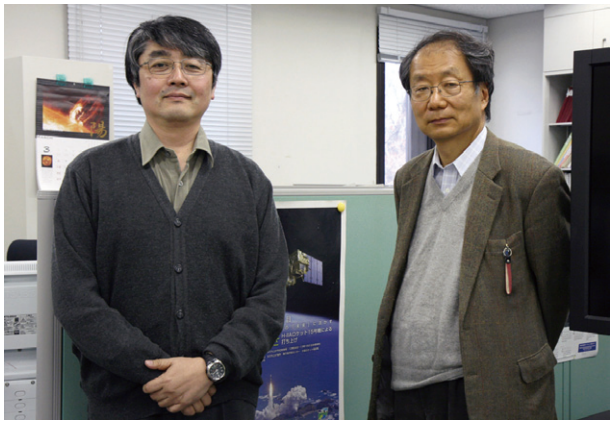
Independent Administrative Institution
National Institute for Environmental Studies (NIES)
A newsletter on the Greenhouse gases Observing SATellite (GOSAT, "IBUKI") project from the NIES GOSAT Project Office.
http://www.gosat.nies.go.jp/

ISSUE # 14
FEB. 2011



NIES GOSAT Project Leader Tatsuya Yokota and Office Manager Hiroshi Watanebe in the GOSAT Project Office on March 22, 2011. The members of the NIES GOSAT Project are all well and safe.

ANNOUNCEMENT

This issue of NIES GOSAT PROJECT NEWSLETTER was delayed partly due to the earthquake occurred in the offshore area of Tohoku region (North-Eastern part of Main Island of Japan) on March 11, 2011.

While the GOSAT Project homepage (http://www.gosat.nies.go.jp/) **is accessible, the GOSAT User Interface Gateway (GUIG), where you can search and download GOSAT data, is currently not in service. Since the earthquake, the NIES GOSAT Data Handling Facility (GOSAT DHF) has been stopped (as of March 22, 2011).**

We are also experiencing difficulty responding to all of your questions at the moment, and would like to apologize for any inconvenience caused by this trouble. We will keep you informed of the latest status by the GOSAT Project homepage. Based on the information from Japan Aerospace Exploration Agency, the operation of the spacecraft and sensors are operating nominally.

March 22, 2011

- NIES GOSAT PROJECT NEWSLETTER

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/

ISSUE # 14
FEB. 2011

CONTENTS

NEWS
18 Proposals Adopted - the 3rd GOSAT Research Announcement 01
Minister of the Environment Ryu Matsumoto Visits NIES 02
"IBUKI" Captures the Eruption of Kirishima in Japan 02
AHA! OF THE MONTH
Column Amount and Column Averaged Mixing Ratio 03
SPECIAL FEATURE
2010 through the Eyes of "IBUKI" 03
GOSAT PEOPLE
People of "IBUKI" - Akihiko Kuze 06
DATA PRODUCTS UPDATE 07
IMAGES OF THE MONTH
Drift Ice in the Sea of Okhotsk - Japan 08
CALENDAR 08
ANNOUNCEMENTS 08

NEWS

18 PROPOSALS ADOPTED -THE 3RD GOSAT RESEARCH ANNOUNCEMENT-

Principal Investigator	Research Organization	Research Theme
	Validation	
Li Zhang	Chinese Academy of Sciences (CAS)(China)	The validation of GOSAT CO_2 flux product over the grasslands
	Data Processing Algorithms	
Hirofumi Oyama	Japan Aerospace Exploration Agency (Japan)	Observation of air pollutants from GOSAT thermal infrared spectra
Otto HaseKamp	SRON-Netherlands Institute for Space Research (Netherlands)	Retrieval of CH_4 from GOSAT-FTS measurements using a full physics approach based on accurate radiative transfer and an approach using the CO_2 column as a light path proxy
	Carbon Balance Estimation, Atmospheric Transport Models	
Peter Rayner	University of Melbourne (Australia)	Assimilating GOSAT CO_2 into a combined weather/climate model
Ray Nassar	Environment Canada (Canada)	Estimation of CO_2 and its fluxes by joint assimilation of GOSAT data and insitu measurements
Dylan Bryce A. Jones	University of Toronto (Canada)	Estimation and attribution of global CO_2 surface fluxes using satellite observations of CO_2 and CO from TES, GOSAT, and MOPITT
	Data Application	
Kristiina Regina	MTT Agrifood Research Finland (Finland)	Carbon balance of selected agricultural soils in southern Finland estimated using GOSAT / FTS satellite sensory data - effect of soil type and management practices on CO_2 and CH_4 vertical flux estimates
Krishna Prasad Vadrevu	University of Maryland (U.S.A.)	Biomass burning research, satellite remote sensing of fires and relating to GOSAT CO_2 retrievals
Philippe Ricaud	CNRS/Universite Paul Sabatier (France)	Transport Processes over the Mediterranean Basin as Diagnosed from the Evolution of Long-lived Species: Spaceborne Measurements and Modeling Studies
Ira Leifer	University of California, Santa Barbara (UCSB) (U.S.A)	Validation of satellite-derived methane budgets from fugitive fossil fuel industrial emissions
Jordi Isern-Fontanet	Institut Catala de Ciencies del Clima (Spain)	The role of oceanic mesoscale structures in the air-sea fluxes
WU Bingfang	Chinese Academy of Sciences (CAS) (China)	Spatial and temporal dynamics detection of the greenhouse gas emissions from the Three Gorges region of China
Muhammad Evri	Agency for the Assessment and Application of Technology (BPPT) (Indonesia)	REDD plus and estimation of land-atmosphere carbon exchange using ground-based and GOSAT data in Industrial plantation forest: Paser-East Kalimantan and Jambi
Ke-Sheng CHENG	National Taiwan University (Taiwan)	Comparing path radiances estimated using GOSAT CAI images and Formosat II images
Rama Rao Nidamanuri	Indian Institute of Space Science and Technology (IIST), Government of India (India)	Estimation of tropical forest biophysical parameters using near UV and NIR reflectance from GOSAT TANSO - CAI sensor
	Data Application ／ Validation	
Mohsin Hafeez	Charles Sturt University (Australia)	Integrated mapping and modeling of water and carbon footprints of Australian irrigated agricultural systems
Yongwon Kim	University of Alaska Fairbanks (UAF) (U.S.A)	Assessment and monitoring of CO_2 and CH_4 in wildfire and healthy boreal forest, Interior Alaska
	Data Application ／ Carbon Balance Estimation, Atmospheric Transport Models	
Chang-Keun Song	National Institute of Environmental Research (South Korea)	Evaluation of long-range transport of greenhouse gases (hereinafter refer to as "GHGs")(CO_2 and CH_4) and estimation of GHGs emission sources using GOSAT data and atmospheric chemistry model for the better understanding of carbon cycle

