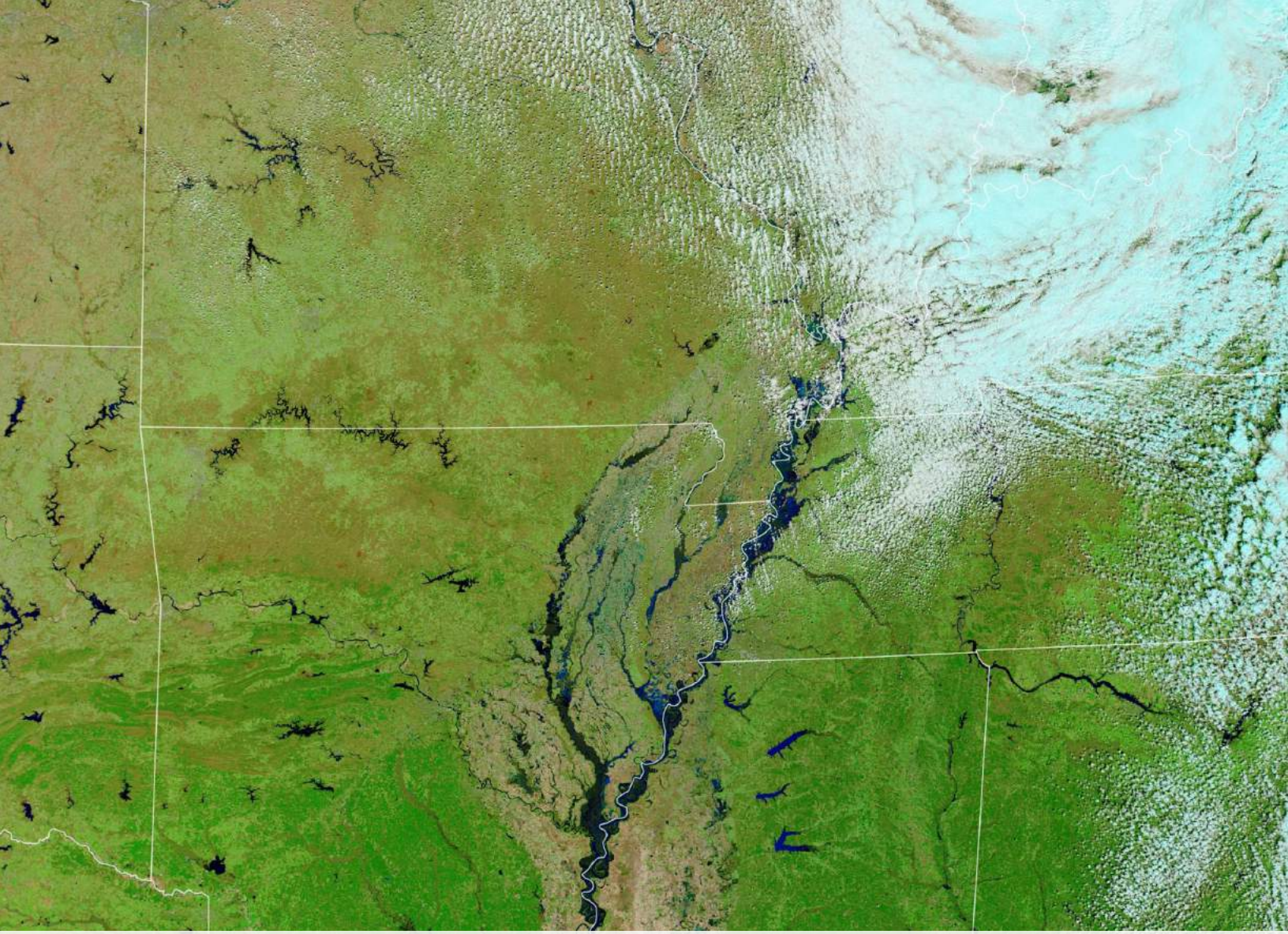

Strengthening Corporate Sustainable Sourcing Commitments for Water Quality in U.S. Row Crops

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Ceres

MERIDIAN INSTITUTE

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With more than 30 years of leadership and proven results, we're more confident than ever in the business case for sustainability. We know a just and sustainable global economy benefits both people and the planet. And we know that investors and companies that integrate sustainability into decision-making outperform their peers.

