



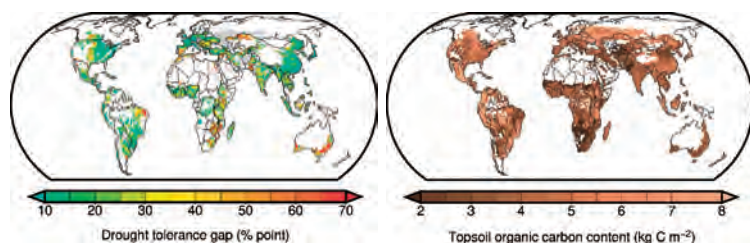
# Institute for Agro-Environmental Sciences, NARO

As part of the National Agriculture and Food Research Organization (NARO), the Institute for Agro-Environmental Sciences (NIAES) promotes the development and implementation of agricultural technologies that can flexibly cope with climate and other environmental changes. We also progress and provide technologies to contribute toward a sustainable agricultural production while ensuring environmental conservation, accelerating our investigations throughout the entire Japan. As for climate change research, the core investigation at NARO, we focus on the effect of climate change in agriculture by integrally promoting research on impact assessment, and the development of adaptation and mitigation measures. We also pursue various agro-environmental research initiatives both in Japan and overseas in collaboration with international frameworks, such as the Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), and other environmental research institutions.

## Division of Climate Change

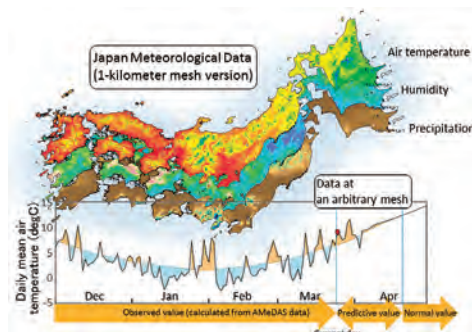
Impact assessment, adaptation and mitigation of climate change

We assess the impacts of climate change on agricultural production and develop effective measures for mitigating global warming by reducing greenhouse gas (GHG) emissions from the agricultural sector. We also elucidate the responses of crops and agroecosystems to climate change and develop efficient agricultural production technologies for climate change adaptation.



### Global scale analysis on crop production and soil carbon storage

Drought damage on crop yield can be reduced by increasing soil organic carbon content in semi-arid cropping regions of the world. Such regions are characterized by a large drought tolerance gap. The existing gap between potential attainable yield and actual yield in drought years can be reduced by enhancing soil organic carbon. Such effort represents a synergy of mitigation (C sequestration) and adaptation (crop drought tolerance) and would contribute to multiple Sustainable Development Goals.



### Agro-Meteorological Grid Square Data System (AMGSDS)

The Agro-Meteorological Grid Square Data System (AMGSDS) provides daily updates of meteorological data sets that include nationwide weather forecasts at approximately 1 km square grids. The data enable us to establish an early warning system for agrometeorological disasters and a decision support system for crop management with simulation models that can be used to predict crop growth and crop damage due to pests and diseases.

## Division of Biodiversity

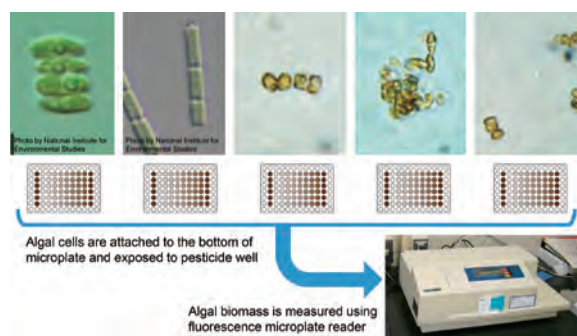
Investigating impacts of changes in environment and agricultural activities on the biodiversity of agro-ecosystems

Elucidating variations of biodiversity by changes in environment and agricultural activities, we advance research on the assessment of benefits from agro-ecosystems as ecosystem services. In addition, we evaluate the impacts of invasive alien species and agrochemicals on ecosystems.



