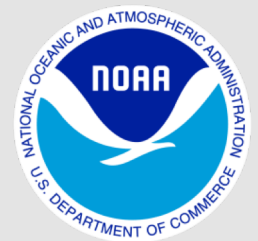




NOAA/NCEI

Data Stewardship Maturity Assessment



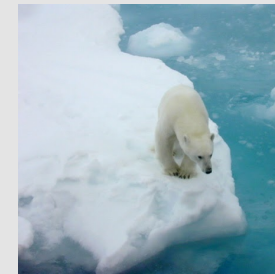
Nancy Ritchey

Archive Branch, Chief

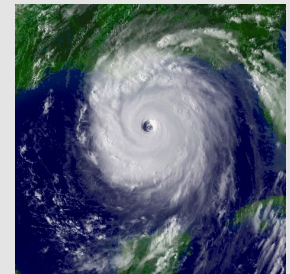
NOAA National Centers for Environmental Information

NOAA's National Centers for Environmental Information

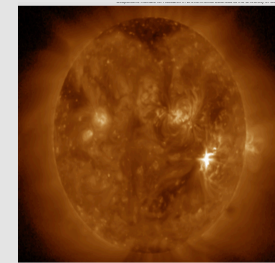
- Responsible for preserving and providing access to one of the most collections of environmental data, with comprehensive oceanic, atmospheric, and geophysical data
- From the depths of the ocean to the surface of the sun and from million-year-old sediment records to near real-time satellite images
- Nation's leading authority for environmental information



Monthly U.S. & Global
Climate Reports



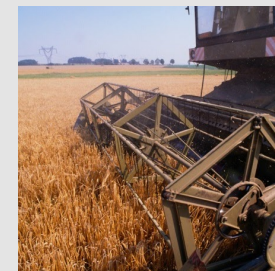
U.S. Billion-Dollar Weather
& Climate Disasters report



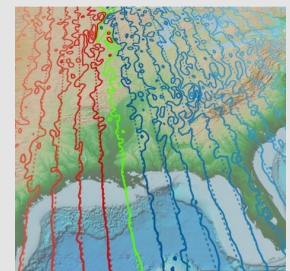
Space Weather Data



World Ocean Database



U.S. Drought Monitor



Magnetic Model

OneStop

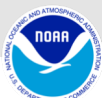
To improve the discovery of, access to, and usability of NOAA's vast and diverse collection of big data

- *Modern, user-friendly discovery interface*
- *Open infrastructure*
- *Standards and Best Practices*

Data Stewardship Maturity Matrix (DSMM)

*A Unified Framework for
Measuring Stewardship Practices Applied to
Individual Digital Earth Sciences Data
Products*

<http://tinyurl.com/DSMMintro>



DSMM Evaluates Stewardship Maturity in Nine Key Components

- Consistent framework for assessing and reporting quantifiable stewardship practices
- Allows for greater stewardship quality transparency, builds trust among user community and contributes to the reproducibility of NOAA's data products.
- Developed jointly by domain experts leveraging institutional knowledge and community best practices and standards
- Vetted through use case studies with diverse datasets managed by different organizations, in collaboration with NC State University, NCEI Data Stewardship Division, and U.S. and international data stewardship groups.

Maturity Scale	Level 1 - Ad Hoc	Level 2 - Minimal	Level 3 - Intermediate	Level 4 - Advanced	Level 5 - Optimal
Key Component	Not Managed	Managed Limited	Managed Defined, Partially Implemented	Managed Well-Defined, Fully Implemented	Level 4 + Measured, Controlled, Audit
Preservability	The state of dataset being preservable				
Accessibility	The state of dataset being publicly searchable and accessible				
Usability	The state of data product being easy to understand and use				
Production Sustainability	The state of data production being sustainable and extendable				
Data Quality Assurance	The state of data product quality being assured/screened				
Data Quality Control /Monitoring	The state of data product quality being controlled and monitored				
Data Quality Assessment	The state of data product quality being assessed				
Transparency /Traceability	The state of data product being transparent, trackable, and traceable				
Data Integrity	The state of data integrity being verifiable				

Guidance, Templates, Tools

A Quick Startup Guide for Utilizing
the NCEI/CICS-NC Scientific Data Stewardship Ma
Ge Peng (Ge.Peng@noaa.gov)
CICS-NC/NCEI
Version: 0001 20160408

Guidance

1. Introduction

1.1 Purpose

The purpose of this guide is to provide a quick start to the NCEI/CICS-NC Scientific Data Stewardship Management System (SDMS) results.

1.2 What is this guide for?

The DS is a digital environment for the management of environmental data. The DS is a digital environment for the management of environmental data. The DS is a digital environment for the management of environmental data.

