

Ecosystem Markets and Ecosystem Valuation

Valuing Ecosystem Services on Conservation Lands 101



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ECOSYSTEM MARKETPLACE: Global source of news, data and analytics around environmental markets and payments for ecosystem services.



The collage displays three key components of Ecosystem Marketplace:

- Forest Project Inventory:** A map interface showing project locations across Europe. It includes filters for Keyword, Proj. Stage (Operational & Pipeline), Proj. Type (All Project Types), Seeking (Any), Market (All Markets), and Country (All Countries). Buttons for "I NEED HELP!" and "+ ADD A NEW PROJECT" are visible.
- Report Cover:** "Gaining Depth: State of Watershed Investment 2014 Executive Summary". The cover features a landscape image with icons for water, land, and community, and logos for donors including the US Agency for International Development (USAID), the Swiss Agency for Development Cooperation (SDC), and the German Development Cooperation (GIZ).
- Website Screenshot:** The Ecosystem Marketplace homepage, featuring a navigation bar with links to Home, News & Articles, Our Publications, Marketwatch, Library & Tools, Directory, Newsletters, Events, and About Us. The main content area includes a "TOP STORY" about a webinar on tenure and deforestation, a "New Report!" section for the "State of the Voluntary Carbon Markets 2014", and a "TODAY'S NEWS" section with various environmental headlines.

WHAT ARE ECOSYSTEM SERVICES? Benefits from functioning ecosystems that humans rely on for clean air, clean water, healthy soils, recreation...



Air quality

Cultural and spiritual values

Water supply

Wild species & habitat protection

Soil formation & fertility

Recreation

Water quality

**Carbon sequestration
& storage**

Plant pollination

WHY VALUE ECOSYSTEM SERVICES? Currently, conservation is seen as having little value, and degradation is seen as having little cost.



WHY VALUE ECOSYSTEM SERVICES?

- Recognize contributions to economic process
- Show benefits of protection/regulation
- Justify rewards for good stewardship
- Identify beneficiaries and make business case for conservation

HOW DO YOU VALUE NON-MARKET ECOSYSTEM SERVICES?

- Stated preference (*What people say*)
- Revealed preference (*How people behave*)
- Benefits transfer (*What ES values are in other places*)
- Cost-based (*How much does it cost to avoid damages or substitute/replace?*)

HOW ARE ECOSYSTEM SERVICES VALUES USED? Valuation data has a range of applications. Valuation estimates have been used to...

Influence policy

Ex: Principles and Requirements for Federal Investments in Water Resources - CEQ, 2013

Guide planning and set priorities

Ex: Open space saves residents in SE PA \$132.5M/year in clean water, air, flood defense, and recreation benefits¹

Integrate natural values into legal decision-making, damages assessments

Ex: FEMA denial of disaster assistance for Rim Fire in Hetch Hetchy reversed after ecosystem valuation damages were dramatically undervalued²

Integrate natural values into business and national accounts

Ex: NatCap Declaration

Create an evidence base for new revenue streams for conservation

Ex: Markets and payments for ecosystem services

¹ GreenSpace Alliance and the Delaware Valley Regional Planning Commission. *Return on Environment*.

² Earth Economics. *The Economic Impact of the Rim Fire 2013*.

LIMITS TO VALUATION: Caveats and critiques on assigning economic value to nature –three major debates.



