



Issue 40, Winter 2025

MASGP-25-001-04

We're gonna need a bigger ROV: White Shark Appearances in Alabama

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Stereotypical Sharks

When you hear the word “shark,” what comes to mind? Probably razor-sharp teeth, crushing jaws, a strong tail, and other powerful features that help fuel a voracious appetite. You may picture these features on a gray and white torpedo-shaped body with piercing black eyes. A specific name may even cross your mind: the *great white shark*.

The white shark, also referred to as the great white shark, is often thought to epitomize the concept of a shark. For decades, our curiosities and imaginations have synchronously adored and feared the white shark, painting it as the ultimate symbol of might and aggression in the ocean. Countless media featuring white sharks, such as Discovery’s Shark Week and Spielberg’s *Jaws*, range from educational documentaries to fictional nightmares.



A white shark attacks a seal decoy in shallow waters near Western Cape, South Africa. Photo by Bernard Dupont, [CC BY-SA 2.0](#).

Here on the Gulf Coast, many view the white shark as a distant boogeyman. It’s pictured as breaching majestically off the coasts of South Africa and California,

and terrorizing Australian surfers. It certainly wouldn't venture into our warm, blue-green waters... right?

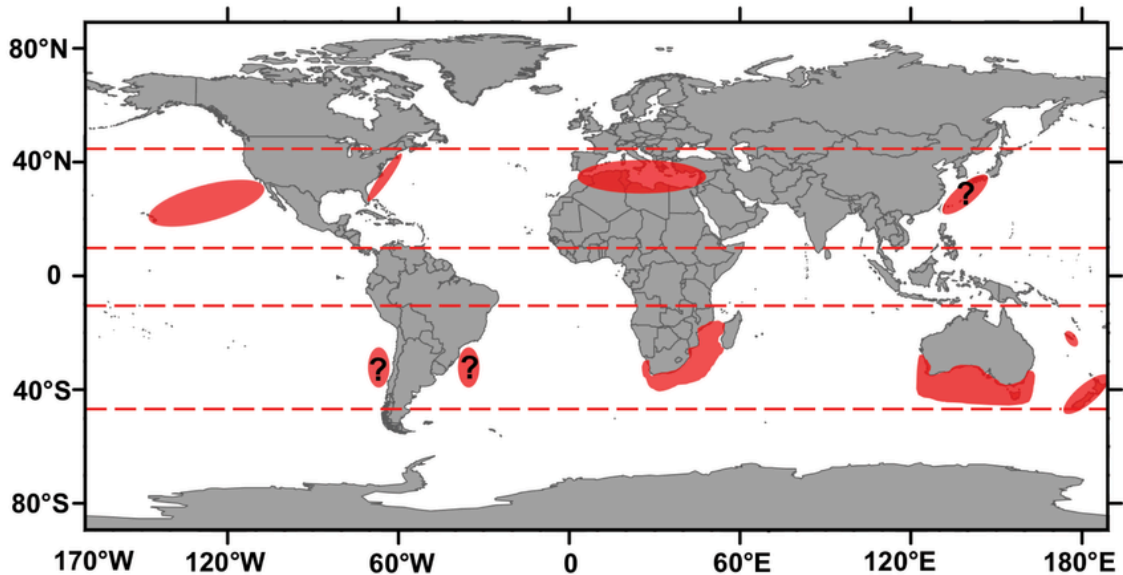
What in the World is a White Shark?

Who is the white shark outside of the media and myths? As a member of the family Lamnidae ("mackerel sharks"), the white shark shares many characteristics with makos, porbeagle sharks, and salmon sharks. Sharp, streamlined bodies with firm tails and large gill slits make these sharks built for speed and power. A unique adaptation allows the mackerel sharks to regulate (specifically, increase) their body temperatures, aiding in bodily functions and giving larger individuals a heightened tolerance to decreased water temperatures. This gives them the ability to explore cooler waters, and provides flexibility in migratory habits.

Members of the family Lamnidae hold impressive feats, such as the shortfin mako's record as the fastest shark in the world (46 mph). When it comes to feeding, the white shark "takes the cake." Measurements vary, but its bite force clocks in at around 4000 psi, giving it some of the strongest jaws of any animal on the planet. These jaws are used to grab and slice into favorite prey items, such as marine mammals, bony fishes, invertebrates, and even other sharks and rays. White sharks are ambush hunters, using their dark dorsal coloring to stay hidden and opportunistically striking unaware prey swimming above them. This method proves to be effective for preferentially hunting specific prey, but white sharks aren't afraid to scavenge – they're often seen feeding on whale carcasses at the surface. Diet studies show that younger white sharks ingest more fishes and invertebrates as opposed to their older counterparts, whose diet contains more marine mammals. The larger and more experienced white sharks likely have an easier time hunting the intelligent and agile marine mammals, while the smaller individuals go for the easier targets.

