



# Inverse modeling based approach for land cover mapping

## A modeling approach for generating land cover maps for crop growth predictions utilizing satellite images and weather data

**IP Status:** Provisional Patent Application Filed

### Applications

- Land Cover Mapping
- Crop Mapping

### Technology Overview

The ability to monitor and predict the growth of crops is essential in numerous areas related to agriculture, including in food security assessment and in developing improved land management practices but current approaches are limited because they depend exclusively on satellite imaging. Researchers at the University of Minnesota have developed a machine learning-based modeling approach to generate land cover maps from satellite images combined with weather data. This approach provides accurate and timely land cover maps up to 5 months ahead of standard methods, generating predictions even before crops are harvested.

### Phase of Development

**TRL: 5-6**

A working model of this technology currently exists.

### Desired Partnerships

This technology is now available for:

- License
- Sponsored research
- Co-development

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### Researchers

- [Vipin Kumar, PhD](#) Professor, Department of Computer Science and Engineering
- [David Mulla, PhD](#) Professor, Department of Soil, Water, and Climate

### References

1. Praveen Ravirathinam, Rahul Ghosh, Ankush Khandelwal, Xiaowei Jia, David Mulla, and Vipin Kumar(2024) , <https://epubs.siam.org/doi/10.1137/1.9781611978032.52>, Proceedings of the 2024 SIAM International Conference on Data Mining (SDM), 445 - 453

### Technology ID

2024-054

### Category

All Technologies  
Engineering & Physical  
Sciences/Sustainable Technology  
Software & IT/Ag IT  
Software & IT/Artificial  
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