

TARA_	YYYY	MM	DD	PORT (CITY)
Start	2023	08	05	Kristineberg
End	2023	08	11	Bergen

SCIENTIFIC INTEREST & CAMPAING OBJECTIVES

The Leg from Kristineberg (Sweden) to Bergen (Norway) in August 2023 was part **Tara EUROPA** expedition (April 2023 – July 2024; <https://fondationtaraoccean.org/en/expedition/tara-europa/>). **Tara EUROPA** is the ocean part of a larger program, **TREC** – Traversing European Coastlines (<https://www.embl.org/about/info/trec/>) –, whose main goals are to: (i) study the invisible biodiversity at the land-sea interface across 19 European countries from Finland to Greece, and understand the effect of environmental changes on the interactions and evolution within and between ecosystems (soil, sediments, air, water); (ii) understand the impact of human activities (pollution and global change) on marine coastal biodiversity and ecosystems; (iii) share systems bio/ecology knowledge and advanced technologies with scientists and the general public from all coastal European countries.

In this framework, a team of 6 international researchers and engineers on board *Tara* realize the sampling of coastal waters and aerosols. At Kristineberg (St. 59) we sampled at the same time where an EMBL land team sampled from the R/V Alice while in Bergen (St. 61), we sampled a after the land team. We sampled at three stations with the fjords near Bergen (St. 60-62) with 60 being the furthest inland, 61 being at the mouth of the Bergen Port and 62, in between the two but in an area with many salmon farms. In Bergen we had visits on board from local scientists.

At each *Tara Europa* station, the team onboard realize a complex suite of at least 50 protocols, and collect c.a. 100 samples stored in appropriate conditions for future analyses in laboratories. These protocols allow characterization of the biological content and diversity present in the water (from viruses to animals, from genomes, expressed genes, metabolites, proteins, to cellular and organismal features), together with contextual physical, biophysical, chemical and biochemical properties.

PARTICIPANTS

ROLE		NAME, Surname, Affiliation
1	CREW - Captain	Martin Hertau, Tara
2	CREW - 1st Officer	Pierre, Landoeuer, Tara
3	CREW - Mecano	Dave Picaud, Tara
4	CREW - Deck	Francois Aurat, Tara
5	CREW - Deck	David Monmarche, Tara
6	CREW - Cook	Carole Pire, Tara
7	CREW - Media	Maeva Bardy
8	GUEST - Artist	Ariane Michel
9	GUEST - Observer	
10	SCIENCE - A - Oceano. Engineer	Charlotte Begouen Demeaux, UMaine

11	SCIENCE - B – Bio. Engineer	Morgan Guillame, Tara
12	SCIENCE - C - W-Lab genomics	Odette Beluche, Genoscope
13	SCIENCE - D – Deck Chemical profiling	Tilman Schramm, Tübingen University
14	SCIENCE - E – Deck/Chief Scientist	Emmanuel Boss, UMaine
15	SCIENCE - F - S-Lab sorting/imaging	Clara Trelu, EPFL

REALIZED STATIONS

St. 59: Historical station facing the Kristineberg Marine Lab, sampling at the same time as their R/V Alice, performing many of the same protocols. Conditions – windy. Begun SML sampling.

St. 60: End of a fjord in Norway. Windy and cloudy.

St. 61: Stormy, facing the Bergen Port, rainy and windy facing Bergen. Skipped SML protocol.

St. 62: Calm, cloudy, surrounded by aquaculture/salmon facilities (station between the other two in Fig. 1).

