The Effect of Different Angles on Rain Drops

State Climate Office of North Carolina

Chowan Middle School Students

Introduction/Rationale

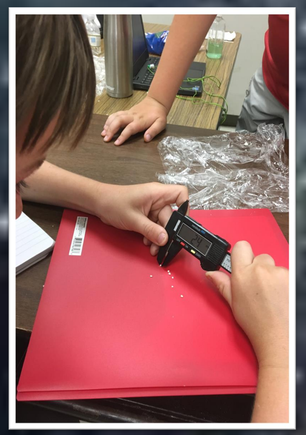
Our project was to show the effect of raindrops on the surface of Earth. We did this because it could be useful for people who are trying to stop erosion and better understand how rain impacts different surfaces.

Research Problem

Does the angle of the surface affect the size of a raindrop?

Hypothesis

We think that steeper angled surfaces would create a larger raindrop impression because it causes the raindrop to run more across the surface rather than hitting the surface directly.



Materials and Methods

We started off by building four mounts for our trays that were set at four different angles, 0, 10, 20, and 30 degrees. Then we filled each pan with about an inch of sifted flour. After setting up our rain board we set our board in a rainstorm until collected an adequate amount of drops. We left the pans out in the rain for 30 seconds. After the drops dried we used a sieve to separate the loose flour from the raindrops. We randomly measured the drops with calipers.

Results

Rain Drop Diameter- 5/11/19					Rain Drop Diameter- 5/04/19				
Degrees	0	10	20	30	Degrees	0	10	20	30
	2.2		2.5	1.4		2.1	1.3	1.3	0.9
	1.6	1	2.1	1.3		2.4	2	1.1	1.2
	2.3	1.4	1.8	1.2		2.2	1.7	1.5	1.7
	1.5	0.3	2.6	1		1.9	1.3	1.7	1.1
	1.3	1.2	3.2	2		2.2	1.4	1.9	1.9
	1.8	1.3	2.4	0.9		1.6		2	1.3
	1.5	1.5	1.3	1.5		2.3		1.7	1.1
	1.3	1.4	2.6	2				1.9	1.2
	1	1	1.9	1.7					
	2.6	1.1	2.3	1.3					
	0.9	0.8	1.9	1.5					
	2.5	0.9	1.4	1.1					
	1.8	1.2	1.9	1					
	1.1	2.4	1.7	1.3					
Average	1.67	1.19	2.11	1.37	Average	2.1	1.54	1.64	1.3

While our method for collecting and measuring raindrops was successful there appears to be little correlation between the angle and drop size.

Discussion of Results

It turned out that the angle of the surface had no connection to the size of the water drops, the results were random. If we were able to continue this study we would use our technique for capturing and collecting raindrops to measure how the rainfall rate would impact the size of the rain drops.

Conclusion

Our hypotheses turned out to be incorrect. The data did not show that there was much connection to the angle of our boards and the size of the collected raindrops.

References and Acknowledgements

Mazon, Jordi, and Marta Vinas. "A Low Cost Experiment for Determining Raindrop Size Distribution." Weather, vol. 68, no. 2, 23 Feb. 2013.

We would like to thank the Burroughs Wellcome Student Science Enrichment Program, the NC State Climate Office, Mrs. Olson, Mr. Reinhold and Mrs. Karl for their help on this project

BURROUGHS WELLCOME FUND