

Net-Zero Soil Erosion is Iowa's Common Ground For a Resilient and Sustainable Food System in 2050

A Call to Action

2050 Food System Vision Prize Sponsored by the Rockefeller Foundation

By the Iowa Food Systems Vision Youth Team
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NOTE TO READER: To fully evaluate our submission according to the selection criteria, please read the other application questions first. This document is a call to action written to connect with and inspire our fellow Iowans. It represents the current thinking and aspirations of the Vision 2050 Youth Team from Iowa and is not a commitment from our sponsors.



Call to Action

Building this future food system will happen over the next 30 years, and we need your help. It is vital that people start taking action now to design the future that we want in 2050. This is especially important for young people, because we will be living that future.

Here is a list of actions you can take to help Iowa move toward a sustainable food system by 2050.

1. Support sustainability focused farmers. This is not easy to do, and often requires getting to know people personally, getting your shoes dirty at the farms you are buying from, and seeing for yourself. Some ways to do this are to go on field days through Practical Farmers of Iowa, the World Food Prize, and other organizations. You can meet farmers at local markets, sign up for Community Supported Agriculture shares, and focus your diet on the quality of food you eat, not the quantity. Keep in mind, big can be sustainable. There are some great large-scale farms that produce high quality food while nurturing their ecosystem.
2. Educate yourself and your community. Growing a plant will help you understand just how difficult it can be to grow food and give you an appreciation for everyone who helps make the food system work. There are great YouTube videos about what it is really like to be a large-scale commodity grower.
3. Support Public Action. Voicing your desire to local, regional and statewide representatives for a resilient and sustainable food system is a great starting point.
4. Contribute your ideas. Everyone trying their best and taking a diversity of approaches is what will help us succeed. Net-zero soil erosion is a great starting point, but we will need to keep building to achieve more resilient and sustainable food systems.
5. Become a member of the Soil Rescue League in the fall of 2020. This is an organization we are working on to help unite a diverse range of stakeholders around net-zero soil erosion in Iowa. Through this organization we will organize collective action, send invitations to farmer field days, and inform you on ways that you can help move Iowa toward net-zero soil erosion by 2050.

The goals we have listed in this application and the actions you take are the initial steps on the long road to 2050. By working with a broad coalition, allowing for a diversity of approaches, focusing on net-zero erosion as our common ground, and learning from mistakes, we can unite as Iowans to keep making progress toward a resilient and sustainable food system.



Perennial Crops and Orchards



Working Together for Nutritious Food



Farm Tourism and Value-Added Crops

Iowa's Resilient and Sustainable Food System of 2050

Imagine a 2050 where Iowa still has the highest yields for corn and soybeans anywhere; every Iowan has nourishing food that allows them to develop to their fullest potential; our natural environment is thriving; our economy has grown even stronger by capitalizing on a diverse range of incomes resilient against system shocks; agricultural companies have propelled us into another agricultural revolution through sustainable technologies; our culture is reinvigorated through a common purpose that inspires youth and unites rural and urban communities; and our governmental policies encourage a focus on well-being, support ecological services, and lead to an increasingly sustainable food system.

We can create this future, and it will start with something we all agree on – protecting and building soil is the foundation of Iowa's future prosperity.

Achieving net-zero soil erosion in Iowa by 2050 is a worthy goal for everyone because soil is the foundation of economic prosperity for producers and preventing erosion will improve environmental quality for consumers. Additionally, actions taken in a united effort to create net-zero erosion will have positive impacts on the cultural, political, dietary and other challenges facing Iowa. Beyond the state, reduction in pollution levels will reduce the dead zone in the Gulf of Mexico.

In this positive vision for the future:

- Farmers connect with this new mission and pursue it with the can-do attitude that they have always had. The conservation programs and income from selling carbon credits means that farmers can make ends meet without the pressure of having to plant on vulnerable acres.
- An Erosion Reduction Hero is recognized every year at the Iowa State Fair (still the single largest event in the state with over a million visitors per year). Farmers appreciate the social recognition for their role as land stewards and enjoy showing off the newest tractors and the latest inventions in sustainable agriculture practices.
- There is an increasing diversity of farms supported across the landscape. People are growing a wider range of crops and bringing back the varieties their grandparents used to use. Old timers that remember the nuts-and-bolts of how to include oats and grazed pasture into a crop rotation with corn and soybeans find that they are getting a lot of questions. Seed Savers, an organization that preserves heirloom vegetable varieties, is receiving submissions from across the state and no longer needs to go searching for seeds. In fact, gardening has become popular again, and neighbors regularly swap seeds of their favorite vegetable varieties.
- Peri-urban farms serve as a cultural bridge and educational hub. Schools take field trips to their community garden just down the block to learn about biology, soil, conservation, and healthy eating. Cooking classes are held on the farm to help teach people about how to use fresh produce in their cooking and to demonstrate where food comes from.
- Teachers take on the role of instilling conservation ethics in young people, thus becoming some of the most important protagonists in the net-zero erosion story.

