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A 450-kyr planktonic foraminiferal assemblage record of IODP Site U1352 and its implications for the migration of the Subtropical Front in the south-west Pacific

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ABSTRACT

The Subtropical Front (STF) is one of the major ocean fronts in the south-west Pacific. The STF migration has a distinct but varying impact on the temperature change throughout the region. To improve our understanding on the history of the STF migration and the relationship between STF migration and global climate change, we have generated a 450-kyr record of sea surface temperature (SST) change at IODP Site U1352 located in the Canterbury Basin off New Zealand. Planktonic foraminiferal assemblages from the site were used to derive SST estimates. Comparisons of the planktonic foraminiferal assemblage and SST record of IODP Site U1352 with those of ODP Site 1119, DSDP Site 594 and core MD06-2986 allow us to reconstruct the spatial change of the STF over the last 450 kyr by locating the positions of its Southland Front (SF) section, which runs nearly parallel to the South Island's shoreline. The percentage of *Neogloboquadrina pachyderma* in the sum of *Nq. pachyderma* and *Nq. incompta* was below 40% at Sites IODP U1352, ODP 1119 and DSDP 594 during Marine Isotope Stage (MIS) 11c, MIS 7a–c and MIS 5e. Moreover, the SSTs of the three sites during these periods were similar and close to that of the present-day. This indicates that the three sites were covered by a Subtropical Water–Subantarctic Water (STW–SAW) mixture during these interglacials. IODP Site U1352 recorded a similar scenario during MIS 7e. In comparison with previous studies, the higher resolution record of IODP Site U1352 showed the influence of STW–SAW mixture was