Assessment and Monitoring of Wetland Environment with AVNIR

Fig.1   AVNIR Image over Prachuap Khiri Khan
        (27 December 1996)
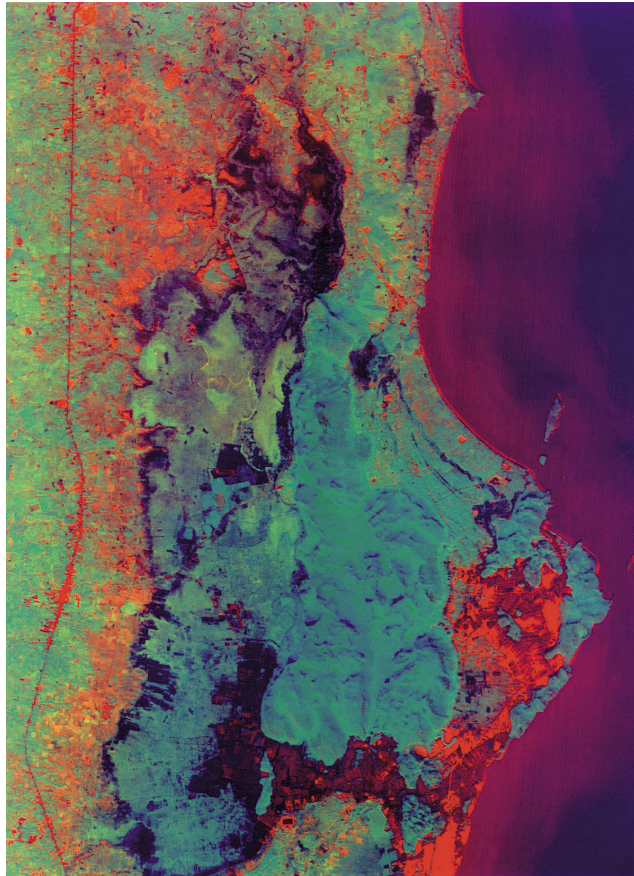
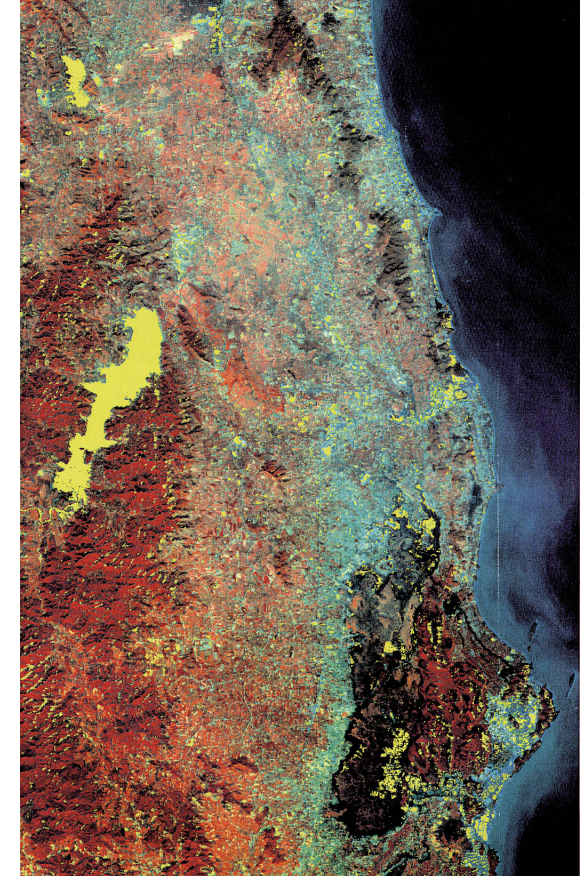Fig.2   VSW Index Map

Fig.3   Landcover Change Detection Map
        from 1973 to 1996

Provided by NASDA / NIES

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The necessity of monitoring the wetland environment and its distribution has been pointed out because of its importance as a treasure house of living things as well as major emission source of methane, one of the greenhouse gases. It is now urgently necessary to monitor the wetland and its surrounding environment from physical, biological and social viewpoints. Ground survey of wetlands is, however, not easy because wetlands are spatially huge and change dynamically. Moreover, it is difficult for us to get into wetland areas and to have direct observation. Remote sensing is expected to provide an efficient tool for monitoring the wetland environment. In particular, AVNIR may provide detailed landcover information on wetlands because of its high spatial resolution observation capability.

This example from ADEOS AVNIR shows landcover assessment around the Prachuap Khiri Khan wetland in Thailand. The AVNIR image was obtained on December 27, 1996. The image was converted to the VSW Index image to assess landcover mixtures of vegetation, soil and water and was compared with the LANDSAT MSS image obtained on January 1, 1973 to extract the landcover change areas.

Figure 1 is the original AVNIR image, figure 2 is the VSW index image, and figure 3 is the landcover change image shown in yellow color and overlayed on the original AVNIR image. The VSW index is an vegetation index which emphasize the landcover mixture of vegetation (V), soil (S), and water (W). It is displayed in green (V), red (S), and blue (W). The VSW index reflects the water mixture as well as vegetation and soil conditions, while the NDVI only reflects vegetation cover conditions. The VSW index is expected to be effective for monitor water inundation in wetland areas.