JAN HEUSCHELE
IDA JOHANNESSEN

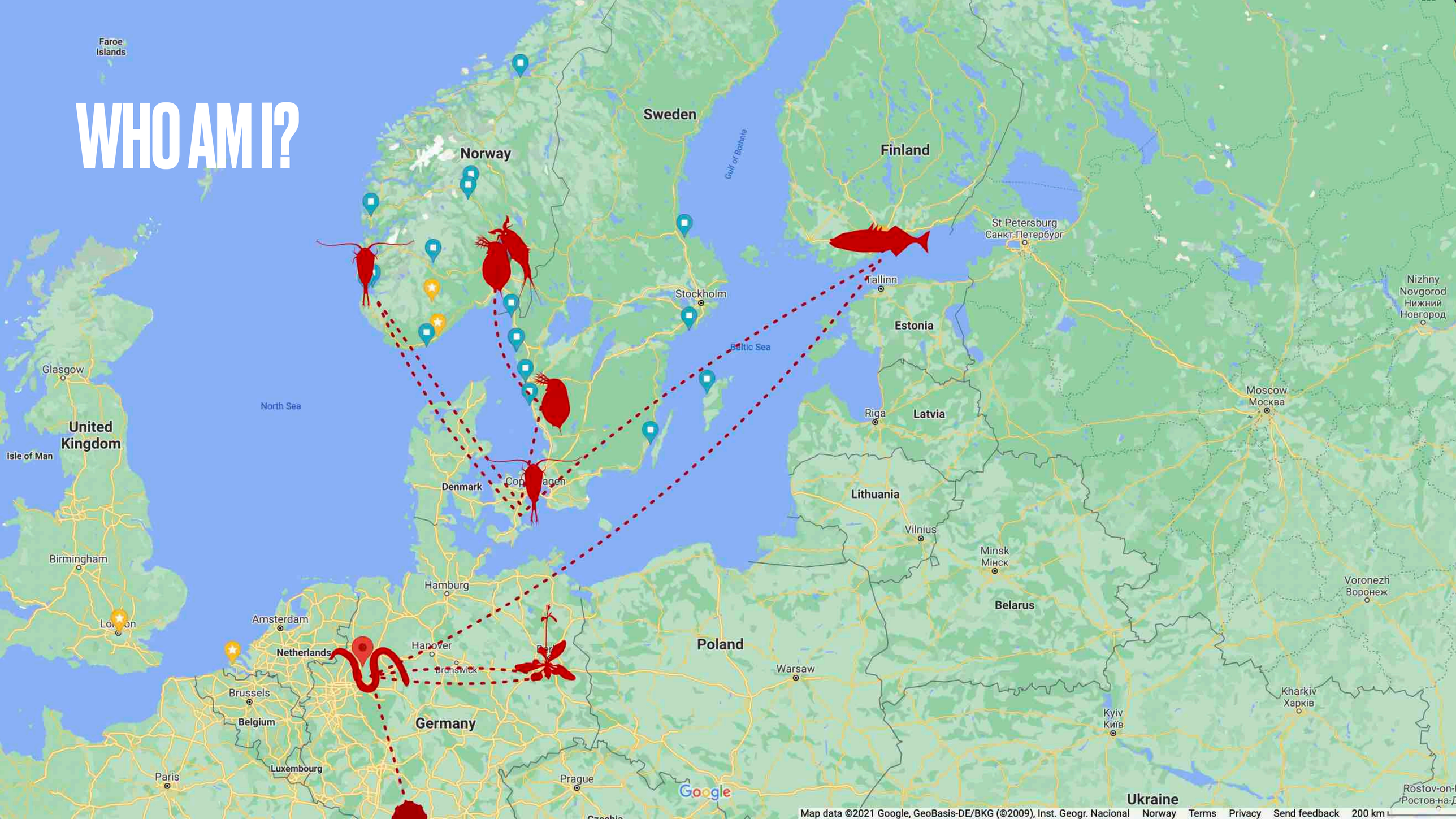
MACROCOP + SKOLELABORATORIET

The hidden role of copepods in coastal macroalgae for marine ecosystem functioning

Funded by
The Research
Council of Norway

UNIVERSITETET
I OSLO

WHO AM I?


Faroe Islands
Sweden
Norway
Finland
Gulf of Bothnia
St Petersburg
Санкт-Петербург
Tallinn
Stockholm
Estonia
Baltic Sea
Nizhny Novgorod
Нижний Новгород
Glasgow
North Sea
Moscow
Москва
United Kingdom
Isle of Man
Riga
Latvia
Denmark
Lithuania
Vilnius
Minsk
Мінск
Birmingham
Hamburg
Amsterdam
Belarus
Voronezh
Воронеж
Netherlands
Hanover
Poland
Warsaw
Brunswick
Brussels
Belgium
Germany
Kharkiv
Харків
Kyiv
Київ
Luxembourg
Paris
Prague
Ukraine
Google
Map data ©2021 Google, GeoBasis-DE/BKG (©2009), Inst. Geogr. Nacional
Norway
Terms
Privacy
Send feedback
200 km

WHAT I WILL TALK ABOUT



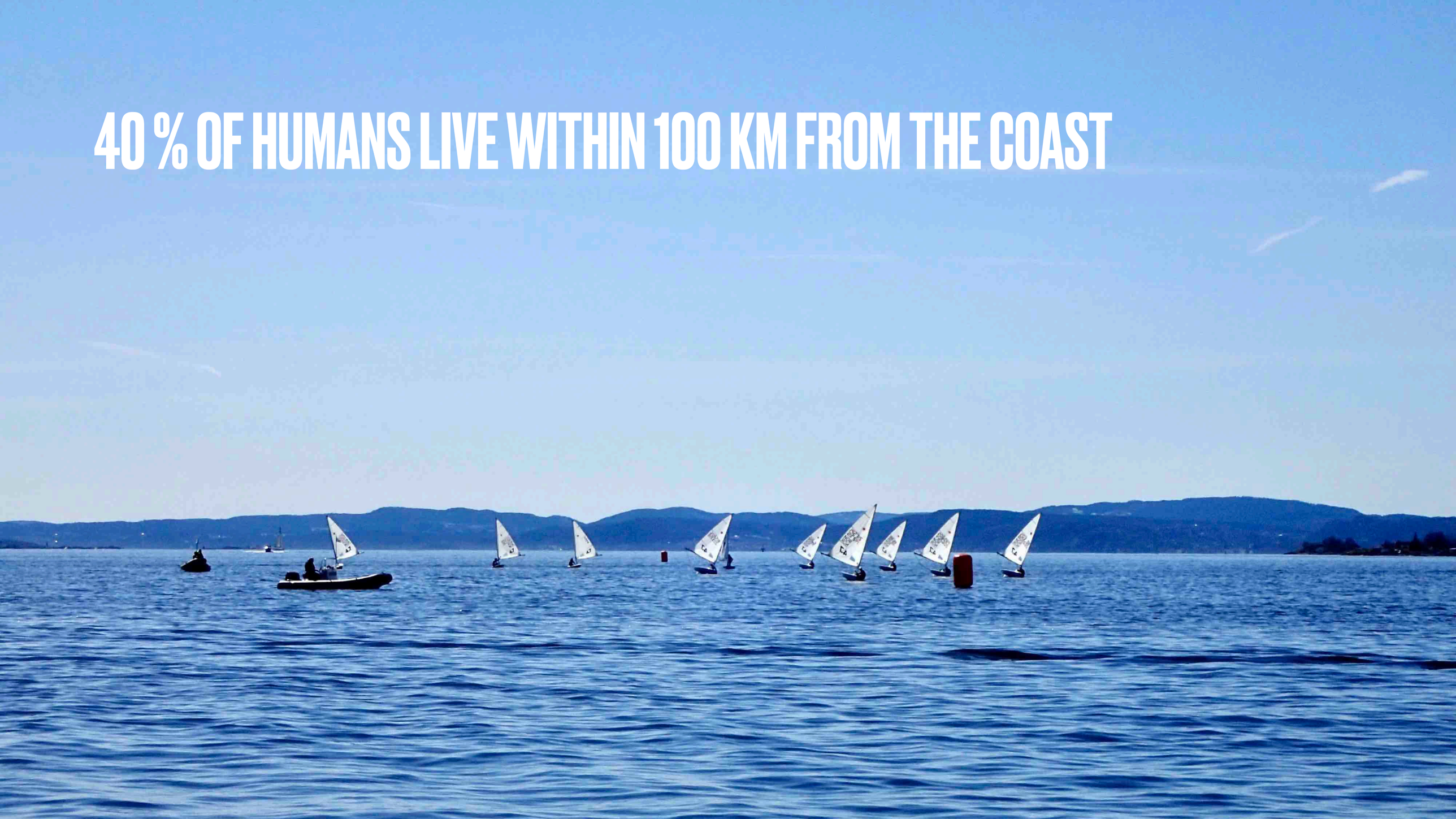
Small introduction to copepods and why they matter.

Introduction of the MACROCOP project.

Why we need you in the project!


72% OF EARTH IS COVERED BY WATER
Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO Landsat / Copernicus IBCAO PGC/NASA U.S. Geological Survey
Camera: 22,252 km 36°19'12"N 147°56'44"W

40 % OF HUMANS LIVE WITHIN 100 KM FROM THE COAST





17 % OF ALL PROTEIN

consumed by humans comes from the ocean (UN fact sheet 2017)

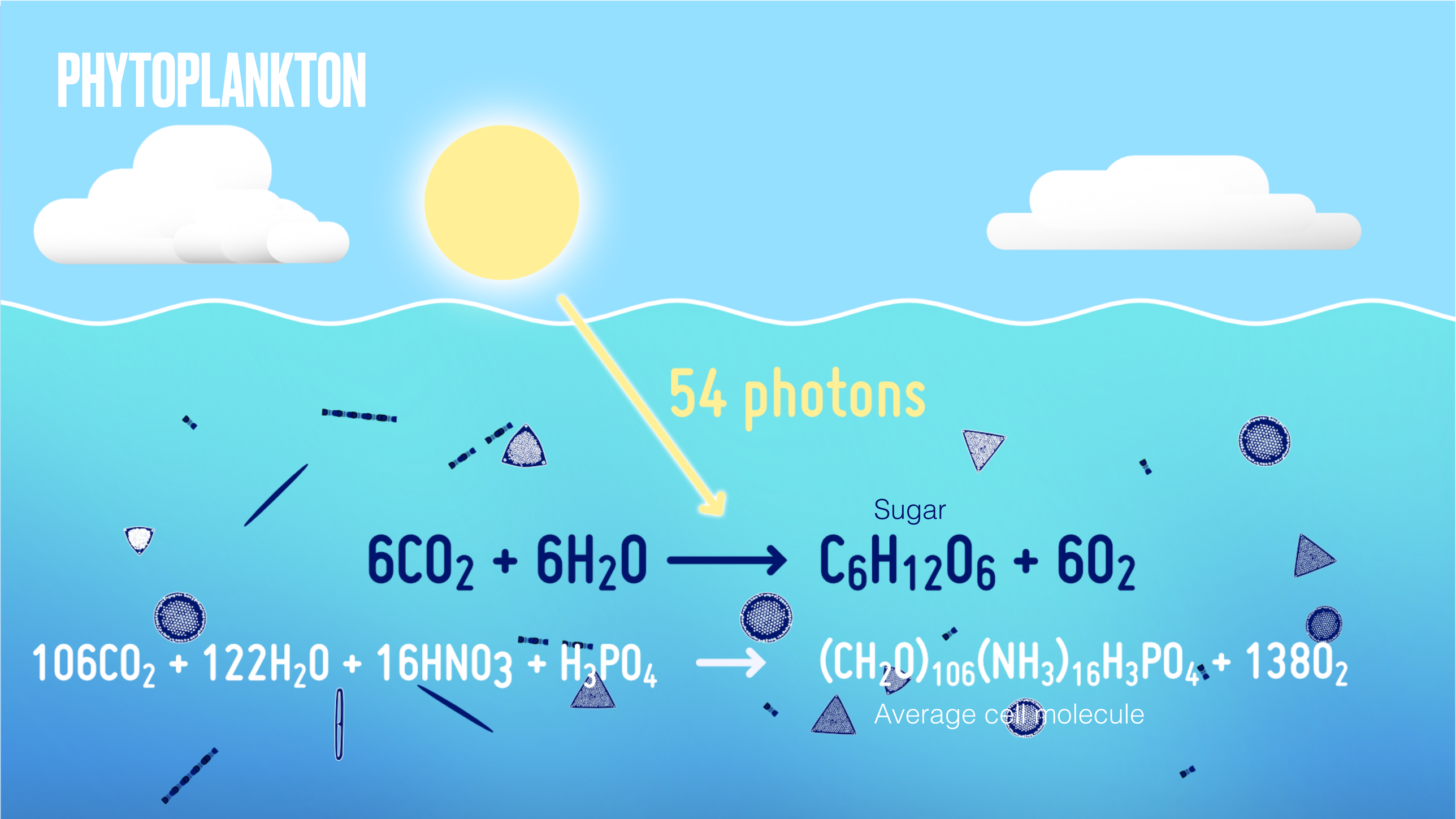


~50%

of oxygen is produced by phytoplankton

Photo by Thierry Meier on Unsplash

PHYTOPLANKTON



Sugar

$$6CO_2 + 6H_2O \longrightarrow C_6H_{12}O_6 + 6O_2$$

$$106CO_2 + 122H_2O + 16HNO_3 + H_3PO_4 \longrightarrow (CH_2O)_{106}(NH_3)_{16}H_3PO_4 + 138O_2$$

