



Metadata and the Sustained Assessment: Data Transparency as Climate Science Communication

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Cooperative Institute for Climate and Satellites

Overview

- What is the Sustained Assessment?
- Federal Guidelines and Requirements
- Metadata Process
- Sustained Assessment metadata as a climate science communication tool

Sustained Assessment

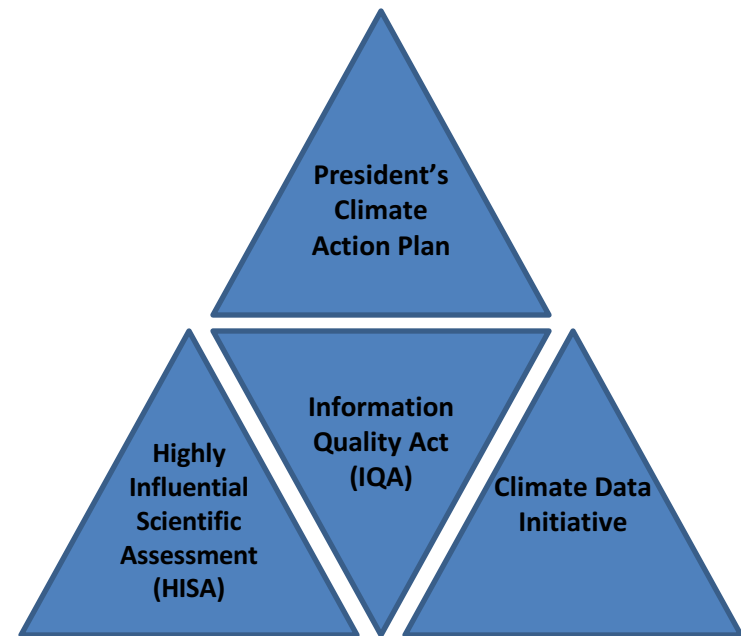
- Global Change Research Act of 1990
 - Requires the production of an Assessment of Climate Change and Impacts on the United States every 4 years
 - Three National Climate Assessments have been produced.
 - NCA3 was approximately 800 pages of text, and nearly 300 figures
 - Metadata collection is a critical part of the Assessments process
- Sustained Assessment: assessments activities as a continuous process

