Relation of Road Surface Friction and Salt Concentration

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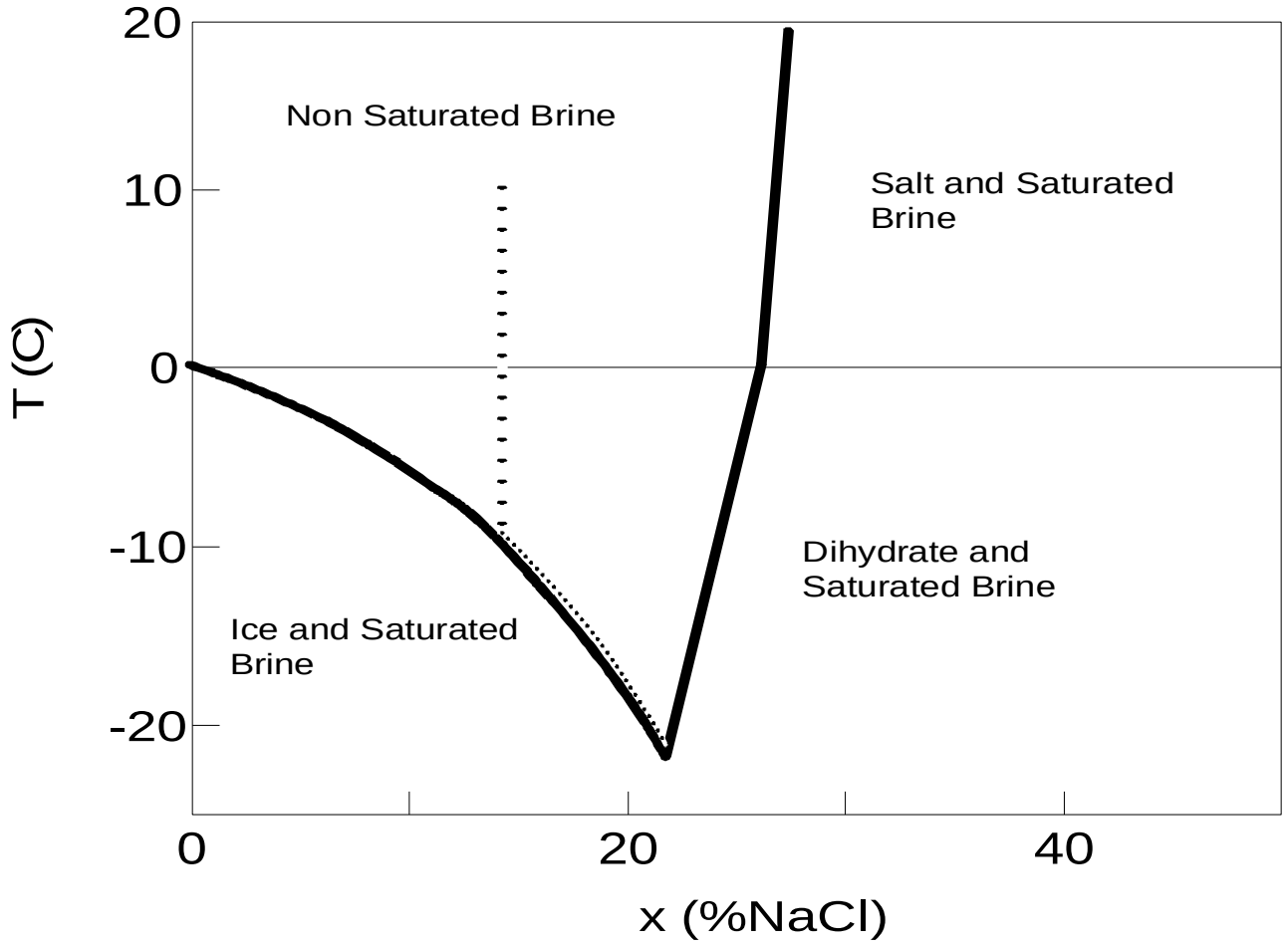
ID 17

