Global Change Master Directory (GCMD) Keyword Management Process and Lifecycle

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Tyler Stevens
EED-2 Senior Discipline Engineer
Tyler.B.Stevens@nasa.gov

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Outline

I. What Are the GCMD Keywords?
II. Transparency in Process and Change
III. GCMD Keywords in Action
IV. Learn More
V. Questions/Roundtable Discussion
I. What Are the GCMD Keywords?
GCMD Keywords

- A hierarchical set of controlled vocabulary covering Earth science disciplines that have been evolving for over 25 years.
- Helps describe Earth science data and services in a consistent and comprehensive manner.
- Allows for the precise searching of collection metadata and subsequent retrieval of data.
- Follows a governance process for keyword changes and additions.
## Keyword Examples

<table>
<thead>
<tr>
<th>Category</th>
<th>Keyword Level</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Earth Science</strong></td>
<td>Topic</td>
<td>Atmosphere</td>
</tr>
<tr>
<td></td>
<td>Term</td>
<td>Weather Events</td>
</tr>
<tr>
<td></td>
<td>Variable Level 1</td>
<td>Subtropical Cyclones</td>
</tr>
<tr>
<td></td>
<td>Variable Level 2</td>
<td>Subtropical Depression</td>
</tr>
<tr>
<td></td>
<td>Variable Level 3</td>
<td>Subtropical Depression Track</td>
</tr>
<tr>
<td></td>
<td>Detailed Variable</td>
<td>Subtropical Depression 7 Track</td>
</tr>
<tr>
<td><strong>Data Centers</strong></td>
<td>Short Name</td>
<td>LP DAAC</td>
</tr>
<tr>
<td></td>
<td>Long Name</td>
<td>Land Processes Distributed Active Archive Center</td>
</tr>
<tr>
<td><strong>Projects</strong></td>
<td>Short Name</td>
<td>ESIP</td>
</tr>
<tr>
<td></td>
<td>Long Name</td>
<td>Earth Science Information Partner</td>
</tr>
<tr>
<td><strong>Instruments-Sensors</strong></td>
<td>Short Name</td>
<td>MODIS</td>
</tr>
<tr>
<td></td>
<td>Long Name</td>
<td>Moderate-Resolution Imaging</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spectroradiometer</td>
</tr>
<tr>
<td><strong>Platforms-Sources</strong></td>
<td>Short Name</td>
<td>Aqua</td>
</tr>
<tr>
<td></td>
<td>Long Name</td>
<td>Earth Observing System, Aqua</td>
</tr>
</tbody>
</table>
II. Transparency in Process and Change
GCMD Keyword Community Forum

The **GCMD Keywords Community Forum** provides keyword users and metadata providers with a transparent area for discussion of keyword topics. Participants are invited to use the forum to ask questions, submit keyword requests, discuss trade-offs, and track the status of keyword requests. See [http://earthdata.nasa.gov/gcmd-forum](http://earthdata.nasa.gov/gcmd-forum)
Who Makes Changes

**Teams:**
- Global Change Master Directory (GCMD)
- Analysis and Review of CMR (ARC)
- Common Metadata Repository (CMR)
- International Directory Network (IDN)

**CMR System**
- **ARC Team:** Recommends Metadata Changes
- **CMR Team:** Metadata Model (UMM) Changes
- **GCMD Team:** Keyword Changes
  Metadata Changes (IDN DIF)

**Community:**
- DAACs
- IDN Providers
Contributing Keyword Changes

Keyword Forum

Slack #curation Channel

Email (support@earthdata.nasa.gov)
Rationale for Keyword Changes

- Fix Errors
- User Requests
- Keyword Backlog
- Align With Common Terminology
- Record Examination
- Keyword Gap Analysis
- User Search Behavior
Keyword Review Types

• Fast Track
  — Impact is none to minimal
  — Small number of changes
  — Shorter turn around time (< a week)
  — Example: “I would like to add a new Project keyword HMA > High Mountain Asia”.

