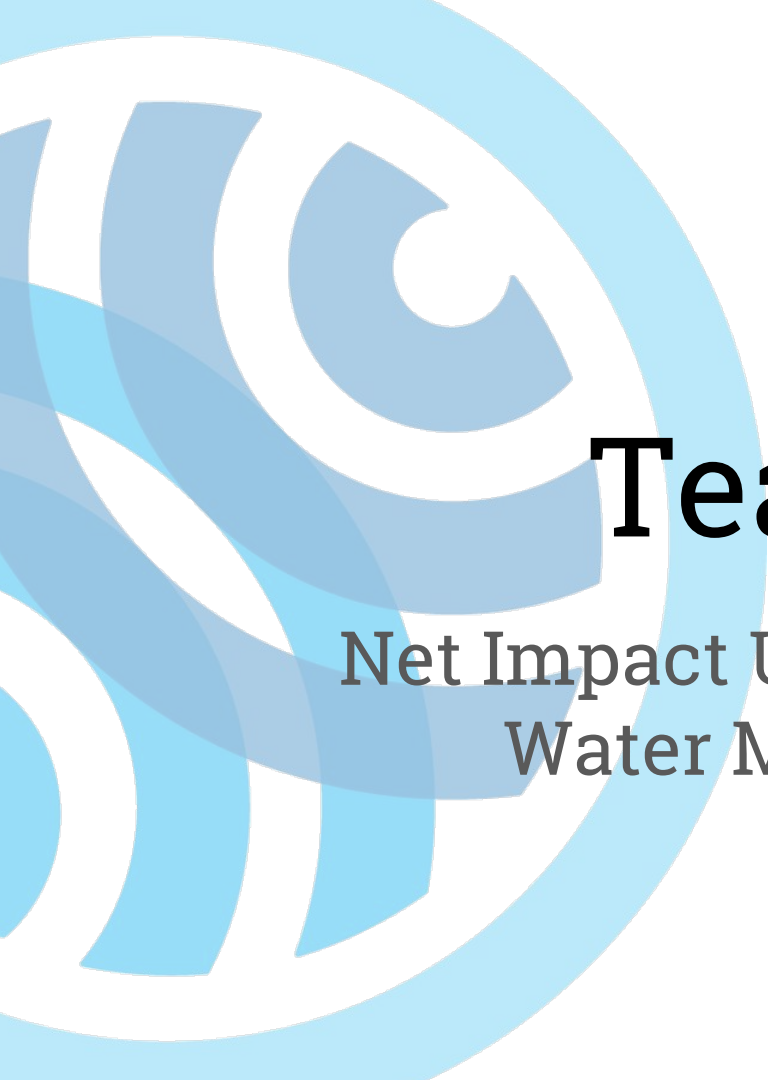


Team Aqua

Net Impact Undergraduate Chapter
Water Management Team



Team Aqua

Net Impact Undergraduate Chapter
Water Management Team

Problem/Solution Statement

Our Story



The Idea

- Supply the technologies needed for Davis farms to monitor water use.
- Supply Technologies to give Davis farmers an idea of when to irrigate
- Offset labor costs by offering UC Davis students internship credit to monitor and interpret data

Why is this Important?

- According to the USGS Californians withdrew an estimated 38 Billion gallons of water per day.
- 60.7% was used for irrigation



California has been the state with largest water use in the US since the USGS began compiling water-use data in 1950.



