NASA GCMD Keywords

CEOS WGISS-47
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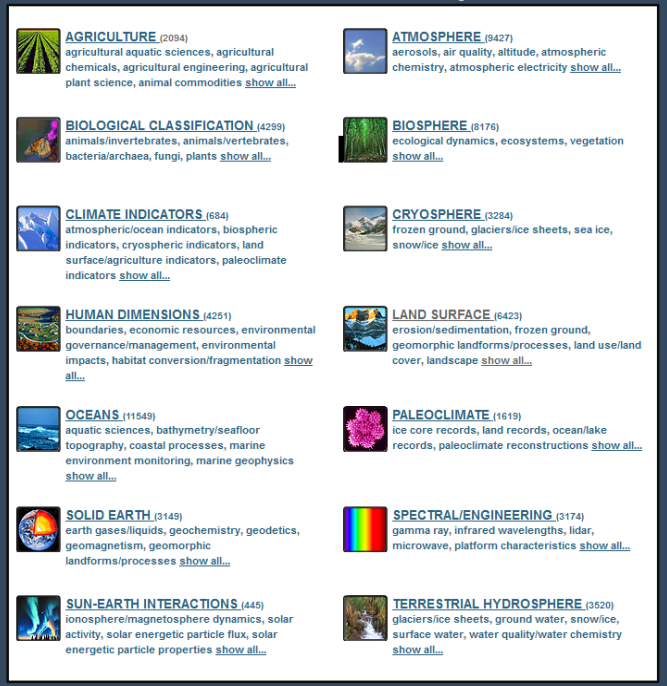
What Are The GCMD Keywords?

- Hierarchical set of controlled vocabulary covering Earth science disciplines that have been evolving for over 25 years.
- Contains
  - 12 published keyword types
  - Over 11,000 unique keywords
  - More than 100 defined keyword relationships

GCMD Earth Science Keywords



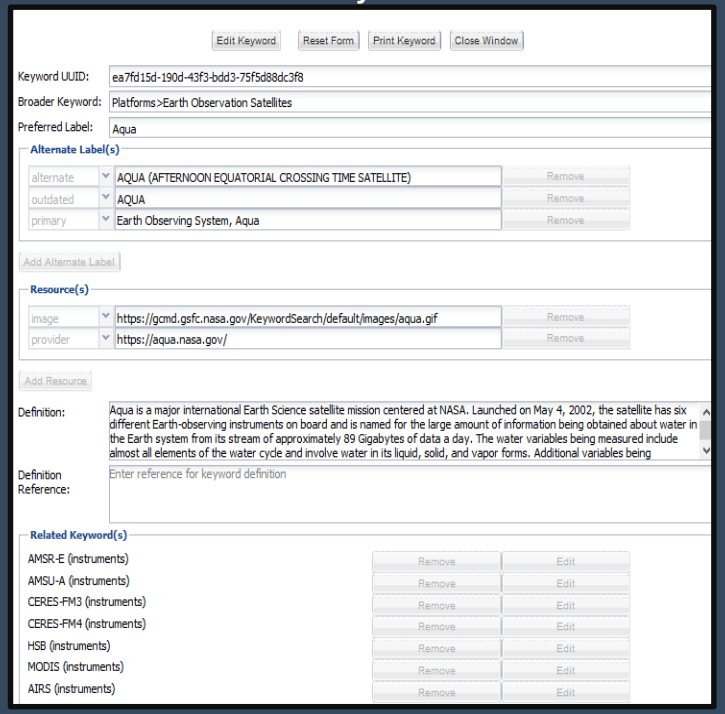
https://gcmd.nasa.gov/

Implementing Keywords and Relationships

1. Add Keyword
2. Add Alternate Label
3. Add Resource
4. Add Definition
5. Add Reference
6. Add Related Keyword

Each keyword created has a universally unique identifier (UUID) that does not change.

GCMD Keyword Editor



A Look Behind The Scenes

Request for a list of platforms and their relationship to an instrument (AQUA has several related instruments):
https://gcmdservices.gsfc.nasa.gov/kms/concept_relation/?scheme=platforms&relation_type=has_instrument


```
{"prefLabel": "AQUA",
      "scheme": "platforms",
      "uuid": "ea7fd15d-190d-43f3-bdd3-75f5d88dc3f8",
      "relatedConcepts": [
        {"prefLabel": "AMSR-E",
          "relationType": "has_instrument",
          "uuid": "736038ef-c1ae-47c7-a50e-729474eeb3b1",
          "scheme": "instruments"},
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          "scheme": "instruments"},
```

Visualizing Keyword Relationships

The example below shows a relationship between Platforms and Instruments. These instruments fly on the Aqua satellite.

