# Article information:

Vertical distribution of excess ice in icy sediments and its statistical estimation from geotechnical data (Tuktoyaktuk Coastlands and Anderson Plain, Northwest Territories)
<https://cdnsciencepub.com/doi/full/10.1139/AS-2021-0041>

# Article summary:

1. Excess ground ice is a dominant control on terrain and geotechnical response to permafrost thaw, making it important to quantify.

2. A statistical model was developed using a training data set from the Tuktoyaktuk Coastlands to estimate excess ice content of icy sediments based on interval depth, visible ice content, material type, and Quaternary deposits.

3. Ground ice within icy sediments can contribute up to 65% of excess ice and potential thaw strain within the first 10 m from the surface in this area, highlighting the importance of collecting quantitative data on ground ice conditions for accurate predictions of future ground subsidence.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article "Vertical distribution of excess ice in icy sediments and its statistical estimation from geotechnical data (Tuktoyaktuk Coastlands and Anderson Plain, Northwest Territories)" provides valuable insights into the importance of excess ground ice in permafrost terrain and its impact on potential thaw strain. The study uses a cryostratigraphic dataset collected along the Inuvik-Tuktoyaktuk Highway to develop a beta regression model that predicts the excess ice content of icy sediments based on interval depth, visible ice content, material type, and Quaternary deposits.

The article highlights the need for reliable quantitative data on current EIC and distribution to define initial ground ice conditions in permafrost models so that these simulations might return more realistic predictions of future ground subsidence. The study shows that ground ice within icy sediments can contribute up to 65% of the excess ice and potential thaw strain within the first 10 m from the surface in this area. This finding has significant implications for infrastructure built on ice-rich terrain, such as the Inuvik-Tuktoyaktuk Highway.

However, there are some limitations to this study. Firstly, it only focuses on one specific region (Tuktoyaktuk Coastlands and Anderson Plain) and may not be generalizable to other regions with different geological characteristics. Secondly, while the study provides valuable insights into the importance of excess ground ice in permafrost terrain, it does not explore potential solutions or mitigation strategies for addressing this issue.

Additionally, there is a lack of discussion around potential biases or limitations in the methodology used to develop the beta regression model. For example, it is unclear how representative the training dataset used is of the entire study area or whether there were any confounding variables that may have influenced the results.

Overall, while this article provides valuable insights into excess ground ice in permafrost terrain and its impact on potential thaw strain, further research is needed to explore potential solutions or mitigation strategies for addressing this issue. Additionally, more discussion around potential biases or limitations in the methodology used would strengthen the study's findings.

# Topics for further research:

* Mitigation strategies for excess ground ice in permafrost terrain
* Regional variations in excess ice content in permafrost terrain
* Impact of climate change on excess ground ice in permafrost terrain
* Methods for measuring excess ice content in permafrost sediments
* Relationship between excess ice content and soil properties in permafrost terrain
* Long-term effects of excess ground ice on infrastructure in permafrost terrain

# Report location:

<https://www.fullpicture.app/item/6a569fe2b8c9410c1c4d0e18b1d4711e>