Ecosystem Marketplace
A FOREST TRENDS INITIATIVE

AN ATLAS OF ECOSYSTEM MARKETS IN THE UNITED STATES

About Forest Trends' Ecosystem Marketplace

Ecosystem Marketplace, an initiative of the non-profit organization Forest Trends, is the leading global source of information on environmental finance, markets, and payments for ecosystem services. As a web-based service, Ecosystem Marketplace publishes newsletters, breaking news, original feature articles, and annual reports about market-based approaches to valuing and financing ecosystem services. We believe that transparency is a hallmark of robust markets and that by providing accessible and trustworthy information on prices, regulation, science, and other market-relevant issues, we can contribute to market growth, catalyze new thinking, and spur the development of new markets, and the policies and infrastructure needed to support them. Ecosystem Marketplace is financially supported by a diverse set of organizations including multilateral and bilateral government agencies, private foundations, and corporations involved in banking, investment, and various ecosystem services.

Forest Trends works to conserve forests and other ecosystems through the creation and wide adoption of a broad range of environmental finance, markets and other payment and incentive mechanisms. Forest Trends does so by 1) providing transparent information on ecosystem values, finance, and markets through knowledge acquisition, analysis, and dissemination; 2) convening diverse coalitions, partners, and communities of practice to promote environmental values and advance development of new markets and payment mechanisms; and 3) demonstrating successful tools, standards, and models of innovative finance for conservation.

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An Atlas of Ecosystem Markets in the United States

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Glossary

Asset type: The class of ecosystem services or goods primarily targeted by an ecosystem market or project. The main asset types presented in the EnviroAtlas' Ecosystem Markets maps are forest and land-use carbon, imperiled species/habitats, watersheds, and wetlands/streams.

Bilateral agreements: This transaction mechanism involves a single user or beneficiary of ecosystem services compensating one or more parties for activities that maintain or enhance ecosystem services delivery to the payer.

Candidate species: Candidate species are plants and animals which may be eligible for listing under the US Endangered Species Act based on available information on their status and threats, but which have not yet been the subject of a proposed listing regulation by the U.S. Fish and Wildlife Service.

Co-benefits: Additional environmental, social, or other benefits arising from a project, quantified based on metrics or indicators defined by the project developer, a co-benefits certification program, or third-party project standard. Some registries and standards enable co-benefits certification to be "tagged" onto issued credits, if quantification and verification of co-benefits are not already embedded in a project standard.

Collective action fund: This transaction mechanism pools resources from multiple water users in a basin (and sometimes from non-governmental organizations or governments acting in the public interest) to pay for coordinated ecosystem services conservation actions across a landscape.

Compensatory mitigation: The restoration, creation, enhancement, and/or—in certain circumstances—preservation of natural resources for the purposes of offsetting adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved. For the purposes of this report, compensatory mitigation represents a spectrum of practices that range from rigorous and measurable biodiversity offsets to less direct efforts to compensate for impacts through financial donations and land protection.

Compliance markets: Ecosystem services markets whose buyers participate in order to meet regulatory obligations.

Credit: A defined unit of environmental goods or services that can be applied toward compliance with a permit, held, traded, sold or retired. Credits may be measured in terms of mass, acreage, functional units, or other assessment methods. Within carbon and greenhouse gas markets, the term "credit" specifically represents a tradable permit equal to the reduction of one metric tonne of carbon dioxide equivalent. In water quality trading markets a credit represents the quantity of a pollutant reduced over a specified time period that is in excess of the required reduction for a certain source. In imperiled species/habitat markets a credit is a defined unit representing the accrual or attainment of ecological functions and/or services at a mitigation site or within a mitigation program.

Ecosystem services: The benefits to human society that derive from nature, such as reliable flows of clean water, timber products, pollination of crops, or cultural values associated with a specific place.

Environmental externality: An environmental cost or benefit to an individual, group, or society that arises from processes of development or production but is not captured by any existing market mechanism. For example, air pollution from traffic congestion represents an uncompensated cost to society in terms of public health.

Environmental water markets: This class of transaction mechanisms includes initiatives that harness trading of water or water rights for environmental purposes. This includes both instream buybacks and groundwater mitigation mechanisms (see definitions below).

Groundwater mitigation: This transaction mechanism refers to programs that require new users of groundwater in an area to mitigate for their impact, typically through purchasing offsets.

In-Lieu Fee (ILF): A permittee pays a fee into a compensation fund program in lieu of creating their own

offset or buying a credit. ILFs are run by governments or non-profit organizations which use the funds to undertake offset activities.

Instream buybacks: This transaction mechanism typically involves governments or non-governmental organizations acting in the public interest that buy or lease surface water rights. Water rights allocations are not used by the buyer but instead set aside to ensure a minimum level of flows or recharge, often to protect aquatic habitats or maintain groundwater levels.

Interventions: The specific land management, restoration, enhancement, or conservation activities undertaken in expectation of ecosystem services benefits or maintenance.

Forest and land-use carbon markets: Markets or projects that transacted carbon offsets generated through Agriculture, Forestry and Other Land Use (AFOLU) interventions.

Market: An ecosystem market is any program or platform that facilitates transactions between buyers and sellers who exchange financial compensation for ecosystem assets or practices that restore, enhance, or protect ecosystem services. Markets are organized around specific asset types; ecosystem assets or credits are typically not fungible across markets. A market can encompass many distinct projects.

Mitigation bank: A site, or suite of sites, where resources (e.g., wetlands, streams, habitat, species) are restored, established, enhanced, and/or preserved for the purpose of providing compensatory mitigation for impacts. In general, a mitigation bank sells compensatory mitigation credits to developers whose obligation to provide compensatory mitigation is then transferred to the mitigation bank sponsor.

Mitigation banking: A term used colloquially in the United States to refer to wetland and stream mitigation banking; in the global setting the term includes the banking of any environmental credit including species, habitat, ecological function or other.

Offset: This term refers to a quantified environmental benefit that is designed to compensate for impacts to habitat, environmental functions, or ecosystem services. Offsets may be regulatory or voluntary. Within carbon and greenhouse gas markets, offsets specifically refer to one metric tonne of carbon dioxide equivalent reduced, avoided or sequestered by an entity to compensate for emitting that tonne elsewhere. In water quality trading markets, offsets refer to pollutant load reductions that are purchased by a new or expanding point source to mitigate its increased discharge to an impaired waterbody. In imperiled species/habitats markets, offsets are the quantified environmental improvements undertaken to compensate for losses to habitat, environmental functions, or ecosystem services.

Project: A project is a site, or suite of sites, where restoration, enhancement, or other resource conservation actions are implemented, for the purposes of marketing the resulting ecosystem service assets or outcomes to buyers.

Public subsidies: This transaction mechanism, similar to a traditional agricultural subsidy model, leverages public finance for large-scale programs that reward land managers for enhancing or protecting ecosystem services.

Trading and offsets: This class of transaction mechanisms allow parties facing voluntary or regulatory obligations to compensate other parties for activities that maintain or enhance ecosystem services or goods. The ecosystem services or goods are packaged as a standardized credit or offset that may be purchased or traded.

Transaction: Transactions occur at the point that offsets or agreed deliverables are contracted, regardless of the date of delivery.

Voluntary markets: Markets through which firms, individuals, and organizations voluntarily buy offsets or pay for ecosystem services.

Watershed markets: Markets coordinating transactions between a buyer and a seller where financial value is exchanged for activities or outcomes associated with the maintenance, restoration, or enhancement of watershed services or natural areas considered important for watershed services. In this report, watershed markets include payments for watershed services, water quality trading, and environmental water markets mechanisms.

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Maps and Figures

Statement of the Partners

Today's natural resource managers and policy makers operate in a rapidly changing landscape. Decision-makers must contend with biophysical shifts from development and climate change, as well as changes in economic development patterns and social values, like growing interest in renewable energy and market-based conservation. To make sound decisions, leaders need a comprehensive and continually updated understanding of the dynamics at play in managing natural resources. Recent years have brought a steep increase in publicly available scientific and social data, but making sense of these inputs in decision-making is not always easy.

It's in this context that Forest Trends' Ecosystem Marketplace, the U.S. Environmental Protection Agency (EPA), and the U.S. Department of Agriculture's Office of Environmental Markets have formed a partnership to help actors interested in environmental markets identify and understand key market trends and patterns across the United States.

In the following pages you will find a selection of maps generated under this partnership. We asked fundamental questions about ecosystem markets in the United States: Where are watershed, forest and land-use carbon, wetland/stream, and species projects? Who owns them? How do they operate? What drives them? Mapping offers a unique bird's eye view in answering these questions.

In other cases, maps can also raise new questions about markets: why do we find clusters of forest and land-use carbon projects in certain states? How effective have state water quality trading policies been in encouraging market growth? We consider these questions a good sign of the project's utility and of the need to continue improving transparency and reporting in ecosystem markets.

We hope you will take time to browse the demonstration maps in this atlas. Please think of them as a departure point. The goal behind the *Atlas of Ecosystem Markets in the United States* is to provide proof of concept of the value of mapping US ecosystem markets in the context of scientific and demographic data that help to shape markets and decision-making. These maps also function as a useful introduction to ecosystem markets in the United States for those unfamiliar with the field.

We hope this Atlas will inspire you to ask your own questions based on your own projects, goals, and experiences.

