



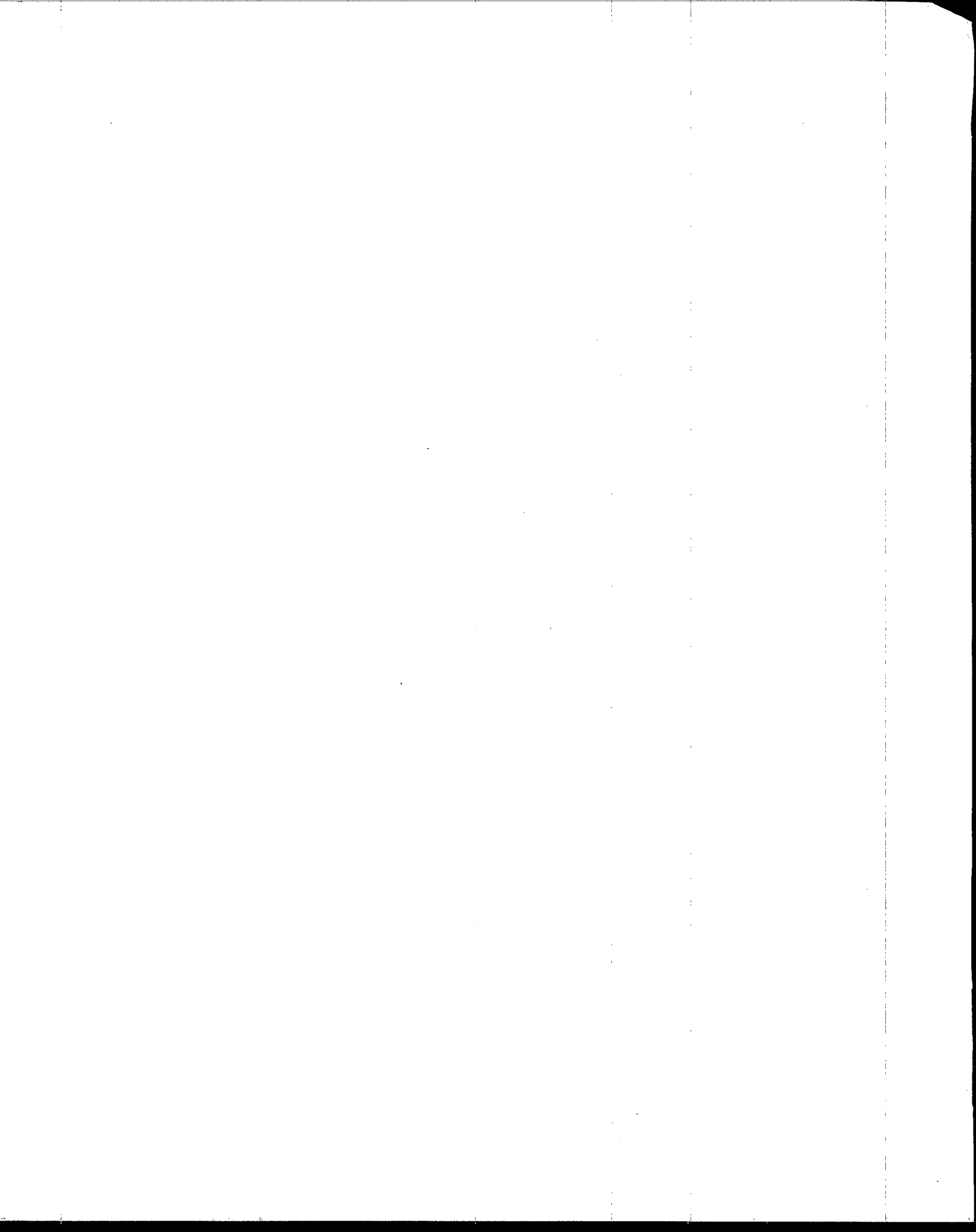
United States
Environmental
Protection Agency

Office of
Research and
Development

Office of
Water

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Watershed Ecological Risk Assessment

Over the past twenty-five years, substantial reductions have been achieved in the discharge of pollutants into the nation's air, lakes, rivers, coastal waters and ground water. These successes have been achieved primarily by controlling point sources of pollution and, in the case of groundwater, preventing contamination from hazardous waste sites. Although these sources continue to be an environmental threat in some areas, it is clear that the causes of impairment of a water body are as varied as human activity itself. For example, our waters and the terrestrial systems associated with them may be threatened by urban, agricultural, or other forms of contaminated runoff; landscape modification; over-harvesting of natural resources; the introduction of exotic species; and deposition and recycling of pollutants between air, land and water.

