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Commentary

Local and Watershed Land Use Controls: A Turning Point for Agriculture and Water Quality

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INTRODUCTION

Domestic food production and the conservation of limited agricultural resources, such as prime farmland soils, are of critical importance to both the short- and long-term health and welfare of Americans. Typical farming practices today require many inputs, such as fertilizers, pesticides, and mechanized cultivation. Our nation's industrialized agricultural systems produce essential food products, but also environmental externalities, including excess nutrient runoff from fertilizers and livestock wastes, pesticide runoff, soil erosion and sedimentation, greenhouse gas emissions from farm machinery and livestock manure, and human enteric or intestinal pathogens. These outputs affect not only fish, wildlife, and other ecologically beneficial species, but also human use of water resources, including ground and surface waters, for domestic use and consumption, recreation, and commercial activities.

With few exceptions, there has been limited effective local, state, or federal land use planning, management, and regulation for the long-term conservation of limited agricultural natural resources or regulation of the environmental externalities of industrialized agriculture production. Given the lack of voluntary land stewardship by landowners in general, and farmers in particular, and the lack of a culturally accepted "land ethic," a new approach is desperately required that blends existing voluntary coordination efforts with public coercion (e.g., police-power-based regulatory controls).

This commentary recommends that state and local governments, supported by federal guidance, technical assistance, and funding, create and implement a comprehensive and holistic approach to agricultural natural resource conservation, land use planning, and land management, which incorporates watershed-based land use controls and regulation of the effects of agricultural land use on other critical natural resources, specifically water.

Existing legal tools include: local comprehensive planning; agricultural districts; agricultural protection zoning; cluster zoning; transfer of development rights (TDR) programs; growth management laws; farmland loss mitigation policies; state and local right-to-farm laws; farm viability programs; tax relief credit; and abatement programs. Relatively new and innovative approaches include payment for ecosystem services (PES) provided by environmentally friendly farming practices and standardized certification of related farm products. Finally, direct federal funding of agriculture, such as crop subsidy payments under the Farm Bill, should require environmentally sustainable agricultural land use and management.

In concert with farmland conservation planning, a more effective system of planning, regulation, and review of modern agricultural land use and management practices must be developed to decrease the negative environmental effects created by industrialized farming, notably polluted stormwater runoff, erosion, and sedimentation. Planning and regulation of agricultural land uses and management practices should consider the effects of both farming inputs and outputs. To increase local and regional planning for agricultural resource conservation and regulatory review of farm management practices, this commentary recommends that states create watershed-based soil and water conservation districts that are statutorily empowered with land use regulatory authority over agricultural land uses. The institutionalization of watershed-level conservation districts is essential to address the cumulative environmental effects of modern agricultural land use. The new watershed-level conservation districts should build on the existing framework in place for county-level soil and water conservation districts and seven decades of voluntary agricultural natural resources conservation and land use planning efforts.

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IMPORTANT TRENDS IN UNITED STATES AGRICULTURE

There were approximately 2.2 million farms in America in 2007. The U.S. Department of Agriculture (USDA) defines a farm as "any place from which $1,000 or more of agricultural products were, or normally would be, produced and sold during the Census year."[1] While the total number of farms nationwide has generally declined since World War II, the 2007 Census recorded a four percent increase from 2002.[2] During this five-year period, almost 300,000 new farms began operation; most of this increase came from growth in small farm operations, particularly within the New England and Intermountain West regions.[3] In 2007, the average size of new farms was 201 acres, while the national average size for all farms was 418 acres.

Today's farms range from very small retirement and residential farms to industrialized operations with sales in the millions of dollars. The 2007 Census showed the two largest groups of farms are residential/lifestyle farms (36 percent) and retirement farms (21 percent). Residential/lifestyle farms, or "small family farms," include those that produce less than $250,000 in sales of agricultural products per year, where the principal operators reported primary occupations other than farming.[4] An example of a residential/lifestyle farm is my father's 86-acre, 60-head beef farm outside of Lake Placid, New York, which he has operated for the last 25 years. Large family farms (sales between $250,000 and $500,000) and very large family farms (sales over $500,000) made up only nine percent of all farms in the country in 2007, but produced over 63 percent of the value of farm product sales.[5]

Most farms in the United States are small; 60 percent of all farms report less than $10,000 in sales of agricultural products. Of the 2.2 million farms nationally, only one million show positive net cash income from farming operations. The remaining 1.2 million farms depend on nonfarm incomes to cover farm expenses.

In 2007, U.S. farms sold almost $300 billion in agricultural products while incurring $241 billion in production expenses.[6] The average per-farm net cash income was almost $34,000, which includes $9,500 in government payments.[7] The value of agricultural production in the United States is concentrated in several regions, including the Midwest, Mississippi Delta, California, and the Atlantic seaboard. Nearly half of the total value of U.S. domestic agricultural products in 2007 came from nine states, with the top five being California, Texas, Iowa, Nebraska, and Kansas. Current census figures show the concentration of agricultural production has increased in the last five years, with 125,000 farms producing 75 percent of the value of U.S. agricultural production.[8]

However, despite agricultural land's economic, cultural, and environmental importance, the United States loses two acres of agricultural land to development every minute of every day. Farm and ranch land is desirable for development because it tends to be flat, well drained, and affordable.[9] Between 1997 and 2002, about 20 percent of new "developed land," defined to include large and small urban and built-up areas, came from cropland.[10] Developers convert prime cropland, or land with the best combination of physical and chemical characteristics for agricultural production, to residential and commercial uses at the same rate as nonprime cropland.[11] Fertile soils take thousands of years to develop.[12] Cropland conversion to urban uses is largely irreversible, and excessive loss of cropland to urban uses could reduce production of food and fiber as well as rural amenities, including open space, water protection, and rural lifestyles.[13]

Farm real estate values vary widely between regions and states. As of 2004, Northeastern states continued to record the highest average values for farm real estate, with Connecticut and Rhode Island exceeding $10,000 per acre. These values reflect continued pressure from nonagricultural sources for conversion to residential or other urban-related uses.[14] High values in California, Florida, Ohio, Illinois, Indiana, and North Carolina are the consequence of urban pressures, the production of high-value crops, or high soil fertility. Large amounts of arid farmland and less productive cropland influence low farm real estate values for many states in the Northern and Southern Plains and Mountain regions. New Mexico, Wyoming, and Montana recorded the lowest average farm real estate values per acre in 2004, with an average of $265, $315, and $410 per acre respectively.[15]

Many factors unrelated to agricultural productivity contribute to the value of lands in rural areas today, including urban influence, government program payments, and rural amenities.[16] Proximity to cities often inflates the value of farmland by creating demand for nonfarm development. As the population continues to grow and disperse, even primarily rural states experience urban-related influences on farmland real estate values. Commuters are often willing to pay more than agricultural value in order to live in primarily rural areas. Research conducted in 2000 indicates that nonfarm influence accounts for 25 percent of the market value of U.S. farmland.[17] However, farmland also provides nonmonetary benefits, which until recently were supplied in such abundance that they were rarely recognized.[18] The decrease in "rural amenities" in the wake of urbanization—including recreation, aesthetic enjoyment of scenic landscapes and wildlife, environmental quality, and nostalgia related to the cultural significance of rural America, have become a source of national concern.[19]

Why should the country retain a domestic food production base? Although the rate of growth in America is slowing, the U.S. Census Bureau projects a dramatic increase in population over the next 40 years.[20] With almost 307 million people today,[21] the U.S. population is projected to exceed 310 million by 2010 and 439 million by 2050.[22] World population projections also show continued growth. The current 6.8 billion population[23] is anticipated to grow to nine billion by 2040.[24] Projected U.S. population growth, coupled with world population growth, will create an increased demand for food production both domestically and globally throughout the first half of the 21st century. Preservation of domestic agricultural resources is a key component of comprehensive land use planning; resource conservation may help U.S. communities accommodate future changes in environmental and geopolitical conditions

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affecting global food and fuel supplies and exchange.

To increase food production levels to accommodate the nutritional requirements of future populations, more agricultural inputs will be required to increase productivity and utilization of existing idled farmland or nonfarmland for agricultural use. Standard farming practices require extensive inputs of fertilizer, fuel, and feed, which create outputs that include excess nutrient runoff from applied crop fertilizers, pesticide runoff, soil erosion, sedimentation, greenhouse gas emissions from farm machinery and livestock manure, and human enteric or intestinal pathogens.[25] With more inputs into agricultural operation to increase productivity, or increased utilization of the land for agricultural production, negative environmental externalities will also increase if current standard farming practices are continued without modification. If the trend of prime farmland conversion to urban land uses continues at its current pace, there may be a shortage of suitable farmland to supply the nation's food needs. Thus, Americans must work proactively to preserve key domestic agricultural resources, including prime farmland soils, as well as to decrease environmental externalities generated by current farm practices and management.

