

# DELAWARE RIVER WATERSHED INITIATIVE CASE STUDY



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## OSI Grant Helps NJ County Identify Key Lands for Watershed Protection

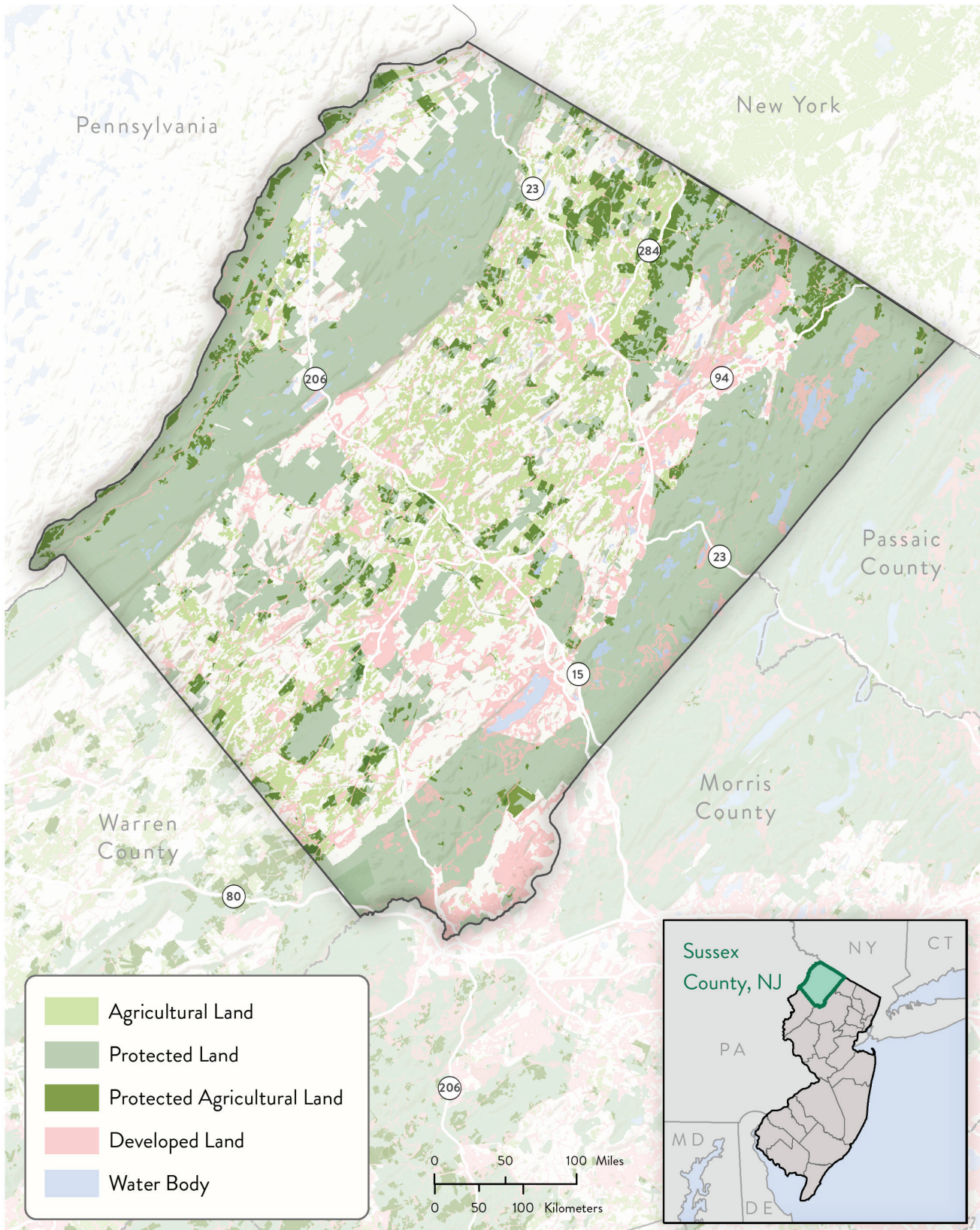
Analysis of watershed lands in Sussex County provides a model for how to incorporate watershed priorities in county open space plans

This document describes efforts by Sussex County and the Land Conservancy of New Jersey to update its Open Space Plan to incorporate watershed science and geographic modeling to identify lands critical to protect and restore so as to ensure water quality. The analysis used hydrological and ecological information to pinpoint lands where development would have the greatest negative impact on water resources. The updated study, which was adopted by Sussex County, identified 34,740 acres, or 10 percent of the county, that are critical for watershed protection.