The countries and numbers of adopted proposals: the United States 3; Canada, Australia, and China 2; France, Netherlands, Spain, Finland, India, Indonesia, Taiwan, South Korea, and Japan 1.

continued from the previous page

18 Research Proposals Adopted - 'The 3rd GOSAT Research Announcement'

- Fumiho Takahashi, GOSAT Project Office, NIES

The Greenhouse Gases Observing SATellite (GOSAT, "IBUKI") was launched as the world's first satellite specialized for global greenhouse gas observation on January 23, 2009, and it has been making observation for two years without any major problems since then. With an aim to make an efficient use of the research outcomes of the satellite, the promoters of the GOSAT Project, the Japan Aerospace Exploration Agency (JAXA), the National Institute for Environmental Studies (NIES) and the Ministry of the Environment (MOE) (hereinafter referred to as the 'Three Parties') solicited research proposals from August 2010 to November 2010 for the third time (the third Research Announcement (RA)), reflecting the fact that the GOSAT Project has accumulated two years' worth of data sets in this time when the role of greenhouse gases such as carbon dioxide and methane in global warming is widely recognized., the Three Parties solicited proposals from universities and research institutes in and out of Japan on the following areas: the data processing algorithms, calibration, validation, carbon balance estimation/atmospheric transport models, and data application.

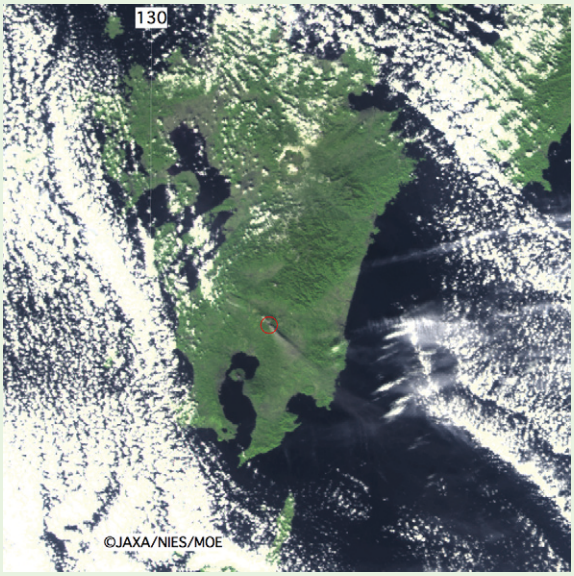
As a result, through this RA, proposals covering the research areas above were submitted from all over the world. The topics were, for example, building atmospheric transport models based on the 'annual variation,' 'seasonal variation,' and 'regional variation,' as well as studies on carbon cycle and development of data processing algorithms, and also studies on validation using various measurements, evaluation methods and comparative studies with other satellite data for producing more accurate data.

The Three Parties adopted 18 proposals according to the decision made at the eighteenth GOSAT RA Selection and Evaluation Committee held on January 21, 2011. 106 proposals in total have been adopted through the three RAs. The successful applicants of the third RA are expected to work on the advanced and innovative research following the footsteps of researchers of the first RA (53 proposals) and the second RA (36 proposals). We sincerely hope they can achieve the proposed goals, and that as a result contribute to the efficient use of GOSAT data products and further inspirations for researchers and opportunities for extensive research.

NEWS

Minister of the Environment Ryu Matsumoto Visits NIES

At NIES, the minister was first given presentations from the institutes' ongoing biodiversity and invasive species research program, 'the Japan Environment and Children's Study' project, and the global warming research program. From the GOSAT Project, Project Leader Tatsuya Yokota explained about the summary and current status of the project (photos on top row). After the presentation session, the minister visited the Research Laboratory of Material Cycles and Waste Management, and the Environmental Specimen Time Capsule Building where the genes of endangered species etc. are being stored. In the end of the visit, a Q&A session was organized for opinion exchange. (photos on bottom row). Photo: taken on January 19, 2011 at NIES by Yuki Tanaka.



