ODISEES: Ontology-Driven Interactive Search Environment for Earth Science

Atmospheric Science Data Center
NASA Langley Research Center

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ASDC, NASA Langley Research Center, Hampton, VA, United States

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ASDC ODISEES DATA PORTAL

- Aerosols-Optical Properties
- Aerosols-Chemical Composition
- Clouds-Optical Properties
- Clouds-Physical Properties
- Cloud Radiative Effects
- Hydrologic Cycle
- Land-Energy Change
- Precipitation
- Pressure
- Radiation
- Land-Surface Features
- Temperature
- Water Vapor/Humidity
- Wind

Compare

Welcome to the Ontology-Driven Interactive Search Environment for Earth Science (ODISEES). Users can query the ASDC semantic metadata repository for information about and access to select archived data and climate model outputs. No prior knowledge of the ontology, or the data vocabulary is required.

To begin, select a category. Or, visit the help page.

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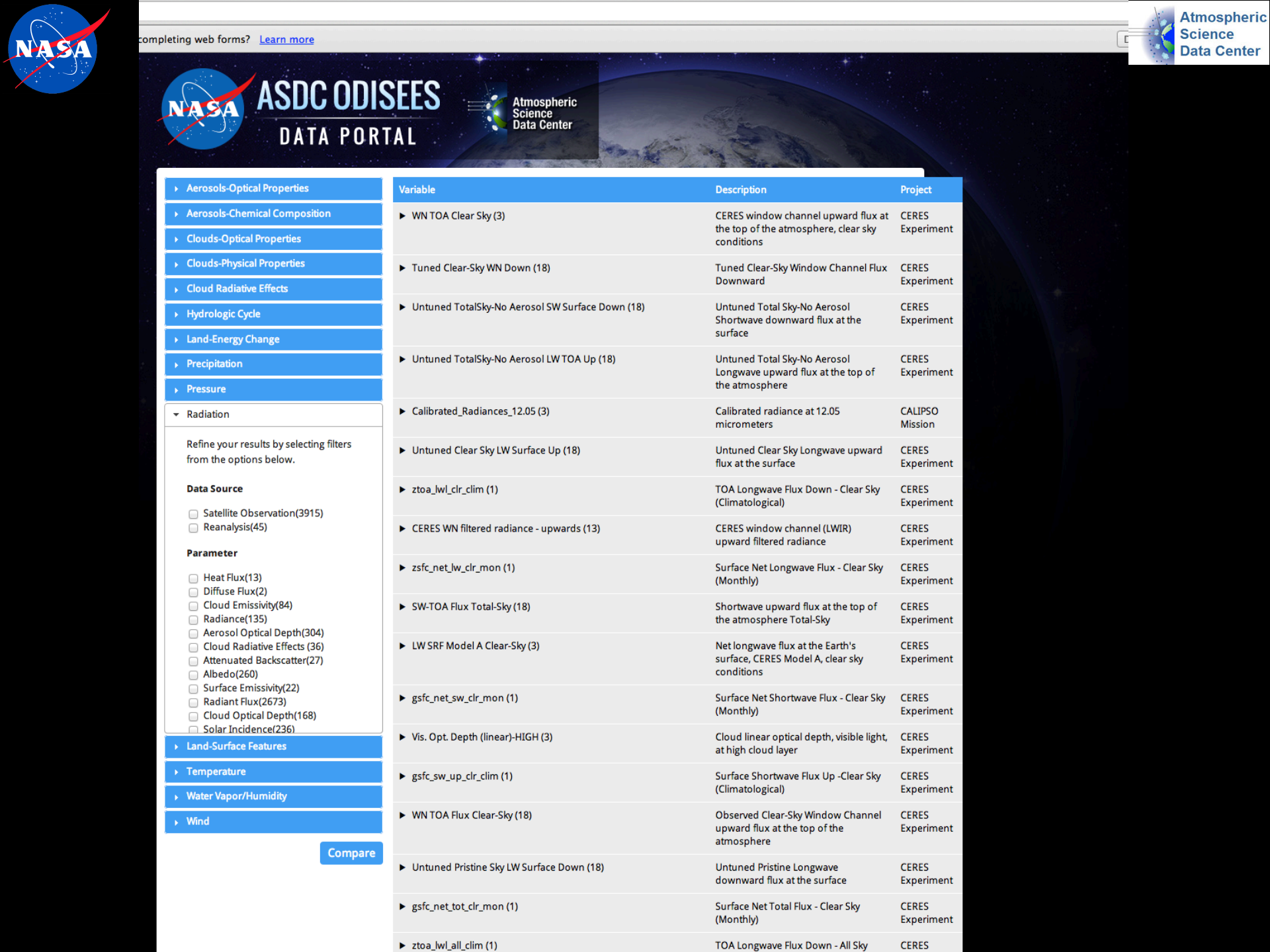
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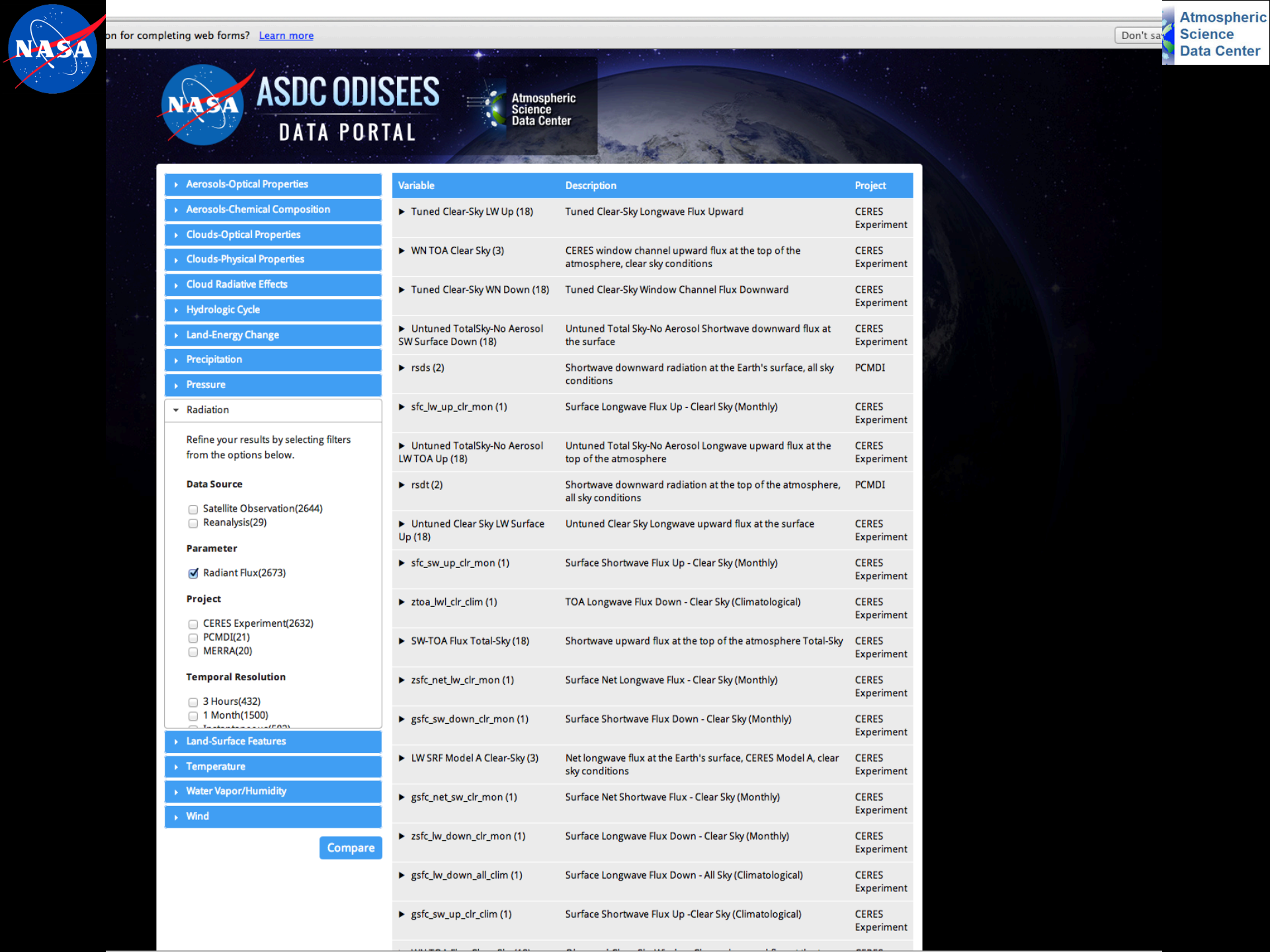
ASDC ODISEES
DATA PORTAL
Atmospheric Science Data Center
Aerosols-Optical Properties
Aerosols-Chemical Composition
Clouds-Optical Properties
Clouds-Physical Properties
Cloud Radiative Effects
Hydrologic Cycle
Land-Energy Change
Precipitation
Pressure
Radiation
Refine your results by selecting filters from the options below.
Data Source
Satellite Observation(3915)
Reanalysis(45)
Parameter
Heat Flux(13)
Diffuse Flux(2)
Cloud Emissivity(84)
Radiance(135)
Aerosol Optical Depth(304)
Cloud Radiative Effects (36)
Attenuated Backscatter(27)
Albedo(260)
Surface Emissivity(22)
Radiant Flux(2673)
Cloud Optical Depth(168)
Solar Incidence(236)
Land-Surface Features
Temperature
Water Vapor/Humidity
Wind
Compare
Variable
Description
Project
WN TOA Clear Sky (3)
CERES window channel upward flux at the top of the atmosphere, clear sky conditions
CERES Experiment
Tuned Clear-Sky WN Down (18)
Tuned Clear-Sky Window Channel Flux Downward
CERES Experiment
Untuned TotalSky-No Aerosol SW Surface Down (18)
Untuned Total Sky-No Aerosol Shortwave downward flux at the surface
CERES Experiment
Untuned TotalSky-No Aerosol LW TOA Up (18)
Untuned Total Sky-No Aerosol Longwave upward flux at the top of the atmosphere
CERES Experiment
Calibrated_Radiances_12.05 (3)
Calibrated radiance at 12.05 micrometers
CALIPSO Mission
Untuned Clear Sky LW Surface Up (18)
Untuned Clear Sky Longwave upward flux at the surface
CERES Experiment
ztoa_lwl_clr_clim (1)
TOA Longwave Flux Down - Clear Sky (Climatological)
CERES Experiment
CERES WN filtered radiance - upwards (13)
CERES window channel (LWIR) upward filtered radiance
CERES Experiment
zsfc_net_lw_clr_mon (1)
Surface Net Longwave Flux - Clear Sky (Monthly)
CERES Experiment
SW-TOA Flux Total-Sky (18)
Shortwave upward flux at the top of the atmosphere Total-Sky
CERES Experiment
LW SRF Model A Clear-Sky (3)
Net longwave flux at the Earth's surface, CERES Model A, clear sky conditions
CERES Experiment
gsfc_net_sw_clr_mon (1)
Surface Net Shortwave Flux - Clear Sky (Monthly)
CERES Experiment
Vis. Opt. Depth (linear)-HIGH (3)