While EPA has focused past efforts primarily on particular sources, pollutants, or water uses, many remaining threats are not so readily amenable to regulatory action by the federal government. Therefore, we must look for new ways to deal with these issues that build upon existing programs, but more effectively integrate the assessment and management functions of both local and state governments, federal agencies and non-governmental organizations.

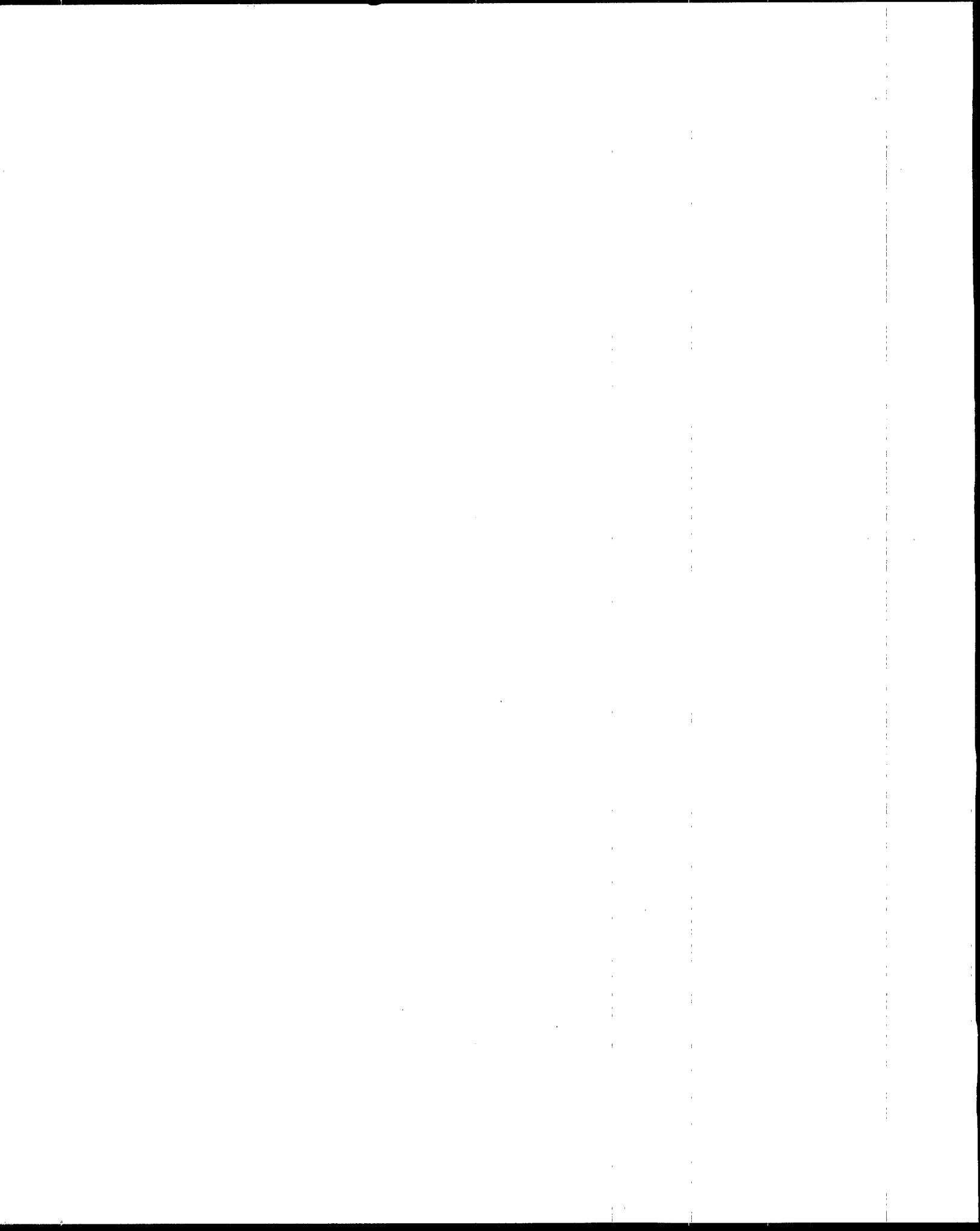
Coordinating both regulatory and nonregulatory programs to prevent, mitigate and restore ecosystem degradation makes good sense for environmental, economic, and administrative reasons. For example, by jointly reviewing the results of assessments for drinking water protection, pollution control, wildlife habitat protection and other factors, managers from all levels of government can better understand the cumulative impacts of human activities, determine the most critical problems within a watershed, and set priorities for action. In addition to the environmental benefits, this approach can result in substantial cost savings by

leveraging the financial and human resources available to local communities.