NEWS

"IBUKI" Captures Eruption of Kirishima in Japan

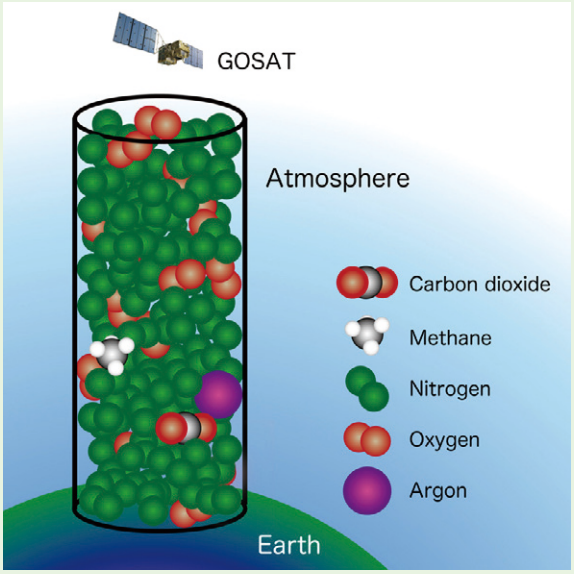
Nobuyuki Kikuchi Specialist, NIES GOSAT Project Office

"IBUKI" captured the volcanic plume of Mt. Shinmoedake in the Kirishima mountain range in Japan. The image was acquired when "IBUKI" passed over the Kyushu District at 1:26 pm on January 26, 2011 (JST). The image shows that a volcanic plume is spreading southeastward, coming from the Kirishima mountain range (a red triangle in the image) located on the border of Miyazaki Prefecture and Kagoshima Prefecture. Miyakonojo City of Miyazaki Prefecture is right on the path of plume. According to the Japan Meteorological Agency, the volcanic activity of Mt. Shinmoedake has increased considerably after 3:00 pm. What "IBUKI" captured is the volcano before the increase of activity. The image is a false color image produced from the data acquired by the Cloud and Aerosol Imager (CAI) installed on "IBUKI." (Red = Band 2, Green = Band 3, Blue = Band 1.)

AHA! OF THE MONTH

'Column Amount' and 'Column-Averaged Mixing Ratio'

- Nobuyuki Kikuchi
Specialist, NIES GOSAT Project Office



"IBUKI" measures an amount of carbon dioxide (CO_2) or methane (CH_4) in the form of column amount or as column-averaged mixing ratio. This article explains about the column amount and column-averaged mixing ratio.

"IBUKI" measures the light that reaches the satellite from the ground surface as reflection of sunlight. By examining the light as spectra to know how much light was lost in the atmosphere due to the absorption by CO_2 or CH_4, it is possible to measure the amount of CO_2 or CH_4. For this reason, "IBUKI"'s measurement of CO_2 and CH_4 come out as a total amount of CO_2 or CH_4 from the ground surface to the top of atmosphere. A column amount is a total amount of gas in a column of a unit area with a height from the ground to the top of atmosphere.

A column amount varies as the elevation of the ground surface or the air pressure change. In order to know the variations of CO_2 or CH_4, it is necessary to remove the interference of air pressure by calculating a column average mixing ratio. A column average mixing ratio is the ratio of a column amount of CO_2 or CH_4 to a column amount of dry air. The dry air is the air minus vapor that makes up about 0.5% of air at average, and consists of 78.1% nitrogen, 20.9% oxygen, 0.9% argon, and 0.04% carbon dioxide, and 0.003% others. The column amount of dry air can be calculated on the ground by measuring the air pressure, but it cannot be measured directly from space. Instead, the column amount of dry air is calculated by measuring a column amount of oxygen using its characteristic that its ratio to the dry air is almost always consistent. "IBUKI" calculates the column amount of oxygen by measuring the attenuation of light due to the absorption by oxygen.

SPECIAL FEATURE

THROUGH THE EYES OF "IBUKI" 2010

Dr. Nawo Eguchi,
Center for Atmospheric and Oceanic Studies
Graduate School of Science, Tohoku University
(A member of CGER, NIES until December 2010)

The December issue of NIES GOSAT PROJECT NEWSLETTER introduced to you the natural phenomena observed by "IBUKI"'s Cloud and Aerosol Imager. This issue is going to explain about the current global greenhouse gases amount and distribution observed by "IBUKI"'s Fourier Transform Spectrometer during the year 2010.

The Intergovernmental Panel on Climate Change (IPCC) reported that "most of the observed increase in global averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentration, [1]" and various mitigation scenarios are being discussed. However, the details on variation of greenhouse gases on a global scale is yet to be made clear because there have not been sufficient global observations. Under such circumstance, "IBUKI"'s global greenhouse gas observation from space was initiated in April 2009.

This article shows the global distributions of CO_2 and CH_4 and their seasonal variations using "IBUKI"'s data products.

Figures 1 and 3 show the global distributions of CO_2 and CH_4 monthly column-averaged mixing ratios[2] (XCO_2 and XCH_4) of January, April, July, and October of 2010. The figures were plotted using the TANSO-FTS SWIR Level 3 data products.

Figure 2 shows the time series of XCO_2 and XCH_4 monthly average calculated using the TANSO-FTS SWIR Level 2 data products. The XCO_2 and XCH_4 values retrieved from "IBUKI"'s observational data are lower (by 2~3% for XCO_2, by 1% for XCH_4) than the validation data[3]. For making the Figure 2, the retrieved values of XCO_2 were multiplied by 1.025 and the values of XCH_4 were multiplied by 1.01.

The colors in the Figures 1 and 3 indicate the amounts of XCO_2 and XCH_4. The areas in white indicate that the column-averaged mixing ratio for those areas could not be retrieved due to the interference by clouds and aerosols (tiny particles in the atmosphere). Over the ocean, the retrieved XCO_2 and XCH_4 are restricted around the sunglint region where the relatively high reflection of sunlight is observed by "IBUKI". Latitudinal bands in colors over the ocean march along with the seasonal change of the solar altitude.