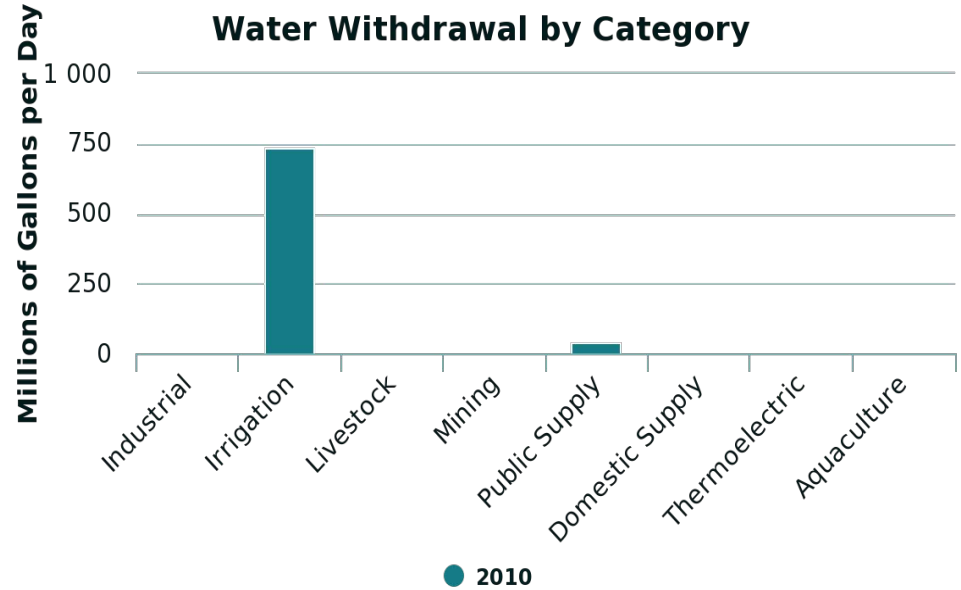
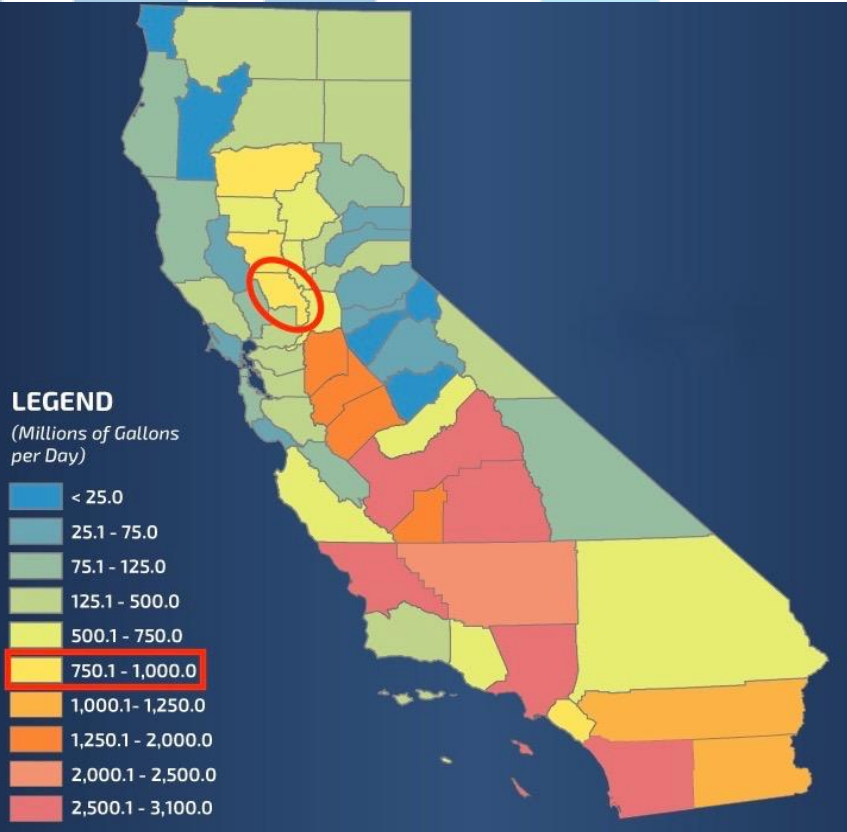
38 Billion
gallons per day

*(total withdrawals of
all water types in California)*



TOTAL DAILY WATER
withdrawals for California is enough to drain
SHASTA LAKE
(California's largest reservoir) about once
every 40 days

Yolo County



Highcharts.com

The Problem



- **Labor on farms (biggest cost factor)**
 - Professor of Food Science and Technology - Edward Spang
- **Equipment**
 - Extension Specialist - Danielle Zacarria
- **Water usage - how much? Too much?**
 - Land, Air, and Water Resources - Mark Grimmer
- **Over watering of crops**
 - Field Operations Coordinator - Jim Muck
- **Increasing soil salinity from overwatering**
 - Soil Specialist - Toby O'geen

Our Solutions

- Internship - Win-Win!
- Soil science and agricultural development students
- Farmers without equipment or labor forces
- Technology provided to minimize cost for farmer
- Environmental improvements!