Cloud linear optical depth, visible light, at high cloud layer
CERES Experiment
gsfc_sw_up_clr_clim (1)
Surface Shortwave Flux Up -Clear Sky (Climatological)
CERES Experiment
WN TOA Flux Clear-Sky (18)
Observed Clear-Sky Window Channel upward flux at the top of the atmosphere
CERES Experiment
Untuned Pristine Sky LW Surface Down (18)
Untuned Pristine Longwave downward flux at the surface
CERES Experiment
gsfc_net_tot_clr_mon (1)
Surface Net Total Flux - Clear Sky (Monthly)
CERES Experiment
ztoa_lwl_all_clim (1)
TOA Longwave Flux Down - All Sky
CERES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Don't sa
Atmospheric Science Data Center
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DATA PORTAL
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Aerosols-Optical Properties
Aerosols-Chemical Composition
Clouds-Optical Properties
Clouds-Physical Properties
Cloud Radiative Effects
Hydrologic Cycle
Land-Energy Change
Precipitation
Pressure
Radiation
Refine your results by selecting filters from the options below.
Data Source
Satellite Observation(2644)
Reanalysis(29)
Parameter
Radiant Flux(2673)
Project
CERES Experiment(2632)
PCMDI(21)
MERRA(20)
Temporal Resolution
3 Hours(432)
1 Month(1500)
Land-Surface Features
Temperature
Water Vapor/Humidity
Wind
Compare
Variable
Description
Project
Tuned Clear-Sky LW Up (18)
Tuned Clear-Sky Longwave Flux Upward
CERES Experiment
WN TOA Clear Sky (3)
CERES window channel upward flux at the top of the atmosphere, clear sky conditions
CERES Experiment
Tuned Clear-Sky WN Down (18)
Tuned Clear-Sky Window Channel Flux Downward
CERES Experiment
Untuned TotalSky-No Aerosol SW Surface Down (18)
Untuned Total Sky-No Aerosol Shortwave downward flux at the surface
CERES Experiment
rsds (2)
Shortwave downward radiation at the Earth's surface, all sky conditions
PCMDI
sfc_lw_up_clr_mon (1)
Surface Longwave Flux Up - Clearl Sky (Monthly)
CERES Experiment
Untuned TotalSky-No Aerosol LW TOA Up (18)
Untuned Total Sky-No Aerosol Longwave upward flux at the top of the atmosphere
CERES Experiment
rsdt (2)
Shortwave downward radiation at the top of the atmosphere, all sky conditions
PCMDI
Untuned Clear Sky LW Surface Up (18)
Untuned Clear Sky Longwave upward flux at the surface
CERES Experiment
sfc_sw_up_clr_mon (1)
Surface Shortwave Flux Up - Clear Sky (Monthly)
CERES Experiment
ztoa_lwl_clr_clim (1)
TOA Longwave Flux Down - Clear Sky (Climatological)
CERES Experiment
SW-TOA Flux Total-Sky (18)
Shortwave upward flux at the top of the atmosphere Total-Sky
CERES Experiment
zsfc_net_lw_clr_mon (1)
Surface Net Longwave Flux - Clear Sky (Monthly)
CERES Experiment
gsfc_sw_down_clr_mon (1)
Surface Shortwave Flux Down - Clear Sky (Monthly)
CERES Experiment
LW SRF Model A Clear-Sky (3)
Net longwave flux at the Earth's surface, CERES Model A, clear sky conditions
CERES Experiment
gsfc_net_sw_clr_mon (1)
Surface Net Shortwave Flux - Clear Sky (Monthly)
CERES Experiment
zsfc_lw_down_clr_mon (1)
Surface Longwave Flux Down - Clear Sky (Monthly)
CERES Experiment
gsfc_lw_down_all_clim (1)
Surface Longwave Flux Down - All Sky (Climatological)
CERES Experiment
gsfc_sw_up_clr_clim (1)
Surface Shortwave Flux Up -Clear Sky (Climatological)
CERES Experiment

