ROLES FOR REGIONAL AND LOCAL AGENCIES TO INTEGRATE SOURCE WATER PROTECTION INTO BASIN MANAGEMENT: MISSISSIPPI'S UPPER PEARL RIVER BASIN

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INTRODUCTION

Basin approaches have long been used to plan and implement navigation, flood control and certain agricultural conservation programs. Environmental concerns were never truly integrated into those efforts. Several overlapping "watershed/basin approaches" are evolving to remedy this defect. Federal basin management policies propose a flexible framework to encourage states to develop and implement more formal Basin Approaches. For instance, Mississippi's Department of Environmental Quality (MDEQ) recently adopted a *Basin Approach to Water Quality Management* to resolve litigation relating to Mississippi's Clean Water Act § 303(d) list and the preparation of Total Maximum Daily Loads waterbodies on that list. Simultaneously, a Mississippi Source Water Assessment Program plan was developed to satisfy the Safe Drinking Water Act's Source Water Assessment Program. Existing basin management programs show that environmental basin approach policies will only succeed to the extent that intrastate regional and local agencies voluntarily participate in developing and implementing specific basin management plans. To maximize personnel and financial resources and avoid duplication, a single, comprehensive integrated Basin Approach is more practical than many parallel perhaps competing approaches or management efforts. This paper has two goals: 1) introduce federal and Mississippi environmental basin-scale initiatives and opportunities to use MDEQ's Basin Approach to integrate water quality and safe drinking water requirements into a single basin plan, and; 2) analyze the application of these initiatives in Mississippi's Upper Pearl River Basin and identify roles for the Basin's regional and local water and related land management agencies and its agricultural watershed projects in implementing MDEQ's Pearl River Basin Management effort

BASIN MANAGEMENT POLICY OVERVIEW

Increasingly, integrated basin management is being touted as a cure for a multitude of environmental ailments. Driven by regulatory issues and litigation, new basin management approaches are evolving to transform environmental protection from single media (*e.g.*, air, surface/ground water, etc.) *end of the pipe* regulatory programs into elements of basin management. Still, these programs share three common elements: a) a geographic focus along natural hydrological boundaries; b) partnerships (interagency and stakeholder/public involvement), and; c) comprehensive planning.

Basin Approaches are Not New

Navigation, flood control, and certain agricultural conservation programs are planned along hydrologic basin, sub-basin, watershed, sub-watershed boundaries. These boundaries rarely correspond with political boundaries and no single governmental level (Federal, State, Tribal, or Local) or agency has all the legal authority necessary to implement basin plans or projects. Federal agencies such as U.S. Army Corps of Engineers (USACE) and the U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service [(NRCS) previously the Soil Conservation Service] were required to conduct much of their planning and project implementation in conjunction with intrastate regional and/or local agency sponsors (*e.g.* levee districts, soil and water conservation districts, etc.). The USACE and NRCS provided a national perspective and conducted basin surveys and assessments to plan, prioritize, and coordinate sub-basin, watershed and sub-watershed management efforts and projects. Basin plans were implemented by site-specific, sub-basin, watershed or sub-watershed-scale cooperative federal, state, regional and local administrative infrastructures that provided

explicitly authorized mechanisms to focus federal technical and financial support and coordinate the necessary legal authority to plan, construct, and operate and maintain water and water related land management projects.

Over time, federal *procedural* laws interjected environmental and natural resource considerations into this planning process (*e.g.,* Fish and Wildlife Coordination Act, 16 U.S.C. §§ 661 *et seq.*; National Environmental Policy Act, 42 U.S.C. §§ 4321 *et seq.*). Regrettably, environmental consultations, considerations, impacts and mitigation were considered to meet the letter of the law but never truly integrated in a basin framework. In fact, these laws were often viewed as weapons to frustrate or stop water resources projects rather than as tools to integrate environmental considerations into existing basin administrative infrastructures. Recently a variety of different federal, state and local environmental and natural resource basin management scenarios have been developed and are evolving to help environmental programs make the transition whenever possible from single media (e.g., air, water, etc.), end of the pipe regulatory programs into elements of cooperative, comprehensive, integrated, basin management programs (Ballweber 1999; 1998).

