CERES Education and Outreach Update

Lin Chambers, EPO SD Lead NASA LaRC, Hampton, VA

The S’COOL - MY NASA DATA Team:
Educators, Graphic Artists, Writers, Editors, Programmers, DBAs, Managers, Systems Admins, Translators (SSAI STARS II)

Brian Bresina  Camelia Deller  Damien Josset  Daniel Oostra  Jay Madigan  Jennifer Lapan  Karen Brown  Katie Bethea
Kristina Ruhlman  Penny Oots  Preston Lewis  Sarah Crecelius  Susan Moore  Tim Marvel  Tina Coleman  Tina Rogerson

https://mynasadata.larc.nasa.gov
https://scool.larc.nasa.gov
https://science-edu.larc.nasa.gov
Email us at: scool@lists.larc.nasa.gov or mynasadata@lists.larc.nasa.gov

CERES Science Team Meeting
• Involve students in real science.
• Enable K-12 teachers and students, as well as citizen scientists, to explore the large volumes of data that NASA collects about the Earth from space.
• Students use scientific inquiry and math skills as they access and display microsets of the Earth System.

MY NASA DATA Provides access to CERES:

Lessons | Educational Resources
Projects/Ideas | A Climate Education Portal
Data Visualization | Cross-mission EPO tool
Workshops/Training | Access to Scientists
Partnership with Educators | A True Scientific Experience
CERES Data Visualization
- New CALIPSO, AMSR-E, MISR Data
- New Depth/Animations Functions
- Over 60 new parameters added, and more on the way
MY NASA DATA Website Make Over

60 likes, 20 +1’s in under a week

MY NASA DATA (MND) has a new look!
The MND team has worked hard to put a new spin on data visualization, science concepts, and educational resources.

• Easy to navigate
• Accessible
• Geared towards the user

When you visit our site you can discover and enjoy the resources that are most relevant to your needs. Content is divided into 5 main categories:

• Educators (3 grade divisions/related content)
• Students (3 grade divisions/related content)
• Citizen Scientists
• Researchers
• Using MND
MY NASA DATA: CERES, Aqua, and Terra

• Lessons ~30
• Projects
• Multi-media
• Data
• Live Access Server
• Albedo, Fluxes (EBAF & TRMM)
• Surface Scene Type
• CO2 AIRS on AQUA

Lesson Content: Current vs. Last Period

National Aeronautics and Space Administration

Pageviews
38.51%
20,009 vs 14,446

Lesson Content: Current vs. Last Period
Education and Public Outreach arm of CERES
Backbone of Terra/Aqua formal education effort
A simple way to involve K-12 students in authentic science
A source of validation data for the CERES cloud retrievals

http://scool.larc.nasa.gov
• > 111,500 observations from 63 countries and all 50 states
New countries participation (Rover): Nigeria, Malaysia, and Honduras
• 76% of S’COOL participants are from USA, 47% of our collected observations are from the US
• > 3,710 registered participants from 83 countries

Map as of Oct. 2012
States “Top Five”
- PA 12%
- VA 4%
- CA 3%
- PR 2%
- NH 2%

Countries “Top Five”
- USA 50%
- Colombia 25%
- Argentina 5%
- France 4%
- Nicaragua 4%

States “Bottom Five”
- North Dakota 14
- DC 13
- Virgin Islands 9
- Guam 6
- Northern Marianas 0

Stats This Year
- S’COOL Registrations 312
- ROVER Recommendations 39
- Material 36

*States, no change since last meeting
Database of observations - as of April 29, 2012

- > 63,000 satellite correspondences (963 match both)
  For 56% of ground observations
- > 3,710 registered participants
  35% submitted data
- 83 countries
  - data from 63 countries (75%)
- Recent feature: S’COOL has already begun collecting NPP data for comparison; 1,386 ground observations where NPP was selected as the satellite passing over
23,862 people visited this site

- **Visits**: 56.26%
  - 34,567 vs 22,122
- **Unique Visitors**: 81.75%
  - 23,882 vs 13,129
- **Pageviews**: 133.85%
  - 69,941 vs 29,909
- **Pages / Visit**: 49.66%
  - 2.02 vs 1.35
- **Avg. Visit Duration**: 39.64%
  - 00:02:01 vs 00:01:27
- **Bounce Rate**: -16.50%
  - 66.44% vs 79.57%
- **% New Visits**: 16.52%
  - 68.11% vs 58.45%

- **68.14% New Visitor**
  - 23,554 Visits
- **31.86% Returning Visitor**
  - 11,013 Visits
S’COOL Data Analysis

Comparison between Ground Observations and Terra Satellite data. (37997 obs.)

Note: SAT = Satellite results and GND = Ground Obs.

*Analysis: Alice Fan & Dr. Bing Lin
Comparison between Ground Observations and Terra Satellite data. (37997 obs.)