The global distributions and seasonal variations of XCO_2 and

1 IPCC, 2007: Summary for Policymakers. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

2 Please refer to this issue's article, "AHA OF THE MONTH – Column Amounts and Column Average Mixing Ratio."

3 For further information, please refer to the "Results of Validation" in the Document section of the GOSAT User Interface Gateway website (requires guest user log in).
https://data.gosat.nies.go.jp/GosatWebDds/productorder/distribution/user/V01XX_ResultInitialValidation_gu_en.pdf

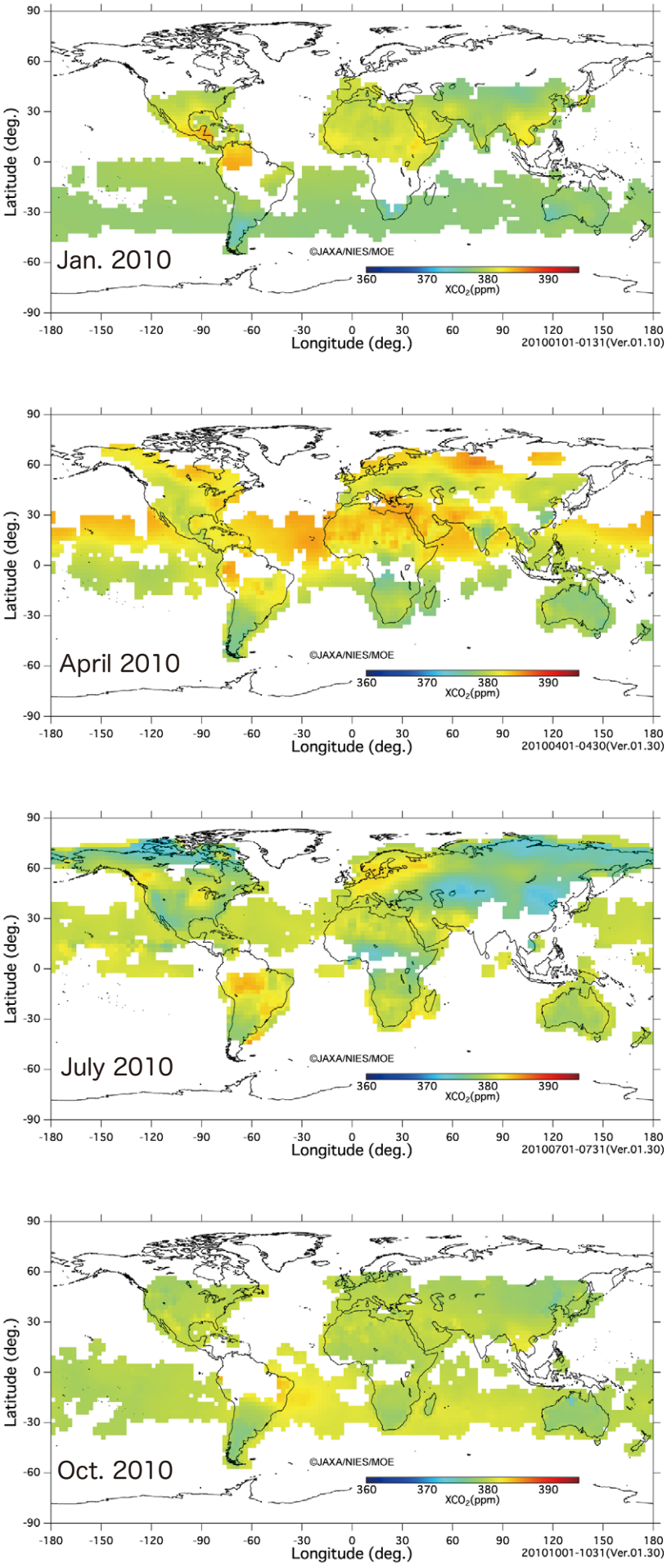


Figure 1. The global distributions of column-averaged mixing ratio of carbon dioxide (XCO_2) in 2.5 degree mesh (created with "IBUKI" Level 3 data products). The areas in white indicate that the column-averaged mixing ratios for those areas could not be retrieved due to the interference by clouds and aerosols.

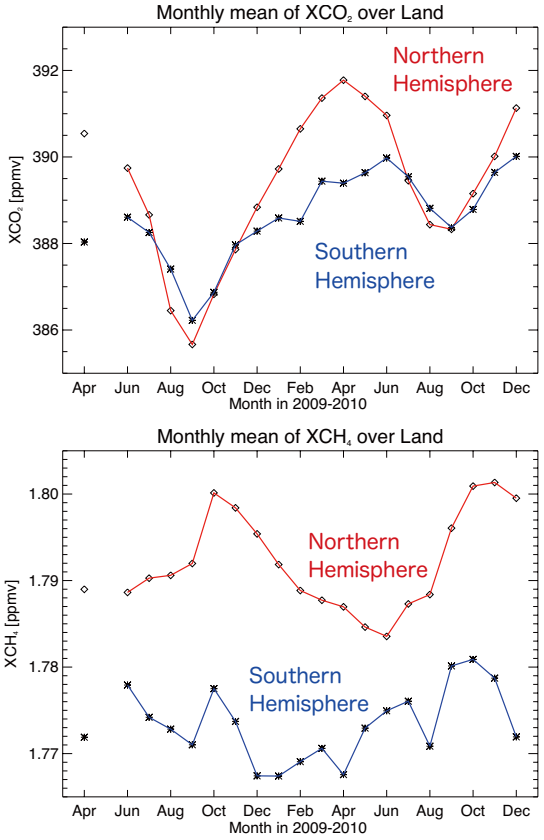


Figure 2. A time series of XCO_2 (top) and XCH_4 (bottom) monthly average from April 2009 to December 2010 over the land. Red line: the northern hemisphere. Blue line: the southern hemisphere. Abnormal data are being removed for the creation of the graphs. May 2009 was left blank because the data are not available. For the creation of this figure, the values of XCO_2 were multiplied by 1.025, and the values of XCH_4 were multiplied by 1.01.

