Summer Sea ice in the Arctic Pacific Sector from the CHINARE-2010 cruise: Preliminary Results

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The Fourth Chinese National Arctic Research Expedition (CHINARE) from July 1 to Sep. 20, 2010 conducted comprehensive scientific studies on ocean-ice-atmosphere interaction and the marine ecosystem's response to climatic change in Arctic. The sea ice team of 10 persons collected sea ice physical properties (ice concentration, floe size, melt pond coverage, sea ice and snow thickness) of the Arctic Pacific sector, in particular between 150°W to 180°W to 88.5°N, based on (1) underway visual observations of sea ice at half-hourly and automatic camera recording (side looking in both starboard sides of the R.V. Xuelong) every 10 to 15 seconds; (2) a downward-looking video mounted on the left port side of the Xuelong at a height of 7 m above waterline recording overturning of ice floes; (3) on-site measurements of snow and ice thickness using drilling and electromagnetic instrument EM31 (9.8 kHz) at eight short-term (~3 hours each) and one 12-day ice stations; (4) six flights of aerial photogrammetry from helicopter, and (5) Satellite data (AMSE-E ice concentration, ENVISAT ASAR) and NIC ice charts that extended the observations/measurements along the ship track and airborne flights. It seems in this region that ice edge reached the minimum on Sept 10 (Table 1), about 9 day earlier than the mean minimum for the entire Arctic ocean reached on Sept 19. Along the northward leg the width of the MIZ decreased from 350km on July 25 to 0km on Sept 19. For the southward leg, the width of the MIZ was more complicated. The maximum width was 500km on Aug 28, while it was still about 100-200km scattered ice south of the 200km or more no ice zone before reached the edge of pack ice.

Table 1. the northmost latitude and width (km) of the marginal ice zone (MIZ) along the northward and southward legs on selected days (MMDD).

	0725	0729	0820	0825	0828	0830	0905	0910	0915	0919
North leg	74.8° (350)	75.1° (350)	76° (250)	78° (220)		78° (200)	80.9° (280)	81.1° (200)	78.9° (10)	79.6° (0)
South leg			77.5° (^)	80° (^)	80.5° (500)	79.5° (400)	79.5° (400)	80.6° (*)	80.2° (*)	80.6° (*)

^denotes MIZ beyond the last ship-based observation on Aug 28; * denotes there is a 200km or more region of no ice zone between the northmost latitude and scattered ice zone.

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