CERES Meeting (Tuesday)

Review Status of CERES Instruments and Data Products:
- Terra & Aqua Status & Plans for Edition 5
- SNPP Status and Plans for Edition 2
- Earth Venture Continuity-1 (EVC-1) Update
- CERES Terra, Aqua, S-NPP, NOAA-20 Instrument Calibration Update
- MODIS & VIIRS Cloud Algorithm & Validation Status
- ADM, SOFA, SARB and TISA Working Group Reports
- FLASHFLUX Update
- Data Management Team Update
Currently, 6 CERES instruments fly on 4 satellites: Terra (L1999), Aqua (L2002), SNPP (L2011), NOAA-20 (L2017)
RMS differences between Terra, Aqua and SNPP monthly anomalies for common period are: < 0.2 Wm\(^{-2}\) for SW and LW, and < 0.25 Wm\(^{-2}\) for net TOA flux.
CERES Journal Publications and Citation Counts
(For Papers Between 1993-2019; Updated October 14, 2019)

- Total number of peer-reviewed journal articles: 1,809
- Total number of citations to CERES papers: 66,991

(Compiled by Anne Wilber & Dave Kratz)
### Number of Unique Users by CERES Data Product
(through September 30, 2019)

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- 67,410 unique Applied Science users ordered CERES data products via the POWER Web Portal
### CERES Terra and Aqua Data Product Availability

<table>
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<tr>
<th>Data Product</th>
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Planning for Terra & Aqua Edition 5

Main Considerations:

1) GMAO improvements to their atmospheric reanalysis system.
   - CERES and GMAO hold WebEx meetings every 3 weeks to gauge progress and provide ongoing validation results for the latest GEOS FP or FPIT version.

2) MODIS Collection 7 schedule.

3) Changes to Terra and Aqua MLT.
   - MLT starts to drift in 2021 (Terra) and 2022 (Aqua)
   - Ideally, this would be a good time to transition CDR from Aqua to NOAA-20 or S-NPP.

4) CERES production code improvements.

5) CERES algorithm improvements (particularly those enabling a seamless transition across satellite platforms).
Presented at ESC/A-Train MOWG Meeting on 12/6/2017

Aqua Predicted MLT
with A-Train exit in March 2022

Mission Requirement: 13:30:00 ± 15 min

No Changes from December 2017 MOWG Meeting

Start of Constellation exit and perigee-lowering maneuvers: March 2022

Science Collection and Constellation Coordination: 13:35:45 ± 45 sec (13.583 – 13.608)

9/6/2018

Aqua Science Team Teleconference
Terra and Aqua Mission Budgets

- The in-guide budgets for Terra, Aqua and Aura provided by NASA HQ this year are significantly lower in FY23 and beyond compared to last year’s in-guide budget.

- The new in-guide budget ends data collection on Terra and Aqua 3-3.5 years sooner than what is achievable based upon available fuel and orbit drift considerations.
  \[\Rightarrow\] Significantly increases risk of a data gap in ERB record.

- All three missions submitted over-guide requests at this year’s annual budget review (PPBE) to restore the funding levels in last year’s in-guide budget.

- Terra and Aqua will also make the case to restore the funding during the upcoming Senior Review in spring 2020.

- The in-guide budget for the Radiation Budget Science Project has not changed since last year.
# S-NPP Edition1 Product Availability

<table>
<thead>
<tr>
<th>Product</th>
<th>Platform</th>
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<td>10/2017</td>
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**Edition 1:**
- Instrument gains (from onboard calibration) were taken into account. No attempt was made to place FM5 on same radiometric scale as FM3 or correct for spectral response function changes with time.
- ED1 cloud retrieval, ADMs, TISA & SARB algorithms were based upon those from Aqua.
  - Some changes to VIIRS cloud mask since water vapor and CO$_2$ bands are unavailable.
  - Cloud retrieval look-up tables were recomputed for VIIRS bands.

**Edition 2:**
- Will place FM5 on same radiometric scale as FM3.
- Will correct for FM5 spectral response function changes with time (LW daytime only).
- Will place VIIRS on same radiometric scale as MODIS Aqua, use the latest version of VIIRS level 1b, tune VIIRS cloud mask to be consistent with MODIS-Aqua.
- Will not ingest CrIS WV & CO$_2$ radiances to supplement VIIRS.
- FM5/S-NPP has been placed in restricted RAP mode to enable ADMs to be constructed. Will be used for FM5/S-NPP, FM6/NOAA-20 and beyond.
EVC-1 Selection Timeline

**EVC-1 PEA Released**
- 12/17/2018

**Preproposal Teleconference**
- 02/28/2019

**GFE Info Teleconference**
- 03/14/2019

**Notices of Intent due**
- 04/26/2019

**Proposals due**
- 07/26/2019

**Proposal Compliance Check (SALMON3 Apx.F)**
- 08/09/2019

**TMC evaluation with clarifications**
- 08/16/2019 – 10/20/2019

**Science evaluation with clarifications**

**TMC plenary**
- 10/21-22/2019

**Science plenary**
- 10/23-25/2019

**Debriefing**

**Formulation & Implementation**

**Noncompliant Proposals Returned**

**Headquarters**

**Categorization Committee**
- 12/03/2019

**Steering Committee**
- 12/17/2019

**Selection January 2020**
• **EVC-1 Selection Process is still on schedule.**
  - Selection meeting planned January 2020. Selection rollout expected several weeks later (maybe mid-February?)
• Technical, Management and Cost (TMC) Panel and Science Panel (SP) evaluations have been held.
• Remaining headquarters process includes:
  • Categorization committee meeting to categorize proposals on basis of TMC and SP results (from Category 1 – the best, to Category 4, the worst),
  • Steering Committee to check categorization committee work,
  • ESD decision process and development of ESD recommendation,
  • Presentation of recommendation to Selecting Official (Thomas Zurbuchen, head of the Science Mission Directorate),
  • Selection Decision,
  • Decision Rollout (9\(^{th}\) floor concurrence, etc.)
• Government shutdowns could slow process but it looks like plans for November – February/March CR are not controversial, so hopefully will not be a problem.
Granite Island

