



California Science Center
CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

Your Name (List all student names if multiple authors.)

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Science Fair Use Only

S0107

Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)

Designing and Constructing an Original unique ROV in order to collect soil samples from a depth at up to 30 meters.

Division

S Junior (6-8) S Senior (9-12)

Preferred Category (See page 5 for descriptions.)

1 - Applied Mechanics/ Structures & Mechanisms/ Manufacturing

Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.)

Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.

Objective: Our objective was to design and construct an ROV capable of retrieving large soil samples from a depth of up to 30 meters.

Materials: We constructed an aluminium frame to which we attached floatation, a power supply, propulsion system, and a retrieval mechanism. Three 12-Volt trolling motors provided the propulsion. A small PVC pipe on a pivot with a cap on the back end acted as a soil sample retriever. Double Throw, Double Pole relays enabled the power source to be mounted on the ROV, but the control to come from a control box on the surface.

Methods: Once we built the ROV we took it to different sites to launch. First, we sent out a sonar buoy to determine the depth of the bottom, to insure that the ROV would not descend below crush depth, 30 meters, where the water pressure would cause parts of the ROV to implode. In our negative buoyancy test, a safety line to the ROV allowed us to control descent. In our positive buoyancy test, a thruster controlled the descent. After the ROV had completed its descent, we drove the ROV along the bottom, forcing soil into the soil sample retriever.

Results: In bodies of water with goop soil, it was easy to collect a large sample. In bodies of water with a rocky or sandy bottom, it was difficult to collect a large sample.

Conclusion: The type of soil determines the size of a soil sample for a mechanical soil sample retriever.

Summary Statement (In one sentence, state what your project is about.)

We designed and built an ROV to collect soil samples.

Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4.

Parents drove us to stores to purchase materials, and drove us to launch sites and aided in the set up and tear down there. Our chemistry teacher, Dr. Rose, supervised us in the lab while we analyzed the soil samples. Ryan Teeter, a friend, did the welding of the battery box and frame, since it is dangerous for those without experience!