There are several key components to the DS. The DS is a digital environment for the management of environmental data. The DS is a digital environment for the management of environmental data. The DS is a digital environment for the management of environmental data.

1.3 References

This document is a quick start guide for the NCEI/CICS-NC Scientific Data Stewardship Management System (SDMS).

Document ID: NCDC-CICS-SMM_0001
Version: Rev. 1.12/09/2014

Data Stewardship Maturity Scoreboard for NOAA's Product A – A Notational Example

Maturity Level as of 01/30/2015

Maturity Scale	Presentability	Accessibility	Usability	Production Sustainability	Data Quality Assurance	Data Quality Control/Monitoring	Data Quality Assessment	Transparency / Traceability	Data Integrity
Level 1 – Ad Hoc Not Managed	Any storage location. Data only.	Not publicly available. Person to person.	Unusable product.	Not applicable.	Not applicable.	Not applicable.	Not applicable.	Not applicable.	Not applicable.
Level 2 – Minimal	Non-designated repository. Redundancy.	Publicly available. Direct file download via anonymous FTP or web.	Unusable product.	Unusable product.	Unusable product.	Unusable product.	Unusable product.	Unusable product.	Unusable product.
Level 3 – Basic	Designated repository. Redundancy.	Publicly available. Direct file download via anonymous FTP or web.	Unusable product.	Unusable product.	Unusable product.	Unusable product.	Unusable product.	Unusable product.	Unusable product.
Level 4 – Intermediate	Designated repository. Redundancy.	Publicly available. Direct file download via anonymous FTP or web.	Unusable product.	Unusable product.	Unusable product.	Unusable product.	Unusable product.	Unusable product.	Unusable product.
Level 5 – Advanced	Designated repository. Redundancy.	Publicly available. Direct file download via anonymous FTP or web.	Unusable product.	Unusable product.	Unusable product.	Unusable product.	Unusable product.	Unusable product.	Unusable product.
Level 6 – Expert	Designated repository. Redundancy.	Publicly available. Direct file download via anonymous FTP or web.	Unusable product.	Unusable product.	Unusable product.	Unusable product.	Unusable product.	Unusable product.	Unusable product.

DSMM diagram

DSMM diagram

Workflow

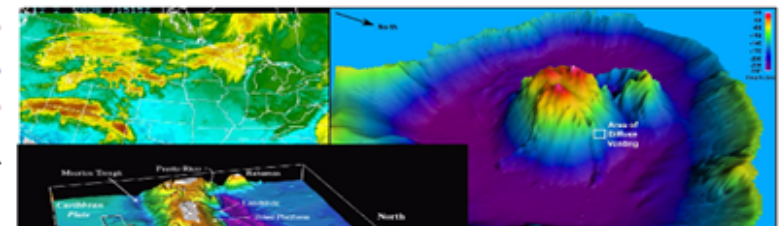
ISO metadata

NOAA Technical Report_NESDIS XXX

doi: 10.7289/XXXXXX

Data Stewardship Maturity Scoreboard
Dataset Title

Report



DSMM in OneStop

Overall rating is inserted into the collection metadata which is indexed by *OneStop* and displayed on the dataset landing page

DSMM Rating:

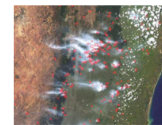
★★★★☆ [hide info](#)

The average DSMM rating of this collection is 3.89.

The [Data Stewardship Maturity Matrix \(DSMM\)](#) is a unified framework that defines criteria for the following nine components based on measurable practices:

- Accessibility
- Data Integrity
- Data Quality Assessment
- Data Quality Assurance
- Data Quality Control Monitoring
- Preservability
- Production Sustainability
- Transparency Traceability
- Usability

NOAA JPSS Visible Infrared Imaging Radiometer Suite (VIIRS) Active Fires Environmental Data Record (EDR) from NDE



This dataset contains a high quality operational Environmental Data Record (EDR) that contains pinpoint locations of active fires (AF) as identified by an algorithm based on the Moderate Resolution Imaging Spectroradiometer (MODIS) Fires and Thermal Anomalies Collection 6 product, but improved upon and adapted for use by the Visible Infrared Imaging Radiometer Suite (VIIRS) instrument onboard the Suomi-NPP satellite. The algorithm utilizes sensor data from the 4 micron and 11 micron spectral bands (M13 and M15) to deliver locations and fire radiative properties of active fires on the earth's surface. In addition, the Improved NPP Data Exploitation (NDE)

algorithm delivers an improved fire mask and fire radiative power retrievals (FRP). VIIRS infrared bands have a spatial resolution of 750 meters at nadir, and 375 meters at nadir for the imagery bands, as such, the sensor is sensitive enough to detect fires at sea which is an improvement over the previous Active Fires product produced by the Interface Data Processing Segment (IDPS). AF data obtained from the Comprehensive Large Array-Data Stewardship System (CLASS) are distributed as single 86-second granules in netCDF-4 format with metadata attributes included.

