



# MINNESOTAVIEW 2018 - 2019



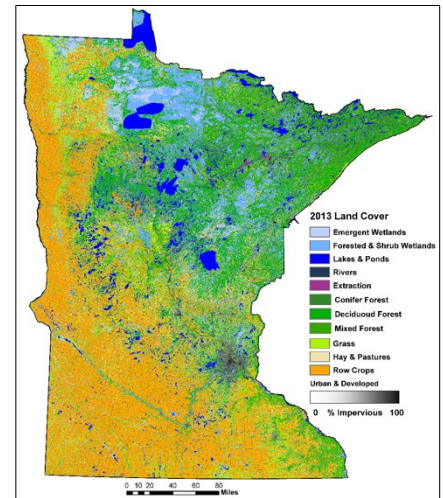
## MINNESOTAVIEW HISTORY AND SUCCESSES

MinnesotaView undertakes research, education, and outreach activities in remote sensing. The broad goals of these activities are to help stakeholders use remote sensing methods and products, to enhance public appreciation of the importance of remote sensing, and to publicize the results of remote sensing research done by MinnesotaView members. We particularly focus our efforts on outreach to users and potential users of remote sensing data and methods. The awareness of remote sensing has increased dramatically in Minnesota over the last several years, but there are numerous opportunities to further increase use, and to help ensure that such use is consistent with accepted best practices.

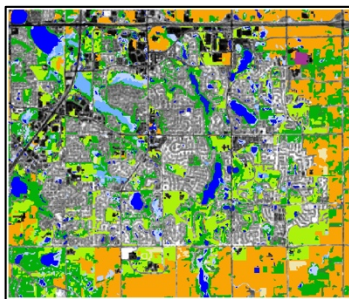
MinnesotaView also supports the development, distribution and application of geospatial information derived from remote sensing data for mapping, monitoring and analysis of land and water resources. Key activities in recent years have been mapping water clarity for over 10,000 Minnesota lakes and completing land cover/use maps for Minnesota (see figures on this page). Our remotely sensed data products can be viewed on our recently revised data portals:

Water Clarity Data Portal: <https://lakes.rs.umn.edu>

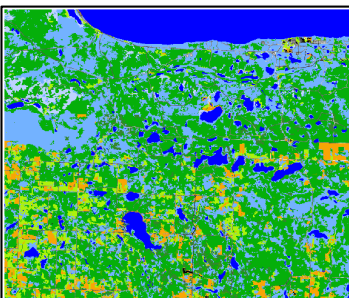
Land Data Portal: <https://z.umn.edu/landcover>



*Land Cover/Use of Minnesota mapped using Landsat imagery*



*Mixed land cover in Woodbury, MN*



*Lower Red Lake area with cropland, forest, wetland and lakes.*

Conversion of rural landscapes to urban and suburban land uses (e.g. Woodbury, MN in the figure to the left) results in increasing amounts of impervious surface area. Imperviousness affects the amount of runoff to streams and lakes and is related water quality of surrounding lakes and streams, to urban heat island effects, habitat degradation and fragmentation, and aesthetics of landscapes.

The University of Minnesota's Remote Sensing and Geospatial Analysis Laboratory has completed classifications of land cover and impervious surface area of the state and for the Twin Cities metro area over several decades. Classification using Landsat Thematic Mapper data enables quantifying the spatial and temporal patterns of impervious surface area over large geographic areas at modest cost.

MinnesotaView was established in 2008 and is working with state agencies and universities in Minnesota to advance remote sensing research and application, education and outreach. The Consortium is led by the University of Minnesota's [Remote Sensing and Geospatial Analysis Laboratory](#), and includes the [Minnesota Geospatial Information Office](#), the [Minnesota Pollution Control Agency](#), and [Minnesota Department of Natural Resources](#).

MinnesotaView is a member of the AmericaView Consortium, a nationally coordinated network of academic, agency, non-profit, and industry partners and cooperators that share the vision of promoting and supporting the use of remote sensing data and technology within each state. AmericaView is funded by USGS grant agreement G18AP00077.



