

Biological Oceanographic Survey



Supapong Pattarapongpan

Fishery Oceanographer

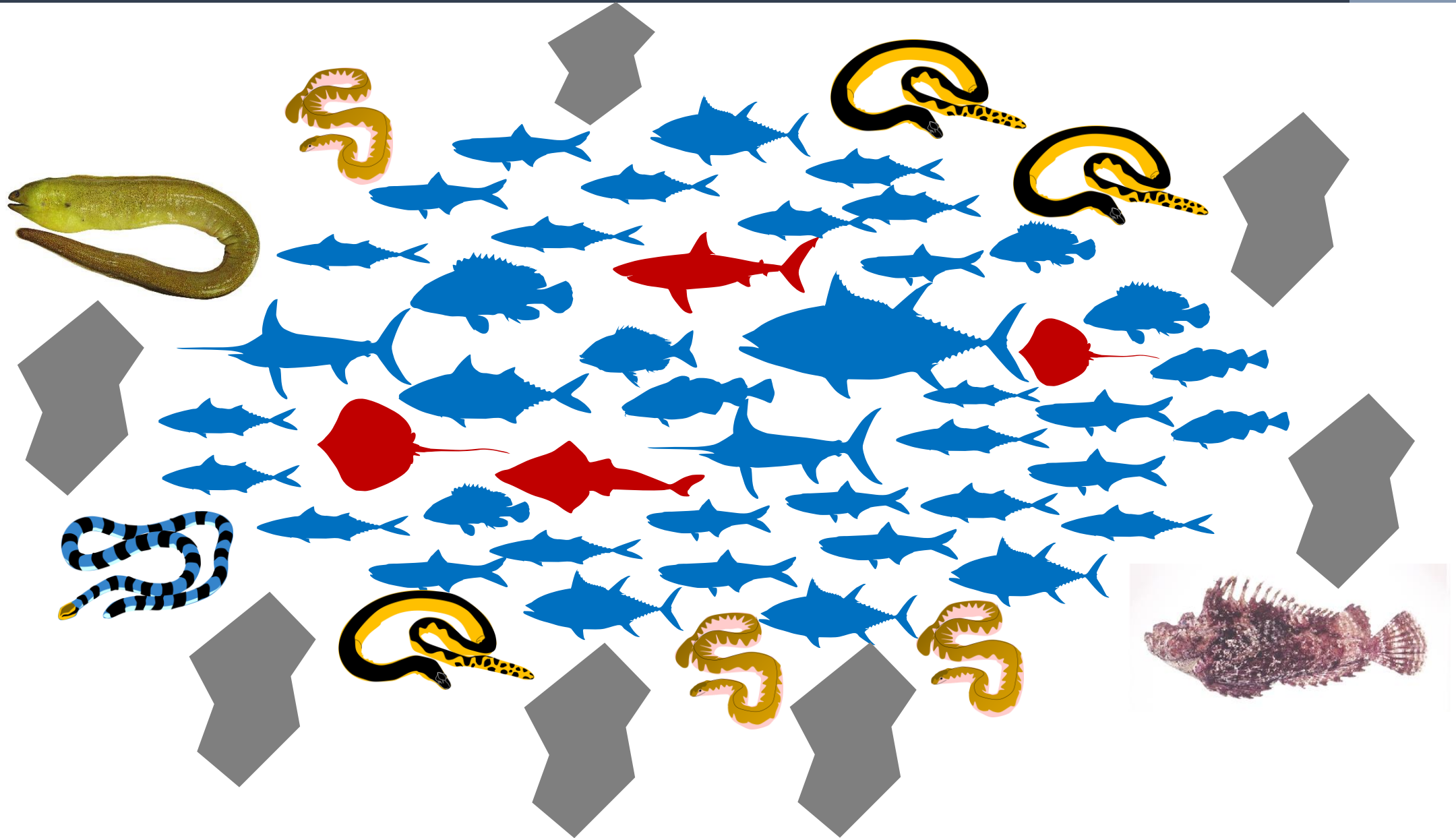
Fishing Ground and Oceanographic Section

Southeast Asian Fishery Development Center, Training Department (SEAFDEC/TD)



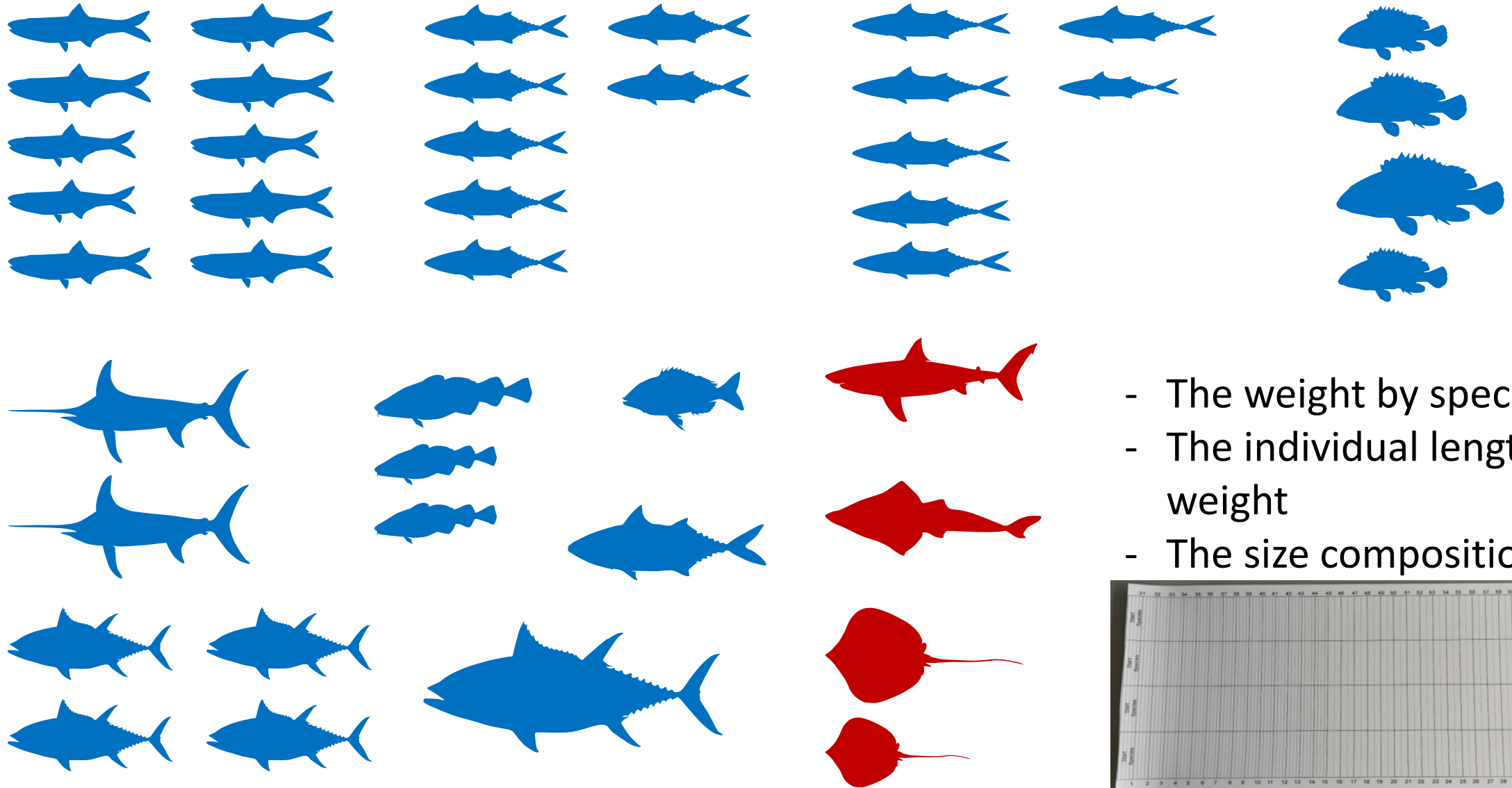
The trawl catch management

2



The trawl catch management

3

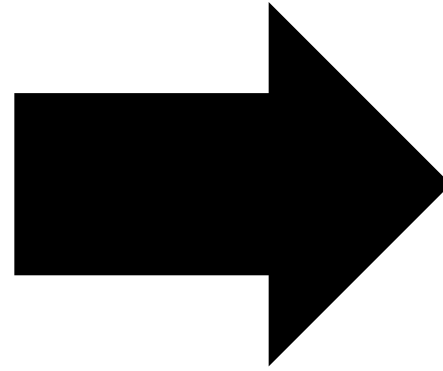
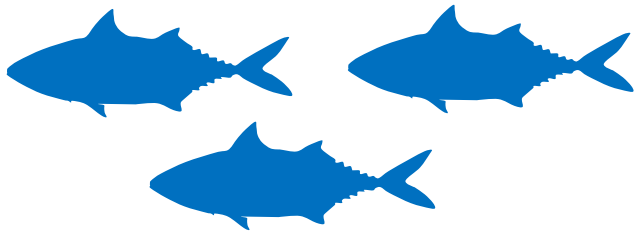
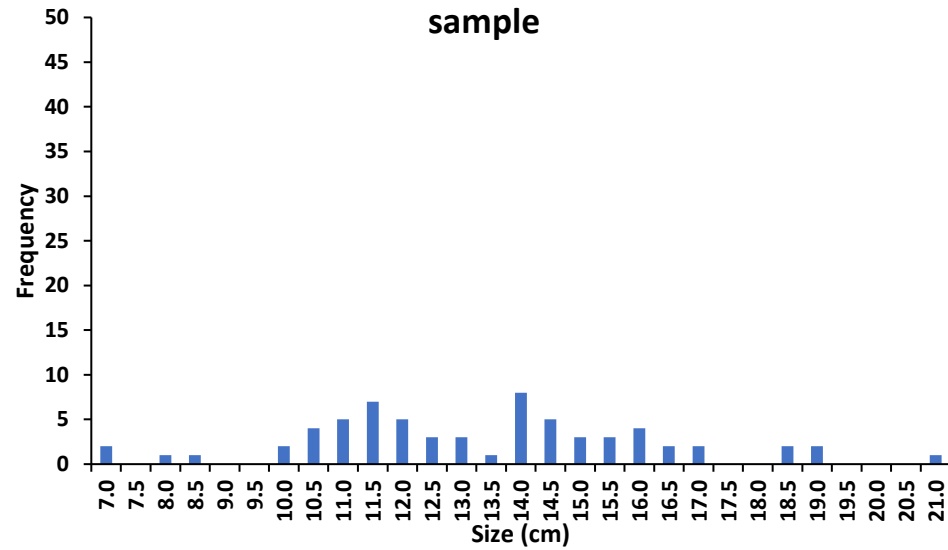


- The weight by species
- The individual length and weight
- The size composition

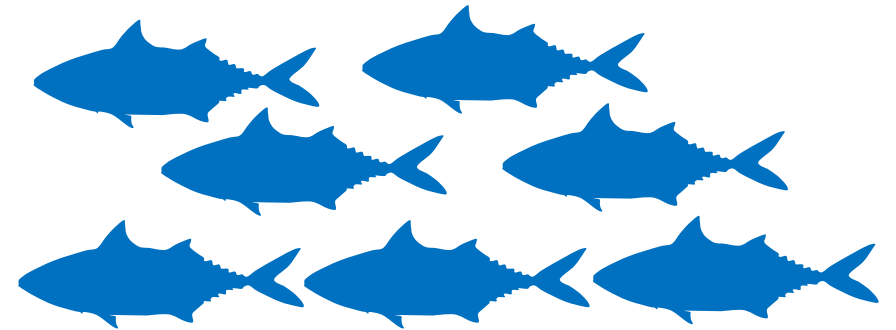
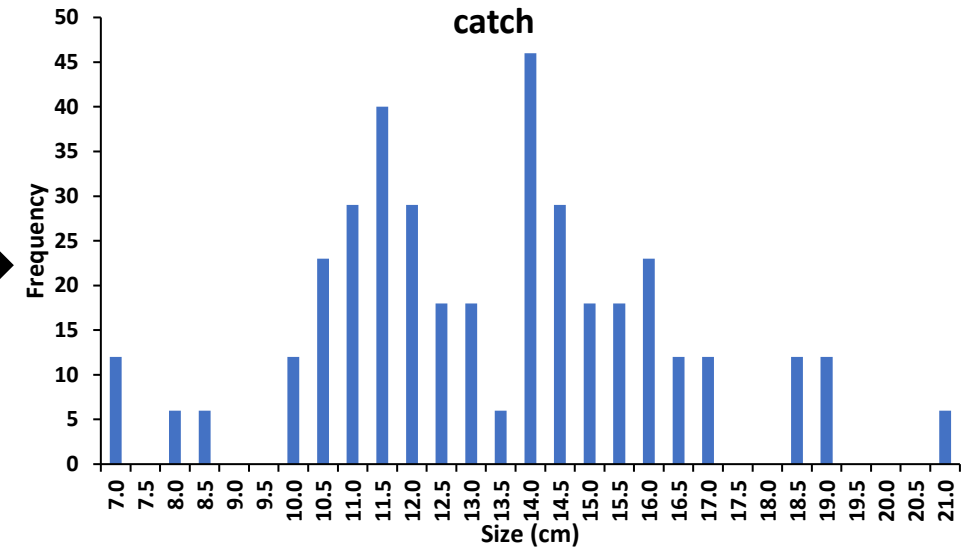
A photograph of a "Length measurement form" used for recording fish data. The form includes fields for "Species", "Date", "Time", "Location", "Depth", "Weight", "Length", "Sex", and "Remarks". It also features a grid for recording individual fish measurements, with columns for "Length (cm)" and "Weight (kg)". The form is titled "Length measurement form" and has a logo in the top right corner.

