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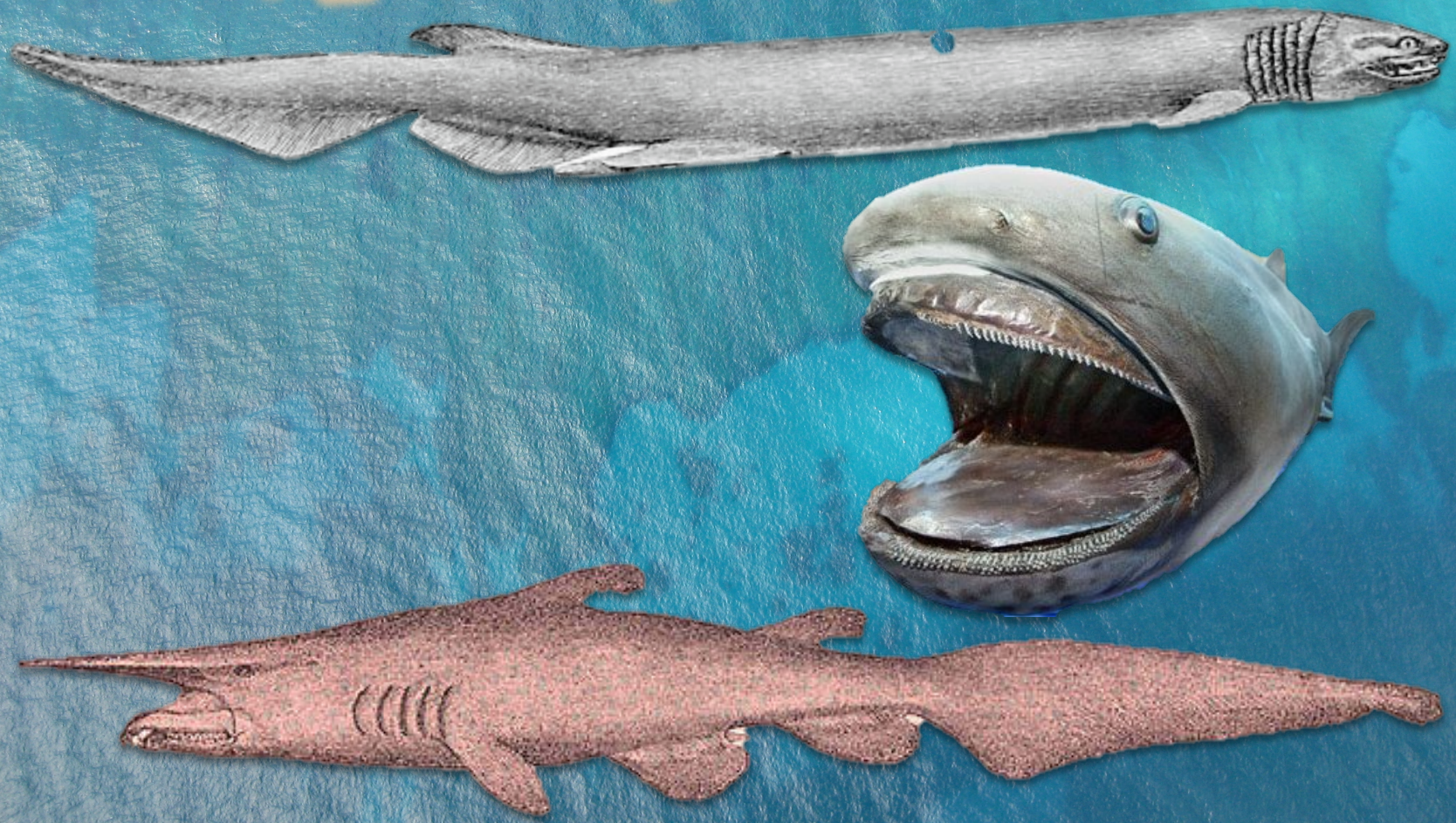
Deep Sea Sharks: Megamouth, Goblin & Frilled



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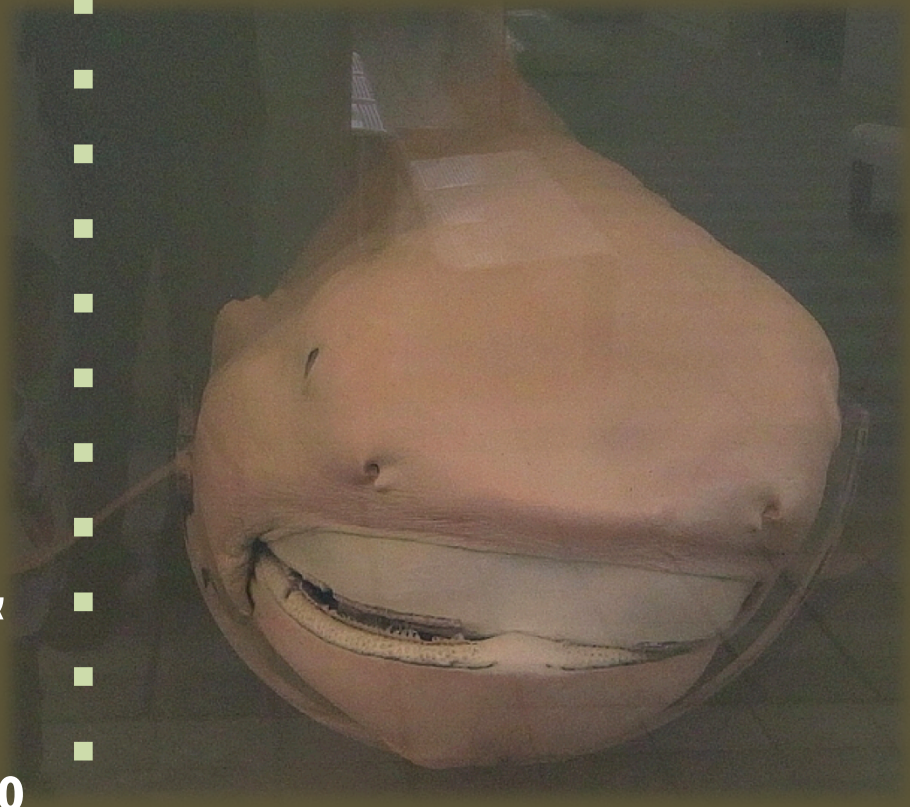
Family Megachasmidae: The Megamouth Shark

