

North Carolina and Sharks

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(*Rhincodon typus*), which is the world's largest fish. Because North Carolina's geography is so diverse and variable, many of our sharks have a variety of special traits. Our deep water is the least explored part of North Carolina's coast; however, it is home to as many species of shark as our shallow waters. Sharks suited for life in the abyss utilize different specializations to thrive in such a harsh environment. For example, it can be difficult to find food in a dark and desolate environment, but many sharks living in deep dark waters have specialized eyes that are either green in color and/or very large, to maximize eyesight. All sharks have a tapetum lucidum in their eyes for seeing in low-light conditions. This tapetum lucidum is what gives cats and dogs the "red eye" effect in photographs. Another cool specialization includes light production. North Carolina is home to multiple species of lantern sharks, which possess small organs on their body known as photophores that emit a glowing light. Light emitted from the shark's belly helps break up its silhouette in case a predator is lurking below, looking up for a meal. Another example includes multiple species of dogfish, which have thick spines on their dorsal fins to defend themselves from a hungry larger predator. At least 10 species of sharks in North Carolina have defensive spines.

Because sharks have adapted and are well suited to their environment, they have persisted successfully through time. Some species even look the same as they did when they first speciated, like our native deep-water dweller, the bluntnose sixgill shark (*Hexanchus griseus*).

If you are wondering about the history of skates and rays, known as batoids, they start to appear in the fossil record during the Jurassic period, about 150 million years ago. It is generally agreed upon that batoids are derived from ancestral sharks, so overall, skates and rays are geologically younger than their "cousins."

Sharks, skates and rays, collectively known as Elasmobranchs, are in fact a kind of fish, called cartilaginous fishes. The main difference between cartilaginous fishes (Chondrichthyes) and bony fishes (Osteichthyes) is the makeup of the skeleton. Sharks have a basic skeletal form: a "skull" (which is actually called the chondrocranium), a spine, a pectoral girdle and a pelvic girdle. The skeletal components of Elasmobranchs are all formed via prismatic calcified cartilage, which is a unique characteristic. Why do they have this? Although the shark's bones calcify and get harder over time, they are still more flexible and lighter in weight than true bone, which is advantageous for Elasmobranchs and their life history.

When sharks are first born, their cartilage is very soft and flexible, like a gummy shark (which is an actual common name for an Australian species of shark). Apart from the skeleton, there are many other identifying characteristics that separate Chondrichthyans from Osteichthyans, the most obvious to us being sharks generally have five to seven visible gill slits on each side of the head, whereas bony fish have a half-circle shaped cover, called the operculum, over their gills.

Sharks, skates and rays have a very long and rich geologic history. Ancestral sharks started appearing in the fossil record over 400 million years ago during the Devonian period, nicknamed the "age of fishes." Extant (living) sharks we see today have changed very little over the past 65 million years. When it comes to shark science, studying extinct species can be difficult due to their cartilaginous nature. Even though their cartilaginous skeleton calcifies over time, it does not fossilize well. Most of our knowledge of extinct sharks is derived from studying teeth and dermal denticles (shark scales); however, the occasional perfectly preserved articulated fossil may pop up and allow us to visualize what the shark actually looked like.

While it is easier to identify the differences between a shark, skate and ray from other fish, it is lesser known what separates a shark from a skate or ray. Skates and rays are sometimes affectionately nicknamed "sea pancakes" because they are dorsoventrally flattened, like a pancake. Most sharks are not, but some species are, which can lead to confusion. Sharks that may look like rays, but aren't true rays, will always have pectoral fins that are not fused to their head like the "wings" of a ray or skate. The mouth of a "flat shark" is generally terminal (at the end of the head) and not ventral (underside of the body) as it is in some rays and skates. One

example is a species actually native to North Carolina—the Atlantic angel shark (*Squatina dumeril*). These flattened, camouflaged sharks are the color of sand and are almost diamond shaped. Occasionally, during certain times of the year, I will receive calls and messages about weird-looking creatures washing up on the beach, and quite often it is an angel shark.

Eastern North Carolina is a beautiful place. I was born and raised here and have loved the water since I can remember. I got my first book about sharks from the gift shop at the Maritime Museum in Beaufort about 11 years ago. Since then, I have been hooked on sharks and shark research. Why? Sharks are fascinating, and they get a bad rap. Sharks are extremely diverse and occupy every oceanic habitat. From the North Pole to the South Pole, sharks are keeping our aquatic environments healthy and stable.

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Real Estate News

By Marian Goetzinger, Pine Knoll Shores Realty



The care and feeding of your private septic tank

Until I moved to Pine Knoll Shores 25 years ago, I never thought about a septic tank. I used my laundry room, kitchen and bathroom with blissful ignorance. Whatever happened to the dirty water and other stuff that went down the drains was a mystery to me. And then . . . I bought a house in Pine Knoll Shores.

What is a septic tank? A big concrete, plastic or fiberglass box buried in your yard. And what goes in it? Then what? Honey Wagon? You're kidding, right? Some people actually have jobs where they are paid enough to take the lid off that "thing" and clean it out. Actually, I'm not sure they are paid enough, but it's what they do.

So now you know. You very well may have a septic tank in your yard. Experts say you should have them pumped out every three to five years. Some people tell me they've had one for 25 to 30 years, never had it pumped and never had a problem with it. I've also had people tell me the first time they took a shower in their just-bought older home that raw sewage backed up into the shower. You really want to risk that?

Like everything else that goes along with home ownership, the septic tank requires proper care and maintenance. If you have a septic tank, you should not have a garbage disposal—but if you do, you need to be extremely picky about what goes into the disposal. One of the worst culprits for septic problems is grease. Do not pour the drippings from anything containing fat down the sink. Put it in a coffee can or plastic container, and put it in the trash for pickup. Vegetable peels, eggshells, coffee grounds and bones are all no-nos. In fact, if it's solid enough to pick up, do that and put it in the garbage, not the disposal.

My expert tells me that almost all families use way too much toilet paper, so maybe you can go a bit easier on that. Use enough, but not too much. Never throw baby wipes, cosmetic wipes, paper towels or personal hygiene products in the toilet . . . nothing but toilet paper, please—and only as much as you need.

My current home is almost five years old, and I just recently noticed all the signs that I'd waited too long to call the septic tank doctor. If you notice frequently backed-up drains, slow moving drains, frequent use of the plunger or gurgling noises from sinks or toilets, it's time. Call the Honey Wagon and be grateful that you don't have to do it yourself.

P.S. It's not way expensive, and it's not so bad. I grew up with an outhouse.