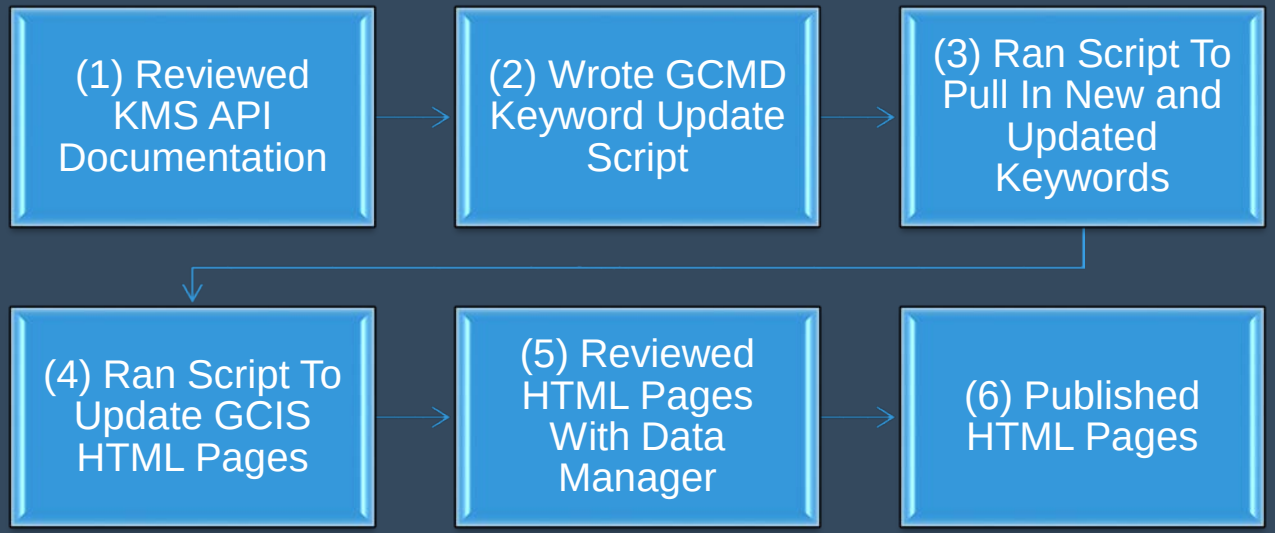
Keyword Relationship Use Case: GCIS

The Global Change Information System (GCIS) wanted to implement GCMD science keywords and associated relationships to describe figures, tables, chapters, etc. in the Fourth National Climate Assessment (NCA4).

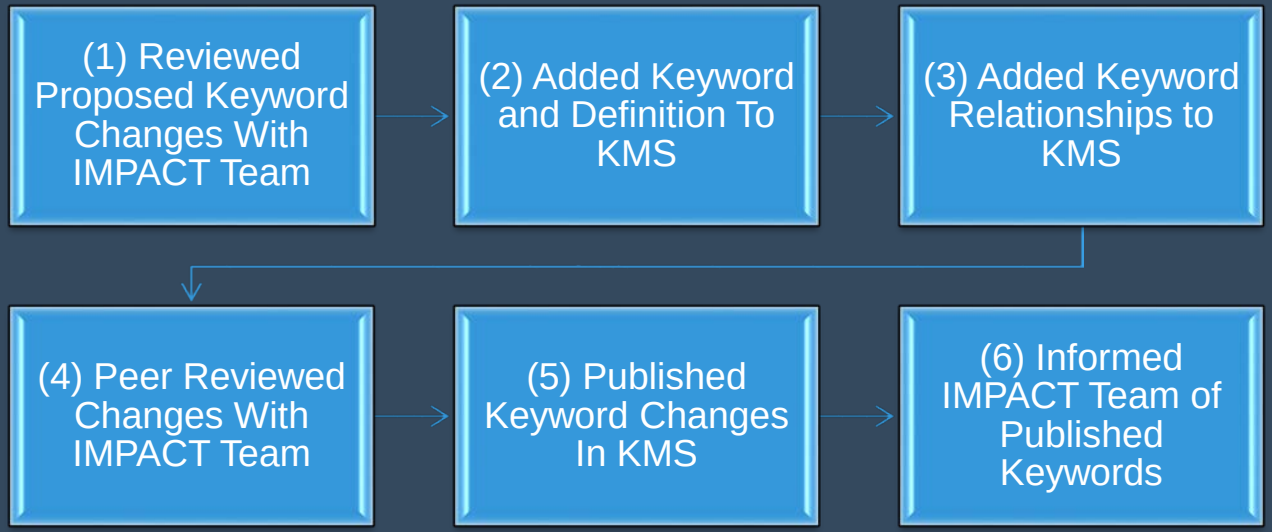
https://data.globalchange.gov/report/nca4/

- Background:
  - The GCIS is working with NASA's Inter Agency Implementation and Advanced Concepts (IMPACT) team to improve the discovery of global change resources.
  - The MSFC IMPACT team is collaborating with the GCMD/IDN team to identify gaps in keywords based on the NCA4 review.
  - The GCMD is implementing keyword changes and defined relationships based on the gap analysis.

