**Introduction**



**Major Themes for the Unit**

* Scientific themes: Ecological Interactions, Climate Change, Nutrient Cycling, Energy Flow, Biodiversity
* Scientific practice: modeling, argumentation
* SSI: Climate change and its effect on ecosystems

**Driving Question**: How might climate change affect the complex interactions in local ecosystems?

**Concepts needed to explore the driving question**

* Science concepts
  + Carbon Cycling
  + Photosynthesis
  + Relationship Between Photosynthesis and Cellular Respiration
  + Ecological Interactions
  + Energy Flow
* What social ideas and concerns influence negotiation of the issue?
  + Economics
  + Politics
  + Energy Production and Consumption
  + Alternative Energy Sources

**Unit-level performance expectations**

* Use an ecosystem model to make predictions regarding the stability/change of populations within a particular ecosystem in response to climatic changes. Engage in argumentation about the relative stability/change of an ecosystem (NGSS HS-LS2-6).
* Develop and use multiple models, some of which include mathematical representations, to explain the cycling of matter and flow of energy among organisms in an ecosystem (NGSS HS-LS2-2, HS-LS2-4).
* Obtain, evaluate and communicate information about a specific climate change impact. Engage in argumentation regarding appropriate responses to this situation (NGSS HS-LS2-7).
* Develop a qualitative model of the inputs and outputs of photosynthesis that accounts for/predicts impacts of climatic changes (NGSS HS-LS1-5).
* Develop a qualitative model of the inputs and outputs of cellular respiration that accounts for the cycling of matter and transfer of energy (NGSS HS-LS1-7, HS-LS2-5).
* Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere (NGSS HS-LS2-5).

[**Instructional Sequences**](https://web.archive.org/web/20190710100143/http:/ri2.missouri.edu/ri2modules/The%20Vanishing%20Prairie/sequences)

**Assessments**

* Practice quizzes- two short quizzes throughout the unit
* Models- Photosynthesis and Carbon cycling models produced throughout the unit
* Culminating Project- model and explanation to make sense of the likely impacts of climate change on an organism from another part of the world
* Unit Test- 25 multiple choice and short answer questions

**Acknowledgments**

The materials associated with the Vanishing Prairie Unit are based upon work supported by The Missouri Transect, a National Science Foundation EPSCoR Program, Cooperative Agreement IIA-1355406. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.