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VEGETATION CHANGE OVER 42 YEARS (1962 – 2004) AT CAPE HALLETT, 72^{O}S, NORTHERN VICTORIA LAND, CONTINENTAL ANTARCTICA

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Change in vegetation has often been suggested in recent years as one way to track the effects of global climate change in Antarctica. However, vegetation processes, especially growth, are very slow in the Ross Sea region. Until now we have had little firm evidence that change will occur at a rate that would be detectable and useful for monitoring, or about which environmental factors will actually cause change. Here we present evidence of substantial change in vegetation over 42 years, certainly one of the longest available time spans in the Antarctic.

E. D. Rudolph, in 1962, mapped in detail the vegetation of a site approximately 28m by 120m at Cape Hallett, Victoria land, Antarctica. Although he died tragically his original maps and data were archived by Ohio State University. The actual site was rediscovered in 1999 and remapped in 1 m^2 quadrats using percentage cover in January 2004. Changes were assessed using GIS techniques.

The analysis indicated that considerable change had occurred. There had been an increase in cover in 29, 19 and 60% of surveyed sites, and decreases in 21, 9 and 12% of sites, for the moss, lichen and alga, respectively. The present day occurrence of moss and, especially, alga showed that they preferred wetter sites. The lichens were concentrated in the rockier, drier sites. The large increase in algal and, to a lesser extent, moss cover strongly suggests that the changes had been driven by increased water supply, particularly in wetter areas.

The extent of the change indicates that vegetation cover can be used for monitoring change even in areas as extreme as the Ross Sea region. For this analysis to be successful it was important that the mapping techniques used were totally explicit and could easily be replicated. Fortunately, Rudolph had defined his cover classes and the site was also well marked allowing application of GIS mapping techniques that could be clearly defined and easily replicated. The results show the value of establishing mapped areas in order to detect and explain change.