OKI LAB.

Global Monitoring for Ecology and Environment, and its applications

Department of Human and Social Systems

Department of Civil Engineering/
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*In 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
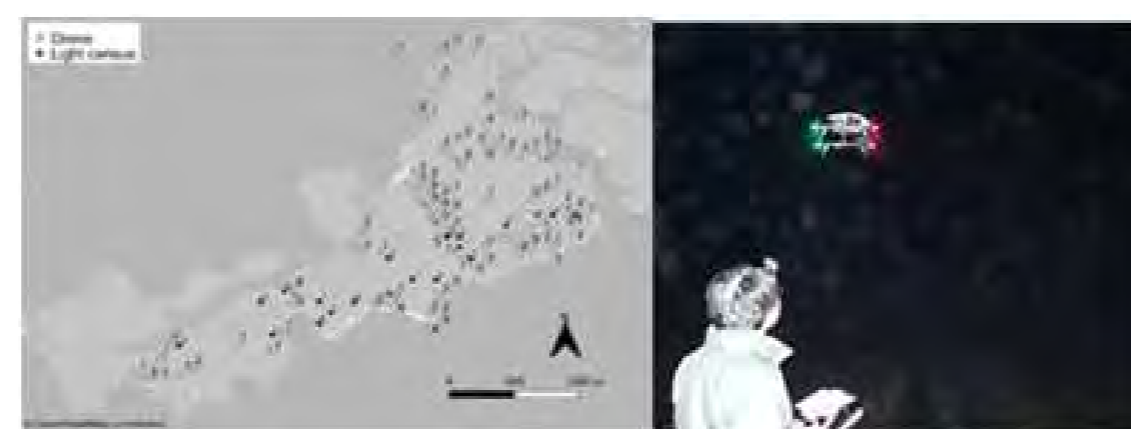
Estimation of deer population by night drone observation

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.
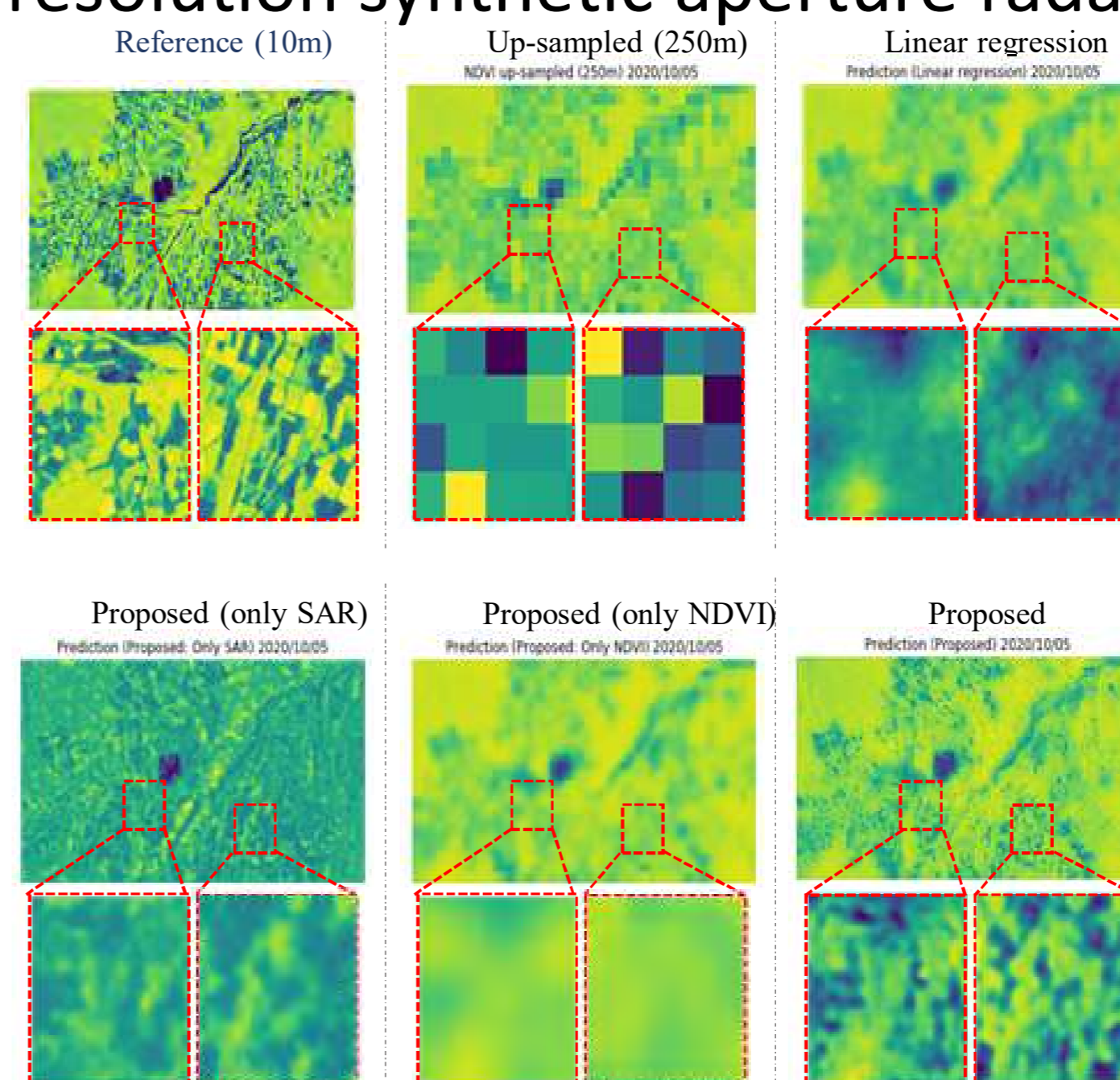

