

"Demonstration of macroalgae harvesting in the River Šventoji"

for LIFE17 ENV/LT/000407 project

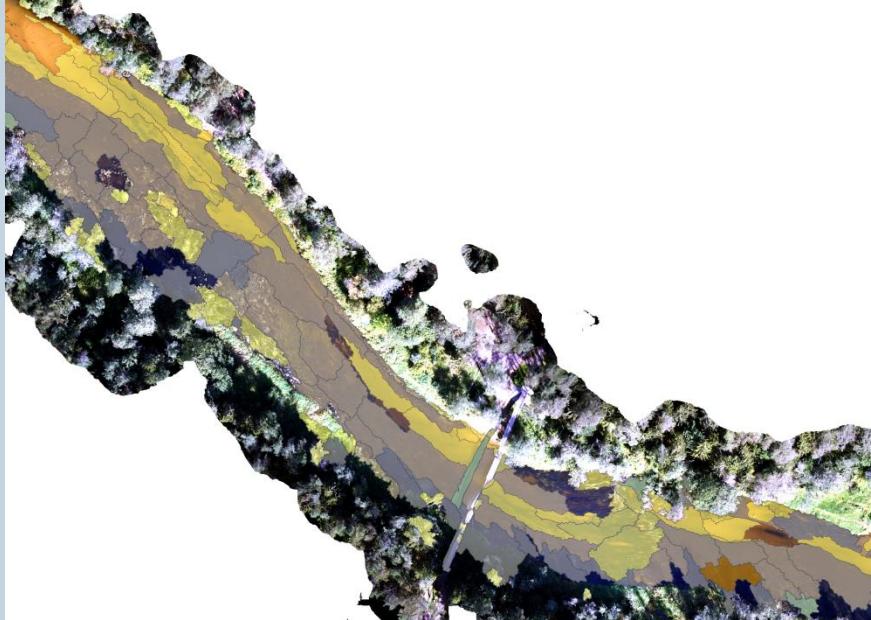
"ALGAE – ECONOMY BASED ECOLOGICAL SERVICE OF AQUATIC ECOSYSTEMS"

12 August 2020

Anykščiai



Use of remote sensing methods for evaluation of algae blooms in River Šventoji



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Institute of Geosciences

Department of Geography and Land Management



- The main purpose of the study.**

Based on remote sensing methods, to form a reasonable method of identification and accounting of filamentous algae and cyanobacterial resources in selected reference water bodies, which would create real preconditions for rational and efficient algae collection using their collection technique.

- The set tasks of this project segment were consistently realized in the period of 2018 - 2019:



- Research sites in rivers:

- A. Šventoji (section of Mikieriai - Androniškis and Anykščiai - Tree Crown Trail);
- B. Nevėžis (section of Babtai - Užliedžiai village);
- C. Dubysa (Betygala - Ariogala and Čekiškė - Seredžius section);
- D. Jūra (Kvedarnos - Pajūrio section).



- Remote sensing tools used for the research:**

- Unmanned aerial vehicles system consisting of:

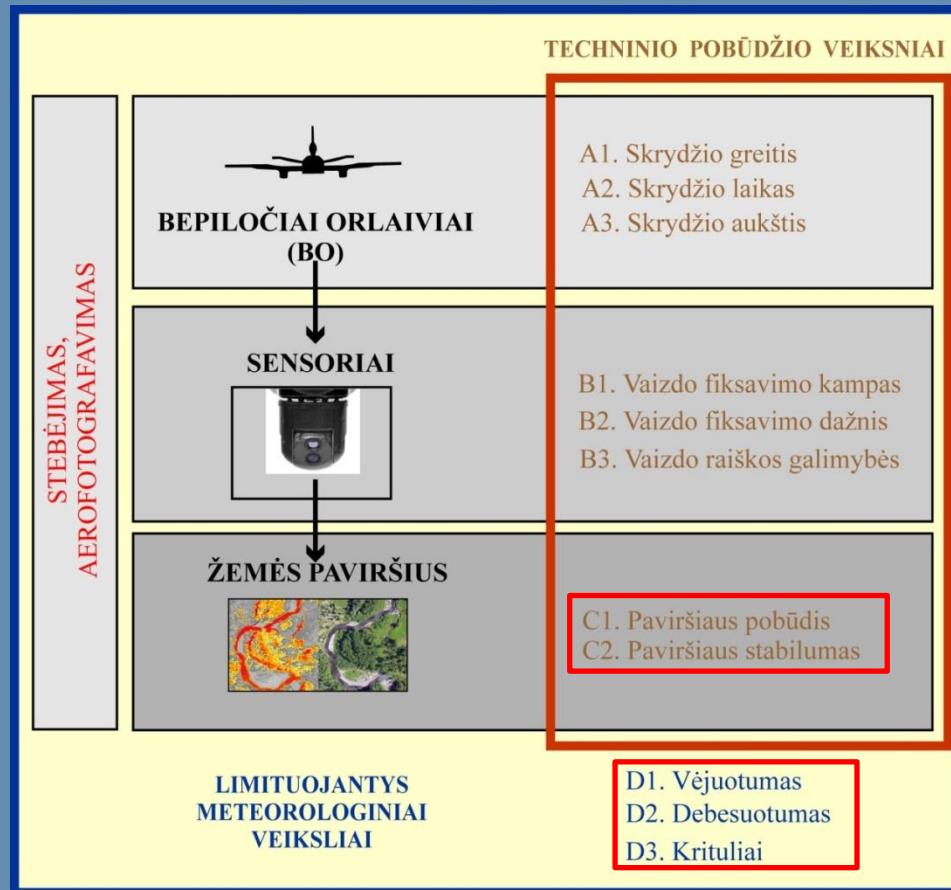
- (A) Fixed wing unmanned aerial vehicle (BO)

- B) Visual spectrum and IR cameras





• Research implementation strategy



The main factors determining the research results:

Technical factors:

- C1. Nature of the surface
- C2. Surface stability

Meteorological factors:

- D1. Windiness
- D2. Cloudiness
- D3. Precipitation



• Programinė įranga:

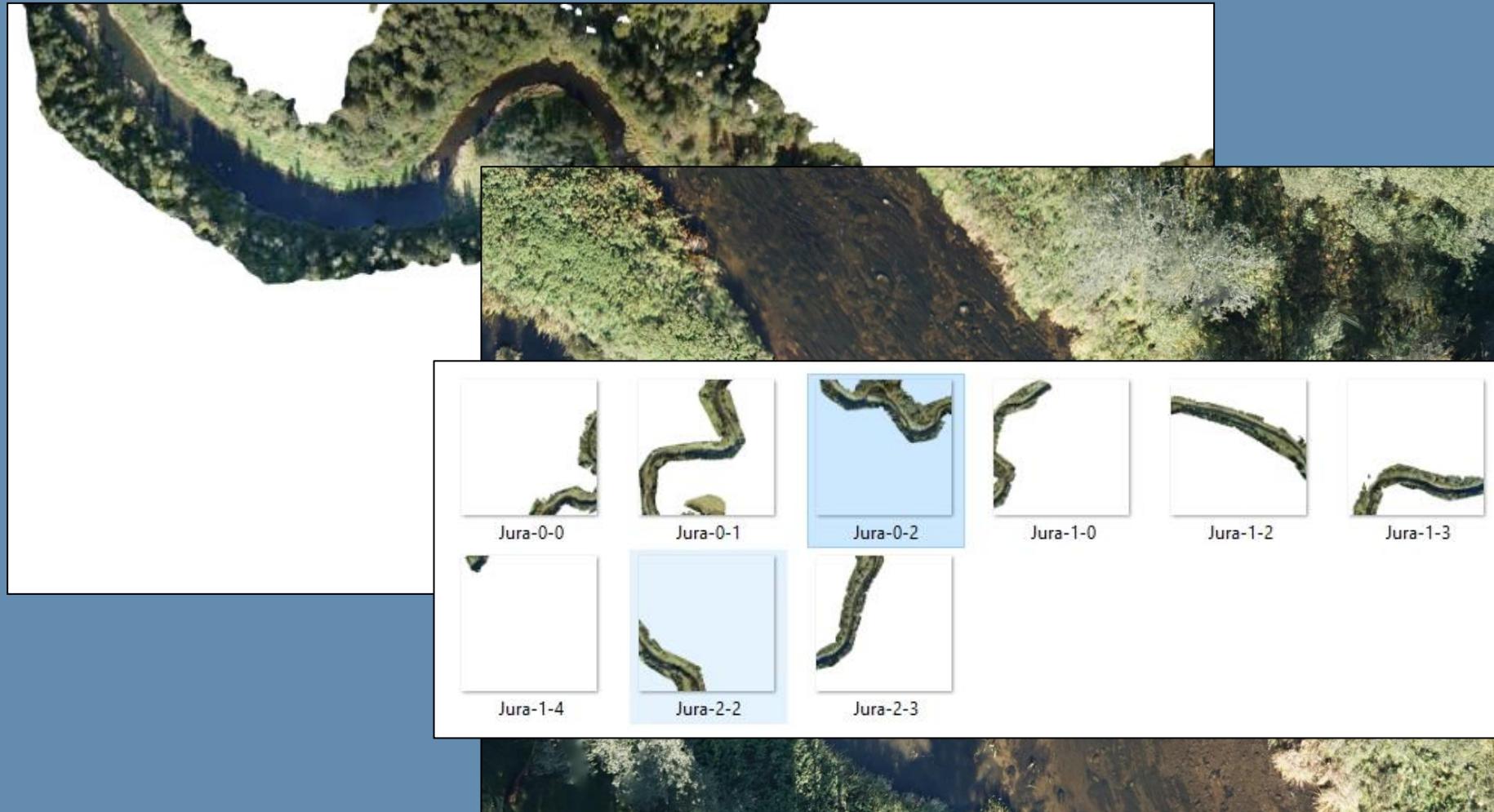
- **Agisoft PhotoScan Professional** (Aerial photogrammetry)
- **eCognition Developer** (Automated segmentation)
- **ArcMap** (Spatial data analysis, accounting and visualization)

