THE CERES S'C'OOL PROJECT

Students' Cloud Observations On-Line

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SSAI

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What is S’COOL?

• 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
S’COOL Project

- > 65,000 observations from 50 countries and all 50 states
- 43% from outside the US (80% US participants)
- > 2,400 registered participants from 73 countries

Map as of Nov. 2007
## Impact Measures

- ~60 requests for S’COOL materials since Apr. 2007

### States “Top Five”
- PA: 21%
- VA: 9%
- PR: 6%
- NH: 5%
- CA: 5%

### Countries “Top Five”
- US: 57% ➖
- Colombia: 10% ➕
- France: 7%
- Argentina: 6%
- Taiwan: 4%

### States “Bottom Five”
- Virgin Islands: 9
- Vermont: 7
- Guam: 6
- Delaware: 3
- Northern Marianas: 0

**Small Changes**

(We have a new registrant in Guam, so there is hope.)
Impact Measures (cont’d)
Database of observations - as of Oct. 2007

• > 28,500 satellite correspondences
  • For 44% of ground observations
• >2,400 registered participants
  • 39% submitted data
• 73 countries
  • data from 50 countries (68%)
S’COOL Data (Cont’d)

• 522 observations have both Terra and Aqua satellite match
• Under the current auto-email system, these are being shared immediately with the CERES clouds group.
• Also can be explored on-line: http://scool.larc.nasa.gov/en_query_double_matches.html

(Aqua and Terra do not always match)
S’COOL Interaction

- 60 percent are getting satellite matches in past year (thanks to FLASHFlux!)
- 13 percent of those are sending comments on the match
S’COOL Presentations Since April 2007

- Presentations at regional Science Teachers Association Conference (NSTA); Detroit, MI
- Visited a school in Detroit
- Presentation at Virginia Association of Science Teachers (VAST)
- Educator and Homeschool Open Houses at Virginia Air and Space Center
- Exhibit at Virginia State Fair (10 days); LaRC 90th
S’COOL + SPHERE

- 3 college and one HS student this summer
- CALIPSO and CloudSat tutorials to access browse images
- Study of ground vs satellite cloud opacity
- Rework of data analysis portion of S’COOL project (Excel tools and tutorial)


| Agree | Ground | Satellite | | Agree | Ground | Satellite |
|-------|--------|-----------| |       | Table 1 | Table 30 |
| High  | 0      | 0         | | Mid   | 0      | 0        |
| Low   | 0      | 0         | | Low   | 0      | 0        |

| Agree | Ground | Satellite | | Agree | Ground | Satellite |
|-------|--------|-----------| |       | Table 2 | Table 31 |
| High  | 0      | 0         | | Mid   | 0      | 0        |
| Low   | 1      | 1         | | Low   | 1      | 1        |

| Agree | Ground | Satellite | | Agree | Ground | Satellite |
|-------|--------|-----------| |       | Table 3 | Table 32 |
| High  | 0      | 0         | | Mid   | 1      | 1        |
| Low   | 0      | 0         | | Low   | 0      | 0        |

<table>
<thead>
<tr>
<th>Ground report</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Cloud</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Clear</td>
</tr>
<tr>
<td>Party</td>
</tr>
<tr>
<td>Mostly</td>
</tr>
<tr>
<td>Overcast</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Total Cases with Cloud</th>
<th>486</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete agreement</td>
<td>213</td>
<td>43.83</td>
</tr>
<tr>
<td>Off by 1 Cloud Cover Class</td>
<td>221</td>
<td>45.47</td>
</tr>
<tr>
<td>Off by 2 Classes</td>
<td>48</td>
<td>9.88</td>
</tr>
<tr>
<td>Off by 3 Classes</td>
<td>4</td>
<td>0.82</td>
</tr>
</tbody>
</table>
S’COOL + GoogleEarth

- 1 degree grid box (from clouds)
- School
- 0.4 degree FOV average (from SSF)
S’COOL in the Field

• Teacher Ambassador presentations:
  – Massachusetts Earth Central Institute (R. Snyder)
  – Tennessee Board of Regents (K. Affholter)
  – Regional NSTA meetings:
    • Carole Mashburn (workshop alumna; Birmingham, AL)
    • Dr. Debra Krumm (former CloudSat EPO lead; Denver, CO)
S’COOL Connections

• Created cloud chart with NOAA NWS
• NOAA is printing > 1,000,000 copies!!!!

• S’COOL to be in a book!

Chapter 2  Managing Weather
Weather Scouts and S’COOL Kids
S’COOL Needs YOU!

• Participants in every state and >70 countries
  – Offer to serve as a resource to a local teacher
  – Arrange a S’COOL visit when traveling
  – Provide S’COOL info to teachers you know
• Presentation materials available, with script suggestions
• Help with translation of materials
• Serve as resource for scientific content questions sent in by participants