The length-frequency data

4



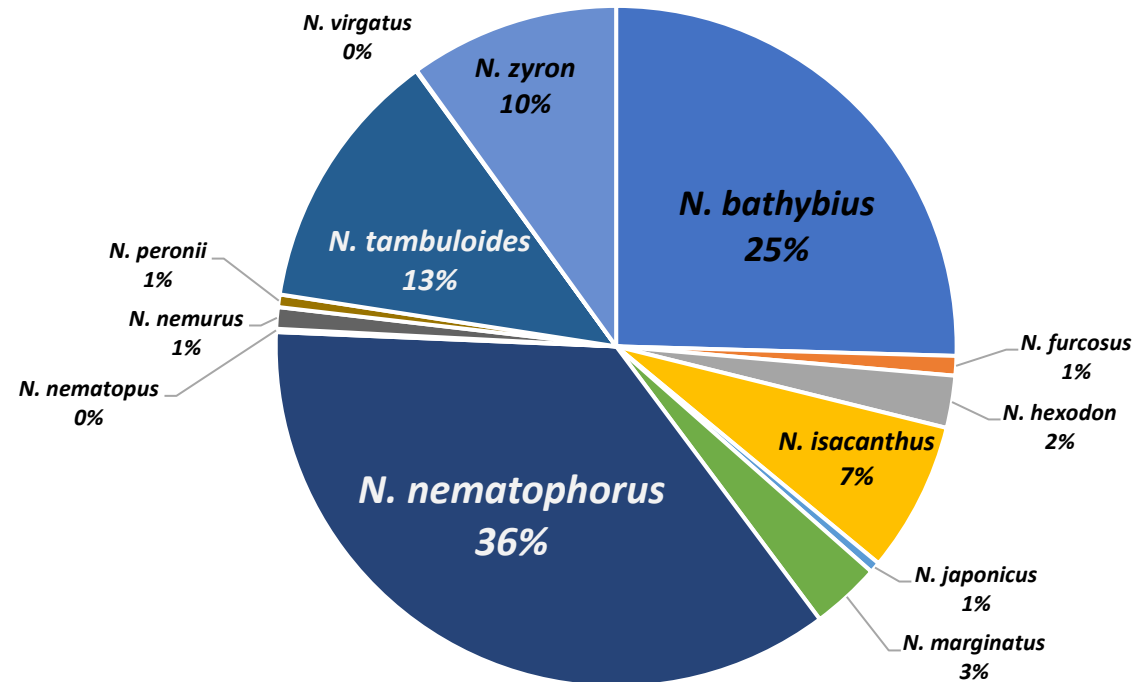
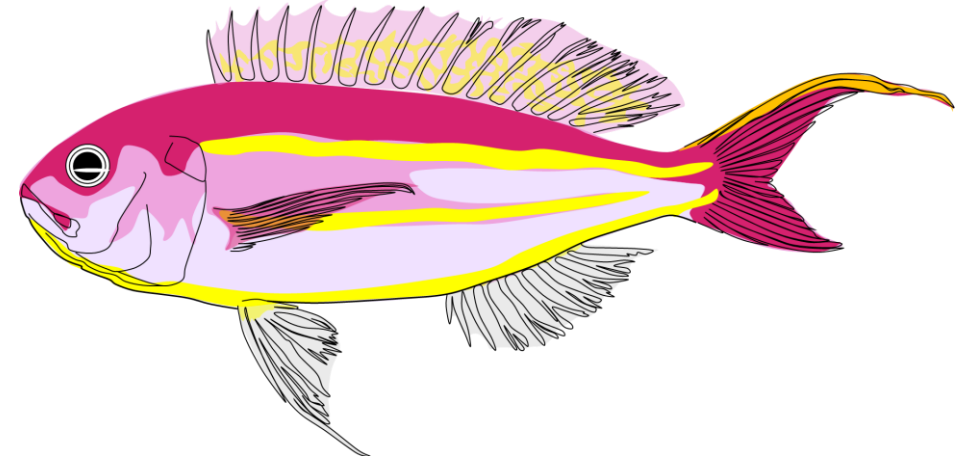
**Raising
with the
total catch**



Example, red sea bream (*Nemipterus* spp.)

5

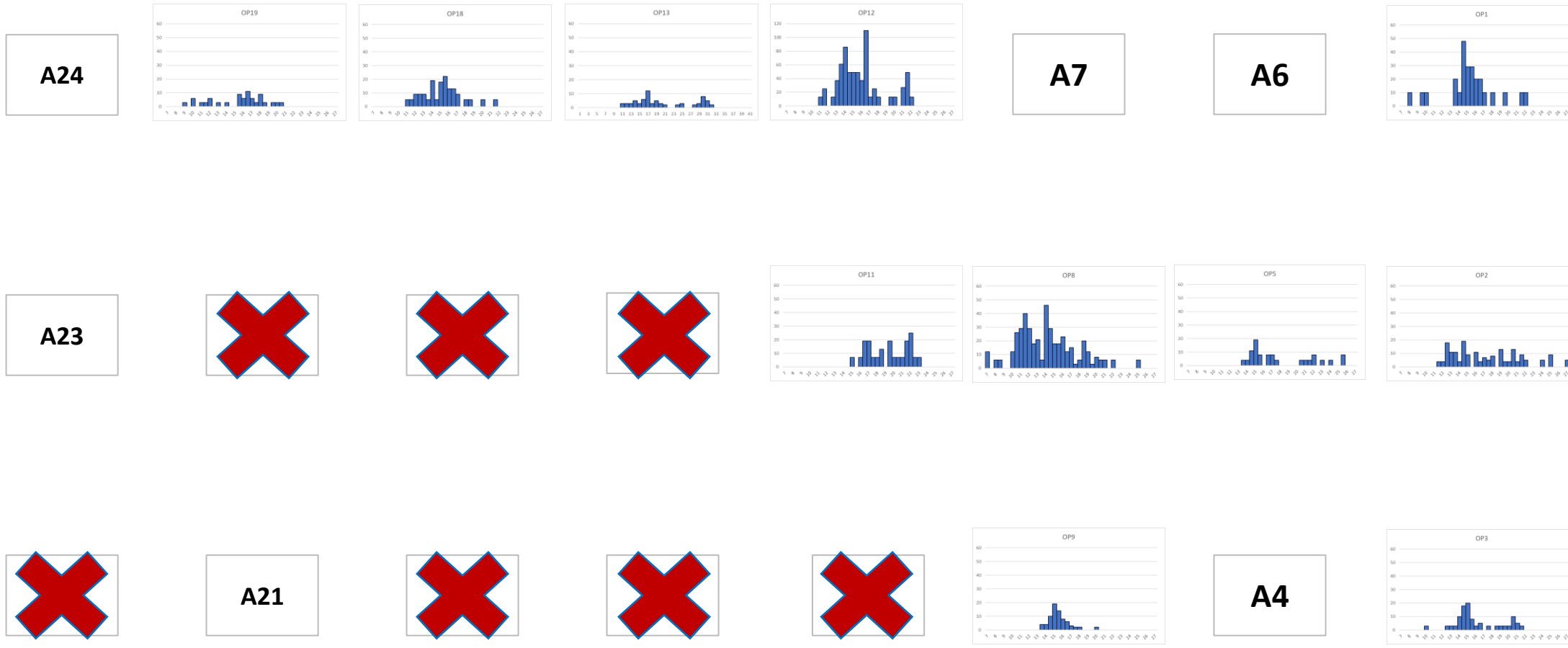
- Benthic fish
- Schooling
- High biodiversity
- Approximately 13 spp. were found



Example, red sea bream (*Nemipterus* spp.)

6

Deep
sea

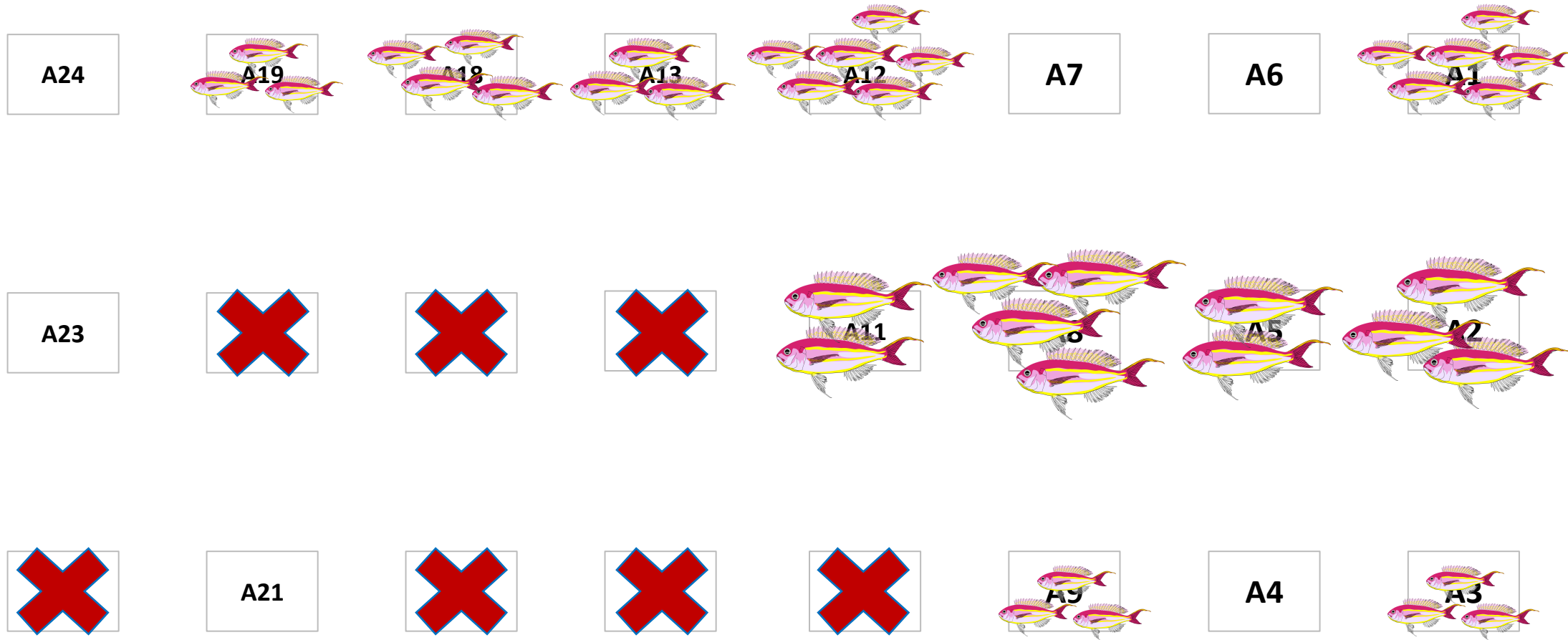


Coastal

Example, red sea bream (*Nemipterus* spp.)

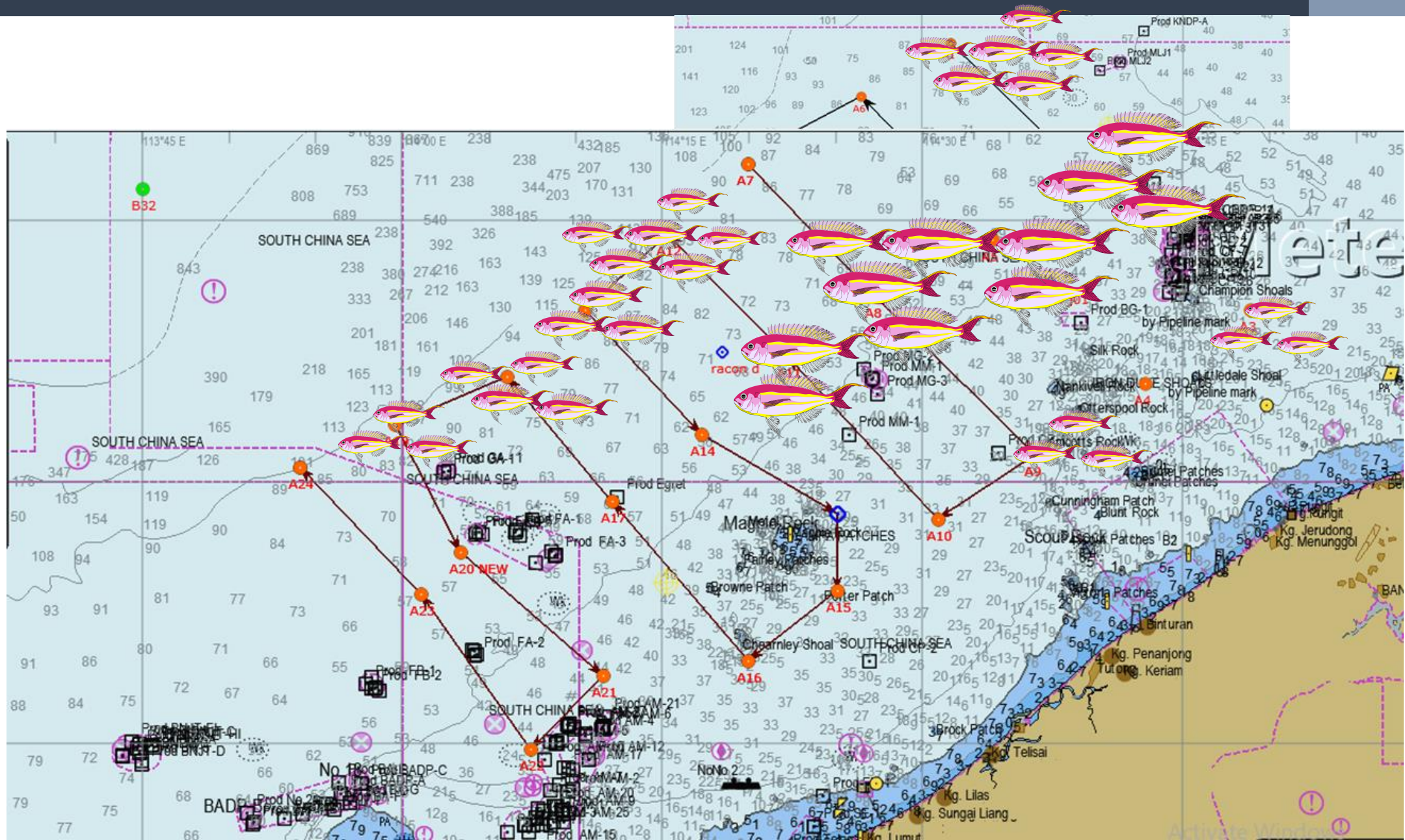
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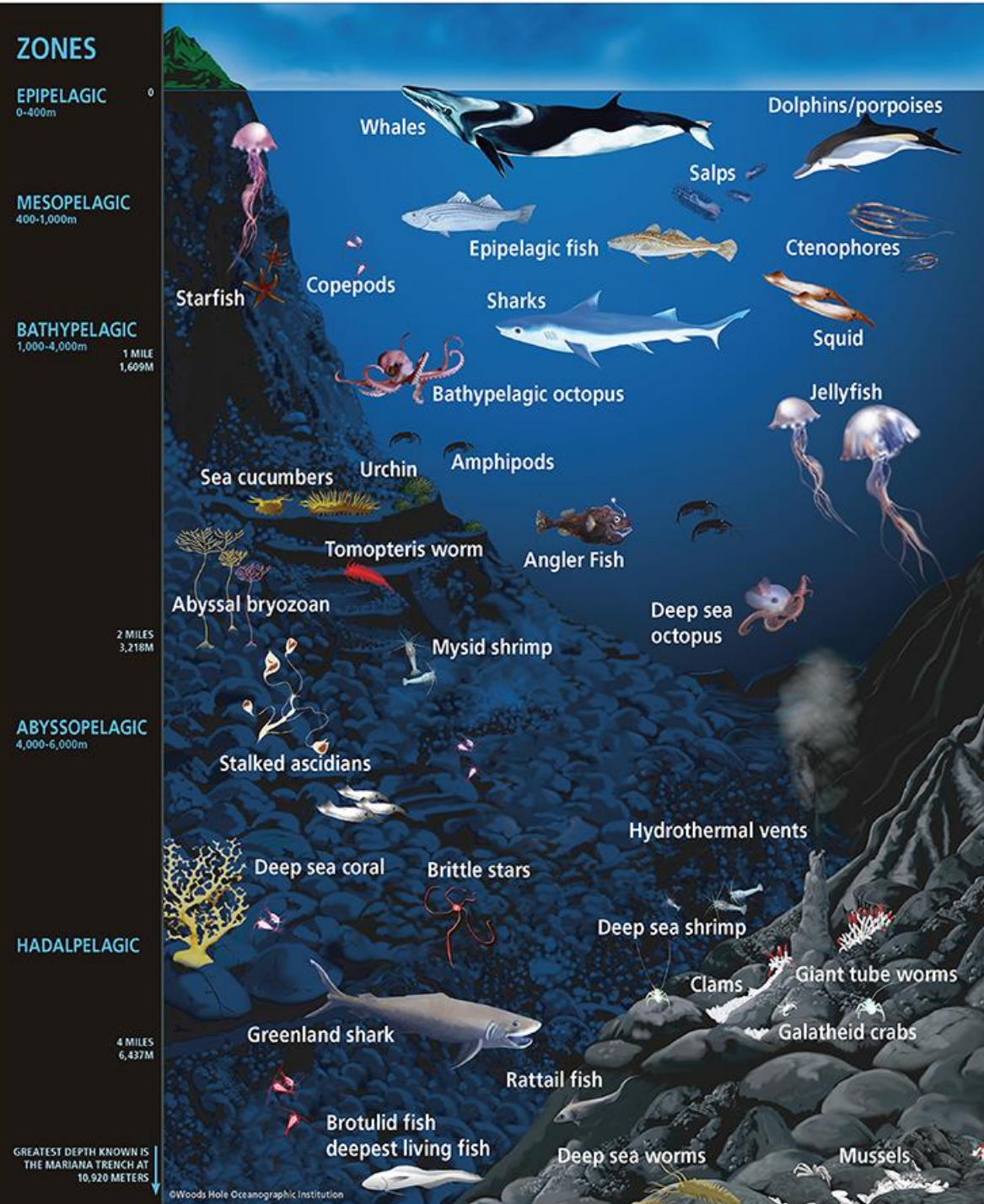
Deep
sea
↓
Coastal



Example, red sea bream (*Nemipterus* spp.)

