

INDICADORES ECOLÓGICOS DE ALTERAÇÕES AMBIENTAIS GLOBAIS:

diagnosticar, avaliar e antecipar

Cristina Branquinho

cE3c, Centre for Ecology, Evolution and Environmental Changes, Faculdade de Ciências, Universidade de Lisboa, Campo Grande, C2, 5º piso, Lisboa. cmbranquinho@fc.ul.pt

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Human activities have directly or indirectly affected the planet. Some authors have renamed this geological age as the Anthropocene, showing that the impact of man on Earth today is greater than that of natural fluctuations. Only a thorough scientific understanding, based on quantitative analysis, of how external pressures affect ecosystems, their resistance and resilience, will allow us to design the most effective mitigation and adaptation strategies for coping with human influence. The ecosystem approach is fundamental in managing the earth's resources because it addresses interactions with biotic systems, of which human beings are an integral part, and with the physical systems on which it depends. This applies to the scale of the Earth, to a continent, or to an agricultural field.

Ecological indicators of atmospheric changes can be used as surrogates to describe the effects of atmospheric changes cause by human activities on ecosystem structure and functioning. Taxonomic metrics of indicator taxa have been widely used for more than 100 years to study the effects of atmospheric changes in ecosystems. Its biological diversity can be exploited as an ecological indicator because different species differ in their tolerance of atmospheric changes: some species are extremely sensitive and will disappear whereas others persist. In the period beginning with the Industrial Revolution until the 1980s, the loss of diversity in urban and industrial areas could be ascribed to sulphur dioxide pollution. Since then, nitrogen pollution has been the most significant factor in the loss of species diversity. We expect that if current efforts to reduce nitrogen emissions are successful, climate change will emerge as the most important driver of species diversity over time. An overview of the results of ecological indicators used to monitor the effects of the Anthropocene on ecosystems will be presented.

Key words: biodiversity, air pollution, nitrogen pollution, climate change