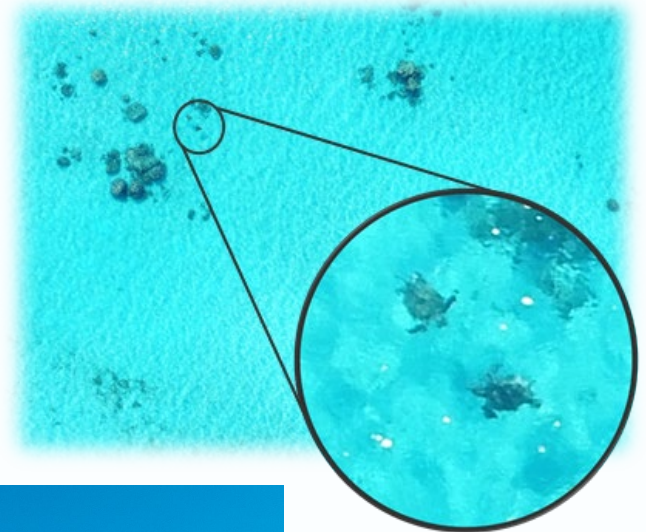


Introduction – Assessing turtle detectability for accurate abundance estimates with drone surveys

- How many are there?
- Turtle detection probability and turtle diving behaviour
- Refine drone survey methodology
- Enhance the accuracy of estimates



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Detection Probability

- Several critical variables affect our ability to detect turtles:
 - Turtle depth relative to water surface
 - Water turbidity or clarity
 - Sea state
 - Habitat complexity (e.g., seagrass, coral reefs)
 - Sunlight and glare
 - Time of day
 - Drone altitude
 - Drone camera specs and angle



Turtle Diving Behaviour

- Influences turtle detectability in drone surveys
- Depth usage data
 - Proportion of time spent at various depth ranges

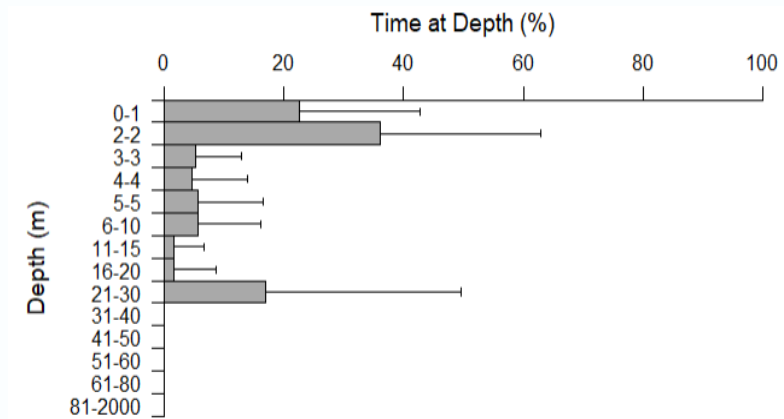


Fig a) Proportion of time at various depths for a tagged turtle.

