

Building the Biocarbon Economy: How the Northwest Can Lead

Working Lands Toolbox: Building Biocarbon *Supporting biocarbon-building practice changes by farm and forest landowners*

By Patrick Mazza, Research Director
Climate Solutions
7.1.2010

EXPLORING NEW WAYS TO SUPPORT BIOCARBON

This briefing looks at tools and policies to promote new land use practices, both existing and potential, including ecosystem services markets, land conservation efforts and sustainable products marketing.

To this point innovative financing of biological carbon sequestration has mostly been associated with carbon offset markets. In these markets, farm and forest landowners change practices to improve carbon accumulation and reduce greenhouse gas (GHG) emissions. They require funding by a carbon emitter, such as a utility operating coal-fired power plants, that either wishes or is required to mitigate its emissions. By creating a balance between new emissions and emissions reductions, offsets are designed to stabilize overall GHG releases.

But actually reducing historic CO₂ concentrations to 350 ppm will require funding tools that support biocarbon storage as an independent objective. Since offsetting inherently trades off against current emissions, it does not address the buildup of CO₂ concentrations since humanity began massive fossil fuel burning around 250 years ago. New tools to reduce the historic buildup of CO₂ can form a parallel and complementary track to offset markets.

A keystone understanding is that **practices which build carbon storage generally synch well with provision of other ecosystem services** such as clean water, flood control, clean air, wildlife, biodiversity, beauty and recreation, to name just a few. Carbon-enhancing practices sequester carbon in biomass above and below ground. This increased vegetation and soil organic matter also retains water, buffering extremes of drying and drenching. Ecosystems rich in carbon also tend to provide good habitat for wildlife and diverse species, and often offer greater aesthetic assets and recreational opportunities.

A wide array of potential options builds biocarbon while improving other ecosystem services and economic viability. This represents tremendous opportunities. Focusing on biocarbon alone might not provide the incentives for needed practice changes in many

situations. But **supporting biocarbon as part of a broader portfolio of ecosystem services could tip the balance and spur changes.** Targeting the increase in any single ecosystem service is less important than supporting practice changes which build overall healthy ecosystems. This opens many options for improved biocarbon performance even if that is not necessarily the prime objective.

It is important to note that these are difficult areas in terms both of complexity and resource requirements. As the old saying goes, if it were easy we would have done it by now. **Building new tools and policies to support biocarbon calls for collaborative exploration that cuts across sectors,** including private landowners, public agencies, environmental NGOs and ecosystem markets organizations. This discussion in this briefing is intended to spur those discussions on a regional level in the Northwest, an acknowledged leader in developing support for ecosystem services. The “whole” that is produced should be greater than the sum of the “parts” outlined here, and even bring some new “parts” to the table.

VALUING NATURE’S SERVICES

An old saying goes, “The best things in life are free.” But free things are often taken for granted, and abused as a result. There is no set of things for which that is more true than ecosystem services where another common saying might be more fitting, “You don’t know what you have ‘till it’s gone.”

“Historically, these services have been available for free as landowners do not receive payments for the value they provide through sustainable management. Typically, they were noticed only when reduced or eliminated,” the Oregon State University Institute for Natural Resources notes. “Perceiving their loss as a failure of a market economy to provide for the common good, **environmental economists advocated for payments for ecosystem services as a way to align economic interests with land and water stewardship.** The creation of tradable credits for the development or preservation of ecosystem services has emerged as a method to provide such payments.”¹

While ecosystem services provide real benefits, they are not quantified or rewarded so economic incentives tip toward products that have a defined market. Part of the gap is met through direct regulation and public action. For example, state growth management laws preserve farm and forest land, while state forest practices rules set minimum standards for logging operations. Clean air and water rules set boundaries for pollution and runoff. Regulation is an appropriate means to achieve ends of broad social benefit. **A complementary means to ensure provision of ecosystem services is to create economic values and markets that provide incentives and efficient tools to achieve regulatory goals.**

¹ Ray Hartwell et al, *Ecosystem Service Market Development: The Role and Opportunity for Finance*, Oregon State University Institute for Natural Resources, Jan. 2010, p.iii

Ecosystem services markets are emerging for carbon, water quality, wildlife, wetlands and flood protection. For example, a water quality market is in development for the Chesapeake Bay watershed, driven by regulatory requirements to cap runoff into the bay. New York City pays forest owners to do low-impact logging to protect its upstate water supplies. Advanced efforts in Oregon are covered below.

