



Ecosystem Market Information



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According to the US Environmental Protection Agency (EPA), ecosystem services markets allow companies, communities and other beneficiaries to pay landowners and managers *to protect, restore or mitigate* for impacts to ecosystems. While many of the practices that offer the greatest ecosystem benefits are typically encouraged via traditional state and federal financial assistance programs, market payments are generated via outcomes verified at the field level and are not necessarily practice-specific. Current active and pilot markets exist for several ecosystem services including carbon sequestration and greenhouse gas (GHG) reductions, water quality and quantity improvements, as well as wetland and habitat creation, among others. This resource focuses on agricultural opportunities for carbon and water quality markets.

What is a carbon offset – According to the [US Government Accountability Office](#), a carbon offset is defined as a measurable reduction of GHG emissions from an activity or project in one location that is used to compensate for emissions occurring elsewhere. Carbon offsets are typically measured in metric tonnes (2,205 pounds) of carbon dioxide equivalent (CO₂e).

What is a water quality credit – The [EPA defines a water quality credit](#) as a unit of pollutant reduction usually measured in pounds equivalent. Credits can be generated by industrial and municipal point sources implementing new treatment technologies or via implementation of management practices that improve water quality above an established baseline. General water quality market information can be found on EPA's [Water Quality Trading Basics and Policy Resources Page](#).

Planning Resources to Assist in Moving from Practices to Outcomes

[COMET-Planner](#) provides general estimates of the GHG impacts of certain NRCS conservation practices. Estimates can be supplied in tonnes of CO₂e reduction potential per acre per year.

American Farmland Trust's (AFT) [CaRPE Tool](#) expands the utility of the data reported by COMET-Planner by integrating cropland and grazing land acreages and data from the 2017 Census of Agriculture. AFT's recent [Combating Climate Change on US Cropland](#) Report highlights an application of this tool along with a summary of the technical capacity of cover cropping and no-till to sequester carbon and reduce GHG emissions.

Additionally, AFT's [Guide to Water Quality, Climate, Social and Economic Outcomes Estimation Tools](#) features 14 outcome estimation tools and two methods.

Note – While this resource list is not intended to be exhaustive or comprehensive, the above referenced project pages and reports provide extensive reference lists that can serve as a great starting point for anyone interested in digging deeper into these topics.

Background on Featured Entities

CARBON MARKET ENTITIES

Nori – In pilot phase, project enrollment is currently available nationwide. Two projects have sold and received payment for ~30,000 credits to date. Planning to expand to Canada, Brazil and Eastern Europe in the next 2 to 3 years.

<https://nori.com/>

Indigo Ag – Project enrollment currently available in 21 states including: AR, CO, GA, IA, IL, IN, KS, KY, LA, MN, MO, MS, NC, ND, NE, OH, OK, SC, SD, TN, TX. Piloting expansion in Europe. <https://carbon.indigoag.net>

CARBON AND ADDITIONAL ECOSYSTEM SERVICES MARKET ENTITIES

Soil and Water Outcomes Fund – Project enrollment currently available in select counties in Iowa, Illinois, and Ohio. Planning to expand to additional geographies in crop year 2022. <https://www.theoutcomesfund.com/>

Ecosystem Services Market Consortium (ESMC) – In pilot phase, project enrollment currently available in select U.S. regions including: Corn and Soy Belt, Great Plains, Great Lakes, Pacific Northwest, and California. Anticipated national market launch to include payment for water quantity and biodiversity ecosystem services in addition to carbon, net GHGs, and water quality in harvest year 2022-2023. <https://ecosystemservicesmarket.org/>

	Nori	Indigo Ag	Soil & Water Outcomes	ESMC
Acreage Min/Max	None	One-field min, no max	None	None
Contract Length	10 yrs	5 yrs	Annual with yearly renewal	Pilot – Annual Market Launch – Scope 1: 10 yrs; Scope 3: TBD
New Practice Requirement	Yes, with a look-back of up to 5 years during pilot phase	Yes, with a look-back of 2 growing seasons	Yes	Yes, but investigating potential of payments to producers already implementing conservation practices for Scope 3
Payment Schedule	End of month when offset credit is sold	50% yr 1, 20% yr 2, 10% yrs 3, 4, 5	Annually, split 50/50–1 shortly after signing, 1 after verification	Pilot – Annual Market- Launch - Annual to every 5 yrs depending on Scope for carbon 1 vs 3, respectively; annual for water quality.
Ability to Enroll Same Fields in Gov't Programs/ Other Markets	Designed to stack with both	Designed to stack with both, but other incentives cannot include payments for carbon credits or related assets (financing is okay)	No Note – payment for water quality and carbon outcomes	Designed to stack with gov't programs; individual fields cannot be in two market programs. Note – ESMC internally stacks carbon with GHG reductions, water quality, and water quantity.
Outcome Estimation	Soil sample reference network-based modeling (Soil Metrics) - cost incurred by Nori. Farmer has option to true-up via soil sampling - farmer incurs sampling cost.	Modeling (biogeochemical and statistical) + soil sampling, Indigo assumes cost (Indigo does not charge growers for anything)	Modeling, with 10% of fields subject to in-field soil and water sampling at no cost to farmer	Modeling (peer reviewed biogeochemical model) + soil sampling. ESMC assumes costs and includes in asset price to buyers.
Third Party Practice Verification	Minimum once every 3 years; standard audit procedure (review representative sample of receipts and invoices)	Random site visits and evidence checks, registry-approved methodology.	Yearly field visits, remote sensing	Scope 1– small subset of producers randomly selected for site visit + remoting sensing. Scope 3 –smaller subset of producers randomly selected for site visit +remote sensing.
Data Collected on Enrollment	Farm operational data – previous 10 years OR proprietary “ <i>Smart Defaults</i> ” option	Basic farmer info, field boundaries, and commitment to new practice(s)	Farm operational data – 2-3 years historical baseline plus 2-3 years of proposed practice change(s)	Scope 1 – detailed farm operational data Scope 3 – some operational data; Soil sampling and remote sensed data for both.
Penalty for Temporary Break in Practice Implementation	Farmer commits to make best effort to retain C stocks; not bound to any practice plan; not liable for <i>force majeure</i> C losses.	Payment pauses until soil carbon returns to previous level. Methodology prevents credits from being overestimated.	Breach of contract, farmer would not receive payment	Stall in soil carbon gains requires initial gains to be realized before additional credit issuance/payment; no consequences for dropping out of pre-market launch pilots
Enrollment Assistance	Supply Account Managers on-call; regular training; direct assistance with enrollment process	Customer success hotline or webchat options	Provided via staff and affiliates	Producer’s preferred advisor (e.g. conservation district staff, CCAs) can be trained to assist; option to import data from 3 rd party platform
Technical / Agronomic Assistance	NA (but supply account managers include trained agronomists)	Free in-house agronomic guidance, supplemented with on-the-ground help	Free conservation agronomists on staff	Provided by ESMC’s member organizations and partners (e.g. conservation district, CCAs, NGOs).



Matrix information was provided and vetted by company representatives. Questions regarding this document can be sent to ebruner@farmland.org or jbrokish@farmland.org.

Suggested citation: Bruner, E. and Brokish, J. (2021) *Ecosystem Market Information: Background and Comparison Table* [Fact sheet]. Illinois Sustainable Ag Partnership.

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