- Grocery stores become the champions of local farmers and regularly host “Meet Your Farmer” to build community and boost sales. The new Net-Zero Erosion label is all over the produce section of the grocery store from May to October and can be seen year-round in the dairy and canned goods aisle. Shoppers strongly prefer these products because they know they are helping the environment and supporting the local economy. (After COVID, people started to realize that having at least some local supply chains could help avoid shortages in a crisis.)
- Policy makers ensure this is a movement accessible to all of Iowa by creating synergy between sales for sustainable farmers and low-income families’ access to nutritious, local food. When the 10% of Iowan families who benefit from the Supplemental Nutrition Assistance Program spend \$15 on net-zero erosion certified products with their SNAP electronic benefits transfer card, it only counts as \$10 against their monthly balance.
- The Raygun Shirt Company is still as popular as ever, and now features net-zero erosion clothing with phrases like “**EROSION: Everyone Realizes Our Soil Is Obviously Needed**” and “Don’t farm naked. Plant cover crops”. You can see all kinds of people wearing these shirts, from urban hipsters to rural grandparents. Though the grandparents often say to the kids with a smile, “Hey. I was net-zero soil erosion back in 2020 before it was cool.”
- Youth organize around the cause of resilient and sustainable food systems and come up with creative ways to improve beyond the initial idea of net-zero soil erosion.



Prairie Strips On the Farm

This can be part of the beautiful quilt that is Iowa’s Food System in 2050. Soil is our common ground for aligning the incentives of farmers, city dwellers, agricultural technology companies, policy makers, and others. By committing to net-zero soil erosion by 2050, we are committing to a healthy, sustainable, and profitable food system for all.

Iowa’s Current Food System

The overall food system in Iowa can be seen as two main sub-systems. One system of agricultural production designed to produce commodities like corn and soybeans for export and a second system of consumption designed to supply the 3.2 million residents with food imported from other locations. These two systems are linked and have some exchange, but in general, the overarching system is structured so that producers and consumers have different goals and opposing incentives.

Farm legacy and debt from land and large equipment pushes Iowa farmers to produce commodities like corn, soybeans, pork, and eggs. These commodities have been undergoing decreasing price margins for decades incentivizing farms to get as big as possible and increase yields. This is exacerbated by a reliance on government subsidy programs that are limited to the major commodity crops and reward farmers based on yield. Technology such as biotechnology and automated tractors are readily adopted because they facilitate efficient production. Focusing on

commodities has a negative effect on diets as the production system shifts away from vegetables and fruits. Producers are rarely incentivized for positive environmental outcomes like reducing pollution or improving soil quality and so environmental protection is often deprioritized. Farmers would like a way to escape the current system, but they are primarily concerned with the short-term financial survival of their operations and exert significant political pressure to preserve the status quo of subsidy programs.

Consumers desire healthy food and better environmental quality but often take action based on lower food prices which generally has a negative impact on dietary choices and worsens the economic squeeze felt by farmers. There are some efforts to purchase sustainably grown food, but these dollars mostly go to large organic brands with producers in other locations and do not directly impact the local food system. Consumers place a high value on environmental protection, but there is not a clear path to rewarding those who protect the environment. Consumers do not receive direct benefits from the technologies implemented by farmers and are concerned about potential risks. Consumers are generally unengaged in the political process of the food system because the individual reward received is small relative to the effort required to participate.

Previous efforts to impact change have had limited success because they were one sided or tried to address a problem in isolation.

An Opportunity for Change

There are many signals suggesting that now is the time to realign these two separate systems into one sustainable food system that works for Iowa.

Farmers have been looking for a way to diversify their income and become more resilient. Since 2014, the prices for Iowa's major crops have been under the cost of production. Medium sized farmers are going out of business and the farmer suicide rate is five times higher than average.

