The sedimentology and stratigraphy of the Mabou Group near Sussex, New Brunswick

Andrew Cook
Department of Geology, University of New Brunswick, Fredericton, NB, E3B 5A3

Mississippian sedimentary rocks, including those of the Mabou Group, were deposited in several component basins that constitute part of the Maritimes Basin in Atlantic Canada. Most of the work done on the Mabou Group has been from several Nova Scotia basins. The succession there is predominately grey, fine-grained rocks that gradually succumb to overlying red siltstone and sandstone. The facies interpretation is of an extensive, shallow lake at the base of the group, overlain by ephemeral lake and fluvial deposits. Very little research has been carried out on Mabou strata in New Brunswick, though it is understood that the reddish interval is much coarser grained and quite often conglomeratic suggesting a more alluvial setting.

The Mabou Group is found in the western part of the Moncton component basin in south-eastern New Brunswick, with limited, sporadic outcrops in the Sussex area. Earlier mapping indicates a complex distribution of conglomerate, sandstone, and mudstone units. Several boreholes have also been drilled through the succession in the area. East of Sussex, in the Penobsquis area, sandstone and mudstone at the base gradually grade up into conglomerate. To the south and south-west of Sussex however, conglomerate is almost directly underlain by marine strata of the Windsor Group. The Millstream #1 borehole, the main focus of this thesis, is located to the west of Sussex. It contains ~15m of mudstone, siltstone and sandstone at the base of the Mabou Group. Low-angle cross laminations and planar laminations can be found throughout these fine grained strata. Moving up-section, there is a broad coarsening into sandy to muddy conglomerate, likely of braid plain or alluvial fan origins. Rip-up clasts are observed. Intermittent intervals of red-brown sandstone are not uncommon and often contain cross-laminations as well as planar laminations. Short intervals of high angle, medium grained orange-brown sandstones may be interpreted as dune structures. Strata become sandier further up section. A distinct interval of highly porous, matrix free conglomerate ~500 m above the base of the Mabou Group (~930 m) in the Millstream #1 borehole may be of great help in correlating with boreholes to be logged further east. Petrography has also shown that there is change in cement type from ferroan dolomite to non-ferroan calcite at ~ 823 m moving up-section.

Atlantic Geology, 2005, Volume 41, Number 2-3