S'COOL and MY NASA DATA: two existing potential models

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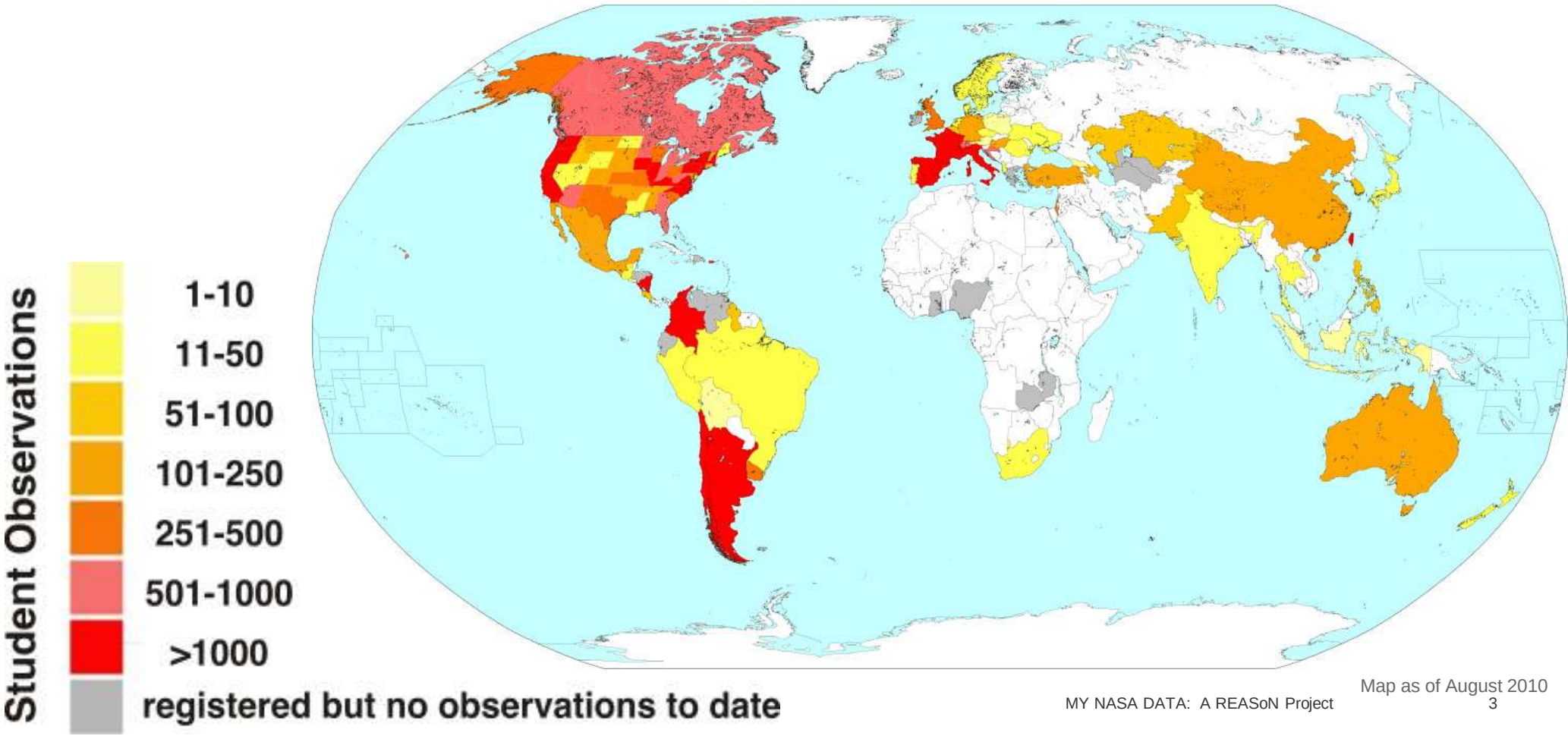
Workshop to Define Student Climate Research, Nov. 2010

The S'COOL Project

- **Research:** Seeking to improve satellite-based cloud property retrievals by comparing to human observers on the ground
- **Site:** Any site will do; the more the better. Ideally, should have a good view of the sky. But if not, a repeatable view also works.
- **Instrumentation:** None: human observations (camera option)
- **Data collection:** manual and reported to a database.
- **Accuracy and quality control:** We rely on statistics, but studies have shown that students are just as good as trained weather observers (Rogers, personal communication, 2010)
- **Other data needs:** Correspondence with satellite cloud retrieval is generally complete within a week (FLASHFlux) and presented through a user-friendly interface.