The Project Partners,

USDA Office of Environmental Markets

U.S. Environmental Protection Agency

Forest Trends' Ecosystem Marketplace

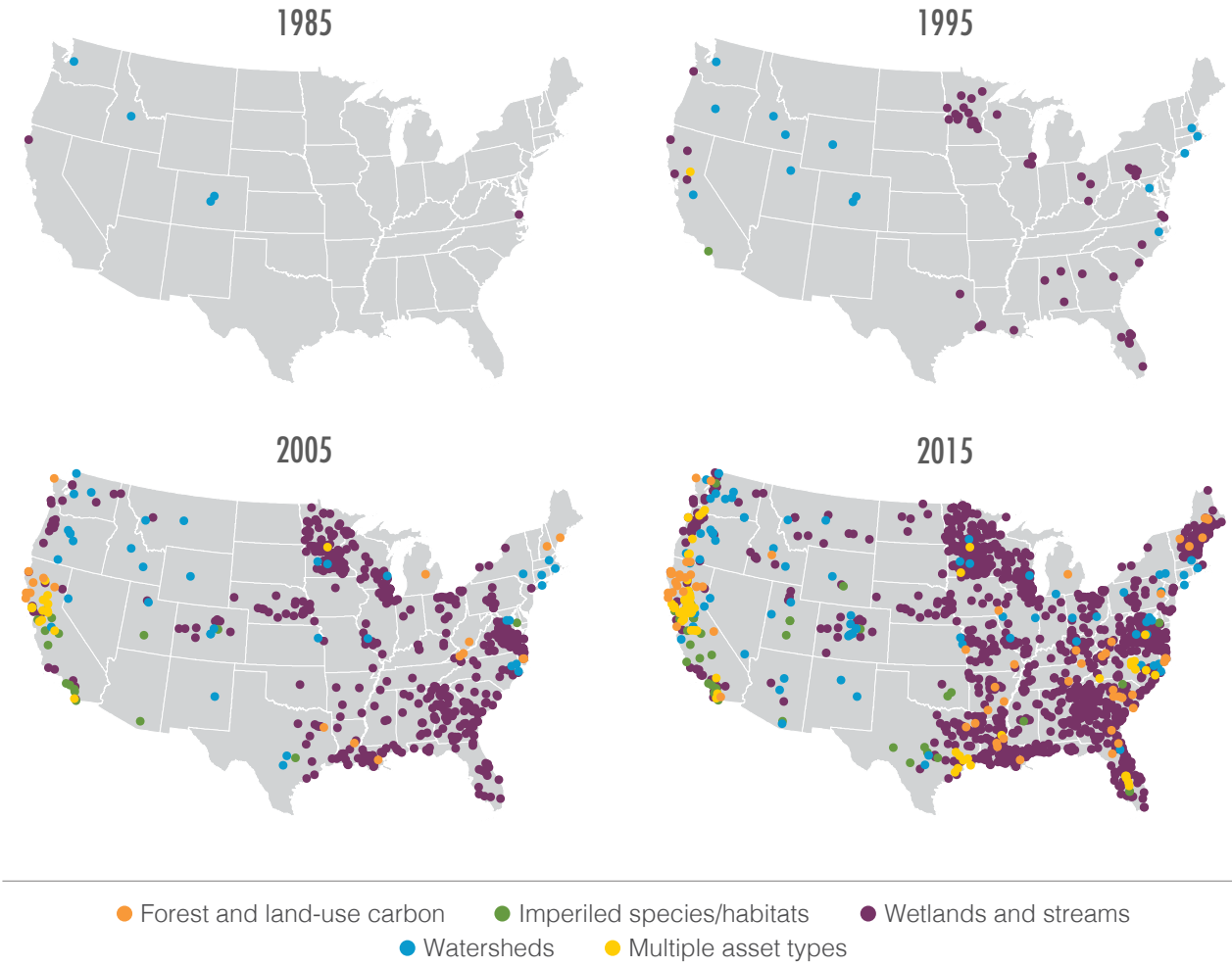
Report Methodology

These maps are primarily based upon data generated through Ecosystem Marketplace research, consisting of surveys of wetland/stream, species, carbon, and watershed markets project developers and market administrators conducted during 2008–2014, supplemented by interviews and desk research of primary and secondary sources of market data. During 2015, additional wetland/stream and species/habitats data was obtained from the Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS) database. Metadata for the geodatabase used to create these maps is available at EnviroAtlas (https://www.epa.gov/enviroatlas/).

Mapping Markets

Where are ecosystem markets growing?

Map 1. Growth in Ecosystem Markets Initiatives in the United States, 1985–2015



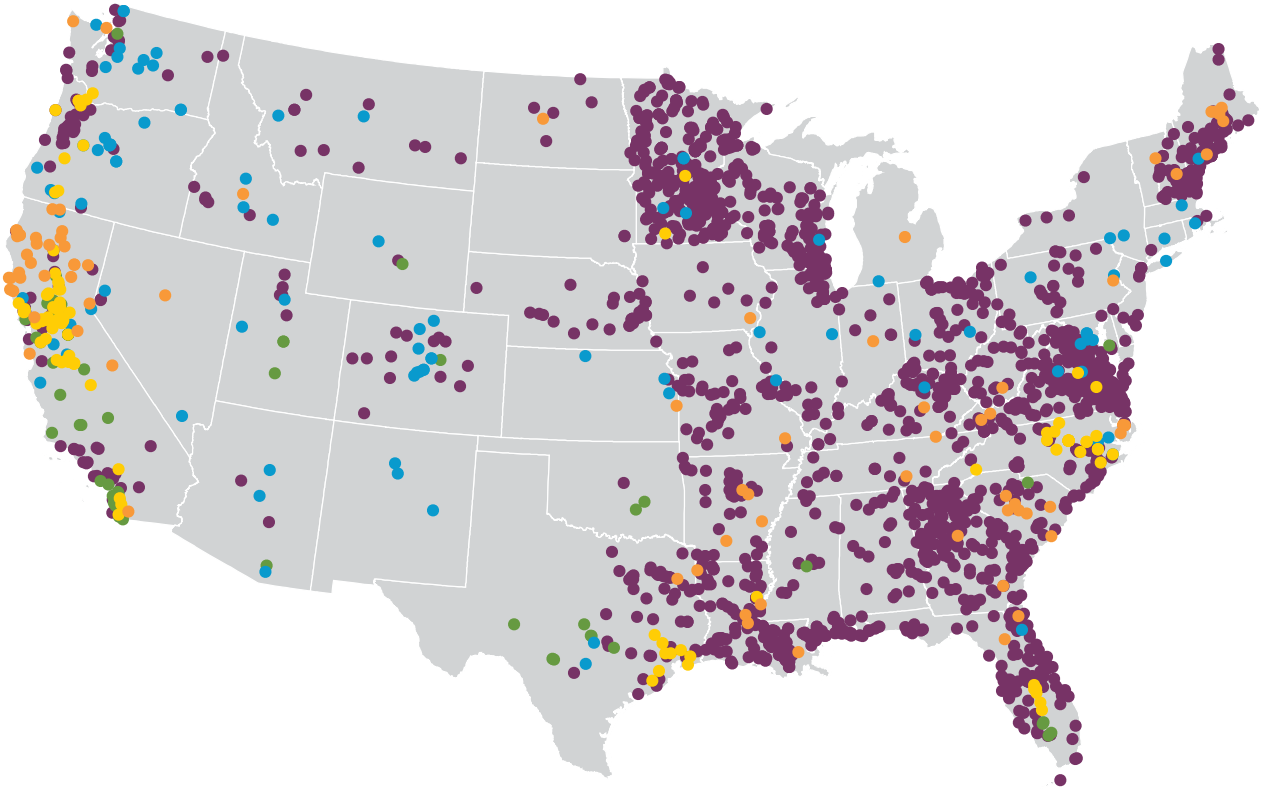
Notes: In this report, each point represents the centroid point of an initiative.

In this report, "Multiple asset types" refers to projects that generate multiple ecosystem credit types in order to sell credits in more than one ecosystem market. For example, a restoration project might be approved by regulators to sell either wetland credits or species credits.

Ecosystem markets connect people who restore and maintain healthy landscapes with people or organizations willing to pay for conservation activities—whether to safeguard ecological values that they depend on, to meet regulatory compliance, or to provide a public good. Market activity has grown rapidly in recent decades in the United States, from just a handful of initiatives to more than 2,400 today. Typically, markets focus on a single ecosystem service, or asset type. The best-established markets in the United States are for wetland and stream conservation, carbon sequestration, imperiled species/habitats conservation, and watershed services.

What ecosystem services are markets focused on?

Map 2. Ecosystem Markets Initiatives in the United States by Asset Type

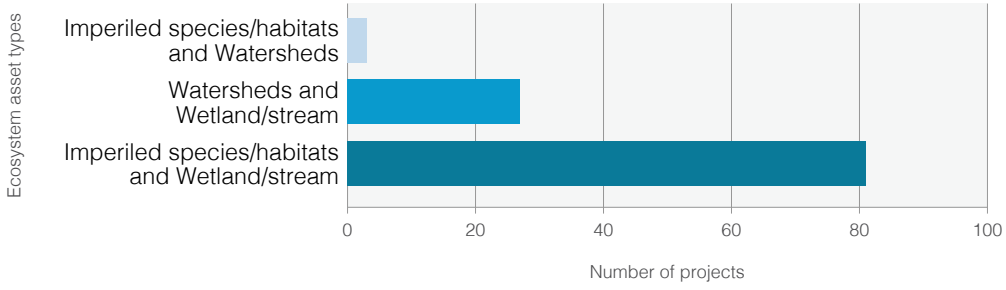


Forest and land-use carbon (81) Imperiled species/habitats (76) Wetlands and streams (1,973)
Watersheds (97) Multiple asset types (113)

Notes: All data is presented for the most recent full year for which ecosystem markets data is available. For forest and land-use carbon initiatives, this is 2014; for imperiled species/habitats and wetlands/streams it is 2015; for watersheds it is 2013; and for multiple asset types it is 2015.

