Japanese Periglacial Studies in Antarctica

N. Matsuoka

Reporter: Yoshikawa, K. (Univ. Alaska Fairbanks)

1. Site: **Ellesworth Mountains**. 80°21'S, 81°35'W, 1250-1400 m ASL.
Data types: Rock surface temp. (S-face 0 cm, N-face 0, 15 cm depth); Ground temp. (15, 40, 80, 150 cm depth); Air temp.; RH; Wind direction and speed; Weathering chemistry (XRD).
Data period: Dec. 1992- Jan.1993.
Data description: Effective freeze-thaw cycles (>2°C, <-2°C) 46; MAGT -20.2°C (N-face), -21.6°C (S-face). Active layer thickness 15 cm.
Reference: Yoshikawa et al. 2000.

2. Site: **Thiel Mountains**. 85°26'S, 86°46'W, 1600 m ASL.
Data types: Weathering chemistry (XRD and SEM)
Data period: Jan.1993
Data description: High concentration of Sulfur in weathering products and snow. Clay minerals are found in holes possively derived from thermal weathering.
Reference: Ishimaru & Yoshikawa 2000.

Reporter: Sawagaki T. (Hokkaido Univ.)

3. Site: **East Ongul Island, Prince Olav Coast, East Antarctica** 69.0°S, 39.6°E, 30 m ASL.
Data type: Ground temperature (0, 10, 40, 80 cm depth), Frost heave.
Data period: Feb. 7, 1993 – Dec. 25, 1993 (1hr intervals)
Material: Seasonaly flooded surface by snow-melt, composed of sand and gravel (Till)
Data description: MAGT ca.-12°C; Active layer thickness >80 cm.
Reference: Sawagaki 1995.

4. Site: **Cape Hinode, Prince Olav Coast, East Antarctica** 67.8°S, 42.5°E,
Data type: Ground temperature (0, 10, 30, 70 cm depth), Frost heave.
Data period: Dec. 30, 1992 – Feb.11, 1993 (1hr intervals)
Material: Sorted circles composed of sand and gravel (Till)
Data description: MAGT -12°C; Active layer thickness 60 cm.
Reference: Sawagaki 1995.

Reporter: Miura, H. (National Institute of Polar Research)

5. Site: **Riiser-Larsen Mts., Enderby Land**. 66.5°S, 50.4°E, 12-390 m ASL.
Data type: Ground temperature (2 sites: 0-130 cm); Rock temperature (4 sites: 0, 5, 10 cm); Soil movement (painted line); Soil profiles and grain size.

Data period: Apr. 1997 – Dec. 1998.
Data description: MAAT -10.1°C (inland); -9.4°C (nearshore). MAST -3.5 °C (NW-face rock) to -7.2°C (S-face rock). Active layer depth 100-120 cm. No downslope soil movement.

Reporter: Sone, T. (Hokkaido Univ.)
6. Site: **Seymour Island (Base Marambio), Antarctic peninsula**. 56°37'W, 64°14'S, 200 m ASL.
Data type: Ground temperature (0.1, 0.5, 1, 2, 3, 4, 6, 8 m depth)
Data period: March 1999 -
Data description: MAGT ca. -7°C, Active layer thickness: ca. 65 cm, Depth of zero amplitude: 17 m. Thickness of permafrost was estimated to be 200 m by DC resistivity soundings. Ice wedge polygons present.

7. Site: **James Ross Island, Antarctic peninsula**. 57°48'W-58°25'W, 63°52'S-64°04'S, 7-300 m ASL.
Data type: Surface movement of five rock glaciers by geodesic survey
Data period:1992-2004 (intermittent)
Reference: Strelin & Sone 1998.

7-1. Site: **Lachman coast, James Ross Island , Antarctic peninsula**. 57°48'W, 63°52'S, 7 m ASL.
Data type: Ground temperature (0.05, 0.5, 1.3, 1.8, 2.3 m depth)
Data period: February 1999 -
Data description: MAGT ca. -3°C, Active layer thickness: ca. 130cm, Depth of zero amplitude: 7 m.

7-2. Site: **Riscos Rink, James Ross Island, Antarctic peninsula**. 57°48'W, 63°52'S, 210 m ASL.
Data type: ground temperatures (0.1, 0.2, 0.3 m depth)
Data period: from February 1997 -
Data description: MAGT -7°C; Active layer thickness 50 cm.

Data type: Surface movement of solifluction lobes with painted stone lines
Data period: 1995-2004
Data description: Large solifluction lobes develop on a gentle slope.

7-3. Site: **Villar Fabre, James Ross Island, Antarctic peninsula**, 58°25'W, 64°04'S, 127 m ASL.
Data type: Ground temperature (0, 0.7, 1.5 m depth)
Data period: from March 2001-
Data description: MAGT -6°C

Reporter: Matsuoka, N. (Univ. Tsukuba)
8. Site: **Sør Rondane Mountains, Dronning Maud Land**. 71.9°W, 24.5°S, 1200 m ASL.
Data type: Rock surface temperature (NW, E-facing)
Data period: Jan. 1985 – Feb. 1991
Data description: High diurnal freeze-thaw cycles in mid-summer.
Reference: Matsuoka 1991; Matsuoka et al. 1996

Data type: Soil temperature (2-50 cm depth)
Data period: Jan. 1985 – Feb. 1991
Data description: High diurnal freeze-thaw cycles in mid-summer. Maximum active layer depth ranges from 8 cm (cold-humid site) to 40 cm (warm-dry site). MAGT -17°C
Reference: Matsuoka et al. 1988, 1990. Matsuoka & Moriwaki 1992.

Data type: Wind erosion
Data period: Jan. 1987 – Mar. 1990
Data description: Significant erosion of the windward face of an asbestos board. Maximum erosion at 30-40 cm above the ground.
Reference: Matsuoka et al. 1996.

Data type: Frost heave
Data period: Jan. 1986 – Feb. 1991
Data description: Diurnal frost heave (<2 mm) occurs only at a warm-humid site during mid-summer. Most sites are too dry and stable.
Reference: Matsuoka et al. 1988, Matsuoka & Moriwaki 1992.

Data type: Frost creep
Data period: Jan. 1986 - Feb. 1991
Data description: Annual movement recorded with strain probes and cumulative movement for 1-5 yrs. Maximum surface velocity 1.5 cm yr^{-1}; Maximum depth of movement 17 cm.

Reference: Matsuoka & Moriwaki 1992.

Data type: Soil characteristics (profiles, granulometry and mineralogy)
Data descriprtion: Old dry soils lack cryoturvation, clay fraction (clay minerals) but include high contents of salts and silt grains.
Reference: Matsuoka et al. 1995.

Data type: Morphology and structure of ice-wedge polygons
Data description: 4-10 m in diameter, either ice wedge or ice wedge cast due to sublimation. The top of the ice wedge at 30 cm depth.
Reference: Matsuoka & Hirakawa 1993.

Data type: Rock weathering index
Data description: Weathering stages (1-5) of moraine stones are clasified with a combination of features (staining, pits, venifact and crumbling) and used to distinguish past ice sheet levels.
Reference: Moriwaki et al., 1991, 1994.

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