

EDITORIAL

Biological consequences of global change: opportunities and challenges

Global change has become a major concern. Wildlife habitat loss, environmental pollution, biological invasion and transmission of infectious diseases are some of the negative effects of intensified human disturbance (Ceballos & Ehrlich 2002). There has been fierce debate concerning the cause of climate warming. The most popular view is that recent warming has been caused largely by an increase in CO₂, due to rapid development of industry worldwide. However, some insist that global warming is a natural variation in the temperature of the Earth. In any case, the long-term effects of climate warming remain unclear.

In 2008, the International Society of Zoological Sciences (ISZS), supported by the Chinese Academy of Sciences (CAS), initiated an international research program called Biological Consequences of Global Change (BCGC). In 2009, ISZS organized a BCGC symposium in Beijing and soon after the BCGC program was adopted by the International Union of Biological Sciences (IUBS). In June 2010, *Integrative Zoology* published a special issue on BCGC, guest edited by Nils Chr. Stenseth.

The focus of the BCGC program is to bring together a diverse group of international scientists, with expertise in a variety of disciplines, to work toward an understanding of the biological consequences of global climate change. Currently, there are over 20 scientists from Australia, Chile, China, France, India, Norway, Russia and the USA participating in the program. These studies suggest that the effects of global change are not always negative, and are highly dependent on region, taxa group and time-scale.

Some studies find that global change has negative effects on wildlife. For example, by studying fossil records in Australia, Buckeridge (2010) showed that there was a steep drop in barnacle diversity during periods when oceans became cooler. Furthermore, Zhang *et al.*

(2010) found that over the past two millennia, more drought, flooding and war occurred in China in colder periods rather than during warmer periods. On the other hand, Li *et al.* (2010) indicated that certain species benefit from global warming. Also, based on more than 100 years of historical records in China, Xu *et al.* (2011) found that the intensity of the third plague pandemic was positively associated with precipitation of previous years in dry northern China, but negatively associated previous years in damp southern China.

In this issue, Buckeridge (2012) describes his research on the opportunism and resilience of barnacles to environmental change. Charles-Edouard Imbert *et al.* (2012) test the expansion of the pine processionary moth and monitor its impact on the endangered Spanish moon moth. Harold Koopowitz and Bradford A. Hawkins (2012) discuss species conservation strategies under global climate change. Craig D. Millar *et al.* (2012) examine the effects of temperature change in Antarctica on the Adélie penguin. Stephen A. Oswald and Jennifer M. Arnold (2012) investigate the effects of heat stress in seabirds as bioindicators of climatic warming.

The IUBS/ISZS-sponsored BCGC program provides an excellent platform for international scientists to collaborate in exploring the impact of global change. We look forward to seeing you all at the 31st IUBS General Assembly and Conference on Biological Sciences and Bioindustry in Suzhou, China, 5–9 July 2012. We also look forward to presenting results from the BCGC program in *Integrative Zoology*, the official journal of ISZS. Free submissions are always welcome.

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