Federal Environmental Basin Approaches

Without an express legislative enactment of new legal authority for environmental basin-scale management, the Environmental Protection Agency (EPA) and other federal agencies are adopting it administratively by modifying their regulatory programs and shifting the emphasis of their assorted technical and financial assistance programs. In 1998 the Federal, Administrative Clean Water Action Plan (CWAP) expanded the EPA's earlier *Watershed Protection Approach* into a broader interagency effort that advocates a flexible framework for intergovernmental, interagency coordination along hydrologic boundaries (Fed. Reg. 63(56): 14109-14112 (March 24, 1998); *See* EPA 1993). The CWAP encourages locally-led management initiatives to coordinate and adapt national water related agricultural, natural resource and environmental programs to fit local priorities and conditions. Of the plethora of environmental issues included in the CWAP; the Clean Water Act (CWA), 33 U.S.C. §§ 1251 *et seq.* and the Safe Drinking Water Act (SDWA) 42 U.S.C. §§ 300f *et seq.* exemplify the opportunities and obstacles for integrated environmental basin management.

The CWA's regulatory "Total Maximum Daily Load" (TMDL) provisions highlight the necessity of a basin-scale approach to coordinate regulation and management of point source and non-point sources of water quality impairment to satisfy water quality goals. The EPA developed a Geographical Information System (GIS) based "Better Assessment Science Integrating Point and Nonpoint Sources" (BASINS) software modeling package to help state and local basin management efforts comply with TMDL mandates. A nation-wide effort, BASINS includes an abundance of large scale, low resolution GIS themes and data sets to assist state and local agencies examine and analyze environmental data, analyze environmental systems, and provide a framework to support basin-scale decision-making (EPA 1998). Despite advocating "locally led" initiatives, to ensure compliance with regulatory mandates the federal basin approach is heavily influenced from the top down by myriad, ever changing EPA TMDL policy and guidance documents.

Similarly, in 1996 Congress amended the SDWA to strongly encourage states to adapt proactive, multiple barrier (*e.g.,* basin or watershed-scale) approaches to prevent contaminants from entering surface and ground sources of drinking water rather than relying on expensive reactive efforts to treat drinking water after the source is contaminated (EPA 1999). The basin-scale Source Water Assessment Program (SWAP) is a key component of this multiple barrier approach (42 U.S.C. § 300j-13; EPA 1999a). The SWAP's four major steps are:

1. Delineate source water protection areas (*i.e.*, watersheds/basins);
2. Inventory significant potential sources of contamination in those areas;
3. Determine the susceptibility of public water systems to those contamination sources, and;
4. Release the results to the public.

To avoid duplication, and encourage efficiency, SWAPs can make use of CWA delineations or assessments of surface or ground water sources (42 U.S.C. § 300j-13(a)(6)(E)).

Mississippi's Environmental Basin Approaches

For the most part, States are left to comply with the federal CWA and SDWA requirements. The Mississippi Air and Water Pollution Control Law, (MAWPCA) Miss. Code Ann. §§ 49-17-1 *et seq.*, is Mississippi's equivalent to the CWA. The MAWPCA grants the Mississippi Department of Environmental Quality (MDEQ) primacy, subject to EPA certification and approval, to plan and implement Mississippi's water quality programs. Therefore, within the flexible federal basin management framework, MDEQ has designed and is implementing a *Basin Approach to Water Quality Management*. This Basin Approach responds to both the new federal emphasis on basin management and was a critical component of a December 1998 consent decree to resolve litigation over MDEQ's CWA 303(d) list and schedule to complete TMDLs for listed waterbodies (*Sierra Club V. Hankinson*, (GA.) (Filed 12/11/97)). The consent decree validates MDEQ's Basin Approach of 1) a ten year schedule to complete TMDLs for Mississippi's five basin groups; 2) requires EPA to establish TMDLs if MDEQ fails to meet the ten year schedule; 3) addresses EPA's review of MDEQ's CWA 303(d) lists, and 4) amends the MDEQ/EPA annual work plan and NPDES permit review.

The Basin Approach's goal, "is to efficiently develop effective and consistent long range management strategies that protect the quality and intended uses of Mississippi's water resources and allow for environmentally sound economic planning and development" (MDEQ 1999, at p. vii.). Effective management strategies will result from improved, coordinated water and water related monitoring, assessment, problem identification and prioritization, planning, permitting, and water and land use to allow comprehensive, integrated point and NPS basin-scale water quality management. A key aspect of coordinated management is the use of GIS software and EPA's BASINS models for data assimilation, management, analysis and water quality modeling. Briefly, MDEQ's Basin Approach merges Mississippi's nine river basins (Big Black, Coastal Streams, North Independent, Pascagoula, Pearl, South Independent, Tennessee, Tombigbee, and Yazoo basins) into five basin groups.

