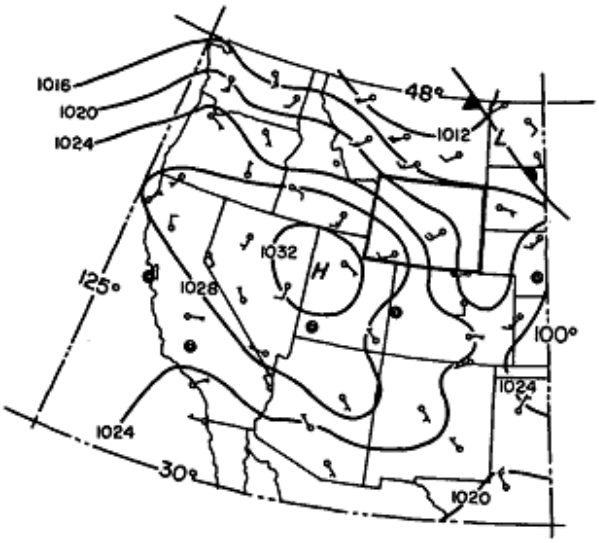

FIG. 1. Surface weather map of 0500 MST 11 February 1976. Note high pressure in Utah and the strong pressure gradient across Wyoming.

for inferring airflow characteristics from eolian (wind-formed) features observed on satellite and aircraft imagery. To confirm the eolian results, 16 low-level aircraft flights were made over prominent sand dunes, sand streaks, wind scour regions and playa lake fields in southern Wyoming. The flights were conducted during afternoon hours in January, February, November and December of 1976 in a National Center for Atmospheric Research (NCAR) Queen Air airplane.

The wind measurements in this study were made with fast response air sensing probes and a Litton LTN-51 inertial navigation system installed aboard the NCAR aircraft (304D). Basic aircraft capabilities and instrumentation have been summarized by Burris *et al.* (1973) and Lenschow *et al.* (1978). The air motion sensing system combined with the inertial navigation system was capable of measuring the average horizontal air velocity to within ± 1 m s^{-1} and the average vertical air velocity to within ± 0.1 m s^{-1} (Kelley, 1973). The flights were typically flown at 100 to 200 m AGL. Profile soundings of the airflow were also performed, consisting of soundings and level upwind/downwind flight legs at various altitudes extending up to ~1600 m AGL.

A listing of the 16 flights in 1976 with the primary eolian or terrain features investigated is given in Table 1. Interpretations of the windflow characteristics from eolian features were described by Marrs and Kolm (1982). The wind characteristics in southern Wyoming based on a network of anemometers and instrumented towers were reported by Martner and Marwitz (1982). Seaman (1982) has simulated the airflow in this area with a three-dimensional model and the results resemble the observations in a number of significant ways.

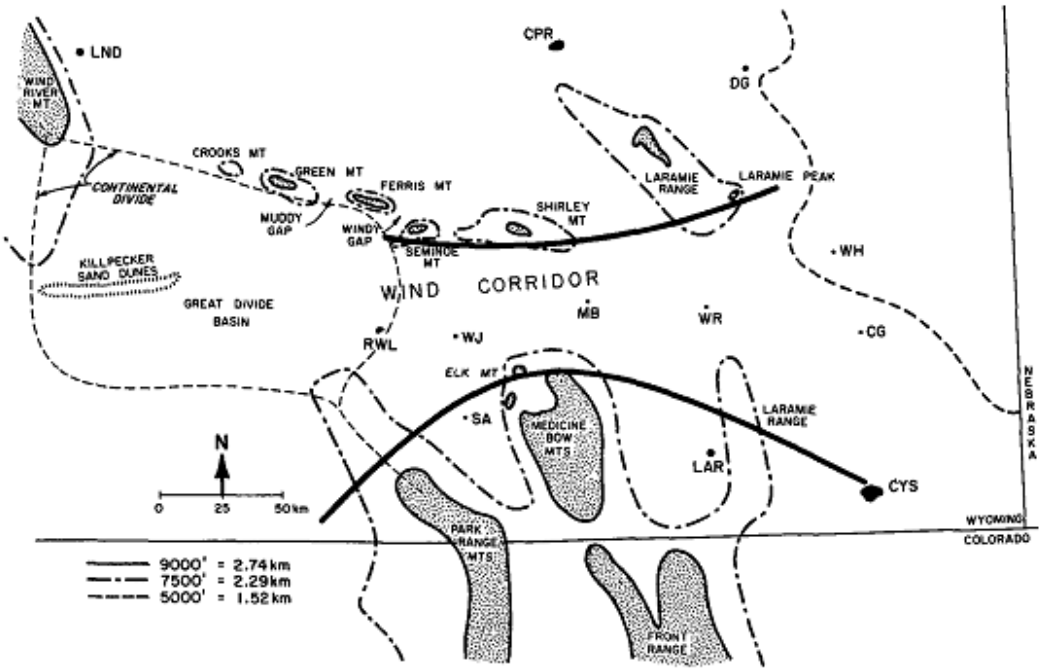

FIG. 2. Topographic map of southern Wyoming. The letter designations for cities are Lander (LND), Casper (CPR), Douglas (DWG), Rawlins (RWL), Laramie (LAR), Cheyenne (CYS), Walcott Junction (WJ), Saratoga (SA), Medicine Bow (MB), Wheatland Reservoir (WR), Wheatland (WH) and Chugwater (CG).