

Drones help map sea level rise

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Drones can be used to create low-cost and accurate 3-D maps of coastal areas, new research shows. The technique – developed by the University of Exeter – was tested at beaches where sea turtles nest, allowing scientists to see how rising sea levels will affect them. It combines drones and photogrammetry (extracting measurements from photographs) with accurate GPS satellite location to create detailed digital models of coastal habitats. Previous methods were either cheap

but low in quality, or high-quality but cost thousands of pounds to produce.

Scientists tested the technology at Alagadi in Cyprus – a key nesting site for loggerhead and [green turtles](#) – and found that a [sea level rise](#) of 1.2 metres would result in the loss of up to 67% of loggerhead nesting sites and 59% of those used by green turtles.

"Being able to accurately map out terrains in such a fine and local scale is crucial if we want to develop effective conservation strategies," said lead author Miguel Varela, of the Centre of Ecology and Conservation on the University of Exeter's Penryn Campus in Cornwall. "Most of the studies on [climate change impacts](#) are done on a global scale, but is also crucial to understand what will happen on local areas. This method allows us to create realistic digital models that are highly accurate (less than 10cm error). This is a fine scale when compared to global projections. It's ideal for surveying coastal sites, but could also be applied to other habitats and species, and be used to help identify wildlife protection areas."

In this [case study](#), the researchers combined their imagery of Alagadi's beaches with data on the location and depth at which turtle eggs are laid.

Professor Brendan Godley, who supervised the research, added:

"Although some beaches may effectively move inland as sea levels rise, natural and human-made barriers will prevent this in some places. Thankfully, we can see from our modelling that our site has resilience and because of good management at our [site](#), there is room for the beach to migrate landwards."

The paper, published in the journal *Global Change Biology*, is entitled: "Assessing climate change associated [sea level](#) rise impacts on sea turtle nesting beaches using drones, photogrammetry and a novel GPS system."

More information: Miguel R. Varela et al. Assessing climate change associated sea-level rise impacts on sea turtle nesting beaches using drones, photogrammetry and a novel GPS system, *Global Change Biology* (2018). [DOI: 10.1111/gcb.14526](https://doi.org/10.1111/gcb.14526)

Provided by University of Exeter

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