Beginning in July 1998 with Basin Group I, MDEQ, started a repeating five phase process that takes five years per cycle, per basin group. The phases are:

1. Planning, MDEQ organizes basin forums to identify and collect relevant information on the Basin, its water quantity and quality, and other ecological and environmental conditions; prioritize issues and identify data gaps; issue Basin status report, and begin GIS development;
2. Gather Data, to fill data gaps and as necessary to address priority issues identified in phase 1 and implement data management protocols;
3. Evaluate Data, to identify and clarify the sources and causes of water quality problems, identify high quality waters in need of special protection and develop models or other tools; update Basin status report and justify management priorities and resource allocation;
4. Develop Plan, for basin management including action strategies to address priority issues, and;
5. Implement Plan, and cycle back to Phase 1 (MDEQ 1999).

This Approach needs federal and Mississippi intra- and inter-agency coordination and support. MDEQ's senior level intra-agency Basin Planning Committee leads the process. A Resource Agency Partners Forum provides an annual opportunity for senior administrators and managers from MDEQ and other relevant "partner" agencies involved in managing Mississippi's water quantity and quality management to discuss overriding statewide water resource issues. At the basin group level, the MDEQ led Basin Team provides an interagency forum to focus individual agency's resources to satisfy each of the five phases including coordinated Basin Plan implementation. The individual federal, state, and intrastate regional and local, agencies participating on any given Basin's Basin Team will vary considerably. Similarly, Basin Stakeholder groups will be formed for each basin group to allow organizations to comment on issues, priorities, strategies and activities (MDEQ 1999).

The Mississippi Source Water Assessment Program Source Water Protection report was completed on October 12, 1999. The SWAP followed an interagency format similar to but distinct from that

outlined above for MDEQ's Basin Approach. Public and stakeholder participation in the SWAP's development was critical (MDEQ 1999a). Although the number is expected to increase in coming years, currently, only three of Mississippi's 1,535 public water systems utilize surface water: 1) the City of Jackson with one intake structure on the Ross Barnett Reservoir and another downstream on the Pearl River, 2) the City of Tupelo with an intake on the old Tombigbee River channel, supplemented by water diverted from the Tennessee-Tombigbee Waterway, and; 3) the Short-Coleman Park Water Association which diverts water from Pickwick Lake (id.). Being the exception to the rule in Mississippi, the SWAP proposes addressing the entire watershed area upstream of the surface water supply intakes using the U.S. Geological Survey's (USGS) 8-digit Hydrologic Unit Codes (HUC). Furthermore, Mississippi's SWAP proposes using MDEQ's Basin Approach to satisfy the SDWA's source water assessment/protection mandates (*id.*).

INTEGRATING WATER QUALITY AND SOURCE WATER PROTECTION IN A BASIN APPROACH

Within the federal CWAP it should be a simple matter to integrate clean water and safe drinking water programs in a single basin approach. The CWA's water quality provisions and the SDWA's "multi-barrier" approach to safe drinking water are essentially two sides of the same coin. The CWA's basin approach aims to control *inputs* from point sources and the *transportation* of contaminants from the land into waterbodies from nonpoint sources. Conversely, the SDWA uses basin management to ensure *outputs* of safe surface and ground water for public drinking water systems. For example, certified watershed programs allowed several municipalities to avoid the Surface Water Treatment Rule's requirement to install filtration treatment of drinking water supplies (EPA 1999b; EPA 1993). In fact, integrating these two related environmental water programs could provide a viable, long term foundation for more comprehensive basin-scale management. Notwithstanding statutory language for integration, the CWAP, and policy documents; some intra- and inter agency impediments remain at both the federal and state levels.

The EPA has jurisdiction over the relevant provisions of both the CWA and the SDWA. Yet intra-agency coordination is hampered because the CWA falls under the Office of Wetlands, Oceans and Watersheds (http://www.epa.gov/owow), while the Office of Ground Water and Drinking Water (http://epa.gov/OGWDW/) administers the SDWA. The issue is further fragmented in Mississippi where MDEQ has primacy over CWA programs and some SDWA programs (e.g., Wellhead Protection Program) (*See* MAWPCA Miss. Code Ann. §§ 49-17-1 *et seq.*). While Mississippi's Board of Health has primacy over most of Mississippi's safe drinking water programs (Miss. Code Ann. §§ 41-26-1 *et seq.*). Despite these administrative complexities to integrating two such similar programs; from a policy perspective, integrated basin management is being touted as a panacea to a multitude of environmental concerns. The transition from abstract basin approach policies to concrete, specific basin management plans demonstrates the discretionary opportunities for intrastate regional and local agencies to be proactive in developing and implementing comprehensive, integrate basin management efforts.