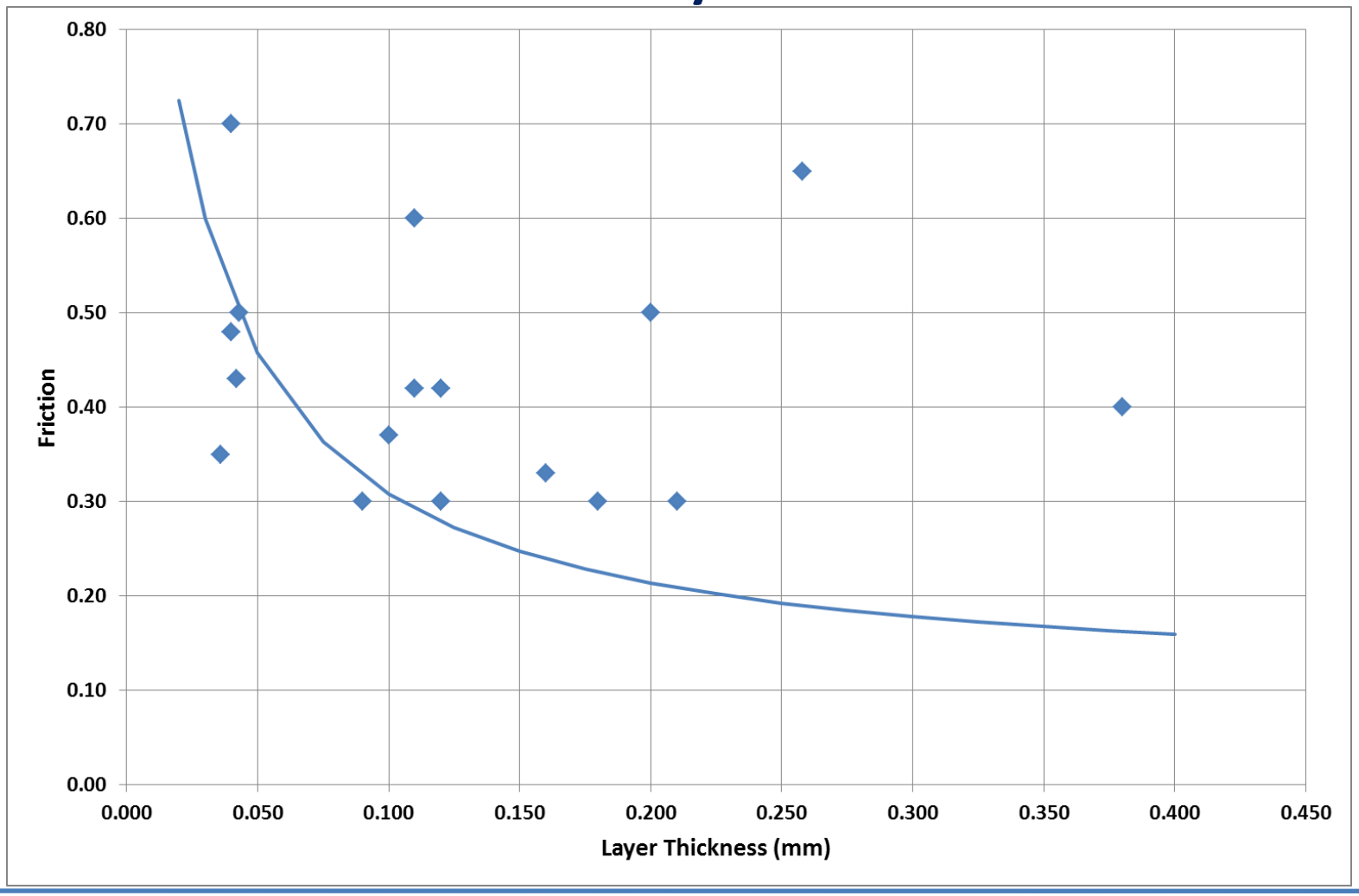
Friction and Salt Concentration

- Purpose of the research
  - How does friction depend on salt concentration and temperature?
