Smoke and mirrors: are Australian seaweed communities retreating?

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A recent publication by Wernberg *et al.* (2011, *Current Biology* 21: 1828–1832) used historical herbarium specimen records sourced from Australia's Virtual Herbarium to suggest that the distributions of numerous seaweed species were shifting southward, purportedly as a response to climate change. I contend that the paper is fatally flawed for several reasons: an inappropriate interpretation of herbarium records, a failure to check the underlying data relating to crucial records, the absence of ground-truthing to confirm actual extirpation, and an incorrect interpretation of collection effort. The major assumptions of the paper are that herbarium records from a particular period are equivalent to a species' distribution in that period, and that the absence of a herbarium specimen from subsequent periods is evidence for the species' local extinction. No effort, however, has been made to validate these assumptions. Herbarium specimens are not collected in a systematic way, geographically or otherwise. Collectors are often selective in their taxonomic coverage, and there has never been a program of extensive seaweed collection over a defined period. Collections are often built up *ad hoc*, as opportunities and funding arise. Thus the absence of a herbarium record is potentially due to any number of factors, the least likely being a local extinction. Moreover, none of the results were tested by revisiting sites and checking for the presence of supposedly locally extinct species. To compound the problems, the locality data of crucial specimens were not checked. I also suggest that the claimed northwards collection effort bias, used in support of the conclusions, is grossly oversimplified. When examined in detail the collection effort is actually skewed southward, and potentially the underlying cause for the perceived range contractions.

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