



United Nations
Environment Programme



Mediterranean Action Plan
Barcelona Convention



SPA / RAC

*The Mediterranean
Biodiversity
Centre*



Republic of Lebanon
Ministry of Environment

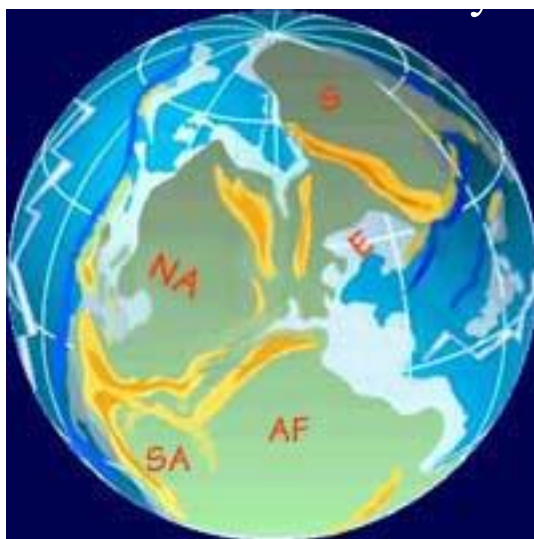
National Training Session on monitoring techniques of marine turtles

Tyre Nature Coast reserve (Lebanon) , 3-7 July 2018

Biological and Physiological aspects regulating existence of Sea Turtles

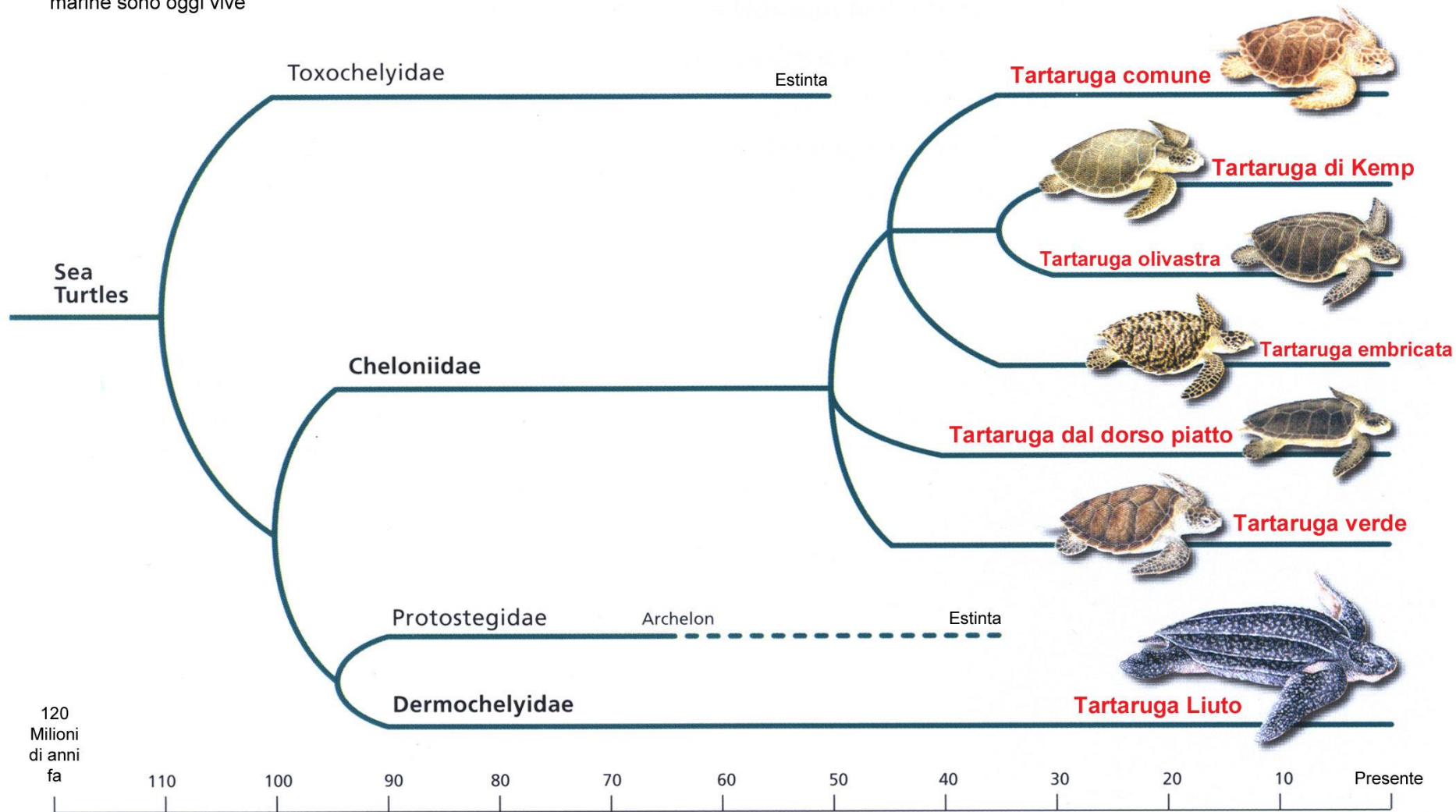
Flegra Bentivegna

*National Training workshop on monitoring techniques of marine turtles
Tyre (Lebanon) ,3-7 July 2018*



Sea Turtle Relationships

Le attuali tartarughe marine hanno rappresentanti nel cretaceo e sono i discendenti di una antica linea di tartarughe marine. Due delle quattro famiglie delle tartarughe marine sono oggi vive

