CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)

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Project Number

31399

Project Title

As Pure As Rain: Testing the Purity of Rainwater from the San Mateo Coast to Sacramento

Abstract

Objectives/Goals

My hypothesis is that rainwater will be less pure (more acidic, more biological materials and other impurities) the further you get from the coast.

Methods/Materials

Between 12/31 and 2/26 I collected three clean catch rainwater samples at six locations from El Granada to Sacramento. I analyzed the samples four ways: (1) measured the rainwater (2) grew it in Petri dishes (3) chemically tested it (4) filtered it.

Results

Rainwater is normally mildly acidic (<7). Coastal pH averaged 6.467 and inland samples were LESS acidic than the coast. Filtrate at El Granada (coast) and on Kings Mountain were measurable at 4 grams and 2.5 grams per liter respectively. The other sites had almost no filtrate. Biological Activity: generally, rainwater collected further inland (Dublin, Sacramento) had fewer colonies and less biological diversity than other regions, although Milpitas (next to the SF Bay) along with areas closer to the coast had many species of bacteria, yeasts and other microorganisms.

Conclusions/Discussion

My hypothesis is incorrect. Coastal rainwater has more solids and is very biologically diverse, more so than rain collected further inland. Unexpectedly, inland rainwater is slightly less acidic. So, do not drink the rainwater unless you are at least 30 miles inland.

Summary Statement

I collected three clean rainwater catches (12/31 to 2/26) at 6 locations between the San Mateo Coast and Sacramento and analyzed them, concluding that rainwater falling at least 30 miles inland is purer than coastal rainwater.

Help Received

Rainwater Collecters: G. Jug, D. Miller, K. Kennedy, H. Smith, D. Buserwini, H. Wood. Equipment: T. Koos of Stanford Earth Science Lab (pH meters), R. Ferber (microscope, laser pen, Autoclave), Science teacher T. Joi (gram scale, second group of Petri dishes), D. Doran who gave me two chemical testing