The Great American Wetland

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Introduction

Unfortunately, there are no comprehensive historical geographies of the Great American Wetland, Florida's Everglades (Fig. 1). Of all the famous wetland systems across the nation such as the Dismal Swamp along the Virginia-North Carolina border, the Prairie Pothole Region of the Upper Midwest, Georgia's Okeefenokee Swamp, or Louisiana's famous bayous to name only a few—Florida's Everglades are perhaps most deserving of the title Great American Wetland. Size, proximity to a major population concentration, and popular image certainly make the Everglades (or simply "Glades") a contender for such a title. Furthermore, what happens to this extensive area of wetlands next to a densely settled portion of the country's fourth most populous state is likely to have a profound effect on similar areas throughout the nation.

In contrast to the Everglades and other wetlands in the United States, the Great Plains are the subject of a rich historical geographic literature. During a brief period in the middle 19th century, this region was known as the Great American Desert (Fig. 2). In addition to Walter Prescott Webb's well known 1931 book entitled *The Great Plains*, geographers such as John Hudson (1985, 1986, 1990), Malcolm Lewis (1962, 1966a, 1966b, 1967, 1976, 1979), and Martyn Bowden (1969, 1971, 1975, 1976)—among others—have made substantial contributions to the historical geography of the Great Plains. Is it possible that the Plains can provide a model for historical geographic studies of wetlands such as the Everglades?

Model construction is a difficult task especially in historical geography. Yet if successful, a model might make it possible to more fully understand human activity on landscapes of the past. For example, Peirce Lewis (1990) suggests that both Pennsylvania and New England are cultural hearths whose influence can be seen far into the Central and Western United States. In other words, if one

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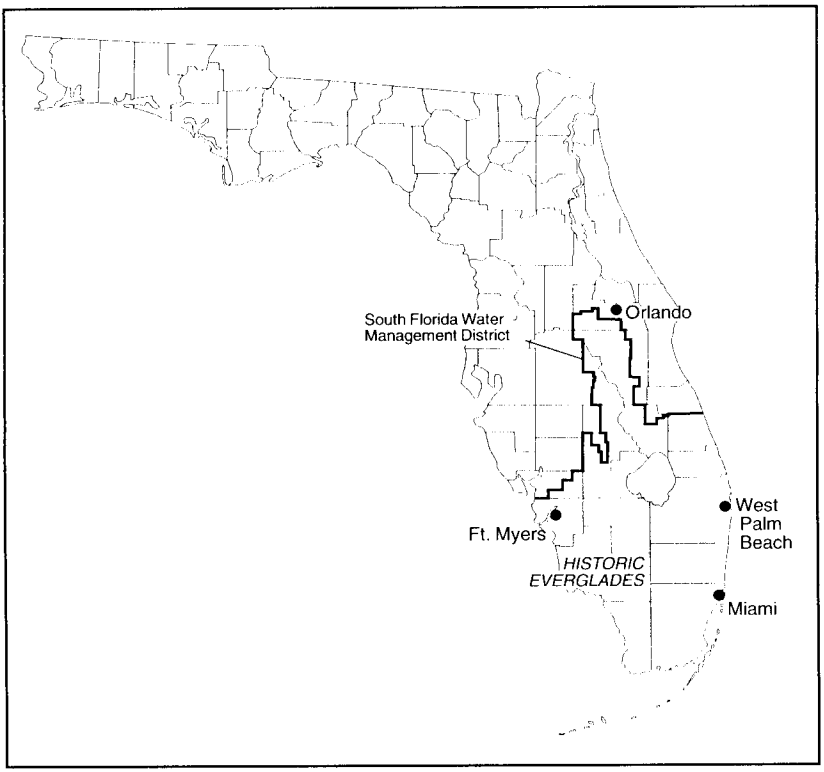
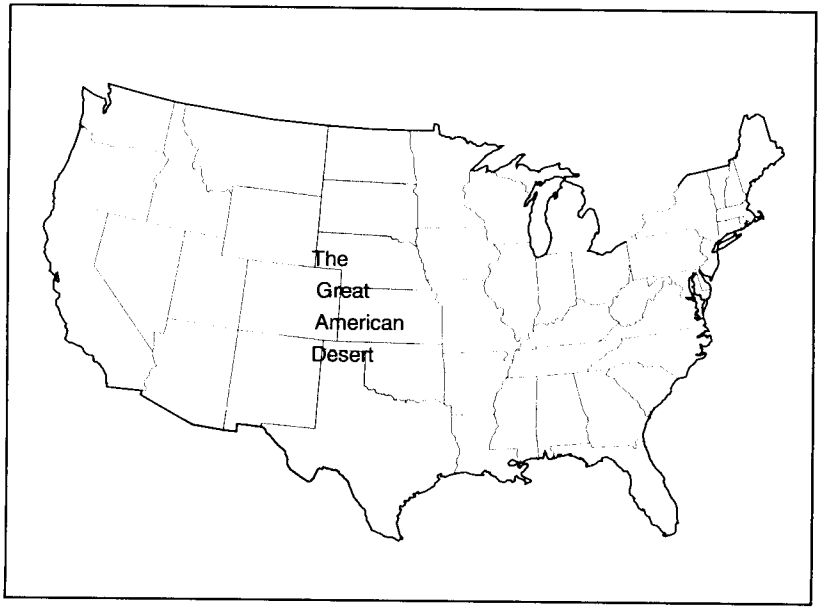
Figure 1