Sustained Assessment

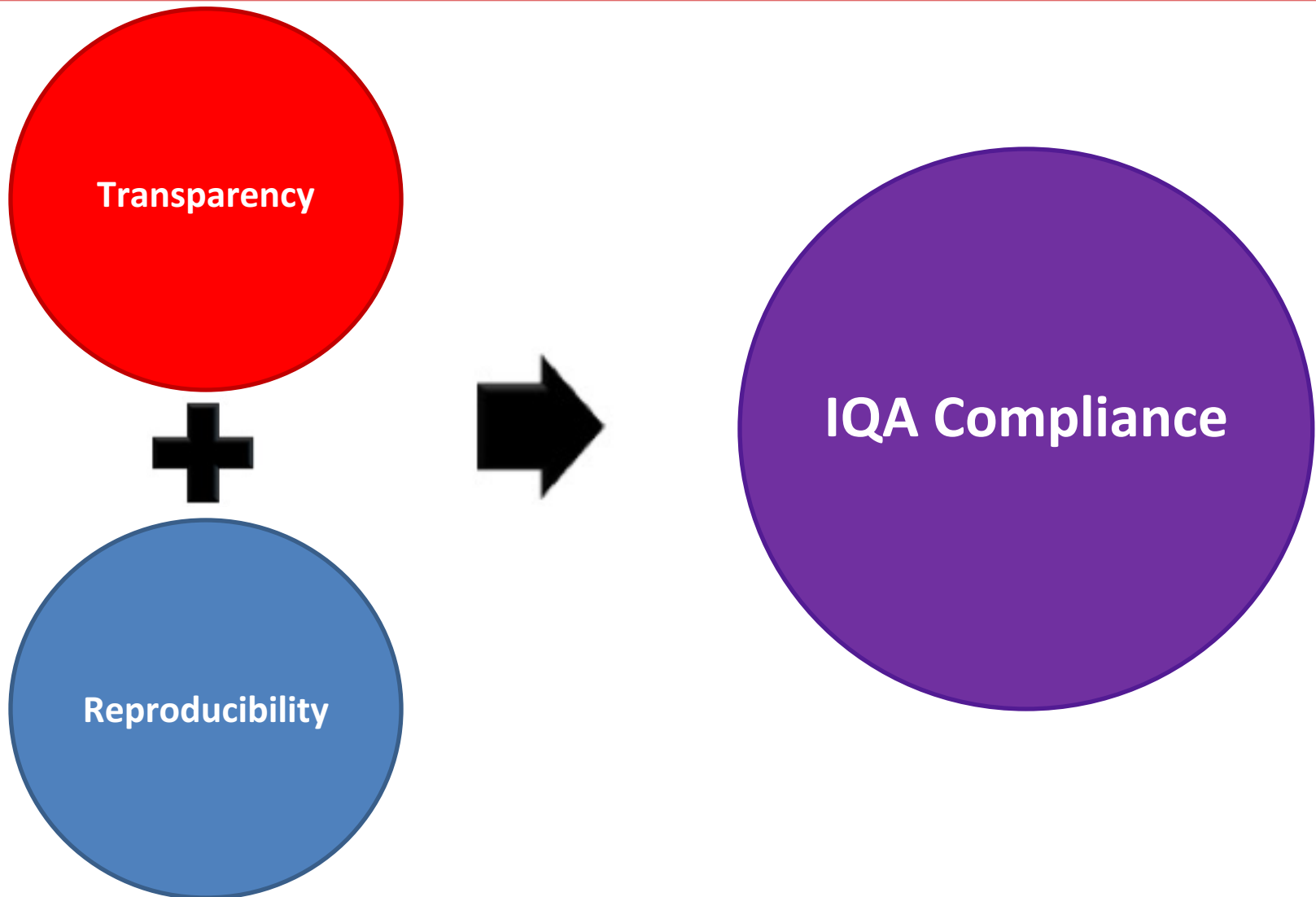
- First National Climate Assessment (2000)
 - Second National Climate Assessment (2009)
 - Third National Climate Assessment (2014)
-
- The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment (2016)
 - NOAA's State Climate Summaries (2017)
 - Climate Science Special Report (Ant. 2017)
 - Fourth National Climate Assessment (Ant. 2018)

Metadata: Federal Requirements

- Federally mandated by the Information Quality Act (IQA), and at a level required as a Highly Influential Scientific Assessment (HISA)
- Required to provide transparency and reproducibility of data and methods, such that Assessment results can be “reasonably reproduced”
- To meet this, we collect figure metadata about the figure sources, datasets, analysis methods, and tools