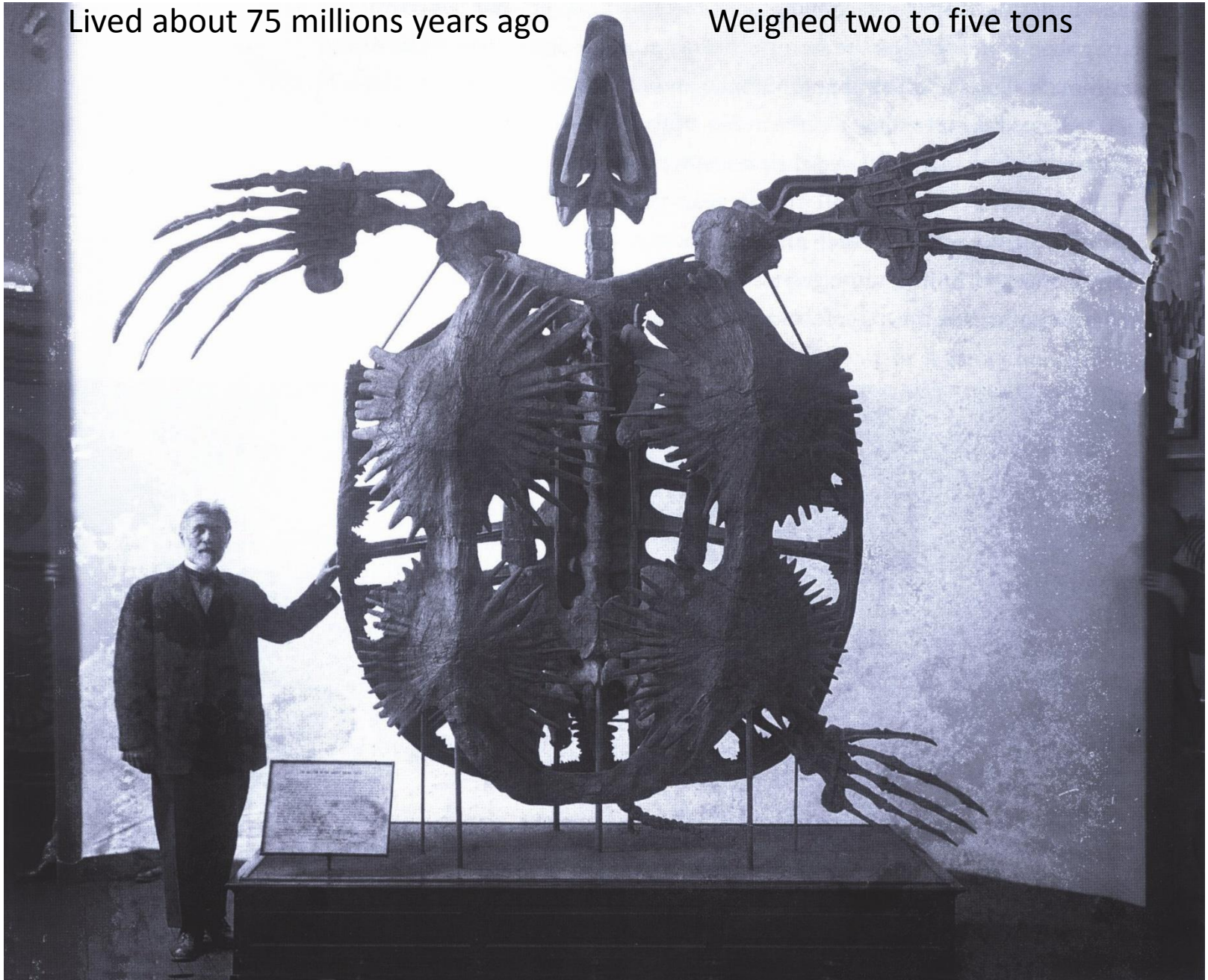


Modern Sea Turtles arose about 110 million years ago. Two of the four families are live today

Archelon was enormous : length 4,5 m; head 3,3m; long and a span 5,25m (tips of flippers)

Lived about 75 millions years ago

Weighed two to five tons





The green turtle
Chelonia mydas



The hawksbill
Eretmochelys imbricata



The black turtle
Chelonia agassizii

Many scientists consider *C* as an eighth species



Olive ridley
Lepidochelys olivacea



The flatback
Natator depressus.



