



# CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

<b>Name(s)</b> Genesis V. Lucero	<b>Project Number</b> <b>J1118</b>
<b>Project Title</b> <b>The Effects of Various Filtration Media on Stormwater Contaminants</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> According to the EPA, the nation's number one water quality problem is stormwater runoff. Runoff water is contaminating nearly half of our rivers and lakes, leaving them unable to support fishing or swimming. I learned about a newly adopted General Permit for Discharges of Stormwater Associated with Construction Activity in California and I was very interested to find out how businesses and land owners were going to meet the new requirements. My experiment tested five filtration media in a modular wetland and their effectiveness in removing stormwater contaminants. I hypothesized that a new type of bonded fibrous material called BioMediaGreen would remove contaminants more effectively than other more traditional types of filtration media.</p> <p><b>Methods/Materials</b> I performed more than 600 tests. The filtration media I tested were aquarium stone (rock), activated carbon with organoclay, expanded shale, zeolite, and BioMediaGreen. I tested eight different water samples for each filter media for a total of 40 water samples filtered through a simulated wetland. Each of the 40 samples was tested for pH, total suspended solids (TSS), total dissolved solids (TDS), dissolved phosphate, dissolved oxygen, dissolved copper, dissolved iron, dissolved chromium, nitrates, nitrites, oil and grease, alkalinity, turbidity, total hardness, and bacteria both before and after filtering.</p> <p><b>Results</b> The BioMediaGreen filtration media was more effective in removing total suspended solids, dissolved iron, dissolved copper, dissolved phosphate, oil and grease, turbidity, and total hardness than the other media I tested. BioMediaGreen was also the most effective at increasing the dissolved oxygen levels. I was surprised that activated carbon with organoclay had higher efficiency removals for nitrates and nitrites which are difficult pollutants to remove. None of the filtration media tested had any significant impact on reducing bacteria levels.</p> <p><b>Conclusions/Discussion</b> My findings suggest a combination of BioMediaGreen and activated carbon with organoclay be used as a filtration media to remove pollutants from runoff. This filter media combination could be used to greatly improve water quality before runoff mixes with other water in the environment.</p>	
<b>Summary Statement</b> In my experiment I performed more than 600 water quality tests using five types of filtration media in a modular wetland to assess media effectiveness in removing stormwater contaminants.	
<b>Help Received</b> Mother helped with methods; Science teacher supervised me in the lab and teaching me proper procedures; BioClean Environmental Services supplied a modular wetland apparatus	