Metadata: Federal Requirements



Metadata: Process



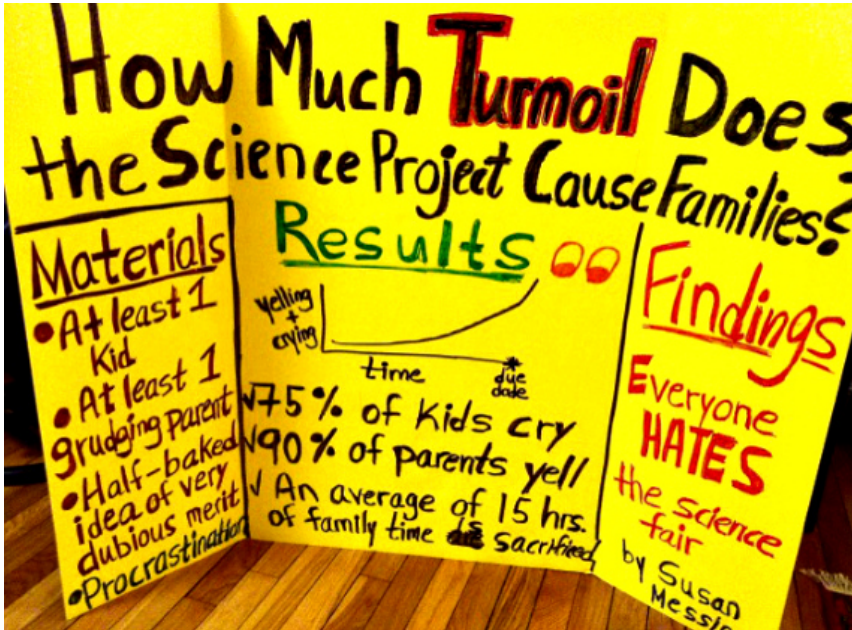
Source: Chocolate Cake Info

Metadata: Process

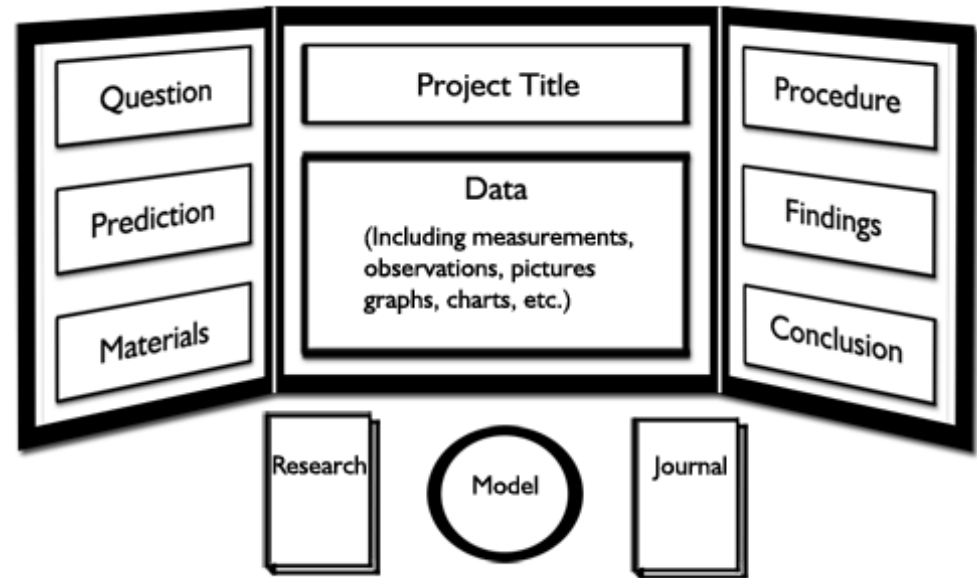


Source: Citingbytes

Metadata: Process



Source: Huffington Post



Source: Central Elementary

Metadata: Process



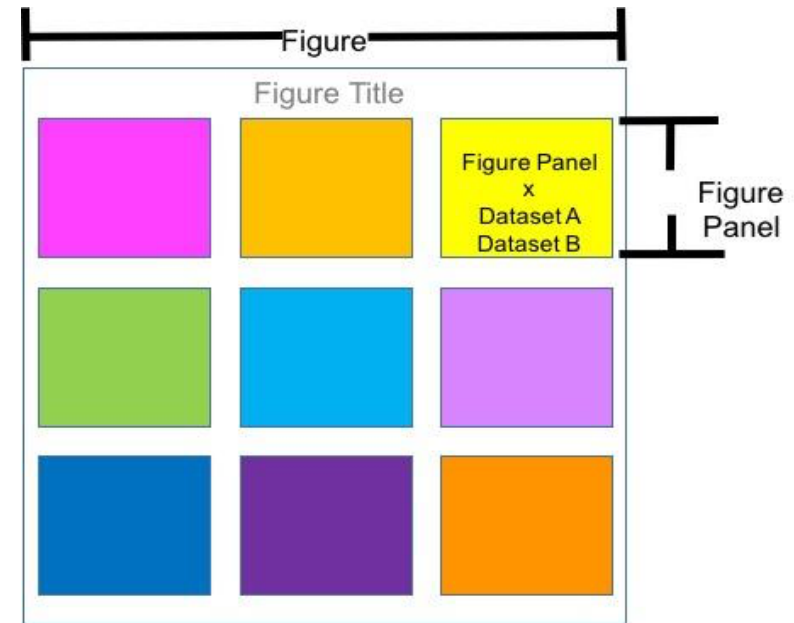
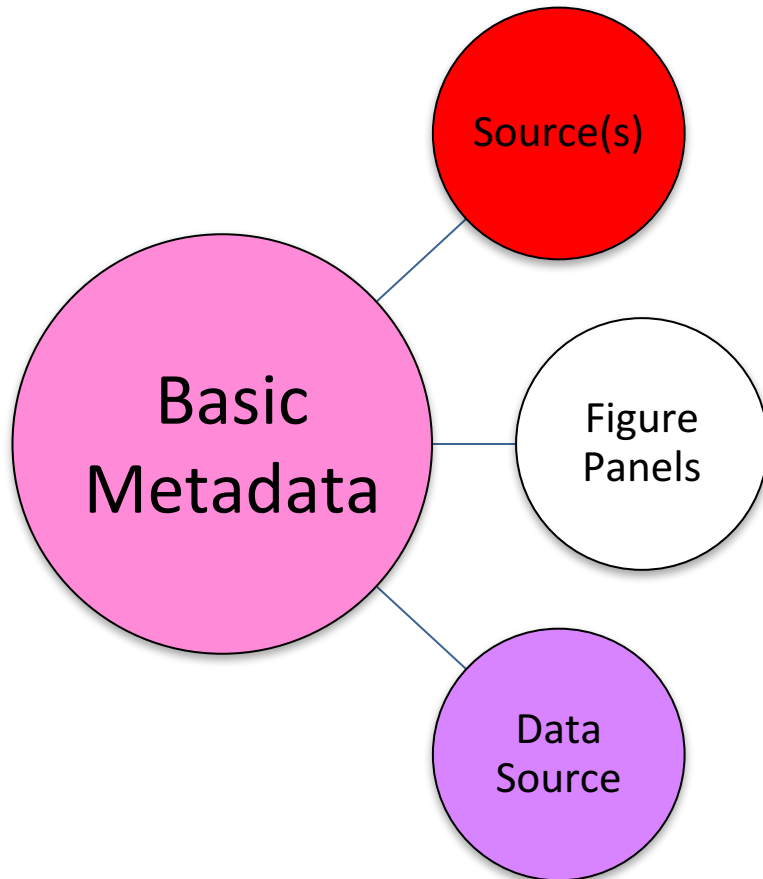
Source: Super Science Fair Projects