XCH_4 are described as follow.

CARBON DIOXIDE (XCO_2):

The atmospheric CO_2 concentration varies with the nature activity (e.g. ocean and plants) and the emission caused by human activities. According to the analysis by the World Data Centre for Greenhouse Gases (WDCGG), the global average of atmospheric CO_2 concentration near the ground surface is about 387 ppm[4] for 2009.

Figure 1 shows that the concentration of CO_2 varies with the location and season. In April (spring in northern hemisphere (NH)), the concentration marks high value globally, and in July (summer in NH) the concentration in the middle and high latitudes is low especially in Central to Eastern Eurasian Continent (in Siberia). In October (fall in NH), the concentration seems higher than July in the NH, and lower in land areas in the southern hemisphere (SH).

Top graph in Figure 2 shows the seasonal variations of XCO_2 in NH and SH. As it was explained with Figure 1, the concentration in the NH is high in April, and low in July. It also indicates that the concentration is higher in general and the amplitude (the range of variation within a year) is larger in the NH than in the SH.

4 The symbol ppm (parts per million) is a unit of concentration that describes the proportion of amount of target molecules to the total amount of molecules in the dry air.

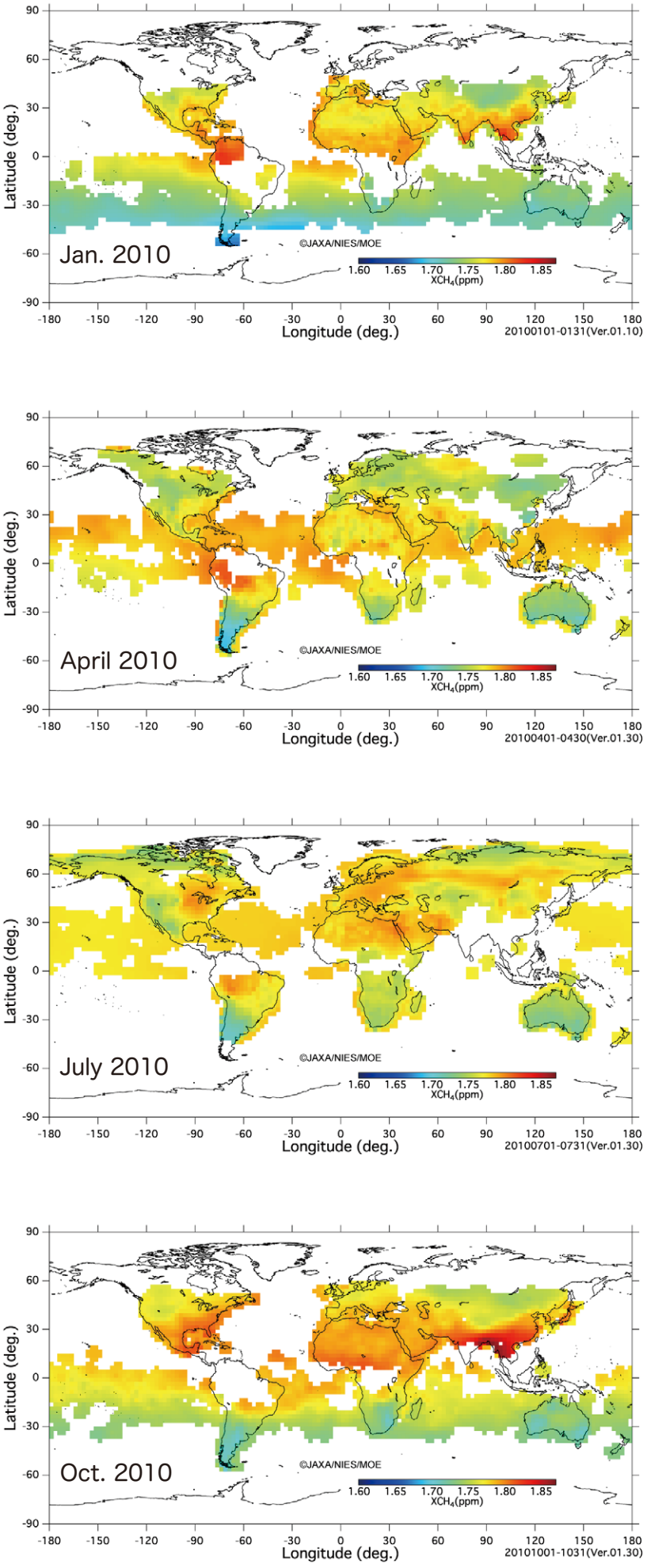


Figure 3. The global distributions of column-averaged mixing ratio of methane (XCH_4) created the same way as Figure 1.

In general, the global CO_2 concentration in the atmosphere is largely affected by the terrestrial ecosystem of the NH where there is a bigger land surface. The CO_2 concentration reaches its highest right before the plants start their activities in April (spring in NH), then decreases until September as the amount of absorption exceeds the emission due to the photosynthesis of plants. In the SH, the seasonal variation is less prominent than in the NH because of the smaller vegetation area.

