DRAFT

FIELD MANUAL

sampling instructions for the collection of the SIMONA National Sediment Quality Monitoring Baseline Network samples

SAMPLING DESIGN

(Sampling Plan, Sampling Programme)

Gyozo Jordan and Franko Humer

Project co-funded by the European Union
http://www.interreg-danube.eu/approved-projects/simona

SAMPLING CATEGORIES

operational definition

SMALL RIVERS
sampler enters river

LARGE RIVERS
sampling from boat

Bottom Sediment

Suspended Sediment

Overbank Sediment

LOWLAND

ALPINE

LOWLAND

ALPINE

QUESTION: Is my river a **small river** OR a **large river** at the Monitoring Site?

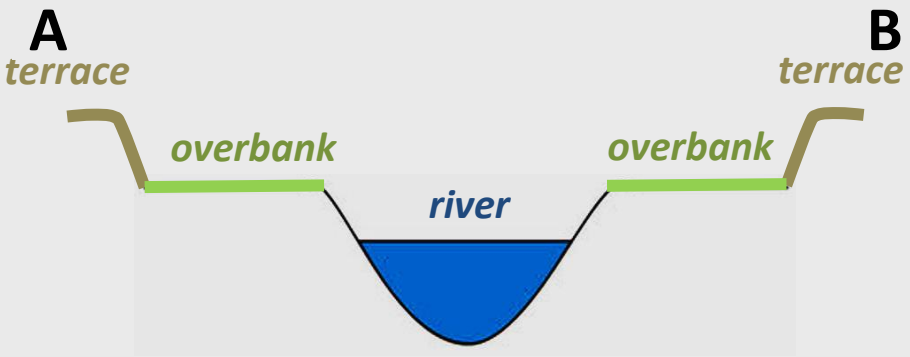
RESPONSE: *Follow the relevant sampling design below.*

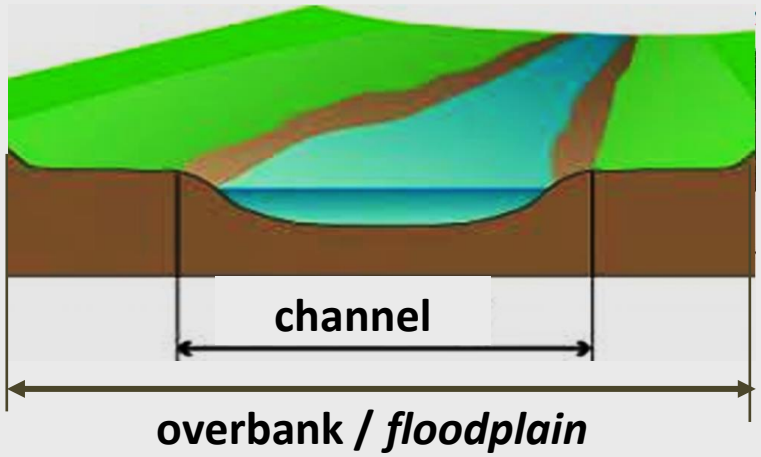
SMALL RIVER

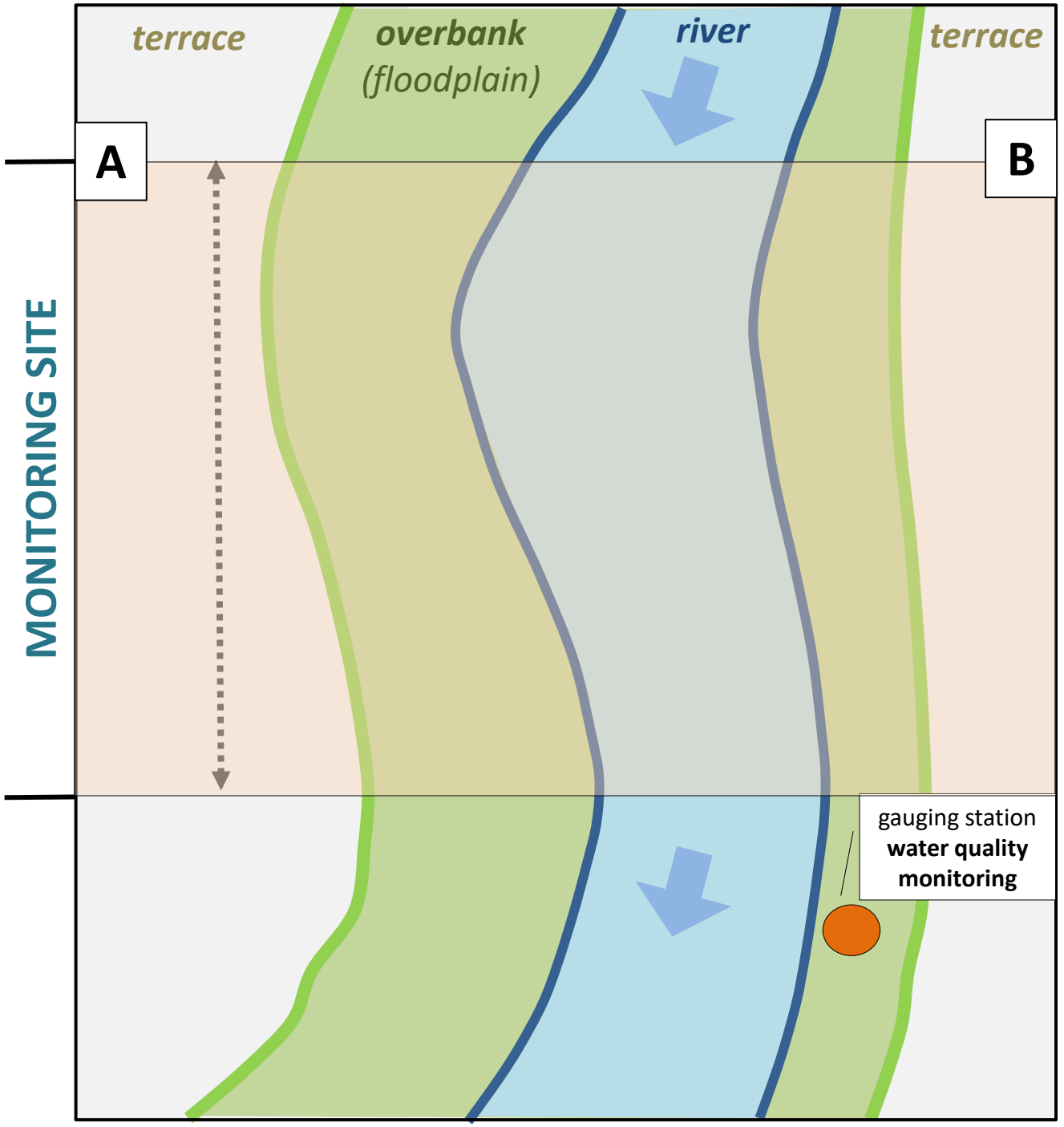
sampler enters river

1. MONITORING SITE LOCATION

1. MONITORING SITE LOCATION

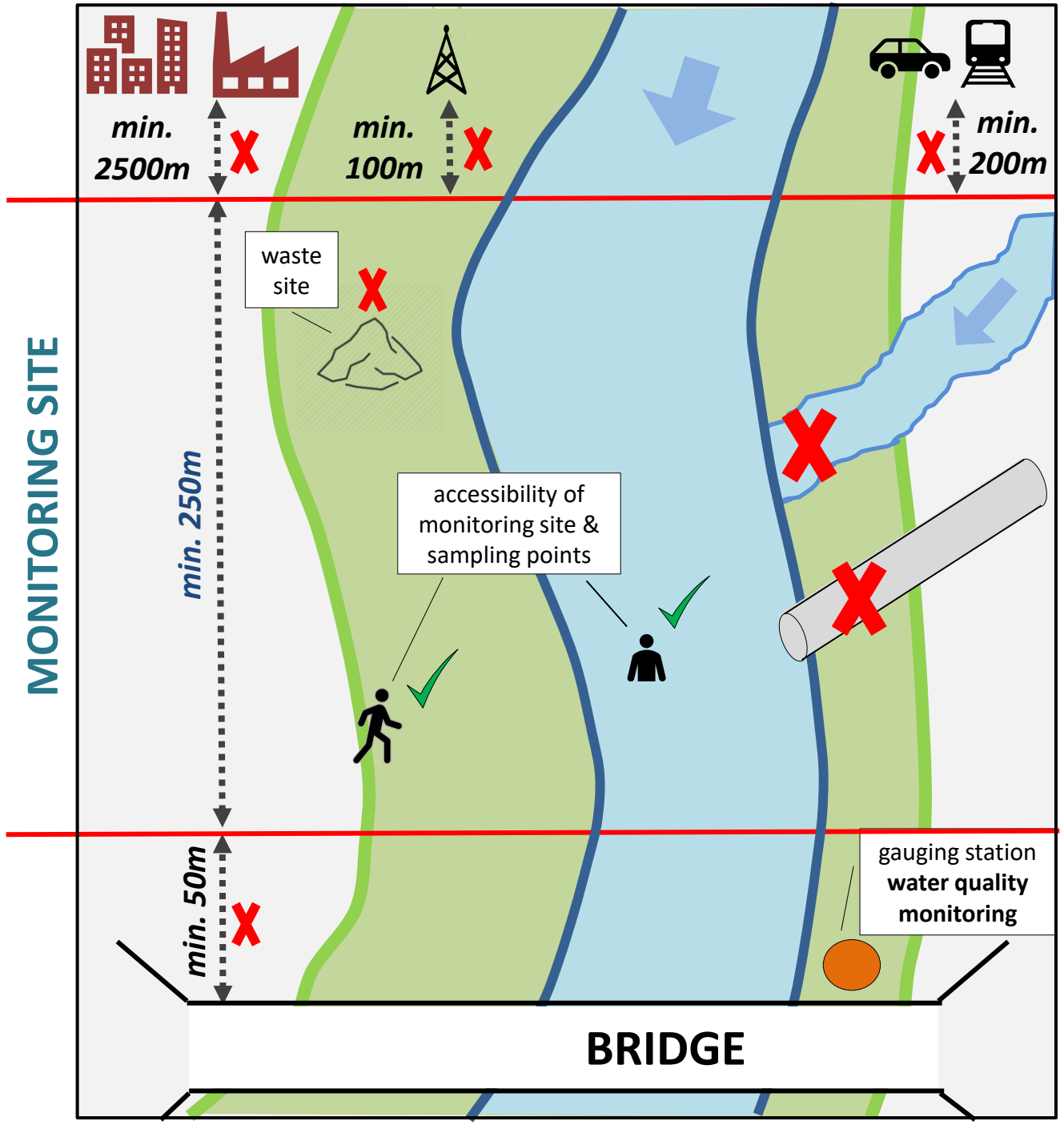






1. MONITORING SITE LOCATION

1. **AT NATIONAL WATER QUALITY MONITORING POINT** *(preferably upstream)*
2. **MIN. 250M LONG**
3. **BOTTOM SEDIMENT, SUSPENDED SEDIMENT, OVERBANK SEDIMENT SAMPLING POSSIBLE** *(availability, accessibility)*
4. **AVOID TRIBUTARY CONFLUENCE**
5. **AVOID KNOWN CONTAMINATED SITE**
6. **AVOID LOCAL CONTAMINATION SOURCE**
   - *Discharge channel or pipe*
   - *Waste site*
   - *Industry or power plant (min. distance 2500m)*
   - *Railway lines & major roads (min. distance 200m)*
   - *Electric line & pylon (min. distance 100m)*
   - *Bridge (min. distance 50m upstream)*
   - *Other sources*
7. **UNIFORM HYDROMORPHOLOGY**



2. SAMPLING POINT LOCATION

2.1 BOTTOM SEDIMENT

HORIZONTAL DESIGN

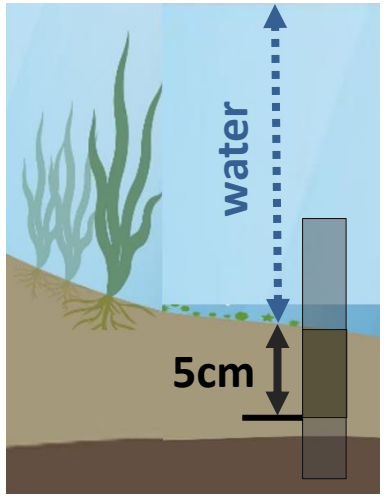
1. **5-10 SAMPLING POINTS**

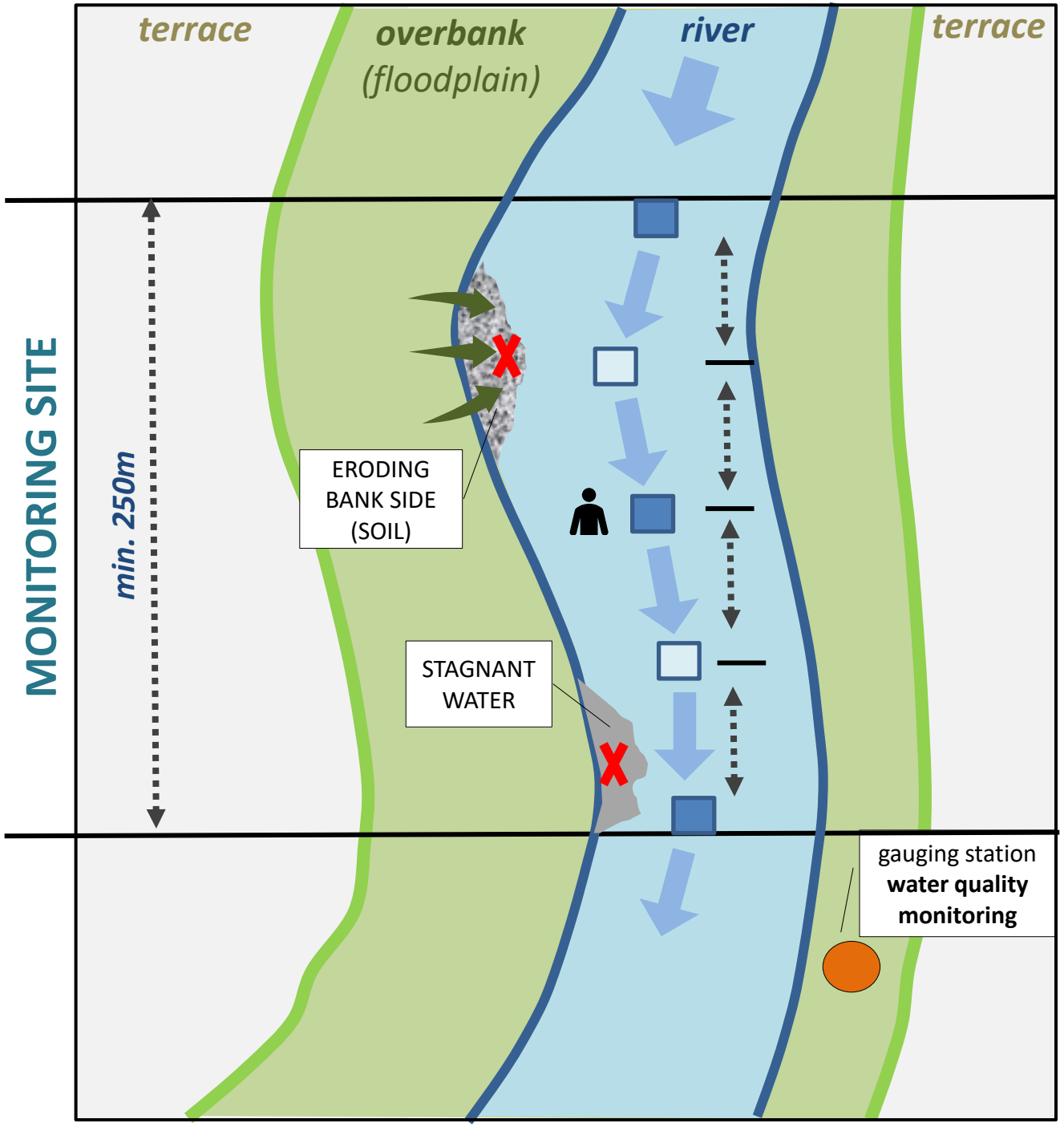
   - *Composite sample: 5-10 sub-samples (always at least 3)*

2. **SAMPLING POINTS EQUIDISTANT**
3. **SAMPLING POINTS IN MAIN STREAM LINE** *(active river flow)*
4. **AVOID STAGNANT (NON-ACTIVE) WATER**
5. **AVOID EDGE EFFECTS** *(local river bank erosion into river)*

VERTICAL DESIGN

1. **TOP 0-5 CM**
2. **AVOID PLANTS & PLANT REMNANTS**
3. **SAMPLED SEDIMENT IN CONTACT WITH (UNDER) RIVER WATER**





2.1 BOTTOM SEDIMENT

SAMPLING METHOD

1. **VACUUM CORER SYSTEM**

➕ *Precise depth control*

➕ *Very good representativity & reproducibility*

➖ *Requires specific tool & safety*

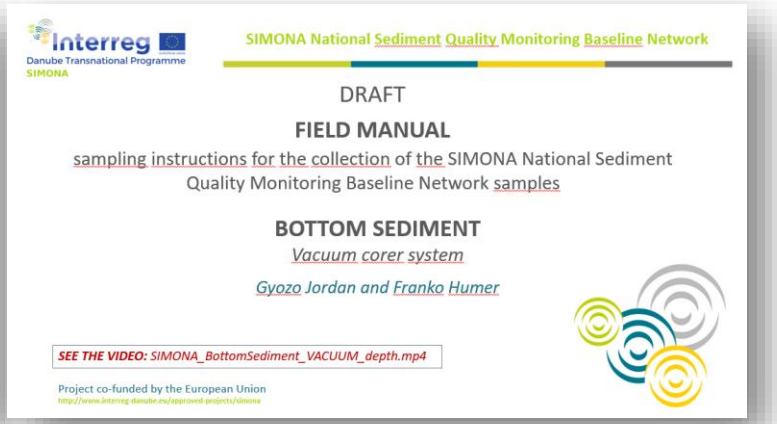
2. **SCOOP SYSTEM**

➖ *Limited depth control*

➕➖ *Requires expertise & experience: good representativity & reproducibility*

➕ *Requires no specific tool & safety*

➕ *Fast*



VIDEO: *SIMONA_BottomSediment_VACUUM_depth.mp4*

VIDEO: *SIMONA_BottomSediment_SCOOP.mp4*

SAMPLING METHOD OPTIONS

1. **YOU CAN COLLECT ADDITIONAL SAMPLES WITH ANY OTHER METHOD (SAMPLING SYSTEM)**
2. **AVOID GRAB SYSTEMS**

SAMPLE QUANTITY

1 kg *(top up 0.7L glass jar)*

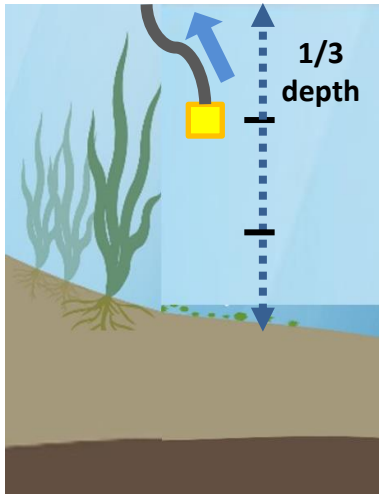
2.2 SUSPENDED SEDIMENT

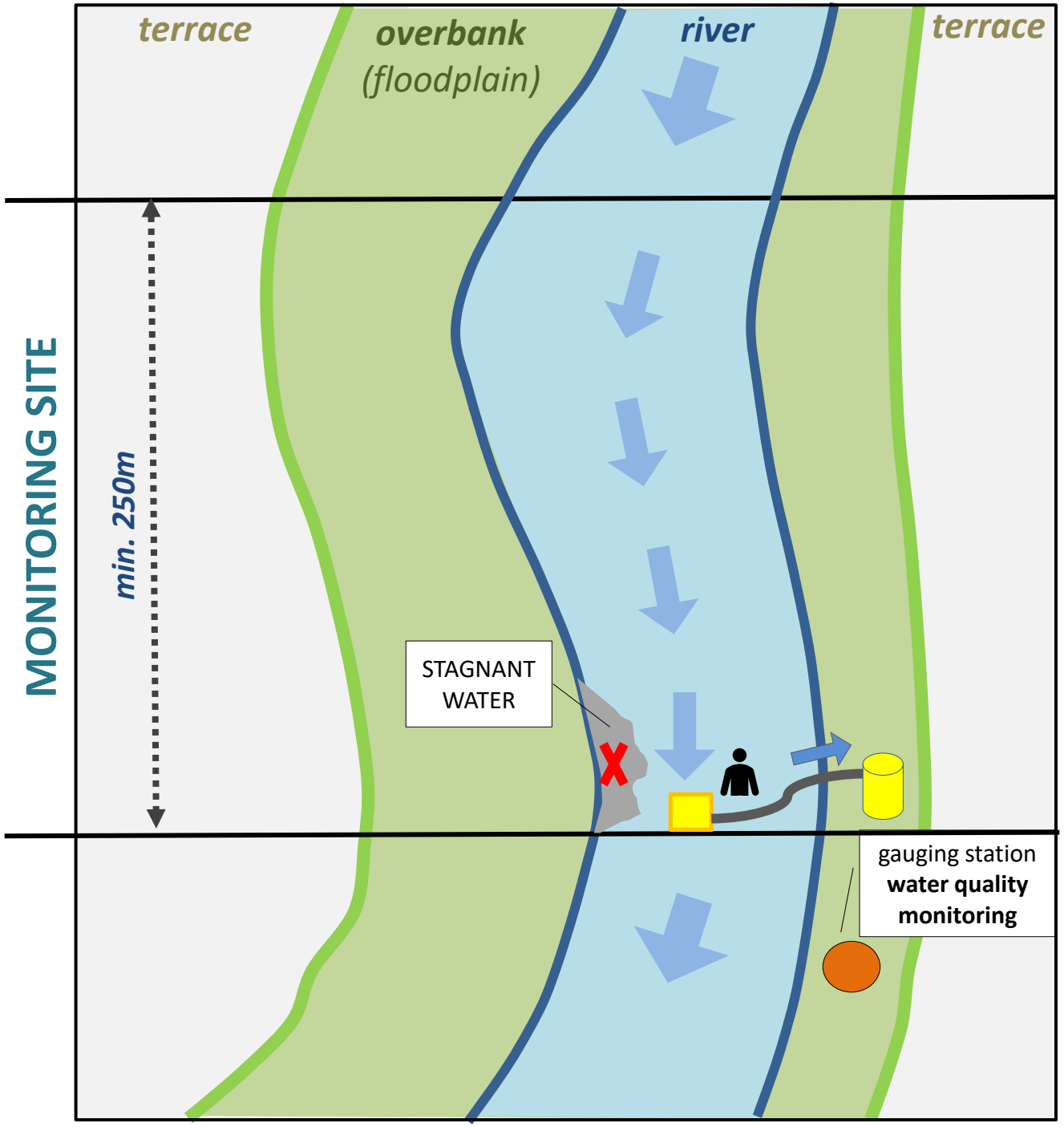
HORIZONTAL DESIGN

1. **ONE SAMPLING POINT**
   - *Composite sample: suspended sediment sample is natural composite by flowing river water mixing*
2. **SAMPLING POINT LOCACTION AT DOWNSTREAM END OF MONITORING SITE**
3. **SAMPLING POINTS IN MAIN STREAM LINE** *(active river flow)*
4. **AVOID STAGNANT (NON-ACTIVE) WATER**