Most farmers could potentially manage their agricultural lands to provide important environmental benefits and services. These environmental services were historically available in great abundance, and thus were rarely monetized.[26] Well-managed farms can help modulate ecosystem services with economic relevance to humans, such as gas composition, air and water temperature and quality, nutrient flows, and waste decomposition.[27] Specific ecological services and benefits provided by environmentally sensitive farmland management include:

- conservation of fish and wildlife habitat and corridors;
- protection of wetlands, which serve as fish and wildlife habitat, slow stormwater runoff, and provide groundwater recharge;
- absorption and filtration of stormwater by nonimpervious soils and vegetation, which decreases stormwater runoff and flooding;
- filtration of wastewater, as well as properly applied livestock wastes;
- recharged groundwater through soil;
- absorption and sequestration of carbon by woody and grassy biomass;
- improvement of air quality, by filtering air and producing oxygen; and
- preservation of biological diversity.[28]

FARMLAND CONSERVATION AND LAND USE CONTROLS

Farming in America encompasses a broad array of activities—from raising livestock (such as cattle, poultry, hogs, sheep, bison, and emu) and aquaculture to growing crops, including hay, grains, corn, soybeans, fruits, nuts, vegetables, cotton, and tobacco. Agriculture also includes growing decorative plants in nurseries and greenhouses.[29]

The various agricultural activities and scales of production require the use of different land use planning approaches. Like all other real property, each parcel of farmland real estate contains unique physical and geographic characteristics. The operation, perhaps legally organized as a sole proprietorship, partnership, family corporation, nonfamily corporation, or cooperative, also has its unique economic, social, and cultural characteristics. A national one-size-fits-all approach to agricultural land use planning and regulation is not recommended.[30]

Comprehensive Local Planning

As authorized by state-level planning enabling acts, localities formulate comprehensive plans that allow citizens to create a shared vision for their town or county's future. Designed to articulate community policies, objectives, and decision-making guidelines, comprehensive plans (also known as master or general plans) can serve as local blueprints for future development and conservation within a given government's scope of jurisdiction. Comprehensive plans can provide a basis for local farmland protection strategies by identifying areas where future growth will be encouraged and where agricultural or other uses or activities, such as conservation and recreation, should be promoted. Comprehensive plans can incorporate specific local agricultural land use objectives and recommend future implementation systems, such as transfer of development rights or agricultural conservation easements.[31]

Agricultural Districts

Agricultural districts, typically authorized by state law and implemented on the local level, allow farmers to form special areas where commercial agricultural activities and land use is encouraged and protected. For voluntary enrollment, farmers typically receive a package of benefits, which varies from state to state. As of 2008, 16 states have authorized agricultural district programs, including California, Minnesota, New Jersey, North Carolina, and Virginia. To conserve the existing land base for agricultural use, some state programs protect farmland from annexation and eminent domain and require state agencies to limit the construction of roads and sewers within the districts. These districts also create a more secure social environment for participating farmers by preventing local governments from passing laws that restrict farm practices and providing enhanced protection from private nuisance suits.[32]

Agricultural Protection Zoning

Agricultural protection zoning (APZ) refers to local municipal or county zoning aimed at stabilizing the agricultural land base. Unlike agricultural districts, APZ is a regulatory, not voluntary, tool. APZ designates areas within the municipality or county, based on the underlying policies and objectives identified through its comprehensive planning processes and procedures, where agriculture is the desired land use. Such designation is based on soil quality as well as locational factors.

APZ ordinances vary, but generally discourage or sometimes prohibit nonagricultural uses that are incompatible with commercial farming.[33] Many APZ ordinances also limit residential development density, ranging from one

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residence per 20 acres in the eastern U.S. to 640 acres in the West.[34] APZ ordinances can also limit subdivisions, designate site design criteria, and include local right-to-farm provisions. Communities can use APZ to conserve a "critical mass" of agricultural land within their localized jurisdiction to prevent individual farm fragmentation within areas of urban development. Maintaining a critical mass of agricultural land can help ensure that there will be enough farms to economically support and sustain agricultural service businesses.[35]

Cluster Zoning

Cluster zoning is a relatively common planning and zoning technique that is used by many different municipalities and counties across the country to promote the design of spatially condensed residential and commercial development and conserve identified land-based resources of community interest—including prime farmlands, wildlife habitat, steep slopes, wetlands, riparian corridors, and scenic vistas. While specific requirements of cluster zoning ordinances vary, ordinances generally allow or require development grouped on small lots in order to protect open land. Clustered residential developments, while effective in preserving open space and farmland soil resources, infrequently incorporate active commercial agriculture. However, cluster zoning has been successful in creating transitional areas between farm and residential land uses.[36]

TDR

TDR programs allow landowners to transfer the right to develop from one parcel of land to a different parcel of land. Effective TDR systems clearly designate specific "sending" and "receiving" zones. TDRs are relatively complex in that they require a bureaucratic system for tracking the transfer of rights, the use of easements to restrict future development on "sending" parcels, and local governmental staff to monitor and enforce restrictions. Further, as TDRs rely on market forces, sufficient demand for local development markets must exist to entice developers to buy transferrable rights to increase development density over that already permitted by the base zoning within the designated "receiving" area. If sufficient market conditions exist or are likely to exist in the near future, TDRs may protect existing farms and agricultural resources, such as prime farmland-designated soils, by shifting development pressure from agricultural areas to areas designated for growth. Factors such as steady growth, the political will to maintain strong zoning ordinances, and experienced planners with sufficient time to administer complex regulations characterize communities most successful in using TDRs to preserve important agricultural lands.[37]

Growth Management and Farm Loss Mitigation Laws

As of 2008, 12 states had enacted legislation to control the pace of regional development and provide planning standards for local governments. Several address the conversion of farmland for urban development.[38] Oregon's Land Conservation and Development Act of 1972 is one of the strongest growth management laws in the country, requiring that every county implement agricultural protection zoning. Washington's Growth Management Act, enacted in the early 1990s, has also served as an effective farmland protection tool.[39]

Farmland mitigation laws aim to compensate for the conversion of agricultural land to other uses by requiring the protection of comparable off-site agricultural land. Mitigation laws and policies vary between states, counties, and municipalities across the country. Some states have also created comparable mitigation laws to help conserve other natural resources, such as wetlands. Connecticut's Public Act No. 04-222, enacted in 2004, requires municipalities to mitigate the loss of active agricultural land taken by eminent domain by either purchasing easements on comparable farmland within their jurisdiction or paying a mitigation fee into a statewide farmland protection program.[40]

State and Local Right-to-Farm Laws

Every state in the United States has enacted a right-to-farm law. Local governments have also enacted similar ordinances to strengthen or clarify state right-to-farm legislation. State agricultural agencies, such as New Jersey's State Agricultural Development Committee, has encouraged local governmental initiatives by providing model local right-to-farm ordinances. Generally, the intent of these laws and ordinances is to protect farmers from nuisance lawsuits filed by neighbors affected by noise, dust, odors, and other inconveniences created by typical and accepted farming practices.[41]

Purchase of Agricultural Conservation Easements

Forty-nine states have enacted laws authorizing conservation easements; 23 of these states based their laws on the Uniform Conservation Easement Act of 1981.[42] Easements are recorded deed restrictions limiting future land use, management, and development in accordance with the terms and conditions of the negotiated easement agreement. All easements legally "run with the land" or are binding on both current and future landowners.[43] The easement holder has the right (as well as the duty) to enforce the restrictions. Most conservation easements restrict future development in perpetuity, and only gifts of perpetual easements qualify donors for income and estate tax benefits. While most holders only accept perpetual easements, limited term easements may be written for a specific term of years.[44]

The purchase of agriculture conservation easements (PACE), either by private parties (e.g., nonprofit land trust organizations) or governmental entities, has become a popular method for encouraging voluntary conservation of agricultural resources. Since the first agricultural easements acquired in the late 1970s, the American Farmland Trust (AFT) estimates that landowners have placed about 1.1 million acres of farmland nationwide under conservation easements, at an approximate cost of $2.3 billion.[45]

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agricultural use, and all easements must provide some documented public benefit. While the farmer, as grantor of the easement, gives up some future development and land use rights, he retains the right to use the land for farming and other activities that do not reduce or interfere with the property's agricultural viability. The grantee (usually a land trust or government agency) is responsible for legally holding, monitoring, and enforcing the terms of the "negative" or restrictive conservation easement.[46]

A farmer who grants an agricultural conservation easement retains legal title to his property and can restrict access (unless otherwise required to receive federal tax benefits or provided for in the terms of the easement), as well as the right to give or sell the easement-encumbered property to another party.[47] When agricultural easements are purchased by the grantee or easement holder, the price is usually the difference between the value of the land for agriculture and the value of the land for its "highest and best use," most often residential or commercial development.

PACE programs allow farmers to receive cash equity for conserving their land for agricultural use and provide an alternative to selling farm properties for nonagricultural uses. Permanent easements also generally reduce the future market value of the property, which can help facilitate intergenerational family land transfers or make the farm more affordable to other interested future farmers. Liquid capital provided by PACE agreements can help farmers enhance the economic viability of their farm operations and make infrastructure improvements. Many farmers use the proceeds of PACE sales to reduce debt; expand, modernize, change, or diversify their operations; or settle estates.[48]

To enhance funding and financial support of PACE programs, the federal Farmland Protection Program (FPP), first established in the 1996 Farm Bill, provides matching funds to state, local, and tribal agricultural easement acquisition programs. The 2002 Farm Bill expanded FPP to include certain nongovernmental organizations working on farmland conservation and protection. The 2008 Farm Bill authorized $743 million for FPP through federal fiscal year 2012. In addition to federal sources, several state PACE programs have reported contributions from private sponsors.[49] Participating farmers also become private PACE sponsors when they accept a bargain sale price for their agricultural conservation easement (e.g., a payment below the difference between the value of the land for agricultural use and the value of the land as appraised for development of its "highest and best use").

Farm Viability Programs

Besides the liquid capital gained from PACE programs, several states have also created farm viability programs to enhance the economic vitality of in-state farming operations. Administered by state departments of agriculture, programs funded to date include technical assistance to farmers and small grants. Massachusetts and Minnesota have implemented viability programs. The 2002 Farm Bill authorized grants to eligible entities with farm viability programs.[50]

Differential Tax Assessment and Relief Credits

Other tools currently used by states to promote agricultural land use include differential assessment programs (also known as current use assessment or farm use valuation) and circuit-breaker tax relief credits. Through state-level differential assessment laws, every state except Michigan directs local governments to assess agricultural land at its current use or agricultural value, as opposed to the standard local property assessment of the property used for its "highest and best use." Differential assessments help promote the economic viability of farming operations by reducing an individual farmer's tax burden.

