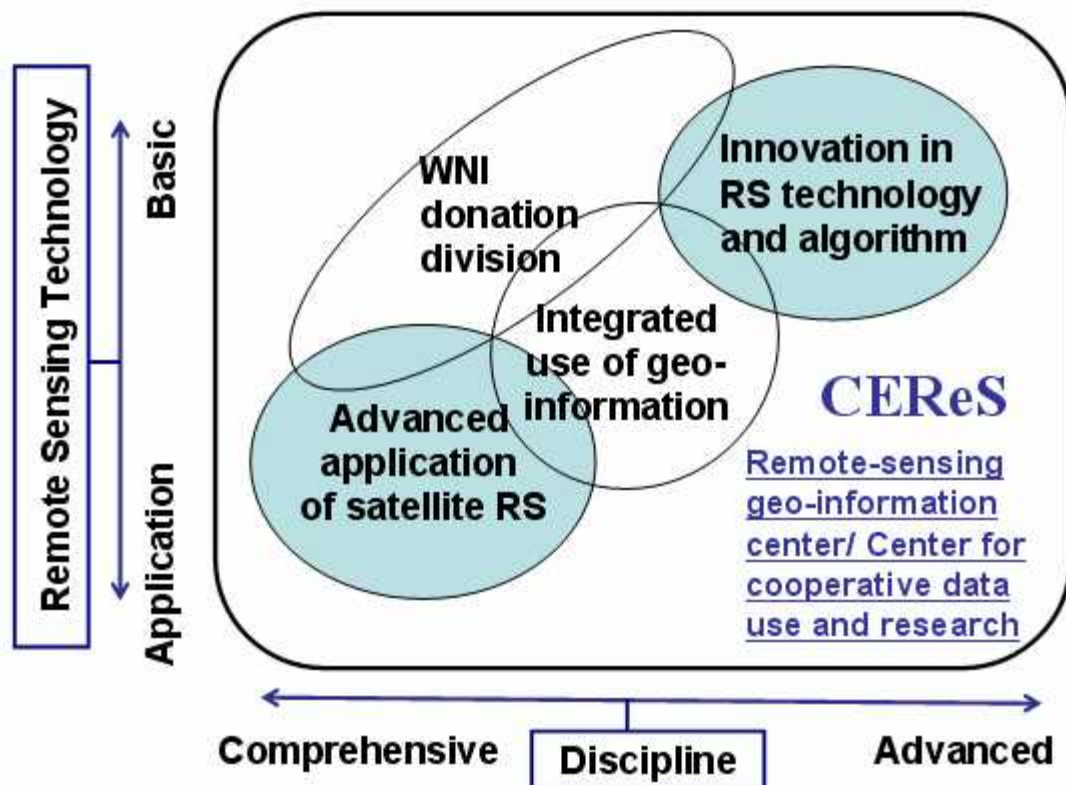


Announcement of New Research Programs of CEReS

Center for Environmental Remote Sensing (CEReS), Chiba University, has contributed to the science community of environmental studies through archiving, processing and disseminating satellite data since its establishment as a national cooperative research center in 1995. Reorganizing foregoing six projects, CEReS has started the following four programs as a newly, officially approved center for cooperative use and research cooperation starting from April 2010: (Program 1) Innovation in remote sensing technology and algorithm, (Program 2) Integrated utilization of geo-information, (Program 3) Advanced application of satellite remote sensing, and (Program 4, WNI donation division) Program for global warming and utilization of weather and ocean information. The summary and short- and middle-term targets of each program will be outlined below.



Program 1

[1] Innovation in remote sensing technology and algorithm

The limitation of existing approaches has often been recognized in the course of the Earth environment studies using remote sensing. In this program, novel sensors and algorithms are explored in order to establish remote sensing methodologies that enable more in-depth and

comprehensive analyses of various targets including vegetation and atmosphere. In this way this program aims at the innovation of remote sensing through such activities as construction and operation of next-generation satellite sensors, and the integration of wide spectral-range observations using optical and microwave remote sensors.

【Short term targets】 (2-3 years)

Environmental applications of circularly polarized synthetic aperture radar (SAR) data/
preliminary design of SAR onboard small satellites

Development and validation of algorithm for retrieving greenhouse gases from satellite-borne sensors

Atmospheric sounding by combining satellite and ground-observation data

Activities for next-generation Earth observing satellite GCOM-C - Establishment of validation methods for the visible and near-infrared data/ algorithm development for the GCOM-C standard products including biomass index, water stress index, shadow index, and vegetation roughness index

【Middle term targets】 (6 years)

The goals of this program are the integration of wide spectral-range observations using optical and microwave remote sensors, and practical applications of innovative remote sensing to global and regional problems.