Ceres' unique theory of change is to move investors, companies, policymakers and other capital market influencers to take action. Over the years, we have built influential networks of investors, companies and nonprofit organizations that have grown exponentially in size, scope of work and depth of engagement. By equipping these leaders with science-based research and innovative tools on sustainability risks and opportunities and deploying them, we have created a powerful formula for transforming the global economy.

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INTRODUCTION

Food and agriculture companies are increasingly making commitments to sustainably source commodities and raw materials throughout their supply chains. These commitments vary widely in geographic scope, the commodities covered, intended outcomes, and methods of measurement and implementation. A subset of company commitments focus on the impact of conventional row crop production (e.g., corn and soy) and on water quality outcomes in the United States (U.S.). Ceres and the Meridian Institute collaborated to conduct an analysis of some of the unique factors associated with U.S. row crop production and water quality outcomes. This analysis outlines options and best practices for companies working with their supply chain to reduce nutrient and sediment loading, and provides recommendations for developing and implementing strong commitments to incentivize row crop producers to improve water quality outcomes in the U.S. Mississippi River Basin. This analysis is heavily informed by 27 interviews that surface unique insights from company representatives, conservation and sustainable agriculture organization members, farmers, and other experts.

ROW CROP PRODUCTION IN THE MISSISSIPPI RIVER BASIN

The Mississippi River Basin is vital to U.S. and global agriculture and food production. Corn, soy, wheat, cotton, and rice grown in the Mississippi River Basin contribute to the global food supply, supply ingredients for livestock feed, and provide inputs for biofuel production.

The Mississippi River Basin produces 92% of the nation's agriculture exports, 78% of the world's exports in feed grains and soybeans, and most of the domestically produced livestock and hogs.

Agriculture production in this region is associated with significant water quality impacts:

Nutrients Agriculture runoff, especially from row crop agriculture and animal feeding operations, is the largest source of excess nutrients (in particular nitrogen and phosphorus) in the Mississippi River Basin. Nutrient pollution in the river can impair drinking water and result in algal blooms, which has created hypoxic conditions and contributed to a significant "dead zone" in the Gulf of Mexico (see image below).

Sediment Excess sediment caused by soil erosion degrades water quality and impairs wildlife habitats.

Chemical pollution Pesticides, herbicides and fungicides that run off fields and into surface and groundwater can be detrimental to water quality downstream and can have negative impacts on the health of humans and other species.

Federal and state regulation is frequently insufficient to address these complex, multi-source challenges. The Clean Water Act regulates the discharge of pollutants into surface waters from "point sources," such as factories and water treatment plants, but stemming "non-point sources" such as agricultural runoff is beyond its main scope. State and local government responses to water quality vary, but often focus on voluntary measures rather than regulation. Laws or regulations that do exist tend to focus on requiring nutrient management plans, application restrictions (less common), and applicator certification and education (primarily focused on feedlots or chemical application).

As a result, there is a significant opportunity – and imperative – for private sector actors that source agriculture products to work with farmers and the broader agricultural supply chain to incentivize farming practices that reduce water quality impacts.

4

FARM-LEVEL SOLUTIONS

A range of in-field conservation practices improve water quality outcomes through water infiltration and reduced erosion and nutrient run-off. These practices also often result in many other environmental co-benefits, such as improved soil health, increased carbon sequestration, and improved wildlife and pollinator habitats. Notably, some of these practices have also been shown to demonstrate economic benefits over time through reduced input costs and improved yields. Conservation agriculture practices that promote soil health and water quality improvements include:

Nutrient optimization Managing the amount, source, placement, and timing of fertilizer to optimize yield without applying in excess. This optimization is often accomplished with precision technology practices such as yield mapping, remote sensing, soil testing, and variable rate application.

Crop rotation Growing different crops on the same piece of land season after season in a planned, recurring sequence. This could involve a rotation from corn to a legume, small grains, (wheat, barley), or oilseeds. Extended, more complex rotations typically provide stronger water quality and soil health benefits.