VERTICAL DESIGN

1. **AT TOP 1/3 OF WATER DEPTH**





2.2 SUSPENDED SEDIMENT

SAMPLING METHOD

1. **BARREL SYSTEM**

SAMPLING METHOD OPTIONS

1. **YOU CAN COLLECT ADDITIONAL SAMPLES WITH ANY OTHER METHOD (SAMPLING SYSTEM)**

SAMPLE QUANTITY

1. **10L** or **30L** *(in plastic tank, barrel)*

VIDEO: *SIMONA_SuspendedSediment_BARREL.mp4*

2.3 OVERBANK SEDIMENT

HORIZONTAL DESIGN

1. **5 SAMPLING POINTS**

   - *Composite sample: 5 sub-samples (always at least 3)*

2. **SAMPLING POINTS EQUIDISTANT**

3. **SAMPLING POINTS ON ACTIVE OVERBANK**
   (overbank flooded min. once per year)

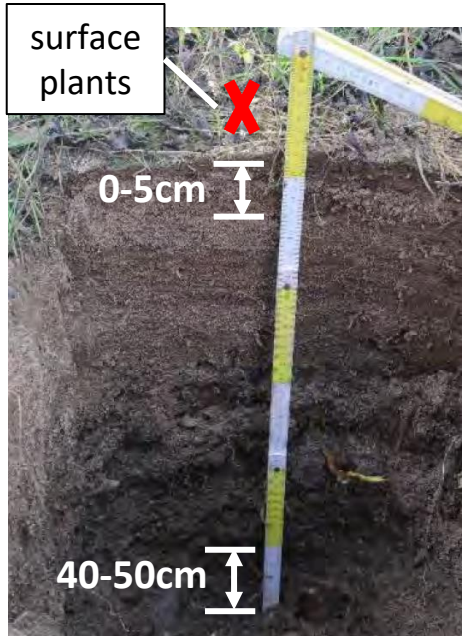
4. **AVOID EDGE EFFECTS** *(local side wall erosion onto overbank)*

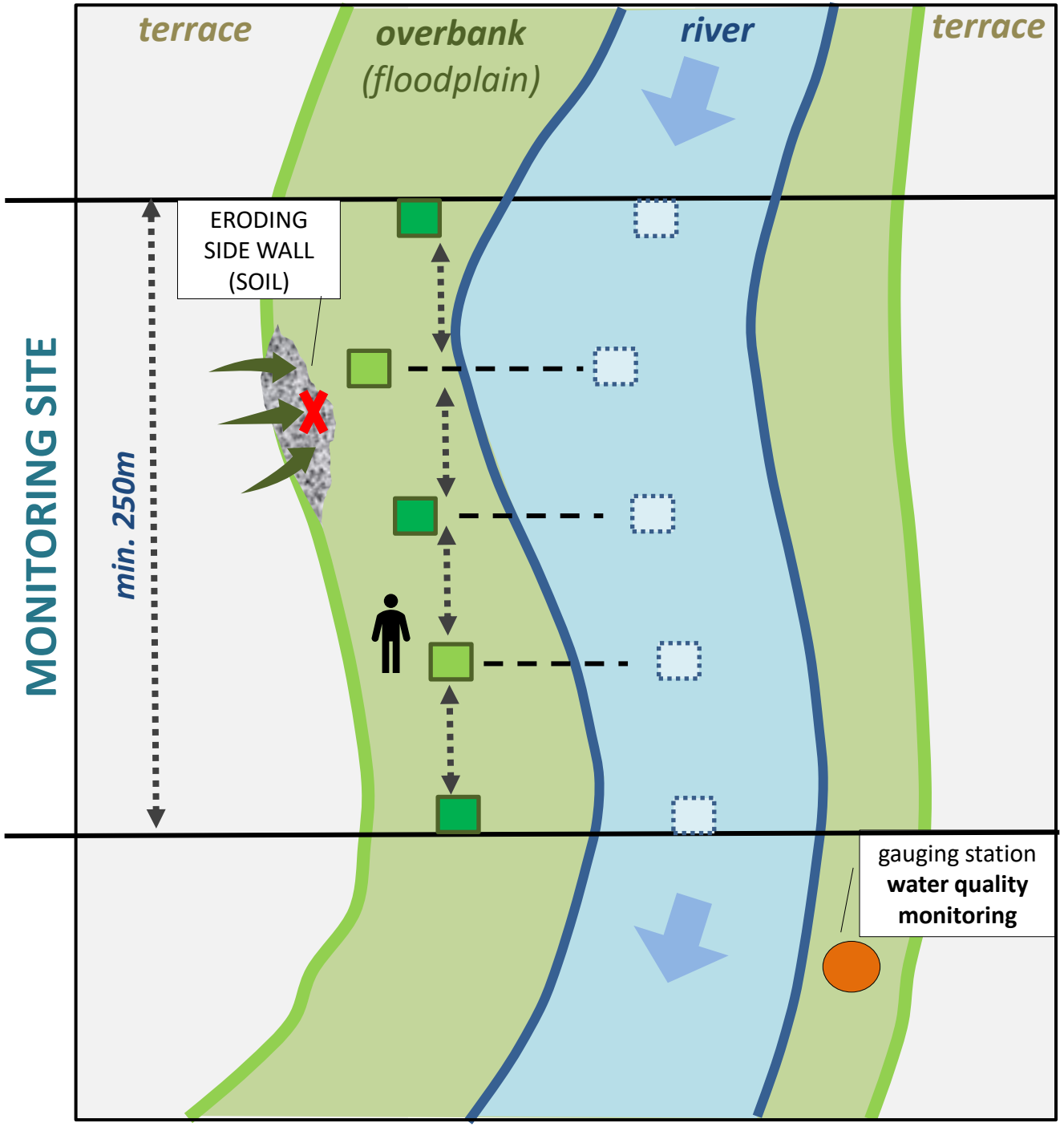
VERTICAL DESIGN

1. **TOP 0-5 CM**

2. **BOTTOM 40-50 CM**

3. **AVOID SURFACE PLANTS**





2.3 OVERBANK SEDIMENT

SAMPLING METHOD

1. **SPADE SYSTEM**

- *Precise depth control*
- *Very good representativity & reproducibility*
- *Very slow*

VIDEO: *SIMONA_Overbank_SPADE.mp4*

SAMPLING METHOD OPTIONS

1. **YOU CAN COLLECT ADDITIONAL SAMPLES WITH ANY OTHER METHOD (SAMPLING SYSTEM) OR AT OTHER DEPTH (e.g. 0-25CM)**
2. **AVOID AUGER / CORER SYSTEMS**

SAMPLE QUANTITY

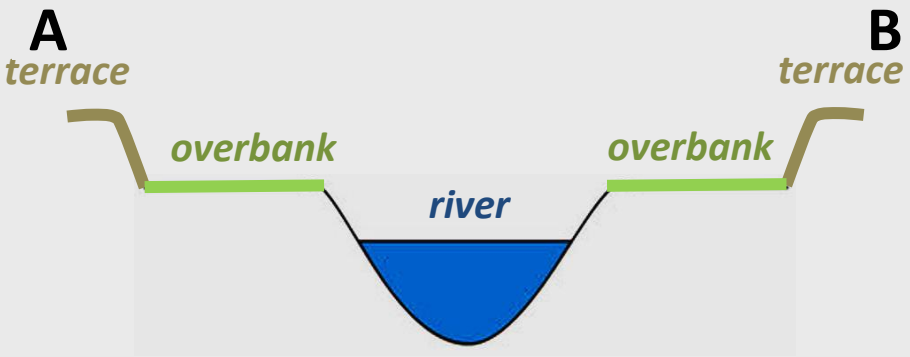
1. **1 kg (0-5cm)** *(top up 0.7L glass jar)*
2. **1 kg (40-50cm)** *(top up 0.7L glass jar)*

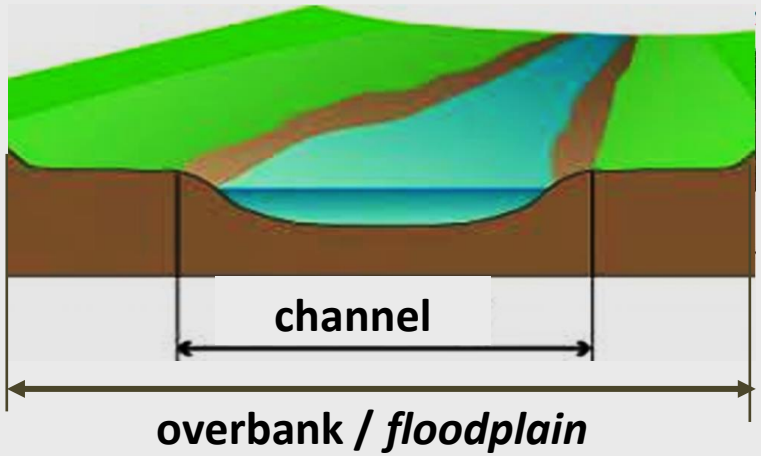
LARGE RIVER

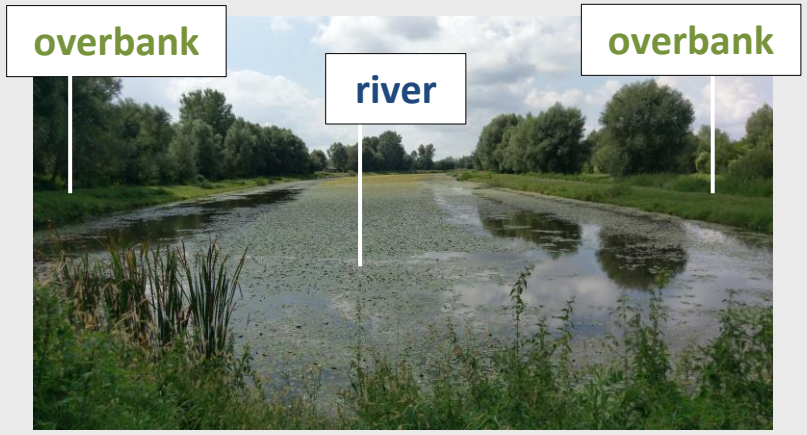
(sampling from boat)

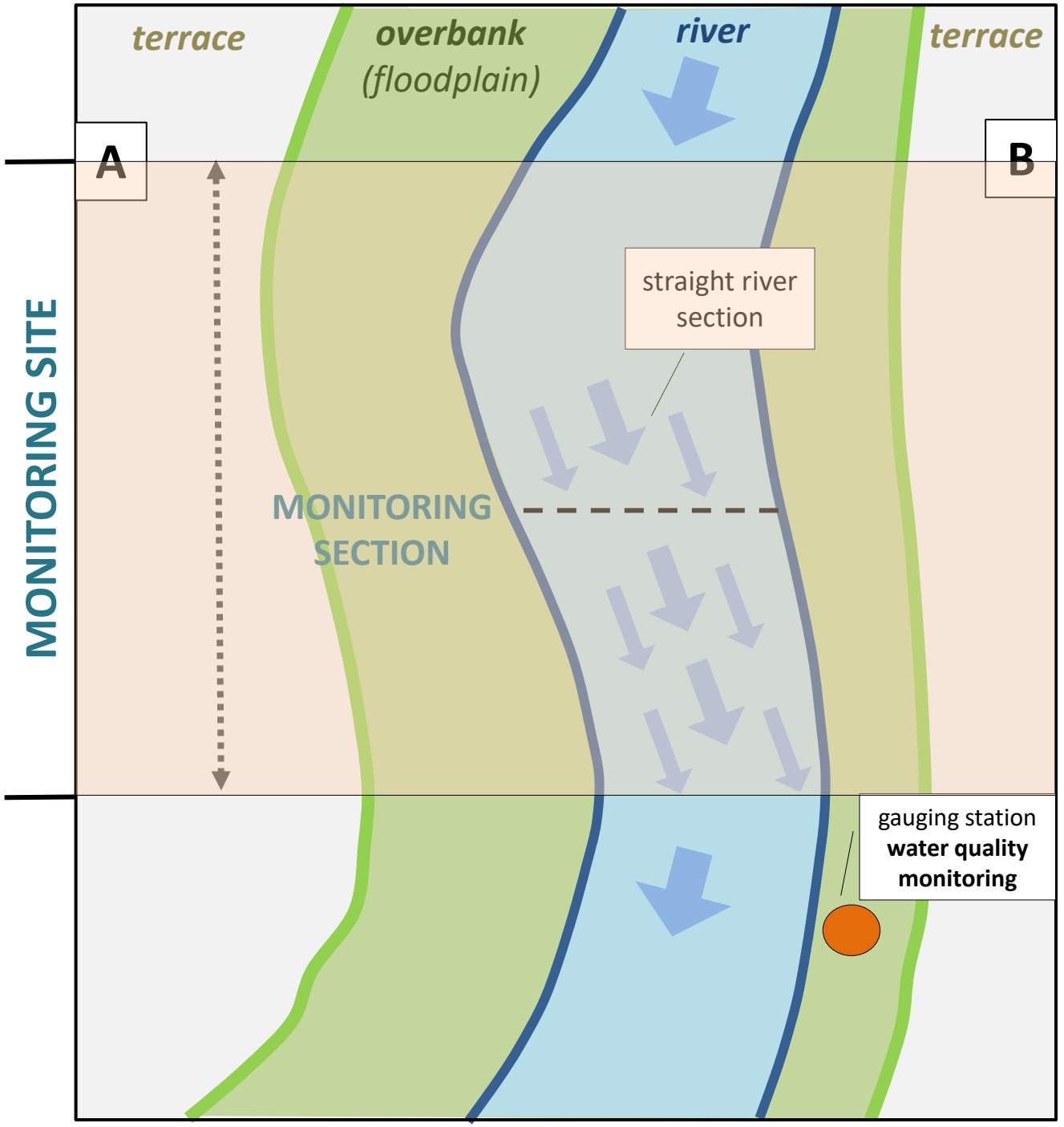
1. MONITORING SITE LOCATION

1. MONITORING SITE LOCATION



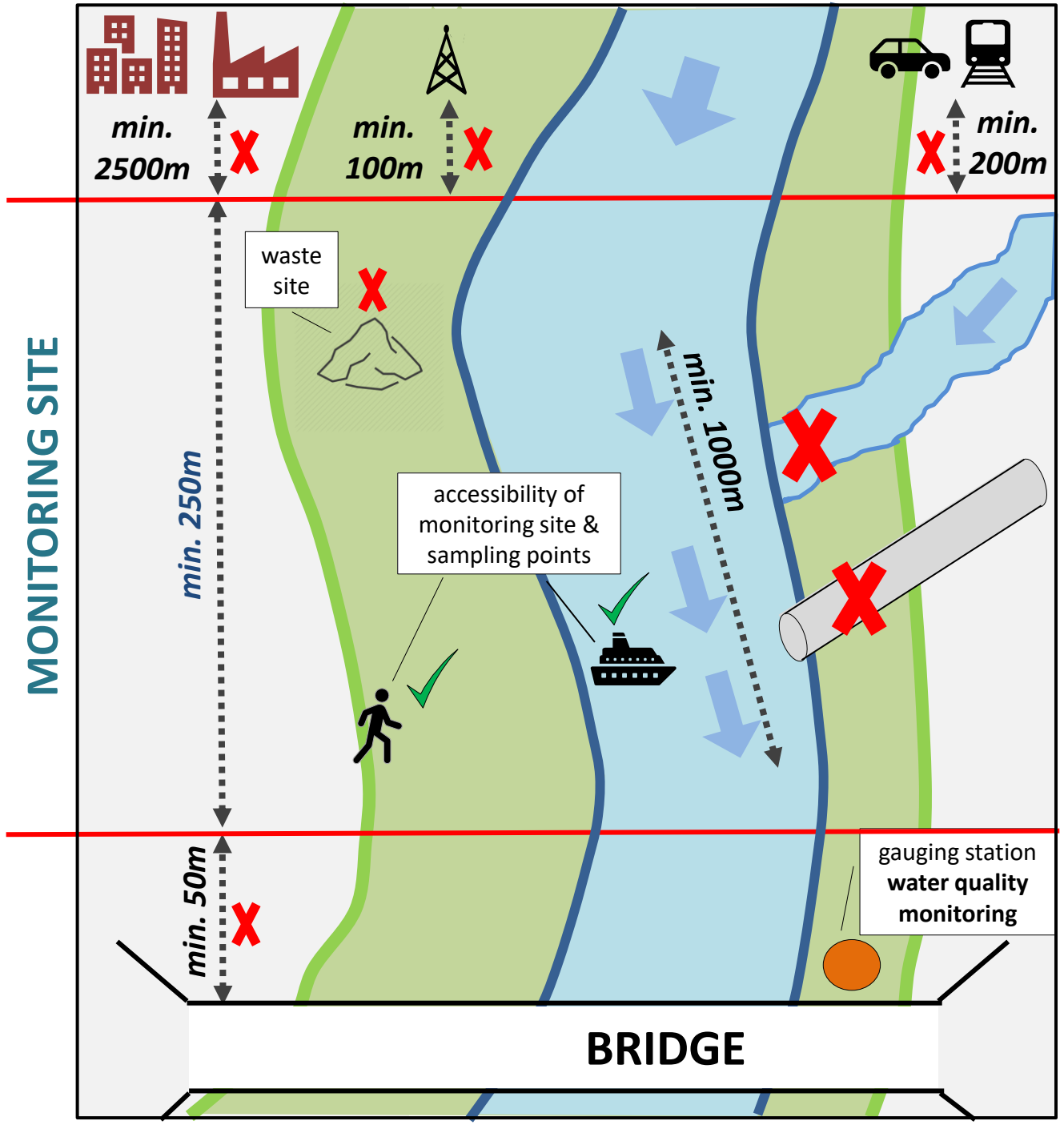






1. MONITORING SITE LOCATION

1. **AT NATIONAL WATER QUALITY MONITORING POINT** *(preferably upstream)*
2. **MIN. 250M LONG**
3. **STRAIGHT RIVER SECTION** *(min. 1000m)*
4. **BOTTOM SEDIMENT, SUSPENDED SEDIMENT, OVERBANK SEDIMENT SAMPLING POSSIBLE** *(availability, accessibility)*
5. **AVOID TRIBUTARY CONFLUENCE**
6. **AVOID KNOWN CONTAMINATED SITE**
7. **AVOID LOCAL CONTAMINATION SOURCE**
   - *Discharge channel or pipe*
   - *Waste site*
   - *Industry or power plant (min. distance 2500m)*
   - *Railway lines & major roads (min. distance 200m)*
   - *Electric line & pylon (min. distance 100m)*
   - *Bridge (min. distance 50m upstream)*
   - *Other sources*
7. **UNIFORM HYDROMORPHOLOGY**

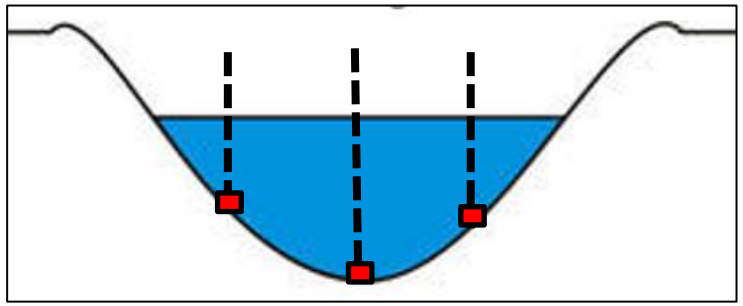


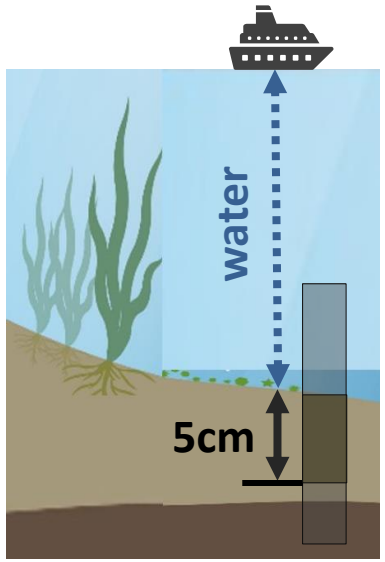
2. SAMPLING POINT LOCATION

2.1 BOTTOM SEDIMENT

HORIZONTAL DESIGN

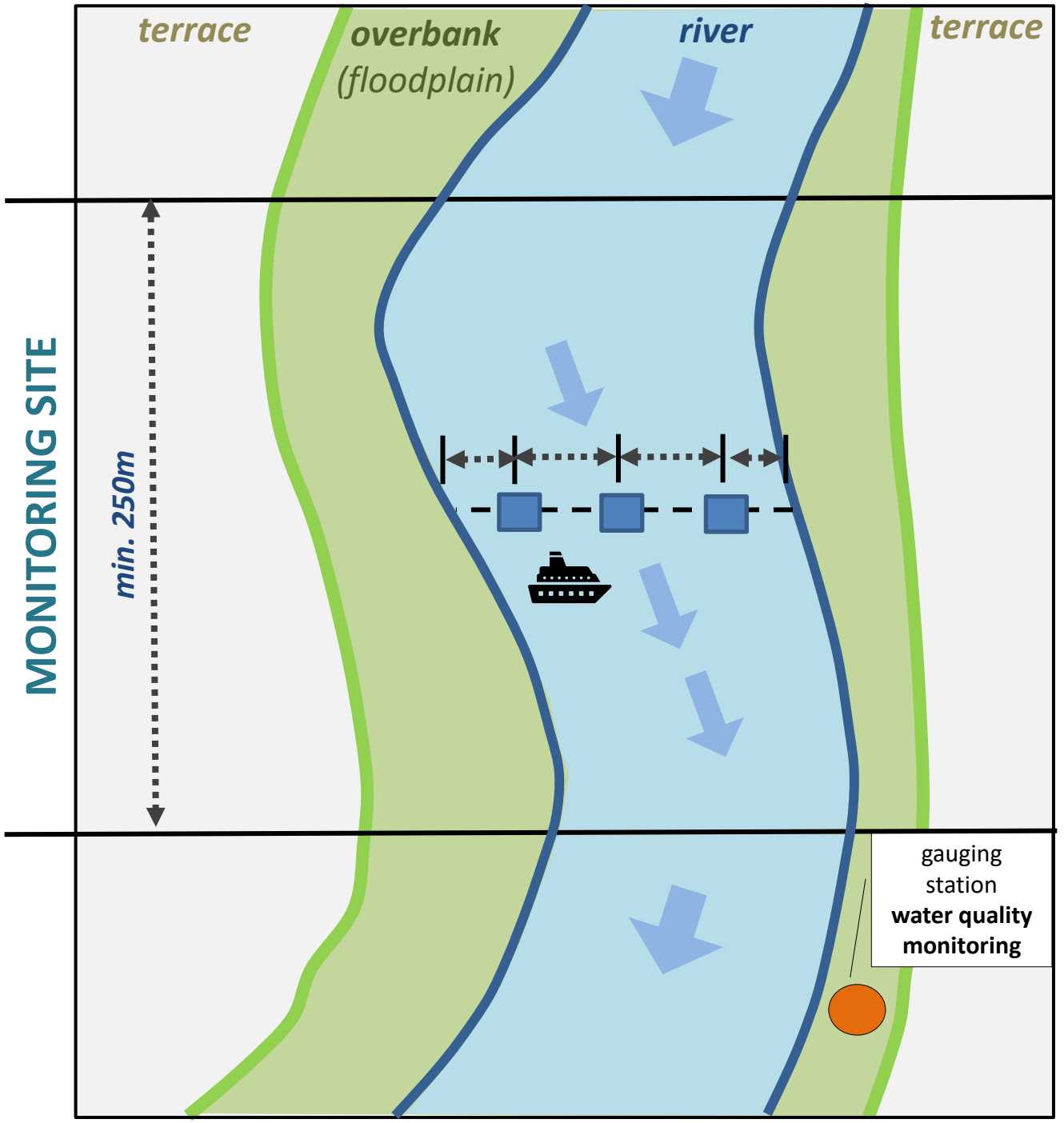
1. **3 SAMPLING POINTS AT LEAST**
   - *Composite sample: 3 sub-samples at least*
2. **SAMPLING TRANSECT IN STRAIGH RIVER SECTION**
3. **AVOID RIVER BENDS**
4. **SAMPLING POINTS EQUIDISTANT**
5. **SAMPLING POINTS IN MAIN STREAM LINE** *(active river flow)*





