

Somma, M. S. 1992. The Colorado River: A dynamic study of the dependence of politics on the initial conditions of ecology. Ph.D. dissertation. University of Iowa. Iowa City, Iowa. 306 pp.

Since the 1960s, predictions of dire water shortages have attended discussions of the southwestern US. To combat possible shortages, the most common recommendations are market strategies; raising prices, promoting increased efficiency and higher returns on water use. Central to the market strategy is ending government subsidies for irrigation water. The dissertation questions the applicability and use of market strategy in solving certain kinds of ecological problems including discontinuity of supply, fungibility, tragedy of the commons, and the uncertainty of powerful human impacts on complex, nonlinear, ecological systems.

The dissertation considers the Colorado River system from an ecological perspective, intertwining production and reproduction with bioregions and natural selection to produce an explanation of public policy. Public policy confronts the requirements of collective actions. Policy is typically seen as structured by the prevailing understandings and political processes of society. It often has dramatic effects on the surrounding ecological web but, so also, ecology has a subtle and influential effect on the making of public policy. In the area of policy/ecology interaction, some sets of problems go unaddressed and their consequences accumulate over time. The problems also begin to undermine the legitimacy and competence of the political institutions.

The dissertation features public policy and political institutions, ecological theory, mathematical modelling, and detailed data analysis. A mathematical model of the society/ecology relationship in the Colorado River basin is developed. It includes initial conditions, demographic and economic growth, and the feedback between society and ecology. The model is put into motion using current data on water flow, climate, storage capacity, water use, and other ecological and behavioral variables. Political responses by legislatures and bureaucracies feed back into water demand and supply.