

# Better together: How ecosystem services and adaptive decision-making can improve land management

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An ecosystem services approach combined with adaptive decision-making can aid land and resource managers in administering their regions for the benefit of communities and stakeholders, according to a recent report by the U.S. Geological Survey and Resources for the Future.

Ecosystem services are the benefits to people from things produced by the natural living environment, such as pollination of crops, filtering of groundwater by wetland vegetation, and buffering of storm surge by mangrove swamps. Adaptive [decision-making](#), meanwhile, allows managers to learn by doing, adjusting their operations based on results from management decisions, and ongoing research and monitoring over time.

"Resource management decisions are having greater impacts on our lives, and we need the best methods to assess and understand the consequences of decisions," said Carl Shapiro, director of the USGS Science and Decisions Center. "Our work showing how adaptive decision-making and ecosystem services complement each other will help [resource managers](#) make the best decisions affecting the Nation's natural resources."

Both ecosystem services and adaptive management have been widely explored, but there have not yet been widespread attempts to use both

together. To address this gap, researchers at USGS and Resources for the Future explored the conceptual basis for combining the two approaches and examined several projects that evaluated ecosystem services within an adaptive management decision process.

The first, a suburban community of Clarksburg, MD, in the Washington, DC, area, weighs development against water quality in the Tenmile Creek drainage basin. By applying the concept of ecosystem services, county managers can put the benefits of [water quality](#) in the same categories as the benefits of development, while the adaptive decision-making process allows them to adjust their plans over time based on new information and community feedback.

Thousands of miles away, in the Intermountain West, Interior's Bureau of Land Management is facing a similar dilemma in balancing the permitting of solar energy facilities, their effects on [ecosystems](#), and the concerns of stakeholders as diverse as Tribes, ranchers, electrical utilities and conservationists. Just as in Clarksburg, MD, evaluating the situation through the concept of ecosystem services allows the BLM to make an apples-to-apples comparison for potential benefits and drawbacks.

Meanwhile, using an adaptive decision-making process enables the BLM to apply new information when it is available to engage stakeholders throughout the entire course of the activity.

Finally, the benefits of using both adaptive decision-making and ecosystem services can be seen in the Migratory Bird Regulations Committee's recommendations for regulating the hunting of migratory waterfowl across the United States. Currently, adaptive decision-making has been used to adjust the recommendations for hunting season length and amount of birds that can be harvested, based on things like environmental conditions and total population of the birds. By incorporating [ecosystem services](#), the values of the various stakeholders

can be incorporated into the hunting recommendations.

This report used results from two workshops that considered ways in which adaptive management approaches and ecosystem service concepts may be complementary, leading to improved natural [resource](#) and societal outcomes. The report can be accessed here:

<https://pubs.er.usgs.gov/publication/cir1439>

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