Average cell molecule

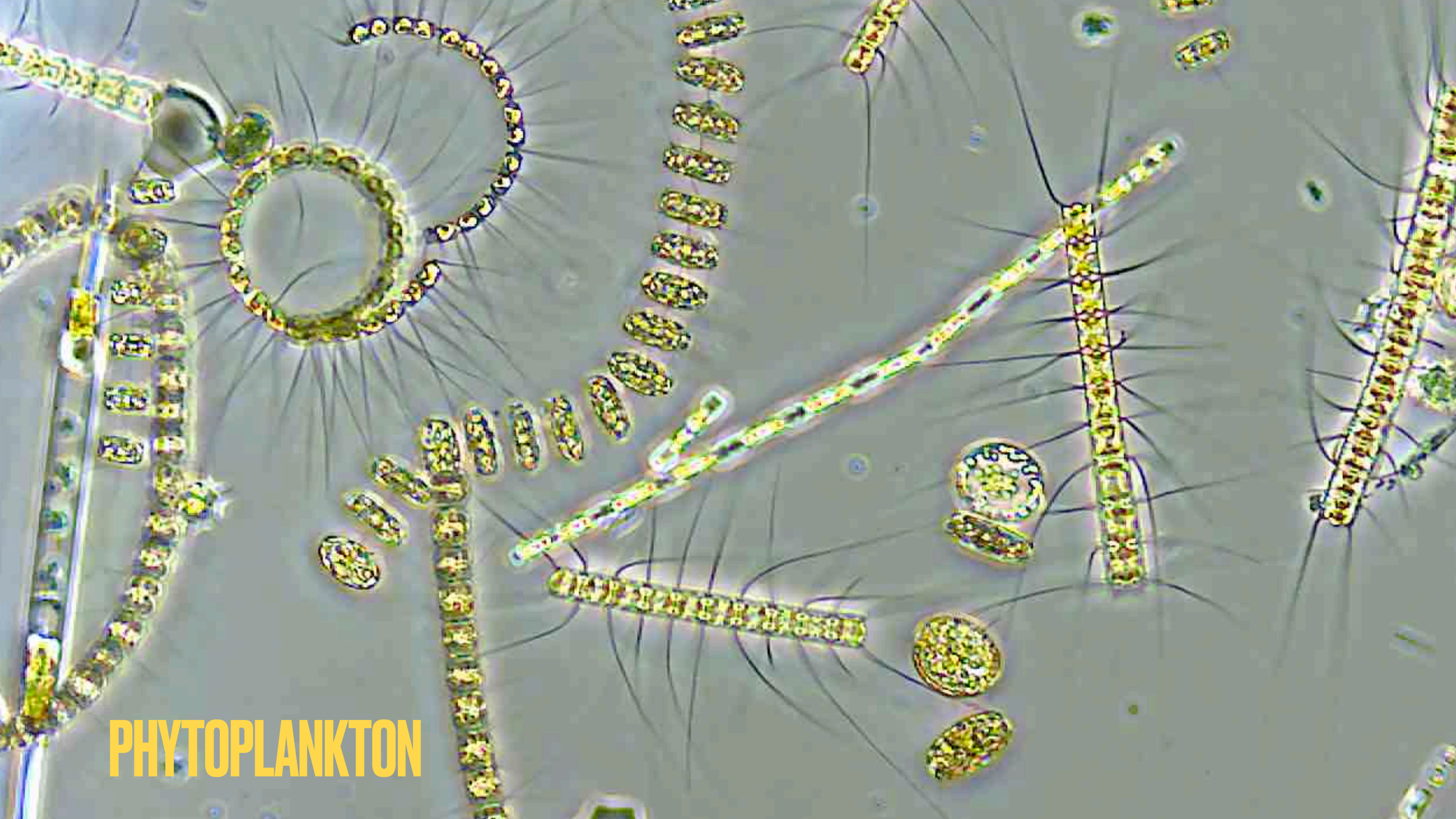

PHYTOPLANKTON



Photo by Luisa Brimble on Unsplash

ZOOPLANKTON

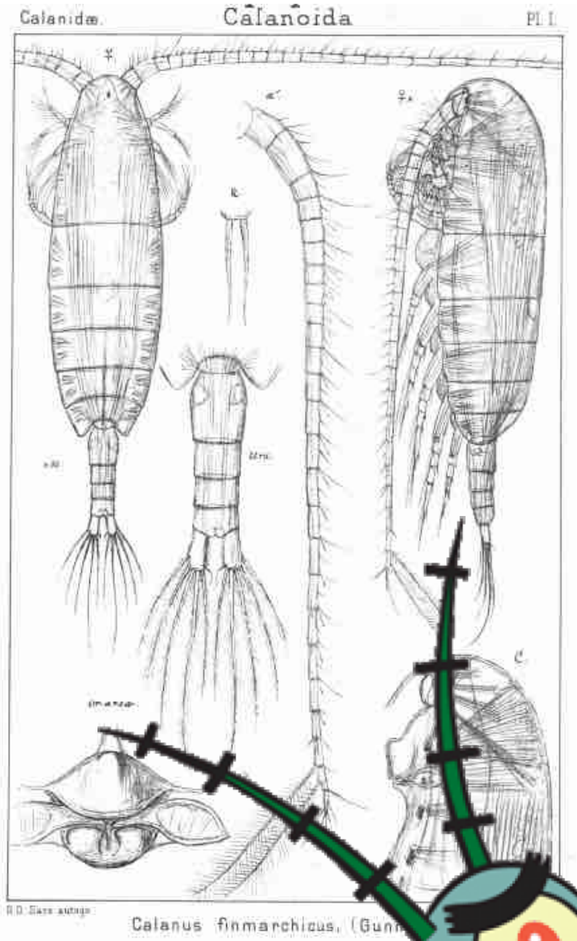


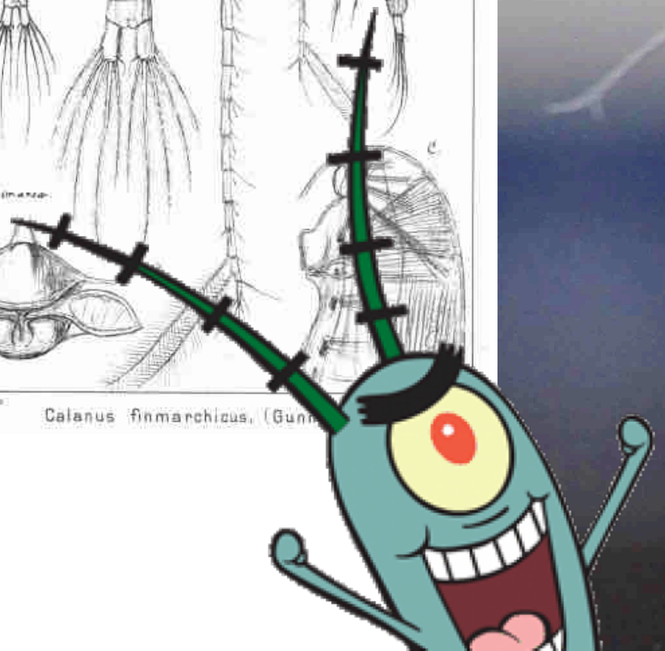
Holoplankton and meroplankton


COPEPODS

COPEPODS

Hoppekrebs

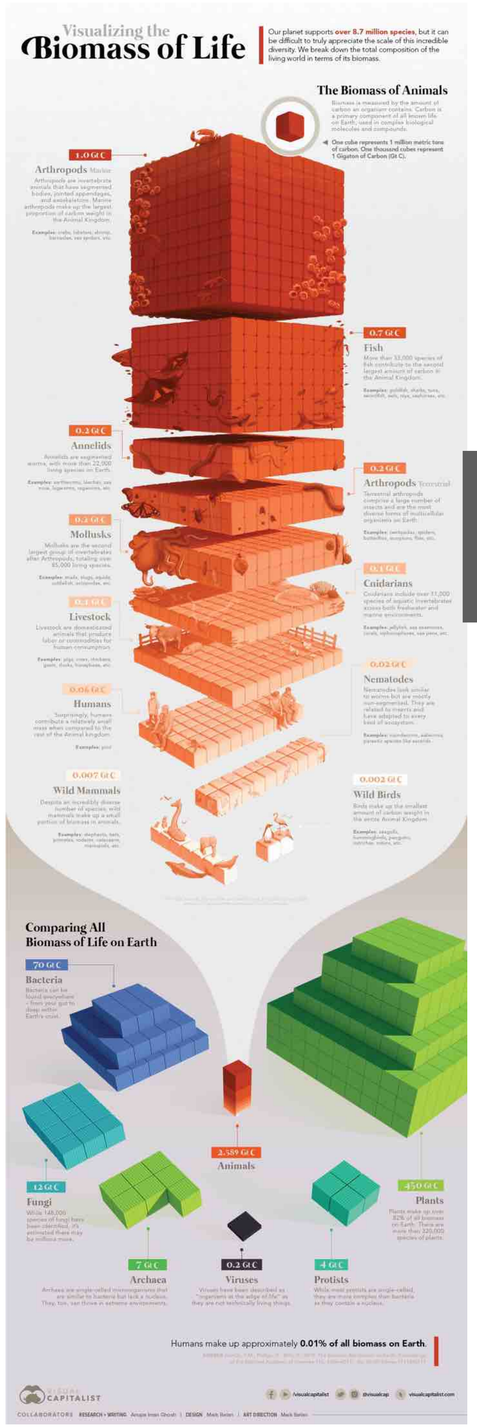


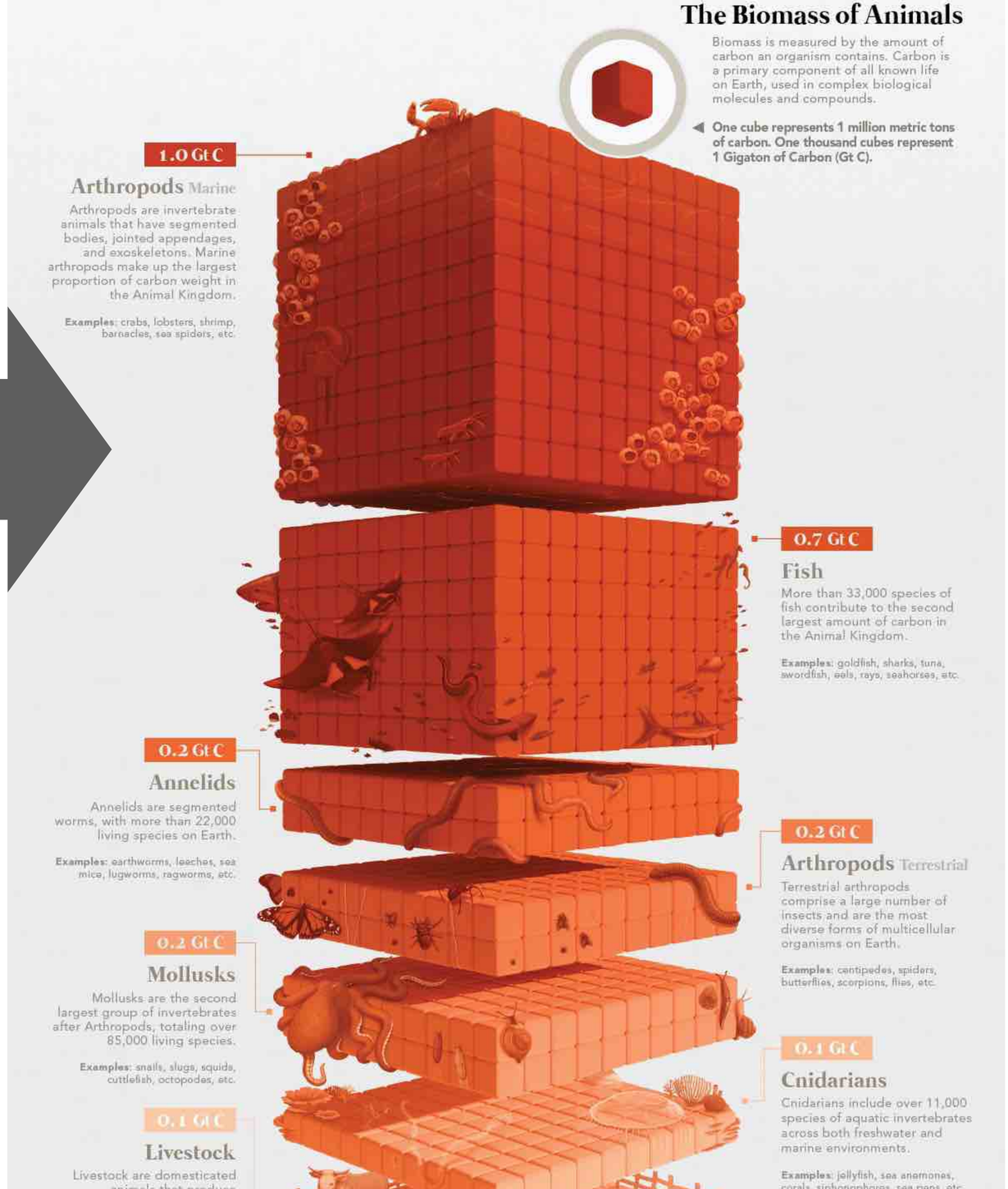




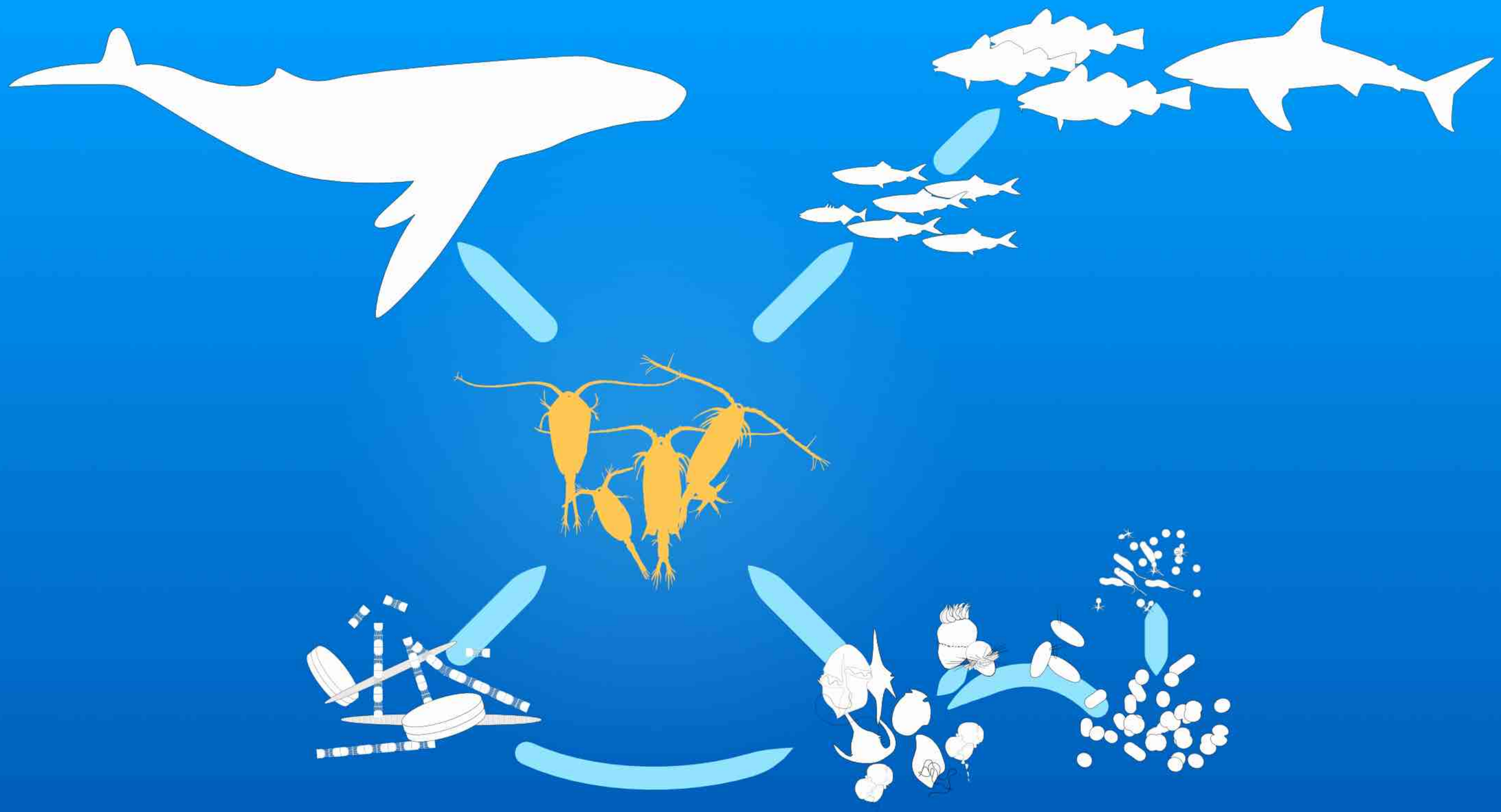
Raudåte Calanus finmarchicus

COPEPODS are the most numerous animals on the planet





https://www.visualcapitalist.com/



Copepods are central to the marine food web