Metadata: Process

- Using the ISO19115 documentation standard, we use a web-based survey to collect figure metadata
- Collected in two phases
 - Tier 1: Basic Metadata
 - Tier 2: Additional Metadata
- Survey inputs are routed into the Global Change Information System (for multiple purposes), and then routed back to us for display in our “metadata viewer”
- End-to-end process ensures transparency and reproducibility, and communicates the science of the report to the general public
- Built an in-house viewer for user access to all documentation
 - Accessible by report website
 - Plain language “discussion” of collected metadata in an interactive interface, to include full analysis details for each dataset cited in each figure panel
 - Ability to review/download complete metadata record
 - Access to dataset(s) via URL

Metadata: Process

Basic Metadata

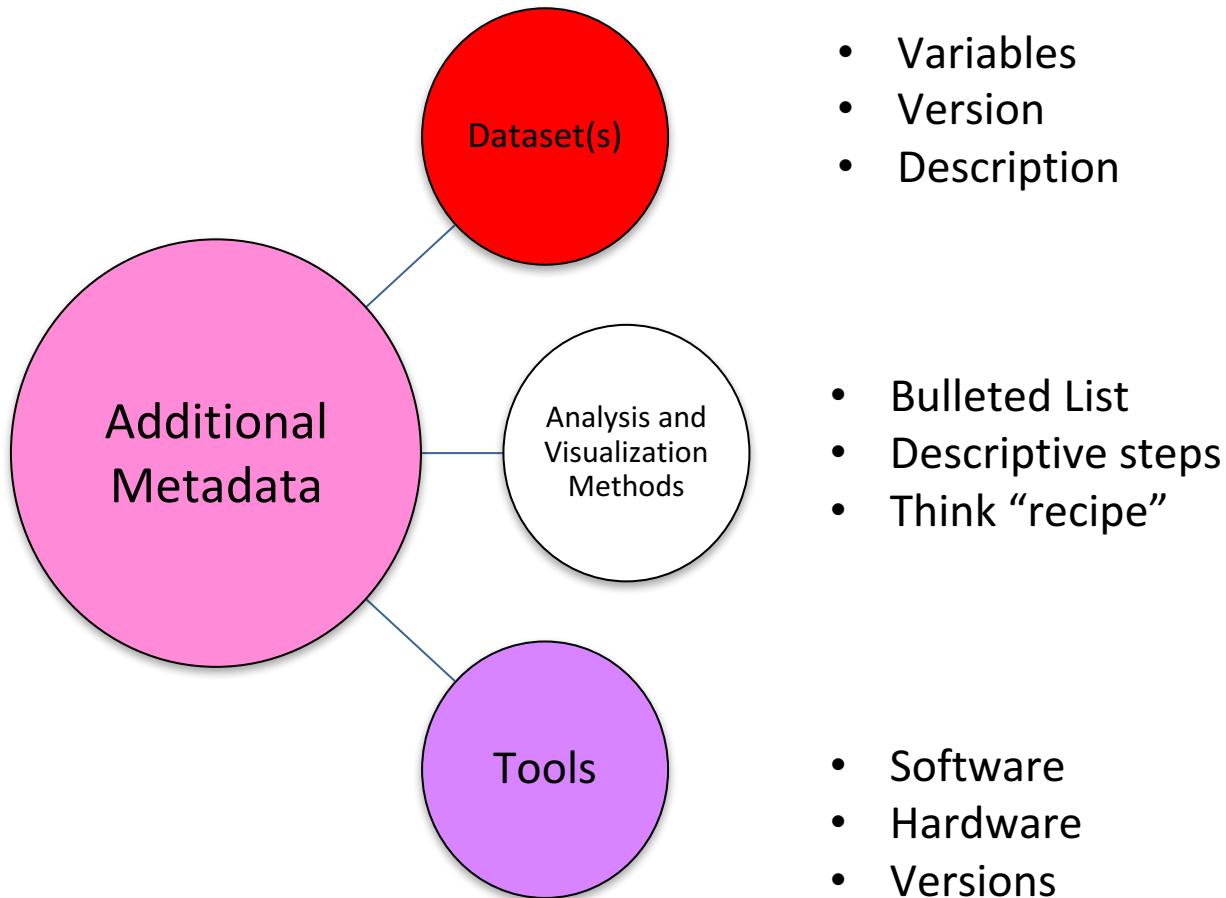


Origination source:

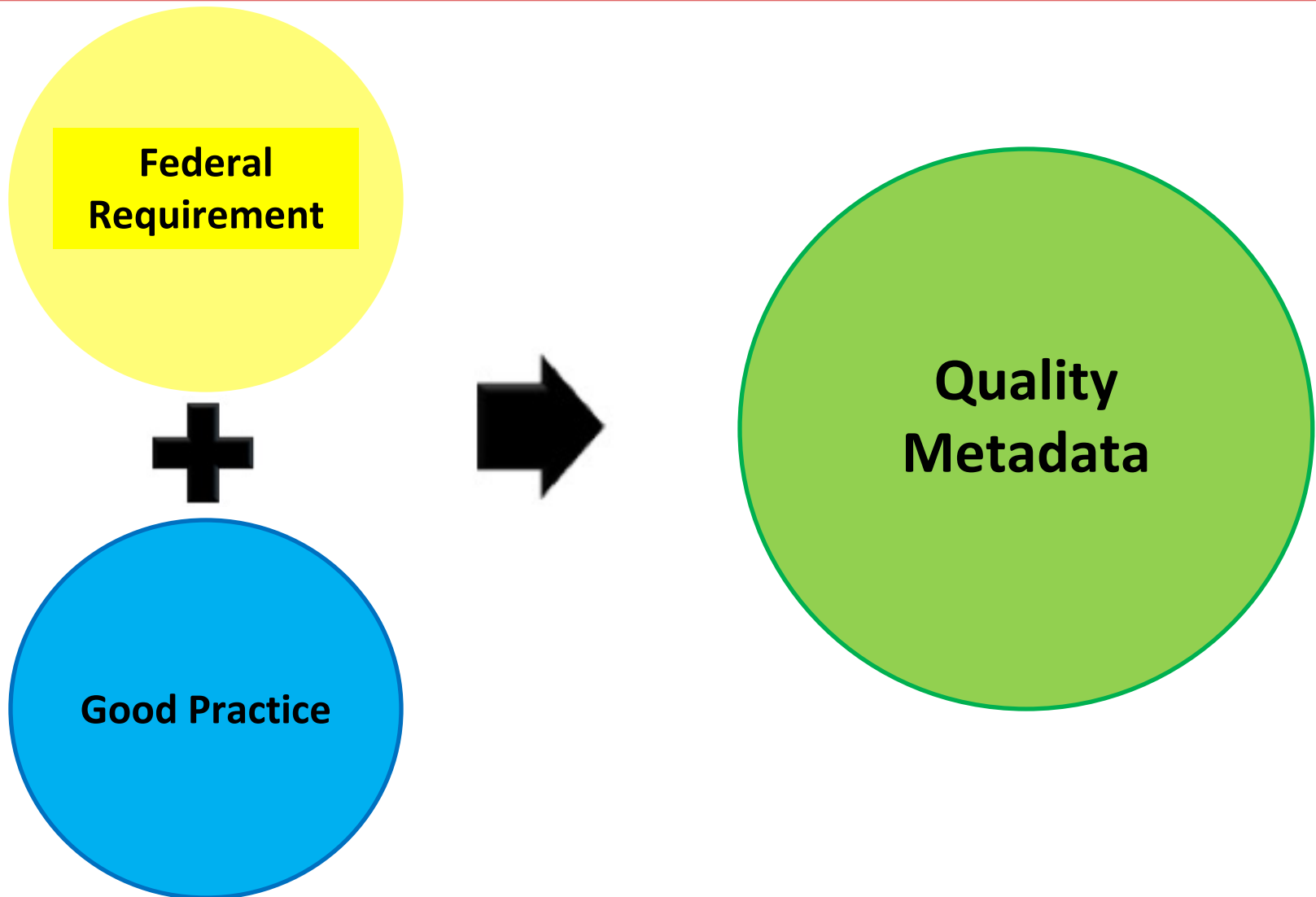
- Directly cited
- Adapted
- Redrawn
- Original for the report

