

Payments for watershed services in the United States

Cost-effective strategies to align landowner incentives for abundant clean water

In South Florida, phosphorus pollution from agricultural land costs the public hundreds of millions of dollars per year in water treatment expenses, while threatening the state's vast tourism industry. By the early 2000s, regulations and public water quality investments had addressed the problem to some degree, but not enough. In 2005, the Florida Ranchlands Environmental Services Project (FRESP) unveiled a new approach by which ranching and ecosystem restoration could go hand-in-hand. Led by a coalition of ranchers, state and federal agencies, a conservation group, and others, FRESP provides annual payments to ranchers to retain water on their land, thereby removing phosphorus and other nutrients that pollute downstream waters. The payments help support South Florida ranches while reducing costs to the public to ensure clean water for drinking and recreation. The successful pilot phase convinced the Southern Florida Water Management District in 2011 to invest an additional \$50 million to expand win-win benefits from the FRESP model.

What is PWS?

FRESP is a prime example of payment for watershed services (PWS) - voluntary programs that offer cash payments or other benefits to landowners in exchange for providing "watershed services" that help protect water quantity or quality. For instance, landowners may manage water quantity by increasing aquifer recharge, storing flood waters, or improving irrigation efficiency on their land. Or, they may manage water quality by restoring forests, protecting wetlands, or implementing pollution reduction measures. Watershed services are purchased by service beneficiaries such as water utilities, government agencies, or industrial water users. As the FRESP example illustrates, PWS offers flexible incentives to landowners, which can increase landowner income, support watershed-friendly farm and forest management, and reduce costs to the public of maintaining abundant clean water.

Some forms of publicly-funded PWS—such as Conservation Reserve Program payments under the U.S. Farm Bill—are relatively well-known. However, new forms of PWS involving local governments, non-governmental organizations, private companies, and others are pointing the way toward cost-effective watershed protection approaches that may benefit landowners, water users, and ecosystems alike.

New opportunities from PWS

PWS can help landowners, resource managers, and policymakers to achieve their goals cost-effectively:

- **Farm and forest owners** can capitalize on a new source of revenue to boost income and help meet stewardship goals.
- **Water users and managers** may find PWS to be the least expensive way to protect public, irrigation, or industrial water supplies.
- **Policy-makers and conservationists** can use PWS to complement traditional conservation tools (e.g., land acquisition or regulation) when these tools are not environmentally, economically, or politically suitable.
- **All stakeholders** may favor PWS as a flexible, voluntary approach that supports private property ownership, rural lifestyles, and productive agriculture and forestry.

Lessons Learned from Recent Innovations in PWS

With support from the U.S. Endowment for Forestry and Communities and the USDA Office of Environmental Markets, EcoAgriculture Partners conducted a nationwide survey of PWS in the United States, with a particular focus on new and innovative project models involving non-federal ecosystem service buyers. The study identified 32 PWS projects from around the country, including public drinking water protection efforts, watershed-friendly certification labels, and “landscape auctions” in which private entities bid on projects proposed by landowners to provide watershed services. These projects already have benefitted over 1,300 landowners, with many projects still in the planning phase or set to scale up.

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Where is PWS taking place?

The survey uncovered innovative PWS activities in all regions of the country (Figure 1). Projects tended to address the key water-related concerns in their region. For instance, water scarcity was the main driving factor in western states, while nutrient pollution and water quality deterioration tended to drive PWS in the East.

Who’s buying?

Ecosystem service buyers in the 32 surveyed PWS schemes included a wide range of public and private entities (Figure 2). In the case of water utility and other government buyers, ecosystem services are generally purchased on behalf of the public (e.g., water consumers), who are the ultimate beneficiaries and source of funding.