Ecological risk assessment explicitly evaluates the potential adverse effects that human activities have on ecological resources, and organizes and presents the information in a way relevant to environmental decision-making. This assessment provides local communities a forum to participate in developing management options for specific resources in their watershed, coordinates the assessment capabilities in existing programs in local, state and federal agencies, and develops partnerships between government, the private sector and the general public. The information developed in the risk assessment ensures that evaluating threats to ecological systems is a conscious step in the land and water resource decision-making process, and that the solutions we choose to reduce risks to these ecosystems will permit economic growth and development.

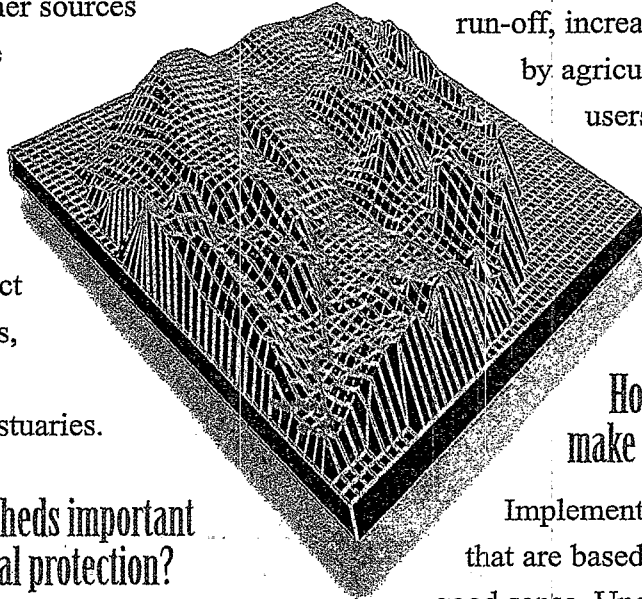
The United States Environmental Protection Agency is integrating the principles of ecological risk assessment into its decision-making process. The Office of Water is developing guidance for conducting watershed-scale ecological risk assessments as a 'community-based' effort consistent with the recently released Watershed Approach Framework (EPA 840-S-96-001). Concurrent to this effort, and in support of other USEPA programs as well, the Office of Research and Development is developing risk assessment methods and techniques to address the relationship between human induced stressors and subsequent ecological responses.

In this era of shrinking government, our financial and human resources must be utilized in the most cost effective manner possible. By opening the science involved in the risk assessment process to the ultimate decision-makers, local and state government agencies and the general public, we take an important step forward in this direction.



What is a Watershed?

A watershed is a geographically defined drainage basin where rain, springs and other sources of water on the landscape flow from high ground to low areas and collect to form streams, rivers, lakes, wetlands and estuaries.



Why are watersheds important to environmental protection?

The adverse affects of environmental damage occurring across the landscape are combined in the water as it flows into our rivers, wetlands and other valued surface waters. What seems like minor human impact in one part of the watershed may seriously impair it elsewhere when multiple impacts are combined.

Why do we need more than regulations to protect our valuable watershed resources?

Only a few problems caused by human activities can be regulated by the federal government. Control of industrial discharges, for example, is a successful

