End-to-End Solution for Data Customization with NASA's Earthdata Search

2018 AGU Fall Meeting

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The Challenge

- "there is very little consistency of the tools available to perform subsetting, and there is very little consistency with services across the DAACs."[1]

[1]CMR End-to-End Services Study, 2016

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The Challenge

- September of 2016, of over 90 interview subjects, a prevailing issue was that regardless of their experience level, they all had difficulty in finding the right data set and preparing the data to get it in the desired format.

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*"Perfection is achieved, not when there is nothing left to add, but when there is nothing left to take away." – **A. de Saint-Exupery***

THE VISION

The Vision

- User is required to provide a minimum of input for service invocation.

- Optimization for the majority of the user population, not the totality.

- Use the user's jargon, i.e. options not services; files not granules.

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*"No one can whistle a symphony. It takes a whole orchestra to play it." – **H.E. Luccock***
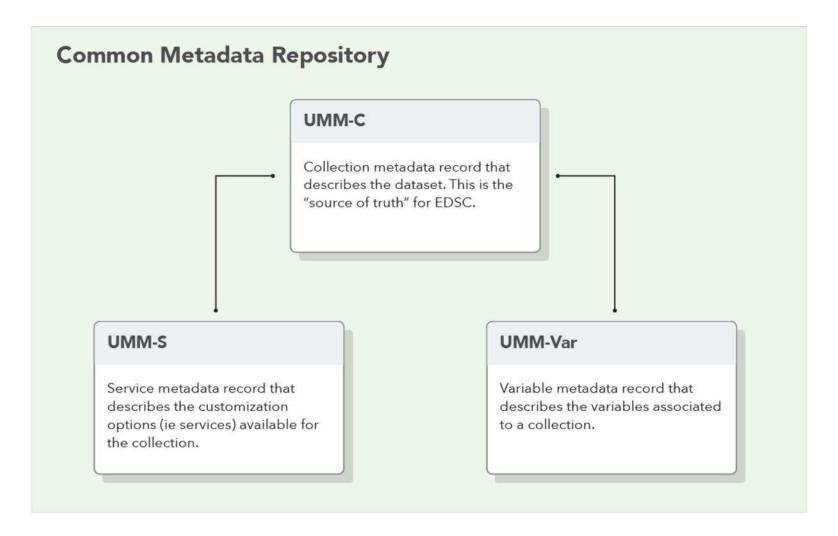
THE PIECES

The Pieces

- "If you wait until the last minute to complete the user interface, it only takes a minute." -Anonymous

The Pieces

- User Experience Driven Design (UXDD)
  - Start with the end in mind
  - Consider users over architecture and current capabilities
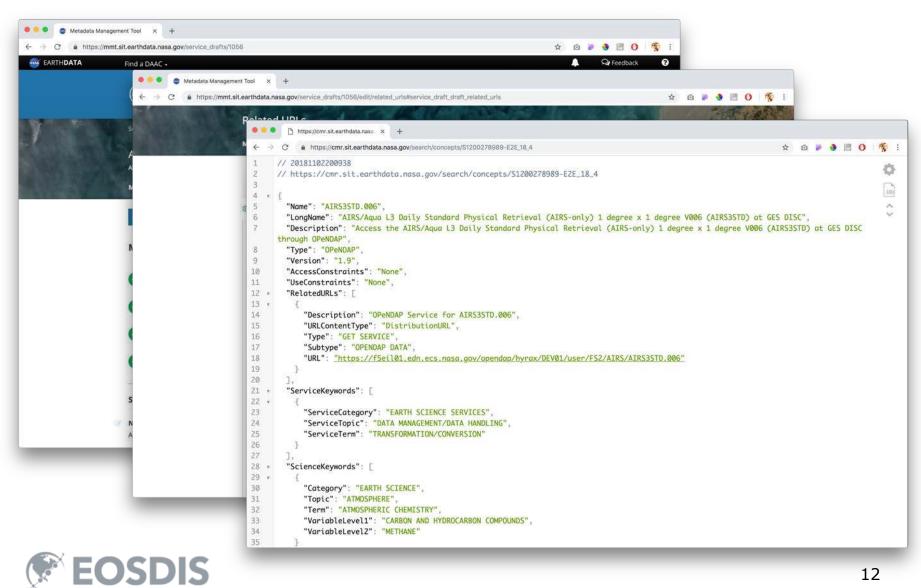 - Favor simplicity above all

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The Pieces

Common Metadata Repository

UMM-C

Collection metadata record that describes the dataset. This is the "source of truth" for EDSC.

