

Article title	Spatial Crop Modeling at Scale: GSSAT2
Authors	<u>Willingthon Pavan, Nathan Postal Bombana, Upendra Singh, Job Fugice & Latha Nagarajan</u>
Abstract	<p>Precision agriculture and data-driven decision-making are increasingly important in the face of growing global food demand and the challenges posed by climate change. GSSAT2, an <i>Interactive Geospatial Crop Modeling and Decision Support Tool</i>, combined with DSSAT Cropping System Model (CSM), offers a powerful solution for analyzing climate information and management options across more than 40 crops on a spatial scale. The development of GSSAT2, a new version of the legacy GSSAT using cutting-edge web and cloud technologies, presents a significant advancement in spatial crop modeling and decision support systems.</p> <p>GSSAT2 enables users to run spatial simulations by selecting areas of interest (administrative zones) or uploading GIS-compatible input files with the boundaries of interest. Through parallel processing, GSSAT2 makes it possible to conduct large-scale analyses in an easy and time-efficient manner. By combining input data such as weather (from NASA Power and Climate Hazards Group InfraRed Precipitation with Station Data), soils (from Global High-Resolution Soil Profile Database for Crop Modeling Applications), harvesting area (from Global Spatially Disaggregated Crop Production Statistics Data), and management practices in a grid format, GSSAT2 offers a comprehensive and flexible platform for agricultural decision-making. The system employs the DSSAT-Pythia tool, developed by the University of Florida, to run simulations in parallel, further enhancing its processing capabilities.</p> <p>The GSSAT2 user-friendly web interface allows for seamless exploration and visualization of results in a GIS environment. It aims to support stakeholders in creating timely and reliable recommendations on fertilizers, sowing dates, and other management inputs across various biophysical and socioeconomic conditions, ultimately enhancing agricultural input efficiency and reducing production risks.</p>
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