COORDINATION: THE MISSING ELEMENT IN WATER-RESOURCES PLANNING AND MANAGEMENT

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INTRODUCTION

Because Alabama receives abundant rainfall, the State has had few serious water-resources problems. However, localized problems such as the overpumpage of aquifers, saltwater intrusion, water shortages, and conflicts in use are expected to increase in frequency. Many water-resources problems, because of their complexity, must be anticipated and resolved. Because they can be complex, most water-related problems would be resolved most effectively within the scope of a water-management plan.

As the result of the passage of the Water Resources Planning Act of 1965, Alabama began to plan for water management. In several studies, the State's water-resources requirements were identified and means of achieving objectives were outlined. Legislative action was even proposed. However, after almost two decades of such planning, many of the proposals and recommendations contained in these studies have not been implemented.

Of the attributes essential to successful water-resources planning and management, "coordination" is undoubtedly one of the most important. In Alabama, where several agencies can be involved in similar aspects of the same program and where each agency can have many responsibilities, coordination is even more essential. Effective coordination signifies effective leadership, that programs have direction, and that the whole system is operating efficiently and effectively. Effective coordination also signifies that those in positions of leadership are aware of common problems and goals and that each agency assumes some of the responsibility necessary for solving these problems and for reaching specific goals.

In this study, Alabama's water-related agencies and their activities were examined both objectively and subjectively from a lengthy questionnaire. The authors were specifically interested in factors that had inhibited the implementation of an effective water-management plan.

The results of this study indicate that some water-resources activities are coordinated. In all aspects of the State's water-resources program, however, ineffective coordination of activities has prevented the agencies from formulating an effective water-management plan.

PREVIOUS INVESTIGATIONS

After passage of the Water Resources Planning Act of 1965, numerous investigators began to study all aspects of Alabama's water "spectrum." Several studies were very extensive and provided information from which the State could have developed a water-management plan. In many of these studies, the importance of coordination was stressed.

One of the earliest reports to deal with the need for coordination of planning activities was that of Grubbs in 1969. One conclusion of this report was that:

> Consideration should be given to formulation of planning and development procedures to be coordinated by a single statewide agency, with jurisdiction of those entities participating in development of water and related resources spelled out in such manner as to eliminate potential conflict and overlap (p. 69).

Coordination among individual agencies and their respective activities has received attention by several authors. In his 1969 study, *Alabama Agencies with Water-Resources and Related Land-Use Responsibilities,* Grubbs reported that more effective communications among all state agencies might eliminate problems of potential overlaps of functions. Lack of coordination of water-resources investigations was also noted. In 1970, Grubbs and Cohen authored *Status of Water-Resources Management in Alabama.* In discussing problems related to coordination and university involvement, they noted that:

> Some duplication of effort among the institutions (and other State departments and agencies) particularly in the field of research, is inevitable in the absence of measures taken to preclude this eventuality. Part of this overlap or excess activity might be eliminated by procedures designed to provide effective communication and coordination among State institutions involved in water-resources research and investigations (p. 64).

METHODS OF INVESTIGATION

For this study, which was conducted in 1982, the analysis of specific aspects of the State's efforts in water management was structured around a list of 10 attributes which are important in a water-resources program (Table 1). A questionnaire that would provide objective data about these attributes was developed. Two publications helped to provide a framework for this questionnaire (Krausz, 1968; and Elmore, 1972). The questionnaire was structured around eight categories, shown in Table 2, and are referred to as "functional programs."

Table 1. – Attributes which characterize an effective water-management program

1. Comprehensive data base
2. Comprehensive water-resources planning
3. Comprehensive water-management plan
4. Coordination
5. Financing
6. Functional programs
7. Agencies
8. Agencies' activities
9. Interagency relationships
10. Legislative action

The questionnaire contained 11 sections: eight of these contained questions about the eight functional programs; the remaining three sections contained questions on comprehensive water-resources planning, water-resources investigations, and opinions and general information (Table 2). Phases of data collection, planning, development, and operation were used within each of the eight functional programs.