S'COOL Project

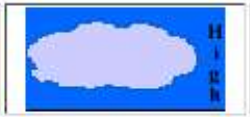
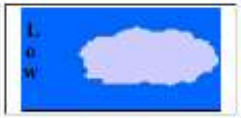
- > 87,000 observations from 56 countries and all 50 states
- 48 % from outside the US (77% US participants)
- > 3,000 registered participants from 80 countries



Map as of August 2010

Simple Pictorial Analysis

5: School Name	Latitude	Longitude	City	State	Country
Colegio Orlando Fals Borda	4.600000	-74.083000	Bogota	no state	Colombia

Ground Observation: 91672				Aqua Satellite				
Date: 2010-11-01		Local Time: 14:00	Universal Time: 19:00	Date: 2010-11-01		Universal Time: 19:00:00		
Opacity	Cloud Cover	Type	Visualization		Altitude (km)	Opacity	Cloud Cover	Phase Temp(K)
					11.66	Opaque 12.02	Overcast (95% to 100%) 95.21	ice 225.52
Opaque	Mostly Cloudy (50% to 95%)	Altostratus			9.68	Translucent 7.30	Clear (0% to 5%) 4.79	ice 245.32
Opaque	Mostly Cloudy (50% to 95%)	Stratocumulus						
Contrails:	Persistent - 00 Short-Lived - 00			View Corresponding  MODIS Aqua Satellite Image		***Vertical Profiles Along the MODIS Centerline*** Cloudsat Quick Look Cloudsat Tutorial CALIPSO Quick Look CALIPSO Expedited Browse Image CALIPSO Tutorial		
Surface Observations:	Snow/Ice: No Standing Water: Yes Muddy: Yes Dry Ground: No Leaves on Trees: Yes Raining/Snowing: No							
Temperature: C Barometric Pressure: hPa Relative Humidity:								
Ground Observation Comments: No comments provided by participant.								

Collaboration

- Science / Education collaboration is essential (integrated team)
- Project has been run on a shoe string, with insufficient support for scientific data analysis

Education Component

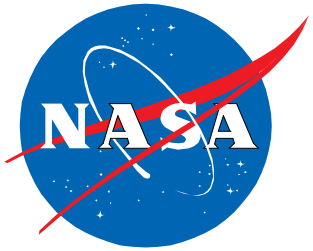
- Age-Appropriate for:
  - K-12 (demonstrated success even at K with simple approach)
  - More sophisticated analysis can begin in upper elementary (spreadsheet usage)
- Implementation: very low tech, low commitment
- Meeting Student Needs: automated interaction via satellite matching emails, with follow-up as needed
- Meeting Educator Needs: registration package and extensive website
- Relevant STEM and geography standards (National and selected states) are available on website

The MY NASA DATA Project

- Objective: Enable K-12 teachers and students, as well as citizen scientists, to explore authentic data resources about the Earth from space.
- Students use scientific inquiry and math skills as they access and display microsets of the Earth System. They can have similar experiences as scientists.
- Example lesson plans include national and some state standards.

Education Component

- Age Appropriate: K-12, based on teacher lesson plans posted on the site
- Implementation: Ideally, a computer lab; but some lessons are designed to work on paper.
- Meeting Student Needs: Integrated science/education team works together to prepare background material. Help is available via email.
- Meeting Educator Needs: Webinars, presentations at teacher conferences.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