Conservation tillage/direct seeding In a traditional farming system, the soil is turned to prepare the seedbed and control for weeds. In no-till, direct seed, and reduced till approaches, the soil is disrupted as little as possible, leaving maximum plant residue on the surface.

Cover crops Grasses, legumes, or forbs (herbaceous flowering plants) are planted to provide seasonal soil cover on cropland after the primary harvest, when the soil would otherwise be bare. Cover crops are generally not intended for harvest or sale, although some growers earn revenue by integrating livestock feeding into their cover crop systems or planting an overwintering cash crop such as winter wheat.

5

Meeting water quality goals requires combining in-field nutrient management practices with downstream nutrient removal practices such as bioreactors, filter strips at the edges of fields, and the creation and restoration of wetlands and floodplains. Downstream practices include:

Buffer strips Buffer strips are areas that are permanently vegetated to trap sediment, slow runoff, and trap nutrients and pesticides.

Drainage water management Drainage systems that include water control structures to control soil moisture levels can reduce nitrogen and phosphorus losses by retaining water following fertilizer application.

Bioreactors Bioreactors are passive filtration systems that use bacterial processes known as denitrification to remove nitrate from water that drains from farm fields.

DEFINING THE SUSTAINABLE SOURCING CHALLENGE

Several factors unique to row crop supply chains pose challenges for companies looking to sustainably source row crop commodities:

Water quality is difficult to measure and attribute to farm-level actions. Testing for nutrients and chemicals in water is time-consuming, slow, and expensive. Remote sensing can provide some information on sediment transport, but the technology is not adequate for monitoring applications. As a result, most monitoring focuses on either self-reported or independently verified farm practice adoption.

Non-operating landowners own 60% of Midwest farmland. Farmers and landowners are not always aligned in their commitment to create solutions for soil health and water quality.

Traders, aggregators, and other supply chain actors are important in row crop supply chains, and often don't have the same motivation to make sustainability commitments. Consumer-facing companies and brands often make sustainability commitments in response to pressure from consumers and/or concerns about reputational risk. In the conventional row crop supply chain these consumer-facing companies often do not have direct relationships with farmers, but purchase grain via grain aggregators, traders or on commodity exchanges. Because these actors are less visible to consumers, they often do not have the same motivation to make sustainability commitments.

Water quality solutions require context-rich decision-making. Local context is important when implementing farm-level practices to improve water quality. A practice that works well in one geography may not be appropriate or achieve the same degree of success in another. Furthermore, available technical and financial support and infrastructure for agricultural practices that improve water quality may vary by area.

Trusted advisors may not provide information that furthers conservation practices. Farmers often rely on their agricultural input suppliers — often agriculture chemical and seed companies — for advice, education and information to inform their decision-making. Agronomists from input companies are not incentivized to suggest practices and farm activities that result in reduced use of farm inputs such as fertilizer and pesticides, and therefore may not encourage conservation agriculture practices that promote soil health or water quality improvements.

Despite these challenges, many farmers and private sector actors welcome voluntary or market-driven actions that lead to positive outcomes for the farm, environment, and society.

ESTABLISHING MEANINGFUL COMMITMENTS

Meaningful corporate sustainable sourcing commitments should be:

Science-based, timebound, quantifiable, and verifiable. They should be ambitious, but achievable. And they should include plans for implementation. Commitments or implementation activities should first target watersheds that are most water quality impaired or high-risk.

Currently, company commitments to address environmental sustainability concerns in their agricultural supply chains tend to fall into three categories:

Measurement commitments in which companies commit to working with farmers and supply chain partners to deploy tools that measure environmental outcomes of agricultural practices for a certain number of farms or acres.

Practice adoption commitments which target specific producer practices that are expected to lead to the desired outcomes.

Outcome-based commitments which aim to achieve a specific environmental outcome directly linked to an on-the-ground change.

Water quality outcomes can be difficult to measure at the farm-level, which has implications for how companies have — and could — approach sustainable sourcing commitments.

