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PROJECT BIODIVERSITY TOO HOT to Hatch?

The Impact of Sand Temperature on Loggerhead Sea Turtle Nesting



Introduction

Anthropogenic pressures in tropical and subtropical regions are exposing many species to unprecedented environmental changes that threaten their survival. Among the most affected is the **Loggerhead sea turtle (Caretta caretta)**, whose reproductive success depends heavily on sand temperature. Cabo Verde hosts one of the world's largest loggerhead rookeries, making it a critical site for conservation efforts.

Aims

- **Monitor** seasonal sand temperature dynamics at key nesting beaches.
- Detect critical exceedances of the 29 °C.
- **Evaluate** the effectiveness of hatcheries with shaded conditions.

Methods

Temperature monitoring: One logger was deployed on smaller beaches, and two loggers on larger beaches - with back dune systems.
Hatchery conditions: One logger was placed in each conditioned hatchery area (shaded vs. unshaded).
Hatchery nest analysis: Data were collected from relocated nests, including full inventories of nest contents after hatchling emergence.
Wild nest surveys: 5 × 5 m plots were randomly excavated in high-density nesting areas to assess natural nest success.

Results

Temperature gradient: Western beaches were, on average, 0.79 °C significantly warmer than eastern beaches.

Incubation conditions: Most days during the nesting season exceeded the critical 29 °C threshold, especially around peak nesting periods.

Hatchery performance: Shaded areas showed higher nest and hatching success rates compared to unshaded areas.





2 0.25 0.00 Shaded Unshaded Condition Unshaded Condition Unshaded Condition

Sediment cooling: the Northeast trade winds and upwelling currents contributed to lower sand temperatures on **eastern beaches**.

Nest success: Hatching success rates were similar between the east and west sides of the island.

Shaded hatcheries: Shaded areas produced a higher percentage of hatchlings and a greater proportion of males.

Hatchery conditions: Sediment type and shading structures significantly influenced hatchery sand temperatures.

Additional factors: Variables such as humidity, sand composition, light pollution, and predation must be considered in population assessments.