- 2.5 acre island located about 5 miles offshore in Lake Superior.
- Established shortwave, longwave, and AERONET in June, 2018.
- Site accepted by BSRN in July, 2018.
- Tracker broken for Winter 18/19; unsafe to repair until Spring 2019.
- Repaired tracker and data has been flowing since May 14, 2019.
- But a spider nested in pyrheliometer ~June 29, as evidenced by residuals:
  \[ \text{residual} = \text{global} - (\text{direct} \times \cos(\text{SZA}) + \text{diffuse}) \gg 0 \]
- Automated cleaning system was ineffective on spider.
- NMU student Elizabeth Hoffman cleaned all instruments on Aug 21.
- Working with SSAI to hire Ms. Hoffman on an "as needed" basis.
- Bryan Fabbri will present a talk at NMU during Fall trip to garner additional student interest.

Clear day, but residuals > 100 W/m²

Cleaning immediately increases direct beam
Other Items

- Terra@20 Celebrations at AGU
  - Dec. 8 from 6–8 pm at the Marriott Union Square Savoy. 480 Sutter St.)
- MDPI Special Issue (due April 30, 2020):
  "Analysis of Decadal-Scale Continuous Data Products from Weather Satellite Platforms"
- CERES webpage redesign
CERES Webpage Redesign

What is CERES?

Climate is controlled by the amount of sunlight absorbed by Earth and the amount of infrared energy emitted to space. These quantities—together with their difference—define Earth’s radiation budget (ERB). The Clouds and the Earth’s Radiant Energy System (CERES) project provides satellite-based observations of ERB and clouds. It uses measurements from CERES instruments flying on several satellites along with data from many other instruments to produce a comprehensive set of ERB data products for climate, weather and applied science research.

The goals of the CERES project are to:

• Produce a long-term, integrated global climate data record for detecting decadal changes in the Earth’s radiation budget from the surface to the top-of-atmosphere.
• Enable improved understanding of how Earth’s radiation budget varies in time and space and the role that clouds and other atmospheric properties play.
• Support climate model evaluation and improvement through model-observation intercomparisons.
Upcoming Conferences & Meetings of Interest

Fall AGU
- December 9-13, 2019, San Francisco, CA.

AMS Annual Meeting
- January 12-16, 2020, Boston, MA.

European Geophysical Union
- May 3-8, 2020, Vienna, Austria.
- Session: The Earth’s energy budget and the general circulation of atmosphere and ocean). Abstract deadline: 01/15/2020

Spring 2020 CERES Science Team Meeting
- April 28-30, 2020, NASA LaRC OR
- May 12-14, 2020, NASA LaRC
  (Actual date depends upon 2020 Senior Review schedule)

International Radiation Symposium
- July 6-10, 2020, Thessaloniki, Greece. Abstract deadline: 12/20/2019

IEEE International Geoscience and Remote Sensing Symposium (IGARSS)
- Session: Remote sensing of Earth’s energy budget
Let GLOBE Clouds be Your Outreach – Help us Spread the Word

Spring 2018 Data Challenge

The 2018 NASA GLOBE Clouds Spring Data Challenge received over **55,000 observations** from more than **15,000 locations** in **99 countries** in every continent!

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<th>Cloud Observations 2018-10-01 thru 2019-09-09 (no data challenge advertised)</th>
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<tr>
<td>GLOBE Observer App</td>
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<tr>
<td>GLOBE Program (mostly schools)</td>
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<tr>
<td><strong>Total Observations</strong></td>
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<td>Aqua Matches</td>
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<tr>
<td>Terra Matches</td>
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<td>GEO Matches</td>
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<td><strong>Total Match Emails Sent</strong></td>
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Access GLOBE Cloud Data coincident with satellite data: [https://observer.globe.gov/get-data/cloud-data](https://observer.globe.gov/get-data/cloud-data)
NASA GLOBE Clouds Fall Data Challenge: What’s Up in YOUR Sky?

**Audience:** Everyone! (formal/informal education and citizen scientists) *Help spread the word!*

**Dates:** October 15, 2019 - November 15, 2019

**Observations:** Clouds and aerosols (dust storms, haze, smoke)

Participants are invited to enter **up to** 10 observations per day of clouds and enter their data using any of GLOBE’s data entry tools including the clouds tool on the [GLOBE Observer mobile app](https://bit.ly/2lUmF5t).

**As a reward**, the GLOBE and GLOBE Observer participants with the most observations will be congratulated by NASA scientists with a video posted on the NASA GLOBE Clouds website.

Only those that enter their cloud observations using the GLOBE Online Data Entry website, GLOBE Data Entry app, or the GLOBE Observer app will be considered.

NASA ROSES Funding

Proposers to any ROSES program element are invited to incorporate citizen science and crowdsourcing methodologies into their submissions, where such methodologies will advance the objectives of the proposed investigation.

- Need handouts or resources on GLOBE Clouds for educators or general public?
- Curious about using GLOBE Clouds for research or learning more about ROSES Citizen Science funding?

Contact: Marilé Colón Robles, GLOBE Clouds Project Scientist
marile.colonrobles@nasa.gov

End