Kemp's ridley
Lepidochelys kemp



The loggerhead
Caretta caretta



The leatherback
Dermochelys coriacea



Cosmopolitan distribution from the Arctic to the Tasman Sea



Lepidochelys olivacea
kg 45

Dermochelys coriacea
Kg 900



Adaptation to an Aquatic Life

Terrestrial



→ flat carapace

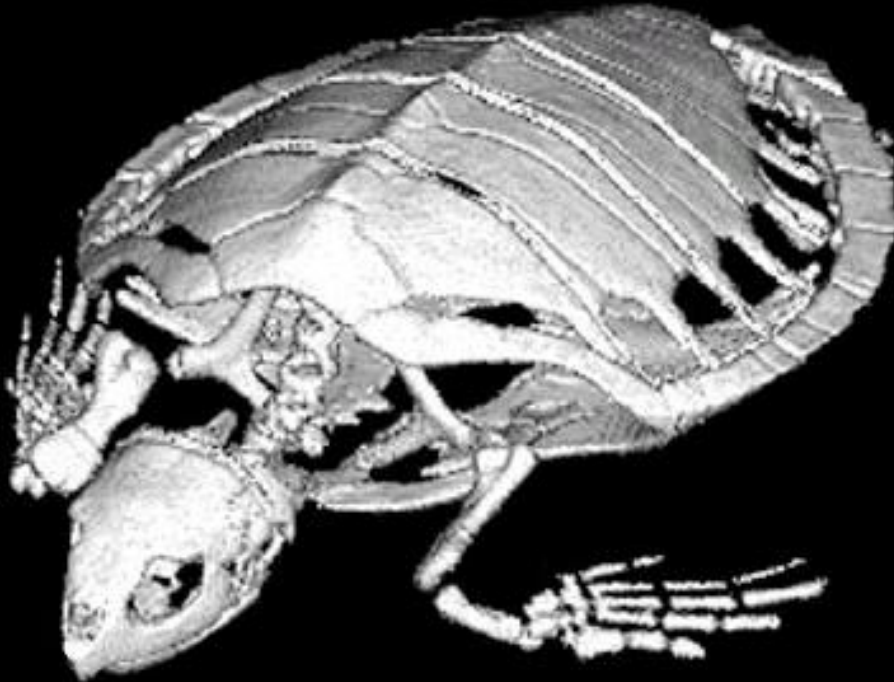
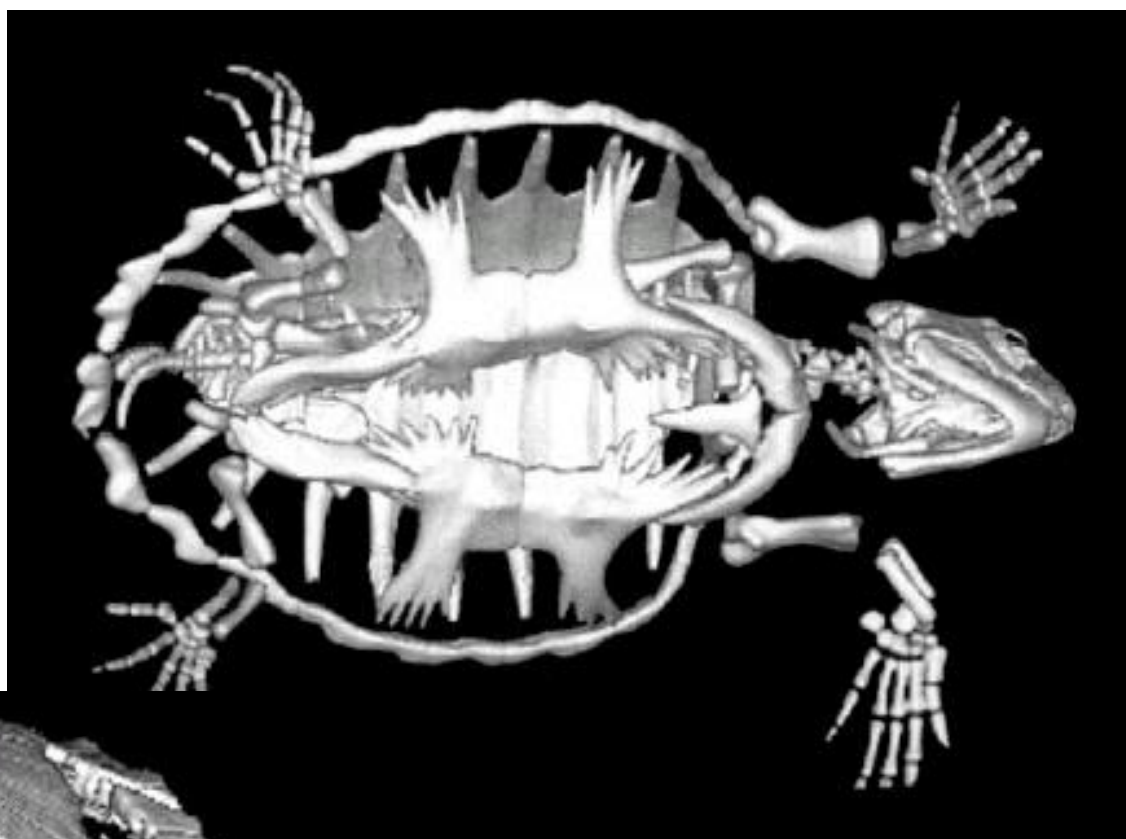
→ long and large flippers

Aquatic



Skeleton

Reduction in ...



heavy substances (bones!)

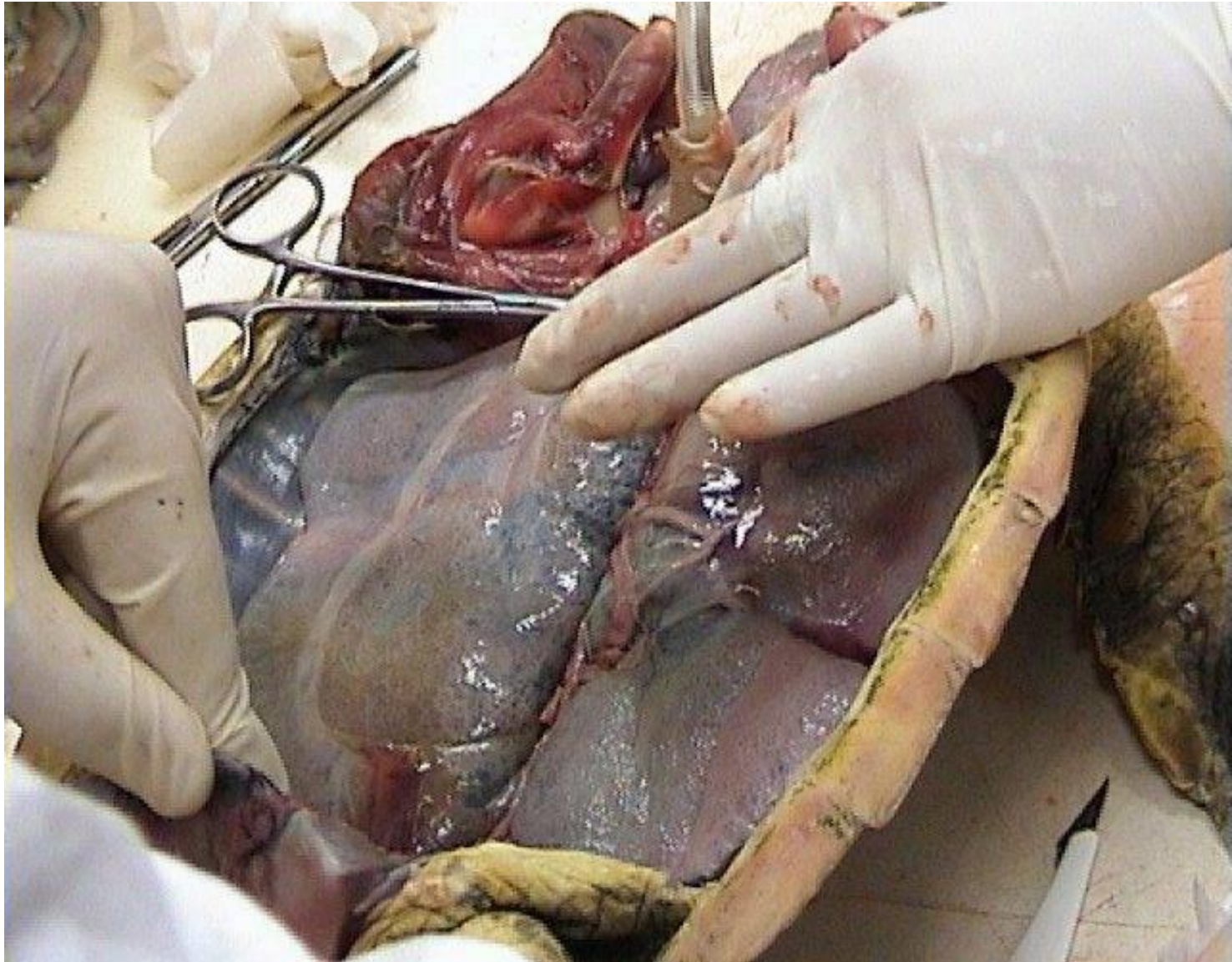
Sea turtles must come to the surface to breathe



