



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2003WY12B

Title: Water Scarcity and Economic Growth in Wyoming

Project Type: Research

Focus Categories: Economics, Water Quantity

Keywords: Data Analysis, Economics, Water Use Data

Start Date: 03/01/2003

End Date: 02/29/2005

Federal Funds: \$9,953

Non-Federal Matching Funds: \$28,887

Congressional District: 1

Principal Investigator:

Edward B. Barbier

Abstract

The persistence of drought conditions over much or all of the state of Wyoming in recent years has raised concern as to whether water availability relative to use may be limiting economic growth and development in certain regions or even state-wide. The proposed research aims to address this issue by analyzing the relationship between relative water availability and economic growth across the counties and key water-using sectors in Wyoming. The modeling approach is based on Barbier (2002), which depicts the influence of water utilization on the growth of the economy through a model that includes this congestible public good as a productive input for private producers. The result is that the aggregate rate of water utilization by all producers is related directly to the growth of the economy. In Barbier (2002), this relationship was empirically tested through a statistical analysis across countries, and allowing for the fact that some countries face moderate or extreme conditions of water stress. The aim of the proposed research is to modify the water-growth model and apply it to the state of Wyoming. Two types of analysis are envisioned. The first involves examining empirically the relationship between the rate of water utilization and economic growth across the individual counties of Wyoming and over time (i.e. annually). The degree of water stress faced by certain counties in some years will be incorporated specifically into the analysis. The second analysis also involves examining the water-growth relationship over time but for the three

main water-using sectors in Wyoming's economy: irrigated agriculture (i.e. the annual crop sector), irrigated fodder (i.e. the ranching sector) and the minerals/energy sector. Both the county and sector-level analyses will not only reveal the extent to which overall economic growth in Wyoming is affected by water availability relative to use but also identify those counties and sectors whose economic development is especially at risk from water scarcity. Such information may be critical to future water use planning in Wyoming, and for the design and implementation of institutional and allocation mechanisms for water supply in the state.