

Bottom habitat mapping in Plateliai lake applying remote underwater video techniques

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Benthic habitat:

regularly occurring bottom areas (typically at least 10 m²) with relatively uniform geomorphology and corresponding biological features (aquatic plants, animals, traces, etc.).



Terms:

“Habitat” = “Biotope”

Advantages:

- *easily detectable;*
- *in comparison to water column characteristics, relatively stable over time;*
- *integrate main environmental and biological features.*



Overall aim:

to define potential sites and parameters for monitoring of benthic habitats in the lake Plateliai

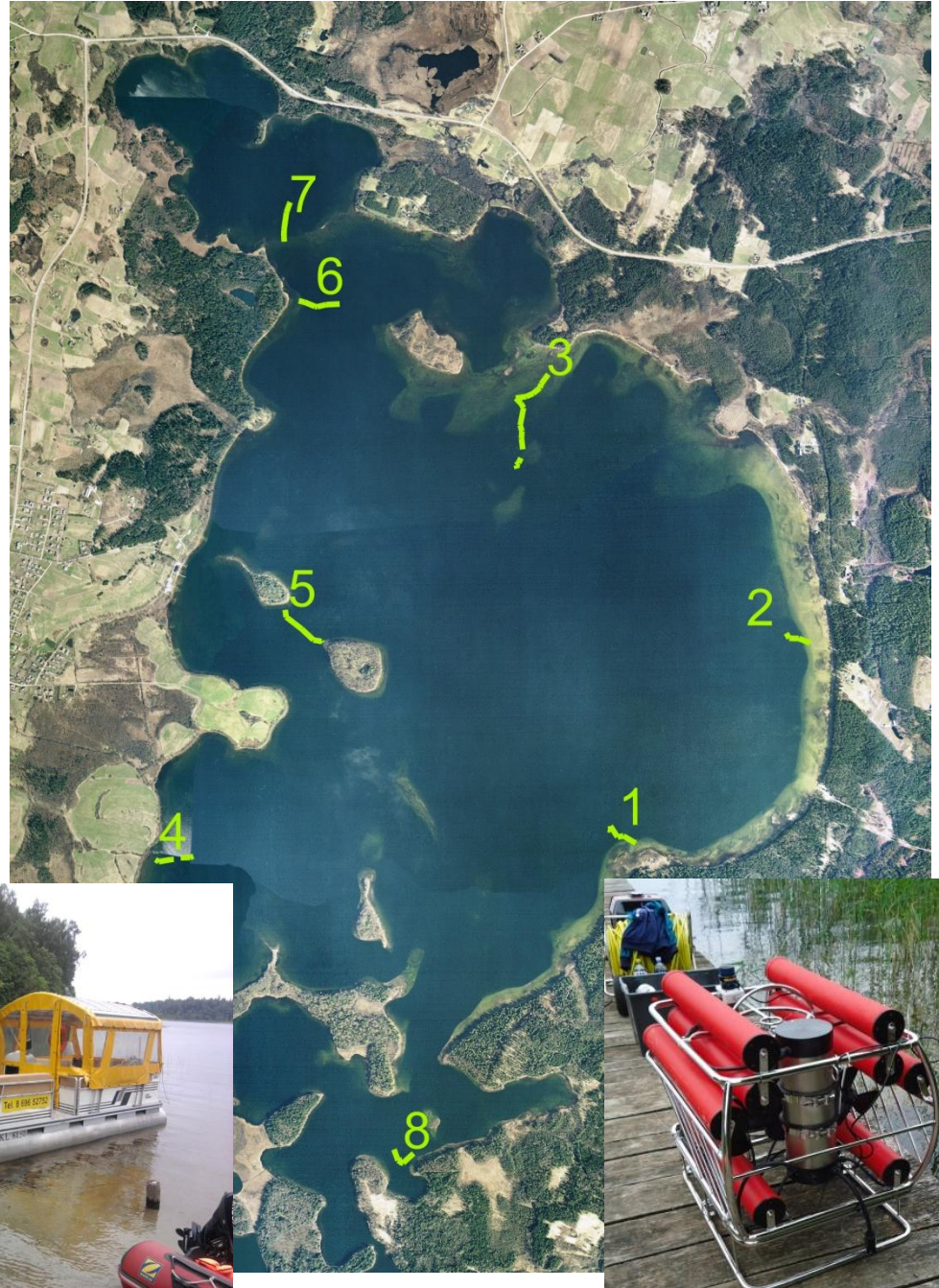
Currently:

- How many main benthic habitats?
- What are the main features of the benthic habitats?
- Which benthic habitats are the most widespread, and which ones are rare and valuable?
- Are remote sensing techniques applicable in detection of key habitat features?



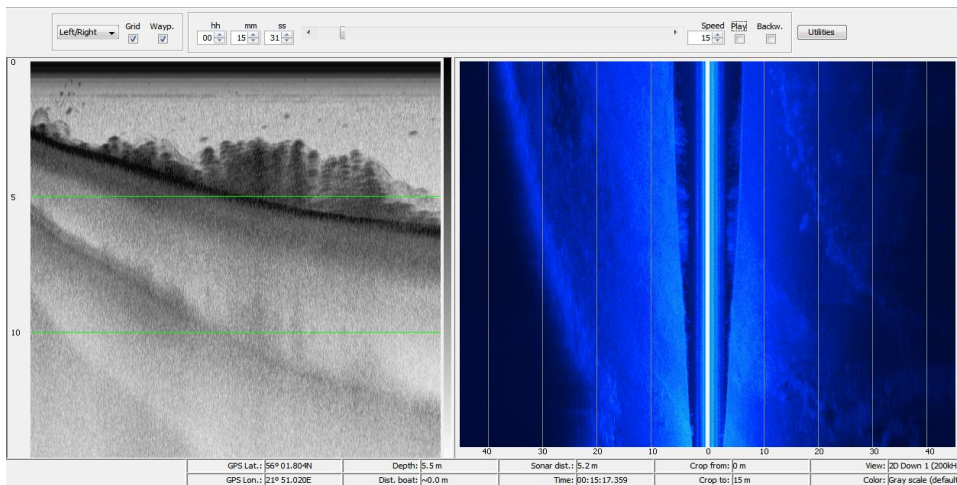
Methods:

- three main techniques: acoustic sonar, macrophyte sampling, underwater recording.
- 8 sampling transects, mostly in depths down to 10 m;
- ~4 hours of underwater video data;
- ~13 hours of acoustic data.



Remotely operated underwater video system (ROV) and acoustic sonar

- Three engines
- Buoyancy regulators
- Two cameras (navigation, recording)
- Acoustic positioning
- Depth sensor
- Light
- Control unit (speed, distance above bottom, view wangle, zoom etc.)
- Cable (50 m)



- Depth
- Bottom topography
- Substrate type
- Small scale distribution in the area below the ship

Inventory of macrophytes:

	1995 (Sinkevičienė, Stepanavičienė, 1996)	2012 (this study)
Submerged phanerogams	17	12
Horsetails (Equisetum sp.)	1	1
Aquatic mosses	2	3
Stoneworts (Charophytes)	9	8
Macroscopic green algae	1	4
TOTAL:	30	28

Habitat Directive Annex 1 Habitat types

3150 - Natural eutrophic lakes with Magnopotamion or Hydrocharition – type vegetation

Characteristic species:

Aldrovanda vesiculosa

Hydrilla verticillata

Hydrocharis morsus-ranae

Lemna minor

Lemna trisulca

Myriophyllum verticillatum

Potamogeton lucens

Potamogeton perfoliatus

Potamogeton praelongus

Potamogeton × *angustifolius*

Potamogeton × *salicifolius*

Spirodela polyrhiza

Stratiotes aloides

Utricularia vulgaris



Z. Sinkevičienės nuotr.

Potamogeton perfoliatus
Permautalapė plūdė



Z. Gudžinsko nuotr.

Lemna trisulca
Trilypė plūdena



Z. Sinkevičienės nuotr.

Myriophyllum verticillatum
Menturinė plunksnalapė



Utricularia vulgaris
Paprastasis skendenis



Z. Sinkevičienės nuotr.

Potamogeton lucens
Blizgancioji plūdė

Habitat Directive Annex 1 Habitat types

3140 - Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.