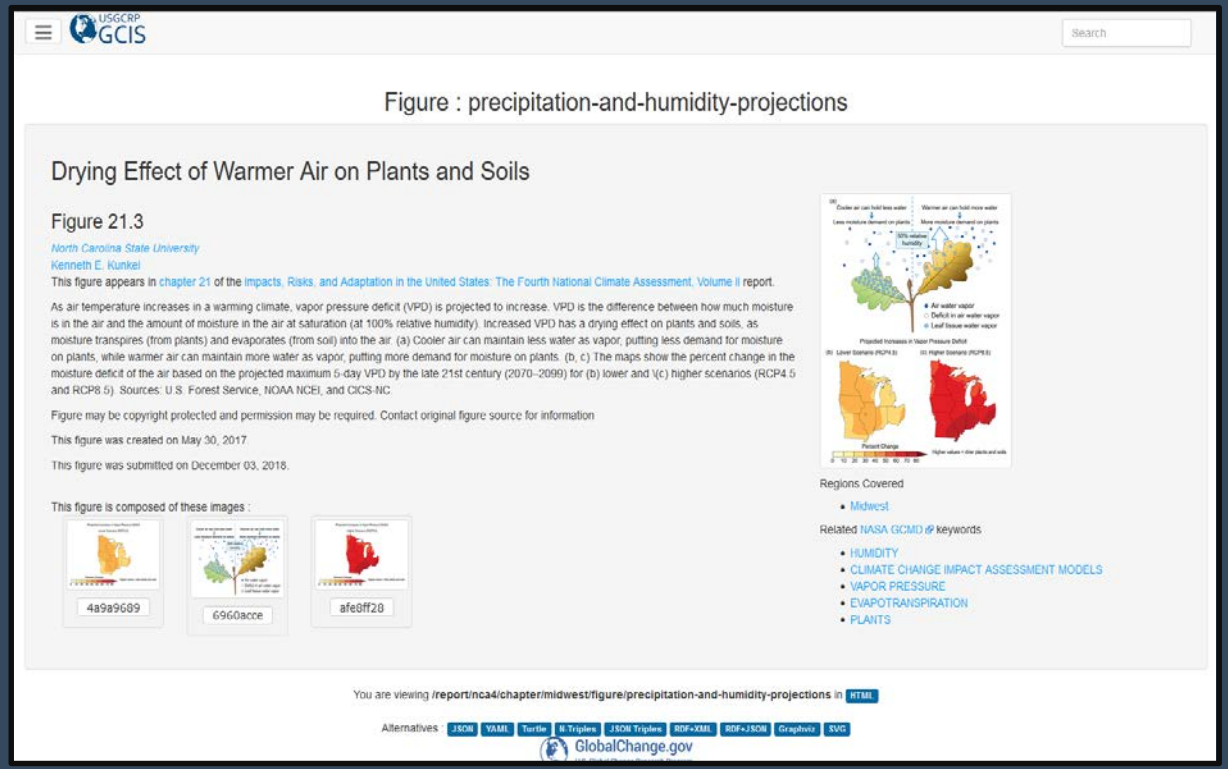
GCIS Implementation Process



GCMD Implementation Process

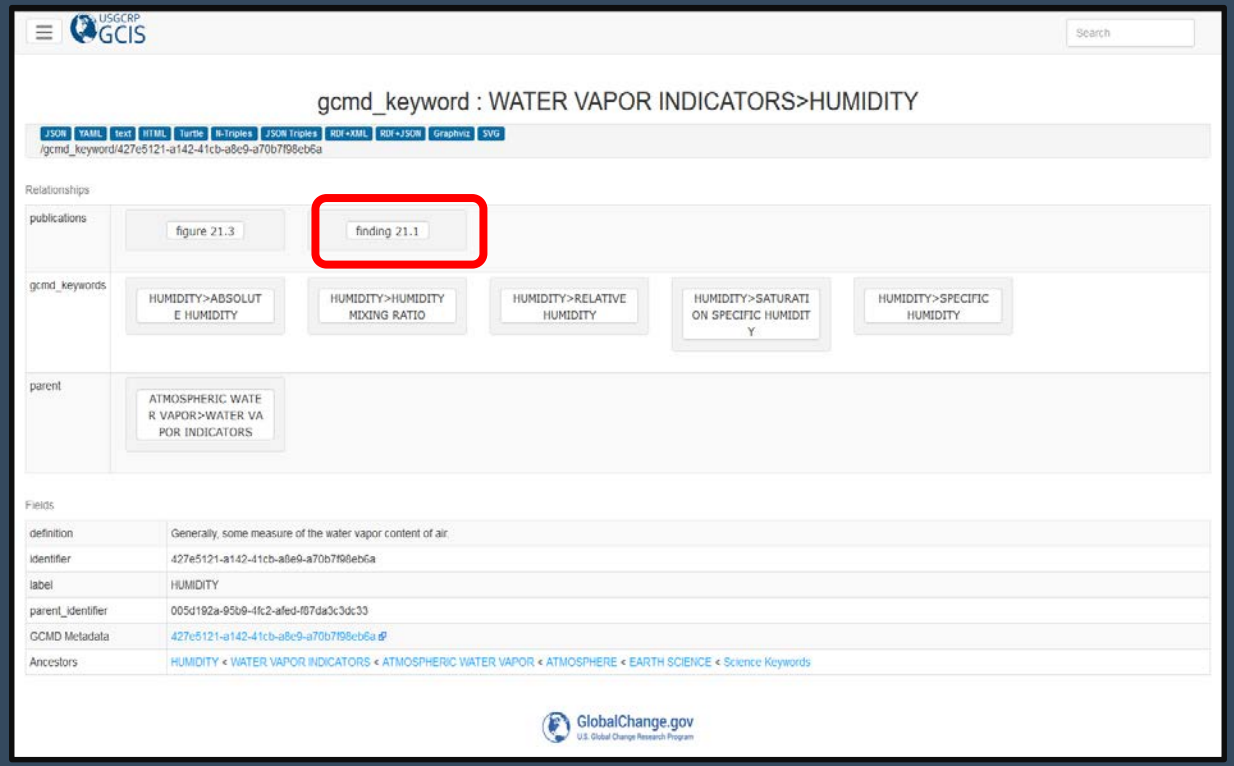


Result: GCIS Publication Page



https://data.globalchange.gov/report/nca4/chapter/midwest/figure/precipitation-and-humidity-projections

