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Meteorological data from ice-free areas in Yukidori Zawa, Langhovde, Kizahashi Hama, Skarvsnes and Skallen in Sôya Coast, East Antarctica during 2014–2015

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1. Introduction

This report presents meteorological data recorded by automatic weather stations (AWSs) in the Yukidori Zawa (Yukidori Valley), Langhovde, and in Kizahashi Hama, Skarvsnes, and Skallen on the Sôya Coast of East Antarctica, between Japanese Antarctic Research Expedition 55 (JARE-55) in 2014 and JARE-56 in 2015. This study, part of the National Institute of Polar Research (NIPR) project "Monitoring of terrestrial ecosystems (AMB06)," recorded environmental conditions for terrestrial organisms in ice-free areas of Syowa Oasis. The AWSs continuously monitored air temperature, relative humidity, solar radiation, photosynthetically active radiation (PAR), ultraviolet radiation (UV), wind speed and direction, and air pressure, logging them automatically at intervals of 10 min, 1 h, and 1 day.

2. Materials and methods

Observation sites: Yukidori Zawa, in central Langhovde, is Antarctic Specially Protected Area No. 141, where a relatively rich community of vegetation occupies ice-free areas in Syowa Oasis (Kosugi *et al*., 2014). An AWS was installed at a flat site in the middle of the valley at 69º14′28″S, 39º44′21″E approximately 53 m above sea level, as determined by GPS (Fig. 1). Another AWS was installed at a coastal site in the southeastern part of Kizahashi Hama, a sandy beach in central Skarvsnes, at 69º28′25″S, 39º36′43″E at an elevation of 3 m (Fig. 1). A new AWS was installed at a rocky terrace in the southern coast of Skallen at 69º40′25″S, 39º24′13″E at an elevation of 15 m (Fig. 1).

Observation systems: Each AWS consisted of a data logger (CR1000-4M-XT, Campbell Scientific, USA), an anemometer (05103, Young, USA), a hydrothermometer (HMP155D, Vaissala, Finland), a solar radiation sensor (PCM-01(L), Prede, Japan), a PAR sensor (PAR-01(L), Prede, Japan), a UV sensor (CUV3, Kipp & Zonen, Germany), a barometer (PTB210, Vaissala, Finland) and six sets of lithium ion batteries (TL5930/T, 3.6 V, four cells connected in series for a total of 14 V) capable of supplying 3 years of electric power (19 Ah) to the system. The logger, barometer and batteries were stored in a watertight plastic container (Pelican Products, USA), and the other sensors were mounted on a tripod. Specifications of each sensor had been listed in the previous report (Kudoh *et al*., 2015). The AWS at Yukidori Zawa was installed on 25 December 2009; that at Kizahashi Hama was installed on 2 February 2010, and that at Skallen was installed on 11 January 2014.

Data logger settings: Every 10 min, the logger compiled a data file containing 10-min average of continuous measurements of wind speed, wind direction, and radiation (solar radiation, PAR and UV), and instantaneous values of temperature, humidity and air pressure. Every 60 min, it compiled 60-min average wind and radiation data with instantaneous values of temperature, humidity and air pressure. In addition, every 24 h it created a summary of daily average wind speed and direction, temperature, humidity, solar radiation, PAR, UV and air pressure. This file also included maximum and minimum values for all parameters and time stamps for all of these values except for solar radiation, PAR and UV. These data were retrieved by the authors during the JARE-56 summer party.

3. Data

We have converted the 10-min, 60-min and 24-h data from the AWS data loggers to CSV files representing each year from 1 January 2014 to 31 January 2015 for Yukidori Zawa, from 1 January 2014 to 10 January 2015 for Kizahashi Hama, and from 12 January 2014 to 25 January 2015 for Skallen, respectively.

We noted during our maintenance visit in January 2014 that the opaque cosine correct plate on the PAR sensor had been broken. The broken sensor had been changed to a new one by the JARE-56 members on 10 January 2015, then, the PAR data during this period had no means. Therefore we removed this portion of the PAR data from Kizahashi Hama in all summary files for 2014 and 2015.

Following is the complete list of data files.

