

First assessment of the impact of shrimp aquaculture on the mangrove of New Caledonia

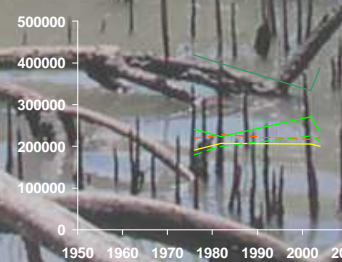
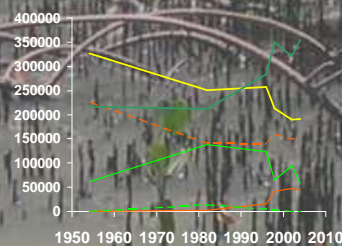
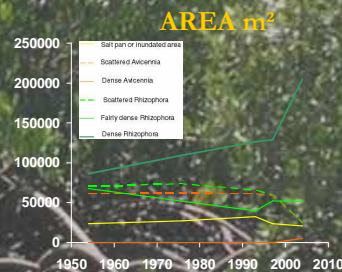
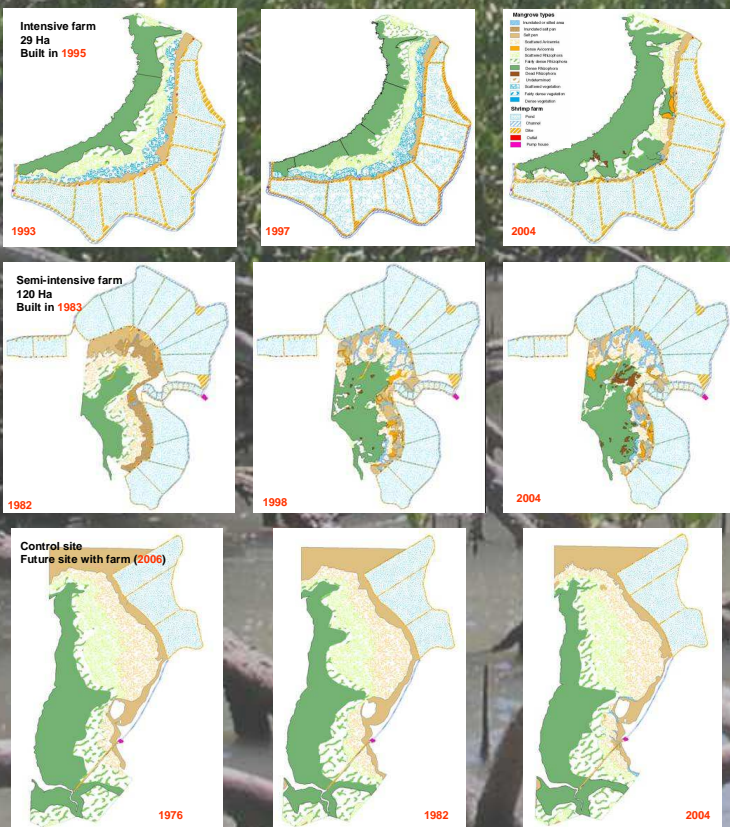
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Shrimp aquaculture in New Caledonia is dedicated to the species *Litopenaeus stylirostris* and is a developing industry. In 2004, 19 farms have harvested around 2200 tons of shrimps. Located on salt marches just behind the mangrove forests, the shrimp farms could affect the neighbouring environment, particularly the mangrove. The shrimp pond effluent discharged into the lagoon could represent the main impact on the coastal environment.

A study related to the impact of aquaculture on mangroves has been carried out in 3 sites (2 of them close to shrimp farms with different level of intensification and one control site without any impact). The main goal was to assess historical changes of different vegetation types in terms of structure and surface, based on aerial photograph processings and analysis.

RESULTS



DISCUSSION and CONCLUSION

The temporal comparison of aerial photographs of sites close to farms between 1954 and 2004 has highlighted an increase of *Rhizophora* area landward and a densification of this canopy. These changes which were minimal before building shrimp ponds, seem to increase after the farm settlement. At the same time, the *Avicennia* area between the *Rhizophora* and the salt pan has become scarce over time. A development of silted areas close to pond outlets have also been noticed and some gaps (dead *Rhizophora*) appeared on the same sites.

Shrimp aquaculture has an impact on mangrove structure by the way of effluents which lead to nutrient enrichment and sometimes flooded and silted area depending on the hydrological regime and topographical level of the site. *Avicennia* spp., which are generally more salt tolerant than *Rhizophora* spp. tend to replace *Rhizophora* in areas that are less frequently flooded by the tide. One explanation for the landward migration of *Rhizophora* spp. may be that the input of wastewater from the ponds has made the soil wetter along the landward margins of the mangroves. Then, the soil has become more suitable for colonization by *Rhizophora* spp.