Characteristic species:

Chara aspera

Chara contraria

Chara filiformis

Chara rudis

Chara strigosa

Chara tomentosa

Lychnothamnus barbatus

Nitella flexilis

Nitella opaca

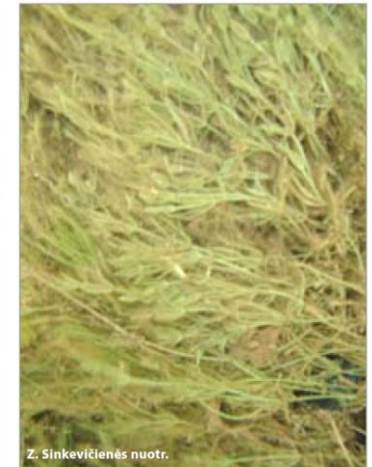
Nitellopsis obtusa



Nitellopsis obtusa



U. Suško nuotr.
Chara aspera



Z. Sinkevičienės nuotr.
Chara contraria



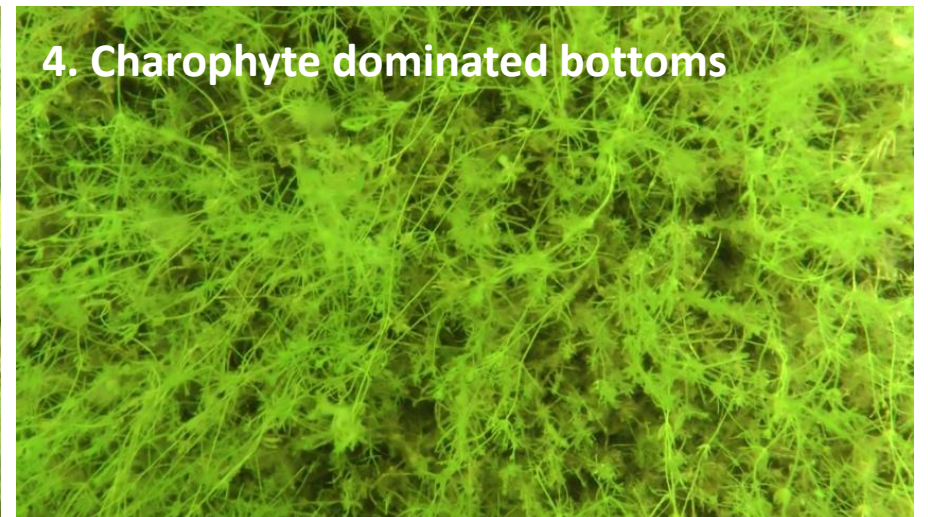
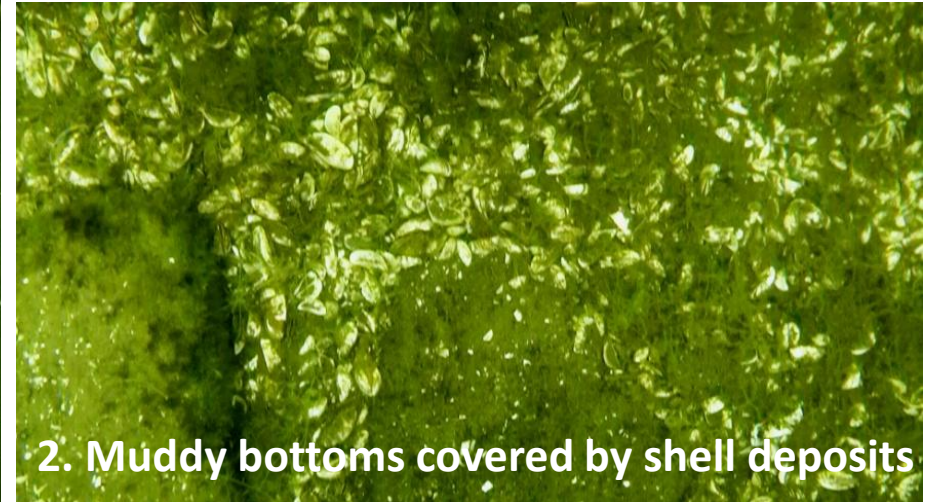
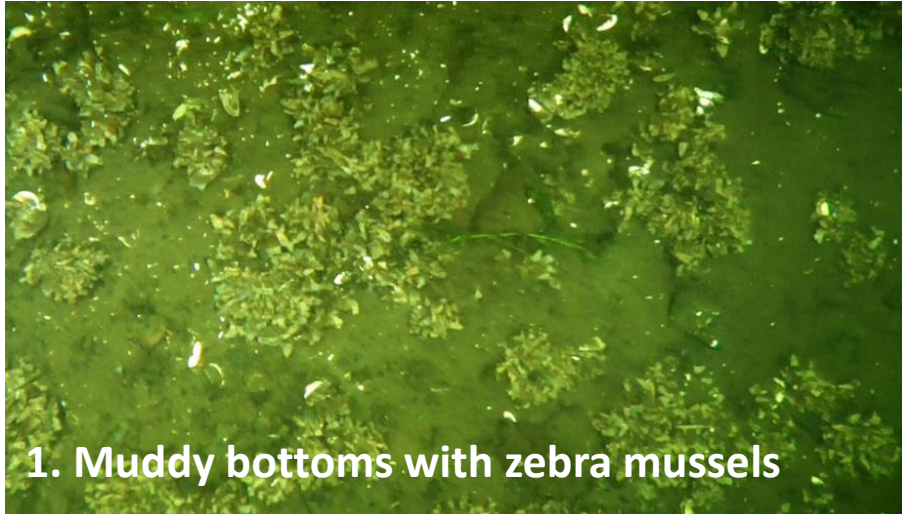
Nitella opaca