Qualitative results for different methods

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

## 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.

Past use of the orchard, alfalfa pivot irrigation, may affect on current use
May 21st, 2011.
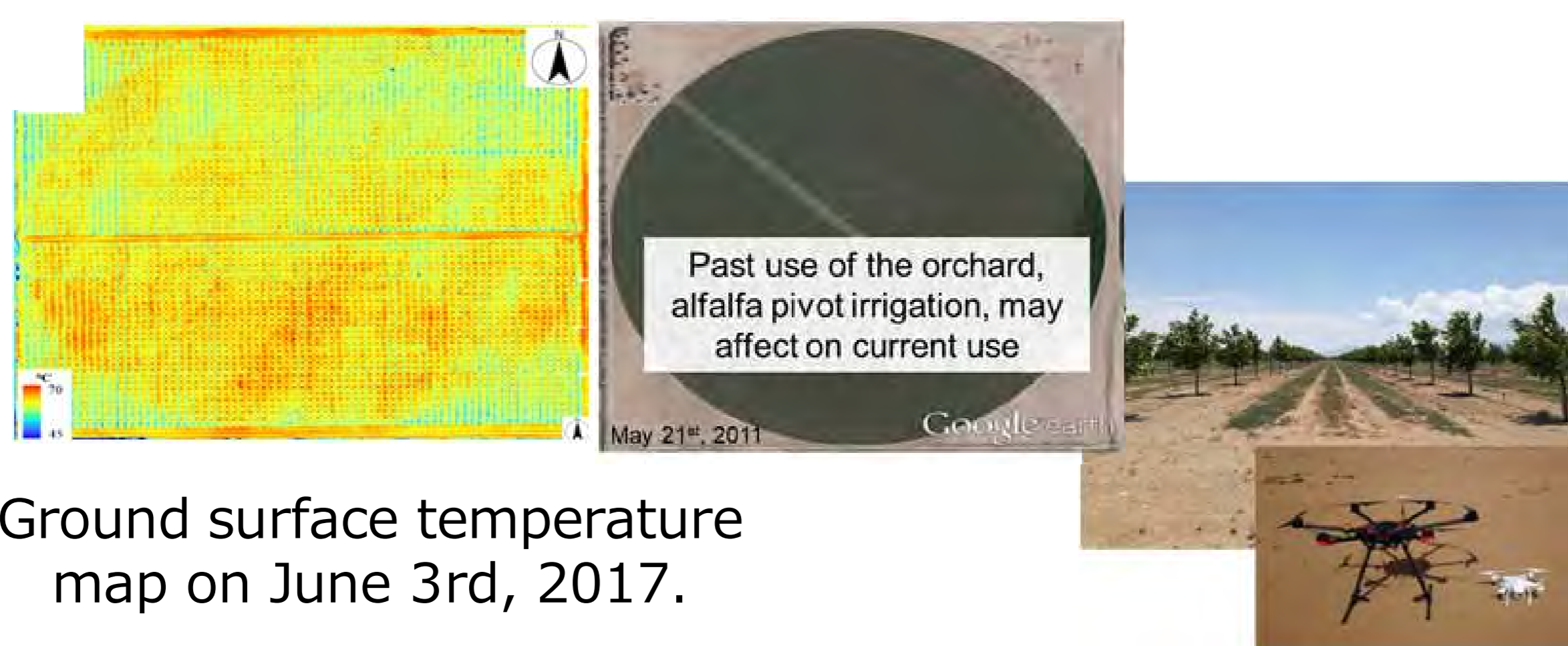
Ground surface temperature map on June 3rd, 2017.