With increased growth pressures, society will “increasingly need to find the least costly and most effective ways to mitigate for the environmental impacts,” notes Don Stuart, Pacific Northwest Director for the American Farmland Trust. “. . . **our farm and forest lands (are) where environmental gains can be accomplished at moderate cost...** farmers can typically continue to farm while enhancing these environmental values for much less than it would cost to ignore, prevent or offset them elsewhere.”

Adds Stuart, “An agriculture industry broadly engaged in selling ecosystem services will ultimately become as enthusiastic about, and as effective at producing clean water, clean air and wildlife habitat as they are today about growing wheat and carrots.”²

But overall progress toward ecosystem services markets has been slow. The Institute for Natural Resources points out that “a paucity of transactions in the early stages of market development is a challenge.” A lack of markets translates to unwillingness by landowners to take on the complex tasks of developing marketable ecosystem services products. This “in turn, leaves potential buyers discouraged. This broad chicken-and-egg dynamic has meant that **the potential to harness credit markets to meet environmental goals has been largely unrealized.**”³

OREGON: AN ECOSYSTEM SERVICES INNOVATOR

Oregon institutions are seeking to overcome these hurdles, making Oregon a national leader in developing ecosystem services markets.

Oregon’s leadership in developing carbon markets dates to 1997 when the state created the nation’s first institution to buy carbon offsets. That institution was *The Climate Trust (TCT)*, a nonprofit commissioned to develop offsets for a mandated portion of emissions from new natural gas power plants. This was the first law in the U.S. setting a carbon limit. Since its first offset purchase in 2001, TCT has channeled \$10.5 million to 18 projects ranging from Portland low-income energy efficiency retrofits to a Mt. Vernon, Washington dairy biodigester. Methane emissions eliminated by the biodigester are the basis of an effort with NW Natural; it is the first U.S. natural gas utility offering customers an option to offset emissions by supporting Northwest methane capture projects. Two forest projects in the Northwest and one in Ecuador directly support biocarbon sequestration.

² Don Stuart, *How Ecosystem Services Markets Can Transform Agriculture and Protect the Environment*, American Farmland Trust

³ Hartwell, p.iii

TCT's work now extends far beyond Oregon. The group advised the Northeast states Regional Greenhouse Gas Initiative carbon cap-and-trade system on offsets, and recruits projects and manages funds for the Colorado Carbon Fund. In 2007 TCT led creation of the Offset Quality Initiative and serves on the steering committee for the Voluntary Carbon Standard, a global effort to ensure offset performance.

From the start with TCT Oregon has generated a cluster of organizations and activities in the ecosystem service area. *Bonneville Environmental Foundation* creates voluntary markets to support habitat restoration, water conservation and renewable energy. *Portland General Electric* includes a habitat restoration option in its voluntary green power program. The Portland area has also generated a number of consultancies in the ecosystem services and credits arena.

Experience in developing offsetting deals and protocols will help push biocarbon forward generally. Financing and project management provides a knowledge base of incentives and assistance needed to propel land practice changes. This is true whether the ecosystem services support is provided by offsetting or other tools discussed later in this briefing. **The carbon credits cluster that has developed in Oregon gives the region a leg up.**

An emerging Oregon ecosystem services leadership initiative is the Willamette Partnership. An alignment of public agencies, environmental groups and industry, the partnership is developing the Willamette Ecosystem Marketplace to support a range of services. Those include clean water, fish and wildlife and carbon. The partnership was formed in 2004 as a follow-on to the Willamette Basin Study, which identified land use changes to restore salmon and other species. In 2005, the partnership began creating the marketplace with a \$779,000 grant from the U.S. Environmental Protection Agency. The group also received a conservation innovation grant from the USDA Natural Resources Conservation Service.

