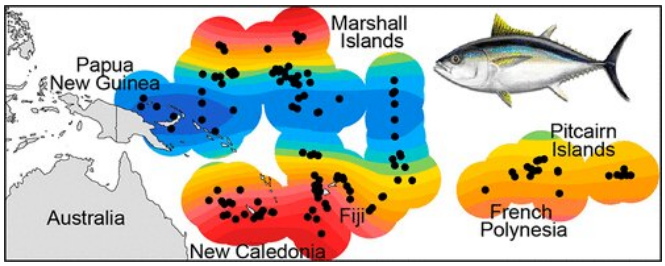
Identifying factors that influence mercury levels in tuna

23 January 2019



Credit: American Chemical Society

Most consumers' exposure to toxic methylmercury occurs when they eat fish. But research just published in the ACS journal *Environmental Science & Technology* could help clarify why methylmercury concentrations in tuna vary geographically.

Inorganic mercury compounds are released into the atmosphere from natural sources, such as volcanoes, and human-based sources, such as fossil fuel combustion and gold mining. Some of these compounds settle onto oceans, where natural processes convert them into methylmercury. This substance is then naturally transferred to sea creatures, including tuna, which sometimes contain amounts exceeding food safety guidelines. David Point, Anne Lorrain, Valérie Allain and colleagues wanted to map regional variations in methylmercury levels in tuna and to investigate the biological, environmental and ecological factors that drive these variations.

The scientists studied bigeye, yellowfin and albacore tuna captured in a region known as the Western and Central Pacific Ocean (WCPO). The researchers found that methylmercury levels were below food safety guidelines for most of the samples. In addition, they confirmed earlier findings from other ocean regions that body size is the primary factor in determining contamination within a species, with bigger fish accumulating a higher concentration of methylmercury in their tissues than smaller fish. They found that sea-surface temperature and the depth of the ocean layer in which tuna feed also affect this concentration. The team developed a model that draws on these findings to predict methylmercury levels in tuna. The model worked well for WCPO, as well as for the North Central and Central Equatorial Pacific Oceans, though it underestimated levels in fish from the Eastern Equatorial Pacific Ocean. The researchers say that their results could help in evaluating the risks and benefits of eating tuna caught in a particular location, or tuna of different sizes.

More information: A Model of Mercury Distribution in Tuna from the Western and Central Pacific Ocean: Influence of Physiology, Ecology and Environmental Factors, *Environ. Sci. Technol.*, Article ASAP, DOI: 10.1021/acs.est.8b06058

Provided by American Chemical Society