

# NIES GOSAT PROJECT NEWSLETTER

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Independent Administrative Institution  
National Institute for Environmental Studies (NIES)  
A newsletter on the Greenhouse gases Observing SATellite (GOSAT, "IBUKI") project from the NIES GOSAT Project Office.  
<http://www.gosat.nies.go.jp/>

### NEWS

## SUMMER OPEN HOUSE AT NIES

### NIES GOSAT PROJECT HOSTS "IBUKI" EXHIBITION BOOTH

On July 24th, 2010, the National Institute for Environmental Studies hosted the Summer Open House. The Summer Open House is an annual event held on late July Saturday. Major research facilities are opened to the public. The aim is to introduce state of the art research progress directly through experiments and lectures.

NIES GOSAT Project exhibited a miniature model of "IBUKI," as well as observation data and simulation results screened on a spherical display, and demonstrated an experiment using an instrument similar to the sensor on "IBUKI." The exhibition and experiment introduced the audience "IBUKI" and the current status of research on global warming based on "IBUKI"'s observation. At the site, 16 members from NIES GOSAT Project, including Project Leader Yokota, attended the visitors and answered questions in person. Despite the



heat outside (the temperature hit 35 °C), the Climate Change Research Hall where "IBUKI"'s booth was located was crowded with visitors throughout the day. Thank you for those who came out to the event.

NIES GOSAT Project Leader Tatsuya Yokota stands next to an illustrated version of him on a sign at the entrance of the Climate Change Research Hall.  
Photo: Nobuyuki Kikuchi



The spherical display presented data including the global greenhouse gases concentration maps estimated from "IBUKI"'s observation. People in yellow shirts are NIES GOSAT Project members. Special Senior Researcher Shamil Maksyutov (L), GOSAT Project Office Manager Hiroshi Watanabe (C), and Office for Global Environmental Database Chief Tsuneo Matsunaga (R).



An experiment to measure CO<sub>2</sub> in a plastic bag using an instrument similar to the sensor on "IBUKI." NIES Special Researcher Yukio Yoshida explaining to the visitors.

## NEWS

## THE THIRD GOSAT RESEARCH ANNOUNCEMENT - NOW CALLING FOR APPLICANTS

- Fumiho Takahashi

Guest Researcher,

GOSAT Project Office, Center for Global Environmental Research (CGER), NIES

🍏🍏🍏 The World's first earth observing satellite that measures global greenhouse gases, "IBUKI" (GOSAT) was successfully launched on January 23, 2009. Since then, it has continued its observation for about one and a half year. GOSAT Project is a cooperative effort among the Japan Aerospace Exploration Agency, the National Institute for Environmental Studies, and the Ministry of the Environment (the three parties) to promote the development, operation, and data application of this satellite. As the project has now gained a data set for the duration of one and a half year, its been decided that the third GOSAT Research Announcement (RA) should be posted.

In recent years, it has been recognized that greenhouse gases such as carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) take part in global warming, and "IBUKI" draws a great amount of attention from scientists worldwide as a satellite that specifically measures greenhouse gases. The three parties that promote GOSAT Project posted the first RA in April 2008, and out of 58 proposals, 52 research themes were selected. Then the second RA was released in April 2009 after the launch, and 36 research themes were selected out of 42 proposals. Through these RAs, researchers around the world work on leading research studies using GOSAT data products. The examples of research themes adopted in the first and second RA are listed on the table.

Eligible applicants for the GOSAT RAs are researchers of all nationalities whether independent or affiliated with research institutions, educational organizations, government institutions, or private companies, who aim to use the GOSAT data products for non-profit and peaceful purposes. Once the research proposal is adopted, the researcher is given priority when receiving GOSAT data products, and endowed with rights to make observation requests under certain conditions, as well as an access to the additional information on GOSAT data products. The research proposals are called for on the following five categories: calibration, validation, data processing algorithms, carbon balance estimation and atmospheric transport models, and data application.

Applications for the third RA are accepted between August



Photo. At the second GOSAT RA PI Meeting held on January 28 and January 29, 2010 at Kyoto International Conference Center, Kyoto, Japan.

Table. Examples of research themes from the first and second RA.