### Biodiversity evaluation in rice paddy fields

We have published the manual to evaluate biodiversity in rice paddy fields of Japan. In this evaluation, survey species are egrets and herons, which are common top predators, and their prey species, reflecting the food chain in rice paddy fields.



### Toxicity assay using 5 species of riverine periphytic algae

We developed an effective method that can simultaneously test the toxicity of pesticides on 5 species of periphytic algae commonly found in Japanese river ecosystems.

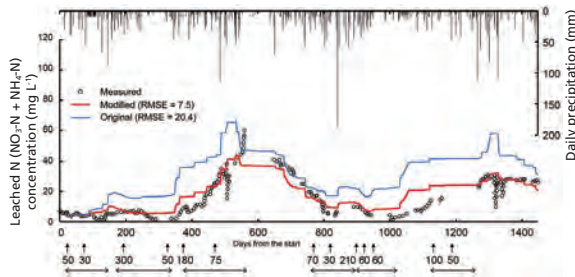
## Division of Biogeochemical Cycles

Investigating the impacts of changes in agricultural management on biogeochemical cycles in agro-environment

We elucidate the effects of changes in agricultural management practices and applied materials on soil and water quality. In addition, we evaluate the nitrogen and other nutrient cycles at the regional and national scales, and propose technologies for improving cyclical function of nature using organisms living in the agro-environment.

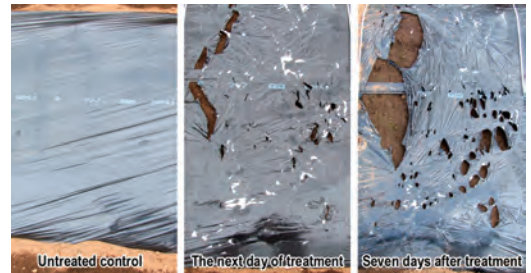


Long-term lysimeter experiment (Chiba Prefecture)



### Predicting nitrogen (N) leaching from upland Andosols fields

Andosols cover about half of the upland field surface area in Japan. To predict nitrogen leaching from Andosols, we developed a model (modified LEACHM) that takes into account the long-term turnover of organic matter and nitrate adsorption in soil.



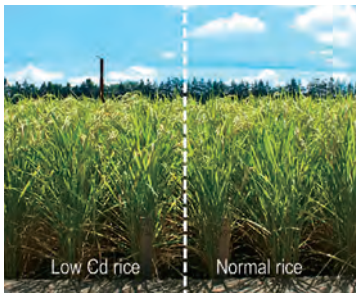
### Acceleration of the degradation of used biodegradable plastic (BP) mulch films by enzyme treatment

Decomposition of BP mulch films in agricultural settings can be accelerated by phylloplane fungal enzyme treatment.

## Division of Hazardous Chemicals

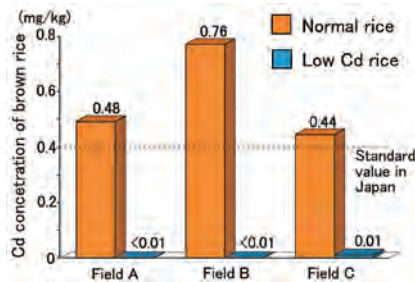
Investigating hazardous elements and pesticide residues in soil and crops

We develop technologies for evaluating and mitigating the risks associated with the hazardous elements such as cadmium (Cd), arsenic (As) and organic chemicals including pesticides in soil and agricultural products.



Development of low-Cd rice cultivar  
We developed a rice mutant that hardly absorbs cadmium from soils, and identified the gene that controls Cd absorption.

