**Assessment of Nitrogen Footprints**

Nitrogen causes variable environmental problems such as an eutrophication in coastal area. Therefore it is important to grasp a movement of nitrogen. In this study, we established the framework which calculates nitrogen footprints made from the real nitrogen outflow for the river. As a result, the contribution from other areas to the environmental pollution at the specific river was elucidated.

**Precision Agriculture with UAV**

The agriculture which performed with detailed observation and control is called Precision Agriculture. It can improve the quality of crops to increase the yield. By recent rise of UAV, it came to be able to acquire specific data extensively. In this study, we estimate the soil moisture content and monitor growth at pecan orchards in the U.S.

**A new monitoring technique of water quality**

Lake water contains 90% of the global liquid freshwater. To monitor the water quality in lake, chlorophyll-a concentration can be estimated from satellite remote sensing. Existing various techniques have their merits and demerits. So we reassessed them for the same lake. Moreover, we proposed a new estimation technique which combined their merits.

**Land use classification with unmixing method**

Though land analysis by using satellite images has been conducted widely, the coarse pixel size is a challenging problem. Unmixing method can extract mixed information in one pixel separately. We applied this method for land use classification, and obtained specific information.