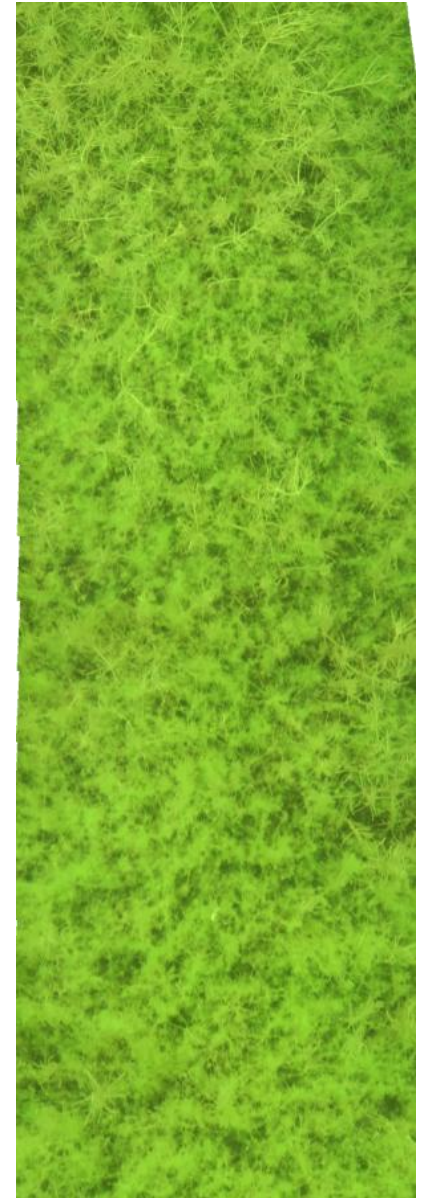
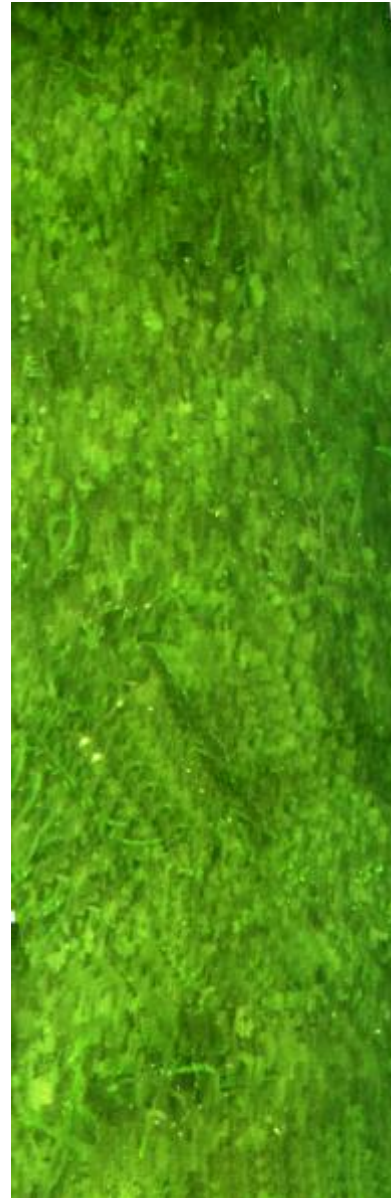
