

# A bird's eye view on river floodplains

## Mapping and monitoring land cover with remote sensing

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### Challenge

As a response to the world-wide degradation of river floodplains, many restoration projects have been initiated. As a result, changes in land cover will occur more often in space and time. As floodplain functions are mainly determined by land cover, knowledge on the state of the floodplain is indispensable for integrated floodplain management. Hence, monitoring is essential to evaluate and document the state of floodplains.

### Innovative components

- Methods to accurately measure vegetation height and efficiently map floodplain land cover using drone images.
- Change detection methods to monitor land cover conversion at a seasonal frequency using images from multiple satellites.
- Mapping method for water temperature and related habitat suitability in floodplain water bodies using drone-based thermal images.

### For whom and where?

River managers that are interested to use novel monitoring techniques to efficiently map or identify changes in the floodplain land cover over a range of scales.

### Application development and findings

We developed and tested methods over a range of different spatial and temporal scales and learned that:

- Vegetation height can be measured with an accuracy of 17-33 cm using UAV-based photogrammetry.
- Floodplain land cover can be semi-automatically mapped with unprecedented accuracies (>90%) using UAV-based images and vegetation height.
- Land cover change in natural forest, grassland and arable land can be detected accurately (>75%) at seasonal frequency with satellite images.
- Water surface temperature can be measured accurately (0.53°C error) using drone-based thermal imagery.

### Status for day-to-day practice

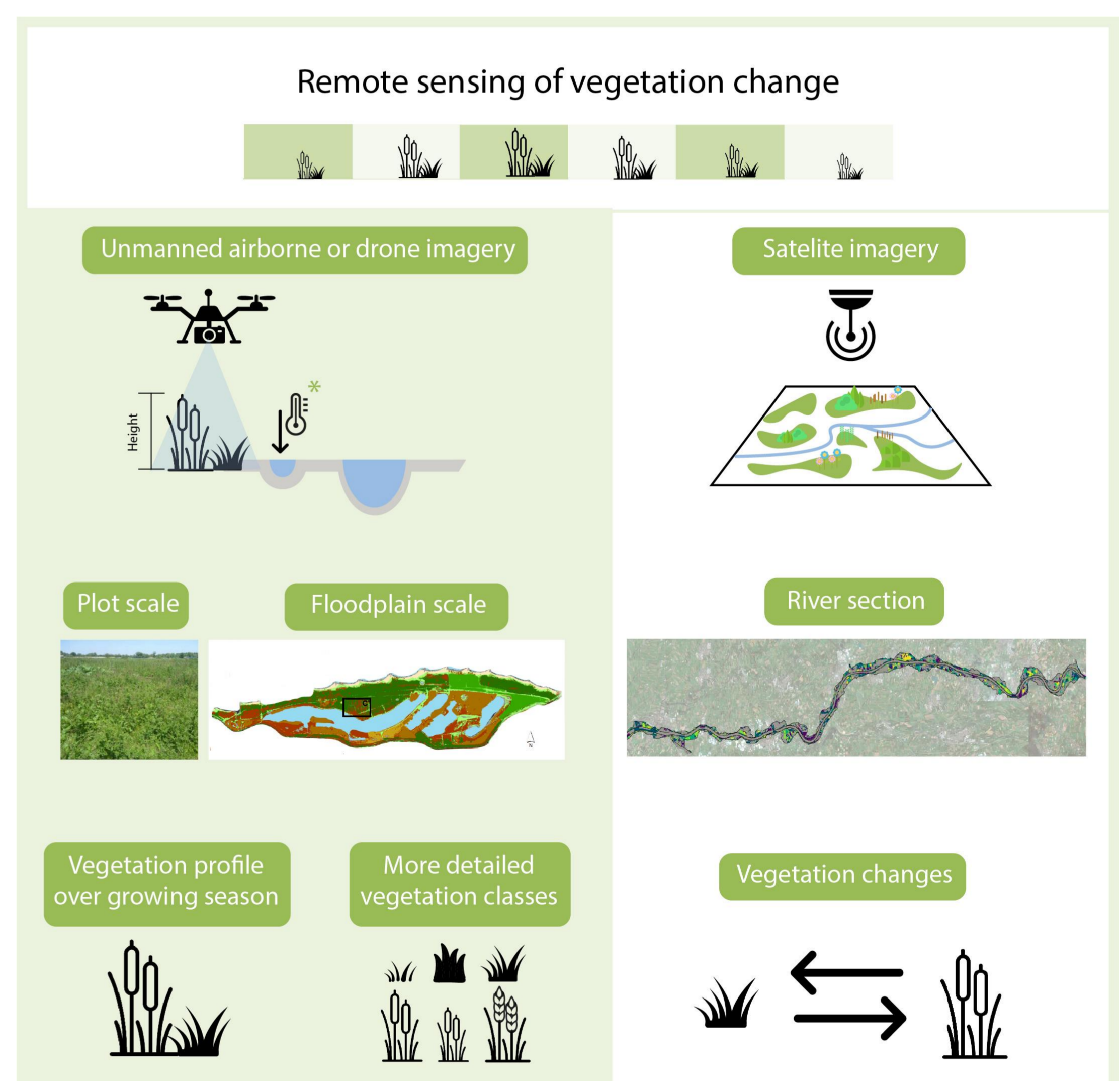
- UAV-based monitoring is useful for areas of a few km<sup>2</sup>.
- Satellite-based methods provide solutions at regional scale.

