



# The CloudSat Downlink

## GLOBE and CloudSat: Partners for Inquiry

*CloudSat and the GLOBE program spent their summers exploring the meaning of student science inquiry, and dreaming of new opportunities – by Todd Ellis*



In early August, most of the CloudSat Education Network team found themselves in sunny Calgary, Alberta, Canada surrounded by scientists and educators from around the world at the GLOBE Annual Partners Meeting. The theme this year was “Exploring Climate Through GLOBE Student Research,” and so it wasn’t surprising that nearly all of the activities were related to how to empower students to engage in scientific inquiry using GLOBE Data.

CloudSat played a prominent role in this year’s meeting, in large part because of all of the expertise that you, our partner schools, have shown in conducting your own inquiry. CloudSat Education Network were invited to help lead field day activities where participants focused on what it means to observe the environment (and to conduct trainings on a new Carbon Cycle protocol). The CEN held a 2 day workshop drumming up excitement among participants around the world showing off the great work you have already done in science inquiry. Dr. Graeme Stephens gave the keynote address on the connections between art and science (and we share some exciting news on that topics later in this issue!). And Dr. Matt Rogers gave a talk and a poster highlighting the many ways

CEN students have gotten involved with conducting scientific explorations of clouds and the

environment. Your achievements were the stars of the show, and we salute you for that.

Probably the most common question I get from new teachers when I talk about inquiry is a simple one: “What does science inquiry mean?” After all, in the school where I grew up, most science “inquiry” consisted of following directions, writing down measurements, and then drawing conclusions. And for learners like me, who love the challenge of following these procedures precisely, that works well to generate enthusiasm. But for many students, well, it can be boring just following the directions. True science inquiry, however, gets students involved at all levels of the process, helping learners to “own the experiment”, because they helped to design it. It’s an authentic science experience, and one that is much more successful at generating enthusiasm.

We mention this now, because some of you may be interested in learning more about a new initiative that GLOBE is starting: The Student Climate Research Campaign. This campaign is all about getting students involved in their own inquiry, and since so many of you already have experience in asking and

answering questions about clouds, you’re just the kind of people they are looking for. For more information on this, and other ways to get involved in authentic student science, contact us or go to the GLOBE website at <http://www.globe.gov>.



Native dancers from the prairie lands around Calgary shared their traditions, music, and dancing with us at the conclusion of the meeting.



