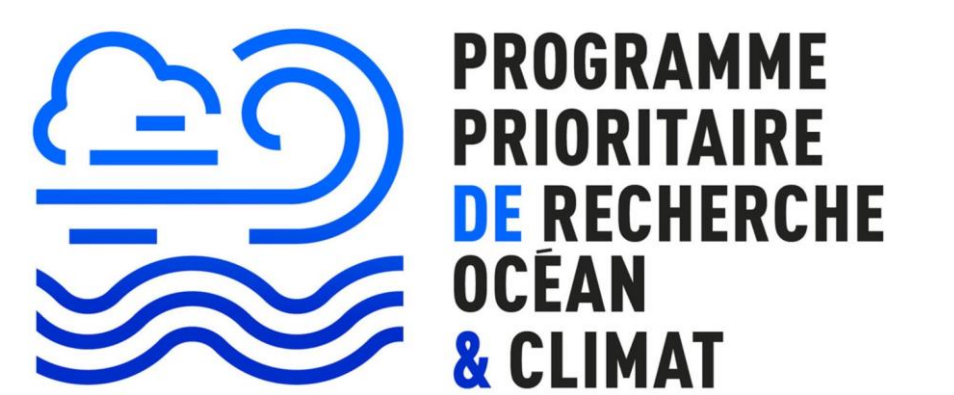


# The Deterministic Opportunism Of Mangrove Natural Establishment

## Lessons From The Open Muddy Coast Of French Guiana

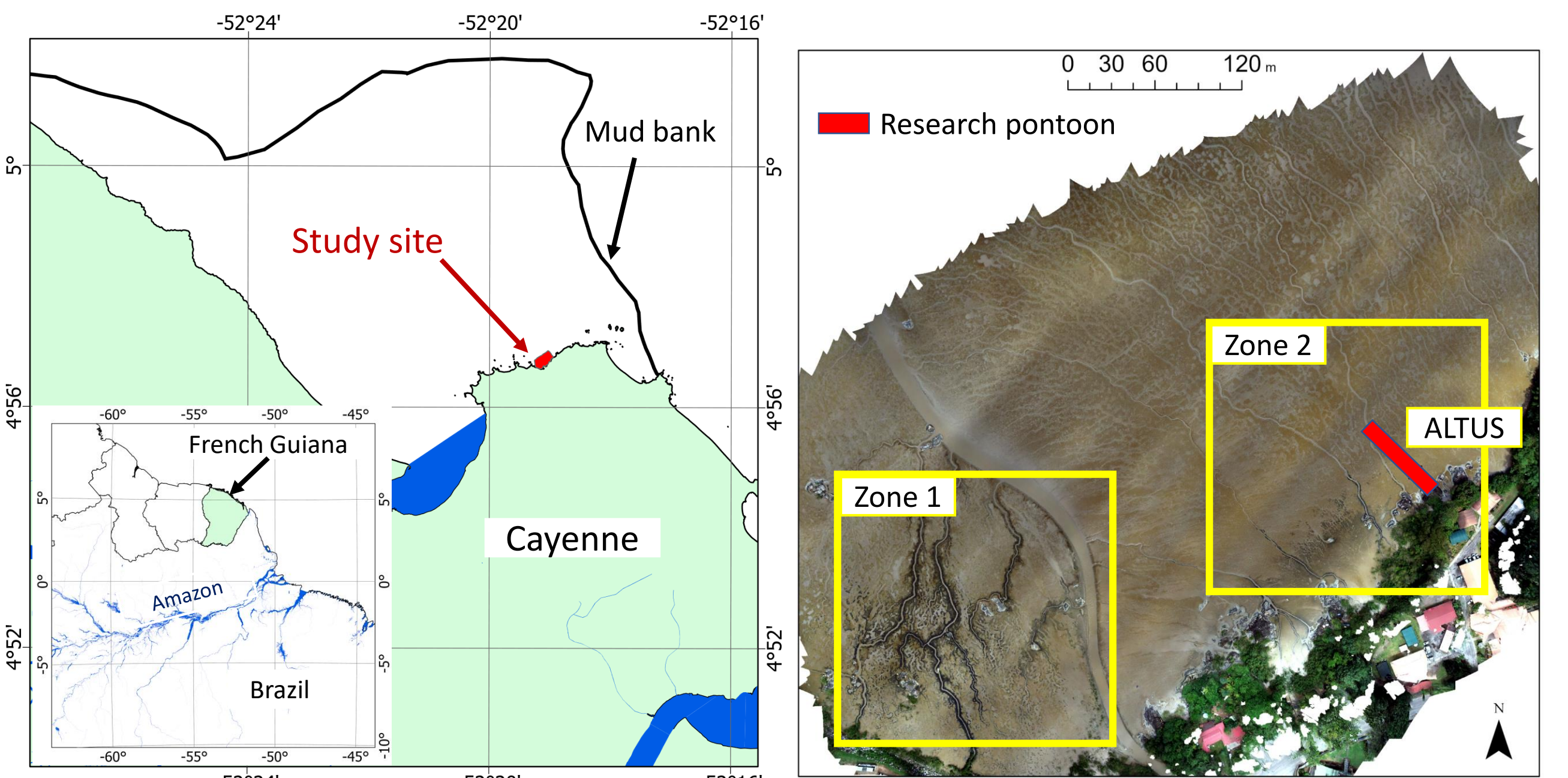
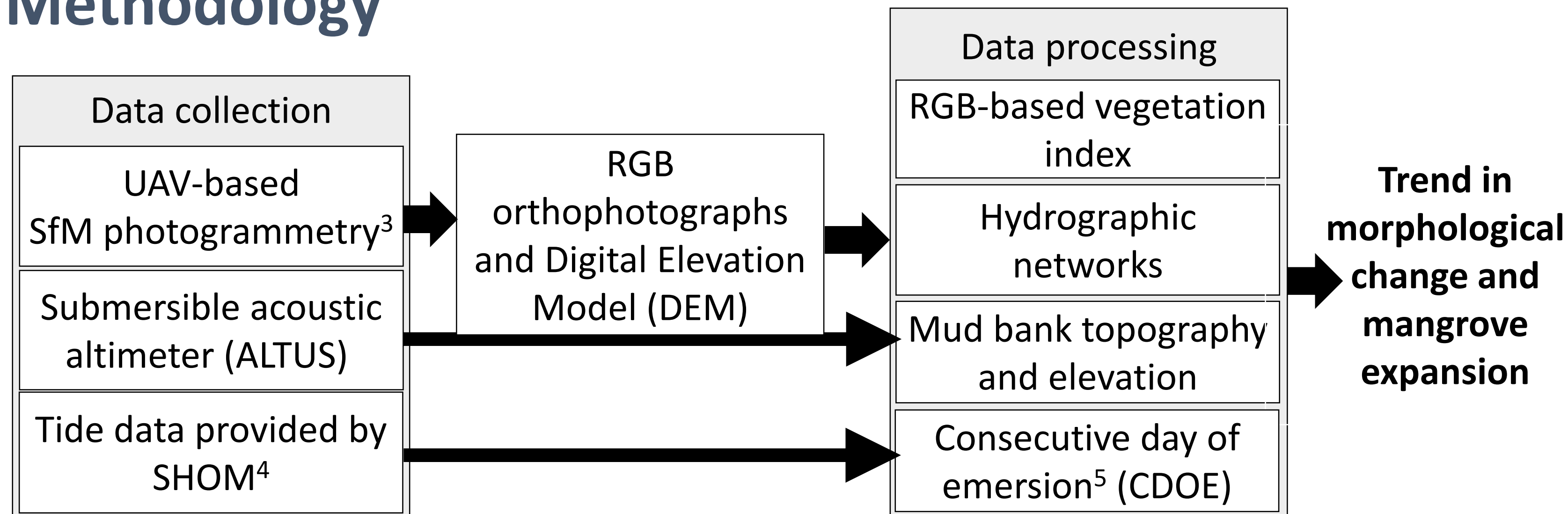
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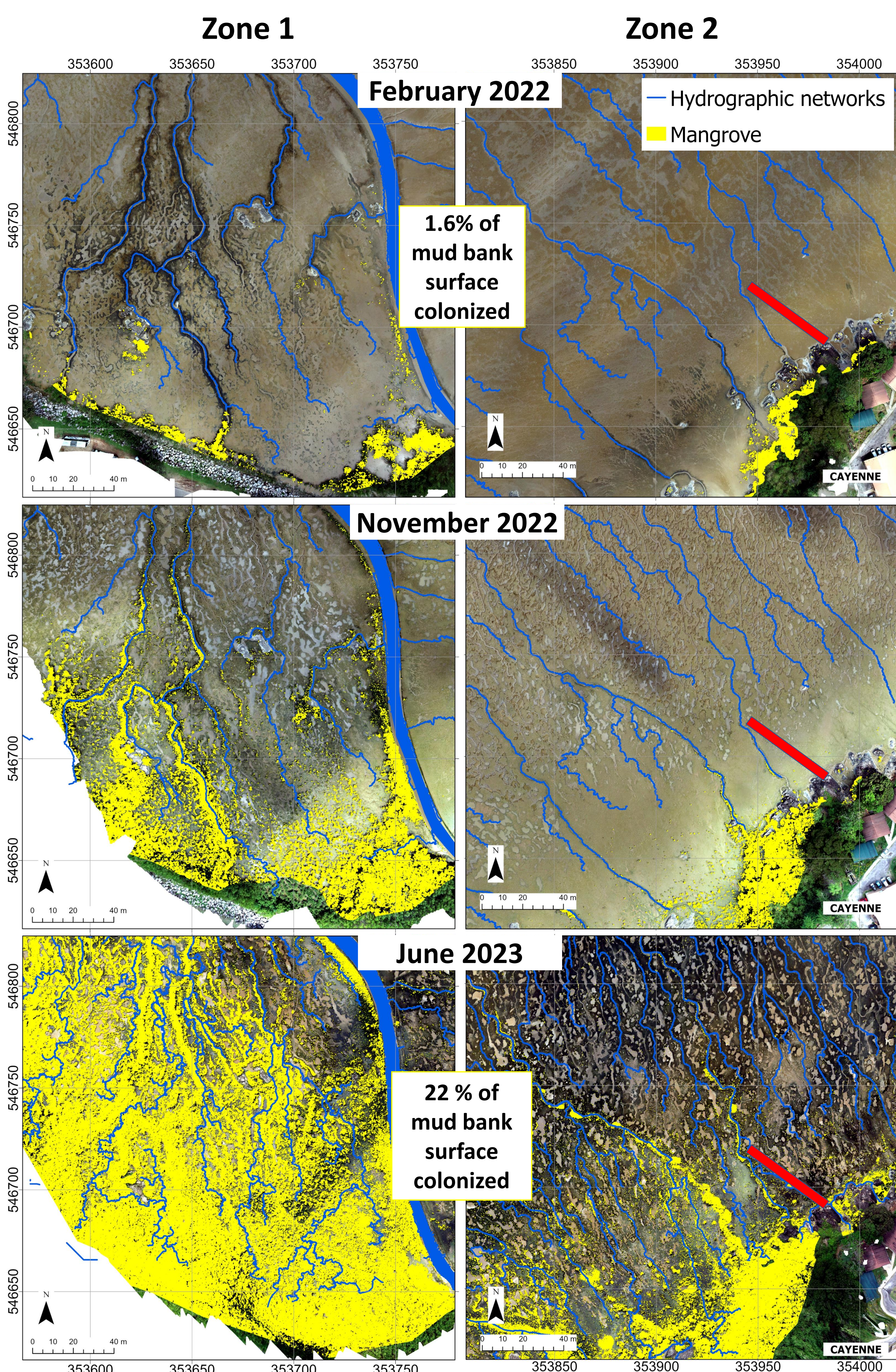
French Guiana has 320 km of coastline, 80% of which is covered by mangroves. Situated at the heart of the Amazonian sediment dispersal system, which is responsible for the migration of huge mudbanks, it's one of the most unstable coastal dynamics in the world. Spatial observations have shown that both cross-shore mangrove removal and establishment rates can reach up to 500 m per year<sup>1,2</sup>. Here, there is no need to restore mangroves at all: the mangrove expansion processes are so fascinating that they give us the opportunity to analyze in depth their ability to establish themselves naturally on rapidly changing muddy shores, under the effect of wave climate.