The Partnership is pioneering a first-of-its-kind Ecosystem Credit Accounting System to standardize values for several ecosystem services. It has regulator approval on a standard crediting process for “currencies” in four areas – wetlands, salmon habitat, upland prairie habitat and water temperature. The group is working with the *Freshwater Trust* on a currency for water quality and stream flow. It is also partnering with *Defenders of Wildlife* on voluntary market currencies for biodiversity and habitats including oak, sagebrush and bottomland hardwood. A carbon currency is planned.

The effort has generated a level of agreement among stakeholders that may be unparalleled in the nation. Twenty-five organizations have agreed to pilot accounting system protocols for the initial four currencies during 2010-11. All environmental regulatory agencies operating in Oregon are on board, as well as key environmental groups, local governments, and lands and water agencies. Data is being collected and methodology tested at sites around the Willamette.

The Partnership’s currencies system aims to solve a critical problem with ecosystem services contracting: how to credit multiple benefits from improved management.

Systems to date have only credited one benefit to avoid “double-dipping.” While avoiding such double counting is important to maintain the integrity of the projects, creative solutions must be found to provide sufficient incentives for change. So the accounting system sets up standardized means to quantify and credit multiple services generated by an action. Restoration projects are divided into ecologically distinct map-units. Landowners can then seek the best deals for map-units among ecosystem credit markets.

The Willamette Ecosystem Marketplace has opened with a nation-leading stream temperature trading program led by Clean Water Services in the Tualatin River Basin.

Overly warm water in the Tualatin basin endangers fish, so temperatures of water discharges into the river are regulated. However, improving streamside vegetation and shade cover can more economically cool stream temperatures than refrigeration equipment at treatment plants. The marketplace provides a way to shift investments from industrial plants to green plants. By spring 2010 those funds generated 35 miles of streamside restoration and native planting.

The Tualatin project is an example of a “fee in-lieu” system that provides a hybrid market-regulatory model.

The regulation provides the driver for participation. The public regulatory agency provides a market option to meet the regulation by collecting fees in lieu of direct action at the participant’s site. The aggregated funds then drive the marketplace, attracting offerings by landowners to supply ecosystem services needed to realize the overall regulatory goal.

“In a fee in-lieu program a very conscious, scientific effort is made to establish fees that will generate the right amount of revenue needed to address the problems being caused by the mitigated behavior,” Don Stuart says.

THE ROLE OF CARBON OFFSETS

In carbon offset markets, polluters pay for carbon reductions in order to balance out their own emissions. To date much of the market has been voluntary. But in systems that place a mandatory cap on carbon emissions, offsets allow emitters an alternative to meeting the cap on their own by purchasing carbon reductions outside of capped sectors. For example, utilities which are capped buy offsets from agriculture and forestry which are not. Such emitters can also buy emissions allowances from others within a capped sector who are exceeding requirements.

The Offset Quality Initiative⁴ provides this definition of the practice:

“Offsets are used in lieu of an emissions reduction, removal or avoidance that would have otherwise been required to occur within the boundaries of the emissions cap. In other

⁴ <http://www.offsetqualityinitiative.org/> viewed June 18, 2010

words, provided that the project meets the established eligibility criteria, the purchasing firm is allowed to use offset credits to meet its compliance obligation as though the firm had made the reduction itself. The essential promise of an offset is the achievement of a real and verifiable reduction in global GHG emission levels beyond what would have otherwise occurred that is equally effective as on-site emission reductions by regulated entities.”

By giving regulated emitters more options for finding and financing emission reduction projects, **offsets lower the costs associated with complying with climate legislation.** Carbon offset projects can provide lower cost options while new, more economical technologies are developed.

Don Stuart makes the case, “When you can address an environmental problem like carbon emissions less expensively than with an on-site technological fix or a reduction in operations, it frees up resources making it easier to deal with more of the problem.”