CALIBRATION
Infrared Validation and Mid-Tropospheric CO <sub>2</sub> from the FTS GOSAT Sensor
Assessment of GOSAT TIR FTS absolute calibration through validation
Characterization of micro vibration effect to spaceborne-FTS on orbit
VALIDATION
An instrument prototype for column CO <sub>2</sub> , CH <sub>4</sub> and N <sub>2</sub> O using direct solar flux
Validation study of GOSAT CO <sub>2</sub> data with coherent differential absorption lidars
Evaluation and improvement of the phenology monitoring algorithm of terrestrial vegetation
DATA PROCESSING ALGORITHMS
Algorithms for aerosol retrieval and validation for GOSAT / CAI : Combination use of multi-sensor data and ground based in-situ measurements
Studies on atmospheric minor constituents and polar stratospheric clouds retrieved from thermal infrared spectra of TANSO-FTS
Retrieval of cirrus cloud parameters from TANSO-FTS spectra and investigation of global cirrus cloud variations
CARBON BALANCE ESTIMATION AND ATMOSPHERIC TRANSPORT MODELS
Quantification of the carbon cycle in Europe and Western Africa by the top-down method
Chemical data assimilation and inverse modeling of atmospheric CO <sub>2</sub>
Four Dimensional Data Assimilation of GOSAT Observation Data Using a Local Ensemble Transform Karman Filter
DATA APPLICATION
Analysis of Spatial and Temporal Relationship Between Greenhouse Gases and Landuse/Landcover in China
Analysis of GOSAT methane data to characterize the methane source from rice paddies in Asia
Aerosol distribution estimation using GOSAT CAI data in coastal environments for red tide bloom detection

20th and October 29th, 2010. The decision of acceptance/rejection is scheduled on January 31, 2011. The three parties hope that more applications than the first and second RA are going to be sent in by researchers around the world.

For further information, please refer to NIES GOSAT Project website's "Research Announcement" section.

<http://www.gosat.nies.go.jp/eng/proposal/proposal.htm>

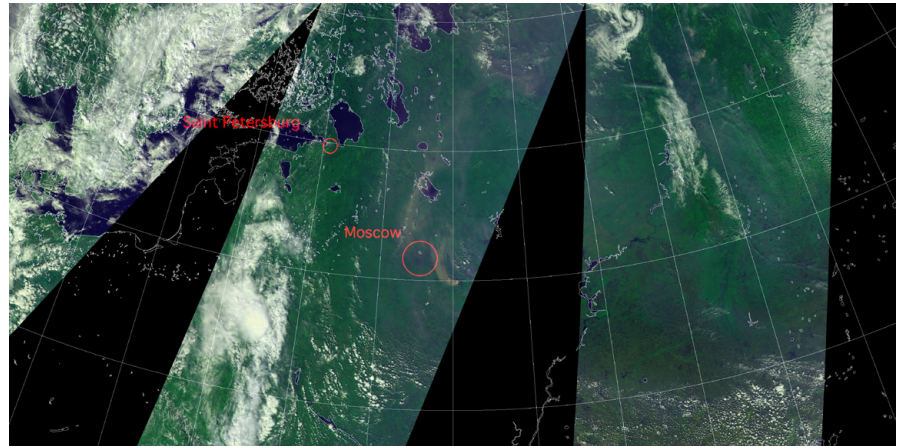


NEWS

# CLOUD AND AEROSOL IMAGER CAPTURES WILDFIRES IN RUSSIA

- Nobuyuki Kikuchi Specialist, GOSAT Project Office, CGER, NIES

🍌🍌🍌 A record-breaking heat wave started in July 2010 in western Russia was followed by wildfires in forests and peat lands spreading across a large area in late July. The image was acquired by "IBUKI" on August 9, 2010. A site of serious fire can be seen in the south east of Moscow, and the smoke is moving northwards and pouring into the Arctic Ocean. Depending on the direction of wind, Moscow was under the lee, and how the thick smog covered Moscow was in news.