An example of such a differential assessment program is Vermont's Current Use Program (the Agricultural and Managed Forest Land Use Value Program), which was created in 1978 and offers participating landowners use value property taxation based on the productive value of their land.[51] Administered by the Vermont Department of Taxes, in 2000 the current use value of the land enrolled in the program statewide averaged about 20 percent of the full fair market value. The program allows abatement of farmers' locally assessed property taxes. Vermont's program also includes a Land Use Change Tax as a disincentive to farmland development; this tax is about 20 percent of the fair market value of a property, or—in the event of a subdivision and sale of a portion of the enrolled property—a pro rata share of the fair market value of the entire property. Vermont's program has proven to be very popular: In 2008, landowners enrolled more 15,000 properties totaling over two million acres, about one-third of the state's total land area.

Alternatively, states such as Michigan have created circuit breaker tax programs that offer tax credits to offset farmers' property taxes. In Wisconsin and New York, farmers may receive state income tax credits based on the amount of their real property tax bill and income. In Iowa, farmers receive school tax credits from local governments when taxes exceed a statutory threshold, and are reimbursed later from a statewide fund. Unlike differential assessment programs, these programs base tax relief credits on a farmer's income and are funded by the state instead of local governments.[52]

Payment for Ecosystem Services

Observing that "agriculture has long been the Rubik's Cube of environmental policy," legal scholars such as J.B. Ruhl and some economists have suggested new ways to value the "multifunctional capacity of farms to contribute to the environmental and economic well-being of the landscape while continuing to serve as our primary source of food and fiber."[53] Natural capital produced by farms managed in an environmentally sensitive manner includes preservation of biological diversity (e.g., diversity of plant, animal, and insect species), groundwater recharge, and improvement of both

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ground and surface water quality. In the past, however, U.S. agricultural "research, development . . . and policy has traditionally focused on maximizing biomass production and optimizing its use, with far less emphasis on the evaluation of environmental, social, and economic performance."[54]

By contrast, agricultural multifunctionality emphasizes the joint production of standard commodities (e.g., food and fiber) and "ecological services" on the premise that "major additional gains may result from a working landscape approach that improves environmental performance of active farmland by rewarding farmers for delivering environmental benefits, as well as food and biomass."[55] Payments for ecosystem services could be valued by the avoided cost of technological infrastructure, such the avoided costs of municipal water purification upgrades where enhanced ecosystem services provided by farms effectively safeguard local drinking water quality. Monetarily valued in this way, PES would be a demand-driven payment for valuable services rendered, instead of a subsidy or payment for intrinsic or ecological benefits such as wildlife habitat or clean surface and groundwater.[56]

The PES program "must be devised in such a way for the buyer and seller to know that payment X yields service value Y, and that this is a rational economic move for both parties."[57] Methods used by multifunctional farms to achieve a more balanced production profile could include: precision, no-till, contour, or organic farming; rotational cropping; crop residue use; biological-based pest controls; riparian cover; filtration strips; incorporation of pollinator habitat; and water retention and recharge ponds.[58] For ongoing agricultural land uses, preservation of an accepted status quo could provide the farmer with a basic, standard ecosystem service payment, while sets of more stringent land management and restoration practices could define higher levels of service premiums.[59]

The Florida Ranchlands Environmental Services Project provides a current example of a PES program. Started in 2005 by the World Wildlife Fund with private and public partners, the pilot project pays ranchers in an 850,000 acre area of central Florida for enhanced delivery of ecosystem services—specifically water retention, phosphorus load reduction, and wetlands habitat expansion. The targeted area is located north of Lake Okeechobee, where cattle ranching operations are the dominant agricultural land use. Under this program, ranchers can sell environmental services to government agencies and other willing buyers.[60] As noted by Ruhl, "understanding the multifunctional capacity of agricultural lands provides insight into how state and local governments, with federal guidance and support, can promote alternatives that blend enhanced environmental performance with better development planning."[61]

"Sustainable Farms" Certification and Labeling

Another market-based approach that could enhance both the economic viability and environmental quality of domestic U.S. farms is the creation of statewide or national "sustainable farms" certification programs and trademarked labeling. [62] Analogous existing programs provide models for certification, including "fair trade" and "sustainable farm" certification labeling of international food products like coffee, cocoa, and tropical fruits, and domestic "sustainable forestry" certifications.[63]

A domestic "sustainable farms" certification program should set forth minimum baseline management and land use standards for a variety of different agricultural operations. A governmental entity, such as state agricultural departments or the USDA, could administer the certification program, building and improving on its existing "organic" certification procedures. Alternatively, an independent third-party organization could run certification programs. Regardless of its administration, a "sustainable farms" program should provide an initial on-site farm management review, as well as annual or biannual audits of land use practices used on certified farms or ranches.

A NEW-OLD IDEA: WATERSHED-BASED PLANNING

Watershed Defined

The word "watershed," like the words "ecosystem," "agriculture," or "farm," is a broad, conceptual term used to refer to a wide variety of topographic drainage features. According to the National Research Council's (NRC) Watershed Committee, the term "watershed" commonly encompasses a range of spatial and temporal scales.[64] In its general usage, the term "watershed" often connotes a relatively small drainage area, while "river basin" usually identifies a very large drainage area; however, neither term is by definition scale-specific.[65] One potential analogy for watersheds, which include smaller drainage areas nested within larger ones, is a set of Russian nesting dolls.[66]

Both the social and scientific literature often commingles the various terms and concepts associated with watersheds. According to NRC, a "drainage basin" refers to a "portion of the surface of the earth where all water falling on its surface collects in a network of channels and exits the watershed at a single point."[67] With a few exceptions, drainage basins divide the entire earth's surface. Each basin contains smaller sub-basins with their own identity, with minor "inter-basin areas" where slopes drain directly into large channels. Thus, basins have two key topographic properties—they divide the earth's surface into naturally defined subunits, and are nested areas, with larger basins subsuming smaller.

While the term watershed is now a "wide-ranging label," it originally referred only to the line of high ground separating two basins (now scientifically known as an "interfluve"), but in the 1900s came to denote a drainage area.[68] As used herein, watershed includes water (both surface water and groundwater influenced by surface water), associated soil or land,[69] vegetation, land use, and human activity occurring within a topographically defined drainage basin that discharges to a specific point (e.g., a stream, river, lake, estuary, sea, or ocean). This two-dimensional definition also incor-

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porates the varying temporal or time-based scales related to the response times associated with environmental or manmade changes in different watershed features (e.g., vegetation, land use, soils, hydrology, geology), which range from very short (years to decades), long (decades to centuries) or extremely long (longer than a millennium).[70]

U.S. Geological Survey (USGS) Watershed Classification System

The USGS has precisely delineated the boundaries of the nation's drainage areas, which are available in printed and digital form[71] through its free, interactive online mapping interface.[72] In the 1970s, the U.S. Water Resources Council (WRC) originally devised a conceptual framework for dividing the United States into water resources regions wherein all regional boundaries are hydrological and topographic. In 1974, in cooperation with WRC, USGS published maps for each state showing the location of hydrologic unit boundaries and a national map.[73] Based on the WRC framework and USGS mapping:

> The United States is divided and subdivided into successively smaller hydrologic units that are classified into four levels: regions, sub-regions, accounting units, and cataloging units. The hydrologic units are arranged within each other, from the smallest (cataloging units) to the largest (regions). Each hydrologic unit is identified by a unique hydrologic unit code consisting of two, four, six or eight digits based on the four levels of classification in the hydrologic unit system.[74]

The first level of the classification system divides the country into 21 major geographic areas, or "water resource regions," identified with a two-digit numeric code. These regions "contain either the drainage area of a major river, such as the Texas-Gulf region, which includes a number of rivers draining into the Gulf of Mexico." The second level divides regions into 221 "subregions," which include "the area drained by a river system, a reach of a river and its tributaries in that reach, a closed basin(s), or a group of streams forming a coastal drainage area." The third level subdivides many subregions into 378 hydrologic "accounting units," which are nested within or equivalent to subregions. The fourth level is the "cataloging unit," the smallest element in the current hierarchy of hydrologic units,[75] which includes a geographic area representing part or all of a surface drainage basin, a combination of drainage basins, or a distinct hydrologic feature. Identified by eight-digit numeric codes, cataloging units subdivide accounting units into smaller areas. There are 2,264 cataloging units, sometimes referred to by the USGS and others as "watersheds."[76]

Why Watershed-Based Planning?