PRACTICAL

- Evidence of real policy influence is still slim

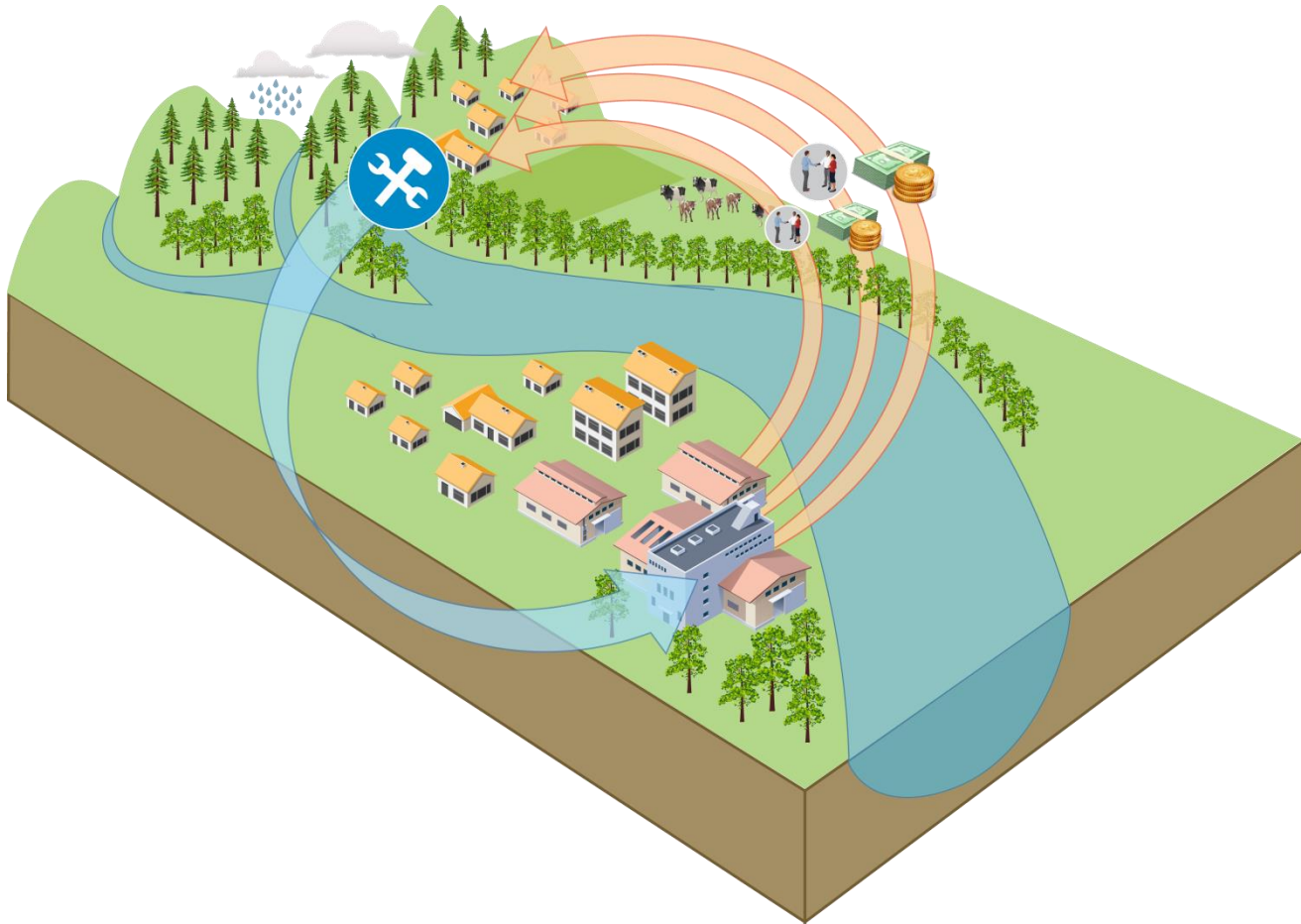
METHODOLOGICAL

- Danger of “black box” thinking
- Value is context specific & not easily transferrable
- Understand preferences but don’t forget science
- The discount rate debate
- Value is “at the margin” – limited ability to handle large, long-term change. Costanza et al (1997) estimated that globally, nature is worth \$33 trillion: **“A serious underestimation of infinity”**

ETHICAL

- High values for one service could mean management at expense of others
- Putting a “price tag on nature” and its intrinsic values
- More broadly, an over-reliance on numbers?

MARKETS FOR ECOSYSTEM SERVICES: Companies, communities, and other beneficiaries pay land managers to protect, restore, or mitigate for impacts to nature.



ECOSYSTEM MARKETS: Annual transactions of more than \$2.8 billion each year in the US to restore/protect ecosystems, dominated by compensatory mitigation for wetlands.



