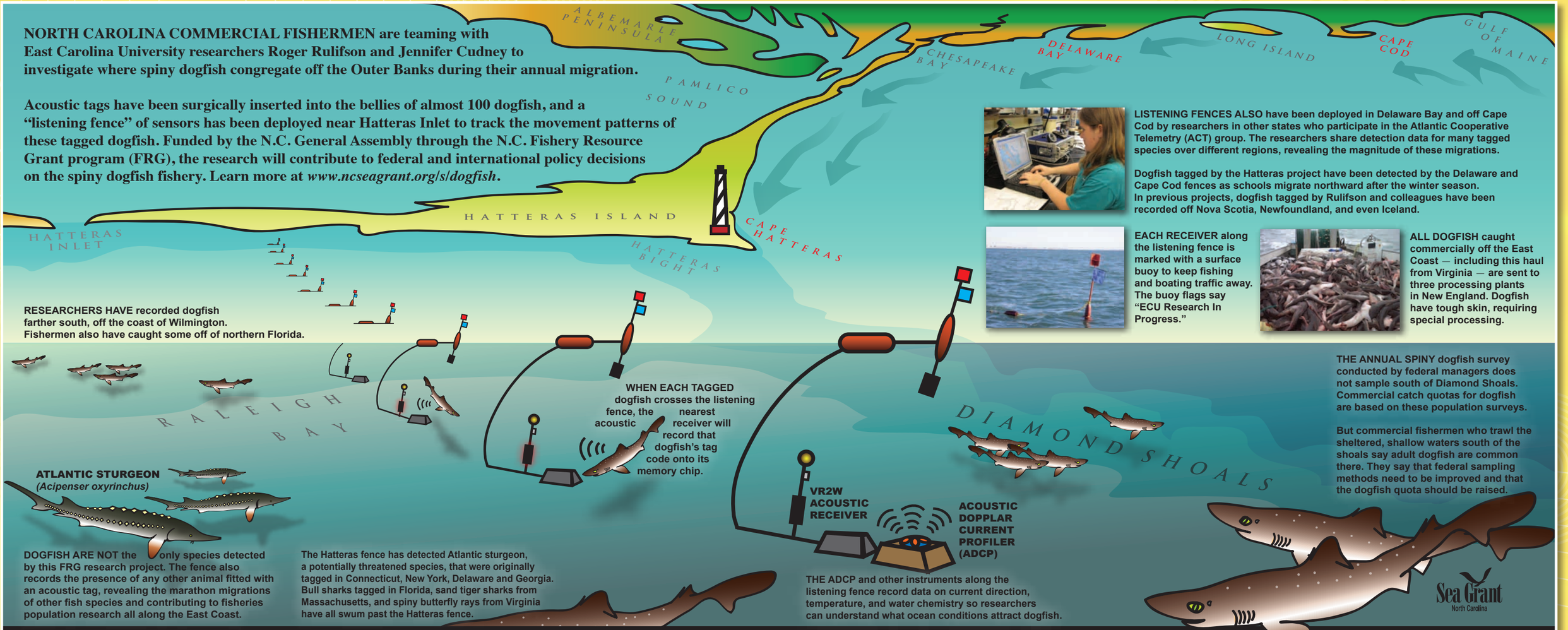


NORTH CAROLINA COMMERCIAL FISHERMEN are teaming with East Carolina University researchers Roger Rulifson and Jennifer Cudney to investigate where spiny dogfish congregate off the Outer Banks during their annual migration.

Acoustic tags have been surgically inserted into the bellies of almost 100 dogfish, and a "listening fence" of sensors has been deployed near Hatteras Inlet to track the movement patterns of these tagged dogfish. Funded by the N.C. General Assembly through the N.C. Fishery Resource Grant program (FRG), the research will contribute to federal and international policy decisions on the spiny dogfish fishery. Learn more at *www.ncseagrant.org/s/dogfish*.

LISTENING FENCES ALSO have been deployed in Delaware Bay and off Cape Cod by researchers in other states who participate in the Atlantic Cooperative Telemetry (ACT) group. The researchers share detection data for many tagged species over different regions, revealing the magnitude of these migrations.

Dogfish tagged by the Hatteras project have been detected by the Delaware and Cape Cod fences as schools migrate northward after the winter season. In previous projects, dogfish tagged by Rulifson and colleagues have been recorded off Nova Scotia, Newfoundland, and even Iceland.

EACH RECEIVER along the listening fence is marked with a surface buoy to keep fishing and boating traffic away. The buoy flags say "ECU Research In Progress."

ALL DOGFISH caught commercially off the East Coast — including this haul from Virginia — are sent to three processing plants in New England. Dogfish have tough skin, requiring special processing.

RESEARCHERS HAVE recorded dogfish farther south, off the coast of Wilmington. Fishermen also have caught some off of northern Florida.

