IGEM Grant Report

☐ **Progress (due January 1)** ☐ Annual (due July 31) ☐ Final (due August 31)

IGEM Grant #: IGEM26-008 Principal Investigator: Mary Everett

Name/Full Title of Project: Turning Data into Action: Stress Testing the SCARECRO Sensing System

Submission Date: 12/04/25 Primary Institution: University of Idaho

Section 1: The goal of this project is to (1) finish up the SCARECRO software testing suite and document it, and (2) prepare for and execute a 4-month full testing deployment in 3 locations (Laurel Grove, Virginia, Sandpoint, Idaho, and Deary, Moscow) to determine the reliability of the software and accessibility of the sensor visualizations.

Section 2: In this reporting period, we have made significant changes to the dashboard allowing better reliability, real-time visualization and phenology modeling of sensed data. We have also compiled the LoRa sensor statistics to determine their realistic range in the planned UI Experimental Forest deployment.

Section 3: Of the total 127,900 budget, 54,049.22 has currently been spent. We are on-track for expenditures. The materials and supplies and publication charges spending will increase in the next period as deployment is conducted and testing begun.

Section 4: We have submitted two USDA Grants on the SCARECRO System; one to increase soil sensing, and one to increase phenology modeling. We have received permission to submit an NSF Future CoRE grant to fund more of the technology stack. We are currently engaging with the Photonic sensing TechHub in Montana to explore partnerships.

Section 5: We have 1 faculty (supervising LoRa technology stack), 1 staff (PI and main gateway developer), 4 PhD students (2 directly funded by IGEM and working on LoRa sensors and Data Gator development, 2 funded by other related sources and working on AI application to weather data), and 2 undergraduate student participants (1 direclty funded to work on dashboard, 1 on a school funding source to help with the dashboard) as a result of the grant.

Section 6: We are planning next to release tutorials for the SCARECRO build process to increase its visibility and use in multiple configurations. We are going to submit an NSF grant for project continuation in addition to the 2 USDA grants already submitted. We have submitted a graduate research fellowship proposal for the SCARECRO LoRa aspect. This next period we plan to increase our collaboration with private industry leads: connections from Laurel Grove, Amalgamated Sugar, and the Photonic Sensing TechHub.

Section 7: Please see attached expenditures report.

IGEM Expenditure Report

IGEM Grant # IGEM26-008 Principal Investigator: Mary Everett

Submission Date: 12/04/25 Primary Institution: University of Idaho

Expenditure Report

Personnel:
Budgeted: 99,229.33
Spent: 36,664.97
Remaining: 62,564.36
Description: The personnel category has been spent primarily on 2 graduate students, an undergraduate student, and the Sandpoint Organic Agriculture Center orchard manager. The 2 graduate students have been finishing up LoRaWAN integration and testing, making incremental design improvements to the Data Gator, and writing software for system setup and provisioning. The graduate students have also been working on AI exploration, and sensor installation and testing on-site at partner deployments. The undergraduate has been working improvements to the dashboard particularly in terms of improving the reliability and increasing the overall uptime of the site. The SOAC orchard manager was allotted a month of salary, which has been used during several site visits, making use of the data provided by SCARECRO, and checking on sensors.

Equipment:
Budgeted: 0
Spent: 0

Travel:
Budgeted: 1,860.67
Spent: 1,736.76
Remaining: 153.91
Description:
During this progress period, the team has visited Sandpoint Organic Agriculture Center several times to check out equipment and visited the UI Experimental Forest site once during the fall which helped scope out the planned build for the spring. Laurel Grove Wine Farm was visited to maintain sensor deployments and install 3 new sensors and approximately 50 updated temperature and humidity sensors.

Participant Support:
Budgeted: 22,280
Spent: 12,338
Remaining: 9,942
Description:
Participant support has been half spent, covering fall tuition for both of the graduate students. The remaining half will be spent on their spring tuition.

Other Direct Costs:
Materials and Supplies Budget: 3,000

Materials and Supplies Spent: 309.49
Materials and Supplies Remaining: 2,690.51
Publication Charges Budget: 1,500
Publication Charges Remaining: 1,500
Description:
Materials and Supplies is slightly under budget (it has been spent on testing equipment and upgrades) but the majority of the budget will be spent on the UI Experimental Forest build and SOAC updates planned for the spring. Publication expenses have not been used yet, although a journal paper has been written on LoRaWAN testing is planned for submission early in 2026. This will likely use the entire publication charges budget.

Total Budget: 127,900
Total Spent Budget: 54,049.22
Total Budget Remaining: 73,850.78
We are on track with the budget, having slightly over half the budget remaining (at the time of this report, the budget is accurate through October, as we are awaiting the November budget update. This puts us on track for about 50% spent). The next period will see expenditures on-par with this period for personnel, but increased for materials and supplies as the experimental forest unit is deployed, as well as for publication charges, as the journal article is submitted.