PUTTING POLICY INTO PRACTICE: THE UPPER PEARL RIVER BASIN

As mentioned above, basin management has three core elements: a) a geographic focus along hydrologic boundaries; b) interagency partnerships and stakeholder/public involvement, and; c) comprehensive planning. So a necessary first step in putting basin policies into practice is to focus on a particular basin. Mississippi's Upper Pearl River Basin encompassing the entire Yockanookany/Upper Pearl River watershed (HUC 03180001) and that portion of the Middle Pearl River above Strong watershed (HUC 03180002) upstream of the City of Jackson's source water intake on the Pearl River provides an ideal site to analyze mechanisms for integrating water quality and safe drinking water into a single basin approach. As part of the federal CWAP, a cooperative federal/Mississippi interagency effort published a *Unified Watershed Assessment for Mississippi* in September 1998 (http://www.epa.gov/owow/uwa/ms.pdf) which identified the Upper Basin's two watersheds as either not meeting, or facing imminent threat of not meeting, clean water and other natural resource goals. Mississippi's Source Water Assessment

Program report recognized that the Upper Pearl Basin delineates the largest of Mississippi's three surface public water supply sources (MDEQ 1999a). The MDEQ also initiated phase I of its Basin Approach effort for the Pearl River Basin in January 2000 (MDEQ 1999). Finally, the Upper Pearl River Basin has several active, regional and local agencies with assorted water and related land management authority.

Geographic Focus: The Upper Pearl River Basin

The Upper Pearl River flows from the headwaters southward through Central Mississippi's predominately rural counties to roughly the City of Jackson's water intake below the Ross Barnett Reservoir's spillway. The Upper Basin includes urban, suburban and rural communities. From a governance perspective, the Upper Basin includes portions of the Mississippi Band of Choctaw Indian's tribal lands in Neshoba County, federal lands managed by the National Park Service and the Forest Service, a State Waterfowl Refuge, and assorted county properties (Map 1). Both the Pearl River and the Reservoir's water quality are significantly influenced by diverse land-based urban and suburban development and agricultural activities in the Upper Basin. These "NPS" activities can cause erosion which leads to sedimentation, turbidity, and nutrient loading in the River and Reservoir. The Upper Basin's rural incorporated and unincorporated communities rely on ground water for their public water supply and often have individual, on-site wastewater disposal systems. As a distinct hydrologic unit in the Pearl River Basin, an integrated basin management effort in the Upper Basin's headwaters could contribute significantly to improved water quality throughout the Pearl River and while simultaneously providing surface source water protection benefits for the growing urban area served by Ross Barnett Reservoir.

Partnerships: The Upper Basin's Regional and Local Agencies

No single federal, state, or intrastate regional or local agency has either the statutory mandate or the jurisdiction necessary for comprehensive basin-scale management. Basin partnerships are critical to: 1) amass the diverse types and quantity of data needed for comprehensive planning and 2) assemble the necessary legal authority (regulatory, management, and financial and technical assistance programs) to actually implement the plan. Despite a plethora of federal and state regulatory authority and basin policies; intrastate regional and local water and water related land management agencies have distinct legal authority vital to any basin management plan, especially management authority over NPS of water quality impairment (Ballweber 1999; 1998; *See* Environmental Law Institute 1997). "Responsibility for managing Mississippi's water resources is splintered among a number of state, regional and local governmental entities. Many of these agencies' jurisdictions overlap; some have broad powers, while others are limited to a single purpose. Several have water resource management planning responsibilities, ranging from local to statewide" (Sage and Jarman 1984, at pg. 66). These agencies include regional special purpose agencies and regional and local agencies authorized by general legislation. Many of these agencies have or are authorized to serve as local sponsors with the USACE and the NRCS to plan, implement and operate and maintain water resource development and agricultural watershed-scale conservation projects (Ballweber 1998; 1999).

Regional - Special Purpose Agencies

Mississippi's legislature has long recognized that comprehensive, integrated basin-scale management was a prerequisite for sustainable economic development in the Pearl River Basin. To ensure such comprehensive management, the legislature authorized three "special" purpose regional agencies in the Pearl River with a mandate to preserve, conserve, store, and control the waters of the Pearl River and its tributaries and its overflow waters for domestic, municipal, commercial, industrial, agricultural, and manufacturing purposes, for recreational uses, for flood control, timber development, irrigation, and pollution abatement (Miss. Code Ann. § 51-9-103; § 51-11-1). These three regional agencies provide a core of water and related land management authority necessary to implement any Pearl River Basin management plan. In addition, through their broad-based, Boards of Directors which include multiple state agencies and county/city representatives these agencies offer a foundation for basin-scale partnerships.

