Paleoclimate archive potential of the possibly former sub-glacial Lake Manicouagan (Canada)

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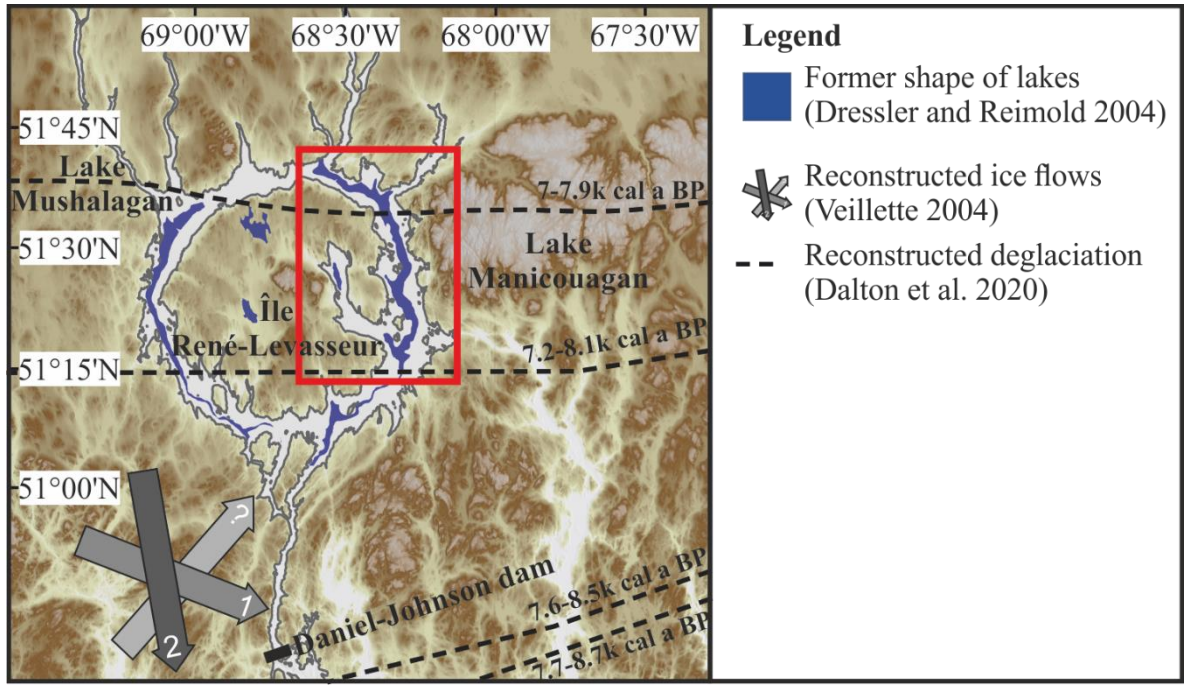
K.-F. Lenz[1,2], C. Gebhardt[3], P. Lajeunesse[4], A. Lohrberg[1], F. Gross[1,2] and S. Krastel[1]

[1]Institute of Geosciences, Christian-Albrechts-Universität zu Kiel, Kiel, Germany
[2]Center for Ocean and Society Kiel, Christian-Albrechts-Universität zu Kiel, Kiel, Germany
[3]Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research, Bremerhaven, Germany
[4]Département de géographie, Université Laval, Québec, Canada

