

Lifesaving rescue mission directed from 23,000 miles above the Earth

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Karson Keith might not be alive today if not for the environmental and weather satellites that rotate around the Earth 24/7. Aided by an electronic device called an emergency position-indicating radio beacon (EPIRB), Keith was pulled out of the wind-whipped waves of the Gulf of Mexico last August after his boat capsized in a storm.

Weather satellites have a full-time job helping scientists understand the changing climate and the temperature, rainfall, ice and snow changes that go with it. The same satellites, operated by the National Oceanic and Atmospheric Administration, have a lesser-known side business. They were responsible for rescuing 261 people in the United States last year.



He was looking for grouper. Fortunately, there was a satellite looking for him. Photos courtesy of Karson Keith.

They included lost and injured hikers, capsized fishermen like Keith, and people in other types of distress. NOAA's Search and Rescue Satellite Aided Tracking [system](#) is credited with saving about 35,000 lives worldwide since it began in the 1980s.

Keith, 23, of Gainesville, Fla., is one of those lucky ones. He went out fishing for grouper in the Gulf of Mexico with his brother and two close buddies early one morning in August. They fished all day until the

evening, when they realized their boat's battery had gone dead. They were 17 miles from shore when a sudden storm came up, lashing them with heavy waves and sharp winds punctuated by thunder.

"It just blew and blew like crazy," he recalled in a phone interview. "The storm just took us over; you could tell the boat started to tip lower and lower, and then we started looking at each other like, oh, [expletive], and coolers started floating across the deck. It just flipped over and we had to get off of it, and we grabbed the EPIRB and got off."

Adrift somewhere in the Gulf

"Your whole life flashes in front of you, you don't know if you're going to make it back or not, you look at that EPIRB and you thank God you brought that," he said. Six months before he had to use it, he had bought the EPIRB, a 20-ounce device about the size of a satellite phone. Made by ACR Electronics Inc. of Fort Lauderdale, Fla., it had sent a specific radio signal out into space.

Boats aren't usually required to have such a beacon on board. "That's kind of the scary thing. You know there are people out there running without them, and in a situation like that, you can't get one mailed to you out there," joked Keith, who works as a small-engine mechanic.

The beacon told the satellite positioned in geosynchronous orbit in space where the fishermen were floating in their life jackets within a ring of 100 meters (328 feet). After the Coast Guard received a call from the boat that they were stranded, it called the local branch of Sea Tow Services International, a Southold, N.Y. firm. On duty was Capt. Daniel Smith, who zoomed his boat to where the call had come from.

But he couldn't see the fishermen. "The visibility was so bad that I could hardly see the front of my boat. I came within 30 to 50 feet of the boat, it was underwater," he said. "I was sitting there and thinking, 'God, I hope I don't have to pull anybody's kids out of the water,' because families go out all the time."

The fishermen were now drifting in the roiling ocean, but the U.S. Coast Guard had received the coordinates from the satellite rescue system and dispatched a helicopter.

"We basically have a needle in the aircraft" that helps lead to the coordinates of a distressed person, explained Coast Guard aviation survival technician Randy Lopez, 25, the rescue swimmer on the mission to save Keith and the others.

A critical routine

So where were the fishermen floating within a circle of ocean the diameter of a football field? The EPIRB that the men were carrying provided the answer. It is equipped with a built-in strobe light, and Lopez saw it flashing. From there, it was routine.



A rescuer found this boat floating upside down, but where was the crew?

"I went down into the water and swam up to them and asked how long they had been in the water and what exactly had happened and made sure that none of them had any injuries," said Lopez, who estimates he has been involved in the rescue of almost 50 people during more than seven years in the Coast Guard.

Then the Sea Tow boat helmed by Smith was called over to bring the men back to the shore, where their families were waiting.

Keith and his friends had drifted about 6 miles away from where their boat had capsized. As Keith put it: "Sharks are out there. You could get eaten by a shark! You never know, man."

Matt Seybold, an atmospheric scientist at NOAA, said the geostationary satellites that NOAA operates about 23,000 miles above the Earth always look over the same area of the planet and are able to provide continuous imagery of what is occurring in weather patterns, which is valuable to forecasters.

Both those satellites and others that are in low-Earth orbit are used in rescues. Besides weather patterns, the satellites are able to monitor hurricanes, fires, volcanic ash plumes, oil spills, nighttime lights and even space weather. They're also used for climate research, such as examining ocean surface temperatures, water budgets, land cover changes and atmospheric temperature changes.

"I think the climate scientists would tell you that the satellite information is essential to their analyses," he said. "It's particularly good because it's continuous and it's global, and climate analysis is largely interested in doing global analysis."

Keith does not need to be sold on the merits of the satellite system. He bought a new fishing boat with the insurance money he got for his old boat. He still goes out fishing as much as he can.

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