8





Biodiversity

Genetic Diversity

Population Dynamics

Bio-
Chemistry

Habitat
Usage/Specification

Laval
Distribution

Resilience

Distribution

Evolution
and
Adaptation

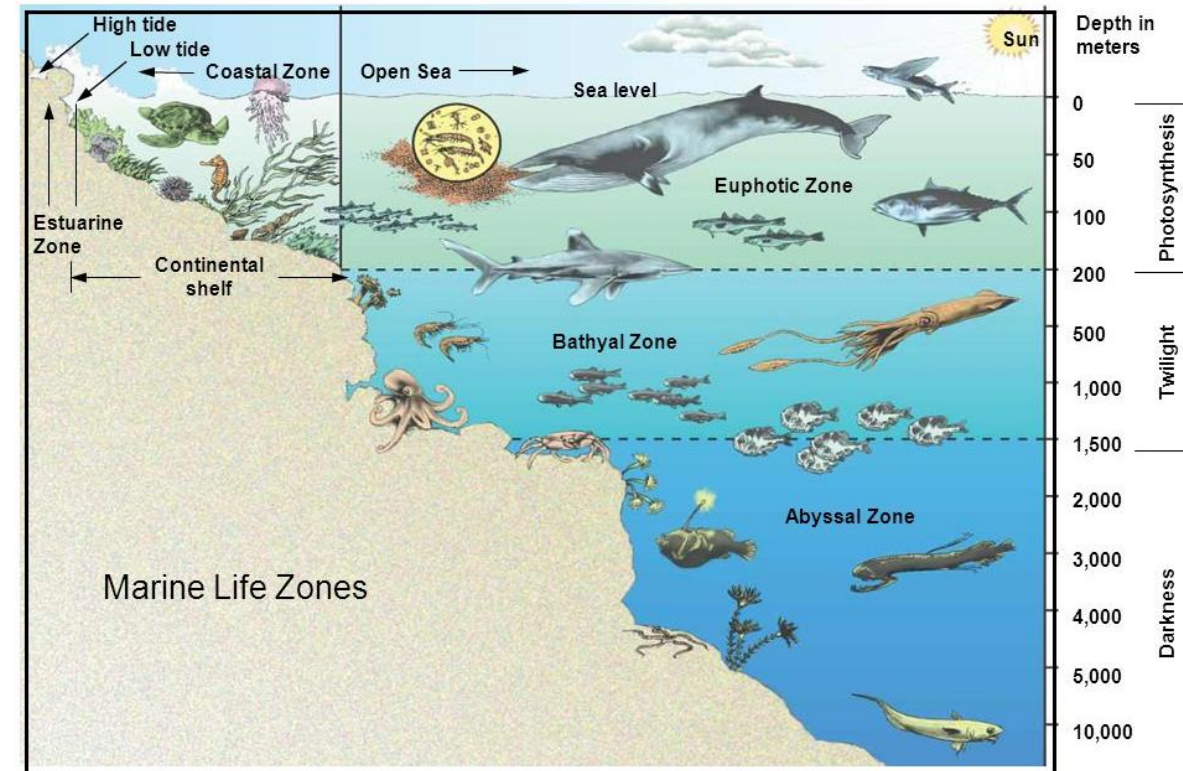
Stock Assessment

Comparative
Physiology

Deepsea
Ecology

Hydrothermal
vent

- To study on the marine organism
- Including the biological process
- Topics such as
 - Taxonomy
 - Ecology
 - Distribution
 - Migratory pattern
 - Etc.
- Be the base line information for
 - Fish stock assessment
 - Fishery management





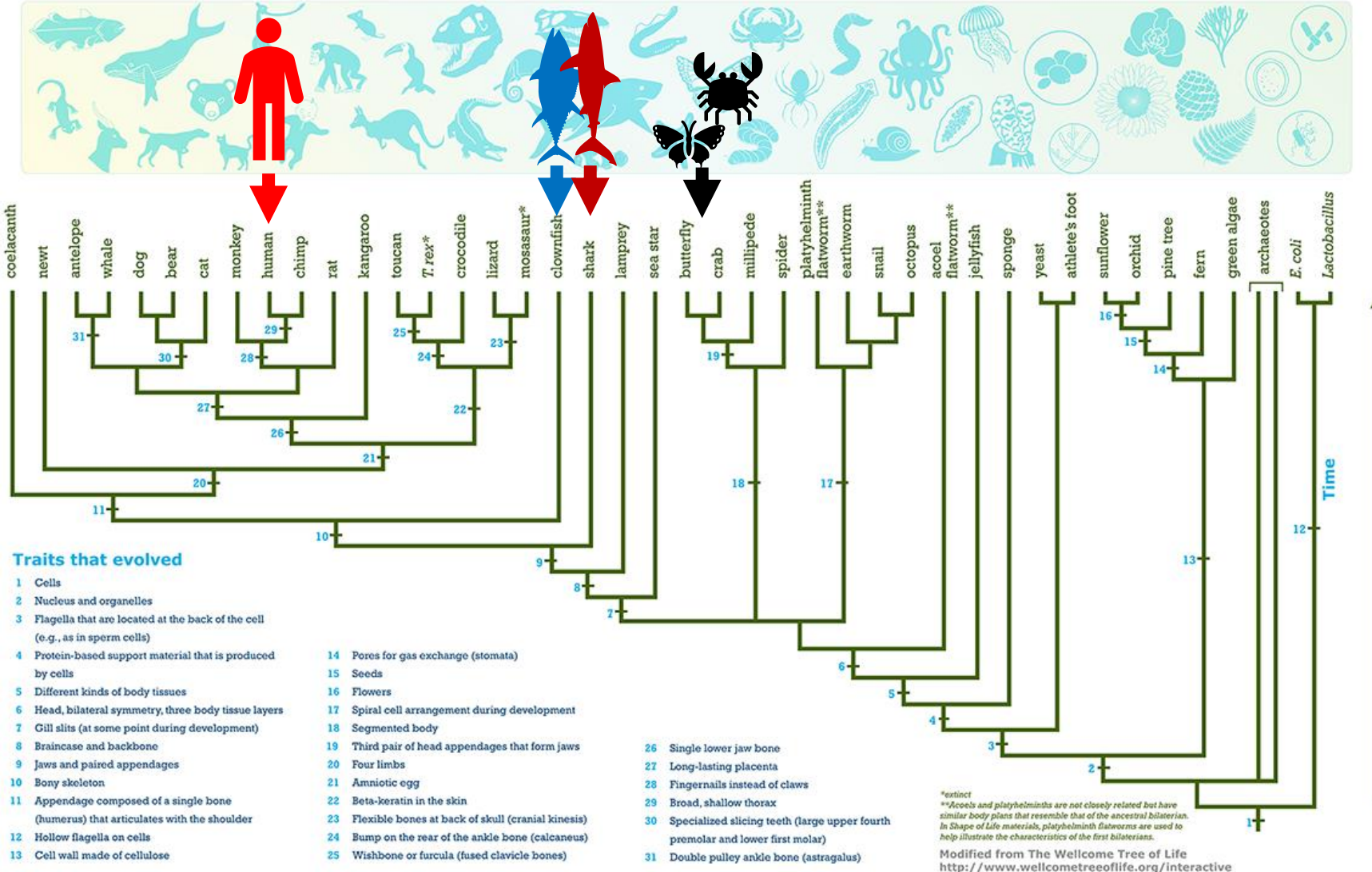
The Tree of Life

Find your favorite organisms and follow the tree to find their common ancestor.



Visit **The Tree Room** at www.treerom.org to learn more about evolutionary trees.

UCLP Understanding Evolution - <http://evolution.berkeley.edu>
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- All life forms are related at some points.
- The distance between point to point indicate the evolution.
- The closer, the more relate between taxa.

<https://www.shapeoflife.org/news/resource/2016/10/18/tree-life>

Top Predators

The ocean's top predators—be they fish, mammals, or birds—are simply larger and faster than most of their competition. Some have no predators but humans.

Carnivores

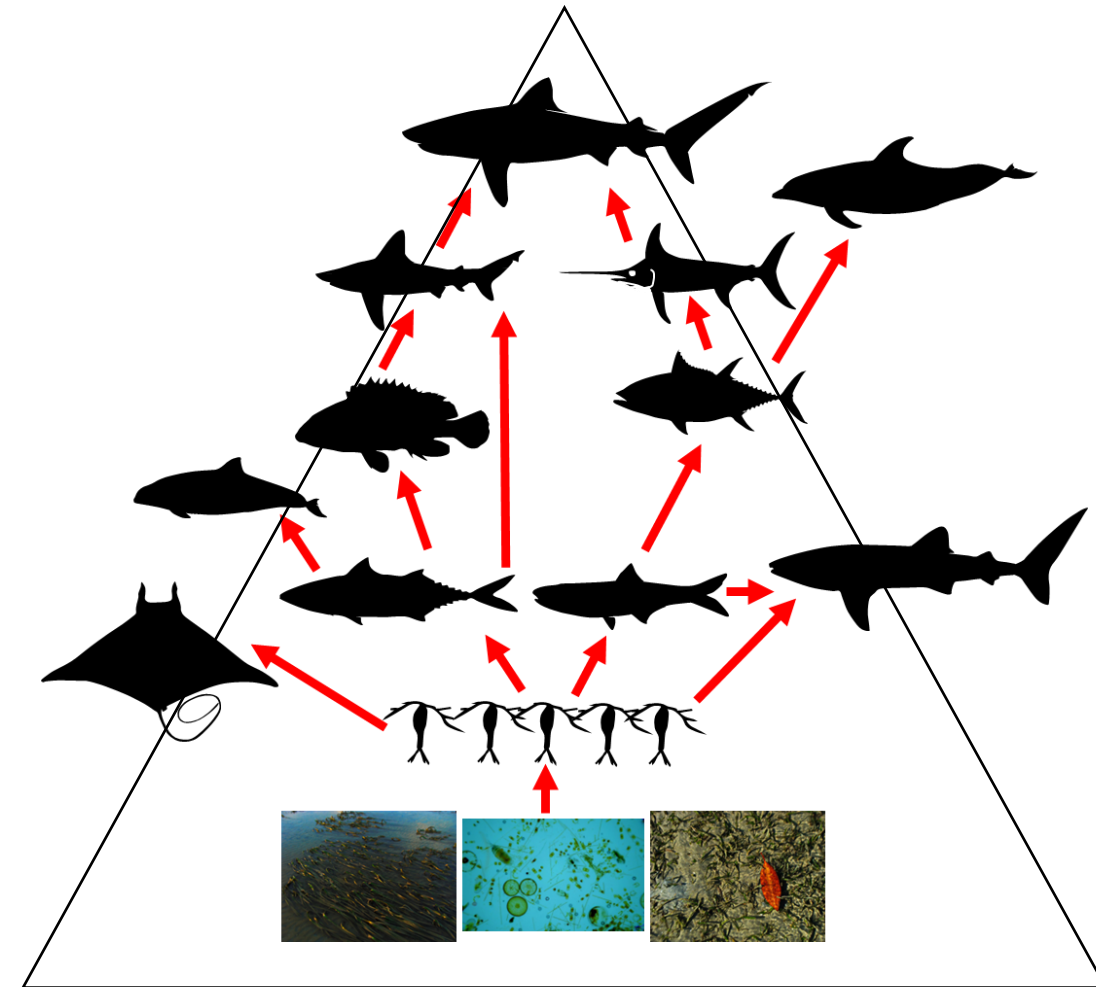
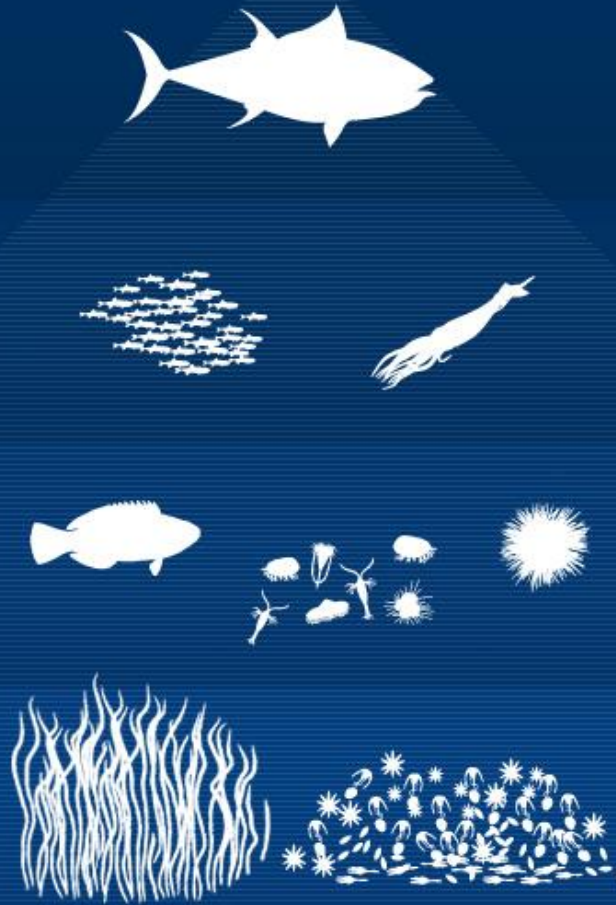
The ocean's smaller carnivores, such as sardines, feast on herbivores like zooplankton—but ultimately serve as nourishment for bigger, faster animals atop the food chain.

