

Gonzales High students build weather stations for NOAA

By Juan Reyes, Monterey County Herald

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Gonzales High School sophomore Veronica Rodriguez, who is part of the Wings of Knowledge program, works on typing up code to help build a weather station, which is part of a new project the team is working on with local farmers in the Salinas Valley. (Contributed by Vahid Motazedian)

Gonzales >> Students from the Wings of Knowledge program will show off their latest weather station project they developed in collaboration with the National Oceanic and Atmospheric Administration at Wednesday's Science Maker Faire at Soledad High School.

"It's actually really cool because you get to show people what you're doing and how you're working," said Gonzales High School sophomore Veronica Rodriguez, one of the 12 students from the Wings of Knowledge program, "and that this thing can help out a lot of people at what they do as well." said.

The Science Maker Faire is focused on projects that involve Science, Technology,

Engineering, Art and Mathematics (known as STEAM). The maker faire is from 3:30-5:30 p.m. and other schools participating are King City, Greenfield and host Soledad High.

The students of Wings of Knowledge will be showing off the new sensors and software capabilities they developed to collect weather-related data that could help NOAA enhance the accuracy of its weather forecasts in the Salinas Valley.

The effort was led by three student research teams: climatology, hardware engineering and software development.

Rodriguez, who is part of the software development team, said they've been writing an application that's going to collect the data and send it NOAA's server. She said she has enjoyed learning how to code.

"It's like learning another language. It's hard at first but it gets easier as you go," she said.

Vahid Motazedian, the Wings of Knowledge co-founder and program coordinator, spoke with NOAA meteorologist Charles Bell during a mixer and asked if there was any type of project the students could help out on. Bell told Motazedian that there aren't any reliable weather stations between Salinas and Bradley, which means there's a large amount of invalid data.

Motazedian said NOAA's weather forecast and knowledge of weather patterns was poor based off of satellite images that made the forecast temperatures off by 10 or 15 degrees. Bell wanted to know if the current equipment that measures soil moisture can also measure temperature and humidity. Motazedian arranged a meeting with Bell where he met with the hardware, software and earth sciences groups to talk about the new weather stations.

Before that, Motazedian said the students started drilling Bell with questions like "Why is it you can't go put up weather stations?" Bell told the students NOAA has tried in the past but there are various obstacles, including their lack of a strong relationship with growers in the area.

"(Bell) liked the idea of working with youth and he really liked the idea of spending time with them and giving them a project but then it turned out they had a genuine need," Motazedian said. "So, it wasn't something he had to force or create. They were able to come up and say 'We lack this data and if you can generate it that would a huge thing for us.'"

The students built a prototype and it successfully read the temperature and humidity. Next up, the group was aiming to build a prototype system in time for the Science Maker Faire. Motazedian said if it works the first weather stations could be installed at Bedolla Ranch in Hollister, Chula Vina in Chualar and a place not yet determined in San Lucas.

Gonzales High freshman Lola Mendoza said her team is currently looking for the best locations to put more of the weather stations. She said she was onboard for working on the project when the idea came up in class.

“I really like doing something that can benefit the community,” Mendoza said.

“Around here we have a really big agricultural part of California so there’s a lot of money being put into all these big companies and a bad weather forecast could cost them a lot of money.”

Mendoza said by giving NOAA an accurate weather forecast they can help companies and the state save money.

The temperature sensors, which are shielded by a homemade weather screen to prevent rain from getting inside, sit out in various places and measure the weather every 10 minutes.

Gonzales High sophomore Jerome Russell, who was introduced to the program in the eighth grade, is now part of the hardware team. He said the group has had to use cheaper material like metal poles, PVC tubing and plastic bowls, but he still likes helping out with the project despite not having state of the art tools.

“I’ve had a love for technology ever since I was young and being able to not only work with technology but being able to work with technology for a better cause for our community, it just interests me and I enjoy every bit of it.”

Motazedian said rather than uploading the data to a website where a meteorologist would have to interpret a graph to get the data, the students will create a server to server link between the Wings of Knowledge and NOAA.

“Where as we get the data we just push it to them in real time,” Motazedian said. “Then their server gets it and then they funnel it into their mathematical algorithm that are used for predicting the forecast.”

Motazedian said the group is creating a pipeline between the two institutions to share data. He added that meteorologists can go on the web to look at the data, but he thinks the most interesting aspect of using the students’ data is that it’s accurate and it’s being used to help feed the algorithm.

“I think, the kids, more than anything they appreciate working on meaningful things,” Motazedian said.

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