Table 2. – Contents of the sections in the questionnaire

Questionnaire section	Content
	Functional programs:
1	Water supply for domestic, public, and industrial/commercial uses
2	Water-pollution control
3	Agricultural land and water use
4	Fish and wildlife
5	Outdoor recreation other than fish and wildlife
6	Flood management
7	Development of waterways and rivers
8	Electrical-power generation
	Other information:
9	Comprehensive water-resources planning
10	Water-resources investigations
11	Opinions and general information

The agencies included in this investigation and their abbreviations used herein are given in Table 3. When possible, all interviews were recorded on magnetic cassette tapes. A typical interview usually required approximately two and one-half hours.

Table 3. – Water-related agencies selected for study

Agency name	Abbreviation
[1]Alabama Development Office	ADO
[1]Alabama State Docks Department	ASDD
[1]Department of Conservation and Natural Resources	DCNR
[1]Department of Industrial Relations	DIR
[1]Highway Department	HD
[1]Office of State Planning and Federal Programs	OSPFP
[2]Alabama Surface Mining Commission	ASMC
[2]State Board of Health	SBH
[2]State Forestry Commission	SFC
[2]State Oil and Gas Board	SOGB
[2]State Soil and Water Conservation Committee	SSWCC
[2]Water Improvement Commission	WIC
[3]Department of Agriculture and Industries	DAI
[3]State Geologist	SG
[3]Water Resources Research Institute	WRRI
Auburn University	AU
University of Alabama	UA
[4]Marine Environmental Sciences Consortium	MESC
[4]Alabama Coastal Area Board	ACAB
[4]Bear Creek Development Authority	BCDA
[4]South Alabama Regional Planning Commission	SARPC
[4]West Alabama Planning and Development Council	WAPDC

[1]State agency whose chief administrative officer is a member of the Governor's cabinet.
[2]State agency administered by a commission, board, or committee.
[3]State agency administered by a director or commissioner.
[4]Regional agency.

RESULTS

A complete set of data collected for this study is available in Moffett's doctoral dissertation (Moffett, 1983). For illustration purposes and because similar results are seen in the data, the authors have selected representative data from the following attributes: Data base, comprehensive planning, coordination, financial assistance, and functional programs.

DATA BASE

There were potential overlaps in the data-collection activities of some of the agencies (Table 4). In water-pollution control, both the Water Improvement Commission and the agency of the State Geologist collected data on surface-water characteristics. Thirteen agencies investigated the pollution of surface waters and nine investigated the pollution of ground waters. Eight agencies obtained some type of water-quality data or reports from wastewater facilities.

Large quantities of ground-water data have been collected in Alabama (Table 5). The agency of the State Geologist was the principal agency responsible for collecting this data.

To collect information about data storage, the author asked the following questions: "Are the above ground-water data retained and stored only in 'in house'? _____Yes _____No; If no, where are they stored?" Essentially, none of the agencies were entering their ground-water data into master storage facilities. If they collected the data, they compiled and published the results or just filed the data for manual retrieval.

Large quantities of data have also been collected on Alabama's surface waters. Of the 22 agencies interviewed, 13 used their own staffs to collect their data. The results concerning the storage of these data resembled those for ground water.

COMPREHENSIVE PLANNING

Role of a Comprehensive Planning Agency

To determine which agencies were providing leadership in comprehensive planning, the authors asked questions about activities that he assumed would be the responsibility of a comprehensive planning agency. Questions concerned the promulgation of rules and regulations about planning, the dissemination of planning information, the involvement of other agencies in planning, the coordination of their efforts, the formulation of priority-use plans, and the review of research proposals.

No questionee reported that his agency promulgated rules and regulations for water-resources planning. Only two agencies reported regularly and routinely disseminating information about planning. Only the questionee for the Office of State Planning and Federal Programs responded that his agency routinely participated in planning. The Office of State Planning and Federal Programs was also the only agency to report coordinating the planning efforts of all levels of agencies. No agency reported any activity in the development of a priority-use plan. The Office of State Planning and Federal Programs was the only agency reported to review regularly and routinely research proposals to determine their contributions to comprehensive water-resources planning.

The Office of State Planning and Federal Programs was reported to have extensive coordinating activities. The questionee for the Office of State Planning and Federal Programs responded positively to 79 percent of all questions related to coordination.

Roles of Lesser Agencies in Comprehensive Planning

To determine the roles of state agencies other than the Office of State Planning and Federal Programs in the planning process, the authors analyzed responses to questions about the participation by agencies in the development of plans, in reviewing the planning process, and in making recommendations for changes.

