

## **NOAA Response to SAB Observations on GOES-R L0 Archiving**

### **Background**

The next generation of the Geostationary Operational Environmental Satellite (GOES) series will begin with the GOES-R mission scheduled to launch in November 2016. A two-satellite GOES-R series on-orbit constellation is capable of producing approximately one terabyte of Level 0 (raw) data per day and approximately two terabytes of Level 1b and higher-level processed data per day.

The National Environmental Satellite Data and Information Service (NESDIS) approach to data archiving is based on:

- Environmental Data Management at NOAA: Archiving, Stewardship, and Access, National Research Council (NRC) 2007.
- NOAA Procedure for Scientific Records Appraisal and Archive Approval, 2008.
- NOAA Administrative Order (NAO) 212-15, Management of Environmental Data and Information, 2010.
- NOAA Environmental Data Management Framework, 2013.
- Implementation issues, such as information technology infrastructure, cost and user needs, including data reproducibility.

The GOES-R Program built data delivery points in the ground system for delivery of all levels of data. In May 2013, NOAA decided only to archive Level 1b (and higher) data permanently, whereas Level 0 data would be retained temporarily in a two-year rolling window (for calibration and validation purposes). At the time, NOAA made this decision based on cost and the recognition that the primary purpose of GOES satellite data was for the very perishable mission of real-time weather forecasting.

### **SAB Observations and NOAA's Response**

The NOAA Science Advisory Board (SAB) and its Data Archive and Requirements Working Group (DAARWG) transmitted three observations to NOAA in August 2015 regarding the decision not to archive GOES-R Level 0 data. NOAA thanks the SAB and DAARWG for their interest in this important topic, agrees with the concerns, and welcomes the opportunity to respond.

- 1. DAARWG endorses the digital data curation standard practice of archiving the lowest-level satellite data possible for potential future reprocessing, in addition to archiving derived products.**

**Response:** NOAA appreciates this endorsement. NOAA concurs with the digital data curation standard practice of archiving the lowest-level satellite data possible for potential future reprocessing. Existing NOAA data management guidance, including the *NOAA Environmental Data Management Framework*<sup>1</sup> and references therein, states such a goal, while recognizing that cost may be a factor in what is "possible" and that

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<sup>1</sup> <https://nosc.noaa.gov/EDMC/framework.php>

trade-offs may be necessary in a constrained budget environment. Prior to the NESDIS decision not to archive L0, the National Climatic Data Center (NCDC) and National Geophysical Data Center (NGDC)<sup>2</sup> advocated for archival of the L0 data, in keeping with best practice for information preservation and consistent with adopted standards such as those of the Committee on Earth Observation Satellites (CEOS). Communication and other system costs were a significant driver in deciding to not archive GOES-R L0 data, but portions of the distribution architecture have changed since the decision was made that may have reduced the cost to archive. Also, the two-year rolling storage of L0 data for calibration/validation provides a potential opportunity for moving the raw data into an archival storage infrastructure prior to deletion. As a result, NOAA has revisited its decision. NOAA will establish long-term archival storage of the GOES-R Level 0 data prior to expiration of the two-year cache of L0 data.

- 2. DAARWG encourages NOAA to ensure that all future (after GOES-R) satellite development efforts consider data archiving requirements for both unprocessed data and derived products at the beginning and throughout the development Process.**

**Response:** The draft *Policy on NESDIS Environmental Data Management Planning*<sup>3</sup> states that the archive system shall include, at a minimum, the most primitive, useful form of environmental data; that NESDIS shall ensure that the archive is involved throughout the concept, design, development, and operations phases of observing systems; that NESDIS shall provide sufficient resources to support Archive functions and systems; and that NESDIS shall adopt an acquisitions strategy for NESDIS observing systems and associated data management systems which secures all necessary rights and provisions for the data to be archived and used in a free and open manner by NOAA and NOAA external customers. This policy will be in effect prior to future satellite missions.

- 3. DAARWG recommends NOAA utilize the interim period of two to three years before the first round of GOES-R L0 data is slated to be discarded to host a workshop to invite the relevant communities, e.g. scientists and others, to examine in more detail the utility of maintaining a L0 copy of data for the long term. The output of this workshop should influence NOAA's policy regarding the archiving of GOES-R L0 data.**

**Response:** NESDIS has decided to archive the GOES-R Level 0 data and will hold a workshop to help decide whether to archive may be moot. However, at the next NOAA Satellite Conference in 2017, we may include a breakout session specifically to discuss potential Use Cases for GOES-R L0. This bi-annual conference brings together users and

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<sup>2</sup> NCDC and NGDC have since been incorporated into the NOAA National Centers for Environmental Information (NCEI).

<sup>3</sup> In review; URL not available.

providers of polar-orbiting and geostationary satellite data, products, and applications from the public, private, and academic sectors. Participants, from some 40 countries, include members of NOAA, NASA, Department of Defense, Environment Canada, EUMETSAT, and the Hydrometeorological Services of countries in North, Central and South America, the Caribbean, and Asia.