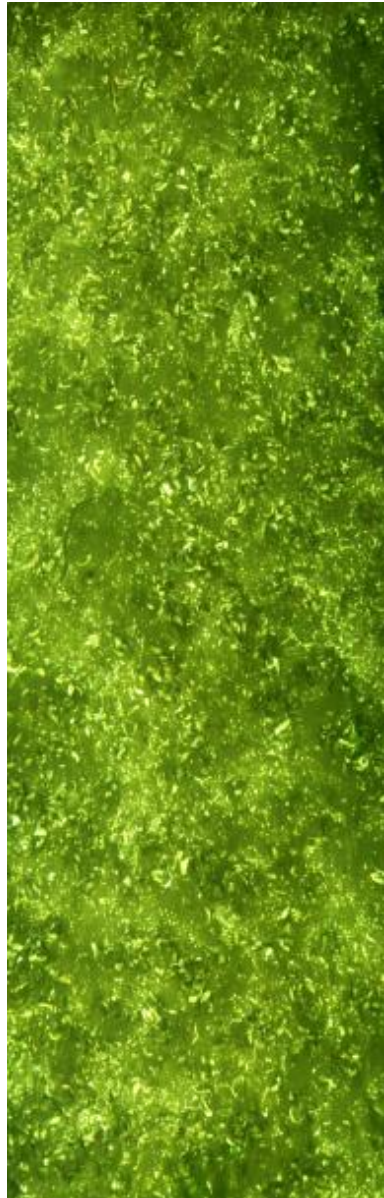
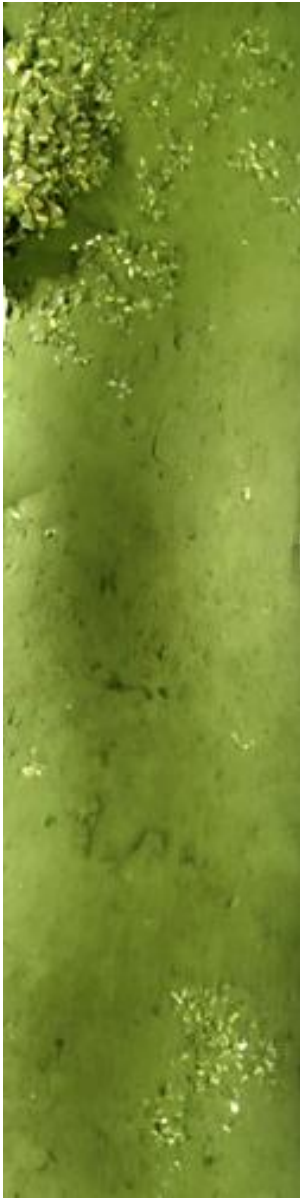
Z. Sinkevičienės nuotr.
Chara tomentosa

