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Background

- Freshwater flowing from rivers through estuaries into the marine realm maintains essential ecological processes that keep marine resources healthy by providing nutrients and sediments that form important habitats and underlie critical ecological processes.
- Plumes are readily observable as brown turbid water masses contrasting with the clearer saline seawater.
- The spatial scale and dynamic behavior of river plumes can be detected in satellite imagery to provide quantitative insights into freshwater discharge volume, sediment loads, plume extent, and plume duration.
- For this study turbidity act as proxy for freshwater discharge , and a substitute for water clarity.

Objectives

- To define the “footprint” of fluvial flows in marine realm.
- To create a spatial layer data repository for river plumes in the marine realm.

Results

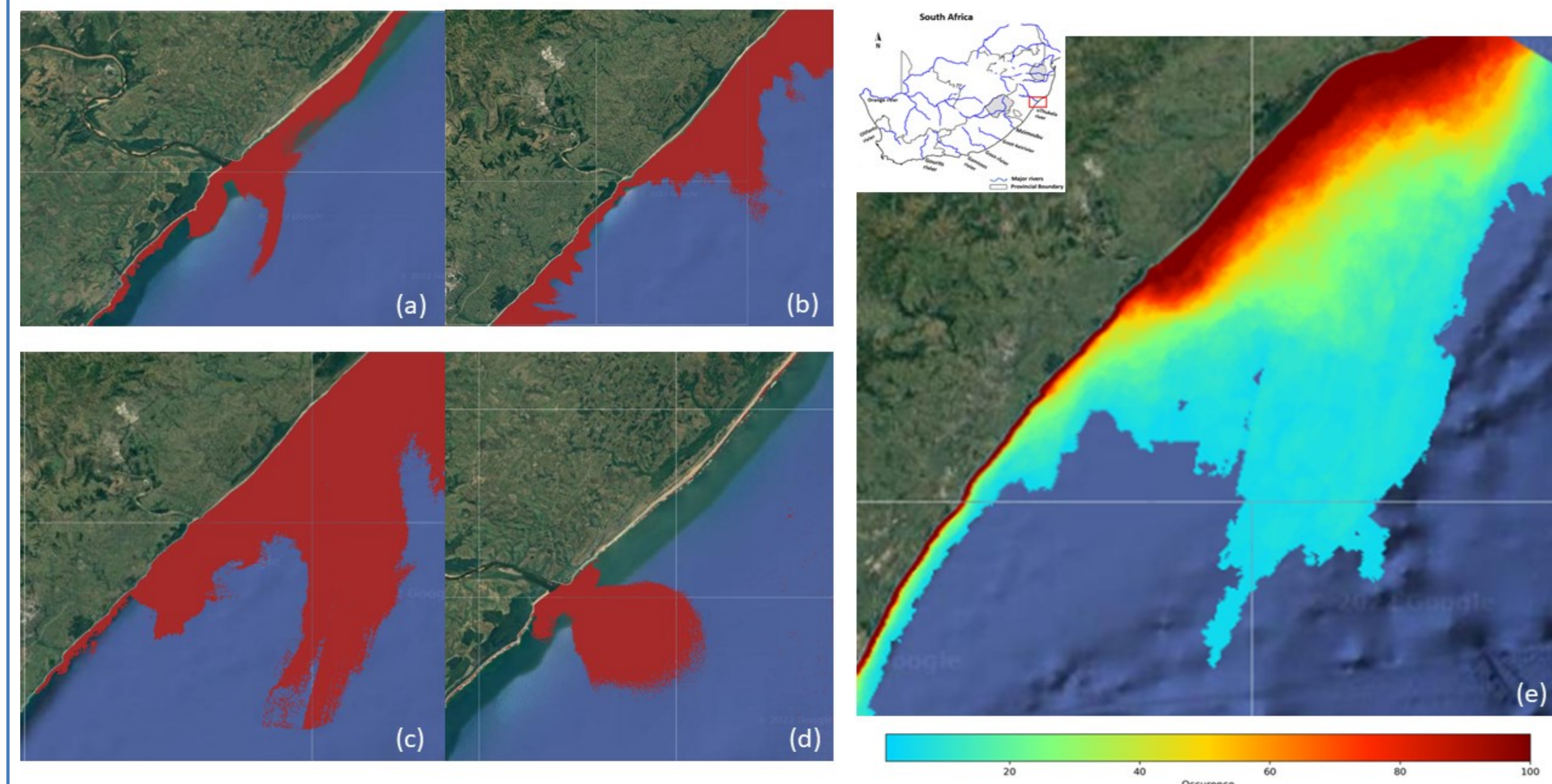