The idea that watersheds provide a logical basis for water resource planning and land use management to regulate the environmental effects of agriculture, specifically water and soils, is not new. Federal and state watershed-based programs and policy initiatives focusing on the relationship between land and water quality date back to the 1930s.[77] While there are several comprehensive studies reviewing both the opportunities and constraints of watershed-scale management,[78] there are four key imperatives for why this approach is essential for successful agricultural land use conservation and effective soil and water quality protection. These imperatives, identified by Robert W. Adler, reflect ecological, institutional, economic, and social needs; current pressures; and practical realities.[79] The ecological imperative for watershed-level planning, management, and new regulatory controls is "strongly suggested" by the synthesis of three relevant factors:

- the nature of aquatic ecosystems, including the interaction between land and water, the link between water quality and quantity, the connection between surface and groundwater, and the variability of natural systems;
- the continued decline of the health of aquatic species and ecosystems, despite the implementation of federally directed, state-based point source pollution programs and other engineered solutions; and
- the nature of primary sources of continued impairment (e.g., agriculture) that existing source-specific regulatory programs have not addressed well.[80]

Several factors also support the institutional imperative for the development of watershed-based approaches in the United States:

- political fragmentation of domestic institutions used to manage and protect water resources, including overlapping and conflicting divisions of responsibility among levels of government and agencies;
- issue fragmentation, including the artificial legal and political division of related water issues such as quantity and quality, land and water use, and surface and groundwater regulation and management; and
- the existing gaps in water resource policy program design and implementation, including its continued failure to control nonpoint-source pollution (to which agriculture is the primary contributor).[81]

Adler notes that due to the "intractable nature of polluted runoff," a watershed approach would best enable "programs to target the worst causes of polluted runoff in, and to implement the combination of solutions bested tailored to the conditions of, each watershed."[82]

The two economic imperatives for watershed programs include the need for equity between point sources, nonpoint sources, and other sources of water pollution, and efficiency in the use of scarce public and private resources.[83] Finally, sociological imperatives for watershed protection include "bioregionalism," the idea that people are more willing to take actions and to make sacrifices to protect and to restore a specific place to which they are personally connected. In addition, American culture continues to evade a generally accepted land ethic,[84] extensively discussed in the writings of Aldo Leopold.[85] Further, watershed-based planning and management allows for greater local stakeholder input; group-based "peer pressure"; and the establishment of a localized compliance system enforced not only through

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regulation by community-based norms, but through the crystallization of public opinion around a specific problem and a democratically identified community solution. Localized land use planning, management, and control historically proved successful when it was used to address soil erosion issues faced by farmers during the Dust Bowl.[86]

Regarding the nexus among watershed-based management, land use planning, environmental quality, and agricultural lands conservation, Norm Berg (a former chief of the USDA's Soil Conservation Service (SCS) and 35-year USDA veteran),[87] noted in 1976:

> In summary, projections of land use patterns are difficult to make. . . . The true impacts need to be assessed on a watershed-by-watershed basis. National land use trends by crops and by region have not been consistent or predictable. It's not easy to find suitable "analogous" watersheds for proper "with project" and "without project" comparisons. And many projects just haven't been completed long enough to have their full effect on land use changes—or for land use changes to have their full effects on the watersheds. One land use issue that deserves particular attention in every watershed is prime agricultural land. . . . It's obvious that competition, conflict, and pressure over the use of prime agricultural land will increase because the supply of good farm-and-ranch acres is finite. Public policy is needed to assure that prime land is used wisely.[88]
>
> . . . However, I believe that the small watershed approach is uniquely suited for looking at land, water, and other resource needs in a meaningful package. I believe that watershed projects can give more focus to land use concerns, especially prime agricultural land, wetland, and other areas of environmental significance. I believe that watershed projects should put more emphasis on land treatment and on nonstructural control measures including land use controls . . . may your alternatives in watershed management be truly comprehensive and practical. The future of American land and water hangs in the balance.[89]

Earlier in this speech, Berg highlighted the importance of watershed-based planning and decision making, noting the "essential simplicity" that "every man, woman, or child" can immediately grasp—that "water runs downhill."[90] He emphasized the importance of local participation to finding lasting solutions to local problems and observed that "the physical and economic interests in a watershed, blended with people's interests and needs, are precisely what determine land use in the watershed. Conversely, the patterns and problems in land use affect every other physical and economic relationship."[91] Discussing the effects of urban development and continued population growth, Berg stressed the need for local land use planning and lamented the lack of preparation by most communities in guiding development. He identified the need for "somebody" to make decisions, "perhaps unpopular decisions—about allocating local resources. By whom and how is the tough question to answer."[92]

History of Soil and Water Conservation Districts

The use of watersheds as an institutional framework for public policy, planning, and localized political decision making regarding agriculture, land use, and related land management issues dates back to the "dirty '30s"and the American Dust Bowl.[93] The USDA's new SCS published a model Standard State Soil Conservation Districts Law in 1936, intended to enable the creation of local "soil conservation districts" as state government subdivisions and promote a localized approach to soil erosion issues faced by affected farmers during the Dust Bowl. In exchange for SCS technical service, advice, and federal funding, states were required to enact enabling legislation for conservation districts. States adopted laws, but with significant modifications.[94]

The SCS model law proposed that soil conservation districts organize along watershed boundaries and possess the power to regulate land uses therein. However, many state legislatures eliminated both of these key elements.[95] States also roundly rejected the SCS recommendation to provide conservation districts with taxing powers. Instead, as continued in many states today, state laws directed conservation districts to organize along county lines and few possessed (or if they had it, few used) land use control authority. Today, relying almost exclusively on education, technical assistance, and cost sharing, districts face the "unenviable task of encouraging voluntary adoption of conservation practices, but without the substantial federal subsidies, without police power authority, and without the organizational logic of the watershed."[96]

The potential land use regulatory authority of local soil and water conservation districts engendered broad public interest during the mid-1970s as efforts progressed to implement the area-wide planning provisions of Clean Water Act (CWA) section 208.[97] Included in the 1972 amendments, Section 208 required states to identify planning organizations that would develop waste treatment management plans in designated areas or undertake such planning themselves in more rural areas.[98] These plans were supposed to identify agricultural nonpoint sources of water pollution and their cumulative effects, as well as manure disposal area runoff and land used for livestock and crop production, and "methods (including land use requirements) to control to the extent feasible such sources."[99] However, despite the legislative intent to address nonpoint source pollution and assist farmers with best management practices to reduce agricultural runoffs, Section 208 water quality planning is widely viewed as a failure.[100] EPA approved 209 of the 222 plans submitted by 1982, but most approved plans failed to adequately identifying nonpoint source pollution regulatory mechanisms (such as land use controls). Many areawide plans designated state conservation agencies and local conservation districts responsible for implementation, but did not use land use regulatory powers.[101] Section 208 was never formally repealed and remains on the books, although funding ended in 1981.[102]

In addressing water quality problems related to agricultural land, a smaller watershed unit presents an appropriate scale for watershed management.

AN INSTITUTIONAL FRAMEWORK FOR WATERSHED CONTROLS

Based on his comprehensive review of historic U.S. watershed programs and proposals throughout the 1900s,[103] watershed protection and restoration efforts under the CWA, and existing regional watershed protection statutes,[104] Adler identifies several key issues critical to successful watershed management programs, including questions of scale, boundary, control, mission, consistency, and a "series of accompanying paradoxes which make solutions elusive."[105]

Scale and Boundary

Regarding the critical question of scale, Adler observes "serious disagreement . . . over the appropriate scale for watershed programs, reflecting a tension between ecological and political considerations."[106] Proponents of large river basins or other broadly defined hydrologic regions, such as the Texas-Gulf, Great Basin or New England Water Resource Regions, argue that watershed programs at broad, regional scales can more readily account for the landscape-level hydrologic connections between different types of water bodies (e.g., wetlands, streams, lakes, rivers, and estuaries) and cumulative, regionwide effects of human activities. A broader basinwide approach, however, includes significant political and institutional hurdles, because larger watersheds usually cross several political boundaries (e.g., local, state, national, international) and programs would require more intergovernmental coordination.[107]

On the other end, proponents of smaller-scale watershed programs, "such as devotees of the SCS small watershed program," cite social, political, and practical benefits, including greater programmatic accounting for the unique physical and sociopolitical conditions of a particular smaller watershed area.[108] Drawbacks of this localized approach include "the lack of scope necessary to address expansive hydrological and ecological linkages over space and time. Small programs might solve local problems while ignoring, or in some cases exacerbating, conditions in other areas, resulting in geographic externalities."[109] Adler suggests that one solution to this first paradox of scale is that "watershed programs require planning and implementation at multiple, nested scales, allocating roles and responsibilities as appropriate to each scale." While the largest watershed units, such as Water Resource Regions, should address issues of regional planning, assessment, and coordination, the smallest watershed units should focus more on design and implementation of on-the-ground controls.[110]

In addressing water quality problems related to agricultural land, a smaller watershed unit presents an appropriate scale for watershed management. In considering the closely related question of boundary, the use of USGS cataloging unit hydrological boundaries, instead of municipal, county or state political boundaries, is appropriate due to the interconnections between agricultural land uses and water quality. UGSG hydrologic cataloging units, which are roughly the size of counties, appear large enough to identify and effectively address key agricultural land use and related water quality issues, but are not so large as to decrease the social benefits of small, group-based community planning, decision making, and local enforcement. Watershed management at the level of the cataloging unit could incorporate existing state soil and conservation districts for political and regulatory decision making related to agricultural land use controls.

Control

Closely intertwined with these issues of scale and boundary is "the pivotal and contentious matter of control."[111] The control issue includes the allocation of power, or decision-making authority, among different levels of government, and distribution of decision-making authority between the government (elected officials, appointed managers, and administrative staff) and people (political constituents of a given elected official, citizens residing in a given jurisdiction, and affected property owners).[112]

Since hydrological units today generally lack independent political power, "a paradox exists between the U.S. tradition of state and local rule within geopolitical boundaries and the need to coordinate efforts within watershed or ecological boundaries." In providing a "reasonable compromise," Adler outlines a series of basic control principles, which include retaining federal-level control for "activities amenable to uniform controls, and for which variations would produce economic and environmental externalities."[113] Environmental goals should also remain national, "to avoid the problem of interstate or regional competition for economic growth at the expense of the environment."[114] However, "especially for land use, runoff pollution, and other sources of impairment that vary significantly in operation and impact, states and localities should retain some flexibility to adopt their own appropriate requirements."[115] Adler observes that this approach is only fair and viable "if such standards provide approximately equal levels of control, use objective performance criteria, and achieve roughly equivalent levels of compliance."[116]

Generally following the divisions of decision-making authority between local, state, and federal governments recommended by the USDA in 1936[117] and legal scholars,[118] states should statutorily vest localized regulatory control over agricultural land use activities and practices affecting land and water quality in expanded soil and water conservation districts organized by watersheds, specifically USGS cataloging units. However, existing state political subdivisions are very likely to oppose state enabling legislation that provides land use and zoning authority to watershed-level conservation districts. Municipalities and counties, as well as private landowners whose use of their land may be restricted, will likely view watershed-level districts vested with land use authority as an erosion of local political control and personal autonomy.