is armed with a reasonable understanding of historical geographic activity in a given place, one might be able to explain historical geographic activity elsewhere.

That both the Plains and the Glades (along with other wetlands) are generally flat is of profound significance. It has long been thought that mountainous or hilly areas are vulnerable to development pressure because development can cause severe soil erosion and flooding of rivers and streams. On the other hand, the threat to wetlands and other "flatlands" is more subtle, and this causes people to overlook their vulnerability to development pressure. Phillips (1997) has made this case from a geomorphologic perspective, and it is argued here that flatland hydrology and biology can be damaged as well. During the 19th century, Midwestern flatlands—including the Great Plains—attracted thousands of settlers. Shortly after 1900, wetlands (including the Everglades) became

Figure 2



viewed as a fertile class of flatlands; and because the Glades and other wetlands soon accounted for much of the undeveloped land in many regions, this made them especially attractive and vulnerable to development pressure.

Although their physical geographies are quite different, there are a host of perceptual similarities between the Great American Wetland and the Great American Desert. Eleven of these have been gathered into three broad categories that describe perceptual themes germane to both regions (Table 1). These themes are prominent features of Great Plains historiography and it is believed that substantial evidence will justify extrapolation to the Everglades.

First Theme: Strange Places

Both the Plains and the Glades share several common attributes that help create the impression that these landscapes are not only undramatic, but also undesirable. Lewis (1962) contends that during the first 150 years of sporadic exploration by French and Spanish explorers, Plains descriptions varied from desert to useless grassland. Not until well into the 19th century did significant numbers of

Table 1
Points of Comparison between the Great Plains and Everglades

1. Both regions were ignored when first explored by Euro-Americans.
2. Both regions have been described as a "sea of grass."
3. Both regions have significant, if not readily apparent, landscape variation.
4. Tree islands in the Everglades and riparian corridors in the Plains are relative oases of biodiversity.
5. Both regions had animals that were severely over-hunted.
6. Groundwater in the Plains and peat soils in the Everglades are being "mined."
7. Both regions have significant natural hazards.
8. Settlers of both regions were proud of "conquering" difficult environments.
9. The federal government has provided both regions with significant agricultural subsidies.
10. The federal government has invested substantial sums in water-related projects in both regions.
11. Both regions have been the subject of high-profile reports regarding future land use.

people begin to view the region as an area of immense potential. Ignorance of the Everglades is equally apparent. According to Tebeau (1974 p.1), "the Spanish era produced very little knowledge of South Florida and almost none of the interior." Knowledge of the Glades improved little even after Florida became a part of the United States in 1821. Captain John LeConte of the U.S. Topographical Engineers investigated South Florida in the early 1820s, and he rejected the existence of Lake Okeechobee despite its presence on previous maps (Tebeau 1974; Fig. 1). Years later, the U.S. Army generated volumes of information about the Everglades during the Seminole Indian Wars of the 1830s and 1840s. After the conflict, however, most of this information remained buried in official reports awaiting rediscovery when interest in the Great American Wetland resurfaced at the dawn of the 20th century. Clearly, there had been little interest in either the Plains or the Glades until at least the later 19th century.