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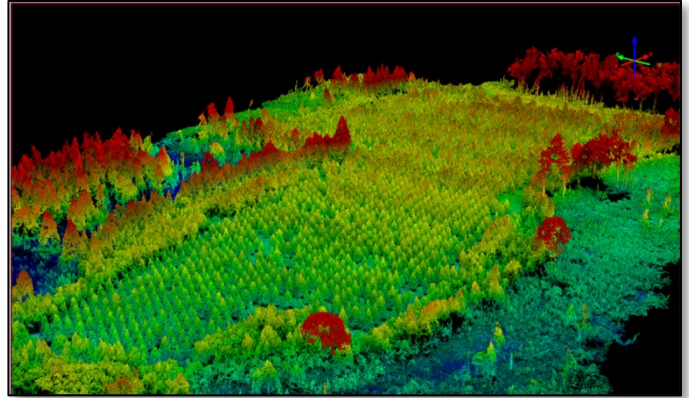
## MINNESOTAVIEW CURRENT ACTIVITIES

An ongoing focus of MinnesotaView is offering workshops on remote sensing to Minnesota stakeholders. We have developed a large amount of workshop content for lidar, object-based image analysis, and Unmanned Aircraft Systems (UAS). UAS operations and applications are increasingly of interest for a variety of stakeholders, including the Department of Natural Resources (DNR) Forestry group, DNR's Resource Assessment group, the MN Pollution Control Agency's wetlands and water scientists, county land management agencies, and many others. In the 2018-2019 grant year, we conducted five workshops for stakeholders around the state.

The images to the right depict data products derived from the Microdrones UAS shown in the middle-right. The top image shows the structure of a forest plantation, colored by height (red is taller). Such a dataset is useful for management planning, monitoring of tree health, and forest inventory studies. The bottom image is a high-resolution photo of a forest canopy in northern Minnesota, near Ely.

MinnesotaView performs substantial remote sensing research outreach. We believe it is vital that stakeholders and the public see the results of our work. These efforts include: 1) Exhibiting at remote sensing related events such the MN Drone Day and the annual GIS/LIS conference; 2) Showcasing remote sensing to thousands of attendees at the Minnesota State Fair; 3) Making research results and data product available on websites and web-based data serving tools; 4) Publishing research in peer-reviewed scientific journals; and 5) Involving local media outlets in publicizing our work.

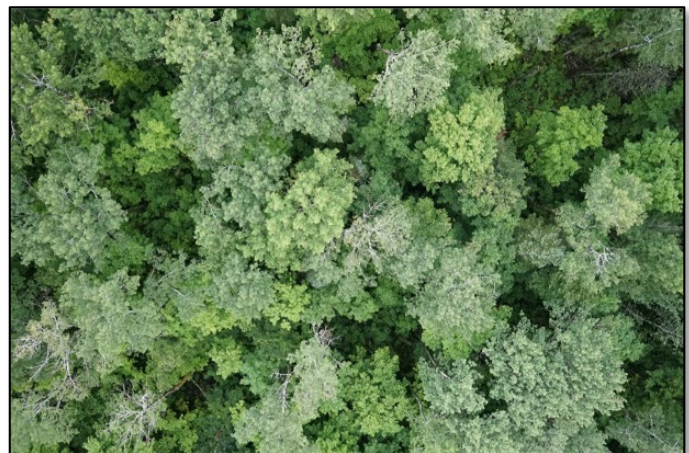
As the only institution in Minnesota with a complete remote sensing and geospatial analysis curriculum, the University of Minnesota is a leader in the state and the Upper Midwest in remote sensing education. We continue to offer a wide range of courses on remote sensing and related topics (e.g. geodesy, spatial analysis, image processing, etc.) These courses are highly integrated across disciplines and incorporate the latest research results.



*Photo-derived point cloud of a plantation forest in Minnesota*



*Microdrones MD-4000 research grade Unmanned Aircraft System*



*Drone image of a forest research stand in northern Minnesota*

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