

Seattle teens dive into underwater robotics competition

By Zahra Farah, Seattle Times

Aug. 22, 2014 1:00 AM



Annika Hustad lowers her team's robot into the waters of Saratoga Passage from the marina in Langley on Washington state's Whidbey Island during a July 2014 testing session.

SEATTLE—In the McConnaughey house, on Whidbey Island in Puget Sound, a robot sits as a centerpiece on the dining room table.

Three teenage girls question whether their creation will be ready for its next challenge. Snacking on guacamole and chips, Hannah, Haley and Annika begin to pull apart their finished machine.

Something doesn't feel right.

Haley McConnaughey, 14, explains the trigonometry she did to figure out the dimensions for the blades on the robot's propellers. Older sister Hannah quickly wipes away some guacamole that escaped onto the machine.

The team asks themselves again: Can their underwater robot save a 200-pound diver trapped at sea?

That was the task at hand as they were preparing to leave for the upcoming Black Sea International ROV Competition and Exhibition in Romania—the largest underwater robotics competition in Europe. Teams will compete to see whose robot can rescue an underwater mannequin diver and

defuse an underwater mine. The top three will be taken out to a real shipwreck, where their robots must retrieve hidden treasure.

“The fact I get to do this before I have my driver’s license is crazy,” said Hannah, 17, who also was to deliver the keynote address at the competition.

The only U.S. team in the competition, they will face high school and collegiate underwater robotic teams from Egypt, India, Iran, Poland, Russia and Romania.

“We went from middle schoolers to representatives of the United States,” said Haley.

“It’s incredible how much your life can change in three months,” said Annika Hustard, who recently joined the team and who competed in her first robotics competition in May. The competition in Romania ends on Aug. 20.

The girls, who say they get bored easily and love to solve problems, have spent their summer working 12- to 14-hour days on their robot.

“This is a once-in-a-lifetime experience,” said Haley. “All the things we could do this summer will be here next summer.”

Each has a different motivation.

Annika, 13, has been obsessed with math and science since she was in kindergarten.

“I always try to ask the why in a math problem,” she said.

Annika said she wants to be a part of “innovation that can help so many people.” Her father uses a prosthetic leg, and he has benefited from design improvements.

She hopes for a career in medicine to “test my boundaries to see how far I can go in the service of others,” she said.

Haley, who learned pre-algebra at 8, said she is fascinated with the ocean.

“I want to be one of the building blocks of ocean exploration,” she said. “People say space is the last frontier; actually, the ocean is the last frontier.”

Hannah—who was reciting William Shakespeare’s “A Midsummer Night’s Dream” at the age of 6—likes to win, at everything.

She aspires to one day be CEO of just about anything.

“I want to dispel the illusion that girls aren’t good at math and science,” she said. “We want to give somebody the confidence to try it (robotics) for themselves, even if they don’t know anyone else doing it.”

The team calls its neon green and blue robot Twelve, after the Seattle Seahawks' 12th Man. The teens have rebuilt the ROV (remotely operated vehicle) three times within about a month.

With a budget of about \$500, their robot is made of donated items and whatever they had lying around.

They use PVC, or plastic pipes; an old printer feeder is used as reducing gears; the hand is a curry comb used to groom horses; the lights are LED strips used to illuminate pools; and a bicycle inner tube, cooking racks and pool "noodles" maintain the machine's buoyancy.

"To keep costs and time down, you take the things you have and then you adapt them to what you need. That's inventing," said Del Hardesty, 64, a mentor and former satellite-communications engineer.

The McConnaughey sisters learned about this niche game from a friend's older brother who competed in the Marine Advanced Technology Education (MATE) ROV Competition—an organization working to improve marine education and produce a future workforce for ocean occupations.

The girls, who are home-schooled, thought it would be an opportunity to have fun and do something that related to the real world.

What was supposed to be an after-school neighborhood nerd club, Atlantis ROV, turned into a winning international underwater robotics team. The team, formed a few years ago with elementary and middle school children, started beating high schoolers.

It wasn't easy. Sometimes their robot would die 10 minutes before competition.

"They would go one step forward and three steps back for months," said Ashley McConnaughey, mother of Hannah and Haley.

At the 2012 MATE ROV Competition, where Hannah and Haley were on the team, the robot blew a fuse, which stopped the team from advancing to international.

The following year, with renewed focus, the girls went on to win first place in the Pacific Northwest, with another teammate, and 11th in the world.

The girls—who together raised the money for their trip to Romania—aren't in it just for themselves. They want to encourage other girls to take an interest in science, engineering and math. They appear at county fairs with their robot.

During a recent appearance, they noticed, "The boys will rip the controller out of your hands, while a lot of the girls were a lot more reticent," Hannah McConnaughey said.

"Everything we are doing proves girls can do exactly what guys can do, and better," Annika

said.

The team's outreach has led to about 12 robotic teams forming in the south end of Whidbey Island.

"I think it's extraordinary that you can make so much of a change with a little bit of inspiration, a few friends and a lot of PVC," Annika said.