Furthermore, both places have been described in the past as "seas of grass." Although sawgrass is technically not a grass (it is a

sedge), it covered much of the Glades and grew in some places to over ten feet above water (Derr 1993). The historic tall grasses of the more eastern prairies are widely recognized, but some sections of the Great Plains used to be covered by grass so tall that pioneers could not see ahead of their horses (Tom Seltvedt, personal communication).

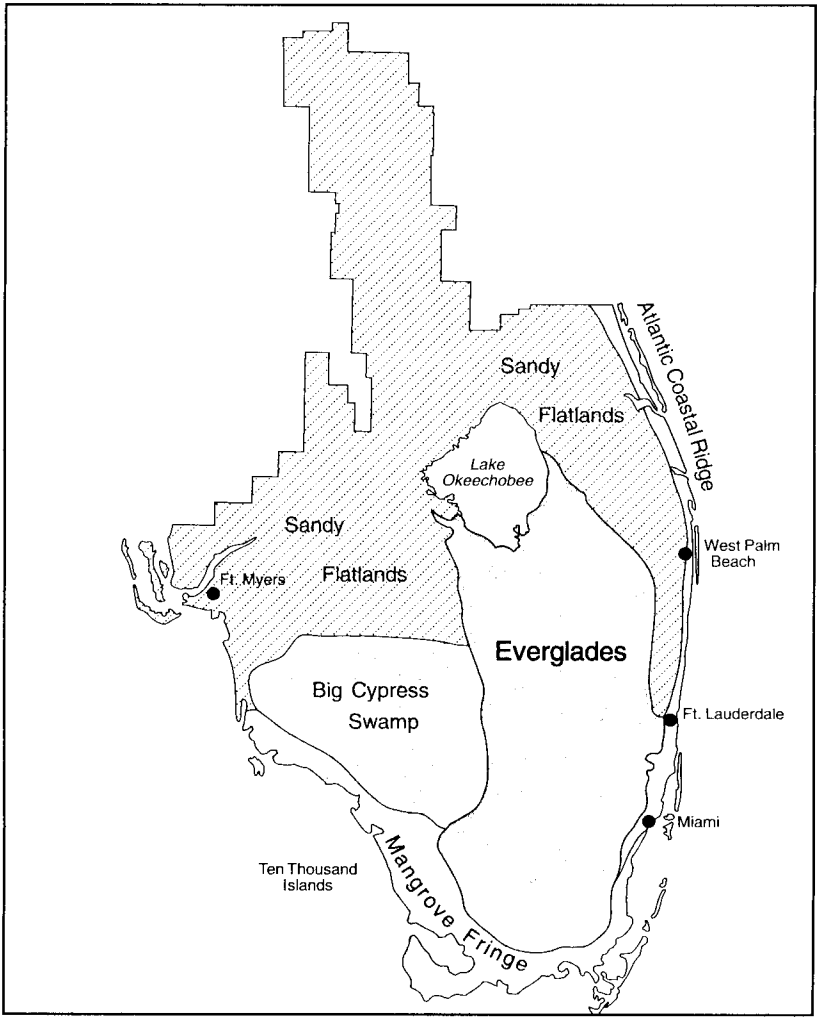
Contrary to popular perceptions of seemingly endless stretches of grass, there is landscape variation in both the Plains and the Glades. Much of the problem revolves around people's past experiences. European colonists to North America came from places with hills or mountains. As they settled the eastern seaboard, they found familiar topography. When the wave of settlement reached Florida and central North America, however, pioneers encountered substantially different landscapes. In these regions, changes in relief are generally much less noticeable.