Many offset projects provide multiple environmental or social benefits beyond their climate mitigation value. **Offsets provide incentives for innovation, investment and deployment in unregulated sectors like agriculture and forestry.** They give a cap-and-trade system the flexibility to quickly funnel capital from capped sectors into new practices and technologies outside of the cap.

But the cost advantage of offsets has a flipside. **By opening reduction opportunities outside of capped sectors, offsets can reduce the incentive for clean technology innovation, investment and deployment in capped sectors.** For instance, a utility might meet a requirement to reduce emissions from its coal-fired plants by buying an offset that preserves forests instead of investing in wind and solar power. To respond to this concern, limits on the use of offsets have been proposed in many climate policy initiatives.

“The key point is that energy-related emissions – which account for the vast majority of heat-trapping pollution -- must be reduced in order to reach climate stabilization objectives. Energy technology transformation and biocarbon storage must be complementary and additive – not competing initiatives.” says Climate Solutions Policy Director K.C. Golden.

COMPLEXITIES OF CARBON OFFSETTING

Offset deals face complex requirements to assure they will really reduce carbon emissions in the amount and for the time that is claimed

“**Additionality**” is one of the many challenges faced by offsets. This means that for an offset to be credible, it must represent added carbon storage that would not have taken place without the offset purchase. For example, if a forester was already preparing to manage their lands in ways that would store more carbon, that action does not qualify as

a high-quality project. The additionality requirement can prove thorny. Proving what a farmer, forester or other offset provider would or would not do if the offset contract were absent can be highly speculative and subject to manipulation.

The Offset Quality Initiative sets out these guidelines for additionality: “Because offsets are used to compensate for emission reductions that an entity operating under an emissions cap would otherwise have to make itself, the reductions resulting from offset projects must be shown to be ‘in addition to’ reductions that would have occurred without the incentive provided by offset credits. The revenue from selling the project’s emission reductions should be reasonably expected to have incentivized the project’s implementation for an offset project to be considered additional.”

The amount of carbon that would have been stored or not emitted if the offset had not been purchased is known as the “baseline.” Here is how the Offset Quality Initiative defines the baseline: “A baseline represents forecasted emission levels in the absence of the offset project; this is sometimes referred to as the baseline scenario, or the ‘without project’ case. The difference between the baseline and the actual emissions after the offset project is implemented represents the reductions achieved by the project, and this amount is credited as an offset. Offsets are only as credible as their baselines.”

The Northwest has taken a leadership position in sorting out the additionality issue with the first forest methodology approved under the Voluntary Carbon Standard. The work was led by Ecotrust, a Portland-based effort missioned to build a conservation-based economy in the Northwest. With the protocol, forest owners will more readily be able to market offsets.⁵

Another requirement is **the quantity of carbon stored as a result of an offset purchase must be monitored, measured and verified.** This involves establishing the baseline and using technically acceptable means to track carbon additions. For example, farm soil tests are employed to measure carbon accumulations. If they do not meet contract specifications the farmer may receive a lower performance-based incentive payment because carbon delivery was lower than anticipated.

Landowners are also required to guarantee that carbon will be stored for a particular amount of time, commonly 100 years. Known as “permanence,” this obligation is tied to the property and becomes a condition in any sale.

Finally, **offset deals must ensure against “leakage.”** This is when instituting a carbon accumulating practice in one place merely shifts carbon emissions elsewhere. For example, if a contract for longer rotations in one forest resulted in a shift of timber demand to other forests, that would be leakage.

