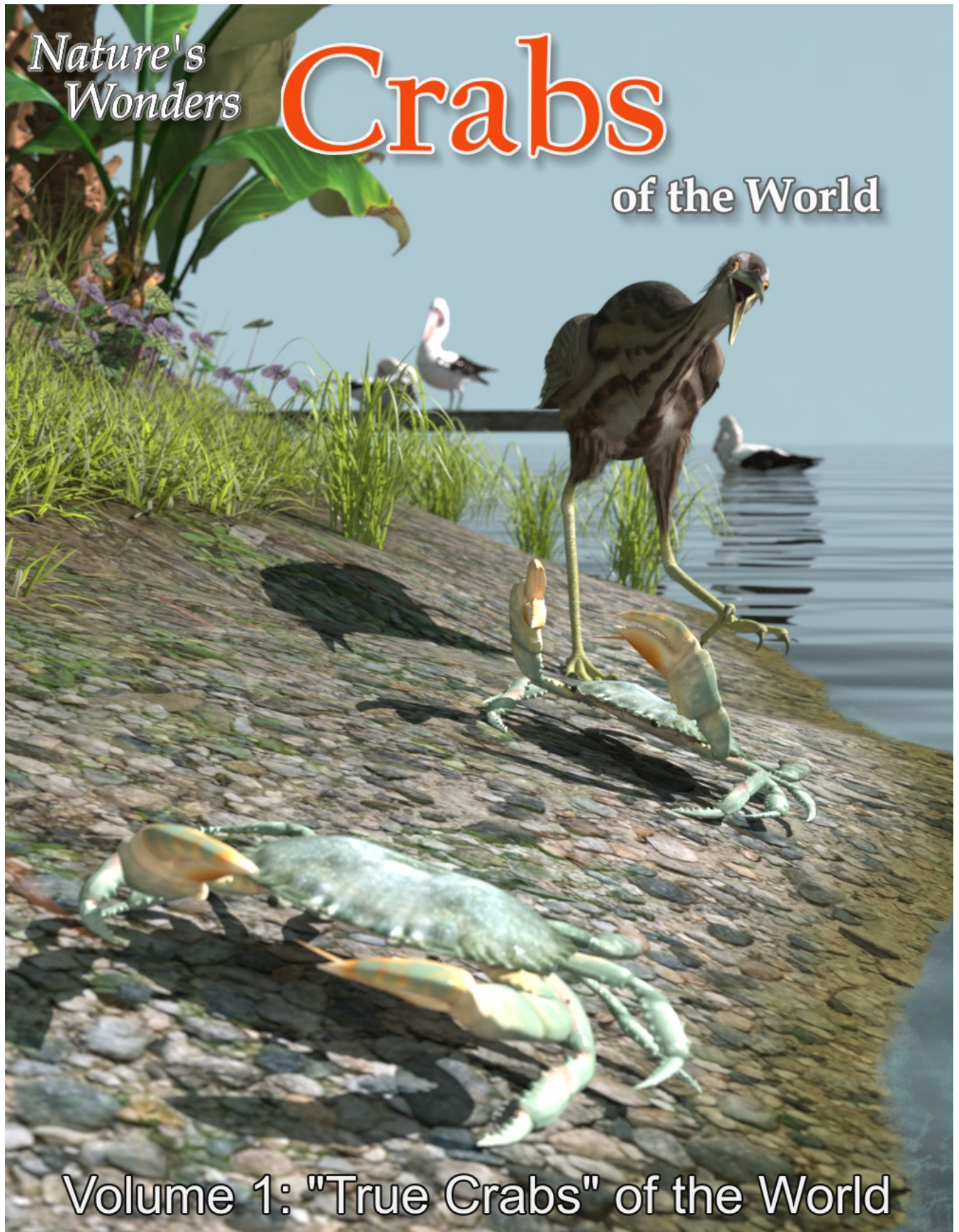




3D model set by Ken Gilliland

Nature's Wonders

Crabs of the World

Volume 1

Manual

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Introduction

This set is an add-on volume for Nature's Wonders Crab and includes 7 different crab species. It includes such "True Crabs" as the colorful and showy Blue, the European Green, and the Purple Shore Crabs. There also favorites such as the Red and Pacific Rock Crabs and the Mud Crab.