Topographic variation in both the Plains and Glades is not stark, but it does occur and this variation produces different vegetation communities. In the Everglades, for example, tree islands dot the landscape. Microtopographic changes in elevation produce habitat for tree species that could not survive at lower, more frequently waterlogged, elevations. On the other hand, the Plains are crossed by a number of rivers and streams—some of which contain water all year. In many respects these riparian areas are the counterparts of tree islands in the Everglades. They are islands of biodiversity compared to surrounding grasslands.

Not only have many observers ignored subtle changes in topography, many have failed to recognize broad intraregional variety within the Plains and Glades. For example, before most of the grass was plowed into cropland, the eastern and slightly more humid Plains were home to tall prairie grasses while short grasses dominated the more arid western Plains. Furthermore, the Prairie Pothole Region of the northern Plains is pocked with shallow, glacially created depressions that usually contain water during the spring and early summer months. Also, northwest Texas and parts of surrounding states are similarly marked with wind blown depressions called Playa Lakes. Between these subregions lie Nebraska's Sandhills; to the northwest, South Dakota's Black Hills; and across much of the western Dakotas, there are the rugged Badlands.

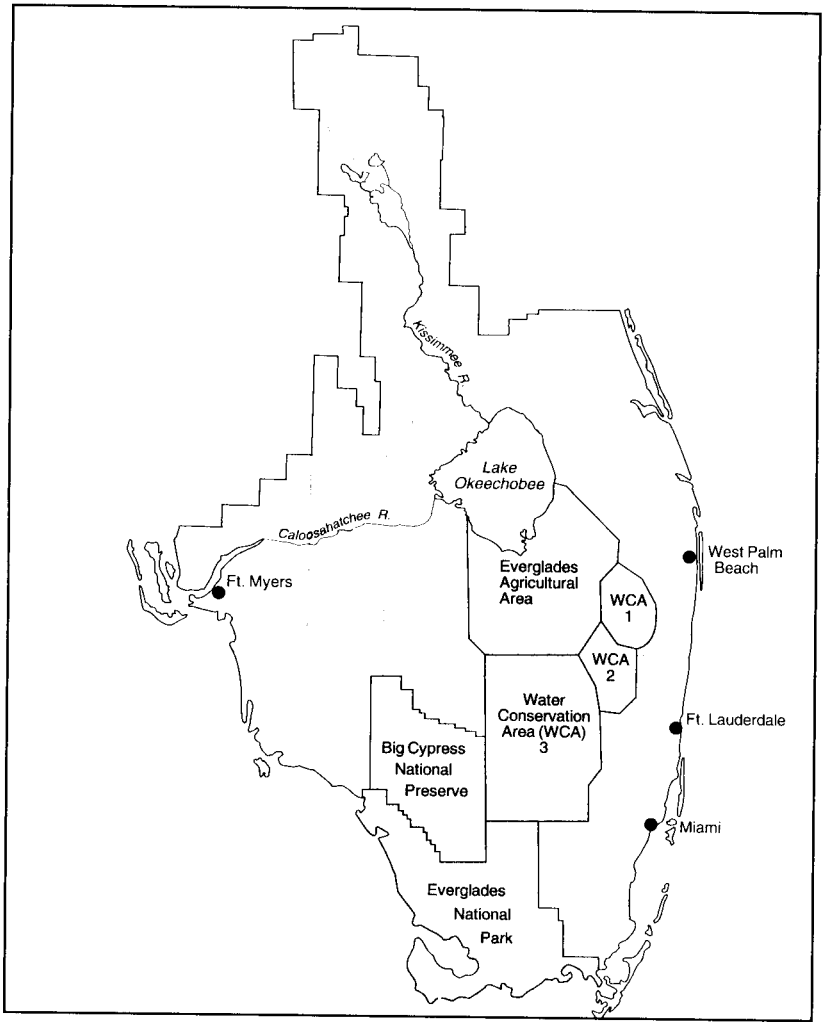
South Florida also has landscape variety (Fig. 3). In addition to sawgrass marshes in South Florida's interior, the Everglades are bordered on the east by the Atlantic Coastal Ridge, a strip about five miles wide and between four to twenty feet higher than the Glades

Figure 3



themselves. The southwestern Glades blend imperceptibly into the Big Cypress Swamp, most of which is now a 3,100-square-kilometer national preserve dominated by dwarf cypress trees (Fig. 4). As one moves closer to the southern and southwestern coasts, sawgrass and cypress trees give way to mangrove swamps. Immediately off the southwestern coast is a region called 10,000 Islands—so named because of the myriad of mangrove dominated islands

Figure 4



offshore. Also within the Glades are slightly elevated limestone outcrops that support pine forests. Finally, one can also find a host of lakes sprinkled throughout South Florida.

