

SPECTRAL UNMIXING ANALYSIS FOR GRAVEL BAR DETECTION IN FLUVIAL ECOSYSTEMS

Liza STANČIČ^{1*}, Žiga KOKALJ¹, Krištof OŠTIR²
¹ZRC SAZU Institute of Anthropological and Spatial Studies; ²University of Ljubljana, Faculty of Civil and Geodetic Engineering; *lstancic@zrc-sazu.si

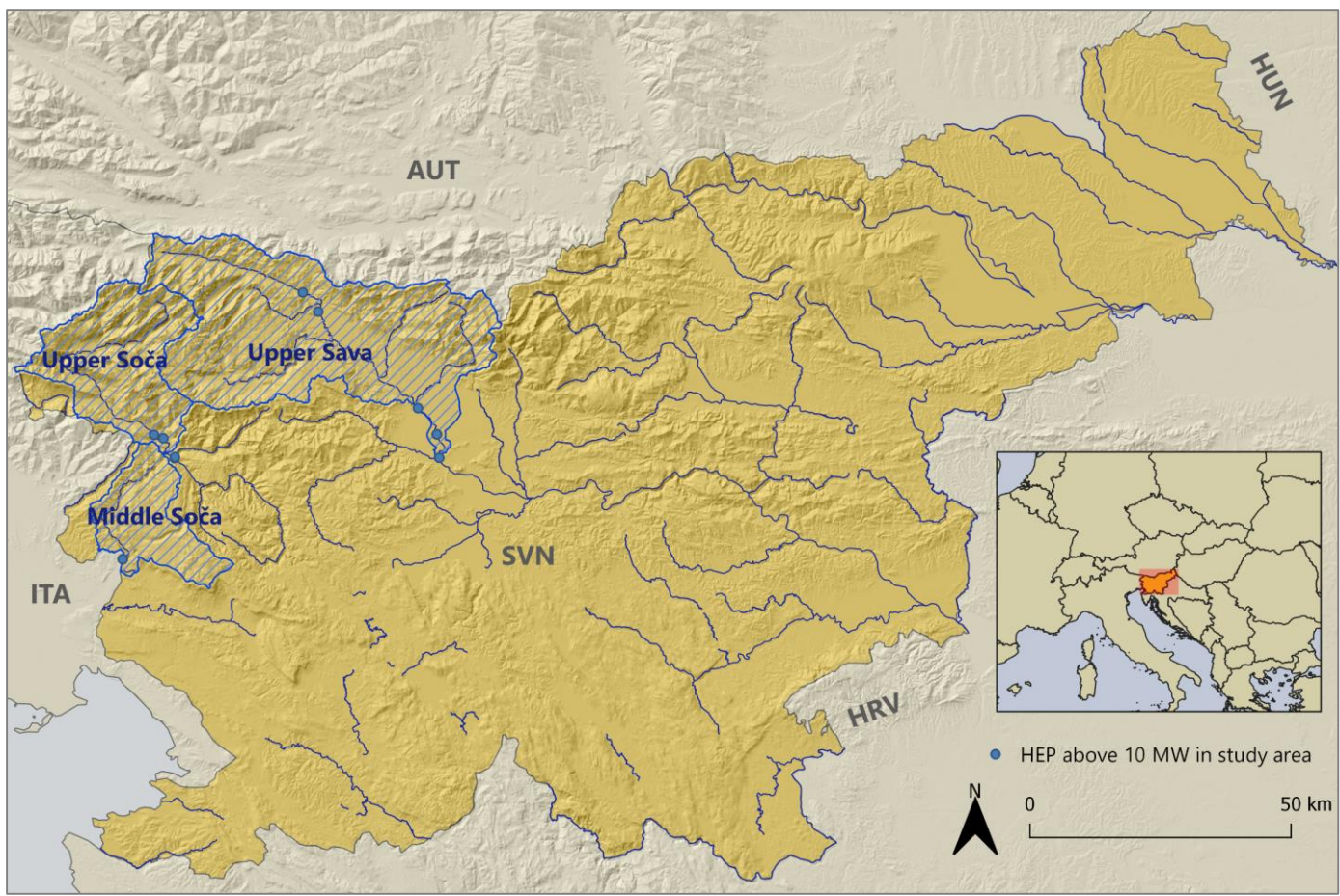


1. INTRODUCTION AND OBJECTIVE

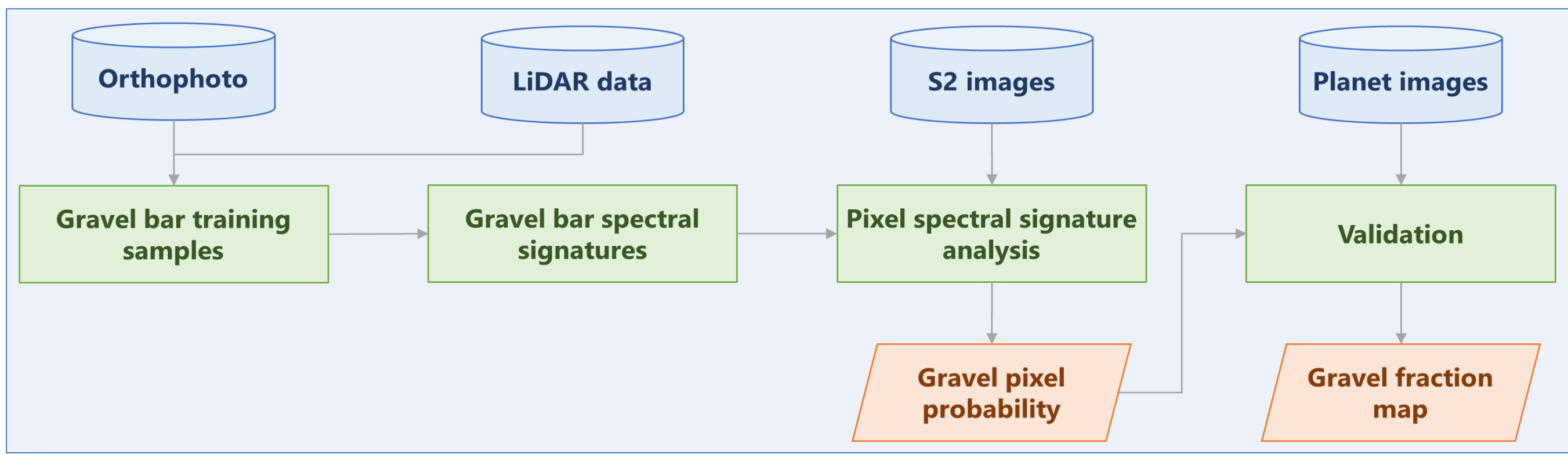
Earth observation data can contribute to monitoring the progress towards reaching the UN Sustainable Development Goals (SDG). This study focuses on SDG 6 *Clean water and sanitation* and associated indicator *Extent of water related ecosystems through time*. Several global products are already available, however, their coarse spatial resolution is problematic in regions with a high spatial fragmentation such as is typical for mountainous regions.



Through spectral unmixing of Sentinel-2 (S2) data, fluvial surface gravel bars are delineated. Being sensitive to changes in hydrology, gravel bars are important indicators of ecosystem disturbance due to dam construction and related water management practices. The test areas are upper and middle Soča, and upper Sava rivers in Slovenia.