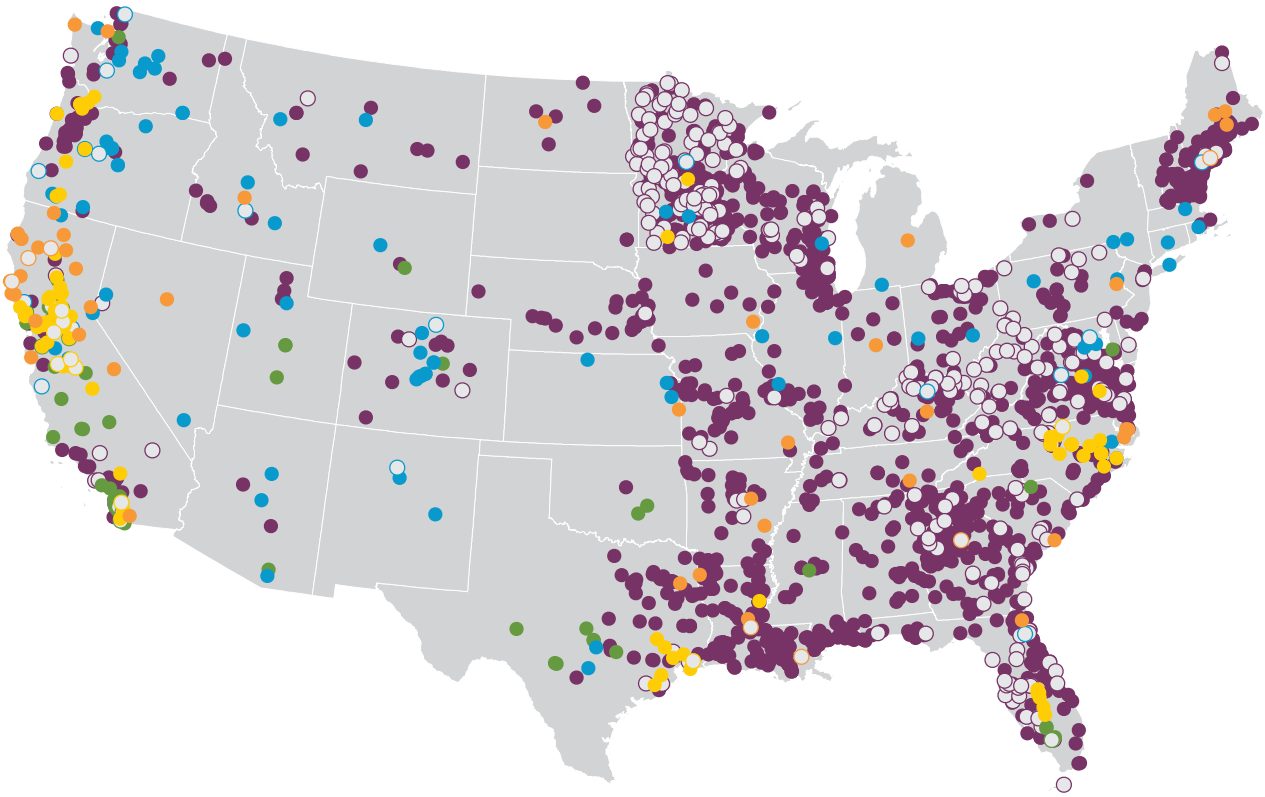
Ecosystem markets and projects sometimes focus on more than one ecosystem asset. A landowner for example might sell both wetland credits representing restoration activities on wetland areas, and habitat credits covering a forested area nearby on his property. These multiple-asset initiatives represent only a small share of current projects (111 out of 2,921 projects in total) (Figure 1). But in areas where multiple ecosystem markets are active, such as North Carolina, Virginia, California, and Oregon, more and more project developers seek to court buyers across market types.

Figure 1. Projects Marketing Multiple Ecosystem Services Asset Types, 2014



Where are new initiatives emerging in the United States?

Map 3. Status of Ecosystem Service Initiatives in the United States by Asset Type



Pending/In-development initiatives
- Forest and land-use carbon (7)
- Imperiled species/habitats (10)
- Wetlands and streams (287)
- Watersheds (17)
- Multiple asset types (9)

Active initiatives
- Forest and land-use carbon (45)
- Imperiled species/habitats (65)
- Wetlands and streams (1,549)
- Watersheds (80)
- Multiple asset types (102)

Notes: This map does not display programs that are inactive (e.g., either sold-out or suspended) or whose status could not be confirmed.

All data is presented for the most recent full year for which ecosystem markets data is available. For forest and land-use carbon initiatives, this is 2014; for imperiled species/habitats and wetlands/streams it is 2015; for watersheds it is 2013; and for multiple asset types it is 2015.

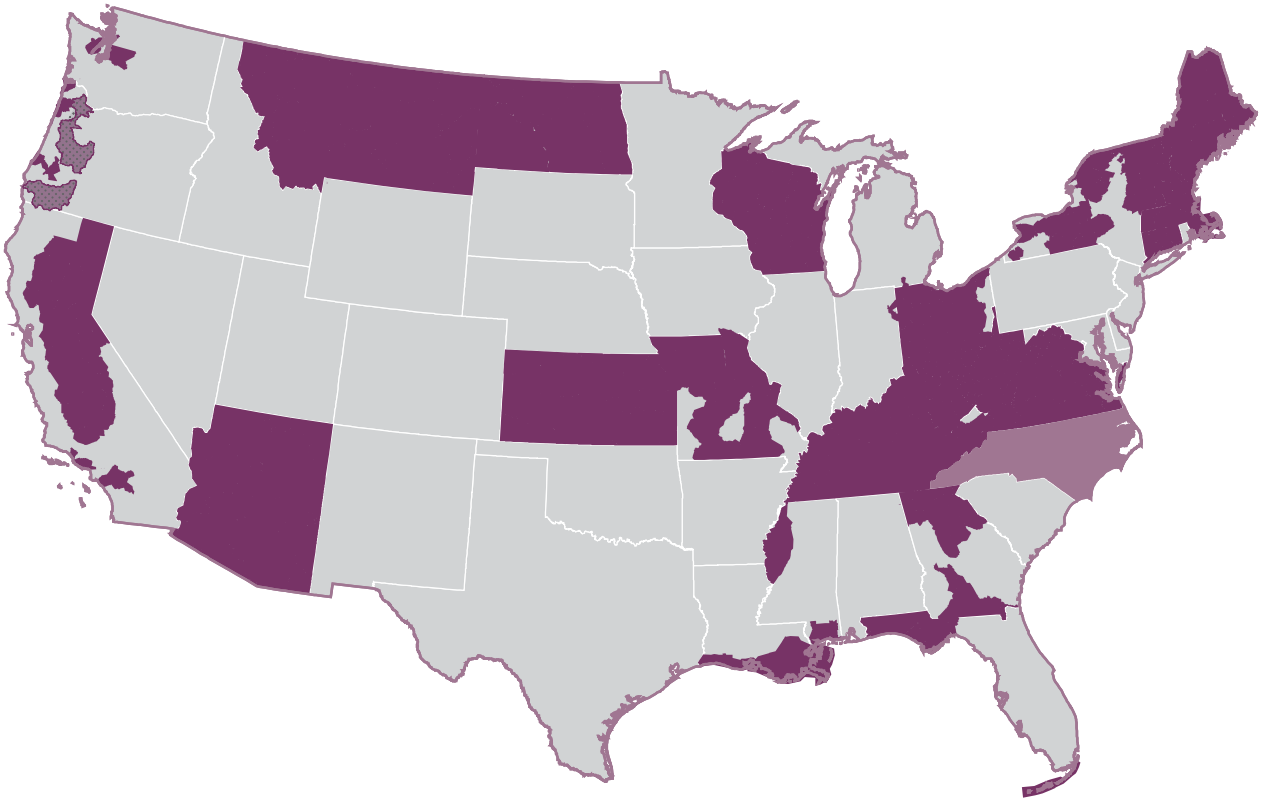
Many factors drive growth in ecosystem markets, including the presence of enabling policy and supportive regulators, development activity that can trigger demand for ecosystem credits, and the existence of protected or threatened ecosystem types. Map 3 displays active and pending initiatives, meaning initiatives which are not yet fully implemented or await approval from regulators to sell compliance-grade credits.

As the map suggests, new growth tends to cluster in areas where demand and regulatory had support is strongest. In 2015, California, Minnesota, the Mid-Atlantic states, Georgia, and Florida all have a high number of projects in development.

Where are markets active? What drives them?

Markets consist of shared platforms, rules, and frameworks for transacting the ecosystem services assets that projects generate.

