

Open-Source Principles Utilized by the CERES Edition 5 Level-3 Framework

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Clouds and the Earth's
Radiant Energy System

CERES Edition 5 data products are currently under development. Edition 5 products include both scientific improvements and behind-the-scenes enhancements for code maintainability.

Modularity improvements include:

- Migrating Fortran-90 codebase to Object Oriented languages:
 - Fortran 2018
 - C++17
- Implementing single purpose algorithms and functions
 - increasing reusability
- Increasing the usage of unit testing
 - using doctest for C++
- Migrating aspects of product definition to JSON configuration files

CERES Level 3 working group leads' goals for the Edition 5 framework maintainability improvements:

Greater
Modularity

Configurable

Rapid
Analysis

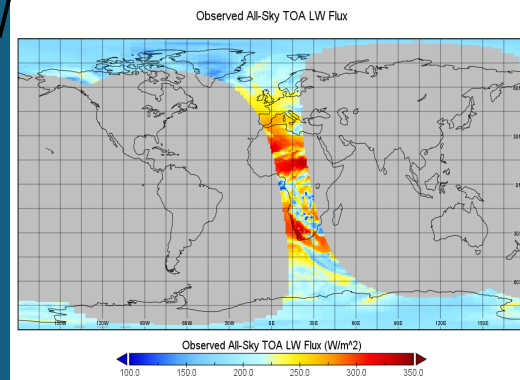
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```

JSON-based Configuration

- Reduces the need for hard-coded elements
- Configuration parameters includes:
 - valid ranges for datasets
 - variable weight/scaling factors
 - gridding layout
 - attributes for data variables
 - algorithm selection (binning, etc.)

Easier and faster to configure experimental test runs. More rapid feedback to science team.

Edition 5 Framework Proof of Concept:
CRS1deg-Hour (Edition 4A)
Product released to public: March 28, 2024



The Edition 4A CERES Cloud Radiative Swath (CRS) 1deg-Hour data product generator used as a proof-of-concept for the Edition 5 Level 3 framework.

Framework showed positive results aiding in maintainability and reusability for use in future Edition 5 data products generators.