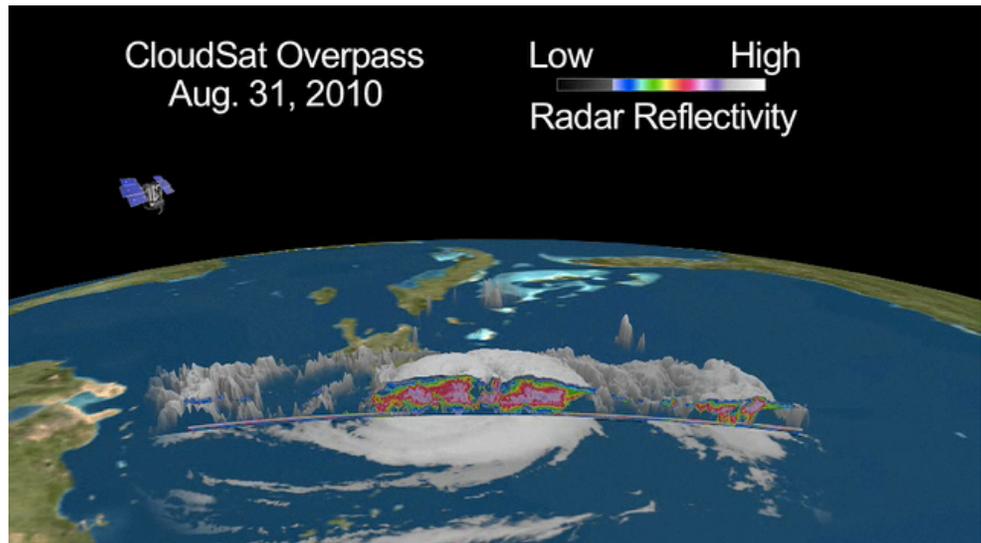


## QUICKLOOK HIGHLIGHT - HURRICANE EARL

In this edition of the Quicklook Highlight, we come back again to the topic of tropical cyclones. As I write this, Hurricane Earl is less than a day from impacting the islands off of the coast of North Carolina called the Outer Banks. And we were fortunate that CloudSat passed over Hurricane Earl as it was strengthening on August 31st.

Our friends at NASA went a step further and made an animation of the hurricane, overlaying

CloudSat's overpass onto other satellite images. This animation, which can be found at: <http://www.jpl.nasa.gov/video/index.cfm?id=928#fragment-4> shows Hurricane Earl as it's going through a common process known as Eyewall Replacement, where a tropical cyclone's is replaced by a new ring of intense thunderstorms. You can actually make out some of the features of the old and the new eyewall in the image. To read more about Eyewall Replacement Cycles, check out this link from the excellent Haby Hints blog: <http://www.theweatherprediction.com/habyhints2/412/> And keep checking back to the CloudSat webpage for more current events.

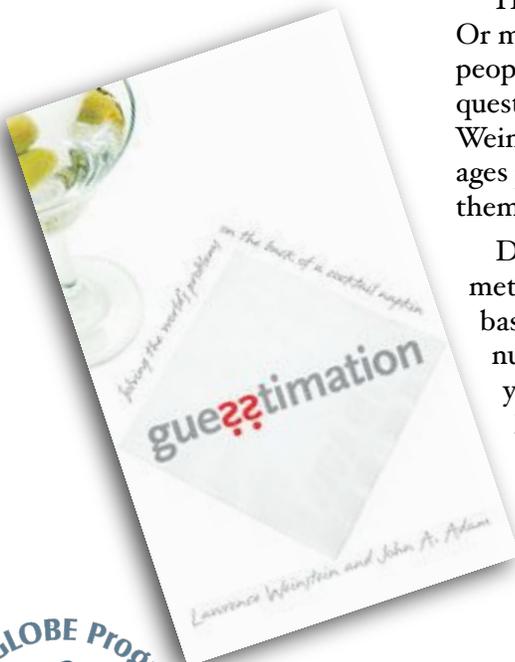


## BOOK REVIEW: GUESSTIMATION!

Have you ever wondered how much the atmosphere weighs? Or maybe how many portable toilets it would take to let a million people relieve themselves? The answers to these, and many more questions are **not** the point of *Guesstimation*, by Lawrence Weinstein and John Adam. Rather, this book helps learners of all ages practice the skills used to figure out these numbers for themselves without the use of a calculator.

Dr. Ellis is currently using this book in his undergraduate meteorology course because it's really fantastic at introducing basic skills like how to use scientific notation, how to estimate a number to within a factor of ten, and how to use units to help you determine an answer. But in the final analysis, the basic life skill of being able to calculate a estimate without needing a calculator, is one all of us need to practice with from time to time.

*Guesstimation* is available from most online booksellers for a list price of \$19.95 US Dollars. Its ISBN number is 978-0-691-12949





### HONORING OUR SCHOOLS CREATIVITY

Recently, one of our schools has been recognized for their creative approach to studying the clouds, and we want to share the news with you and show off one of the many unique ways that our community talks about our favorite meteorological phenomena.

Westall Secondary School, and their science class led by Roland Gesthuizen, recent created and produced "The Cloud Dance", a create entry into the 2010 Science Drama Awards in Victoria, Australia. They placed highly in



the statewide competition, and you can see their efforts at: <http://bit.ly/aIbJUL>.

Westall Secondary School is one of several schools who have made learning about clouds a unique experience, and we want to honor all of those creative approaches to talking about and learning about the clouds.

