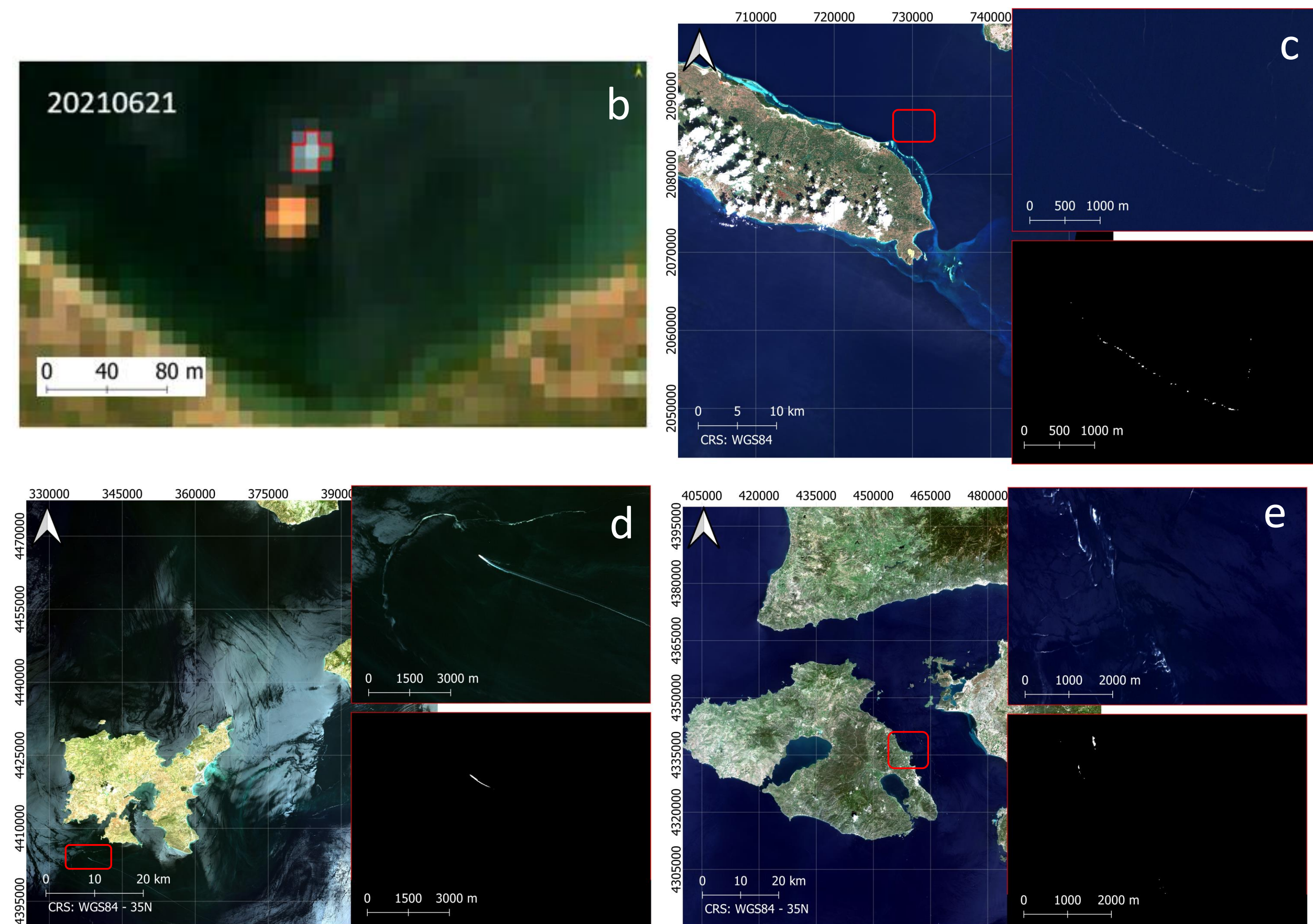


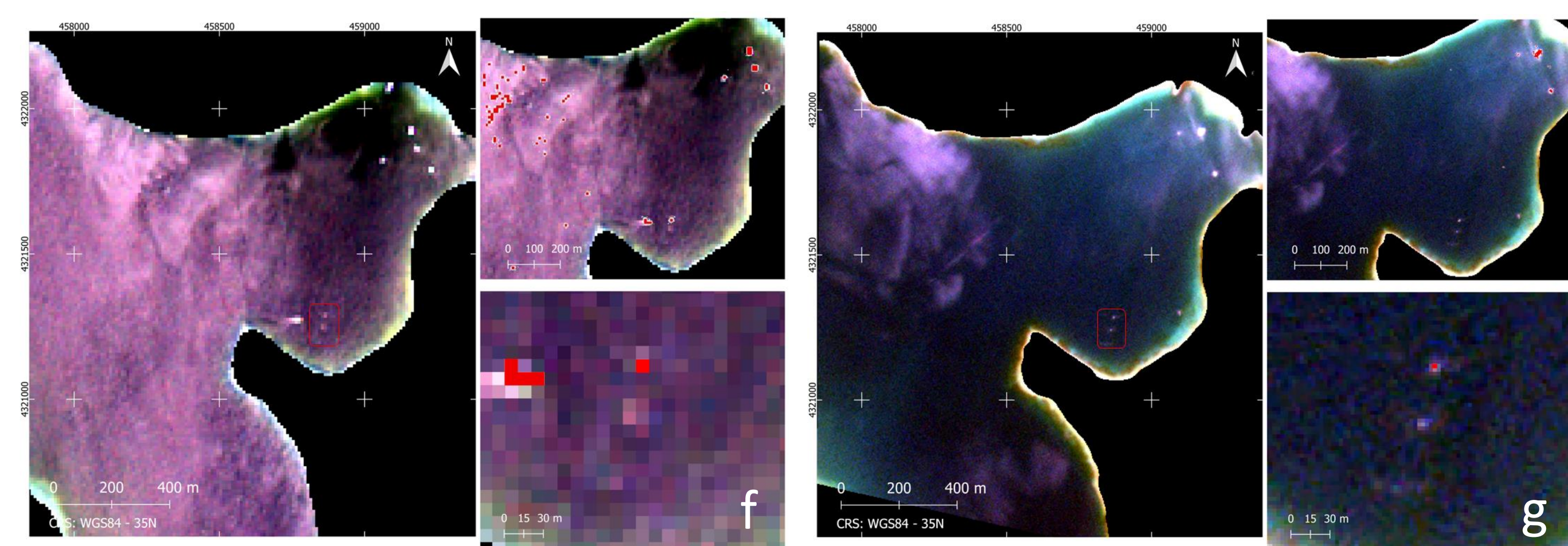
## Contributions to Remote Sensing of Floating Marine Litter Using Artificial Targets: The Plastic Litter Projects

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The Plastic Litter Projects (PLP) were initiated in 2018 as exploratory studies and data acquisition campaigns using artificial targets, for floating marine litter (FML) detection through satellite and UAS remote sensing. The PLPs have demonstrated the possibility to effectively detect artificial FML targets using spectral classification methodologies with Sentinel-2 data. An FML abundance fraction of 20% in a 10x10 m<sup>2</sup> Sentinel-2 pixel, can be discriminated from water pixels and natural debris, under reasonable conditions of sun-glint, wind, and cloud cover.

