Current activities of the AMPEX AMSR/AMSR-E studies*

KAIHOTSU Ichirow[1], YAMANAKA Tsutomu[2] and KOIKE Toshio[3]

[1] Department of Natural Environmental Sciences, Sogokagaku-bu, Hiroshima University, Higashi-Hiroshima, Japan
[2] Terrestrial Environment Research Center, University of Tsukuba, Tsukuba, Japan
[3] Department of Civil Engineering, University of Tokyo, Tokyo, Japan

Key words: ADEOS II, AMSR, AMSR-E, soil moisture

I Introduction

Although, unfortunately, all functions of ADEOS II were suspended because of electrical troubles in last October, AQUA has been flying with the soil moisture measurement by AMSR-E. However, ground-based observations have been continuing in the AMPEX study area. We collected successfully monitoring data by AWS and ASSH in June/September 2003 and June/October 2004.

Some results of the AMSR/AMSR-E validation studies in 2003-2004 are shown in this report.

II Monitoring by AWS and ASSH

Fundamental meteorological and hydrological elements by four AWS and twelve ASSHs monitoring have been smoothly continuing in the AMPEX study area. The data obtained from September 2002 to August 2004 have been still processing. The monitoring results at all AWS sites during the period from October 2002 to September 2003 showed that the mean value of annual precipitation was from 157.4 to 170.2 mm, air temperature varied widely from 34.3 °C to -34.0 °C, the mean annual air temperature was 1.1 °C, and the mean annual volumetric water content of soil at the 3 cm depth was from 3.3 to 5.6%. This soil water content value in 2002-2003 was a little bigger than that in 2001-2002. There occurred highly relative humidity in winter and the lowest one in May. The snow fell several times in autumn, winter and spring. Freezing and melting of soil at all AWS sites were seen in March and October, respectively. We can see these same changes as 2001 and 2002 and in the other sites.

The processed data of AWS and ASSH from October 2002 to May 2003 have been opened at the web site of CEOP (http://www.ceop.net).

III Soil moisture observation by AMSR-E

We tried to estimate the soil moisture distribution using the AMSR-E observation data. Fig. 1 shows the results of the monthly mean soil moisture data by AMSR-E. As reported in 2003 (2003 IWSTCM in Yokohama), comparison with the ASSH monitoring data and the calculated results by the AMSR-E algorithm in summer of 2002 presented a good agreement. Each distribution pattern of soil moisture of both two figures in Fig.1 is almost similar to that of precipitation (Batima and Dagvadorj, 2000). We obtained the same result of AMSR observation in 2003. That is, the higher part of soil moisture can be seen in northern-central Mongolia and the lower one in the Mongolian plateau. The distribution pattern of the soil moisture was also similar to that of vegetation in Mongolia.

There is a difference between the upper figure and the lower in Fig. 1. We can glance that the soil moisture in the upper figure is averagely and spatially a little smaller than that of the lower. Namely, the surface soil in 2003 was a little wetter than that in 2002.

According to the monitoring results by four AWS, the precipitation amount in July 2003 was 1.5 times of that in July 2002. We measured intensively soil water contents at the 2.5 cm and 4 cm depths at all grid points in the AMPEX study area within a several days with AMSR-E synchronous observation in summer of 2002 and 2003. As a result, we obtained the higher values of the soil water contents in 2003 comparing with those of 2002. This implies that the soil moisture observation by AMSR-E was reasonable and we succeeded in ground truth.

IV Future plans

We will continue the monitoring by AWS and ASSH in 2004 for the AMSR-E validation study.

References

Batima, P. and Dagvadorj, D. (2000): *Climate changes and its impacts in Mongolia*. JEMR Pub., 227p.

* JAXA and Heiwa Nakajima Foundation supported this project.

