

Kellogg Biological Station's GK-12 BioEnergy Sustainability Project (BEST): Bringing Fellow Expertise to Classrooms and Engaging Fellows, Teachers, and K-12 Students in Sustainable Inquiry Activities

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Project Overview

The Graduate STEM Fellows in K-12 Education (GK-12) Program partners graduate fellows with K-12 schools to train graduate students in science communication skills and help prepare them for advanced careers. GK-12 fellows learn to place their research in a broader societal and global context, integrate research with teaching, collaborate across disciplines, and more effectively communicate their research to wide audiences. This partnership also enriches K-12 curriculum and provides fifteen rural school districts across southwest MI with resources and expertise necessary to carry out cutting-edge inquiry based science activities.



The GK-12 program shows students that scientists can do many things.

Classroom-ready Lessons

The GK-12 program provides a unique opportunity to create interdisciplinary educational and scientific products. Together, GK-12 Fellows and teachers have designed over 110 freely available lessons addressing topics in ecology, evolution, and sustainability. These lessons meet the guidelines of the Michigan Core Curriculum, High School Science Content Expectations, and Next Generation Science Standards (NGSS) and are available to the public on the GK-12 website:

<http://kbsgk12project.kbs.msu.edu/>



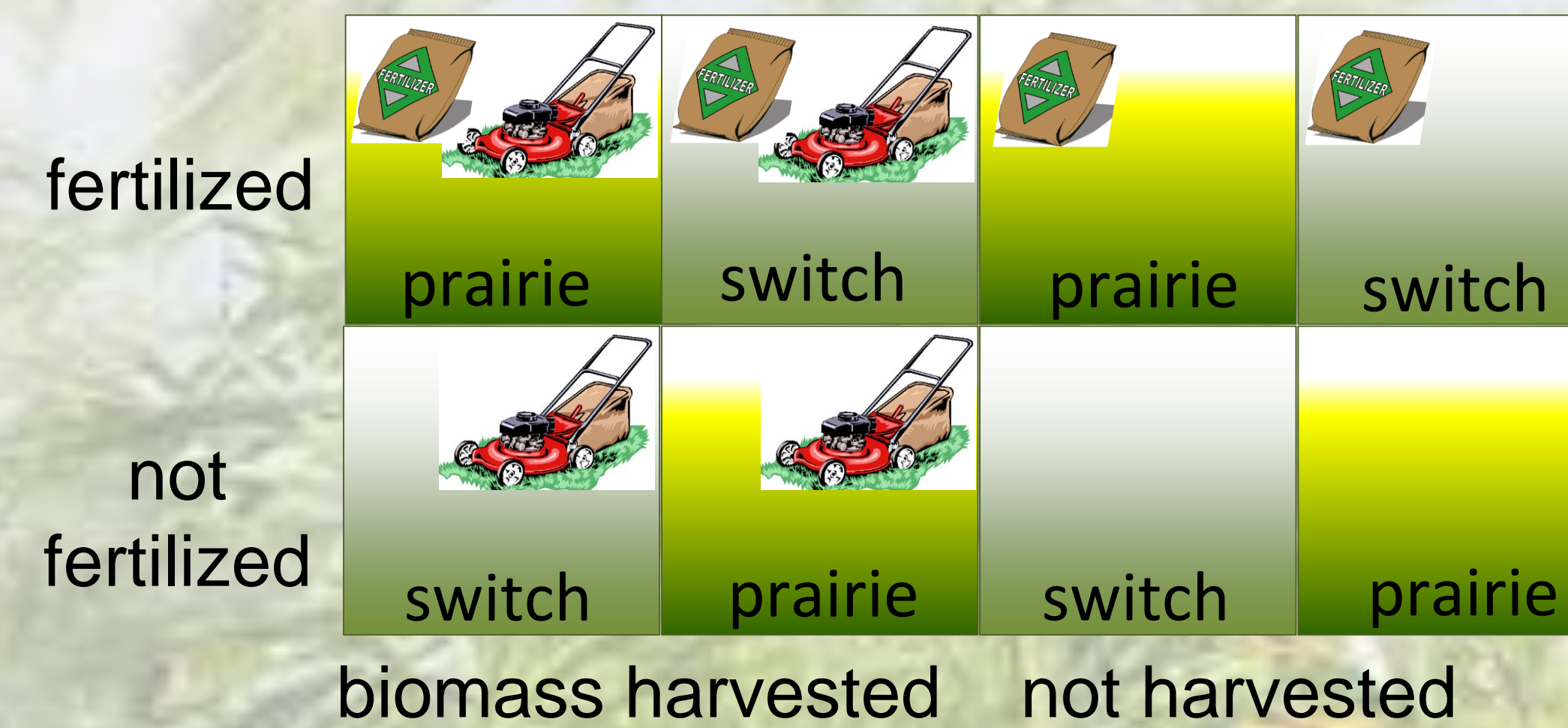
Can we grow our fuel and our flowers and butterflies too?

