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Conference Abstracts

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Impact of Extreme Weather Events on Leaf Emergence Timing: An NDVI-Based Phenological Assessment

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The increasing frequency and intensity of extreme weather events, driven by climate change, pose significant challenges to ecological systems worldwide. This study investigates the impact of extreme weather events on the timing of leaf emergence, utilizing the Normalized Difference Vegetation Index (NDVI) as a key analytical tool. NDVI, a remote sensing metric, offers a comprehensive view of vegetation dynamics and greenness, enabling researchers to discern subtle phenological changes in response to climatic variability.

Our research focuses on two core objectives: first, to quantify changes in leaf emergence timing across diverse ecosystems subjected to varying degrees of extreme weather events; second, to examine the correlations between NDVI fluctuations and specific meteorological phenomena, such as heatwaves, droughts, and late frost events. By employing time-series analysis of NDVI data alongside meteorological records, we aim to illuminate the complex interactions between atmospheric conditions and vegetative phenology.

Preliminary findings indicate significant alterations in leaf emergence timing correlated with extreme weather occurrences. Specifically, regions experiencing prolonged heatwaves demonstrate delayed leaf emergence, while areas affected by late frosts show compressed emergent windows. These shifts suggest a potential restructuring of growing seasons, which could have profound implications for ecosystem productivity and resilience. Furthermore, altered phenological patterns may influence agricultural outputs and biodiversity conservation efforts, necessitating adaptive management strategies.

This research underscores the importance of integrating climatic data and remote sensing technologies to enhance our understanding of ecosystem responses to climate change. By elucidating the phenological impacts of extreme weather events, this study contributes to the broader discourse on climate adaptation and mitigation strategies, highlighting the need for proactive measures in safeguarding ecological integrity amidst increasing climatic uncertainty.

Ultimately, these findings offer valuable insights for policymakers, environmental managers, and researchers focused on climate impacts, fostering informed decision-making and resilient community planning.

Key Words: Biodiversity Conservation, Climate Adaptation, Ecosystems Resilience