Automated Precipitation Sampler (APS)

Chinh Do, Kristopher Lyles, and Frederik Washburn
Engineering Department and Marine Science Research Institute at Jacksonville University

Extended Abstract

The design of an Automated Precipitation Sampler (APS) is a cooperative project involving the participation of the Engineering Department and the Biology and Marine Science Department at Jacksonville University. The study combines the conceptual and need-based insights of environmental scientists with the mechanical and electrical expertise of engineering students, under the advisement of professors from both aforementioned departments. The APS will enable analyses of isotopic signatures in rainfall, as well as air pollution and water contamination studies.

The aim of the study is to design and build an automated machine that will collect and store rain water samples and environmental data. The samples are currently collected manually, which is labor intensive and inefficient. The APS will be cost effective and more functional than similar products currently on the market. The machine's main functions are collecting rainwater samples in individual containers, while simultaneously recording rainfall data. Several meetings were held with environmental scientists and literature was searched to determine the functional requirements and design parameters for such a product. A conceptual design was developed and the main components and features of the mechatronic system were determined. The device has been manufactured and the controller unit has been fabricated. After completing the prototype, it will be tested in the field and modified as needed. The final product will increase the efficiency of scientific studies by decreasing labor time, increasing the number of rain water samples collected, and providing data in an organized manner.