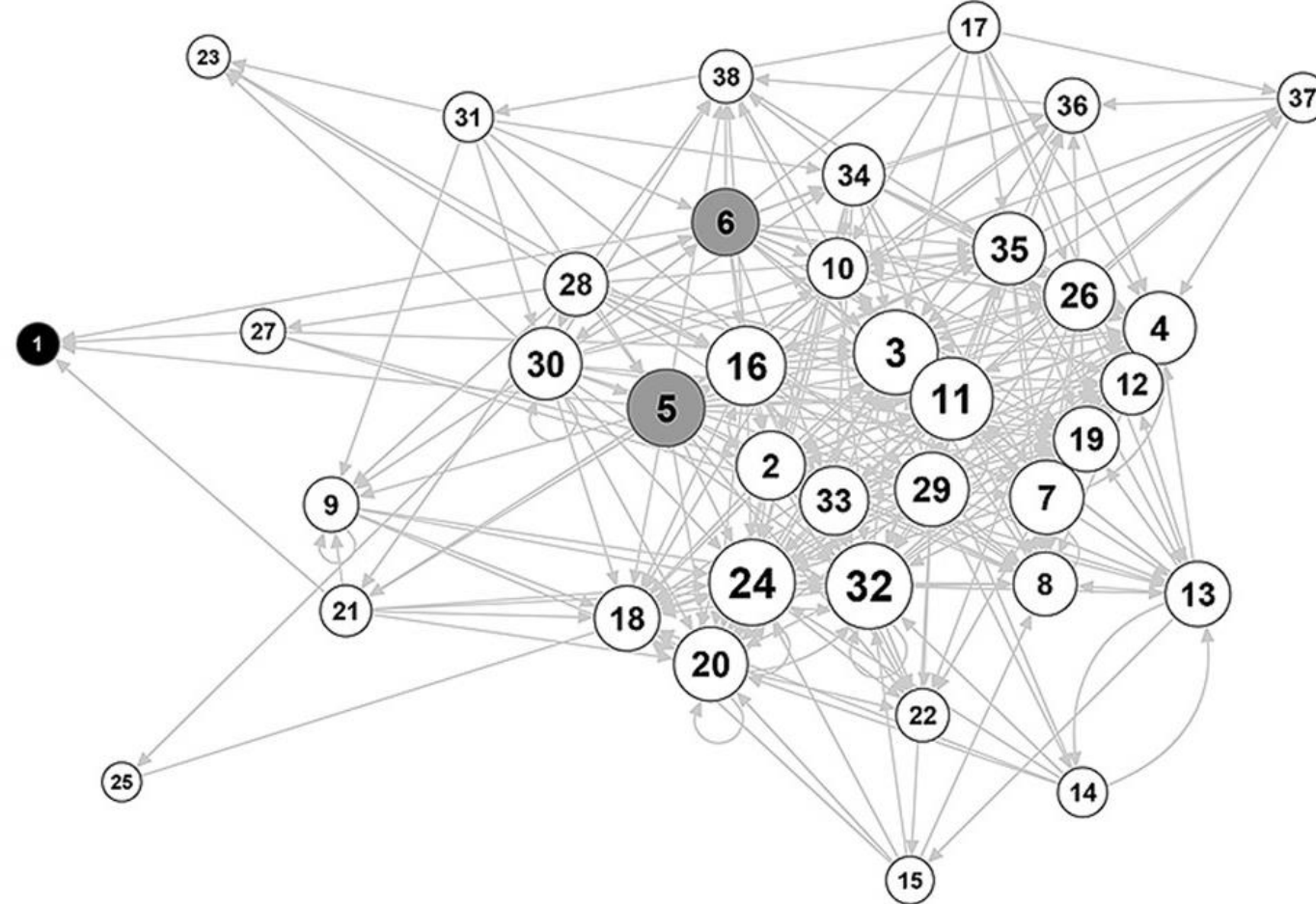
Herbivores

Tiny grazing animals (zooplankton) devour the sea's phytoplankton in staggering numbers, and larger invertebrates (such as sea urchins) and vertebrates (such as parrotfish and manatees) eat seaweed and seagrasses.

Photo-Autotrophs (Plants)

Every species in the sea's food chain needs organic carbon to survive, and these tiny organisms produce it all, as plants do on land. Phytoplankton tap energy from the sun to fuel the entire ocean ecosystem.





1 Clam_fishers
2 Grouper
3 Large_shark
4 Small_shark
5 Clams
6 Hatchet_clam
7 Snapper
8 Sea_lion

9 Sea_urchin
10 Sea_turtle
11 Squid
12 Cazon
13 Spanish_mackerel
14 Corvina
15 Weakfish
16 Octopus

17 Seaweed
18 Gulf_grouper
19 Seabirds
20 Sand_bass
21 Snail
22 Brown_snake
23 Mussel
24 Spotted_cabrilla

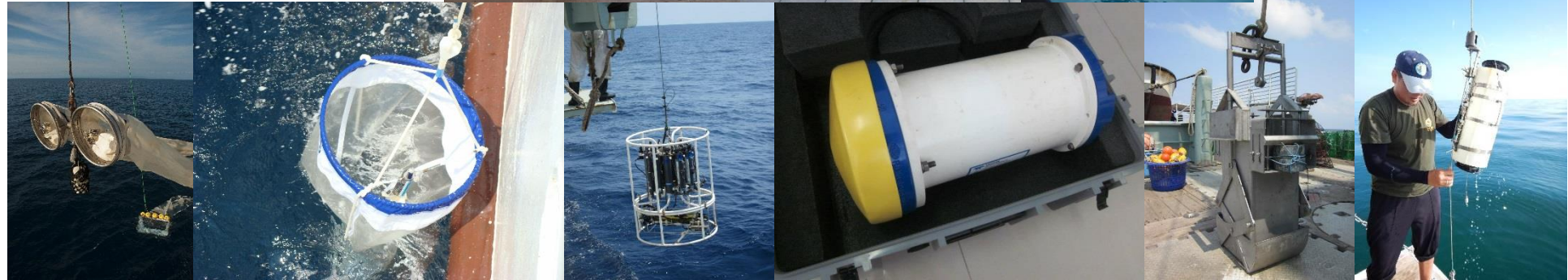
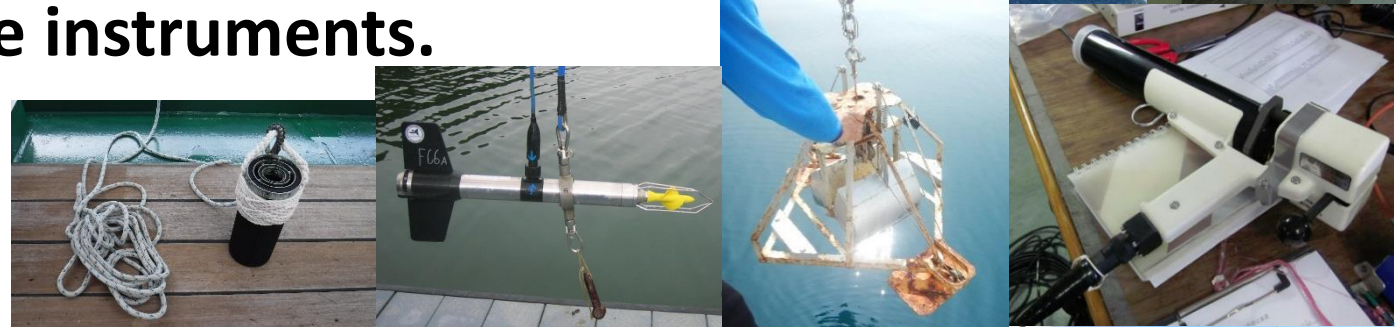
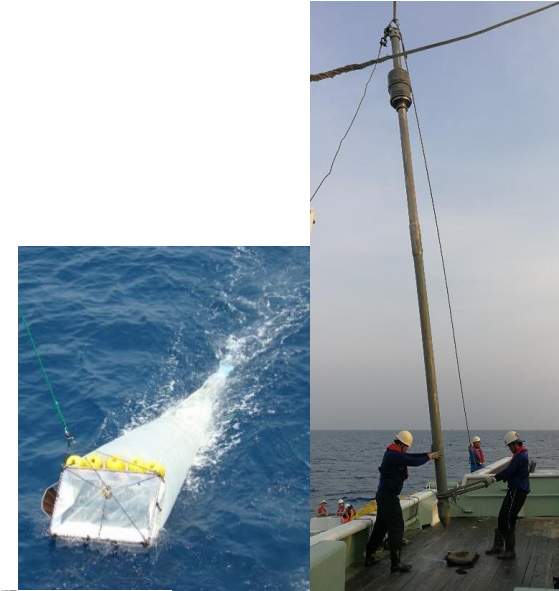
25 Silverfish
26 Triggerfish
27 Sea_cucumber
28 Detritus
29 Sardine
30 Zooplankton
31 Phytoplankton
32 Gulf_coney

33 Leopard_grouper
34 Shrimp
35 Flounder
36 Clownfish
37 Angelfish
38 Stingray

Biological Oceanographic Instrument

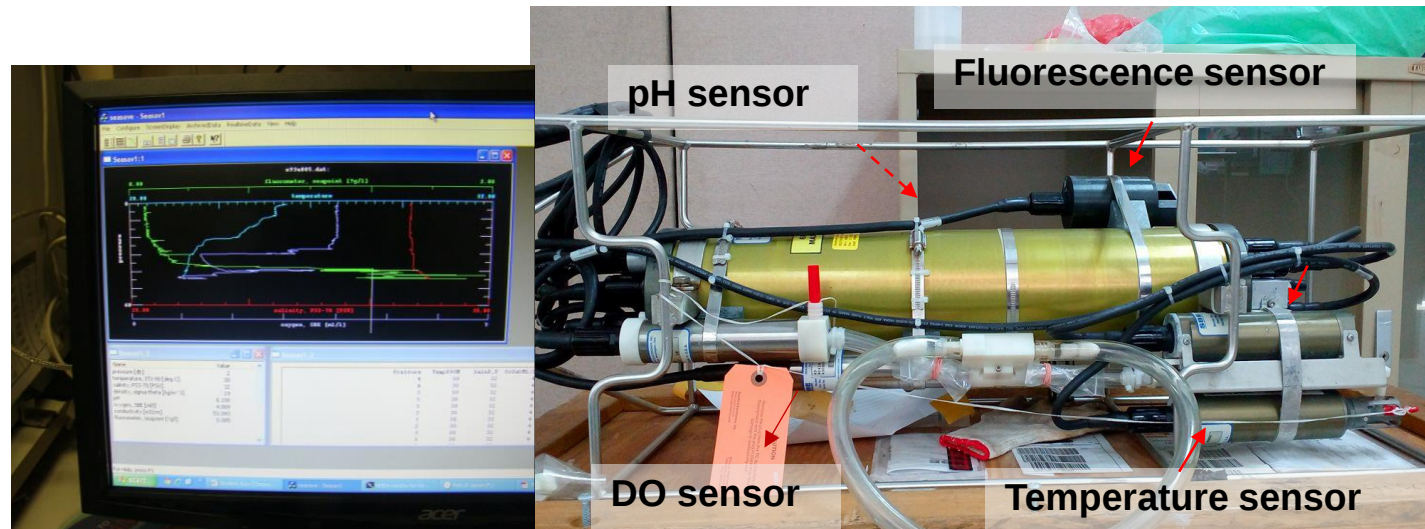
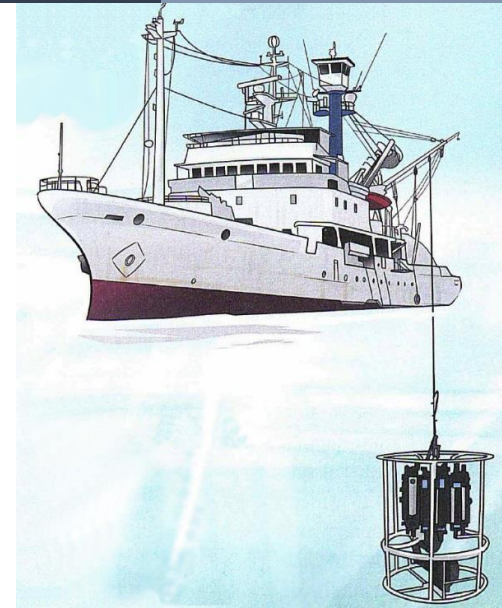
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- The instruments that help us to measure or sample various oceanographic samples for all purposes.
- These instruments can help us to understand the condition in their habitat
- Also, to develop the sampling plan based on the results.
- **We can understand the adaptation and biodiversity from the information obtained by using these instruments.**

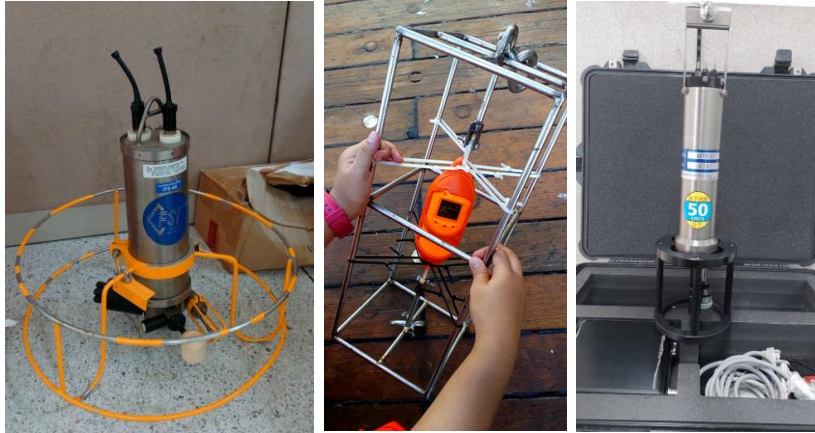


Conductivity Temperature Depth (CTD)

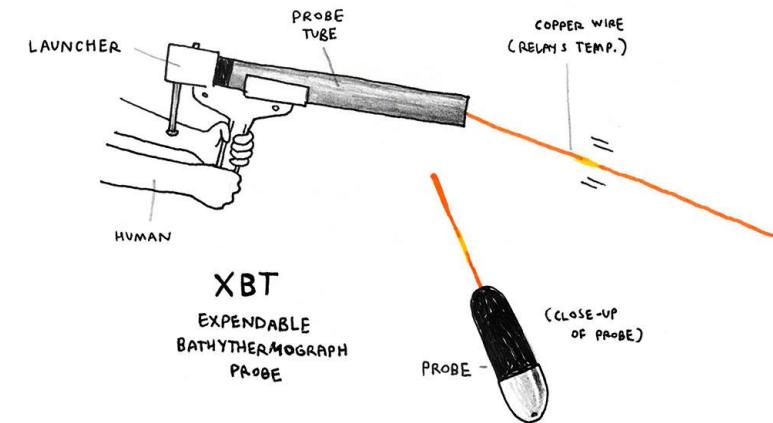
- The maximum operation depth: 6800 meters.
- With a frame, it can collect water from 12 depth ranges.
- Can put additional sensors along.
- Send the real-time signal to the processing unit onboard.