COPEPODS LIVE EVERYWHERE

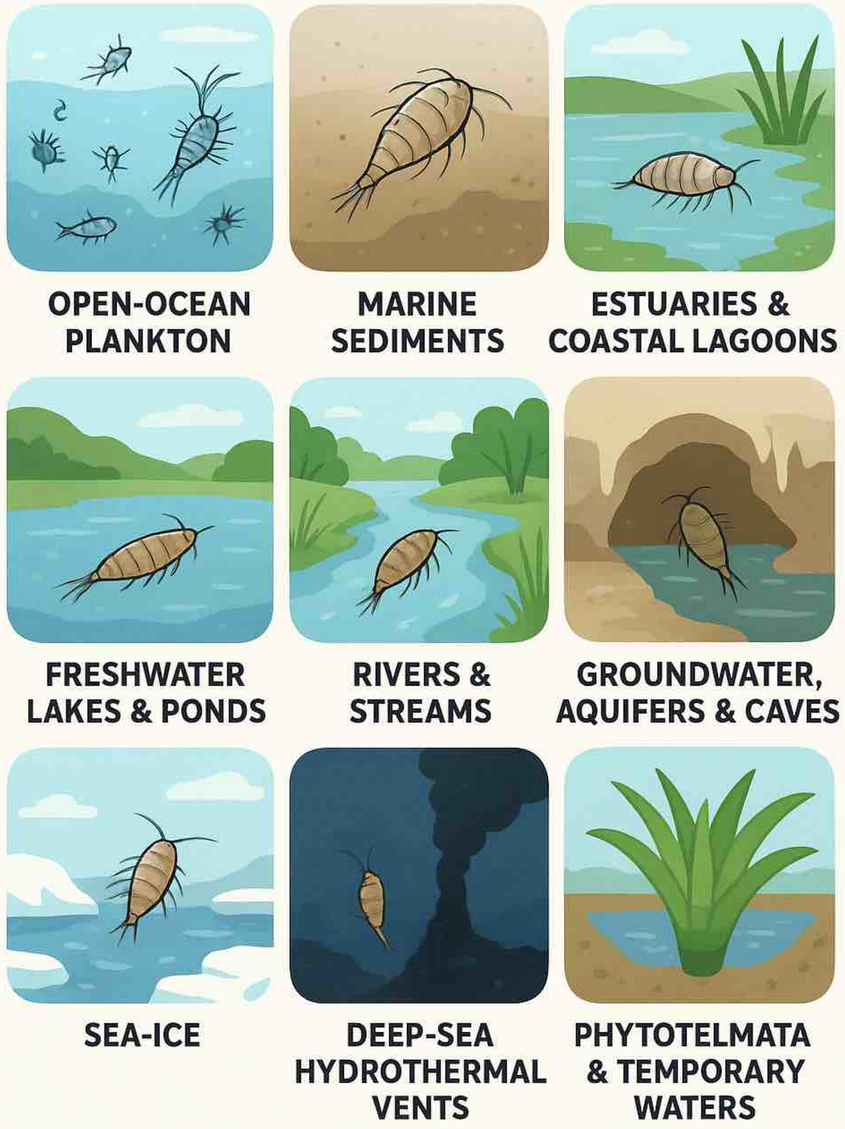
Some are free living, some are parasites, some live on plants and in the sand

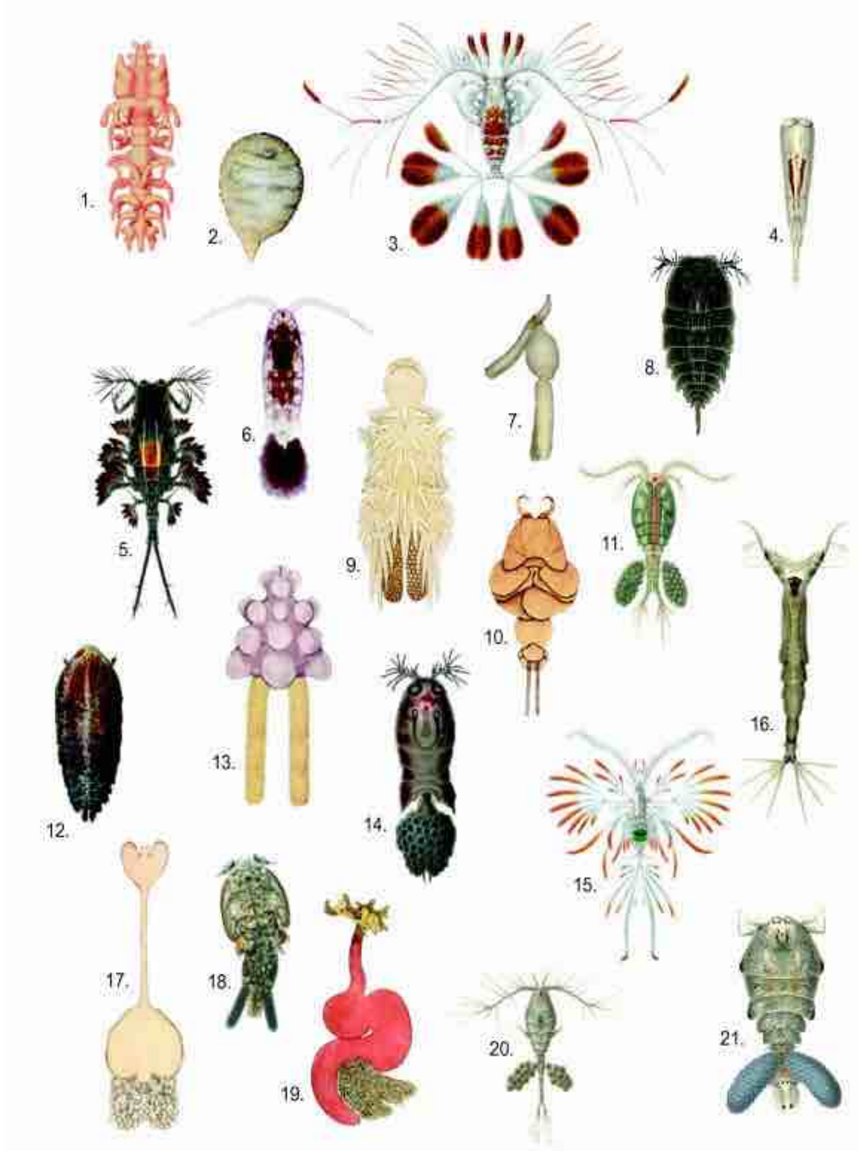
They come in all kinds of different shapes and forms

A lot is known about the pelagic copepods, but as much about the others



Salmon louse *Lepeophtheirus salmonis Lakselus*





Bron, J.E., Frisch, D., Goetze, E., Johnson, S.C., Lee, C., Wyngaard, G.A., 2011. Observing copepods through a genomic lens. Front Zool 8, 22. https://doi.org/10.1186/1742-9994-8-22