LIMITATIONS OF CARBON OFFSETS

⁵ Ecotrust, “Breakthrough Ecotrust Tool Advances Carbon Markets,” May 20, 2010

The complexities of offsetting spur skepticism about their effectiveness, and ammunition in efforts to limit the role of offsetting in carbon caps. Such concerns have undermined voluntary offsetting efforts. For example, In early 2010, Nike abandoned its offsetting program.⁶

Meanwhile, **meeting requirements can prove costly and complex, creating disincentives to participate in offset markets.** The risks are too great and the revenues they provide are too small or uncertain to be worth the hassle for many landowners, **especially smaller land owners.** Because the transaction costs associated with implementing, monitoring and verifying a project are relatively fixed regardless of the size of the project, **projects that are capable of storing large amounts of carbon are favored over smaller projects.** Current domestic offset markets, with low carbon prices due to lingering uncertainty about regional and federal cap-and-trade programs, in many cases simply do not currently provide the funding to make practice changes. If policies created a more certain and robust price signal, then many project types would become viable.

The complexities of offsetting raise questions about how many farmers and foresters will actually participate in markets.

For farming, carbon offset markets as they are envisioned will only provide limited incentives for change, says Chad Kruger, an agricultural scientist with Washington State University's Climate-Friendly Farming Project.

“By and large our group thought offsetting would not be a very effective strategy. Overall it’s too complicated,” Kruger says. However, he adds, making offset deals simpler and development of new technology for monitoring performance could help overcome obstacles.

The project has extensively analyzed the economics of offsets for dryland farming areas of the Northwest, where practice changes such as conservation tillage would curb soil erosion and runoff into streams while increasing soil carbon. But in some dryland areas relying on carbon credits alone to drive the change would take \$67-\$123 acre/year per metric ton of carbon dioxide equivalent, levels “unlikely to occur in near future.”⁷

“We have a substantial public benefit that could be achieved by making changes, but individual incentives are low,” Kruger says. “The changes farmers need to make to stay in farming for the long term are likely to provide a carbon benefit.” But carbon credits alone will not provide the incentive to make the practice change in many cases, he

⁶“Nike Makes Environmental Strides and Abandons Carbon Offsets,” *New York Times Green Inc.*, Feb. 2, 2010

⁷ K. Painter, *An Economic Analysis of the Potential for Carbon Credits to Improve Profitability of Conservation Tillage Systems Across Washington State*, , CSANR Research Report 2010-001, Washington State University, Chapter 24, p..16-17, 19.

adds. **“We need a more comprehensive plan to promote widespread adoption of new practices. The goal of policy is to accelerate the inevitable.”**

In the forest sector, “It is hard for landowners to wrap their heads around offsetting requirements,” notes Paula Swedeen, director of ecosystem service programs at the Pacific Forest Trust, a group which works with forest landowners to promote sustainable practices. **“I don’t think there’s going to be massive participation in markets. People are thinking about alternatives to offsets. We need more straightforward rules.”**

Ecotrust Forest Management CEO Bettina von Hagen comments, **“It is mind-boggling how much brain space is involved in offsetting. So doing these deals is hugely expensive.** The current tool is hopelessly complex and needs to be greatly simplified.”

Ecotrust is engaged in a project to aggregate offset offerings from smaller landowners, who alone could not handle the complexities and costs.

“If we did not see offsets as part of a larger project of incentivizing better land use practices, we would not be engaged,” von Hagen says. **“I think many forest owners would be receptive to other tools.”**

OPTIONS IN CONSERVATION AND MARKETING

A number of tools that promote land conservation and sustainable products already support biocarbon.

One land conservation tool that builds biocarbon is purchase of lands or development rights. Under the latter, landowners sell conservation easements which guarantees land will be left in forestry and agriculture and not developed. Rights are sold to developers in other areas. For example, developers may be allowed to build buildings in cities taller than standard zoning would allow. Groups such as *The Nature Conservancy* and *Trust for Public Lands* have secured large swathes of land to serve conservation goals, in effect creating carbon reserves. The *Cascade Land Conservancy (CLC)* works to preserve working forest lands around Puget Sound through leveraging development rights. CLC has partnered with King County, Washington to secure development rights on working forest lands in the old Weyerhaeuser Snoqualmie tree farm. Proposed federal legislation would allow non-profits to sell up to \$3 billion in tax-exempt Community Forestry Bonds to secure conservation lands.