Main benthic habitats (ROV data analysis):

- Approx. 110 bottom types determined according to 17 physical and biological features

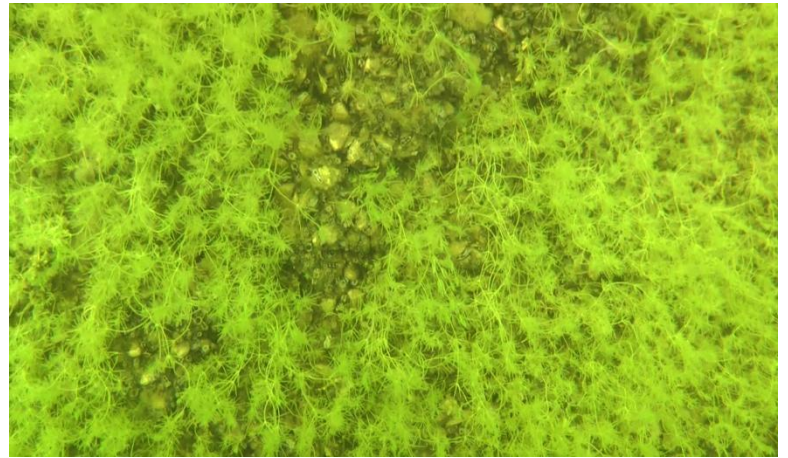


Video mosaics – analysis of benthic habitats at larger spatial scales:

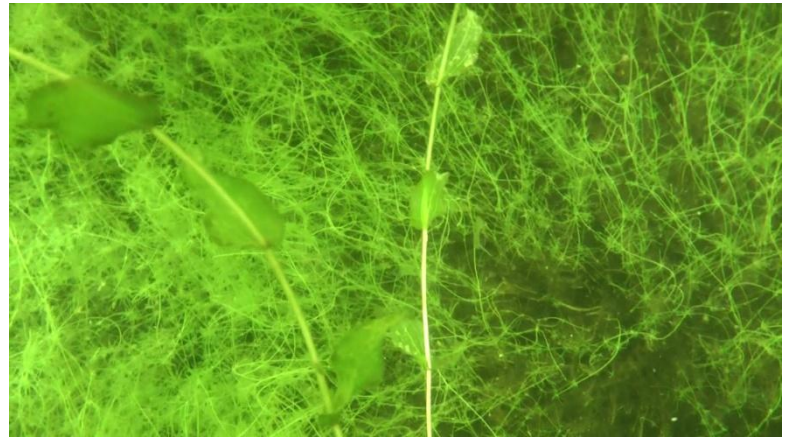


Closer look at Chara dominated bottoms: habitat sub-types

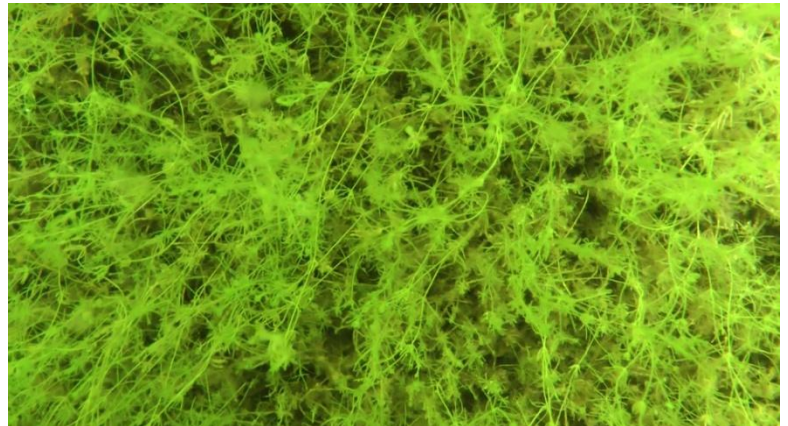
1. *Chara* dominated bottoms with colonies of zebra mussels.



