

FUNDING PROGRAM FOR NEXT GENERATION WORLD-LEADING RESEARCHERS

Project Title: Climate change impact assessment of forest ecosystem functions by satellite-ecophysiology-modeling integrated study

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1. Background of research

Current global climate change situation requires us to assess its impacts on present forest ecosystem functions and services, and then to predict the future changes. Process-based understanding and assessment of climate change impacts on forest ecosystems would provide valuable knowledge to establish 'green innovation' strategy, which involves adaptation and mitigation to climate change.

2. Research objectives

This research project aims to reveal the ecophysiological processes underlying forest carbon cycling by combining in situ environmental control experiments on trees and soil, remote sensing and model simulations. The specific themes are: (1) to reveal the possible impacts of temperature increase on leaf photosynthesis, tree and soil respirations by in situ warming experiments in a forest ecosystem, (2) to validate and develop analytical methods for satellite remote sensing data to detect the impacts of climate change on forest canopy processes, (3) to assess the current situation and predict future changes in forest ecosystem functions by using ecosystem simulation models and satellite remote sensing.

3. Research characteristics (incl. originality and creativity)

This research project is characterized by its multidisciplinary approach which involves in situ warming experiments and ecophysiological observations, remote sensing, and modeling. By combining the intensive ecological experiments and satellite remote sensing, we will attempt to develop accurate methods to observe and analyze the forest ecosystem functions in Japan.

4. Anticipated effects and future applications of research

The outcomes of this project would contribute to Earth observation science as well as to environmental policy management. Our interdisciplinary research, involving ecology, micrometeorology and environmental engineering, would enable us to bridge natural science and societal science for adaptation to climate change.

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