

Use ORNL DAAC TDS Data Resources in Matlab

1. Required Matlab Toolbox

Matlab loaddap Tool

The Matlab loaddap Tool provides a way to read any DAP-accessible data into Matlab. Visit <http://www.opendap.org/matlab-loaddap> to find out how to download and install loaddap and its required libraries.

2. Usage Examples

Find data of your interest in ORNL DAAC THREDDS data server

Go to <http://thredds.daac.ornl.gov/thredds/catalogs/ornldaac/ornldaac.html> to browse the ORNL DAAC THREDDS data server and find data of your interest. In the following examples, it's assumed the data of interest is *climate6190.nc* in the "[GLOBAL 30-YEAR MEAN MONTHLY CLIMATOLOGY, 1961-1990 \(NEW ET AL.\)](#)" data set. Get its OPeNDAP data access URL (<http://thredds.daac.ornl.gov/thredds/dodsC/ornldaac/542/climate6190.nc4>) from the OPeNDAP Dataset Access Form.

Retrieve Data File Metadata

```
% Define data access URL
>> url =
http://thredds.daac.ornl.gov/thredds/dodsC/ornldaac/542/climate6190.nc4
';

% Retrieve all the metadata using loaddap with the -A switch.
>> m = loaddap('-A', url)

m =

    latitude: [1x1 struct]
  longitude: [1x1 struct]
     month: [1x1 struct]
         CLD: [1x1 struct]
         DTR: [1x1 struct]
         FRS: [1x1 struct]
         PRE: [1x1 struct]
         RAD: [1x1 struct]
         WET: [1x1 struct]
         TMP: [1x1 struct]
         TMX: [1x1 struct]
         TMN: [1x1 struct]
         VAP: [1x1 struct]
         WND: [1x1 struct]
Global_Attributes: [1x1 struct]
```

```

% Check detailed metadata for the "TMP" variable.
>> m.TMP

ans =

        long_name: 'Mean Temperature'
           units: 'degreeC'
    valid_range: [2x1 double]
    scale_factor: 0.1000
    ml_FillValue: -9999
  DODS_ML_Real_Name: 'TMP'
           TMP: [1x1 struct]
           month: [1x1 struct]
           latitude: [1x1 struct]
           longitude: [1x1 struct]

% Check metadata for the longitude dimension.
>> m.longitude

ans =

        long_name: 'longitude'
           units: 'degrees_east'
    valid_range: [2x1 double]
  DODS_ML_Size: 720
  DODS_ML_Real_Name: 'longitude'

% Check metadata for the latitude dimension.
>> m.latitude

ans =

        long_name: 'latitude'
           units: 'degrees_north'
  DODS_ML_Size: 360
  DODS_ML_Real_Name: 'latitude'

% Subset and retrieve data content from the TDS server by applying a
% constraint. From the above metadata information, we can see the TMP
% variable is 3-dimensional: month (12), latitude (360), and longitude
% (720). We want to subset climatology data (Mean Temperature) in June.
>> constraint = [url '?TMP[5:1:5][0:1:359][0:1:719]']

constraint =

http://thredds.daac.ornl.gov/thredds/dodsC/542/climate6190.nc?TMP[5:1:5
][0:1:359][0:1:719]

% Load the actual data by dropping the '-A' switch to loaddap.
>> d = loaddap(constraint);
>> d.TMP

ans =

        TMP: [360x720 double]
        month: 6
        latitude: [360x1 double]
        longitude: [720x1 double]

```

```
% Set Missing Value
>> d.TMP.TMP(d.TMP.TMP == m.TMP.ml__FillValue) = NaN;

% Plot your data
>> pcolor(d.TMP.longitude, d.TMP.latitude, d.TMP.TMP);
>> shading flat;
>> colorbar;
>> title('Global 30-Year Mean Monthly Climatology (1961-1990), Mean
Temperature in June');
```