• Full Review
  — Impact is major
  — Large number of changes
  — Longer turn around time (yearly)
  — Example: “I would like to add and revise all keywords under Terrestrial Hydrosphere > Water Quality/Water Chemistry”.
Keyword Review Process (1 of 2)

1. Submit Keyword Request
2. Triage Keyword Request
3. Fast Track Review

- Refine Request
  - Keyword Meets Requirements?
    - Yes
      - Keyword Impact?
        - Minimal
          - (3) Fast Track Review
        - Major
          - (3) Full Review
    - No
      - Refine Request

- Approve Keyword?
  - Yes
    - Continues On Next Slide
  - No
Keyword Review Process (2 of 2)

(4) Notify Requestor

(5) Notify Affected Metadata Authors

(6) Implement Keyword in KMS

(7) Publish Keyword Release Announcement
Keyword Review Documents

**Keyword Review Spreadsheet:**
Conveys keyword changes to reviewers

**Keyword Review Survey:**
Reviewers rate the keyword changes

**Keyword Review Feedback:**
Conveys all feedback received from keyword reviewers
How You Can Participate in Keyword Change Reviews

- The GCMD Keyword review is facilitated by the NASA ESDIS Standards Office (ESO).
- Keyword reviewers will review proposed keywords and complete an online questionnaire to provide their feedback.
- If you are interested in becoming a keyword reviewer, please contact the ESO at eso-staff@lists.nasa.gov.
- We need your science expertise!!
III. GCMD Keywords In Action
Authoritative Vocabulary, Taxonomy, or Thesaurus

Organizations that have adopted the GCMD keywords use them to describe their Earth science data in a consistent and comprehensive manner.
Ontologies, including the Semantic Web for Earth and Environmental Terminology (SWEET) and Sea Ice, are using the GCMD keywords as a "low-level" source of keywords (knowledge base) for building broader domain specific ontologies.
Integration Within Metadata Curation Tools

- CMR metadata providers are required to use the GCMD keywords to describe their data.
- CMR metadata team reviews science keywords in records for consistency and makes recommendations as needed for additional keywords to better describe providers' data.

**Metadata Management Tool**

Keyword Pick-List From GCMD Keyword Management System (KMS)
Integration Within Metadata Catalogues for Search and Discovery

NASA Earthdata

NASA GES DISC

FEDEO

NOAA One Stop
IV. Learn More
Keyword Landing Page

- Learn More about the Keywords
- Access the GCMD Keywords
- Submit a Keyword Request
- See Keyword Release Announcements
- Review the Keyword Governance Document

https://earthdata.nasa.gov/about/gcmd/global-change-master-directory-gcmd-keywords
Utilizing the KMS API

- The Keyword Management Service (KMS) is a RESTful web service for maintaining and accessing the keywords.
  - Retrieve the keywords as SKOS Concepts (RDF, JSON, OWL), XML, and CSV
  - Retrieve previous versions
  - Retrieve in different case (Native, Title Case, Upper Case, Lower Case)
  - Search by keyword pattern (i.e. Search by ‘Terra’)

- Help Documentation
  - [https://wiki.earthdata.nasa.gov/x/gwxNBQ](https://wiki.earthdata.nasa.gov/x/gwxNBQ)
V. Questions/Roundtable Discussion
Questions for Audience Interaction Activity

• Ease of access of the GCMD keywords.
• Rate the usefulness of the GCMD keywords for describing Earth science data sets in your specific discipline.
• How did you hear about the GCMD keywords?
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Backup
Evolution of Keyword Review Process

(1990-2010) Internal review and public reviews with IDN representatives.

(2010-2015) Internal review and informal public reviews with SMEs.

(2015-Present) Formal reviews by SMEs in coordination with the NASA ESDIS Standards Office.

Increased Transparency and Improved Process For a Curated Keyword List
Tracking All Changes Across CMR

(1) Change Proposed

(2) Change Tracked and Documented

(3) Change Impact Assessment

(4) Change Community Reviewed

(5) Changed Approved

(6) Change Implemented

Continuous Improvement and Evolution