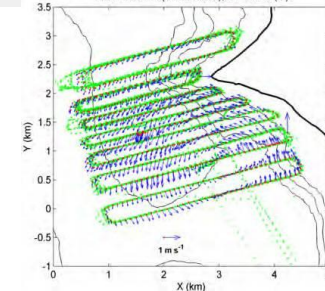
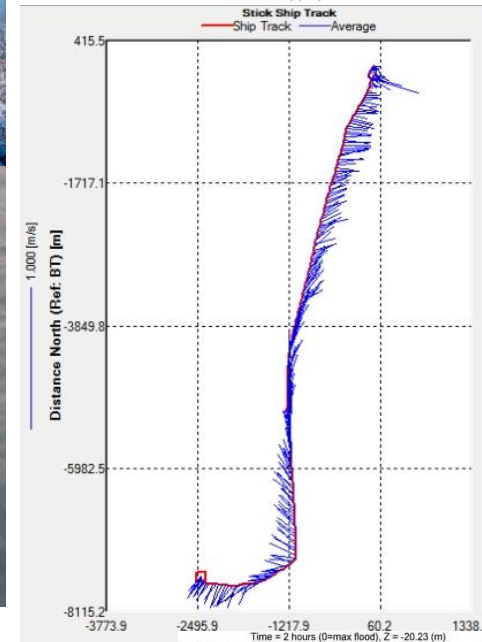
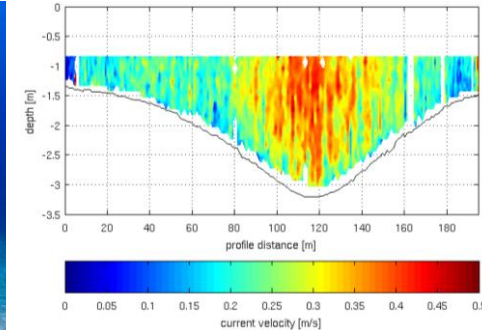
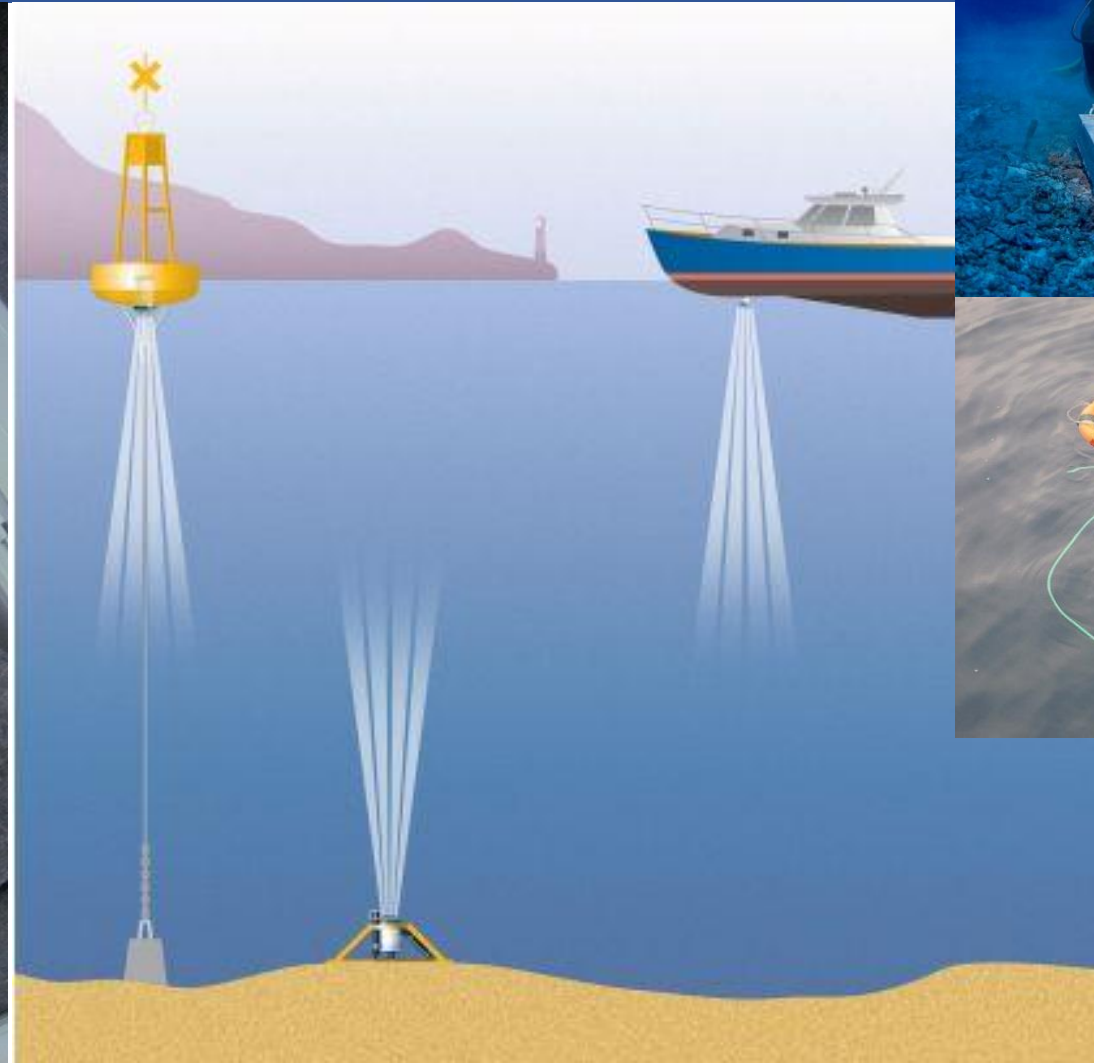
Conductivity Temperature Depth (CTD)



Expendable Bathymograph Probe (XBT)



Acoustic Doppler Current Profilers (ADCP)