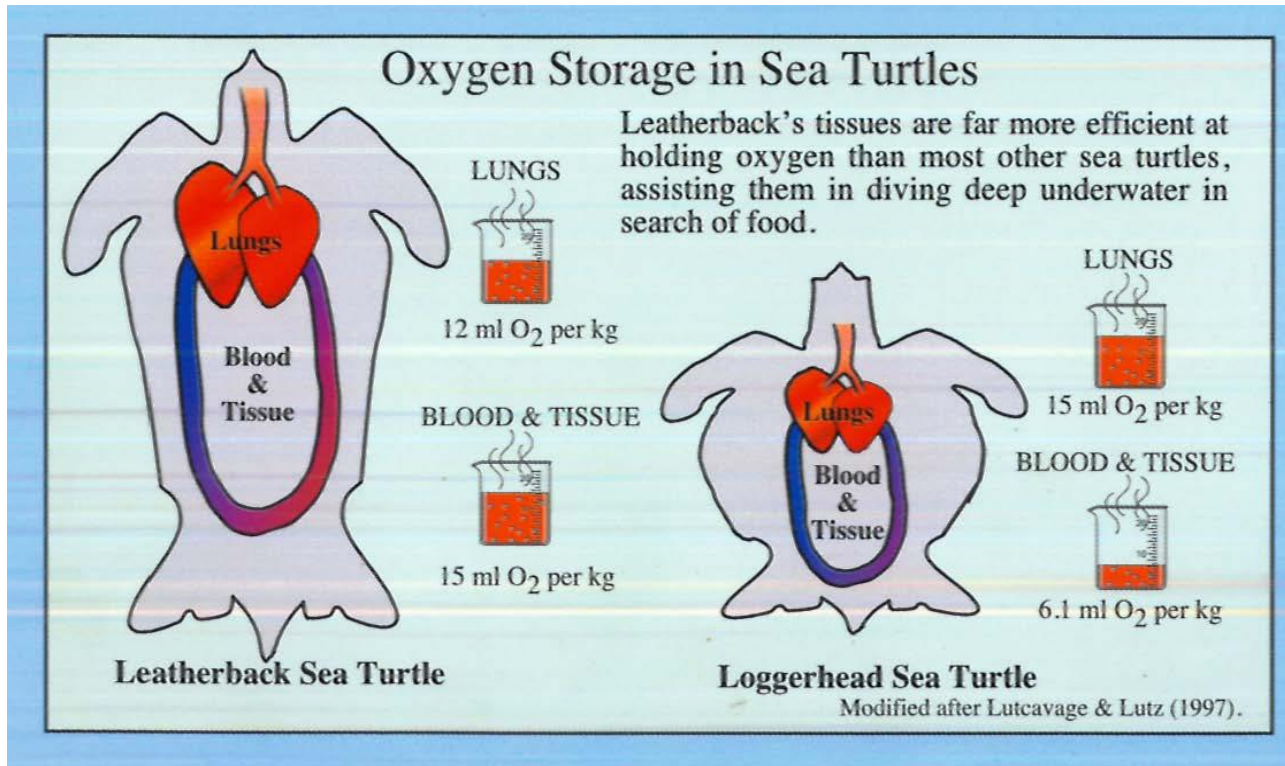
Inspirations short

Long periods of apnea

Lungs provide a large area for gas exchange



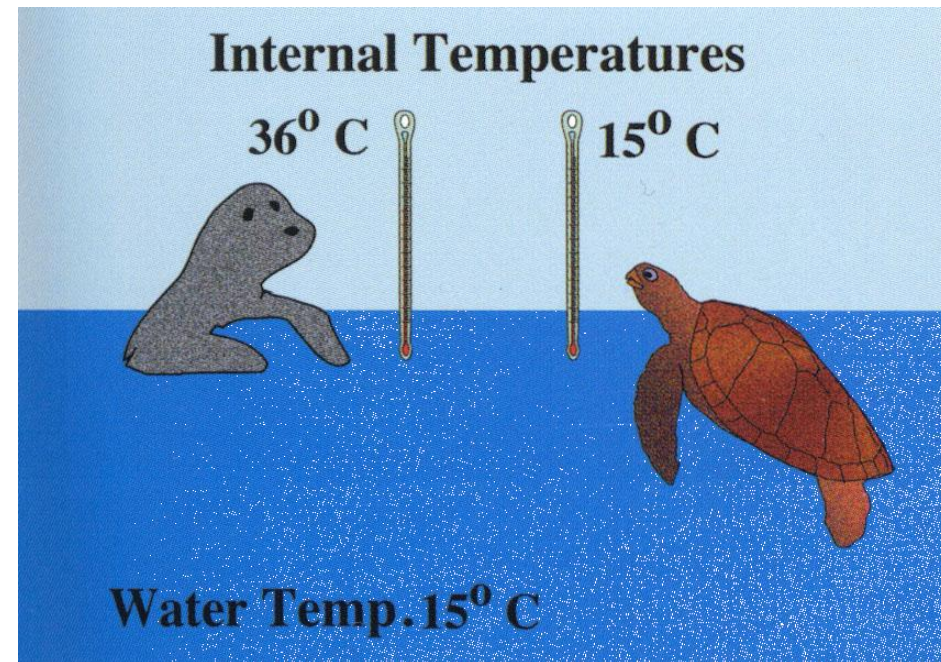
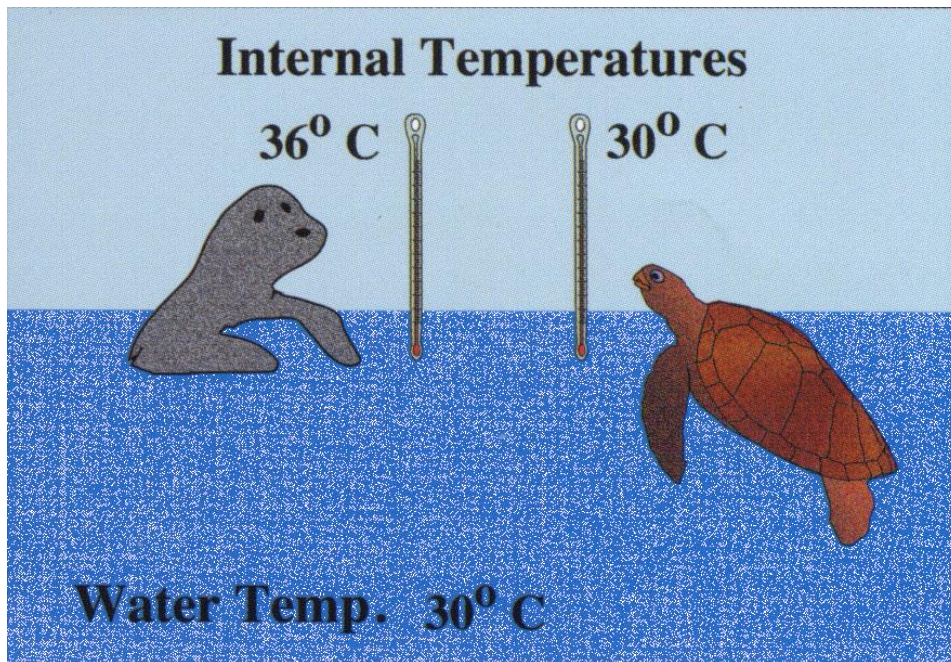
Sea turtles may retain oxygen in the muscles and blood rather than in their lungs



Leatherback is much more efficient than other species to store oxygen in the blood and tissues

Influence of the ambient Temperature

