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Penguins in Peril

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Cover: Two male Magellanic penguins braying on the beach at the colony at Punta Tombo, Chubut, Argentina. In the morning and evening the penguins socialize—calling, preening, bathing, and drinking—before some walk inland to their nests. The challenges facing Magellanic and other penguin species are discussed by P. Dee Boersma in the article that starts on p. 597. Photograph: P. Dee Boersma.

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BioScience

Organisms from Molecules to the Environment

American Institute of Biological Sciences

Penguins in Peril

Global circulation models have long predicted that greenhouse warming would be greatest in polar regions, and abundant data confirm strong warming there. Not surprisingly, in recent decades there have been pronounced effects on wildlife in polar regions. The plight of the polar bear, the Arctic wildlife poster species facing the disappearance of its habitat, was officially recognized in May when the US Department of the Interior designated the animal "threatened" (a designation challenged, however, by the State of Alaska). Penguins, which play a similarly iconic role for the Antarctic (though they are found throughout the Southern Hemisphere), are facing more varied challenges, as P. Dee Boersma describes in the article that starts on p. 597.

Climate change again underlies many of the challenges. Parts of Antarctica have warmed by 6 degrees Fahrenheit (3.3 degrees Celsius) in recent decades, more than any other part of the world, and existing legal protections for penguins have been insufficient to prevent population declines resulting, at least in part, from the warming. An obvious effect of warming has been a large reduction in sea ice near the continent. Thus Adélie and chinstrap penguin populations in Antarctica have decreased (at lower latitudes, however, gentoo and chinstrap penguin populations have grown). Emperor penguins, which are restricted to the Antarctic, are also being affected by melting ice. Boersma's article makes clear, however, that temperature trends can influence penguin populations through a variety of mechanisms, including increases in snow and rain. This can kill birds whose breeding cycles depend on finely calibrated behavioral adaptations to a hostile environment. Even equatorial species are affected by climate change: Galápagos penguins are in a major decline, seemingly because of stronger El Niños that many researchers have suggested are tied to global warming.

Penguin species in temperate regions are affected more directly by human activity than are Antarctic species. Boersma makes a strong case for an effort to systematically monitor the world's 43 major aggregations of penguins: they are more easily counted than many other aquatic species and could be effective sentinels of ocean health. In the meantime, the World Wildlife Fund is seeking a network of marine protected areas that might encompass 10 percent of the Southern Ocean's 35 million square kilometers. Such a network could limit fishing and oil pollution, with benefits for many seabirds as well as for whales and seals. Boersma suggests some novel ideas for biologically efficient protections.

The Southern Ocean has been considered one of the most pristine areas of the globe. In fact, absent strong protections, growing pressure from fishing and other human activity means that its ecology will be seriously and adversely affected in coming decades. Improved biological monitoring is an essential step if this unique ecosystem is to be preserved. Carefully designed protections for native wildlife there could reduce the chance of extinctions of iconic penguins and other wildlife during this century, which otherwise seems inevitable.

TIMOTHY M. BEARDSLEY
Editor in Chief

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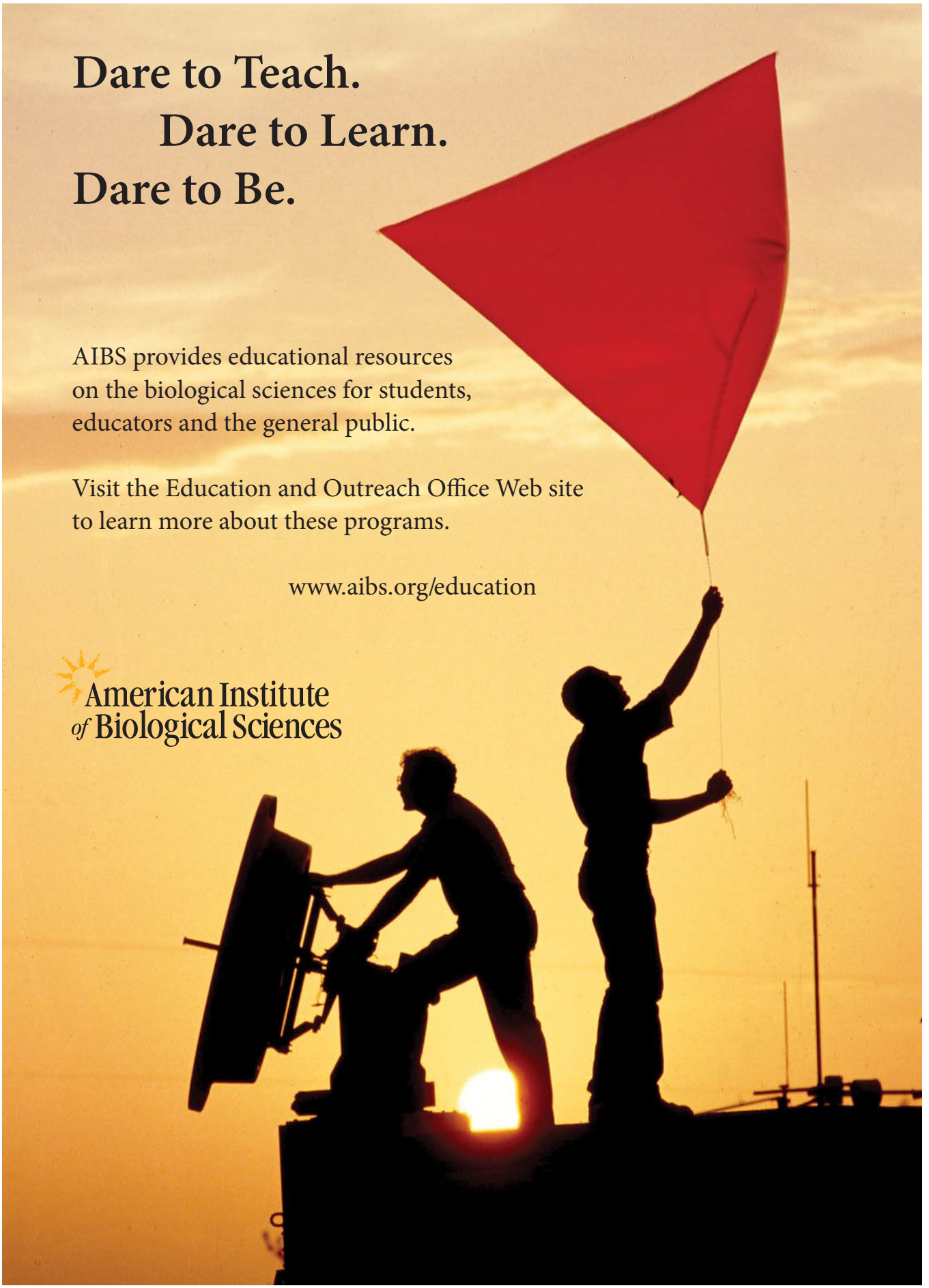

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