Creating new marketing tools that build demand for sustainable products also builds biocarbon.

For example, forest products sustainability certification offered by groups such as the *Forest Stewardship Council (FSC)* look to improve wildlife habitat and water management. By requiring increased tree retention and longer rotations, certification criteria also build forest carbon. The *Northwest Natural Resources Group (NNRC)* builds on FSC certification to gain carbon credits for smaller landowners in the region.

Currently its Northwest Certified Forestry program includes 146 members managing 65,000 acres. NNRG Policy Analyst Stewart Matthiesen says FSC criteria can result in up to 50 metric tons of additional carbon storage per forest acre. Similarly, farm products with superior nutritional value gain premium market prices through targeted marketing. For example, Palouse wheat grown by the *Shepherd's Grain* cooperative targets improved farmer revenues and erosion prevention. The higher quality wheat is grown in a conservation tillage system that also adds carbon to farm soils.

BUILDING BIOCARBON THROUGH USDA PROGRAMS

USDA land conservation programs aimed at reducing soil erosion and water pollution promote practice changes on farms and forests. Programs help share the costs of practice changes with landowners, and pay for setting aside conservation lands. These programs constitute ecosystem services payments by government to farm and forest landowners to promote broader public interests. Though increased carbon storage is not the goal, they provide a carbon benefit.⁸

Financial and technical assistance

The *Environmental Quality Incentive Program* (EQIP) shares up to half the costs farm and forest operators incur implementing new practices and buying equipment to improve environmental performance. The program provides financial and technical assistance. In the 2008 fiscal year, EQIP provided \$1.2 billion in cost-shares, including \$80 million to Northwest farmers.⁹ *The Conservation Security Program* (CSP) provides similar support, and can support existing practices as well as changes. Northwest states in 2008 drew a \$60 million share of the \$300 million national program. The *Wildlife Habitat Incentives Program* shares costs for practice changes to improve habitat. Chad Kruger says *cost-shares are “probably #1 for general change in practice.* When money comes on the table that gets people thinking.”

Land Conservation

The *Conservation Reserve Program* (CRP) pays farm and forest owners to place highly erodible farmland in grasses and trees. One study found that CRP lands gain on average 0.27 metric tons of CO₂ equivalent per acre each year over a 4.5-5.5-year period.¹⁰ However, there is evidence that this carbon boost is short-term as the system rapidly reaches a new equilibrium in the absence of active management. All Washington farm lands set aside under USDA conservation programs sequester 1.13 million MTCO_{2e} annually, the Washington Department of Agriculture estimates. However, contracts on

⁸ For a fuller discussion of programs, see *Federal Resources for Sustainable Farming*, ATTRA – National Sustainable Agriculture Information Service

⁹ http://www.nrcs.usda.gov/programs/2008_Allocations/pdfs/FY_2008_final_eqip_state_allocations_footnoted.pdf Viewed May 4, 2010

¹⁰ *Climate-Friendly Farming Project Summary*, CSANR Research Report 2010-001, Washington State University, p.13

around 40 percent of those lands will expire by 2010, with the threat of significant carbon losses.¹¹

The *Conservation Reserve Enhancement Program* (CREP) pays to set aside riparian areas. Another conservation program that does not retire land but allows managed grazing is the *Grasslands Reserve Program*. The *Forest Legacy Program* administered by the U.S. Forest Service helps states buy conservation easements on forest land threatened by development

Outside of USDA, the National Oceanic and Atmospheric Agency, a branch of the Department of Commerce, offers help to state and local governments in securing coastal area conservation easements through the *Coastal and Estuarine Land Conservation Program*. The *Land and Water Conservation Fund administered by the Department of Interior* acquires land for parks, wildlife and open space directly and through matching grants with states.

FOCUSING BIOCARBON IN THE 2012 FARM BILL

Large opportunities to promote biocarbon are presented by the next Farm Bill revision slated for a vote in 2012.

