INDONESIA DISSERTATION/THESIS PROJECT

IN43 Quantifying marine plastic pollution levels in the Wakatobi National Park

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Plastic pollution has been a global crisis for decades, but recent media attention (for example being featured in Blue Planet II) has raised awareness amongst the general public like never before. Ultimately, the production of items that can take hundreds or thousands of years to degrade to support a human population numbering billions could never be sustainable, and when combined with our increasingly consumerist lifestyles a crisis was inevitable. The facts make sobering reading. Eight million metric tonnes of plastic enters the ocean each year, and this plastic can trap marine animals causing death. Many marine organisms also consume plastic, either accidentally or by mistaking them for food. A recent study even showed that not only does plastic often look like food to marine animals, but as it degrades it can also produce a chemical called dimethylsulphide (DMS). DMS is a commonly produced chemical by marine organisms to help them cope with stress, and many marine animals have evolved to use DMS as a navigational cue to locate food – where there is DMS there must be organisms producing it. This means that not only does plastic look like food, it even smells like food! Experts have also predicted that based on current trends, by 2050 there will be more plastic in the ocean than fish. This problem has direct consequences for humans beyond the aesthetic concerns and costs to nature, as microplastics enter the food chain meaning direct human consumption when eating seafood. One recent study even found plastic particles in big brand bottled water!

This increase in global awareness about the threats of continued plastic use has already led some governments and companies to take action, wary that consumer and voter pressure has turned against unnecessary plastic use. This can only be a good thing, although it is important to note that it has also led to concern amongst some marine scientists and conservationists that too much focus is being placed on plastic while other threats such as climate change and overfishing, which could be argued to be more urgent and the consequences potentially more devastating for the planet, are failing to receive the attention they desperately need because the solutions require greater changes to lifestyles that many are unwilling to make. To read more about this viewpoint I would recommend this excellent and thought-provoking article (https://theconversation.com/climate-change-obsession-with-plastic-pollution-distracts-attention-from-bigger-environmental-challenges-111667).

Students on this project will explore patterns in plastic pollution around Hoga island in Indonesia and individual projects could take a range of different directions. SCUBA diving based projects could collect plastic waste from areas of reefs of different depths, locations and exposure levels to explore patterns in plastic settlement on the reefs. The same areas could also be revisited after a set time period to quantify the rates of settlement. Similar projects could be conducted via snorkelling on shallower habitats such as seagrass beds. Land-based projects could explore plastic deposition along the coastline, including the types of plastic being found, and once again this could be repeated to calculate exact deposition rates and even to look at how this rate changes over a lunar cycle or with changing weather. Finally, projects could look at microplastics by sieving sediment/sand samples.

Recommended Reading

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