However, "Dillon's Rule" supports a state's inherent authority to reallocate or assign new land use authority to state subdivisions, including watershed-level

State-level statutory guidance for soil and water conservation districts and related watershed plans is important for creating intrastate consistency among districts.

soil and water conservation districts.[119] The Supreme Court has repeatedly found that state political subdivisions receive no protections from the authority of their parent state under the U.S. Constitution.[120] As penned by Iowa Supreme Court Justice Dillon in *City of Clinton v. Cedar Rapids & M.R.R.*:

> The true view is this: Municipal corporations owe their origin to, and derive their powers and rights wholly from, the legislature. It breathes into them the breath of life, without which they cannot exist. As it creates, so it may destroy. If it may destroy, it may abridge and control. Unless there is some constitutional limitation on the right, the legislature might, by a single act, if we can suppose it capable of so great a folly and so great a wrong, sweep from existence all of the municipal corporations in the State, and the corporation could not prevent it. We know of no limitation on this right so far as the corporations themselves are concerned. They are, so to phrase it, the mere tenants at will of the legislature.[121]

Further, Dillon's Rule has been specifically applied and upheld in the context of state reallocation of local land use control and zoning power. For example, in 1971, the New York State Legislature created the Adirondack Park Agency. The Town of Black Brook was "one of the many local governments in the vast Adirondack Park region whose zoning and land planning powers have been subordinated to the comprehensive land use and development plan of the Adirondack Park Agency Act (Executive Law, art. 27)."[122] The town commenced a declaratory judgment action, arguing that the Act was unconstitutional under the New York Constitution because it diminished and impaired the town's powers to zone under the state's Statute of Local Governments.

The court recited the general rule that a local government is without standing to attack the constitutionality of state legislation affecting its power. However, in this case, it found that where the contention was that the statute violated the home-rule guarantees included in the New York Constitution, a limited exception for local government standing applied. While affirming that the town had standing, the court at the same time cited the "well-settled doctrine" that a "local government is merely a political subdivision created by the sovereign State. As such, it exercises its powers subject to the direction and control of the State, and impairment of those powers raises no constitutional issue."[123] Today, as it has for the last 30-plus years, the Adirondack Park Agency regularly exercises its land use control and zoning authority within the Adirondack Park's boundary.[124]

Finally, another key issue related to the creation of an institutional framework for watershed-level conservation districts is the division of power between the government and the people. Constitutional takings claims by landowners can "pose serious barriers to sound environmental planning and management."[125] Due to the many environmental externalities created by modern agricultural activities and their negative effects on public health, safety, and welfare, coupled with the firmly established authority of a state to utilize its inherent police powers to regulate for the protection of the public interest, state laws related to the institutional framework of watershed-level districts and their associated land use and management responsibilities will likely survive rational basis judicial review. Agricultural land use regulations and controls, which would still allow for many different economic uses of the related farmland, are extremely unlikely to result in a deprivation of "*all* economically beneficial uses" of the property, as required for a *Lucas* categorical regulatory taking.[126] Watershed-based land use controls and regulations would also very likely survive a takings claim under the traditional *Penn Central* balancing test.[127]

Mission and Consistency

A comprehensive watershed approach should have a clearly defined and holistically oriented mission. Questions related to mission include whether a watershed program (or, as proposed herein, a political state subdivision) should be procedural (i.e., defining a series of procedural steps which must be taken to act) or substantive (i.e., pertaining to rights related to the real nature or essence of a thing or concept). State enabling legislation should include both the procedural requirements for land use control and related decision making[128] and identify the substantive land use rights and duties of property owners related to watershed health. Watershed-specific plans, developed and adopted by each soil and water conservation district following public comment and review, should be consistent with state-defined mission of the districts (which in turn should also be consistent with broader related interstate or federal water quality objectives). Individual plans should also serve as a community vision statement for the health of their watershed and include plan elements required by state statute. State enabling legislation should require consistency between the district's watershed plan and its land use regulations.

State-level statutory guidance for soil and water conservation districts and related watershed plans is important for creating intrastate consistency among districts. State legislation should require the establishment of watershed-based conservation districts and specify that their watershed plans "shall" include specified elements and meet certain standards.[129] Guidelines set by interstate agreements will likely prove important for consistency in watershed management in cataloging units that cross state lines; international agreements may be necessary for effective watershed management where watersheds associated with cataloging units cross national borders.

Soil and Water Conservation District Governance

An institutional framework or governance structure for "local watershed management councils" was set out by J.B. Ruhl in his 2003 proposal for a model State Watershed Management Act.[130] In his three-tiered watershed management governance structure,

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Ruhl identifies the need for an umbrella state watershed agency responsible for statewide water quality and quantity regulation and implementation of applicable federal laws, such as the Clean Water Act's water quality standards and impaired water lists.[131] One step down, Regional Watershed Coordination Agencies (RWCAs) would organize by USGS Subregions as constrained by state boundaries. RWCAs would in turn establish Local Watershed Management Council boundaries as it deems appropriate, but to the maximum extent practicable according to USGS cataloging units.[132] These councils would be comprised of generally elected local representatives, and their responsibilities and authorities would include:

- preparing a watershed plan in compliance with a regional plan;
- reviewing local government and private landowner land use and water projects, making a finding of "no significant impact" or potential "significant impact" and providing conditions necessary to ensure compliance with the local plan, or referring matters deemed to have a regional watershed impact to a RWCA;
- acquiring (using eminent domain if necessary) and managing lands identified in its local plan as important to watershed management;
- financing its operations through property taxes, recreational user fees, water utility fees, and development permit fees, including surcharge fees and bonds;
- notifying the state watershed management agency of any state or regional agency action that may substantially interfere with its local watershed plan; and
- developing processes for citizen volunteers to participate in the development of the local watershed plan through planning forums.[133]

The soil and water conservation districts (district), as proposed herein, should also have the authority to enact zoning ordinances to protect and buffer critical water features (such as wetlands, streams, rivers, lakes, or identified ground and surface-water interface areas) from agricultural fertilizer, pesticide, sediment, and livestock waste runoff. They should also have the power to enforce their ordinances (through the assessment of monetary fines and property liens). Based on complaints filed by the public or upon their own initiative, district zoning enforcement staff should have the authority to investigate allegations of over-application of manure, fertilizer, pesticides, or other environmentally harmful chemicals. After sufficient documentation and evidence collection, the districts should have the authority, depending on the severity of the offense, to either fine the landowner and farm operator or seek injunctive relief.

Finally, in the election of district commissioners (with the responsibility for making significant impact determinations and requiring conditions as necessary to conform the development or land management to the local watershed plan), state enabling legislation should specify whether district elections would be held at-large throughout the watershed area, by town, or by county. If voters elect district members by town or by county, if practicable, the town or county's district representation should be adjusted by location upstream/downstream in the watershed (with more weight given to votes by downstream district representatives). District-specific election procedural requirements would also need to account for the relative differences in town or county size as well as the number of its citizens residing within the district's watershed-based jurisdiction. Alternatively, existing town or county councils could appoint district commissioners, with representation adjusted by area, population, and location.

If watershed-based residents directly elect district commissioners, issues may arise regarding district voter-eligibility criteria requirements.[134] State statutes that allow all eligible voters in a district to participate in elections and referenda would provide the broadest level of public participation in district activities, while statutes requiring land ownership would be most restrictive. In its 1973 decision in *Associated Enterprises Inc. v. Toltec Watershed Improvement District*, the U.S. Supreme Court held that special

ADDITIONAL RESOURCES

- McKinstry, Robert, Coreen Ripp, and Emily Lisy. 2006. *Biodiversity Conservation Handbook—State, Local, and Private Protection of Biological Diversity*. Environmental Law Institute.

  A complete guide to developing a state or local biodiversity program; it explains the various legal and financial tools that can be used in implementing such programs, along with the importance of considering people's social and economic needs.

  Daniels, Tom, and Katherine Daniels. 2003. *Environmental Planning Handbook*. APA Planners Press.

  The authors clarify complex environmental issues, examine current sustainability efforts, and offer step-by-step guidance for local governments to incorporate sustainable environmental quality into local and regional comprehensive planning.

- McElfish, James. *Nature-Friendly Ordinances*. 2004. Environmental Law Institute.

  A resource to help communities take affirmative steps to conserve and restore those biodiversity features of their environment that add value regionally and locally.

- Nolon, John, ed. 2003. *New Ground—The Advent of Local Environmental Law*. Environmental Law Institute.

  A collection of papers examining local environmental law and its strategic role in shaping an appropriate response to a new generation of environmental and land use challenges.

- Sabatier, Paul, Will Focht, Mark Lubell, Zev Trachtenberg, Arnold Vedlitz, and Marty Matlock, eds. 2005. *Swimming Upstream—Collaborative Approaches to Watershed Management*. Massachusetts Institute of Technology.