Files ▾

Files in this collection are not currently searchable

Citation ►

Identifier(s) ►

Overview

Access

Time Period:

2016-03-15 to Present

Map:



Bounding Coordinates:

Bounding box covers: -180°, -90°, 180°, 90° (W, N, E, S).

DSMM Rating:

★★★★☆ [show info](#)

Themes:

Biosphere, Ecological Dynamics, Fire Ecology, [Show All](#)

Instruments:

Visible-Infrared Imager-Radiometer Suite

Platforms:

Suomi National Polar-orbiting Partnership, Joint Polar Satellite System - 1

Guidance, Templates, Tools

A Quick Startup Guide for Utilizing the NCEI/CICS-NC Scientific Data Stewardship Manual

Ge Peng (Ge.Peng@noaa.gov)
CICS-NC/NCEI
NCEI/CI-00-01 20160408

Guidance

1. Introduction

1.1 Purpose

The purpose of this guide is to provide a quick start to the NCEI/CICS-NC Scientific Data Stewardship Manual. The guide is intended for use by data stewards who are new to the NCEI/CICS-NC Scientific Data Stewardship Manual.

1.2 What is Data Stewardship?

The Data Stewardship Manual is a guide for data stewards to manage the lifecycle of scientific data. It provides a framework for data stewardship practices and procedures. The manual is organized into five sections: Introduction, Data Stewardship Practices, Data Stewardship Procedures, Data Stewardship Tools, and Data Stewardship Training.

1.3 References

This document is based on the NCEI/CICS-NC Scientific Data Stewardship Manual, Version 1.0, published in 2016. The manual is available at: <https://www.noaa.gov/data-stewardship>.

Document ID: NCEI-CICS-NC-0001
Version: Rev. 1.0/05/2014

Data Stewardship Maturity Scoreboard for NOAA's Product A – A Notational Example

Monitoring Level as of 01/04/2015

DSMM diagram

Workflow

ISO metadata

Report

NOAA Technical Report NESDIS XXX
doi: 10.7289/XXXXXXX

Data Stewardship Manual
Dataset Title

Not sustainable as a manual process

Streamlined Assessment Process

Data Stewardship Maturity Questionnaire (DSMQ)

User-friendly questions
within the Collection
Manager Enterprise
Tool (CoMET)

Maturity Scale	Accessibility
Level 1 – Ad Hoc Not Managed	Not publicly available Person-to-person
Level 2 - Minimal Managed Limited	Publicly available Direct file download (e.g., via anonymous FTP server) Collection/dataset level searchable
Level 3 - Intermediate Managed Defined, Partially Implemented	Level 2 + Non-standard data service Limited data server performance Granule/file level searchable Limited search metrics
Level 4 - Advanced Managed Well-Defined, Fully Implemented	Level 3 + Community-standard data services Enhanced data server performance Conforming to community search metrics Dissemination report metrics defined and implemented internally
Level 5 - Optimal Level 4 + Measured,	Level 4 + Dissemination reports available online Future technology and standard changes planned

Accessibility

The state of being publicly searchable and accessible

(2.1) Is the dataset available online? *

☐ Data files are not publicly available and can only be obtained from an individual person

☐ Data files are available via public FTP site

☐ Data files are available via a web service or data server with different levels and capabilities of data customization

(2.2) How searchable is the dataset? *

☐ Not searchable

☐ Data files are online searchable at the collection-level. Dataset has no granules to be searched

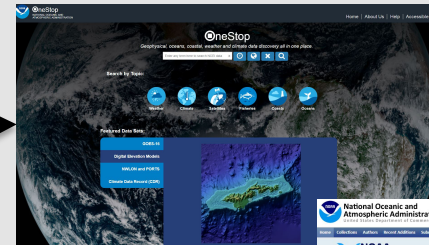
☐ Data files are online searchable at the granule-level (e.g., CLASS, AIRS, etc.).

