Robert McConnell disputes the author's contention that California has successfully managed water supplies. McConnell is an associate professor of Geology at Mary Washington College, Fredericksburg, Virginia, and has his Ph.D. in Geology from the University of California, Santa Barbara.

Who Gets the Water?

A Book Review by Robert McConnell

DIVIDING THE WATERS: GOVERNING GROUNDWATER IN SOUTHERN CALIFORNIA
By William Blomquist
San Francsico: Institute for Contemporary Studies
413 pp., $44.95 (hardcover)
$14.95 (paperback)

William Blomquist has presented an informative story of the historical development of groundwater "management" strategies for eight groundwater basins in the Los Angeles metropolitan region of southern California. He attempts to demonstrate that local solutions by polycentric *ad hoc* organizations to water supply issues are feasible, more efficient and infinitely more workable than those imposed by central bureaucracies or "water czars."

The book seeks to explain how various and, importantly, *different* "solutions" to groundwater overdraft developed in each of the eight groundwater basins studied. Blomquist documents how the solutions were developed by consensus among the water users themselves (supervised closely by the courts) and were not imposed from Sacramento or Washington. He then cites them as examples of the success of local governance over central planning.

While conceding that roughly one in ten groundwater basins throughout the state is still in overdraft, he states "groundwater use had been brought under control in most of the area's major groundwater basins by 1980. How this happened, and the institu-tions and organizations created to bring about and sustain that control, are the subjects of this study."

In the book's preface, Robert B. Hawkins, Jr., president of the Institute for Contemporary Studies (the book's publisher), promotes these "solutions" as evidence that citizens who "have the opportunity to engage in self-governing, collective action" and who "are able to successfully address issues as complex and vexing as those surrounding groundwater [use]" can avoid "tragedies of the commons," and by inference can solve environmental and resource allocation problems much more efficiently than large governmental entities devoted to centralized planning (such as EPA), which "now [prevail] in most areas of our lives."

The eight basins studied are: Raymond Basin, West Basin, Central Basin, Main San Gabriel Basin, San Fernando Valley, Mojave River, Chino Basin and Orange County.

It is also well to state at the beginning what the book does not do: it does not describe the specific detailed hydrological attributes of each basin, which unfortunately is critical to understanding why the management strategies "worked" in the various basins. Central to the "success" that each basin has achieved is high permeability coupled with low compactability of the shallow aquifers, which allow them to be used, as it were, as massive underground storage tanks to be overdrafted and refilled cyclically without suffering permanent damage. The author in fact interchanges incorrectly two important terms: *porosity* (a measure of the pore volume within media), and *permeability* (a measure of the rate of fluid flow through media). He also incorrectly inter-changes *soils* and *sediment*. To be fair, Blomquist is a political scientist, not a hydrologist or geologist. And, to be sure, he provides a valuable discussion on the general behavior and characteristics of ground-water basins. Nor does the book consider issues of groundwater degradation in any significant detail.

The book does contain much valuable data: usable storage capacity of California groundwater basins is immense, 143 million acre-feet (1AF equals nearly 326,000 gallons), triple the capacity of surface impoundments; groundwater provides one-third of all the water used in southern California; there are nearly 450 discrete groundwater basins in the state; and so forth. Moreover, there is a very informative chapter describing characteristics of the state's four watersheds: San Gabriel River, Mojave River, Los Angeles River and Santa Ana River. The history of groundwater development, and incidentally the development of southern California itself, is treated well — from the Spanish exploration in the 1760s and the founding of the Los Angeles pueblo in 1781 with its pueblo water rights and Crown land grants, through the various land "booms" of the 1800s, to the explosive growth after World War II and beyond.

A major focus of the book is the extent to which the courts have been essential participants in development and maintenance of viable groundwater management strategies. Blomquist manages to explain in unusually clear prose the various water doctrines, their historical development, and the extent to which vagaries in those doctrines, used by the courts to adjudicate disputes, have complicated the process, such that final adjudication of water disputes may take decades. An example may serve to illustrate the

process.

West Basin contains the cities of Long Beach and Torrance and is the western-most basin within the San Gabriel River watershed. Southwest of Los Angeles proper, it is bordered on the west by the Pacific Ocean (with whose salt waters its aquifers are in intimate contact) and on the east by the Newport-Inglewood Uplift, a fault zone which transmits groundwater flow from the Central Basin to the east. Due to urbanization and the abundance of clay-rich soils, little groundwater recharge occurs within the basin itself.

At the turn of the century West Basin was largely agricultural, but by 1950 it had been almost completely urbanized. By 1912, the slope of the entire water table had been altered from overpumping, such that seawater was being drawn into the aquifers along the coast and coastal wells were being abandoned. Through 1957, the total overdraft was estimated at over 800,000 acre-feet, and most of this had been replaced by seawater. Along the coast, the seawater front was advancing at over 1,000 feet per year. Desperate, three large water users in 1945 filed suit against hundreds of other users, petitioning the Superior Court to essentially allocate groundwater.

By 1952, such sufficient data were available that the overdraft conditions were clear to all users. An interim agreement was finally reached in 1955, but a second lawsuit forced renegotiation of the interim agreement. Finally, in 1961, an agreement was filed with the Court which was speedily approved. Appeals from disgruntled users dragged the process on until 1964, when the last appeal was denied.

The process had taken nineteen years and had cost millions in fees and costs. Even so, this workable agreement was only viable because supple-mental supplies had become available, since "*water users would not likely cooperate in reducing withdrawals from the basin until they had an alternative source of supply"* [reviewer's emphasis].

The book's central thesis, therefore, founders on the fact that each of these groundwater basin "solutions" represent special cases, directly related to and critically dependent on the availability of supplemental water supplies from surface sources: the Colorado River, the Owens Valley, and the great Sacramento River Delta, itself fed by the magnificent Sierra river systems, all of which have been ecologically devastated by dam building and water withdrawal.

The water users in the various basins have not therefore solved a "vexing" problem: that of preserving the integrity of their groundwater supplies, by shared sacrifice, inspiration, or gobs of civic virtue. By using surface supplies to increase their water use and maintain the integrity of the eight basins, they have simply "robbed Peter to pay Paul" and thereby contributed to the destruction of ecosystems throughout California and Arizona. Had additional water *not* been available, and had the water users achieved these kinds of "solutions" by shared sacrifice and mutually reduced groundwater use to the safe annual yield of each basin, *then* Blomquist (and the publishers) could rightly assert their claims about the success of "polycentric" organizations.

In fact, the jury is still out on the southern California profligate, water-consuming lifestyle. With population growth in the area averaging nearly 3 per cent per year, Los Angeles has recently lost rights to much of the water it obtained during the early years of this century through the ecological devastation of Owens Valley. And California will soon lose hundreds of thousands of acre-feet of Colorado River water as Arizona gradually asserts water rights. The mandate to restore the Sacramento Delta/San Francisco Bay estuary and to restore the devastated irrigated land of the western San Joaquin Valley will eventually place rigid, and probably much lower, limits on water withdrawals for southern California.

Only then will Blomquist's "solutions" be truly tested. ■