The analysis, supported with a Delaware Watershed Catalyst grant from the Open Space Institute, helped Sussex County create a state-of-the-art, science-based open space plan that not only helped identify the best lands for protecting drinking water but also increased local interest in open-space funding. It has prompted inquiries from towns interested in potentially applying for county open-space funding to protect or improve management of land to ensure water quality.

# Map 1: Sussex County, New Jersey Land Use Map

Water is a defining feature of Sussex County, a largely rural and agricultural corner of the tri-state metropolitan area with some of the most diverse topography in New Jersey. Interspersed among extensive farmland, its mountains and valleys, are laced with streams, lakes, and wetlands that feed major tributaries of the Delaware River, the source of drinking water for 15 million people.



Clean, safe drinking water is essential for all communities. Throughout the Delaware River Watershed, however, towns and cities are grappling with watershed sustainability and management issues. In a number of places, contaminated farm runoff, industrial pollution, stream bank erosion, and flooding from impervious surfaces, among other stresses are degrading water quality in streams and rivers. This puts water supplies at risk for major cities along the East Coast.

In the face of these threats, land conservation, which safeguards forests and other natural lands that filter, clean, and moderate the flow of water, is a key strategy for drinking-water protection. However, cuts in state, county, and local funding for land acquisition have crimped efforts to preserve lands critical for water resources. Even where such funding exists, many towns lack the data and tools to target the appropriate parcels.

Thanks to a \$25,000 Catalyst Grant from the Open Space Institute's Delaware River Watershed Protection Fund, Sussex County was able to create a state-of-the-art, science-based open space plan that not only helped prioritize the best lands for protecting drinking water, but also helped revive public support for public open-space funding.

Now, in place of debating whether to keep its open-space program, the county is instead able to focus on protecting lands that conserve county and downriver drinking-water resources while expanding and connecting open space and trails.

Sussex County is a largely rural corner of the tri-state metropolitan area with some of the most diverse topography in New Jersey. Interspersed among extensive farmland, its mountains and valleys are laced with streams, lakes, and wetlands that feed major tributaries of the Delaware River, the source of drinking water for 15 million people. These lakes and rivers, as well as abundant parks and trails, draw people from all over the region for outdoor recreation. Numerous aquifers supply most residents' drinking water, while unique aquatic habitats sustain plant and animal species, including the largest number of damselfly and dragonfly species in the country.

In 2015, with its 13-year-old Open Space and Recreation Trust Fund coming up for renewal, Sussex County was discussing the future of the program and whether to continue the property tax that funded it.

Every county in New Jersey has an open space fund, as do half of the local municipalities. County and local funds like these are critical to achieving open-space protection goals.

By providing initial funding and demonstrating local commitment, these initiatives can act as a catalyst to pull together the funding needed for a land conservation project.



Some elected officials and communities felt that enough open space had already been set aside: 37 percent of the county is preserved in parks and other public open space, while another 12 percent is farmland protected under agricultural easements.

After 2008, as property values dropped and the county's population declined, some in the county were concerned about the impact of continuing the tax. "It was time to evaluate where the program has been and where it could go," said Cliff Lundin, Open Space Committee Chair.

Despite these concerns, local support for land protection was strong and the county applauded

Thanks to a grant from the Open Space Institute, one county in New Jersey was able to create a state-of-the-art, science-based open space plan that not only helped prioritize the best lands for protecting drinking water, but also helped revive public support for open-space funding.

when in 2015 it received a \$25,000 Catalyst Grant to update the Open Space and Recreation Plan originally established to guide future land protection. The original 2003 plan, a comprehensive blueprint that laid the groundwork for the open-space program, was out of date and missing some recent county planning components such as the Strategic Master Plan and Wastewater Management Plan.