Development of unmanned aerial vehicle and small satellite for microwave remote sensing and their application to Earth observation

Feasibility study of air pollutant and other atmospheric minor gas retrieval from geostationary satellites

Information retrieval from next-generation sensors for global environment, especially aimed at the atmospheric and vegetation monitoring

Implementation of validation and various data applications of the next-generation Earth observing satellite GCOM-C

Program 2

[2] Integrated use of geoinformation

This program aims to promote atmospheric/terrestrial environmental studies based on integrated use of geoinformation including satellite remote sensing data, ground measurement data, and extracted environmental data. Main research subjects in the program are correction and preprocessing of satellite data, efficient processing methods for a huge volume of satellite data, environmental monitoring method by integrating satellite data and ground data, and extraction of

atmospheric/terrestrial environmental parameters. This program has close relationship with the operation of the data distribution and sharing systems of the whole CEReS.

【Short term targets】 (2-3 years)

Archiving global data of geo-stationary meteorological satellites for more than 10 years, with validation, high-level analysis, and data publication

Feasibility study for the seamless monitoring of the atmosphere by means of comprehensive analysis of satellite data that enables the profile retrieval of atmospheric parameters

Production of advanced and highly precise datasets for global tree coverage and land coverage

Development of a basic geo-information system, “CEReS Gaia”, for efficient data accumulation and sharing

【Middle term targets】 (6 years)

Long-term climatology analysis is implemented by means of the seamless monitoring over more than 20 years, leading to the synergy of land and atmospheric studies and realization of the information center for the earth environment.

Long-term seamless monitoring of the atmosphere is employed for climatology study, through the high-level analysis of various earth-observing satellites, especially geo-synchronous meteorological satellites.

Invigorating the atmospheric and land-surface studies through the feedback of the knowledge from the seamless monitoring to the data pre-processing such as calibration and atmospheric correction prior to the land-coverage analysis.

The final goal is the formation of the information center for the earth environment by disseminating the data obtained from this program and other CEReS programs. The international geospatial data sharing system, “ CEReS Gaia ”, will promote terrestrial environmental research by integrating existing data and research products through mutual comparison activities.

Program 3

[3] Advanced application of satellite remote sensing

Since the establishment of the “Aerospace Basic Act” in 2008, the major purpose of the national policy over the space development and utilization has changed from the stage of research and development to that of wide-range, practical utilization. Thus, it is absolutely needed for the environmental remote sensing community to establish the methodology of utilization of remote sensing for finding, understanding, and solving various problems on both scientific and social bases. In view of such background, this program (Program 3) aims at assigning important problems that must be solved on national and global levels, integrating the results of satellite and ground-based

observations, and realizing the advanced application methodology of satellite remote-sensing data through the synergetic activities of scientists representing various fields of environmental monitoring.

【Short term targets】 (2-3 years)

Researches on environmental changes in China

Evaluation of ecological services of hydrologic cycle in the Quaternary uplands (collaboration with Chiba Prefecture)

Extraction of spatial information in relation to the biodiversity (collaboration with Chiba Prefecture)

Formation of database useful for the mitigation of pollen influence on human health

Research on web-based dissemination of spatial information

【Middle term targets】 (6 years)

We plan to produce novel application methodology of satellite remote sensing data in combination with the data obtained from ground observations. The targets will include various problems such as desertification, water problem, food security, evaluation of ecological services, urban and rural planning, etc.

Monitoring and causal analyses of environmental changes in Asia

Restorations of sound hydrologic cycle and biodiversity in Chiba prefecture

Study on spatial information system that nurtures the disaster- and environmental literacy

Providing spatial information helpful to our daily life

Program 4

**[4] Program for global warming and utilization of weather and ocean information
(WNI Donation Division)**

More and more consequences of global warming are seen around the globe. In this research program, we focus on research activities based on remote sensing and weather/oceanic information aiming at elucidating the currently ongoing climate change trends as well as devising ways to cope with and adapt to the resulting environmental problems. The relevant solutions are sought from the viewpoint of the transportation and weather, in particular, thus strengthening the relation between the environmental research using remote sensing techniques and various social activities.

【Targets during the period of this donation division】

Exploration of the northern ocean route

Modal-shift approach to the domestic commercial logistics among the truck, coastal ferry ship,

train and air transportation - the holistic optimization by monitoring system

Evaluation of effects of moored cargo ships using the atmospheric circulation model

Monitoring of snow and ice coverage on roads using microwave remote sensing

Accumulation of atmospheric and climate parameters through satellite and ground-based observations in relation to the climate change

【Topics for operational phase】

Quasi-real time analysis in the evaluation of radiation quantities from global observation data of meteorological satellites

Estimation of on the surface solar irradiance using the geo-stationary meteorological satellite data

Development of one-to-one platform - disaster monitoring in Chiba prefecture