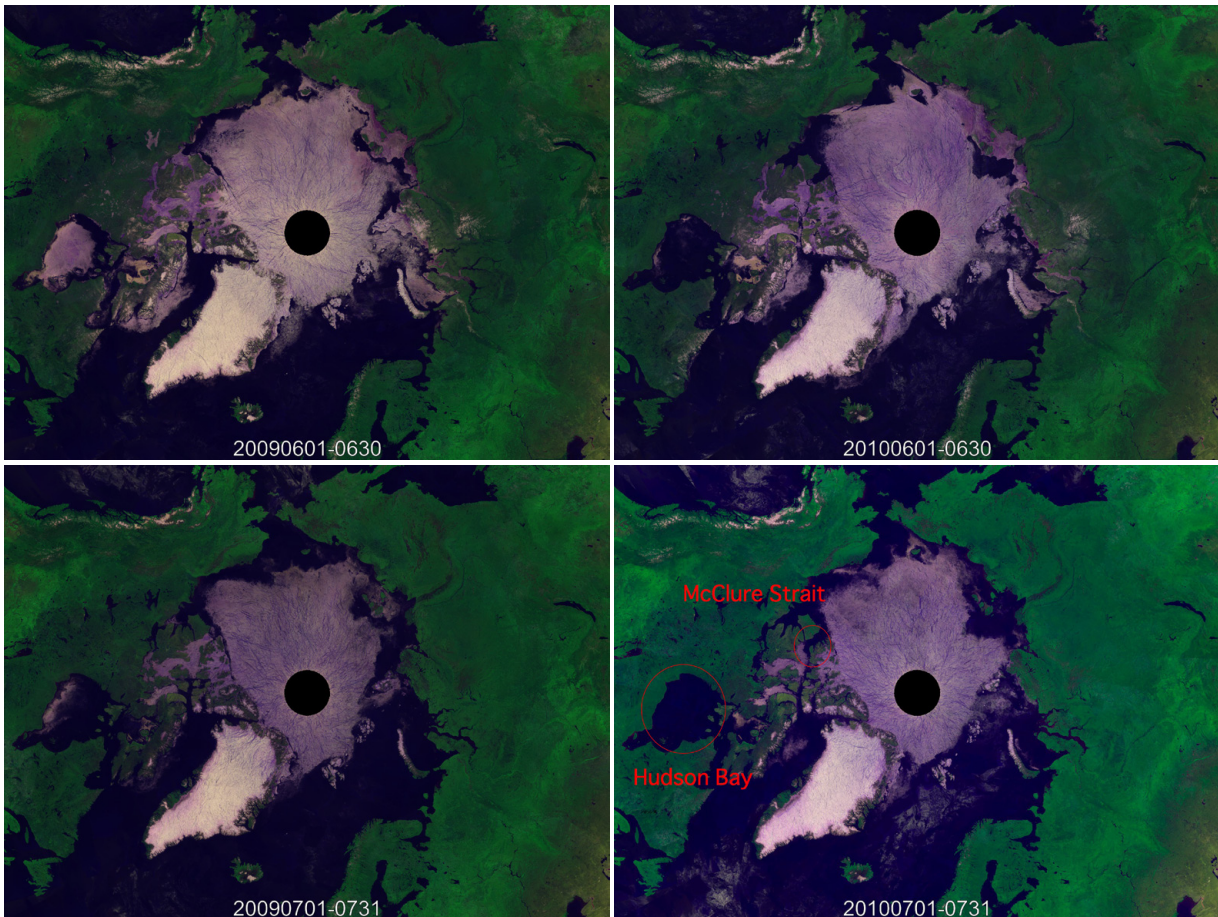


Fires in western Russia captured on August 9, 2010 by "IBUKI."

IMAGES OF THE MONTH

## Sea Ice in Arctic Ocean

- Nobuyuki Kikuchi Specialist, GOSAT Project Office, CGER, NIES



Sea Ice observed by "IBUKI". From Top Left (clockwise) June 2009, June 2010, July 2010, and June 2010.

🍌🍌🍌 The images introduced this month are of Cloud and Aerosol Imager on "IBUKI." These are four images comparing the conditions of sea ice in the Arctic Ocean in June and July of 2009 and 2010. The surface areas of sea ice appear almost the same in 2009 and 2010 images, but the differences can be found if you have a close look near the land. In 2010, the sea ice in Hudson Bay appears completely disappeared, and in the McClure Strait in the Arctic Archipelago is also shown disappeared. The temperature is said to be higher than the

average worldwide this year. It can be seen in "IBUKI"'s images that the impact is also on the sea ice in the Arctic Ocean.

The circular part near the north pole indicates the area of about 800km in diameter where "IBUKI" cannot observe. The images shown here are composites of lowest reflectance ratio images of the month. This is the reason why there are shadows of cloud shown in the images. The streaky shadows are seen in the parts where the reflectance ratio is high, such as on the sea ice and Greenland.