Where in the World are White Sharks?

The white shark has earned its fame with its captivating on-screen appearances and unique biology, but there's one aspect that elevates it even further: a circumglobal distribution. White sharks can be found around the world as long as conditions are favorable. They prefer temperate waters ranging from 50-75° Fahrenheit but can venture outside of that range if need be.



A world map depicting white sharks' suitable ranges and migratory areas (between dashed lines) in the northern and southern hemispheres, as well as known and suspected hotspots (red shapes) around the world. Map sourced from Christiansen et al. (2014).

White sharks make yearly migrations between their summer waters in cooler areas to their warmer strongholds in the winter. For instance, off the east coast of the United States, they spend hot months cooling off near New England and make their way south of Cape Hatteras, North Carolina when the waters begin to chill. Chilling water temperatures affect the younger individuals first, making them the first to venture south.

Although white sharks prefer to stay in relatively shallow coastal waters where prey are abundant, they can cover long distances in the open ocean. This allows them to travel past the southern tip of Florida to the Caribbean islands, and even into the Gulf. They've been historically documented off the west coast of Florida in the eastern Gulf, but sightings in the northern Gulf have been incredibly rare... until recently.

White Sharks in Our Waters

In 2023, anglers landed what is thought to be the [first white shark caught from a beach in Alabama](#). Shortly thereafter, a [deceased white shark washed ashore along the Florida panhandle](#). These two isolated white shark encounters sparked regional interest.

The following year, researchers from the University of South Alabama and the Dauphin Island Sea Lab were conducting a remotely operated vehicle (ROV) survey off the coast of Alabama. The ROV is equipped with a high-definition video camera, along with red lasers aligned in parallel for estimating the lengths of fishes in the video footage. As the scientists were “driving” the ROV, they were shocked to see a 2.4-meter-long (nearly 8-foot-long) female white shark swim into view. This detection was the first of its kind in the area and became even more astounding when a second white shark, a 1.9-meter-long (over 6-foot-long) male, appeared before the ROV just two weeks later.





Images of the white sharks observed in coastal Alabama on April 24 and May 7, 2024 from ROV footage. The top image shows the 2.4-meter-long female, and the bottom image shows the 1.9-meter-long male. The female shows off her entourage of amberjacks and sharksuckers.

Knowing that white sharks are present is a fascinating observation. However, we must ask ourselves whether or not they have always been here and we're just now detecting them, or if they're genuinely new to the area. With the rise of smartphones and other camera equipment, more content is being captured and uploaded than ever before. This can make it difficult to determine whether unusual sightings are actually unique.

Fortunately, we can turn to fishery-independent camera surveys to contextualize the observations. The ROV survey in Alabama has been conducted for 14 years (2011 – 2024) as part of a long-term ecosystem monitoring program. Zero white sharks were detected in this survey until 2024. Furthermore, a similar underwater camera study from the West Florida Shelf has detected zero white sharks since its inception in 2010. Together, these two surveys indicate that the recent reports of white sharks in the northern Gulf may suggest early range-edge expansion.

Will We See More White Sharks?

One factor that might explain the new observations of white sharks in the northern Gulf is season, or temperature. The white sharks may have overwintered in the Gulf, which would likely be followed by movement out of the Gulf toward their summer waters near New England. Another explanation involves foraging opportunities. Recent increases in both coastal shark populations and bottlenose dolphin strandings in the northern Gulf may provide irresistible winter foraging opportunities for white sharks.

Western North Atlantic white sharks faced population declines during the 20th century. Subsequently, the population was listed as prohibited in 1997, and now shows signs of recovery. As numbers continue to rise, individuals could move further west into the Gulf more regularly.

So, will we see more white sharks off our coast? Only time – and likely, long-term camera surveys – will tell. The longer these programs continue, the more secrets they can reveal to us about who is roaming our waters.



Another image of the female white shark observed in coastal Alabama. She appears to investigate the strange machine on her reef and smiles for the camera.

These findings were recently published by our program in *Frontiers in Marine Science*, and can be accessed [here](#).



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