Result: GCIS Keyword Reference

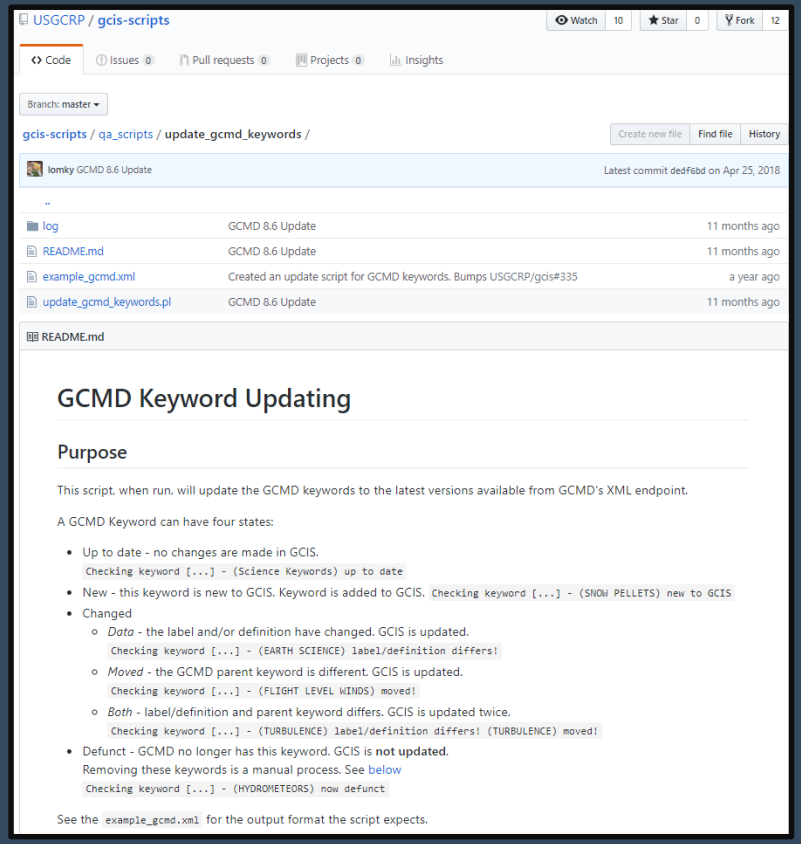


https://data.globalchange.gov/gcmd_keyword/427e5121-a142-41cb-a8e9-a70b7f98eb6a

Result: Related Publications

https://data.globalchange.gov/report/nca4/chapter/midwest/finding/key-message-21-1