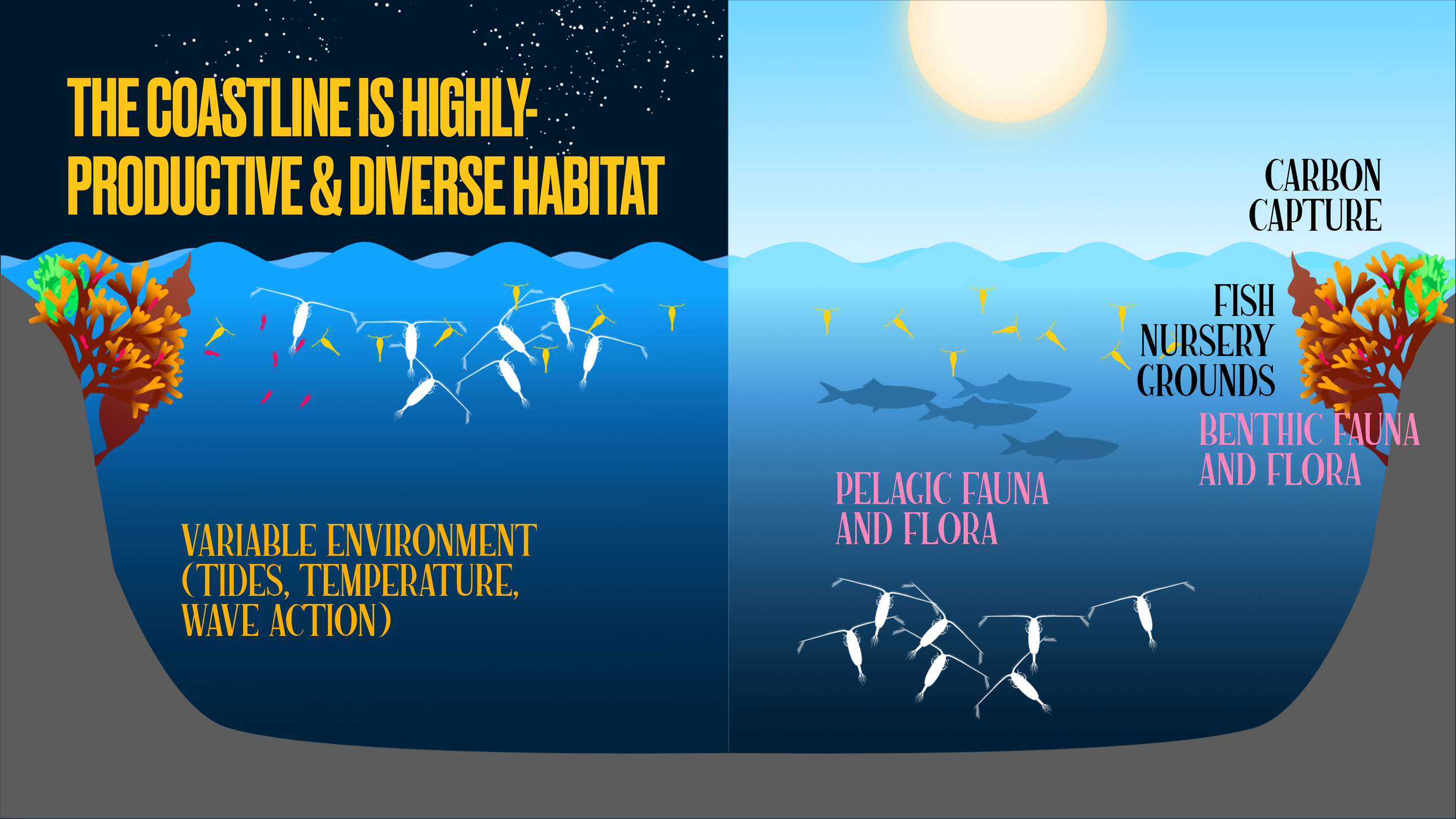
THE FORGOTTEN HABITAT?



NORWAY ~100000 KM COASTLINE

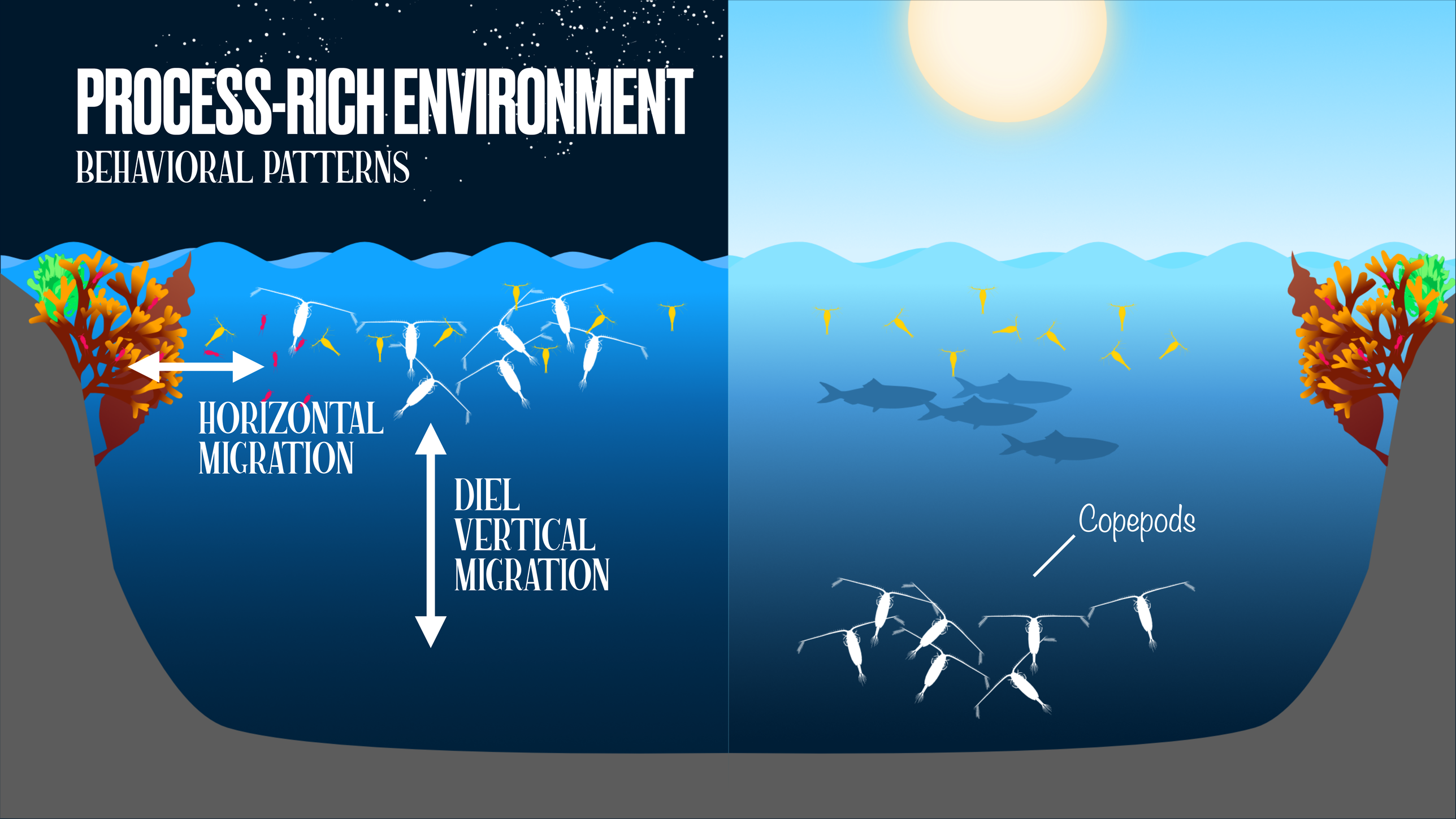


THE COASTLINE IS HIGHLY-PRODUCTIVE & DIVERSE HABITAT

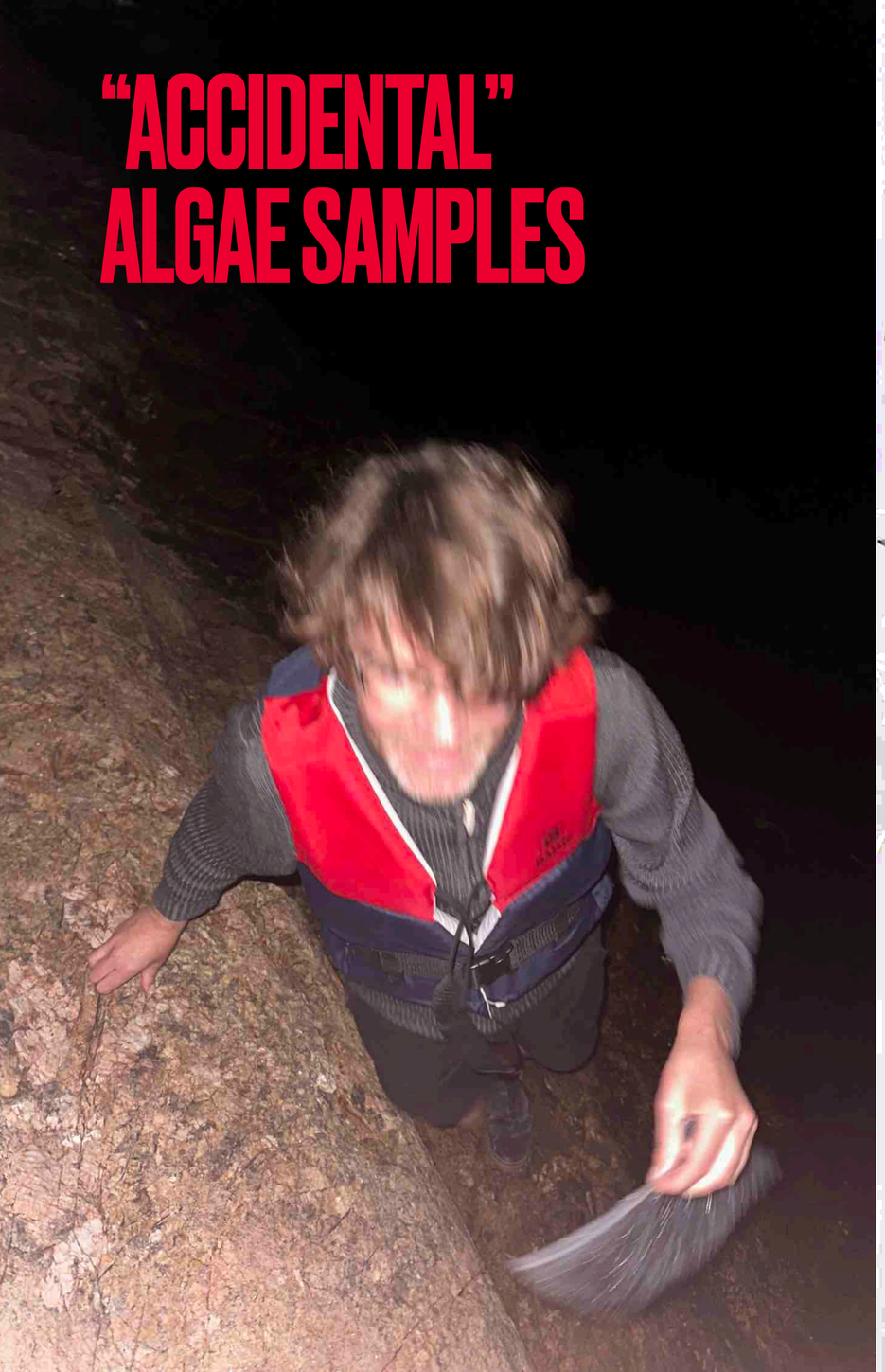


PROCESS-RICH ENVIRONMENT

BEHAVIORAL PATTERNS



“ACCIDENTAL” ALGAE SAMPLES





POICE project

Shaken, not stirred!

Boxshall, G.A., Kihara, T.C., and Huys, R., 2016. Collecting and processing non-planktonic copepods. Journal of Crustacean Biology 36, 576–583. https://doi.org/10.1163/1937240X-00002438



PHYTAL COPEPODS


MACROCOP
2025-2028



WHO ARE THEY AND WHAT DO THEY DO?