Wetlands
>\$2,200M/year



Water
\$383M/year



Species
>\$200M/year



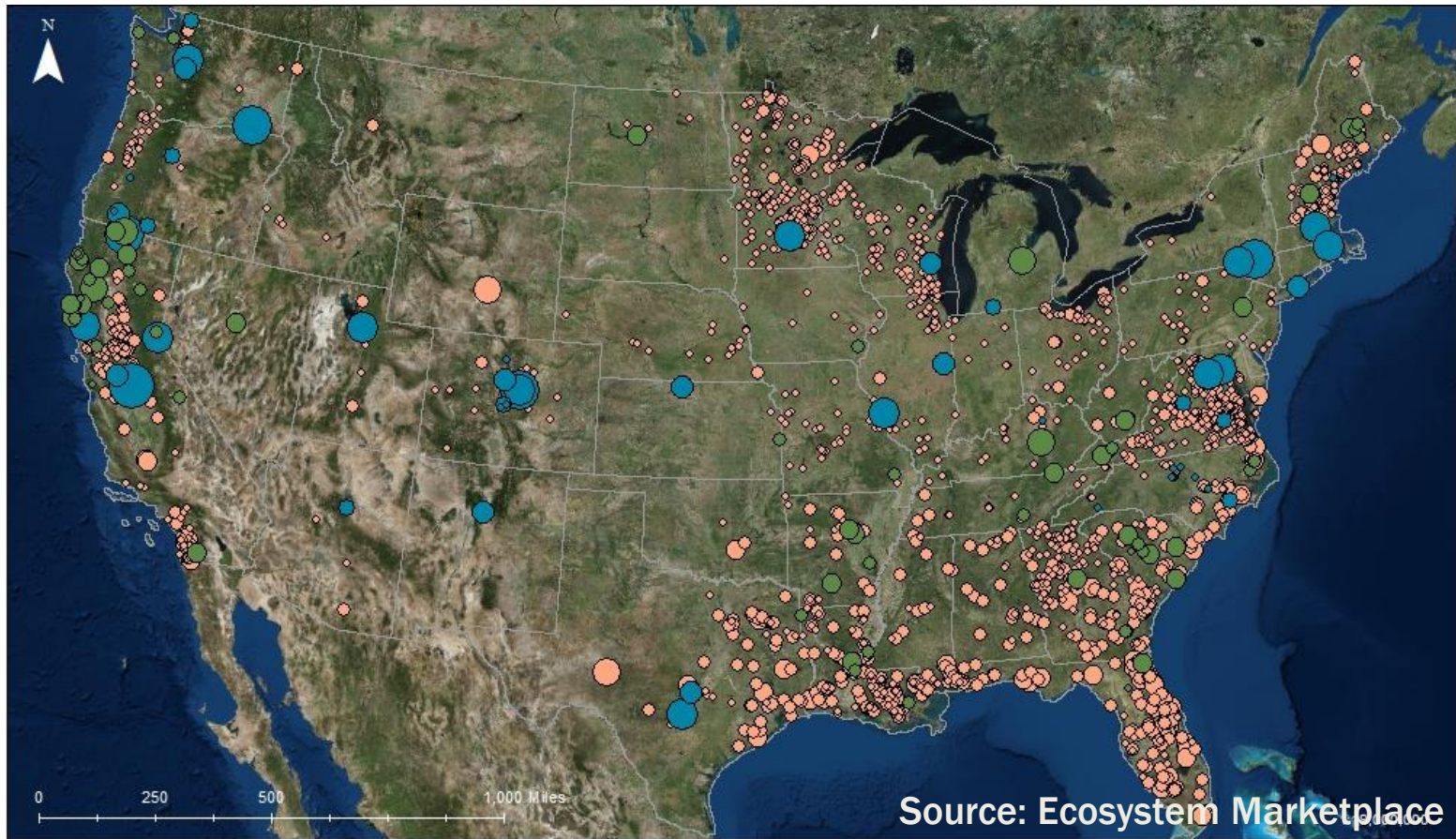
Forest Carbon
\$58M/year

ECOSYSTEM MARKETS: Market mechanisms vary considerably in terms of sophistication, ease of entry, and opportunities – especially depending on where you are in the country.



