

SCIENCE PROTOCOLS BRIEF

VORTEX SWIM

1- TRACKING FLOATING DEBRIS

1a - Debris watching & local concentration study

Partner: *University of Hawaii (UH)*

Method - 30 min watching session, observations recorded on a log. Includes local concentration study: following the science team instructions, we will scout specific area and compare predictions of the model with observations on the field.

Frequency - Everyday unless weather doesn't allow. Usually 4 daily watches from sailing yacht, 1 or 2 from dinghy

Sharing YES - Can share data/numbers, not conclusions. Our data will be added to existing world data set.

1b - Tagging big debris with trackers

Partners: *UH, Ocean Voyages Institute*

Method - Photographing and filming on location. Attach large floating tracker to big debris and activate. Transmit location to scientist via GPS satellites

Frequency - Whenever large piece of Debris is found that is of interest to scientists (we will probably be equipped with around 10 trackers)

Sharing YES - with Ocean Voyages Institute permission, can share location of debris on a tracking interface

1c - Find previously tagged Debris for collection or inspection

Partners: *UH, Ocean Voyages Institute*

Method - The science team on land will direct us to the area where the last pins from trackers were received. We will locate the debris and get in the water to inspect/collect it. Photographing and filming on location.

Frequency - Depending of the number of trackers in the area during the expedition. Currently 15 debris are drifting close to our potential route.

Sharing YES - with Ocean Voyages Institute permission, can share location of debris on a tracking interface

2- LIFE ON DEBRIS

2a - Photographing and collecting/freezing biological samples

Partners: *NASA, Smithsonian Institution, UH*

Method - Photographing all life on and around floating debris. Collecting small samples of algae/mussels etc to be frozen and later identified. Looking at coastal vs pelagic species living on plastic

Frequency - Whenever piece of interest is found.

Sharing YES - Can share photos, videos of life found on/around plastic. Requires Fx500 upload. Will take time for scientist to identify species/family (if possible) on land.

2b - Attaching biological panels to tracked debris

Partners: *NASA, Smithsonian Institution, UH*

Method - Attach PVC panels to debris that we attach trackers to. Scientist in future we retrieve and see what grows on the panels.

Frequency - Whenever piece of interest is found.

Sharing NO - No data to share, long going protocol

3- MICROPLASTICS

3a - Plastisphere / Life on microplastic

Partners: *UH, Woods Hole, NIOZ*

Method - Net tow for 30 mins, 2 biggest pieces of microplastic found put in RNAlater vials and frozen. Water also collected and filtered to compare with micro organisms on plastic vs water.

Frequency - Enough for 200 samples. Spread roughly evenly across expedition

Sharing NO - Can not share until after return to land.

3b - Microplastic count

Partners: *UH, Woods Hole, NIOZ*

Method - Net tow for 30 mins, number counted and photographed

Frequency - Enough for 200 samples. Spread roughly evenly across expedition. Every 30 - 50 NM approximately

Sharing YES - Ongoing, can share numbers and photos of plastic found

3c - Lantern Fish microplastic study

Partner: *Algalita*

Method - Using a spot light at night, small lantern fishes come to surface and they are caught with a net

Frequency - When conditions allow, needs to be little wind and night time drift is minimum.

Frequency should increase now outside Kuroshio

Media Sharing YES - Can share numbers caught and pictures. Cannot share results until after return of land.

4- MICROFIBERS

4a - Microfiber water filtration

Partner: *Scripps*

Method - Water collected and filtered. Three samples at a time

Frequency - Only limited to time and weather conditions. Enough filters for samples pretty much every day

Sharing NO - Can not share until after return to land. Results up to Yokohama sent back to be tested, needs to be followed up.

4b - Microfiber fish flesh

Partner: Scripps

Method - Flesh of any fish caught kept and dried for later analysis.

Frequency - When we catch fish, less frequent now out of Kuroshio current and fishing less due to shark encounters

Sharing NO - Can not share until after return to land. Results from delivery and up to Yokohama sent back to be tested, needs to be followed up.

5- HIGH DEFINITION WATER DATA

5a Water Toxicity

Partner: Woods Hole

Method - Water collected and frozen in a small vial

Frequency - Every two days or so

Sharing NO - Can not share. Needs to be taken to land and analyzed

5b MINI DOT (Dissolved oxygen concentration)

Partner: Woods Hole

Method - Put in water during day

Frequency - Everyday unless bad conditions and sailing too fast

Sharing YES - Can share. Requires upload of file over fx500

6- SOUNDSCAPE

Partners: Université de Toulon, CNRS

Method - Hydrophone put in water during day/night and when wildlife encounters happen

Frequency - As much as possible, when conditions allow

Sharing YES - Maybe possible to share small recordings of wildlife encounters uploaded with FX500 during expedition on request. Can not share until end.

+ Plastic in fish stomachs (not a research protocol)

Method - Cutting open stomach of any fish we catch

Frequency - Whenever we catch fish, no plastic found so far

Sharing YES - Can share if we find any.

+ Plastic Library (not a research protocol)

Method - Collecting trash from ocean and photographing

Frequency - Everyday whenever we find interesting trash. Often collected from the dinghy while Ben is swimming. Photographed once a week

Sharing YES - Can share regularly

7- HEART MONITORING

Partner: DMS Service

Method - Waterproof device worn by Ben during his swim and at night to compare swim heart rate and resting heart rate.

Frequency - Every 10 days (roughly)

Media Sharing - Can share but must be negotiated with Lynda from DMS services, owner of equipment. Requires upload on FX500