PARTNERS

UNIVERSITETET I OSLO

NIVA
Norwegian Institute for Water Research

FairScope

SENCKENBERG
world of biodiversity

INSTITUTE OF MARINE RESEARCH

SAMS
Scottish Association for Marine Science

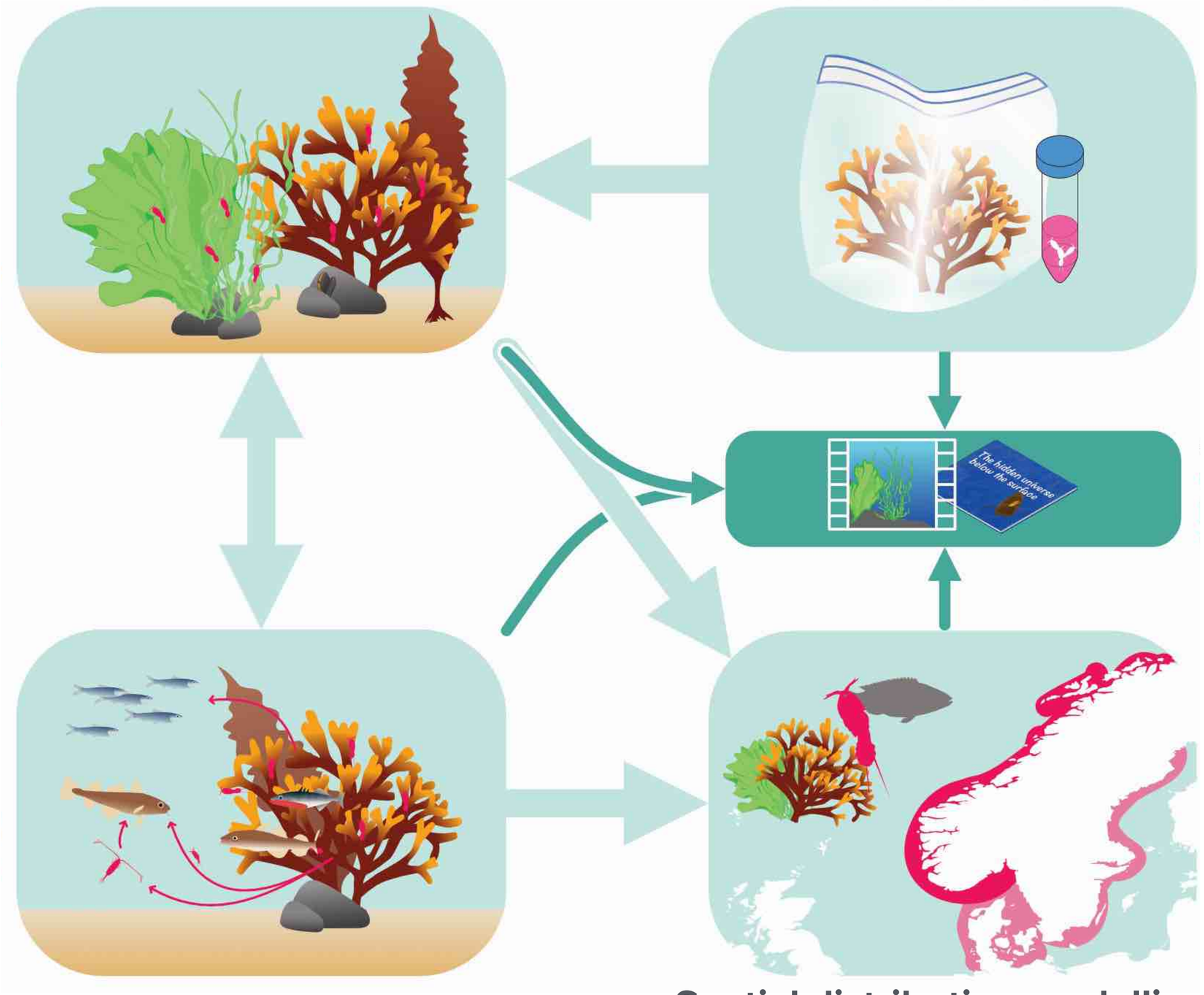


WORK PACKAGES

Diversity and Biomass of phytal copepods

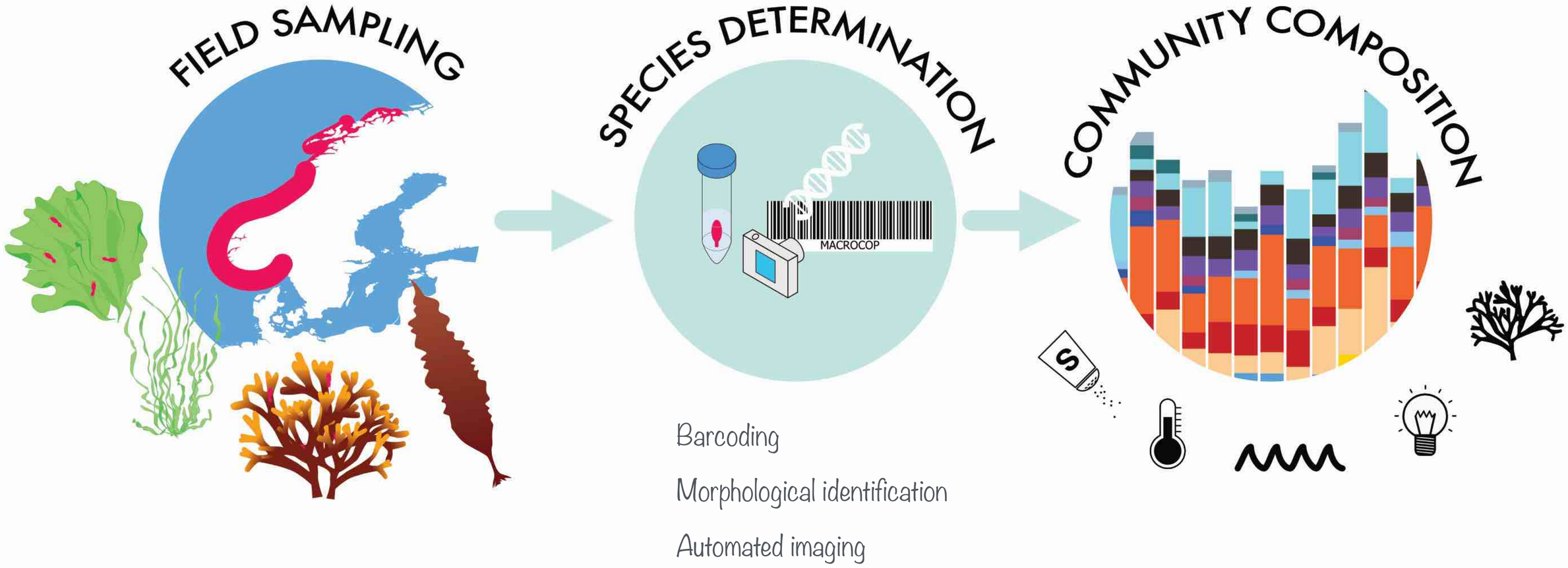
Food web of the macroalgae habitat

Citizen science



Spatial distribution modelling

BIODIVERSITY



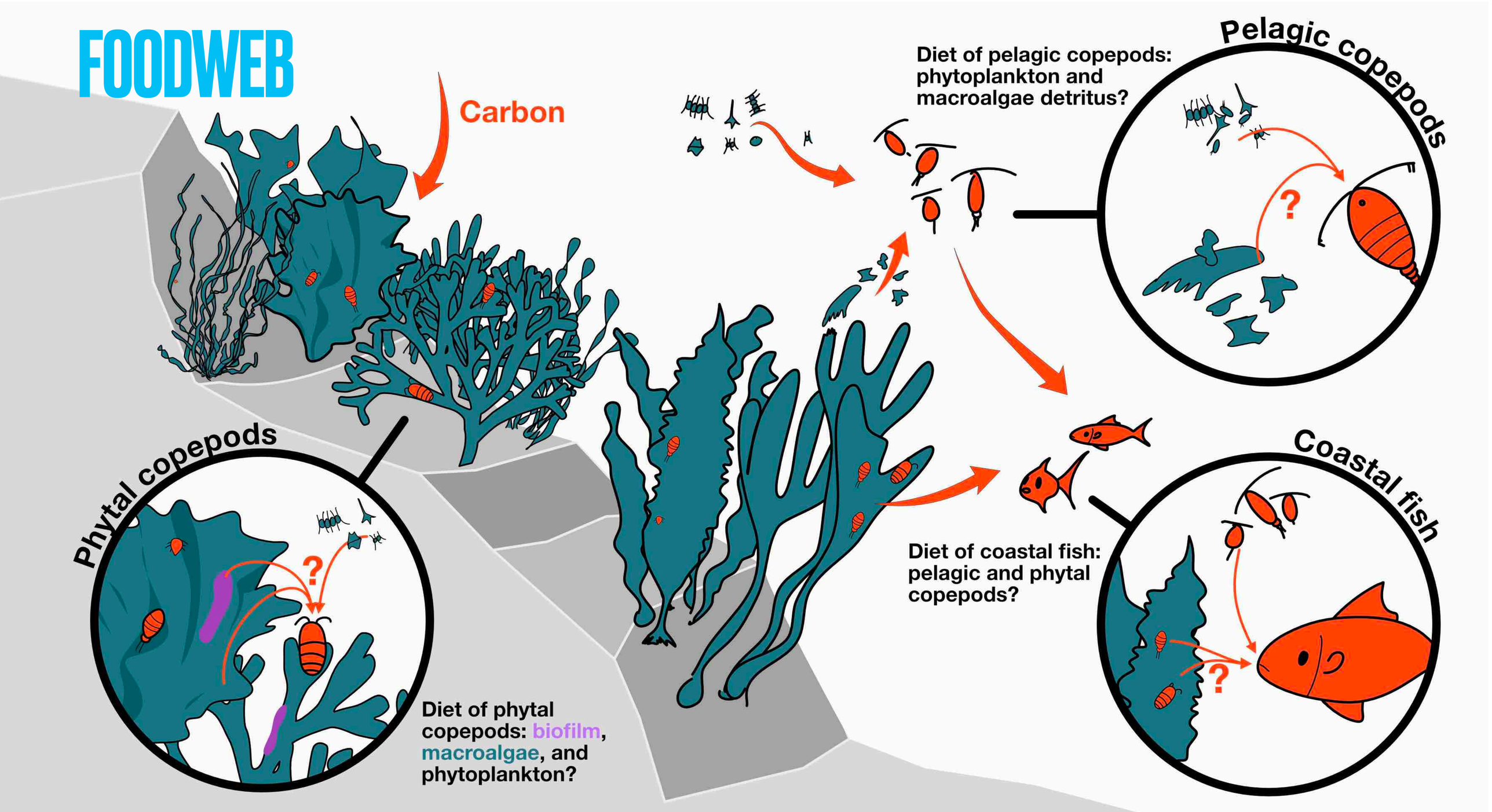
Barcoding

Morphological identification

Automated imaging

WHEN AND WHERE DO WE FIND THEM?

FOODWEB


Carbon
Diet of pelagic copepods: phytoplankton and macroalgae detritus?
Pelagic copepods
?
Phytal copepods
?
Diet of phytal copepods: biofilm, macroalgae, and phytoplankton?
Diet of coastal fish: pelagic and phytal copepods?
Coastal fish
?

OUTREACH

- Instruction videos for citizen science
- Infomaterial for skolelaboratoriet and interested public
- Youtube mini documentary about the “hidden world” on macroalgae
- “Scientific” Kidsbook