None of the lesser agencies reported participating routinely in the development of a comprehensive plan for managing the State's water resources. None of the lesser agencies reported reviewing regularly and routinely the State's planning efforts or of routinely recommending improvements in the State's planning efforts.

Concerning the coordination of research activities, agencies were asked if they notified a centralized planning agency of proposed, active, and recently completed water-resources investigations. Only the Water Resources Research Institute notified the Office of State Planning and Federal Programs.

Ratings Given Comprehensive Planning

To gain additional information about the status of comprehensive planning, the interviewer asked the questionees to rate current comprehensive water-resources planning. Significantly, none of the questionees for the principal state agencies, except the Office of State Planning and Federal Programs, thought that such planning was effective.

COORDINATION

Questions about the coordination of activities were included in those for the eight functional programs and also in the last three sections of the questionnaire. Questionees were also asked how their activities were coordinated with other agencies and to evaluate current efforts to coordinate activities.

In studying the coordination of activities in the eight functional programs (Table 6), one can see the numerous activities reported by the representative of the Office of State Planning and Federal Programs. This questionee responded positively to 79 percent of the questions about coordinating activities. Of the 16 responses for which no coordination was recorded, 12 were at the local level.

Questionees reported that most coordination was probably informal and was accomplished through "courtesy contacts" (for example, telephone communications) or through the presence of the "heads" of agencies or their representatives on water-related committees.

The Office of State Planning and Federal Programs reported that it coordinated activities by reviewing and commenting on proposals and draft studies and by participating in review meetings. The questionee for the Office of State Planning and Federal Programs said that his agency did not try to achieve coordination through formal meetings.

In evaluating coordination activities, four questionees disagreed and four strongly disagreed with the statement that coordination of activities was common. Thirteen questionees, including those from all five principal state agencies, felt that most agencies were concerned only with their own problems and were not involved with the problems of other agencies. Many questionees felt that more coordination was needed and that planning and coordination were lacking among most agencies. Thirteen questionees, including the questionee for the Office of State Planning and Federal Programs, the State Board of Health, the Water Improvement Commission, the agency of the State Geologist, and the Water Resources Research Institute thought that there was a need for more coordination.

FINANCIAL ASSISTANCE

Questions on financial assistance were included in each of the eight functional programs. Questionees were asked to identify the sources of their funding and to indicate how much of their funds were spent on water resources.

Six questionees said that less than 25 percent of their funding came from the Alabama General Fund. Twelve questionees reported that their agencies either received no funds or that the funding they did receive from the Alabama General Fund was an insignificant percentage.

With so little funding coming from the Alabama General Fund, most agencies relied either directly or indirectly on federal funds. Funds were often received from federal sources by providing "in-kind services" or "manhours" in exchange for funding. Other agencies "passed" funds from the federal government to other state agencies. Though this money may have been designated for lesser agencies, the coordinating agency undoubtedly used a percentage of these funds to administer its program. In providing funds for other agencies, the Office of State Planning and Federal Programs had 33 responses and the Water Resources Research Institute had 12 responses. Combined, this is 54 percent of all responses.

Several questionees reported that even though they received a small percentage of their budget from the Alabama General Fund, they spent 100 percent of their funds on water-resources investigations.

FUNCTIONAL PROGRAMS

For each of the eight functional programs, questionees were asked to identify and rate existing and potential problems. Because the emphasis of this paper is on the effects of coordination, the results from only two of these programs, Water Supply and Water-Pollution Control, are presented.

Most questionees felt that there were no serious existing problems with surface- or ground-water supplies. However, several ratings of "serious" were recorded. "Potentially serious" ratings were given by a larger number of questionees.

In the Water-Pollution Control program, existing ground-water pollution was rated as "serious" by four questionees and as "minor" by six. Seven agencies rated the pollution of surface water as "serious." Questionees for the Office of State Planning and Federal Programs and the Water Resources Research Institute felt that "potential" problems in ground-water pollution were "critical."

Attitudes Toward Water-Resources Management

To complete an understanding of the current status of water-resources management, questionees were asked whether they thought water management would be needed in Alabama and, if so, how soon. All except five questionees responded "yes." Seven questionees said that statewide water management is needed "now" or "immediately." Five questionees thought that such management would be needed within 10 years.

