

Localized water-level and ground surface changes at Kushiro basin detected by InSAR

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Kushiro plain is the largest wetland in Japan, which plays an important role as water storage. In recent years, the environment of the wetland are changing rapidly. The local government and some organizations make efforts to preserve the environment.

InSAR (Interferometric Synthetic Aperture Radar) is a method that can detect surface deformation by using SAR data. In general, we cannot apply InSAR technique over areas covered with water, because the reflected microwaves at different acquisition times do not correlate with each other. However, Wdowinski et al (2004) reported that InSAR could measure water level changes at some wetlands, because of double bounce reflection at the point where stable reflectors such as shrubs stick out of water. Following Wdowinski et al, we have applied InSAR technique to detect localized water level changes in Kushiro wetland.

We use ALOS/PALSAR data, which was launched by JAXA in 2006, to observe Kushiro plain. Then, the larger changes were detected at Kayanuma (the northern part of Kushiro plain) and near Setsuri river (the western point of the plain). Moreover, we could detect ground surface displacements in the Kushiro city, which reveal clear deformation boundaries along the city area. The sign detected displacements indicate both negative and positive, which means both upward and downward changes, and thus they are not simply a so-called ground subsidence.

The wetland change will reflect water level changes because the upward change corresponding some heavy rain. On the other hand, we have currently no idea how we can explain the ground displacements that indicate clear boundaries in the populated areas of Kushiro city.

Keywords: Kushiro wetland, water level change, ground deformation, InSAR, ALOS