USDA land conservation programs originated with one of the regular Farm Bill revisions passed in the mid-1980s. They grew substantially with passage of the 2002 Farm Bill. That revision was also noted for the first Farm Bill Energy Title, which now funds renewable energy production and energy efficiency in agriculture. The Section 2007 *Renewable Energy for America Program* enacted in the 2008 bill dedicates \$255 million to farm energy over a four-year period.

The 2008 bill was passed over the veto of President George Bush, who wanted to cut commodity subsidies. Farm groups representing corn, wheat and other subsidized commodity crops strongly objected, and Congress voted overwhelmingly against the cuts. **Hearings have now commenced toward the 2012 revision.** In an era of tighter budgets, debate over the farm program's future could well be fierce.

At the same time, the debate could open the way to discuss new options for biocarbon. **Devoting a greater share of Farm Bill funding to land conservation and farm energy programs would serve biocarbon goals.** To this point, Farm Bill conservation and energy programs have not been tied to carbon objectives. **Setting explicit carbon goals would help focus efforts on actions that produce the greatest carbon reductions.** For example, setting carbon goals for conservation lands could promote more active management to increase long-term carbon storage.

Oregon is setting a precedent for bringing carbon goals to USDA programs. In April 2010 USDA announced the nation's first Natural Resources Conservation Service

¹¹ *Recommendations for the Development of Agricultural Sector Carbon Offsets in Washington State*, Agriculture Sector Carbon Market Workgroup, October 2008, p.19

(NRCS) state program to explicitly include GHG reduction and carbon sequestration. NRCS is the USDA's largest conservation funder. This was the product of an initiative by the Oregon Department of Agriculture and Oregon Environmental Council, which led a multi-partner effort to advocate the change.

A vulnerability in current farm programs is pointed out by Environmental Law and Policy Center (ELPC), a Chicago-based group that has extensively working on Farm Bill and on-farm energy production. **Commodity subsidies could be ruled an illegal barrier to trade by the World Trade Organization.** WTO has already ruled against U.S. cotton subsidies in a case brought by Brazil. ELPC recommends shifting supports to farm programs which provide environmental benefits. These "green box programs" have greater leeway under WTO rules.

"We continue to think **it's an excellent reason to justify farm energy and conservation programs,**" ELPC Senior Attorney John Moore says. In any event, the goal should be to "start putting a carbon filter on Farm Bill and Department of Energy programs."

Russ Zenner, a Genesee, Idaho wheat grower and climate-friendly farming pioneer, says the long-term interests of farmers, consumers or the land would be served by a new approach to federal farm supports.

"We need changes in the farm program from the crop concept. **Instead of taxpayer support for a handful of crops, agriculture and rural communities would be better served by providing incentives for sustainable resources** – growing systems providing healthy, nutritious food. The current farm program is curbing cropping diversity."

Zenner says farm programs should focus on building healthy soils to grow diversified, high-value crops, with benefits ranging from reduced health care costs to a smaller carbon footprint. Farmers themselves are going to have to realize the need for Farm Bill change and move for change in their own commodity groups. **"It's probably going to have to come up through the commodity groups,"** the wheat farmer comments.

NEW WAYS TO SUPPORT ECOSYSTEM SERVICES

New ways to structure and shape ecosystem services markets could make them more effective and economical to operate while spurring broader participation.

One example is **contracting with landowners to implement practice changes rather than to deliver a specific performance level.** This briefing has covered the challenges of carbon offsetting, such as the requirement to monitor and verify carbon accumulation on each project. This adds significant costs, which would be reduced by paying for practices known to accumulate carbon rather than for proving specific results on each piece of land. This format can be applied to other ecosystem services as well.

Moving to practice-based options will require improved scientific understanding of how specific changes promote carbon accumulation and other ecosystem services in

specific landscapes. With that knowledge payments can be made on an expectation that overall goals will be met across the landscape. Some sites may under-perform while others exceed expectations, but there will be confidence an overall average will be maintained. All that must be verified at each site is that the practice change has been implemented and is in use.