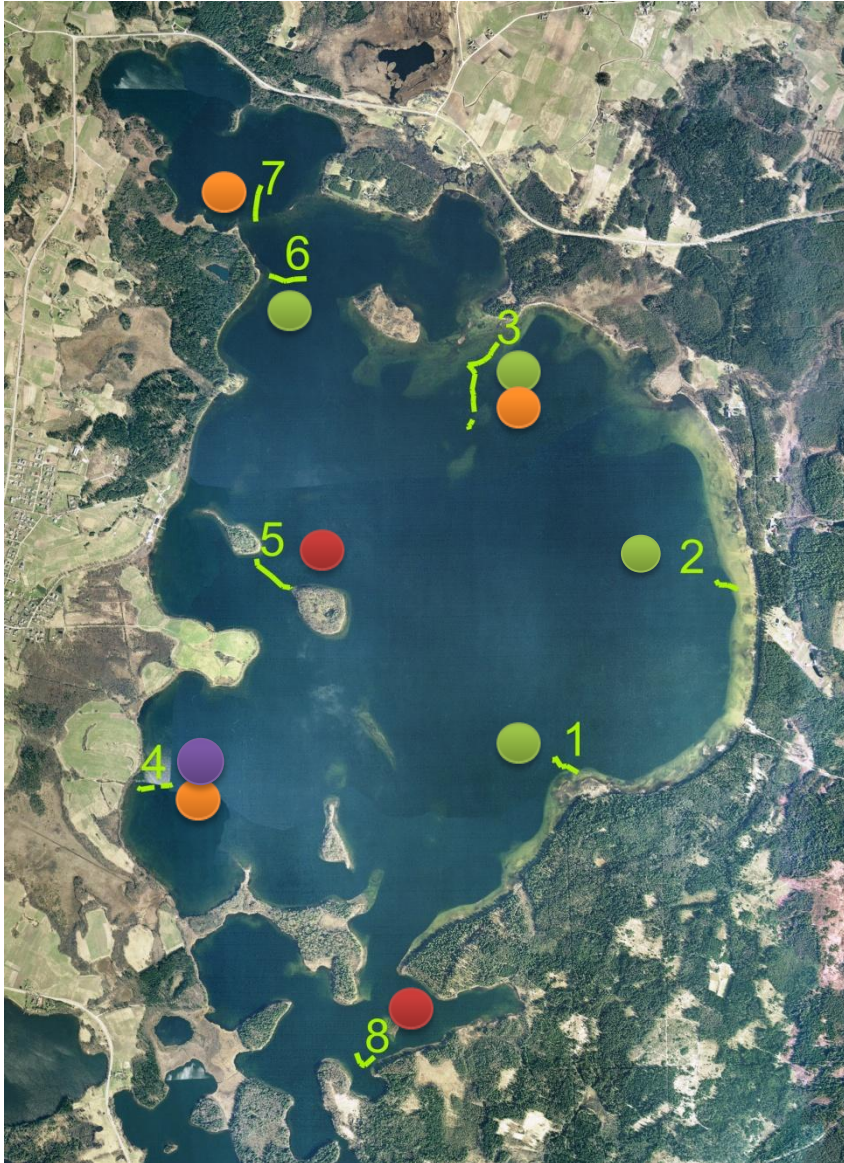
2. *Chara* dominated bottoms with *Potamogeton*.







