



Case files

One case per group

Case 1: Correlation is not causation

The rays and the scallops

In 2007, a study linked the overfishing of big sharks off the US coast to a boom in cownose rays and the collapse of a scallop fishery. In 2016, other scientists re-examined the data. The timing of the shark decline and the ray increase did not match, and there was no direct evidence that rays caused the collapse.

What did the first study assume?

What evidence would you need to show rays really caused the collapse?

Case 2: Lab conditions are not the real world

The sunscreen and the corals

Lab studies showed some sunscreen chemicals harm corals. But a major 2022 review found the concentrations used were often far higher than those measured near reefs, and there is no regulatory definition of 'reef-safe'. Mass bleaching happens during marine heatwaves.

Why might a lab result not apply on a real reef?

What would you tell a tourist choosing sunscreen?

Case 3: Peer review is not a guarantee

The fish that ate plastic

In 2016, a paper in the journal Science reported that young perch preferred microplastics to real food. Other researchers raised concerns within weeks. Investigators found the results were fabricated, and the paper was retracted in 2017. By then, it had been widely reported.

How did science correct this mistake?

Why do retractions rarely get as much attention as the original story?

Case 4: A true fact can lead to a false conclusion

The shrimp with super-eyes

Mantis shrimp have 12 types of colour receptor, compared with our three. It is often said they must see far more colours. But a 2014 experiment found they are worse than humans at telling similar colours apart. They seem to use their eyes differently, recognising colours quickly rather than comparing them.

What was the false step in the popular story?

Why is it tempting to believe it?