The top graph in Figure 2 shows that the concentration in September 2010 is approximately 2 ppmv higher than that of September 2009. The similar tendency can be found in other months. It suggests that the CO_2 concentration in the atmosphere has increased since 2009.

METHANE (XCH_4):

The CH_4 emission is due to the human-forced causes such as leaks during coal mining and transportation of natural gas, also from livestock production, biomass burning and paddy fields, in addition to the natural causes such as microorganisms' activities in wetlands. CH_4 is decomposed by chemical reactions in the atmosphere. According to the analysis by WDCGG, the global averaged CH_4 concentration near the ground surface is about 1.80 ppm for 2009.

Figure 3 indicates that the concentration in the NH is higher than in the SH throughout the year. The concentration marks high especially in the tropics, South America, Central and Southeast Asia. The seasonal variation seems prominent in Asia. However, there is a high possibility that the concentration in July when it is rainy season in Asia is not evaluated accurately due to the influence of clouds.

In the bottom graph in Figure 2, it is suggested that the concentration is higher in the NH than in the SH. The sudden increase in August (summer in NH) to October (fall) is due to the high CH_4 concentration in Asia. The sudden increase starts in September when the rainy season ends (and the cloud coverage becomes small). From winter to spring the concentration decreases gradually.

Now with "IBUKI," it is possible to observe the areas where it was hard to measure the concentration by ground-based observation, especially over the oceans, South America and the Siberia with rich vegetation. However, the concentration retrieved from "IBUKI"'s observation is 2~3% lower (XCO_2) and 1% lower (XCH_4) compared to that of the ground-based observations. The NIES GOSAT Project considers that greenhouse gases retrieval process is interfered by impact factors as thin clouds and aerosols in the atmosphere. There is a space for improvement in terms of observations of the areas where there are thin clouds and aerosols. Currently, we are developing the retrieval methods that treat the clouds more accurately.

GOSAT PEOPLE

Messages from People of "IBUKI"

Sensor Development

Japan Aerospace Exploration Agency
Satellite Applications and Promotion Center

Akihiko Kuze

Photo by Yuki Tanaka

I develop sensors for satellites.

Just a quarter century ago, I worked on a numerical simulation of the thermospheric chemistry as a graduate student, and that is how I started to be involved in the Earth's atmosphere. At that time, the data we would compare to, were mostly provided by the U.S. satellites, except for those provided by the observation rockets of the Institute of Space and Astronautical Science (ISAS) in Japan. Most of the related literature then was also coming from the United States. I still regret that I did not go to the United States to study at that point, but instead I decided to work for NEC Corporation in Japan to work on not just simulations, but to develop observational instruments. Ever since, I am engaged in the development of onboard-satellite sensors.

Around that time in Japan, ISAS had a few satellites with compact spectrometers, but there were not any high spectral resolution sensors like the U.S. Nimbus series for the Earth's atmospheric chemistry. Then at NEC, I was given an opportunity to study at the Harvard-Smithsonian Center for Astrophysics. Even though it is an astrophysical observatory, the spectroscopic experiments and observations on the Earth's atmosphere are also studied as an extension of its long history of spectroscopy of the Sun since the 19th century. There, I had an opportunity to study radiative transfer, the basics in satellite observation of the troposphere. I think my studies on the retrieval of cloud top heights and coverage using the oxygen A-band during this stay were later applied to the GOSAT Project.

After I came back to Japan, I finally got the opportunity I always dreamt of. I was assigned to develop a small sensor, the spaceborne infrared Echelle Grating Spectrometer for ILAS-II[1]. Although it was a small component, it observed atmospheric constituents. Personally, I had a great pride in its elaborate optical design. However, even though the spectroscopic resolution was high, the signal-to-noise ratio (SNR) was insufficient. For "IBUKI," some people requested higher spatial resolution, but learning from that experience, I gave a priority to SNR.

I was so devastated that I got a fever.

After that, I was assigned to develop OPUS/SOFIS[2] sensors. We already built the engineering models (EM), but the project was dropped by the wayside. This happened right after I changed careers and started working for the Japan Aerospace Exploration Agency (JAXA). I was so devastated that I got sick with a fever for the first time since I was a freshman in junior high school. Eventually, however, these OPUS and SOFIS were given new objectives, and were reborn as different sensors in the GOSAT Project. I have been responsible for them until now.

Since 1996, I have participated in the field observations of scattered light from the atmosphere in Mt. Fuji and of sunglint on Sagami Bay using a commercial Fourier transform spectrometer (FTS) with the members of NIES, so I thought "IBUKI" was theoretically feasible. However, FTS is generally used in a lab to measure spectra in the thermal infrared region, and the FTS is installed onboard "IBUKI" to measure spectra in the short wavelength infrared region. I was worried if the sensor could acquire decent spectra from the orbit after surviving the launch, until we received the first spectra in February 2009. Especially for one and half a year before the launch, we met unexpected troubles such as the last minute redesigning, parts replacement, finding bugs in programs, and I would have to ask enormous favors to NEC Toshiba Space Systems Ltd. (sensor) and Mitsubishi Electric Corp. (satellite body). If I think about it, these ordinary days of receiving beautiful spectra now, is 'a dream come true' for me.

What is more exciting than anything is that the oversea researchers that I only knew from their research papers now come to join us at the field campaigns for vicarious calibration of "IBUKI" carried out at the Railroad Valley in Nevada, the United States (RRV), or they even sacrifice their holidays to work on analyzing GOSAT data. Last June at RRV, I felt a strange sense of accomplishment for reaching another level in my career when Dr. David Crisp, the Principal Investigator of NASA's OCO Project and I were digging cat holes together for the base camp… "IBUKI" has been a great experience for me, but "IBUKI" might just be a rookie who happened to make a full swing and hit a homerun. I would like to devote myself to increasing the accuracy of on-orbit calibrations and Level 1 data for "IBUKI" to become a first-string player.