3. Densely vegetated *Chara* bottoms.

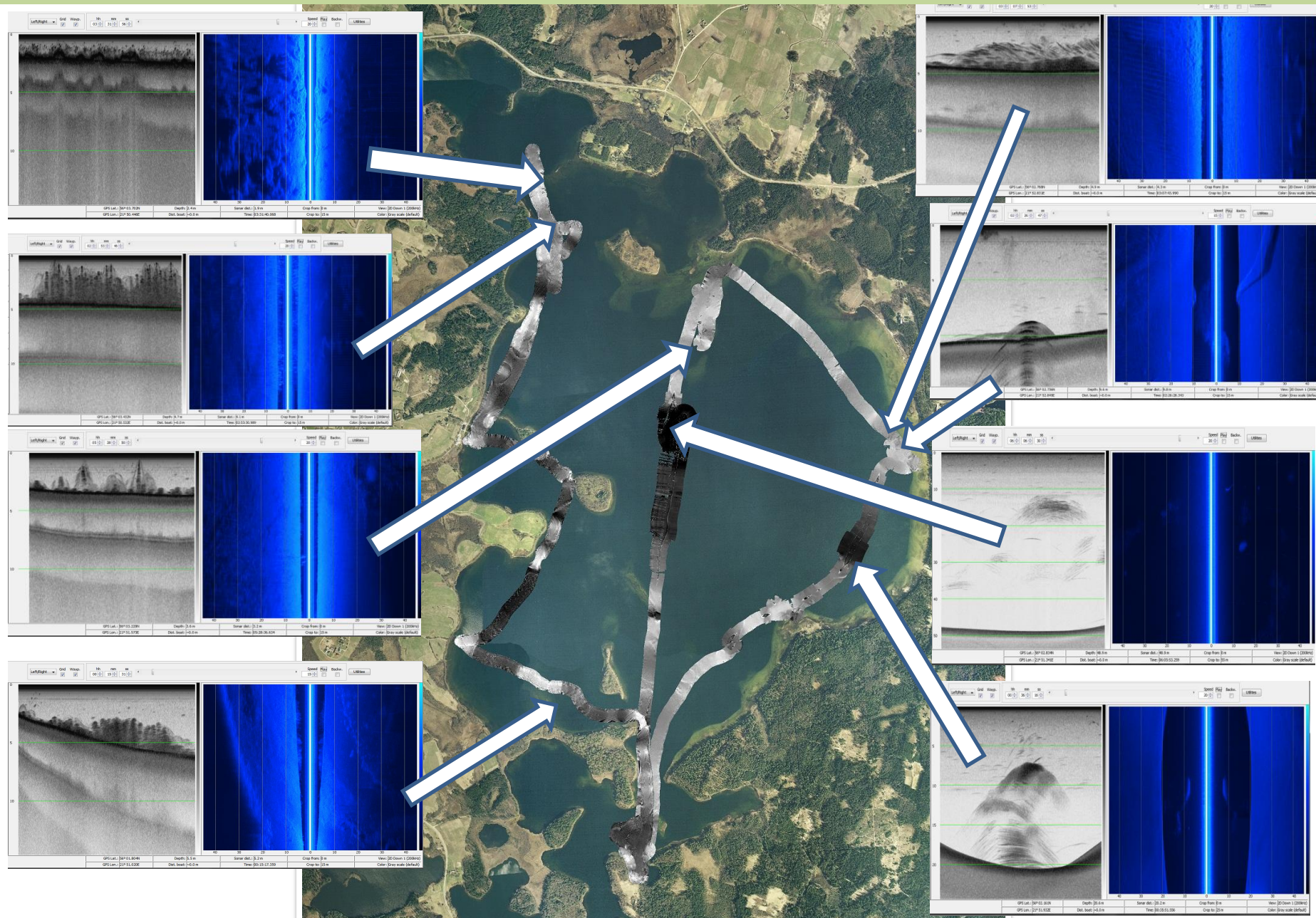


Distribution of *Chara* dominated bottoms:



-  *Chara* dominated bottoms with colonies of zebra mussels.
-  *Chara* dominated bottoms with *Potamogeton*.
-  Densely vegetated *Chara* bottoms.
-  Not found

Acoustics: bottom geomorphology and vegetation types



Distribution/area of Chara dominated bottoms:

