

Antarctic Polar Frontal Zone in Western Scotia Sea-Summer 1975

Gordon, Georgi, Taylor

Journal of Physical Oceanography

Vol 7, No. 3, 1977

- Cruise tracks were conducted from January – March 1975

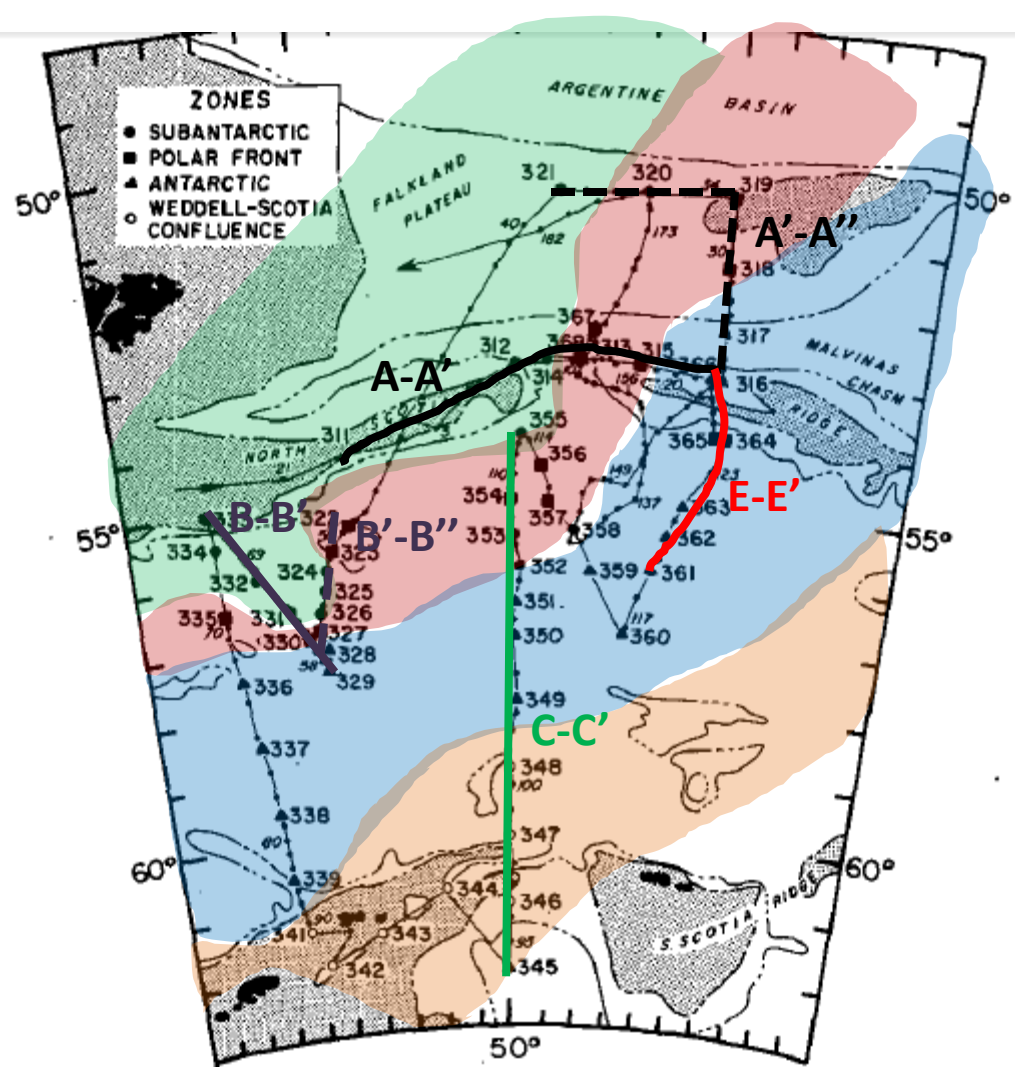


FIG. 1. Cruise track, showing the positions of the STD hydrographic stations (large symbols) and XBT observations (small dots) of *Conrad* cruise 18-01, a component of FDRAKE-75. The STD stations were assigned to one of the four thermohaline stratification types described in the text. The 2000 m (the contour broken with 2 dots) and 3000 m (contour with 3 dots) isobaths are taken from the map of Heezen *et al.* (1972).