for completing web forms? Learn more

- Aerosols-Optical Properties
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- Cloud Radiative Effects
- Hydrologic Cycle
- Land-Energy Change
- Precipitation
- Pressure
- Radiation

Parameter

- [x] Radiant Flux(1500)

Project

- [ ] CERES Experiment(1465)
- [ ] PCMDI(21)
- [ ] MERRA(14)

Temporal Resolution

- [x] 1 Month(1500)

Cloud Conditions

- [ ] Total-sky No Aerosols(216)
- [ ] Total-sky (537)
- [ ] Clear Sky-No Aerosols(1)
- [ ] Pristine Sky (216)
- [ ] Clear Sky (529)

Direction

- Land-Surface Features
- Temperature
- Water Vapor/Humidity
- Wind

Compare

Variable	Description	Project
▶ Tuned Clear-Sky LW Up (12)	Tuned Clear-Sky Longwave Flux Upward	CERES Experiment
▶ sfc_lw_up_all_mon (1)	Surface Longwave Flux Up - All Sky (Monthly)	CERES Experiment
▶ rldscs (2)	Surface Downwelling Clear-Sky Longwave Radiation	PCMDI
▶ Tuned Clear-Sky WN Down (12)	Tuned Clear-Sky Window Channel Flux Downward	CERES Experiment
▶ Untuned TotalSky-No Aerosol SW Surface Down (12)	Untuned Total Sky-No Aerosol Shortwave downward flux at the surface	CERES Experiment
▶ SWTDN (1)	Shortwave downward flux at the top of the atmosphere	MERRA
▶ rsds (2)	Shortwave downward radiation at the Earth's surface, all sky conditions	PCMDI
▶ sfc_lw_up_clr_mon (1)	Surface Longwave Flux Up - Clearl Sky (Monthly)	CERES Experiment
▶ Untuned TotalSky-No Aerosol LW TOA Up (12)	Untuned Total Sky-No Aerosol Longwave upward flux at the top of the atmosphere	CERES Experiment
▶ rsdt (2)	Shortwave downward radiation at the top of the atmosphere, all sky conditions	PCMDI
▶ sfc_net_sw_all_mon (1)	Surface Net Shortwave Flux - All Sky (Monthly)	CERES Experiment
▶ Untuned TotalSky-No Aerosol WN Surface Up (12)	Untuned Total Sky-No Aerosol Window Channel upward flux at the surface	CERES Experiment
▶ LW TOA Flux Clear-Sky (12)	Longwave upward flux at the top of the atmosphere Clear-Sky	CERES Experiment
▶ Untuned Clear Sky LW Surface Up (12)	Untuned Clear Sky Longwave upward flux at the surface	CERES Experiment
▶ zsfc_lw_down_all_mon (1)	Surface Longwave Flux Down - All Sky (Monthly)	CERES Experiment
▶ Untuned TotalSky WN TOA Up (12)	Untuned Total-Sky Window Channel upward flux at the top of the atmosphere	CERES Experiment
▶ ztoa_lwl_clr_mon (1)	TOA Longwave Flux Down - Clear Sky (Monthly)	CERES Experiment
▶ sfc_sw_up_clr_mon (1)	Surface Shortwave Flux Up - Clear Sky (Monthly)	CERES Experiment
▶ ztoa_net_clr_mon (1)	TOA Longwave Flux Up - Clearl Sky (Monthly)	CERES Experiment
▶ Untuned TotalSky LW TOA Up (12)	Untuned Total-Sky Longwave upward flux at the top of the atmosphere	CERES Experiment

Radiation

Parameter

- [x] Radiant Flux(1500)

Project

- [ ] CERES Experiment(1465)
- [ ] PCMDI(21)
- [ ] MERRA(14)

Temporal Resolution

- [x] 1 Month(1500)

Cloud Conditions

- [ ] Total-sky No Aerosols(216)
- [ ] Total-sky (537)
- [ ] Clear Sky-No Aerosols(1)
- [ ] Pristine Sky (216)
- [ ] Clear Sky (529)