	WETLANDS	WATER	SPECIES	CARBON
Strong regulatory driver	●	●	●	●
Clear project standards/metrics	●	●	●	●
Complex project standards	●	●	●	●
Large pool of buyers	●	●	●	●
Market transparency & sophistication	●	●	●	●

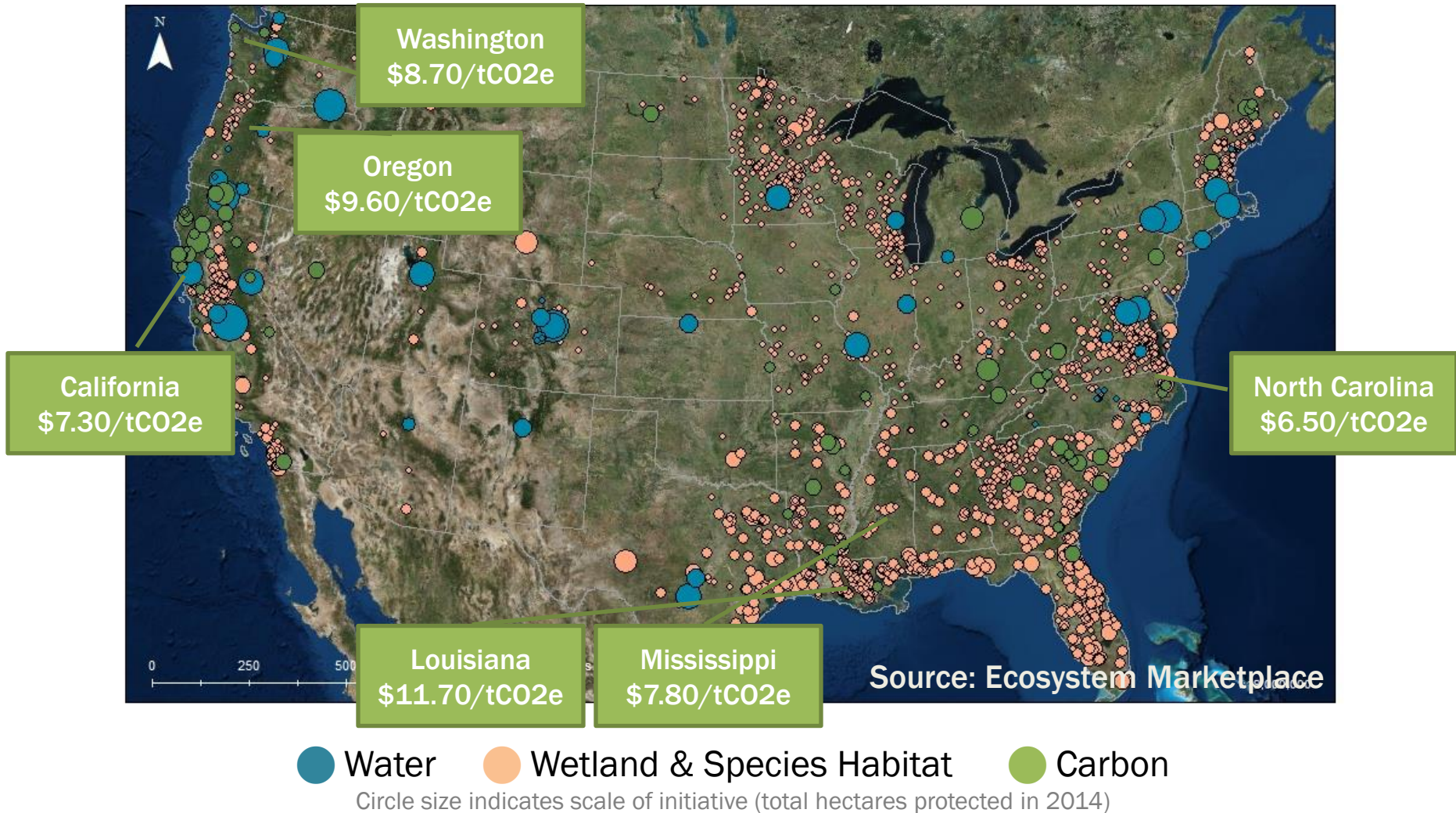
ECOSYSTEM MARKETS: Location of market initiatives in the USA, by ecosystem service type and scale. Price data reflects averages for most recent year available.