“Practice-based transactions are a way to efficiently get to scale. They are very attractive,” says David Primozych, former executive director of the Willamette Partnership. “A really interesting idea is contracts based on whole-landscape practice change. If a broad level of agreement were reached, there would be an ability to move to scale more quickly than with current markets.”

Changing the manner in which funds are delivered could also broaden participation. For example, USDA conservation efforts are structured as programs to which farmers and forester must apply for funding. As noted above, the most they can receive for cost-share programs is half their expenses. This limits participation. An alternative model is provided by in-lieu funding such as the Tualatin water temperature market under development in Oregon.

Building on this model, **federal, state and local land conservation efforts could be structured as markets.** Large funding blocks tied to overall ecosystem services goals would create a marketplace. Landowners would bid into the market to supply services. Instead of a cost-share that requires them to spend money, they would have access to a market in which they might actually make money. Systems which set a market value for changes will reach a far broader swathe of landowners.

Don Stuart maintains, **“The first key change would need to be instituted would be to pay the full cost plus profit – an actual market rate for what the farmer is being asked to do.** If we’re going to solve any real-world problem by paying for this stuff, we’ve got to be prepared to cover what it is worth. Until we stop relying on farmer charity we’re never going to be able to accomplish the density and intensity of change needed to actually solve major problems.”

Finding ways to **credit multiple ecosystem services provided by a project rather than just one,** as the Willamette Partnership is doing in Oregon, would also bring more funding to the table.

“We need to integrate carbon storage with other benefits,” comments Kirk Cook, the Washington Department of Agriculture’s Natural Resources Section supervisor.

DIRECTING CARBON REVENUES TO BIOCARBON

Existing tools and policies provide a groundwork for a broader agenda to build the role of biocarbon in climate stabilization. Important models and experience are provided by carbon and other ecosystem services markets, land conservation payments, practice change cost support and sustainable products marketing. **But achieving CO₂**

reductions to 350 parts per million in the atmosphere, vital to stabilize the climate, will require far more extensive efforts. Adoption of new carbon-accumulating land use practices must be massively ramped up. Current tools and policies must be adopted to new challenges. New tools and policies must be developed. New resources must be brought to the table.

Ultimately, creating the widespread change in practices needed to achieve the 350 ppm goal entails a significant increase in funding. **A logical source is revenues generated through carbon regulation,** whether taxes on emissions or auction revenues from purchase of carbon credits in a cap-and-trade system.

Carbon revenues could support a number of biocarbon-building efforts:

- **Multiply funding for land conservation programs** and other federal, state and nonprofit efforts to preserve working and conservation lands.
- **Develop new markets, business models and mechanisms** for delivering ecosystem services and verifying performance.
- **Support building new markets and businesses** in high-quality wood and food products, bioproducts and bioenergy.
- **Provide federal public lands agencies with new resources** for actions to improve forest health and carbon storage such as road closures and restoration forestry.
- **Build knowledge and experience of carbon-accumulating practices and technologies** through greatly increased research, development and demonstration efforts.

New income streams in addition to offsets are being envisioned in federal climate legislation. The Kerry-Boxer and now Kerry-Lieberman bills include language that would direct funding from the sale of emission allowances to pay private landowners to sequester more carbon. This would be done through direct contracts outside the offset market. Vehicles such as USDA conservation programs could be used to funnel this money through existing federal infrastructure, but the source of funding would be entirely new through the sale of carbon emission allowances.

“This approach has the advantage of using forest-based carbon sequestration as a complement to, rather than a substitute for, reductions of emissions within the fossil fuel sector,” says Paula Swedeen. “In addition, money from the climate bill is directed to fund more voluntary conservation easements, which are a crucial source of income to assist with transitioning to new ecologically-based forestry models, and to prevent the loss of sequestration potential in the first place.”

Federal climate framework legislation that sets a price on carbon emissions must be passed. Employing carbon revenues to directly support new biocarbon-building practices in farming and forestry is a vital step to reach target 350. The investment will also yield many other economic and environmental benefits for those sectors, the nation and the world.