Our global hypothesis: By understanding the basic ecological and social processes at play we can get good bioenergy production while sustaining biodiversity and ecosystem services.

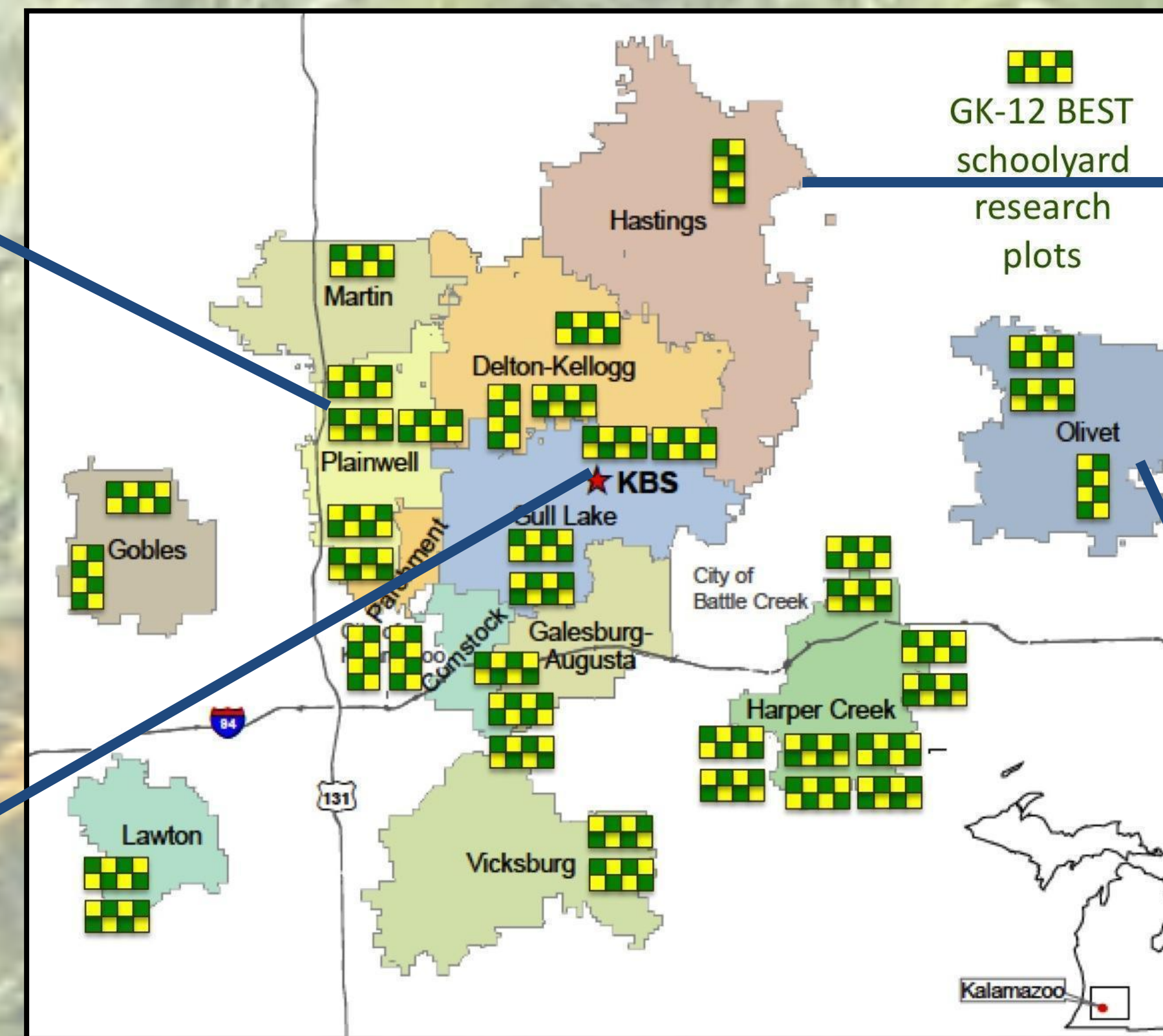
Basic experimental design:
modeled after research at the
Great Lakes Bioenergy Research Center (GLBRC)