"When OSI announced the funding, it was the perfect opportunity to update the plan to meet county goals," said Barbara Heskins Davis of The Land Conservancy of New Jersey (TLC-NJ), which applied for the grant and produced the update in collaboration with the county's Open Space Committee, the Sussex County Municipal Utilities Authority-Wallkill River Watershed Management Group, and with guidance as well from Dr. Daniel Van Abs from Rutgers University.

## Buying land for clean water

With OSI funding in hand, Sussex County wanted the update to focus on water-quality protection through land acquisition and stewardship, with an action-oriented approach targeting specific priorities for protection.

Using watershed science and geographic modeling to identify critical land, the *Open Space Plan Update* promised to be a powerful tool for mobilizing the preservation and stewardship of open space to protect water resources.

"Very few counties are able to complete this depth of analysis, due to constraints in time, technology, and expertise," said Davis.

"When all the water-related factors are combined, about 10 percent of the county is shown as highly critical for water protection," said Dr. Van Abs of Rutgers. "That is not an overwhelming portion of the county, and we hope it will provide a good focus for acquisition."

The planning team heard again and again that properly maintaining watershed lands is as important as protecting them in the first place. To help develop the stewardship recommendations, the planning team drew on the expertise of Nathaniel Sajdak, coordinator of the county's Wallkill River Watershed Management Group.

For 16 years, Sajdak's three-person group has been bringing together government agencies, conservation groups, and community organizations to create watershed management plans, reforest stream corridors, help farmers adopt practices that prevent stream pollution, and educate people about protecting watersheds.

Using the plan's strategies, project examples, maps, and specific watershed restoration opportunities, municipalities in Sussex County will be able to shape their own stewardship efforts.

One of the major outcomes of the *Open Space and Recreation Plan Update*, is the recommendation that the Open Space Trust Fund support stewardship efforts. This requires the County Board of Freeholders to change the legal language governing the open-space program and to submit a new ballot measure to the voters for approval. "There are organizations like ours that can help spearhead opportunities, leverage resources, and bring people together, but a funding source is needed to serve as a foundation," said Sajdak.

### Strengthening Communities: Now and in the Future

In November 2015, voters renewed the Open Space Trust Fund by a vote of more than 70 percent, and in late September 2016 the County Board of Freeholders approved the Open Space and Recreation Plan update. The discussions had revived interest in the open-space program.

In the past few years, none of the county's municipalities had applied for open-space funding, Lundin said, but "now we have several towns talking about putting in applications."

Already, the update is influencing municipal officials' thinking about planning for land use and water protection. In Byram Township, where the groundwater that residents rely on is being used faster than it is replenished, Council Member Scott Olson said that the maps could help the town determine the best locations for green infrastructure or forest preservation to protect or increase groundwater infiltration.

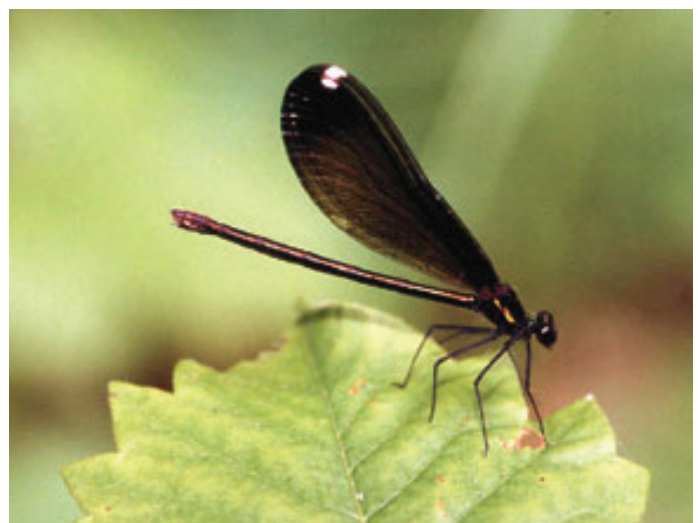
"Going forward, the update will be very useful to us," he said. "The studies showed that we've got a lot of property left that can be preserved and can help prevent the waterways from being impeded further."

