# Nationwide Seismograph Networks in Japan and Discovery of Slow Earthquakes

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**Abstract**

The NIED has constructed three-types of nationwide fundamental seismograph networks, high-sensitivity, broadband, and strong motion networks, according to the governmental plan made after the 1995 disastrous Kobe earthquake. The high-sensitivity seismograph network (Hi-net) comprises around 800 borehole stations with a spacing of 20□30km. NIED Hi-net borehole stations are equipped with a three-component short-period velocity seismometer, three-component strong motion accelerometer and horizontal-component high-sensitivity accelerometer, which covers a wide response range from ground tilting to long-period seismic waves. As a result, detection capability for micro earthquakes has been dramatically improved and some new geophysical phenomena have been discovered. One of remarkable discoveries from Hi-net is wide variety of slow earthquakes including non-volcanic deep low-frequency tremors [Obara, 2002], short-term slow slip events (SSE) [Obara et al., 2004], and very low-frequency (VLF) earthquakes [Ito et al., 2007]. These slow earthquakes lasting for several days occur simultaneously with a certain recurrence interval at the transition zone on the deeper plate interface along the strike of the subducting Philippine Sea plate, southwest Japan. During the active stage, the source of these slow earthquakes migrates with a propagation velocity of around 10km/day along the strike of the plate geometry at the downdip side of the locked seismogenic zone. At the updip side of the seismogenic zone, another kind of VLF earthquake having a predominant period of 10s has been detected [Obara and Ito, 2005]. This shallow VLF earthquake mainly occurs inside the accretionary prism on the landward side of the Nankai trough. These slow earthquakes at updip and downdip sides of the seismogenic zone on the subducting plate interface reflect the stress relaxation process around the plate boundary.