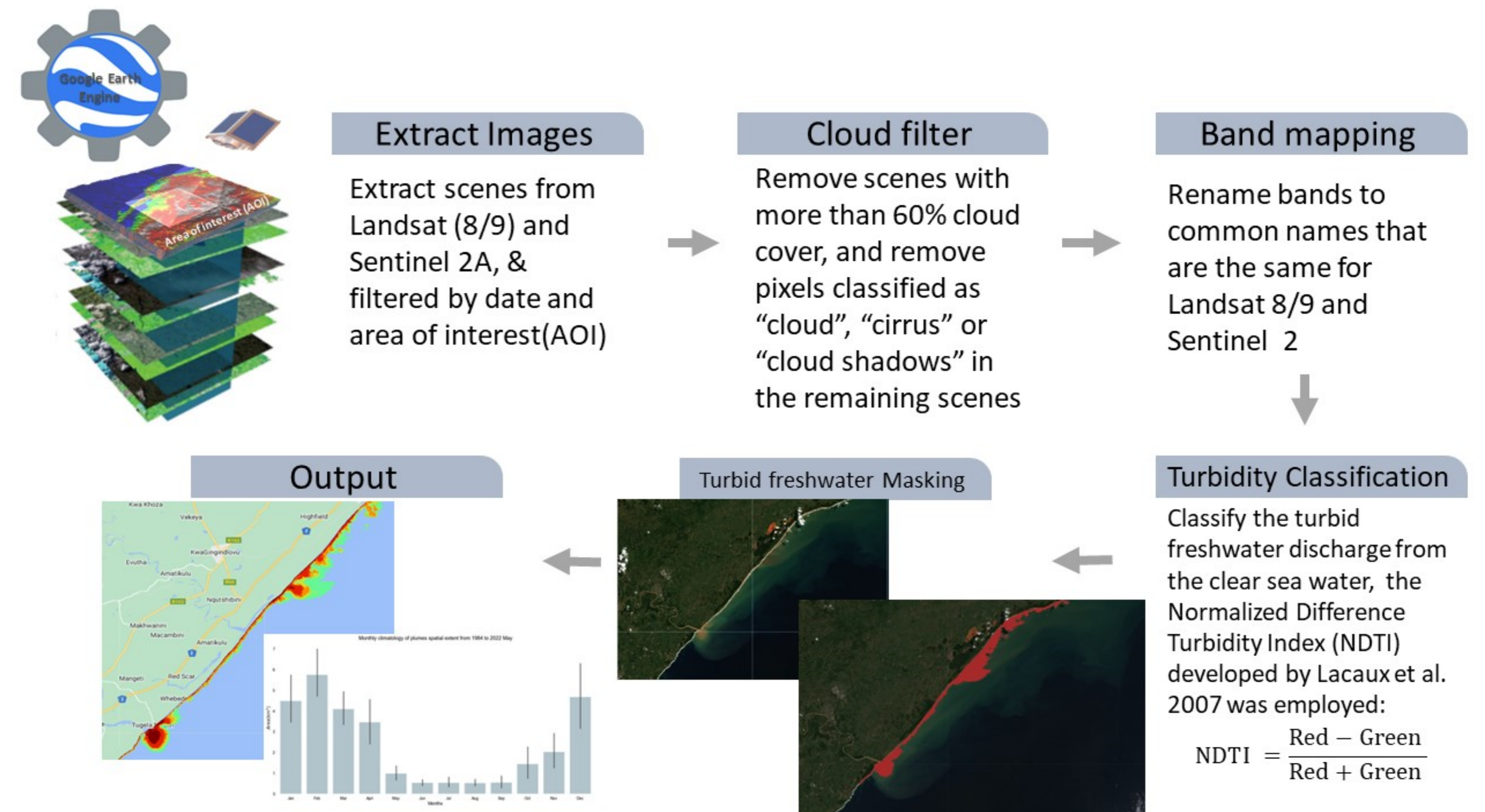


Figure 1: Random images (a-d) with clear sky, showing difference sequential plume extent off uTukela River Mouth. e) Spatial occurrence of the plume between [28/03.2013] and [25/09/2022]

Data and Methods



Conclusion

- The use of remote sensing imagery to map plume extent provides a synoptic view of the impact of extreme even(floods) and catchment land use, even if not fully represent the maximum extent.
- The results will be useful for delineating marine coastal ecosystems subject exposed to freshwater discharges. Plumes can be mapped and their intersection with ecosystems spatially assessed.
- Evaluating historical occurrence and visual representation of plume extents provides a means of analyzing freshwater discharge variability, and how it modulate the ecosystem function and dynamics across space and over time.

References

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