WHEN EACH TAGGED dogfish crosses the listening fence, the acoustic nearest receiver will record that dogfish's tag code onto its memory chip.

VR2W ACOUSTIC RECEIVER

ACOUSTIC DOPPLAR CURRENT PROFILER (ADCP)

THE ADCP and other instruments along the listening fence record data on current direction, temperature, and water chemistry so researchers can understand what ocean conditions attract dogfish.

ATLANTIC STURGEON *(Acipenser oxyrinchus)*

DOGFISH ARE NOT the only species detected by this FRG research project. The fence also records the presence of any other animal fitted with an acoustic tag, revealing the marathon migrations of other fish species and contributing to fisheries population research all along the East Coast.

The Hatteras fence has detected Atlantic sturgeon, a potentially threatened species, that were originally tagged in Connecticut, New York, Delaware and Georgia. Bull sharks tagged in Florida, sand tiger sharks from Massachusetts, and spiny butterfly rays from Virginia have all swum past the Hatteras fence.

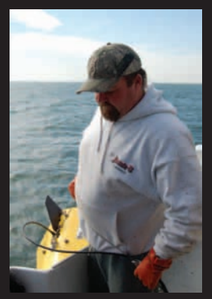
THE ANNUAL SPINY dogfish survey conducted by federal managers does not sample south of Diamond Shoals. Commercial catch quotas for dogfish are based on these population surveys.

But commercial fishermen who trawl the sheltered, shallow waters south of the shoals say adult dogfish are common there. They say that federal sampling methods need to be improved and that the dogfish quota should be raised.

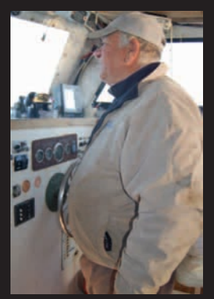
Sea Grant North Carolina

LISTENING TO THE SEA

TO HELP SOLVE A DEBATE, N.C. FISHERY RESOURCE GRANT RESEARCHERS ARE LENDING THEIR EARS TO THE FISHERMEN — AND THE DOGFISH



HEMILRIGHT, who fishes from Wanchese, is vocal and passionate about his trade. "If there's not a resource out there, I'm out of a job! Why would I 'kill the last buffalo,' as the enviros say?"



HICKMAN'S grandfather hauled nets off Virginia's Eastern Shore. After moving to the Outer Banks, Hickman followed his family roots, and has now been fishing for more than 30 years.

CHRIS HICKMAN AND DEWEY HEMILRIGHT have fished the waters of North Carolina for decades. Talking with them, you can get a sense of the tension that can exist between fishermen and some researchers.

"I was told one time that we were 'untrained observers,'" Hickman says, recalling one interaction on a past research project.

Hickman expresses his frustration with how certain studies are managed. He says some federal research cruises could be improved with commercial fishermen alongside, contributing their knowledge of proven fishing grounds and lending their expertise in setting nets and other gear.

But with the FRG dogfish studies, Hickman and Hemilright are having a different experience. Administered by North Carolina Sea Grant, the FRG program encourages seasoned watermen to work with academic researchers on fisheries studies.

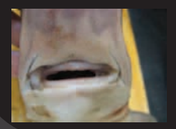
Now on his third FRG project with Rulifson's team, Hemilright has been impressed. He says some researchers come into a study with preconceived notions of fishermen, but that has not been the case with Rulifson and Cudney.

"Somebody can write a report and never been out on the water," he says. "Roger likes to get hands-on and get his students in there. That's not the norm today."

Hickman agrees. "I believe in conservation because I want to have next year [to work]." Hickman is glad someone like Rulifson has taken an interest in the debate, and says Rulifson and Cudney are open-minded to his ideas. "He knows how to ask questions."

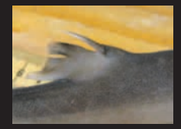
"We want the same answers," Hickman says of the goal shared by fishermen and researchers alike — to improve the long-term management of the spiny dogfish fishery. "This work that I've done with them has been very educational for me."

"We need more of this kind of work."



RULIFSON'S LAB is also studying the diet of spiny dogfish to learn what roles dogfish play in the food web of Outer Banks marine life.

SPINY DOGFISH are incredibly slow-growing. A dogfish the length of this silhouette (16") would be about four years old. Maturity is reached at 35 years, but spiny dogfish are known to live more than 80 years.



THE SPINY DOGFISH (*Squalus acanthias*) gets its name from the sharp spines on each of its dorsal fins. The spines are mildly venomous, but not deadly to humans.

Poster designed and illustrated by Ben Young Landis. All photos courtesy of Jen Cudney except dogfish jaws/spine and Cudney typing photos (Ben Young Landis) and VA dogfish photo (Brent Sanders). The poster profiles N.C. Fishery Resource Grant project 08-FEG-11.