True crabs belong to the infraorder *Brachyura*, which is a part of the order *Decapoda*. This infraorder is incredibly diverse, comprising over 7,000 species that range from the tiny pea crab to the massive Japanese spider crab. True crabs are characterized by their sturdy, broad bodies and four pairs of walking legs, with the fifth pair being modified into a pair of claws. These claws are not only used for defense but also play a crucial role in capturing prey, mating, and even communicating with other crabs.

False crabs, on the other hand, do not belong to the infraorder *Brachyura* but are instead found in other infraorders within the order *Decapoda*. The most common false crabs are the anomurans, which include hermit crabs, king crabs, and squat lobsters. Despite their name, false crabs are not "false" in the sense that they are not crabs at all; rather, they are crustaceans that have evolved crab-like features independently of true crabs. This phenomenon is known as convergent evolution, where unrelated species develop similar traits in response to similar environmental pressures.

It comes in both Poser and DAZ Studio native versions and support Firefly, 3Delight, Superfly and Iray render engines.

Overview and Use

This set uses a common model to digitally recreate digitally the crab species included in this volume. Each species uses specific morphs from the generic model to single-out its unique features.

- **Models included in this volume:**
 - **None.** The Nature's Wonders Crab (purchased separately) is required to use this product.

The set is located within the **Animals : Nature's Wonder** folder. Here is where you will find a number of folders, such as **Manuals**, **Resources** and **Fauna Libraries**. Let's look at what is contained in these folders:

- **Fauna Libraries:** This folder holds the actual species and poses for the "premade" fauna. The fauna for this set can be found in the following folder(s):
 - **Crustaceans / Crabs of the World**
- **Manuals:** Contains a link to the online manual for the set.
- **Props:** Contains any props that might be included in the set
- **Resources:** Items in this folder are for creating and customizing your fauna included in the set

Creating a Specific Crab using Poser

1. For this example, we'll create the Dungeness Crab.
2. Load Poser, select the FIGURES library and go to the "Animals", "Nature's Wonders" and then the Nature's Wonders Fauna Libraries Crustaceans folder.
3. Go to the Crabs of the World folder and select the Firefly or Superfly sub-folder.
4. Select the Dungeness Crab (or a Crab of your choice) and load it by clicking the mouse.

Creating a Specific Crab using DAZ Studio

1. For this example, we'll create the Dungeness Crab.
2. Load DAZ Studio and go to the "Animals", "Nature's Wonders" and then the Nature's Wonders Fauna Libraries Crustaceans folder.
3. Go to the Crabs of the World folder and select the Iray or 3Delight sub-folder.
4. Select the Dungeness Crab (or a Crab of your choice) and load it by clicking the mouse.

Using the Poses

The poses were designed for the default model. The base or "hip" section of the model is **Cephalothorax**. The poses were designed for the default base model. Since individual species may use different body and leg scaling, it may alter the expected ground level of the species model or its legs. Some adjusting may be necessary such as using the "ytran" dial to raise or lower the model or the Up-Down commands on the individual legs to raise or lower them to the desired heights.

Nature's Wonders

Crabs of the World

Volume 1

FIELD GUIDE

Blue Crab

European Green Crab

Graceful Crab

Mud Crab

Pacific Rock Crab

Purple Shore Crab

Red Rock Crab

About Crabs

Crabs are a type of decapod crustacean and are part of the infraorder **Brachyura**. Their exoskeleton is often thickened and hard. They generally have five pairs of legs, and they have "pincers" or "claws" on the ends of the frontmost pair, scientifically termed the "chelae". They are present in all the world's oceans, in freshwater, and on land, often hiding themselves in small crevices or burrowing into sediment. They are found in all of the world's oceans, as well as in fresh water and on land, particularly in tropical regions. About 850 species are freshwater crabs.

Crabs vary in size from the pea crab, a few millimeters wide, to the Japanese spider crab, with a leg span up to 4 m (13 ft). Several other groups of crustaceans with similar appearances – such as king crabs and porcelain crabs – are not true crabs, but have evolved features similar to true crabs through a process known as carcinisation.

Crabs are omnivores, feeding on a variety of food, including a significant proportion of algae, as well as detritus and other invertebrates. Crabs are also widely consumed by humans as food, with over 1.5 million tons caught annually.

Crabs often show marked sexual dimorphism. Males often have larger claws. Another conspicuous difference is the form of the pleon (abdomen); in most male crabs, this is narrow and triangular in form, while females have a broader, rounded abdomen. This is because female crabs brood fertilized eggs on their pleopods.