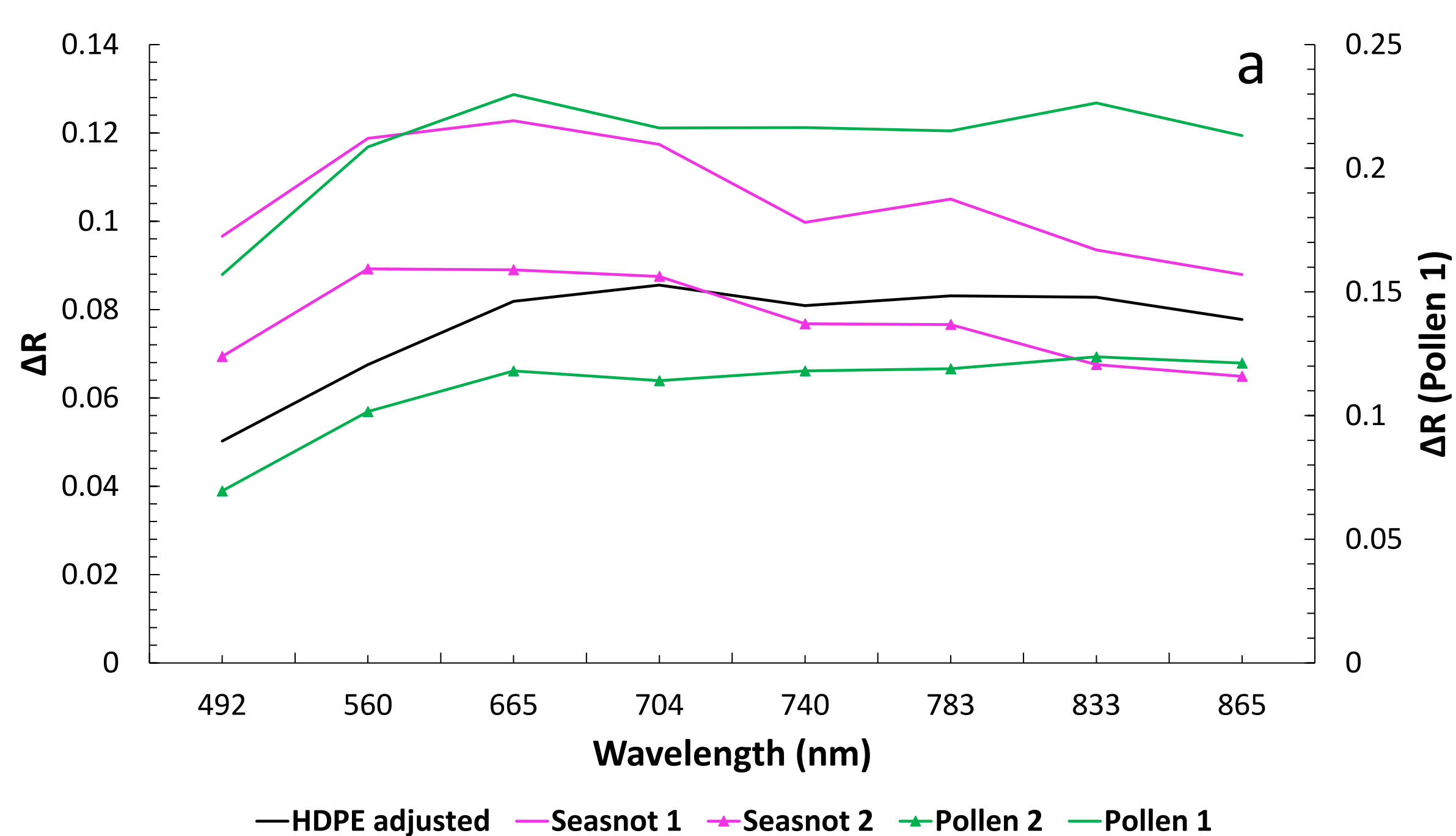


b) PLP2021 HDPE target detection and discrimination from wooden target, c) FML detection off the coast of La Gonave Island, Haiti, d) Sea snout detection avoidance off the coast of Lemnos Island, Greece, e) Pollen false classification off the coast of Lesvos Island, Greece



