Wisconsin could be called a State of icons, and many of the icons can trace their roots to the abundant resources within its four borders. Big beer companies in Milwaukee that began in the 1800s made their beer from water from nearby lakes and rivers, kept it cool with ice from those same sources, and stored it in containers made of harvested wood from State forests. Dairy and cheese factories rely on milk from dairy farms with fields and pastures and generate billions in revenue for the State’s economy. The Wisconsin Dells, Door County, and the Northwoods draw tourists with their natural beauty and recreation opportunities.

Wisconsin contains more than 17 million acres of hardwood and coniferous forest, much of it on land reforested since the large-scale timber cutting of the 1800s and early 1900s. The Badger State boasts nearly 15,000 lakes within its borders and touches two Great Lakes—a bit of Lake Superior and a considerable length of western Lake Michigan. Wisconsin ranks second in the Nation for milk production, but it ranks first for cheese, cranberries, snap beans, and milk goats (U.S. Department of Agriculture, 2021).

Data and imagery from Landsat Earth observation systems assist agencies and land managers in monitoring these resources and planning for future management. Here are several ways Landsat benefits Wisconsin.

Monitoring Crops and Other Land Cover

Agriculture was one of the first areas of interest for Landsat users and remains so today. Crop monitoring helps predict crop yields and the corresponding food supply, and Landsat contributes information to the U.S. Department of Agriculture’s annual Cropland Data Layer (U.S. Department of Agriculture, 2022). Landsat data also are valuable for mapping other types of land cover. The Wisconsin Department of Natural Resources (DNR) collaborated with the University of Wisconsin-Madison and the Wisconsin State Cartographer’s Office to update its 1990s land cover information with data from 2010 to 2014. Both versions were based on Landsat imagery. The updated land cover data, called Wiscland 2, was deemed necessary to provide a level of detail that national land cover databases cannot provide for purposes that range from species management and watershed planning to fire risk assessment and property management (Wisconsin DNR, 2016).

![Wisconsin (center) has a variety of land cover, including forests (medium green), wetlands/lakes (blue shades), and developed areas (gray). Dominant crops by acreage include corn, soybeans, hay, wheat, oats, and rye. Image credit: U.S. Department of Agriculture.](image)

The Landsat series is a joint effort of the USGS and NASA. NASA develops and launches the spacecraft; the USGS manages satellite operations, ground reception, data archiving, product generation, and data distribution. Funding for the National Land Imaging Program’s Landsat operations and data management is provided through the USGS.
Determining Urban Heat Islands

Landsat’s land surface temperature and land cover data have proven useful to measure and mitigate cities’ urban heat island (UHI) effects in areas that have more impervious surfaces, such as buildings and pavement, and fewer natural features. These characteristics contribute to urban temperatures that exceed those of surrounding areas and can contribute to heat-related illnesses and deaths. UHI efforts often focus on large cities, but to get a perspective of UHI in Midwestern cities closely surrounded by agriculture, University of Wisconsin researchers looked at 8 years of summertime ground-sensor and archived Landsat temperature data for the urban and rural areas around Madison. They examined trends of UHI timing and location, along with the variability in land surface temperature of agricultural lands during the growing season (Berg and Kucharik, 2021).

References Cited


For additional information on Landsat, please contact:
Program Coordinator
USGS National Land Imaging Program
12201 Sunrise Valley Drive
Reston, VA 20192
703–648–5953 ISSN 2327-6916 (print)
ISSN 2327-6932 (online)
https://doi.org/10.3133/s20223055