Crabs must periodically molt to grow and this process is called ecdysis. Molting has the ability to regenerate lost limbs, although they will be smaller the first molt after loss. During a molt, the shell will separate where the carapace and abdomen meet. This allows the crab to exit the old shell. Once outside the old shell the soft new shell will fill with water and the crab will become 15-25% bigger than its original size. During the first few weeks after molting, the crab is very vulnerable due to the softness of its shell; the shell will not fully harden for two months after molting. For the first two years of a crab's life, it will molt six times a year. In the third year, males molt twice and females molt once. After that, all crabs will molt once a year, with females molting in the spring and males molting in the summer.

Blue Crab

Callinectes sapidus

It commonly known as the blue crab, Atlantic blue crab, or, regionally, the Maryland blue crab, and a species of crab native to the waters of the western Atlantic Ocean and the Gulf of Mexico, and introduced internationally. It is of considerable culinary and economic importance in the United States, particularly in Louisiana, the Carolinas, the Chesapeake Bay, Delaware, and New Jersey. It is Maryland's largest commercial fishery and has been designated its state crustacean.



Due to overfishing and environmental pressures some of the fisheries have seen declining yields, especially in the Chesapeake Bay fishery. Although, unlike the other fisheries affected by climate change, blue crab is expected to do well; warming causes better breeding conditions, more survivable winters, and a greater range of habitable areas on the Atlantic coast. Whether this will have negative effects on the surrounding ecosystems from an increased crab population is still unclear.

Blue crabs may grow to a carapace width up to 9 inches (230 mm). The species exhibit sexual dimorphism. Males and females are easily distinguished by the shape of the abdomen (known as the "apron") and by color differences in the claws. The abdomen is long and slender in males, but wide and rounded in mature females. Claw color differences are more subtle than apron shape.

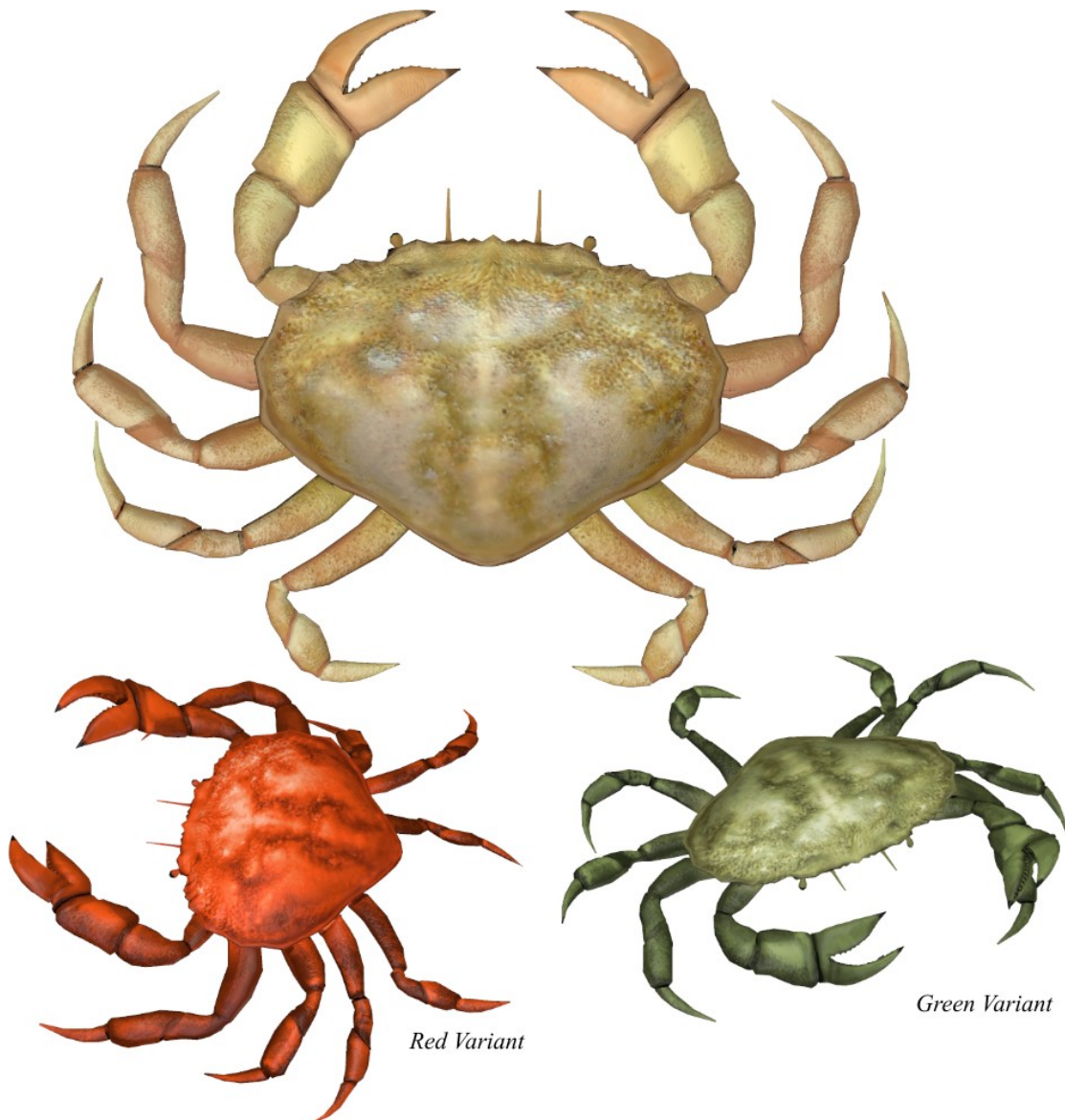
The immovable, fixed finger of the claws in males is blue with red tips, while females have orange coloration with purple tips.

