Distal evidence (?) of the Late Triassic (Norian) Manicouagan impact, northeastern Quebec: New data from the Fundy Group (Canadian Maritimes)

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Abstract

Preliminary petrographic analysis and optical and scanning electron microscopy have revealed that angular clasts are abundant in the basement Upper Triassic Blomidon and Middle (?) Triassic Quaco Formations (Fundy Group) from the Rice Lake Fundy Island Section and the Blomidon Beach, New Brunswick. Results from this study, combined with previous observations of similar angular clasts in the Manicouagan impact-related sediments, indicate that the Manicouagan impact caused sediment mobilization from the impact basin. The mobilized sediments were transported as turbidity flows and deposited in the Fundy Group (Carboniferous-Permian section) from the Nova Scotia coast to the interior of New Brunswick.

Background

The Late Triassic (Norian, ca. 215-225 Ma) Manicouagan impact structure is located within the Grenville geologic province of northeastern Quebec, Canada. Although the structure was confirmed during the 1990s, recent studies have shown that the impact was much larger and more widespread than previously thought. The impact caused significant changes in the geology of the region, including the mobilization of sediments from the impact basin. The mobilized sediments were transported as turbidity flows and deposited in the Fundy Group (Carboniferous-Permian section) from the Nova Scotia coast to the interior of New Brunswick.

Field and Petrographic Observations

Geologic Setting

St. Martins, NB

Five Islands, NS

Houston Beach, NS

Types of Interpreted Distal Evidence

Figure 1: Stratigraphic section of the Nova Scotia Section. The Manicouagan impact sediments are represented by the Lower Triassic Blomidon Formation and the Middle (?) Triassic Quaco Formation.

Figure 2: Stratigraphic section of the Nova Scotia Section. The Manicouagan impact sediments are represented by the Lower Triassic Blomidon Formation and the Middle (?) Triassic Quaco Formation.

Figure 3: Stratigraphic section of the Nova Scotia Section. The Manicouagan impact sediments are represented by the Lower Triassic Blomidon Formation and the Middle (?) Triassic Quaco Formation.

St. Martins, NB

Five Islands, NS

Houston Beach, NS

Types of Interpreted Distal Evidence

Conclusions

Evidence pertaining to the Late Triassic (Norian) Manicouagan impact has been found in the Fundy Group (Carboniferous-Permian section) in northeastern Quebec. The evidence includes angular clasts in the Blomidon and Quaco Formations, which are likely mobilized from the impact basin. The mobilized sediments were transported as turbidity flows and deposited in the Fundy Group (Carboniferous-Permian section) from the Nova Scotia coast to the interior of New Brunswick.

Future Work

Organic geochemical techniques can be used to further study the Manicouagan impact sediments in the Fundy Group. This can help to determine the extent of the impact and its effects on the geology of the region.

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References