Synthesis
Resilience, Panarchy, and World-Systems Analysis

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ABSTRACT. The paper compares two ambitious conceptual structures. The first is the understanding of social-ecological systems developed around the term "resilience," and more recently the term "panarchy," in the work of Holling, Gunderson, and others. The second is Wallerstein's "world-systems" approach to analyzing hierarchical relationships between societies within global capitalism as developed and applied across a broader historical range by Chase-Dunn and others. The two structures have important common features, notably their multiscale explanatory framework, links with ideas concerning complex systems, and interest in cyclical phenomena. They also have important differences. It is argued that there are gaps in both sets of ideas that the other might remedy. Their greatest strengths lie at different spatiotemporal scales and in different disciplinary areas, but each also has weaknesses the other does not address, particularly with regard to the mechanisms underlying proposed cyclic patterns of events. The paper ends with a sketch for a research program within which panarchical and world-systems insights might be synthesised in the study of the "Great European Land-Grab," i.e., the expansion of European capitalism and its distinctive social-ecological systems over the past five centuries.

Key Words: adaptive cycle; cross-scale interaction; panarchy; population; resilience; technology; world-systems.

INTRODUCTION

“Panarchy” refers here to the framework for conceptualizing the type of coupled human-environment systems described in Gunderson and Holling (2002) and more briefly, with some changes, in Walker et al. (2006). This framework may be divided into two parts, referred to here as “the resilience conceptual framework” and “the adaptive cycle metaphor.” This paper critically compares aspects of panarchy with the “world-systems” framework (Wallerstein 1974, 1993, Denemark et al. 2000, Hall 2000), specifically the variant of world-systems analysis developed by Chase-Dunn and colleagues (Chase-Dunn and Hall 1997a,b, Chase-Dunn and Babones 2006). The two approaches have much in common as well as important differences. Their commonalities include seeking broad-scale patterns in human social systems and explaining them in terms of processes that affect multiple, distinct, but interacting spatial and temporal scales. They also have close links with ideas about complex systems (Holland 1992, 1998) and place considerable emphasis on cyclic phenomena, an interest they inherit from Schumpeter (1939, 1943) and, via Schumpeter in the panarchist case, Kondratieff (1979 [1926]), alternatively transliterated as “Kondratiev.” Major differences include the focal scale, which is regional for panarchy and planetary for world-systems; greater emphasis on ecological processes and social-ecological interactions in panarchy and on economic, political, and military processes in world-systems theory; and more attention within world-systems analysis to directional change over the course of multiple cycles.

THE PANARCHICAL FRAMEWORK

For my purposes here, the following aspects of the panarchical view of ecological and social-ecological systems are central.