VERTICAL DESIGN

1. **TOP 0-5 CM**



2.1 BOTTOM SEDIMENT

SAMPLING METHOD

1. **CORER SYSTEM** *(vacuum or other type)*

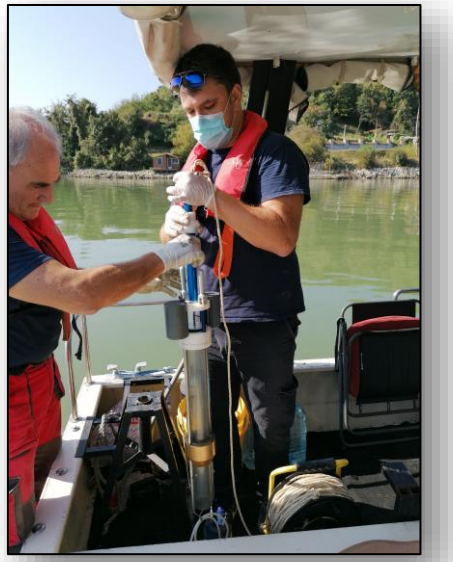
+ *Precise depth control*
+ *Very good representativity & reproducibility*
− *Requires specific tool & safety*

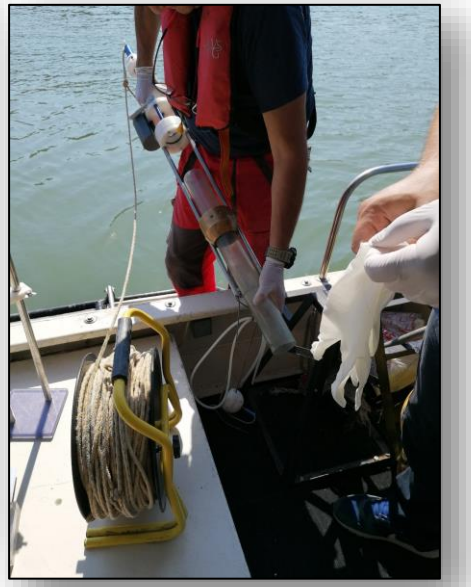
2. **SCOOP SYSTEM** *(manually along river bank)*

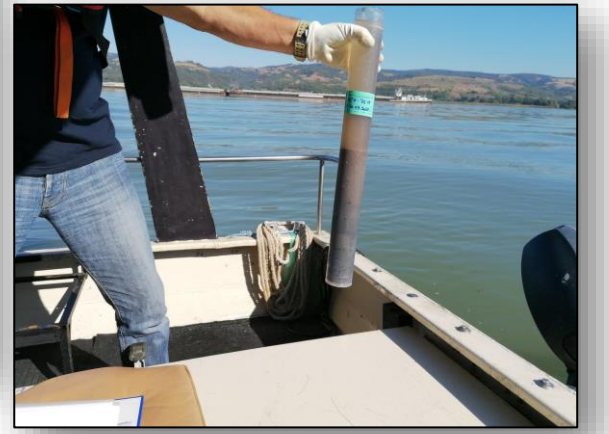
− *Limited depth control*
+ *Requires expertise & experience: good representativity & reproducibility*
− *Requires no specific tool & safety*
+ *Fast*

SAMPLING METHOD OPTIONS

1. **YOU CAN COLLECT ADDITIONAL SAMPLES WITH ANY OTHER METHOD (SAMPLING SYSTEM)**
2. **AVOID GRAB SYSTEMS**







SAMPLE QUANTITY

1 kg *(top up 0.7L glass jar)*

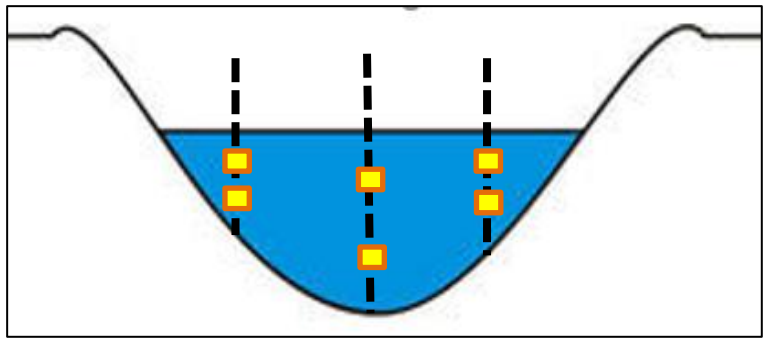
2.2 SUSPENDED SEDIMENT

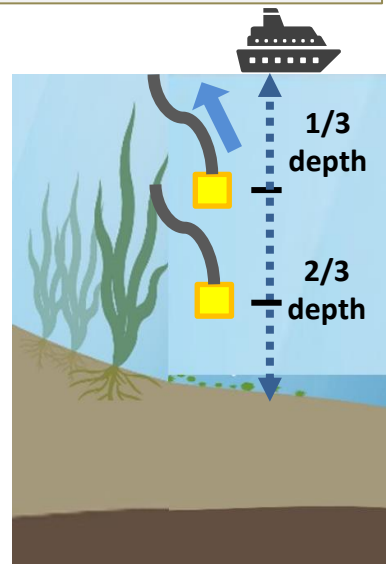
HORIZONTAL DESIGN

1. 3 SAMPLING POINTS AT LEAST
2. 2 DIFFERENT DEPTHS AT LEAST AT EACH POINT

- *Composite sample: 6 sub-samples at least*

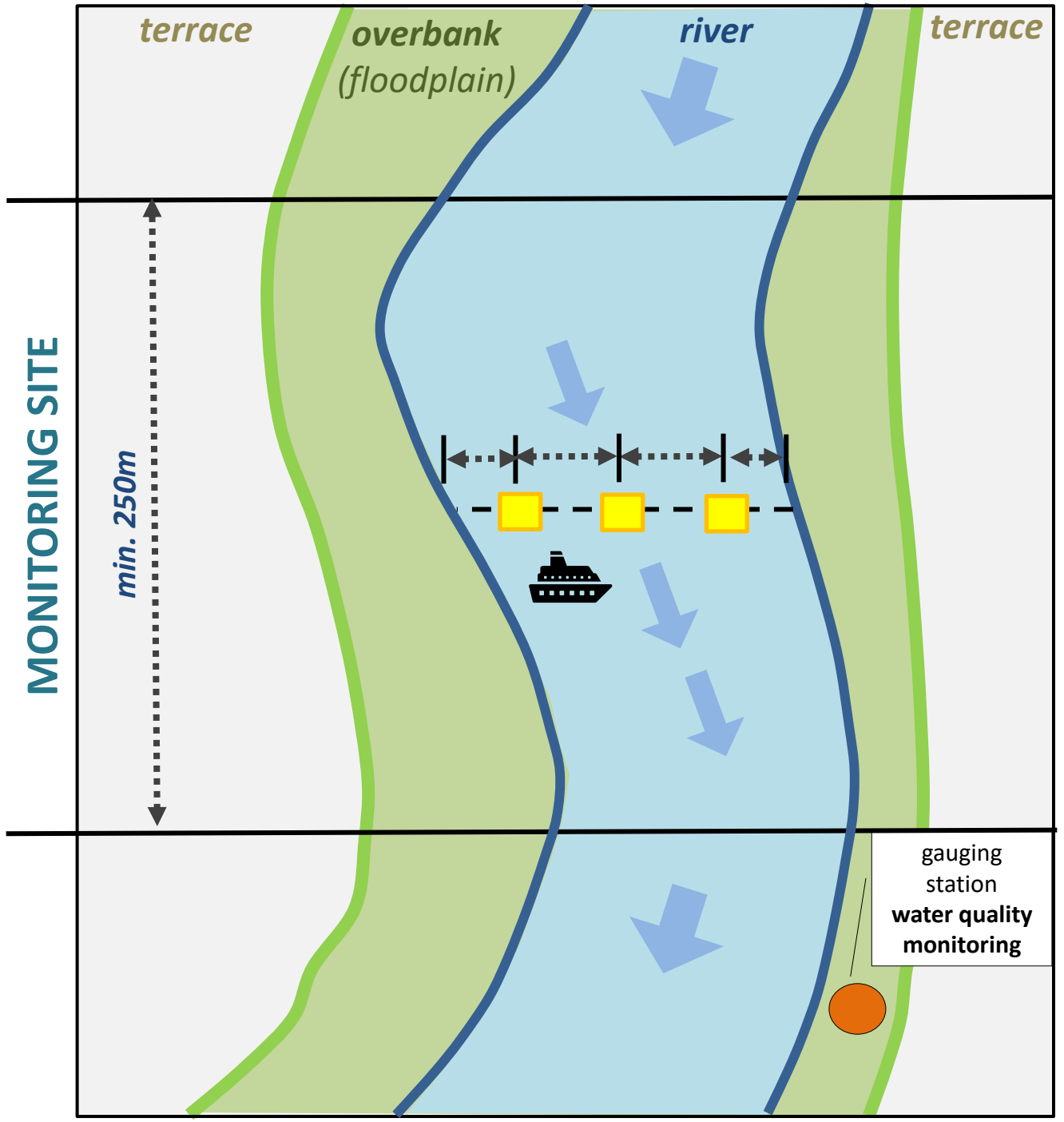
2. SAMPLING TRANSECT IN STRAIGH RIVER SECTION
3. AVOID RIVER BENDS
4. SAMPLING POINTS EQUIDISTANT
5. SAMPLING POINTS IN MAIN STREAM LINE *(active river flow)*





VERTICAL DESIGN

1. AT TOP 1/3 & 2/3 OF WATER DEPTH



2.2 SUSPENDED SEDIMENT

SAMPLING METHOD

1. **BARREL SYSTEM**

SAMPLING METHOD OPTIONS

1. **YOU CAN COLLECT ADDITIONAL SAMPLES WITH ANY OTHER METHOD (SAMPLING SYSTEM)**
2. **AVOID PASSIVE SYSTEMS (TIME INTEGRATED; EG. SEDIMENT BOX)**

SAMPLE QUANTITY

1. **10L** or **30L** *(in plastic tank, barrel)*

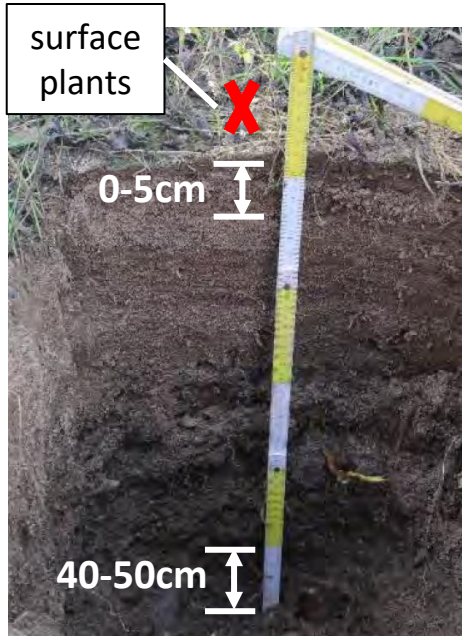
2.3 OVERBANK SEDIMENT

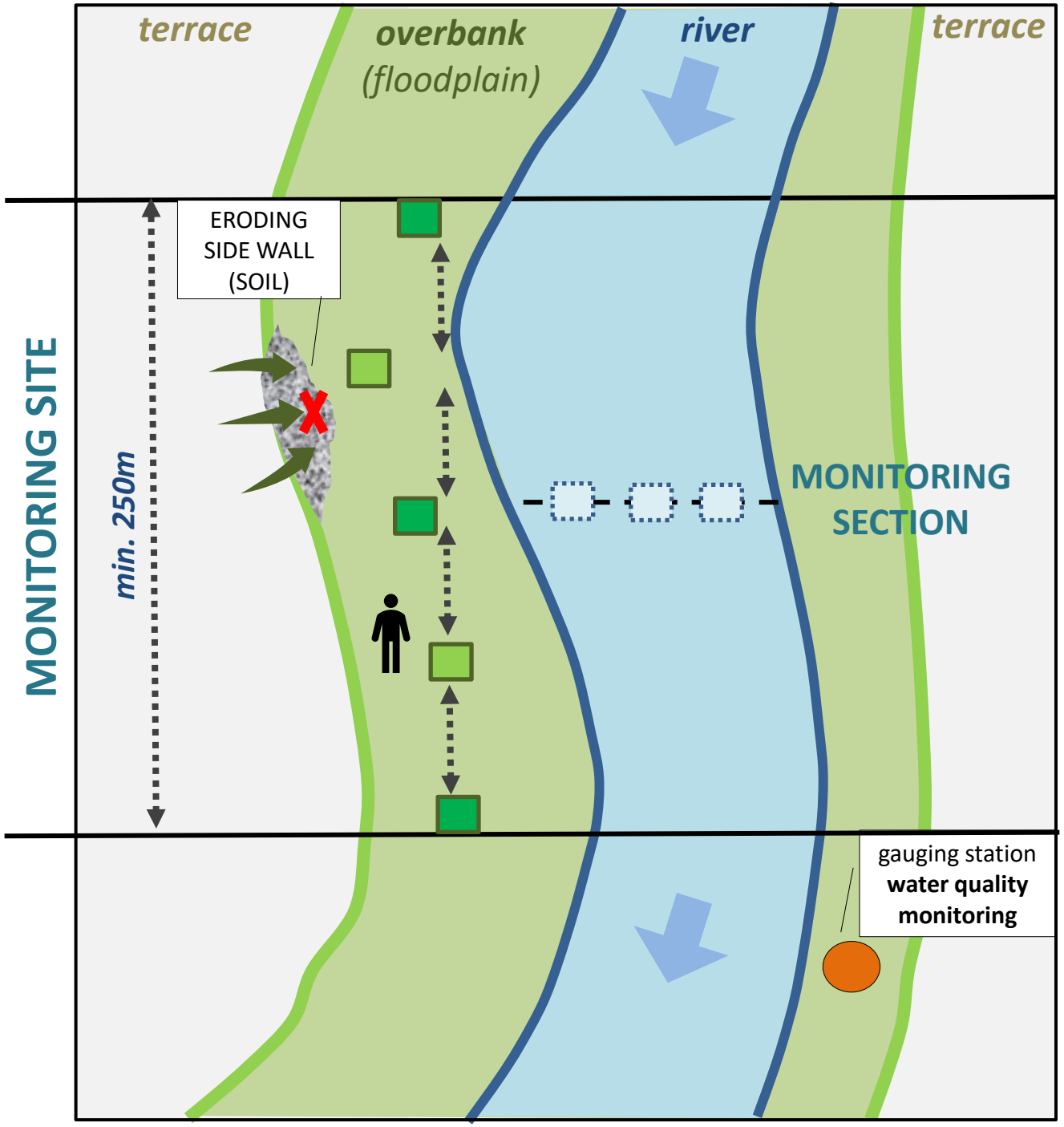
HORIZONTAL DESIGN

1. **5 SAMPLING POINTS**
   - *Composite sample: 5 sub-samples (always at least 3)*
2. **SAMPLING POINTS EQUIDISTANT**
3. **SAMPLING POINTS ON ACTIVE OVERBANK**
   (overbank flooded min. once per year)
4. **AVOID EDGE EFFECTS** *(local side wall erosion onto overbank)*

VERTICAL DESIGN

1. **TOP 0-5 CM**
2. **BOTTOM 40-50 CM**
3. **AVOID SURFACE PLANTS**





2.3 OVERBANK SEDIMENT

SAMPLING METHOD

1. **SPADE SYSTEM**

➕ *Precise depth control*

➕ *Very good representativity & reproducibility*

➖ *Very slow*

VIDEO: *SIMONA_Overbank_SPADE.mp4*

SAMPLING METHOD OPTIONS

1. **YOU CAN COLLECT ADDITIONAL SAMPLES WITH ANY OTHER METHOD (SAMPLING SYSTEM)**
2. **AVOID AUGER / CORER SYSTEMS**

SAMPLE QUANTITY

1. **1 kg (0-5cm)** *(top up 0.7L glass jar)*
2. **1 kg (40-50cm)** *(top up 0.7L glass jar)*

PROBE MEASUREMENTS

(water and sediment)

1 PROBES – WATER

HORIZONTAL DESIGN

1. **ONE SAMPLING POINT**

- *Composite sample: flowing river water is natural composite*

2. **SAMPLING POINT LOCACTION:**

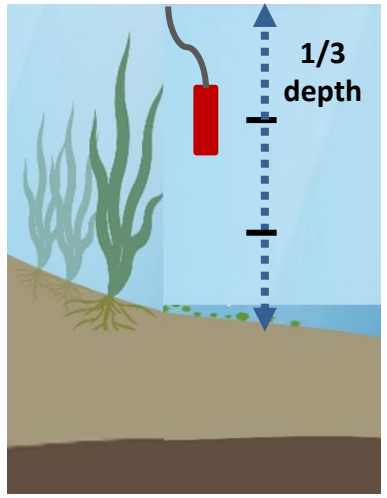
- *Small river: at downstream end of monitoring site*
- *Large river: at centre of monitoring section*

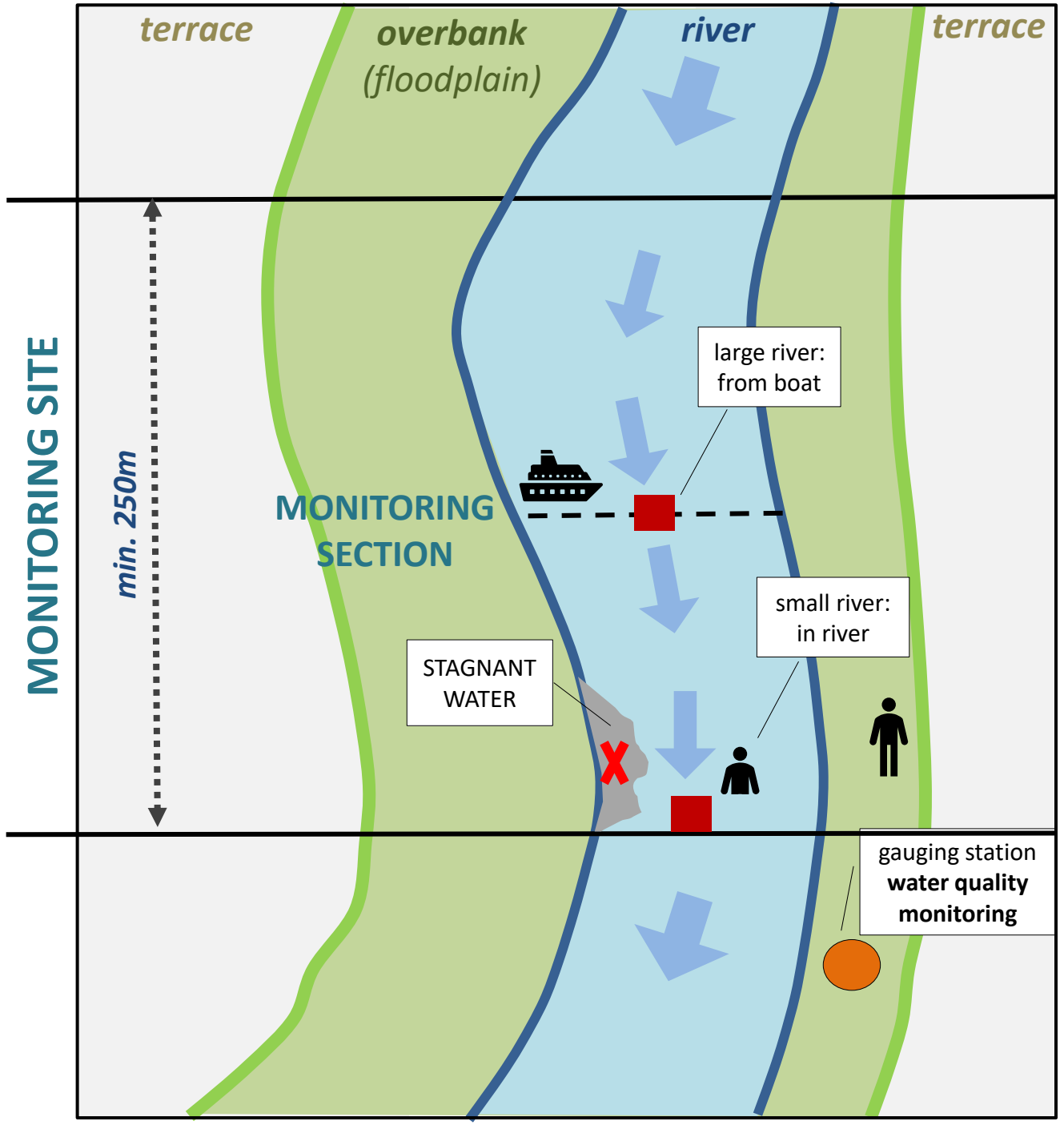
2. **SAMPLING POINT IN MAIN STREAM LINE** *(active river flow)*

3. **AVOID STAGNANT (NON-ACTIVE) WATER**

VERTICAL DESIGN

1. **AT TOP 1/3 OF WATER DEPTH**



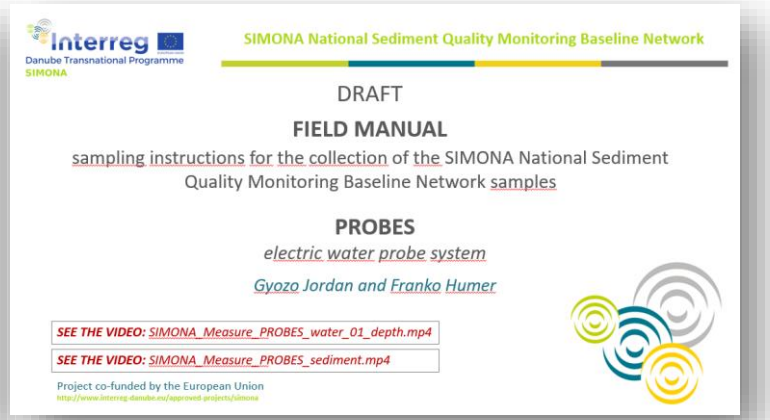


1 PROBES – WATER

SAMPLING METHOD

1. **WATER PROBE SYSTEM**

   - *Insert probes (T, EC, pH, DO, Redox) into water & take measurements*



VIDEO: *SIMONA_Measure_PROBES_water_01_depth.mp4*

SAMPLING METHOD OPTIONS

1. **YOU CAN COLLECT ADDITIONAL SAMPLES WITH ANY OTHER METHOD (SAMPLING SYSTEM)**
2. **AVOID AUGER / CORER SYSTEMS**
3. **ADDITONAL PROBE MEASUREMENTS ALONG THE MONITORING SITE OR ACROSS THE MONITORING SECTION** *(to gain information about heterogeneity such as groundwater inflow)*