<table>
<thead>
<tr>
<th>Cloud Cover</th>
<th>GND</th>
<th>SAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear (&lt; 5%)</td>
<td>5329</td>
<td>3089</td>
</tr>
<tr>
<td>Partly (5-50%)</td>
<td>1175</td>
<td>2027</td>
</tr>
<tr>
<td>Mostly (50-95%)</td>
<td>348</td>
<td>4053</td>
</tr>
<tr>
<td>Overcast (&gt; 95%)</td>
<td>150</td>
<td>3592</td>
</tr>
</tbody>
</table>

- **Agreement 55% of the time**
- One Class off, 36% of the time
- Total 91%
- Consistent with our analysis from 2004

*Analysis: Alice Fan & Dr. Bing Lin*
Comparison between Ground Observations and Terra Satellite data. (37997 obs.)

<table>
<thead>
<tr>
<th>Layer Comparison</th>
<th>L</th>
<th>M</th>
<th>LM</th>
<th>H</th>
<th>LH</th>
<th>MH</th>
<th>LMH</th>
</tr>
</thead>
<tbody>
<tr>
<td>GND</td>
<td><strong>44.51%</strong></td>
<td>11.43%</td>
<td>10.43%</td>
<td>9.05%</td>
<td>7.91%</td>
<td>2.41%</td>
<td>14.27%</td>
</tr>
<tr>
<td>SAT</td>
<td>9.25%</td>
<td>8.88%</td>
<td>16.89%</td>
<td>11.33%</td>
<td>1.20%</td>
<td><strong>36.67%</strong></td>
<td>15.77%</td>
</tr>
</tbody>
</table>

- **44.51%** of GND and **9.25%** of SAT are LOW clouds
- GND classify more low clouds and SAT classify more middle and high clouds
- Combining both provides more accurate observation

*Analysis: Alice Fan & Dr. Bing Lin*
Updated the Report Form:

- New format
- One report form for both S’COOL and ROVER
- Addition of GLOBE components sky visibility and sky color to promote future compatibility of S’COOL and GLOBE data sets.
- New Cloud Fraction Categories.
Blog Highlighting the NASA CERES S’COOL Project, the MY NASA DATA Project, and the Science Directorate Outreach Efforts.

Pages views and visitors to the blog show the summer/back-to-school lag. At the same time this lag has prompted an evaluation and new implementation plan for the blog.
Oh, Oh, it’s MAGIC…

August 31, 2012

This post is also available in: Spanish


MAGIC refers to the Marine ARM (Atmospheric Radiation Measurement) GPCI Investigation of Clouds (MAGIC). These two principal investigators are aiming to improve today’s climate models by understanding the boundary layer clouds and related climate phenomena off the west coast of the United States. The Horizon Lines container ship Spirit will carry a group of instruments, known as ARM/MAUI, between Los Angeles, California and Honolulu, Hawaii measuring properties of clouds, precipitation, aerosols, and radiation, and atmospheric and oceanic conditions, continuously. The round trips will take place between October 2012 and September 2013.

Note from the PIs, “We are grateful to Horizon Lines and the Captain and crew for making this project possible, and are excited to see what will be learned concerning marine clouds.”

Get a first hand account and watch for more PI insights as the project progresses.

For more MAGIC information and highlights please visit:
http://www.bnl.gov/envsci/ARM/MAGIC/
http://science-edu.larc.nasa.gov/S'C'OOL/Rover/

During MAGIC, the research team will be taking cloud observations for the S'T O'Neill (S’C'OOL) Project. Alumni marine observer (ROVER), Mike Rea, Americas, will be on board to help. A total sky imager, which takes pictures of the sky, will be part of the ARM/MAUI instrument group. We will send these images to S’C'OOL satellite data for the same place and time (similar to CIMSS observers) for comparing the ground observations to corresponding satellite data. We look forward to with the start of MAGIC, stay tuned to the blog for updates!
## National Aeronautics and Space Administration

### S’COOL Observations on MAGIC

![Image](image1)