The phasing of the research process is closely related to the use of the mentioned software.



Research results

I Stage Preparation of aerial photograph material





II Stage Decoding and analysis of aerial material



Segmentation and classification
of riverbed according to bottom
and surface properties:

- A. Algae in water mass and surface;
- B. Algae in the bottom and in the water mass;
- C. Algae at the bottom;
- D. Sandy bottom with single plants;
- E. Sandy bottom.

8 Pav. Nevežio upės (žemaičių Babtų) vagos dalij klasifikavimas pagal dugno, ir siūlinių dumblių išsidėstymo pobūdį.

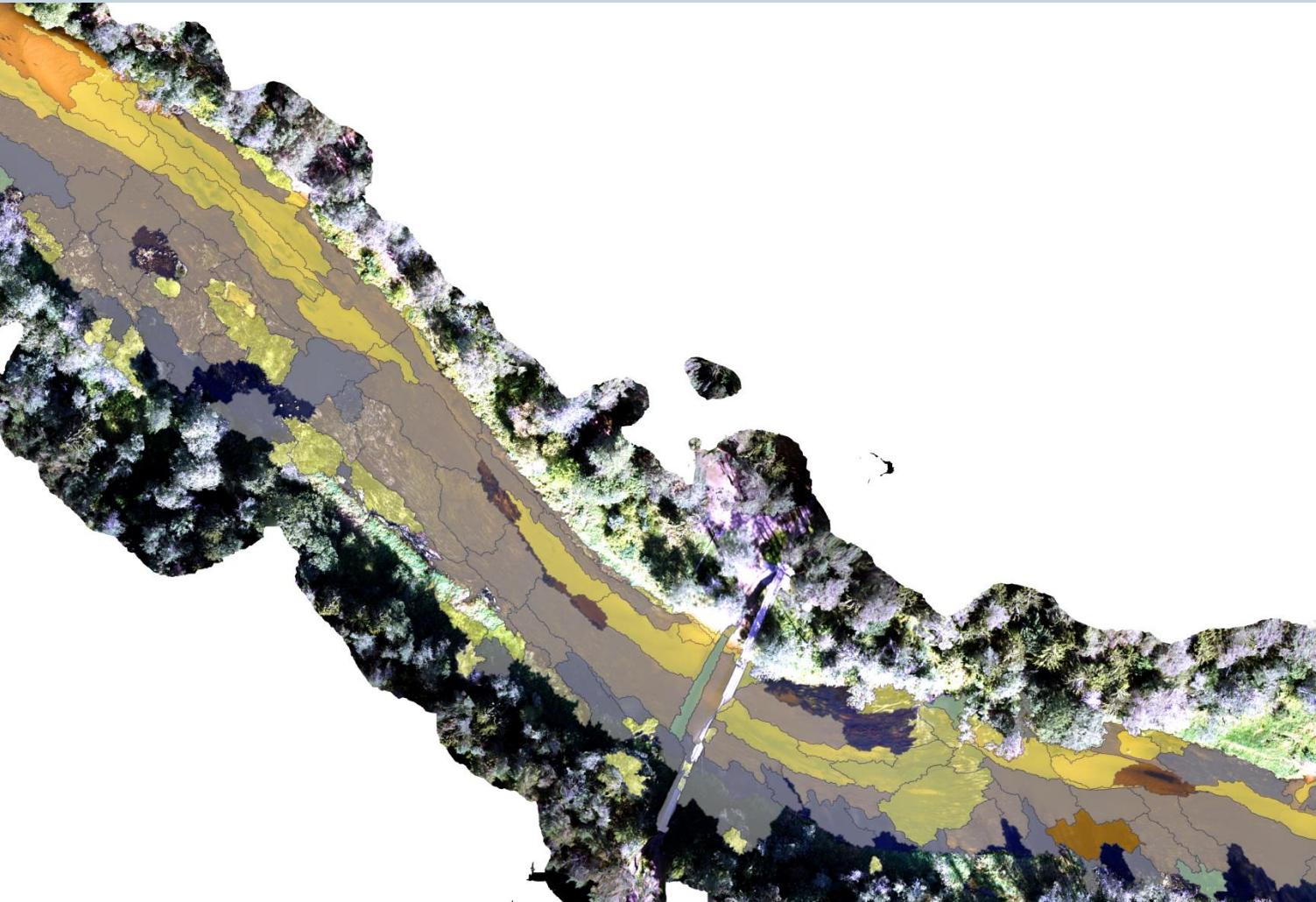
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Segmentation and classification of the Šventoji river bed (in the section Mikieriai - Androniškis) according to the nature of the bed bottom and surface.

