

Rising seas could drown turtle eggs, according to new research

July 22 2015, by James Whitmore



A green turtle hatches in the lab. Credit: David Pike

Immersion in seawater kills sea turtle eggs, suggesting that sea turtles are increasingly at risk from rising seas, according to research published today in *Royal Society Open Science*.

In a laboratory experiment, researchers immersed green turtle [eggs](#) in

seawater for varying lengths of time. The researchers tested eggs of various ages, and then counted the number of eggs that hatched. They found that immersion for six hours reduced survival by a third.

The study partly explains reduced numbers turtle of hatchlings recorded at Raine Island, home to the largest population of green sea turtles in the world.

David Pike, lecturer in tropical biology at James Cook University and lead author of the study, said turtle nests low down on beaches could be underwater for six hours during abnormally high "king" tides or storm surges.

Michele Thums, ecologist at the Australian Institute of Marine Science, said that given climate projections for increased severe weather events, this could mean fewer hatchlings survive in the future.

But every beach will see different impacts from rising seas, said Tim Dempster, senior lecturer in marine biology at University of Melbourne.

"You can't just take [a...] scenario of a certain degree of warming, say that will lead to a certain amount of [sea level rise](#), project how much land will be inundated and then project what proportion of nesting habitat will be affected," he said.

Turtle embryos need oxygen to develop into baby turtles, and immersion in water prevents oxygen from the soil entering the eggs. The embryos effectively suffocate, a process known as "hypoxia".

Thums said that while most turtles nest above the high tide line and are rarely immersed for six hours, "there are always inexperienced turtles that will lay further down the beach and also there is competition at high density nesting sites like Raine Island".

Compared to the rest of the world, green [sea turtles](#) on Raine Island have a much lower level of breeding success, which could lead to a large decline in the number of breeding adults in the future.

Pike said the low level of success could be partly explained by inundation, but there were likely other factors at work.

"One possibility is that the sand is full of bacteria from all of the rotting eggs that are beneath the sand, and that any fresh eggs laid there may be exposed to bacteria that overgrow the egg and kill the embryo," he said.

"Another possibility is that contaminants (heavy metals, pesticides) are being passed from the mother turtle to the eggs, and that may cause the embryos to die."

The Queensland Department of Environmental Heritage and Protection is currently trying to raise low lying spots on Raine Island by moving sand. The island could lose between 7 and 27% of its area thanks to rising seas.

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