Direction

Land-Surface Features

Temperature

Water Vapor/Humidity

Wind

Compare

▼ SWTDN (1)	Shortwave downward flux at the top of the atmosphere	MERRA
This variable can be found in the following datasets. Click on a dataset to see details about the selected variable for that dataset.		
[x] MATMNXRAD order data		
▶ rsds (2)	Shortwave downward radiation at the Earth's surface, all sky conditions	PCMDI
▶ sfc_lw_up_clr_mon (1)	Surface Longwave Flux Up - Clearl Sky (Monthly)	CERES Experiment
▶ Untuned TotalSky-No Aerosol LW TOA Up (12)	Untuned Total Sky-No Aerosol Longwave upward flux at the top of the atmosphere	CERES Experiment
▶ rsdt (2)	Shortwave downward radiation at the top of the atmosphere, all sky conditions	PCMDI
▼ sfc_net_sw_all_mon (1)	Surface Net Shortwave Flux - All Sky (Monthly)	CERES Experiment
This variable can be found in the following datasets. Click on a dataset to see details about the selected variable for that dataset.		
[x] CERES EBAF Surface Edition 2.7 order data		
▶ Untuned TotalSky-No Aerosol WN Surface Up (12)	Untuned Total Sky-No Aerosol Window Channel upward flux at the surface	CERES Experiment
▼ LW TOA Flux Clear-Sky (12)	Longwave upward flux at the top of the atmosphere Clear-Sky	CERES Experiment
This variable can be found in the following datasets. Click on a dataset to see details about the selected variable for that dataset.		
[ ] CER_SYN1deg-Month_Terra-MODIS_Edition3A - Global order data		
[ ] CER_SYN1deg-M3Hour_Terra-Aqua-MODIS_Edition3A-Zonal order data		
[ ] CER_SYN1deg-M3Hour_Terra-Aqua-MODIS_Edition3A-Regional order data		
[x] CER_SYN1deg-M3Hour_Terra-MODIS_Edition3A-Global order data		
[ ] CER_SYN1deg-M3Hour_Terra-Aqua-MODIS_Edition3A-Global order data		
[ ] CER_SYN1deg-Month_Terra-Aqua-MODIS_Edition3A - Global order data		
[ ] CER_SYN1deg-M3Hour_Terra-MODIS_Edition3A-Regional order data		
[ ] CER_SYN1deg-Month_Terra-Aqua-		

odisees.elasticbeanstalk.com/?variable=M3GSYNLWTOAFluxClearSky4

Longwave upward flux at the top of the atmosphere Clear-Sky

Quick Facts	
Data Source	Satellite Observation
Direction	Upward
output frequency	3 Hours
Variable Group	Observed TOA Fluxes CERES Global Data Group
Temporal Resolution	1 Month
Instrument	CERES FM2 CERES FM1
Project	CERES Experiment
Dimensions	Ngmt - 3-hourly time span Ns (Statistic type)
Parameter	Radiant Flux
Spatial Resolution Details (Horizontal)	Earth's Surface (WGS-84 Earth Model)
Method	Monthly Average of 3 Hours of Instantaneous Data
Wavelength Details	5-100 µm (LW)
Vertical Location Details	TOA (30 km above sfc)
Unit of Measure	W/m^2

- [ ] Satellite Observation(1477)
- [ ] Reanalysis(23)

Parameter

- [x] Radiant Flux(1500)

Project

- [ ] CERES Experiment(1465)
- [ ] PCMDI(21)
- [ ] MERRA(14)

Temporal Resolution

- [x] 1 Month(1500)

Cloud Conditions

- ▸ Land-Surface Features
- ▸ Temperature
- ▸ Water Vapor/Humidity
- ▸ Wind

Compare

- [ ] MATMNXRAD order data

▸ rsds (2)	Shortwave downward radiation at the Earth's surface, all sky conditions	PCMDI
▼ sfc_lw_up_clr_mon (1)	Surface Longwave Flux Up - Clearl Sky (Monthly)	CERES Experiment

This variable can be found in the following datasets. Click on a dataset to see details about the selected variable for that dataset.

- [x] CERES EBAF Surface Edition 2.7 order data

▼ Untuned TotalSky-No Aerosol LW TOA Up (12)	Untuned Total Sky-No Aerosol Longwave upward flux at the top of the atmosphere	CERES Experiment

This variable can be found in the following datasets. Click on a dataset to see details about the selected variable for that dataset.

- [x] CER_SYN1deg-Month_Terra-Aqua-MODIS_Edition3A - Regional order data
- [x] CER_SYN1deg-Month_Terra-MODIS_Edition3A - Regional order data
- [ ] CER_SYN1deg-M3Hour_Terra-Aqua-MODIS_Edition3A-Zonal order data
- [ ] CER_SYN1deg-M3Hour_Terra-MODIS_Edition3A-Global order data
- [ ] CER_SYN1deg-M3Hour_Terra-MODIS_Edition3A-

- [ ] Satellite Observation(1477)
- [ ] Reanalysis(23)

Parameter

- [x] Radiant Flux(1500)

Project

- [ ] CERES Experiment(1465)
- [ ] PCMDI(21)
- [ ] MERRA(14)

Temporal Resolution

- [x] 1 Month(1500)

Cloud Conditions

- ▸ Land-Surface Features
- ▸ Temperature
- ▸ Water Vapor/Humidity
- ▸ Wind

Compare

- [ ] MATMNXRAD order data

▸ rsds (2)	Shortwave downward radiation at the Earth's surface, all sky conditions	PCMDI
▼ sfc_lw_up_clr_mon (1)	Surface Longwave Flux Up - Clearl Sky (Monthly)	CERES Experiment

This variable can be found in the following datasets. Click on a dataset to see details about the selected variable for that dataset.

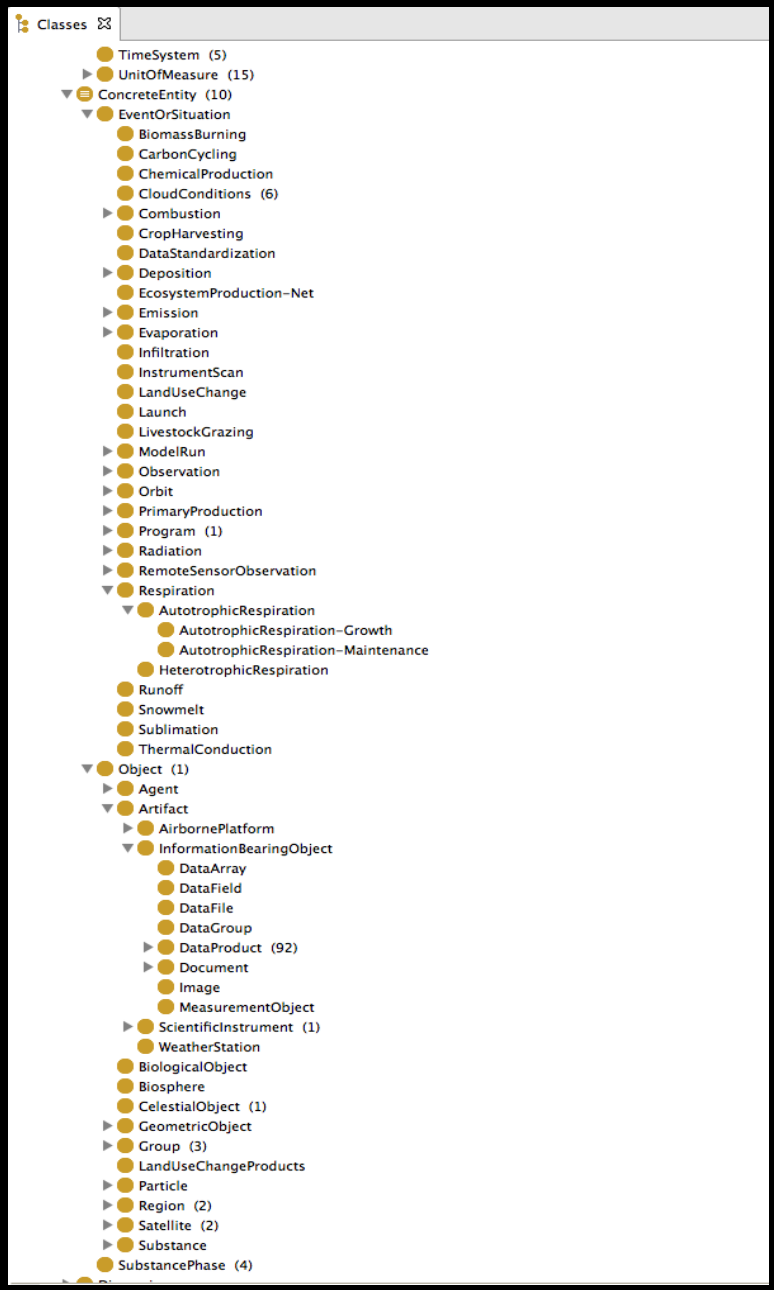
- [x] CERES EBAF Surface Edition 2.7 order data

