Session: Data Stewardship Maturity Matrix – Use Case Study

Session Chairs: Ge Peng and Ruth Duerr

**Agenda**

- **Ge Peng:** An overview of the data stewardship maturity matrix and tiers of maturity assessment
- **Ruth Duerr:** An overview of the ESIP Data Stewardship Committee’s activity on use case studies of the data stewardship maturity matrix, and a use case study of the long-tail datasets maturity
- **Sophie Hou:** A use case study of stewardship maturity of NCAR model reanalysis data and DataOne member node ecological data
- **Lorri Peltz-Lewis:** An overview of the portfolio maturity matrix and a use case study of OMB A-16 portfolio
- **Open floor questions and discussions**
Towards a Consistent Measure of Stewardship Practices Applied to Individual Digital Earth Science Datasets

Ge Peng
Cooperative Institute for Climate and Satellite – North Carolina (CICS-NC), NC State University & NOAA’s National Centers for Environmental Information (NCEI) – NC
(Previously known as NCDC)

14 July 2015
Session: Data Stewardship Maturity Matrix – Use Case Study

2015 ESIP Summer Meeting
Why Should We Care?

- Quality of data and what being done with/to data matter!
- Knowing current data and stewardship maturity is essential in making informed and efficient management, data use and improvement decisions!
What Does Scientific Data Stewardship Mean?

Ensure datasets are

- preserved and secure
- available, discoverable, and accessible
- credible and understandable
- usable and useful
- sustainable and extendable
- citable and traceable
What Is the NCEI/CICS-NC Scientific Data Stewardship Maturity Matrix (SMM)?


Leveraging Institutional Knowledge and Community Best Practices and Standards
The Scope of Stewardship Practices

- Those applied to individual datasets – measureable and progressive
- Those associated with the functional entities of the Open Archival Information System (OAIS) (within the shaded box in the diagram below)
Stewardship Maturity Matrix Follows CMMI level Structure

Reference Maturity Level Structure
- Capability Maturity Model Integration (CMMI)
- Levels of Maturity of Digital repository
- Climate Data Record Maturity Matrix (CDRMM)
SMM Defines Measureable, Progressive Practices

in Nine Quasi-Independent Key Components

- Preservability
- Accessibility
- Usability
- Production Sustainability
- Data Quality Assurance
- Data Quality Control/Monitoring
- Data Quality Assessment
- Transparency/Traceability
- Data Integrity
Ways to Utilize SMM & Assessment Results

- To know the current state of your dataset(s) – maturity assessment (stewardship maturity scoreboard)
- To know where you want or need to be – stewardship requirements
- To know how to get there – roadmap forward (informed, actionable steps)

- A reference model for stewardship planning and resource allocation – informed decision-making support
- A consolidate source for information about stewardship practices – assessment with detailed justifications
SMM Latest Collaboration Status Update

- **ESIP Data Stewardship Committee**
  - to refine content of SMM to ensure its consistency across agencies and extend the scope of SMM to additional dataset types via use case studies

- **NOAA NCEI Data Stewardship Division**
  - to baseline a selected NCEI core datasets - a pilot study for informed decision-making support of managing institutional data holdings and long-term scientific data stewardship planning
  - to explore the potential application of SMM as metadata tags for improved data discovery

- **NOAA Climate Data Records (CDR) Program**
  - to baseline a selected CDRs to demonstrate the utility of SMM for improved stewardship practices and decision-making support process (resource allocation & prioritization) for improving data quality and usability of CDRs

- **NOAA Office of Systems Development (OSD)**
  - to explore the potential application of SMM in decision-making support of managing ground observational network

- **NOAA Technology Planning and Integration Office (TRIO)**
  - to explore the potential application of SMM in decision-making support of managing ground observational System Investment Portfolio
Quick Links

- DSMM Paper: http://tinyurl.com/DSMMpaper
- DSMM Introduction: http://tinyurl.com/DSMMintro
- One-page DSMM in pdf: http://tinyurl.com/DSMMslide
- Self-assessment template: http://tinyurl.com/DSMMtemplate
- Register: http://tinyurl.com/DSMMregister
Putting Maturity Assessment into Perspective
Tiers of Maturity Assessment within Context of Scientific Data Stewardship

- Repository Trustworthiness Maturity (e.g., ISO 16363:2012)
- Asset Management Maturity (e.g., National Geospatial Dataset Asset)
- Stewardship Practice Maturity (e.g., NCEI/CICS-NC matrix)
Individual Datasets Maturity Assessment within Context of Dataset Lifecycle Stages

Create/Evaluate/Obtain
Product

Maintain/Preserve/Access
Stewardship

Use/User Service
Service

Data/Product Maturity Matrix
Bates and Privette (2012)
EUMETSAT (2015)

Stewardship Maturity Matrix
Peng et al. (2015)

Service Maturity Matrix
To Be Developed

An End-2-End, Consistent, Integrated Maturity Matrix Suite
A Consistent Measure of Product, Stewardship, and Service Quality
Questions & Suggestions

Ge.Peng@noaa.gov
Questions and Discussions

• Availability or description of the procedure for users to obtain permission to access restricted datasets, ease of finding and following the procedure
  ➢ Should it be the part of Stewardship MM or Service MM?

• Who is responsible for data quality?
  ➢ Science Quality
  ➢ Product Quality
  ➢ Stewardship Quality
  ➢ Service Quality

(Definition of Quality: Information Quality Cluster Poster (Ramapriyan et al. 2015), Wednesday; Roles and Responsibilities: Information Quality and Stewardship Session, Friday Morning)

• Other?