

KAZUO OKI LAB.

[Global Monitoring for Ecology and Environment, and its applications]

Department of Human and Social System

Global Monitoring for Ecology and Environment

Department of Civil Engineering,

Department of Biological and Environmental Engineering

<http://hydro.iis.u-tokyo.ac.jp/indexJ.html>

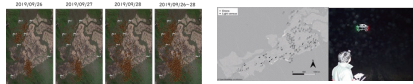
In K. Oki lab, by using **wide-area environmental monitoring & remote sensing techniques**, we capture and improve current situations of **water, food & energy**.

Development on methods for estimating population size of deer

Deer are currently being caught both inside and outside the Oze wetland area, but the number of catches required to reduce vegetation damage in Oze has not yet been established. There is need for a new density survey method that can determine population size in places that are difficult for people to enter, such as Oze.



Deer in Oze

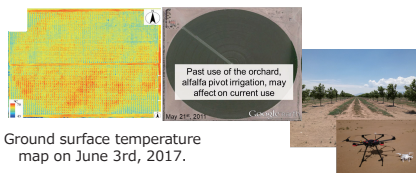


Visualization of deer cry position using multiple microphones

Estimation of deer population by night drone observation

Discovery of a mysterious circle in a pecan orchard with UAV

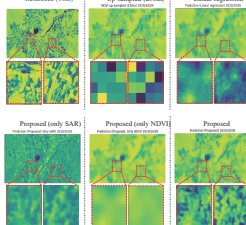
In this study, we established consecutive monitoring methods using UAV in pecan orchards of 64 ha each, in Arizona, USA. Using established continuous monitoring methods, the UAV images of a three-year-old pecan orchard showed circular traces of alfalfa cultivation prior to installation of pivot irrigation that was previously not observed.



Ground surface temperature map on June 3rd, 2017.

Downscaling of MODIS NDVI by Using a Convolutional Neural Network-Based Model

This research produce 10-m resolution NDVI in high temporal resolution from MODIS 250-m NDVI by using Convolutional Neural Network-Based Model with higher resolution synthetic aperture radar (SAR) data.

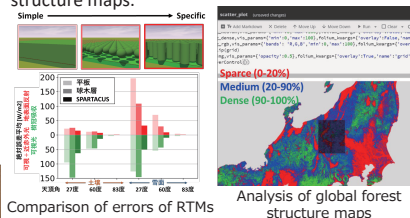


Qualitative results for different methods

	MAE
Only SAR	0.189
Linear Regression	0.114
Random Forest	0.115
Proposed	0.107

Link of forest structure & light use

Radiative transfer models (RTMs), which estimate the amount of lights vegetation uses or discards, is essential to anticipate the future of climate change affected by deforestation etc. In this study we compare RTMs which express forest structure in different ways, and also analyze global forest structure maps.



Comparison of errors of RTMs

Analysis of global forest structure maps