▼ Untuned TotalSky-No Aerosol LW TOA Up (12)	Untuned Total Sky-No Aerosol Longwave upward flux at the top of the atmosphere	CERES Experiment

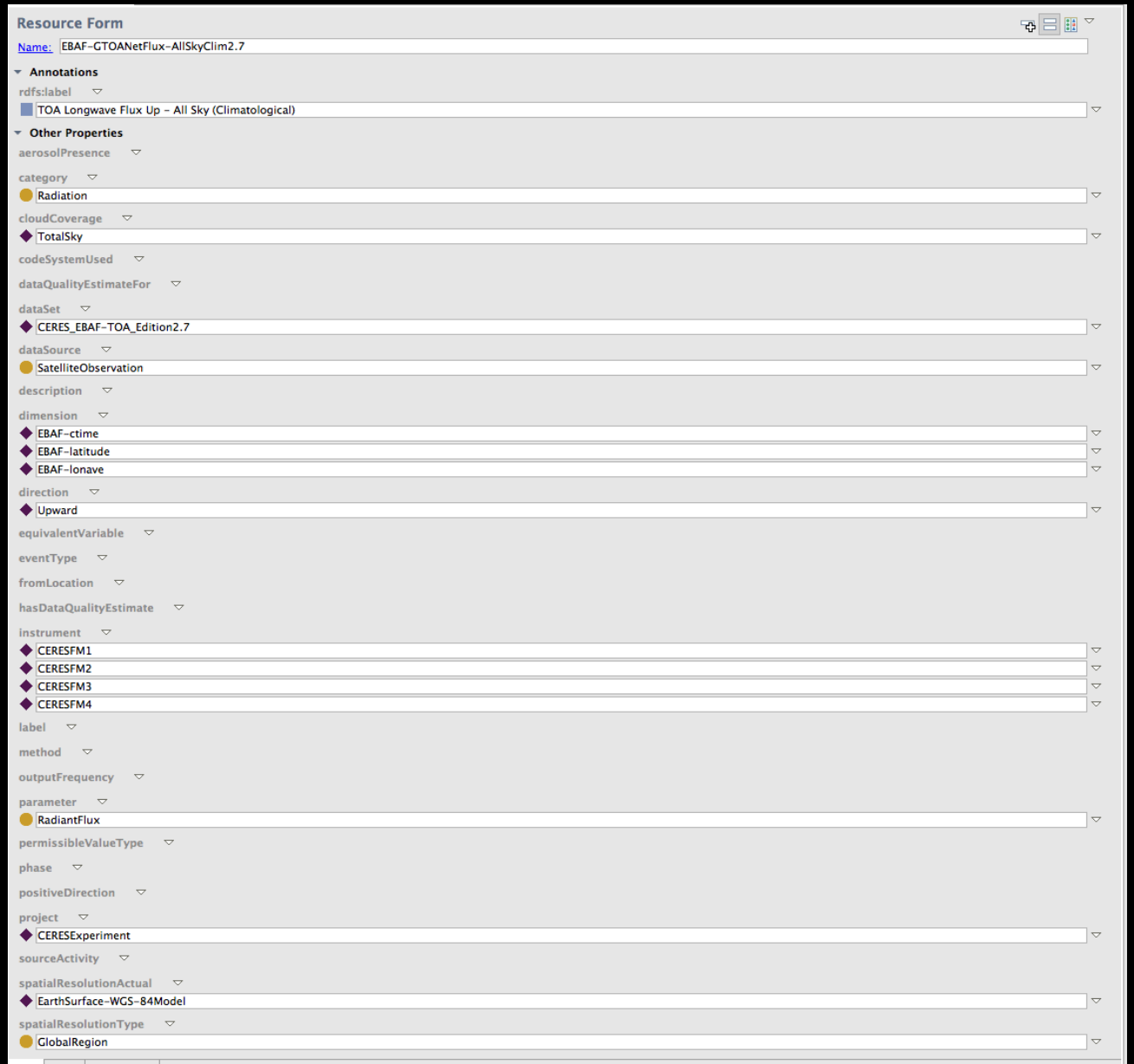
This variable can be found in the following datasets. Click on a dataset to see details about the selected variable for that dataset.