Sea turtles are ectothermic the body temperature varies with ambient temperature



Instead the warm blood animals maintain the warm temperature of the body stable

Basking in water

Some sea turtles species may spend hours floating on the surface



The turtle absorbs solar heat energy...and provides a welcome footrest for ocean –going sea birds

After mating ...



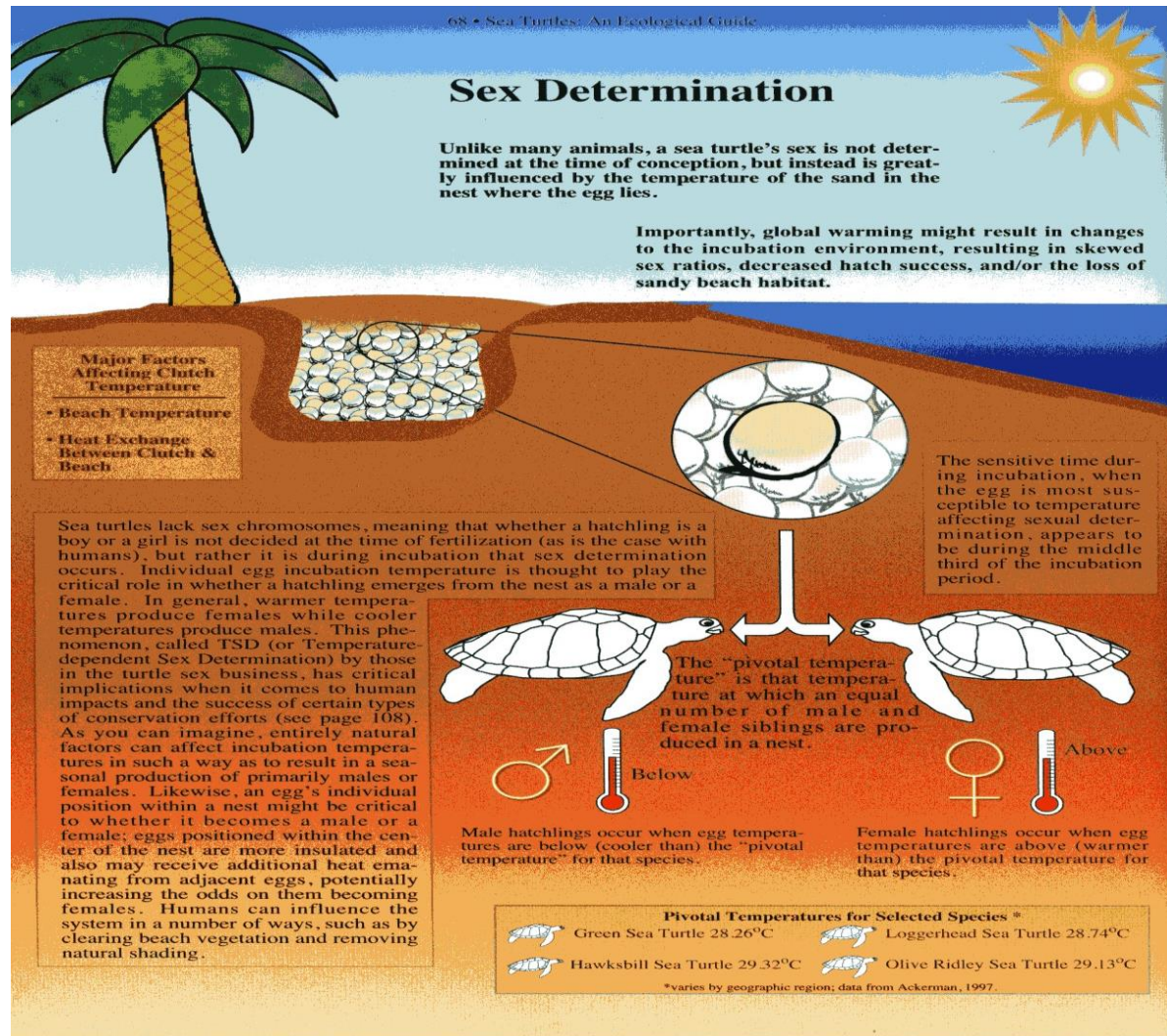
During nesting season the female coming ashore several time to lay hundreds of eggs