The Megamouth Shark *Megachasma pela*

- Rare deepwater shark species
- Smallest of 3 extant planktivorous sharks, besides whale shark & basking shark
- Discovered in 1976
- Since January, 2015 - only 60 specimens caught or sighted including three recordings on film
- Swims with enormous mouth wide open, filtering water for plankton & jellyfish
- Large head with rubbery lips
- Habitat - open ocean, depths of 150 to 1,000 meters (492 – 3280 feet)



A Megamouth. Image credit: OpenCage

Megamouth Shark Geographic Range

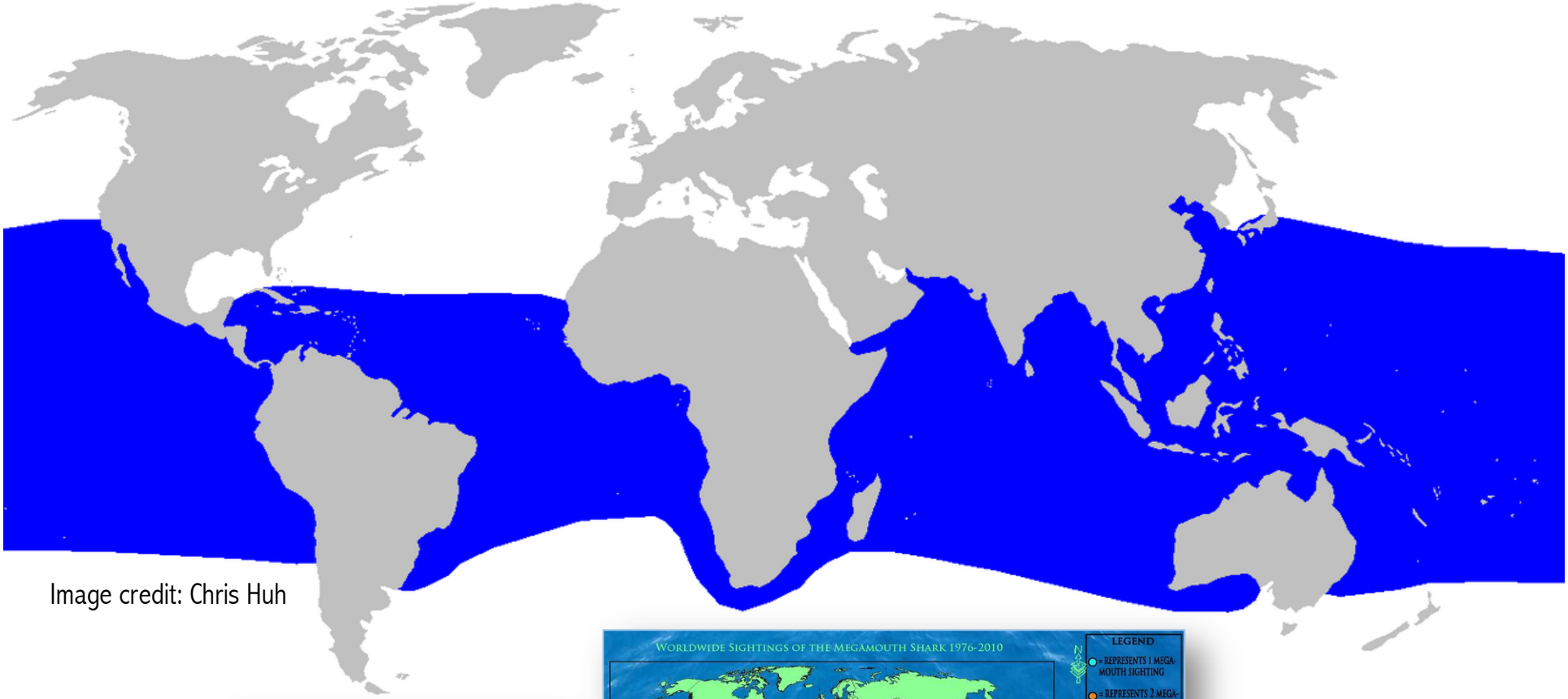
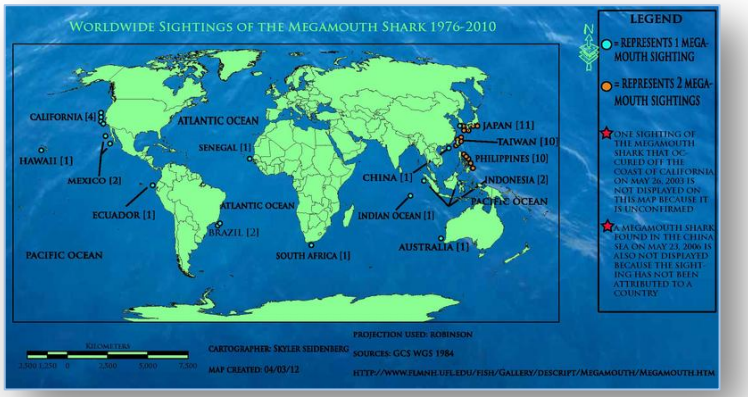


Image credit: Chris Huh

A washed up Megamouth. Image credit: Sharkmans World.



World sightings of the Megamouth. Image credit: Skyler30.