  A comprehensive guide to building watershed management institutions and processes examines historic and current collaborative watershed planning projects in the United States.

Districts must be able to control, regulate, and mitigate the harmful externalities produced by modern farming, including polluted stormwater runoff, soil erosion, and sedimentation.

districts could condition voter eligibility on land ownership where landowners represented the class principally benefited or burdened by district decisions.[135] Land use and zoning decisions made by watershed-based districts would collectively benefit and burden non-landowners and landowners alike, but some landowner advocates might argue for the passage of state legislation requiring land ownership as a condition precedent for district voter eligibility. A decision upholding the application of *Associated Enterprises* to watershed-based districts as proposed herein could negatively affect district activities, as voter eligibility restrictions tend to inhibit the adoption of land use regulations.[136]

Leadership, Capacity, Personnel Resources, and Funding

An important component of creating a successful watershed-level district is the capacity of the district to function independently of local, state, or federal financial assistance, and raise the financial resources necessary to hire effective managers, technical assistance, and support staff. One of the weaknesses of existing county-based conservation districts is their inability to raise funds for district activities.[137] Enabling legislation for districts should allow for independent financing of their operations through property taxes or special assessments, recreational user fees, water utility fees, and development permit fees, including surcharge fees and bonds. State and federal water quality and agricultural agencies should also continue to provide technical guidance and support to local district staff.

CONCLUSION

This commentary strongly recommends that state governments enact legislation to create watershed-level soil and water conservation districts with land use and zoning authority. This expanded institutional framework is essential to implement comprehensive and effective natural resources conservation, land use planning, and watershed management. As identified herein, a wide range of policy, legal, and economic options are available to support agricultural resources conservation, promote environmentally sensitive land use, and improve water quality.

To be effective, it is paramount that these districts, as political subdivisions of the state, are provided with sufficient authority to regulate agricultural land use and management activities. The delegation of state-based police power to watershed-level districts, applied within its constitutional limits, is necessary to protect the health, safety, and welfare of citizens, as well as to protect the functionality of important natural resources, including land and water. Without the guidance and oversight provided by proposed districts, the opportunity to collectively support sustainable agricultural practices, enhance environmental services, and protect water resources, water quality will be lost unless states act in a timely and aggressive fashion.

Enabling watershed-level districts is a critical step that is needed to address the cumulative environmental effects of industrialized agricultural land use and management. Watershed-level planning and the regulation of agricultural land uses need to carefully consider and objectively evaluate both farming inputs and outputs. Districts must be able to control, regulate, and mitigate the harmful externalities produced by modern farming, including polluted stormwater runoff, soil erosion, and sedimentation. They should build upon institutional frameworks in place for county-level conservation districts and 70-plus years of voluntary natural resources conservation, as well as incorporate the time-tested procedures and substantive essence of representative democracy. State legislation and policies guiding district functions and activities need to blend successful voluntary conservation efforts (such as private farmland conservation easements and state PACE programs) with the firm application of state-based land use authority. The implementation of important environmental and land use laws and policies by watershed-level districts represents a key turning point for American agriculture and water quality.

ENDNOTES

1. USDA, Nat'l Agric. Statistics Serv., *Farm Numbers*, in Census of Agriculture (2007), *available at*: http://www.agcensus.usda.gov.

2. The number of farms has declined dramatically since the peak of 6.8 million in 1935, with most of the decline occurring during the 1940s, 1950s, and 1960s. This decline has generally leveled off since the 1970s. Farms today have a much larger average acreage, but averages mask differences among farms that range from very small retirement and residential farms to industrialized operations with sales in the millions of dollars. Part of this diversity stems from the very low sales threshold ($1,000) necessary for an operation to qualify as a farm for statistical purposes. *See* Robert Hoppe, *Land Ownership and Farm Structure*, in Agricultural Resources and Environmental Indicators (AREI) (USDA Economic Research Service (ERS), 2006 ed.).

3. USDA, *supra* note 1.

4. USDA, *supra* note 1. *See also* Hoppe at 18, stating that the USDA ERS farm typology defines "family farm" to include any farm organized as a sole proprietorship, partnership, or family cooperative. "Family farm" excludes farms organized as nonfamily corporations or cooperatives, as well as farms with hired managers.

5. *Id.*

6. USDA, NASS, *Economics*, in Census of Agriculture (2007).

7. *Id.* The federal government made $8 billion in farm subsidy payments to 840,000 farms in 2007. Of the $8 billion paid to farmers, $1.8 billion was for the Conservation Reserve Program, which removes environmentally sensitive lands, particularly wetlands, from agricultural production.

8. USDA, *supra* note 1.

9. American Farmland Trust (AFT), Farmland Protection, http://farmland.org/programs/protection.

10. Ruben Lubowski, Marlow Vesterby, and Shawn Bucholtz, *Land Use*, in Arei Report, 10 (USDA ERS, 2006 ed.) at 7, citing USDA National Resources Conservation Service and Iowa State University, Center for Survey Statistics and Methodology (2003). National Resources Inventory: 2001 NRI.

11. *Id.* Traditional measures of soil quality include NRCS land capacity classes, USDA prime farmland designation, and productivity. The land capacity classification identifies the suitability for a particular use, such as grazing livestock, growing crops or trees, or nonagricultural uses. USDA prime farmland designation is based on the physical and morphological characteristics of the soil, such as depth to water table, moisture-holding capacity, flood frequency, erodibility, and soil acidity. Land classified as prime farmland has the growing season, moisture supply, and soil quality necessary to support high crop yields when managed with modern farming methods. Prime farmland totals 225 million acres or 54 percent of U.S. cropland, excluding Alaska. Soil productivity measures output per unit of input, often based on crop yield per acre. Margot Anderson and Richard Magleby, *Land and Soil Quality*, in AREI Reports, 1996–97, 42–44 (USDA ERS, 1997).

12. AFT, *Why Save Farmland?* (2003), *available at*: http://www.farmlandinfo.org.

13. Lubowski et al., *supra* note 10, at 7.

14. Charles Barnard, *Farm Real Estate Values*, in Arei Report, 10 (USDA ERS, 2006 ed.).

15. *Id.*

16. *Id.*

17. *Id.,* citing C.H. Barnard, *Urbanization Affects a Large Share of Farmland*, in Rural Conditions and Trends, Vol. 10, No. 2 (USDA ERS, 2000).

18. *Id.*

19. *Id.*

20. U.S. Dept of Commerce, Bureau of Census (U.S. Census), *Population Division, Projections of the Population and Components of Change for the United States: 2010–2050* (NP2008-T1) (2008), *available at*: http://www.census.gov/population/www/projections/2008projections.html.

21. U.S. Census, U.S. and World Population Clocks, *see* http://www.census.gov/main/www/popclock.html.

22. U.S. Census, *supra* note 20.

23. U.S. Census, *supra* note 21.

24. U.S. Census, International Database (2008), *available at*: http://www.census.gov/ipc/www/idb.

25. *See* Marc Ribaudo and Robert Johansson, *Water Quality Impacts of Agriculture*; M. Ribaudo and Noel Gollehon, *Animal Agriculture and the Environment*; and Stan Daberkow and Wen Huang, *Nutrient Management*, in AREI (USDA ERS, 2006 ed.).

26. Barnard, *supra* note 14, at 14.

27. J.B. Ruhl, *Agriculture and Ecosystem Services: Strategies for State and Local Governments*, 17 N.Y.U. ENVTL. L.J. 424, 432 (2008).

28. *Id.* at 426; *See also* AFT, *supra* note 12, at 2.

29. USDA, *supra* note 1.

30. AFT, The Farmland Protection Toolbox (2008), *available at*: http://www.farmlandinfo.org.

31. *Id. See also* AFT & Conn. Conference of Municipalities, *Planning for Agriculture: A Guide for Connecticut Municipalities* (2008), *available at*: http://www.farmlandinfo.org; and Town of Williston, Vt., *Open Space and Working Landscapes Plan*, in COMPREHENSIVE PLAN, C-31 (2006), *available at*: http://www.town.williston.vt.us.

32. *Id.* and AFT, *Agricultural District Programs* (2008).

33. Courts have generally rejected the argument that exclusive agricultural use zoning restrictions constitute a regulatory taking. Ruhl, *supra* note 27, at 437, noting Gardner v. N.J. Pinelands Comm'n, 593 A.2d 251 (N.J. 1991).

34. AFT, *Agricultural Protection Zoning* (1998).

35. AFT, *supra* note 30.

36. *Id.*

37. *Id.*

38. *Id.*

39. *Id.*

40. *Id.*

41. *Id.*

42. Land Trust Alliance (LTA), THE CONSERVATION EASEMENT HANDBOOK 12 (2006).

43. *Id.* at 14.

44. *Id.* at 21. However, for legal issues regarding the perpetuity of conservation easements, *see generally* Nancy A. McLaughlin, *Rethinking the Perpetual Nature of Conservation Easements*, 29 HARV. ENV. L. REV. 421 (2005), and Nancy A. McLaughlin, *Conservation Easements: Perpetuity and Beyond*, 34 ECOLOGY L. Q., 672 (2007).

45. AFT, *A National View of Agricultural Conservation Easements*, *available at*: http://www.farmland.org/resources/national-view/default.asp.

46. AFT, *supra* note 30; LTA, *supra* note 42, at 22–23. *See also* Vermont Land Trust, *Operating Farm Easements: Guide to the Legal Document and Farmland Protection: How to Conserve Your Farm*, *available at*: http://www.vlt.org/agriculture.html.