The Pearl River Basin Development District's, Miss. Code Ann. §§ 51-11-1 *et seq.*, jurisdiction covers the entire Pearl River Basin including its tributaries (*id* at § 51-11-7). Within this area, the District is authorized to be the "local sponsor" for federal flood control, navigation or other water development projects or works of improvement. This includes the ability to make, or cooperate in engineering surveys, feasibility studies, and cost-benefit estimates relating to the construction of dams, reservoirs, works, plants, or any other necessary facilities to control, store, use, and distribute, the waters within the Pearl River and adjacent basins, or to prevent floodwater damage, for navigation therein, or to use its water resources for recreational purposes (*id* at § 51-11-11).

Chapter 9 of Mississippi Code Annotated Title 51 is entitled, "Development of Region Bordering Pearl River" authorizes the remaining two regional agencies which are limited to the Upper Pearl River Basin and particularly the area around the Ross Barnett Reservoir and the Jackson, Mississippi metropolitan area. The Pearl River Industrial Commission (Commission), is legislatively mandated to include Hinds, Leake, Madison, Neshoba, Rankin Counties but could potentially expand to the entire Pearl River Basin (Miss. Code Ann. § 51-9-1). The Commission's primary duties relate to administering the federal Surface Mining Control and Reclamation Act, 30 U.S.C. §§ 1201 *et seq.*, in Mississippi.

The regional agency most relevant to integrating water quality and safe drinking water in the Upper Pearl Basin is the Pearl River Valley Water Supply District (PRVWSD), (Miss. Code Ann. §§ 51-9-101 *et seq.*). The PRVWSD was formed primarily to plan, construct, manage and operate and maintain the 33,000 acre Ross Barnett Reservoir (*See* Miss. Code Ann. § 51-9-109). The PRVWSD's jurisdiction includes, "the reservoir, dam, and related facilities as shown on the plats filed with the chancery court and . . . include[s] and [is] limited to an area of one mile from the shore line of the reservoir at high water" (*Id* at § 51-9-109(d). Within this area, the PRVWSD has fairly comprehensive management responsibilities over; water supply, water distribution, flood mitigation, residential communities, river flow management, waste water facilities, recreational facilities and wildlife and forestry management (*See* Miss. Code Ann. §§ 51-9-121; 51-9-122; 51-9-125).

The legal authority these regional agencies can contribute to a basin management effort is enhanced by their individual Boards of Directors which expand the Basin's partnership base. This is especially true of the PRVWSD in the Upper Pearl Basin. The Development Commission's five counties are represented on the PRVWSD's Board as are four state agencies; the State Board of Health, MDEQ, the Department of Wildlife, Fisheries and Parks and the Mississippi Forestry Commission (Miss. Code Ann. § 51-9-107). As such, the PRVWSD provides a conduit for state agencies and counties to discuss ideas, issues, and concerns.

Local - General Authorization Agencies

Mississippi's legislature authorized the voluntary organization of various types of local agencies to address different types of water and related land management issues throughout the state (*e.g.* drainage districts, *id* at §§ 51-29-5 *et seq.*; §§ 51-31-3 *et seq.*; water management districts, *id.* at §§ 51-7-1 *et seq.*; joint water management districts, *Id.* at §§ 51-8-1 *et seq.*, etc.).

To some extent, the existence and importance of specific "types" of local agencies varies from basin to basin (*See* Ballweber 1998). But local Soil and Water Conservation Districts (SWCD), Miss. Code Ann. §§ 69-27-15 *et seq.*, are fairly important statewide including the Upper Pearl Basin. The Basin's first SWCD was started 1938 in Kemper County, Mississippi. By 1971 SWCDs were organized throughout the entire Basin (USDA 1971). A state-level State Soil and Water Conservation Commission, Miss. Code Ann. §§ 69-27-2 *et seq.* provides guidance and supervision to the individual SWCDs and cooperates with MDEQ to address agricultural NPS pollution. The Commission also makes all decisions relevant to individual SWCDs participating in CWA, 33 U.S.C. § 1329, § 319 NPS management projects (*Id.* at § 69-27-308). These local SWCDs not only overlap the PRVWSD's boundaries but have independent, discretionary legal authority to promulgate enforceable regulations directly and indirectly relevant to water quality and source water protection in the Upper Basin's headwater tributaries outside the PRVWSD's

jurisdiction (Miss. Code Ann. §§ 69-27-35, 69-27-37). These local districts can also serve as local sponsors for watershed-scale "works of improvement" under the USDA's Watershed Protection and Flood Prevention Act (P.L. 566), 16 U.S.C. §§ 1001 *et seq.* (*Id.* at 69-27-35(i)).

