Great Barrier Reef turtles exposed to thousands of chemicals

September 25 2015, by Mark Symons

New Queensland research is indicating that green turtles living near urban and farming areas are absorbing possibly thousands of chemicals.

University of Queensland researcher Associate Professor Caroline Gaus said many of the chemicals were associated with industry and agriculture.

"There used to be a theory that the ocean was so huge it would dilute contaminants to such an extent that it remained a relatively healthy

environment for marine creatures," Dr Gaus said.

"But people should be aware that many of the chemicals we flush down the toilet, apply to our gardens, spray on crops, or use in factories can end up in turtles and we don't yet know how it is affecting them," she said.

This revelation about the vast number of chemicals found in turtles is among the preliminary findings from a major research project investigating the impact of contaminants on turtles in the Great Barrier Reef.

In June and July 2012, more than 100 green turtles were found stranded at Upstart Bay, Queensland, and the cause remains unknown.

This inspired the River to Reef to Turtles research project, which in its first year, sampled 1131 turtles across three study sites – the relatively pristine Howick Group of Islands and the two coastal sites of Upstart Bay and Cleveland Bay.

Dr Gaus' work was conducted with the National Research Centre for Environmental Toxicology (ENTOX), a joint venture of UQ and Queensland Department of Health.

"We found chemicals associated with industry and agriculture in the blood of turtles from both Upstart Bay and Cleveland Bay," Dr Gaus said.

"But the preliminary data highlights that Upstart Bay turtles have particularly higher levels of the metals cobalt, molybdenum and antimony, and higher levels of stress-related compounds than turtles at the other locations. These stress-related compounds are often a sign of chemical exposure.

"Other tests indicate that turtles from Upstart Bay also have signs of systemic stress with markedly higher inflammatory responses in a high proportion (45 per cent) of animals. However, it's far too early to know if chemicals are connected to this response.

"Our team at ENTOX is using new forensic screening techniques for this research. There are more than 30,000 chemicals in wide commercial use and many of these have never been measured in the environment.

"We have found indications of potentially thousands of chemicals in coastal turtles and we will keep drilling down into the data to identify the substances of most concern.

"We think it is the combination of chemicals, rather than one or two chemicals on their own, that could be having the biggest impact on turtle health.

"The next step in our research is to see if we can we find a correlation between turtle health and the complex mixture of chemicals they are exposed to in urban locations."

Great Barrier Reef Marine Park Authority Manager of Operations Support Dr Mark Read said the early findings were a significant step to improving understanding of the links between the land and inshore areas, and marine animals.

"This highlights the benefit of bringing together so many different experts to work on the same wildlife mystery – it is a true, multi-disciplinary approach," Mr Read said.

Banrock Station Wetland Manager and Environmental Trust panel member Dr Christophe Tourenq said the early results were fascinating.

"Often researchers look for the single smoking gun to explain poor health in animals, but Rivers to Reef to Turtles is showing that the real answers are incredibly complex and there is probably not a single cause.

Provided by University of Queensland

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