The Statewide Committee for Research honors Alaska's

Northern Innovators

Tom Weingartner/Hank Statscewich

The Power Suppliers

Northern Innovators Hall of Fame Member

The combined length of the glacier fiords, black beaches, mud flats and crumbling bluffs that make up Alaska's coast equals more than 33,000 miles. If you were to travel that distance in a straight line, you could start at Anchorage, complete a lap around the world and then continue on to Kenya.

All those miles are pretty lonely in Alaska, where coastal villages are most often hundreds of miles apart. For someone who monitors ocean currents using scientific instruments depending on power from these places, remotely seeing the waters off the northern shore was an expensive problem. The solution, inspired by scientific need, will serve more than just researchers.

Oceanographer Tom Weingartner of the University of Alaska Fairbanks and a team led by university research analyst Hank Statscewich developed their own power source about the size of a Fairbanks rental cabin. They and have deployed versions of it along Alaska's northern coast. And they work.

The stand-alone units power computers, a satellite-communication system and high-frequency radars that map surface currents in the Chukchi and Beaufort seas, allowing researchers and others to see where the water is moving.

The technology is not only useful for people who study the ocean but could inform cleanup workers which way spilled oil is floating, or assist villagers in search and rescue operations. It also helps researchers figure out how one of the richest places of life on Earth operates.

"Currents have a bearing on the ecosystem and we want to understand how this ocean works — it's an incredible ecosystem," says Weingartner's colleague and installer of the systems Rachel Potter.

The renewable-energy harnessing unit, known as a remote power module, has four turbines to capture the almost constant wind of the northern coast. Solar panels the size of sheets of plywood point southward, providing power during the occasional calms of summer. The wind and solar provide enough juice to run the high frequency radars, which measure currents based on the speed with which the waves travel across the sea surface. The radars work during the open-water season.

"We have satellite communications hooked up so that every hour we get updated maps on the Internet," Weingartner says. "If there is an emergency of some sort, we can look at data in near-real-time."

In 2013, the remote power system enabled radars to read the open ocean off Point Lay, Wainwright, Barrow and Cape Simpson. Scientists and others interested in current activity can go online for live or archived animation of currents. The researchers set them up in July and return northward to pull the systems out in the deep dark of November.

The remote power modules, designed with the help of Greg Egan of Remote Power, Inc., are heavier than a pickup truck but break down into components that two people can move around and assemble. A possible future use for the remote power module and radars is to detect and track ships in an area of the world becoming more accessible every summer as sea ice shrinks.

"We didn't want generators or fuel," Weingartner says. "We wanted redundancy, endurance and resilience and we wanted to be able to break it apart to put on skiffs, ATVs and snowmachines."

The remote power units catch the eyes of the locals and everyone else who sees them standing on the tundra overlooking the ocean.

"Everyone in Barrow asks, 'Could I power a house with that?'" Weingartner says. "No, but it satisfies (the radar's) demand for power, primarily by wind."