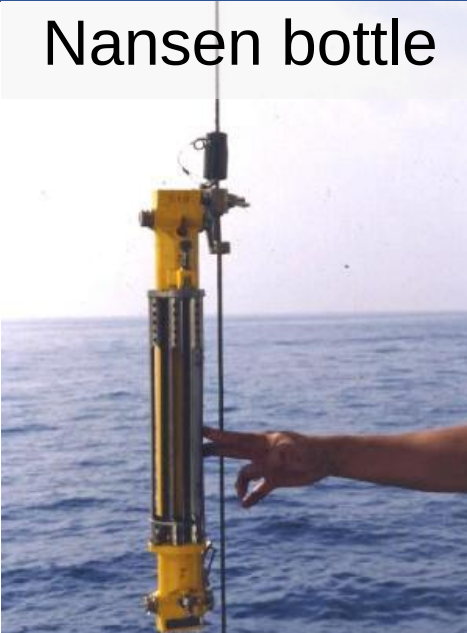


Current Meter



Water Sampler

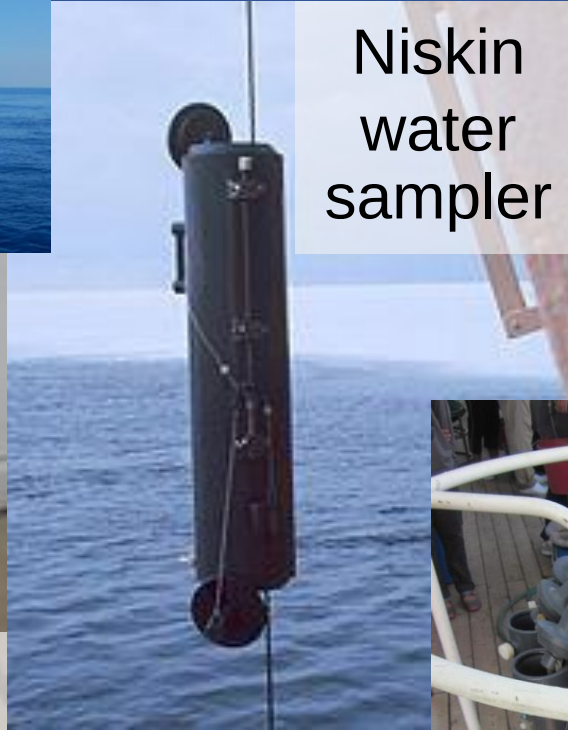
Nansen bottle



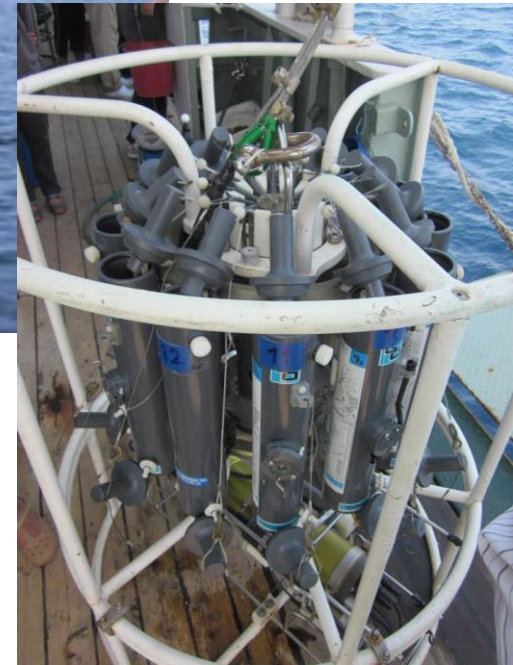
Van Dorn



Niskin water sampler

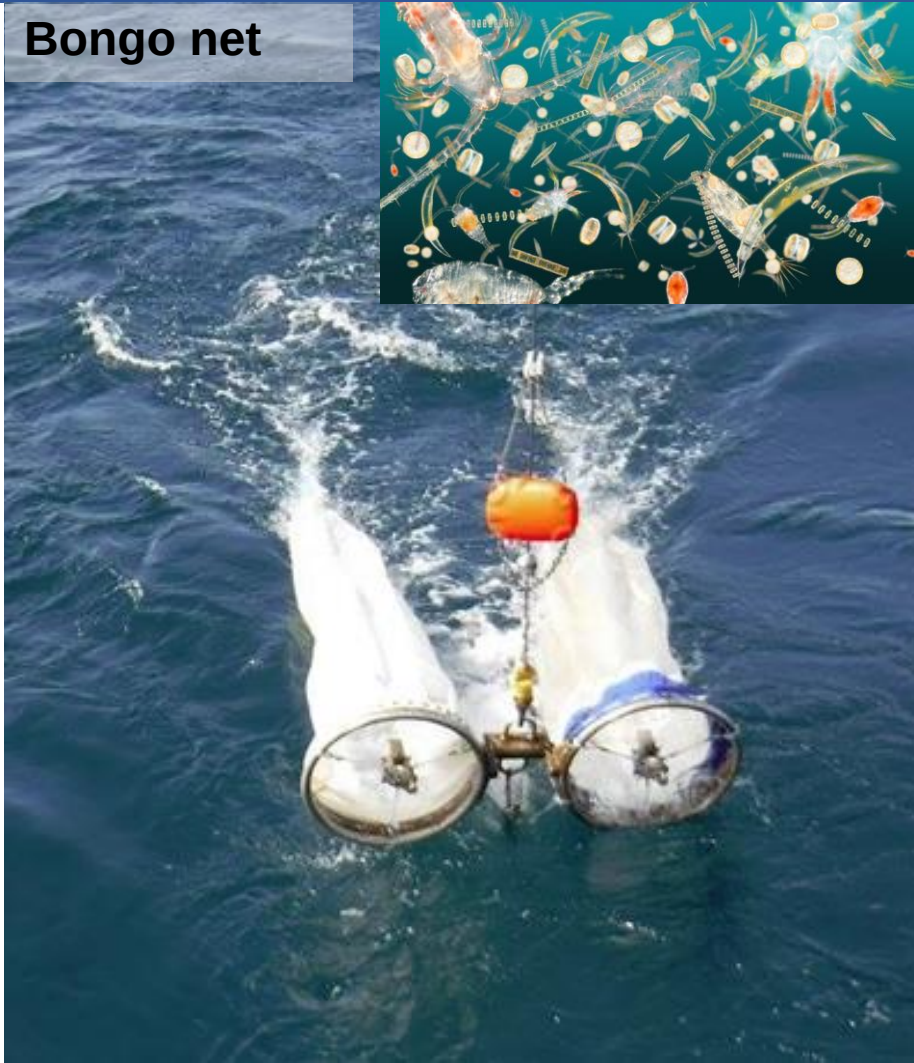


Ruttner water sampler

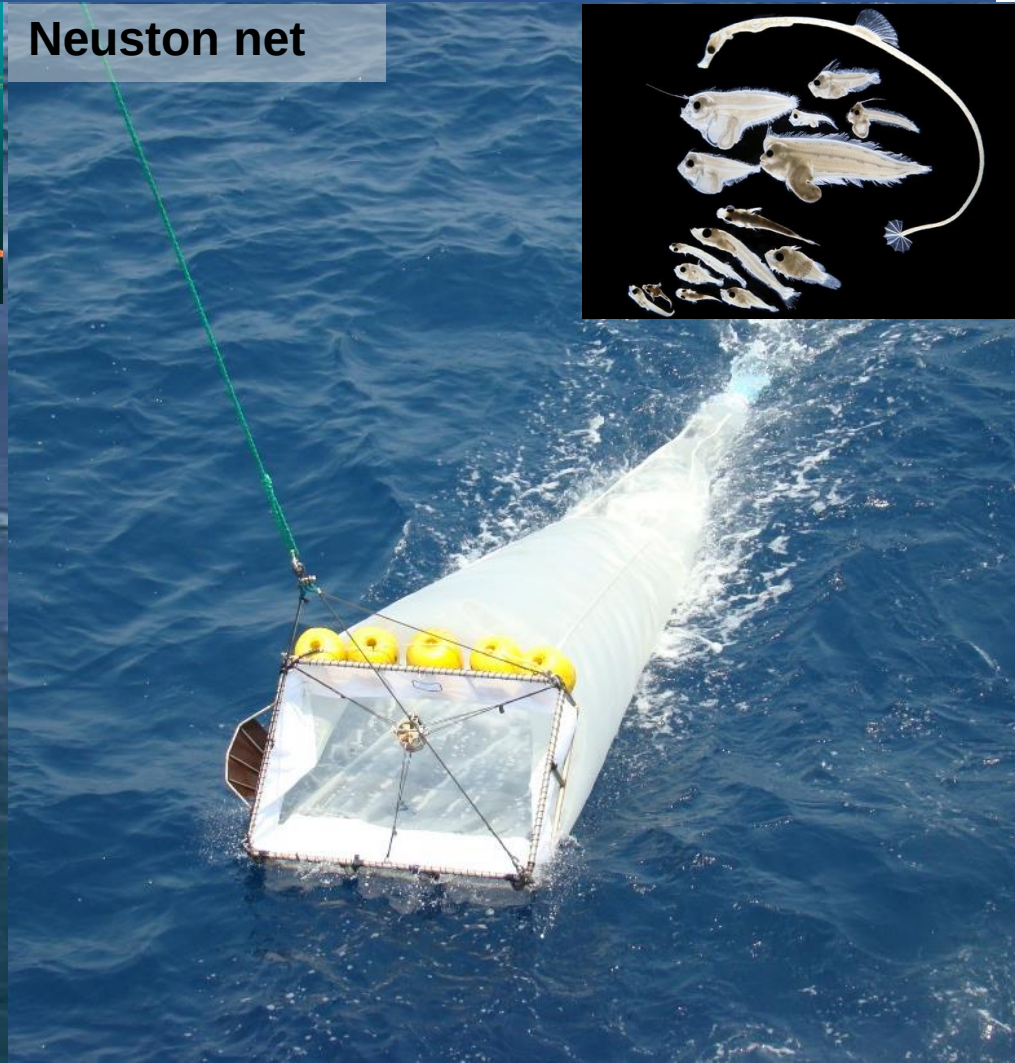


Plankton Sampler

Bongo net



Neuston net



O-ring net

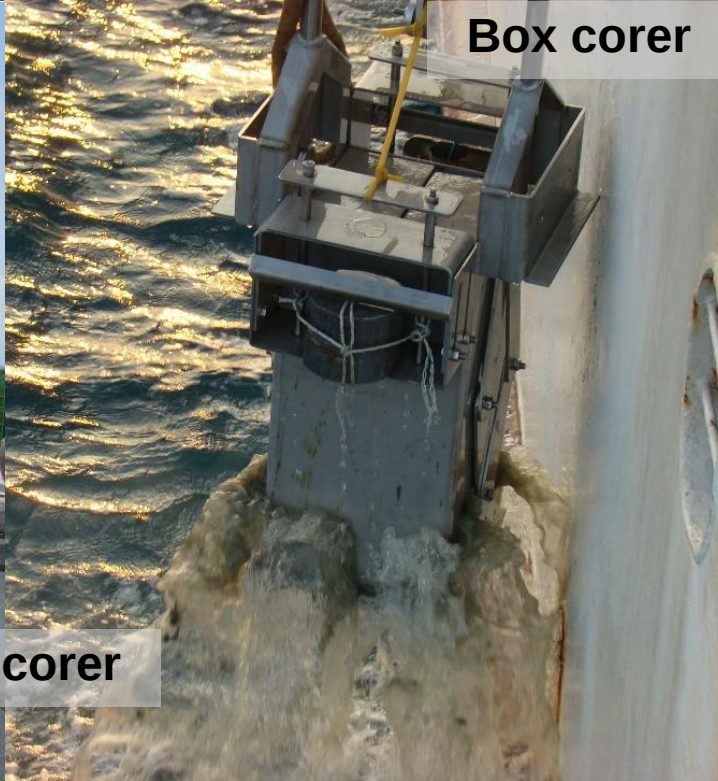


Norpac net for zooplankton

Grab



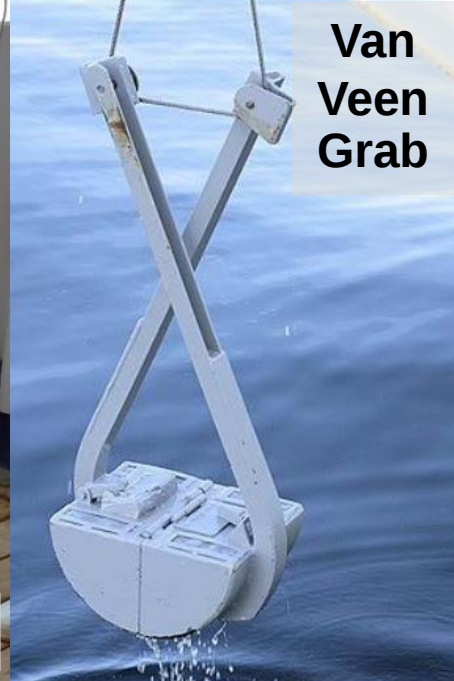
Box corer



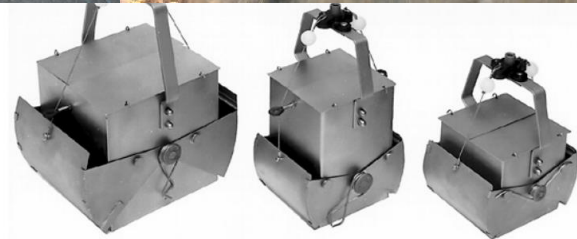
Box corer



Smith McIntyre Grab



Van Veen Grab



Ekman Grab



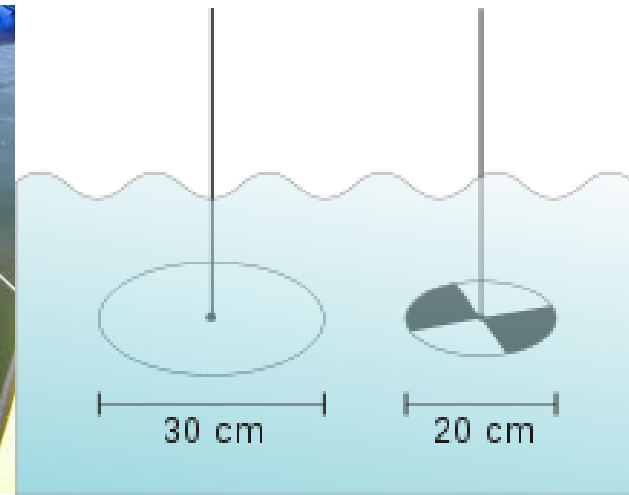
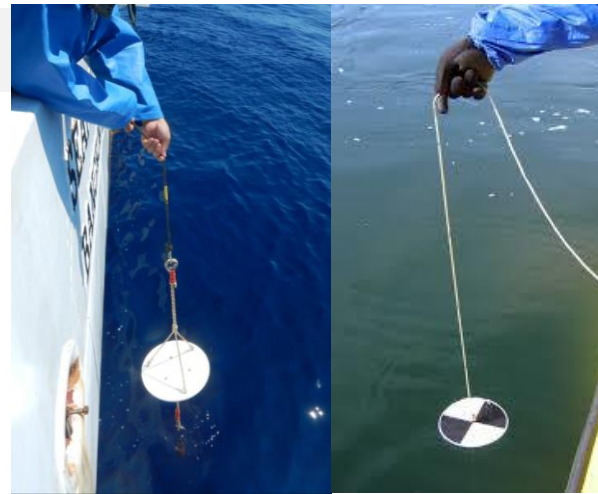
Water surface

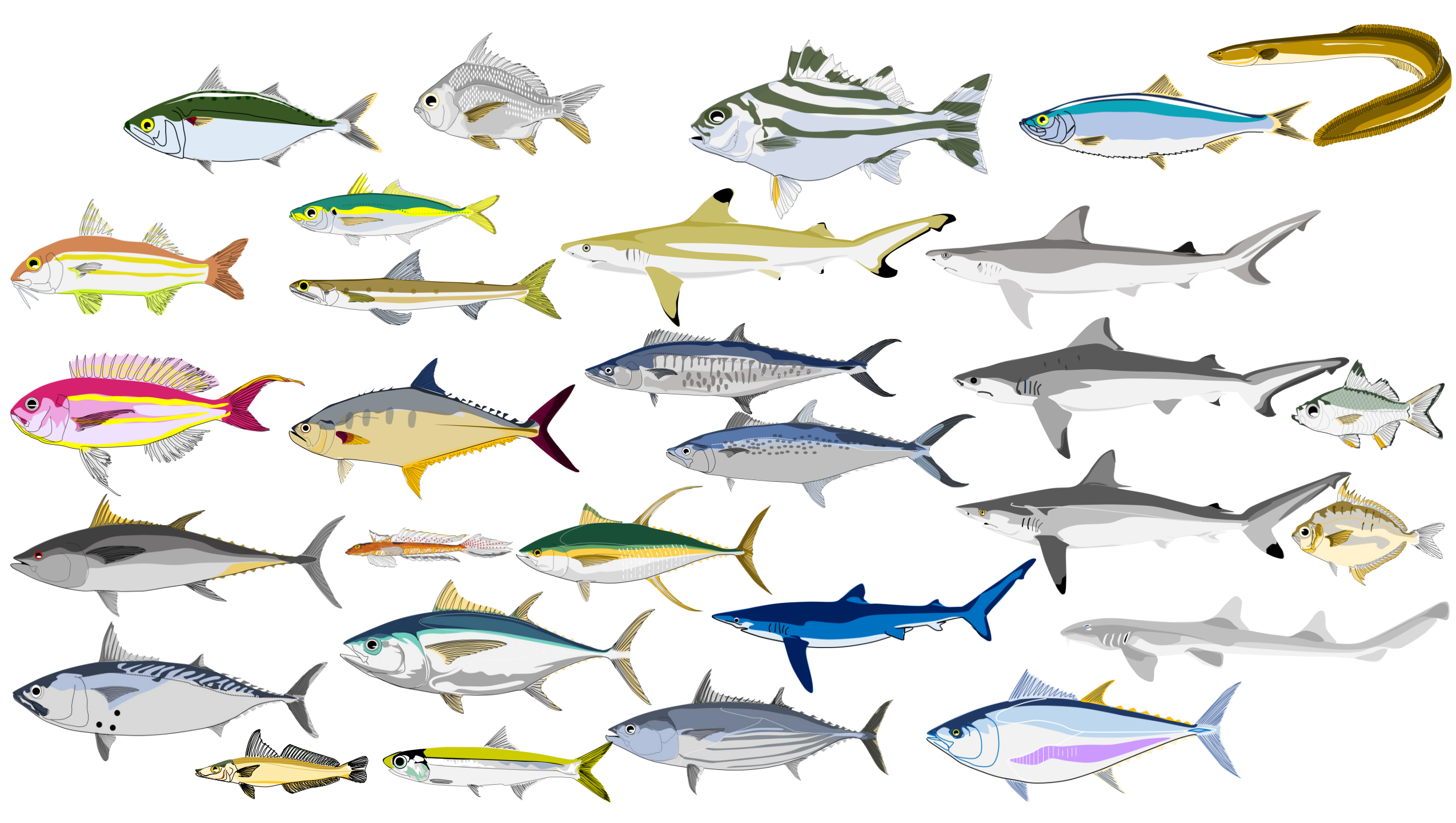


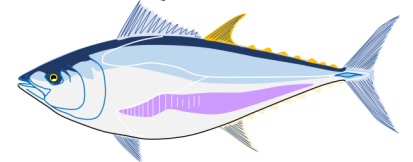
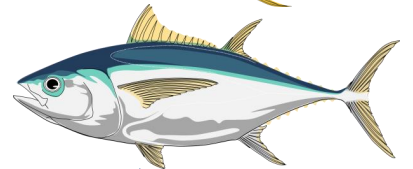
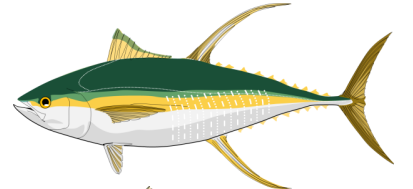
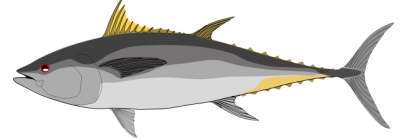
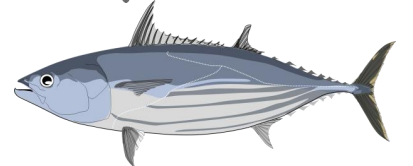
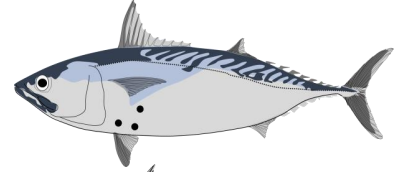
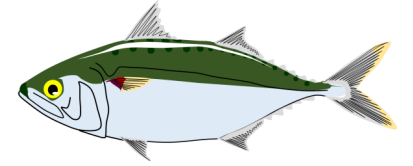
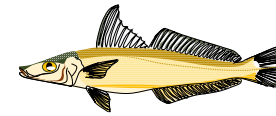
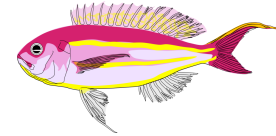
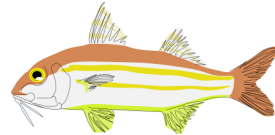
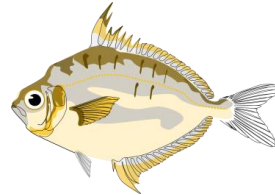
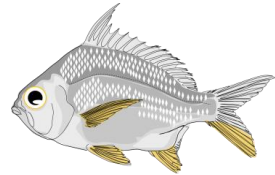
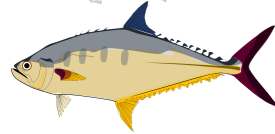
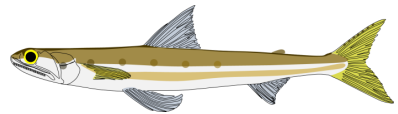
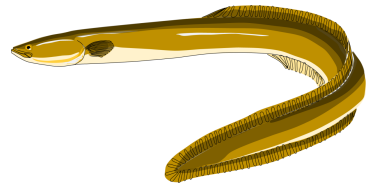
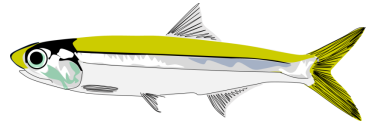
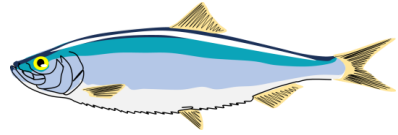
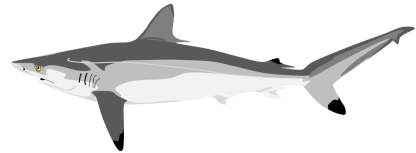
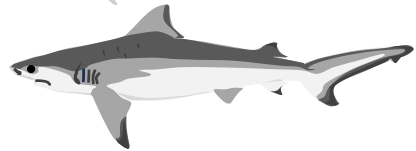
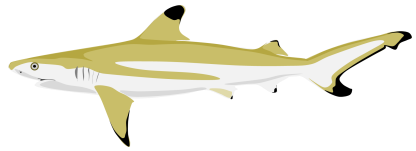
Forel-Ule scale