47. LTA, *supra* note 42, at 21–23, stating that public access is required for the donor to receive federal tax benefits only if the primary conservation value of the property is public recreational or educational use; IRS § 170(h) specifies the extent necessary to meet Internal Revenue Service requirements. Public access to conserved land is typically not a condition precedent for donors to apply for and receive federal tax benefits for conservation or preservation easements that protect wildlife or plant habitats, open space, scenic vistas, historic properties, buildings viewable from public rights-of-way, or agricultural lands.

48. AFT, *supra* note 30; LTA, *supra* note 42, at 199.

49. AFT, *Status of Local PACE Programs* (2008).

50. AFT, *supra* note 30.

51. Vt. Agency of Agriculture, Food and Markets, Current Use Program, http://www.vermontagriculture.com/agdev/currentuse.htm. The program was later expanded to include conservation land held by qualifying nonprofits and the exemption of all property tax of eligible farm buildings. *See* http://www.state.vt.us/tax/pvrcurrentuse.shtml.

52. AFT, *supra* note 30. *See also* David Freshwater, *Applying Multifunctionality to U.S. Farm Policy* 1 (Univ. of Ky., Econ. Staff Paper No. 437, 2002), *available at*: http:uky.edu/Ag/AgEcon/pubs/staff/staff437.pdf. As noted by Ruhl, *supra* 27, at footnote 1, the farm multifunctionality policy began in earnest with the EU's Agenda 2000 reforms for the Common Agricultural Policy; more background and evaluation of this topic is included in Org. for Econ. Co-Operation & Dev., *Multifunctionality: Toward an Analytical Framework* (2001); *See also* Alan Randall, *Valuing the Output of Multifunctional Agriculture*, EUROPEAN REVIEW OF AGRICULTURAL ECONOMICS, Vol. 29, 289 (2002).

53. Ruhl, *supra* note 27, at 425.

54. *Id.* at 432, citing N. Jordan et al., *Sustainable Development of the Agricultural Bio-Economy*, 316 SCIENCE 1570, 1570 (2007).

55. *Id.* at 432, citing N. Jordan et al. *supra*.

56. *Id.* at 440.

57. *Id.* at 447.

58. *Id.* at 432.

59. *Id.* at 455, thanking Katrina Wyman for this suggestion. Ruhl also identifies potential silver, gold, and platinum levels for PES programs to define PES premiums. This suggested model could potentially reflect other existing programs, such as Leadership in Energy & Environmental Design (LEED) rating levels for green buildings; *see* http://www.usgbc.org.

60. *Id.* at 446–47 (citing Sarah Lynch & Leonard Shabman, *The Florida Ranchlands Environmental Services Project: Field Testing a Pay-for-Environmental-Services Program*, RESOURCES, 17 (Spring 2007)).

61. *Id.* at 459.

62. I would like to thank Prof. Dwight Merriam, FAICP, for his suggestions on this certification process.

63. For example, *see* Sustainable Farm Certification International, which certifies international farms and select international food products in South America, Asia, and Africa, http://www.sustainablefarmcert.com. *See also* the Sustainable Forestry Initiative, which provides third-party certification and labeling of wood and paper products throughout North America: http://www.sfiprogram.org.

64. *See* NATIONAL RESEARCH COUNCIL, NEW STRATEGIES FOR AMERICA'S WATERSHEDS, 37 (National Academies Press, 1999), *available at*: http://www.nap.edu (for purchase by chapter).

65. *Id.* at 37.

66. The Russian nesting doll, or *matryoshka*, is a popular Russian national souvenir. The matryoshka is traditionally a wooden toy that includes progressively smaller nested dolls within a larger doll. *See* http://russian-crafts.com/nesting-dolls/history.html, which also states that in old Russian, among peasants, *matryona* or *matriosha* was a popular female name derived from the Latin root *mater* (mother). This name was traditionally associated with the image of a mother of a big peasant family, who was very healthy and had a portly figure.

67. NRC, *supra* note 64, at 39.

68. *Id.,* citing R.L. BATES AND J.A. JACKSON, GLOSSARY OF GEOLOGY (American Geological Institute, 1980).

69. Merriam-Webster dates the use of the term "land" back to before the 12th century, with etymology from Middle and Old English. Definitions include: "(1)(a) the solid part of the surface of the earth; (1)(b) ground or soil of a specified situation, nature or quality <dry land>; (1)(c) the surface of the earth and all its natural resources."

70. For a further discussion of the importance of temporal scales for watersheds and channels, particularly in management-related decisions, *see* NRC, *supra* note 64, at 47–51 and Table 2.2.

71. NRC, *supra* note 64, at 51.

72. *See* USGS Science in Your Watershed website: http://water.usgs.gov/wsc; click on "Locate Your Watershed." Another resource is the U.S. Environmental Protection Agency's Surf Your Watershed website: http://cfpub.epa.gov/surf/locate/index.cfm.

73. NRC, *supra* note 64, citing U.S. Water Resources Council, *The Nation's Water Resources: The Second National Water Assessment by the U.S. Water Resources Council* (U.S. Government Printing Office, 1978).

74. USGS, *Hydrological Map Units*, *see* http://water.usgs.gov/GIS/huc.html, citing P.R. Seaber, F.P. Kapinos, and G. L. Knapp, *Hydrologic Unit Maps*: *U.S. Geological Survey* (1987).

75. *Id.*, noting that efforts are underway to add fifth and sixth levels of subdivisions, *see* Watershed Boundary Dataset, http://www.ncgc.nrcs.usda.gov/products/datasets/watershed.

76. *Id.*

77. NRC, *supra* note 64, at 13.

78. *See Id.* at 28–31. *See* also EDELLA SCHLAGER & WILLIAM BLOMQUIST, EMBRACING WATERSHED POLITICS (University Press of Colorado, 2008).

79. Robert W. Adler, *Addressing Barriers to Watershed Protection*, 25 ENVTL. L. 973 (1995).

80. *Id.*

81. *Id.* at 991 and 995.

82. *Id.* at 995.

83. *Id.* at 996.

84. *Id.* at 1001.

85. *See* ALDO LEOPOLD, A SAND COUNTY ALMANAC: AND SKETCHES FROM HERE AND THERE, 201 (Oxford University Press, 1949). In A SAND COUNTY ALMANAC, as well as his draft essay *Conservation: In Whole or In Part* (1944), Leopold highlights the ethical obligation of the private landowner to promote land conservation, which he identifies as state of health in the land. However, "land" therein includes "not merely soils; it is a fountain of energy flowing through a circuit of soils, plants and animals. . . . Waters like soils, are part of the circuit of energy." Leopold, *Land Ethic*, at 218–219. Furthermore, in *Conservation: In Whole or In Part*, Leopold observes that land health is more than the sufficiency of individual components (e.g., soil, plants, animals, and water). Rather, it is state of vigorous self-renewal in each part and the collective functioning of interdependent parts for maintenance of whole energy-based system. Land use under Leopold's unity concept cannot be good if it conserves one component and injures another. One symptom of land illness includes qualitative deterioration of land crops (personal class and reading notes, Conservation Thought, Prof. Eric Freyfogle, University of Michigan Law School, Winter Term 2007).

86. Larry C. Frarey, Ron Jones, & Staci J. Pratt, *Conservation Districts as the Foundation for Watershed-Based Programs to Prevent and Abate Polluted Agricultural Runoff*, 18 HAMLINE L. REV. 151 (1994). Noting also that, "Most individuals, including most farmers, respond to public opinion, especially to the opinion of the public with which they are best acquainted," and citing to R. Burrell Held & Marion Clausen, *Soil Conservation in Perspective*, 278 (1965).

87. As noted, President Carter appointed Berg in 1979 as the Chief of the USDA's Soil Conservation Service (SCS), now the Natural Resources Conservation Service (NRCS). Before becoming chief, Berg served for 35 years in the USDA SCS, beginning his career in 1943 under the first SCS Chief Hugh Bennett. Until his death on March 18, 2008, Berg "remained a committed conservationist." President Carter applauded Berg in a 1991 speech for his "personal approach and meticulous attention to land use issues." At the May 15, 2009, dedication of a USDA National Plant Materials Center in honor of Berg, U.S. Agriculture Secretary Tom Vilsack stated, "Norm's relentless work ethic, his pride in his community, and his tireless dedication to the conservation of natural resources continue to make him a shining example of what is best about America. . . . We've got to make sure that his papers, his speeches, his thoughts are preserved and that young people have access to that information." *See* FIC, http://www.farmlandinfo.org/norm_berg_collection.

88. Norman A. Berg, *Land Use Changes in America: Effects on Natural Resources*, 11–12 (speech at the 23rd National Watershed Congress Conference in Biloxi, Mississippi, on "Alternatives to Watershed Management" (1976), emphasis added), scanned original text of speech *available at*: www.farmlandinfo.org/norm_berg_collection.

89. *Id.* at 21–22.

90. *Id*, at 2.

91. *Id.* at 3.

92. *Id.* at 8.

93. *See* Schlager & Blomquist, *supra* note 78, at 32; Frarey, Jones, & Pratt, *supra* note 86, at 153; and John H. Davidson, *Conservation Plans in Agriculture*, 31 ELR 10501, 10501 (2001). *See also* J. H. Davidson, *Conservation Agriculture: An Old New Idea* 9, WTR Nat. Resources & Env't 20, 21 (1995), noting that, "Although it is often forgotten or ignored, modern agricultural history includes a major effort at soil and water protection that incorporates BMPs, and at least considers the need for land use controls and watershed management. That effort originated out of a great environmental crisis that today we call the Dust Bowl. In the midst of a general economic depression, persistent drought conditions struck the Great Plains. The black blizzards, denuded fields, choked waterways, and demoralized human communities associated with this epic are written into the national history and need not be recounted here." *See also* Donald Worster, Dust Bowl: The Southern Plains in the 1930s (Oxford University Press, 25th anniversary ed. 2004).