Some of its natural predators include eels, drum, striped bass, spot, trout, some sharks, humans, cownose rays, and whiptail stingrays. It is an omnivore, eating both plants and animals. It typically consumes thin-shelled bivalves (such as clams, mussels, and oysters), crustaceans, annelids, small fish, plants (such as eelgrass), and nearly any other item it can find, including carrion and animal waste. In salt marshes, it will eat marsh periwinkles during high tides.

European Green Crab

Carcinus maenas

It is known by different names around the world. In the British Isles, it is generally referred to as the shore crab or green shore crab. In North America and South Africa, it bears the name European green crab. It is a widespread invasive species, listed among the 100 of the World's Worst Invasive Alien Species. It is native to the north-east Atlantic Ocean and Baltic Sea, but has colonized similar habitats in Australia, South Africa, South America, and both Atlantic and Pacific Coasts of North America.



It grows to a carapace width of about 3.5 inches (90 mm). The color varies greatly, from green to brown, gray, or red. This variation has a genetic component, but is largely due to local environmental factors. In particular, individuals which delay molting become red-colored rather than green. Red

individuals are stronger and more aggressive, but are less tolerant of environmental stresses, such as low salinity or hypoxia. Juvenile crabs on average display greater patterning than adults.

It feeds on a variety of mollusks, worms, and small crustaceans, affecting a number of fisheries. Its successful dispersal has occurred by a variety of mechanisms, such as on ships' hulls, sea planes, packing materials, and bivalves moved for aquaculture. To protect itself against predators, it uses different camouflage strategies depending on its habitat. Those found in mudflats try to resemble their surroundings with colors similar to the mud, while crabs in rock pools use disruptive coloration.

Due to its potentially harmful effects on ecosystems, various efforts have been made to control introduced populations of this crabs around the world. In Edgartown, Massachusetts, a bounty was levied in 1995 for catching it to protect local shellfish, and over 10 tons were caught. There is some evidence that the Blue crab (in eastern North America) has able to control populations.

Graceful Crab

Metacarcinus gracilis

It is known as the Graceful Crab, Graceful Rock Crab or Slender Crab. It is endemic to the Pacific Ocean and has been caught from Alaska to Bahía Magdalena in Baja California Sur.

*Its carapace is usually olive brown, and its legs vary from yellowish brown to purple. It only grows to a width of about 3.5 inches (90 mm) and can resemble a juvenile Dungeness Crab (*Metacarcinus magister*).*



*Larvae and small juveniles of this species are often seen riding jellyfish, especially *Phacellophora camtschatica*. The juvenile crabs steal food from the jellyfish and also clean off parasitic amphipods.*

Mud Crab

Scylla serrata

It is often called the mud crab or mangrove crab, although both terms are highly ambiguous, and black crab). It is an ecologically important species of crab found in the estuaries and mangroves of Africa, Australia, and Asia. The natural range is in the Indo-Pacific. It is found from South Africa, around the coast of the Indian Ocean, where it is especially abundant in Sri Lanka, to the Southeast Asian Archipelago, as well as from southern Japan to south-eastern Australia, northern New Zealand, and as far east as Fiji and Samoa. The species has also been introduced to Hawaii and Florida. In Hawaii, mud crabs are colloquially known as Samoan crabs, as they were originally imported from American Samoa. As these crabs are known for their robust size and dense meat content, they have been greatly sought after over the years. As a result of overcrabbing, local government efforts have restricted harvesting of crabs smaller than 6 inches (width across back) and to harvest females of any size is illegal.