Figure 1. Map of surveyed PWS projects in the United States

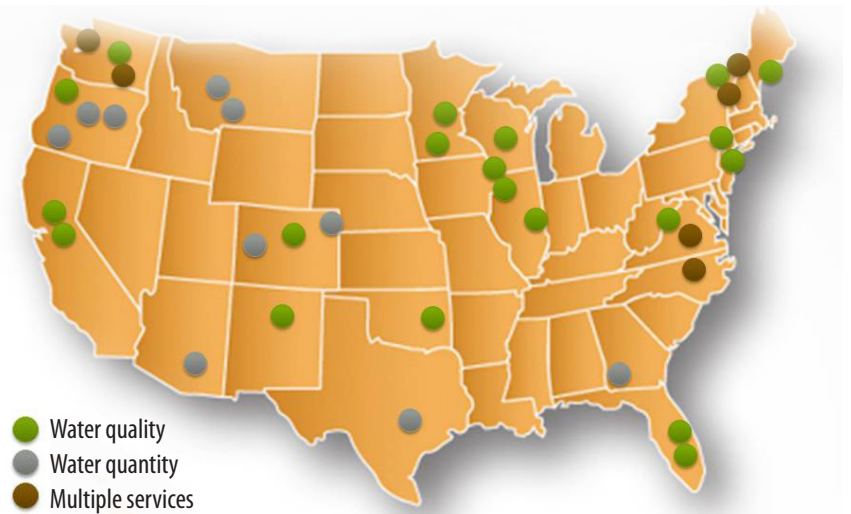
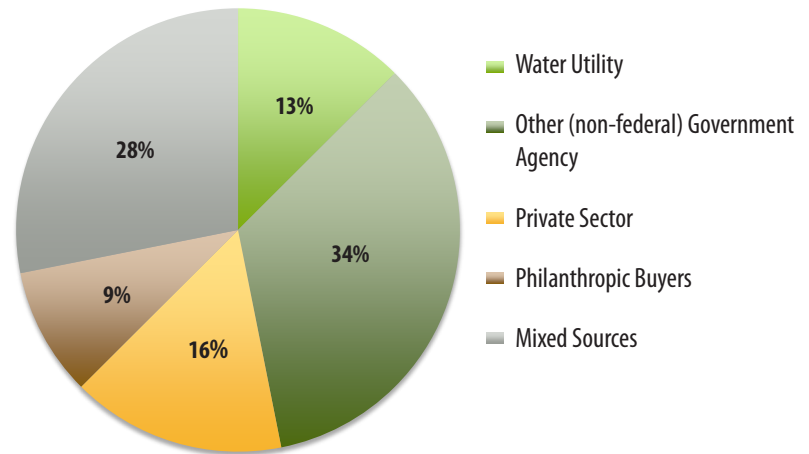


Figure 2. Who is buying ecosystem services?



BMPs for watershed protection

In most cases, PWS compensated sellers to adopt best management practices (BMPs) on their land (see table below). Most projects included multiple BMPs. For example, in a PWS project in Iowa, a local watershed council identified a suite of effective BMPs to reduce nutrient runoff. Landowners then had the flexibility to determine which practices were best suited to achieving project goals on their land in the most economically efficient manner.

Management practice	Percent of PWS projects	Management practice	Percent of PWS projects
Riparian buffers	53%	Fire management	16%
Farm infrastructure	50%	Waste management	13%
Livestock fencing	34%	Conservation tillage	13%
Afforestation/planting	34%	Change in crops	13%
Fertilizer management	25%	Wetland restoration	9%
Cover crops	25%	Invasive species removal	6%
Irrigation/water-use efficiency	19%		

Restoring Old Florida with New Money

How FRESP Supports Win-Win Ecosystem Restoration

As a voluntary incentive mechanism, PWS generally benefits both the buyers and sellers of ecosystem services. In the case of FRESP, for instance, the program paid rancher Jimmy Wohl to build and maintain Mud Lake as a retention pond to improve water flow and reduce nutrient runoff. Just three feet at its deepest point, the wetland is reminiscent of the slowly flowing “river of grass” that was the Everglades before engineers and developers channeled its waters and levied Lake Okeechobee. Thanks to Mud Lake and other ranch improvements, Mr. Wohl’s Rafter T Ranch now retains 850 acre-feet of water (the equivalent of 425 Olympic-sized swimming pools) and almost 700 pounds of phosphorus each year. His is one of eight ranches in the FRESP pilot program that together reduced phosphorous loads by an estimated 12,000 lbs per year. The program is a win-win for Mr. Wohl—who benefits from a new and consistent income source—and for South Florida water customers—who save money on water treatment costs by letting nature do the work of water purification.

Ecosystem Entrepreneur

“I know my land, I know what it takes to get results, and it’s different every day. Pay me to provide ecosystem services, and I’ll provide those ecosystem services and then some!”

-Jimmy Wohl, Rafter T Ranch



Cultivating New Partners in Watershed Conservation

“The benefits of working with the agricultural industry and implementing dispersed water management initiatives, including payment for environmental services, are far-reaching. It can help reduce damaging discharges and improve the water quality reaching the estuaries. At the same time, it also creates a profit-making opportunity

for ranchers in the Northern Everglades that helps maintain their financial sustainability.”

-Benita Whalen, Bureau Chief, Agriculture Water Programs, South Florida Water Management District

What’s in it for Me? – Buyer and Seller Motivations

Buyers in the 32 surveyed PWS projects were motivated by a variety of factors:

- Water utilities sought to protect the quality and quantity of public drinking water sources, often as a way of reducing costs of water filtration, treatment, or compliance with existing or anticipated regulations.
- Other (non-federal) government agencies purchased watershed services to comply with existing or anticipated regulations, or to reduce risks of water shortages, flooding, or other hazards.
- Some private sector buyers participated in PWS to help cultivate a public image of environmental responsibility. Other PWS projects were actively soliciting private buyers to protect water resources for uses such as irrigation or industrial process water, but few such buyers had actually been secured.
- For philanthropic buyers, a conservation ethic was the most common motivation.