So if you have an innovative approach you'd like to share, please let us know, and we'll feature you here!

### CLOUDSAT EVENTS - PRESENT AND FUTURE

Summer was a busy time for the CloudSat Education Network team. It started, as it always does, with a trip to Jet Propulsion Laboratory in Pasadena, CA where we man an exhibit on CloudSat and Clouds for two days. There was an estimated 40,000 people who attended this year - a new record! And as always, you're welcome to come meet us if you are able - next year's event is scheduled for May 14 and 15, 2011.

In addition to our team's participation in the GLOBE annual meeting (see cover story), we also hosted a GLOBE and CloudSat training for the first time in Oneonta, NY at the SUNY College at Oneonta. This four-day workshop focused on helping present and future teachers think

about how to foster student inquiry in the classroom using GLOBE and CloudSat data.

So what does the future hold? Well, we plan to have a presence at the American Geophysical Union fall meeting in San Francisco in December, and the American Meteorological Society meeting in Seattle in January. There are often opportunities for the public to visit the exhibit halls. We also will be at the International A-Train Symposium in New Orleans from October 25-29. This will include some teacher

workshops for schools in the area. We also have other potential trips in the planning stages, so stay tuned for details for when we might be in your region!



Dr. Ellis at the SUNY Oneonta GLOBE/CloudSat Workshop





## CLOUDSAT IN SECOND LIFE

By *Dr. Matt Rogers*, Colorado State University

Reprinted from *My Big Fat Planet* blog: <http://climate.nasa.gov/blogs>

As you might expect from watching movies, few scientists put a lot of effort into being fashionable, which is why I found it odd to have spent a good thirty minutes last Thursday doing my hair. Not in the real world, mind you — I was preparing to give a science talk to fourteen under-privileged students at the [Miami Science Museum](#), while I was sitting comfortably behind my computer in Colorado. We were all to meet in the virtual online world of [Second Life](#), which describes itself as the "internet's largest user-created, 3D virtual-world community." We gathered on a NASA in-game island that has been custom built for the purpose of bringing students, teachers and the public together with scientists. In this virtual world, appearance is everything.

My presentation would be through a computer-generated avatar, using my voice via microphone, and talking to a virtual roomful of student-created avatars. The presentation would be much like a real one — I had slides to present data, there was a question-and-answer period after the talk, and I would even be on a stage, with a computer-generated NASA podium in front of me. And in execution, it was brilliant; the talk went smoothly, and the virtual world was a fitting environment to present my data. More intriguing, however, was the question-and-answer period afterward. Typically, when I present to a teenaged audience, I'll get a few specific questions, and will end up spending most of my time speaking with one or two students who are really into the material, while the rest of the room looks at the floor and waits for time to be up.

The student avatars were much fancier than mine — they'd obviously spent much more time on their hair than I did — and the questions covered a much broader range of topics, from cloud lifetimes, to pollution, to how to get into science as a career. As I spoke with the student avatars, it occurred to me that the virtual world has some real advantages over the real one. In the real world, I think that students are often afraid to step to the microphone and ask a question — peer pressure to 'fit in' can often overpower the desire to learn more about a topic. In the virtual world, however, you're free to be whomever you want to be, dress how you want to dress, and ask any question you choose to ask. Free from any constraints, these students were getting answers to questions they'd always wanted to ask, but never could. In the virtual world, without our real-world insecurities, the transfer of knowledge is unimpeded by social convention, and students and scientists can converse as equals, or even as friends.

It was a wonderful experience, and the Miami Science Museum has hit on a winning formula that will foster real science education across socioeconomic boundaries. I hope to be back again sometime, but next time, I'll make sure to spend more time getting my hair just right.

Don't forget to send your cloud and CloudSat related questions to

[askscientist@atmos.colostate.edu](mailto:askscientist@atmos.colostate.edu)

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