Demographics of the food system will drastically shift in the coming years as 60% of Iowa farmland is now owned by people over the age of 65. This will provide an opportunity to shift the food system toward the priorities of the next generation.

Technological advancements in remote sensing and watershed monitoring have made it possible for the Daily Erosion Project at Iowa State University to make daily estimates for erosion in every county, and within the next 10 years it could be possible to assess erosion on even smaller scales.

There are strong signals that it will be possible to create a market for sustainable farming practices enabled by technological advances. Startup companies like Farmers Business Network, Land O'Lakes TruTerra, and Indigo are using the next generation of on-farm sensing, machine vision, and crop modeling to provide acre level estimates of how a farmer's practices will impact yield, erosion, water pollution, and profits. Tens of millions of acres have been enrolled, and Iowa farmers are some of the biggest customers for these services. These companies have identified the massive market potential for selling farmer provided ecological services in the form of carbon credits, sustainability vouchers, or some other instrument.

An increasing number of consumers are supporting regenerative farming systems with their purchases. Iowa ranks tenth within the US for sales of organic products with 65% growth trend from 2012-2017. CSAs continue to proliferate as the number of vegetable farms grew by 10% over the same period. Iowans increased their purchases at farmers' markets by 92% from 2004 to 2009. As cities continue to grow, the influence of consumer groups will become stronger.

Iowans are collectively striving to improve environmental quality. About \$500 million/year has been spent on water quality efforts and a statewide monitoring networks have been established to measure erosion, water pollution, and implementation of conservation practices.

The pandemic of COVID-19 has highlighted the vulnerability of global supply chains. There have been widespread shortages of meat in grocery stores as production plants shut down due to worker illness while simultaneously over 600,000 pigs have been euthanized in Iowa and buried because the animals will be too big to run through the industrial processing lines once they reopen. These emergencies have helped many stakeholders realize the importance of building resilience into the future food system.

The worldwide trends of globalization, increased automation, and mechanization of jobs could go two ways. They could reinforce the current system and further entrench its challenges. Or we could use them to build upon Iowa's strengths of work ethic, community, and compassion to propel us toward a food system that is equitable, productive, and profitable for everyone.



Family Farming



Leading Goats to Pasture



Farm Field Day

Net-Zero Soil Erosion is Iowa's Common Ground

Striving to achieve net-zero soil erosion is Iowa's common ground for aligning incentives toward a sustainable food system that results in healthy food, land, water, air, farms, families, and communities.

Imagine if everyone in Iowa worked toward net-zero erosion.

This shared goal would create a cultural movement that bridges rural-urban interests. Iowans already care about their agricultural heritage and consumers and producers would be aligned toward a common goal. Preventing erosion benefits everyone by pollution reduction and preserving our foundation of economic productivity.

The momentum from this shared goal could help overcome some of Iowa's longstanding political and economic stalemates by generating the will to add to the current subsidy system to reward producers who meet the standards for net-zero soil erosion rather than just commodity yields.

Technological advancements in remote sensing and artificial intelligence have made it possible to update the existing Iowa Surface Water Monitoring Network to accurately track erosion. Innovations in cover crops and other soil protection methods can help producers meet the erosion standards. Farmers using technology that clearly improves the environment will further strengthen community relations with consumers in the food system.

The environmental impact would be significant as producers alter their practices to reduce erosion. Runoff levels of nitrates and other chemical pollutants would decrease and water utilities downstream would begin to see an improvement in drinking water quality. As well, Iowa would have less impact on the dead zone in the Gulf of Mexico. Cover crops and other soil protection methods also increase levels of carbon stored in the soil which boosts nutrients for farmer yields, increases water holding capacity to help with drought, and removes CO₂ from the atmosphere.

Diets would be affected because systems designed to reduce erosion require a diversity of crops that keep the soil covered for a greater period of the year. Increasing dietary diversity within Iowa has the potential to drastically improve nutrition and health. Vegetables grown in healthier soil tend to have a higher concentration of nutrients. Aligning economic and political incentives to support crop diversity to reduce erosion will also shift the prices in the grocery store to favor nutrition instead of calories. This will help fight hidden hunger while also supporting the one in nine Iowans who are currently food insecure. Often, this is an economic issue of not having enough money for food, and economically supporting nutritious foods can have a big effect.