### Next steps

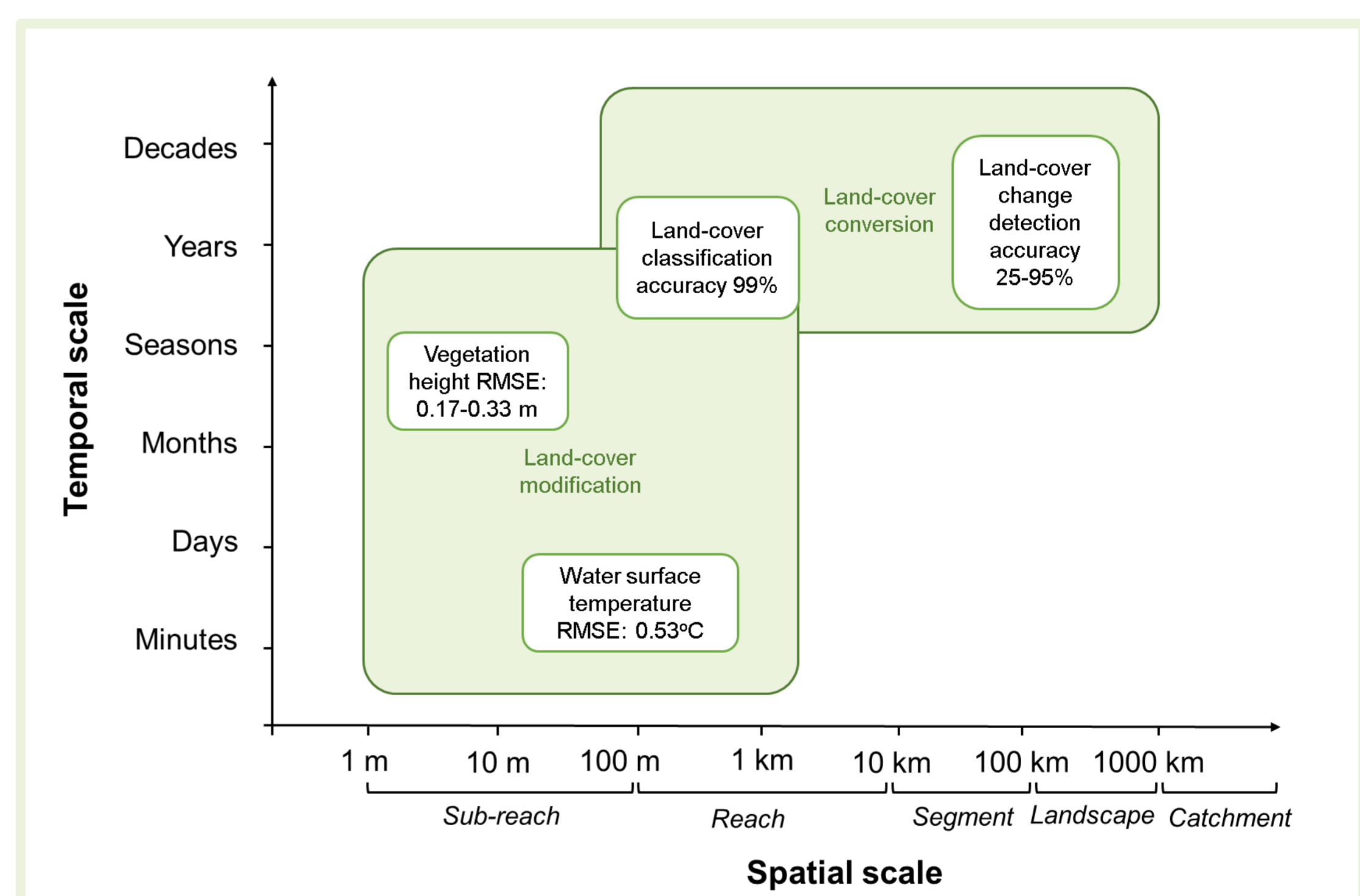
Tests at other locations and contexts using new sensor types to widen the field application of the developed methods.



Fieldwork involving image acquisition and field measurements



Our multiscale approach using UAV and satellite images to study



Accuracy of the monitoring methods at the scale at which they were developed

### Interested?

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Floodplain monitoring [project description](#)