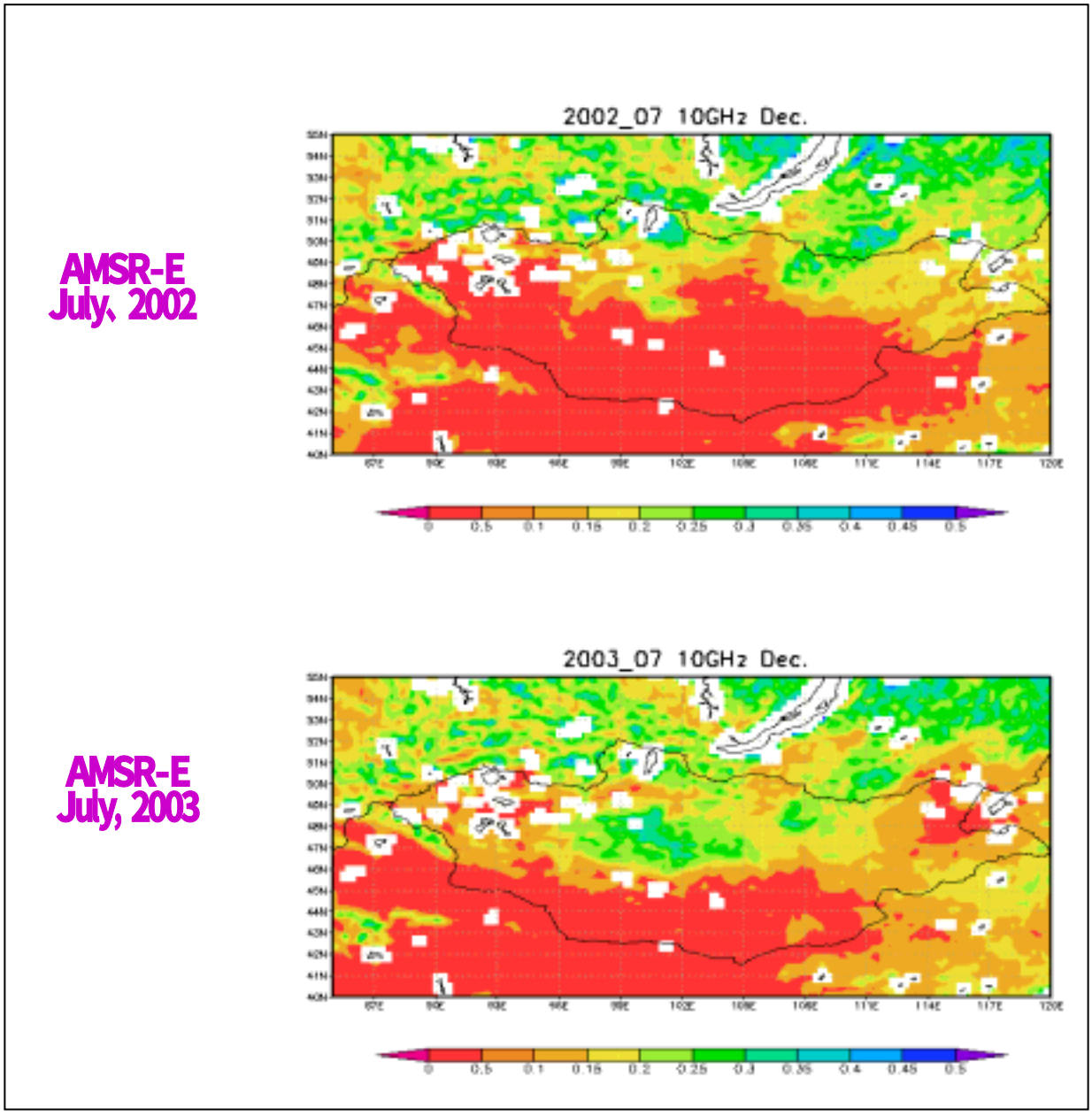

Fig. 1 Results of soil moisture observation by AMSR-E.