Metadata: Process

Additional Metadata



Metadata: Process



Metadata

Communication Tool

2. Observed Summer Temperature

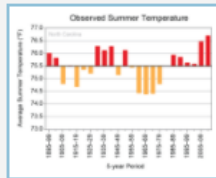


Overview

Datasets & Methods

Full Metadata Record

Download Figure



Zoom

No caption available.

This figure, "2. Observed Summer Temperature", is an original figure provided by [Kenneth E. Kunkel CICSNC/NCEI](#).

Panels

This figure is a single panel figure and 1 dataset analyzed.

1. "2. Observed Summer Temperature" was created on 13 Apr 2015 04:00:00 GMT.

The dataset [U.S. Climate Divisional Dataset Version 2](#) was analyzed for the region bounded by 33.8401°/36.5883° Latitude, and -75.4604°/-84.3217° Longitude and the analysis applies to the time period from 01 Jan 1895 – 31 Dec 2014.

Please access the "Datasets & Methods" tab for details on how the data were analyzed to produce this panel.

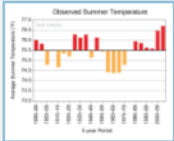
Metadata Communication Tool

2. Observed Summer Temperature



[Overview](#) [Datasets & Methods](#) [Full Metadata Record](#) [Download Figure](#)

2. Observed Summer Temperature



No caption available.

[Zoom](#)

Dataset 1

The author of this panel analyzed the dataset "U.S. Climate Divisional Dataset Version 2" using the following methods:

- Annual mean summer temperature (June-August) for the state was calculated for the full time period
- Annual mean summer temperature was calculated for each five-year period

They used R version 3.1.3 and Windows 7 (64 bit Operating System) to conduct the analysis.

The data were visualized using the following methods:

- Five-year average frequencies were plotted around the mean for the full-time period

and the following software:

Microsoft Office Excel 2007.

These methods are not published. For more information please contact the [author](#).

For full details, please download the full metadata record available on the "Full Metadata Record" tab.

[Display Dataset Information](#)

Metadata Communication Tool

2. Observed Summer Temperature

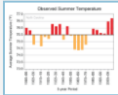
Overview

Datasets & Methods

Full Metadata Record

Download Figure

2. Observed Summer Temperature



No caption available.

Zoom

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Hide Dataset Information

Dataset is a public-or-private dataset. (NB: This field is not in the GCIS.)

The author used version 2 for this panel.