Schoolyard block of 8 research plots
(3x3m each)



Soil Protocol



Students can access data from across the research network to ask their own questions



Biodiversity Protocol

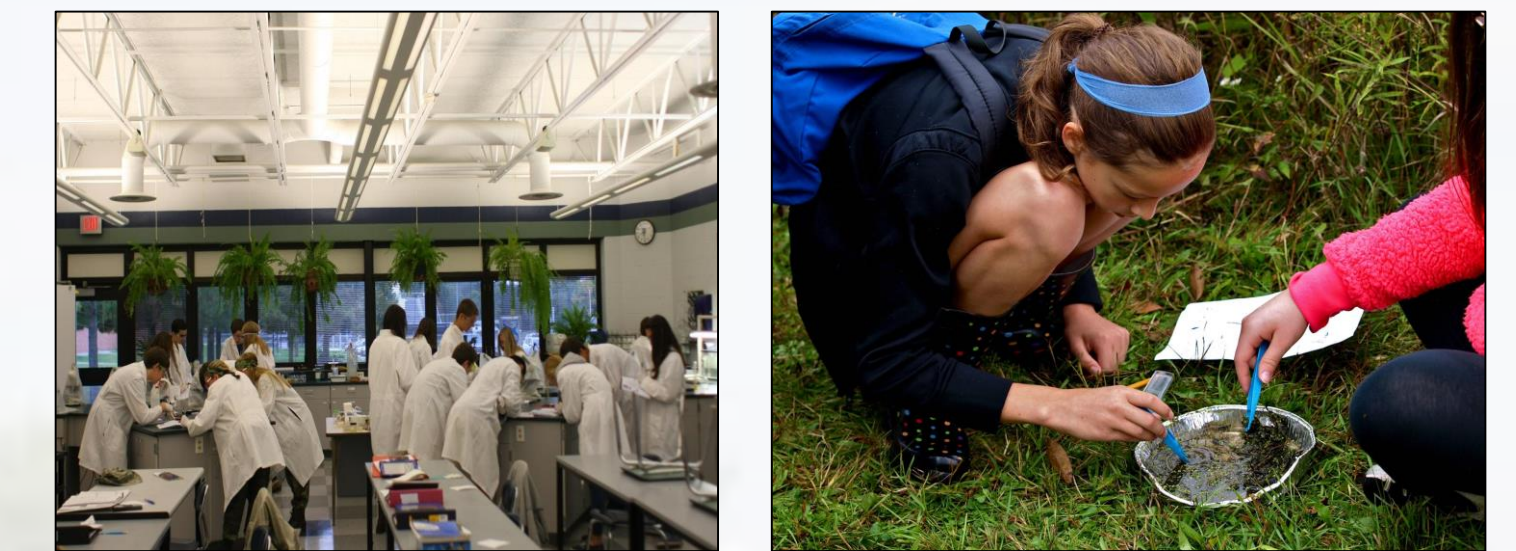


Landscape Protocol



Plant Biomass Protocol

Hands-On Experiments



The GK-12 program established a network of schoolyard research plots throughout our fifteen school districts that aims to improve ecological and bioenergy literacy in K-12 classrooms through hands-on investigation of biofuel sustainability (experimental setup pictured at center). Data is collected annually using standardized protocols and shared across the network. Fellows also develop and lead classroom activities using rigorous field and lab methods related to their own research. This gives students experience with scientific inquiry and hypothesis testing while simultaneously allowing fellows to hone their communication skills.



DATA Nugget

Data Nuggets are worksheets designed to help students practice interpreting quantitative information. Data Nuggets were created by GK-12 fellows in response to the concerns of Michigan teachers about their students' ability to make claims based on evidence. Each Nugget provides a brief background to a research study and a small, manageable dataset. Students are then challenged to answer a scientific question using the data to support their claim. For more information please see the Data Nuggets website at: <http://datanuggets.org/>