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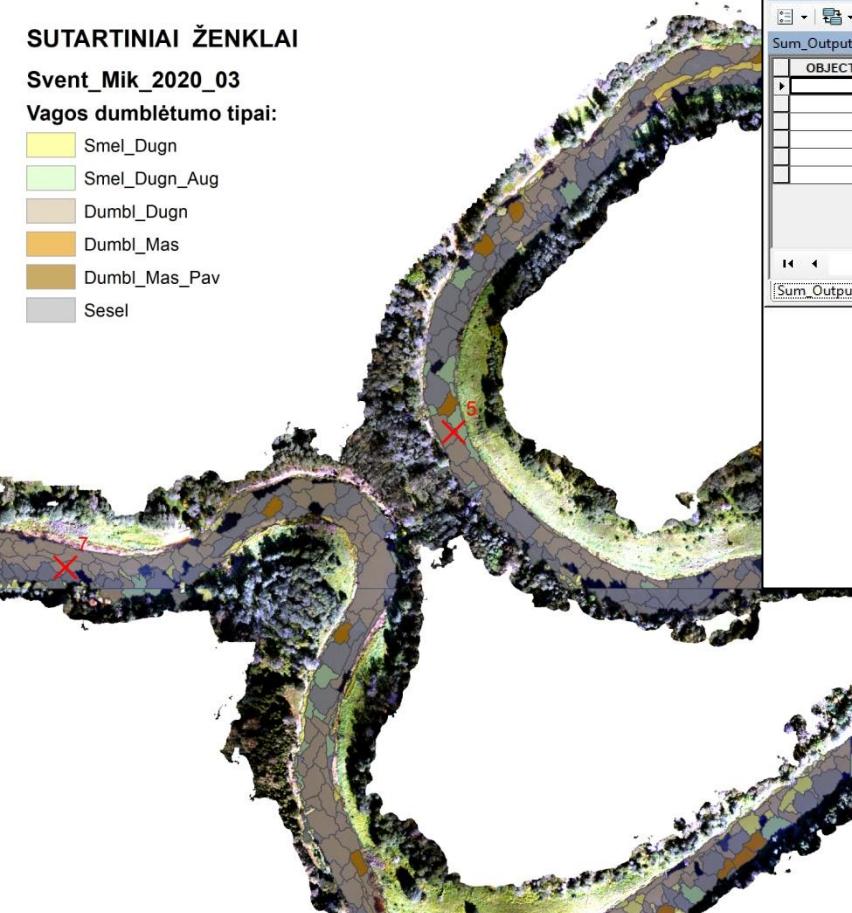
III Stage Algae accounting and resource estimation