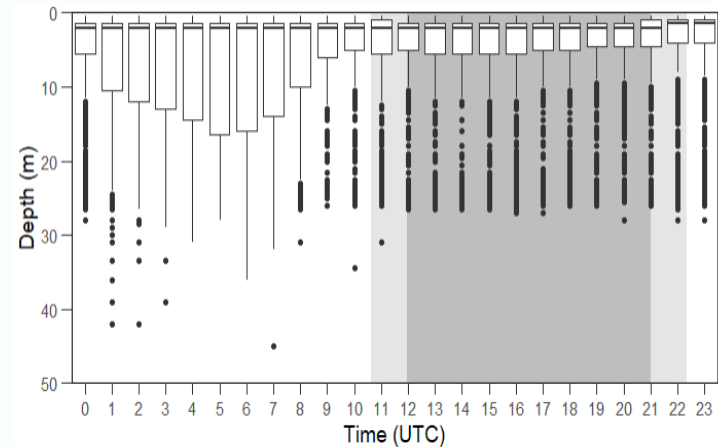
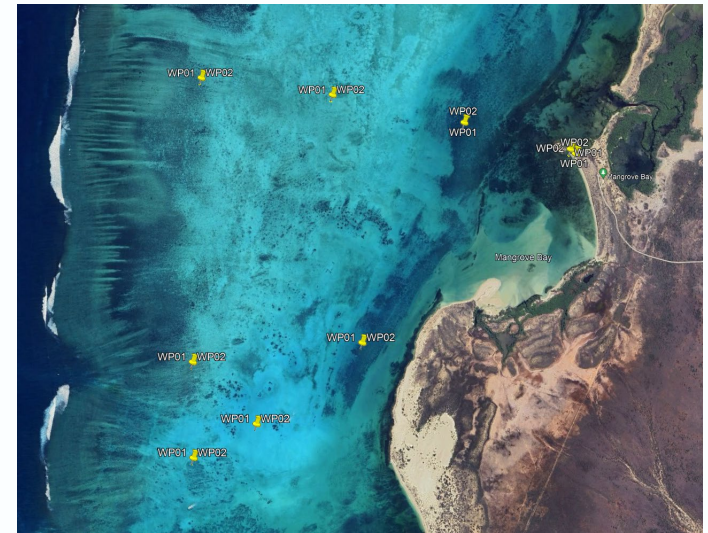
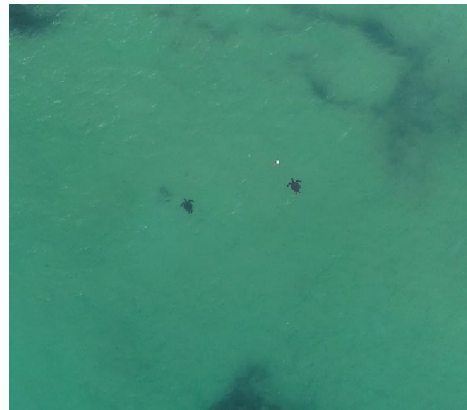
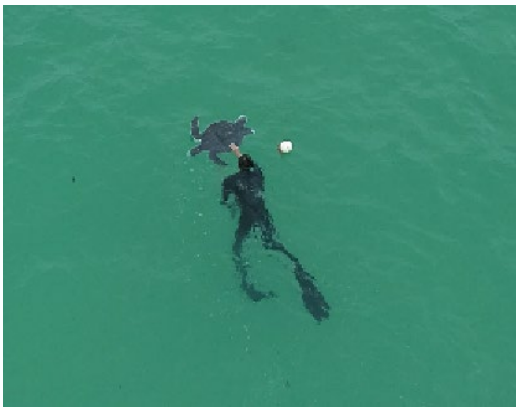
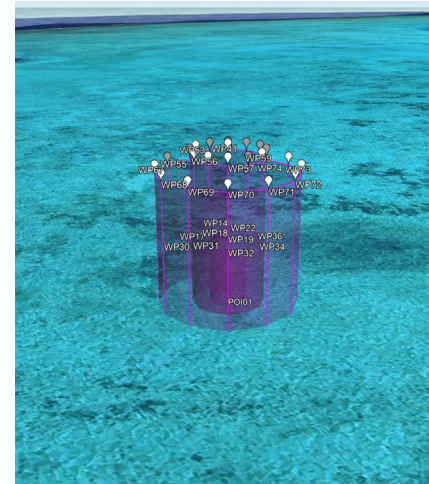


Fig b) Hourly distribution of diving depths for the same tagged turtle.

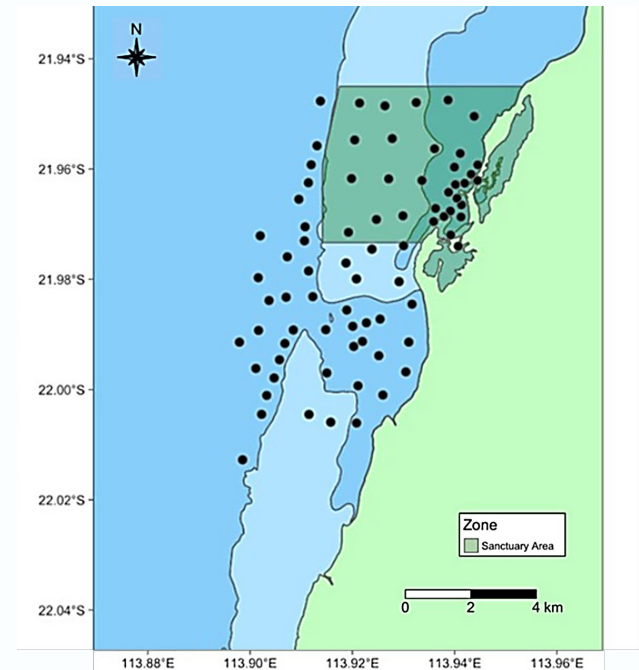
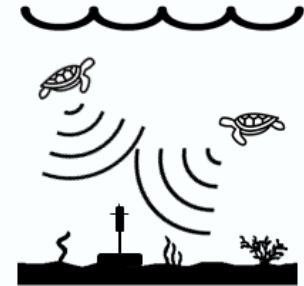
Methodology – Detection Probability Experiments