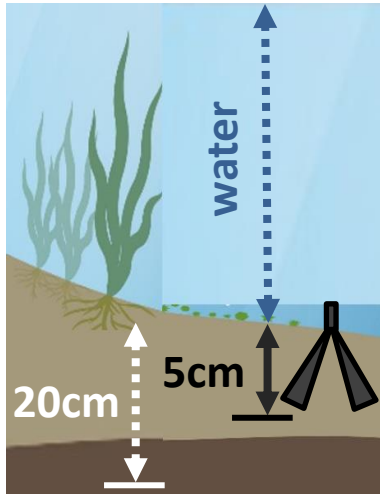
2 PROBES – SEDIMENT

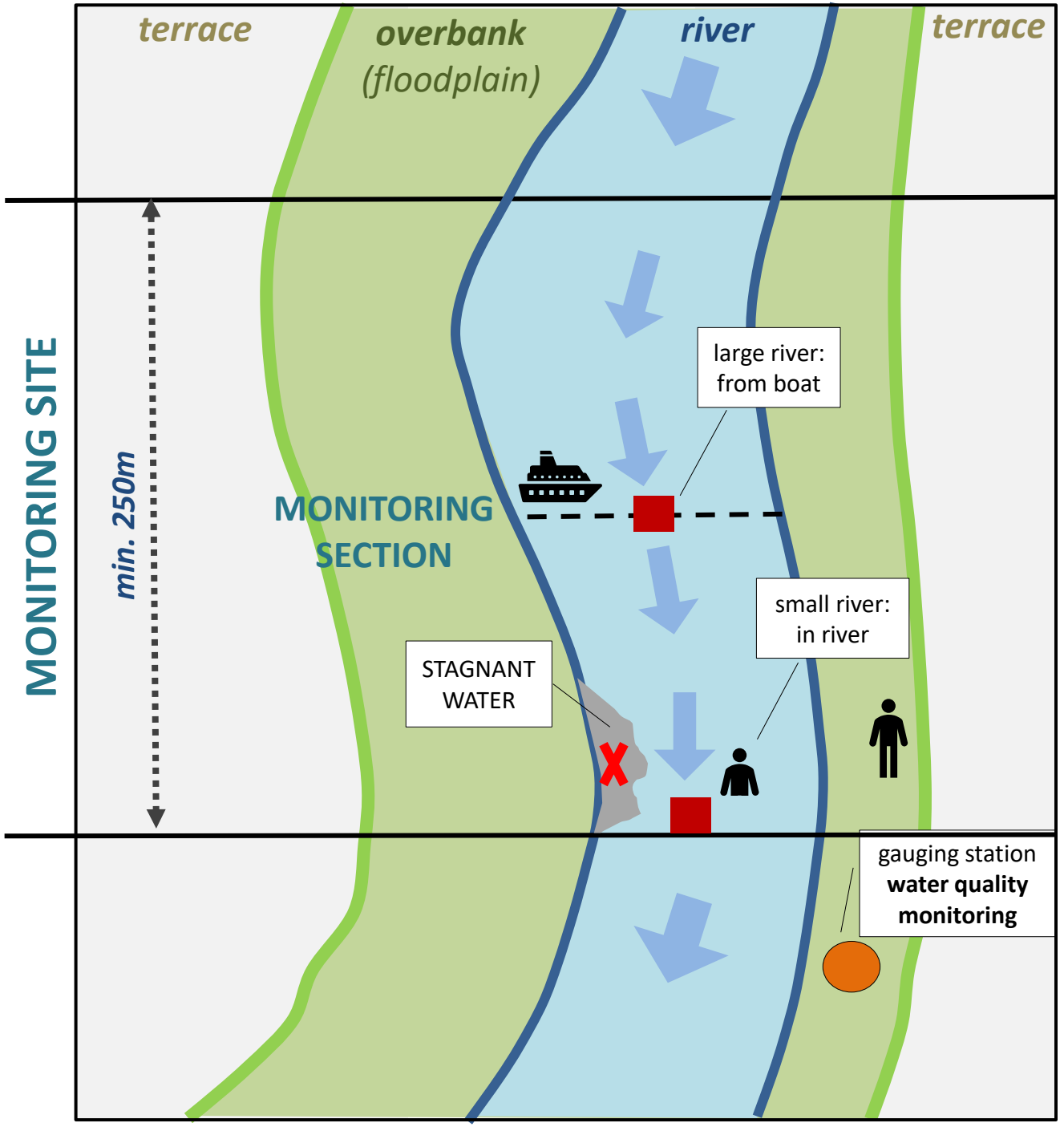
HORIZONTAL DESIGN

1. **ONE SAMPLING POINT** ■
   - *Composite sample: flowing river water is natural composite*
2. **SAMPLING POINT LOCACTION:**
   - *Small river: at downstream end of monitoring site*
   - *Large river: at centre of monitoring section*
2. **SAMPLING POINT IN MAIN STREAM LINE** *(active river flow)*
3. **AVOID STAGNANT (NON-ACTIVE) WATER**

VERTICAL DESIGN

1. **TOP 5-10-20CM**
2. **AVOID PLANTS & PLANT REMNANTS**
3. **SAMPLED SEDIMENT IN CONTACT WITH (UNDER) RIVER WATER**



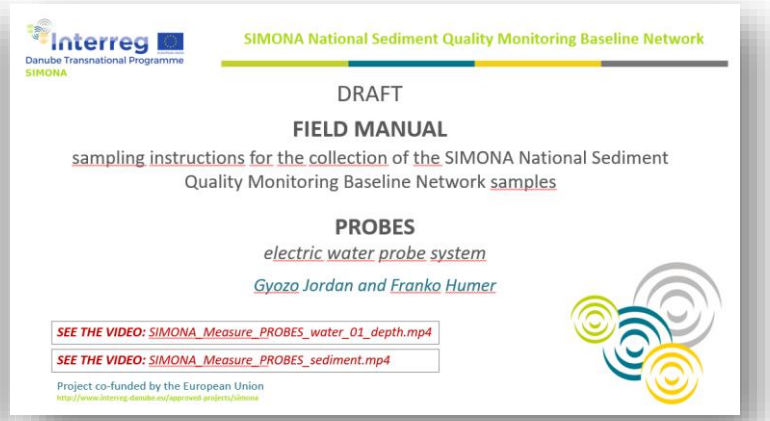


2 PROBES – SEDIMENT

SAMPLING METHOD

1. **GRAB SYSTEM**

- *Grab upper 5-10-20cm bottom sediment*
- *Insert probes (T, EC, pH, DO, Redox) into top 5 cm of sediment in the grab sampler and take measurements*



VIDEO: *SIMONA_Measure_PROBES_sediment.mp4*

DRAFT

FIELD MANUAL

sampling instructions for the collection of the SIMONA National Sediment Quality Monitoring Baseline Network samples

BASIC EQUIPMENT

Gyozo Jordan and Franko Humer

Project co-funded by the European Union
http://www.interreg-danube.eu/approved-projects/simona

BASIC EQUIPMENT – for all sediment sampling

CHECKLIST:

MEASUREMENTS

- **LOCATION MEASURE** *(GPS device)*
  - *min. horizontal accuracy ≤ ±5m*
  - *WGS84 projection system*
- **DISTANCE MEASURE** *(laser distance measure & light reflecting target)*
- **WATER DEPTH MEASURE** *(scaled expandable scale)*
- **COMPASS**

ALTERNATIVES:

- **FOR GPS DEVICE:** *mobile phone if it meets the 2 criteria (min. accuracy ≤ ±5m; WGS84 projection system)*
- **FOR DISTANCE MEASURE:** *tape measure (see picture)*
- **WATER DEPTH MEASURE:** *scaled stick (see picture)*

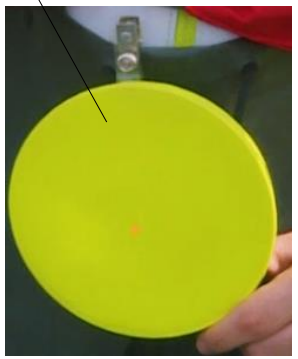
compass

GPS device

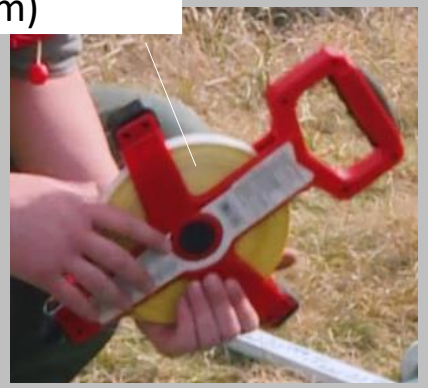
water depth measure

laser distance measure

laser light reflecting target



tape measure (50m)



water depth measure scaled stick

BASIC EQUIPMENT – for all sediment sampling

CHECKLIST:

DOCUMENTATION

Notes:

- **FIELD SHEET (min. 2x)** *(standard SIMONA field sheet)*
- **WATER PROOF FOLDER**
- **PENS (2x) & PENCILS (2x)**

Photo:

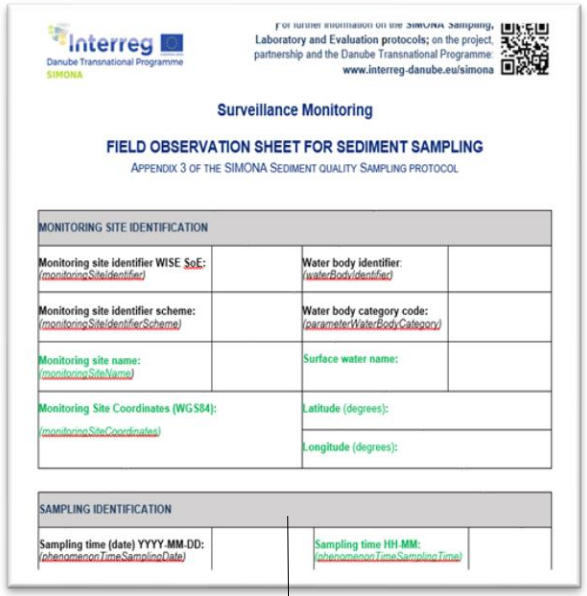
- **DIGITAL CAMERA (2x)** *(min. 600 dpi resolution)*
- **CAMERA BATTERIES & CHARGERS** *(network & car)*

Sample labelling:

- **WATER PROOF STICKERS (min. 20)**
- **PERMANENT PENS: BLACK, WHITE (2x)**

ALTERNATIVES:

- **FOR DIGITAL CAMERA:** *mobile phone (2x) (min. 600 dpi resolution)*



Interreg Danube Transnational Programme SIMONA

Laboratory and Evaluation protocols; on the project, partnership and the Danube Transnational Programme: www.interreg-danube.eu/simona

Surveillance Monitoring

FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING SITE IDENTIFICATION			
Monitoring site identifier WISE SoE: (monitoringSiteIdentifier)		Water body identifier: (waterBodyIdentifier)	
Monitoring site identifier scheme: (monitoringSiteIdentifierScheme)		Water body category code: (parameterWaterBodyCategory)	
Monitoring site name: (monitoringSiteName)		Surface water name:	
Monitoring Site Coordinates (WGS84): (monitoringSiteCoordinates)		Latitude (degrees):	
		Longitude (degrees):	

SAMPLING IDENTIFICATION			
Sampling time (date) YYYY-MM-DD: (phenomenonTimeSamplingDate)		Sampling time HH:MM: (phenomenonTimeSamplingTime)	

standard SIMONA field sheet

water proof folder

digital campera

stickers

permanent pens: black,white

CHECKLIST:

ACCESSORIES

Holders:

- **TOOL BOX – SAMPLING TOOLS**
- **BUCKET**
- **BASKET** *(eqipment, samples, cores)*
- **HOLDER** *(electric probes)*

plastic basket

tool box for sampling tools

plastic bucket (10L)

plastic holder for probes

basket for cores

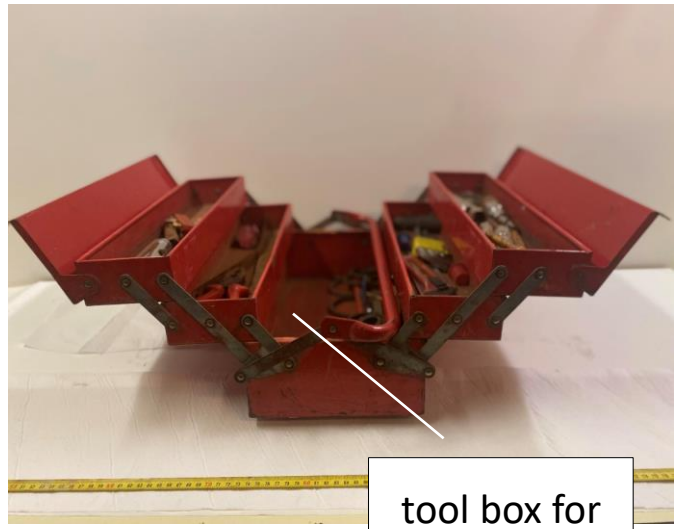
checklist for contents

CHECKLIST:

ACCESSORIES

Holders:

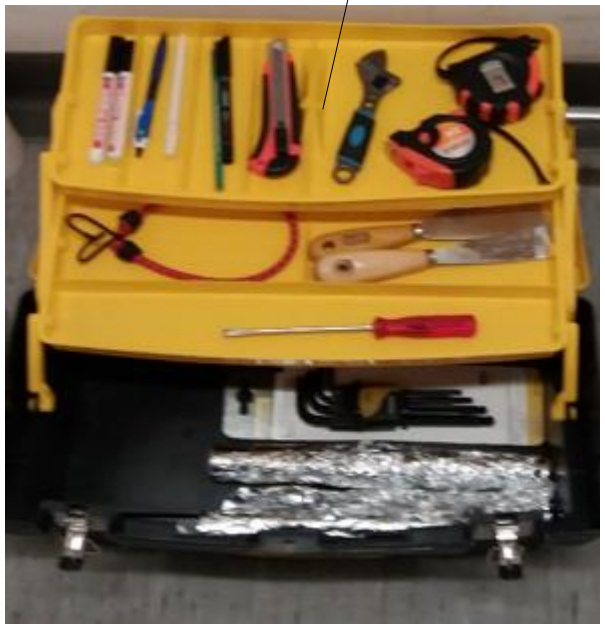
- **TOOL BOX – HEAVY TOOLS**
- **CANVAS**
- **BOX – PROBES**



tool box for heavy tools

plastic canvas

box for the probes



CHECKLIST:

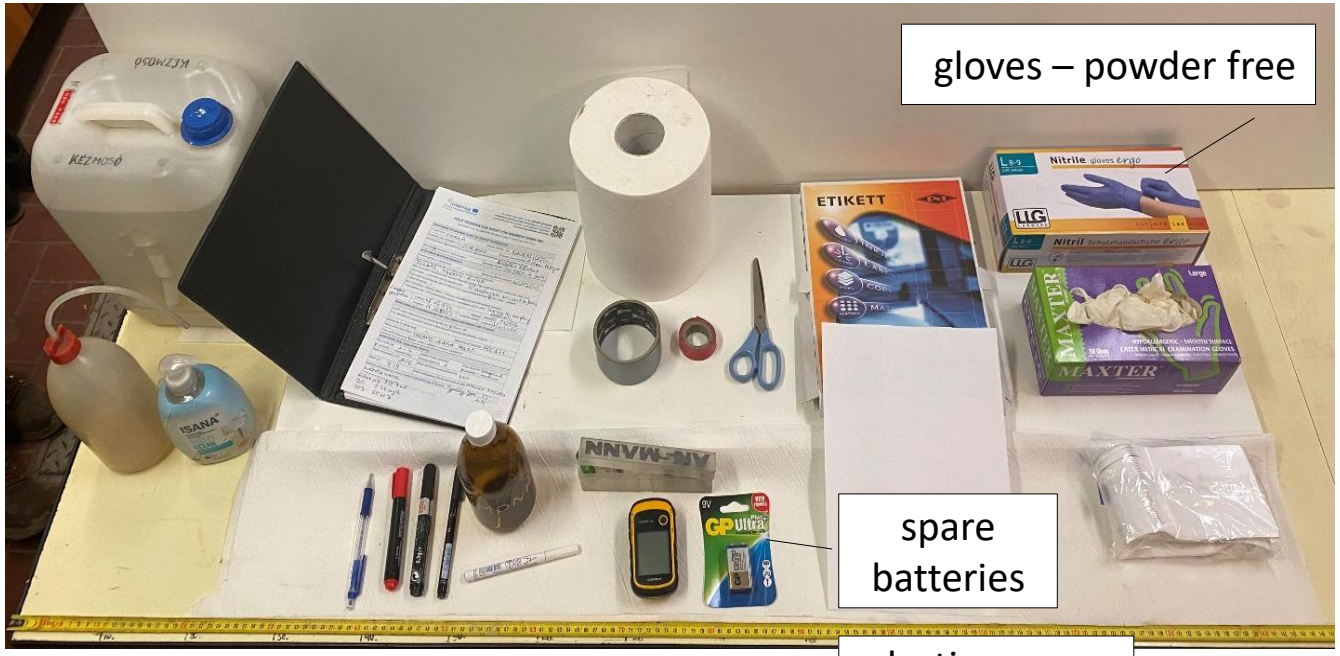
ACCESSORIES

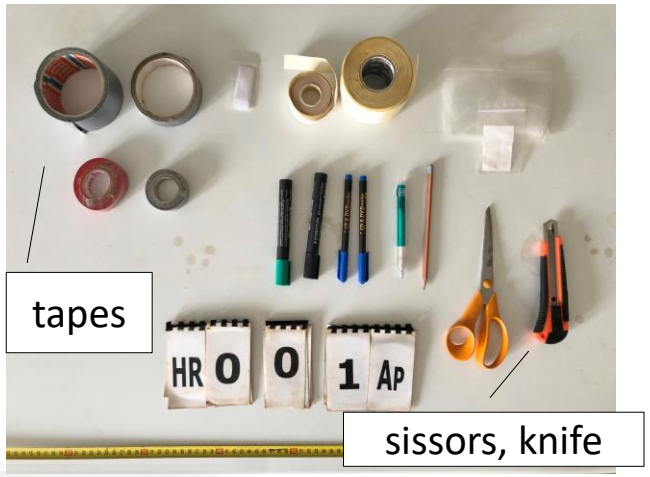
Cleaning tools:

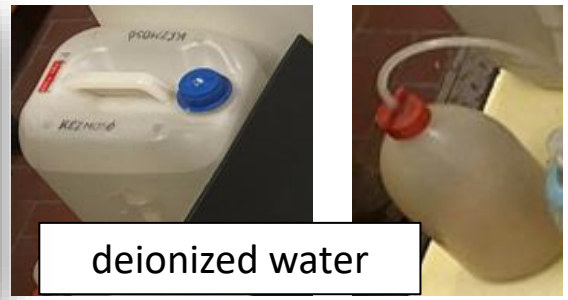
- **BRUSH, PAINTBRUSH, TOWEL/RUG**
- **PAPER TOWEL**
- **KNIFE, SISSORS**
- **CLEAN WATER:** *min. 2 spay bottles (see picture) & min. 10L clean (drinking) water*

CONSUMABLES

- **GLASS JARS** *(for samples)*
- **PLASTIC BAGS** *(for samples; Rilsan bag)*
- **CABLE TIES** *(locking sample bags)*
- **DISPOSABLE PLASTIC SPOONS**
- **GLOVES** *(powder free)*
- **TAPES**
- **SPARE BATTERIES**







BASIC EQUIPMENT – for all sediment sampling

CHECKLIST:

EXAMPLES FOR SAMPLING FIELD KITS

BASIC EQUIPMENT – for all sediment sampling

CHECKLIST:

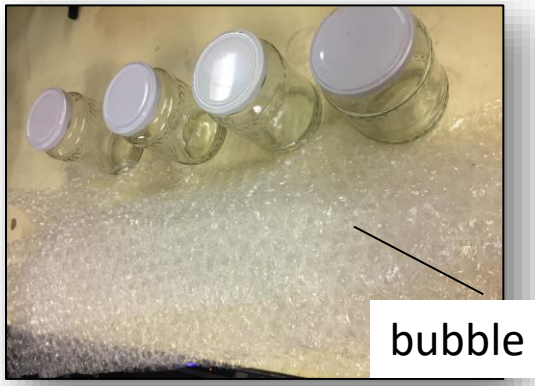
SAMPLE TRANSPORT & STORAGE

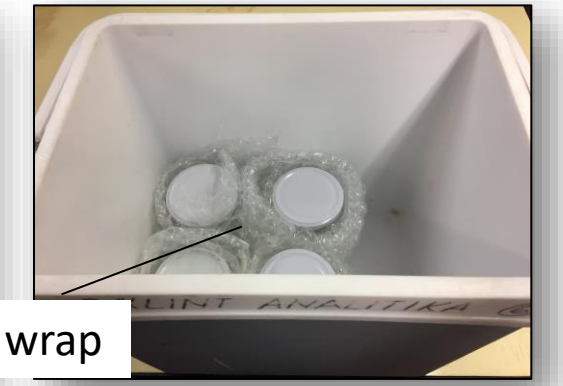
Transport:

- **BASKET FOR SAMPLES** *(glass jars, plastic bags)*
- **BASKET FOR CORES**
- **BUCKET**
- **BUBBLE WRAP**

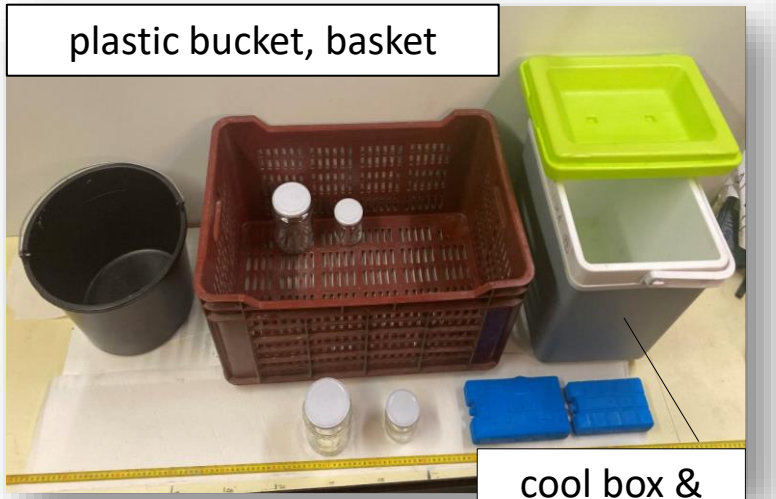
Storage:

- **COOL BOX & ICE BATTERIES**
- **ELECTRIC COOL BOX**





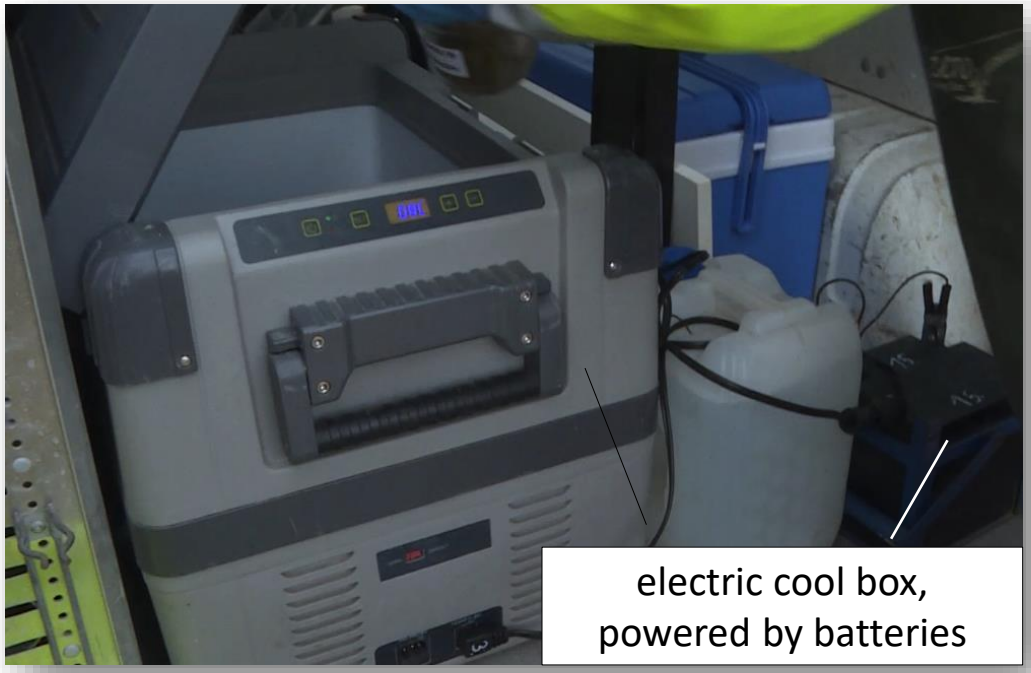
bubble wrap



plastic bucket, basket

cool box & ice batteries

basket for cores



electric cool box, powered by batteries

DRAFT

FIELD MANUAL

sampling instructions for the collection of the SIMONA National Sediment Quality Monitoring Baseline Network samples

BOTTOM SEDIMENT

scoop system

Gyozo Jordan and Franko Humer

SEE THE VIDEO: *SIMONA_BottomSediment_SCOOP.mp4*

Project co-funded by the European Union
http://www.interreg-danube.eu/approved-projects/simona

FLOODPLAIN SEDIMENT

scoop system

EQUIPMENT – SAMPLING

CHECKLIST:

- **SCOOP** *(stainless steel, aluminium, pure iron)*
- **SAMPLE CONTAINER** *(min. 0.7L glass jar)*


scoop


scoop


scoop


glass jars

EQUIPMENT – TOOLS

CHECKLIST:

- **LOCATION MEASURE: GPS**
- **DISTANCE MEASURE** *(laser & light reflecting target OR tape measure)*
- **SEDIMENT DEPTH MEASURE** *(folded rule; metric)*
- **DIGITAL CAMERA**

- **FIELD SHEET IN WATER PROOF FOLDER**
- **PEN, MARKER PEN**
- **DIGITAL CAMERA** *(batteries)*
- **STICK-ON LABEL**
- **PERMANENT PEN: BLACK**

- **2 TRAINED PERSONNEL**

CONTROL QUESTIONS:

- **DO THE DEVICES OPERATE?** *(GPS, laser, camera, batteries)*
- **ARE THE BATTERIES CHARGED?**

- **ARE THE TOOLS & EQUIPMENT IN GOOD CONDITION?** *(demaged or broken tools, etc.)*
- **ARE THE TOOLS & EQUIPMENT CLEAN?** *(sample container, scoop)*
- **ARE THE BATTERIES CHARGED?**

- **IS IT SAFE TO COLLECT SAMPLE?** *(safety gear, health & readiness, weather, site conditions)*

DO NOT START SAMPLING UNLESS ALL ANSWERS ARE 'YES'.

PHASE 1: PREPARE FOR SAMPLING

1. **SET UP SAMPLING STATION AT SAMPLING POINT:**

   - *lay canvas on ground, place equipment on it*

DOCUMENTATION

2. **TAKE THE GPS COORDINATES OF SAMPLING POINT** *(WGS84)*
3. **COMPLETE FIELD SHEET:**

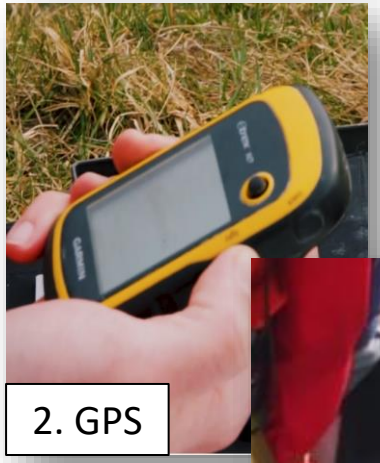
   - *site ID, sampling point GPS coordinates, sample ID, date, etc.*

4. **PUT SAMPLE ID & DATE ON CONTAINER:**

   - *1. stick-on label and 2. sample container (glass jar)*
   - *stick label on container (glass jar)*

5. **TAKE PHOTO-1 ON SAMPLE ID** *(sample container or field sheet)*

1. SAMPLING STATION



2. GPS

3. FIELD SHEET

4. SMAPLE LABELING

5. PHOTO-1 LABEL

PHASE 1: PREPARE FOR SAMPLING

DOCUMENTATION

6-10. TAKE PHOTOS:

- ***PHOTO-2****: sampling point (sample collection conditions)*
- ***PHOTO-3,4,5,6****: landscape photos upstream, downstream, right bank, left bank.*

6. PHOTOS -2

7. PHOTO-3 UPSTREAM

8. PHOTO-4 DOWNSTREAM

9. PHOTO-5 RIGHT BANK

10. PHOTO-6 LEFT BANK

PHASE 2: GETTING READY FOR SAMPLING

1. **SAMPLERS: PUT ON GLOVES** *(powder free)*
2. **SAMPLER 1**: Equilibrate (’rinse’) sampling scoop with the sediment 3 times.

TYPICAL MISTAKES:
1. Sampling system (scoop) is not thoroughly equilibrated with the bottom sediment.

PHASE 3: SAMPLE COLLECTION

1. **SAMPLER 1:** Signal 'SAMPLING STARTS!'
2. **SAMPLER 1**: Take bottom sediment sample (target for top ≤5cm) with scoop from active bottom sediment.
3. **SAMPLER 1**: Put sample into sample container (glass jar).

➢ **REPEAT STEPS 2-3 AS NEEDED** *(to fill the sample container).*

6. **SAMPLER 1**: Signal 'SAMPLING COMPLETED!'

ALTERNATIVES:

➢ **SAMPLER 2:** Hold the sample container (glass jar) during SAMPLER 1 sample collection. Keep the container closed during sampling.

TYPICAL MISTAKES:

1. Sample is not taken from sediment which is in contact with the flowing river water (active sediment).

2. Sample is taken where sediment originates from local source (e.g. eroding soil from the river bank) and does not represent river basin (catchment).

3. Water above the sediment sample in the scoop is decanted (poured off) from the scoop and thus losing the fine fraction.

PHASE 4: CLOSING SAMPLING

1. **PUT THE SAMPLE INTO COOL BOX (2-8 C°)**
2. **CLEAN THE EQUIPMENT (SCOOP)**
3. **PUT EQUIPMENT & TOOLS INTO BOX**
4. **PUT COOL BOX, EQUIPMENT & TOOLS INTO TRANSPORT WEHICLE**

DOCUMENTATION

1. **COMPLETE & CHECK FIELD SHEET DOCUMENTATION**
2. **CHECK PHOTO DOCUMENTATION**

TYPICAL MISTAKES:

1. Equipment, tools are not cleaned properly.

2. Field documentation is incomplete, not checked and corrected.

3.Glass containers break during transport due to insufficient securing.

1. SAMPLE INTO COOL BOX

3. TOOLS INTO BOX

EXAMPLES FOR BOTTOM SEDIMENT COLLECTION

SCOOP SYSTEM

Figure 10.6: Collecting the bottom sediment with the scoop

Figure 10.7 – Loading jar with the top layer of the bottom sediment collected with the scoop

Loading jar with top layer of bottom sediment from the scoop

Figure 8.5: Collecting the top layer of the bottom sediment with the scoop

DRAFT

FIELD MANUAL

sampling instructions for the collection of the SIMONA National Sediment Quality Monitoring Baseline Network samples

BOTTOM SEDIMENT

Vacuum corer system

Gyozo Jordan and Franko Humer

SEE THE VIDEO: *SIMONA_BottomSediment_VACUUM_depth.mp4*

Project co-funded by the European Union
http://www.interreg-danube.eu/approved-projects/simona

BOTTOM SEDIMENT

vacuum corer system

EQUIPMENT – SAMPLING

CHECKLIST:

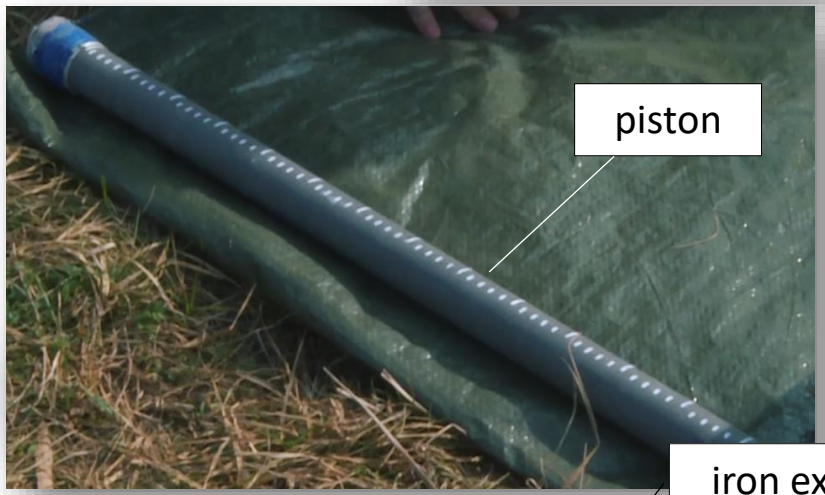
- **VACUUM VALVE UNIT**
- **PLEXIGLASS TUBE** *(2 min. 50cm; disposable)*
- **CAPS FOR PLEXIGLASS TUBE**
- **IRON STICKS** *(extensions for vacuum corer)*
- **PISTON** *(for pushing out sample from plexiglass tube)*
- **PISTON HOLDING UNIT**
- **ROPE** *(for closing valve under water)*
- **SMALL SMARKED PLEXIGLASS TUBE** *(15cm; disposable)*
- **SAMPLE CONTAINER** *(min. 0.7L glass jar)*


vacuum valve unit


rope


plexiglass tube

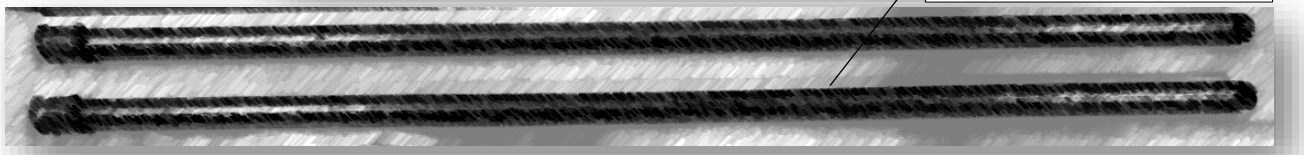

cap


piston


piston holding unit


glass jar


spackling knife


iron extensions

plexiglass tube extension

EQUIPMENT – TOOLS

CHECKLIST:

- **LOCATION MEASURE: GPS**
- **DISTANCE MEASURE** *(laser & light reflecting target OR tape measure)*
- **WATER DEPTH MEASURE** *(scaled expandable stick)*
- **DIGITAL CAMERA**

- **FIELD SHEET IN WATER PROOF FOLDER**
- **PEN, MARKER PEN**
- **DIGITAL CAMERA** *(batteries)*
- **STICK-ON LABEL**
- **PERMANENT PEN: BLACK**

- **GLOVES** *(disposable, powder free)*

- **2 TRAINED PERSONNEL**

CONTROL QUESTIONS:

- **DO THE DEVICES OPERATE?** *(GPS, laser, camera, pump)*
- **ARE THE BATTERIES CHARGED?**

- **ARE THE TOOLS & EQUIPMENT IN GOOD CONDITION?** *(demaged or broken tools, etc.)*
- **ARE THE TOOLS & EQUIPMENT CLEAN?** *(sample container, pump, pipe, beaker)*
- **ARE THE BATTERIES CHARGED?**

- **IS IT SAFE TO COLLECT SAMPLE?** *(safety gear, health & readiness, weather, site conditions)*

DO NOT START SAMPLING UNLESS ALL ANSWERS ARE 'YES'.

PHASE 1: PREPARE FOR SAMPLING 1/3

1. SET UP THE SAMPLING STATION AT SAMPLING POINT:

- lay canvas on ground, place equipment on it

DOCUMENTATION

2. TAKE THE GPS COORDINATES OF SAMPLING POINT *(WGS84)*

3. COMPLETE FIELD SHEET:

- site ID, sampling point GPS coordinates, sample ID, date, etc.

4. PUT SAMPLE ID & DATE ON CONTAINER:

- 1. stick-on label and 2. sample container (glass jar)

- stick label on container (glass jar)

5. TAKE PHOTO-1 ON SAMPLE ID *(sample container or field sheet)*

1. SAMPLING STATION

2. GPS

3. FIELD SHEET

5. PHOTO-1 LABEL

4. SAMPLE LABELLING

PHASE 1: PREPARE FOR SAMPLING 2/3

6. SET UP THE SAMPLING EQUIPMENT:

- *join plexiglass tube to vacuum valve unit*
- *fix extention to sampling unit*
- *open valve*

TYPICAL MISTAKES:
Tube is not fixed air-tight to the vacuum valve unit, so vacuum cannot develop in tube during sampling.

PHASE 1: PREPARE FOR SAMPLING 3/3

DOCUMENTATION

1. **MEASURE DISTANCE BETWEEN RIVER BANK & SAMPLING POINT**

   - *with laser & light reflecting target OR tape measure; ± 5 cm accuracy*

2. **MEASURE WATER DEPTH**

   - *scaled stick; ± 5 cm accuracy*

3. **WRITE MEASUREMENT RESULTS IN FIELD SHEET**

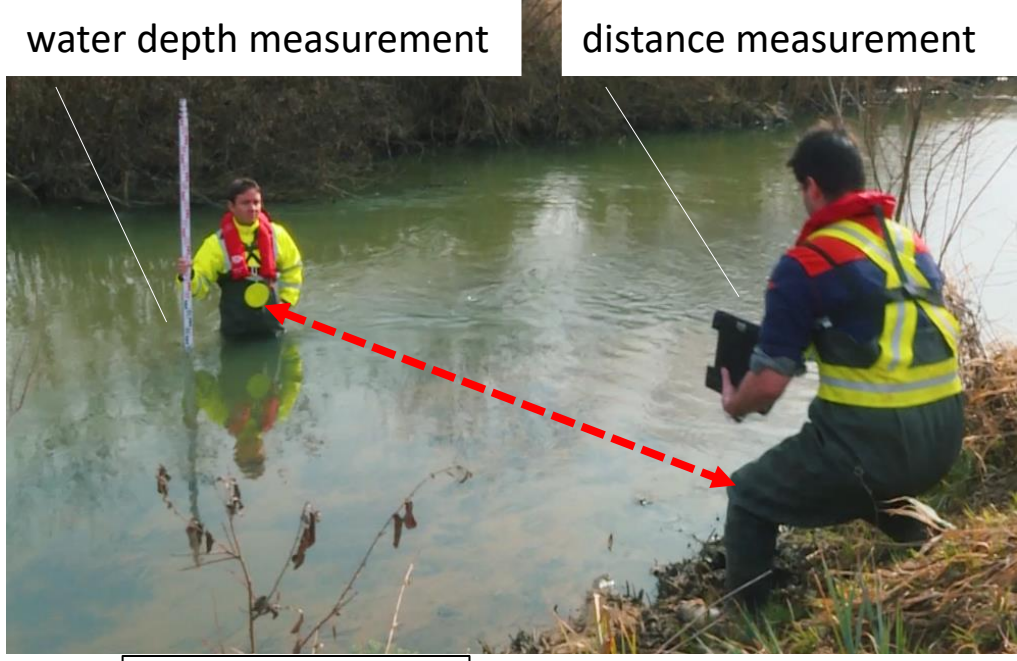
light reflecting target

laser distance measure

1. DISTANCE MEASUREMENT

water depth measurement

distance measurement



tape distance measure

1. DISTANCE MEASUREMENT

2. WATER DEPTH MEASUREMENT

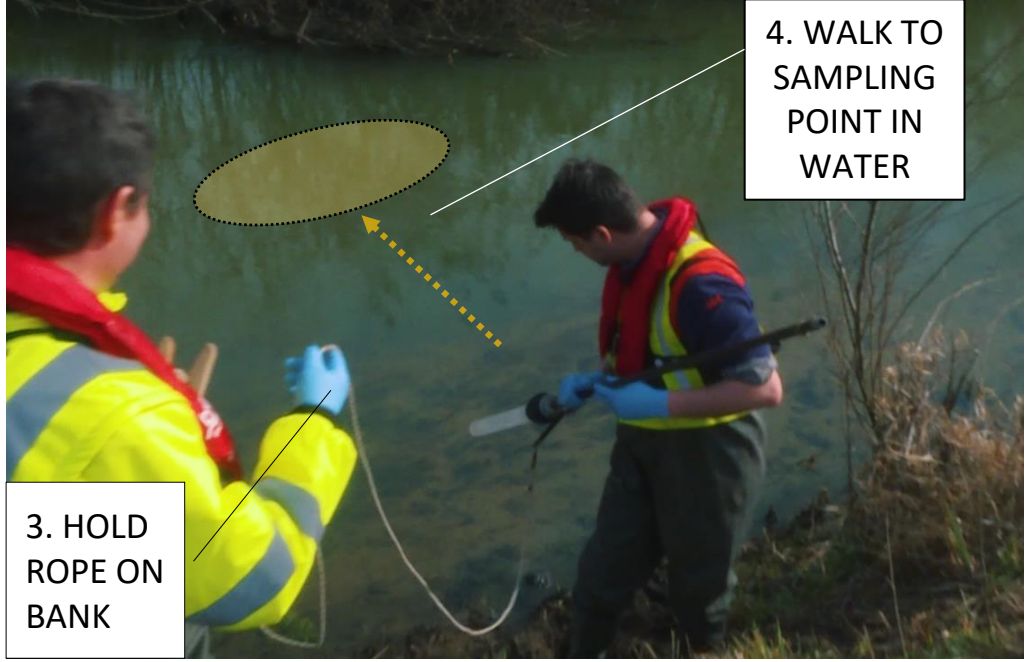
3. FIELD SHEET

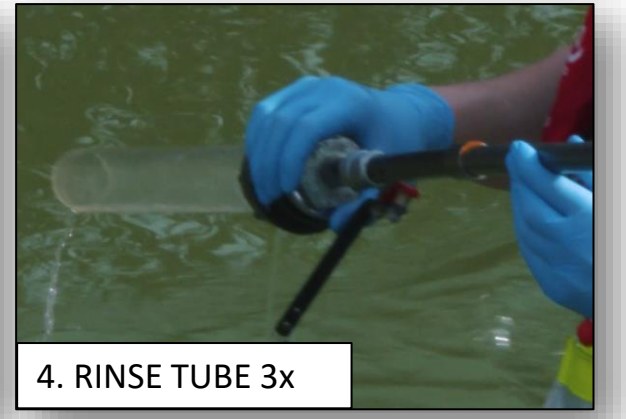
PHASE 2: GETTING READY FOR SAMPLING

1. **SAMPLERS: PUT ON GLOVES** *(powder free)*
2. **SAMPLER 1**: **WALK INTO THE WATER** to the **sampling point** (active flowing streamline) with the vacuum corer.
3. **SAMPLER 2**: Hold the rope fixed to the ball valve from the river bank.
4. **SAMPLER 1**: Equilibrate the sampling equipment (plexiglass tube) with the stream water by rinsing 3 times.

TYPICAL MISTAKES:

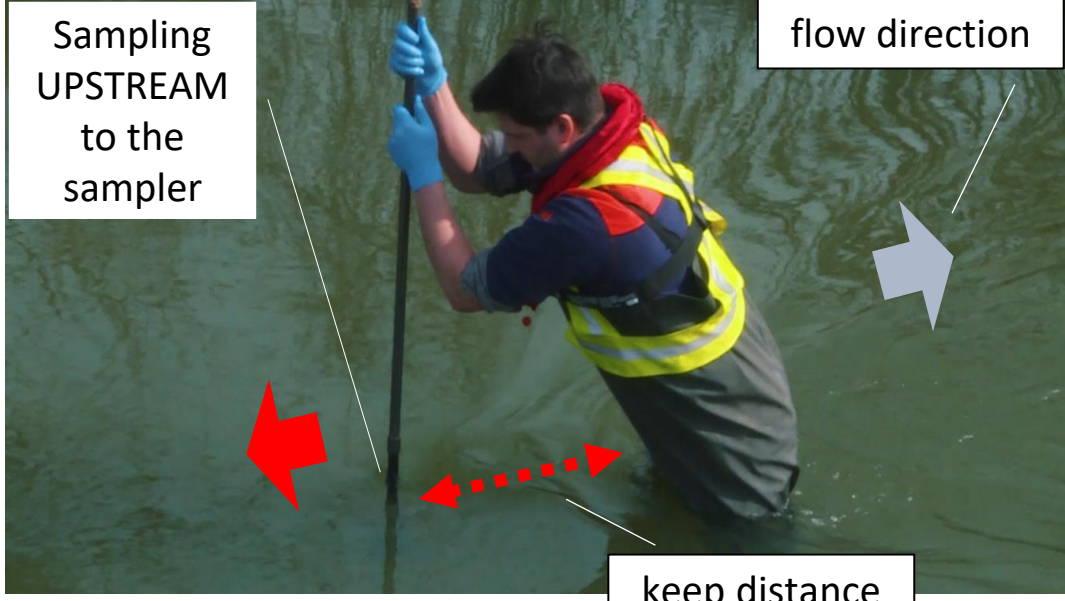
1. Sampler in water disturbs up bottom sediment while approaching the sampling point.
2. Sampling system is not thoroughly equilibrated with the stream water by **rinsing**.
3. Valve is closed.

