

Oceana Magazine Summer 2012: Ask Dr. Pauly: Are the Oceans Jellifying?



Nomura jellyfish, pictured above, have proliferated in Japanese waters in recent years. Photo: Niu Fisheries Cooperative

Local television and newspaper reports have been filled with stories about jellyfish outbreaks in recent years. People notice jellyfish more these days – or is it the jellyfish that notice more people? In any case, more people are getting stung – a rash of rashes as it were.

There are also more reports of the water intake pipes of power or desalinization plants being clogged up by jellyfishes. However, it would be wrong to infer just from such reports that jellyfish are increasing worldwide. It could be that there are more people going to beaches and more power and desalinization plants being built, and that incidents involving jellyfishes are nowadays more likely to be reported than they were earlier.

I decided to get to the bottom of this question a few years ago. I gave one of my graduate students, Mr. Lucas Brotz, the task of elucidating for his master's thesis whether there has truly been a worldwide increase in jellyfish or not. One way to go about this was to rely on data from so-called 'systematic surveys' of marine ecosystems conducted by research vessels. However, the scientists conducting these surveys are usually interested only in the commercial caught species, and they often threw away the jellyfish that they had collected without recording them.

Nevertheless, by searching through a huge amount of scientific literature, one can find many studies indicating, for various ecosystems, that jellyfish have increased, decreased or remained steady over time. Similarly, the opinions of fishers and marine scientists can help identify changes (or lack thereof) in jellyfish populations, as such professionals are keenly tuned to the marine environment.

The results have now been published and they are quite clear: of the 66 so-called large marine ecosystems (LMEs) of the world ocean, 45 had data allowing inferences on trends in jellyfish. Of these,

28 (62%) showed an increasing trend, while only 3 (7%) showed a decreasing trend (the rest — 14 LMEs — showed no trend)¹.

These results received a lot of media attention because it was the first study that demonstrated widespread increases on the basis of an analysis of numerous datasets spanning many decades, contrary to earlier studies and the above-mentioned above media reports, both of which tend to pertain to brief, localized incidents.

We are now engaged in the identification of the causes for the widespread increase of jellyfish. One possible culprit is the recent decimation of jellyfish predators, for example, leatherback turtles and sunfish (*Mola mola*), caught as bycatch of tuna longline fisheries. Similarly, [overfishing](#) of jellyfish competitors (e.g., small pelagic fishes) may also play a role.

Yet another possible cause is the modification of habitats by bottom trawling, which eliminates the potential predators (e.g., crabs) and competitors of 'polyps', the flower-like young stage of many kinds of jellyfish. Finally, another cause for the increase of jellyfish, likely acting in concert with the others, is the construction boom along the coasts of the world, for ports, marinas, jetties, etc. These structures provide new habitat for polyps, which subsequently reproduce, potentially leading to millions of free-floating jellyfish.

There are other ideas floating around, notably linking the increase in jellyfish with global warming or the increase of 'dead zones' in the world's oceans. Whatever the reason(s), jellyfish are proliferating, and since they feast on the eggs and larvae of fish, this is a further challenge to the health of the oceans in general, and to fisheries in particular.

Perhaps bathers everywhere will have to follow the example of the Australians who, because of the nasty box jellyfish, usually venture into the ocean only with a full body suit. Such form-hugging, colorful body suits can be fashionable, which is the only plus side of the ocean jellification story that I can see.



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