People have historically failed to perceive landscape variety in both the Plains and the Glades. Previous experiences of observers and subtlety of topographic changes are partly responsible. Furthermore, relatively slow transportation prevented many 19th and

early 20th century travelers and pioneers from noticing topographic differences over large areas. In summary, since most of North America's settlers were more familiar with hilly and mountainous topography, huge areas of flatlands with generally subtle changes in topography were initially viewed as monotonous and unwelcome sights.

Second Theme: Limited Settlement Potential

As Watson (1969) points out, illusions about environments strongly influence how those environments are used. During the late 19th and early 20th centuries, the Great Plains and Everglades were viewed as places of immense settlement potential. In this case, settlement potential refers to a region's ability to sustain a certain number of people at an acceptable standard of living. Prince (1995 p.18) argues that during this time, "a ladder of progress ascended from destructive exploitation of natural resources to continuous cultivation of crops by permanent settlers." Indeed, Watson (1976 p.71) notes that "development in America had almost become synonymous with ravagement. Love of country had become rape of the land." Examples of this attitude are not hard to find.

On the Plains, for instance, bison were hunted to the brink of extinction. In the Everglades, plumage-producing birds nearly met the same fate. Although alligators were not hunted out of existence, they might have been if not for protection granted under laws like the Endangered Species Act of 1973. In addition, Baltensperger (1992) notes that many Plains promoters encouraged pioneers to "conquer" the difficult environment of the central U.S. Indeed, unscrupulous western real estate promoters lured countless people onto increasingly marginal land, especially in the more arid western Plains. Along the same lines, Will (1968) suggests that early Glades settlers were proud of having overcome the hardships of life in the Everglades. Moreover, it has been well documented that early 20th century land developers in South Florida sold thousands of acres of undrained wetlands to unsuspecting buyers (U.S. House 1912). In neither case was there any recognition that these environments are not able to sustain the large population densities found in other environments.

Environmental degradation in these regions is not limited to late 19th and early 20th centuries. For the past several decades, farmers have been mining water from the Ogallala Aquifer of the central United States to combat periodic drought. Unfortunately, it takes

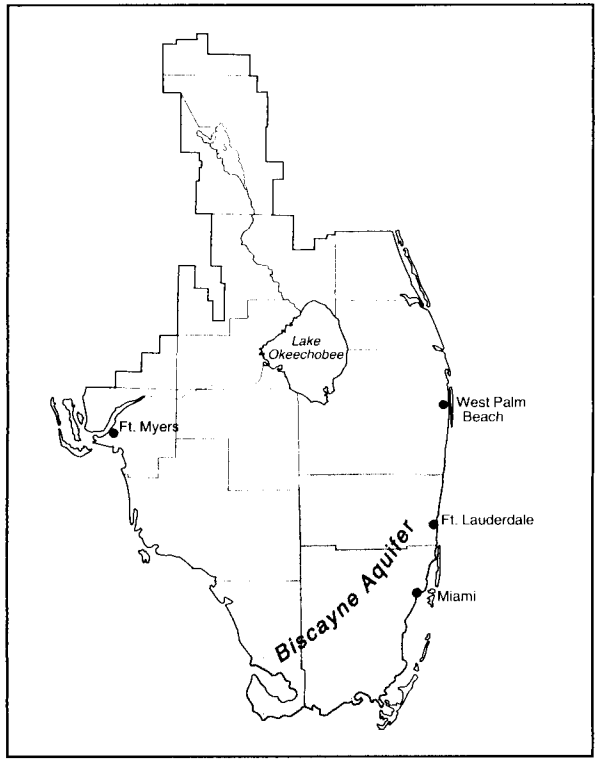
thousands of years for surface water to replace groundwater pumped from many parts of the Ogallala. Water levels in parts of the aquifer have declined substantially in recent years prompting some to speculate that the aquifer will soon be exhausted in some areas of the Plains (Zwingle 1993). In South Florida, farmers have been mining the rich Everglades muck for most of this century. Thick peat soils in the Glades took a few thousand years to develop, but after drainage, these soils oxidize rapidly. Aerobic bacteria literally consume the mostly organic soil. As a result, soil subsidence is a major problem in the Everglades Agricultural Area just south of Lake Okeechobee (Stephens 1984; Fig 4).