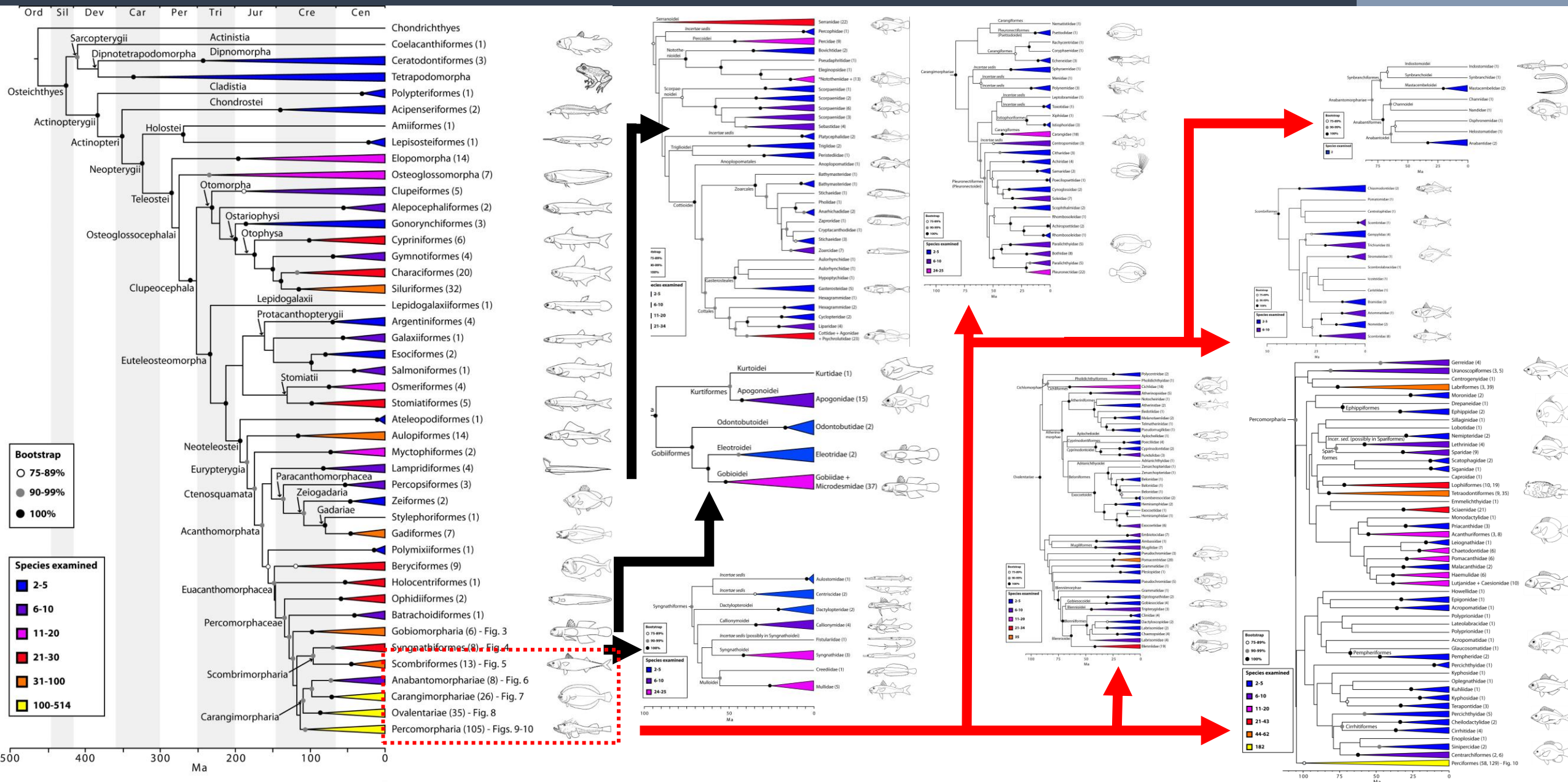
Secchi dish

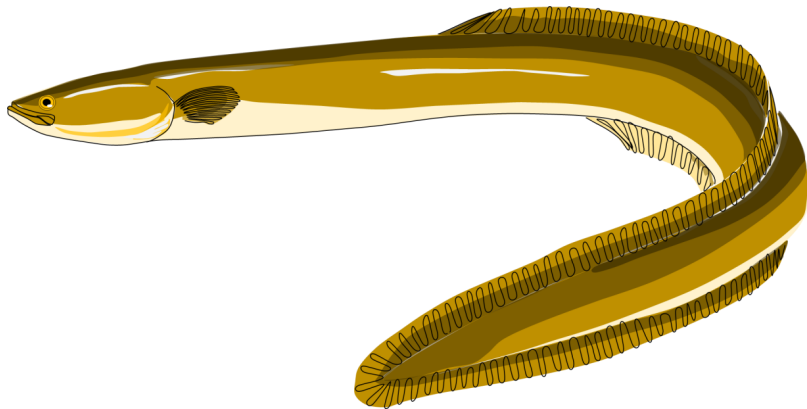
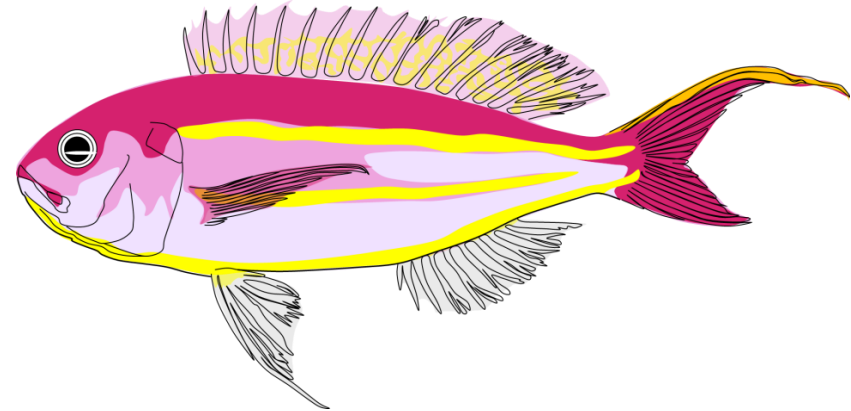
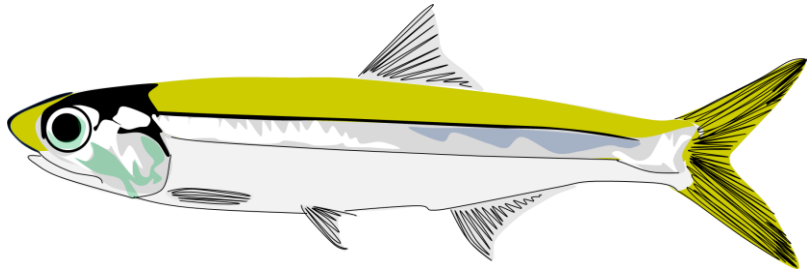
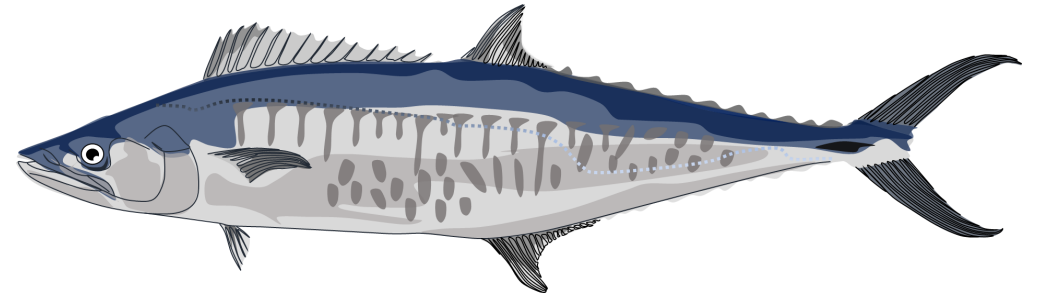
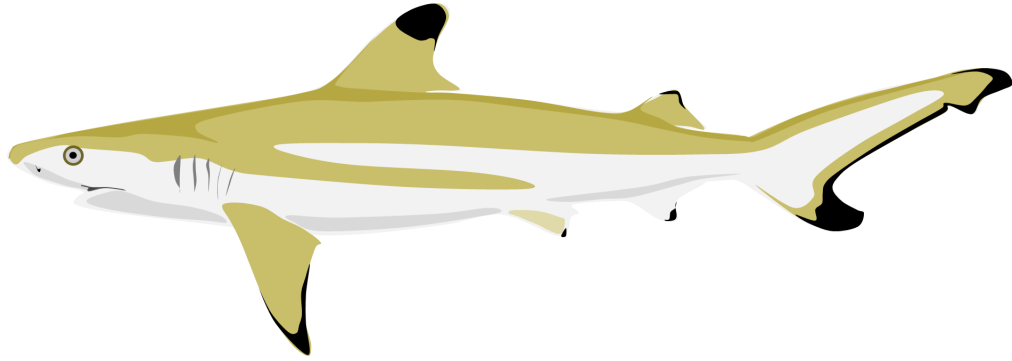


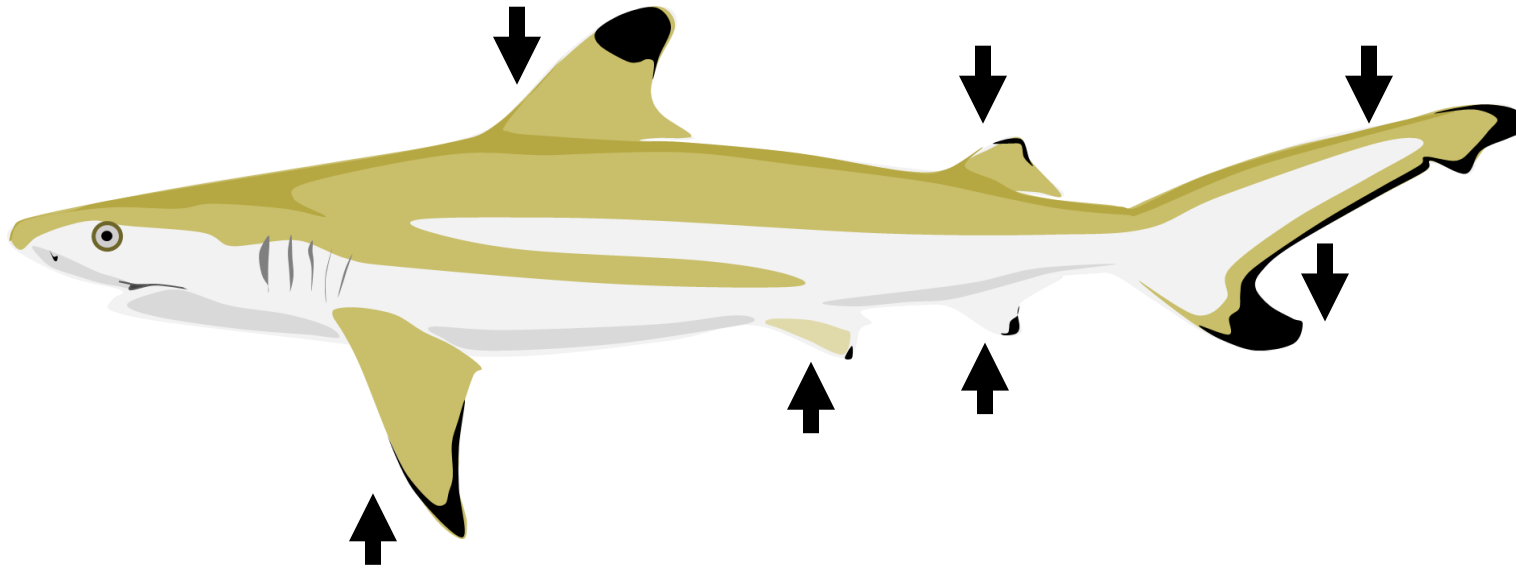




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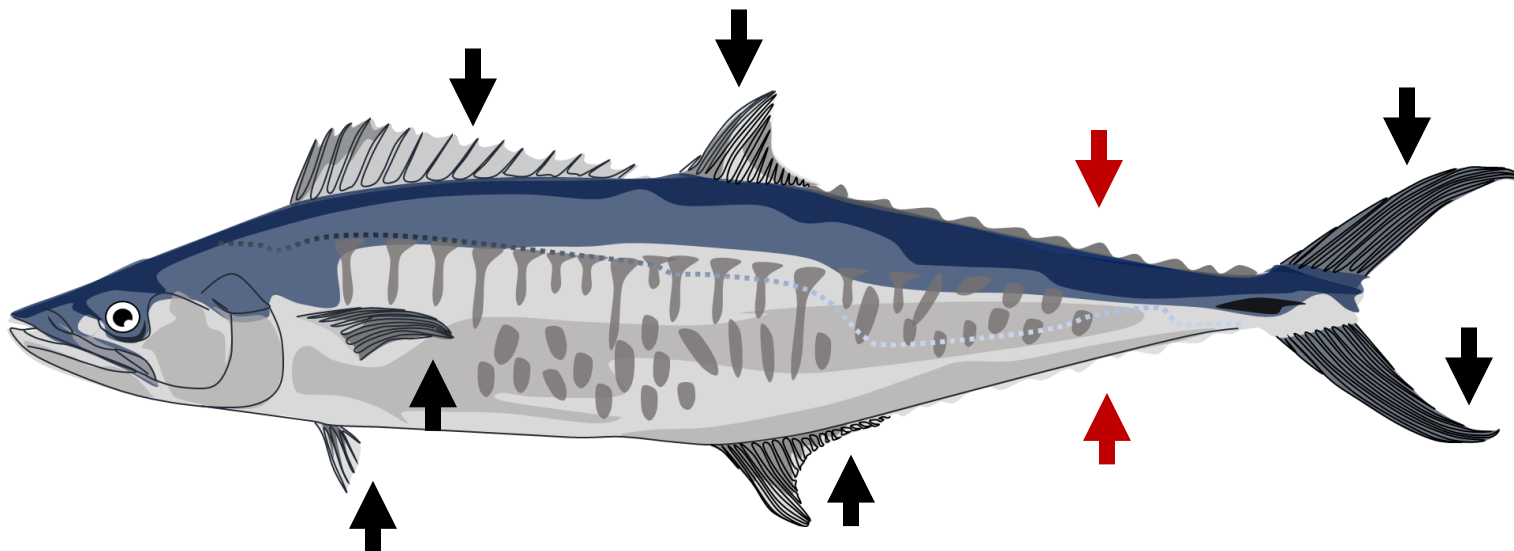