UMM-S

Service metadata record that describes the customization options (ie services) available for the collection.

UMM-Var

Variable metadata record that describes the variables associated to a collection.

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The Pieces

- ## UMM-Var

  – Answers the question "What measurement and variables are available within this collection?"

  – Can be auto-generated!

The Pieces

- UMM-S

  – Answers the question "What can I do with this collection?"

    - What formats can I output this data to?

    - Can I reproject this data?

    - Does this collection support spatial subsetting?

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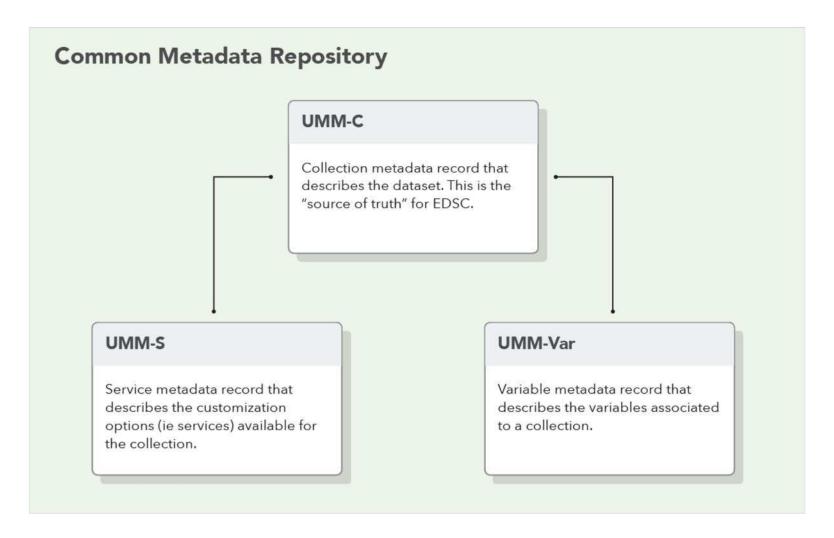# The Pieces

The Pieces

- CMR Magic

```json
{
  "boxes": [
    "-90 -180 90 180"
  ],
  "time_start": "2002-08-30T00:00:00.000Z",
  "version_id": "006",
  "updated": "2014-12-18T00:00:00.000Z",
  "dataset_id": "Aqua AIRS Level 3 Daily Standard Physical Retrieval (AIRS+AMSU) V006 (AIRX3STD) at GES DISC",
  "has_spatial_subsetting": true,
  "has_transforms": true,
  "associations": {
    "variables": [
      "V1200265916-EDF_OPS",
      "V1200266510-EDF_OPS",
      "V1200266548-EDF_OPS"
    ],
    "services": [
      "S1200245793-EDF_OPS"
    ]
  },
  "has_variables": true,
  "data_center": "EDF_OPS",
  "short_name": "AIRX3STD"
}
```