SUTARTINIAI ŽENKLAI

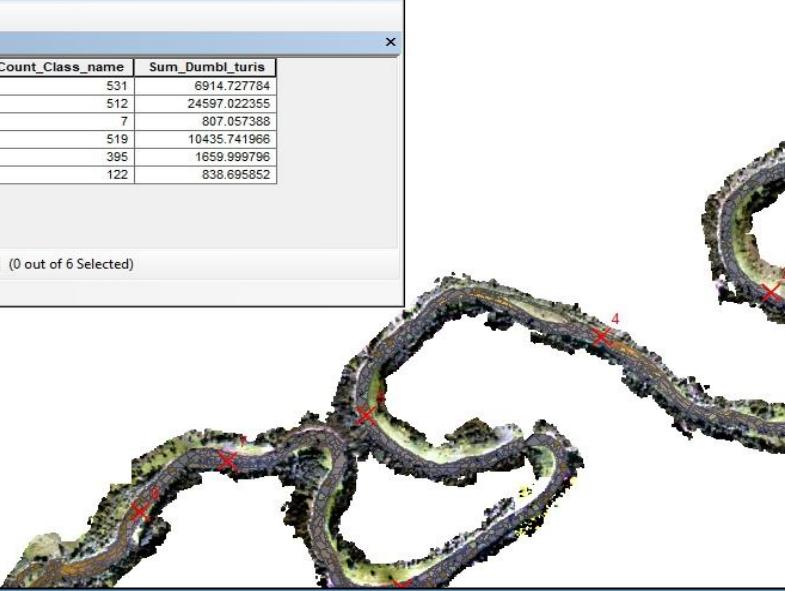
Svent_Mik_2020_03

Vagos dumblėtumo tipai:

- Smel_Dugn
- Smel_Dugn_Aug
- DumbL_Dugn
- DumbL_Mas
- DumbL_Mas_Pav
- Sesel



OBJECTID *	Class_name	Count_Class_name	Sum_DumbL_turis
1	DumbL_Dugn	531	6914.727784
2	DumbL_Mas	512	24597.022355
3	DumbL_Mas_Pav	7	807.057388
4	Sesel	519	10435.741966
5	Smel_Dugn	395	1659.999796
6	Smel_Dugn_Aug	122	838.695852





III Stage Algae accounting and resource estimation

Distribution of areas and volumes of filamentous algae in the section of the Šventoji river (between Mikieriai and Andrioniškis) according to the nature of the river bed.

Vagos dugno tipai	Bendras tipui priskiriamų arealų plotas (ha)	Dugno tipo ploto dalis nuo viso tiriamo ploto (%)	Bendras tipui priskiriamų arealų dumblų tūris m ³	Tipos dalies tūris nuo viso tūrio
Dumbliai dugne	69,147	35,36	6914	16,17
Dumbliai vandens masėje	49,149	25,13	24597	57,53
Dumbliai vandens masėje ir paviršiuje	1,008	0,52	807	1,89
Smėlėtas dugnas	15,699	8,03	0	0
Smėlėtas dugnas su augalų intarpais	8,386	4,29	0	0
Šešeliuoti plotai	52,178	26,68	10435	24,41
VISO	195,567	100	42753	100

