THE CERES S'COOL PROJECT

STUDENTS' CLOUD OBSERVATIONS ON-LINE

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SAIC

CERES Science Team Meeting
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What is S'COOL?

- Education and Public Outreach arm of CERES
- *Backbone of Terra formal education effort*
  - But, Terra EPO budget was cut, so…
  - Formal external evaluation of S'COOL begun
- A simple way to involve K-12 students in real science
- A source of validation data for the CERES cloud data

Impact Measures

- ~50 requests for S'COOL materials since Nov. 2005

States "Top Five"

▪PA	20%
▪VA	10%
▪PR ↑	7%
▪NH ↓	6%
▪CA	5%

Small Changes

Observations "Top Five"

▪US	60%	↓
▪France	8%	↓
▪Colombia	7%	↑
▪Argentina	5%	↑
▪Rep. of China	3%	NEW!

No Change

States "Bottom Five"

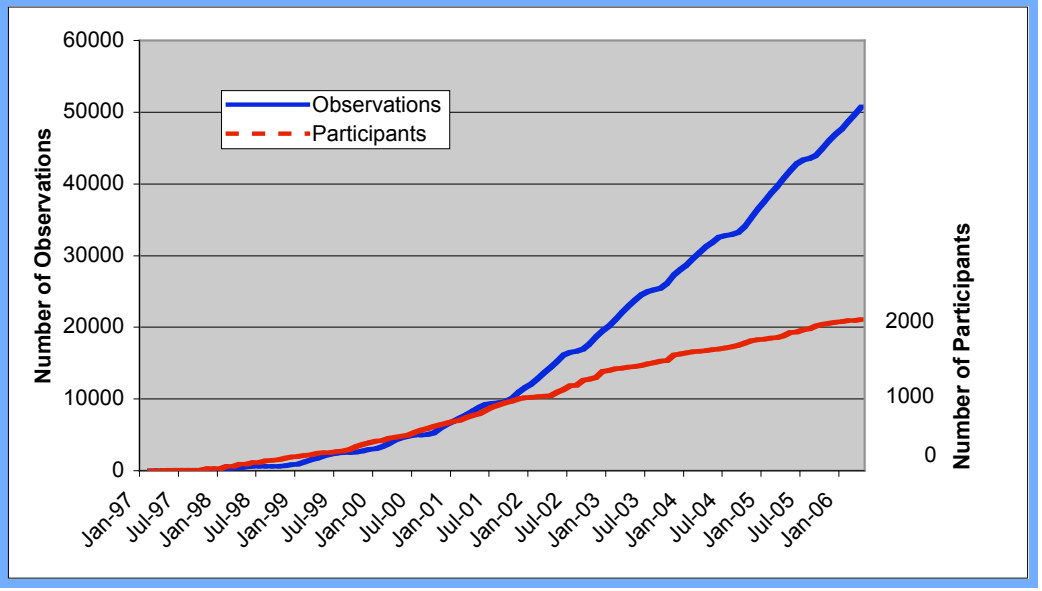
▪Virgin Islands	9
▪Vermont	7
▪Guam	6
▪Delaware	3
▪Northern Marianas	0

Impact Measures (cont'd)

Database of observations - as of Apr. 2006

- > 51,000 observations
  - 40% have corresponding satellite data
  - 3104 from one site in Pennsylvania
- 2,038 registered participants
  - 39% submitted data
- 68 countries
  - data from 50

Countries (74%)



S'COOL Data

- A unique dataset matched to satellite
  - 15 minute temporal match
  - 1 degree spatial match
  - 0.4 degree spatial match (SSF) being done offline
- More than *20,000* correspondences available
- QA applied to weed out obvious errors
- Most recent: Apr. 20, 2006 (from FLASHFlux)
- Data available via the Internet for analysis:

asd-www.larc.nasa.gov/SCOOL/usedata.html

School Name	Latitude	Longitude	City	State	Country
Central Square Middle School	43.30	-76.20	Central Square	NY	USA

Surface Information				Satellite Information 830182				
Date: 2006-04-20		Local Time: 14:18	Universal Time: 18:18	Date: 2006-04-20		Universal Time: 18:18:00		
Satellite: Aqua				Satellite: Aqua				
Opacity	Cloud Cover	Type	Visualization		Altitude	Opacity	Cloud Cover	Phase Temp (C)
Transparent	(0% to 5%)	Cirrus						
								