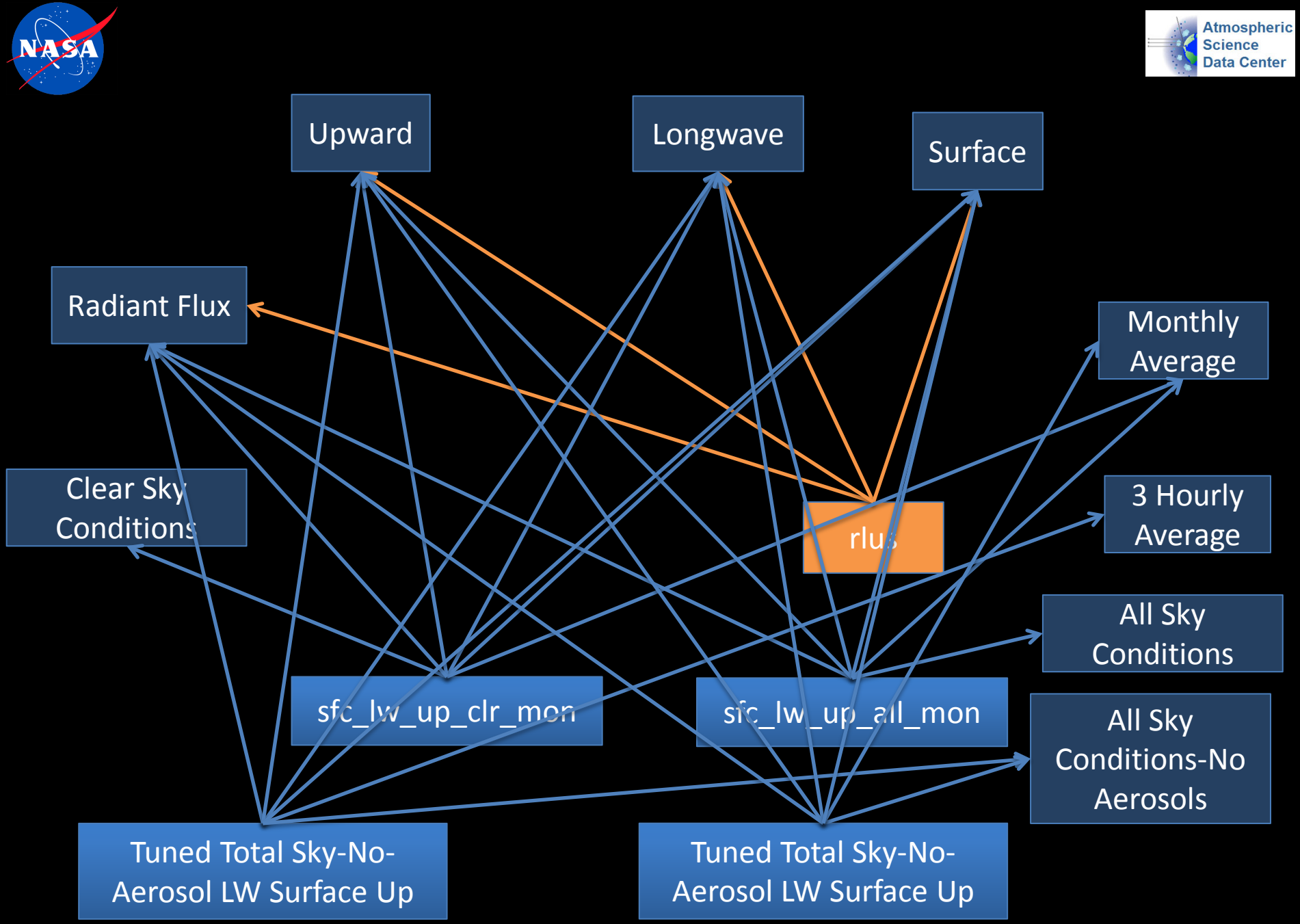
- [x] CER_SYN1deg-Month_Terra-Aqua-MODIS_Edition3A - Regional order data
- [x] CER_SYN1deg-Month_Terra-MODIS_Edition3A - Regional order data
- [ ] CER_SYN1deg-M3Hour_Terra-Aqua-MODIS_Edition3A-Zonal order data
- [ ] CER_SYN1deg-M3Hour_Terra-MODIS_Edition3A-Global order data
- [ ] CER_SYN1deg-M3Hour_Terra-MODIS_Edition3A-

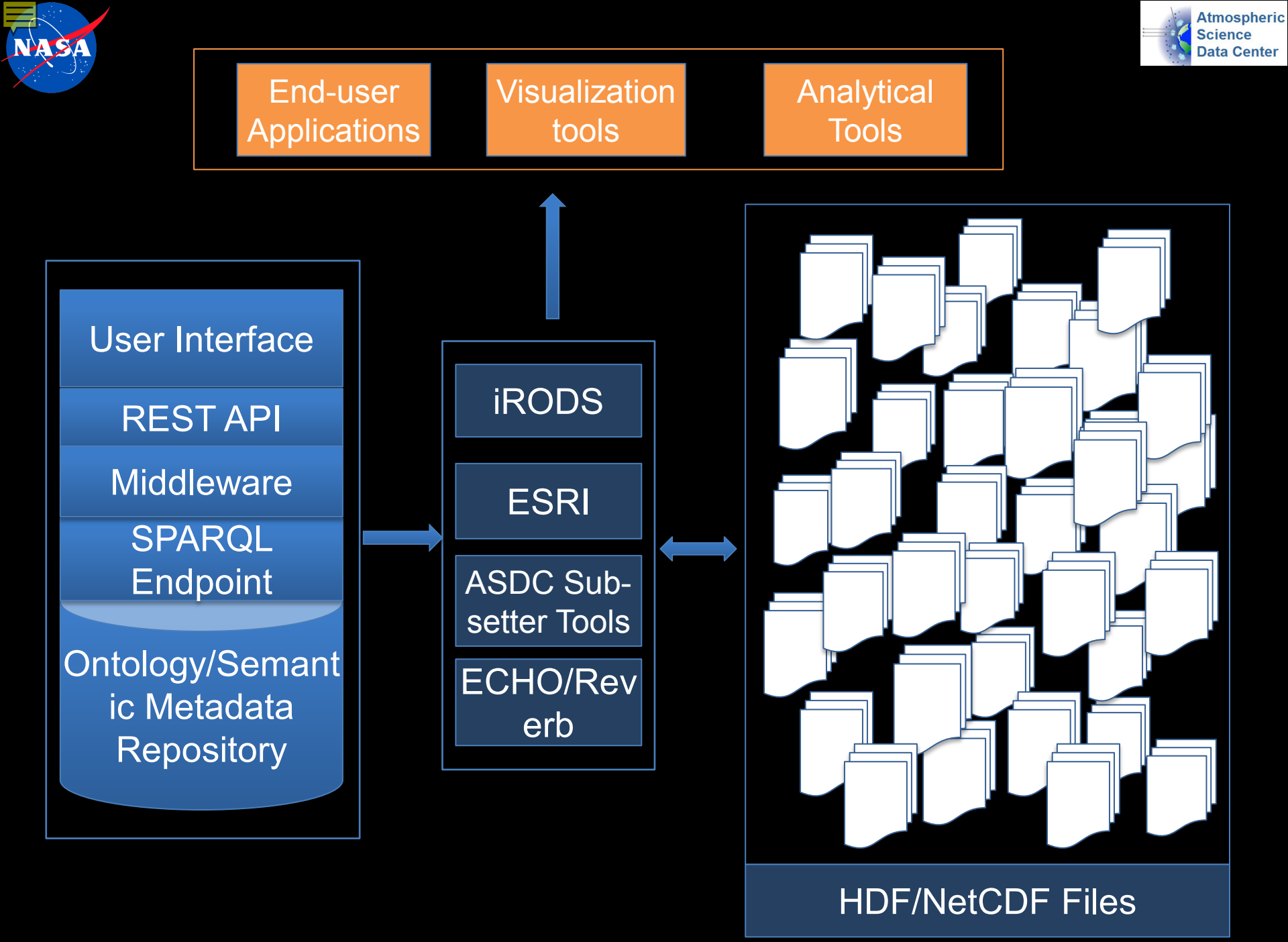
- The ODISEES search tool is supported by an Earth Science domain ontology that represents Earth Science domain objects (e.g., Satellites, Remote Sensing Instruments, Climate Models, Data Sets, Data Variables) and phenomena(e.g., Radiance, Flux, Aerosol Optical Depth, Temperature).