• Sub-Antarctic Zone:

- Characterized by a thick, nearly isohaline salinity layer from 100-400m
 - Bottom is deeper the further away from Polar Frontal Zone).
 - This layer also associated w/ negative temperature gradient, often including a weak temp min just below the salinity min.
- Below isohaline later, salinity gradient is positive

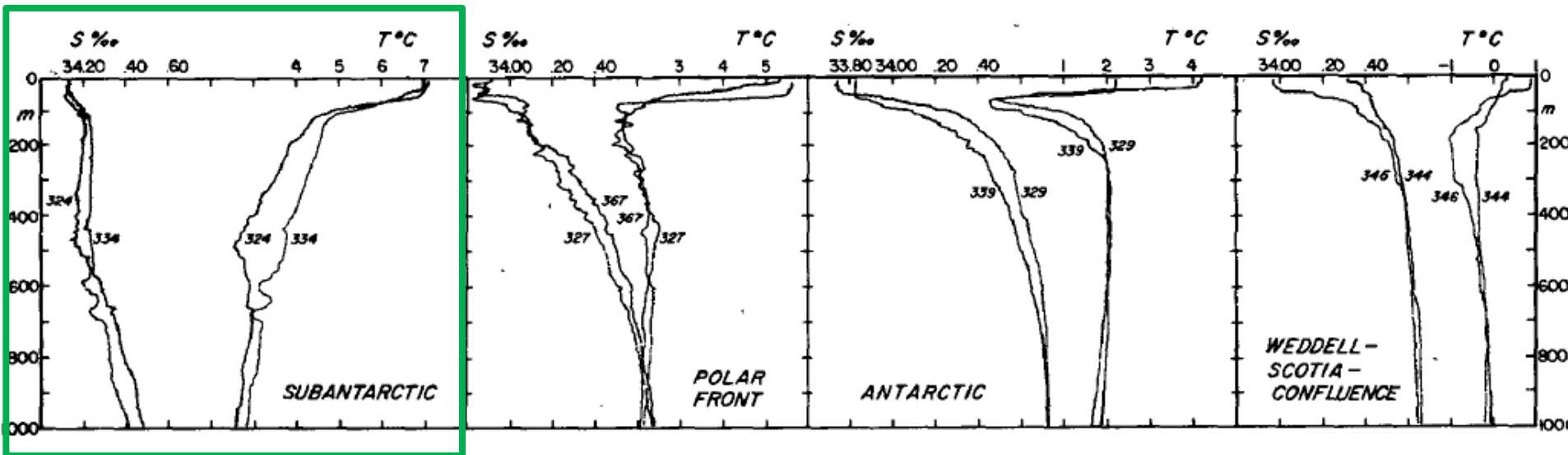


FIG. 2. Two examples from each of the four zones of types of thermohaline stratification observed in the FDRAKE area. The patterned areas in the T/S diagram are defined by all of the STD stations shown in Figs. 2, 12, 13 and 14 and the stations in the Weddell Scotia Confluence.

• Polar Frontal Zone:

- Warm sfc layer with and thermocline with multiple temperature and “density compensating salinity inversions” below, down to roughly 400m.
 - Temperature min around 100 m, but not as pronounced as in Antarctic layer.
- Generally positive salinity gradient

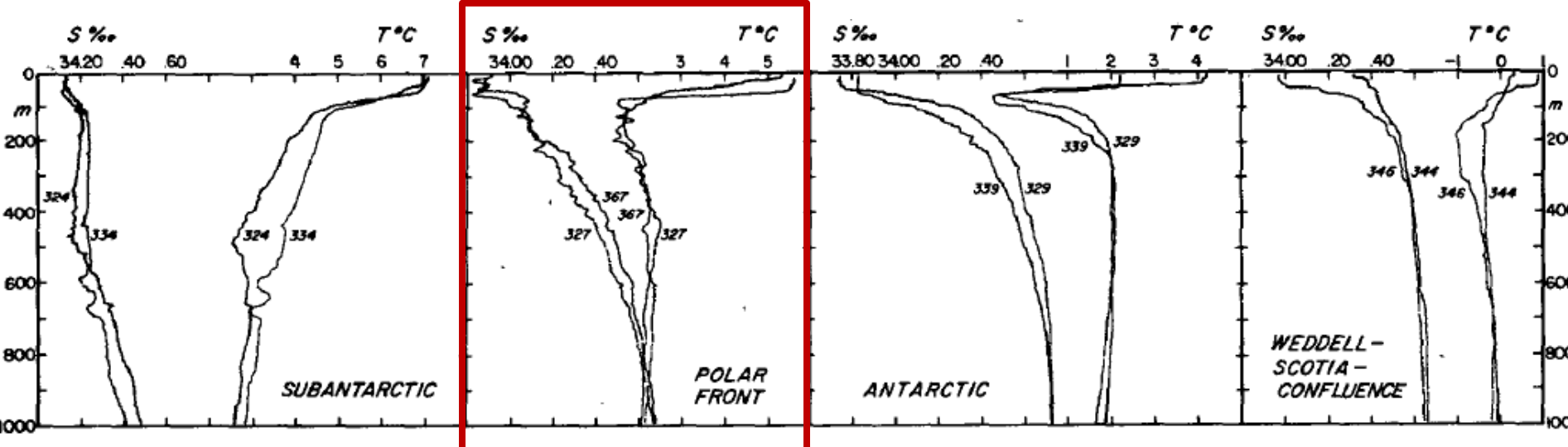


FIG. 2. Two examples from each of the four zones of types of thermohaline stratification observed in the FDRAKE area. The patterned areas in the T/S diagram are defined by all of the STD stations shown in Figs. 2, 12, 13 and 14 and the stations in the Weddell Scotia Confluence.

• Polar Frontal Zone:

- Characterized by well-developed temperature minimum region embedded within a halocline above 200m.
- Temperature gradient is fairly weak below temperature minimum zone.

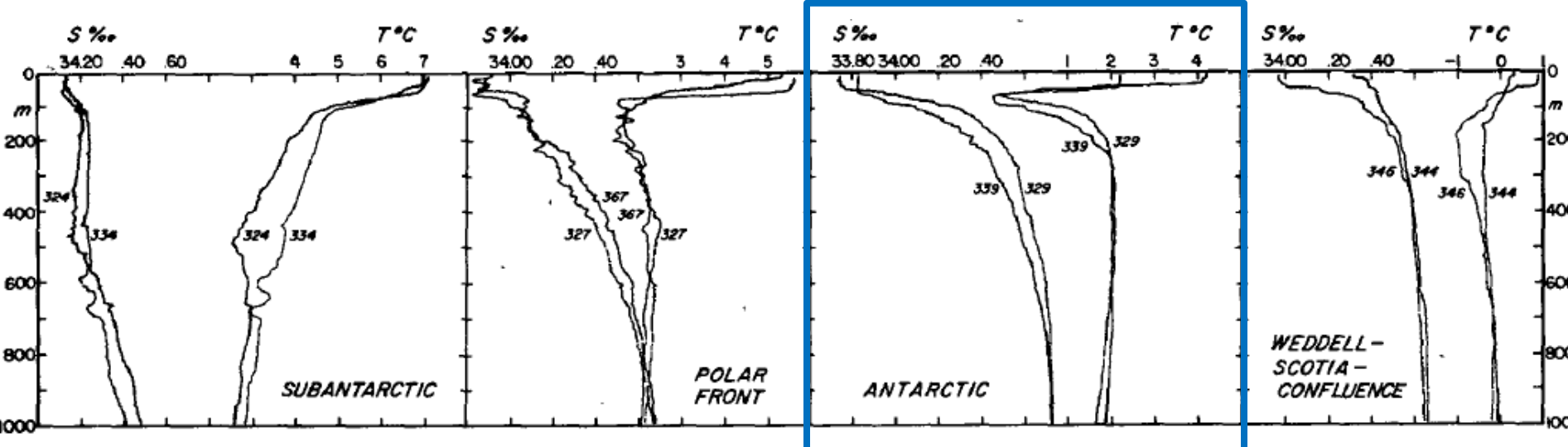


FIG. 2. Two examples from each of the four zones of types of thermohaline stratification observed in the FDRAKE area. The patterned areas in the T/S diagram are defined by all of the STD stations shown in Figs. 2, 12, 13 and 14 and the stations in the Weddell Scotia Confluence.

• Weddell-Scotia Confluence (WSC)

- Separated the Antarctic Zone from Weddell Sea in the Atlantic Sector of Southern Ocean
- Characterized by:
 - Relatively cold, low stability water column
 - Surface water and temp min are more saline

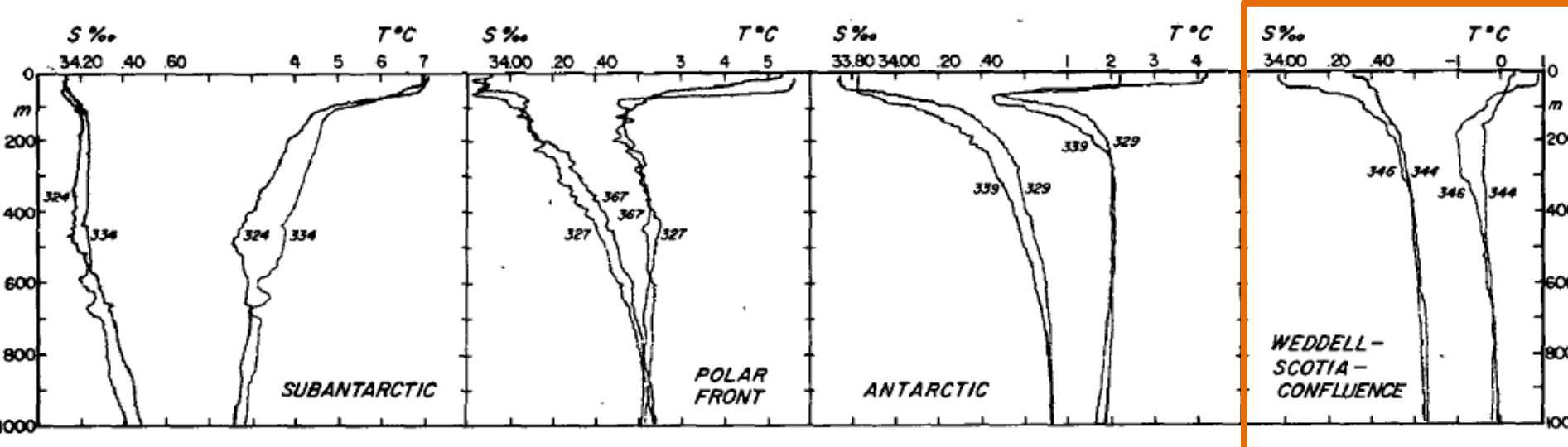


FIG. 2. Two examples from each of the four zones of types of thermohaline stratification observed in the FDRAKE area. The patterned areas in the T/S diagram are defined by all of the STD stations shown in Figs. 2, 12, 13 and 14 and the stations in the Weddell Scotia Confluence.

• Float appears most likely in the Antarctic Zone

- Based on temperature minimum and salinity signature in that region. Temp min just above 200m.