So that municipalities can easily use the water-resource data for open-space and planning decisions, the Sussex County Open Space Committee plans to put the parcel data and maps online in a readily accessible format. Moreover, the science-based plan can also serve as a model throughout the region.

"Replicating the process and making the strategies focus on what's important to the county will help move us forward into the second generation of these open-space trust funds so that they are meaningful and have long-lasting impact," said Barbara Davis of The Land Conservancy of New Jersey.



Looking east from Kittatany Mountain



There are more species of dragonfly in Sussex County, New Jersey (145, and possibly as many as 182) than in any other county in the United States.

## WORKING WITH WATERSHED DATA

In developing the maps and priority acquisition lists, the group approached the data from three focus areas:

- **Hydrology, or the amount of water in streams and the rate of groundwater recharge**
- **Stream and aquifer quality**
- **Unique aquatic ecosystems such as vernal pools, high-elevation lakes, and habitat for endangered species. (see map 2)**

For each focus area, the planners applied a set of up to five characteristics to identify places where development would have the greatest negative impact on water resources.

- **For the focus area of water quality, characteristics were the amount of tree cover, riparian areas, karst topography that increases the risk of groundwater contamination, wellhead protection areas for public water supplies, and source areas for surface water reservoirs**
- **For the hydrology focus, the planners evaluated whether there were stressed watersheds where water demands are high relative to groundwater availability, prime groundwater recharge areas, areas with forest cover, wetlands, and floodplains**
- **To assess parcels for important aquatic ecosystems, the team looked for the presence of undeveloped riparian areas of headwater streams, unique and unusual aquatic habitats, riparian habitat for threatened and endangered species, and wetland and forested wetland that provides habitat for threatened and endangered species**

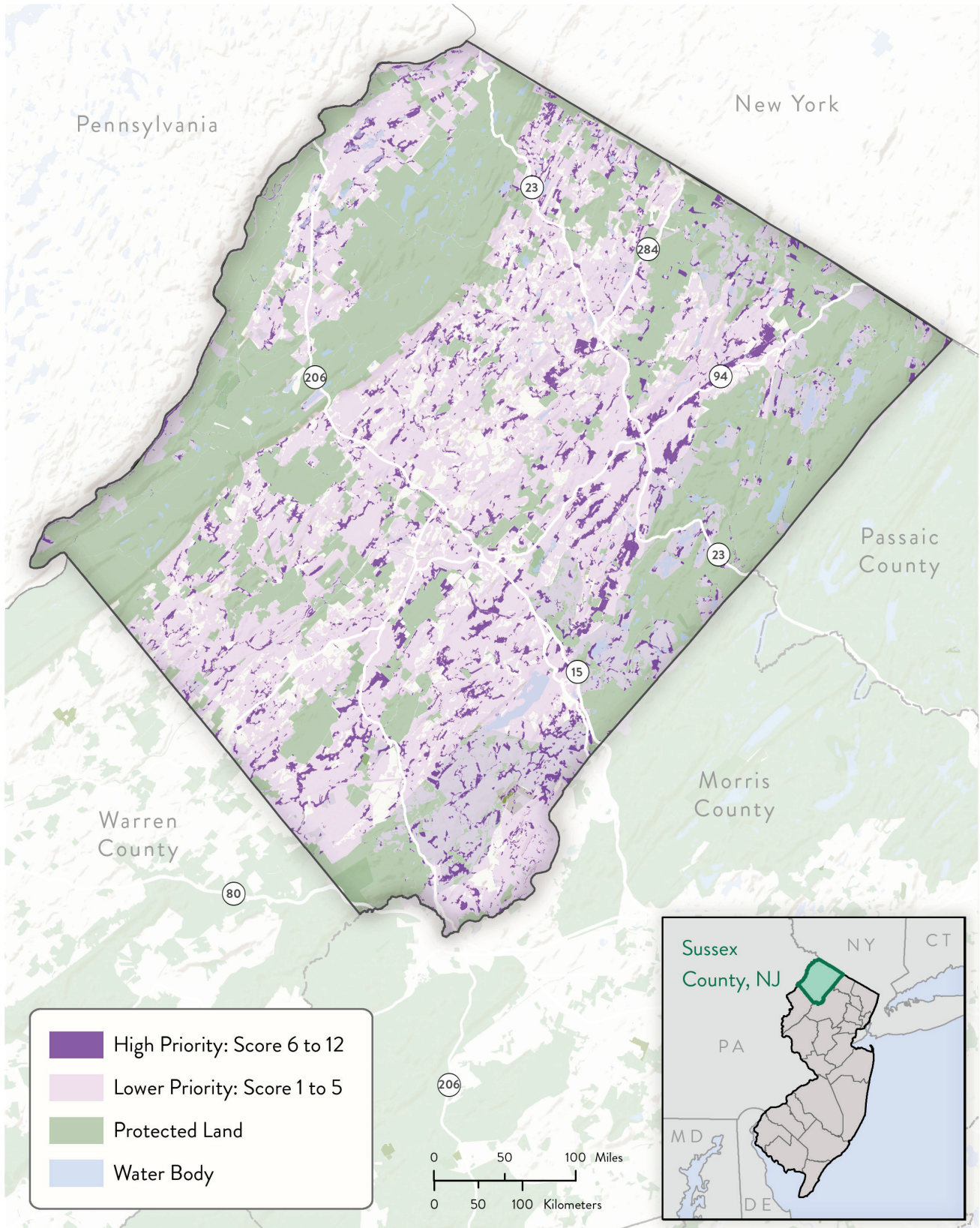
The planners determined how many, if any, of the characteristics for each focus area were present in each parcel. They created maps of each focus area highlighting places with three to five of the characteristics. The highlighted areas were then identified as priorities. Then they combined the three focus areas into composite maps zeroing in on the county's most important parcels for water-resource protection.