To lay eggs the female digs a deep hole with hind flippers



Influence of the temperature on sex determination



Sea turtle's sex is influenced by the temperature of the sand in the nest where the eggs lie. The «pivotal temperature» is that temperature at which an equal number of male and female are produced. Male hatchlings occur when egg temperature are below the pivotal. Female when the eggs are above «pivotal»

... After about 50 to 60 days of incubation, the hatchlings emerge and head for the ocean to begin life as pelagic drifters

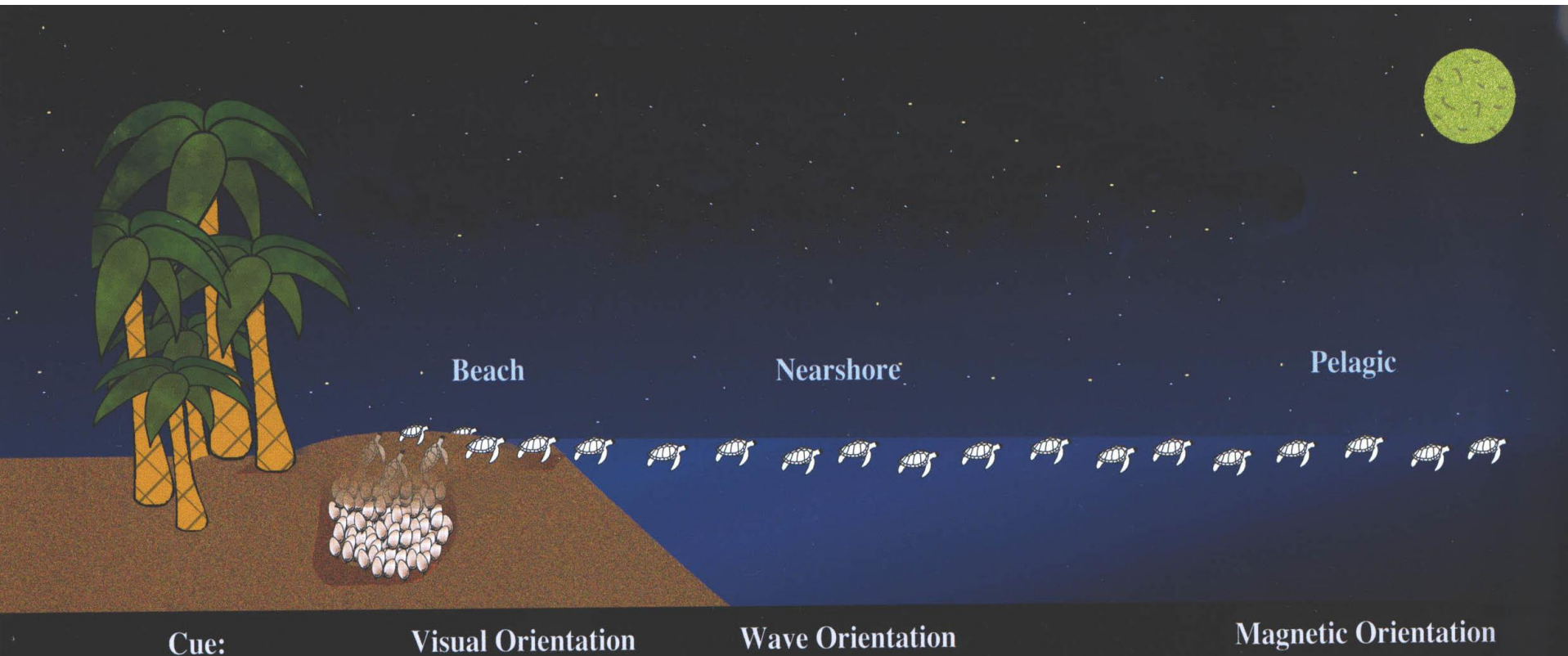


How do Hatchlings navigate from the nest to the open Ocean?