Prior Upper Pearl River Basin Plans

In cooperation with the USACE, the USDA and other federal and state agencies, the Basin's regional and local agencies established *de facto* administrative infrastructures for interagency, integrated basin, sub-basin, watershed, and sub-watershed surveys, assessments and to develop recommendations for and implement specific "works of improvement". These administrative infrastructures, plans and surveys, and the extent to which those plans have been implemented varies considerably between basins. In the Pearl River Basin, preliminary, research reveals that some of these efforts covered the entire Basin while others focused exclusively on the Upper Pearl. The following activities used federal, state, and local interagency partnerships and sought stakeholder and public participation on these reports and plans.

- In 1970 the Development District cooperated in the USACE led interagency, interstate effort published the results of a comprehensive Pearl River Basin study on the water and related land resources and a Basin plan to develop these resources for the Basin's anticipated short and long term needs (USACE 1970).

- In 1971, the USDA led a similar effort to formulate a comprehensive improvement plan to conserve, utilize, develop and manage the Pearl River Basin's water and related land resources (USDA 1971).

- In 1981 the USACE revisited the entire Basin to determine the status of previously recommended projects, identify remaining water resource needs and revise plans to meet those needs (USACE 1981).

- In 1983, the USDA undertook a study of the Mississippi portion of the Pearl River Basin to provide consistent and updatedinformation relating to the Basin's land and water resources with a special emphasis on agricultural and forestry resources (USDA 1983)

- Finally, in 1997, the Development District cooperated with the USACE to undertake "feasibility" studies for flood control in the Jackson, Mississippi metropolitan area. This work included a draft Environmental Impact Statement which examined environmental and natural resource issues in the Upper Pearl Basin (USACE 1997).

The USACE's work in the Pearl River Basin was authorized by eight separate Congressional Resolutions pertaining to all or part of the Pearl River (*See* House Document No. 441, 86th Cong. 2nd Sess). Conversely, USDA had a "blanket" authorization under P.L. 566 to cooperate with local, state, and federal agencies to investigate and survey basins and watersheds to develop "coordinated" management programs as well as to plan and prioritize locations for "works of improvement" to address priority local water and related land resource concerns on a sub-watershed scale (Map 1). As of September 1994, the Upper Basin had two P.L. 566 watershed projects in operation: Standing Pine Creek and Tallahaga Creek and the Town Creek (Carthage) project in the planning stage. Several other delineated projects were terminated or deauthorized (USDA 1994). These sub-watershed-scale projects include fairly extensive planning (Map 2). Projects may include dams, other flood retarding structures and land treatment while also providing numerous "secondary" water quality and water supply benefits to rural communities in addition to their primary conservation goals (Cullum and Cooper 1998). However, despite their benefits these projects are threatened by short comings in funding new projects and maintaining existing ones.

In 1997, Mississippi's legislature enacted a Watershed Repair and Rehabilitation Cost-Share Program, Miss. Code Ann. §§ 51-37-1 *et seq.*,to rectify this situation. The legislative intent for this law provides an apt summary of these P.L. 566 watershed projects "[t]he Legislature has previously stated its desire to improve the quality of water, prevent soil erosion and alleviate flood damage in Mississippi, and great strides have been made

through the use of water impoundment structures constructed through federal watershed construction funding programs. Flood control structures have provided secondary benefits including improvement of water quality and increased recreational opportunities. Flaws have become apparent in the system of maintenance established to protect these flood control structures to the point that many of the structures are in dire need of repair and pose a serious threat to property as well as loss of secondary benefits" (Miss. Code Ann. 51-37-1). Local agencies with management responsibility for a Public Law 566 water impoundment structure are eligible for financial assistance under this program (Miss. Code. Ann. § 51-37-3(1))

CONCLUSION - BRINGING THE PIECES TOGETHER

Analogous to USACE and USDA basin activities, federal and/or Mississippi law require environmental Basin Approaches to be "led" by a specific agency. In this case, MDEQ is responsible to ensure that their Basin Approach complies with EPA guidance and will be approved by EPA. But many of the Basin Approaches' potential benefits would be lost if water quality and source water protection were implemented as parallel rather than integrated efforts. Likewise, MDEQ's Basin Approach in the Upper Pearl River Basin would benefit by building upon previous and existing basin and watershed-scale management efforts.

As this discussion reflects, the Upper Pearl River Basin has several somewhat disjointed basin and watershed-scale cooperative administrative infrastructures. Still, these efforts are imperfect. They did not fully integrate environmental and natural resource considerations into management plans and funding difficulties limited the ability to implement and maintain those plans. However, these efforts support the conclusion that federal, state and local interests are best served when intrastate regional and local interests are given primary responsibility for water resources development with federal and state level technical and financial support (*See* Harrison and Mooney 1993). The question becomes, how will evolving environmental basin approaches interact with regional and local agencies and these existing basin management efforts?