The Pieces

- ## CMR Magic

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}
```
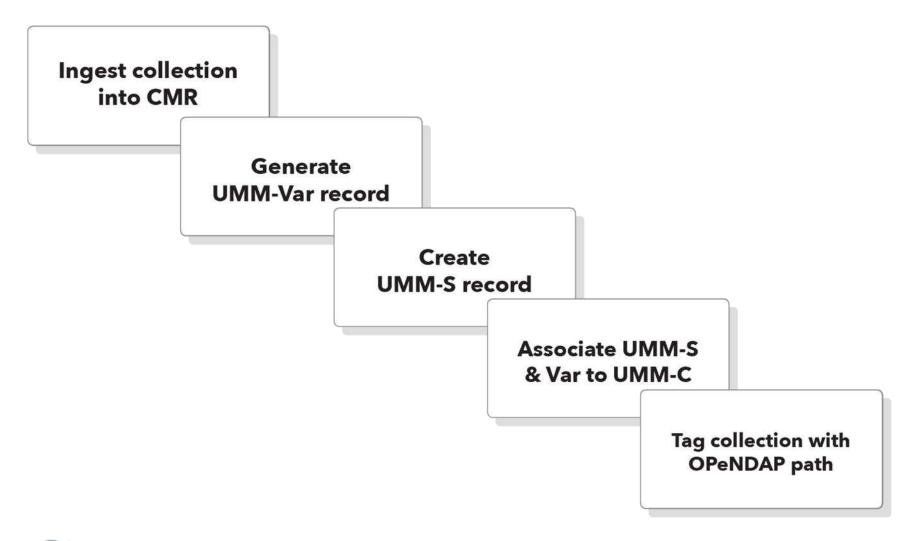
The Pieces

- CMR Magic