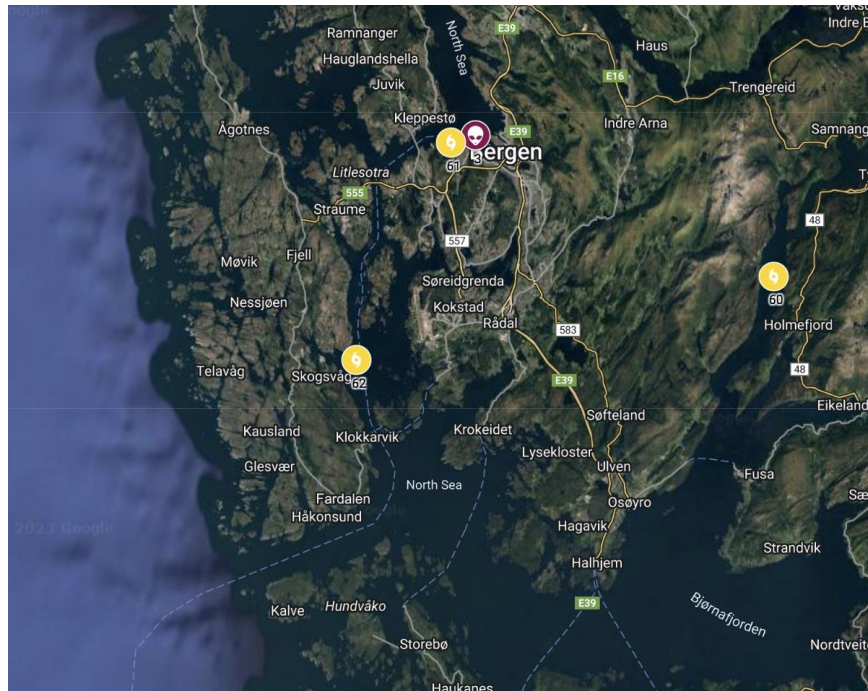


Figure 1 Locations of sampling stations in Norway. Alien station was sampled in and out of the Bergen port on 11/08/23.

SUMMARY OF ACTIVITIES

(Provide an overview of sampling activities on every day of the Campaign, indicating the number of deployments done for each type of event)

Table 1.

Date	Station #	Name	Latitude	Longitude	Cast	Pump A20	Net 5 µm	Net 20 µm	Net 200 µm	Net 680 µm	Bow Pole	ASM	HTSRB	SML	Mercury	eDNA	Aliens in Port	# of samples
05/08/2023	59	Kristineberg shore	58.257° N	11.453° E	1	1	1	1	1	2	1	1	0	1	0	1	0	100
07/08/2023	60	Samnanger	60.317918° N	5.637317° E	1	1	1	1	1	2	1	1	0	1	0	1	0	99
08/08/2023	61	Bergen	60.3967° N	5.25835° E	1	1	1	1	1	2	1	1	0	0	0	1	1	99
10/08/2023	62	Skotaneset	60.2683° N	5.1443° E	1	1	1	1	1	2	1	1	1	1	0	1	0	99

Legend:

Pump A20: Deployment of a tubing system in sub-surface waters, connected to a peristaltic pump installed in the wetlab on *Tara's* deck. Water is then filtered through large membranes to concentrate plankton biomass for genetic analyses.

Net: Deployment of various types of plankton nets with specific mesh-sizes (5 µm, 20 µm, 200 µm or 680 µm), either on *Tara's* deck (Decknets, 5 µm, 20 µm) or overboard (200 µm or 680 µm).

Cast: Deployment of the Rosette sampler (holding 5x12L and 8x8L XL Niskin bottles and sensors) to collect a suite of biophysical data and water samples along the water column.

Bow pole: Manual handling of a long stick for clean, contamination-free collection of small volumes of surface water stored for laboratory analyses of trace elements.

ASM (Aerosol Sampling Mast): Pumping system installed on *Tara's* mast to collect and concentrate aerosols.

HTSRB (Hyperspectral Tethered Spectral Radiometer Buoy): Deployment of a floating gear with sensors to measure optical properties (hyper-spectral radiometry) of surface seawater.

SML (Surface Micro-Layer sampler): Deployment of a screen sampler on the ocean surface to collect 1L of surface microlayer water.

Mercury: Specific filtration protocol to measure mercury from a Niskin bottle, performed at estuary sites.

Aliens in port: Deployment of an *in-situ* pumping system (*Watera* capsules) to concentrate biomass from 30L of subsurface water for eDNA analyses.

INVENTORY OF SAMPLES COLLECTED DURING THE CAMPAIGN

Table 2.