Map 4. Wetland and Stream Markets by Scale and Driver Type



Wetland and stream markets by scale and driver type

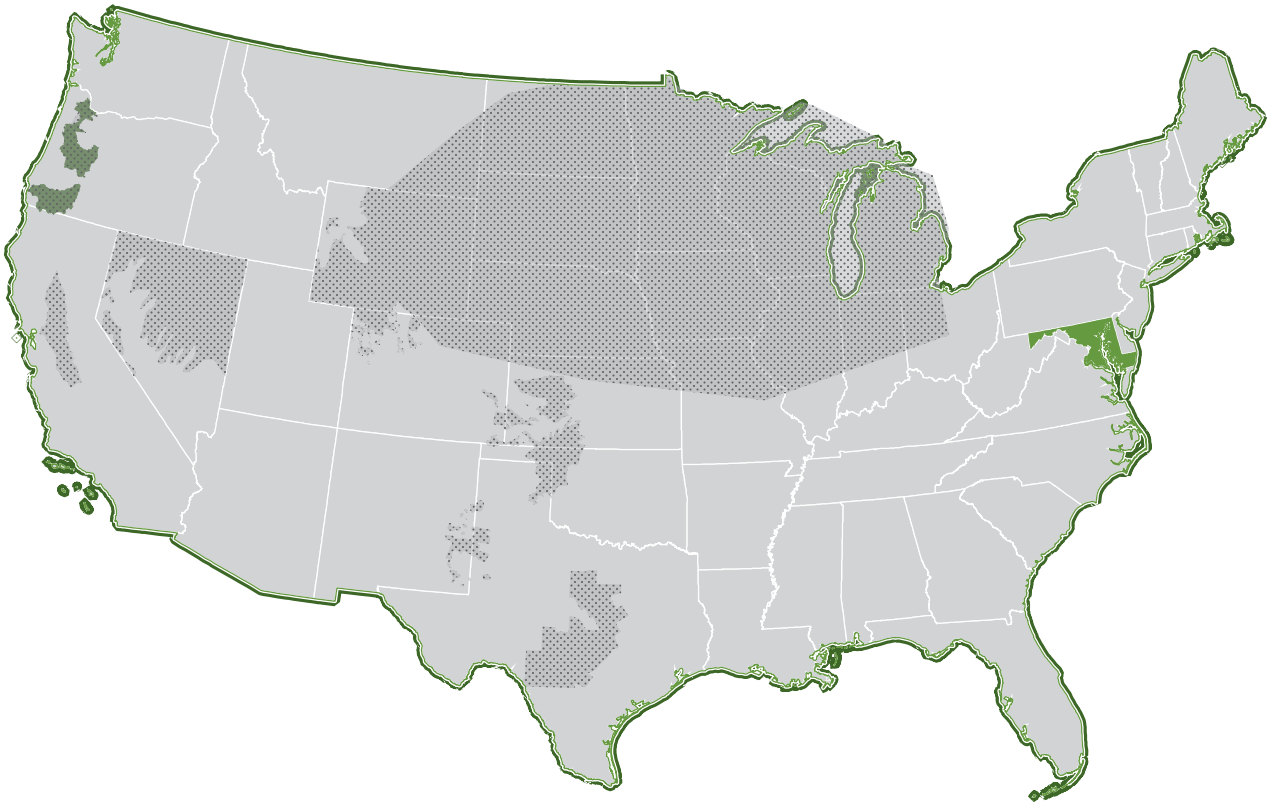
- State-scale compliance-driven wetland markets (1)
- Regional-scale compliance-driven wetland markets (365)
- Regional-scale voluntary wetland markets (1)
- National-scale compliance-driven wetland markets (2)

Notes: Regional-scale compliance wetland and stream markets polygons include In-Lieu Fee programs for compensatory mitigation. While these typically share the same regulatory drivers as national-scale compliance markets for compensator mitigation, their geographic scope is limited to a defined area, typically encompassing part of a state. Thus, they are presented individually in this map.

The largest wetland market is the national-scale Aquatic Compensatory Mitigation Program, driven by compliance to the Clean Water Act Section 404 and the principle of no net loss (Map 4). Applicants filing for permits to drain, fill, or dredge a wetland or stream must mitigate for their residual impacts. State-level regulations may also require compensatory mitigation for wetlands or stream buffer areas, such as in North Carolina. Regulated parties can purchase credits from projects such as commercial mitigation banks. Or they can pay an In-Lieu Fee (ILF) program to implement projects.

Similar rules govern many species markets: entities that impact endangered or threatened species can mitigate for residual impacts under federal and state laws (Map 5).

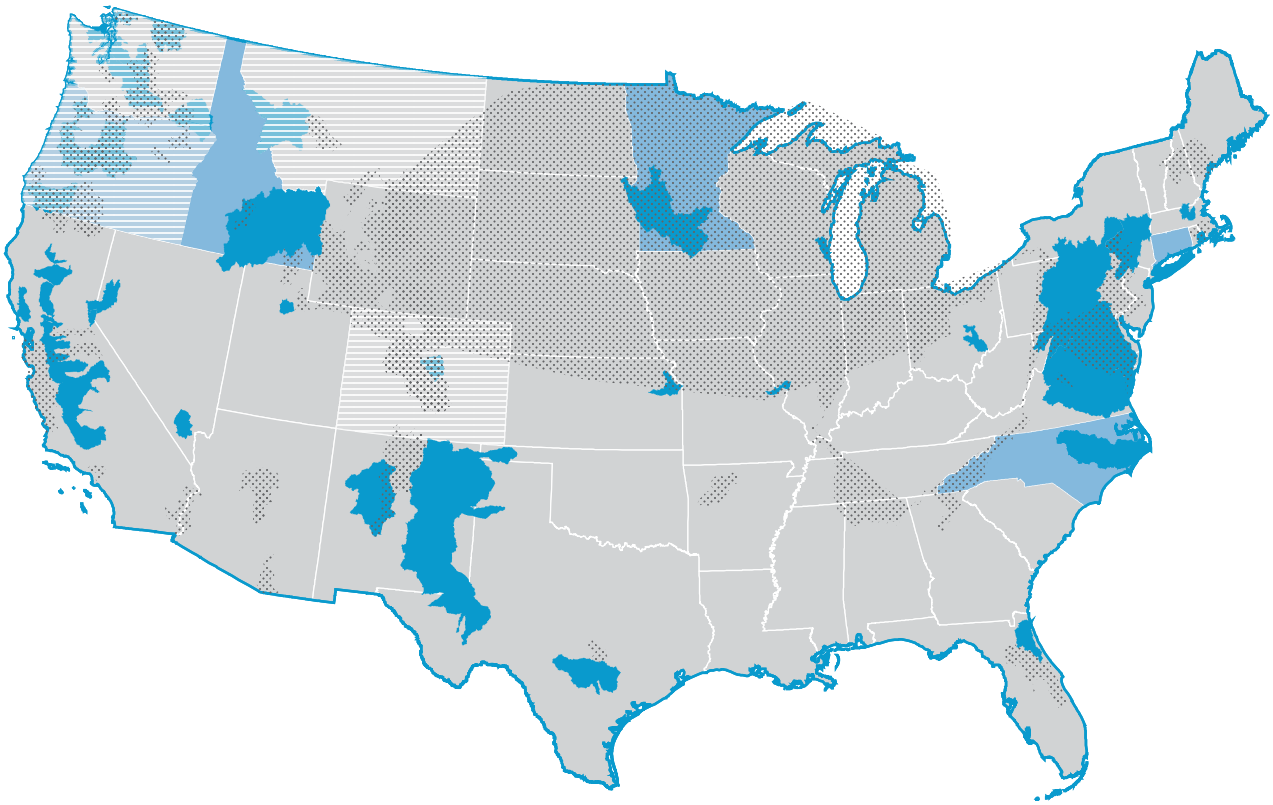
Map 5. Imperiled Species/Habitats Markets Distribution in the United States



Imperiled species/habitats markets by scale and driver type

- State-scale compliance imperiled species/habitats markets (1)
- Regional-scale compliance imperiled species/habitats markets (1)
- Regional-scale voluntary imperiled species/habitats markets (8)
- National-scale compliance imperiled species/habitats markets (1)
- National-scale voluntary imperiled species/habitats markets (1)

Map 6. Watershed Markets Distribution in the United States



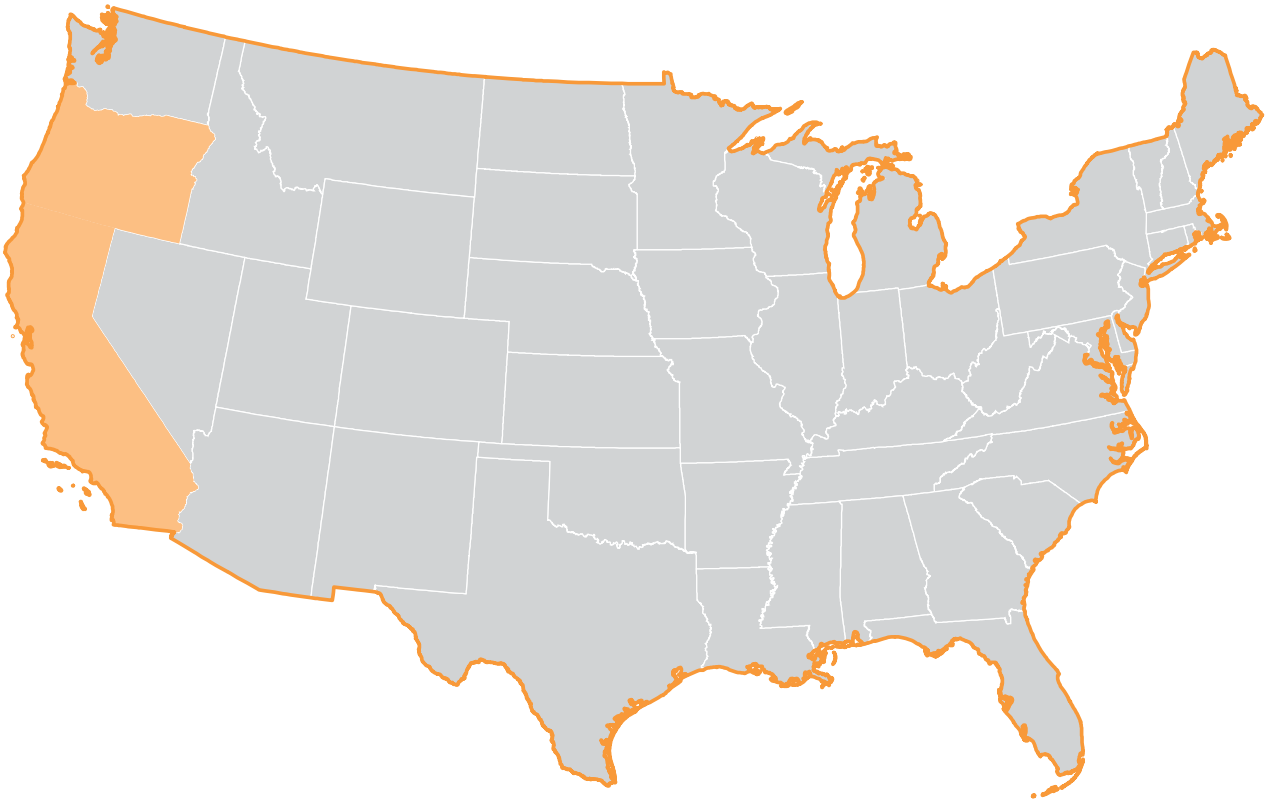
Watershed markets by scale and driver type

