Summary of Oceanographic Sampling Techniques, IPES 2022-010

Sequence of events: (1) Bongo; (2) CTD & 5 m Niskin

**i. Labelling**: (1) **Bongo (zooplankton)**

* Paper labels for (1) formalin preserved sample, and (2) size fractionated zooplankton sample (8 mm, 1.7 mm, 1 mm, 0.25 mm)
* Jar lid sticker label for formalin preserved sample
* Label Tyler’s pre-weighed plastic Ziploc bags with 8 mm, 1.7 mm, 1 mm, and 0.25 mm for size fractionated zooplankton
* Fill-in bongo logbook with all info associated with specific station and event
* Fill-in yellow ‘zooplankton’ deck book during sampling to complete paper and jar lid labels

(2) **Niskin (5 m water sample)**

* Fill-in yellow water sampling sheet with sample number, selected samples (always at least one nutrient and one chl a per station, and at least one O2 & Salinity per day), date, station, and event #
* Label paper stickers top to bottom with Sample #, Sample Type (e.g., OXY), Station ID, Cruise ID, and depth sampled (5 m)
  + For Domoic Acid (DA) samples, also write the total volume (e.g, 1234 mL) of the sampling Nalgene on the label below depth.
* If O2 sample is taken, fill-in the dissolved oxygen sheet on red clipboard with Sample #, Flask ID, Temperature once sampled, Date, Station, and event #

**ii. Sampling**: (1) **Bongo (zooplankton)**

* Read flowmeter (TSK) and record number in yellow deck book
* Ensure cod ends are threaded properly
* Record depth of station and ‘wire out’ in yellow deck book (wire out = depth - 10 m)
* Deploy bongo to ‘wire out’ depth, and communicate with the bridge when the bongo hits the surface and bottom of the cast
* Record the angle of the wire in the yellow deck-book once the bongo is at the bottom
* Wash down the nets upon recovery and match-up the flowmeter side with the red-taped bucket, and non-flowmeter side with the non-taped bucket
  + Flowmeter side = size fractionated zooplankton; non-flowmeter side = formalin preserved zooplankton
* Read the flowmeter and record in yellow deck book
* Use pressure-sprayer to rinse off the ends of the nets into the cod-ends and buckets, and take buckets down into the lab for processing

(2) **CTD**

- Ensure the on/off button is fully pushed-in just prior to deploying

- Send CTD down 10 m and wait 30 – 45 seconds before sending it back to the surface

- Send the CTD down to depth (typically 10 m off the bottom)

- Communicate with the bridge when the CTD hits the surface and bottom of the cast

- Once back on board, ensure the on/off button is fully pulled out

(3) **Niskin (5 m water sample)**

- Cock niskin bottle, and ensure spigot is fully pulled-out (closed) and the threaded top valve is threaded tight

- Deploy the niskin at the same time the CTD is in the water (the two are combined into one event)

- Once the niskin reaches 5 m, deploy the messenger down the wire to trigger the niskin shut

- Recover the niskin and let the bridge know once it’s out of the water

- Take the niskin down into the lab to hang by the handle and sample

**iii. Processing Samples**: (1) **Bongo (zooplankton)**

* **Size Fractionated Zooplankton (Red-taped bucket)**
  + Pour the red-taped bucket zooplankton contents (flowmeter side of bongo) into a stack of sieves arranged from bottom to top as 0.25, 1, 1.7, and 8 mm sieves
  + Use filtered seawater from the pressure sprayer to rinse each sieve before collecting the size-separated zooplankton
  + Transfer the size fractionated zooplankton into their corresponding labelled Ziploc bags (labelled as, e.g., ‘8 mm’) without introducing water if possible
    - Use one the spatulas provided to scoop concentrated clumps of zooplankton from the sieve to the Ziploc bags
  + Once all size-separated zooplankton are bagged, add them all to one larger Ziploc bag with a bongo label filled with the corresponding station information
* **Formalin Preserved Zooplankton (Non-taped bucket)**
  + Pour all zooplankton from the non-taped bucket (non-flowmeter side of bongo) into one 212 or 250 um sieve.
  + Transfer zooplankton into appropriately sized jar (250 mL or 500 mL) with a lid label and ‘paper’ (rite in rain waterproof) label inside the jar.
  + 10 % of the total jar volume must contain 37 % formaldehyde preservative, thus:
    - 250 mL jar 🡪 add 25 mL of 37 % formaldehyde;
    - 500 mL jar 🡪 add 50 mL of 37 % formaldehyde
  + After adding 37 % formaldehyde, top the jar up to the top with filtered seawater

(2) **Niskin (5 m water sample)**

- Chlorophyll (every station)

* Rinse brown bottle three times and fill up to the top with cap
* Filter water via manifold and transfer small filter to scintillation vial and store in – 20 C freezer
* Nutrients (every station)
  + Rinse test tube and lid three times and fill just past the line marked on the tube
  + Wipe off seawater from the outside of the test tube and place in freezing block in – 20 C until frozen before transferring to the test tube racks also in the – 20 C
* Salinity (once a day)
  + Rinse bottle, lid, and plastic stopper three times before filling to the lower shoulder of the glass bottle, and sealing the bottle with the stopper and lid
  + Store in cage where the glass bottle was taken
* Oxygen (once a day)
  + Always sample oxygen first from the niskin
  + Before beginning, prime your MnCl (1) and NaOH (2) dispensers and then dispense two mL’s (two pumps) of each into the waste container
  + Refer to the oxygen sampling sheet supplied with the oxygen gear for proper sampling instructions
* Domoic Acid (CS will indicate which stations to sample this from)
  + Rinse 1L Nalgene bottle and cap three times before filling up to the top
  + Filter water with larger filter head and domoic acid filter paper on manifold
    - **Filter paper is white**, not blue 🡪 **blue paper will not filter**
    - Ensure the filtration head is threaded on properly 🡪 cross-threaded or incomplete threaded filter heads will leak water
  + Once filtering is complete, fold the DA filter and roll it into the labelled cryovial (label must contain volume of nalgene bottle sampled from, e.g., 1234 mL)
  + Place cryovial into DA labelled Ziploc bag in – 20 C freezer