

**Evolutionary Novelty Is Concentrated at the Edge of Coral Species Distributions**

Ann F. Budd and John M. Pandolfi

*Science* 18 June 2010: 1558-1561.[Abstract](#) [Full Text](#) [Full Text \(PDF\)](#) [Supporting Online Material](#)**Response to C. Klein *et al.*'s E-Letter****Ann F. Budd John M. Pandolfi**

Department of Geoscience, The University of Iowa, Iowa City, Iowa 52242, USA

We are delighted that the conservation community is so quickly developing ways to implement practical solutions to spatial reserve design integrating studies of the fossil record. Quantitative methods in conservation science have advanced substantially in recent years, especially in the area of spatial conservation prioritization (1). The new methods include species distribution modeling,

[More...](#)[Submit response](#)

Published 24 September 2010

**Conserving Evolutionary Novelty on the Edge****Carissa Klein Salit Kark, Silvia Carvalho, Maria Beger, Hugh Possingham**

School of Biological Sciences, University of Queensland, Brisbane 4059 QLD, Australia

In their Report ("Evolutionary novelty is concentrated at the edge of coral species distributions," 18 June 2010, p. 1558), A. F. Budd and J. M. Pandolfi state that conservation priorities are determined based on species richness, endemism, and threats, but they misrepresent how spatial priorities are actually determined (1). These older approaches have been criticized (2, 3) and replaced

[More...](#)[Submit response](#)

Published 24 September 2010

**Evolutionary Novelty at Range Edges for Coral Reef Organisms****Jean-Paul Hobbs Lynne van Herwerden**

School of Marine and Tropical Biology, James Cook University, Townsville, QLD 4811, Australia

A. F. Budd and J. M. Pandolfi recently concluded that edge zones and peripheral locations represent areas of evolutionary novelty where species fuse (hybridization) or split (peripatric or parapatric speciation) ("Evolutionary novelty is concentrated at the edge of coral species distributions," Reports, 18 June 2010, p. 1558). Their study was limited to corals in the Caribbean, but accumulating evidence from other recent studies indicates that this is a global pattern for coral reef organisms in general.

Reef fishes are the most diverse vertebrate assemblages on earth, and the greatest number of hybrids occur at two isolated Indian Ocean locations that represent the range edge for both Indian and Pacific Ocean species (1). Similarly, in the Pacific Ocean, reef fish hybridization is concentrated at peripheral range-edge locations (2). For a variety of coral reef organisms, these peripheral locations also represent concentrations of genetically unique populations and centers of endemism that are indicative of peripatric speciation (3–5).

Coral reefs support the greatest diversity of marine life, but this diversity is under threat from escalating anthropogenic impacts. While conservation efforts aim to minimize biodiversity loss, protecting the processes that generate evolutionary novelty and biodiversity at peripheral range-edge locations should be a priority.

Jean-Paul Hobbs and Lynne van Herwerden

ARC Centre of Excellence for Coral Reef Studies, School of Marine and Tropical Biology, James Cook University, Townsville, QLD 4811, Australia.

## References

1. J.-P. A. Hobbs, A. J. Frisch, G. R. Allen, L. van Herwerden, *Biol. Lett.* 5, 258 (2009).
2. J. P. A. Gardner, *Adv. Mar. Biol.* 31, 1 (1997).
3. J. Drew, G. R. Allen, L. Kaufman, P. H. Barber, *Conserv. Biol.* 22, 965 (2008).

4. K. L. Winters, L. van Herwerden, J. H. Choat, D. R. Robertson, *Mar. Biol.* 157, 1679 (2010).

5. C. M. Roberts *et al.*, *Science* 295, 1280 (2002).

[... less](#)

[Submit response](#)

Published 8 September 2010

### Conserve Unique Arabian Gulf Corals

[Bernhard Michael Riegl](#) [Samuel James Purkis](#)

National Coral Reef Institute, Nova Southeastern University, Dania, FL 33004, USA

A. F. Budd and J. M. Pandolfi ("Evolutionary novelty is concentrated at the edge of coral species distributions," *Reports*, 18 June 2010, p. 1558) use Pleistocene Caribbean examples to show increased novelty in speciation and adaptation at the edges of coral distribution. In modern corals, stressful environments with lower connectivity also caused novel speciation, environmental

[More...](#)

[Submit response](#)

Published 10 August 2010