DISCUSSION

Of the attributes listed in Table 1, "Coordination" is undoubtedly the most essential in the operation of an effective water-management program. The data from this study indicate that the State possesses, to a limited degree, all of the listed attributes. However, because of ineffective leadership and coordination, the agencies have been unable to formulate and implement a water-management plan.

Massive quantities of both surface- and ground-water data have been collected. However, much of the data has not been entered into computer storage files and was not readily available to other agencies. Under appropriate management, these data could be used to create a good ground- and surface-water data base.

Since passage of the Water Resources Planning Act of 1965, many studies and recommendations have been made to provide the State with a comprehensive plan to manage its water resources. After 14

years of planning, most of the original recommendations are still applicable.

Results indicated that planning efforts were uncoordinated and that the successful implementation of recommendations was jeopardized because of the lack of participation by other agencies. Results also indicated that the Office of State Planning and Federal Programs was not perceived by most other agencies as a comprehensive water-resources planning agency and that the State's planning efforts were ineffective.

The Office of State Planning and Federal Programs reported coordinating most activities in the eight functional programs and other activities such as comprehensive planning. However, the extent of these efforts must be questioned because of responses that planning and coordination were not common, that more coordination of work effort was needed, and that planning and coordination are very ineffective.

The results concerning the means used to achieve coordination indicate that there was too much informality in the coordination of activities. The presence of representatives on committees and the use of telephone conversations and like methods provide no "direction" to the coordination of activities.

The agencies' evaluation of planning and coordinating efforts clearly characterized the status of those efforts in the State. Efforts were characterized as "uncommon," "ineffective," and "needed" and clearly demonstrated the source of the State's failure in implementing a water-resources management plan.

Because most agencies were and are forced to seek funding from other agencies and the federal government, the diversity of this funding accentuates problems related to planning and coordination. Conceivably, the direction of an agency's programs and activities could be dictated by its sources of funds to the exclusion of the State's priorities in water management. In the absence of effective coordination, many agencies could be left to scramble for whatever funds are available.

Responses within each functional program indicated the critical, serious, and potentially serious nature of many water-resources problems. The validity of these responses is supported by other literature. For example, in its 5- year Plan of Water-Resources Research [1981], the Water Resources Research Institute listed major water- and related land-resources problems facing Alabama. The Institute lists as ground-water problems (p. V-2 and V-3):

1. inadequate data and methods to answer specific water supply [*sic*], particularly as related to groundwater quantities and quality;
2. projected increased demand on groundwater resources in south Alabama for irrigation;
4. contamination of groundwater supplies from agricultural and other practices and sources;
5. saltwater intrusion into groundwater supplies;
7. effects of heavy pumping of aquifers in adjacent states on available quantity and quality of groundwater;
8. expected increased demand on groundwater resources in the projected development associated with completion of the Tennessee-Tombigbee Waterway.

The seriousness of many water-supply problems may not be fully appreciated because of the lack of available information about water supplies. In 1970, in *Status of Water-Resources Management in Alabama*, Gruggs and Cohen noted that " . . . no agency is charged with assembling data on the potential of specific aquifers, streams, and other surface sources on a geographic or demographic basis." To the authors' knowledge, there has been no detailed compilation of information on the occurrence and characteristics of the State's aquifers. Little or no effort has been made to determine safe yields of aquifers. This information is needed especially for south Alabama where there is a demand for large quantities of fresh water. The State's water-supply problems are developing and coordination is essential to solving these problems.

Many questionees designated water-resources problems as "serious" or "potentially serious" and also reported that water management was needed either immediately or within 10 years. These data, though subjective, suggest that the personnel interviewed would be willing to contribute to formulating and implementing an effective water-management plan.

On October 1, 1982, the Alabama Department of Environmental Management assumed regulatory authority for implementing all state and federal environmental statutes and regulations. The functions and personnel of the Water Improvement Commission, the Alabama Water-Well Standards Board, the Divisions of Solid and Hazardous Wastes and Public-Water Supply of the State Board of Health, the Environmental Health Administration Laboratory, the regulatory functions of the Alabama Coastal Area Board, the Board of Certification of Water and Wastewater Systems Personnel, and the Alabama Air Pollution Control Commission were incorporated into the Department on that day. A major goal of the new agency is the establishment of "one step" environmental permitting.

The personnel of the agencies were interviewed prior to the creation of the Alabama department of Environmental Management and the authors' conclusions and recommendations are based upon those interviews.

