Determining decomposition in lakes

Decomposition entails the breakdown of organic material such as dead animals, tree leaves (mostly in fall) and water plants, and is a vital process in the circle of life. Decomposition provides essential nutrients for plants and algae to grow on. An easy and cheap method to measure decomposition is the Tea Bag Index (TBI). NETLAKE wants to bring the TBI to water!

Please read the entire protocol before starting! Normal health and safety precautions should be taken at all times, for more information see website: www.nioo.knaw.nl/Netlake-Citizen-Science

Decide on what locations in the water and sediment you want to place your tea bags. **Default** is on top of the sediment and buried 8 cm deep, additionally tea bags can be placed in the water column hanging at 1 meter depth on a anchored float (see the '*Advanced TBI*' protocol and the '*Securing tea bags*' protocol). At every location you want to determine decomposition you should place 3 rooibos and 3 green tea bags.

Preparation and materials

- (unused) Lipton Green tea (EAN 87 22700 05552 5)
- (unused) Lipton Rooibos tea (EAN 87 22700 18843 8)
- waterproof marker
- transparent waterproof tape
- letter/postal scale (precision ≤ 0,1 gr)
- needle and fishing wire
- duct tape
- iButton set-up (see protocol iButton) or pegs/stick/chicken wire
- Float or stick to be able to find your tea bags again (already included in iButton set-up)
- ruler

- Use the waterproof marker to code the labels of the tea bags with a unique code containing location on the lake, vertical position in the lake (buried in 8 cm of sediment =A; on top of sediment = B, in the water =C) tea type (Rooibos R; green tea G), bag number (1/2/3).
- Weigh each tea bag and note down their individual initial weights
- Cover the coded labels with electrical tape to waterproof them
- Pair the tea bags by tying one green and one rooibos tea bag together using their strings. Be careful, they could tear from the tea bag!
  - Recommended: sew the tea bags together using fishing wire, leave +/- 5 cm of fishing wire between the bags.
- Use 3 tea pairs per location to determine the decomposition process so we will have a good average weight loss.

Starting date					Finishing date		
Lake	Location in lake	Vertical position	Tea Type	Bag	Starting Weight (g)	End Weight (g)	Code
Constance	1	A	R	1			CO1AR1
CO	1	A	G	1			CO1AG1
CO	1	A	R	2			CO1AR2
CO	1	A	G	2			CO1AG2
CO	1	A	R	3			CO1AR3
CO	1	A	G	3			CO1AG3
CO	1	B	R	1			CO1BR1
CO	1	B	G	1			….

Tea pairs

Method

- Go to the chosen suitable spot on your lake shore; were water depth is 1 m above the sediment, in a location that does not attract much attention.
- Record the date and time and GPS/Google maps location.
- Place your tea bags at their designated location (8 cm in the sediment, on top of the sediment and in the water column)
    - In case you have an iButton (see NETLAKE protocol 'iButton at tea bag site'); secure 3 pairs of tea bags using the fishing wire or their strings and duct tape to the iButton.
    - Otherwise use pegs, a large (bamboo) stick or chicken wire to secure the tea bags on top of the sediment (see protocol '*Securing tea bags*').

Remember that you have to be able to find your tea bags again after 90 days!

Retrieval

- Remove the bags after 90 days (three months) and gently rinse or rub off any algae growth or sediment particles.
- Dry the bags by placing them on a windowsill for 3 days (preferably in the sun/above a radiator).
- Remove the label and weigh the bags again. Record each final weight.
- Upload your initial and final tea bag weights on www.nioo.knaw.nl/en/Netlake-Citizen-Science