

Understanding the World's Ocean and Climate

Join NOAA Fisheries for an exploration of the ocean and climate, and how they interact. The series runs Thursdays through June 3.



Shorttraker rockfish hanging out in deep sea coral and sponges. Aleutian Islands, Alaska (Photo: Rebecca F. Reuter/NOAA Fisheries)

CHAPTER THREE

Studying marine life

Some ocean animals are a challenge to study because they live in places that are difficult to get to or because they have complex life cycles. Two such animals that NOAA Fisheries studies are rockfish and Dungeness crabs.

Rockfish

What do rockfish look like?

Calico, canary, chilipepper, china, copper, darkblotched, dusky, freckled, rosethorn, silvergray, tiger, vermilion and yelloweye — these are a few of over 60 species of rockfish that live along the West Coast from Mexico to Alaska. As their names suggest, rockfish are some of the most colorful fish in these waters. Rockfish are in the same family as scorpion fish and lionfish, both famous for their venomous spines. But don't worry, the rockfish you'll find along our coast are not venomous. Still, be careful

of their spines if you ever pick one up as they are sharp. Did you know these spines are important to scientists as one of the key characteristics used to tell the different species of rockfish apart?

Why study rockfish?

Many rockfish species are fished both commercially and for sport. Rockfish are especially sensitive to overfishing because they grow and mature slowly and begin to reproduce late in life compared to many other fish. It's important for scientists at NOAA Fisheries to learn where and how rockfish live to understand how to manage the fishery sustainably.

Where do rockfish live?

Each species of rockfish has its preferred habitat. They may live in the water column, in a kelp forest or on a rocky outcropping deep in the sea, and the young fish often live in a different place than the adults. In addition, rockfish may be solitary or live in schools of hundreds of fish.

How do rockfish reproduce?

Rockfish give birth to live young, rather than lay eggs. This means they are viviparous, like nearly all mammals, some reptiles and a few other fishes. Many rockfish species reproduce relatively late in life and only once a year. Because of this and other factors, rebuilding overfished rockfish populations will take many years.

How old do rockfish get?

The oldest rockfish (a rougheye rockfish off Alaska) aged by scientists was nearly 200 years old! Most rockfish, however, live to be 30 to 60 years old. Scientists can tell how old a rockfish is by counting the rings on its otoliths, which are ear bones. A new layer of bone is added to the otolith each year, and these can be counted like the rings on a tree.

Did You Know?
To study animals in unique habitats, we have to use unique equipment such as remotely operated vehicles, radio tags and submersibles.



A submersible getting ready to study rockfish habitat in Alaska. (Photo: Rebecca F. Reuter/NOAA Fisheries)

Dungeness Crab

What do Dungeness crabs look like?

They have a skeleton on the outside of their body! Like other arthropods, including insects and spiders, they have a thick, strong exoskeleton that supports their body and protects them from predators. They can weigh up to 3 pounds and measure up to 9 inches across the carapace. They have eight walking legs and two claws that they use to capture food and protect themselves.

Why study Dungeness crabs?

Dungeness crabs are good to eat and support both commercial and sport fishing activities. Scientists are studying whether the crab's hard shell makes them vulnerable to changes in ocean acidity caused by climate change. The ocean absorbs carbon dioxide, increasing the acidity of the water, which might cause the shell to dissolve.

Where do Dungeness crabs live?

They live in shallow coastal waters on the West Coast of North America, from Southern California all the way to Alaska. They live as deep as 600 feet beneath the ocean but prefer shallow areas with sand, mud or sea grasses. Estuaries and bays such as Willapa Bay and Grays Harbor in Washington state are important "nursery" areas for juvenile crabs to grow to adulthood.

How do they reproduce?

A male Dungeness crab is attracted to a female's pheromones (chemical scents). Once he finds her, he will hold her in a pre-mating embrace for up to seven days until she sheds her shell, or molts. The male then deposits his sperm and the female crab stores it until her eggs have fully developed. The male may stay with the soft-shelled female for up to two days to protect her from predators and prevent her from mating with other males. A large female Dungeness crab



Dungeness crab at the Farallones National Marine Sanctuary. (Photo: NOAA)

can carry 2.5 million eggs — with this many babies, at least a few are likely to reach adulthood and reproduce again!

What do young Dungeness crabs do?

After hatching, larval crabs (zoea), which are tiny and look nothing like their parents, live in the water column as plankton — drifters — for up to a year before settling on the sea floor and becoming adult crabs. Crabs don't grow constantly like humans. Because they have a hard exoskeleton they get bigger by periodically shedding their shell, or molting.

Next week join us to discover how U.S. seafood gets from the ocean to the marketplace.

Additional Resources:

www.oceanliteracy.wp.coexploration.org/?page_id=167

Rockfish Memory Game:

www.afsc.noaa.gov/Rockfish-Game/gamemenu.htm

Additional activities can be found at www.seattletimes.com/nie in the Featured Content section.

For questions about this series, e-mail afsc.outreach@noaa.gov

Principles

Ocean Literacy Principle 5

The ocean supports a great diversity of life and ecosystems.

Climate Literacy Principle 3

Life on Earth depends on, is shaped by and affects climate.