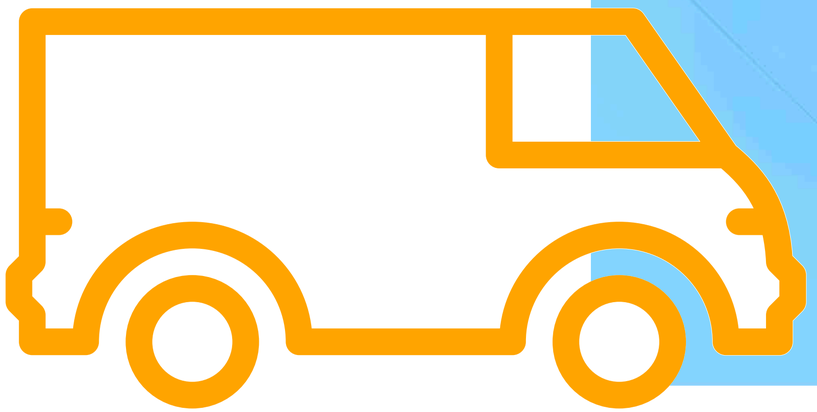


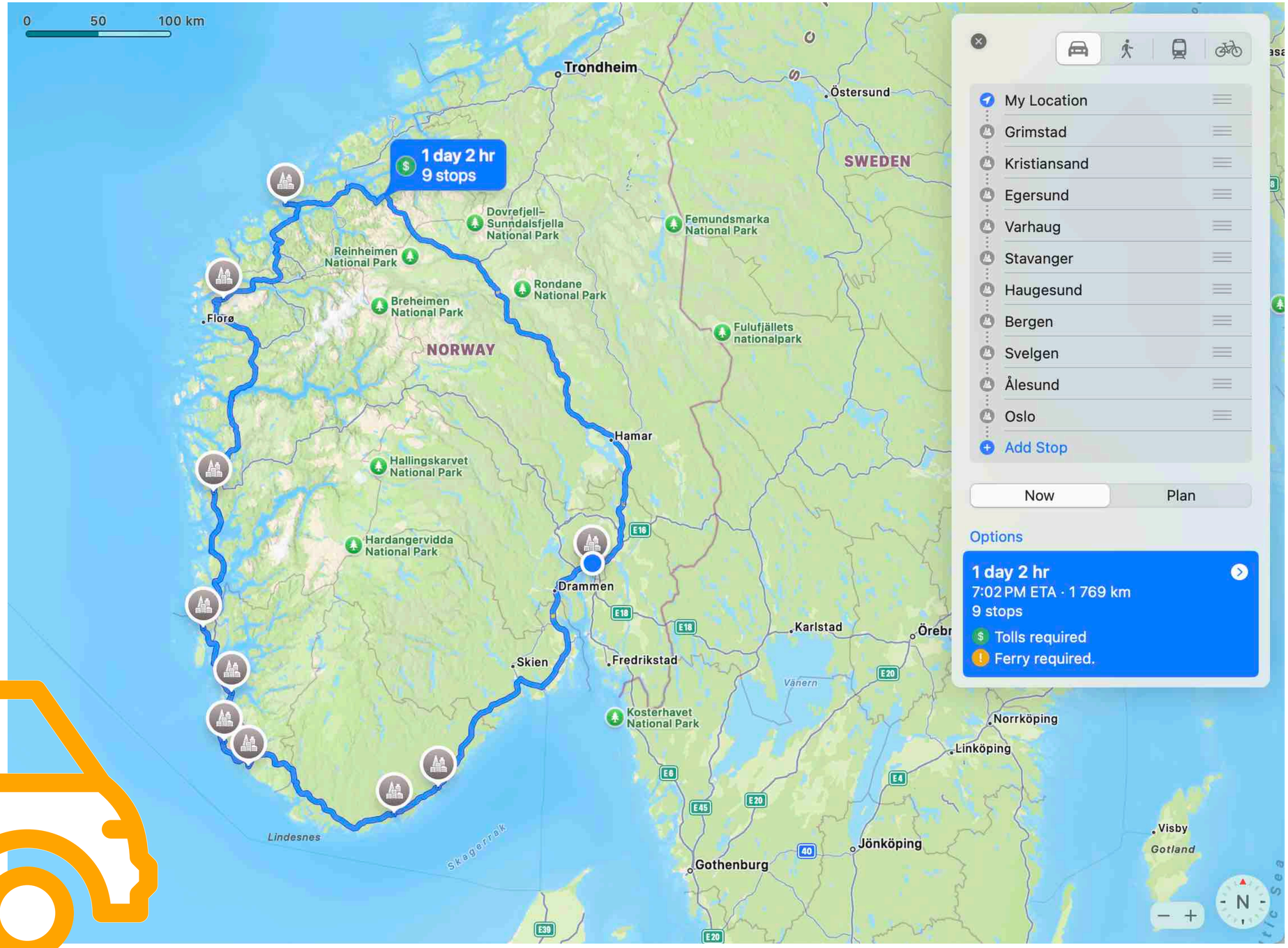
https://www.heuschele.com/worldofhopfs/

SAMPLING EFFORT JUNE 2025

Sample various host algae

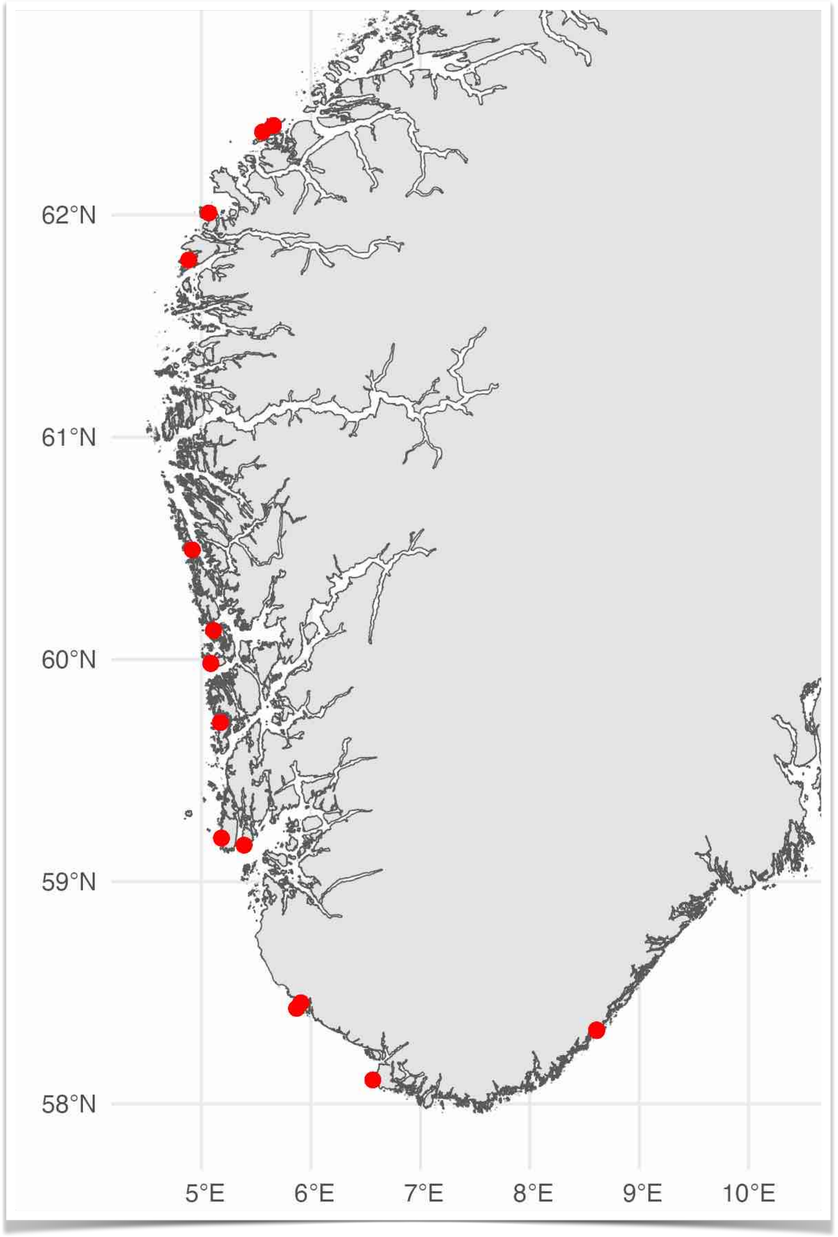
Cover large environmental variation and gradients





1ST SAMPLING EFFORT






BEAUTIFUL PLACES


UNDERWATER


3 liter





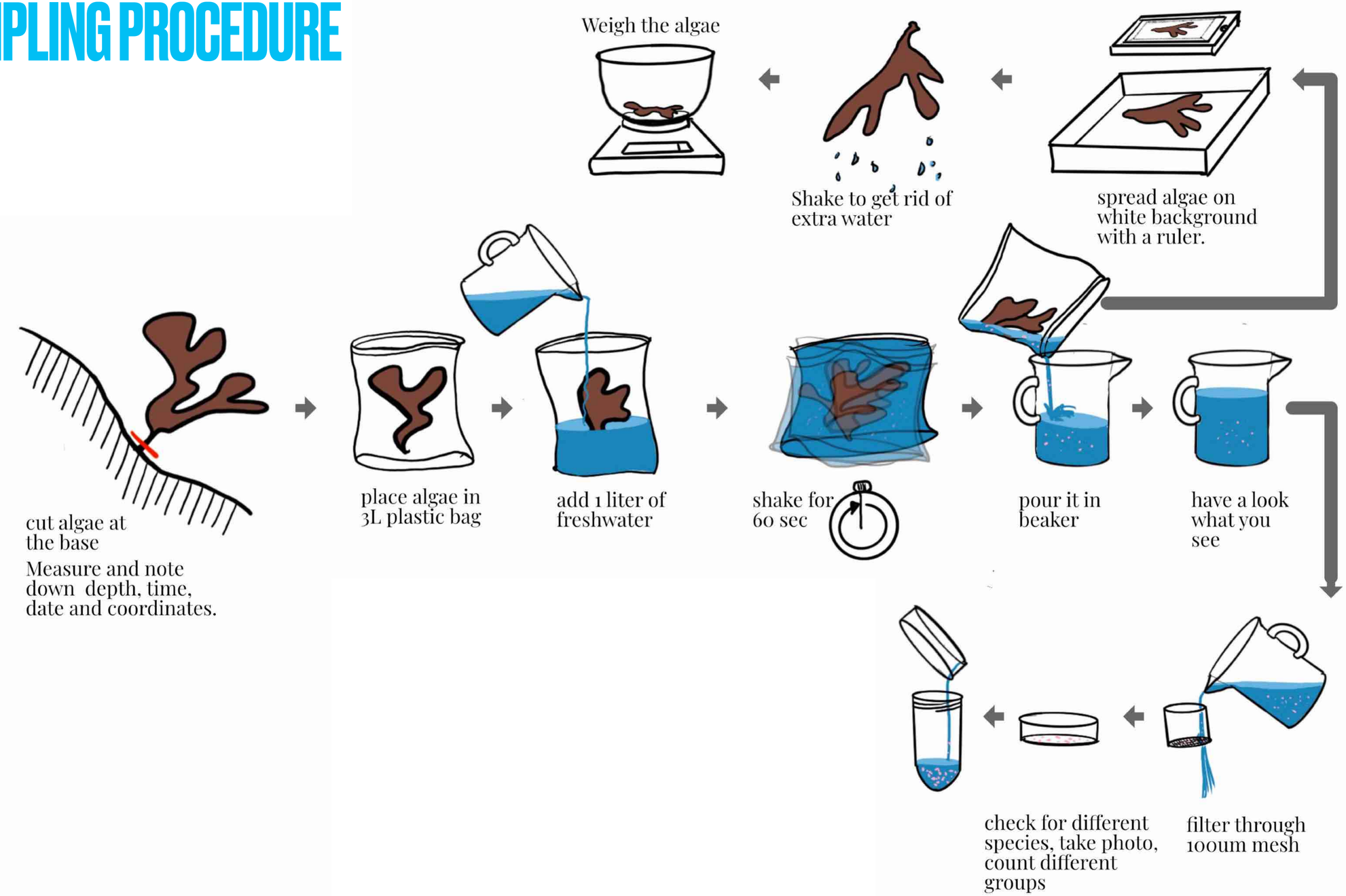
FILTERING, WEIGHING, AND PRESERVING







THE SAMPLING PROCEDURE



WE NEED YOU!

- to increase the spatial scale of our project

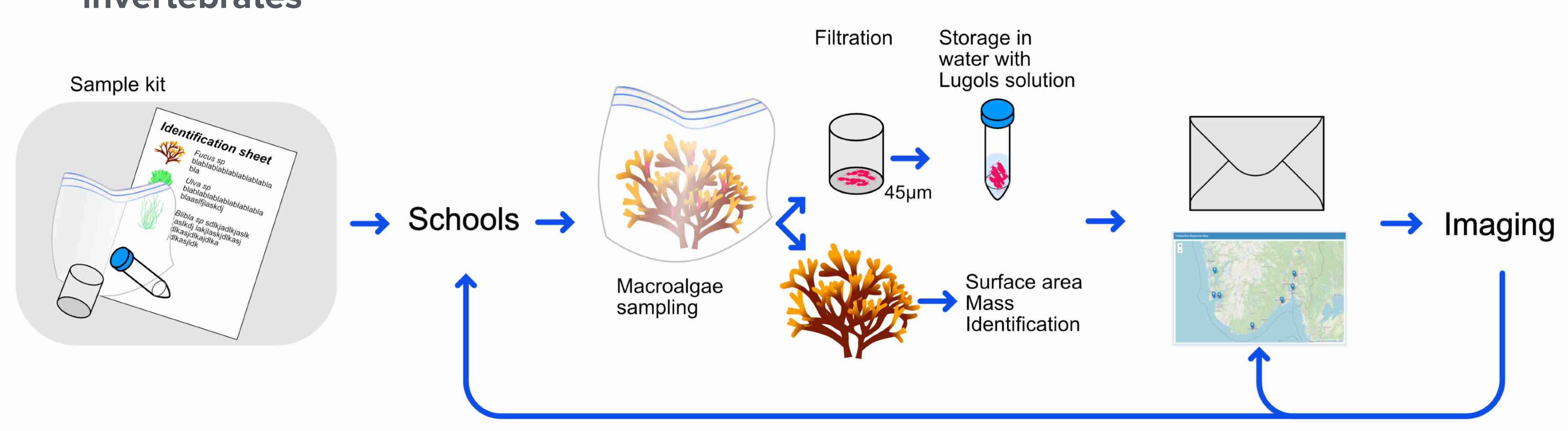
- to sample different places and times so we can see local differences and general patterns

- to spark interest about the biodiversity of seaweed to everyone!