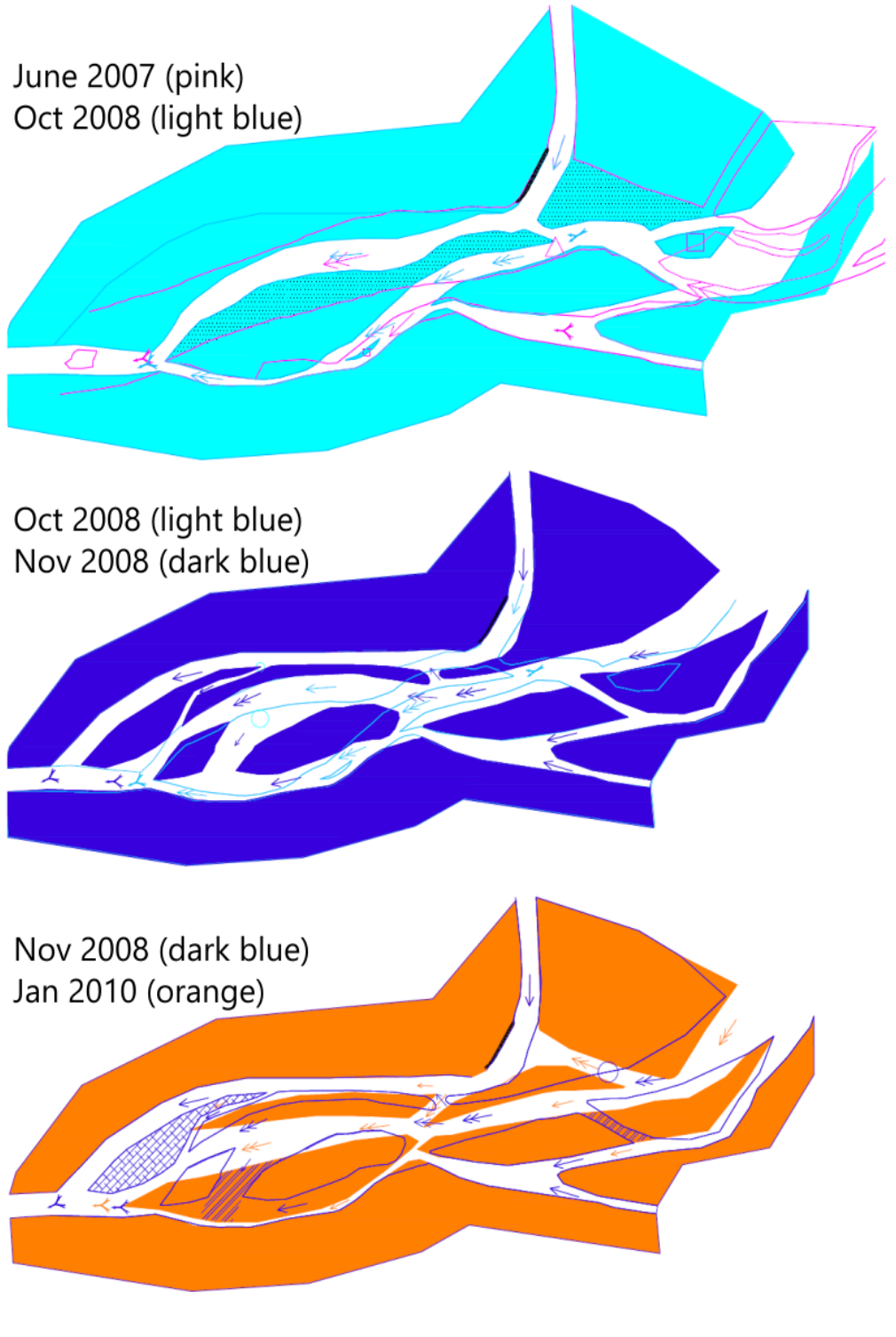
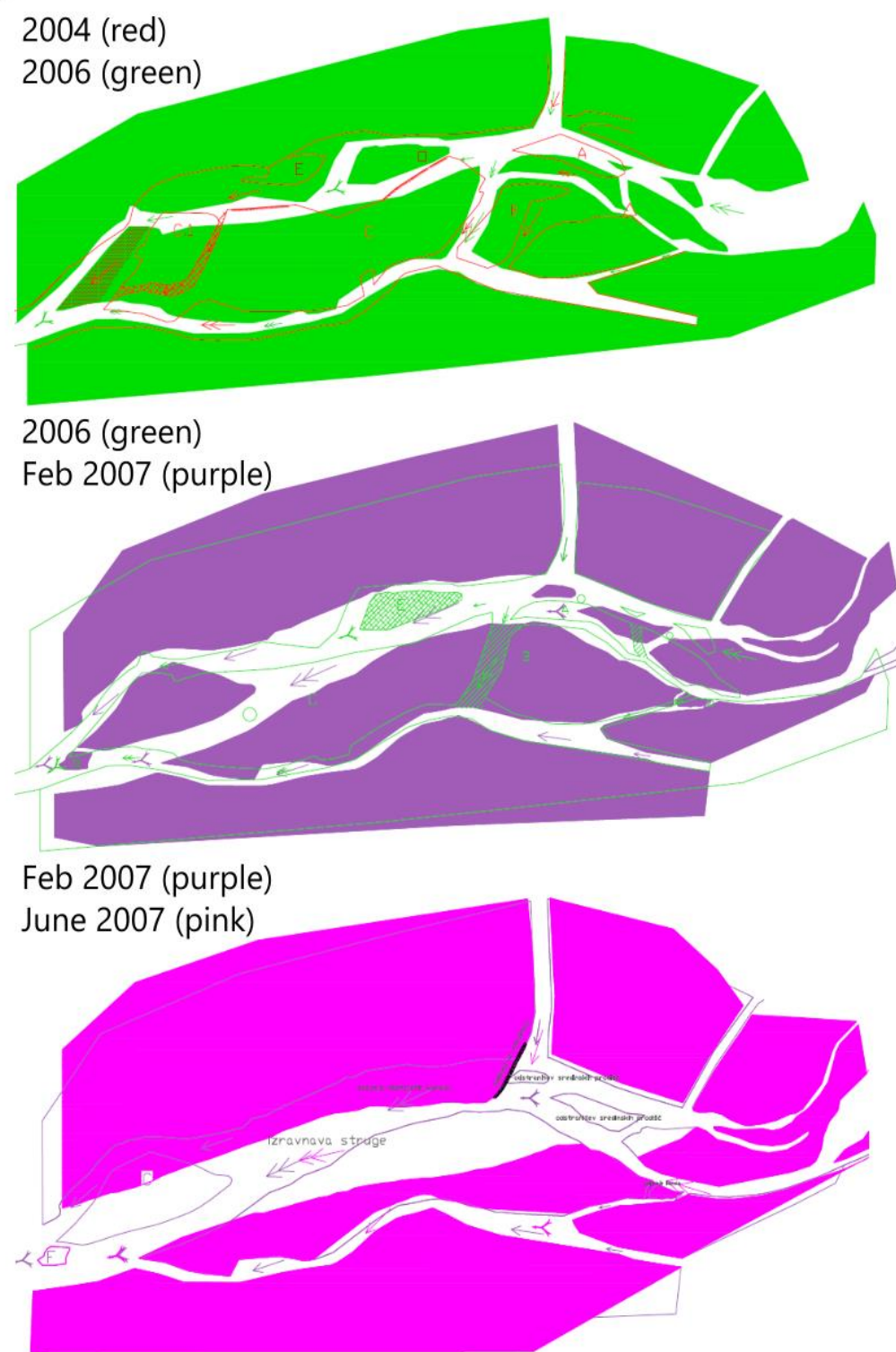


2. METHODS



3. EXPECTED RESULTS

- Standardised approach instead of time-intensive field mapping
- Timely information on gravel bar extent over large study area
- Impacts of extreme weather events, land mass movements and management practices



4. LIMITATIONS AND OPEN QUESTIONS

- Temporal resolution. National aerial photography campaigns once every three years. Only one national LiDAR campaign.
- Distinction between natural and anthropogenic influences
- Delineation of gravel bar ecosystems – how much overgrowth?
- How informative would be the results of spectral unmixing?

CONCLUSION

Spectral unmixing of S2 images using aerial orthophoto may provide more accurate information about the dynamics of fluvial sedimentation in mountainous areas. Mapping and time series analysis of surface gravel bar location may help us to better understand the processes of their formation. Distinguishing between natural and anthropogenic impacts is instrumental in protecting this diverse but fragile ecosystem. High temporal resolution remote sensing data is crucial to promptly follow developments over large and frequently inaccessible areas.

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