GCIS Script Details



USGCRP / gcis-scripts

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Code | Issues 0 | Pull requests 0 | Projects 0 | Insights

Branch: master

gcis-scripts / qa_scripts / update_gcmd_keywords /

Create new file | Find file | History

lomky GCMD 8.6 Update — Latest commit dedf6bd on Apr 25, 2018

log	GCMD 8.6 Update	11 months ago
README.md	GCMD 8.6 Update	11 months ago
example_gcmd.xml	Created an update script for GCMD keywords. Bumps USGCRP/gcis#335	a year ago
update_gcmd_keywords.pl	GCMD 8.6 Update	11 months ago

README.md

GCMD Keyword Updating

Purpose

This script, when run, will update the GCMD keywords to the latest versions available from GCMD's XML endpoint.

A GCMD Keyword can have four states:

- Up to date - no changes are made in GCIS.
  `Checking keyword [...] - (Science Keywords) up to date`
- New - this keyword is new to GCIS. Keyword is added to GCIS. `Checking keyword [...] - (SNOW PELLETS) new to GCIS`
- Changed
  - *Data* - the label and/or definition have changed. GCIS is updated.
    `Checking keyword [...] - (EARTH SCIENCE) label/definition differs!`
  - *Moved* - the GCMD parent keyword is different. GCIS is updated.
    `Checking keyword [...] - (FLIGHT LEVEL WINDS) moved!`
  - *Both* - label/definition and parent keyword differs. GCIS is updated twice.
    `Checking keyword [...] - (TURBULENCE) label/definition differs! (TURBULENCE) moved!`
- Defunct - GCMD no longer has this keyword. GCIS is **not updated**.
  Removing these keywords is a manual process. See below
  `Checking keyword [...] - (HYDROMETEORS) now defunct`

See the `example_gcmd.xml` for the output format the script expects.

https://github.com/USGCRP/gcis-scripts/tree/master/qa_scripts/update_gcmd_keywords

Conclusions

- GCMD keywords continue to evolve based on feedback from U.S. and international agencies, research universities, and scientific institutions.
- Implementing keyword relationships can be used to improve search and discovery of Earth science data and information.
- The process defined here could be reusable for other providers who want to implement the GCMD keywords and see associated relationships.
- You can contribute keywords by contacting the GCMD staff or sending an email to support@earthdata.nasa.gov.

Questions

Please provide questions/comments to:

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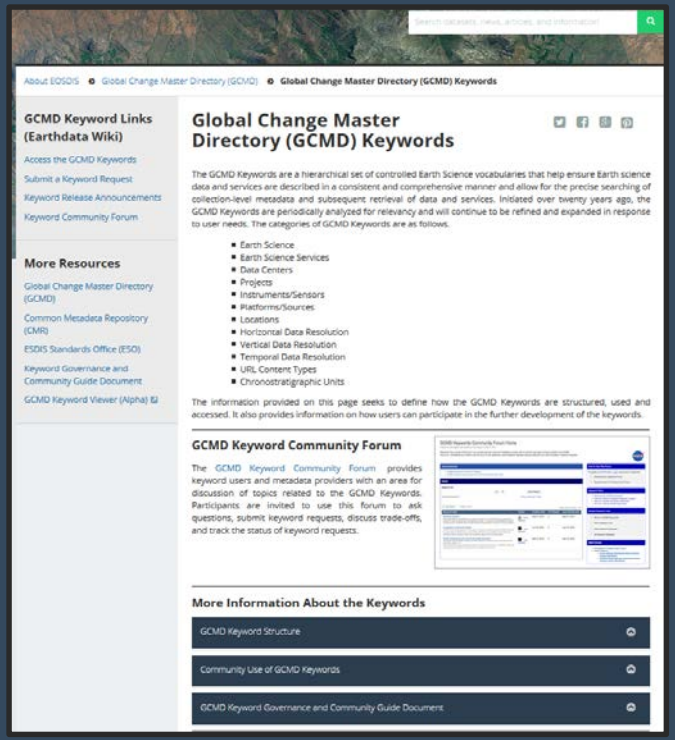
valerie.dixon@nasa.gov (NASA)
christopher.s.lynnes@nasa.gov (NASA)

Background Information

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

GCMD 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 defined keyword relationships
  - 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