8

MEASUREMENT COMMITMENTS

Some companies are committing to use a farm-level measurement tool as part of their sustainable sourcing efforts. Companies have access to several existing tools for measuring sustainable agriculture outcomes within row crop supply chains, including the Fieldprint Platform developed by Field to Market and the Cool Farm Tool from the Cool Farm Alliance. Each of these tools has a slightly different focus and they vary in what, specifically, is measured. Only the Fieldprint Platform includes an assessment of water quality, relying on the USDA Natural Resource Conservation Service (NRCS)'s Water Quality Index for Agricultural Runoff, a qualitative assessment based on farmers' inputs, and providing a water quality score on a 10-point scale. Other companies develop internal tools for measuring sustainable agriculture outcomes.

Examples of companies making measurement commitments include:

General Mills has a goal to sustainably source 100% of its top 10 priority ingredients by 2020. For U.S. wheat, corn and sugar beets, the company defines "sustainability" as "driving towards continuous improvement using Field to Market framework or comparable metrics with at least 25% of acres under measurement. The company uses a performance dashboard to track progress by commodity.

Unilever has a goal to source 100% of its agricultural raw materials sustainably: 10% by 2010; 30% by 2012; 50% by 2015; 100% by 2020. The company defines sustainable sourcing for each commodity through certification standards or through its sustainable agriculture code.

The Kellogg Company set a goal of responsibly sourcing its ten priority ingredients globally by 2020. For row crops like corn, wheat, rice and potatoes, the company defines responsible sourcing as "measuring continuous improvement at the field and farm level across key environmental and social indicators of sustainable, responsible agriculture." The company is working with suppliers to use tools like the Field to Market Fieldprint Calculator, the Cool Farm Tool and the Sustainable Agriculture Initiative's self-assessment and their own Grower Survey to collect data and measure progress.

Measurement commitments can be an effective first step for companies seeking to understand the impacts of their supply chains and create platforms for collaboration with partners to improve their collective sustainability performance. However, it is unclear whether measurement commitments are sufficient to motivate farmers to adjust their practices, with many interviewees indicating that measurement commitments are important, but not sufficient. For this reason, it is key that companies go beyond baseline measurement and use the data they collect to improve the targeting of incentive and education programs for growers, as well as to inform the development of practice- or outcome-focused targets and commitments.

PRACTICE ADOPTION COMMITMENTS

Because of the challenges associated with measuring key outcomes such as nutrients, sediment or chemicals in the water due to farm runoff, many existing sustainability targets focus on the adoption of farm-level practices such as cover crops, no-till practices, or nutrient management. Self-reporting or independent verification is used to verify farm-level practice adoption. Though the science linking farm-specific practices to water quality outcomes is not fully mature, good evidence suggests that the incentivized farm practices do improve water quality and have important co-benefits.

Examples of practice adoption targets include:

Campbell Soup Company has a goal to reduce nitrogen fertilizer applied per ton of tomatoes 10% by the end of 2020, as compared to 2012.

General Mills has committed to "advance regenerative agriculture practices on one million acres of farmland by 2030," with a specific focus on practices that minimize soil disturbance, maximize crop diversity, keep the soil covered and maintain living roots year-round. General Mills recently added water as a fourth measured outcome in the company's regenerative agriculture framework and included improved water stewardship as a holistic outcome in its post-2020 regenerative sourcing strategy.

Tyson Foods has committed to support improved environmental practices on two million acres of row crop corn by the end of 2020, with a focus on encouraging grain farmers to adopt more efficient fertilizer practices, as well as adopt other measures to reduce water runoff and soil loss.

Some companies have not made a specific, quantitative or time-bound commitment to practice adoption, but have taken steps to support farmers in pursuing conservation agriculture practices such as cover crops. For example:

PepsiCo and **Unilever** are offering Iowa farmers cash incentives for cover crops in programs managed by Practical Farmers of Iowa. In a separate program, **PepsiCo** is now offering similar cover crop incentives to farmers who deliver corn directly to **Cargill's** corn processing plant in Kentucky.