Both MDEQ's Basin Approach and the SDWA have formal mechanisms for regional and local agencies to take leadership roles in integrating these parallel federal and state Basin efforts into a single comprehensive Basin Approach: 1) MDEQ's Basin Approach allows for the creation of *ad hoc* Watershed Groups to participate in Basin forums, and; 2) the SDWA has a procedure for organizing "Source Water Quality Protection Partnership" to: a) *facilitate the local development of voluntary, incentive-based partnerships* among owners and operators of community water systems, governments, and other persons in source water areas, and; b) obtain *assistance to identify resources which are available to implement the partnership's recommendations* to address the origins of drinking water contaminants that affect the drinking water supply of a community (42 U.S.C. § 300j-14(2)).

While regional and local agencies participated in existing basin management efforts to qualify for technical and financial support to plan and implement assorted water resource development *projects*, MDEQ's Basin Approach can integrate water quality and source water protection to *streamline or simplify environmental compliance* issues which are critical to sustainable regional and local economic development. Similarly, by embracing previous cooperative interagency basin efforts, MDEQ's Basin Approach could help modify existing federal and state agencies' technical and financial assistance programs to better integrate environmental considerations. This approach would also provide MDEQ with inroads to the existing cooperative sub-basin and watershed-scale administrative infrastructures and encourage regional and local agencies to apply their discretionary water and related land management authority to basin-scale environmental management. Regional and local agencies and their boards are challenged to be proactive in taking advantage of these opportunities to work with MDEQ's Basin Approach to develop acceptable regional alternatives for integrating water quality and source water protection rather than ignoring it or digging in their heels to resist it. Then they can use their diverse, discretionary legal authority to implement the selected management alternative.

A final comment is necessary about technology's

role in MDEQ's Basin Approach. Technology is a two edged sword; on the one hand windows based, desktop GIS technology and EPA's BASINS environmental analysis framework are powerful tools for data collection, analysis and management; however, on the other hand, previous basin surveys, and management plans and projects are not digitized. Furthermore, information about who (which regional or local agency) has what legal authority in a specific basin, sub-basin, watershed, or sub-watershed (regional and local agency boundaries) is not currently available in GIS themes. Still this information can be determined from the Mississippi Code Annotated, verified with state agencies, geo-referenced as a GIS theme. Likewise, site specific information on P.L. 566 projects is available and compatible with GIS technology.

Incorporating such information into GIS themes can facilitate and simplify the organization of partnerships and is critical to comprehensive management in multi-use basins such as the Upper Pearl Basin. Integrating water quality and source water protection into the Upper Pearl River Basin's existing management structure would help offset regional, and local level, stakeholder and public concerns about the necessity of a potential interagency cooperative regulatory environmental basin approach running parallel to other basin-scale efforts. An extra benefit would be additional federal and state agency partners to: contribute to a collective data set, provide additional perspectives in evaluating management alternatives, and help publicize MDEQ's Basin Approach's activities to other agencies and the public.

