

# Flood Mapping Through Satellite Images Using Deep Learning

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**Abstract:** *Flooding is a pervasive natural disaster that significantly impacts agriculture, infrastructure, and communities, particularly in rural and agricultural regions. Traditional methods of flood assessment and compensation are often manual, time-intensive, and prone to inaccuracies, resulting in delayed aid and inequitable resource distribution. With advancements in technology, satellite imagery and artificial intelligence (AI) provide new opportunities for real-time flood mapping and automated disaster response. This project proposes a Real-Time Flood Mapping and Compensation System using the Attention U-Net deep learning model. Satellite imagery is analysed to detect and segment flood-affected regions with high precision. The Attention U-Net architecture enhances segmentation accuracy by focusing on the most relevant regions in the images while ignoring irrelevant or noisy areas, such as clouds or non-flooded landscapes. The system integrates geospatial data on land boundaries to assess flood severity for individual properties, enabling fair and data-driven compensation for affected landowners. This project holds significant potential for transforming flood disaster management by reducing response times, fostering transparency, and empowering affected communities to recover more effectively. The integration of advanced AI and geospatial technologies marks a critical step toward mitigating the impacts of natural disasters in a rapidly changing climate.*

**Keywords:** Flood mapping, Deep learning, Semantic segmentation, Vision MLP, Attention U-Net