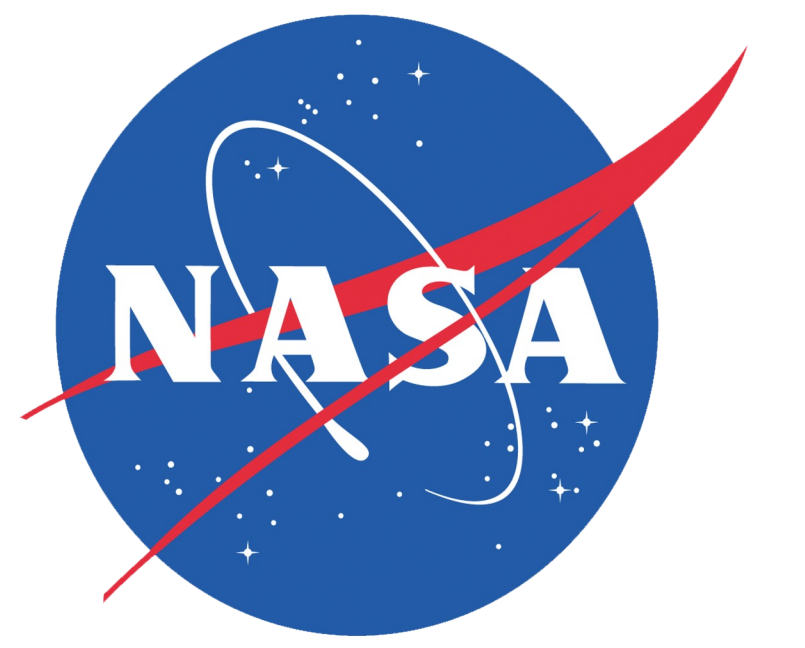


# Abstract



With the open-sourcing of the Common Metadata Repository (CMR) we have seen its independent adoption as an earth science data catalog by a number of organizations (NOAA NCEI and MAAP for example). Both activities have suffered from becoming out of date with respect to NASA EOSDIS' CMR over time. This has caused problems in the area of security and adoption of new features.

We propose several measures to combat those problems,

- Streamlining adoption
- Leveraging existing best practices from industry
- Creating new CMR-specific best practices
- Establishing solid lines of communication between groups

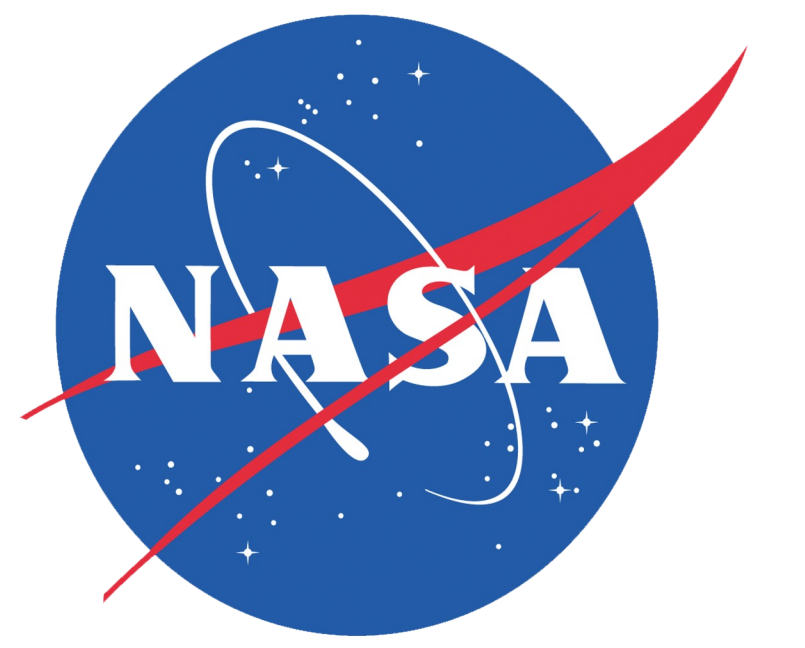
And also seek ways to embrace opportunities associated with sharing CMR,

- Promotion of an open source community, both in terms of taking from NASA EOSDIS CMR and giving back
- Federation of discovery, via distributed CMRs

The above can, obviously, be applied to other open source endeavours, with CMR acting as a pathfinder for best practices.