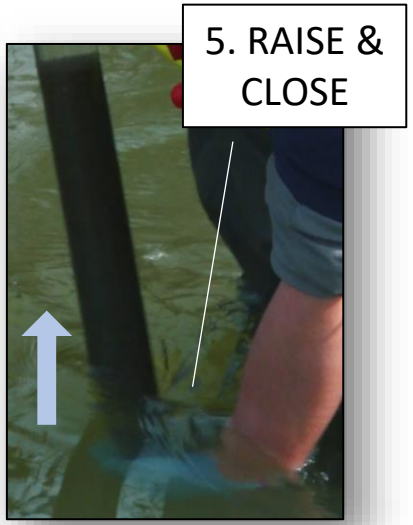




PHASE 3: SAMPLE COLLECTION 1/5

1. **SAMPLER 1**: Signal 'SAMPLING STARTS!'
2. **SAMPLER 1**: Sink the corer gently under water (valve open) until hitting the bottom sediment mildly *(not to disturbe uppermost layer)*
3. **SAMPLER 1**: Push the corer into sediment
4. **SAMPLER 1**: Close the valve *(develop vacuum)*
5. **SAMPLER 1:** Raise corer with sample in the tube above water and close the bottom of the tube with your hand before the corer is taken out of the water.





TYPICAL MISTAKES:

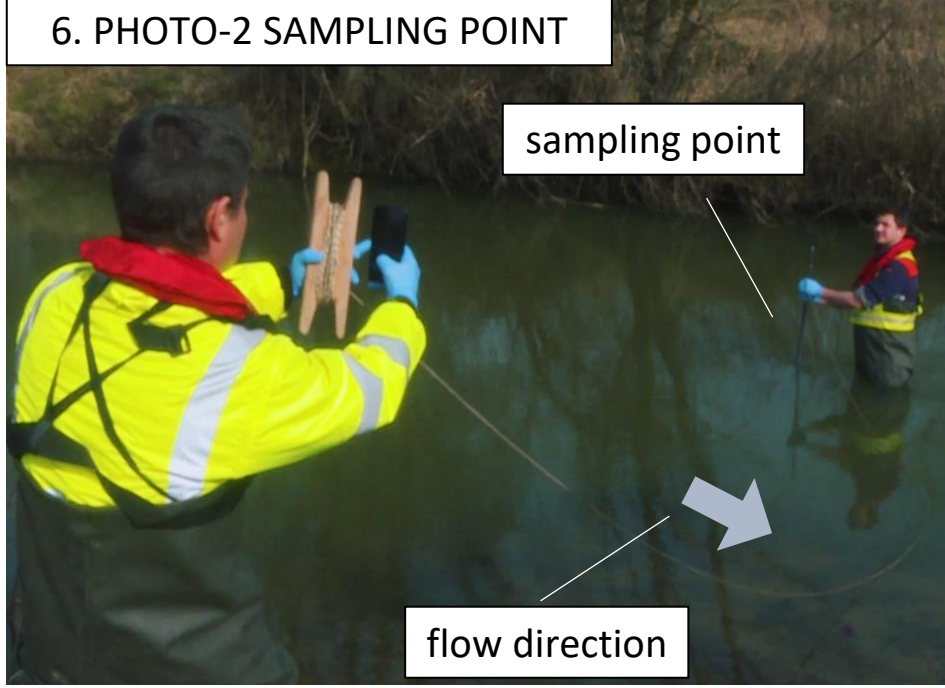
1. Sampler in water disturbes up bottom sediment during sampling.
2. Vacuum is not tight, so sediment is lost from tube under water while rising the corer.

PHASE 3: SAMPLE COLLECTION 2/5

6-10. SAMPLER 2: Take **photos**:

- **PHOTO-2**: sampling point *(sample collection conditions)*
- **PHOTO-3,4,5,6**: landscape photos upsteam, downstream, right bank, left bank.

6. PHOTO-2 SAMPLING POINT



7. PHOTO-3 UPSTREAM

8. PHOTO-4 DOWNSTREAM

9. PHOTO-5 RIGHT BANK

10. PHOTO-6 LEFT BANK

PHASE 3: SAMPLE COLLECTION 3/5

11. SAMPLER 1: Walk out from water, bringing core sample to the sampling station on the river bank.

12. OPEN VALVE (release vacuum), RELEASE COLLAR

13. REMOVE VALVE UNIT FROM PLEXIGLASS TUBE, KEEP TUBE UPRIGHT

11. BRING CORE SAMPLE TO GROUND

12. OPEN VALVE

13. SEPARATE VALVE UNIT FROM TUBE

TYPICAL MISTAKES:

1. SAMPLER 1 does not hold pleaxiglass tube firm enough, so core drops to the ground and sample is lost.
2. SAMPLER 1 does not close the bottom of the tube firm enough, so sample is sliding out and lost downwords.

PHASE 3: SAMPLE COLLECTION 4/5

14. INSERT PUSH-OUT PISTON INTO PISTON HOLDING UNT

15. INSERT PUSH-OUT FROM THE BOTTOM OF PLEXIGLASS TUBE

16. PUSH TUBE DOWNWARDS *(piston pushes the sample upwards)* **UNTIL ALL WATER ABOVE THE SEDIMENT TOP IS LOST FROM TUBE**

15. PISTON INTO TUBE

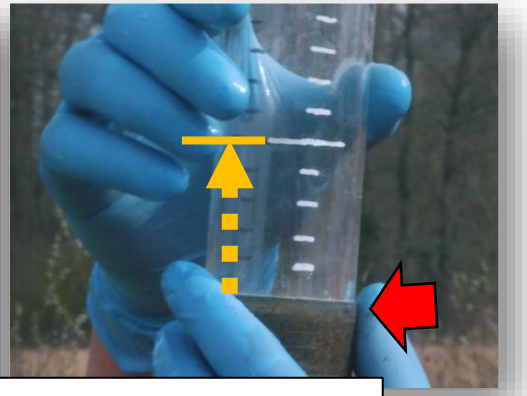
14. INSERT PISTON INTO PISTON HOLDING UNIT

16. PUSH TUBE DOWN, LOSE WATER FROM TUBE

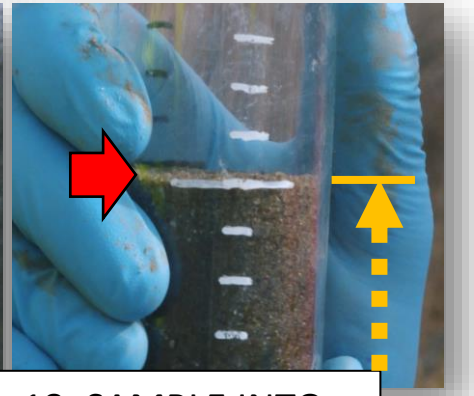
TYPICAL MISTAKES:
Tube is pushed too fast, so top of sediment core sample is pushed out and lost.

PHASE 3: SAMPLE COLLECTION 5/5

17. **FIT SMALL PLEXIGLASS EXTENSION TUBE** *(cm markers)* **TIGHT TO THE UPPER OPENING OF THE SAMPLE TUBE**
18. **PUSH CORE SAMPLE UPWARD INTO SMALL TUBE UNTIL MARKER** *(uppermost 5cm)* *(use hammer if needed; put protecting cap on small tube)*
19. **MOVE SAMPLE FROM SMALL TUBE INTO SAMPLE CONTAINER** *(glass jar)*
20. **CLOSE SAMPLE CONTAINER**
21. **SAMPLER 1:** Signal 'SAMPLING COMPLETED!'

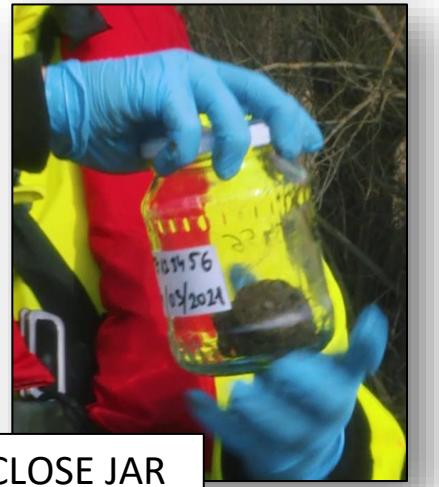


17. FIT SMALL TUBE



18. SAMPLE INTO SMALL TUBE

19. MOVE SAMPLE INTO JAR

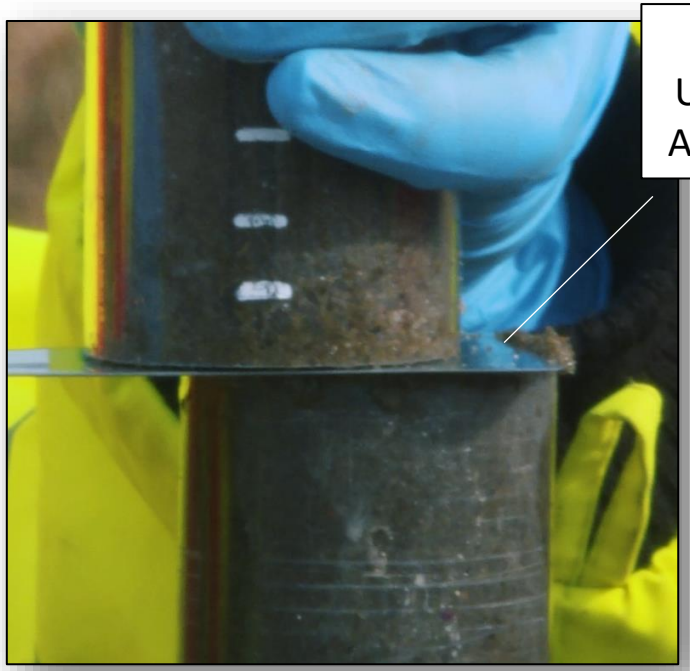


20. CLOSE JAR

PHASE 3: SAMPLE COLLECTION 5/5

ALTERNATIVE:

19. USE SPACKLING KNIFE TO MOVE SAMPLE IN SMALL TUBE INTO SAMPLE CONTAINER *(glass jar) (in case of loose, moddy sediment to avoid loss of sample*



14. SAMPLE INTO JAR USING SPACKLING KNIFE AT SMALL TUBE BOTTOM

PHASE 4: CLOSING SAMPLING

1. **PUT THE SAMPLE INTO COOL BOX (2-8 C°)**
2. **DISPOSE DISPOSABLE SAMPLING UNIT:**
   - Dispose disposable plexiglass core tube
   - Dispose small extension plexiglass tube
3. **PUT EQUIPMENT & TOOLS INTO BOX**
4. **PUT COOL BOX, EQUIPMENT & TOOLS INTO TRANSPORT VEHICLE**
5. **SECURE THE GLASS CONTAINERS AGAINST BREAKING DURING TRANSPORT.**

DOCUMENTATION

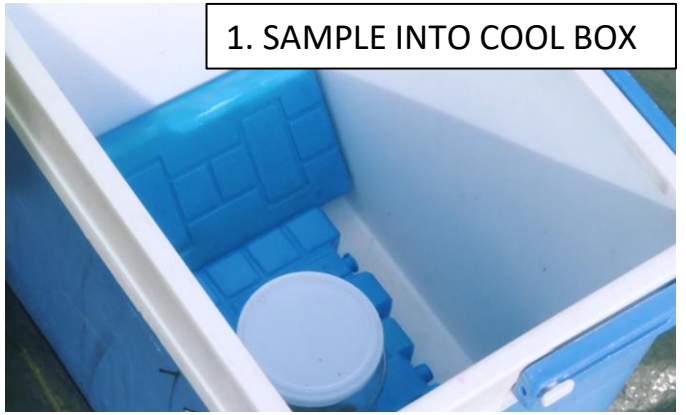
6. **COMPLETE & CHECK FIELD SHEET DOCUMENTATION**
7. **CHECK PHOTO DOCUMENTATION**

TYPICAL MISTAKES:

1. Field documentation is incomplete, not checked and corrected.

2. Glass containers break during transport due to insufficient securing.

1. SAMPLE INTO COOL BOX



4. COOL BOx INTO VEHICLE

EXAMPLES FOR BOTTOM SEDIMENT COLLECTION

VACUUM CORER SYSTEM

Figure 36. Pushing out the top 5 cm of bottom sediment with vacuum core system

Figure 5.3. Loading jar with bottom layer sediment from the vacuum core system

Figure 1.7. Loading a jar with bottom layer of the bottom sediment from the vacuum core system

Figure 2.6. Loading jar with bottom sediment from the vacuum core system

Figure 3.6. Loading jar with bottom sediment from the vacuum core system

DRAFT

FIELD MANUAL

sampling instructions for the collection of the SIMONA National Sediment Quality Monitoring Baseline Network samples

SUSPENDED SEDIMENT

barrel system

Gyozo Jordan and Franko Humer

SEE THE VIDEO: *SIMONA_SuspendedSediment_BARREL.mp4*

Project co-funded by the European Union
http://www.interreg-danube.eu/approved-projects/simona

SUSPENDED SEDIMENT

small river

(sampling in river)

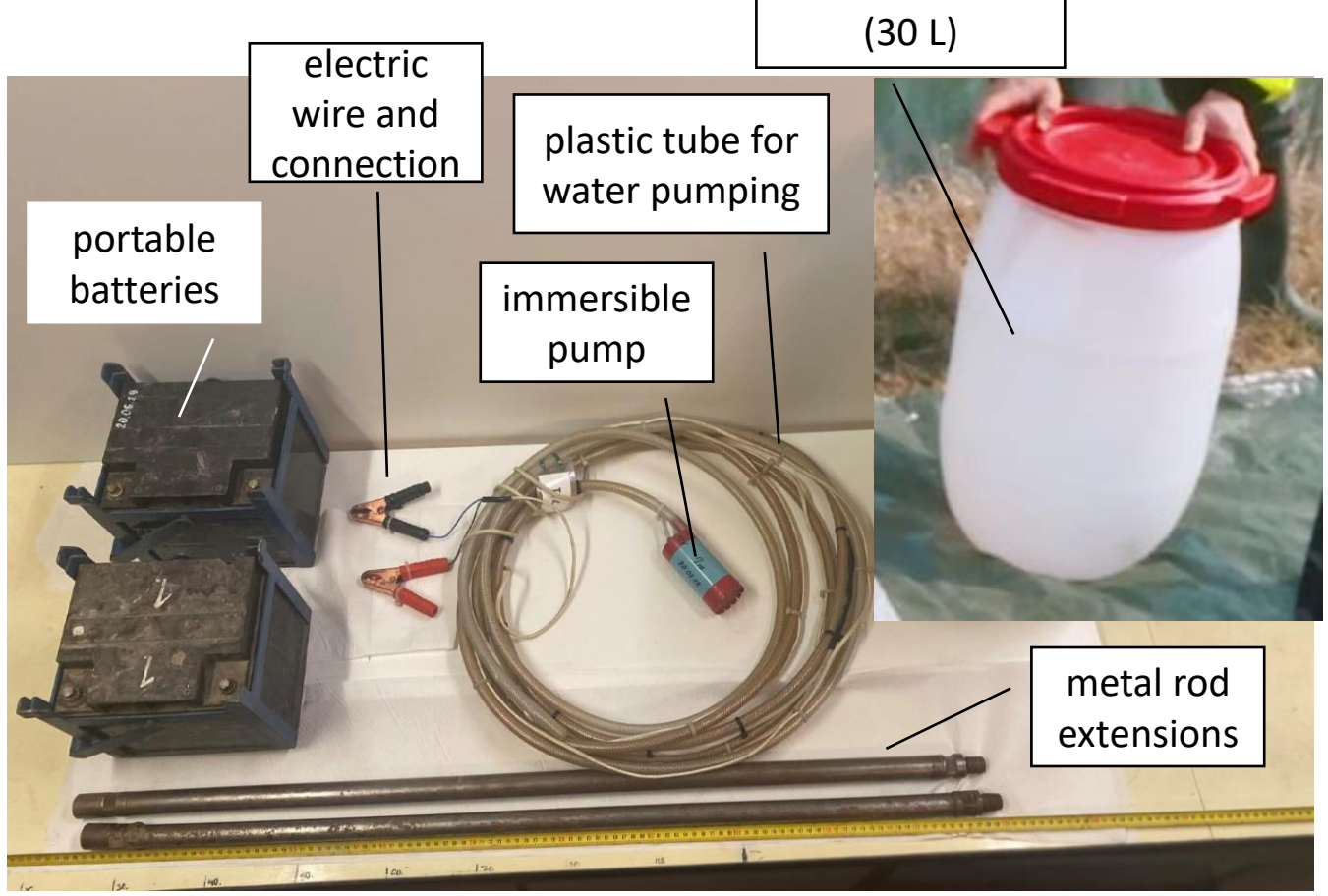
EQUIPMENT – SAMPLING

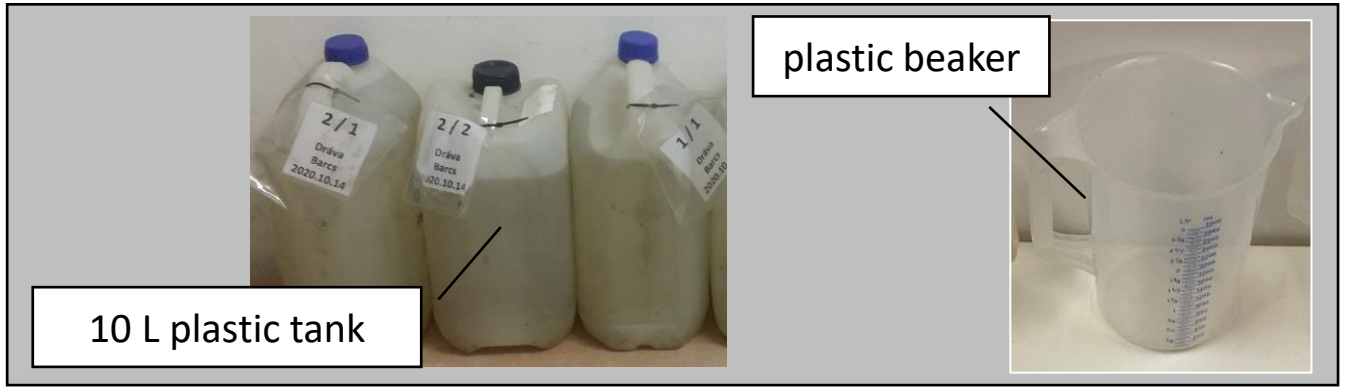
CHECKLIST:

- **IMMERSIBLE WATER PUMP**
- **FLEXIBLE PLASTIC TUBE** *(min. 10m)*
- **ELECTRIC WIRE & CONNECTION** *(between pump & battery)*
- **BATTERIES**
- **METAL STICKS** *(extensions to hold pump under water)*
- **SAMPLE CONTAINER** *(30L commercial plastic tank)*

ALTERNATIVES:

- **FOR SAMPLE CONTAINER:** *10L tank (see picture) or 50L/other sized tank*
- **FOR ELECTRIC PUMP:** *handheld plastic beaker (see picture)*





EQUIPMENT – TOOLS

CHECKLIST:

- **LOCATION MEASURE: GPS**
- **DISTANCE MEASURE** *(laser & light reflecting target OR tape measure)*
- **WATER DEPTH MEASURE** *(scaled expandable stick)*
- **DIGITAL CAMERA**

- **FIELD SHEET IN WATER PROOF FOLDER**
- **PEN, MARKER PEN**
- **DIGITAL CAMERA** *(batteries)*
- **STICK-ON LABEL**
- **PERMANENT PEN: BLACK**

- **GLOVES** *(disposable, powder free)*

- **2 TRAINED PERSONNEL**

CONTROL QUESTIONS:

- **DO THE DEVICES OPERATE?** *(GPS, laser, camera, pump)*
- **ARE THE BATTERIES CHARGED?**

- **ARE THE TOOLS & EQUIPMENT IN GOOD CONDITION?** *(demaged or broken tools, etc.)*
- **ARE THE TOOLS & EQUIPMENT CLEAN?** *(sample container, pump, pipe, beaker)*
- **ARE THE BATTERIES CHARGED?**

- **IS IT SAFE TO COLLECT SAMPLE?** *(safety gear, health & readiness, weather, site conditions)*

DO NOT START SAMPLING UNLESS ALL ANSWERS ARE 'YES'.

PHASE 1: PREPARE FOR SAMPLING 1/2

1. **SET UP THE SAMPLING STATION AT SAMPLING POINT:**

   - lay canvas on ground, place equipment on it

2. **SET UP THE SAMPLING EQUIPMENT:**

   - fix pump-tube-wire & pump to stick, turn on GPS, digital camera, laser measure, water depth measure

DOCUMENTATION

3. **TAKE THE GPS COORDINATES OF SAMPLING POINT** *(WGS84)*

4. **COMPLETE FIELD SHEET:**

   - site ID, sampling point GPS coordinates, sample ID, date, etc.

5. **PUT SAMPLE ID & DATE ON CONTAINER:**

   - 1. stick-on label and 2. sample container (glass jar)

   - stick label on container (glass jar)

6. **TAKE PHOTO-1 ON SAMPLE ID** *(sample container or fieldsheet)*

PHASE 1: PREPARE FOR SAMPLING 2/2

DOCUMENTATION

7. **MEASURE DISTANCE BETWEEN RIVER BANK & SAMPLING POINT**

   - *with laser & light reflecting target OR tape measure; ± 5 cm accuracy*

8. **MEASURE WATER DEPTH**

   - *scaled stick; ± 5 cm accuracy*

9. **WRITE MESUREMENT RESULTS IN FIELD SHEET**

water depth measurement

distance measurement

8. WATER DEPTH MEASUREMENT

9. FIELD SHEET

light reflecting target

laser distance measure

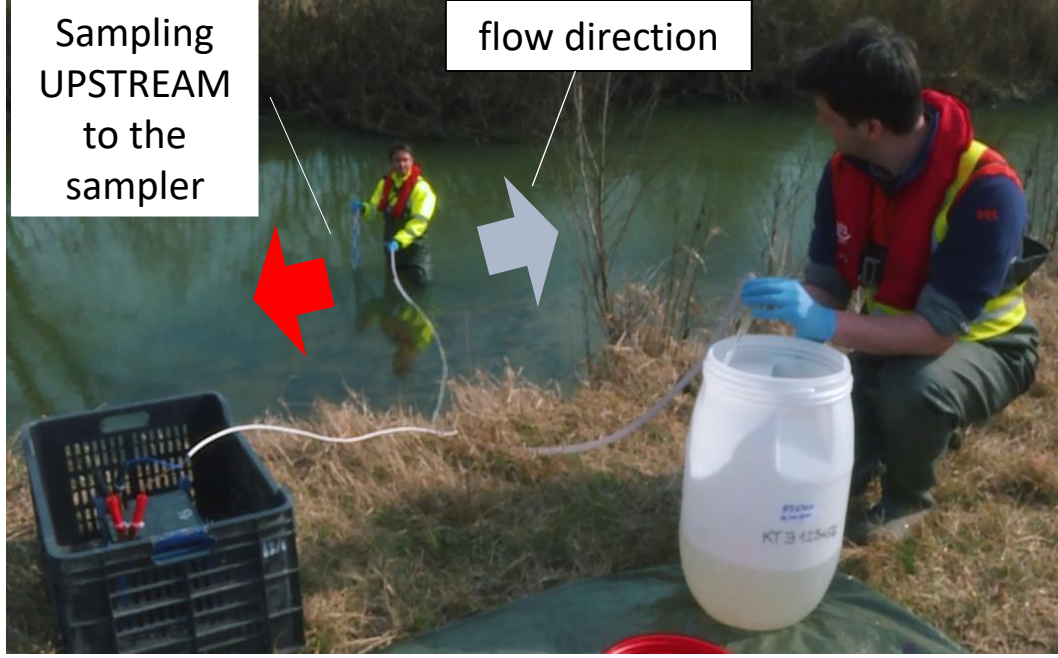
7. DISTANCE MEASUREMENT

tape distance measure

7. DISTANCE MEASUREMENT

PHASE 2: GETTING READY FOR SAMPLING

1. **SAMPLERS: PUT ON GLOVES** *(powder free)*
2. **SAMPLER 1**: Hold the free end of the plastic pipe on the river bank, standing near the sample container (plastic tank) and the baterries.
3. **SAMPLER 2**: **WALK INTO THE WATER** to the **sampling point** (active flowing streamline) with the pump (fixed on the pump-holding stick).
4. **SAMPLER 2**: First, merge the pump with the stick to the upper 1/3 of water depth (adjust pump depth) upstream to the sampler.
5. **SAMPLER 2**: Signal 'READY FOR SAMPLING!'
6. **SAMPLER 1**: Turn on the pump (practically by connecting the wire to the batteries).
7. **SAMPLER 1**: Equilibrate the sampling equipment with the stream water & suspended sediment:
   - Rinse the pump and the plastic pipe by letting the pumped stream water flow on the ground for minimum **10 seconds** (3 times of the pump and pipe volume),
   - Rinse the sample container (plastic tank) with the pumped stream water **3x times**
   - Rinse the cover of the sample container (plastic tank) with the pumped stream water **3x times**.