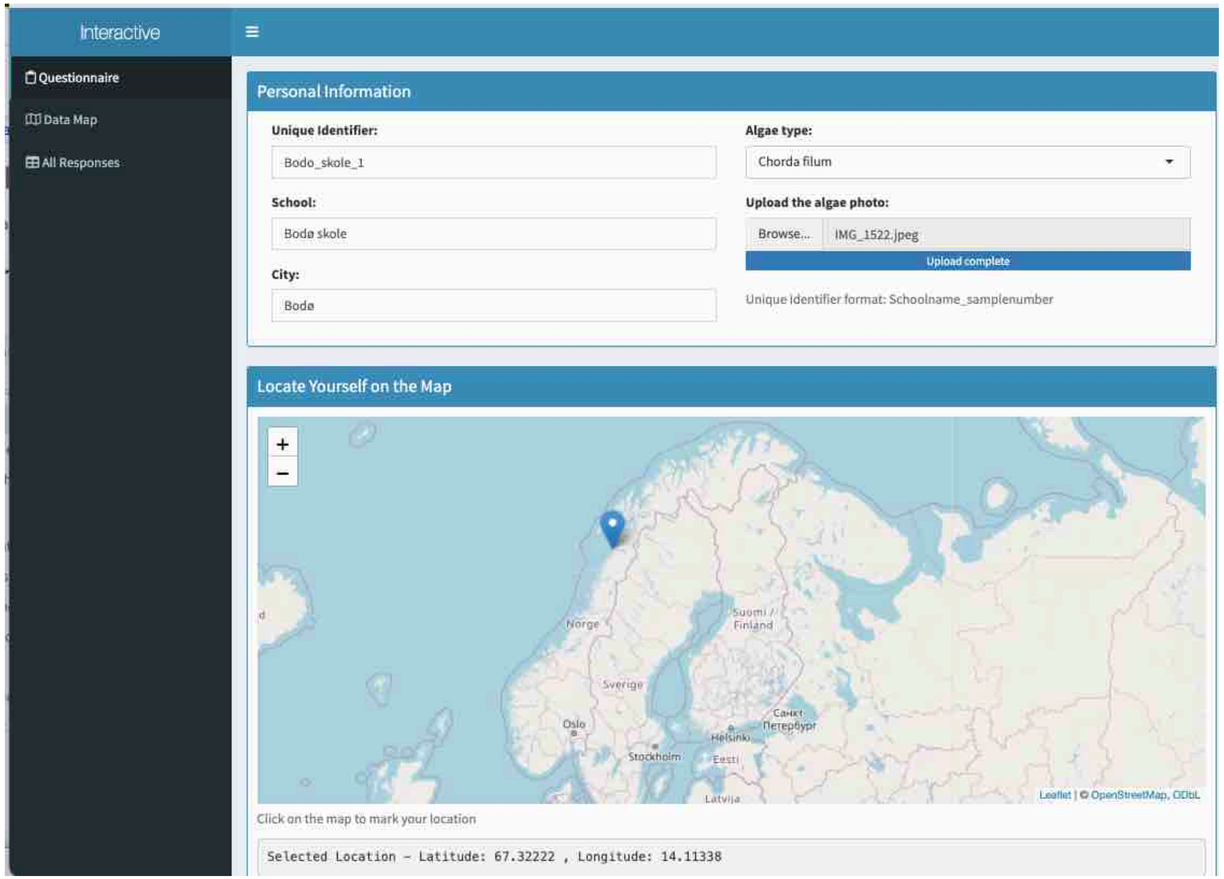
WHAT WE CAN GIVE YOU :)

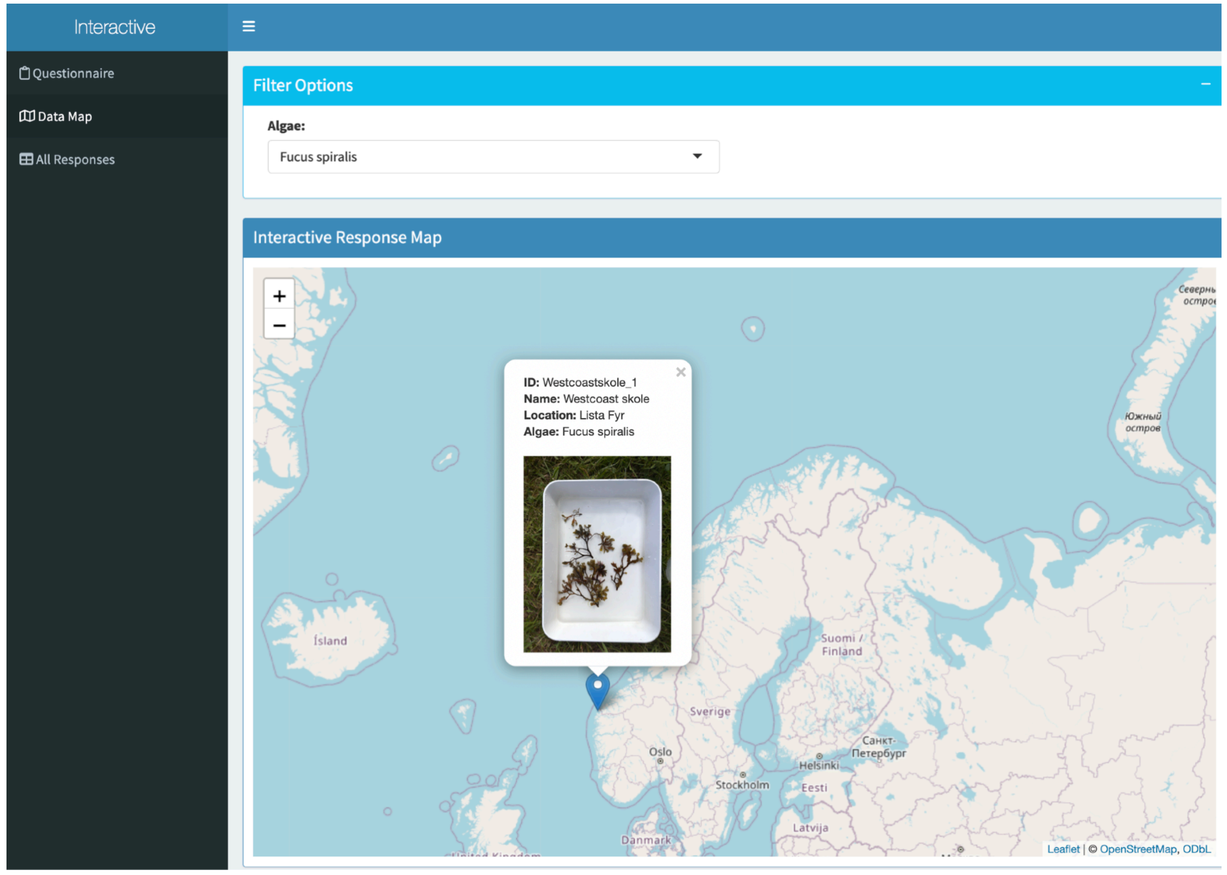
- Instruction videos for citizen science
- Plankton filters, plastic bags, Envelopes, sample labels
- Sampling procedure description
- Identification key in norwegian for the bigger taxonomic groups of algae and invertebrates
- Background information about biodiversity in the ocean and the importance of seaweed habitat
- Short in person online presentation to introduce the project



WHAT WE CAN GIVE YOU

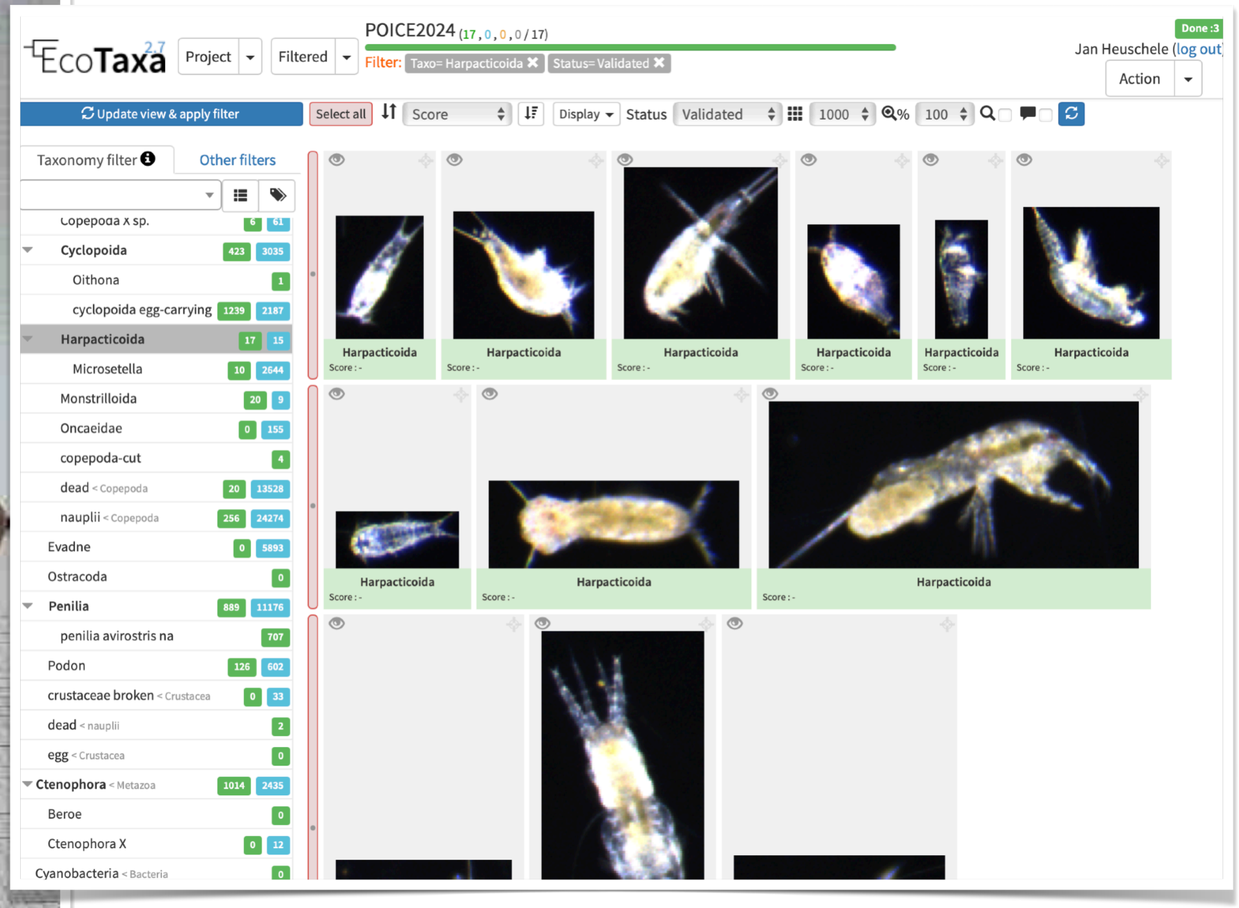
- Immediate Interactive feedback on website where you upload images and sampling data