- State-scale compliance watershed markets (7)
- State-scale voluntary watershed markets (5)
- Regional-scale compliance watershed markets (42)
- Regional-scale voluntary watershed markets (45)
- National-scale voluntary watershed markets (2)

Notes: Polygons for watershed markets operating at the regional or local scale represent the watershed where projects are located and deliver their primary hydrological impacts, based on the 2014 NRCS HUC8 Watershed Boundary Dataset. Watershed markets in this report include payments for watershed services, water quality trading, and environmental water markets mechanisms.

Market scale can range from a single watershed or subwatershed to the entire country: watershed markets frequently operate at the basin level (Map 6) for example, while trading in the voluntary carbon market covers the entire United States (and the rest of the world, for that matter) (Map 7).

Map 7. Forest and Land-Use Carbon Markets Distribution in the United States



Forest and land-use carbon markets by scale and driver type

State-scale compliance forest and land-use carbon markets (3)
National-scale voluntary forest and land-use carbon markets (1)

Notes: This map displays only carbon markets which permit the use of forest and land-use carbon offsets; many compliance-driven markets such as the Regional Greenhouse Gas Initiative (which allows fossil-fueled power plants to use offsetting to meet emissions caps in Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont) currently do not allow offsets from Agriculture, Forestry and Other Land Uses (AFOLU) projects.

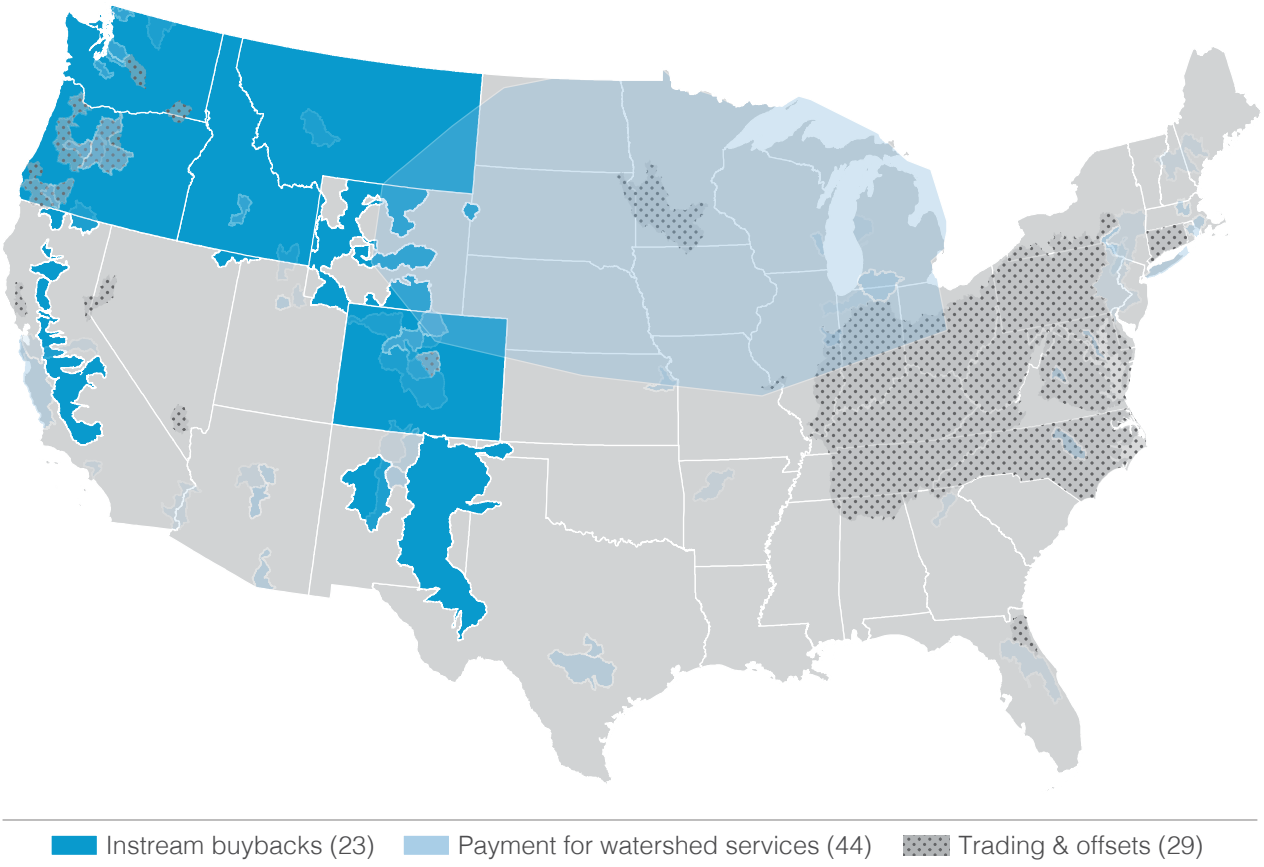
This map displays ecosystem markets distribution only for the United States. However, California's compliance carbon market in 2013 harmonized standards with the Government of Québec's cap-and-trade program, enabling the two markets to accept one another's offsets. Thus, California in our data is considered to be home to two different compliance markets: the California cap-and-trade market and the Western Climate Initiative framework linking California and Québec.

To date, the majority of forest and land-use carbon offsets projects have focused on forest carbon offsets.

What market mechanisms are being used?

The way markets are designed also varies. For example, watershed markets can use as the unit of exchange a standardized credit (Trading and Offsets), a water right (Instream buybacks), or a unit more flexibly defined according to project context (Payments for Watershed Services), as shown in Map 8.

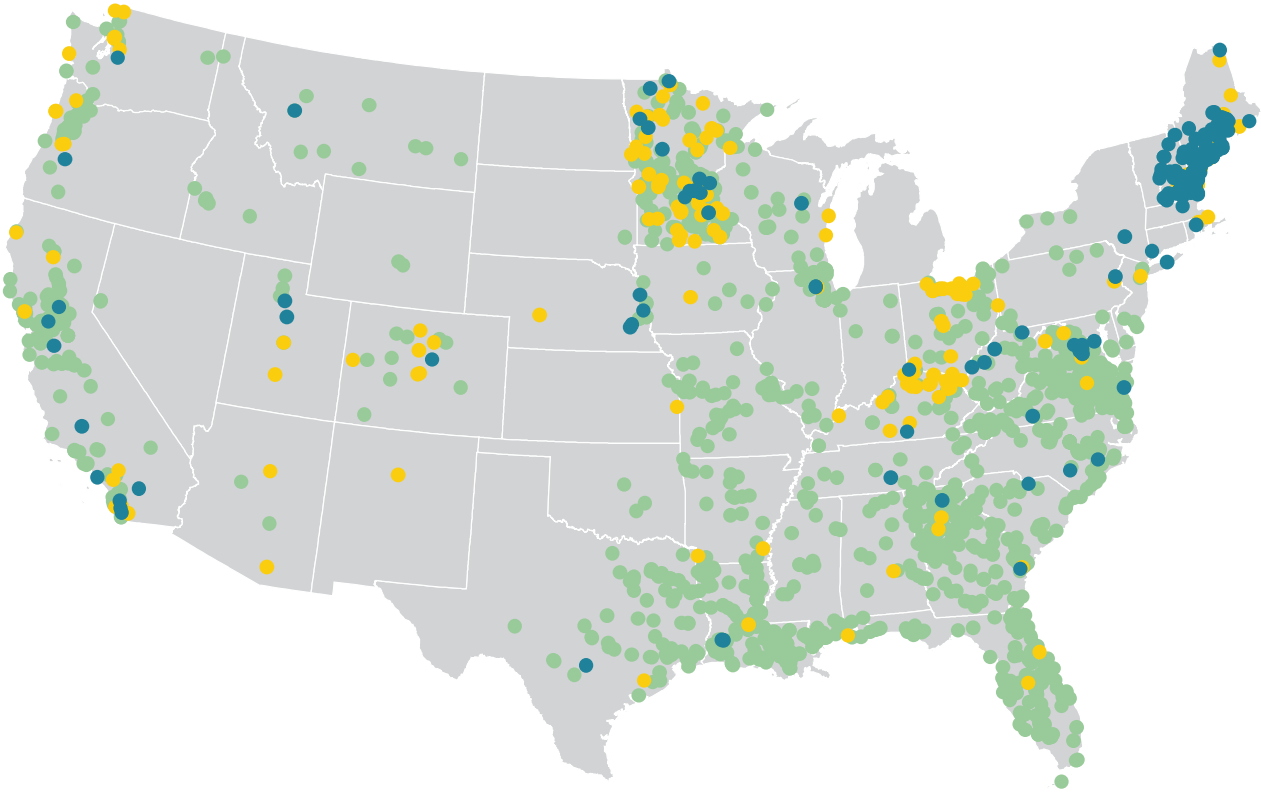
Map 8. Watershed Markets by Mechanism Type



Notes: "Payments for watershed services" include both bilateral contracts and collection action funds for watershed protection. For more information on these mechanisms, please consult the glossary and "Ecosystem Markets 101" Annex of this report.