1. Data from Yukidori Zawa AWS

   1-1. 10-min summary files

   10min_data_Yukidori_2014.csv

   10min_data_Yukidori_2015.csv

   1-2. 60-min summary files

   60min_data_Yukidori_2014.csv

   60min_data_Yukidori_2015.csv

   1-3. 24-h summary files

   24hrs_data_Yukidori_2014.csv

   24hrs_data_Yukidori_2015.csv

2. Data from Kizahashi Hama AWS

   2-1. 10-min summary files

   10min_data_Kizahashi_2014.csv

   10min_data_Kizahashi_2015.csv

   2-2. 60-min summary files

   60min_data_Kizahashi_2014.csv

60min_data_Kizahashi_2015.csv

2-3. 24-h summary files

24hrs_data_Kizahashi_2014.csv

24hrs_data_Kizahashi_2015.csv

3. Data from Skallen AWS

3-1. 10-min summary files

10min_data_Skallen_2014.csv

10min_data_Skallen_2015.csv

3-2. 60-min summary files

60min_data_Skallen_2014.csv

60min_data_Skallen_2015.csv

3-3. 24-h summary files

24hrs_data_Skallen_2014.csv

24hrs_data_Skallen_2015.csv

4. Members who carried out the field study

The AWSs were installed by Sakae Kudoh, Yukiko Tanabe, Masaki Uchida and Takashi Osono (JARE-51 summer), and by Sakae Kudoh, Tomoko Ishihara and Kunio T. Takahashi (JARE-55 summer). Data acquisition was done by Megumu Tsujimoto, Atsushi C. Suzuki and Ryosuke Nakai (JARE-56 summer).

5. Data policy

Before using the data for publication or presentation in any media, please request permission in writing. Inquiries should be addressed to:

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References

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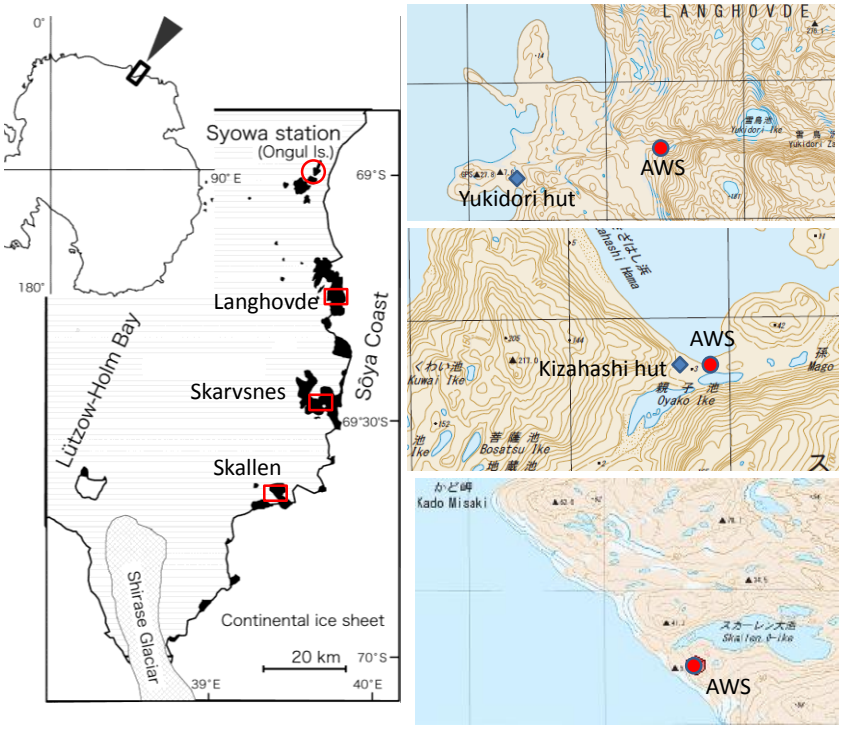

Fig. 1. Maps of AWS sites. Left panel is a location map of Syowa Oasis (ice-free areas shown in black) on the Sôya Coast, East Antarctica. Right panels indicate the positions of Yukidori (top) and Kizahashi (middle), and Skallen (bottom) AWSs. Locations are outlined in red in the left panel.