Cd concentration of brown rice cultivated in soils with high Cd concentration



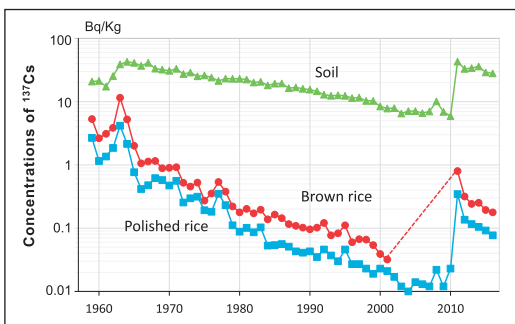
### Effect of clopyralid in soil on the early growth stage of vegetables and flowers

We investigated the effect of clopyralid concentration in soil on the initial growth of 6 plant families (29 vegetable and flower cultivars). Results showing temporal trends in the physiological disorders of these plant cultivars are available on the NARO website.

## Division of Informatics and Inventory

Monitoring of environmental changes and integrative maintenance, utilization, and delivery of environment infrastructure information

As we advance our environmental change monitoring research, we also develop methods for analyzing and modeling agro-environmental information. Moreover, we integrally develop, maintain, utilize, and disseminate information on environment infrastructure including soil resources, insects and small animals, as well as spatial information.



### Long-term monitoring of radioactive substances

The concentrations of <sup>90</sup>Sr and <sup>137</sup>Cs in rice, wheat, and farmland soils have been monitored yearly since the late 1950s.



### Web site "Japanese Soil Inventory", providing various soil information

We compiled a new digital soil map covering whole country, which is provided via the web site "Japanese Soil Inventory" and a mobile phone application "e-SoilMap II". We also provide various soil information such as soil properties, soil temperature map, etc. through these service.

Mobile phone application "e-SoilMap II"

## Director-General

Department of Research Promotion  
Research Promotion Office

Director, Climate Change Research

Division of Climate Change

Division of Biodiversity

Division of Biogeochemical Cycles

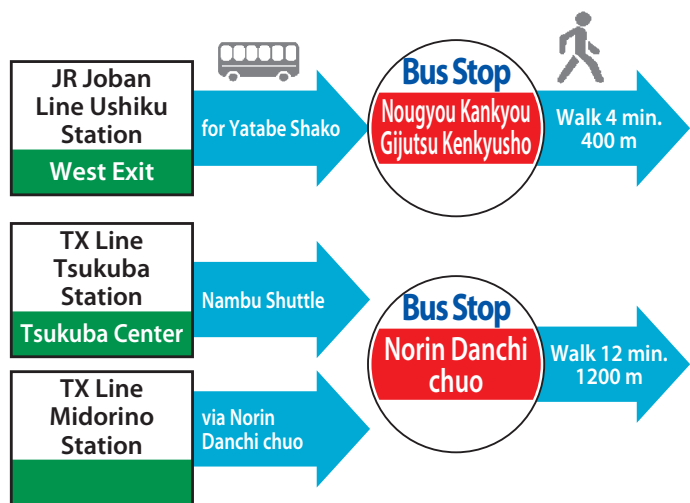
Division of Hazardous Chemicals

Division of Informatics and Inventory

● Staff 118 (As of January, 2020)



## Public transportation



Institute for Agro-  
Environmental Sciences, NARO

## By car

- Approx. 5 km from Joban Expwy Yatabe I.C.
- Approx. 5 km from Ken-odo Expwy Tsukuba Ushiku I.C.

From either direction on route 408, take a turn at the Hoteiike Junction traffic signal (Norin Kenkyu Danchi entrance) and then turn left at the first traffic signal (Kannondai 2 chome Junction) and enter the second entrance at the left.

\* For more information visit  
<https://www.naro.affrc.go.jp/english/inquiry/index.html>

OR




PRINTED WITH  
**SOY INK**  
2020.3.1000  
Printed on Recycled paper

# Institute for Agro-Environmental Sciences, NARO

3-1-3 Kannondai, Tsukuba, Ibaraki, 305-8604, Japan  
Tel: +81-29-838-8148 Fax: +81-29-838-8199 (General Affairs Team)  
URL: <https://www.naro.affrc.go.jp/english/niaes/index.html>