



# SCIENCE ADVISORY BOARD

January 31, 2023

Dr. Richard W. Spinrad  
Under Secretary of Commerce for Oceans and  
Atmosphere & NOAA Administrator  
Herbert C. Hoover Building, Room 6811  
14th Street & Constitution Avenue, NW  
Washington, DC 20230

Dear Dr. Spinrad:

***Subject: Transmittal of the NOAA Science Advisory Board Data Archiving and Access Requirements Working Group (DAARWG) Report***

On behalf of the NOAA Science Advisory Board (SAB), I am pleased to transmit to you the *DAARWG Report on the NESDIS Common Cloud Framework*. The SAB and DAARWG recognize that the NESDIS Common Cloud Framework (NCCF) is a part of NOAA's overall data archiving and curation efforts and supports NCEI's plan to use commercial cloud resources rather than on-prem infrastructure for primary storage.

This report makes seven recommendations. These are summarized as follows:

**Recommendation 1:** DAARWG recommends that NOAA clarify which benefits it is seeking to maximize or optimize in the NCCF project. The goal(s) should be stated along with quantitative metrics to assess whether they have eventually been met.

**Recommendation 2:** DAARWG suggests that NOAA consider some more detailed planning regarding what data are migrated and in what order, including contingencies for unexpected delays.

**Recommendation 3:** DAARWG suggests NOAA include some provision for an exit strategy to be built into the contract with Amazon Web Services (AWS). Concerns could include data egress costs (in particular, can they be waived in the event of a bulk migration out of the cloud), data transfer/copy/verification methods, and the time and effort to perform a bulk transfer to get everything out.

**Recommendation 4:** DAARWG suggests that Spatiotemporal Asset Catalogue (STAC) be considered as an alternative to the Common Metadata Repository (CMR), as it has a much broader community of support and use. Adopters include Google Earth Engine, Microsoft Planetary Computer, RadiantMLHub, and Sentinel Hub. While CMR can be translated to STAC, as exemplified by the NASA CMR-STAC proxy, the resulting STAC metadata is generalized. A direct STAC implementation could leverage community extensions and other specific STAC capabilities to better integrate with the community of tools made available to a STAC-compliant service. See more here: <https://stacspec.org/en/>.

**Recommendation 5:** In order to enhance data when transferred to the cloud, DAARWG recommends that NOAA consider optimizations of highly-utilized datasets, such as organizing data to provide a more holistic, multi-dimensional "datacube" view of data rather than individual files; using cloud-optimized formats such as Zarr or COG; storing as-is with structural metadata such as ncZarr or kerchunk; or other enhancements. As with the data migration step, any enhancement or format conversion should be followed by some kind of data verification. Documentation should also be provided with details of any enhancement or format conversion steps as well as how the verification step was done.

**Recommendation 6:** DAARWG recommends that NOAA clarify what vAIP and KG are, with examples, and indicate the value to either NOAA or users of implementing these.

**Recommendation 7:** DAARWG urges NOAA to consider releasing code as open source, and to contribute back to the community any enhancements NOAA may make to existing open source projects.

During the consideration of this report, the SAB noted that responses to these recommendations should also be explicitly aligned with NOAA data curation and management policies and activities.

Additional details on each recommendation can be found in the full report.

The SAB greatly appreciates the opportunity to provide this advice to NOAA. We look forward to engagement with NOAA on this topic in the coming years.

Very Respectfully,

A handwritten signature in blue ink that reads "John R. Kreider". The signature is fluid and cursive, with the first name "John" being the most prominent.

John R. Kreider  
SAB Chair

Cc: Sarah Kapnick  
Karen Hyun  
Michael Weiss  
Steve Volz  
Adrienne Simonson  
Tony LaVoi  
Ilene Carpenter  
Chris Lenhardt  
Jeff de La Beaujardiere  
Emma Kelley  
Cynthia Decker  
Viviane Silva

Attachment: NOAA Science Advisory Board DAARWG Report on the NESDIS Common Cloud Framework