94. *See* Frarey, Jones, & Pratt, *supra* note 86, at 154, stating that despite "significant opposition" to the establishment of local districts, 22 states adopted district enabling legislation in 1937, followed by an additional 16 states in 1940. By 1945, every state permitted the establishment of local districts. Spurred by strings attached to federal funding after 1936, as many as 33 states simultaneously provide local conservation districts with land use regulatory powers. By 1975, that number had declined to 27. Today nearly 3,000 districts exist in the United States and encompass almost all private farmlands. *See also* National Association of Conservation Districts, *About Conservation Districts*, http://www.nacdnet.org/about/districts/index.phtml.

95. Davidson, *supra* note 93 (2001).

96. Frarey, Jones, & Pratt, *supra* note 86, at 154–55, noting that even districts permitted to adopt land use regulations have generally failed to do so. *See also* Davidson, *supra* note 93 (1995), at 22. Also observing at 67, "State legislatures disappointed the SCS by organizing conservation districts along existing county lines and denying them both taxing and police power controls. The result was that the amount of voluntary compliance by private landowners roughly paralleled the amount of federal cost-sharing available. Conservation districts became awkward appendages of the SCS and local government. As SCS funding dwindled, the districts became necessarily less influential and active."

97. *Id.* at 155–156.

98. *Id.* at 156.

99. *See* 33 U.S.C. § 1288(b)(2)(F) (Thompson West, 2007)(emphasis added).

100. *See* Adler, *supra* note 79, at 1043–44. Prof. Adler lists frequently cited reasons for Section 208's failure, including: lack of administrative support; absence of a link between planning and implementation; lack of financial assistance or other incentives to link planning to implementation; and a very wide gap between the authorization and appropriations. Finally, he notes a "basic resistance of local governments to federal efforts to dictate planning structures and results, however flexibly those programs may have been designed."

101. Frarey, Jones, & Pratt, *supra* note 86, at 156.

102. Adler, *supra* note 79, at 1045 and n. 411.

103. Or "The Watershed Legislation Graveyard," which includes Progressive Era, New Deal, and postwar watershed proposals, as well as the Water Resource Planning Act of 1965.

104. Including the Chesapeake Bay, Great Lakes, Long Island Sound, Lake Champlain, and Clean Lakes and National Estuary Programs.

105. Adler, *supra* note 79, at 1088.

106. *Id.*

107. For example, a governing institution based on the broadest USGS watershed classification, the Water Resource Region, which encompasses the White River in South Royalton, Vermont, would include all six New England states: Vermont, New Hampshire, Maine, Massachusetts, Connecticut, and Rhode Island. However, of note is voluntary, interstate cooperation by all these states, as well New York, New Jersey, and Maryland under the Regional Greenhouse Gas Initiative, recently implemented to address environmental issues related to carbon emissions. Other states have also developed similar regional initiatives, including the Western Climate Initiative (which includes California, Oregon, Washington, Utah, Arizona, and New Mexico, as well as two Canadian provinces) and the Midwestern Greenhouse Accord (which includes Minnesota, Wisconsin, Michigan, Illinois, Iowa, and Kansas, as well as one Canadian province). (David Farnsworth, The Regulatory Assistance Program, *Controlling Greenhouse Gas and Increasing Efficiency*, PowerPoint presentation at Vermont Law School, June 12, 2009, for America's Energy Crisis: Eight Fridays with National Experts, Summer 2009, Prof. Michael Dworkin).

108. Adler, *supra* note 79, at 1088.

109. *Id.*

110. *Id.* at 1091.

111. *Id.* at 1094.

112. *Id.*, at 1095.

113. *Id.* at 1096.

114. *Id.*

115. *Id.*

116. *Id.*

117. *See* USDA SCS Standard State Soil Conservation Districts Law (1936).

118. *See generally* J.B. Ruhl, *The (Political) Science of Watershed Management in the Ecosystem Age*, 35 J. AM. Water Resources Ass'n 519 (1999), noting at 520 that, "First, I propose that the appropriate unit for ecosystem management is the watershed. . . . Second, I propose that the most effective policy approach for ecosystem management decision making is one based on true cooperative federalism. By this I mean a system of governance in which state and local authorities, acting in fulfillment of national goals, are genuinely empowered to shape the regulatory landscape for ecosystems within their territories, and to cooperate with other state and local authorities in the inter-regional ecosystem context." Ruhl defines his recommended "cooperative federalism" approach by distinguishing between three varieties of balancing decision-making power between state and national governments, which include coercion, coordination, and "true cooperation"—which blends the coercion and cooperation approaches. *Id.* at 523. Ruhl notes that, "The coercion element surfaces through well-defined federal standards and goals that are integrated into regulatory programs administered through state and local initiatives. The coordination element surfaces through the use of a regulatory framework that gives wide latitude to the state and local governments to shape the actual decision making procedure and structure in ways that fit state and local regulatory practices. The result is a national program that becomes distinctly local in its various local applications. The classic example of such a program in the Coastal Zone Management Act, which joins federal goals with state and local regulatory initiatives to protect and manage coast zone resources." *Id.* at 524–25.

119. *See* J.J. Richardson, M.Z. Gough, & R. Puentes, *Is Home Rule the Answer? Clarifying the Influence of Dillon's Rule on Growth Management*, a discussion paper prepared for the Brookings Institution Center on Urban and Metropolitan Policy (2003), identifying that all but 10 states apply Dillon's Rule, with exceptions and limitations varying by state for charter cities, municipalities, and home-rule municipalities. This well-established legal rule recognizes that generally, towns, cities, and counties are merely political subdivisions of the state and derive their political and legal authority solely from it, whose state legislature can freely give or take away this authority without local consent.

120. *See* Hunter v. City of Pittsburgh, 207 U.S. 161, 178 (1907), stating, "This court has many times had occasion to consider and decide the nature of municipal corporations, their rights and duties, and the rights of their citizens and creditors. . . . We think the following principles have been established by them and have become settled doctrines of this court, to be acted upon wherever they are applicable. Municipal corporations are political subdivisions of the state, created as convenient agencies for exercising such of the governmental powers of the state as may be entrusted to them (emphasis added). . . . The number, nature, and duration of the powers conferred upon these corporations and the territory over which they shall be exercised rests in the absolute discretion of the state. Neither their charters, nor any law conferring governmental powers . . . constitutes a contract with the state within the meaning of the Federal Constitution. The state, therefore, at its pleasure, may modify or withdraw all such powers . . . repeal the charter and destroy the corporation. All this may be done, conditionally or unconditionally, with or without the consent of the citizens, or even against their protest. In all these respects the state is supreme, and its legislative body, conforming its action to the state Constitution, may do as it will, unrestrained by any provision of the U.S. Constitution."

121. City of Clinton v. Cedar Rapids & M.R.R. Co., 24 Iowa 455 (Iowa 1868).

122. Town of Black Brook v. State of N.Y., 362 N.E.2d 579, 580 (N.Y. 1977).

123. *Id.* The court noted the issue related to the Act's encroachment on the zoning and planning powers granted to local governments had been resolved in the State's favor in Wambat Realty Corp. v. State of N.Y., 362 N.E.2d 581 (N.Y. 1977). Wambat Realty was a companion case brought by a private owner and would-be developer of land in the Town of Black Brook.

124. *See* Adirondack Park Agency, http://www.apa.state.ny.us/About_Agency/index.html.

125. Adler, *supra* note 79, at 1096.

126. *See* Lucas v. S.C. Coastal Comm'n, 505 U.S. 1003, 1019 (1992). (Emphasis included in original.) *See also* Tahoe-Sierra Pres. Council v. Tahoe Reg'l Planning Agency, 535 U.S. 302, 330 (2002). Justice Stevens, for the majority, observed: "The categorical rule that we applied in Lucas states that compensation is required when a regulation deprives an owner of "all economically beneficial uses" of his land. *Id.* at 1019. . . . But our holding was limited to "the extraordinary circumstance when no productive or economically beneficial use of land is permitted." *Id.* at 1017. . . . Anything less than a "complete elimination of value," or a "total loss," . . . would require the kind of analysis applied in Penn Central."

127. *See* Penn Central Transp. Co. v. City of New York, 438 U.S. 104 (1978).

128. To provide procedural certainty to all involved parties and democratic legitimacy to soil and conservation district decision making, as well as comport with federal Due Process clause of the 5th Amendment, as applied to the state actions through the 14th Amendment.

129. Mandatory, rather than permissive or discretionary, language is important.

130. B. Ruhl, *Proposal for a Model State Watershed Management Plan*, 33 Envtl. L. 929 (2003). Note that this author did not know that Ruhl also based his institutional framework for localized watershed councils on USGS cataloging units until after she reviewed the USGS classification system and other watershed management articles, specifically those by Frarey et al. and Adler. However, since the USGS system has been around since the 1970s and the watershed concept is intuitive to "man, woman, and child" according to Berg, similar conclusions are unsurprising.

131. *Id.* at 943.

132. *Id.* at 944.

133. *Id.* at 946–47.

134. *See* Frarey et al, *supra* note 86, at 159, noting that existing county-based conservation districts enabling statutes reflect a range of district voter-eligibility criteria: from all qualified electors and registered voters, to district landholders or occupiers, to district landowners.

135. *See* Assoc. Enter. Inc. v. Toltec Watershed Improvement Dist., 410 U.S. 734, 745 (1972).

136. *See* Frarey et al, *supra* note 86, at 159.

137. *Id.* at 161.