Who implements projects?

Map 9. Ecosystem Service Initiatives by Land Ownership Type



Land ownership type

Public (180) Private (1,496) Combination public/private (176)

Notes: "Single-client" wetland mitigation banks are not included in this map. Single-client banks may be developed by either a public or private entity and it was not possible to determine land ownership status for the purposes of this map for all single-client mitigation banks in the EnviroAtlas dataset.

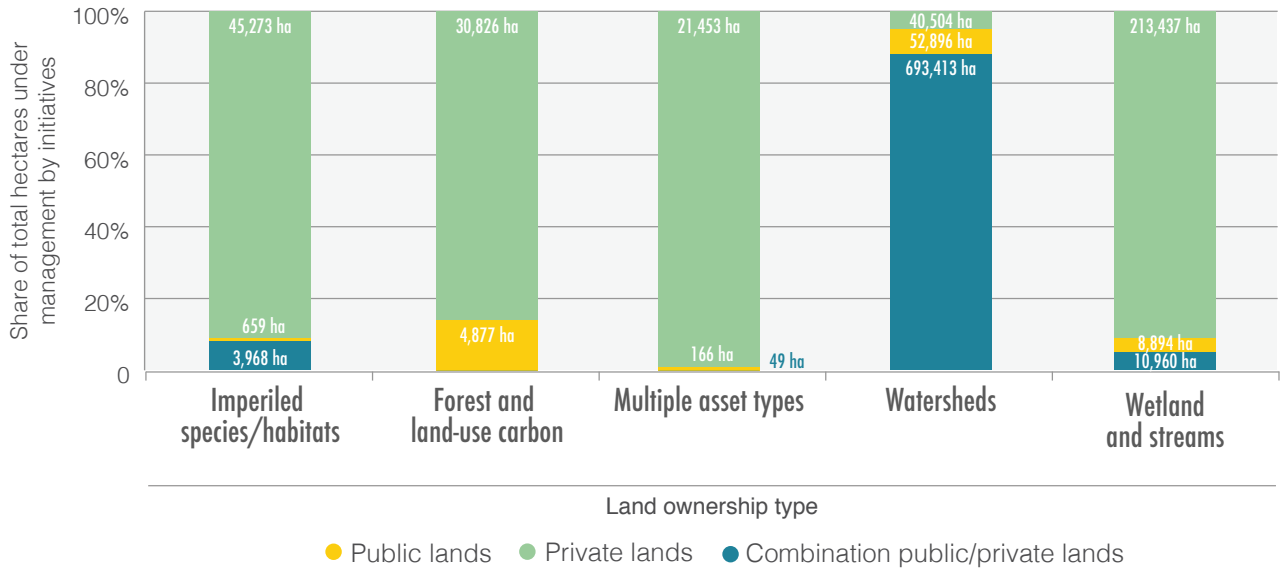
The largest number of projects are located on privately owned land (Figure 2). These projects are mainly commercial wetland and stream mitigation banks. However, hundreds of initiatives also channel funding to publicly owned lands (Map 9).

Local government, the private sector, and landowners also seek out opportunities for new partnerships and finance for conservation. A significant share of initiatives, particularly within the watershed markets segment, focus on coordinating management across a patchwork of land ownership types. These collaborative activities covered nearly 1 million hectares (ha) in 2014.[1]

[1] All land area data in this report and on EnviroAtlas is presented in units of hectares. One hectare is equal to 2.47105 acres.

Figure 2. Share of Lands under Management by Ecosystem Markets Initiatives by Land Ownership Type

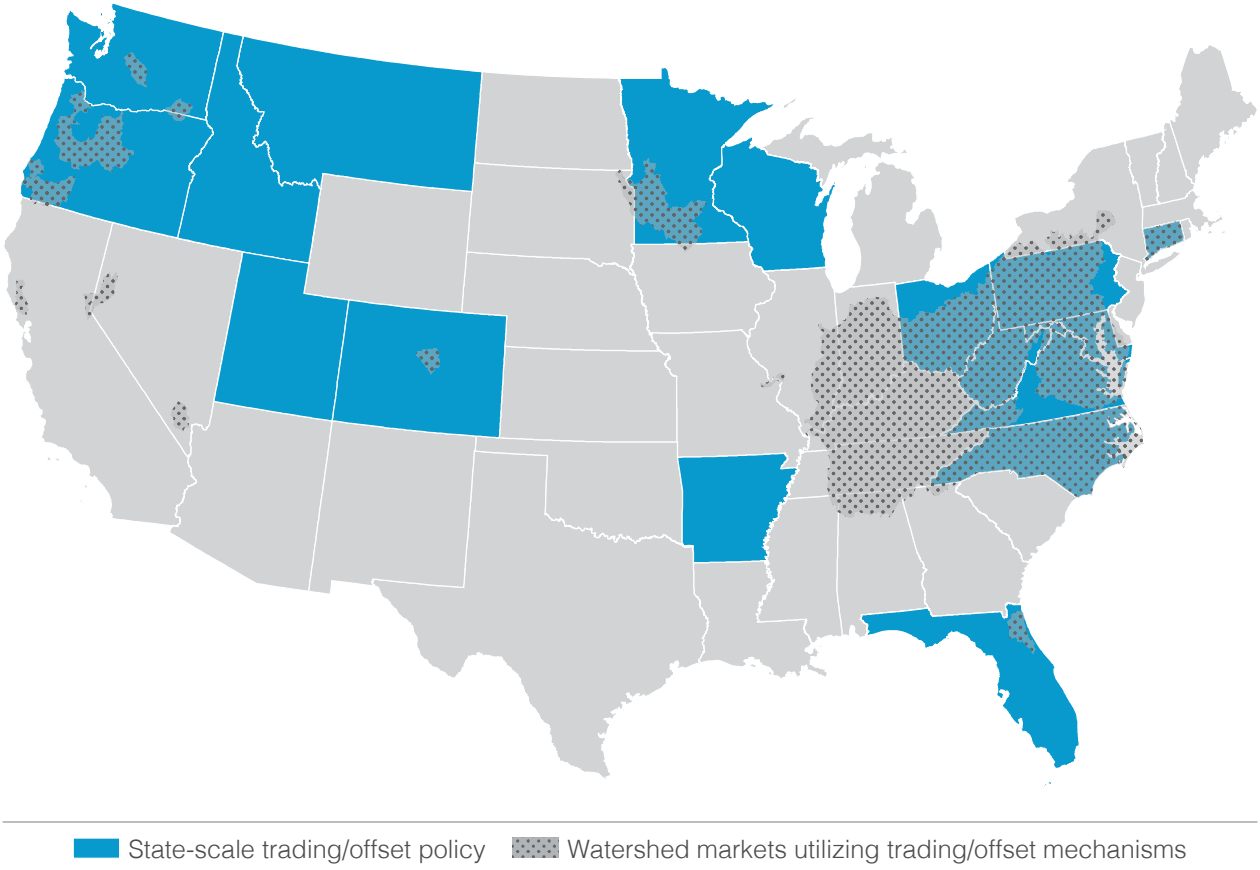
Share of Total Hectares by Market



Notes: This figure excludes hectares under management from single-client wetland mitigation banks. Single-client banks may be developed by either a public or private entity and it was not possible to determine land ownership status for the purposes of this figure for all single-client mitigation banks in the EnviroAtlas dataset.

How can policy help support market growth?