Stakeholders

Environment

- Reduced water usage on farms for water conservation effort
- Effective agricultural techniques employed
- Increased produce health and food sustainability for communities
- Soil salinity and water contamination is no longer a major concern

Farmers

- Free labor
- Improved agricultural practices employed on farm
- Minimized water usage and reduced water costs
- Maximized crop yield and increased crop quality

Faculty Advisor

- Free access to field research
- Management of student research and creation of database
- Establishment of professional connections with local farms

Students

- Experience in field work and technology usage for soil analysis
- Ability to apply material learned in class (hands on learning)
- Ability to have a local impact on farms and in water conservation effort
- Developing and maintaining professional connections

Technology



Watermark Soil
Moisture Sensor



Pressure Bomb



Tensiometer



Water Flow Meter

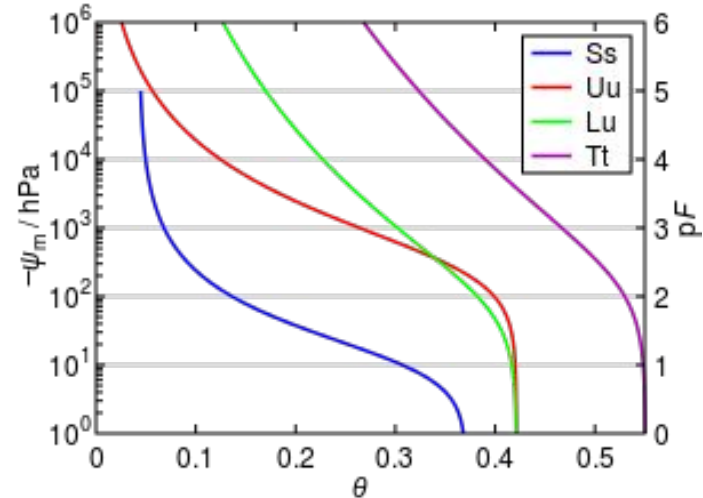
Technology Evaluative Matrix

Equipement	Cost: 9	Weight: 8	Accuracy: 6	Ease of Use: 6		Total
Watermark Soil Moisture Sensor: \$50	10	10	8	9		272
Pressure Bomb: \$1500	1	3	10	3		111
Tensiometer: \$100	8	8	6	7		214

Water Agriculture Efficiency

Crop	Crop water need (mm/total growing period)
Alfalfa	800 – 1600
Banana	1200 – 2200
Barley/Oats/Wheat	450 – 650
Bean	300 – 500
Cabbage	350 – 500
Citrus	900 – 1200
Cotton	700 – 1300
Maize	500 – 800
Mellon	400 – 600
Onion	350 – 550
Peanut	500 – 700
Pea	350 – 500
Pepper	600 – 900
Potato	500 – 700
Rice (paddy)	450 – 700
Sorghum/Millet	450 – 650
Soybean	450 – 700
Sugarbeet	550 – 750
Sugarcane	1500 – 2500
Sunflower	600 – 1000
Tomato	400 – 800

Approximate seasonal crop water needs



Water Retention Curve
Sand, clay loam, loam, peat

Price Breakdown

Technology		Cost	Number		
Moisture Sensor		\$50	5		\$250
Water Flow Meter		\$250	6		\$1,500
Travel					
-					\$0
Administration					
Coordinator Reimbursement					\$500
				Total	\$2,250

Next Steps

Find faculty member with established connections to local farmers

Have faculty member endorse and assist in program implementation

Secure capital: technology for testing and funding to support the program

Have internship approved and publicize through campus sponsors





Internship ★

Soil Science Internship

UC Davis Campus Internship - Davis, CA, United States

+ FOLLOW

Position Type

Internship

Desired Class Level(s)

Sophomores, Juniors,
Seniors

GPA

N/A

Description

For students studying developmental agriculture or soil science, this opportunity will allow students to gain professional experience in monitoring and observing irrigation systems employed on the UC Davis Student Farm. Students will be responsible for analyzing farm irrigation data, involving flow rate and soil moisture analysis. Students will visit the student farm on the University of California, Davis campus on a regular basis during the course of the internship to learn and provide the clients with the essential agricultural data. Equipment and equipment training will be provided to the students. All data collected will then be analyzed and compiled into a report, which will serve to employ water efficient irrigation systems on the farm that minimize water usage and maximize crop yield.

Qualifications

Undergraduate students; agricultural majors
Experience preferred, but training will be provided

Internship Flow

Design

Students will

- Learn analysis techniques with the technology
- Establish a visiting schedule for the farm

Collection

Students will

- Communicate with the farm on what areas have the highest need for analysis
- Perform technology tests
- Visit using the rotation to collect data

Analysis

Students will

- Compile data from all studies performed
- Create graphs and charts outlining water use and crop efficiency
- Create a report recommending specific techniques to farm for implementation

Team Timeline Spring 2017

Week 4

Revisit past connections
Solidify technological needs

Week 5

Form relationships with farmers through contact, set baseline goals for internship's 1st year

Week 6

Continue working with contacts to form internship goals

Week 7

Given goals, solidify resource sources

Week 8

By end of week, create formal paper for administration

Week 9

Meet with campus administrators and ICC to authenticate program

Week 10

Develop advertising techniques and flyers for professors and students.



Thank You