The state of Iowa could use policy to target public conservation dollars on the most vulnerable 20 percent of land, which have been proven to account for 80 percent of the current erosion and water quality problems.

A new Net-Zero Erosion certification that verifies erosion rates and storage of organic carbon in the soil could be developed by the Iowa Department of Agriculture. This certification has the potential to make conservation practices at least as valuable as the supports for high input agriculture through payments for ecological services. The global market for carbon credits alone was \$215 billion in 2019. The Organic certification is a good example of just how rapidly a government certification can transform the food system.

Economically rewarding producers that reduce erosion through adding conservation-based subsidies to the current subsidy system provides an escape from the commodity trap they currently face and eases the transition to a more diverse economic system that reflects the community values of Iowa and reduces the external costs imposed by pollution. Protecting and building soil is the foundation to protecting Iowa's future prosperity.

By shifting individual priorities and systemic incentive structures to achieve net-zero soil erosion, consumers and producers will create a series of positive changes that results in a nourishing and sustainable food system.

Implementing Our Future

Scaling this vision to achieve net-zero soil erosion across Iowa will take broad support. Engaging youth is critical because they will be the ones participating in the food system of 2050. We need to continue growing the coalition of farmers, consumers, food retailers, researchers, NGOs and other groups that support this vision. This will entail educating consumers about the importance of soil and helping farmers understand how net-zero erosion practices can fit within the context of their operation. Practical Farmers of Iowa has a long history of using on-farm demonstration trials to educate about conservation practices and build partnerships to ensure implementation.

Build Awareness. Net-zero erosion should be part of the vocabulary of every Iowan just like caucus, flooding, and corn-on-the-cob. Getting soil and erosion into the school curriculums can go a long way. Partnering with organizations like the Iowa Agricultural Literacy Foundation can leverage existing education networks. Holding a benefits concert like Farm Aid in the 1980s could be a great way to popularize net-zero erosion in Iowa. Continuing to hold engagement events with key stakeholders will help shift thinking in critical organizations.

Demonstrate Feasibility on Farms. Getting support from diverse stakeholders will require on-farm trials demonstrating the feasibility of this vision. Over the next three years, Practical Farmers of Iowa can demonstrate the feasibility of the net-zero erosion vision by linking forward thinking farmers who track erosion and soil organic carbon to markets that pay for these environmental services. Practical Farmers' strategic initiatives team launched its first collaborative project with a supply chain partner in 2015 – at that time to add cover crops to farms growing soybeans for Hellman's mayonnaise. Today, PFI is a partner on seven different supply chain projects that reach 353 farmers and span 66,761 acres. PFI can build on this success to advance net-zero erosion. Movements that have momentum gain more momentum.



Testing Cover Crops

Advance Erosion Monitoring Technology. In three years, Iowa should be able to construct a robust erosion monitoring network that is accurate down to the acre. This can be achieved by building on the existing Iowa Daily Erosion Project and partnering with private companies like Farmer's Business Network or Indigo to leverage their existing technology for farm analytics. Once complete, this network can be used to identify the most critical 20% of acres that can have the largest impact on erosion and environmental goals. With the experience and lessons from the PFI trial programs, statewide conservation programs can begin to focus on scaling up these methods to the 20% of critical acres. This will provide the highest return on investment, offer the most potential for success, and provide practice in scaling up before making a state wide effort.

Expand Markets for Net-Zero Erosion Products and Carbon Sequestration. Markets for net-zero erosion products and carbon sequestration will need to grow beyond the connections made in early farm trials. Hopefully startup companies will succeed in linking producers to supply chain buyers through technology in a way that can scale broadly. Creation of a Net-Zero Erosion product label by the State of Iowa would also help enable the economic opportunities of sustainable practices.

Reward Net-Zero Erosion Practices at Scale

Scaling up government programs that reward net-zero erosion practices will reduce reliance on commodities, giving farmers an opportunity to escape from the pressure to “get big or get out.” With these new incentives, medium sized farms will become more viable. As well, diverse farming operations will be on equal footing for government support because ecological services are crop independent. Diverse crops like fruits and vegetables can earn more per acre, but also require more work. These factors will combine to provide more opportunities for people in Iowa to make a living wage.

Farmer adoption can take time, but we hope that the win-win opportunities provided will help Iowa become a net-zero erosion state by 2050.



Building Connections through Food Systems



Visiting a Peri-Urban Farm on a Field Day