1 The Improved Limb Atmospheric Spectrometer II **(ILAS-II)** is a ozone layer monitoring sensor installed on Advanced Earth Observing Satellite-II (ADEOS-II "Midori-II"). ADEOS-II ended its operation in 1997.

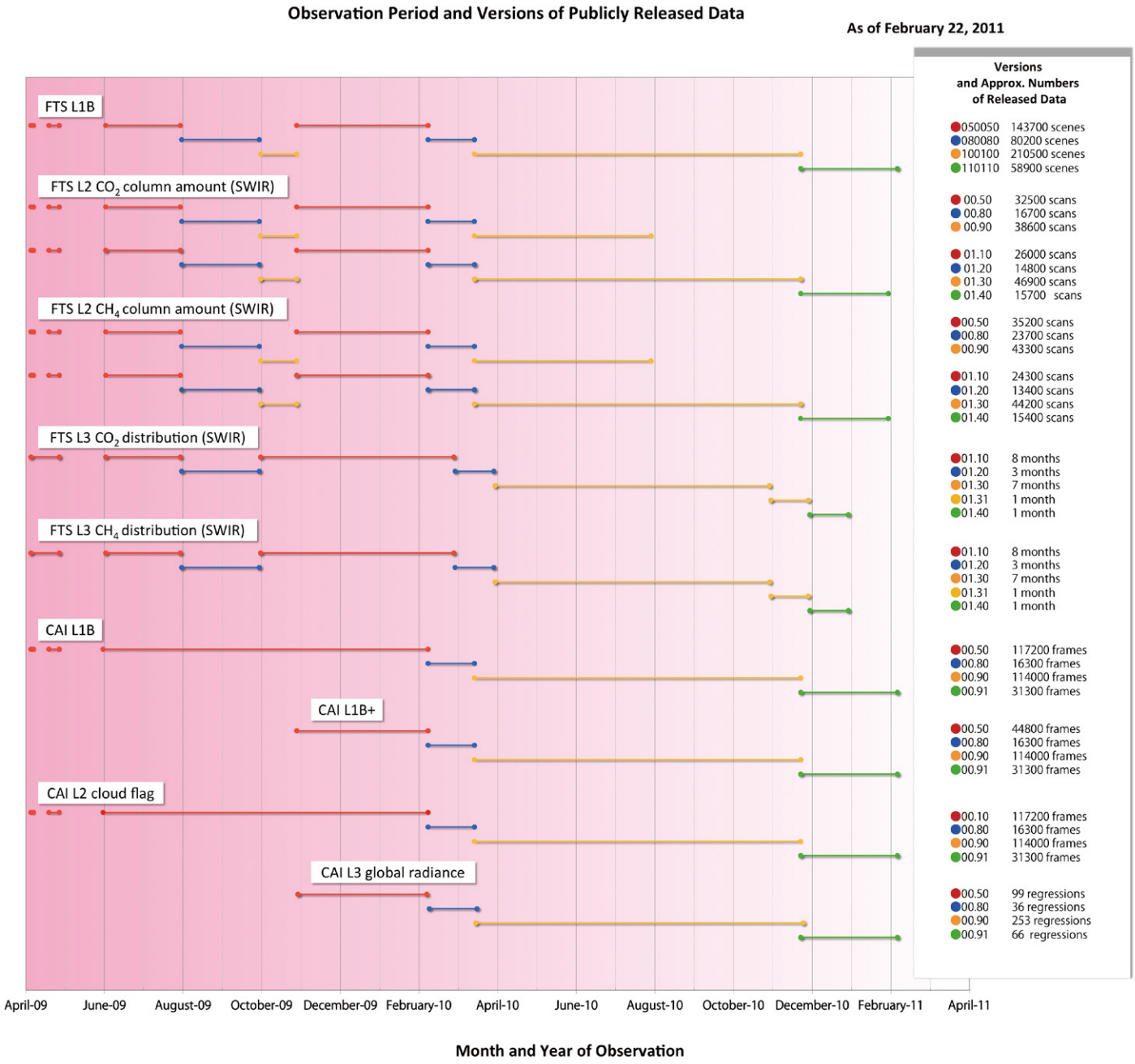
2 Ozone and Pollution Measuring UV Spectrometer **(OPUS)** and Solar Occultation FTS for Inclined-Orbit Satellite **(SOFIS).**

The GOSAT vicarious calibration team (the United States and Japan) at the Railroad Valley in June 2010. (first left in the bottom row) author. (center in the bottom row) Dr. David Crisp, Principal Investigator, OCO Project. Photo: courtesy of the author.