- Controlled experiments with turtle decoys
 - Varying decoy depths, drone altitude, and camera angle
 - Various sites of diverse habitat types and environmental conditions
- “Detection zones”



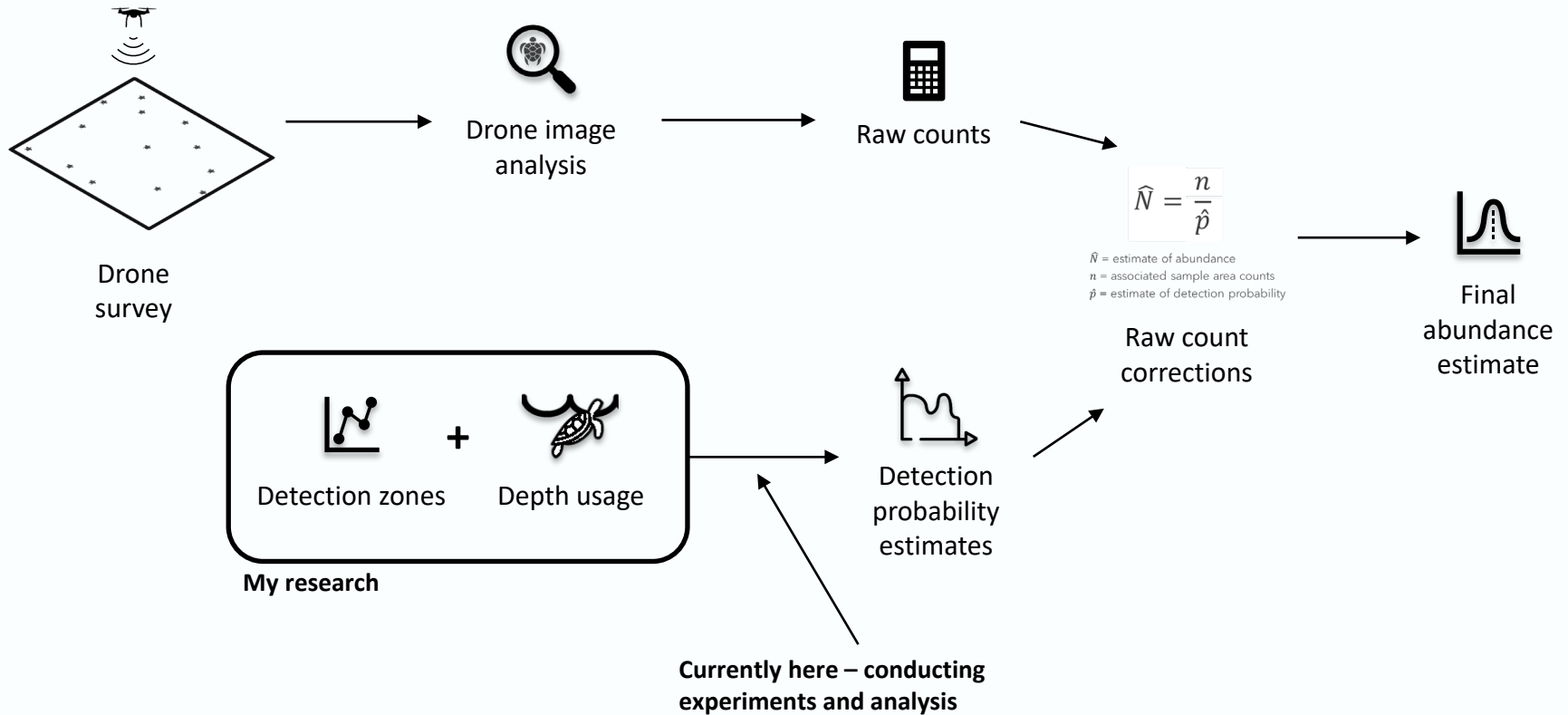
Methodology – Analysing Turtle Diving Behaviour

- Acoustic tagging
 - High-resolution depth and temperature data
 - 26 turtles
 - Mangrove Bay



Data Synthesis and Estimation Process

- Detection zones + depth usage -> detection probability
- Proportion of the turtles that are observable during drone surveys



Conclusion and Future Work

- Develop a robust drone survey methodology and platform
- Benefit broader marine conservation and management efforts

