

Penguins in Peril

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NEWS AND OPINION

- EDITORIAL
571 Penguins in Peril
Timothy M. Beardsley
- VIEWPOINT
574 Group Selection Is Dead! Long Live Group Selection?
Ayelet Shavit and Roberta L. Millstein
- FEATURE
576 How Ecofriendly Are Wind Farms?
Jeffrey P. Cohn
- FEATURE
580 On Antarctic Ice: Life at Low Diversity
Amy Mayer
- WASHINGTON WATCH
586 A New Farm Bill, Research Structure at USDA
Megan Debranski Kelhart
- AIBSNEWS
665 SWS Members Attend AIBS Policy, Media Workshops • AIBS Opposes Antiscience Legislation in Louisiana • NEON in the Field: A Visit to the Mid-Atlantic Domain • Recent Articles Online at www.actionbioscience.org • Recent Public Policy Reports Online at www.aibs.org
- BIOBRIEFS
672 A Wide Range of Hearing
Cathy Lundmark



OVERVIEW ARTICLES

- 21ST CENTURY DIRECTIONS IN BIOLOGY**
587 High-Speed Developments in Avian Genomics
Camille Bonneaud, Joan Burnside, and Scott V. Edwards
- 597 Penguins as Marine Sentinels**
P. Dee Boersma
- 609 Controls on Annual Forest Carbon Storage: Lessons from the Past and Predictions for the Future**
Christopher M. Gough, Christoph S. Vogel, Hans Peter Schmid, and Peter S. Curtis
- 623 "The Calamity of So Long Life": Life Histories, Contaminants, and Potential Emerging Threats to Long-lived Vertebrates**
Christopher L. Rowe
- 632 Biodiversity Congruence and Conservation Strategies: A National Test**
Haigen Xu, Jun Wu, Yan Liu, Hui Ding, Ming Zhang, Yi Wu, Qing Xi, and Lili Wang



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.

DEPARTMENTS

- 640** FORUM
Long-term Agricultural Research: A Research, Education, and Extension Imperative
G. Philip Robertson, Vivien G. Allen, George Boody, Emery R. Boose, Nancy G. Creamer, Laurie E. Drinkwater, James R. Gosz, Lori Lynch, John L. Havlin, Louise E. Jackson, Steward T. A. Pickett, Louis Pitelka, Alan Randall, A. Scott Reed, Timothy R. Seastedt, Robert B. Waide, and Diana H. Wall

- 646** FORUM
The US Ethanol and Biofuels Boom: Its Origins, Current Status, and Future Prospects
Wallace E. Tyner

- 654** EDUCATION
Genetic Literacy of Undergraduate Non-Science Majors and the Impact of Introductory Biology and Genetics Courses
Bethany Vice Bowling, Carl A. Huether, Lihshing Wang, Melanie F. Myers, Glenn C. Markle, Gary E. Dean, Erin E. Acra, Francis P. Wray, and George A. Jacob

Officers	572
New Titles	664
Information for Contributors	668
Calendar	670
Classifieds	671

- 661** BOOK REVIEWS
Fruits and Plains: The Horticultural Transformation of America
Philip J. Pauly. Reviewed by Marshall D. Sundberg

- 662** **The Evolution of Social Wasps**
James H. Hunt. Reviewed by Francis L. W. Ratnieks

- 663** **A Contract with the Earth**
Newt Gingrich and Terry L. Maple. Reviewed by Thomas E. Lovejoy

Coming next month

The Molecular Biology Toolbox and Its Use in Basic and Applied Insect Science
 Vulnerability of Permafrost Carbon to Climate Change: Implications for the Global Carbon Cycle
 Unintended Consequences of Urbanization for Aquatic Ecosystems: A Case Study from the Arizona Desert
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Editorial Correspondence: 1444 I Street, NW, Suite 200, Washington, DC 20005; telephone: 202-628-1500; fax: 202-628-1509; e-mail: bioscience@aibs.org. Instructions for preparing a manuscript for *BioScience* can be found at www.aibs.org/bioscience/resources/Info_for_contribs.pdf.

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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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