



Ecosystem Markets: Wetlands and Streams

These EnviroAtlas Marketplace map layers display polygons representing the location of wetlands and streams markets and projects as of 2015. Polygons for local wetland and stream projects represent the project footprint (i.e., the land area comprising the project site) or the area of primary impact mapped as 8-digit hydrologic units (HUCs). Polygons for regional, state, and national markets represent the entire region that shares market infrastructure and rules or a larger program encompassing many smaller projects, such as In-Lieu Fee (ILF) programs. For projects marketing wetland and stream conservation assets, points represent the centroid locations of projects.

Why are wetlands and streams markets important?

Healthy ecosystems provide us with a wide range of services—including reliable clean water, climate regulation, and productive soils—and they underpin many of our basic needs, economic processes, and cultural or spiritual values. However, except for primary goods like food, fuel, and fiber, most of these ecosystem services do not have widely-accepted, tangible market values.¹ As a result, ecosystems continue to decline because protection of ecosystem services is rarely considered in economic decisions. The Millennium Ecosystem Assessment, for instance, found that more than 60% of ecosystem services are degraded faster than they can regenerate.²

One approach to safeguarding ecosystem services is through incentive mechanisms for conservation, including markets. With ecosystem services markets, companies, communities, and other beneficiaries pay landowners and managers to protect, restore, or mitigate for impacts to ecosystems.³ Ecosystem market mechanisms range from simple contracts between a buyer and seller to sophisticated markets for environmental credits representing delivery of an ecosystem service. All of these mechanisms share the common practice that parties will restore or maintain the delivery of an ecosystem service or group of services in exchange for financial compensation.

Typically, markets focus on a single ecosystem service or asset. The most well-established markets in the United States represent forest carbon sequestration, imperiled species and habitats conservation, wetlands and streams conservation, and watershed services. The term ‘market’ here is used



Photo: Great Blue Heron, NOAA

somewhat loosely, referring to any initiative or program using a market-based mechanism and resulting in financial compensation for the delivery of ecosystem service assets.

Wetland and stream markets are designed to reduce negative impacts on aquatic resources. These compensation mechanisms finance conservation and restoration projects that deliver environmental benefits comparable to or ‘above and beyond’ the mitigated adverse impact.

In the United States, the need to be compliant with a regulation drives most wetland and stream markets. Markets are typically structured around the ‘mitigation hierarchy,’ which establishes that market-based tools should be used only after efforts have been made to (first) avoid damage, (second) minimize impact, and (third) mitigate negative impacts to natural resources.⁴ Compensatory mitigation ranges from rigorous and measurable offsets to less direct efforts to compensate for impacts through financial donations and land protection.

How can I use this information?

This map is one of seven Marketplace maps displaying information on ecosystem market size, scope, and activity in the United States. Users can examine these map layers to understand the geographic distribution of ecosystem markets, identify potential market opportunities, and explore markets and projects by asset type, goals, reason for implementation, exchange mechanism, and intervention. These maps can be combined with other EnviroAtlas map layers to provide a context for market activity and analyze

the market's contribution to conservation objectives. They may be compared with other Marketplace map layers, such as Ecosystem Markets: Point Data and Enabling Policies for Ecosystem Markets, for additional detail on market scope and the role of policy and regulation.

How were the data for this map created?

These data were compiled from the U.S. Army Corps of Engineers Regulatory In-lieu Fee and Bank Information Tracking System ([RIBITS](#)) database (ca. 2015) and Ecosystem Marketplace research on wetland and stream markets conducted during 2009–2011. Spatial data downloaded as KML files from RIBITS include credit bank and In-Lieu Fee (ILF) site footprints as well as market coverage areas. Bank and ILF KML files were converted into ArcGIS polygonal shapefiles.

Wetland and stream market coverage and project primary impact area data compiled via Ecosystem Marketplace research were drawn in ArcGIS utilizing the 2014 NRCS Watershed Boundary Dataset, 2010 U.S. Census, and 2010 Public Land Survey System boundary layers. Tabular data from Ecosystem Marketplace and RIBITS were standardized, combined, imported into ArcGIS, and joined with corresponding spatial records.

What are the limitations of these data?

EnviroAtlas uses the best data available, but there are still limitations associated with the data. These data originate from the RIBITS database and from responses to Ecosystem Marketplace's annual 'State of the Market' survey of project developers, market/program administrators, brokers, retailers, and other market actors. Wherever possible, responses are checked against credit registries and other third-party sources. However, EnviroAtlas and Ecosystem Marketplace provide geographic data "as is" and make no guarantee or warranty concerning the accuracy of information contained in the geographic data. Users of these data are strongly advised not to use the content of Marketplace data in isolation but to take that information together with other market information to formulate one's

Selected Publications

1. King, D.M., and M. Mazzotta. 2000. [Ecosystem valuation](#). Accessed March 2016.
 2. Millennium Ecosystem Assessment. 2005. [Ecosystems and human well-being: Synthesis](#). Island Press, Washington, DC.
 3. Forest Trends' Ecosystem Marketplace. [Atlas of ecosystem markets in the United States](#). Accessed October 2016.
 4. Forest Trends Association. 2016. [Mitigation hierarchy](#). Business and biodiversity offsets program. Accessed March 2016.
- Forest Trends' Ecosystem Marketplace. 2015. [Ecosystem markets and finance: A global primer](#). Accessed March 2016.
- Johnson, S.M. 2011. [Avoid, minimize, mitigate: The continuing constitutionality of wetlands mitigation after Dolan v. City of Tigard](#). Article 8, *Fordham Environmental Law Review* 6(3):689–729.
- Wilkinson, J., and J. Thompson. 2006. In-lieu-fee mitigation programs. Pages 14–19 in [2005 Status Report on Compensatory Mitigation in the United States](#), Environmental Law Institute, Washington, D.C.

own views, interpretations, and opinions. The user is strongly advised to seek appropriate legal and professional advice before entering into commercial transactions. We recommend that the user become familiarized with the terminology and concepts used in these data.

How can I access these data?

EnviroAtlas data can be viewed in the interactive map, accessed through web services, or downloaded.

Where can I get more information?

Further information is available in Ecosystem Marketplace's primer on ecosystem markets and finance.³ Additional data and analysis of ecosystem markets activity is available at Forest Trends' [Ecosystem Marketplace](#). The Regulatory In-lieu Fee and Bank Information Tracking System ([RIBITS](#)) database maintained by the United States Army Corps of Engineers provides detailed data and documentation on mitigation banking and in-lieu fee program activity in the United States. A selection of resources related to ecosystem valuation and wetland and stream markets is listed below. For additional information on how the data were created, access the metadata for the data layer from the drop down menu on the interactive map table of contents and click again on metadata at the bottom of the metadata summary page for more details. To ask specific questions about this data layer, please contact the [EnviroAtlas Team](#).

Acknowledgments

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