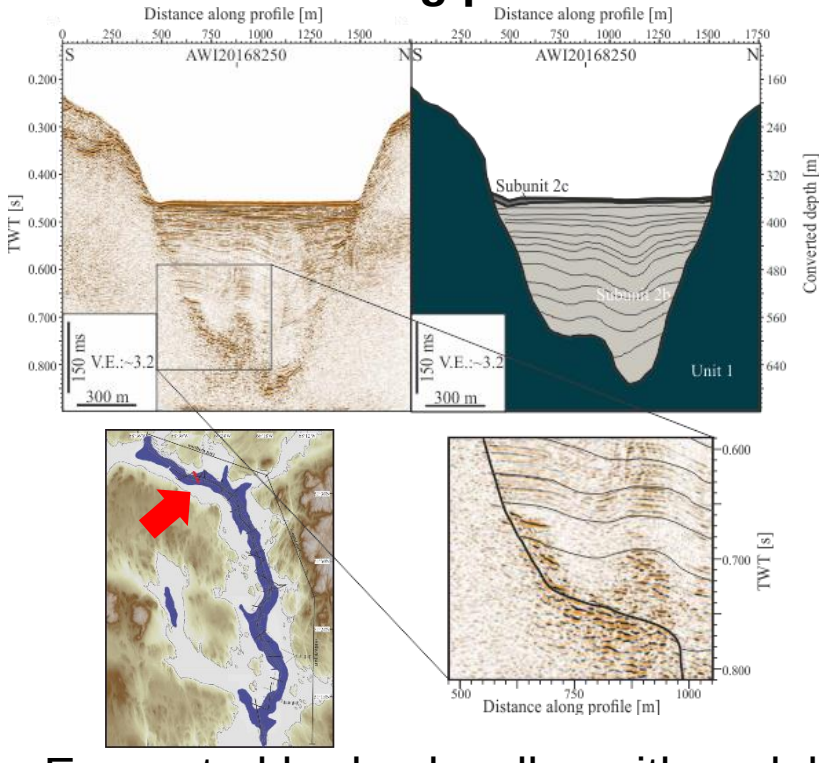
Lake Manicouagan – An impact crater



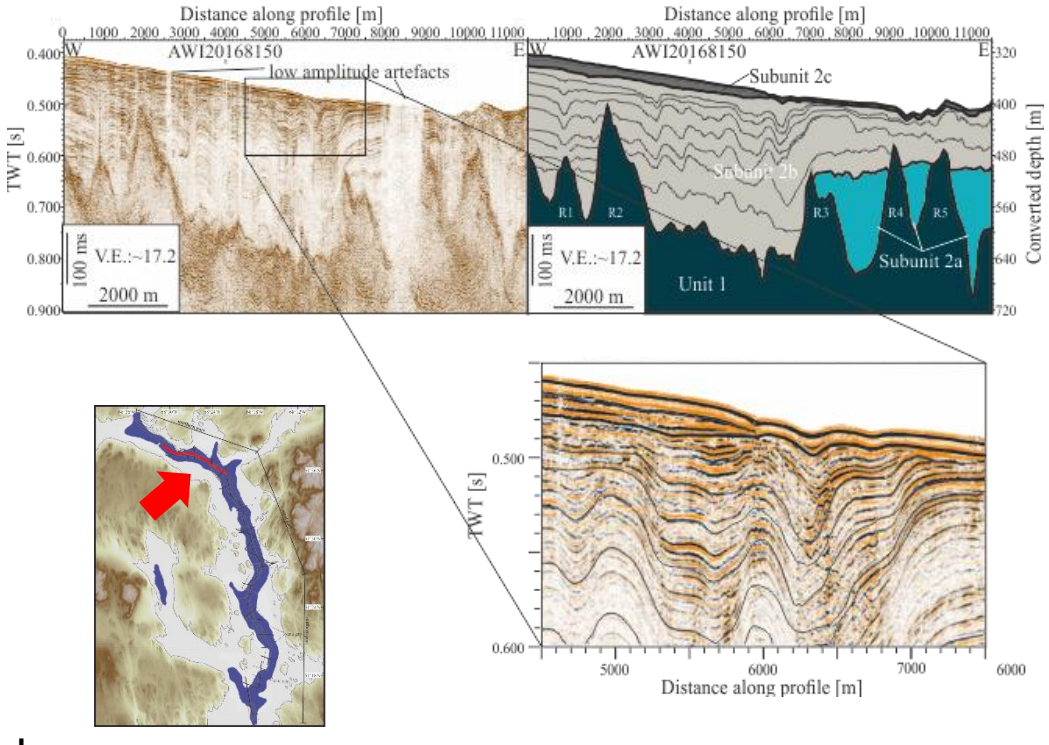
- 214 Ma old impact crater lake
- Area covered by the Québec-Labrador Ice Dome
- Construction of the Daniel-Johnson dam caused lake level rise
- Study area: Eastern crescent-shaped part of the lake

Data - Seismic profiles

Crossing profile



Along profile



- Excavated bedrock valley with undulating thalweg
- Filled with a sedimentary sequence
- Three sedimentary units