"U.S. Climate Divisional Dataset Version 2" includes data for the variables unknown over the 24/49 Latitude, and -129/-65 Longitude for the period 01 Jan 2001 - 01 Aug 2001.

"U.S. Climate Divisional Dataset Version 2" is described as follows:

For many years the Climate Divisional Dataset was the only long-term temporally and spatially complete dataset from which to generate historical climate analyses (1895-2013) for the contiguous United States (CONUS). It was originally developed for climate-division, statewide, regional, national, and population-weighted monitoring of drought, temperature, precipitation, and heating/cooling degree day values. Since the dataset was at the divisional spatial scale, it naturally lent itself to agricultural and hydrological applications. There are 344 climate divisions in the CONUS. For each climate division, monthly station temperature and precipitation values are computed from the daily observations. The divisional values are weighted by area to compute statewide values and the statewide values are weighted by area to compute regional values. (Karl and Koss, 1984).

Data can be accessed by visiting an unspecified agency at <http://www.ncdc.noaa.gov/monitoring-references/maps/us-climate-divisions.php>.

For the complete dataset information, please access the full metadata record.

Metadata

Communication Tool

2. Observed Summer Temperature ✕

Overview Datasets & Methods Full Metadata Record Download Figure

JSON XML

Graphics Title	2. Observed Summer Temperature
Creation Date/Time	13 Apr 2015 04:00:00 GMT
Period of Record	01 Jan 1895 – 31 Dec 2014
Spatial Extent	Lat (min/max): 33.8401°/36.5883° Lon (min/max): -75.4604°/-84.3217°
Point of Contact	Kenneth E. Kunkel
Point of Contact E-mail	Ken.Kunkel@noaa.gov
# of panels	1
Origination	Original
Name and Agency	Kenneth E. Kunkel CICSNC/NCEI
Author's Email	Ken.Kunkel@noaa.gov

Analysis Methods for Dataset #1

Dataset	U.S. Climate Divisional Dataset Version 2
Dataset Modified?	No
Methods Used	-Annual mean summer temperature (June-August) for the state was calculated for the full time period - Annual mean summer temperature was calculated for each five-year period
Dataset Archived?	Not Available
How Visualized	-Five-year average frequencies were plotted around the mean for the full-time period
Methods Published?	No
Authoritative Source	Kenneth E. Kunkel CICSNC/NCEI
Software Used	R version 3.1.3
Visualization Software	Microsoft Office Excel 2007
Operating System Used	Windows 7 (64 bit Operating System)
Creation Time	000:15
Output File	CICS computer cluster /snfs4/assessment/state summaries
Files	state.ave.tave.txt, Code yearly and seasonal tave missing removed.doc, Regression p-values all states FINAL RESULTS.xls

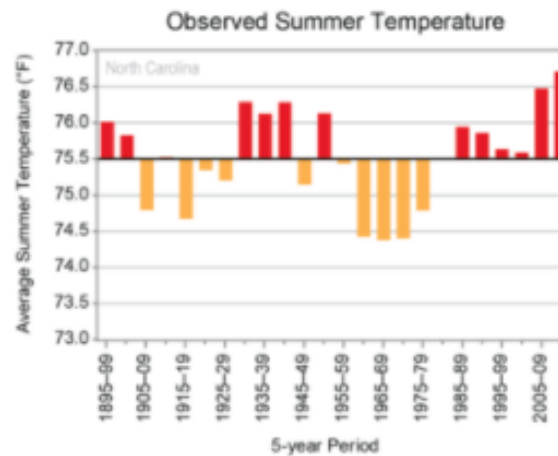
Metadata

Communication Tool

2. Observed Summer Temperature



Overview Datasets & Methods Full Metadata Record Download Figure



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Communication Tool

Examples of Success

- Inquiry on date ranges used in calculating the U.S. temperature change map from the Third National Climate Assessment (Data sources, temporal extents, :

“...would like to request information on the rational for the time frames used for the comparison (1901-1960) and (1991-2012). And why did the info-graphic eliminate the time frame of 1961-1990 from the comparison? My understanding is that it is a standard practice to document ones research and to archive the data so I do not believe you will have any trouble providing the following information.”

- Duplication and adaptation of figures used in earlier Sustained Assessment reports

Communication Tool



Communication Tool



Any questions?