



## Network controls on diversity in human and ecological systems



**Evan P. Economo, Ph.D.**

Assistant Professor

Dept. of Ecology & Evolutionary Biology

Michigan Society of Fellows

University of Michigan

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### ABSTRACT:

Both ecological and human systems are characterized by stunning patterns of diversity. Understanding biodiversity- the variation of genes, species, phenotypes and interactions within and across ecosystems, has long been a fascination of biologists. Humans have created worlds of diversity as well, in the foods we eat, the products we buy, and most of all in the ideas we think. Ecosystems are arranged spatially and connected in complex ways by dispersal of individual organisms, and humans communicate through interpersonal and technological networks. In this talk I explore the theoretical connections between these two types of systems by integrating network influence models in social science with coalescent theory in population genetics. I identify several general features of network structure that can amplify or depress diversity. In particular, the asymmetries of connections among nodes emerges as more important variation in the strength and topology of connectivity. With these theoretical perspectives, I analyze a parameterized coral reef network across the Pacific and show that certain nodes act as structural depressors due to their position in the network. Finally, I discuss how recent revolutions in information transmission may be changing the diversity, performance, and collective wisdom of human societies.

Host: Van Savage, Ph.D.

To receive e-mail seminar notices, contact David Tomita ([dtomita@biomath.ucla.edu](mailto:dtomita@biomath.ucla.edu))