In addition, mapping of trails in the county was completed, filling out an inventory of existing open space to complement the computer water-resource modeling. The final composite maps made it easy to see that top-scoring parcels for water protection were adjacent to preserved lands. Focusing on places where trails and parks could be extended and linked, the planners identified top-priority potential acquisitions in a town-by-town list, down to the block and lot number, of properties more than an acre in size and within 500 feet of existing public lands.

The complete *2016 Open Space and Recreation Plan Update* including the three reports (Technical Report I: Land Preservation, Technical Report II: Land Stewardship, Technical Report III: Analysis and Recommendations) can be found [here](http://www.sussex.nj.us/Cit-e-Access/webpage.cfm?TID=7&TPID=10037).  
(<http://www.sussex.nj.us/Cit-e-Access/webpage.cfm?TID=7&TPID=10037>)

## Map 2: Priorities

In developing the maps and priority acquisition lists, the group approached the data from three focus areas: hydrology—the amount of water in streams and the rate of groundwater recharge; stream and aquifer quality; and unique aquatic ecosystems, such as vernal pools, high-elevation lakes, and habitat for endangered species.



# Open Space Institute

The Open Space Institute (OSI) protects scenic, natural and historic landscapes to provide public enjoyment, conserve habitat and working lands, and to sustain communities. Founded in 1974 to protect significant landscapes in New York State, OSI has been a partner in the protection of over 2.2 million acres in North America.

## Delaware River Watershed Protection Fund

With leadership support from the William Penn Foundation, the Delaware River Watershed Initiative is a broad partnership of nongovernmental organizations working with state and local governments to ensure abundant clean water through conservation of targeted watersheds within the 13,000-square-mile drainage of the Delaware River. As part of this initiative, the Open Space Institute administers the Delaware River Watershed Land Protection Fund, which provides capital grants for land acquisition and planning grants to promote watershed protection.

## Catalyst Grants

OSI's Catalyst Program advances the practical application of climate and watershed science for land protection through grants and technical assistance. The grants enable land trusts to integrate science into conservation planning and outreach.

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The “Black Dirt Region” is a 26,000-acre in Sussex County and Orange County, New York. Known as the “Drowned Lands” in the 19th century, this region’s highly organic muck soil supports local vegetable and sod farming.