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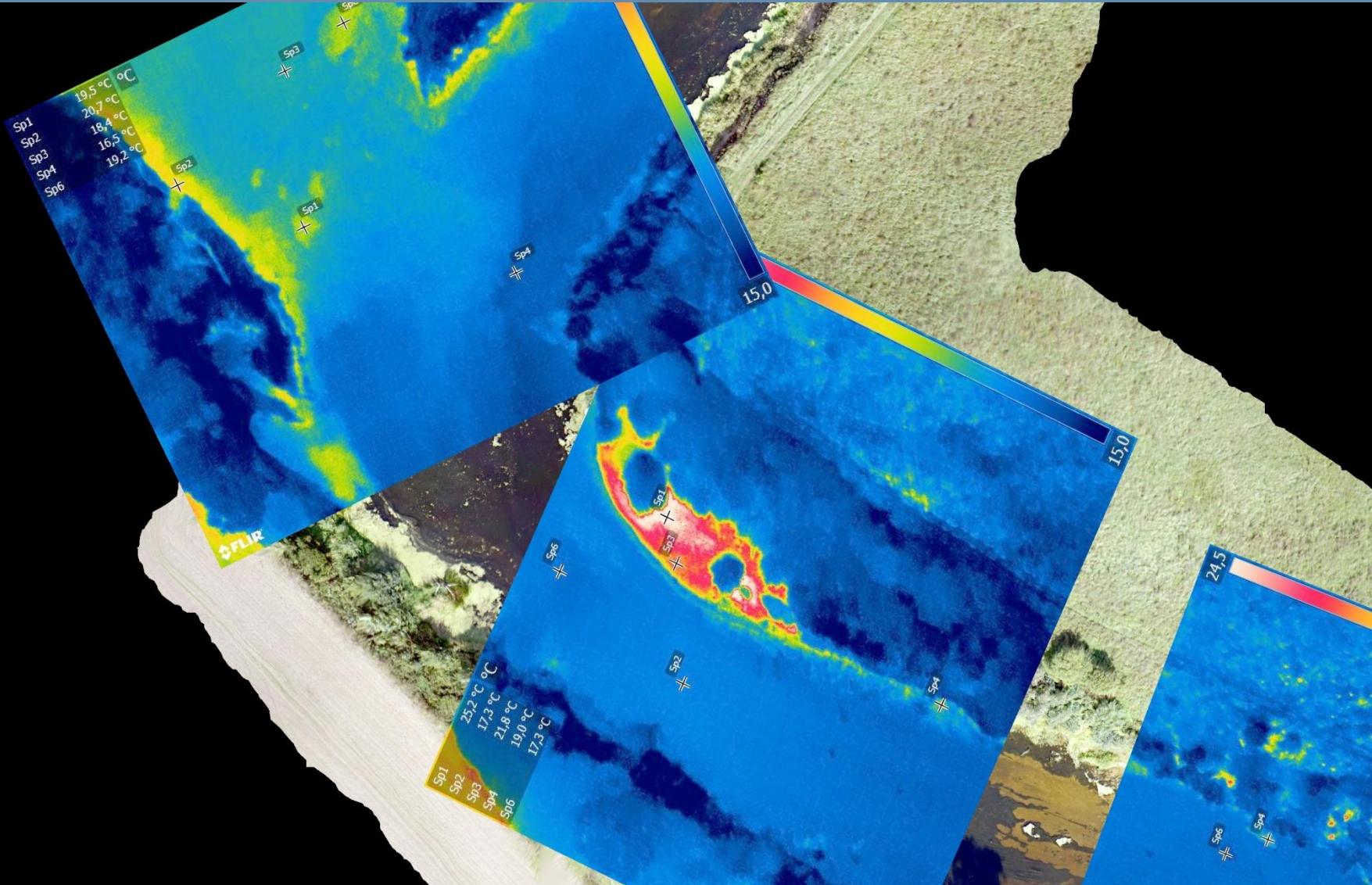
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Possibilities of application of additional algal resource identification methods



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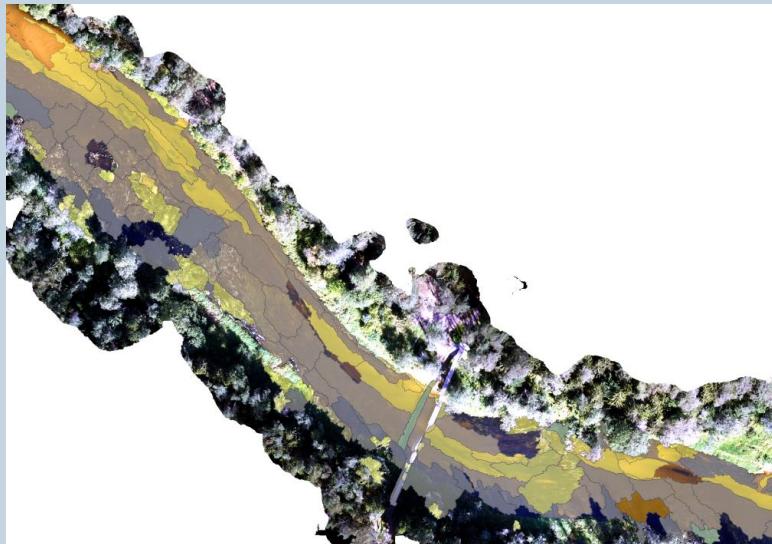
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Thank you
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Attention

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