



National Institute of Polar Research

FARO, ASSW-Montreal April 21, 2012

# **Japanese National Activity in the Arctic Science - The updated activities -**

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**Research Organization of Information and systems(ROIS)**



National Institute of Polar Research

# New Japanese initiative for Arctic Research

Japanese scientists initiated their researches in the Arctic since 1950s, and they have activated as institutional study since 1980s.

## Japanese Activities in the Arctic Observation

1. Conjugate auroral observation in Iceland (1984 ~)
2. Ny-Ålesund, Svalbard Station (1991~) and off

3. EIS
4. Arc
5. Ter
6. Sat
7. Meteorological observations, and atmospheric monitoring.

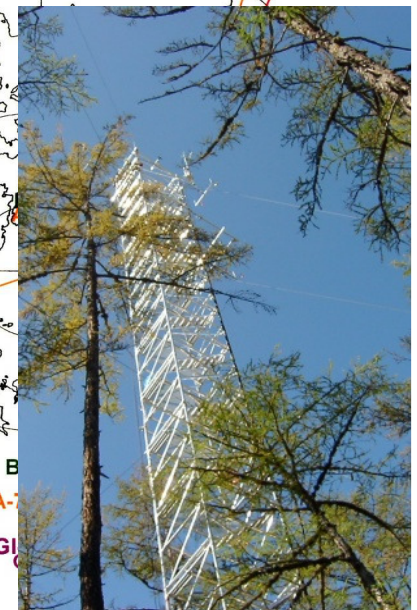
by NIPR, JAMSTEC, JAXA, NIES,  
and many universities and institutes.

O: Oceanography, B: Bio-Science,  
Ge: Geo-Science, GC: Geo-Chemistry, GI: Glaciology,  
A: Atmospheric Science, U: Upper Atmosphere physics,  
CA: Cultural Anthropology

(Svalbard area)  
B-3,5,6,8,11

(Fairbanks area)

A-2,3,4  
U-2,3



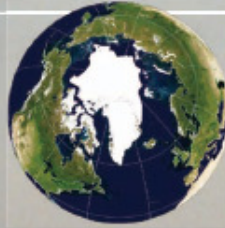
Various research in the Arctic  
Examples of 2000's



**"GREEN Network of Excellence"  
Program (GRENE Program)  
Project are--**

In June 2010, the Japanese Cabinet decided upon a new strategy for growth: the "Strategy for becoming an environment and energy power through green innovation." In response to this strategy, the Council for Science and Technology Policy brought out their report "The Science and Technology Basic Plan" in December 2010 in which they also

Following on, the Ministry of Education, Culture and Sports, Science & Technology (MEXT) and the GRENE Network of Excellence (GRENE) in FY2011. Through a strategic collaboration between universities and research institutions, GRENE aims to promote both the highest level of research in the world and the training and development of human resources. In addition to its work in the Arctic Climate Research Project, GRENE is also involved in research in the environmental



Ministry of Education, Culture and Sports, Science & Technology in Japan (MEXT)  
"GREEN Network of Excellence" Program (GRENE) Program

**Arctic Climate Research Project  
Rapid Change of the Arctic Climate System and  
its Global Influences  
2011-2016**

**Green Network of Excellence Program by MEXT,  
Arctic Climate Change Research Project  
2011-2016**

**"Rapid Change of the Arctic Climate System  
and its Global Influences"**

To the Arctic .....  
where you can see the future of the Earth

Inter-University Research Institute  
Corporation  
Research Organization of Information  
and Systems  
**National Institute of  
Polar Research  
Arctic Environment Research  
Center**

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Issued: March 1, 2012 Editing / Publication

(Photo supplied by: Hayashi Enomoto, NIPR  
NEO/NASA)

**Core Institute**  
National Institute of Polar Research (NIPR)

**Associated Institute**  
Japan Agency for Marine-Earth Science and Technology (JAMSTEC)



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## New Japanese Arctic Climate Research Project

### ***“Rapid Change of the Arctic Climate System and its Global Influences”***

Period: 2011 ~ 2016, 6.5M€ (FY2011), 5.7M€ (FY2012),  
NIPR: the core Institute, JAMSTEC: supporting institute,  
All Japan research program with 35 universities and institutions.

