Results from the NESDIS Ground Enterprise Study

M.F. Bonadonna¹, F. W. Gallagher III¹, S. R. Marley²,
NOAA/NESDIS/OSAAP¹,
The Aerospace Corporation²
Matching NOAA’s Next-Gen Space Capability with Next-Gen Data Science & Ground Capability

DISAGGREGATED & HYBRID CONSTELLATIONS
- MORE SATELLITES, INSTRUMENTS & DATA
- COMMERCIAL BUYS
- INTERNATIONAL PARTNERSHIPS
- OTHER FEDERAL AGENCY PROVIDERS

“BROADER APERTURE” TO ABSORB ALL FORMS OF DATA
- SECURE INGEST & DATA INTEGRATION
- QUANTUM-COMPUTING, MACHINE-LEARNING
- CLOUD-BASED ACCESS, ARCHIVING & INFORMATICS
- USER-CENTRIC DATA DELIVERY
NGES Integral to NESDIS Strategic Objectives

1. Advance terrestrial observational leadership in geostationary and extended orbits
2. Advance space weather observational leadership in all applicable orbits to meet mission needs.
3. Evolve LEO architecture to enterprise system of systems that exploits and deploys new observational capabilities.
4. Develop agile, scalable ground capability to improve efficiency of service deliverables and ingest of data from all sources.
5. Provide consistent ongoing enterprise-wide user engagement to ensure timely response to user needs.
6. Deliver the best value integrated suite of products and services responsive to user needs.
Potential NOAA Future: 2030–2050

New NOAA Asset

New Partner Asset

- Imager, Lightning Mapper, Ocean Color West
- Sounder, Atmospheric Composition Center
- JASON
- HEO
- Winds LIDAR
- Comprehensively SWX – L5
- MTG-I (EUMETSAT)
- MTG-S (EUMETSAT)
- EPS-SG-A
- EPS-SG-B
- JPSS-3,4
- Sounder 1330
- Sounder 1530
- Comprehensively SWX – L1
- Radarsat
- Himawari (Japan) 140° E
- GEO-KOMPSAT (South Korea) 128° E
- Wind LIDAR
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Evolving Observing Needs

• Escalation in supported missions driven by:
  – Disaggregation (multiple satellites to carry the observation suite)
  – More rapid refresh (small shorter-lived satellite refreshed more often)

  - >3x increase in operational satellites
  - >2x of pre/post operational satellites
Mission Cadence in 2035-2050 era will drive costs to exceed current spending levels

- O&M increases from 17% to 21% of Budget

Most alternatives considered can reduce O&M costs to below current spending

- O&M ranges from 9% - 13% of budget
- Significant cost avoidance over Baseline

Non-budgetary cost estimates in FY42 $'s and are for comparison purposes only
**Dimensions of Change**

- Evolution of the NESDIS Ground Enterprise is not only about the use of technology, but also about how that technology is used to provision NESDIS business services

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Integrating Strategic & Tactical Perspectives

Strategic Foresight

Strategic Roadmap

Capability Planning

Tactical Constraints

Tactical Plans
Mission Operations

- Mission Ops Value is driven by approach to legacy missions
- Current NOAA Ops is more costly than Enhanced Operations
- Outsourcing is less costly than Enhanced
- Outsourcing has lower value than Enhanced

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Space-Ground Communications

- NOAA benefits are high for Commercial Ground Stations
- NESDIS Satellites communicate with both partner ground station services and via commercial services
- We have a Commercial Services IPT coordinating a variety of demos, RFIs, and planning to pilot projects
- Efforts across NESDIS already underway

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Other Key Findings

Product Operations
- Demand Driven production augments data driven production by providing both the flexibility while maintaining operational assurance

Data Delivery
- Tactical - Leverage Commercial Sat. Com. delivery of High Availability Products for Severe Weather / COOP operations
- Strategic - Migrate downstream processing (stakeholders) to cloud services

Algorithm Operations & Development
- Collaborative Science - Shared development infrastructure that removes technical barriers for access to data and resources for research activities and facilitates agile promotion to operations
Conclusion

• Current NESDIS operational services are not future proofed
  – Operational costs are projected to become a larger fraction of the NESDIS budget
  – NESDIS will need to change its business practices going forward in order to achieve affordable adaptability and resilience

• Emerging technologies and business practices offers a path forward
  – Cloud-based solutions reduces hardware footprint through reduced redundancy
  – New technologies improve asset utilization through multi-mission use
  – Buying commercial services reduces up front investment and ongoing sustainment costs while providing operational scalability