Map 10. Water Quality Trading Markets and Policies in the United States

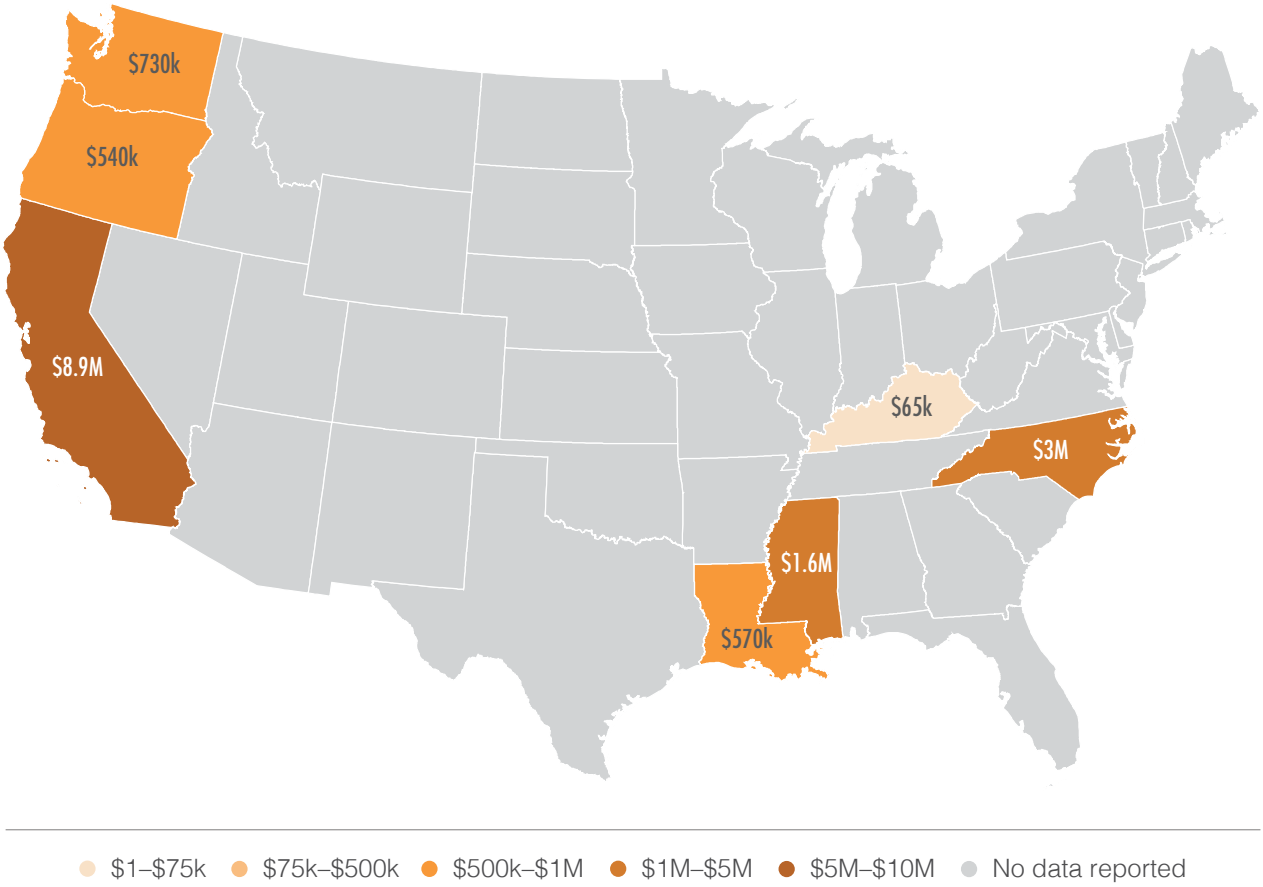


Notes: Policies in this map include both enabling policies specifically enabling/establishing water quality trading mechanisms and non-binding regulatory guidance. Only water quality trading markets reporting transactions in one or more years between 2011 and 2015 are displayed. One-off water quality offsets are not displayed.

Enabling policy for ecosystem markets in the United States, such as state-level policy on water quality trading and offsets, may help facilitate the growth of markets. State-level policy support for water quality trading can include regulatory drivers that accept water quality credits as a compliance option, enabling policies specifically enabling or establishing water quality trading mechanisms, and non-binding regulatory guidance. Frequently, market activity is found in states where these types of enabling conditions exist (Map 10).

How much money is being delivered for conservation?

Map 11. Cumulative Historical Value of Forest and Land-Use Carbon Transactions by State, 2008–2014

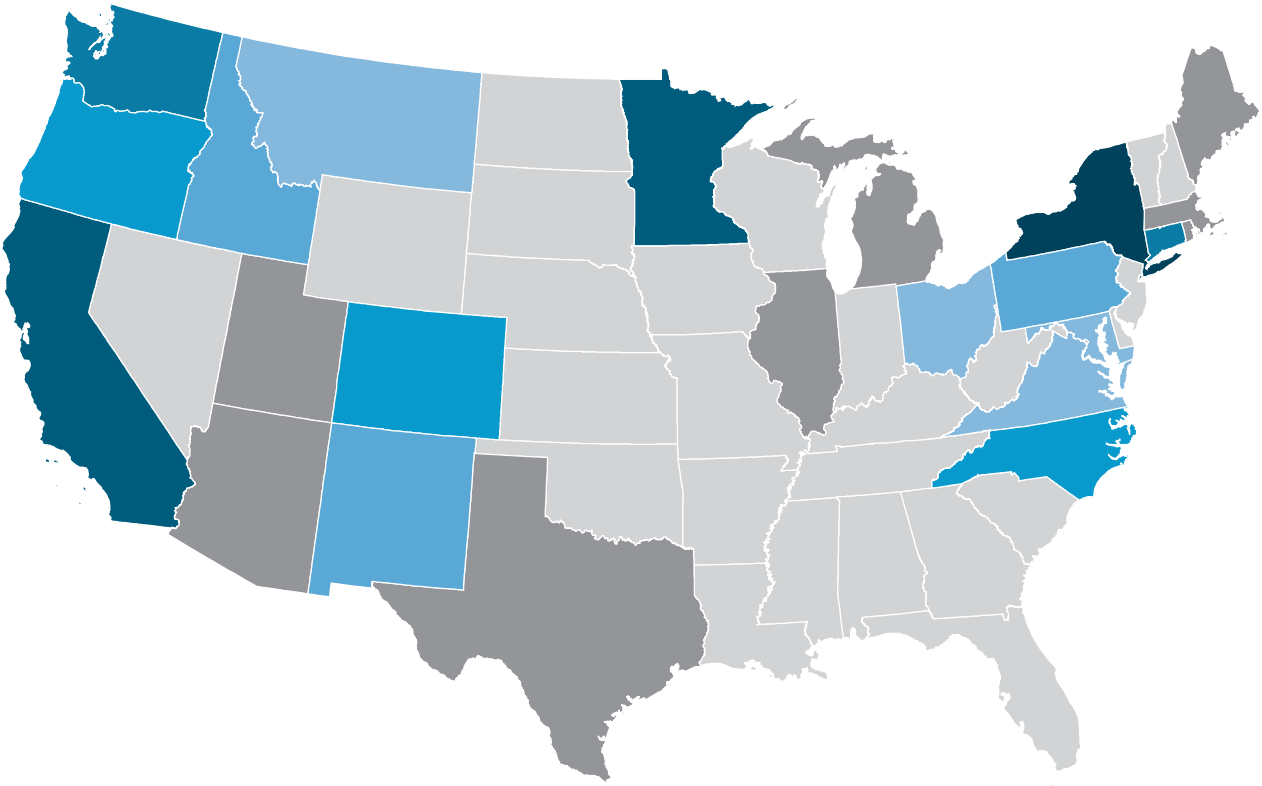


Notes: Transaction data is publicly reported at the state level only if a minimum threshold of three data points has been met to protect confidentiality of our survey respondents. Data is reported for all years available in the Ecosystem Marketplace dataset. Values include both voluntary and compliance markets. All values are shown in nominal terms and are not adjusted for inflation.

Market activity is not evenly distributed across the country. Forest and land-use carbon project development occurs where policy drivers exist (such as California's cap-and-trade program), where there is a high level of high-carbon forest coverage or where there are enterprising project developers (Map 11).

These maps offer a retrospective view of demand: in the coming years value will likely grow or shift on the map as the California carbon market ramps up, new compliance markets emerge accepting land use offsets, or demand drivers change.

Map 12. Cumulative Historical Value of Watershed Markets Transactions by State, 1979–2013



● $1–1M ● $1M–5M ● $5M–25M ● $25M–50M ● $50M–100M ● $100M–500M ● $500M+
● Data reported below minimum quantity for public disclosure ● No data reported

Notes: Transaction data is publicly reported at the state level only if a minimum threshold of three data points has been met to protect confidentiality of our survey respondents. Data is reported for all years available in the Ecosystem Marketplace dataset. Data includes both voluntary and compliance markets. All values are shown in nominal terms and are not adjusted for inflation.

Keep Exploring: About the EnviroAtlas Tool

All data presented in the maps in this report are freely available on the EnviroAtlas platform.

EnviroAtlas is an online tool giving users the ability to view, analyze, and download geospatial data and other resources, and it is designed to inform decision-making, education, and additional research.

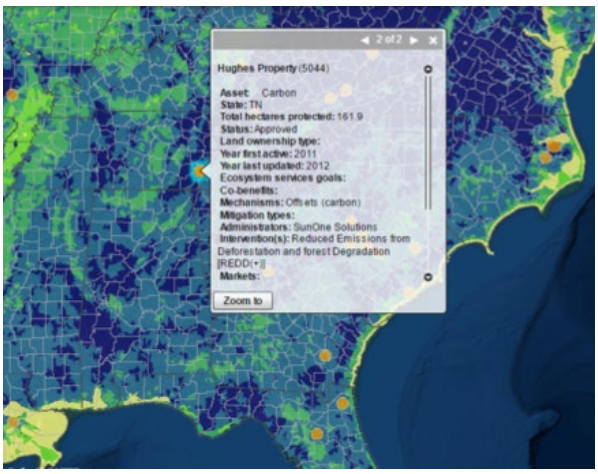
EnviroAtlas includes:

- Geospatial indicators of ecosystem goods and services;
- Supplemental data, such as boundaries, land cover, soils, hydrography, impaired water bodies, wetlands, demographics, built infrastructure, and roads;
- Analytic and interpretive tools; and
- Ecosystem markets data.

Data can be accessed via the EnviroAtlas interactive map, accessed via published web services, or downloaded from EnviroAtlas for use.

In addition to providing a wealth of data and an interactive mapping application, EnviroAtlas also incorporates other tools and resources to help users interpret the data. These include an Eco-Health Relationship Browser, built-in analysis tools, fact sheets for every data layer, downloadable GIS toolboxes, and more.

Map 13. Forest and Land-Use Carbon Projects and Carbon Storage by Tree Biomass in the United States



Notes: This map displays two map layers available on EnviroAtlas: a map layer depicting forest and land-use carbon projects in the United States, and a map layer depicting the kilograms of dry carbon stored per square meter of above ground biomass of trees and forests in each subwatershed (12-digit HUC). It also displays detailed project-level information on a forest and land-use carbon project included in the Ecosystem Markets database.

Source: USEPA EnviroAtlas.