Ecosystems of both regions are well adapted to handle their respective environmental stresses. Yet Americans have frequently paid a heavy toll for ignoring their region's settlement potential. In the Plains, droughts, bitter cold winters, and hoards of grasshoppers have periodically chased people out of the region. Indeed, the human and environmental disaster caused by the Dust Bowl of the 1930s is still the subject of much discussion (Reibsame 1986). Drought can also strike South Florida, causing thousands of acres of drained peat soils to burn for weeks at a time. Flooding has always been a major problem for humans in the Everglades; and hurricanes in 1926 and again in 1928 killed nearly 2,200 South Floridians and caused untold property damage (Blake 1980). Finally, as the population along the Atlantic Coastal Ridge between West Palm Beach and Miami continues to grow and exert more pressure on the Biscayne Aquifer (southeast Florida's chief source of drinking water; Fig 5), the potential for disaster appears to grow.

Both of these regions provide fodder for those who argue for more sustainable development. Frank and Deborah Popper (1991) contend that declining populations in many western and Plains counties is evidence that the region cannot support existing residents; in other words, the Plains have reached or exceeded their settlement potential. On the other hand, Hudson (1996) suggests that the withering and eventual depopulation of many Plains towns does not mean settlement in the region has failed; it is a sign of adaptation. The Plains produce more agricultural products now than ever—but they do it with fewer people.

At the same time, recent popular concern over the fate of the Everglades suggests that limits to settlement potential in South Florida may also have been exceeded. For example, it has been suggested that if Hurricane Andrew had struck just 20 miles farther north (near downtown Miami), property damage and loss

Figure 5



of life would have been far in excess of the actual totals (Anonymous 1993). Furthermore, the insurance industry is beginning to examine the potential impacts of global warming—which could be disastrous for South Florida (Christine 1993). Indeed, much of the recent commotion surrounding the sustainability concept stems from the fact that we still do not know how much pressure an environmental system can withstand before collapsing. Yet as Sonnenfeld (1978 p.21) concludes, "even when resources are obviously being depleted . . . there is often still lacking the sense of an option to conserve resources if this means reduction in standard of living or social well being."

Third Theme: Government Land Policy

Both the Great Plains and the Everglades received substantial

attention from the federal government during the 20th century. Much of this attention has been in the form of agricultural subsidies to farmers in both regions. Many grain farmers in the Plains have grown dependent upon price supports for their produce. Frank and Deborah Popper (1987) argue not only that harsh natural and economic conditions have already begun to depopulate the region, they insist that it is becoming too expensive to continue subsidizing settlement in the Great Plains. Wallach (1985) agrees, suggesting that the federal government should ease residents out of the region by purchasing their land. Indeed, Fite (1979 p.197) adds that "there is no doubt but that the flow of Federal money into the Great Plains has kept the region's income considerably above what it would have been otherwise." At the same time, South Florida sugar growers receive indirect subsidies as well as a foreign policy that prevents less expensive foreign sugar from entering the United States. Clay Henderson, President of the Florida Audubon Society, distributed a letter dated 12 September 1995 urging members to support Congressional efforts to end price supports for sugar.

The federal government has also invested heavily in public works projects for both regions. In the relatively dry Plains, federally sponsored irrigation projects dot the countryside. Indeed, criticism of central North Dakota's Garrison Diversion, a massive irrigation project, eventually became so intense that Congress cut off funding necessary to complete the project (Luoma 1982). In South Florida, the federal government spent millions of dollars digging 1,400 miles of ditches and canals in an effort to drain the landscape (Boucher 1995). Today, there are ongoing experiments in the Everglades to determine the feasibility of leveling dikes and filling ditches currently used in South Florida water management (Culotta 1995; South Florida Water Management District 1996).