In their most common forms, their shell colors vary from a deep, mottled green to very dark brown. They can have a shell width up to 10 inches (260 mm) wide.

These crabs are highly cannibalistic in nature, especially when they undergo molting; other hard-shelled ones sometimes attack the softer shelled molting crabs and devour them. The females can give birth to a million offspring.

Pacific Rock Crab

Romaleon antennarium

It is commonly known as the Pacific, brown or California rock crab. It is found on the western coast of North America. It is harvested by sport and commercial fishermen in California, mostly from Morro Bay south.

*Males can reach up to 7 inches (178 mm) across the carapace, while females typically grow to about 5.8 inches (147 mm). This species is easily confused with the red rock crab (*Cancer productus*). They can be distinguished by the less prominent antennae, less robust claws, and lack of ventral spots on the latter.*



*It is common in the low rocky intertidal waters and is often found under rocks, sometimes partly buried in sand under the rocks. Food includes scavenged bits and animals such as *Chlorostoma funebris* and hermit crabs. It captures the hermit crabs by gradually chipping away the edges of the hermit's shell until the hermit crab has nowhere else to hide.*

Purple Shore Crab

Hemigrapsus nudus

It is also known as the the Naked Shore Crab. It is indigenous to the west coast of United States, Canada, and Mexico.

The purple shore crab is generally a dark purple color with olive green, red, and white spots. It is a very small crab, reaching sizes of approximately 1.6–2.2 inches (40–56 mm) in width.



Adult crabs mainly feed on algae but will occasionally scavenge other animals. It prefers inter-tidal and sub-tidal zones, and it can oftentimes be found sheltering under rocks or other debris. It demonstrates complex compensatory mechanisms to counteract fluctuating salinity and water oxygen concentrations, permitting it to live in a variety of different environments.

Red Rock Crab

Cancer productus

It is found on the western coast of North America. This species is commonly nicknamed the “Pearl of the Pacific Northwest”. It ranges from Kodiak Island, Alaska, to Isla San Martine, Baja California. It inhabits mid-intertidal waters to 79 m depth. It is harvested by sport and commercial fishermen in California, mostly from Morro Bay south. It is not as sought after as Dungeness crab due to the considerably lower amount of flesh. However, the flesh has a delicate flavor and slightly sweet taste.



The carapace is up to 7.9 inches (200 mm) wide. The pincers are large with distinctive black tips. This species lacks serrations or projections on the ventral side of the claws. Adults have a brick-red coloration throughout. The coloration of juveniles is diverse, often white, sometimes with red spots, or zebra-striped.

*It is carnivorous; in Puget Sound it will crush barnacles with its large pincers for consumption. Small living crabs and dead fish are also eaten. Mating in this species occurs when the female is soft-shelled from October to June in Puget Sound. The male can often be seen guarding females until molting during this time. This species is known to be a favorite prey item of the giant Pacific octopus (*Enteroctopus dofleini*).*

Special Thanks to...

....my betatesters Alisa and FlinHawk

Species Accuracy and Reference Materials

The author-artist has tried to make these species as accurate to their real life counterparts as possible. Crabs of the same species vary considerably, as do all other animals in nature. These Crabs were created using the correct field markings and the most common similarities.

With the use of one generic model to create dozens of unique Crab species, some give and take is bound to occur. In addition, 3D-models have many technical challenges, which make exact representations difficult, if not impossible. It's best to think of these Crabs represented as resembling the particular species, and they may not, in some cases, be 100% scientifically accurate.

The model and morphs were created using Luxology's Modo. The texture maps were created in Corel's Painter. The model was rigged and materials were created in Smith-Micro's Poser and DAZ's DAZ Studio.

Internet Sources:

- **Wikipedia** (<http://www.wikipedia.com>)
- **Encyclopedia Britannica** (<https://www.britannica.com>)
- **iNaturalist** (<https://www.inaturalist.org/>)