Data variables are the search subject in ODISEES. A variable is treated as a set of specifications that uniquely describe it with enough detail to differentiate it from similar variables.




Upward
Longwave
Surface
Radiant Flux
Monthly Average
Clear Sky Conditions
rlus
3 Hourly Average
All Sky Conditions
sfc_lw_up_clr_mon
sfc_lw_up_all_mon
All Sky Conditions-No Aerosols
Tuned Total Sky-No-Aerosol LW Surface Up
Tuned Total Sky-No-Aerosol LW Surface Up


End-user Applications
Visualization tools
Analytical Tools
User Interface
REST API
Middleware
SPARQL Endpoint
Ontology/Semantic Metadata Repository
iRODS
ESRI
ASDC Sub-setter Tools
ECHO/Reverb
HDF/NetCDF Files

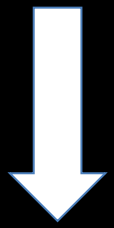
The search tool executes a sequence of SPARQL queries in response to user selections, adding a clause with each selection:

```
SELECT ?x
WHERE {
   ?x :category <user selection>
}
```

```
SELECT ?x
WHERE {
   ?x :category :Radiation .
  }
```

The first query retrieves all of the data elements in the category selected by the user. The user selection is simply substituted in for the object slot variable.

```
SELECT ?x
WHERE {
   ?x :category :Radiation .
   ?x <property> <user selection>
}
```



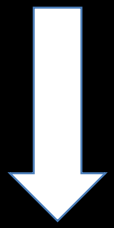
```
SELECT ?x
WHERE {
   ?x :category :Radiation .
   ?x :spectralRange :ShortwaveRadiation
}
```

Each time the user makes a filter selection, an additional clause of the form

?x <property> <value>

is added to the query, where the property/value pair reflects the user's latest selection.

```
SELECT ?x
WHERE {
   ?x :category :Radiation .
   ?x <property> <user selection>
}
```



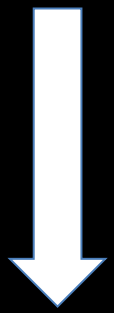
```
SELECT ?x
WHERE {
   ?x :category :Radiation .
   ?x :spectralRange :ShortwaveRadiation
   ?x :temporalResolution :OneMonth
}
```

Each time the user makes a filter selection, an additional clause of the form

?x <property> <value>

is added to the query, where the property/value pair reflects the user's latest selection.

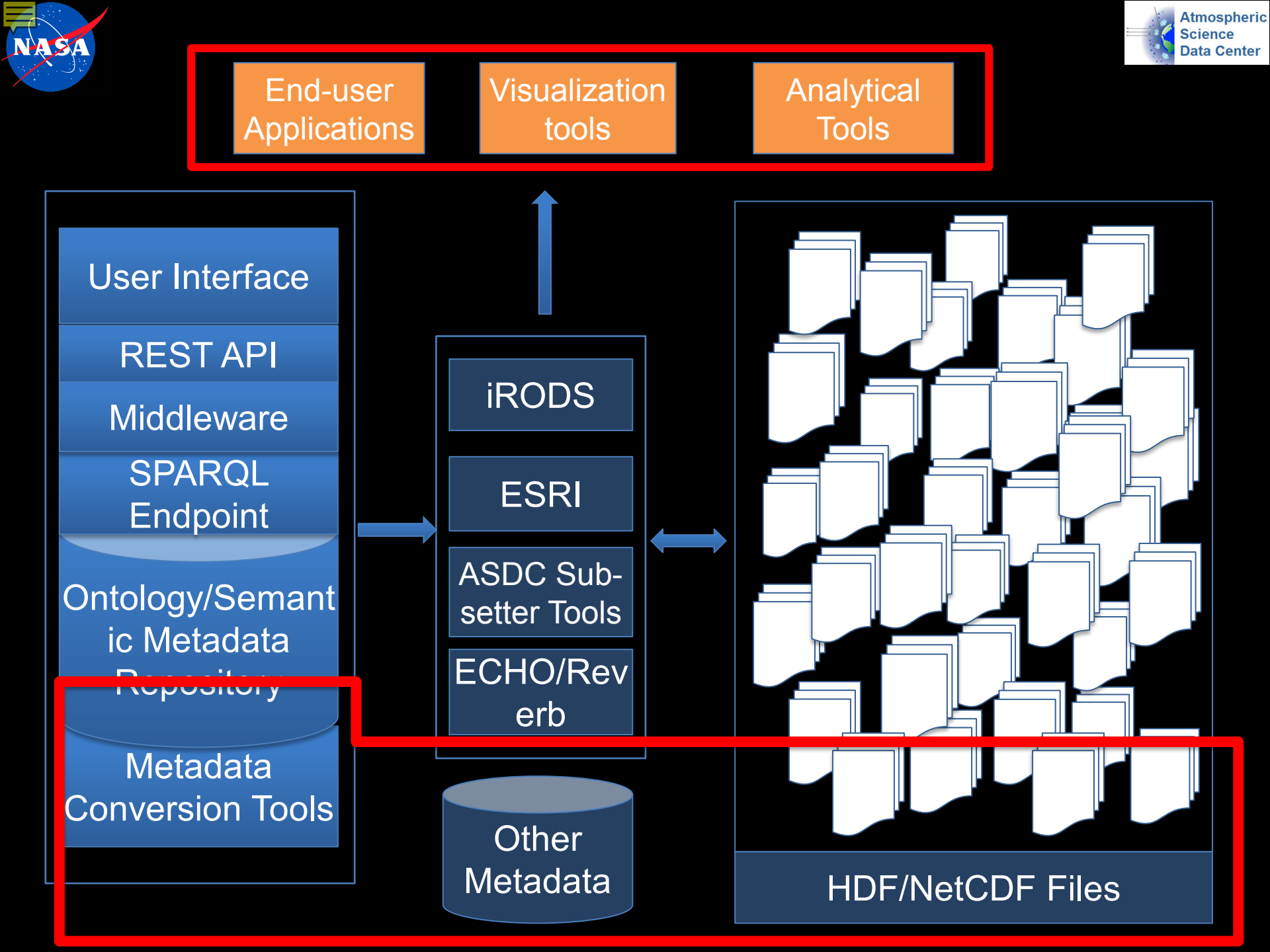

```
SELECT  ?rel ?value
WHERE {
   <selected variable> ?rel ?value .
 }
```

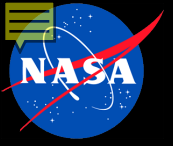


```
SELECT ?rel ?value
WHERE {
   :sfc_lw_up_clr_mon ?rel ?value .
}
```

If the user selects a variable, a list of datasets that the variable occurs in will appear. The use can click on a dataset to see a set of facts about the variable as it occurs in the selected data set. The search tool generate a query that just asks for the relationship/value pairs for the selected variable.