Megamouth Shark Description

- Brownish-black color on top, white underneath, asymmetrical tail with long upper lobe
- Gills - interior of slits lined with finger-like gill rakers that capture food
- Soft, flabby, stout body, long, wide bulbous head
- Lacks caudal keels
- Less active than other filter-feeding sharks
- Length - 5.5 meters (18 ft.); males mature by 4 m (13 ft.); females by 5 m (16 ft.)
- Weight - up to 1,215 kg (2,679 lb.) reported
- Mouth - up to 1.3 m (4 ft. 3 in) wide; surrounded by luminous photophores; may act as lure for plankton or small fish

Megamouth Shark Feeding

- Vertical migrations – spend day in deep water and ascend to midwater at night; likely response to prey species movement such as krill
- Most likely feed by swimming through small prey groups with mouths open

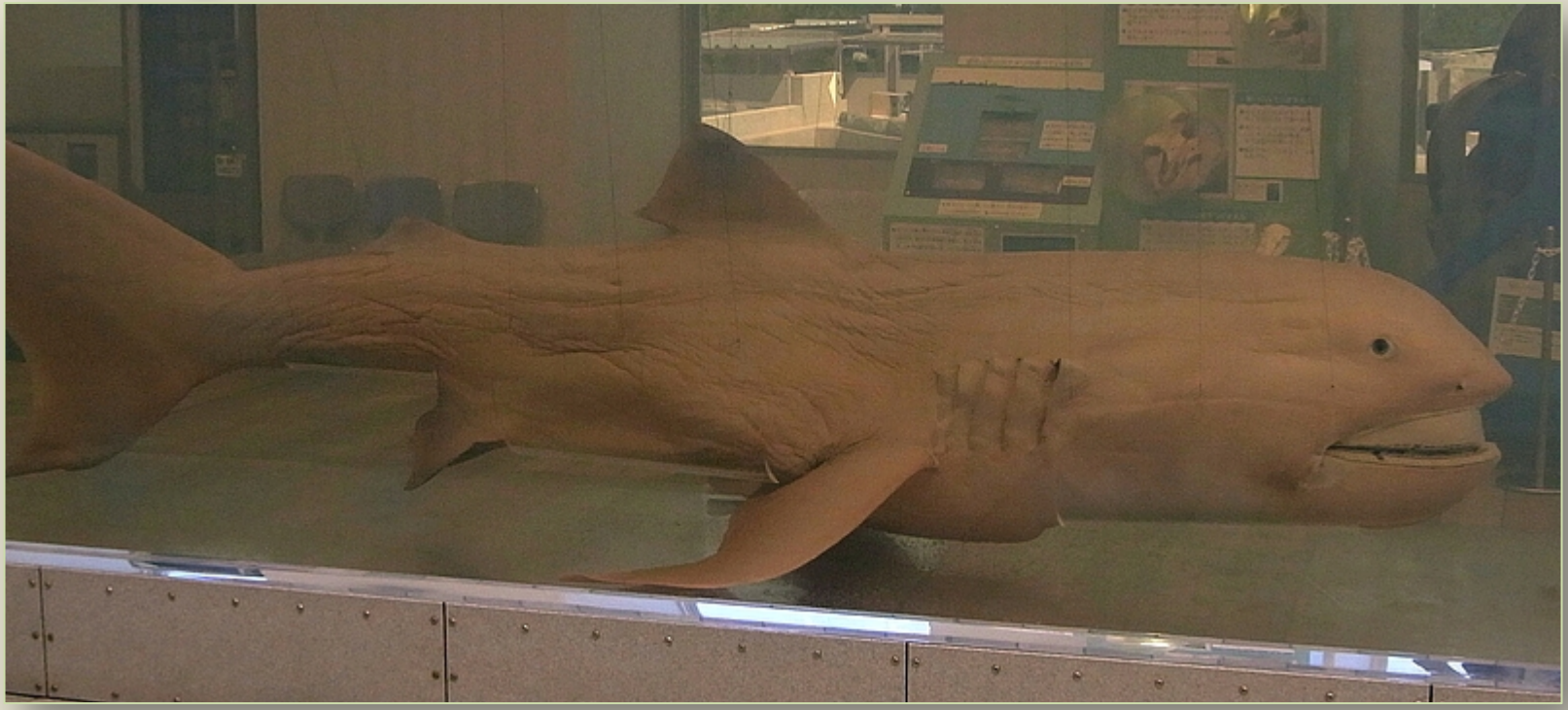


Image credit: OpenCage

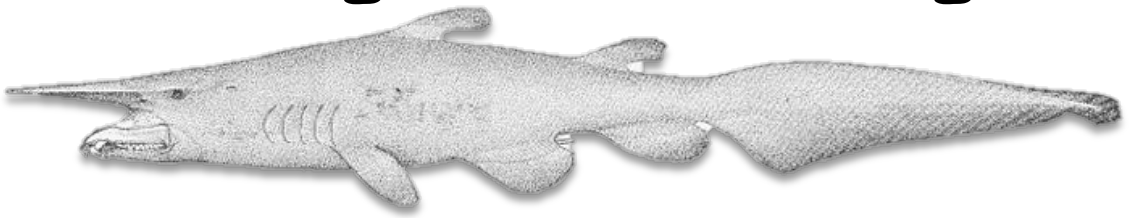
Family Mitsukurinidae: The Goblin Shark

Image credit: Dianne Bray / Museum Victoria.