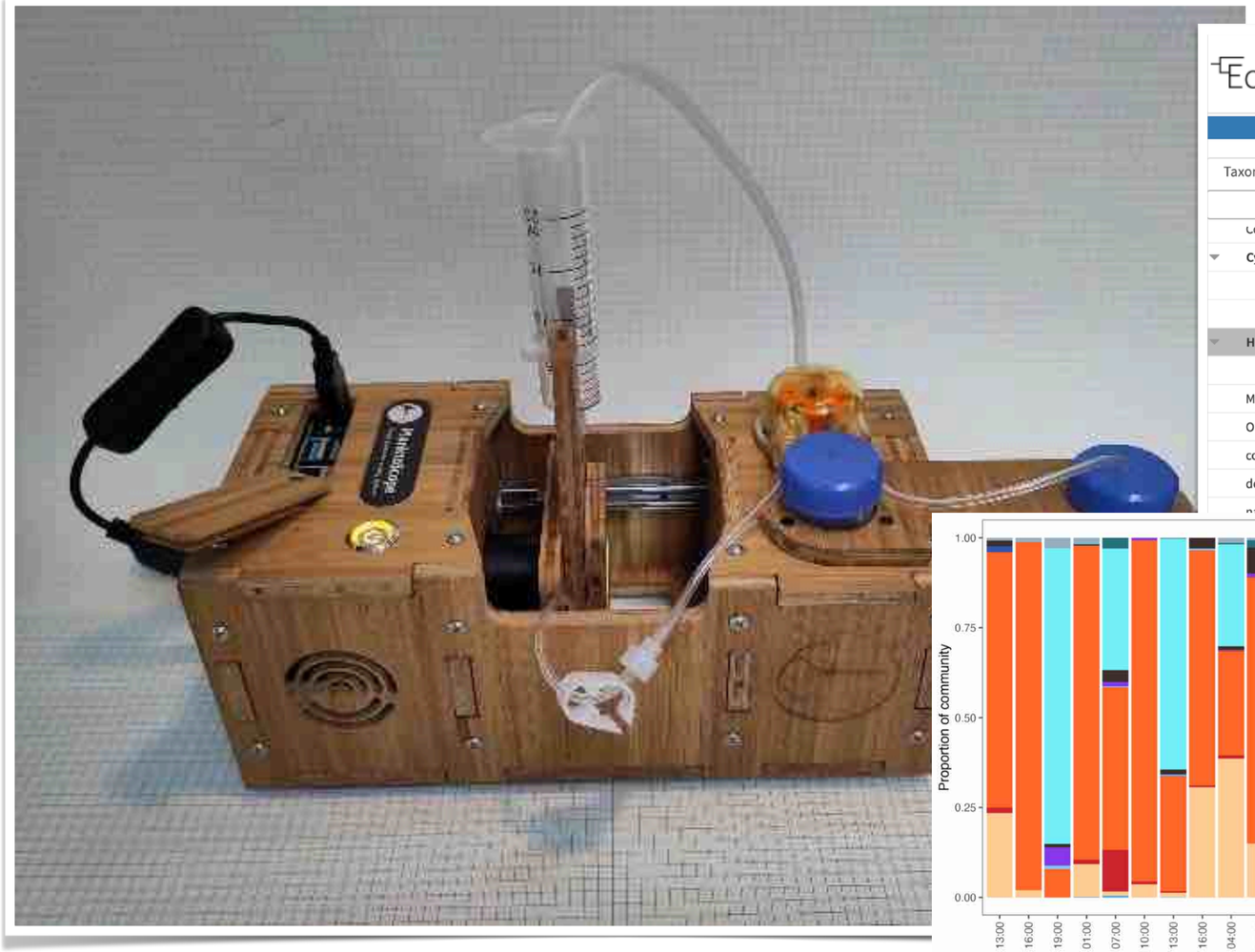


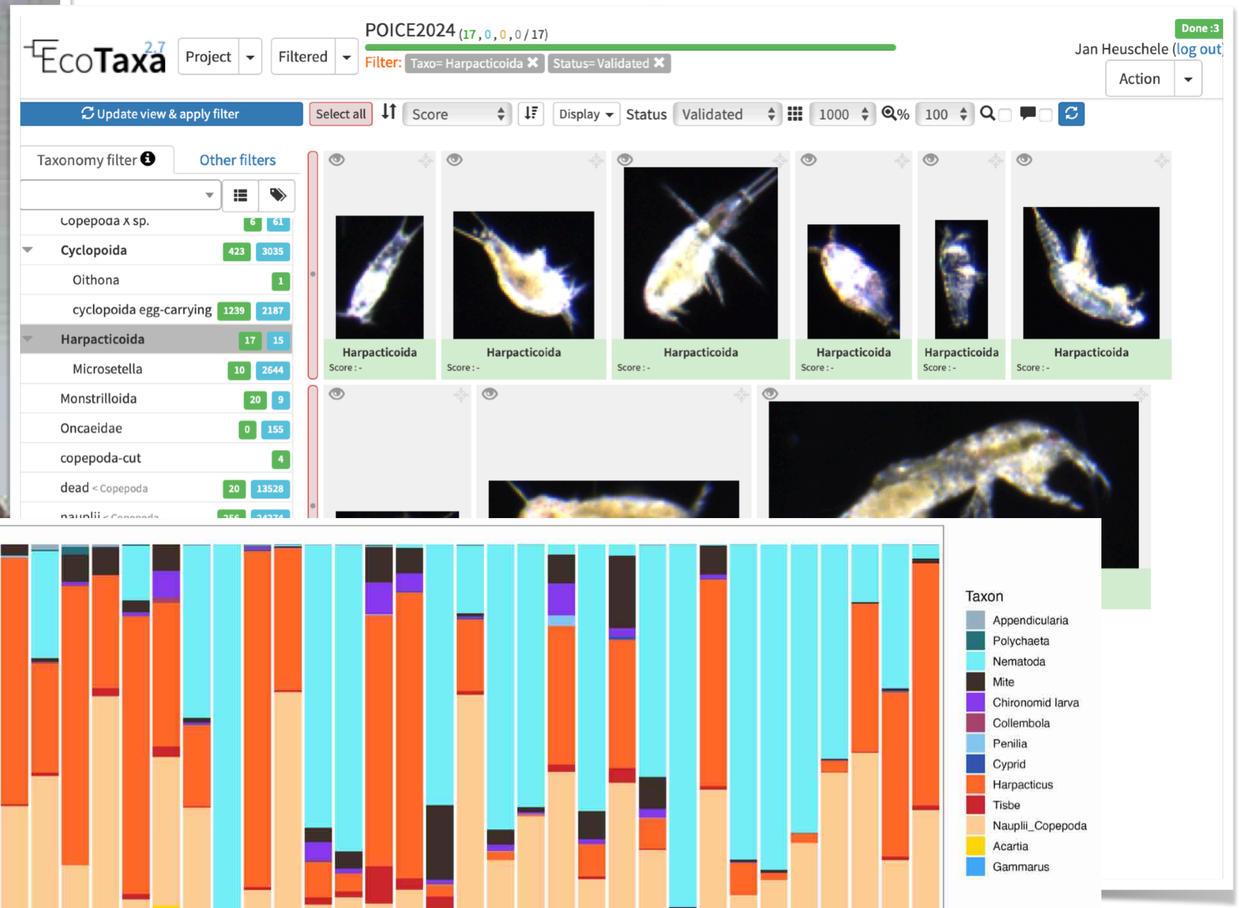
WHAT WE WILL DO WITH YOUR SAMPLES





WHAT WE WILL DO WITH YOUR SAMPLES





- Taxa lists based on imaging analysis

WHAT YOU WOULD NEED TO BRING IN THE FIELD

- 1-1.5 liters of freshwater per sample
- White tray /plastic sheet to image the algae
- Ruler
- Badesko of some sort
- kitchen balance







SOME PRACTICAL INFORMATION

De to **tidspunktene for innhenting av prøver er sent vår 2026 og tidlig høst 2026**.

Klassene som blir trukket ut til å være med får tilsendt pakker med utstyret de trenger for å delta.

Frist for å melde sin interesse er torsdag 4. september kl 23:59 og tilbakemelding blir gitt i løpet av de to påfølgende ukene.

Navn *

E-postadresse *

Hvis du melder på klasser for noen andre kan du oppgi navn og e-postadresse til vedkommende her.

Skole *

For hvilket fag melder du på klasse/klasser? *

- [ ] Naturfag (vg1/vg3)
- [ ] Biologi 1
- [ ] Biologi 2
- [ ] Annet

Fyll ut nettskjema for å melde din interesse til å være med på forskningsprosjektet.

https://nettskjema.no/a/539271

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- [ ] Annet

Fyll ut nettskjema for å melde din interesse til å være med på forskningsprosjektet.

https://nettskjema.no/a/539271

Hvor mange elever skal samle inn prøver?

Oppgi omtrentlige tall på hvor mange elever det er i klassen. Skriv det her hvis det er snakk om flere klasser eller om det kun er noen elever.

Omtrent hvor langt unna skolen er nærmeste aktuelle kyst-område (i kilometer)? *

Elevene må ha tilgang til en tidevannssone med tang (se webinar for hvilke typer tang som er mest aktuelle).

De to **tidspunktene for innhenting av prøver er sent vår 2026 og tidlig høst 2026**.

Klassene som blir trukket ut til å være med får tilsendt pakker med utstyret de trenger for å delta.

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- [ ] Biologi 2
- [ ] Annet

Fyll ut nettskjema for å melde din interesse til å være med på forskningsprosjektet.

https://nettskjema.no/a/539271

NESTE WEBINAR BLIR TORSDAG 22. JANUAR KL 11:45 SÅ HOLD AV TIDEN!

Hvor mange elever skal samle inn prøver?

Oppgi omtrentlige tall på hvor mange elever det er i klassen. Skriv det her hvis det er snakk om flere klasser eller om det kun er noen elever.

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Elevene må ha tilgang til en tidevannssone med tang (se webinar for hvilke typer tang som er mest aktuelle).

UiO : Skolelaboratoriet for biologi

Følg med på nettsiden vår for flere aktiviteter:

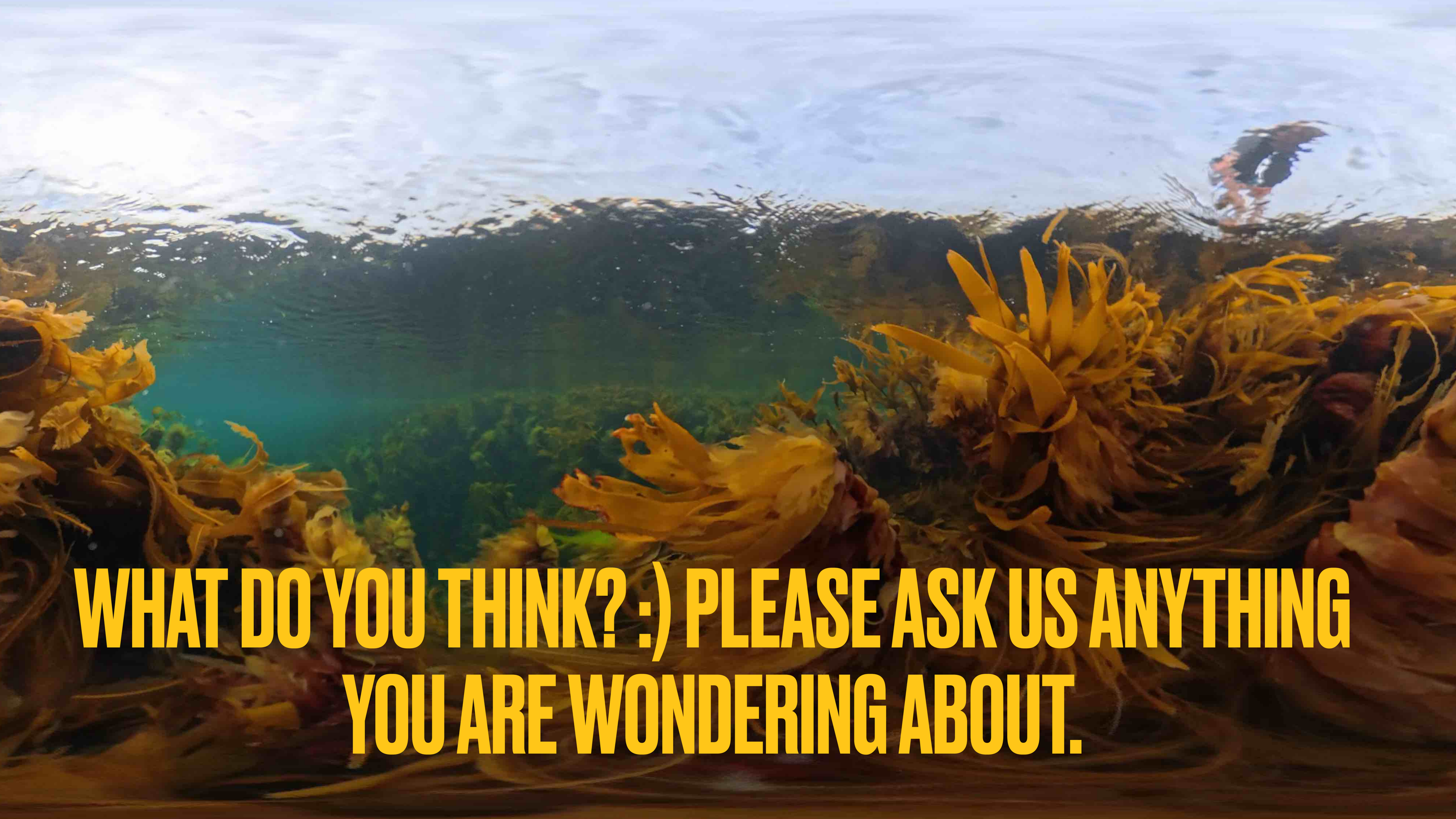
- **BioTorsdag (siste torsdag i måneden) – strømmes**
- **Ta med klassen din på labopplegg hos oss på UiO (booking åpner denne uken)**
- **Nye undervisningstilbud kommer dette skoleåret (Real praksis)**

Til dere som har biologi 1 og 2-klasser:

Meld på klassen din for å være med på årets biologiolympiade. Vi har akkurat sendt ut informasjon om Runde 1 som gjennomføres i uke 40-42.

Lenke til mer informasjon: https://www.mn.uio.no/ibv/om/biologi-ol/

Norsk biologiolympiade


WHAT DO YOU THINK? :) PLEASE ASK US ANYTHING
YOU ARE WONDERING ABOUT.