A Study to Test if Our Contrail Protocol Works.

By Charlee Schuman and Kathryn Peterson
West High School

Problem Statement

Lin Chambers, a GLOBE Scientist, wants to train the computer to find contrails in satellite images. We wanted to know if contrail length effects the weather. There wasn't a protocol for contrail length so we invented one. In this experiment we will test our protocol to see how well it works. Our hypothesis is that many people using our protocol one the same contrail will report the contrails length as the same (within 3 cms).

Procedures

1. We invented a contrail length and width protocol. We made a data table for the protocol and the instructions.
2. We made a hypothesis about quality of our protocol.
3. We arranged to test our protocol using the participants of the GLOBE ONE Student Science Symposium on February 10th, 2006.
4. We prepared to teach our protocol to the students. We gathered the materials and information we would need.
5. We have an alternate plan to use a ribbon as a contrail if there are not contrails visible and to control for contrail length.
6. Next will test the protocol with the students.
7. We will take the student data and make a table.
8. Analyze the table and develop our conclusions.

References & Acknowledgments

The GLOBE Teachers Guide. 2005. Cloud Protocols.

Special Thanks to Lin Chambers and Mrs. Houseal for assistance on this project.

Results

Enter preliminary results…

Date	Time of observation	Contrail #	Length of contrail	Direction from
1/25/2005	9:00 AM	1	15 cm	East
	- -	2	15.5 cm	East
	- -	3	1 cm	East
2/24/2005	11:00 AM	1	1.5 cm	
	- -	2	1 cm	
	- -	3	2 cm	
	- -	4	2 cm	
	12:00 PM	1	1 cm	
	- -	2	1 cm	
	- -	3	1 cm	
	1:00 PM	1	10 cm	
	- -	2	10 cm	
	- -	3	15 cm	
	- -	4	1 cm	
	- -	5	30 cm	
	- -	6	7 cm	
	- -	7	3 cm	
	- -	8	.25 cm	
	2:00 PM	1	1 cm	
	- -	2	20 cm	
	- -	3	21 cm	
	- -	4	29 cm	

Conclusions

ENTER CONCLUSIONS FROM CONTRAIL STUDY HERE.

We would like to do a future study about contrails with the hypothesis "If there are a lot of contrails in the sky it will effect the weather more than if there were fewer".

Our Contrail Length and Width Protocol

1. Record the date on the table.
2. Go outside and find a designated location.
3. Record the time in local time and convert it to GMT if you are able to.
4. Determine if there will be any contrails to measure (85% of the sky covered, then don't measure contrails). Remember no data is as important as lots of data!
5. Set compass on the ground – line up the North arrow with the N, and leave it there. Use this as a reference while you collect the data.
6. Figure out your quadrants (of the sky) for recording data.
   - Making a square with a partner (see foot positions) with one facing NE and the other facing SW – if arms are outstretched over feet, you will form a square)

   - The person facing SW will become the recorder.
7. Record all contrails in this quadrant using the following steps.
   1. Holding a ruler at arms length, measure from the plane to the end of the contrail, such that the plane is at the 0 end of the meter stick/ruler.
      - If the contrail is 2 cm, measure it to the nearest mm (0.1cm)
      - If the contrail is between 2-10cm, measure to the nearest .5cm
      - If the contrail is 10cm and above, measure to the nearest cm.
   2. Determine if the contrail width needs to be measured – if it's (1cm, the width should be measured. Use the same protocols for measuring the width as length.
   3. Record the data in the spaces provided on the data table. Be sure to record a number or N/A (not applicable) in each space.
8. Repeat these steps for all contrails in this quadrant.
9. Repeat the steps for all 4 quadrants, making a ¼ turn to the right each time. You should do the quadrants in the following order. NE, SE, SW, NW, Switching recorders for the SW and NW quadrants.