The Goblin Shark *Mitsukurina owstoni*

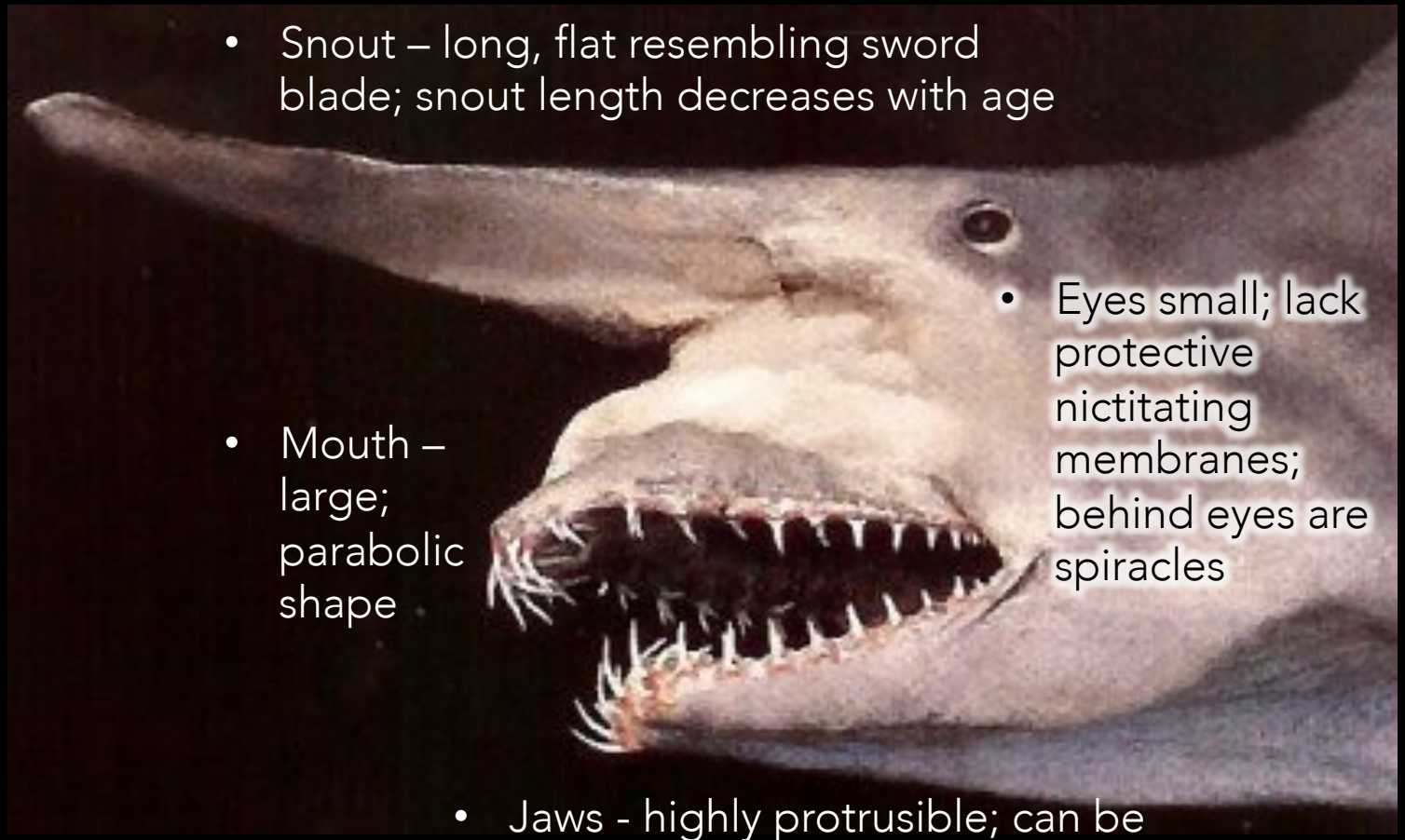
- Rare deep-sea shark species sometimes called a "living fossil"
- Only existing representative of family Mitsukurinidae
- Pink-skinned, elongated, flattened snout, highly protrusible jaws containing prominent nail-like teeth
- Long snout covered sensory organs to sense minute electric fields produced by nearby prey; prey snatched by by rapidly extending jaws
- Size – typical adult length: 3 to 4 m (9.8 and 13.1 ft.) long; in 2000, enormous female estimated at 5.4–6.2 m (18–20 ft.) long showed species can grow far larger than previously suspected
- Maximum weight on record - 210 kg (460 lb.) for 3.8-m-long shark
- Inhabit upper continental slopes, submarine canyons, and seamounts worldwide at depths greater than 100 m (330 ft.); adults found deeper than juveniles

Goblin Shark Geographic Range



Map created by Yzx.

Goblin Shark Physical Characteristics



- Snout – long, flat resembling sword blade; snout length decreases with age
- Eyes small; lack protective nictitating membranes; behind eyes are spiracles
- Mouth – large; parabolic shape
- Jaws - highly protrusible; can be extended almost to snout end, though normally held flush against head underside