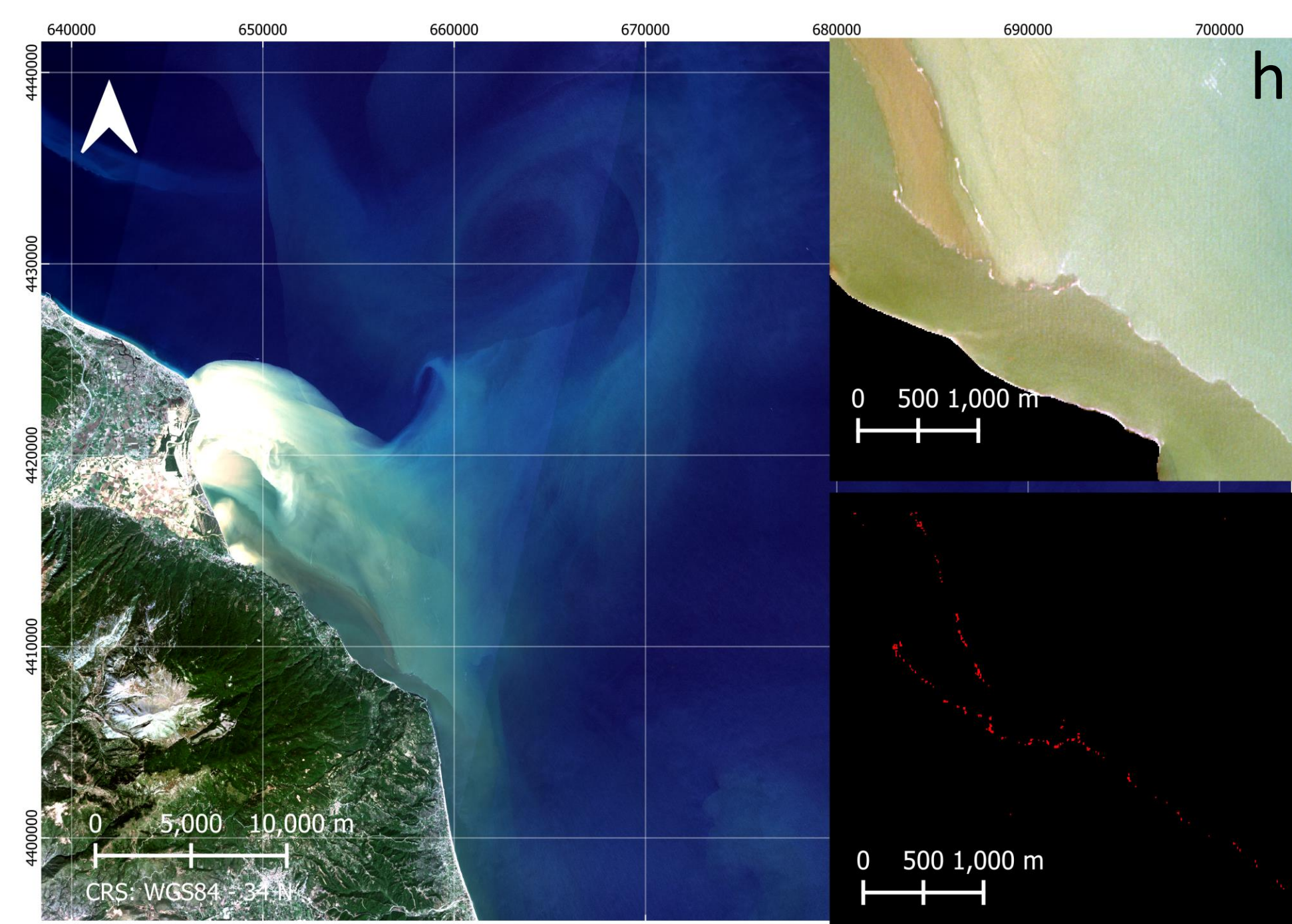
Assessment of minimum detectable FML fraction using Sentinel-2 (f) and PlanetScope SuperDove (g) imagery. We looked at 1, 2 and 3 m<sup>2</sup>.

The identification of FML becomes additionally challenging with the presence of other suspended substances like pollen and marine mucilage (a). These materials accumulate in convergence zones and windrows, as does FML. Biofouling and submersion also notably affect the signature of FML, adding complexity to detection.



### References

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Potential FML windrows detection (h) at the Pineios river delta in Greece, after the torrential rainfall event during Storm Daniel in September 2023. The storm resulted in large amounts of sediment and debris flows, including anthropogenic and plastic debris.

Moving forward, detection of FML and beached litter using satellite and very high resolution UAS imagery, will be implemented in the Danube River in Novi Sad, as part of the EU co-funded UpStream project to tackle riverine plastic litter pollution.

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