Visual cue guide hatchlings from the nest site to the Ocean's edge

Into the sea they orient themselves going against the direction of the waves

At the sea they use the magnetic field for orientation

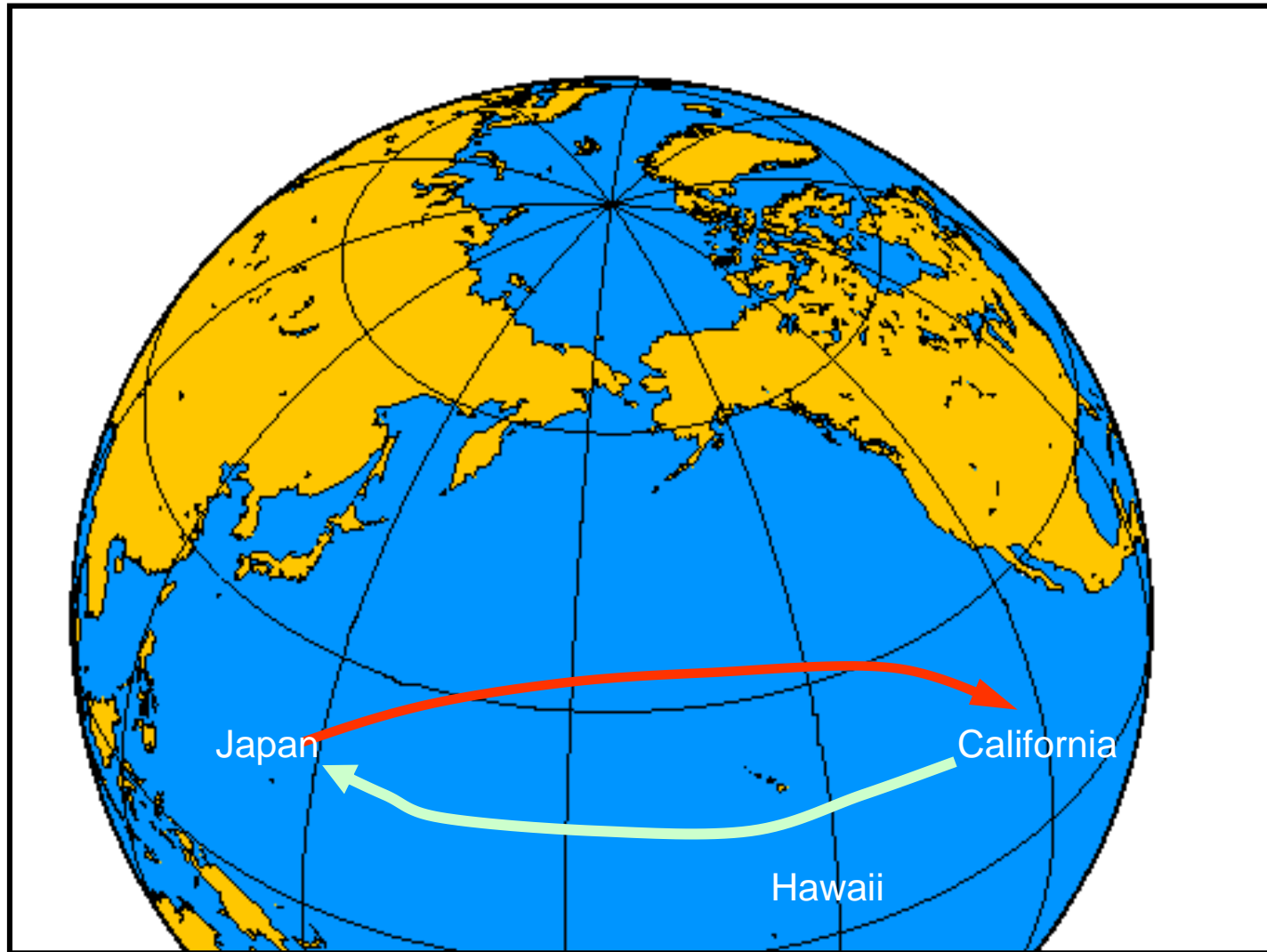


Migratory Behavior



During life , the turtles move continuously from the nesting area to the grazing or wintering area

The turtles cross the Oceans and are able to travel thousands of kilometers



Caretta caretta movements in Japan

Ascension Island, 7°57'S; 14°22'W

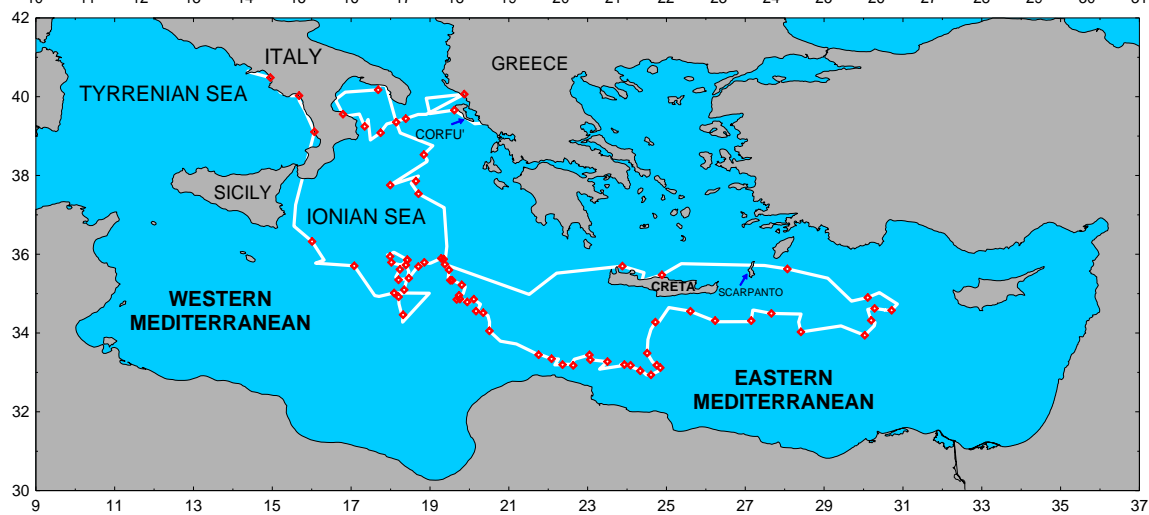


***Chelonia mydas* move in Atlantic Ocean**

Coast of Brazil in search of feeding grounds



Movements of *Chelonia mydas* in the Atlantic



Caretta caretta movements in the Mediterranean

Sens

Vision

Probably turtles are sighted above water

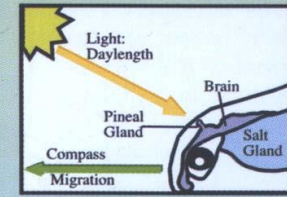
Loggerhead turtle and Green turtle can see all colors especially orange

The Pineal Gland

The leatherback holds the record for long-distance pelagic migrations (see pages 26 -27). Adult leatherbacks have a light skin pigmentation on their heads directly above the brain. It's thought that this translucent pigmentation may provide a literal window to the brain, allowing light to reach the pineal gland.



