Apr 9th, 12:30 PM - 2:30 PM

LARC: Local Agricultural Resource Conservation

Dash Justice
Portland Youth Builders

Josh Davis
Portland Youth Builders

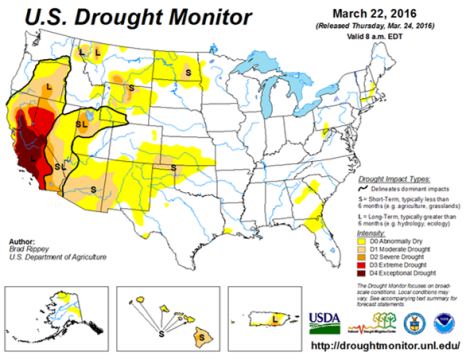
Sid Crumble
Portland Youth Builders

Ashlie Kinney
Portland Youth Builders

“LARC: Local Agricultural Resource Conservation”

Dash Justice, Josh Davis, Sid Crumble, Ashlie Kinney
Portland Youth Builders Technology

Maseeh College of Engineering and Computer Science
PORTLAND STATE UNIVERSITY



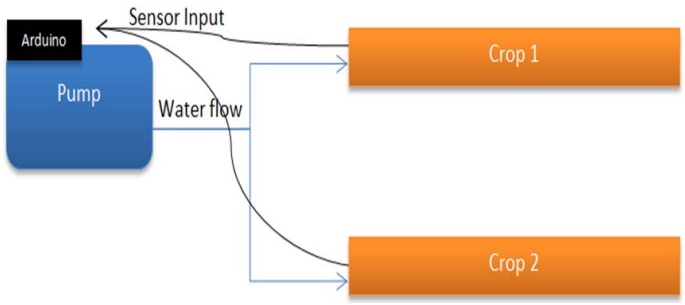
PROBLEM

In America today, over 75% of the nation’s water is used in the irrigation of agriculture. The main users--and abusers--of water in the United States are farmers. In addition, many areas in the U.S. are facing drought conditions, especially in western states. Also, while the drought conditions in California are receding, water shortage as an issue demands a long term solution.

Figure 1: AGRICULTURAL WATER CRISIS

“Approximately 80 percent of the Nation's consumptive water use and over 90 percent in many Western States.”
http://www.ers.usda.gov/topics/farm-practices-management/irrigation-water-use.aspx

Figure 2: WRITE DESCRIPTION



KEY OBSERVATIONS

Considering the majority of water is used in agriculture, our team decided to tackle the issue of water usage in food production. At first, we thought of focusing on the agricultural areas of the state of Oregon, but then decided to focus on the methods in which we could use water use closer to home, in Portland. Our intention is to find a way to grow crops while effectively reducing water waste. Many places in Portland, including restaurants like the Noble Rot Wine Bar, already have rooftop greenhouses. To develop an unique innovation, we chose to focus on creating a more efficient water system to compliment to implemented in the design of a rooftop greenhouse garden. Water is usually wasted when crops are watered excessively. Remarkably, our system detects the moisture levels in the soil as well as determines the correct amount of water needed for each crop and determining specifically when it needs to be watered.

Our Solution

Our project conserves water by growing crops on rooftops in the city in a greenhouse and only watering crops when they need to be watered. Our project is a smart watering system that relies on a sensor input from moisture sensors in the soil. This information is then broadcasted to a computer (in this case, an Arduino circuit board) that controls the flow of water to that row of plants. This system is scalable.

CONCLUSIONS

By watering plants only as they need it, we cut down the amount of water that gets wasted using timers. Plants don’t run on a schedule, they need based on how much they need and when they need it. By using moisture sensors in the soil adjacent to the roots, we can accurately disclose when the crop is running low on water.

DESCRIPTION

Our watering system uses an Arduino Uno with breadboard circuity connected to a moisture sensor and pump to distribute water efficiently based on the water reading of the soil. The process is as automated as possible, to save both water and energy when soil is running low on moisture.