Valley morphology and sediment thickness

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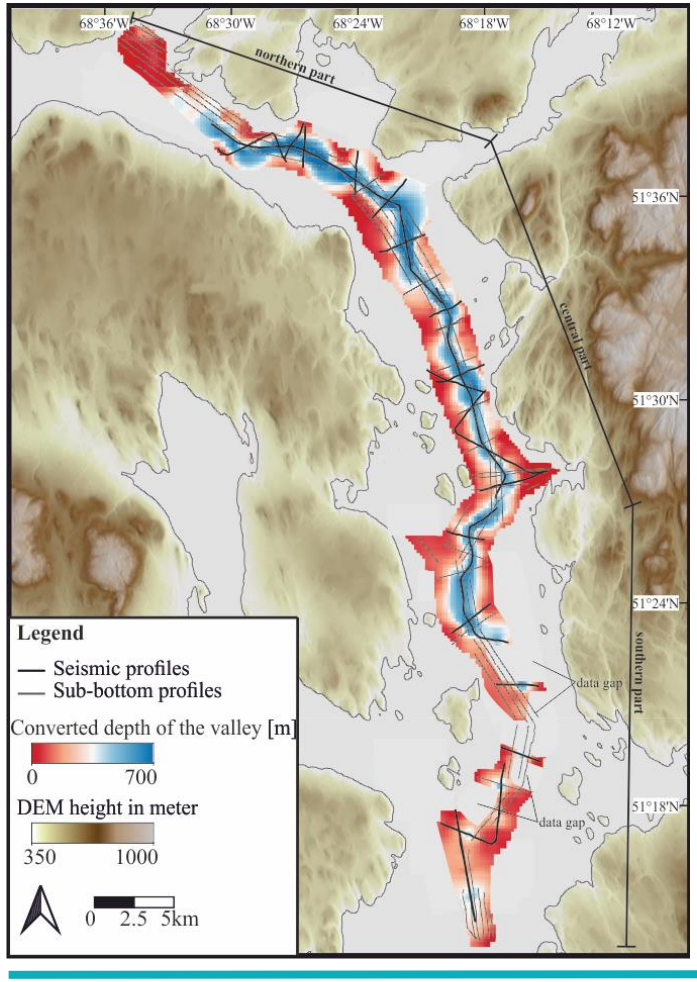
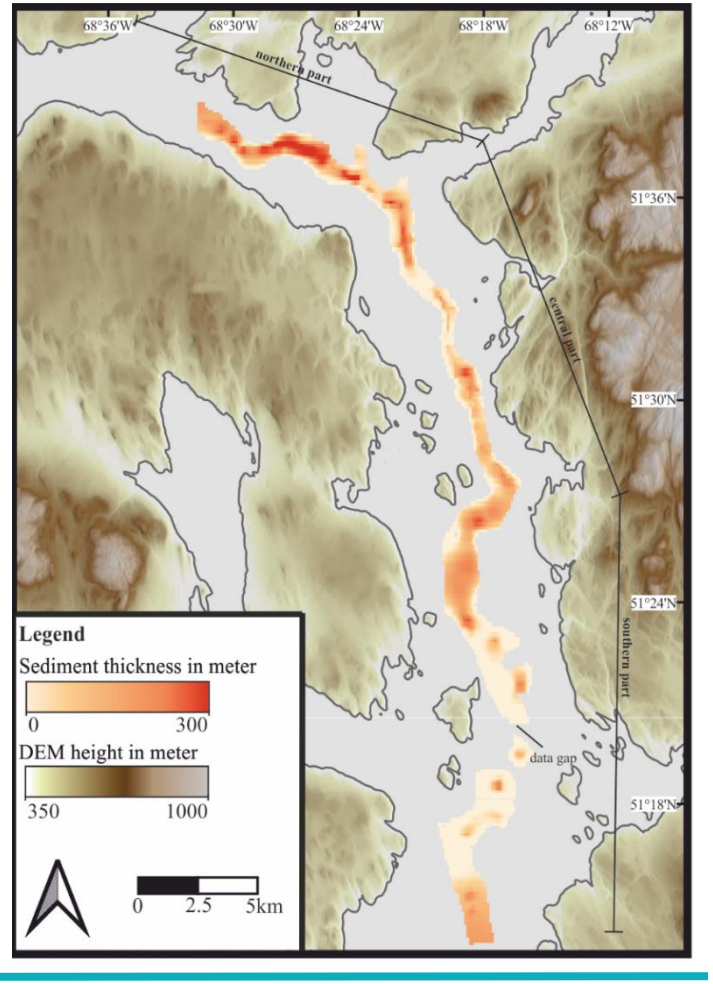
Valley morphology