TYPICAL MISTAKES:

1. Pump is not merged to the correct **depth**.
2. Sampling system is not thoroughly equilibrated with the stream water by **rinsing**.

PHASE 3: SAMPLE COLLECTION 1/2

1. **SAMPLER 1**: Signal ’SAMPLING STARTS!’
2. **SAMPLER 1**: Collect the sample into the sample container (plastic tank):
   - **Fill** the sample container (plastic tank) to the top with pumped stream water carrying the suspended sediment.
   - **Stop** the pump (practically by disconnecting the wire of the batteries).
   - **Close** the sample container (plastic tank) with the cover.
3. **SAMPLER 1**: Signal ’SAMPLING COMPLETED!’

TYPICAL MISTAKES:

1. Tank is not filled completely.
2. Pipe is merged into the sample (water) in the tank.
3. Water is not pumped on the inside wall of the tank.
4. Cover is not tight on the tank.

2. FILL TANK

2. CLOSE COVER

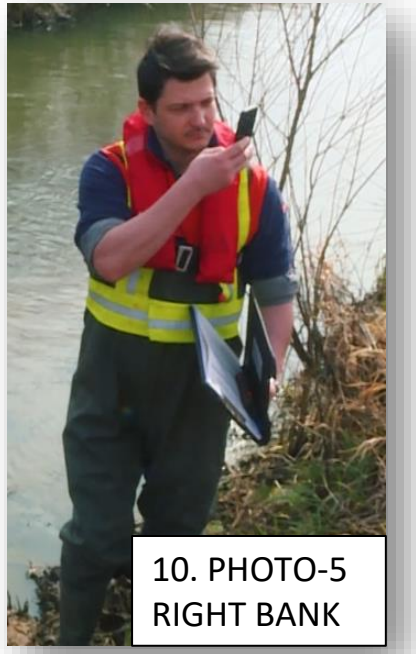
PHASE 3: SAMPLE COLLECTION 2/2

DOCUMENTATION

5-9. TAKE PHOTO:

- ***PHOTO-2****: sampling point (sample collection conditions)*
- ***PHOTO-3,4,5,6****: landscape photos upstream, downstream, right bank, left bank.*

5. PHOTO-2 SAMPLING POINT



PHASE 4: CLOSING SAMPLING

1. **SAMPLER 2**: **WALK OUT OF THE WATER**
2. **CLEAN THE EQUIPMENT & TOOLS :**
   - Rinse pump & tube with deinozed water (1 times of the pump & pipe volume).
   - Clean the equipment & tools with disposable paper towel.
3. **PUT EQUIPMENT & TOOLS INTO BOX**
4. **PUT THE SAMPLE INTO TRANSPORT WEHICLE**
5. **PUT EQUIPMENT & TOOLS INTO BOX INTO TRANSPORT WEHICLE**

DOCUMENTATION

6. **COMPLETE & CHECK FIELD SHEET DOCUMENTATION**
7. **CHECK PHOTO DOCUMENTATION**

TYPICAL MISTAKES:

1. Equipment, tools are not cleaned properly.
2. Field documentation is incomplete, not checked and corrected.

EXAMPLES FOR SUSPENDED SEDIMENT COLLECTION

BARREL SYSTEM

Figure 1.3. Suspended sediment collected into a 30 L barrel with underwater pump

Figure 18: Suspended sediment collected into a 30 L barrel with underwater pump

SUSPENDED SEDIMENT

large river

(sampling from boat)

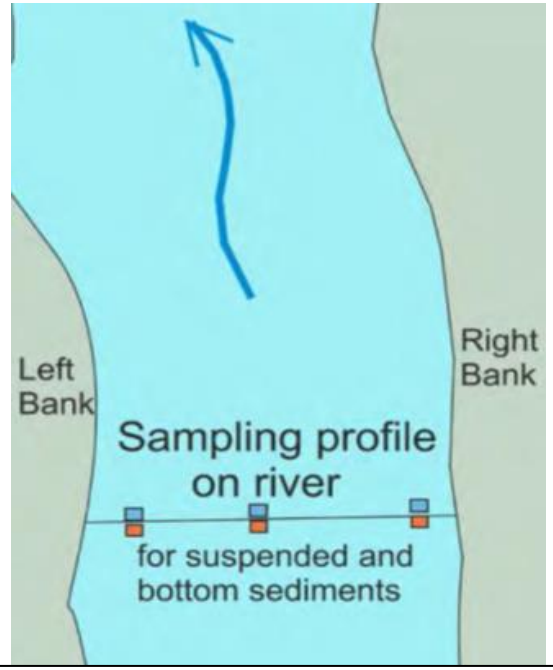
- SUSPENDED SEDIMENT SAMPLE COLLECTION IN LARGE RIVERS FROM BOAT FOLLOWS **EXACTLY THE SAME** PROCEDURE AS IN SMALL RIVERS. (BOTH SAMPLERS ARE ON BOARD.)
- THE ONLY DIFFERENCE IS IN THE SAMPLING DESIGN: **COMPOSITE SAMPLE** ACROSS THE RIVER AT DIFFERENT DEPTHS IS COLLECTED.

SAMPLING DESIGN

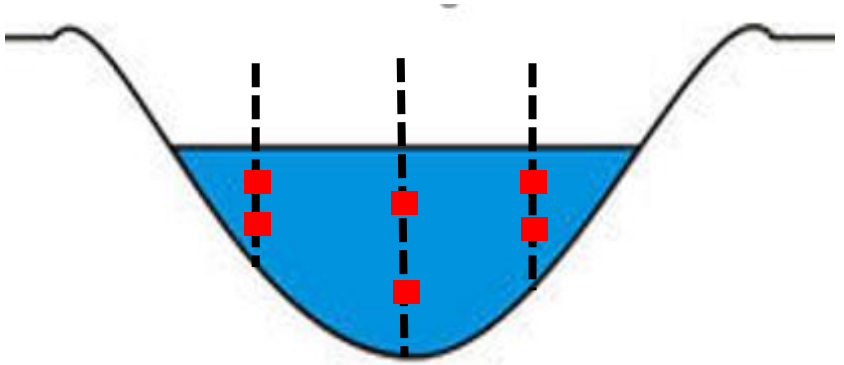
- **ASSIGN AT LEAST 3 SAMPLING POINTS EQUIDISTANT ACROSS THE RIVER WIDTH LINE** *(See figure)*
- **COLLECT SAMPLES AT LEAST AT 2 DIFFERENT DEPTH EQUIDISTANT ALONG THE VERTICAL WATER DEPTH LINE** *(See figure)*
- **COLLECT THE MIN. 6 SUB-SAMPLES INTO THE SAME SAMPLE CONTAINER (PLASTIC TANK) IN EQUAL VOLUMES (1/6 OF TOTAL VOLUME)**

ALTERNATIVES:

- **FOR SAMPLING POINTS:** *Location of sampling points can be in the place of maximum flow velocity (where sediment transport is assumed to be higher), if it represents the suspended sediment across the section.*



HORIZONTAL SAMPLING DESIGN



VERTICAL SAMPLING DESIGN

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FIELD MANUAL

sampling instructions for the collection of the SIMONA National Sediment Quality Monitoring Baseline Network samples

OVERBANK SEDIMENT

spade system

Gyozo Jordan and Franko Humer

SEE THE VIDEO: *SIMONA_Overbank_SPADE.mp4*

Project co-funded by the European Union
http://www.interreg-danube.eu/approved-projects/simona

OVERBANK SEDIMENT

spade system

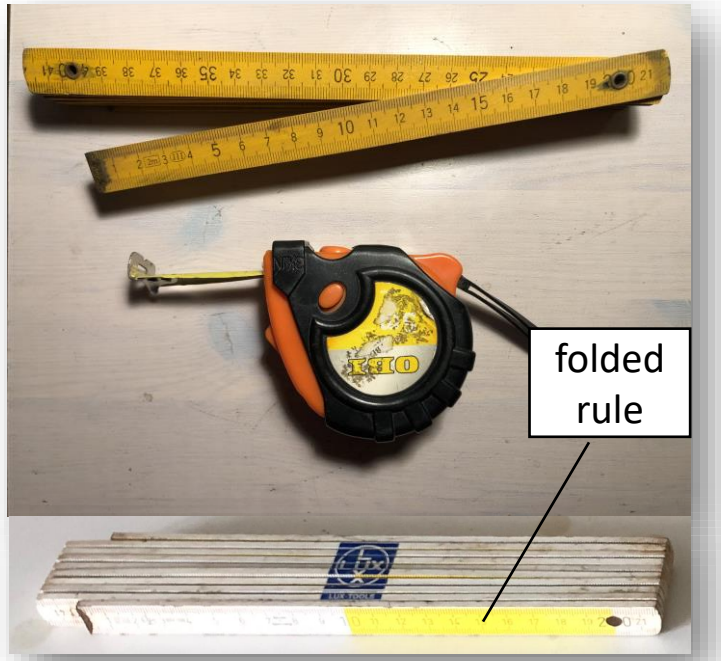
EQUIPMENT – SAMPLING

CHECKLIST:

- **SPADE** *(pure iron)*
- **KNIFE** *(pure iron)*
- **GLOVES** *(disposable, powder free)*
- **SAMPLE CONTAINER** *(2 min. 0.7L glass jars)*

ALTERNATIVES:

- **SPADE** *(stainless steel)*
- **KNIFE** *(stainless steel)*



EQUIPMENT – TOOLS

CHECKLIST:

- **LOCATION MEASURE: GPS**
- **DISTANCE MEASURE** *(laser & light reflecting target OR tape measure)*
- **SEDIMENT DEPTH MEASURE** *(folded rule; metric)*
- **DIGITAL CAMERA**

- **FIELD SHEET IN WATER PROOF FOLDER**
- **PEN, MARKER PEN**
- **DIGITAL CAMERA** *(batteries)*
- **STICK-ON LABEL**
- **PERMANENT PEN: BLACK**

- **2 TRAINED PERSONNEL**

CONTROL QUESTIONS:

- **DO THE DEVICES OPERATE?** *(GPS, laser, camera)*
- **ARE THE BATTERIES CHARGED?**

- **ARE THE TOOLS & EQUIPMENT IN GOOD CONDITION?** *(demaged or broken tools, etc.)*
- **ARE THE TOOLS & EQUIPMENT CLEAN?** *(spade, knife, sample container, rule)*
- **ARE THE BATTERIES CHARGED?**

- **IS IT SAFE TO COLLECT SAMPLE?** *(safety gear, health & readiness, weather, site conditions)*

DO NOT START SAMPLING UNLESS ALL ANSWERS ARE 'YES'.

PHASE 1: PREPARE FOR SAMPLING 1/2

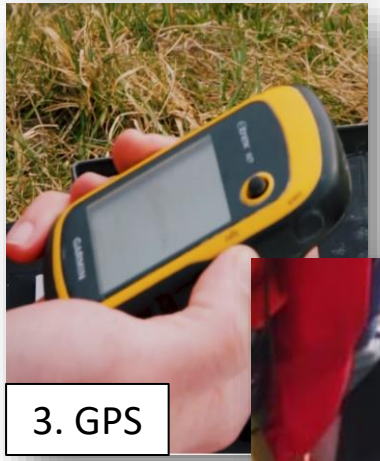
1. **SET UP SAMPLING STATION AT SAMPLING POINT:**
   - *lay canvas on ground, place equipment on it*
2. **DIG SAMPLING PIT WITH SPADE:**
   - *depth: min. 50cm; width: as convenient for sampling (min. 30-40cm)*

DOCUMENTATION

3. **TAKE THE GPS COORDINATES OF SAMPLING POINT** *(WGS84)*
4. **COMPLETE FIELD SHEET:**
   - *site ID, sampling point GPS coordinates, sample ID, date, etc.*
5. **PUT SAMPLE ID & DATE ON CONTAINER:**
   - *1. stick-on label and 2. sample container (glass jar)*
   - *stick label on container (glass jar)*
6. **TAKE PHOTO-1 ON SAMPLE ID** *(sample container or field sheet)*

2. DIG SAMPLING PIT

1. SAMPLING STATION



3. GPS

4. FIELD SHEET

6. PHOTO-1 LABEL

5. SMAPLE LABELING

PHASE 1: PREPARE FOR SAMPLING 2/2

DOCUMENTATION

7-11. TAKE PHOTO:

- ***PHOTO-2****: sampling point (sample collection conditions)*
- ***PHOTO-3,4,5,6****: landscape photos upstream, downstream, right bank, left bank.*

12. MEASURE DISTANCE BETWEEN RIVER BANK & SAMPLING POINT

- *with laser & light reflecting target OR tape measure; ± 5 cm accuracy.*

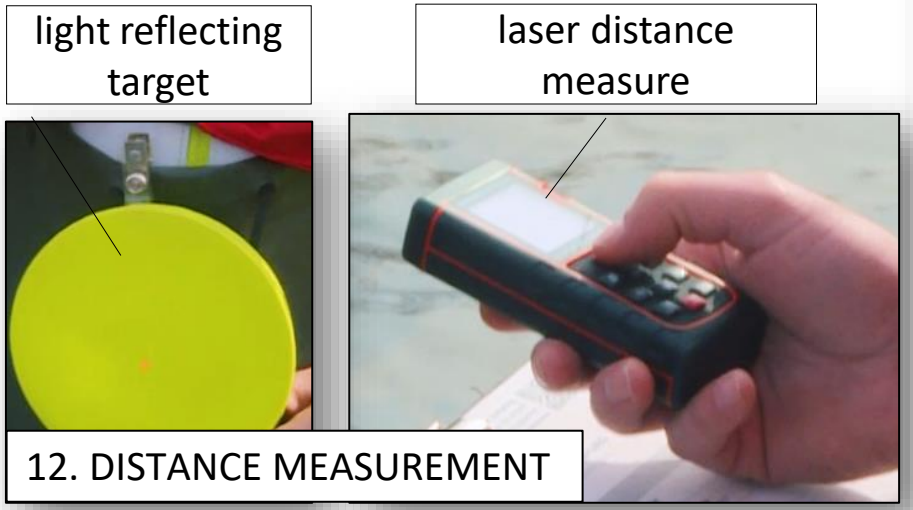
7. PHOTO-2 SAMPLING POINT

8. PHOTO-3 UPSTREAM

9. PHOTO-4 DOWNSTREAM

10. PHOTO-5 RIGHT BANK

11. PHOTO-6 LEFT BANK



12. DISTANCE MEASUREMENT

12. DISTANCE MEASUREMENT

PHASE 2: GETTING READY FOR SAMPLING

1. **SAMPLERS: PUT ON GLOVES** *(powder free)*
2. **SAMPLER 1**: Clear the sediment profile from vegetation with knife.
3. **SAMPLER 1**: Clear the sediment profile in pit with knife, from top to bottom.
4. **SAMPLER 1**: Measure sampling depth interval with rule.
5. **SAMPLER 1**: Equilibrate (’rinse’) sampling knife & sampling gloves with the sediment at the sampling depth 3 times.
6. **SAMPLER 2**: **KEEP SAMPLE CONTAINER CLOSED**.

TYPICAL MISTAKES:

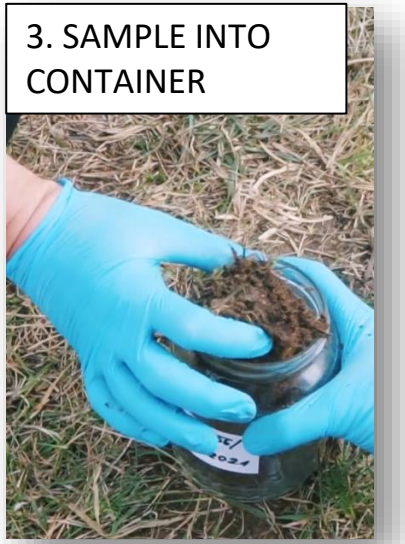
1. Vegetation is not removed from top of sediment profile.
2. Sediment profile is contaminated by tools.
3. Sediment profile is cleared from bottom to top and thus top layer contaminate lower layers.
4. Wrong sampling depth measurement.
5. Sampling system (knife & gloves) is not thoroughly equilibrated with the sediment at the sample depth.

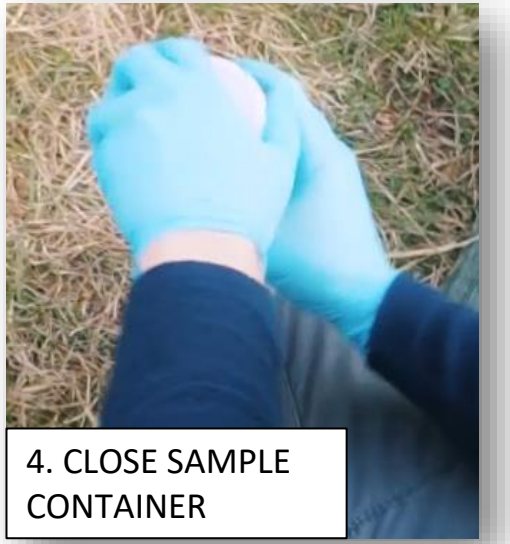
PHASE 3: SAMPLE COLLECTION – DEEP

1. **SAMPLER 1:** Signal 'SAMPLING STARTS!'
2. **SAMPLER 1**: Take deep (40-50 cm) sediment sample with knife and gloves.
3. **SAMPLER 1**: Put sample into sample container (glass jar).
4. **SAMPLER 2**: Close sample container with lid (glass jar).
5. **SAMPLER 2**: **KEEP SAMPLE CONTAINER CLOSED DURING SAMPLING**.

➢ **REPEAT STEPS 2-3-4 AS NEEDED** *(to fill the sample container).*

6. **SAMPLER 1**: Signal 'SAMPLING COMPLETED!'





TYPICAL MISTAKES:

1. Upper layers of sediment profile contaminate the bottom layers during sample collection (keep distance from profile!).
2. Not the whole vertical sampling depth interval (40-50 cm) is represented by sample (depth interval: vertical composite sample) .
3. Sampler touches sample in the sample container, takes out parts (e.g. grass leaves), or puts sediment dropped on ground into the container.

PHASE 3: SAMPLE COLLECTION – TOP 1/2

GETTING READY FOR SAMPLING

1. **SAMPLER 1: CLEAN KNIFE**
2. **SAMPLER 1: REMOVE GLOVES & PUT ON NEW GLOVES** *(powder free)*.
3. **SAMPLER 1**: Measure sampling depth interval with rule.
4. **SAMPLER 1**: Equilibrate (’rinse’) sampling knife & sampling gloves with the sediment at the sampling depth 3 times.
5. **SAMPLER 2**: **KEEP SAMPLE CONTAINER CLOSED**.


1. CLEAN KNIFE


2. PUT ON NEW GLOVES


3. MEASURE DEPTH


4. ’RINSE’ GLOVES & KNIFE WITH SOIL AT DEPTH

PHASE 3: SAMPLE COLLECTION – TOP 2/2

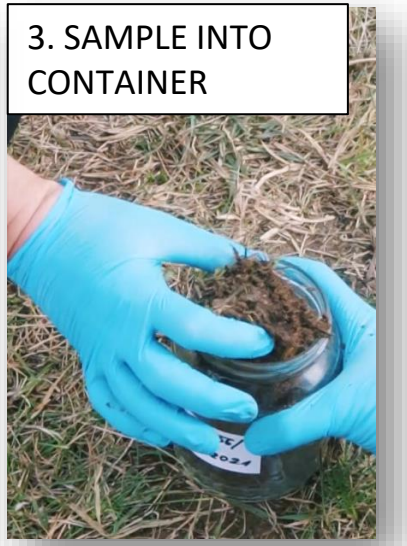
1. **SAMPLER 1:** Signal 'SAMPLING STARTS!'
2. **SAMPLER 1**: Take top (0-5 cm) sediment sample with knife and gloves.
3. **SAMPLER 1**: Put sample into sample container (glass jar).
4. **SAMPLER 2**: Close sample container with lid (glass jar).
5. **SAMPLER 2**: **KEEP SAMPLE CONTAINER CLOSED DURING SAMPLING**.

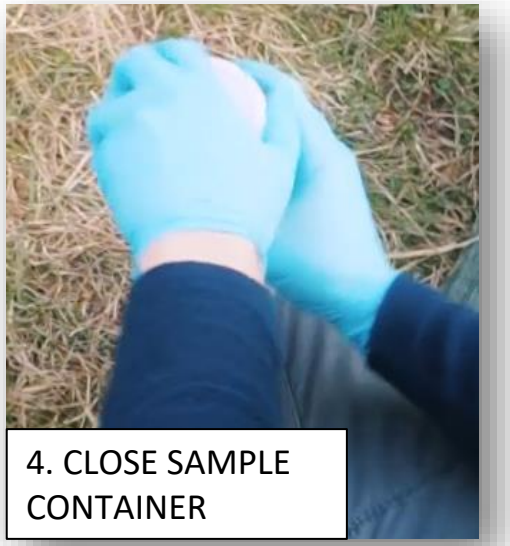
➢ **REPEAT STEPS 2-3-4 AS NEEDED** *(to fill the sample container).*

6. **SAMPLER 1**: Signal 'SAMPLING COMPLETED!'

2. SAMPLE COLLECTION WITH KNIFE & GLOVES

3. SAMPLE INTO CONTAINER





TYPICAL MISTAKES:

1. Not the whole vertical sampling depth interval (0-5 cm) is represented by sample (depth interval: vertical composite sample) .
2. Sampler touches sample in the sample container, takes out parts (e.g. grass leaves), or puts sediment droped on gound into the container.