Seller motivations

Landowners had a multitude of reasons for participating in PWS. Cash payments and other financial benefits were quite important, and often enabled landowners to adopt new management practices they had hoped to implement but could not otherwise justify. In some cases, cash payments alone were not a sufficient motivation. In these instances, PWS tended to appeal particularly to landowners with a strong stewardship ethic, who understood the value of maintaining a healthy environment to support the productivity of their land and their way of life.

Seller motivation	Percent of PWS projects	
	Primary motivation	Secondary motivation
Cash payment	41%	19%
Access to technical assistance	3%	22%
Non-cash financial benefits (e.g., increased farm yields or reduced input costs)	22%	22%
Land stewardship/ environmental ethic	28%	50%
Social/community interests	6%	0%



Thanks to PWS, ranching and watershed management co-exist on South Florida's Rafter T Ranch.

The Potential of PWS: Opportunities and Challenges

Thus far, the total scale of PWS from local government, private, and philanthropic buyers in the United States remains small relative to established conservation mechanisms such as Farm Bill incentive programs, conservation land acquisition, and regulation. However, PWS could be applied much more widely to reduce costs of watershed protection while benefitting farm and forest landowners. Based on the study, PWS may be especially worth considering in situations where:

- Watershed protection is a cost-effective complement or alternative to traditional “grey infrastructure” water treatment facilities;
- Local priorities or public funding limitations dictate that farm and forest lands should remain in private ownership, but provide significant public environmental benefits;
- The need to encourage pro-active watershed stewardship measures on private lands requires alternatives to tools that primarily restrict private activity, such as regulation or conservation easements;
- Local landowners and public and non-profit conservation organizations have the expertise, interest, and leadership capacity to develop flexible solutions for meeting local watershed protection goals; and
- Farm and forest management changes necessary to supply watershed services are also compatible with landowner priorities, with PWS providing an incentive to overcome the initial “investment hurdle” to make these changes.

The greatest challenge to increasing the use of PWS as a win-win solution for private landowners and watershed health is to identify and motivate buyers to participate. At present, many watershed service beneficiaries do not realize that they rely heavily on such services or that poor watershed stewardship jeopardizes these benefits. For instance, most water consumers

pay little or nothing to maintain the health of the watersheds that furnish them with reliable clean water. Other watershed service beneficiaries do not feel compelled to compensate service providers because they can continue to receive the services for free.

Adding the typically relatively small costs of watershed protection into water rates paid by individual, industrial, and irrigation water users could support PWS programs that equitably compensate upstream service providers while assuring water users of continued water availability and quality. In other cases, educational campaigns, outreach activities, or public policies may be the best way to spur buyer demand. For instance, new or proposed regulations to safeguard public water resources may lead governmental and private entities to pursue PWS as a least-cost strategy to ensure compliance with such policies. In all cases, lessons and experiences from the first generation of PWS projects—documented by the studies listed below—can guide watershed stakeholders to design their own customized, context-appropriate PWS projects.

For further information

To learn more about the 32 PWS cases and PWS in the United States, please see: *Innovations in Market-Based Watershed Conservation in the United States: Payments for Watershed Services for Agricultural and Forest Landowners*, by T. Majanen, R. Friedman, and J. Milder (*EcoAgriculture Partners*, 2011).

For additional information and maps of the 32 PWS projects, please visit the online Conservation Registry (www.conservationregistry.org) and search for projects with the keyword “PWS”.

Additional Resources for Landowners and Resource Managers

Guide to Environmental Markets for Farmers and Ranchers, by D. Stuart and D. Cauty (*American Farmland Trust*, 2010). A primer on opportunities for agricultural producers to benefit from environmental markets.

Taking Stock: Payments for Forest Ecosystem Services in the United States, by D. Mercer, D. Cooley, and K. Hamilton (*Forest Trends*, 2011). An overview of payments for ecosystem services, including water quality and carbon sequestration, specifically from forests in the United States.

State of Watershed Payments: An Emerging Marketplace, by T. Stanton, M. Echavarria, K. Hamilton, and C. Ott (*Forest Trends*, 2010). A review of payments for watershed services and water quality trading projects worldwide.

Our Land, Our Water: Case Studies in Local Successes (*National Association of Conservation Districts*, 2008). Twenty-five case studies of water resource management on a watershed or community scale.

Ecoagriculture Policy Focus Series

The Policy Focus series, produced by EcoAgriculture Partners in collaboration with other organizations, highlights issues relevant to policy makers and other professionals to promote integrated solutions for agriculture, conservation, and rural development.