First Progress Report

Integrated Research and Conservation Actions to Mitigate Tourism Impacts on the Greater Caribbean Manatee (Trichechus manatus manatus) in Quintana Roo, Mexico

Reporting period: May–October 2026
Study area: Campechen Lagoon, Sian Ka'an Biosphere Reserve, Quintana Roo, Mexico.
Objective No. 1. To assess the behavioral responses of Greater Caribbean manatees to tourism activities through drone observations and underwater acoustic monitoring.

Before the fieldwork, research permits for the Sian Ka'an Biosphere Reserve were arranged, together with accommodation, meals, transportation, equipment preparation, and the purchase of additional field materials.

From 24 August to 2 September 2026, a 10-day fieldwork was conducted at two sinkholes in Campechen Lagoon, with the support of local collaborators Cosme Cano and Alexis Cano, and research assistants Catalina Ocampo and Carlos Mercado.

On 25 August, five HydroMoth underwater acoustic recorders were installed at the two study sites. At the larger sinkhole (20°04′50.5″), three recorders were deployed using two buoys: two units at approximately 6 m depth were configured for underwater soundscape monitoring (48 kHz, medium gain, with 10-minute cyclic recordings), while a third unit at approximately 3 m depth was configured for continuous recording of potential manatee vocalizations (32 kHz, medium gain). At the smaller sinkhole (20°05′37.0″), two additional recorders were installed on a single buoy, one for soundscape monitoring and the other for manatee vocalizations.

Boat-based surveys began on 26 August, with approximately three daily outings at 07:00, 12:00, and 16:00. When manatees were sighted, drone footage was collected in three consecutive observation periods: approximately 10 minutes before boat interaction, 10 minutes during boat approach and presence, and 10 minutes after the boat departed. Passive and active observation conditions were included to document behavioral responses under different levels of boat disturbance.

Environmental data were also collected during each survey, including water depth, salinity, transparency, pH, temperature, geographic coordinates, and the number of manatees observed. These measurements were also recorded during surveys without manatee sightings. Both sinkholes were monitored following the same field protocol, while the acoustic recorders continued operating. Drone footage was transferred to an external hard drive after each field session to ensure regular data backups.

Field challenges: During the fieldwork, one buoy was struck by another boat, breaking its anchoring rope. The equipment was recovered and reinstalled at the same location. During the final retrieval on 2 September, another rope broke, requiring assistance from a diver to locate and recover the submerged equipment. Both incidents were resolved, allowing the team to recover the monitoring equipment and collected data.

Current progress and next steps

The cleaning, organization, and cataloguing of the collected video and acoustic recordings are currently underway. I will work with my academic advisors specializing in bioacoustics and video analysis to establish the appropriate filtering and quality-control procedures for both datasets.

Reel shared on the laboratory's (LABMAC) social media accounts documenting the project's first fieldwork expedition.

https://www.instagram.com/reel/Dc9q3VjAOnd/?srtk=d3ZoaDcxNjZteGto

Photographic Appendix



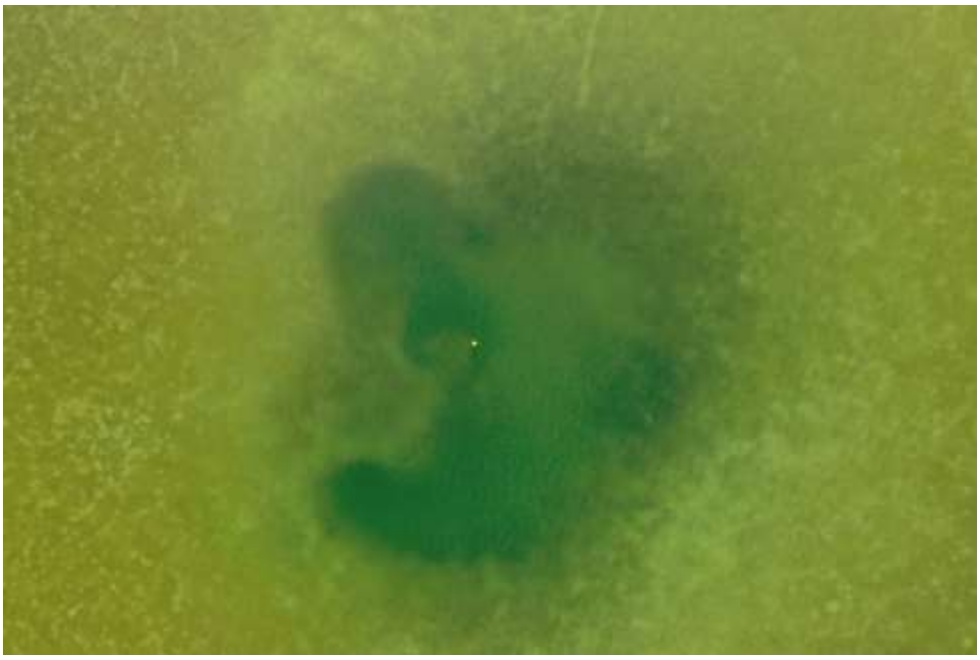
Preparing equipment for deployment and organizing the sampling Schedule



Collecting environmental data, Catalina Ocampo and Carlos Mercado



Catalina Ocampo, retrieving the drone during periods of strong wind gusts



The smaller sinkhole, with a buoy marking the location of the deployed equipment



The smaller sinkhole during drone recording of a mother and calf manatee in the presence of a boat



The diver who assisted us in retrieving the equipment, Tamara Adame



Retrieving the drone after completing the fieldwork surveys, Sara López