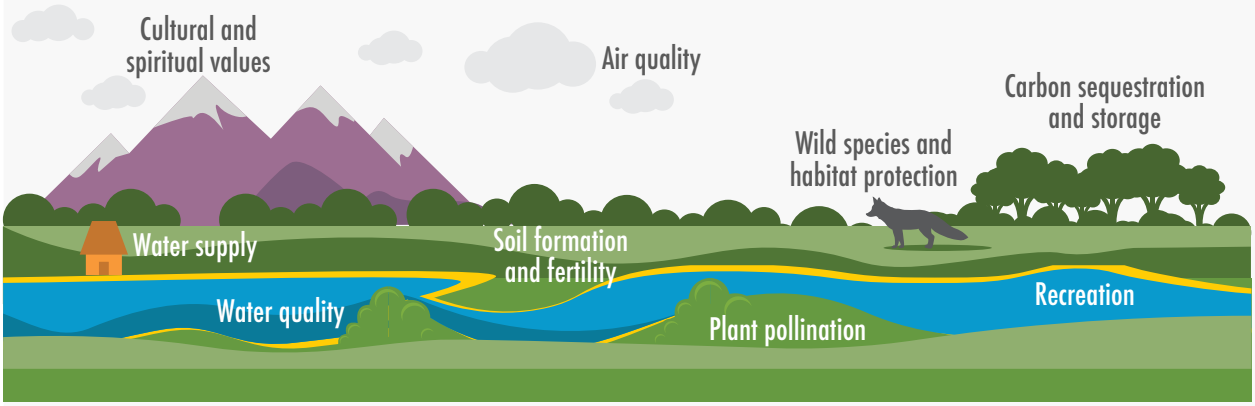
Users can explore ecosystem markets data further alongside EnviroAtlas' 300+ scientific and demographic layers and a suite of decision-support and modeling tools. EnviroAtlas adds critical context to markets—such as map layers displaying impaired waters of the United States or carbon storage by tree biomass—and analytical power in evaluating market status and dynamics (Map 13).

Explore EnviroAtlas at: https://www.epa.gov/enviroatlas

Annex: Ecosystem Markets 101

What Are Ecosystem Services?

Figure 3. Examples of Ecosystem Services Provided by Healthy Landscapes



Healthy natural habitats and working lands provide society with a wide range of benefits—from reliable flows of clean water to productive soil to carbon sequestration. People, companies, and societies rely on these services for raw materials, production processes, and climate stability. These benefits are known as ecosystem services. Some examples of ecosystem services include the purification of air and water, regulation of water flow, pollination of crops and natural vegetation, and the provision of cultural and spiritual values associated with nature.

Why value ecosystem services?	Valuing ecosystem services allows us to account for the economic value of nature in decision-making. A number of tools exist to understand and apply ecosystem services values.		
Purpose	• Measure a nation, region, or company's true wealth and make informed decisions about resource management trade-offs • Accurately consider all assets and liabilities on a company's balance sheet and manage ecosystem-based risks and dependencies	• Make an economic case for conservation • Justify and assess the performance of environmental protection/regulation • Consider environmental externalities in policy and planning decisions • Understand the real costs of environmental degradation in a damage assessment	• Justify incentives to reward good stewardship • Build a green economy that generates value not just from natural resources use, but also restoration and protection
Tools	NATURAL CAPITAL ACCOUNTING	ECOSYSTEM SERVICES VALUATION	ECOSYSTEM MARKETS

In this report, we focus on **ecosystem markets.**

What Are Ecosystem Markets?

We track four main ecosystem markets, distinguished by their **asset types:**


Wetlands and streams


Watersheds


Imperiled species/habitats


Forest and land-use carbon

How ecosystem markets work:

Society depends on healthy ecosystems for clean water, clean air, food, timber, and many other ecosystem services. But these necessities are typically undervalued or not valued in our economic system. Consequently, they are often overexploited. One promising approach to sustaining nature's benefits is to create market-based mechanisms to better mediate supply and demand and value these services. Market-based mechanisms can then generate financing for sustainable management and long-term conservation of ecosystem services.

These mechanisms take many forms: They range from transactions in which individual beneficiaries of ecosystem services contract directly with providers of those services to formal markets for buying and selling ecosystem services. These efforts share a focus on reducing the costs associated with maintaining or restoring ecosystem goods or services.

Market Organization

An ecosystem **market** is any program or platform that facilitates transactions between buyers and sellers who exchange financial compensation for ecosystem assets or practices that restore, enhance, or protect ecosystem services. Markets are organized around specific asset types. A market can encompass many distinct projects.

A **project** is a site, or suite of sites, where restoration, enhancement, or other resource conservation actions are implemented for the purposes of marketing the resulting ecosystem service assets or outcomes to buyers.

Market Drivers

Compliance markets are driven by environmental regulations that set a standard or cap that regulated parties can meet by paying for environmental improvements via ecosystem markets.

Voluntary markets work with buyers who are not driven by any regulation, but who instead seek to demonstrate good corporate citizenship, address risks, or act in anticipation of future regulations.

Mechanisms: The actual transfer of payment(s) for ecosystem services can take many forms, including:

Trading and Offsets

The benefits of restoration or conservation actions are packaged as a standardized credit that can be bought or sold, often to meet regulatory obligations.

Bilateral agreements

A single buyer contracts with one or more landholders to pay them for restoration or conservation.

Collective action funds

Multiple actors with shared environmental concerns pool resources and expertise to fund ecosystem restoration or conservation.

Environmental water markets

Existing markets for water rights are accessed to buy or lease water that is not used by the purchaser, but instead left instream or in the aquifer to protect nature and ensure sustainable supplies.

Public subsidies

Traditional agricultural or landholder payments are linked to conservation or restoration instead of production.

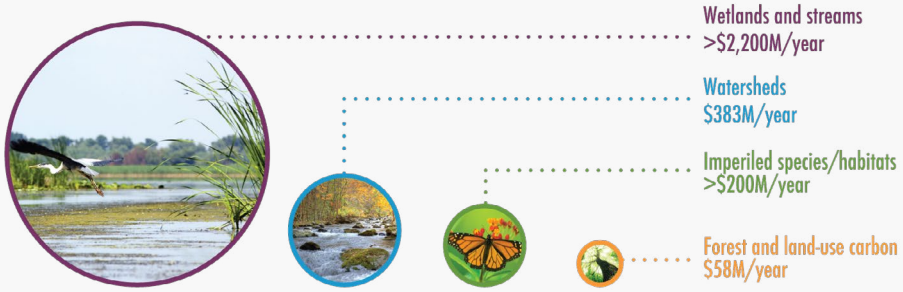
This is a simplified list of mechanisms tracked by Ecosystem Marketplace.

To learn more, explore our data on EnviroAtlas (https://enviroatlas.epa.gov/enviroatlas/) or visit our MarketWatch page (http://www.ecosystemmarketplace.com/marketwatch/).

Ecosystem Markets in the United States

At least $2.8 billion is transacted every year through ecosystem markets in the United States. The largest markets are for wetlands and streams, watershed services, imperiled species/habitas, and land use carbon. But markets also exist for other ecosystem service asset types, such as pollinator habitat and methane emission reductions.

Figure 4. Estimated Annual Value and Key Conservation Goals of Ecosystem Markets in the United States



Notes: All transaction data is presented for the most recent full year for which ecosystem markets data is publicly available at the time of this report. For forest and land-use carbon initiatives, this is 2014; for imperiled species/habitats and wetlands/streams it is 2011; for watersheds it is 2013.

Impact: Ecosystem market projects cover more than 9 million ha in the United States, an area roughly equal to the state of Maine.

Conservation activities: Markets channel funding to an array of conservation activities. Here are the most popular interventions paid for by ecosystem markets buyers in the United States:

Wetlands and Stream Markets

- Wetlands re-establishment
- Wetlands preservation
- Wetlands enhancement

Watershed Markets

- Watershed restoration
- Watershed preservation
- Dedication of water rights for instream flows

Imperiled Species/Habitats Markets

- Habitat preservation
- Habitat establishment

Forest and Land-Use Carbon Markets

- Improved forest management
- Afforestation or reforestation

Enabling Conditions for Ecosystem Markets

Government can support the development and performance of ecosystem markets through policy. This report covers three main kinds of enabling policy conditions, enacted at the national, regional, state, or watershed level:

Regulatory driver
Ecosystem markets are one option for regulated parties to meet compliance, but participation is not required.

Example: Purchasing wetland mitigation credits to comply with Clean Water Act Section 404.

Enabling policy
A policy or regulation explicitly promotes ecosystem markets or creates an ecosystem market.

Example: The California Global Warming Solutions Act of 2006 authorized the California Air Resources Board to use market-based approaches to meet greenhouse gas reduction targets.

Guidance
A government entity issues non-binding recommendations for ecosystem markets or projects.

Example: The State of Idaho's Water Quality Pollutant Trading Guidance covers topics like recommended pollutants for trading, credit calculations, and reporting.

FOREST TRENDS

The Family of Forest Trends Initiatives

Biodiversity Initiative

Promoting development of sound, science-based, and economically sustainable mitigation and no net loss of biodiversity impacts

Coastal and Marine Initiative

Demonstrating the value of coastal and marine ecosystem services

Communities Initiative

Strengthening local communities' capacity to secure their rights, manage and conserve their forests, and improve their livelihoods

Ecosystem Marketplace

A global platform for transparent information on environmental finance and markets, and payments for ecosystem services

Forest Policy, Trade, and Finance Initiative

Supporting the transformation toward legal and sustainable markets for timber and agricultural commodities

Public-private Finance Initiative

Creating mechanisms that increase the amount of public and private capital for practices that reduce emissions from forests, agriculture, and other land uses

Water Initiative

Promoting the use of incentives and market-based instruments to protect and sustainably manage watershed services

Learn more about our programs at www.forest-trends.org