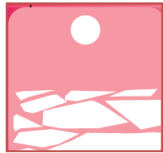
#### Strategic Research Targets

- *Understanding the mechanism of warming amplification in the Arctic*
- *Understanding the Arctic system for global climate and future change*
- *Evaluation of the effects of Arctic change on weather in Japan, marine ecosystems and fisheries*
- *Prediction of sea ice distribution and effects upon Arctic sea routes*

# *GRENE- Arctic Climate Change Research Program*

## *“Rapid Change of the Arctic Climate System and its Global Influences”*

Understanding mechanism of warming amplification in the Arctic



Evaluation of effects of the Arctic change on weather in Japan, marine ecosystem and fishery



- **Improvement of coupled general circulation models based on validations of the Arctic climate reproducibility and on mechanism analyses of the Arctic climate change and variability**
  - **The role of Arctic cryosphere in the global change**
  - **Change in terrestrial ecosystem of pan-Arctic and its effect on climate**
  - **Studies on greenhouse gas cycles in the Arctic and their responses to climate change**
  - **Atmospheric studies on Arctic change and its global impacts**
  - **Ecosystem studies of the Arctic ocean declining Sea ice**
  - **Projection of Arctic Sea ice responding to availability of Arctic sea route**
- 
- **Changes in the Arctic ocean and mechanisms on catastrophic reduction of Arctic sea ice cover**
  - **Coordinated observational and modeling studies on the basic structure and variability of the Arctic sea ice-ocean system**
  - **Sea ice prediction and construction of ice navigation support system for the Arctic sea route**

Understanding of Arctic climate system for global climate and future change



Projection of sea ice distribution responding to availability of Arctic Sea routes



*Present status, April 2012:*

## **GRENE-Arctic Project**

- Project started in October 2011:
  - NIPR prepared new shift for executing project as a coordination institute.
  - JAMSTEC is taking an associated part of this program.
- NIPR has been installing of new systems, keeping interdisciplinary discussions.
  - Arctic Data Archive System
- April 2012:  
new fiscal year and practical start of observations.



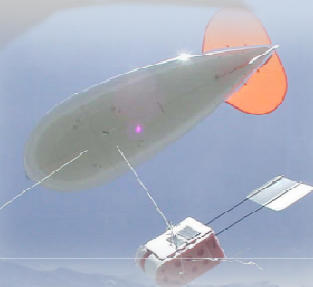
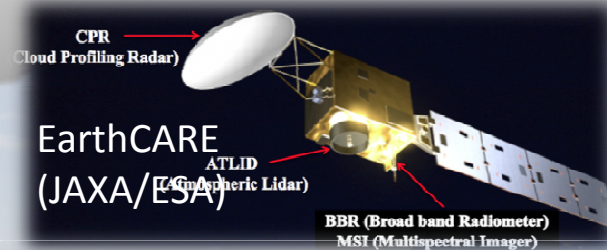


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# Research infrastructures in Svalbard, enhanced by the Arctic Climate Research Project

- Cloud, aerosol, precipitation
- Black carbon sampling
- Greenhouse gas monitoring
- Terrestrial ecosystem

New instrument at Ny-Ålesund,  
and cooperation with satellite  
observations



Cloud Particle  
Probe  
And imager



**NEW 95GHz Cloud Radar**



**Lidar/MPL**



**i-Skyradiometer**

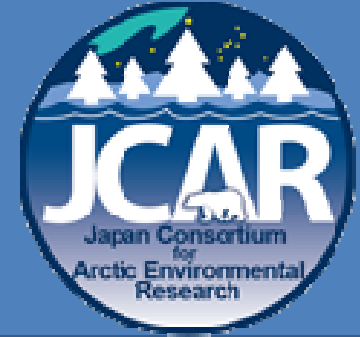


**All-Sky Camera**

**UPDATING SENSOR AND RESEARCH ACTIVITY**

We will also promote the EISCAT/EISCAT-3D program intensively.

# Japan Consortium for Arctic Environmental Research *JCAR*



- ◆ Japanese Arctic science group established the consortium in May, 2011.
- ◆ The number of members: 284 as of Mar. 2012.
- ◆ Discussions :
  - recommendation of future research, international and national action items for long-term effective collaborations,
  - data management,
  - outreach.
- ◆ Executive office of JCAR is placed in NIPR.



# ***3rd International Symposium on the Arctic Research*** ***ISAR-3***

***-Detecting the change in the Arctic System  
and searching the global influence-***

**Date: 15-17 January 2013**

**Venue: Mirai-CAN Hall**

**National Museum of Emerging Science and Innovation  
Tokyo, Japan**

**Symposium website: <http://www.jcar.org/isar-3/>**

**E-mail: [isar3@jcar.org](mailto:isar3@jcar.org)**

*The 1<sup>st</sup> circular will be distributed soon.*