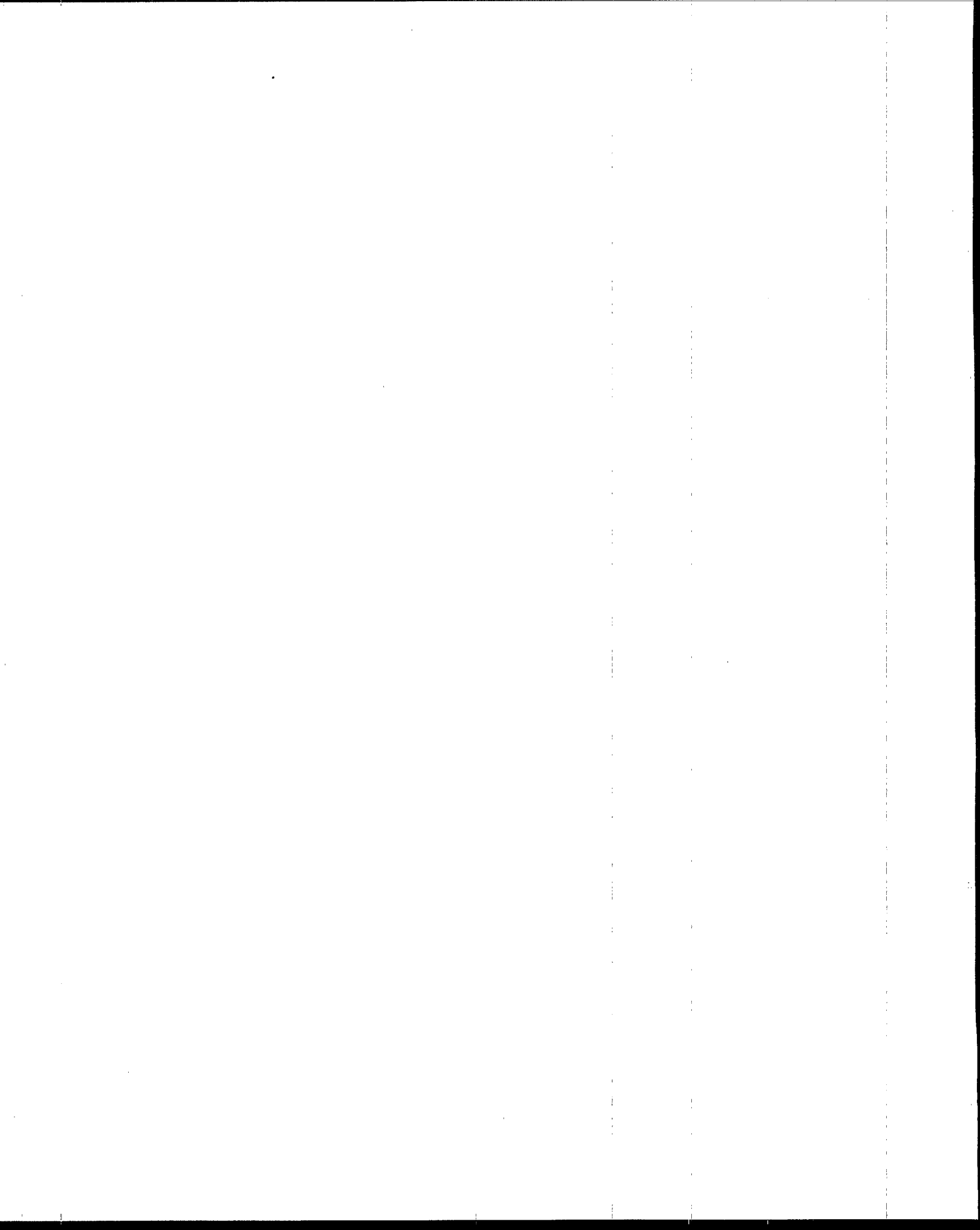
part of the point source permit program mandated by federal law and regulated by states. But many problems, like habitat destruction, contaminated surface run-off, increased demand for water by agricultural and industrial users, and nutrient over-enrichment require voluntary actions and effective land use practices.

How does science make a difference?

Implementing management plans that are based on good science makes good sense. Understanding how a watershed ecosystem functions and responds to human impacts is central to developing a plan that will achieve desired results. This is why we are conducting watershed ecological risk assessments in each of the five described watersheds.



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What is a watershed ecological risk assessment?

This is a systematic scientific process for assessing the cause of observed problems and predicting the ecological response of watershed resources to human activities. It depends on partnerships with watershed managers, including the public, and on partnering among scientists. It is specifically designed to answer managers' questions about how best to protect their valued watershed resources.



What are the essential ingredients for protecting our watersheds?

- Partnerships among federal, state, and local governments, industry, environmental groups, and the public working toward common environmental goals.
- Science to guide our understanding of what ecological values are at risk and why.
- Reasoned management decisions that balances environmental concerns with socioeconomic and political concerns, making the environment an equal partner at the decision table.