Goblin Shark Physical Characteristics II

- Flabby body, small fins, suggest sluggish nature

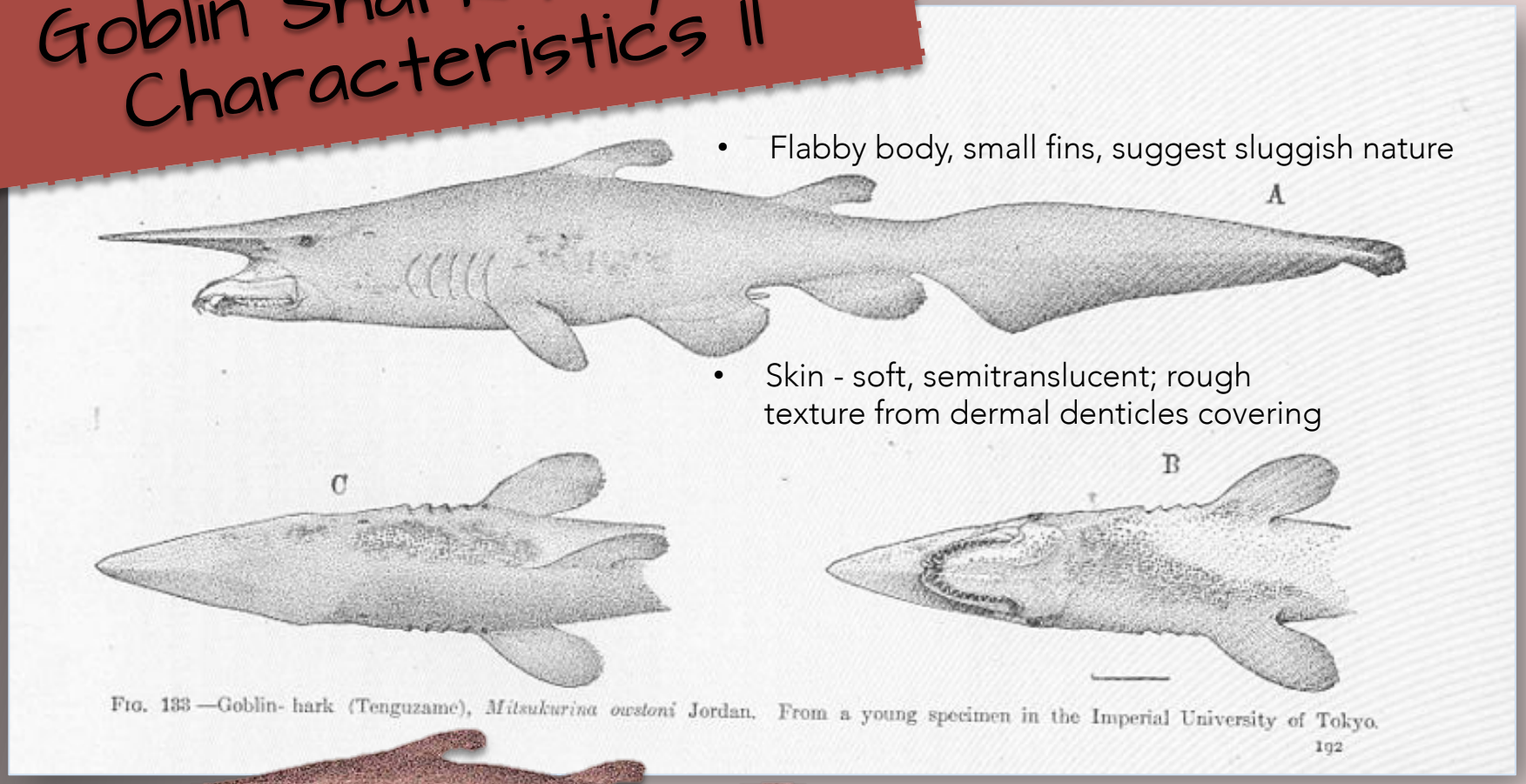


Fig. 133.—Goblin- hark (Tenguzame), *Mitsukurina owstoni* Jordan. From a young specimen in the Imperial University of Tokyo.

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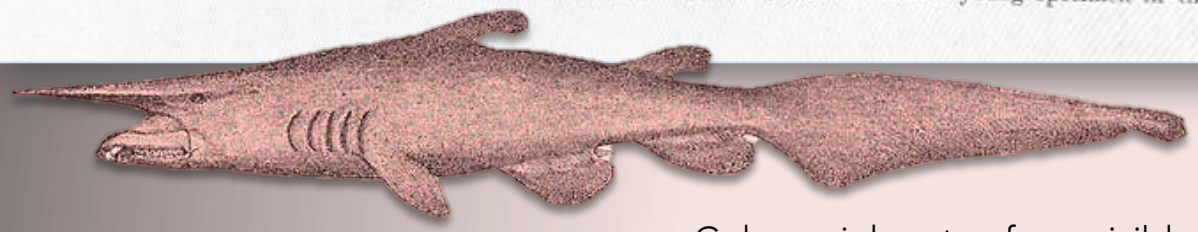
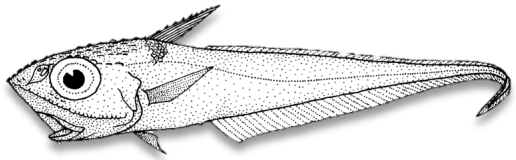
- Skin - soft, semitranslucent; rough texture from dermal denticles covering



- Color - pink or tan from visible blood vessels beneath skin; color deepens with age; young sharks can be almost white

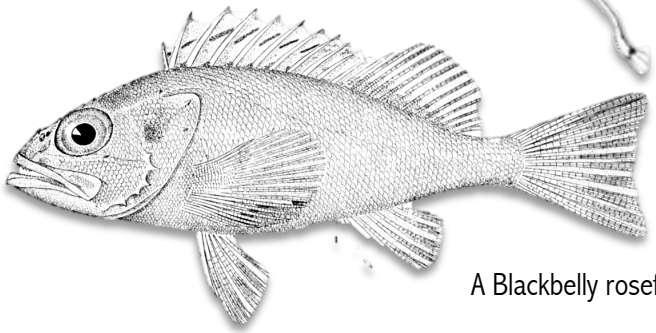
Goblin Shark Diet

- Main food rattails, dragonfishes & other deep-living teleosts
- Crustaceans - including decapods & isopods
- Garbage found in some specimens stomachs
- Cephalopods - blackbelly rosefish (*Helicolenus dactylopterus*), and midwater species such as the squid *Teuthowenia pellucida* and ostracod *Macrocypridina castanea rotunda*
- Forages near sea floor & far above it
- Slow swimmer; probably ambush predator
- Low-density flesh & large oily liver make it neutrally buoyant; allows drifting towards prey; minimal motions avoiding detection