DATA PRODUCTS UPDATE

Data Processing Status Update from GOSAT Project Office

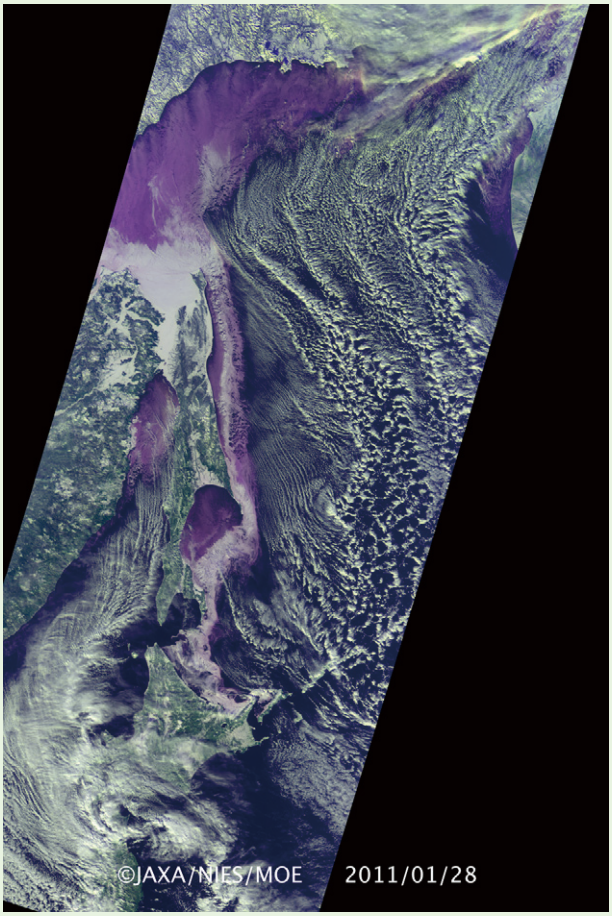
- Fumie Kawazoe
Specialist NIES GOSAT Project



Here we report an update on data processing status for late December 2010 to early January 2011.

Continued from last month, we are processing and releasing the V110110 of the FTS L1B data products, V00.91 of the CAI L1B, CAI L1B, L1B+, L2 cloud flag data products, and the L3 global radiance distribution products, and V01.40 of the FTS L2 CO_2 and CH_4 column amount (SWIR) data products for the months of November and December 2010. Please also visit the GOSAT User Interface Gateway (GUIG) (https://data.gosat.nies.go.jp/) and check for the updates in the "Remarks on Monthly FTS SWIR L2 Product" and "Gallery" sections. Satellite images of volcano eruption and drift ice can be found on GUIG's "Gallery" or GOSAT Project website (http://www.gosat.nies.go.jp/).

The number of registered general users reached 998 as of February 22, 2011.



IMAGES OF THE MONTH

Drift Ice in the Sea of Okhotsk - Japan

Nobuyuki Kikuchi
Specialist, NIES GOSAT Project

"IBUKI" captured drift ice in the Sea of Okhotsk.

The image was acquired when "IBUKI" passed over the Sea of Okhotsk during 12:45 pm to 12:50 pm on January 28, 2011. In the image, you can see drift ice moving towards the Okhotsk Coast of Hokkaido, Japan. Drift ice has come southward along the Sakhalin Coast all the way up from the north of the Sea of Okhotsk. In this image, the ice looks purple and the snow looks white. This is because "IBUKI" measures invisible light, the near infrared rays (0.86 μ m). Ice and water absorb the near infrared rays, and look tinted in "IBUKI"'s images. However, snow and clouds are reflected as white since snowflakes and cloud particles are tiny and they have a tendency to scatter light than to absorb. This causes the fresh drift ice to look purple, and to turn white as it is covered in snow, then to come back to purple as it melts. The image shows that drift ice in northern part of the Sea of Okhotsk is not snow-covered because it looks purple, and drift ice that reached Hokkaido is snow-covered. Mamiya Strait is all white, entirely blocked by ice and covered in snow.

"IBUKI"'s images are false-color images produced by assigning band 2 (0.674 μ m) to red, band 3 (0.87 μ m) to green, and band 1 (0.38 μ m) to blue. This causes the images to have different color combination from that of what a person sees.

ANNOUNCEMENT Correction and Apology

In the article "Data Processing Status Update from GOSAT Project Office" on August, September, October, November 2010, and January 2011 issues of NIES GOSAT PROJECT NEWSLETTER, we reported a wrong version number for the L1B data products that we were processing and releasing. It was reported as "V00.90," however the correct version number is "V100100" (August - November 2010) and "V110110" (January 2011). We apologize to the readers for any inconvenience caused by this article. These issues online were revised on February 8, 2011.

CALENDAR

2011/03/11
Hosting the 1st Workshop on GOSAT Data Utilization at Tsukuba Internatinal Congress Center (EPOCHAL Tsukuba) in Tsukuba, Japan.
2011/03/16-18
Participating in the 5th GEOSS Asia-Pacific Symposium held at Tokyo Station Conference in Tokyo, Japan.
2011/03/29-31
Participating in NOAA NASA EUMETSAT Satellite Hyperspectral Sensor Workshop held at the University of Miami, in Miami, U.S.A.

ANNOUNCEMENT

NIES GOSAT PROJECT NEWSLETTER welcomes letters from our readers.
We appreciate your opinions,
"I want to read articles on ..."
"... was really interesting." etc.
We also appreciate opinions or contributions from people involved in the GOSAT Project.
Please feel free to contact : gosat_newsletter@nies.go.jp.
Thank you for supporting our newsletter.

- Yuki Tanaka, editor

NIES GOSAT PROJECT NEWSLETTER **ISSUE #14 FEB. 2011** Issued On : 2011.03.22

edited and published by : NIES GOSAT Project Office

email : gosat_newsletter@nies.go.jp
website : http://www.gosat.nies.go.jp/eng/newsletter/top.htm
address : 16-2 Onogawa, Tsukuba-City, Ibaraki,
305-8506 Japan
GOSAT Project Office
Center for Global Environmental Research
National Institute for Environmental Studies

You can download this newsletter here:
URL : http://www.gosat.nies.go.jp/eng/newsletter/top.htm

If you would like to receive an email notification when each issue is published, please send us an email with your name, email address, and preferred language (English or Japanese) at:
gosat_newsletter@nies.go.jp