<table>
<thead>
<tr>
<th>User Name</th>
<th>Age</th>
<th>Skill Level</th>
<th>Latitude</th>
<th>Longitude</th>
<th>City</th>
<th>State</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAGIC</td>
<td>Adult</td>
<td>Expert</td>
<td>21.31</td>
<td>-157.87</td>
<td>HORIZON SPIRIT</td>
<td></td>
<td>USA</td>
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<table>
<thead>
<tr>
<th>Ground Observation - 4785</th>
<th>Aqua Satellite</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Date:</strong> 2012-09-14</td>
<td><strong>Date:</strong> 2012-09-14</td>
</tr>
<tr>
<td><strong>Local Time:</strong> 13:40:00</td>
<td><strong>Universal Time:</strong> 23:30:00</td>
</tr>
<tr>
<td><strong>Universal Time:</strong> 23:30:00</td>
<td><strong>Phase Temp(K):</strong> ice 206.13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opacity</th>
<th>Cloud Cover</th>
<th>Type</th>
<th>Visualization</th>
<th>Altitude (km)</th>
<th>Opacity</th>
<th>Cloud Cover</th>
<th>Phase Temp(K)</th>
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</thead>
<tbody>
<tr>
<td>Transparent</td>
<td>Clear (0% to 5%)</td>
<td>Cirrus</td>
<td></td>
<td>6.36</td>
<td>Transparent</td>
<td>Clear (0% to 5%)</td>
<td>1.39</td>
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<tr>
<td>Opaque</td>
<td>Partly Cloudy (5% to 50%)</td>
<td>Altostratus</td>
<td>Mild</td>
<td>2.98</td>
<td>Opaque</td>
<td>Partly Cloudy (5% to 50%)</td>
<td>Mixed 262.26</td>
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</tr>
<tr>
<td>Opaque</td>
<td>Partly Cloudy (5% to 50%)</td>
<td>Stratocumulus</td>
<td>Low</td>
<td>1.62</td>
<td>Opaque</td>
<td>Partly Cloudy (5% to 50%)</td>
<td>Water 286.83</td>
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<tr>
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<table>
<thead>
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<tbody>
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<td>Persistent: 0</td>
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<td>Short-Lived: 0</td>
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</tbody>
</table>

### Surface Observations

- **Snow/ice:** Not Observed
- **Standing Water:** Yes
- **Muddy:** Not Observed
- **Dry Ground:** Not Observed
- **Leaves on Trees:** Not Observed
- **Raining or Snowing:** No

**Temperature:** 26.20°C
**Barometric Pressure:** 1012.40 hPa
**Relative Humidity:** 55.00%

**Comments:** Leaving port. Clouds are clearing quickly.

### View Corresponding Satellite Images

- **Cloudsat Quick Look**
- **Cloudsat Tutorial**
- **CALIPSO Quick Look**
- **CALIPSO Tutorial**
- **Need Observation Help?**

**Aqua MODIS**
**New! LANCE**

**LANCE Tutorial**
**S’COOL MODIS Guide**
• The web is going **mobile**.
• Housed on the new redesign of science-edu pages.
• **CITRUS** – Cloud Id Tool for Students
  – Dichotomous Key
  – Cloud pic to map
  – Weather
  – Chart
  – METAR Integration
  – Picture Analysis?
NSTA Regional Conference, KY:
Ambassador-Brandon Hargis (teacher from KT) presented S'COOL and MND

NSTA Regional Conference, GA:
Team Member-Preston Lewis presenting S'COOL and MND

NSTA Regional Conference, AZ:
Team Member-Tina Rogerson presenting S'COOL and MND

Upcoming:
• Virginia Association of Science Teachers Meeting
• AISES National Conference 2012
• NSTA National Conference 2012
• AGU 2012/AGU GIFTS Teachers Workshop
• AMS National Conference 2013
Woodrow Wilson High School (Portsmouth)
  • Teacher Professional Development
  • Student Training Workshop
American Nicaraguan School (Nicaragua)
  • Skype, Project Overview and Instrument Introduction

Other Events:
  • Provide activities/material for Science Action Club, afterschool program
  • Langley 95th Open House
  • Earth Science Week readings
  • Astronomical Society of the Pacific
  • Public Participation in Scientific Research
  • NASA Explorer Schools Research Experience
  • GLOBE Workshop
  • LEARN Workshop

Thanks to all who participated or presented S’COOL or MND!
Thank you to the large group of SD employees who supported the NASA Langley 95th Anniversary Open House!

10,000 visitors during the Open House with 700 through the Pearl Young!

Science Directorate showcased in the Pearl Young Theater @ Langley’s 95thn Open House: September 22, 2012
Tina Coleman received her B.S. in Human Learning K-8 and her M.S. in Science Education with an emphasis in Earth and Space Science from the University of Tennessee at Martin. She has taught middle school science for the past fifteen years in the state of Tennessee, prior to which she taught for three years in the state of Kentucky. During the past two years she has served as President of the Tennessee Earth Science Teachers Association in addition to serving on the Tennessee State Leadership Team for the development of the Next Generation Science Standards (NGSS). Currently she is a contractor in educational outreach for the NASA LaRC Science Directorate and is working with the MY NASA DATA and S’COOL teams as education specialist focusing on the development of science curriculum resources.
We Need YOU!

- Make S’COOL Rover observations!
- Present S’COOL/MND – scripted materials available
- Dig into Data - new opportunity within data analysis (CALIPSO, CloudSat)
- Translation Services needed!
- Serve as resource for scientific content questions sent in by participants
- Connect with observers in every state and >83 countries
- Contact any one of the team members for posting to the blog or other information
  - scool@lists.nasa.gov or mynasadata@lists.nasa.gov

https://mynasadata.larc.nasa.gov
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