					0.21	Transparent 0.70	(5% to 50%) 29.46	water 292.61
								
Persistent Contrails: 04		Short-Lived Contrails: 01						
	Snow/Ice: No							

S'COOL Data (Cont'd)

- 341 observations have both Terra and Aqua satellite match
  - North America (incl. Alaska) and Europe north of 42°
  - About 1/3 do not match in satellite cloud levels

  - 26 cases (~8 %) where one satellite sees clouds and the other does not
    - 6 where Terra sees clouds Aqua does not
    - 20 where Aqua sees clouds Terra does not
    - 1, 2, or 3 layers may be involved
- View angle is obviously an issue

- No clear pattern in comparing to ground reports

Impact of FLASHFlux

- Began processing FLASHFlux data Oct. 1, 2004
  - 753 Aqua Correspondences to date
  - 1276 Terra Correspondences to date
- Provides satellite correspondence within a week for some S'COOL observations
- Developing a process to send a weekly email to those with FLASHFlux matches
  - Will include direct link to see matching result
  - Working on classification system

Draft

Class	Name
1	Perfect match
2	Fraction match
3	Opacity match
4	Overcast low
5	Mostly cloudy low
6	Overcast high
7	Fuzzy match
8	Sparse, thin high cloud
9	Sparse, thin mid cloud
10	Sparse low cloud
11	None of the above

School Name	Latitude	Longitude	City	State	Country
College Les Tamarins	-21.33	55.50	Reunion Island		France

Surface Information				Satellite Information 829744				
Date: 2006-04-19		Local Time: 14:41	Universal Time: 10:41	Date: 2006-04-19		Universal Time: 10:41:00		
Satellite: Aqua				Satellite: Aqua				
Opacity	Cloud Cover	Type	Visualization		Altitude	Opacity	Cloud Cover	Phase Temp (C)
Translucent	(0% to 5%)	Cirrus						
					5.89	Opaque 23.79	(5% to 50%) 28.44	mixed 264.54
Opaque	(5% to 50%)	Cumulus			1.85	Translucent 5.97	(5% to 50%) 18.72	water 288.30
								
Persistent Contrails: 00		Short-Lived Contrails: 00						

S'COOL Presentations Since Nov. 2005

- **Exhibits and/or Share-a-thons at 2 National conferences** (NSTA, NCTM)
- **Presentations at 2 regional conferences** (Virginia, and NSTA Midwest)
- **Presentations at 2 NASA educator conferences** (Sun Earth Connection and Education Products Workshop)
- **9 Presentations to student groups** (classroom visits, after-school groups, CHROME)
- **1 presentation to student teachers** (CNU science methods class)

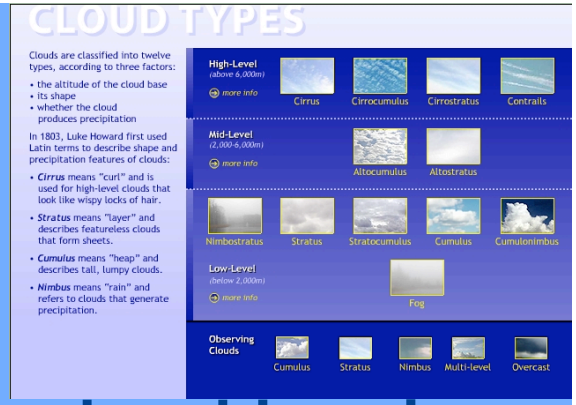
S'COOL in the Field

- Country Ambassador: E. Arabini, Italy
- Teacher Ambassador presentations:
  - Kansas State Science Convention (L. Eppich)
  - Space Exploration Educator's Conference, Houston (L. Werhun)
  - NSTA Share-a-Thon (J. Harnden)

What's new at S'COOL

- New registration page (multi-language)
- Cloud Photo of the Month feature

S'COOL Publicity



- **Started monthly E-notes in March 2006**
  - **Brief, friendly email of timely news and notes**
- **Adapted cloud type tutorial debuted on teachers'domain in January:**
  - http://www.teachersdomain.org/9-12/sci/ess/watcyc/cloudtype/index.html
- **Article by Katie Lorentz in Earth Observer**
- **Article by Lin Chambers in Journal of the Science Teachers Association of Ontario**
- **Article in Rochester, NY, Democrat and Chronicle about local S'COOL participant**
- **Link from kids page on NASA portal**
- **Filming for TV program in Spain with Spanish participant**

S’COOL Needs YOU!

- **Participants in every state and 68 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** (especially German and Italian)
- **Serve as resource for scientific content questions sent in by participants**