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News and Views

Chinese seventh Arctic scientific expedition

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Chinese seventh Arctic scientific expedition began from Shanghai on July 11, 2016, journeying through the Bering Sea—Chukchi Sea—Canada Basin area—submarine plateau of the Chukchi Sea—high latitudes Arctic Ocean—Mendeleyev Ridge and covered more than 13 000 n mile in 78 days. The distance travelled in floating ice area is more than 2 800 n mile and the northernmost point of the journey reached latitude 82°52′59″N (Figs 1 and 2).

Chinese seventh Arctic scientific expedition is a part of the "Comprehensive Investigation and Assessment of Environmental Protection of the Arctic and Antarctic". The research area of this expedition is concentrated in the traditional Pacific Arctic and the research zones are focused on the Bering Sea, Chukchi Sea, submarine plateau of the Chukchi Sea, Mendeleyev Ridge and the Canadian Basin.

As a multidisciplinary and comprehensive expedition, it includes observation works in the fields of oceanophysics and marine meteorology, sea ice dynamics, marine geology, marine geophysics, thalassochemistry and atmospheric chemistry, marine biology and ecology. During this expedition, a total of 84 stations for multidisciplinary data acquisition were set up. Works of deploying and collecting five sets of anchor subsurface buoy and float for long-term observation were completed. Six short-term and one long-term observation stations were established. Underway observation was conducted on the oceanography, meteorology, sea ice and atmospheric composition. A total of 300 disposable XBT, 24 XCTD, 17 Argos and 58 sounding balloons come into use. A geophysical reflection seismic line of 231 km and a sea surface magnetic survey line of 1 500 km were completed.

Compared with the past, Chinese seventh Arctic scientific expedition made lots of new records. It is the first time for the Chinese research team to set up a comprehensive observation cross-section in the Mendeleyev Ridge on the Arctic Ocean, including six data acquisition stations; the first time to successfully deploy deep-water anchor subsurface buoy in the Bering Sea and the length of the anchor system is 3 800 m. The team also used the helicopter to set up an array of floats composed of 13 floats around the long-term observation station in the Canadian, which is also the most regular array of floats built in all the Arctic expeditions; it is also the first time to use the China's icebreaker *Xuelong* to set up an ocean profiling float independently developed by our country at the upper layer of the ice base; the first time to discover seafloor crust in the Chukchi; and the first time to use air gun as seismic source to stimulate artificial seismic waves in the Arctic Ocean for geophysical study, which significantly increased the investigation depth of the multi-channel seismic system.

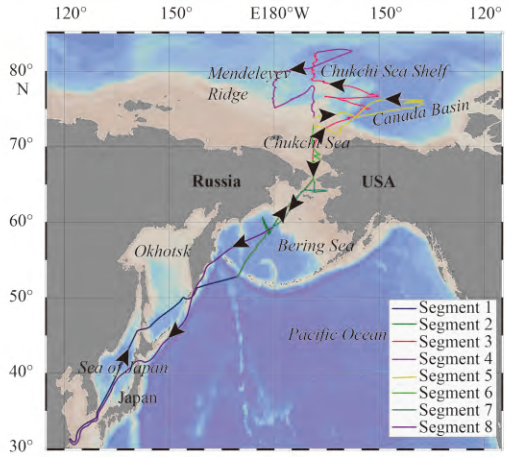

Fig. 1. The course of the 7th Chinese Arctic scientific expedition of R/V *Xuelong*.

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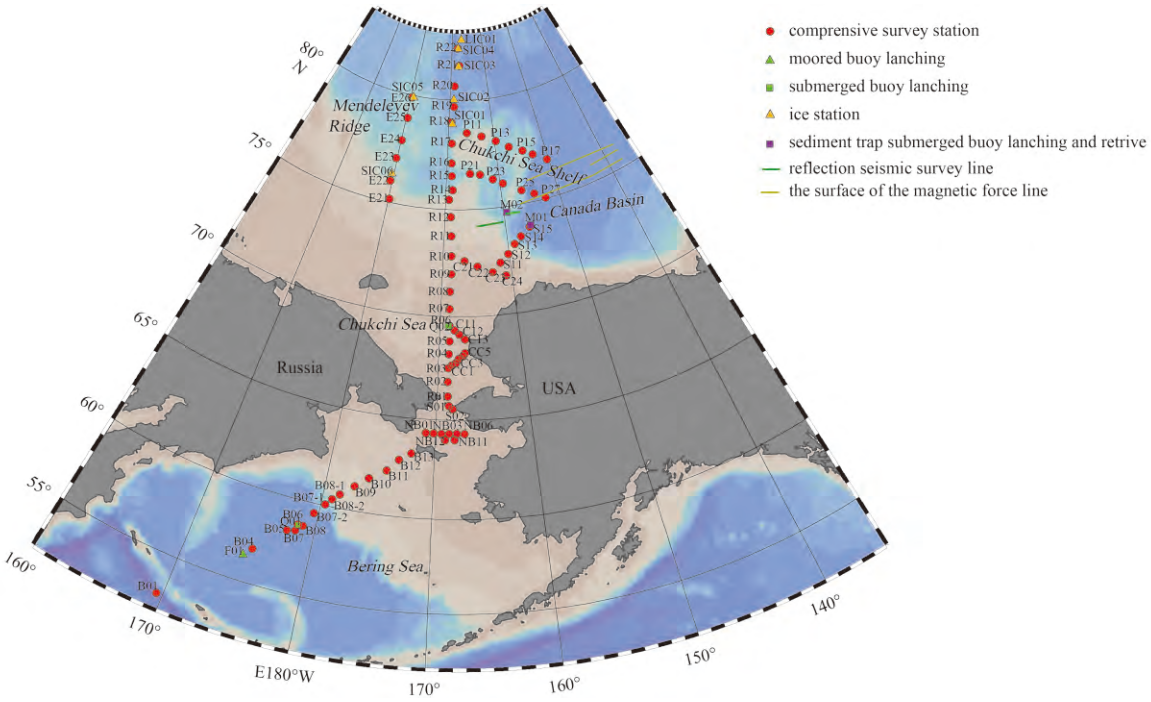

Fig. 2. The station distribution of the 7th Chinese Arctic scientific expedition.