DATA PRODUCTS UPDATE

# Data Processing Status Update from GOSAT Project Office

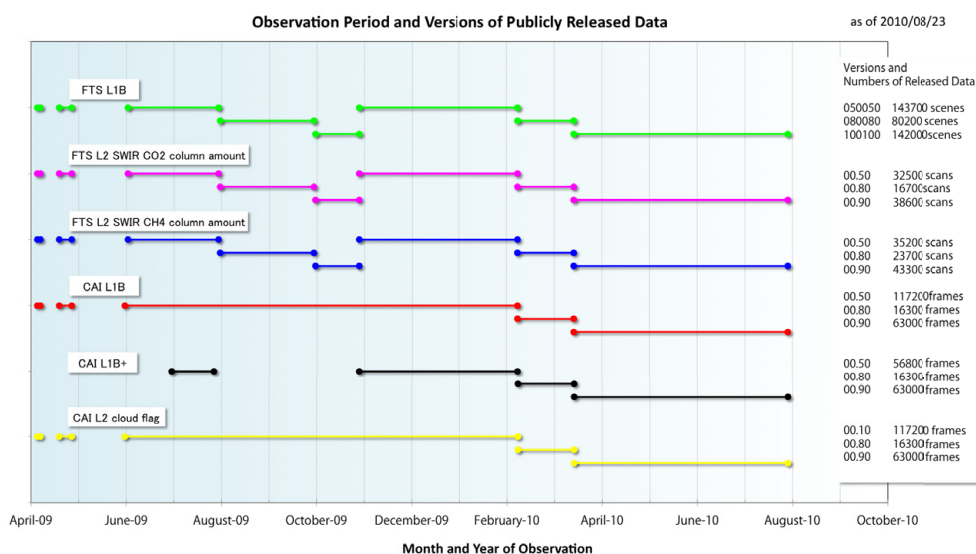
- Fumie Kawazoe, Specialist, NIES GOSAT Project Office

Here we report an update on data processing status for the month of July and August 2010. The The CAI L1B, L1B+, and L2 cloud flag products are processed and available to the public as V00.90. The FTS L1B data products are processed and available as the V100100.

On August 24, 2010, for FTS L2 SWIR CO<sub>2</sub> and CH<sub>4</sub> column amounts data, we have released products as new versions processed with new algorithms. The new versions (V01.10, V01.20, V01.30) of data from April, July, October 2009, and January 2010, and former versions (V00.80, V00.90) of data from August to October 2009, and from April to July 2010 are available in public along with the monthly important notices.

For more information on new version data, please refer to "Product Format Descriptions FTS L2 (V01.10 - V01.30 (SWIR L2 CO<sub>2</sub>, CH<sub>4</sub>)," "Important Notes at Releasing (V01.10-V01.30(SWIR L2 CO<sub>2</sub>, CH<sub>4</sub>)," and "Results of Validation (V01.10-V01.30(SWIR L2 CO<sub>2</sub>, CH<sub>4</sub>))" under "Product Description" page after logging in at GOSAT User Interface Gateway (GUIG).

Monthly important notice can be found on "Remarks on Monthly FTS L2 SWIR Product" page. For details on versions of released products, please refer to "Products list under distribution," "Relationship between obs. period and version." The number of registered users reached 868 as of August 20, 2010.



NEWS

## Symposium on Greenhouse Gases Measurement from Space Hosted by GOSAT Project

"Symposium on Greenhouse Gases Measurement from Space - A Role of Greenhouse Gases Observing Satellite "IBUKI" (GOSAT) -" was held at KOKUYO Hall in Tokyo on August 25, 2010. GOSAT Project Office appreciates very much all of you (298 people) who attended the event. The entire event was live-streamed by Necovideo Visual Solutions, and now the video can be watched on their website.

<http://nvs-live.com/achievements/20100825gosat.html>

CALENDAR

2010/09/05-09

Participation at the 2010 Meeting of Japanese Federation of Statistical Science Associations (Japan Statistical Society the 78th Meeting) held in Tokyo, Japan.

2010/09/06-08

Participation at the 2nd Workshop on Carbon from Space held in Oxford, UK.

2010/09/07-11

Participation at the 21st International

Conference on High Resolution Molecular Spectroscopy - POZNAN 2010 held in Poznań, Poland.

2010/09/09-10

Participation at the 28th Laser Sensing Symposium held in Otsu, Shiga, Japan.

2010/09/20-23

Participation at the SPIE Remote Sensing held in Toulouse, France.

PUBLISHED PAPERS

**Name of Journal:** Journal of The Remote Sensing Society of Japan (Volume 30, Number 3, July 2010, pages 149-156)

**Title:** Lidar Observation of Stratospheric Aerosols Increased from the 2009 Mount Sarychev Volcanic Eruption

**Authors:** Osamu Uchino, Tetsu Sakai, Tomohiro Nagai, Takuya Sakashita, Kenji Suzuki, Takashi Shibata, Isamu Morino and Tatsuya Yokota

\* The paper is written in Japanese except for its abstract, figures, and tables.

ANNOUNCEMENT

The interview article with President Shuichi Rokugawa of the Remote Sensing Society of Japan is postponed, and scheduled for the next issue.



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