Archer Daniels Midland has committed to providing a lump-sum or premium incentive to any farmer who participates in its sustainable agriculture programs for parts of its U.S.-based corn, wheat and soybean acres. The programs encourage specific practices such as cover cropping and optimization of fertilizer application, as well as the use of farm management software to measure and track soil health and water quality.

Danone North America has established funding to help farmers in its supply chain convert to organic and regenerative practices. The company has partnered with an impact investment firm to establish a $20 million debt fund. The company is also working with the National Fish and Wildlife Foundation to leverage USDA funding to support soil health.

Smithfield Foods is supporting improved fertilizer management through several programs, including a nitrogen management system. The company also provides farmers with a discounted price on seeds to encourage planting winter wheat as a cover crop.

These practice adoption of commitments can be easier for companies that have direct relationships with producers since implementation is at the farm level and market mechanisms to readily source row crop commodities grown using specific farm practices are limited. For companies without direct producer relationships, it is important that they work with traders (specialty or mainstream), rely on independent verifiers (where available), or source directly from farmers for the portion of their supply covered under the commitment.

OUTCOME-BASED COMMITMENTS

An outcome-based commitment would tie a company's commitment directly to the desired on-the-ground change. With water quality, for example, this could be a percentage reduction in nitrogen (or sediment, or chemical) runoff from specific farms, or within a sub-watershed.

Other corporate sustainability commitments that target something other than water quality, such as greenhouse gas (GHG) emissions, increasingly use outcome-based commitments. Rather than focus on activities or outputs, these commitments focus on outcomes such as a measurable reduction in emissions or water use.

Most outcome-based commitments are articulated in terms of percent improvements. Increasingly, companies are considering science-based targets — an outcome-based commitment that specifies how much and how quickly a company needs to make changes based on the best available science. Most science-based targets to date have focused on climate change and GHG emissions, and a growing number of food companies have set science-based targets for reducing Scope III supply chain emissions. For example:

The Kellogg Company has committed to a 15% reduction in emissions by 2020 from a 2015 base-year (Scope 1 and 2), as well as to reducing the absolute value chain emissions by 20% from 2015-2030 (Scope 3), in alignment with science based targets.

To date, no clear examples of companies making specific, outcome-based commitments related to water quality impacts exist. Measuring water quality outcomes associated with conventional U.S. row crop production is challenging because of limitations in current testing technology and the difficulty with connecting outcomes to specific farm activities.

Some companies have included water-use or water quality targets into their sustainability commitments, working to define and measure targets despite the challenges in measurement methodology:

Mars has a long-term stewardship goal of ensuring water use is within annually renewable levels, by watershed. Recognizing the lack of methodology for defining science-based water targets, Mars introduced context-based water targets (CBWTs) based on science and informed by stakeholder consultations. Mars also has short term targets, such as improving water intensity by 15% in factories in water-scarce locations by 2020, and halving the gap to sustainable water usage levels from 2015 to 2025. The company relies on the WRI Aqueduct tool to measure progress towards its sustainable water use and water intensity goals.

PepsiCo has a target to improve water-use efficiency 15% by 2025 in areas of high-water risk in its direct agricultural supply chain. This goal is informed by an evaluation of the company's water footprint in watersheds critical to the supply chain.

OTHER COMMITMENT ELEMENTS

In order to achieve water quality improvements in the Mississippi River Basin, more companies must set rigorous sustainable sourcing commitments. Ensuring that these commitments drive sustained improvements in water quality outcomes will likely require a number of complementary elements that support implementation and watershed-level actions. Our analysis generated a range of ideas for strengthening commitments, some of which are ready for implementation while others may be further in the future. These ideas include:

Supplier incentives and support To be effective, commitments must include tools or mechanisms to support implementation by suppliers, such as:

- **Funding for trusted expert agronomists** who can provide advice to farmers about the implementation of good farming practices that help farm profitability and improve environmental outcomes.
- **Creation of peer networks** to share information and overcome social stigmas associated with the adoption of new practices.
- **Cost or risk-sharing for new practices** which can include cost-share programs for new equipment (e.g., precision agriculture systems), operating costs (e.g., cover crop seed), infrastructure (e.g., storage and transport for third rotation of small grains), or long-term contracts for sustainable practices.

