

New Water Resource Challenges

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Managing the nations water resources has been a major challenge for generations. Early colonial times and national expansion required navigation improvements. Later, flood control and irrigation in the West became national priorities, and new national programs and agency authorities were created. PL-566 is one of the programs created for the Soil Conservation Service to assist in implementing flood control and irrigation projects for small watersheds (250,000 acres or less).

The PL-566 program was very popular with agricultural producers and small communities. The program provided for multiple uses of impoundments, including recreation, drinking water, and irrigation water supply storage. Many small communities would not have these improvements without the PL-566 program.

Today, the national issues have changed. Environmental issues are the new national priorities. Different environmental programs have emerged. Water and air quality improvement, endangered species protection, maintaining biological diversity, ensuring safe food supply, and a host of other environmental issues are placing new requirements on Federal, state, and local agencies, as well as the citizens of this country. Some of the environmental issues have created major policy concerns. Governmental units and local citizens are striving to integrate the laws and concerns into their operations; however, the tasks are becoming increasing difficult.

Emerging from this situation is the concern that a common point of reference is needed to coordinate environmental issues and programs with local citizens. Bingo! The watershed boundary. Since water is one of the major driving forces in the ecosystem, the watershed boundary is a convenient boundary for most environmental issues.

The Soil Conservation Service has already begun moving in the direction of environmental planning within the watershed boundary. Recently, SCS developed a Water Resource Strategy based on interviews, and group meetings with staff and outside customers. It became apparent that the future environmental issues should be based on the watershed boundary. Not only should the PL-566 program continue in the environmental watershed planning direction, but the same watershed planning approach should be initiated in all resource management programs. Today, the new planning starts are concentrating on land resources protection, pollution abatement and other environmental concerns.

The watershed momentum is becoming widely accepted as the new direction that all water resource policy and other environmental issues must be implemented. An example of the momentum shift was the recent Watershed '93 conference held in Washington. The attendance requests doubled the conference capacity. In addition, draft legislation for the reauthorization of the Clean Water Act proposes using the watershed approach for delivering water quality improvement programs - a new policy direction.

The ecosystems inside the watershed boundary are often very complex and intervention in one part of the ecosystem will affect other segments of the ecosystem. The watershed approach places the water resource planner more in the role of bringing diverse specialties together with the local people to get a consensus on resource management. Some have referred to this process as "Consensus Planning," other refer to it as "Total Resource Planning" or "Ecosystem Planning." Regardless of the title, some elements are consistent. They are:

- Local people must be involved. They will implement many of the action items and can help develop practical solutions.

- A broad spectrum of expertise is needed. Experts from hydrology specialist to aquatic and terrestrial biologist, from geologist to land resource management expert, from economist to fate and transport chemist will be needed.

- Professional judgment is necessary. There will never be enough data to answer all the questions, but the skilled specialist can make some judgment decisions. New modeling tools help.

- The plan must be developed in a short period of time. Local people and outside environmental pressures will not be patient.

- A major information, education and technical assistance support system will be necessary. Most of the action items in these watershed plans will require the local people to change their day-to-day actions. The purpose and need for implementation must be constantly communicated and supported.

Ideally, the watershed planning approach will be adequate to resolve the major environmental concerns and additional regulatory programs will not be required.

These new uses of the watershed approach place new demands on water resource planners. No longer can a planner be technically astute in water resources only. He or she now must be able to market ideas, coordinate diverse experts, know when and where to get specific experts, and maintain good relations with the local political system. Many already are meeting this challenge.

Universities should consider how future water resource planners must perform and develop courses to meet these needs. Some basic questions should be asked. Are the students taught marketing? Do the students understand the importance of local people and government support for a project? Can they make a convincing presentation of their ideas? Are they exposed to the skills of other disciplines? How knowledgeable are they of the current environmental laws?

Research needs to include ecological impacts, and the basic interactions of the different ecosystem segments. An interdisciplinary approach requires big-picture thinking that involves many disciplines to help dissect the segments and explore some "what if" scenarios. New concepts are beginning to form that highlight the deeper knowledge of the ecosystem. Consider the following simple example:

Storm runoff and snow melt from some Maine potato fields flows directly into a lake. It was felt that normal economically viable land treatment of the fields was insufficient to reduce the load of farm pesticides and nutrients entering the lake. The local people wanted to maintain the lake's water and fishery quality. A biologist came up with the idea of using constructed wetlands. An agricultural engineer designed a system to capture the runoff water and route it through sediment traps and wetlands. The system was installed and monitored. The system provides major reduction of nutrients and sediment entering the lake. Although the pesticides were not monitored due to cost, the system should provide similar pesticide load reduction. After this successful field trial, more systems are being installed for fields. Additionally, field trials are testing constructed wetlands as part of animal waste management systems. Now, other locations are considering using constructed or restored wetlands as part of a watershed plan to improve water quality. A side benefit is the improvement of biological diversity.

Future watershed projects will be very different from the projects of even ten years ago. Projects will have a mix of ecosystem protection and restoration as well as development and economic incentives. Future planners must be good at marketing, recognizing need for various expertise, managing interdisciplinary teams from different agencies and universities, and maintaining excellent relations with local people and government. The opportunities are limitless.

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