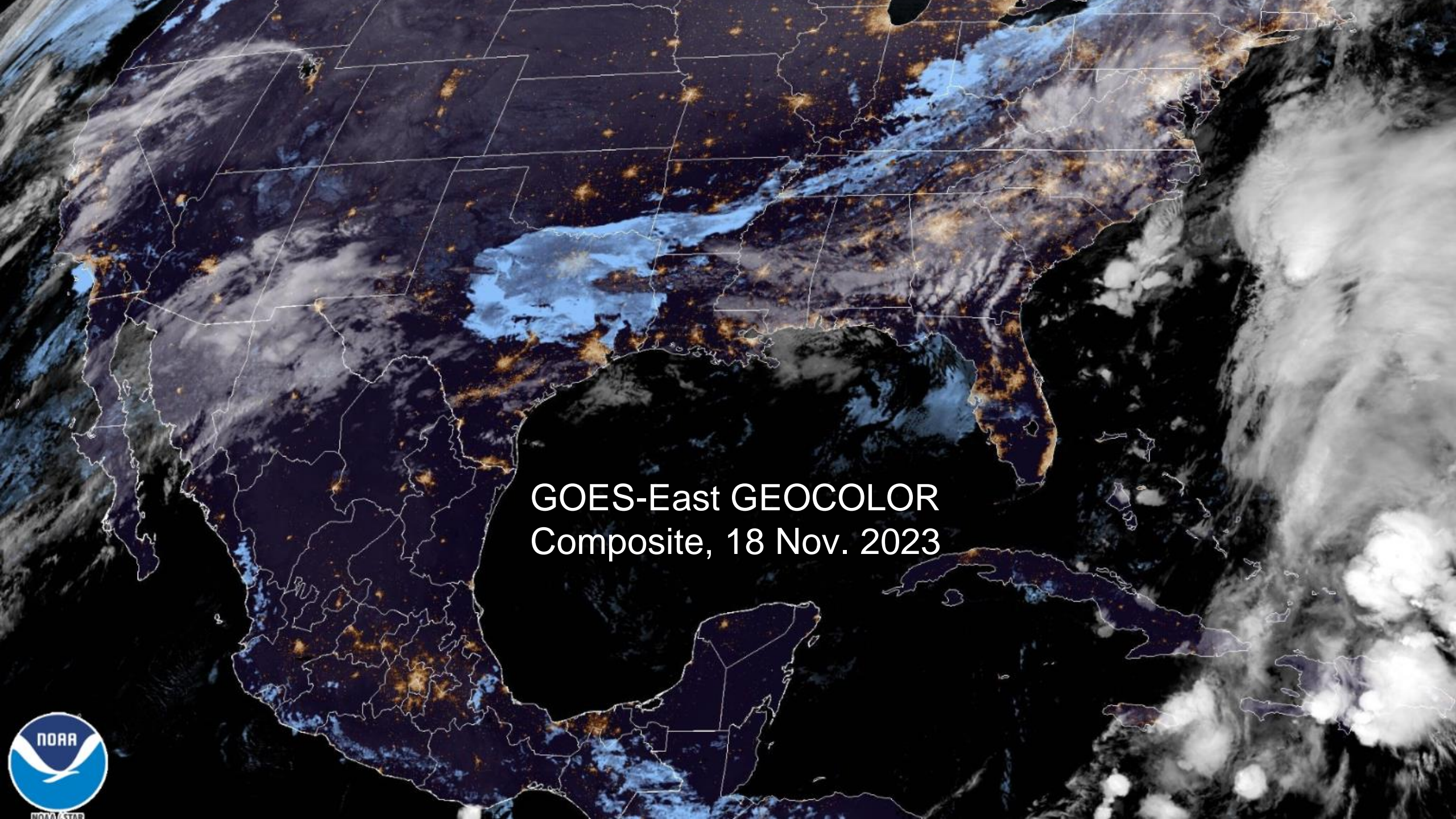
Image from Virapongse, A., Pearlman, F., Pearlman, J. et al. Ten rules to increase the societal value of Earth observations. Earth Sci Inform 13, 233-247 (2020). <https://doi.org/10.1007/s12145-020-00453-w>. Image licensed under [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/).

NOAA Satellite Systems Provide a Global Perspective, enabling us to:

Provide a truly integrated digital understanding of our earth environment that can evolve quickly to meet changing user expectations by leveraging our own capabilities and partnerships

NESDIS Vision Statement





GOES-East GEOCOLOR
Composite, 18 Nov. 2023