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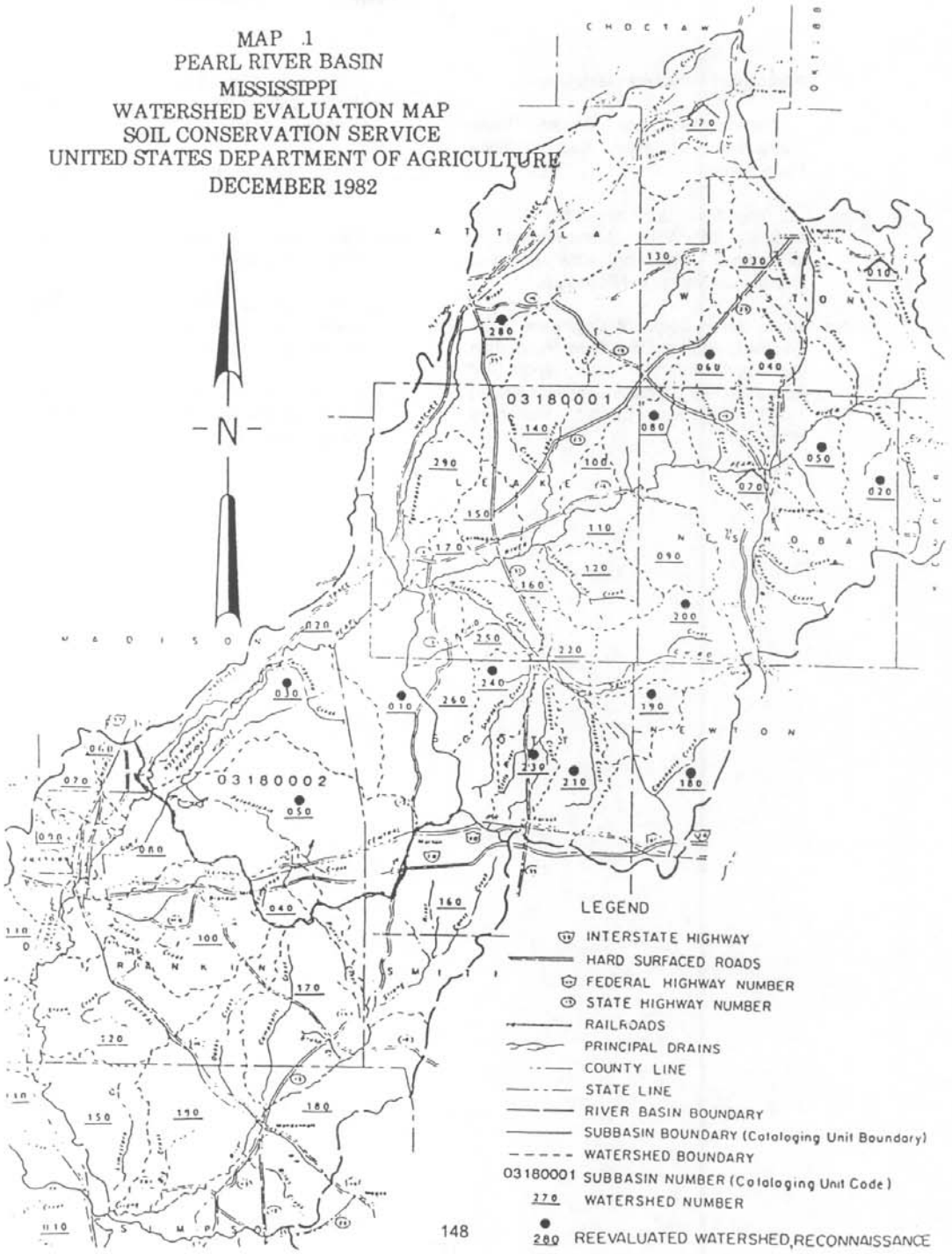
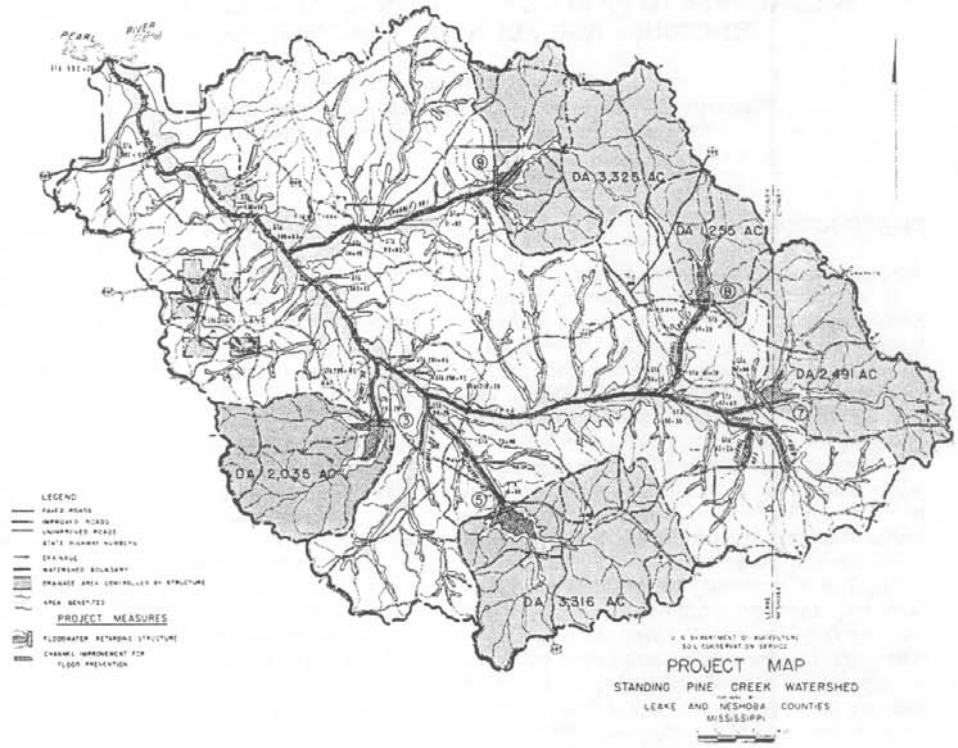
MAP .1
PEARL RIVER BASIN
MISSISSIPPI
WATERSHED EVALUATION MAP
SOIL CONSERVATION SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE
DECEMBER 1982





Map 2: Standing Pine Creek Watershed P.L. 566 Project