1) 1st dorsal fin

2) 2nd dorsal fin

3) Upper caudal fin

4) Lower caudal fin

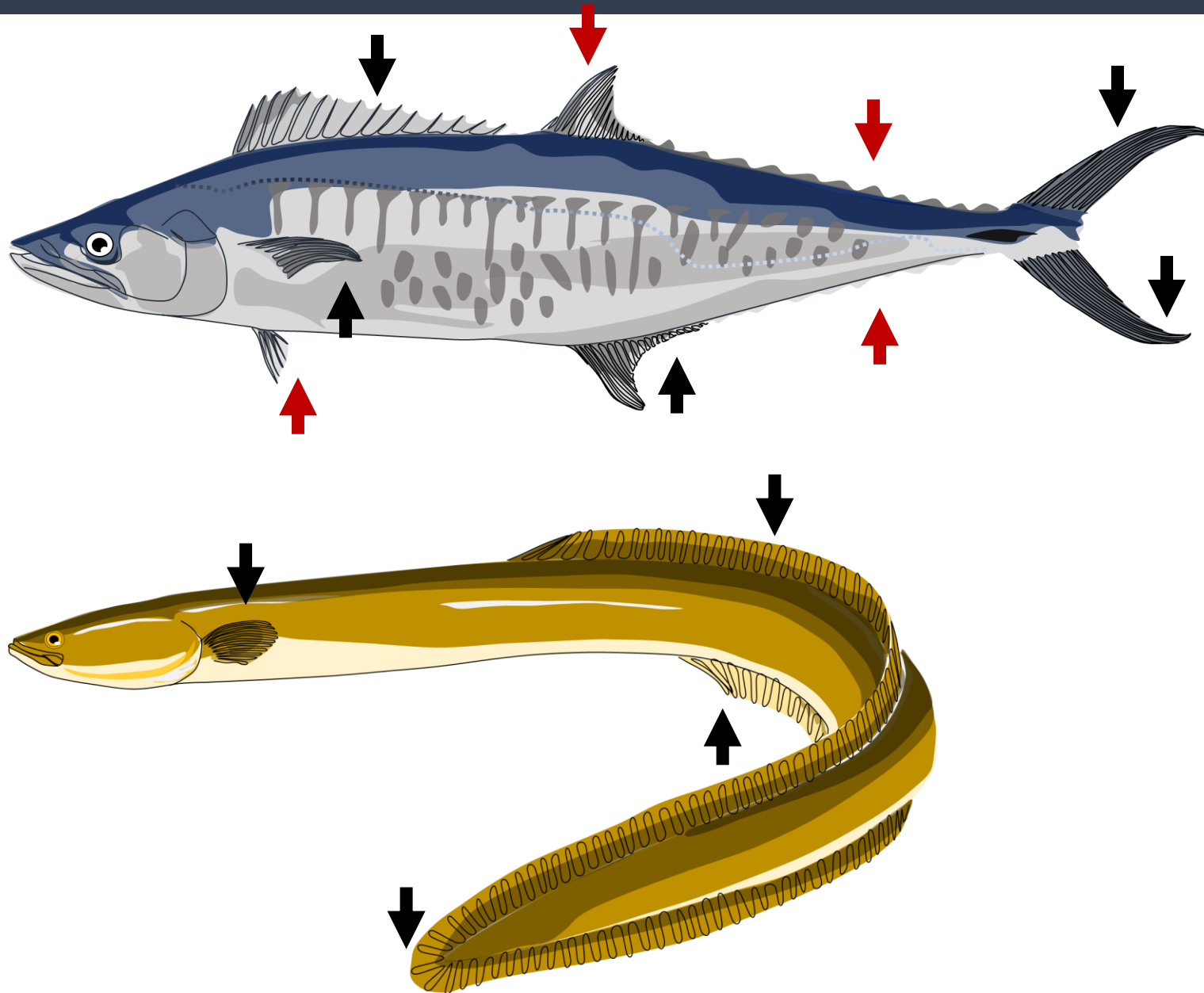


5) Pectoral fin

6) Pelvic fin

7) Anal fin

8) Finlet



1) 1st dorsal fin

2) 2nd dorsal fin

3) Upper caudal fin

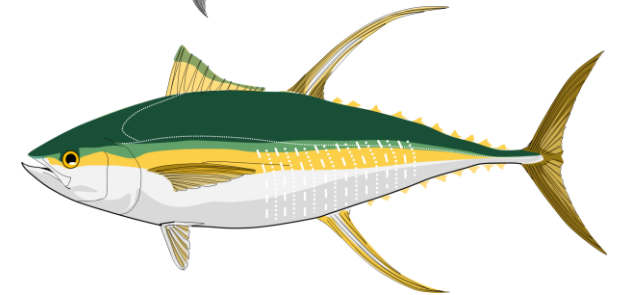
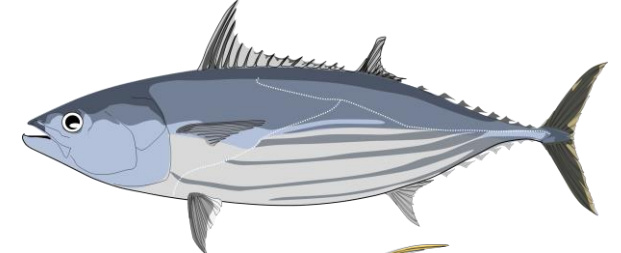
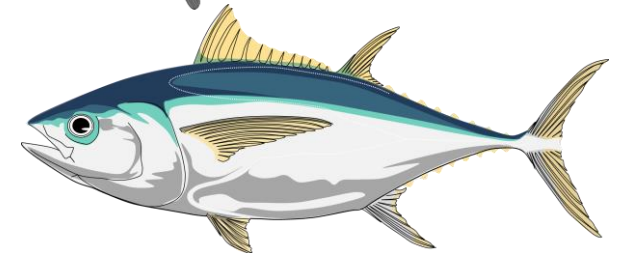
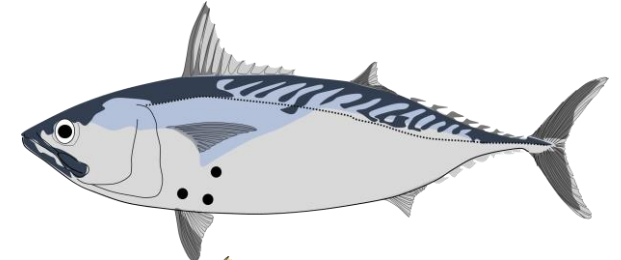
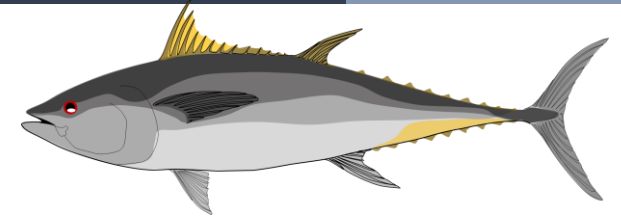
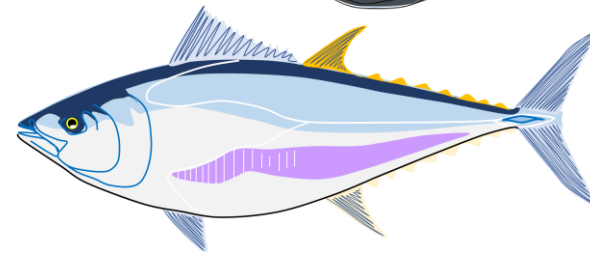
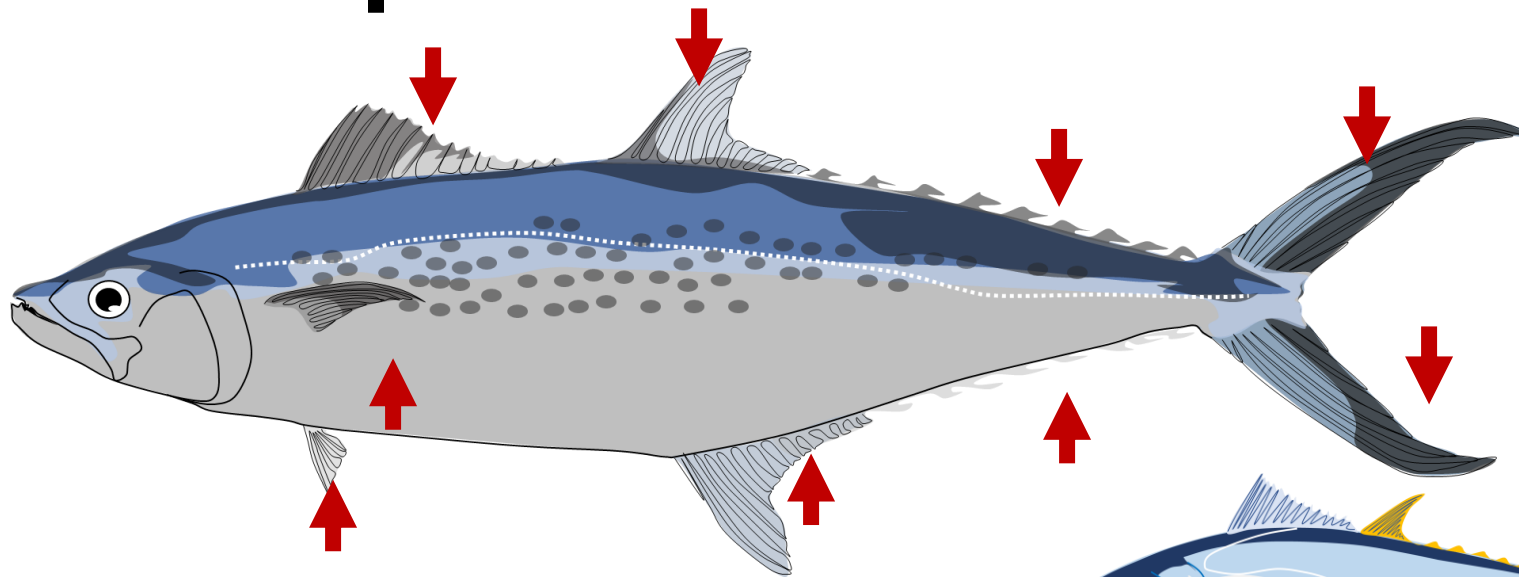
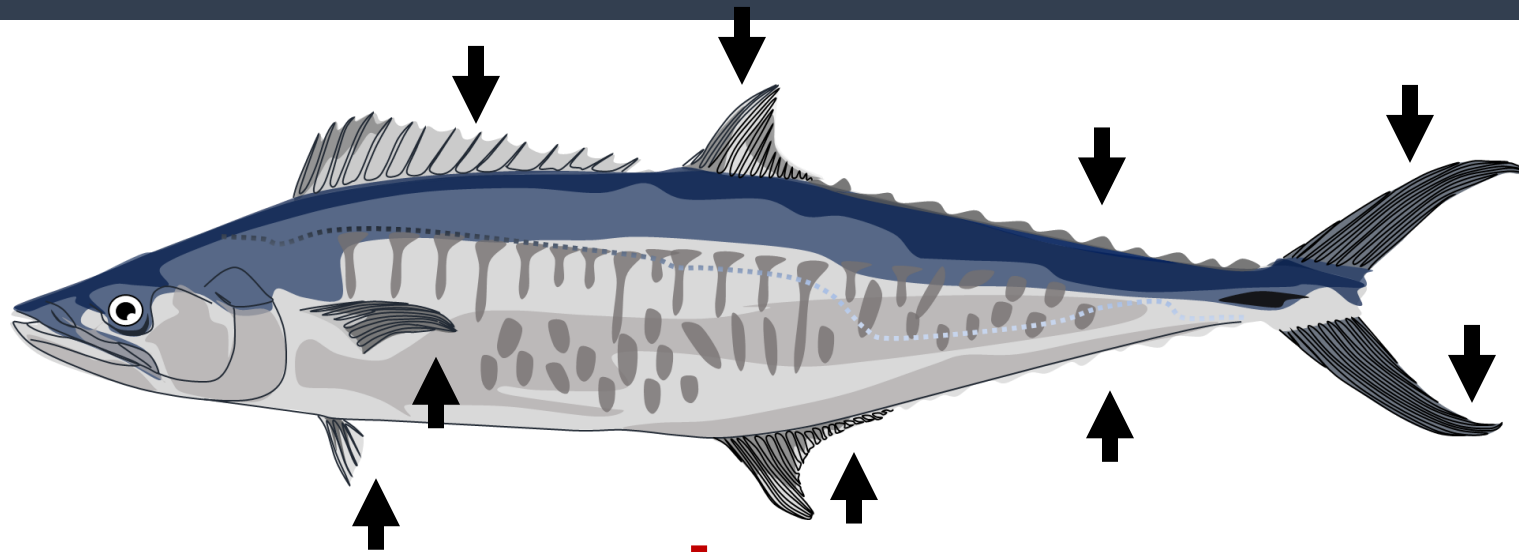
4) Lower caudal fin

5) Pectoral fin

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8) Finlet



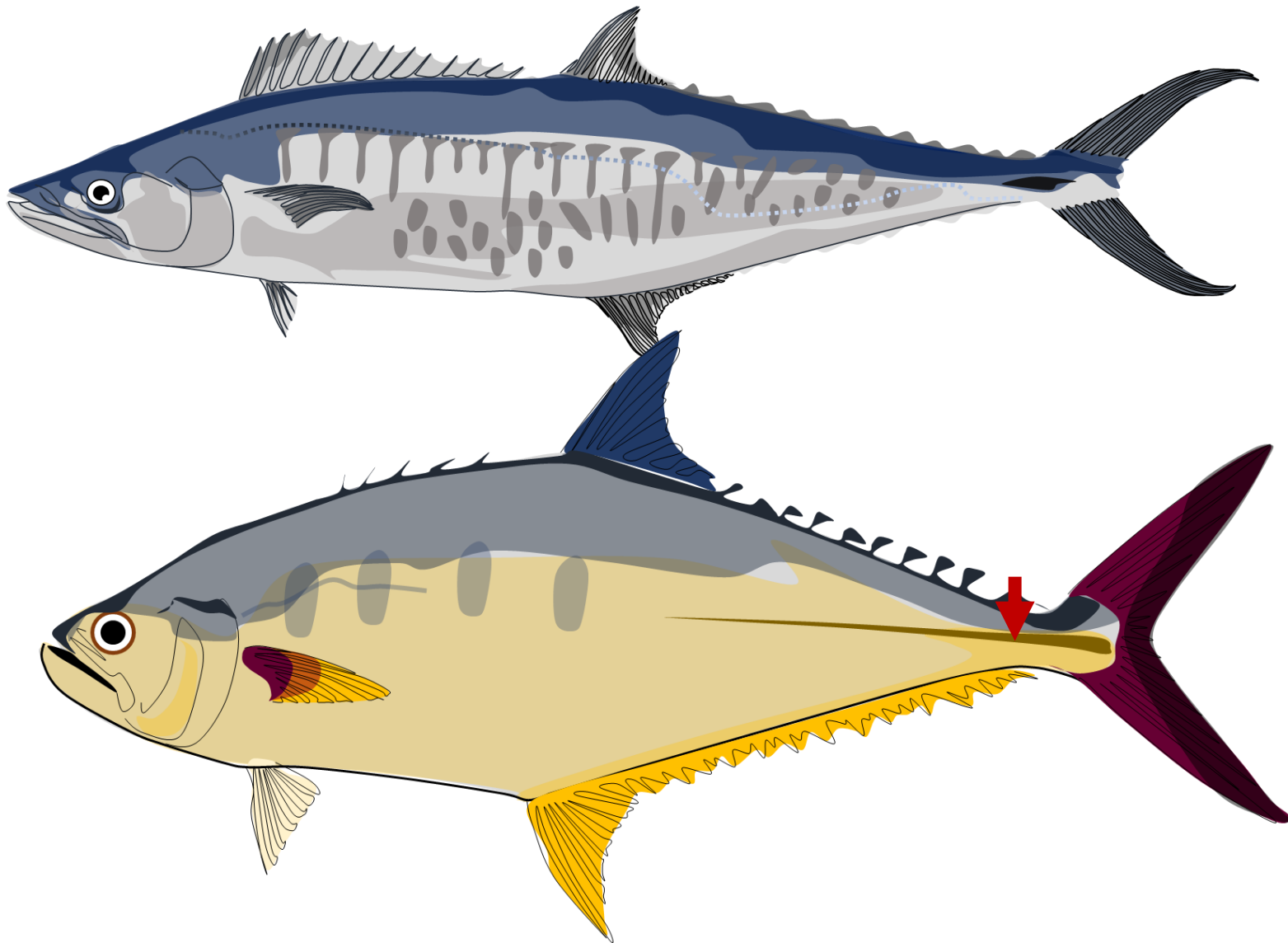


Fig. 4

