



# Global Environmental Opportunities Strategy

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## Essex Global Environmental Opportunities Strategy: Investing in Sustainable Farming Executive Summary

The Essex Global Environmental Opportunities Strategy operates at the nexus of environmental challenges and finance by using a thematic investment process to invest in solutions. GEOS invests in **listed equity** companies with disruptive clean technologies that are solving the most pressing environmental megatrends of our time, seeking to provide attractive financial returns. Equally as important, GEOS companies deploy technological solutions that will accelerate the transition to a more sustainable and equitable society and create significant social impact returns for investors.

Our white paper focuses on the agricultural sector. We outline the different challenges the agricultural sector faces, namely the sector's environmental footprint, climate resilience, and productivity. We also provide examples of technologies that GEOS invests in within our Agricultural Productivity and Clean Fuels theme that enable farmers to improve the productivity and sustainability of farming operations.

### Setting the Scene: An overview of agricultural challenges

Decades after avoiding widespread famine through innovation during the Green Revolution, agriculture now faces another historic challenge. The agricultural system needs to produce 50-70% more food by 2050, but it must also confront environmental impacts such as climate change, water stress, drought, and nonpoint source pollution. Agriculture is responsible for 23% of global greenhouse gas emissions, 11% from direct agricultural production and 12% from land use change, and an astounding 70% of global water withdrawals.<sup>1</sup> Farmers must adopt practices to improve the sustainability of their operations as the world transitions to net-zero to avoid the most catastrophic impacts of climate change. However, farmers are also tasked with increasing resilience to climate-related impacts such as heatwaves, drought, flooding, and greater range of crop pests. Climate change is expected to negatively impact crop yields, with vegetable and legume yields estimated to fall by up to 35% by 2100.<sup>2</sup> Without significant productivity improvements, farmers will be unable to combat intensifying climate-related impacts and satisfy growing food demand. In order to boost productivity and improve the sustainability of farming, deploying clean technology solutions will be critical.

### GEOS Agricultural Productivity and Clean Fuels Theme: Enabling productivity and sustainable growing practices

Companies within the GEOS Agricultural Productivity and Clean Fuels theme help farmers improve sustainability, productivity, and resilience by providing clean technology solutions for agricultural use. GEOS invests in *precision agriculture technology* that facilitates greater productivity and more sustainable farming by gathering and analyzing data to improve input application and total-farm efficiency.<sup>3</sup> Precision agriculture technology helps farmers reduce the volume of input applications by improving the application quality, reducing the cost of inputs, and reducing environmental degradation. Data and connectivity help farmers identify areas of inefficiency so they can optimize their operations to produce more food and reduce

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<sup>1</sup> Ceres. *Climate Change and Agriculture Production: An overview of risks and opportunities*. Engage the Chain, 2019

<sup>2</sup> Renee Cho. *How Climate Change Will Alter Our Food*. Columbia Earth Institute, 2018.

<https://blogs.ei.columbia.edu/2018/07/25/climate-change-food-agriculture/>

<sup>3</sup> Trimble. *What is Precision Ag?* 2020. <https://agriculture.trimble.com/blog/what-is-precision-ag/>



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their environmental impact. GEOS investment in precision agriculture technology includes wireless software to connect total-farm operations and increase efficiency, customized irrigation management and scheduling technology, autonomous guidance and steering solutions, and flow and application control.

By providing technologies to enable sustainable farming practices, companies within the GEOS Agricultural Productivity and Clean Fuels theme help address three of the UN Sustainable Development Goals (SDGs): **Goal 2 Zero Hunger, Goal 6 Clean Water and Sanitation, and Goal 14 Life Under Water.**

## Outlook

The reality and urgency of the current state of agriculture provides a strong outlook for adopting clean technology solutions like precision agriculture technology. With so many conflicting forces affecting the profits and yields of farmers, technologies that improve efficiency and enhance productivity will have strong demand. Smart farming and precision agriculture technology can help farmers establish operations that are more resilient to drought, flooding, heatwaves, and other impacts of climate change. Furthermore, as sustainability continues to be a key global megatrend, farmers will continue to be encouraged to adopt technologies that help them decrease their environmental footprint and become stewards of the environment.

## Disclosures

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