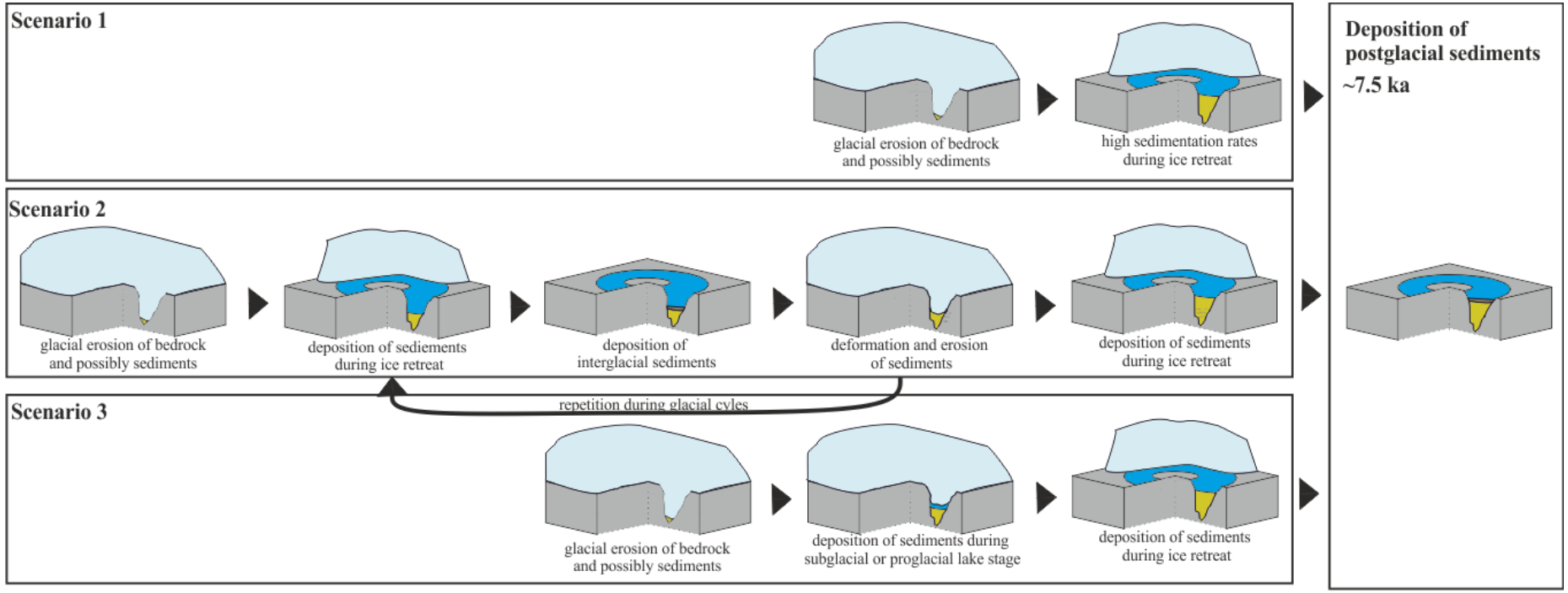


- Decreasing trend of the thalweg from north to south
- Maximum depth of 690 m below lake level
- Overdeepened basin providing accommodation space
- Sedimentary thickness of up to 280 m

Sediment thickness



Model for the deposition of the sedimentary sequence



- S1: Sediments deposited during last ice retreat, very high sedimentation rates needed
- S2: Sediments deposited during multiple glacial-interglacial cycles, erosional unconformities and interglacial units expected
- S3: Sediments deposited during subglacial or proglacial stage during last glaciation

Conclusion

- Lake Manicouagan forms a deep overdeepened basin that provided accommodation space for a thick sedimentary sequence.

- Lake Manicouagan is a valuable paleoclimate archive and holds a mostly undisturbed sedimentary sequence of up to 280 m thickness.

- Parts of the sedimentary sequence have most likely been deposited prior to the last deglaciation.

Conclusion

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- Parts of the sedimentary sequence have most likely been deposited prior to the last deglaciation.

Thank you for your time!

Corresponding author:

Kai-Frederik Lenz

frederik.lenz@ifg.uni-kiel.de

ResearchGate Profile

Marine and Coastal Geohazards
Center for Ocean and Society (CeOS)
Institute of Geosciences
Christian-Albrechts-Universität zu Kiel (CAU) / Kiel University
Neufeldtstr. 10
24118 Kiel / Germany