protocol name	Protocol category	Storage T°	TOTAL of samples
PM	Oceanography/Biogeochemistry	- 20°C	14
FOI	Oceanography/Biogeochemistry	- 20°C	12
PA	Oceanography/Biogeochemistry	- 20°C	4
S023-L (long read)	Nucleic Acids/Sequencing	- 20°C	4
S320-L (long read)	Nucleic Acids/Sequencing	- 20°C	4
E20	Nucleic Acids/Sequencing and imaging	- 20°C	4
MB320	Chemical profiling	- 20°C	4
MB033	Chemical profiling	- 20°C	4
PPL	Chemical profiling	- 20°C	16
HLB	Chemical profiling	- 20°C	16
S20-L	Nucleic Acids/Sequencing	- 20°C	4
S200-L	Nucleic Acids/Sequencing	- 20°C	4
S680-L	Nucleic Acids/Sequencing	- 20°C	4
MB20	Chemical profiling	- 20°C	4
NUT	Oceanography/Biogeochemistry	- 20°C	12
ASM	Aerosol	- 20°C	4
pMeHg	Chemical profiling	- 20°C	0
pTHg	Chemical profiling	- 20°C	0
fMeHg	Chemical profiling	4°C	0
fTHg	Chemical profiling	4°C	0
ufTHg	Chemical profiling	4°C	0
THg (from bow pole)	Chemical profiling	4°C	4
CDOM	Oceanography/Biogeochemistry	4°C	12
DOC	Oceanography/Biogeochemistry	4°C	12
TOC	Oceanography/Biogeochemistry	4°C	12
S<0.2 (Virus)	Nucleic Acids/Sequencing	4°C	8
FM5	imaging	4°C	8

protocol name	Protocol category	Storage T°	TOTAL of samples
FM20	imaging	4°C	8
eDNA	Nucleic Acids/Sequencing	4°C	4
FC-P	imaging	LN2	0
SML-FC	imaging	LN2	8
FC-G	imaging	LN2	6
HPLC	Oceanography/Biogeochemistry	LN2	8
SML-320	Nucleic Acids/Sequencing	LN2	4
SML-023	Nucleic Acids/Sequencing	LN2	9
HC	Nucleic Acids/Sequencing	LN2	9
HC-G	Nucleic Acids/Sequencing	LN2	32
CP-G	Nucleic Acids/Sequencing	LN2	32
SG	Nucleic Acids/Sequencing	LN2	12
S023-S	Nucleic Acids/Sequencing	LN2	8
S320-S	Nucleic Acids/Sequencing	LN2	8
S20-S	Nucleic Acids/Sequencing	LN2	8
S200-S	Nucleic Acids/Sequencing	LN2	8
P023	Nucleic Acids/Sequencing	LN2	8
P320	Nucleic Acids/Sequencing	LN2	4
SG5	Nucleic Acids/Sequencing	LN2	4
S02-2000 QN	Nucleic Acids/Sequencing	LN2	8
SML-CP	Nucleic Acids/Sequencing	LN2	0
DICTA	Oceanography/Biogeochemistry	RT	9
SAL	Oceanography/Biogeochemistry	RT	4
MTE	Chemical profiling	RT	0
F200	imaging	RT	4
F680	imaging	RT	4
F2000	imaging	RT	4

TOTAL SAMPLES Tara Europa Kristineberg-Bergen	383
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Table 3. Total number of samples preserved for each of the 4 protocols performed underway during the Tara Europa navigation. The details of the number of samples per protocol per stations can be found [@here](#).

protocol name	Protocol category	Storage T°	TOTAL of samples
AF	Aerosols	- 20°C	6
AS	Aerosols	LN2	6
HPLC underway	Oceanography/Biogeochemistry	LN2	1
FC-P underway	Imaging	LN2	1
FC-G underway	Imaging	LN2	1
AI	Aerosols	RT	6

TOTAL SAMPLES UNDERWAY Tara Europa Kristineberg-Bergen	21
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COMMENTS

Tara Europa Station #	Comments
59	extra site in Kristineberg with AML. We were drifting during all the station with regular repositioning. Connection problem with rosette, impossible to close the bottle or have data from the CTD. We decided to start the station with eDNA, A20 and A40 pump. At the middle time of the station, we decided to close manually the bottles. Ariane (the artist) dived and closed one by one the niskin bottle. We also broke a regent net because of too many jellyfish. Apart from these problems, the weather was beautiful with no waves. The new chief scientist and op. E was trained during the station and Morgane replaced Doug as bio engi. Odette resumed her role as op. C following Eric.
60	Station into a beautiful fjord. Very calm weather but rainy. Everything runs great, no problem this time. Low abundances of organisms, some big jellyfish. We broke the last station the 680-µm régent net and we just had on-board a 670-µm régent net. So, from now we sample with this régent net. CTD profile of 220m was made. Adrift station
61	Station in the bay of Bergen. Very bad conditions with a lot of wind. We decided to postpone the Aliens protocol to another day at Bergen. SML protocol was cancelled because of the wind and waves.
62	Station adrift. Close to salmon farms. Problem with CTD, no profile; we closed the bottles manually (Ariane dived for that). We did a HTSRB. No rain, no wind.