# Distributed CMRs



## NASA EOSDIS CMR

The Common Metadata Repository (CMR) is a high-performance, high-quality, continuously evolving metadata system that catalogs Earth Science data and associated service metadata records. These metadata records are registered, modified, discovered, and accessed through programmatic interfaces leveraging standard protocols and APIs.

The success of CMR, coupled with its commitment to open source, has led to the deployment of several CMRs outside of EOSDIS.

This presents,

- new challenges in the realms of security and operations
- new opportunities in the area of collaboration and federation

## Other CMR deployments

*Multi-Mission Algorithm and Analysis Platform (MAAP)*

MAAP is a collaborative project between NASA and the European Space Agency, designed to support aboveground biomass research.

MAAP uses a deployment of CMR to manage their metadata.

*NOAA National Centers for Environmental Information (NCEI)*

NCEI is the nation's leading authority for environmental data, and manage one of the largest archives of atmospheric, coastal, geophysical, and oceanic research in the world.

A deployment of CMR will be used to provide an online catalog for NCEI's cloud-based inventory.

## Why we should work together

CMR is a complex system. High performance and scalability comes with a cost. We need to provide other organizations with support to maximize their investment in CMR.

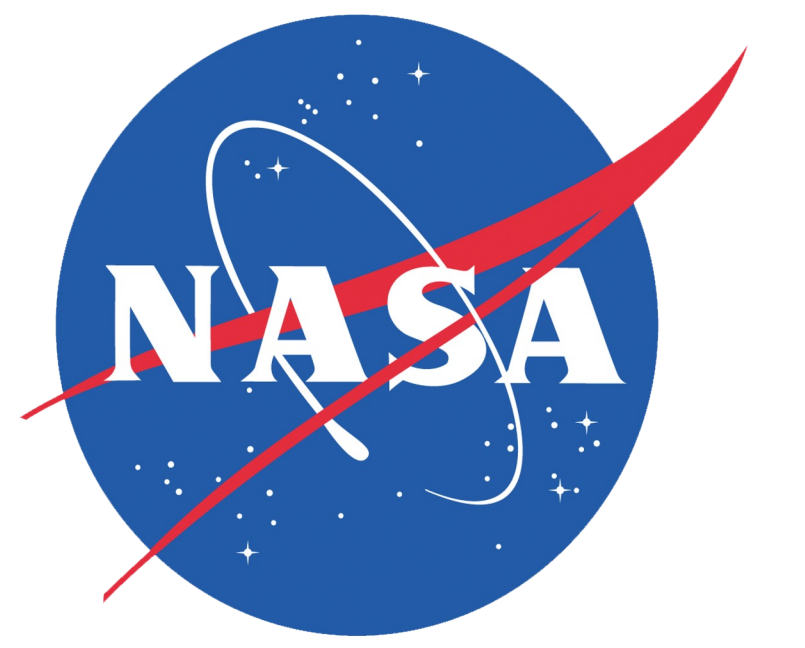
Like any software, CMR is subject to evolving security threats. Distributed CMR's need to be patched as quickly as NASA EOSDIS CMR.

A diverse group of stakeholders increases innovation. Incorporating functionality from MAAP, NCEI and others can only improve CMR.

EOSDIS CMR is constantly evolving, improving upon existing features and adding new functionality. We expect other deployments to do the same. Communication is needed to avoid conflicting/redundant development



# Evolving best practices and the future



## Communicate

In order to effectively deploy and maintain multiple CMRs, we should establish the following,

CMR operations working group via Operational Community of Practice.

- Report EOSDIS CMR roadmap
- Report maintenance issues
- Representatives from each deployed CMR
- Moderated by ESDIS

Rapid communications channels for out-of-band updates,

- Mailing list
- Slack

## Document & reuse

Provide processes and documentation for the

- forking and deployment of CMR
- upgrading of CMR
- contributions from forks to the 'master' CMR

Use common, standard services and best practices

- Git repositories
- Git documentation of best practices

Fork and pull request

- Earthdata Wiki documentation of CMR-specific best practices

Regular deployment cadence

Out-of-band patching

## The future

### *Federation*

The federated CWIC architecture, using two-step searching and Open Search/STAC, could be extended to distributed CMRs such as MAAP and NOAA NCEI.

OpenSearch and STAC APIs are part of the CMR. We could provide 'front-lobby' at NASA EOSDIS CMR leading to federated 'rooms' at MAAP, NCEI etc.

### *External improvements*

We expect our partners will contribute back to CMR with essential functionality. For example,

- UMM-ISO translations from NOAA NCEI
- SAR/LiDAR metadata extensions from MAAP