The findings in this report should not be affected, to any significant extent, by the creation of the Alabama Department of Environmental Management. The agencies that existed at the time of the interviews are now simply divisions within the new Department. Although there is the potential for better coordination of water-related activities within the new agency, many problems will continue to exist among the State's water-related agencies. Indeed, the conclusions and recommendations within this report should be useful as future decisions are made concerning activities of the Alabama Department of Environmental Management and its interactions with other agencies—state, regional, local, and federal.

CONCLUSIONS AND RECOMMENDATIONS

Whatever attributes are ascribed to a particular state's water-resources program, the coordination of water-related agencies and their activities is essential in formulating and implementing an effective water-management plan. A state may have sufficient data to form a data base, may spend millions of dollars on planning, and may finance various agencies and their programs. Unless the state's priorities are identified and plans are formulated to meet these priorities, however, the state's water-resources program may have no direction and may not efficiently use available time, funds, or personnel. The following recommendations are based on the results of this study:

1. Any governing body attempting to manage its water resources should recognize the important role of coordination. Only by effectively coordinating the activities of all water-related agencies can a state maximize the results of its use of time, funds, and personnel.
2. Factors involved in coordination should be clearly established. These include:
   a. Identifying specific priorities or objectives;
   b. Identifying those agencies and personnel who can contribute to achieving the designated objectives;
   c. Selecting means for achieving objectives;
   d. Assigning specific responsibilities to the agencies responsible.
3. Formal communication must be included in the means used to coordinate activities of the water-related agencies. Examples are quarterly or biannually released newsletters

or bulletins, regularly scheduled executive meetings for agency directors, and seminars.

4. Coordinating methods should be reviewed according to these criteria:
   a. Have specific priorities or objectives been identified?
   b. Are all principal agencies involved?
   c. Have means of achieving objectives been identified?
   d. Are responsibilities shared?
   e. Can specific formal methods of coordinating activities be identified?
   f. Is the program effective and successful?

REFERENCES

1. Barksdale, H. C., 1971, An annotated outline of a water-resources development plan for Alabama: [Geological Survey of Alabama] Water for Alabama Series, 23 p.

2. Elmore, G. R., Jr., 1972, State organization for water resources management: Georgia Institute of Technology, Environmental Resources Center Report ERC-0472, 143 p.

3. Grubbs, D. M., 1969, Alabama agencies with water-resources and related land-use responsibilities: University of Alabama, Natural Resources Center Report 691, 75 p.

4. Grubbs, D. M., and Cohen, Harry, 1970, State of water-resources management in Alabama: University of Alabama, Natural Resources Center Report 702, 103 p.

5. Grubbs, D. M., and Cohen, Harry, 1971, Legislative needs in water- resources management: University of Alabama, Natural Resources Center Report 711, 86 p.

6. Grubbs, D. M., and Cohen, Harry, 1973, Legislative framework for water resources management in Alabama: Alabama Development Office Report Number ALA-NRC-X996-WRC-73, 45 p.

7. Grubbs, D. M., Mullis, C. H., and Warman, J. C., 1968, Water planning and management for Alabama: Alabama State Planning and Industrial Development Board, 15 p.

8. Krausz, N. G. P., 1968, Intergovernmental relationships in the administration of water resources: University of Illinois, Water Resources Center Research Report Number 18, 336 p.

9. Moffett, T. B., 1983, Water-resources management in Alabama: A proposed system based upon a study of agency activities: Unpublished doctoral dissertation, The University of Alabama, 543 p.

10. Water Resources Research Institute, [1979], Fiscal year 1979 annual report: Auburn University, Water Resources Research Institute, 92 p.

Table 4 – Agency Activities in Water-Pollution Control.