### Methodology



Location of the study site (20 ha) in Cayenne, Fr. Guiana.

### Mangrove expansion



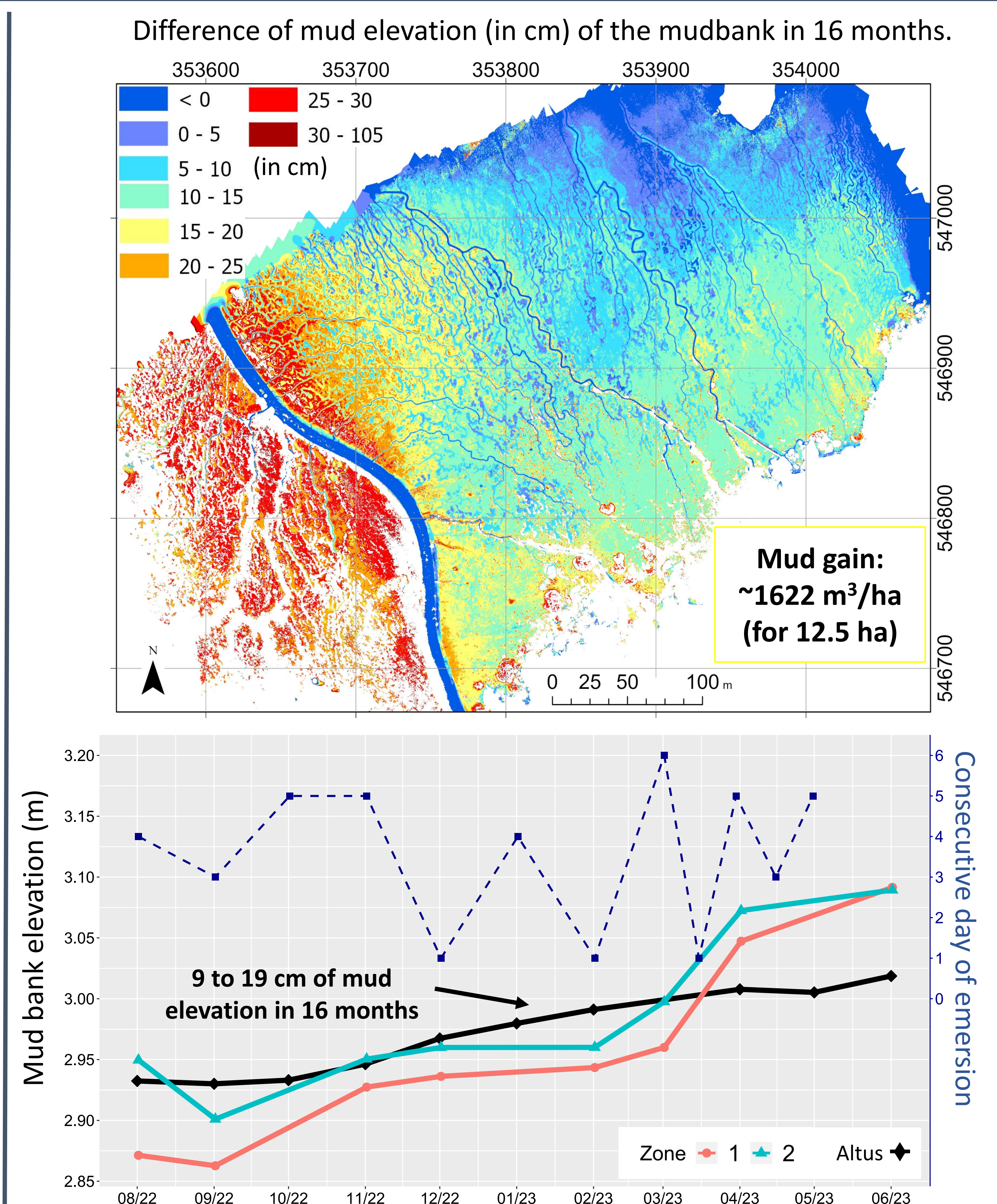
Mangrove expansion and hydrological network development in 16 months.

→ Early development in Zone 1 while mangroves develop from December onwards in Zone 2. *Laguncularia racemosa* seedlings dominate.

→ Then, mangrove continue to grow along the dewatering channels and everywhere in between during the Nov.-June period

### Results

### Mudbank elevation monitoring



Mud elevation > 2.8 m → High probability of mud cracking and emersion periods (>3 CDOE) → increase opportunity for mangroves seeds to be trapped<sup>6</sup>.

### Conclusion

- Before Nov. 2022, mud elevation and consolidation are too low.
- Then, sediments are deposited and a network of dewatering channels and mud cracks follow : conditions propitious to mangroves establishment?
- Dominance by *Avicennia germinans* should come after December (huge flux of seeds, neoteny).
- On the effects 1) from heavy rainfalls on the liquefaction of the mud surface, 2) from emerged rocks on the protection against seedling uprooting and 3) from long drought on mud and mangroves, ... ?

### References

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