FUTURE WORK


End-user Applications
Visualization tools
Analytical Tools
User Interface
REST API
Middleware
SPARQL Endpoint
Ontology/Semantic Metadata Repository
Metadata Conversion Tools
iRODS
ESRI
ASDC Sub-setter Tools
ECHO/Reverb
Other Metadata
HDF/NetCDF Files
Atmospheric Science Data Center

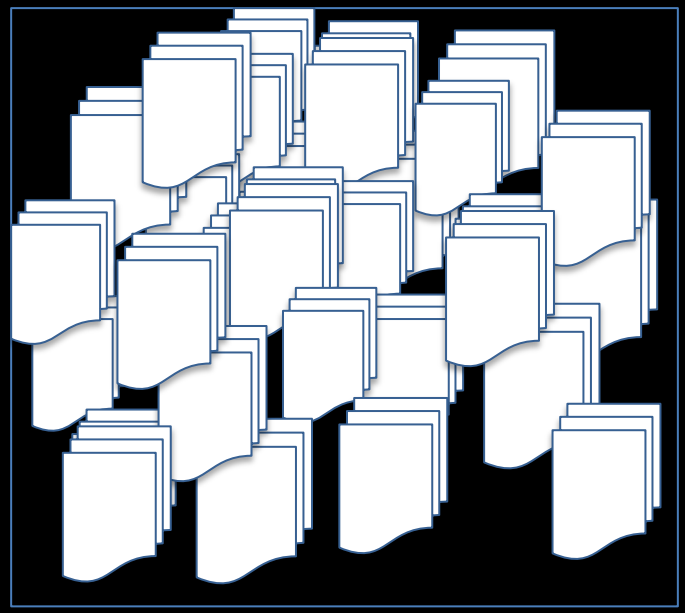


<CERES SW Filtered Radiance> <location> <AtmosphereAt30KM>
<CERES TOT Filtered Radiance> <location> <AtmosphereAt30KM>
<CERES WN Filtered Radiance> <location> <AtmosphereAt30KM>
<CERES SW unfiltered radiance> <location> <AtmosphereAt30KM

(→
(x is a radiance measurement)
x is made with a CERES instrument))
(the location of x is 30 KM above the Earth's surface))

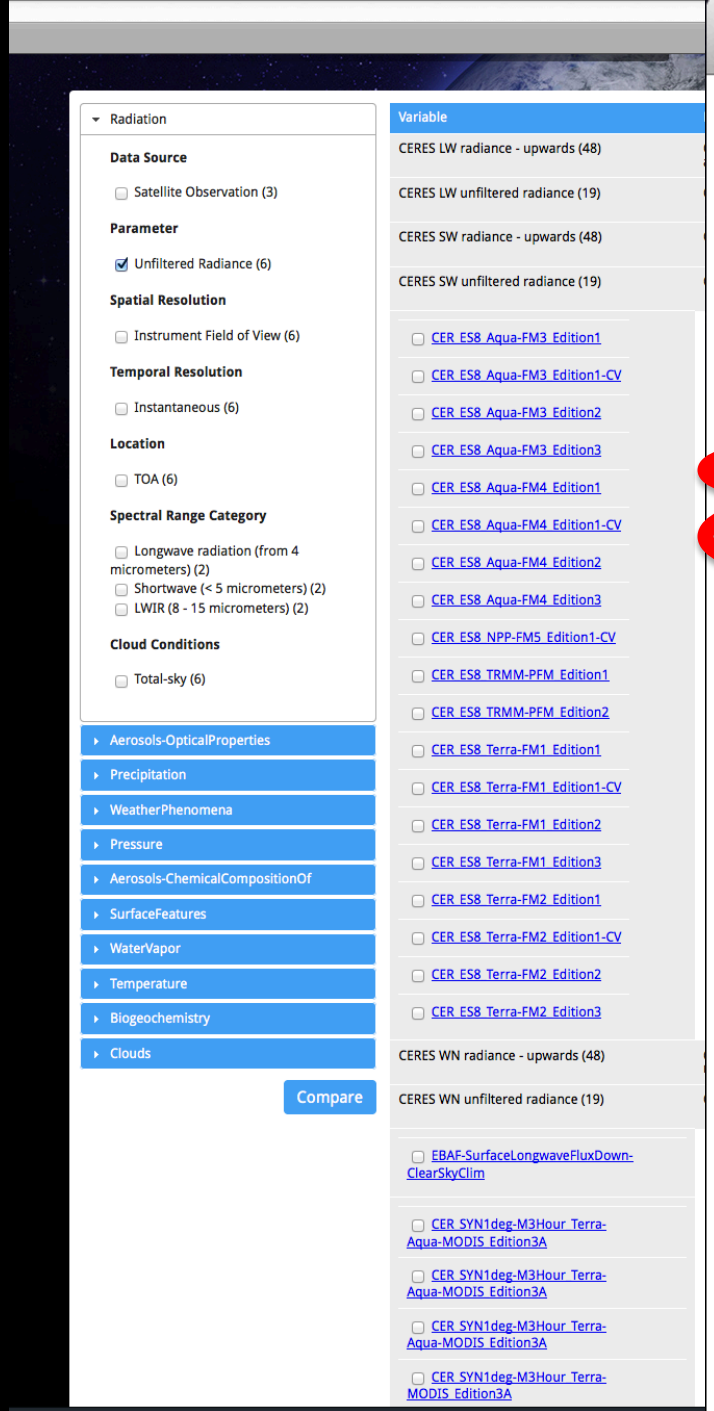
Ontology/Semantic Metadata Repository

Data set names
Temporal extent
Instruments
Parameter names



HDF/NETCDF Metadata

Other Metadata



CERES SW unfiltered radiance Info

nasa-sandbox.elasticbeanstalk.com

CERES SW unfiltered radiance

Quick Facts:

Method: Sample

Dimensions: Dimension - Record Number, Sample Number

Spectral Range: .3 - 5 micrometers (SW)

Instrument: CERESFM4

Parameter: Unfiltered Radiance

Location: TOA

Location: TOA (30 km above sfc)

Data Set: CER_ES8_Aqua-FM4_Edition3

Project: CERES Experiment

Cloud Conditions: Total-sky

comment: Shortwave upward unfiltered radiance at the top of the atmosphere

Direction: Upward

Products:

CER_ES8_Aqua-FM4_Edition3

THANK YOU

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