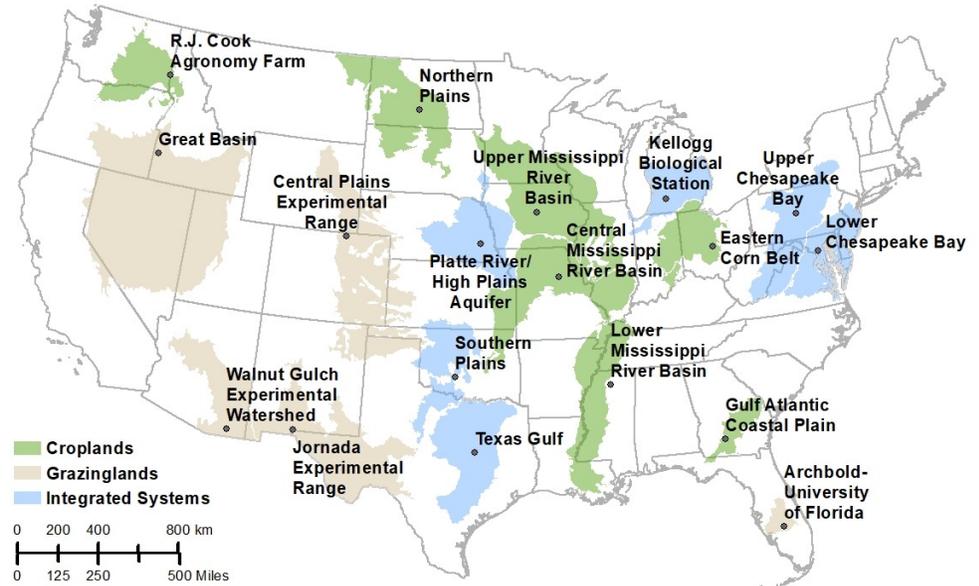


# W.K. Kellogg Biological Station (KBS)

## Long-Term Agroecosystem Research

The KBS LTAR site is part of the USDA's LTAR network, established to develop national, long-term strategies for sustainable agricultural production.

- *What practice changes are needed to adapt to and mitigate climate change?*
- *Can we better design production systems to deliver multiple ecosystem services?*
- *Can modern crop and livestock systems be integrated and better managed to provide better outcomes?*



[ltar.ars.usda.gov](http://ltar.ars.usda.gov)

## Location and Climate

KBS is located in southwest Michigan in the northeast portion of the U.S. corn belt, 50 km east of Lake Michigan (42° 24' N, 85° 24' W; elevation 288 m).

The KBS region has a humid continental climate with warm summers and cold winters. Average annual precipitation is 91 cm. Mean daily temperature maximums are highest in July (28°C) and mean daily minimums are lowest in Jan-Feb (-8°C).



The KBS LTAR site comprises 120 ha with long-term experiments and observations at the scale of plots, fields, and landscapes.

Major field crops in the KBS region include corn, soybean, winter wheat, and alfalfa. These crops are grown at KBS on moderately fertile, well-drained Alfisol soils.



*Aerial view of the KBS LTAR Aspirational Cropping Systems Experiment (Plot-Scale).*

### The KBS LTAR Common Experiment compares *Aspirational vs. Business-as-Usual* production systems.

#### Aspirational Production System

- High crop diversity (5 phase rotation)
- High efficiency and circularity (nutrient cycles)
- Animal integration (grazing, forages, manure)
- Forever green (cover crops, perennial crops)
- Prairie strips on low-yielding areas
- Continuous no-till
- Adaptive management
- Variable rate inputs, precision technologies

#### Business-as-Usual Production System

- Prevailing practices in the region
- Corn-soybean rotation
- Conventional tillage, fertilizers, pesticides
- Transgenic varieties of corn and soybean
- No cover crops
- No manure or irrigation

#### Key ecosystem services

- Production efficiencies
- Greenhouse gas mitigation (carbon dioxide, methane, nitrous oxide)
- Biodiversity conservation (pollinators, habitat)
- Climate resiliency
- Soil health, water quality
- Profitability, farmer well-being



### Collaborators

KBS is part of Michigan State University, and KBS LTAR researchers work with a broad range of collaborators, stakeholders, and funders, including scientists in other national research networks (Long-term Ecological Research, Great Lakes Bioenergy Research, AmeriFlux, and National Phenology Networks); farmers; federal government agencies; external colleges and universities; corporations; and nonprofit organizations.

**KBS LTAR field sites are maintained as national research facilities available to all scientists with a legitimate research interest.**

*We welcome further trials and sampling that:*

- Are relevant to LTAR goals of understanding sustainable agricultural systems and landscapes.
- Are best answered in a stable long-term experimental setting.
- Meet the data sharing requirements made of all research on site.



**Interested in visiting or collaborating?**

Website: [ltar.kbs.msu.edu](http://ltar.kbs.msu.edu)

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