```
1   {
2     "boxes": [
3       "-90 -180 90 180"
4     ],
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6     "version_id": "006",
7     "updated": "2014-12-18T00:00:00.000Z",
8     "dataset_id": "Aqua AIRS Level 3 Daily Standard Physical Retrieval (AIRS+AMSU) V006 (AIRX3STD) at GES DISC",
9     "has_spatial_subsetting": true,
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11    "associations": {
12      "variables": [
13        "V1200265916-EDF_OPS",
14        "V1200266510-EDF_OPS",
15        "V1200266548-EDF_OPS"
16      ],
17      "services": [
18        "S1200245793-EDF_OPS"
19      ]
20    },
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23    "short_name": "AIRX3STD"
24  }
```

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*"Data is a precious thing and will last longer than the systems themselves." – **Tim Berners-Lee***

THE PROVIDER WORKFLOW

The Provider Workflow

Ingest collection into CMR

Generate UMM-Var record

Create UMM-S record

Associate UMM-S & Var to UMM-C

Tag collection with OPeNDAP path

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*"And I knew exactly what to do. But in a much more real sense, I had no idea what to do." - **Michael Scott**
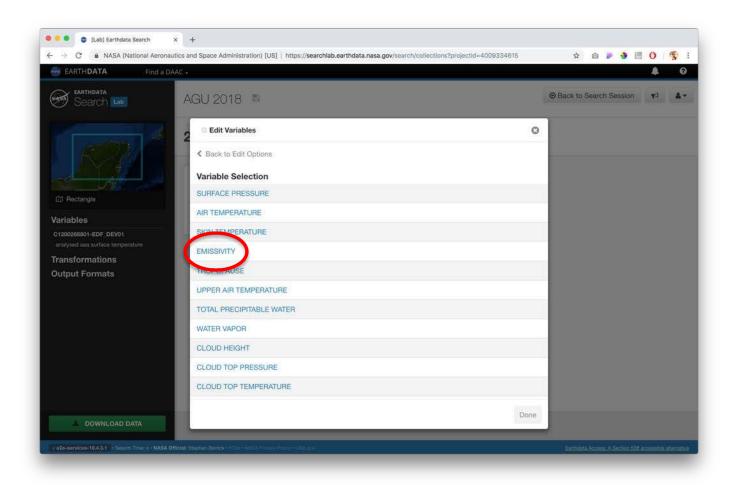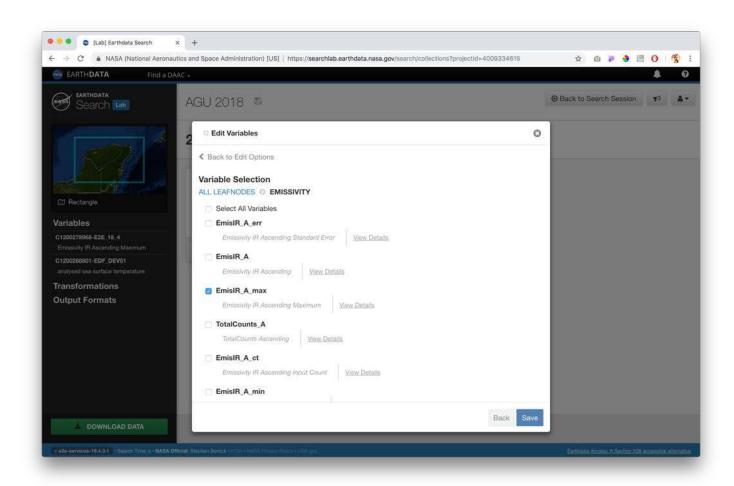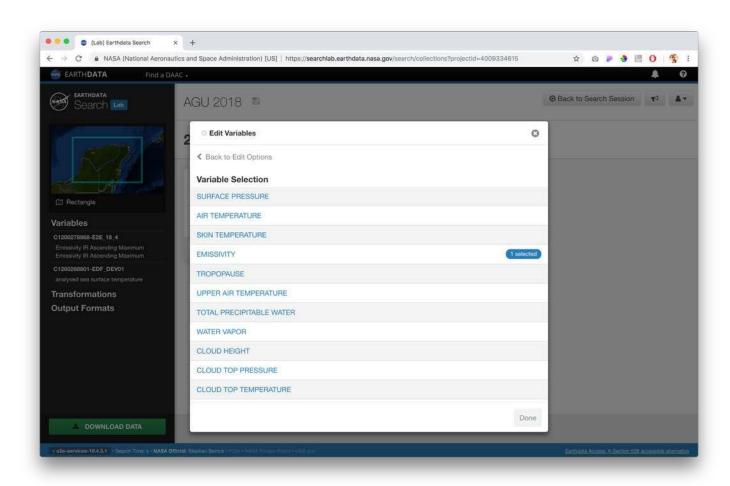
THE USER WORKFLOW

Search and Add to Project

Customize Output

Customize Output

Customize Output

Customize Output

EOSDIS

Customize Output

Confirm Output

Download Data

Download Data

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Science!

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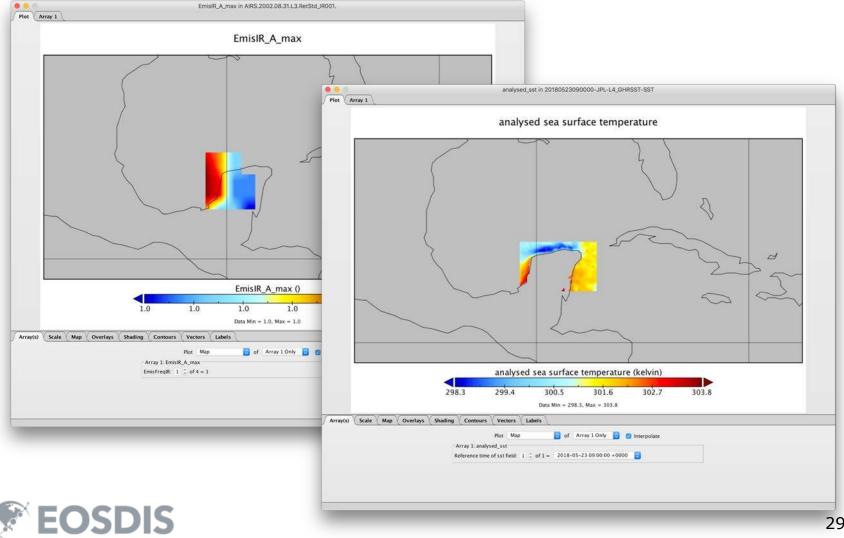# This work was supported by NASA/GSFC under Raytheon Co. contract number NNG15HZ39C.

in partnership with

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