BACK NEXT

[CoMET User's Manual](#)



DSMQ Workflow (Future)

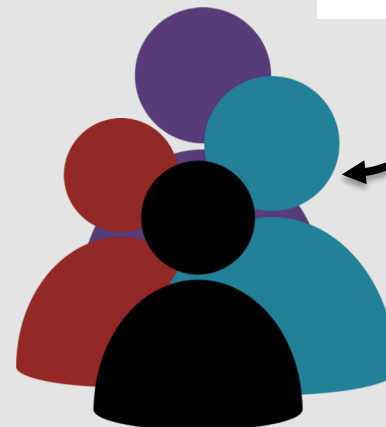
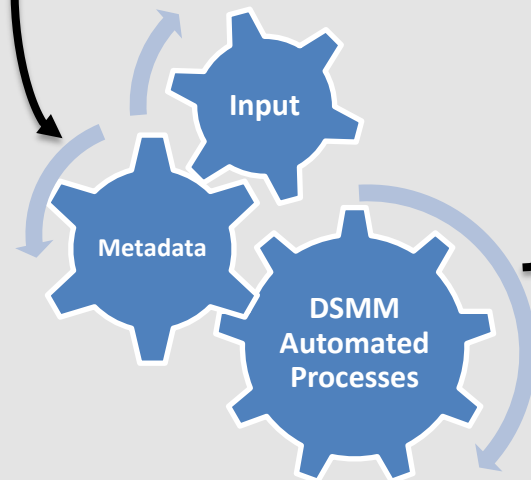


Data Stewardship Maturity Scoreboard for NOAA's Product A - A Notational Example

Category	Score
Preservation	★★★★★
Accessibility	★★★★★
Usability	★★★★★
Production Sustainability	★★★★★
Data Quality Assurance	★★★★★
Data Quality Control/Monitoring	★★★★★
Data Quality	★★★★★
Transparency	★★★★★
Assessment Date	2014-01-01

Stewardship Maturity Rating for NOAA's Product A - A Notational Example

Category	Score
Preservation	★★★★★
Accessibility	★★★★★
Usability	★★★★★
Production Sustainability	★★★★★
Data Quality Assurance	★★★★★
Data Quality Control/Monitoring	★★★★★
Data Quality	★★★★★
Transparency	★★★★★
Assessment Date	2014-01-01



Happy Users

Keys to success

- User involvement
- Agile approach



Questions?



www.ncei.noaa.gov
www.climate.gov

NCEI Climate Facebook: <http://www.facebook.com/NOAANCElclimate>

NCEI Ocean & Geophysics Facebook: <http://www.facebook.com/NOAANCEloceangeo>

NCEI Climate Twitter (@NOAANCElclimate): <http://www.twitter.com/NOAANCElclimate>

NCEI Ocean & Geophysics Twitter (@NOAANCElocngeo): <http://www.twitter.com/NOAANCElocngeo>



Additional Details

DSMM Resources



DSMM paper: tinyurl.com/DSMMpaper

DSMM Introduction Slides: tinyurl.com/DSMMintro

A DSMM Self-Evaluation Template: tinyurl.com/DSMMtemplate

OneStop DSMM ISO Metadata Example

Conceptual Consistency

Measure Name: [Data Stewardship Maturity Assessment](#)

Measure ID: MM-Stew

Measure Description: The Data Stewardship Maturity Matrix (DSMM) is a unified framework that defines criteria for each of nine components based on measurable practices, which can be used to apply a progressive, 6-level rating to an individual dataset, representing stewardship maturity stages rated as Not Assessed or Not Available (Level 0), adHoc (Level 1), minimum (Level 2), intermediate (Level 3), advanced (Level 4), and optimal (Level 5).

Evaluation Description: Data Stewardship Maturity Assessment was evaluated by the metadata content editor for the NOAA OneStop project using the Scientific Data Stewardship Maturity Assessment Model Template v4.0.

Procedure Reference: Peng, Ge. The Scientific Data Stewardship Maturity Assessment Model Template. 2015-06-23.
[doi:10.6084/m9.figshare.1211954](https://doi.org/10.6084/m9.figshare.1211954)

Template
Content



Example of DSMM Results in ISO Metadata

Conceptual Consistency

Date of Measurement: 2016-06-22

Quantitative Result:

- Data Quality Assessment: minimal
- Accessibility: advanced
- Data Quality Control Monitoring: minimal
- Production Sustainability: advanced
- Data Integrity: intermediate
- Preservability: advanced
- Transparency Traceability: intermediate
- Usability: advanced
- Data Quality Assurance: advanced

Results

Conformance Result

Explanation: Data Stewardship Maturity Assessment was (etc...) **Pass:** (inapplicable)

Reference: Ionin, R., G. Peng, and K. Saha (2016), Data stewardship maturity report for GHR SST Level 4 AVHRR_AMSR_OI Global Blended Sea Surface Temperature Analysis (GDS Version 1), NOAA/NESDIS Technical Report XXX, NOAA National Centers for Environmental Information, doi: 10.7289/XXXXXX.

Results