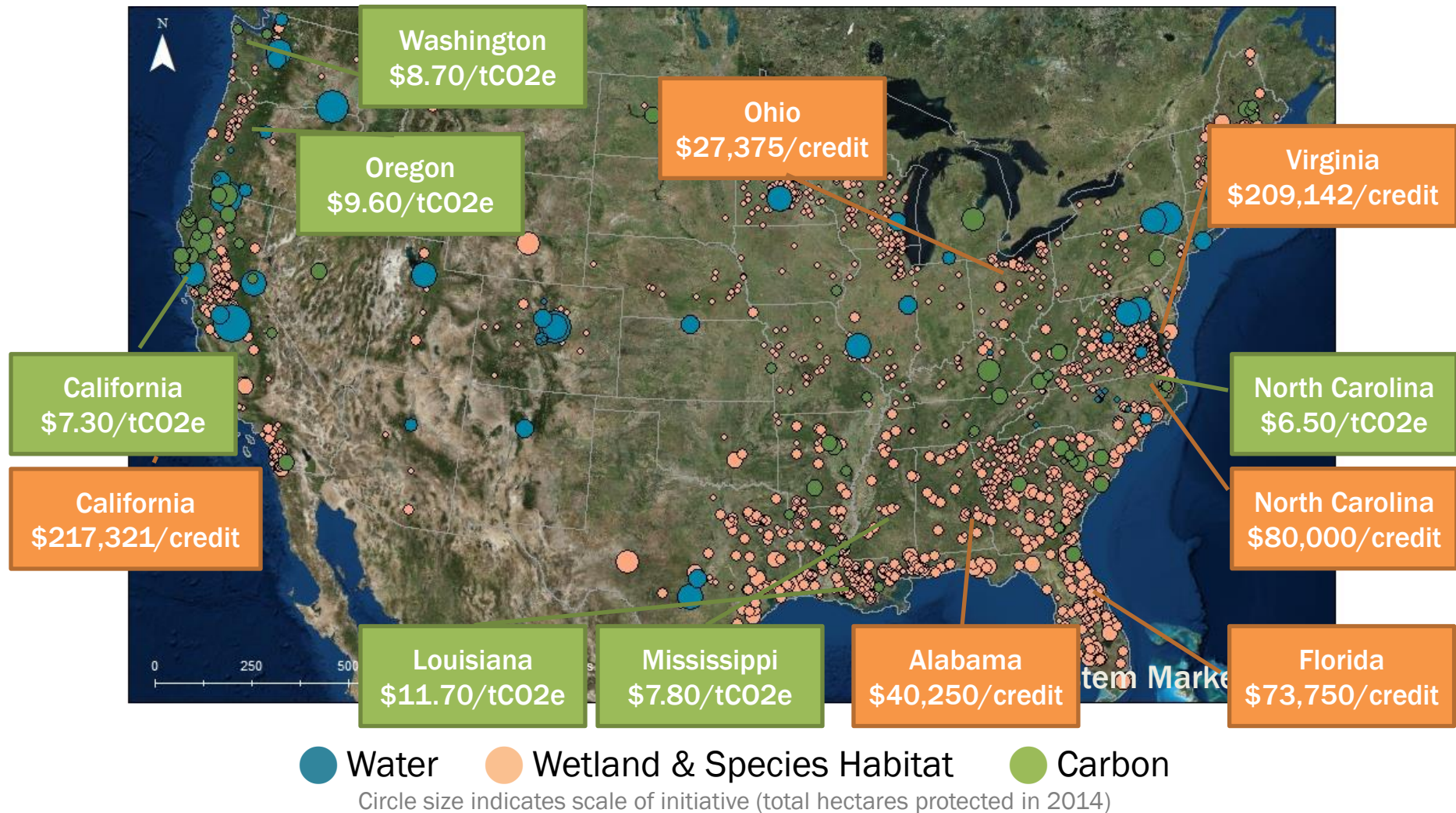
 Water  Wetland & Species Habitat  Carbon