Watershed action in impaired watersheds Improving water quality typically requires coordinated action by multiple stakeholders in a watershed. Companies should engage in coordinated efforts at the level of a watershed or supply-shed to support specific actions or activities that improve water quality and watershed health. Companies could overlay information on impaired watersheds with sourcing regions (supply-sheds) to prioritize watersheds where water quality action is most needed and that are major sources of commodity production. Companies can also invest in multi-stakeholder watershed stewardship coordination. For instance, **General Mills** has developed multi-stakeholder watershed stewardship plans for eight priority watersheds as part of the implementation of its sustainable-sourcing commitment. Funding can support convening multi-stakeholder groups, planning activities or developing technical expertise. Companies could also direct funding dollars to specific watershed priorities, restoration projects, infrastructure needs or monitoring/testing costs.

Sector-wide collaboration Precompetitive collaboration on sustainability and water quality goals could result in a much greater impact than acting alone. Collectively, consumer-facing brands and retailers could leverage their purchasing power to demand improved water quality outcomes in the products they source from traders or other upstream suppliers. There may also be opportunities to collaboratively invest in technology and infrastructure to achieve water quality outcomes at scale.

Policy engagement Given the need to take coordinated multi-stakeholder action at the watershed level, the most powerful water quality approaches may include a mix of government policy and voluntary private sector actions. By advocating for water quality or conservation-focused policies, companies could support a complementary policy environment. Companies could advocate for legislation and budget appropriations that further local water quality-related outcomes such as proposals supporting monitoring infrastructure, or crop insurance reform that furthers soil quality as part of the Farm Bill. Some companies are already engaging on policy — with guidance and coordination from Ceres and its **Connect the Drops** initiative, companies support specific bills at the state and national level. In two examples, companies submitted a letter of support for a bill in California to improve a statewide information system for water data and another to provide appropriations for sustainable agriculture programs. **Unilever** and other companies are advocating for improved government support to incentivize cover crops. **General Mills** has also included water stewardship policy engagement in its sustainability commitment.

Clean supplier model Companies could commit to sourcing row crops from suppliers that only source from farms that meet a certain standard (based on practices or outcomes).

Clean watershed model Companies could incentivize suppliers within a specific geography to implement certain farming practices or achieve watershed-scale water quality outcomes (measured at the tributary instead of farm-scale) in return for preferential sourcing or risk of market exclusion.

RECOMMENDATIONS FOR CORPORATE COMMITMENTS

Taking into account the current limitations, challenges, and latest thinking about meaningful corporate sustainable sourcing commitments, the following corporate commitment framework surfaced as one that would further water quality outcomes for U.S. row crops and that could be immediately implemented:

Number of new acres across key agricultural commodities within the company's supply chain that adopt locally relevant conservation agriculture practices, that promote soil health and water quality improvements, in priority high-risk watersheds **AND** one or more of the following:

- **Implementation support** as defined by agronomy advice and technical support; peer-to-peer network and support; and cost- or risk-share;
- **Collective watershed action** as defined by good-faith engagement and collaboration with stakeholders whose support is needed to help farmers implement locally relevant soil health practices and/or a policy engagement plan.

CONCLUSION

As fresh water becomes increasingly depleted and polluted in agricultural regions around the world, food and agriculture companies can and should respond to water risks, improve water outcomes, and enhance the resilience of their supply chains. Companies send important signals to producers when they develop policies and set goals to source commodities grown with reduced impacts on water resources.

This analysis outlines options and best practices for companies working with their supply chain to reduce nutrient and sediment loading, and provides recommendations for developing and implementing strong commitments to incentivize row crop producers to improve water quality outcomes in the region.

Ceres will use the findings and recommendations from this research to help companies and partners further align and take action on setting and implementing meaningful sustainable sourcing commitments to improve water quality outcomes for U.S. row crops. As companies increasingly make public commitments to sustainably source commodities and raw materials, it is essential that these commitments are strong, have measurable progress plans, and truly lead to beneficial water outcomes.