Settlement and its associated problems in both the Plains and the Glades has stimulated much discussion about "what to do" with each region. During the 1930s, the federal government created the Great Plains Committee that produced a detailed examination of the region in order to make recommendations regarding land use and future government policy (White 1986). In recent years, as already mentioned, both Wallach and the Poppers are calling on the federal government to help Plains residents move out of the region.

The Everglades have also been the subject of several special commissions during the early 20th century (Florida Everglades Engineering Commission 1914; Copeland 1930; Natural Resources

Committee 1936). Recently, Davis and Ogden (1994) edited a massive volume on the Everglades written by representatives of the South Florida Water Management District, Everglades National Park, National Audubon Society, academia, and other institutions. After decades of much debate in both regions, it seems clear that in the future, there will be even more high profile discussion regarding appropriate land use in both regions.

Significant Differences between the Great Plains and the Everglades

Having assessed many similarities between these two regions, it is important to keep in mind some key differences. To begin with, the Great Plains is a much larger region than the Everglades which, even before drainage, covered only the southern portion of peninsular Florida (Fig. 1). Moreover, the Glades are rimmed by South Florida's burgeoning urban population while direct urban influence on the Plains is much less. Also, the current embargo on Cuban sugar is a fundamentally different source of subsidization for South Florida sugar farmers than the direct price supports given to many Plains grain farmers. Finally, the relative aridity of the region briefly known as the Great American Desert contrasts sharply with Florida's Everglades—the Great American Wetland.

These fundamental differences have led to somewhat different perceptions of appropriate land use in each region. During the late 19th and early 20th centuries, most Americans viewed land in a utilitarian sense that usually meant summarizing a landscape's potential in terms of agricultural production. A century later, perceived uses of the Plains still center on agriculture and perhaps mineral extraction. Yet perceived uses of the Everglades have expanded from just agriculture to encompass a variety of functions and values associated with wetlands. In addition to flood control and groundwater recharge uses, wildlife habitat and aesthetics are a large part of many people's perception of the Great American Wetland.

Summary and Conclusions

The Everglades are important for a variety of reasons. To begin with, portions of the Glades recharge the Biscayne Aquifer (Fig. 5), widely regarded as one of the most productive water table aquifers in the world (Kreitman and Wetterburn 1984). If not overused, this fresh groundwater keeps salt water from encroaching inland

toward municipal well fields. Some scientists have suggested that Florida Bay (immediately south of the Glades)—and its associated recreation and fishing industries—are dependant upon a biologically "healthy" Everglades (*Gainesville Sun* 1994). The Great American Wetland is home to a wide variety of plant and animal life, the result of a unique combination of temperate and tropical influences. Indeed, the Everglades was the first primarily biological national park. To this list of Everglades benefits one could add aesthetic and wilderness values.

At first glance it might appear as if there is absolutely no connection between the Great American Desert and the Great American Wetland; there are certainly some important differences between the two regions. Yet it should be clear that these landscapes share much in common, and as a result, prominent historical geographic themes that appear in Great Plains literature can be used to explain people's historic relationship with large wetland areas like the Everglades. The two regions' relative flatness and apparent emptiness have created negative impressions in the minds of many people. Furthermore, lack of relief may have led to a perception that these regions are so expansive that no amount of human pressure could hurt them. A land-hungry population eventually spilled into both regions, and population pressure produced environmental problems prompting pleas for government intervention.

Why? Because landowners have long maintained an unshakable belief in their right to convert the landscape into wealth, even if it requires government assistance to do so. The Everglades were the perfect flatland. Since the late 19th century, the lure of flatlands in the U.S. has led people to ignore possible consequences associated with their development. Recent discussion of unsustainable populations in the Plains leads one to wonder if we are not allowing unsustainable populations to move into South Florida—possibly setting the stage for a 1930s style environmental disaster.

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