Circle size indicates scale of initiative (total hectares protected in 2014)

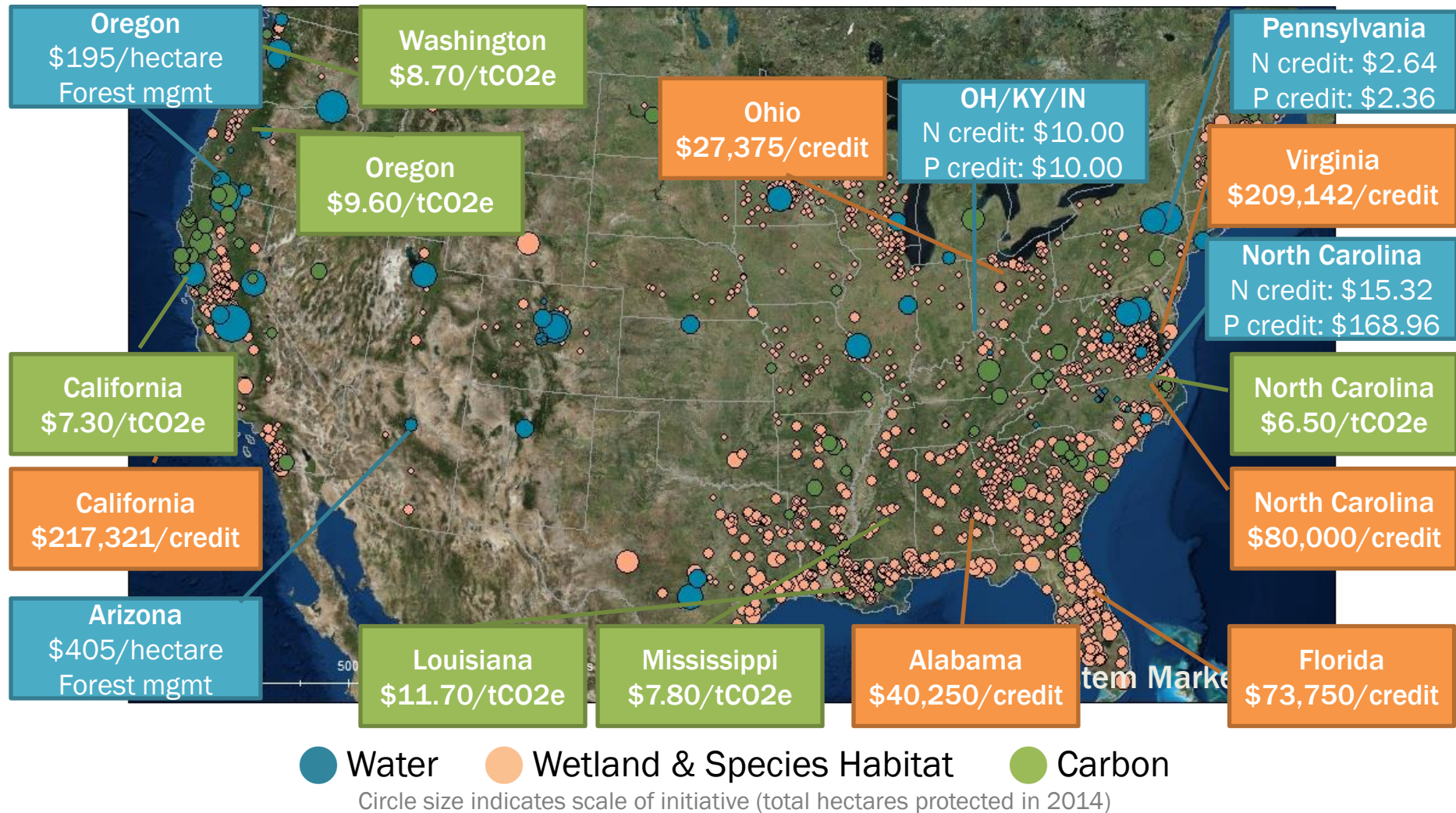
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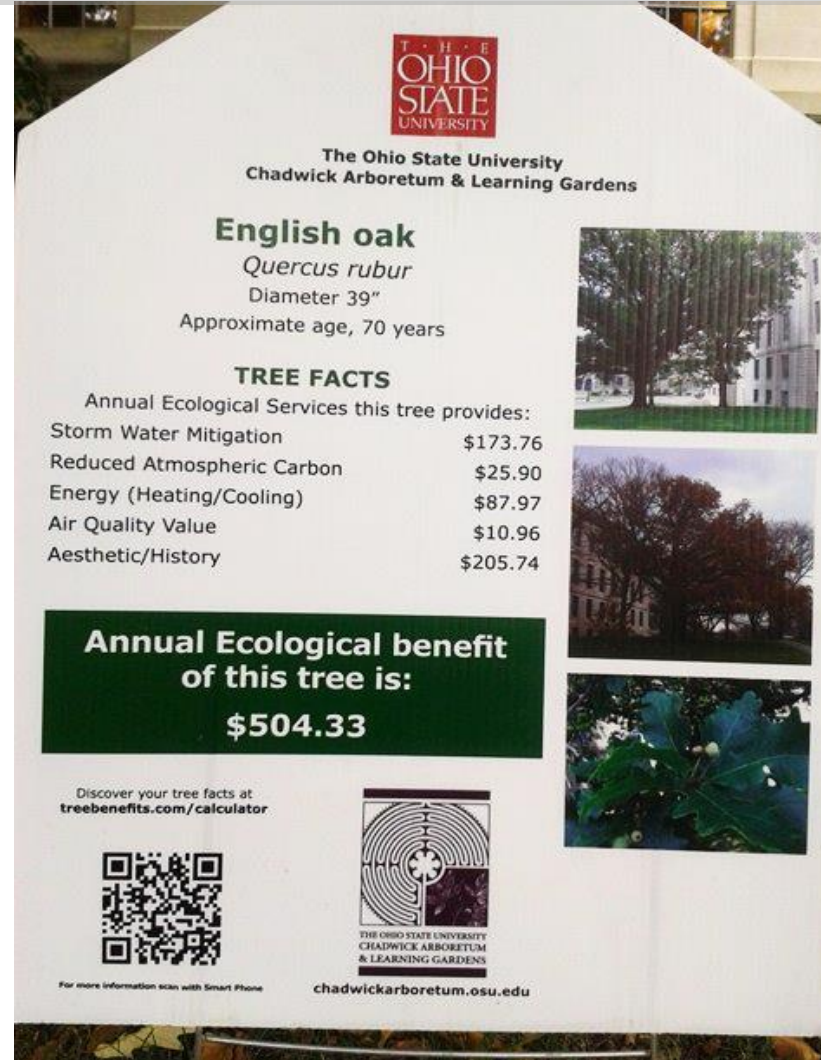
HOW CAN LAND TRUSTS GET INVOLVED IN ECOSYSTEM MARKETS? Variety of roles depending on interest, local opportunities, and resources.



PRICE \neq VALUE! In practice, prices in ecosystem markets *do not* capture full value of conservation to society.

What actually determines price?

- Project costs
- Buyer willingness to pay
- Available demand and supply
- Regulatory interventions to create and influence markets
- Transparency, trading infrastructure, and other factors affecting transaction costs
- Relative scarcity of the resource locally
- Local opportunity costs of land use
- Et cetera...



THE OHIO STATE UNIVERSITY

The Ohio State University
Chadwick Arboretum & Learning Gardens

English oak
Quercus rubur
Diameter 39"
Approximate age, 70 years


TREE FACTS

Annual Ecological Services this tree provides:


Storm Water Mitigation	\$173.76
Reduced Atmospheric Carbon	\$25.90
Energy (Heating/Cooling)	\$87.97
Air Quality Value	\$10.96
Aesthetic/History	\$205.74

Annual Ecological benefit of this tree is:
\$504.33

Discover your tree facts at
treebenefits.com/calculator




For more information scan with Smart Phone



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CHADWICK ARBORETUM
& LEARNING GARDENS

chadwickarboretum.osu.edu





Thanks!

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