	ADO	ASDD	DCNR	DIR[1]	HD[2]	OSPFP	ASMC	SBH	SFC	SOGB[3]	SSWCC	WIC	DAI	SG	WRRI	AU	UA	MESC	ACAB[4]	BCDA	SARPC	WAPDC
A. Data collection																						
1. Does your agency perform routine data collection for the determination of:																						
a. Surface-water characteristics? (e.g., waste assimilation capacity, nutrients)				o					o[5]	o[6]		x	x[7]	x		x	x	x				x[8]
b. Ground-water characteristics?										o[6]				x			x					
c. Municipal discharge characteristics?												x										
d. Industrial/commercial discharge characteristics?					o							x		x[8]								
e. Domestic discharge characteristics?												x										
f. The economics of water-pollution control?									x													
2. Does your agency investigate:																						
a. Pollution of surface water?			x	o			x	x	x	x		x	x[9]	x	o[10]	x	x	x		x		x
b. Pollution of ground water?				o			x	x	x	x		x	x[9]	x	o[10]	x	x					
c. Pollution by municipal discharge?			x									x		x	o[10]	x		x				x
d. Pollution by domestic discharge?			x					x				x		x			x	x		o[11]		x
e. Pollution by industrial/commercial discharge?			x				x			x		x	x[9]	x	o[10]	x	x	x				x
3. Does your agency obtain water-quality data or reports from wastewater facilities?					o		x			x		x		x	o[10 12]		x	x[12]	x		x[13]	

[1] Department of Industrial Relations' activities are just beginning and are associated with its responsibility for the "Abandoned Mine Lands" program. Open circles reflect the agency's probable activities on a site-specific basis. Funding for the program was undefined at the time of the interview.

[2] The State Highway Department plans, develops, and operates lagoons at rest areas. However, "planning" also results from the preparation of Environmental Impact Statements.

[3] Virtually all of the activities of the State Oil and Gas Board result from their regulatory activities to control salt water disposal resulting from oil and gas exploration.

[4] Potential exists for additional activities as the agency's new program develops.

[5] Potential study of the relationship between sediment in streams and harvesting activities.

[6] The State Oil and Gas Board has a cooperative agreement with the State Geologist for the performance of these activities.

[7] Pesticide Laboratory at Auburn collects samples from major rivers and from the Mobile Bay area once or twice each year for pesticide "screening."

[8] This activity will likely cease in the 1982 budget year with the loss of 208 funding from federal sources.

[9] Not routinely–in response to complaints.

[10] Through the Institute's funding activities.

[11] Potential pollution by septic lines.

[12] For specific projects.

[13] For specific planning efforts.

Table 5 – Ground-Water Data Collected by All Sources.

	HD[2]	OSPFP[3]	ASMC[4]	SBH[5]	SOGB[3]	WIC[6,7,8]	DAI	SG[9]	WRRI[10]	AU	UA[11]	MESC	ACAB[3]	BCDA	Staff	Number of agencies obtaining data collected by: Permitting procedures	Other agencies	Consultants	Total number of agencies collecting
Ground-water levels	S[12]	O	SCP	SO[13]P	O	OP		SOP[14]	SO	S	SOC	S	O	S[15]	9	4	8	2	13
Samples of ground water for inorganic chemical analysis (e.g., major ions)	S[16]	O	SP	SP	O	SP		SO	SO	S	S	S	OP		9	4	5		12
Samples of ground water for organic chemical analysis (e.g., pesticides)				SP		SP	S[17]	SO	SO	S					6	2	2		6
Samples of ground water for any of the following analyses:															9	4	5	1	12
pH	S[18]	O	SCP	SP	O	SOP		SO	SO	S	S	S	OP						
Specific conductance	S[18]	O	SCP	SP	O	SOP		SO	SO	S	S	S	OP						
Acidity		O	S[19]CP	SP	O	SP		SO	SO	S									
Alkalinity	S[18]	O	S[19]CP	SP	O	SP		SO	SO	S			OP						
Color		O		SP	O			SO	SO	S			O						
Dissolved oxygen			C		O			S	SO	S									
Turbidity	S[18]		SCP	SP	O				SO	S			O						
Sediment	S[18]	O	CP	SP	O	SP		S	SO	S									
Temperature	S[18]	O	SCP	SP	O	SOP		SO	SO	S	S		OP						

[1] The following symbols are used to indicate the sources of data: S=Staff, O=Other agency, C=Consultant, and P=Permitting procedure.

[2] Consultants have been hired by the Highway Department to prepare environmental impact statements; these reports may contain ground- and surface-water data.

[3] For all responses, the "other agency" is the State Geologist.

[4] Most of these data are collected in the Small Operators Assistance Program. Some additional data are received from the consultants who are hired by the coal companies. The Alabama Surface Mining Commission may, at times, receive some data from the U.S. Office of Surface Mining, the U.S. Geological Survey, and the agency of the State Geologist; however, the data are not collected directly for the Commission.