Ridge scaled rattail

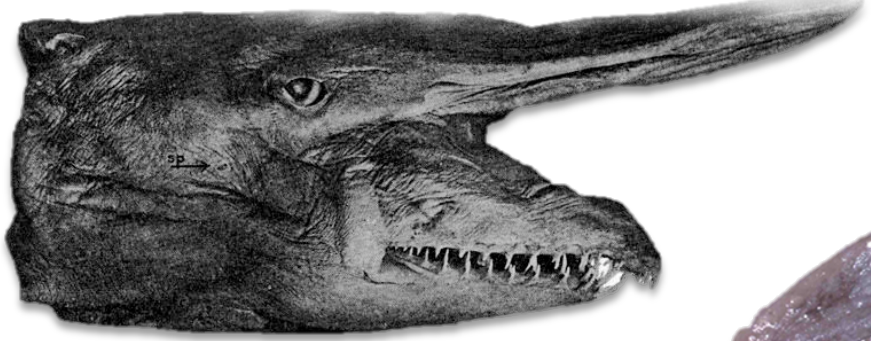
A Scaly dragonfish

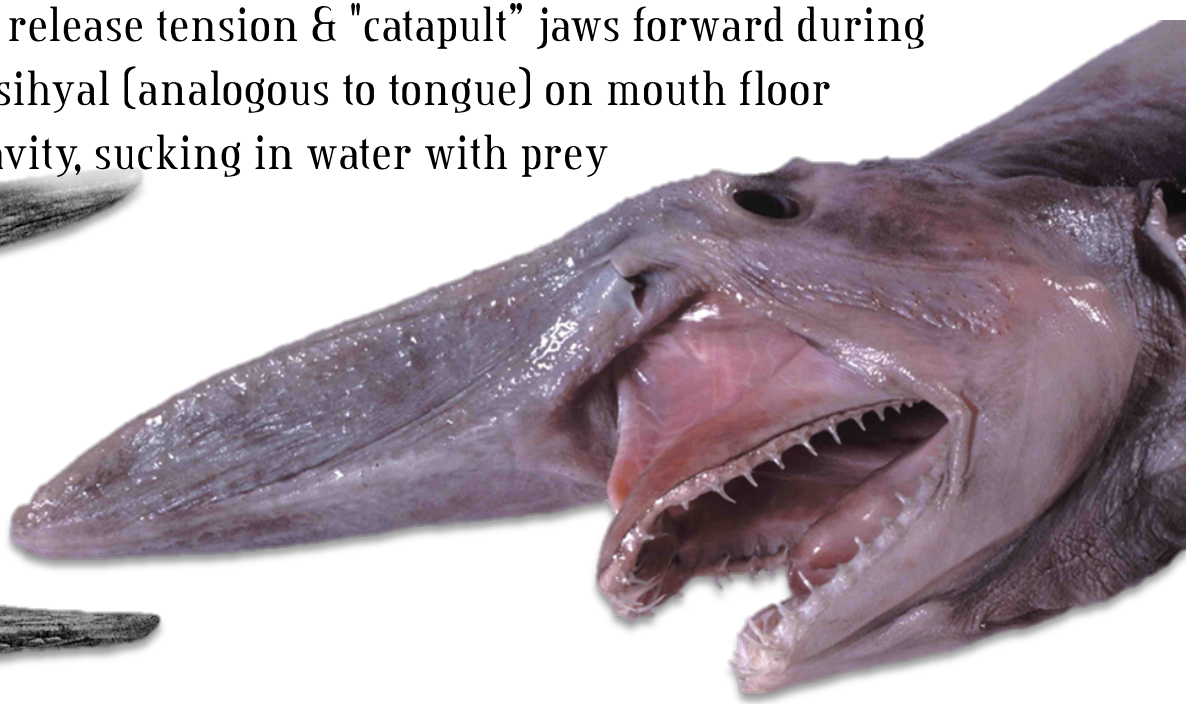


A Blackbelly rosefish

The Goblin Shark's Specialized Jaws

- Specialized jaws can snap forward capturing prey
- Jaw protrusion assisted by two pairs of elastic ligaments associated with mandibular joint pulled taut when jaws in normal retracted position
- When it bites, ligaments release tension & "catapult" jaws forward during which well-developed basihyal (analogous to tongue) on mouth floor drops, expanding oral cavity, sucking in water with prey





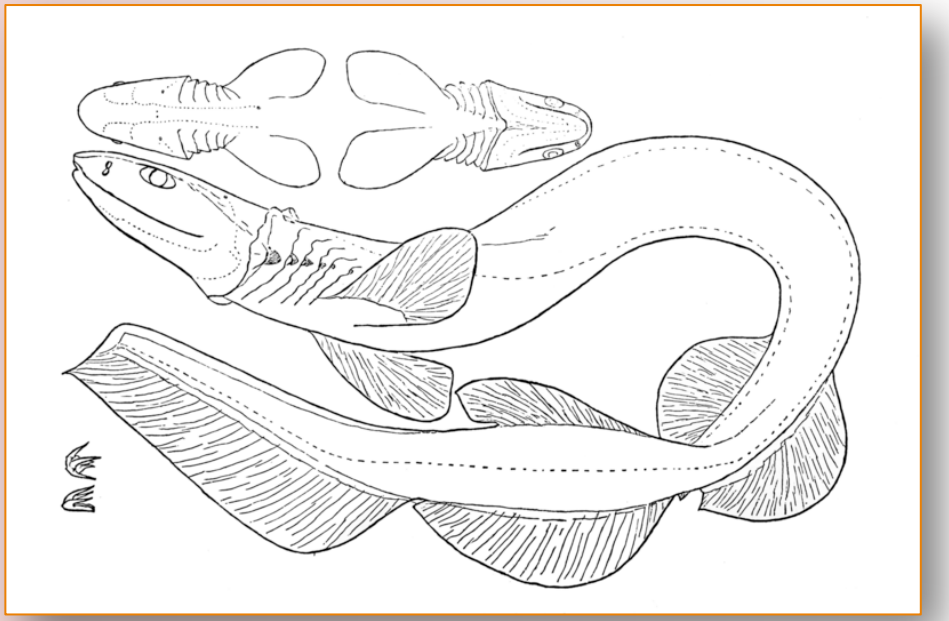
Images credit: Banner: Dover Designs; black & white Goblin shark in the public domain. Color Goblin shark by Dianne Bray.

Family Chlamydoselachidae
Frilled Shark

The Frilled Shark *Chlamydoselachus anguineus*

- 1 of 2 shark species in family Chlamydoselachidae
- Geographic range - wide, patchy distribution in Atlantic & Pacific Oceans
- Found over outer continental shelf & upper continental slope, generally near bottom; evidence of substantial upward movements
- Caught as deep as 1,570 m (5,150 ft.), although uncommon below 1,200 m (3,900 ft.)

- Length - 2 m (6.6 ft.)
- Dark brown, eel-like body with dorsal, pelvic, and anal fins placed far back
- May capture prey by bending body & lunging forward like snakes
- Occasional by-catch with little economic value
- IUCN listing - Near Threatened; incidental catches may deplete population given low reproductive rate



A Frilled shark showing it's "frilled" gills & body form. Image in the public domain.