Improvement of flood management approaches using paddy field

This study used an improved hydrological model H08 to establish that, if rainwater can be stored within paddy field embankments during the non-harvest season, this reservoir strategy reduces peak river discharge of large rivers in Japan. This green technique has some potential when combined with structural measures, and can contribute as a sustainable flood management approach.
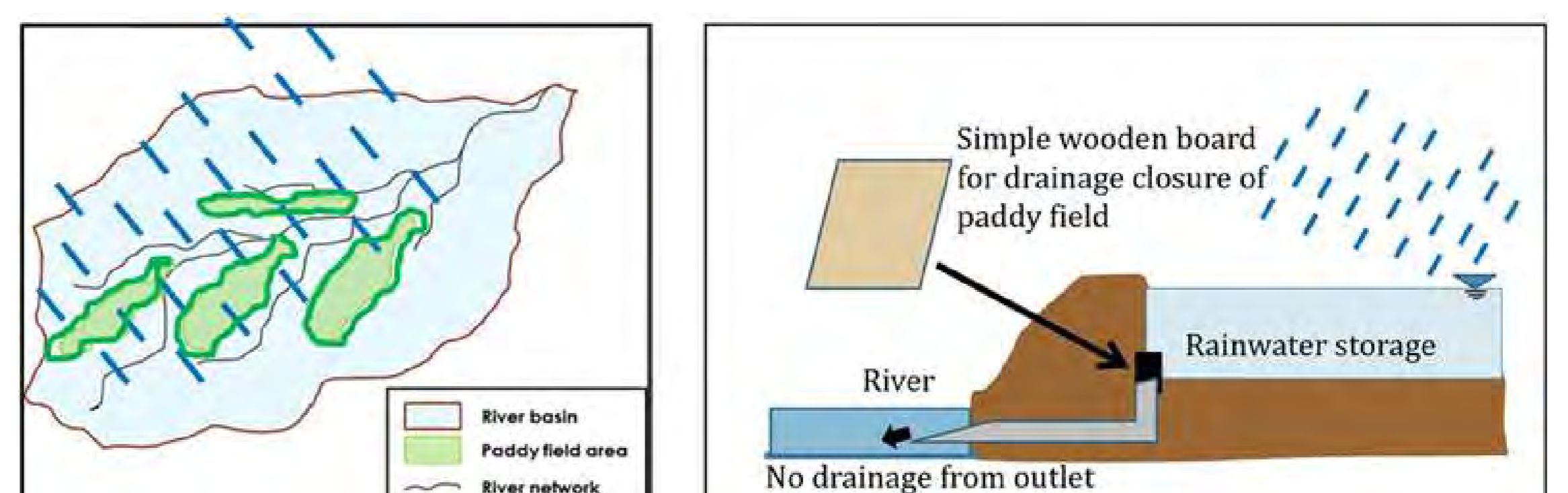
Proposed operation of paddy field reservoir during October-December