[5] For data collected by staff, see the text for additional information concerning the collection of water-resources data by the Public Water Supply Division, the Division of Solid and Hazardous Wastes, and the Alabama Water Well Standards Board.

[6] The principal source of ground-water data for the Water Improvement Commission is through permitting procedures.

[7] For all responses, the "other source" is the State Geologist. The data are collected by the staff of the State Geologist as a part of "treatment and disposal" site evaluations for the Water Improvement Commission.

[8] The receipt of the data in this category results from permitting procedures associated with the approval and review of "land application" and "underground injection control" sites.

[9] The State Geologist has a cooperative agreement with the U.S. Geological Survey which results in the collection of these data. Some water samples are analyzed for the U.S. Geological Survey by the staff of the State Geologist; both organizations have the results of the analyses.

[10] For all responses, the "other agencies" are the universities and other state agencies.

[11] Other than the ground-water levels, all the data items will probably be obtained by Argonne National Laboratory if funding for a proposed investigation is approved according to Dr. Travis Hughes of the Department of Geology.

[12] Measured by "boring teams."

[13] Water levels are measured by staff of the State Geologist as a part of hydrogeologic evaluations of potential solid-waste disposal sites for the Division of Solid and Hazardous Wastes.

[14] The State Geologist receives "report of drilled well" forms from water-well drillers through the permitting requirements of the Alabama Water Well Standards Board. These forms frequently contain information on ground-water levels.

[15] The Bear Creek Development Authority conducted a ground-water survey for bacteriological information in Franklin County during the 1960's.

[16] Rarely.

[17] Analyses are by the Pesticide Laboratory at Auburn University. The Laboratory does not collect ground-water samples but does analyze them. They may be submitted by investigators within the Department of Agriculture and Industries, by the public, or by other agencies.

[18] Data for this item are mostly from a study of "spoil materials" from strip mining in the Interstate 59 to Warrior "corridor." Samples of water from this study were "split" for analysis by the U.S. Geological Survey.

[19] Probably.

Table 6 – Coordination of Activities in the Eight Functional Programs

[Data shows which agencies reported coordinating the activities of other state, regional, local, and federal agencies in the three phases of each functional program

	Water supply	Water-pollution control	Agricultural land and water use	Fish and wildlife	Outdoor recreation	Flooding	Development of waterways and rivers	Electric power generati
Planning								
State	OSPFP	OSPFP, WIC	OSPFP, WIC	OSPFP	DCNR, OSPFP	OSPFP	OSPFP	OSPFP
Regional	OSPFP	WIC, WAPDC	OSPFP	OSPFP	DCNR, OSPFP	OSPFP	OSPFP	OSPFP
Local	--	WIC, WAPDC	OSPFP, SSWCC	–	DCNR	OSPFP	OSPFP	–
Federal	OSPFP	OSPFP, WIC	OSPFP	OSPFP	DCNR[1], OSPFP	OSPFP	OSPFP	OSPFP
Development								
State	OSPFP	OSPFP, WIC	OSPFP	OSPFP	DCNR, OSPFP	OSPFP	OSPFP	OSPFP
Regional	OSPFP	OSPFP, WIC	OSPFP	OSPFP	DCNR, OSPFP	OSPFP	OSPFP	OSPFP
Local	--	WIC	OSPFP	–	DCNR, OSPFP	OSPFP	OSPFP[1]	–
Federal	OSPFP	OSPFP, WIC	OSPFP	OSPFP	DCNR[2], OSPFP	OSPFP	OSPFP	OSPFP
Operation								
State	OSPFP	OSPFP, SOGB[3]	OSPFP	OSPFP	OSPFP	OSPFP	OSPFP	–
Regional	OSPFP	OSPFP	–	–	OSPFP	OSPFP	OSPFP	–
Local	--	--	–	--	–	OSPFP	OSPFP	–
Federal	OSPFP	OSPFP	OSPFP	OSPFP	OSPFP	OSPFP	OSPFP	OSPFP

[1] To some extent.

[2] Indirectly, since the activities of such federal agencies as the U.S. Army Corps of Engineers, the Department of Housing and Urban Development, and the U.S. Soil Conservation Service must be in compliance with the Statewide Comprehensive Outdoor Recreation Plan.

[3] Virtually all of the activities of the SOGB result from their regulatory activities to control salt-water disposal resulting from oil and gas exploration.