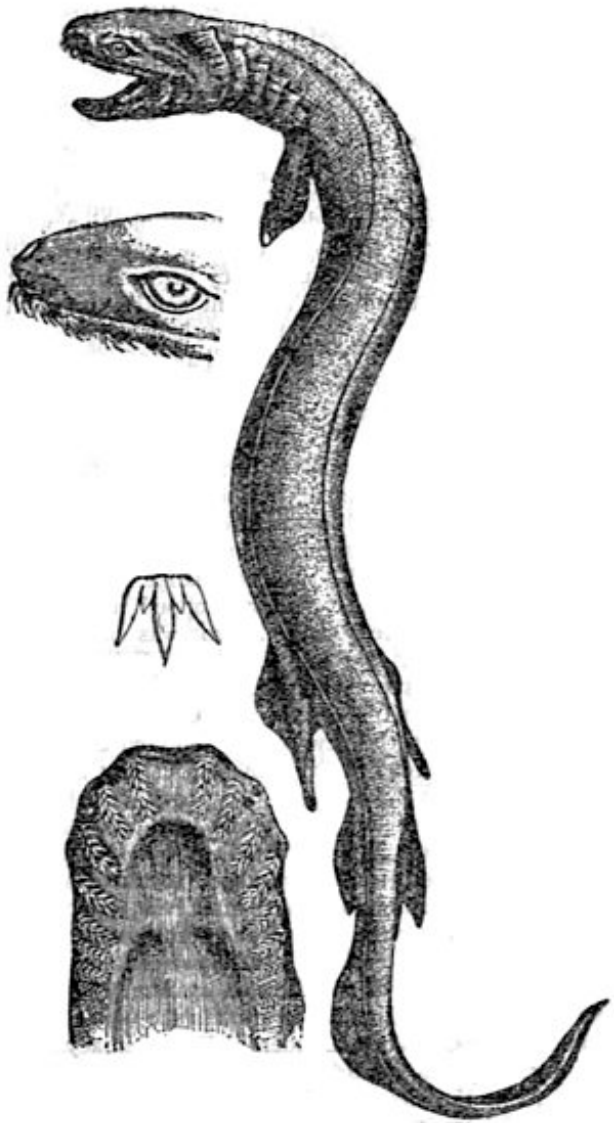
Frilled Shark Geographic Range

Images credit: Map - Chris Huh; black & white Frilled shark line drawing in the public domain. Frilled shark mouth by saname777.

FRILLED SHARK YOUNG

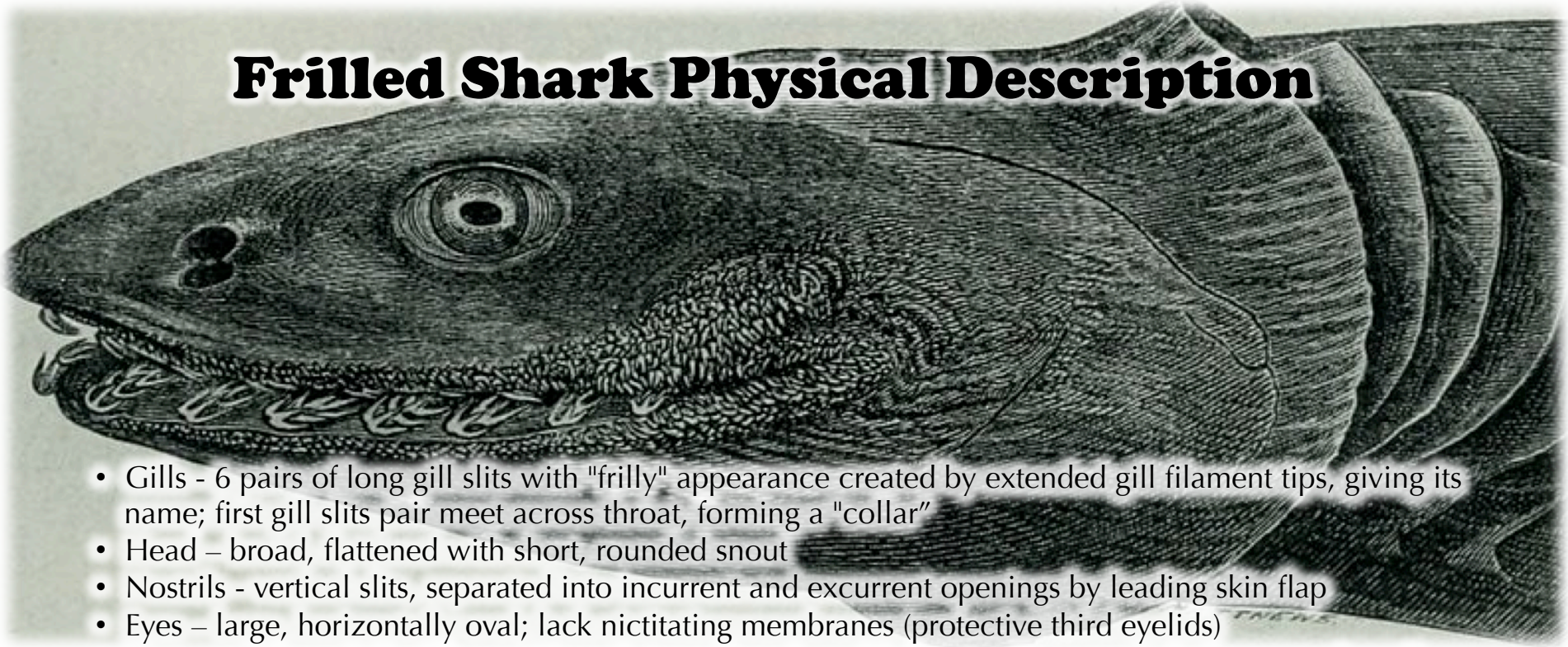
- Aplacental viviparous: embryos emerge from egg capsules inside mother's uterus, surviving mainly on yolk
- Gestation period – possibly 3 ½ years, longest of any vertebrate
- Litter sizes – 2 to 15; no distinct breeding season

A young Frilled shark yet attached to its yolk sac.

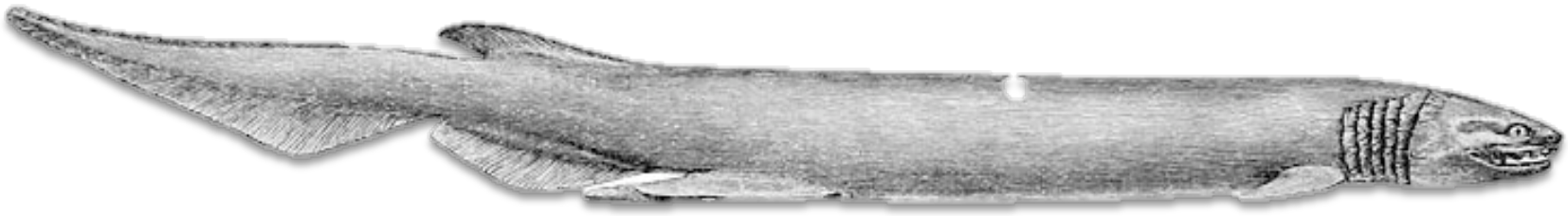


A Frilled shark black & white lined image showing anatomical details in the public domain.