PHASE 4: CLOSING SAMPLING

1. PUT THE SAMPLE INTO COOL BOX (2-8 C°)
2. CLEAN THE EQUIPMENT (KNIFE) & TOOLS (FOLDED RULE) WITH CLEAN WATER & DISPOSABLE PAPER TOWEL
3. PUT EQUIPMENT & TOOLS INTO BOX
4. CLOSE THE SAMPLING PIT
5. PUT COOL BOX, EQUIPMENT & TOOLS INTO TRANSPORT VEHICLE
6. SECURE THE GLASS CONTAINERS AGAINST BREAKING DURING TRANSPORT

4. CLOSE SAMPLING PIT

DOCUMENTATION

7. COMPLETE & CHECK FIELD SHEET DOCUMENTATION
8. CHECK PHOTO DOCUMENTATION

1. SAMPLE INTO COOL BOX

2. CLEAN TOOLS

3. TOOLS INTO BOX

TYPICAL MISTAKES:

1. Equipment, tools are not cleaned properly.
2. Field documentation is incomplete, not checked and corrected.
3. Glass containers break during transport due to insufficient securing.

EXAMPLES FOR FLOODPLAIN SEDIMENT COLLECTION

SPADE SYSTEM

Figure 1.10. Loading jar with floodplain sediment

Figure 9.6. Collecting floodplain sediment

Figure 4.5. Loading jar with floodplain sediment (bottom layer)

Figure 8.7. Collecting top soil from floodplain sediment

Figure 5.5. Profiling floodplain sediment

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FIELD MANUAL

sampling instructions for the collection of the SIMONA National Sediment Quality Monitoring Baseline Network samples

SAFETY INSTRUCTIONS

Gyozo Jordan and Franko Humer

SEE THE VIDEO: *SIMONA_PRACTICE_safety.mp4*

Project co-funded by the European Union
http://www.interreg-danube.eu/approved-projects/simona

BASIC EQUIPMENT – for sediment sampling

CHECKLIST:

SAFETY

- WATER PROOF FISHERMAN'S PANTS; RUBBER BOOTS
- VISIBILITY VEST
- LIFE JACKET
- GLOVES
- HELMET
- FIRST AID KIT
- ROPE

BASIC EQUIPMENT – for sediment sampling

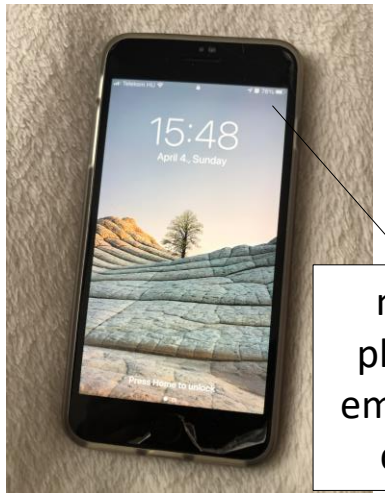
CHECKLIST:

SAFETY

- WHISTLE
- WALKIE-TALKIE; MOBILE PHONE
- SET OF CHANGE CLOTH; TOWEL; BLANKET

whistle

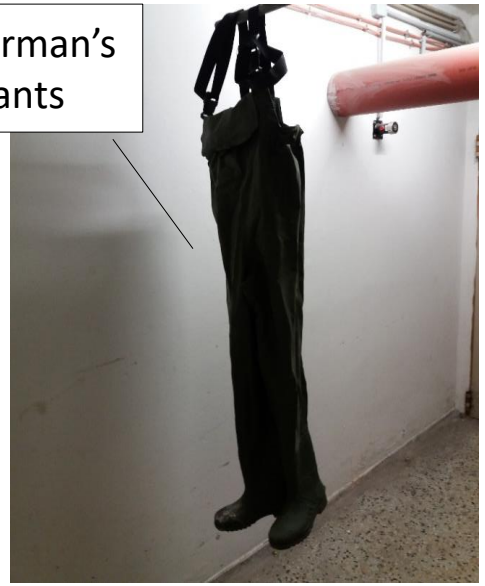
walkie-talkie



mobile phone as emergency device

heavy gloves

life jacket



fisherman's pants

whistle

life jacket

gloves

fisherman's pants

SAFETY INSTRUCTIONS:

- **CLARIFY ACCIDENT RESPONSIBILITIES PRIOT TO FIELD**
- **FOLLOW THE SAFETY RULES OF YOUR COUNTRY, YOUR COMPANY, INT'L STANDARDS**
- **ALWAYS AT LEAST 2 PERSONNEL DURING SAMPLING**
  - *one personnel alway in at bank to secure other in water*
- **WEAR PROPER SAFETY FIELD GEAR**
- **MAINTAIN COMMUNICATION EQUIPMENT**
  - *Whiste (2 blasts: Come back!; 3 blasts: Danger!)*
  - *mobile phone (have team members' number)*
  - *walkie-talkie (always recharged & turned on)*
- **ALWAYS STAY IN MUTUAL VISIBILITY** *(See picture)*
- **KEEP FIRST AID KIT READILY AVAILABLE**
- **KEEP EMERGENCY PHONE NUMBERS READY**
- **KEEP NEAREST FIRST AID & HOSPITAL ADDRESS**
- **KEEP WEHICLE READY FOR EMERGENCY RIDE**

- **KEEP BOTTLED WATER & HYDRATE YOURSELF BY DRINKING WATER REGULARLY**
- **PROTECT YOURSELF AGAINST OVERHEATING** *(Summer time)*
- **PROTECT YOURSELF AGAINST OVERCOOLING** *(Winter time)*
- **PROTECT YOURSELF AGAINST CHANGING WEATHER** *(rainfall, etc.)*
- **PROTECT YOURSELF AGAINST HARMFUL SUBSTANCES**
- **AT RIVERSIDE: SWIMMING SKILLS ARE AN ASSET**
- **ASK: IS IT SAFE TO COLLECT SAMPLE? NEVER TAKE RISK!**

DRAFT

FIELD MANUAL

sampling instructions for the collection of the SIMONA National Sediment Quality Monitoring Baseline Network samples

SAMPLE TRANSPORT

1. In field from sampling point to transport vehicle

2. From field to laboratory

Gyozo Jordan and Franko Humer

SEE THE VIDEO: *SIMONA_PRACTICE_sample_transport.mp4*

Project co-funded by the European Union
http://www.interreg-danube.eu/approved-projects/simona

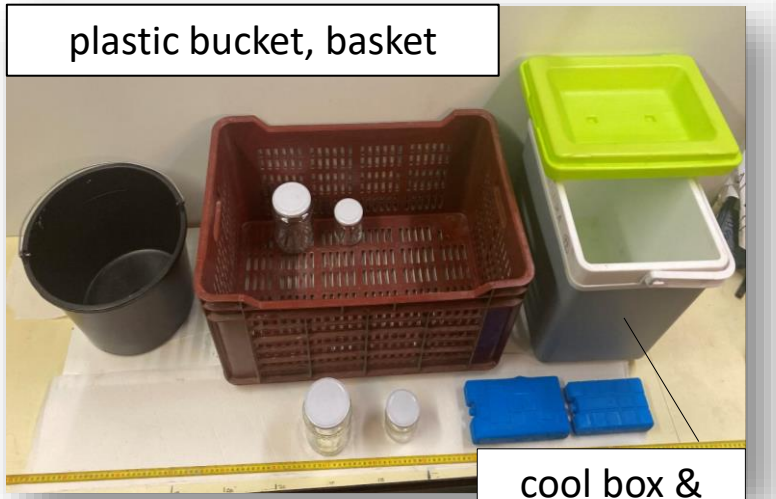
EQUIPMENT

CHECKLIST:

- **TRANSPORT VEHICLE**
- **BASKET FOR SAMPLES** *(glass jars, plastic bags)*
- **BASKET FOR CORES**
- **BUCKET**
- **BUBBLE WRAP**

Storage:

- **COOL BOX & ICE BATTERIES**
- **ELECTRIC COOL BOX**

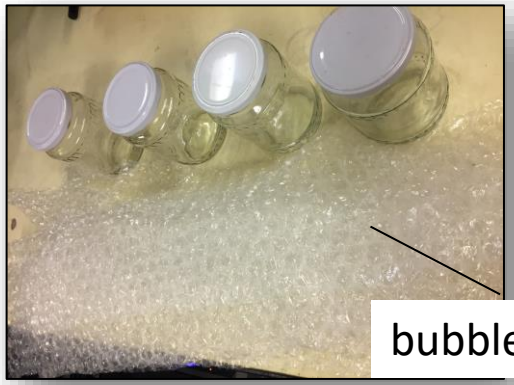


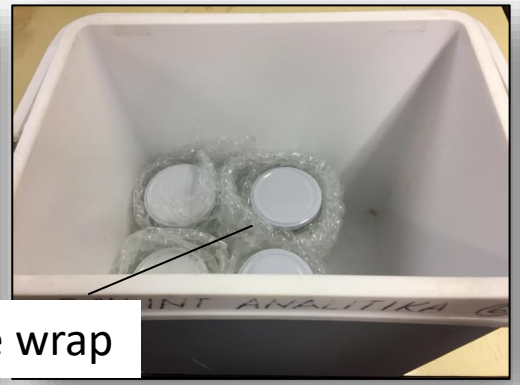
plastic bucket, basket

cool box & ice batteries

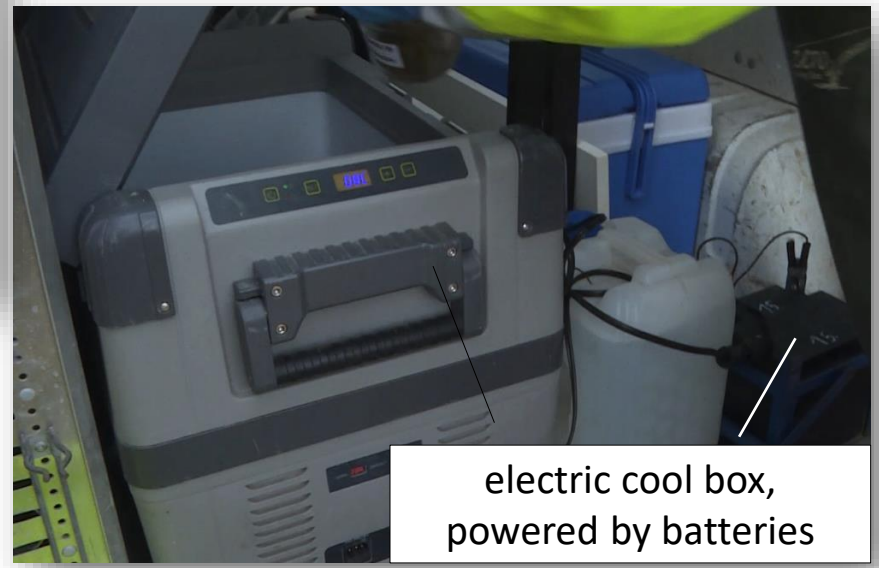
basket for cores

transport vehicle





bubble wrap



electric cool box, powered by batteries

EQUIPMENT

CHECKLIST:

- **2 TRAINED PERSONNEL**

CONTROL QUESTIONS:

- **DO THE DEVICES OPERATE?** *(electric cool box)*
- **ARE THE BATTERIES CHARGED?**

- **ARE THE TOOLS & EQUIPMENT IN GOOD CONDITION?** *(demaged or broken tools, etc.)*
- **ARE THE TOOLS & EQUIPMENT CLEAN?** *(sample container)*

- **IS IT SAFE TO TRANSPORT THE SAMPLE?** *(car, sample holding compartment (e.g. cool box), health & readiness, weather)*

DO NOT START SAMPLE TRANSPORT UNLESS ALL ANSWERS ARE 'YES'.

SAMPLE TRANSPORT

In field from sampling point to transport vehicle

PHASE 1: CLOSING SAMPLING

BOTTOM & FLOODPLAIN SEDIMENT

1. **PUT THE SAMPLE INTO COOL BOX (2-8 C°)** *(check if sample containers cannot be damaged; use bubble wrap between glass jars)*
2. **CLOSE COOL BOX FIRMLY**

1. SAMPLE INTO COOL BOX

2. CLOSE COOL BOX

TYPICAL MISTAKES:

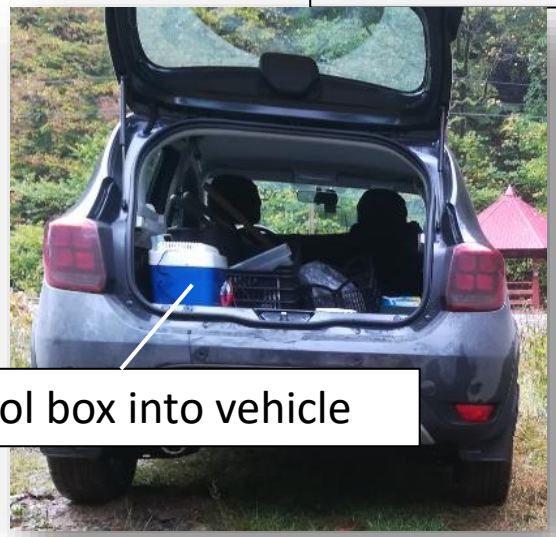
1. Cool box is not properly cooled.

PHASE 2: TRANSPORT FROM SAMPLING POINT TO CAR

BOTTOM & FLOODPLAIN SEDIMENT

1. **CARRY COOL BOX WITH SAMPLE TO TRANSPORT VEHICLE**
2. **PUT SAMPLE INTO TRANSPORT VEHICLE**

- *Put cool box into vehicle*
- *Transfer sample from cool box to electric cool box*



cool box into vehicle

2. SAMPLE INTO VEHICLE

sample transfer to electric cool box

1. COOL BOX WITH SAMPLE TO THE TRANSPORT VEHICLE

TYPICAL MISTAKES:

1. Cool box is not properly cooled.
2. Glass containers break during transport due to insufficient securing.

PHASE 1: CLOSING SAMPLING

SUSPENDED SEDIMENT

1. **CLOSE SAMPLE CONTAINER (PLASTIC TANK) FIRMLY**

TYPICAL MISTAKES:

1. Container is not properly closed (strong & watertight).

1. CLOSE PLASTIC TANK

PHASE 2: TRANSPORT FROM SAMPLING POINT TO VEHICLE

SUSPENDED SEDIMENT

1. **CARRY SAMPLE CONTAINER (PLASTIC TANK) TO TRANSPORT VEHICLE**
2. **PUT SAMPLE INTO TRANSPORT VEHICLE**
3. **SECURE CONTAINER FIRMLY IN VEHICLE**

TYPICAL MISTAKES:

1. Container is not properly closed (strong & watertight), so container can be dropped during carrying.
2. Container is not properly closed (strong & watertight) and firmly secured in transport vehicle, so sample (water & suspended sediment) can be lost during transport by vehicle.

2. SAMPLE INTO VEHICLE

SAMPLE TRANSPORT

From field to laboratory

PHASE 1: TRANSPORT FROM FIELD TO LABORTORY

BOTTOM & FLOODPLAIN SEDIMENT

1. BY CAR

- Transfer samples (glass jars) in (electric) cool box in car directly to lab

2. BY POST

- Transfer samples (glass jars) in cool box by post

REFERENCE LAB POSTAL ADDRESS:

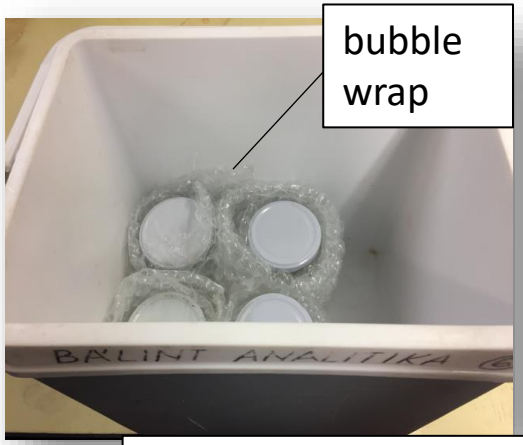
BÁLINT ANALITIKA LTD

SIMONA - Világosi Zoltán

Fehérvári út 144, Budapest 1116

HUNGARY

1. SAMPLES IN ELECTRIC COOL BOX IN CAR



2. SAMPLES FIXED IN COOL BOX FOR MAILING

2. SAMPLES IN INSULATION BOX FOR MAILING

TYPICAL MISTAKES:

1. Cool box is not properly cooled.
2. Glass containers break during transport due to insufficient securing.

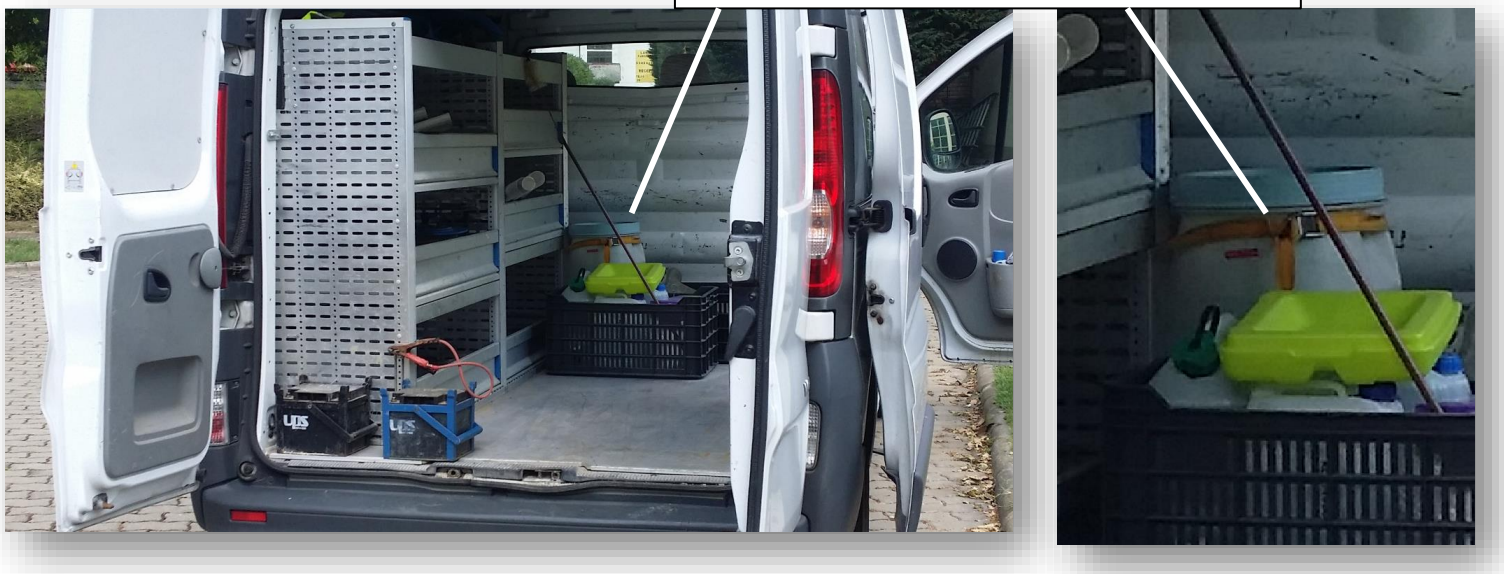
PHASE 1: TRANSPORT FROM FIELD TO LABORATORY

SUSPENDED SEDIMENT

1. BY CAR

- Transfer samples (glass jars) in (electric) cool box in car directly to lab

1. 30L PLASTIC TANK FIXED IN VEHICLE FOR TRANSPORT



TYPICAL MISTAKES:

1. Cool box is not properly cooled.
2. Glass containers break during transport due to insufficient securing.

REFERENCE LAB ADDRESS:

BÁLINT ANALITIKA LTD

SIMONA - Világosi Zoltán

Fehérvári út 144, Budapest 1116

HUNGARY

1. 30L PLASTIC TANK FIXED IN CAR FOR TRANSPORT

PHASE 1: TRANSPORT FROM FIELD TO LABORATORY

SUSPENDED SEDIMENT

2. BY POST

- *Decant water from suspended sediment in barrel to 5L*
- *Transfer 5L plastic tank by post*

DECANTING PROCEDURE

1. Leave the sample stored in plastic tank (barrel) to **settle for 24 hours**
2. After 24 hours, **decant settled water** so that no more than **5L** is left at the bottom of a plastic tank. Decanting is done by oppening the tap and slowley empting settled water.
3. The remaining 5L water containing all the collected suspended matter is **transfered to a clean plastic 5L container** and transported to the lab.

TYPICAL MISTAKES:

1.Supended matter is lost during decanting.

REFERENCE LAB ADDRESS:

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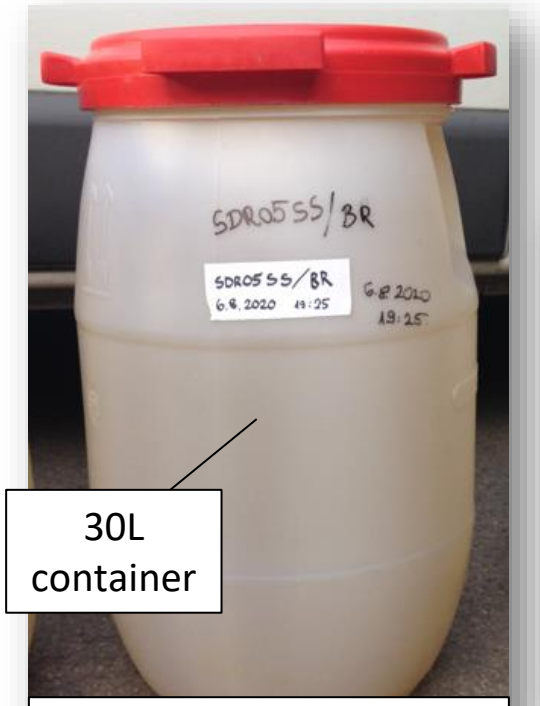
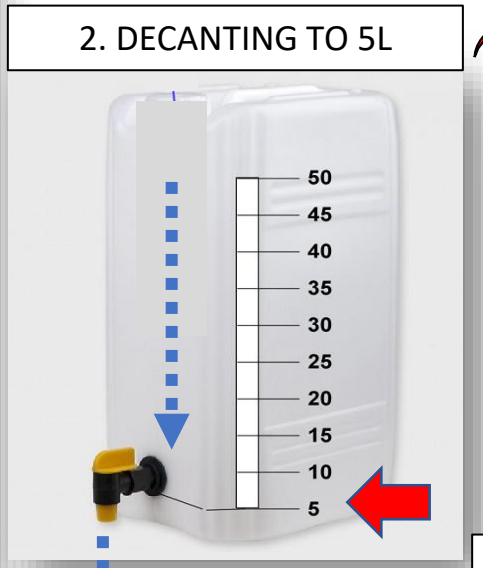
SIMONA - Világosi Zoltán

Fehérvári út 144, Budapest 1116

HUNGARY





PHASE 2: SAMPLE ARRIVAL AT LABORATORY

1. **UNLOAD SAMPLES FROM TRANSPORT VEHICLE TO THE LAB**
2. **CHECK THE INTEGRITIY OF SAMPLE CONTAINERS**
3. **CHECK THE SAMPLE CODES AND LIST OF SAMPLES**

1. UNLOADING SAMPLES AT LAB

2. CHECKING SAMPLE INTEGRITY

3. CHECKING SAMPLE CODES

TYPICAL MISTAKES:

1. Sample containers break during unloading transport vehicle.
2. Sample containers break during mailing.
2. Sample codes are messed up.