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It's hypothesized that the pineal gland may differentiate differences in day length, which the leatherback may be able to use as an accessory compass during its migrations.

A Little Insight on our View of the Vision Thing...

In evolving for a lifetime spent virtually entirely underwater, the sea turtles have modified their visual systems from those possessed by their terrestrial and freshwater turtle relatives. Cutting edge research shows that while they are still capable of seeing light throughout the visible spectrum (from "long wavelength" reds through to "short wavelength" blues), they have shifted both their daytime and nighttime sensitivity towards the greenish hues that predominate in the ocean environment. In fact, while land-based turtles are much more sensitive to red and yellow lights, sea turtle sensitivity is actually very similar to our own visual abilities. Sea turtles probably also share our well-developed ability to discriminate colors. However, unlike humans and non-marine turtles, sea turtles do not see particularly clearly on land. Consequently, sea turtles probably find things quite blurry above water, just as we humans require goggles to correct for what would otherwise be a very blurry landscape under water!



Meters

0
10
20
30
40

Red

Orange

Yellow

Green

Blue

indigo

Violet

0
33
66
98



Hearing:

The turtles do not have ears but internal auditory canals

The turtles are sensitive to low- frequency Sounds up to 1000 Hertz

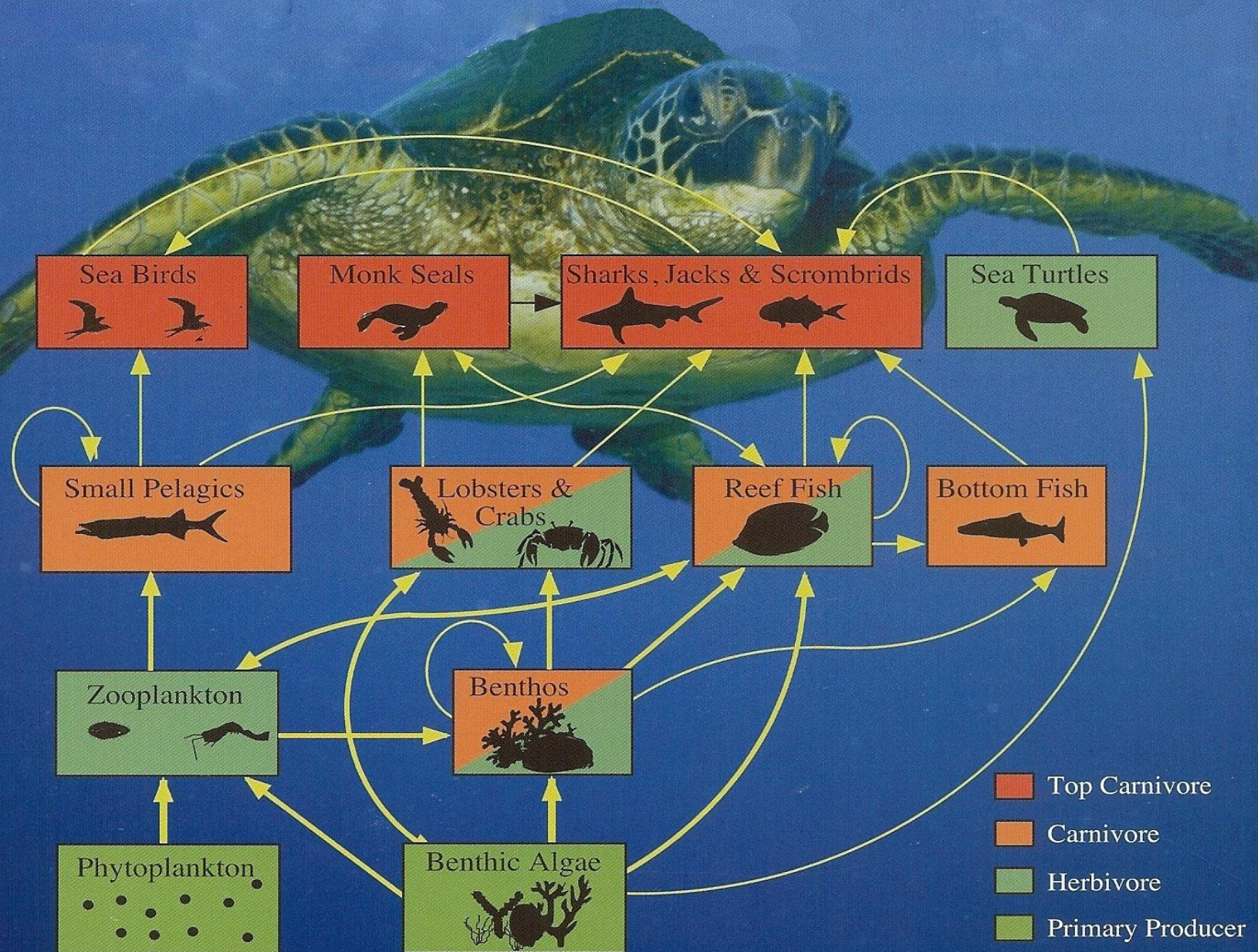


Smell

Acute sense of smell, may serve to allow for prey detection in water



Roles of sea turtles in ecosystems



Sea Turtles

Flag species :attract the interest of large public

Umbrella species :protection measure include protection and conservation of different habitats and associated species .