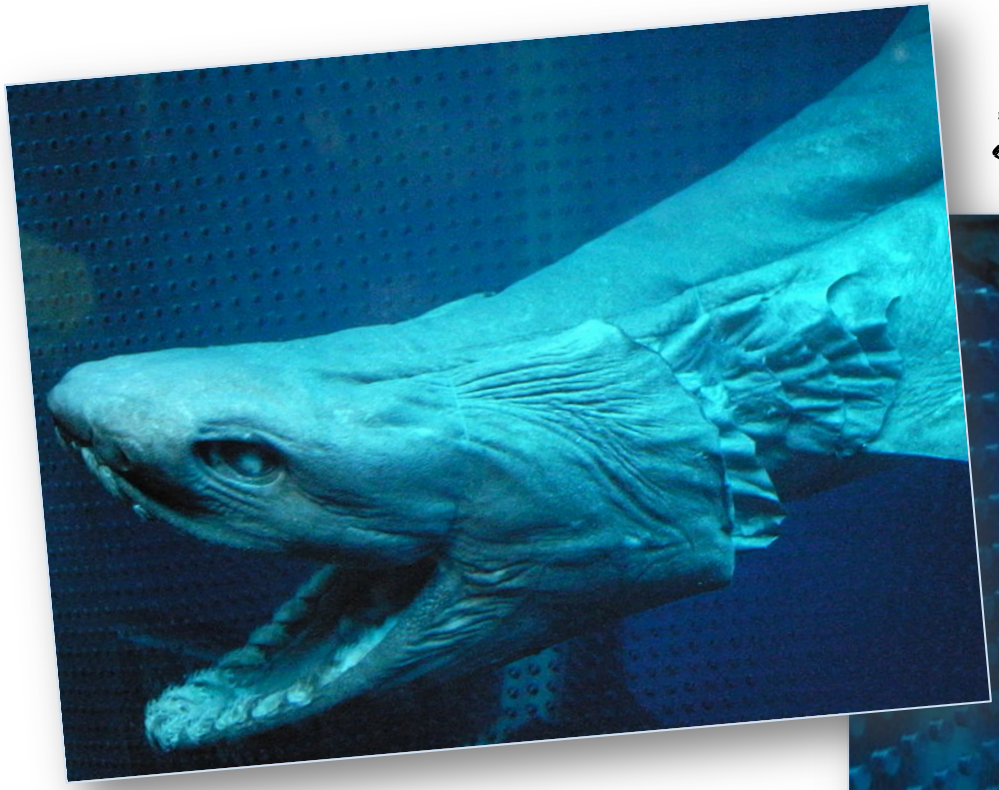
Frilled Shark Physical Description

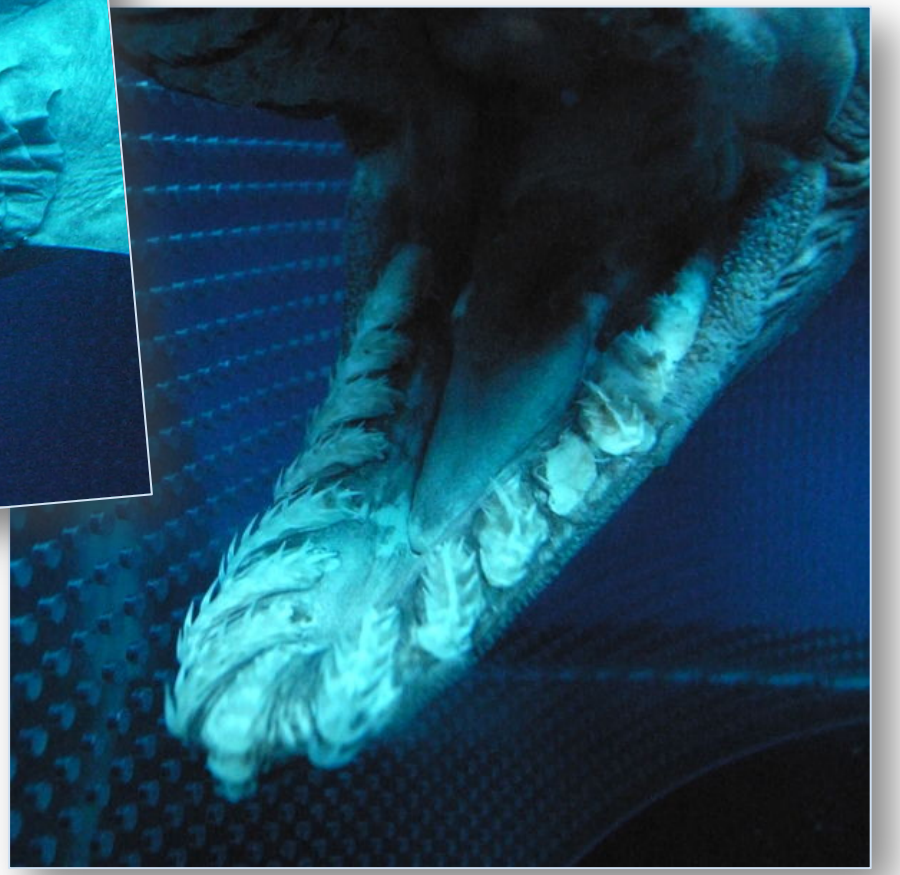


- Gills - 6 pairs of long gill slits with "frilly" appearance created by extended gill filament tips, giving its name; first gill slits pair meet across throat, forming a "collar"
- Head – broad, flattened with short, rounded snout
- Nostrils - vertical slits, separated into incurrent and excurrent openings by leading skin flap
- Eyes – large, horizontally oval; lack nictitating membranes (protective third eyelids)
- Jaws - very long & flexible; positioned at snout end; enabled to swallow prey whole; rows of small, needle-like teeth make it difficult for prey to escape
- Teeth – 300 total; widely spaced rows, 19–28 in upper jaw, 21–29 in lower jaw; each small, with three slender, needle-like cusps alternating with two cusplets
- Pectoral fins – short & rounded
- Color - uniform dark brown or gray
- Size - maximum known length: 1.7 m (5.6 ft.), males & 2.0 m (6.6 ft.), females



FRILLED SHARK TEETH





Drawing of a tooth row of a frilled shark.

Images credit: Color: OpenCage; black & white: public domain.

Frilled Shark Feeding

- Numerous needle-like teeth suited for grabbing soft-bodied squid

- Prey - cephalopods, bony fishes, smaller sharks

- Long jaws distensible with wide gape, allowing it to swallow whole prey over one-half its size

Image credit: Citron

References

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Thank you for watching!

A washed up Megamouth shark. Image credit: Sharkmans World.