- Research conducted during 2010-2011
  - collecting samples from road surface
    - layer thickness, conductivity, friction, temperature

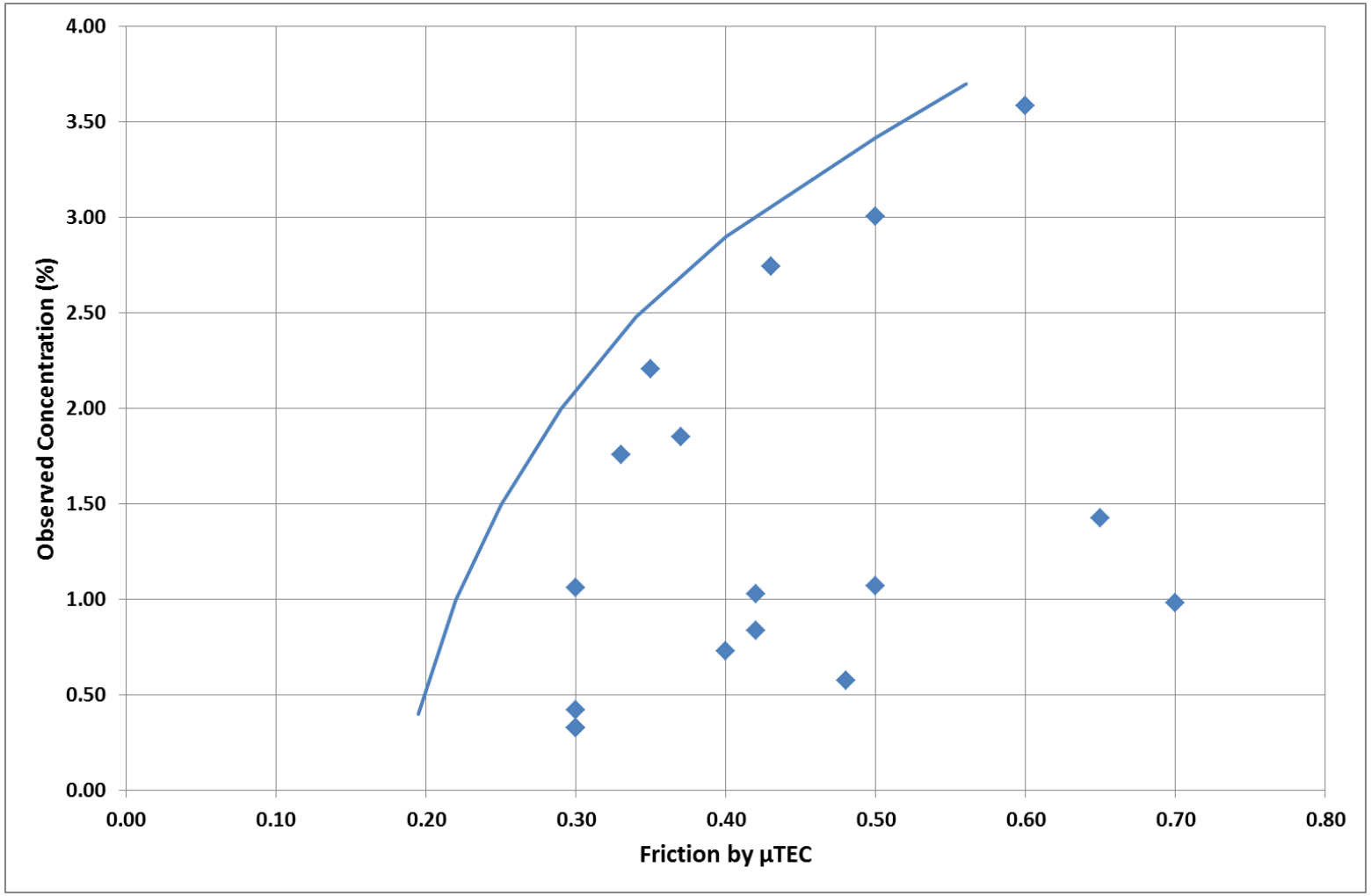
Phase Diagram of NaCl



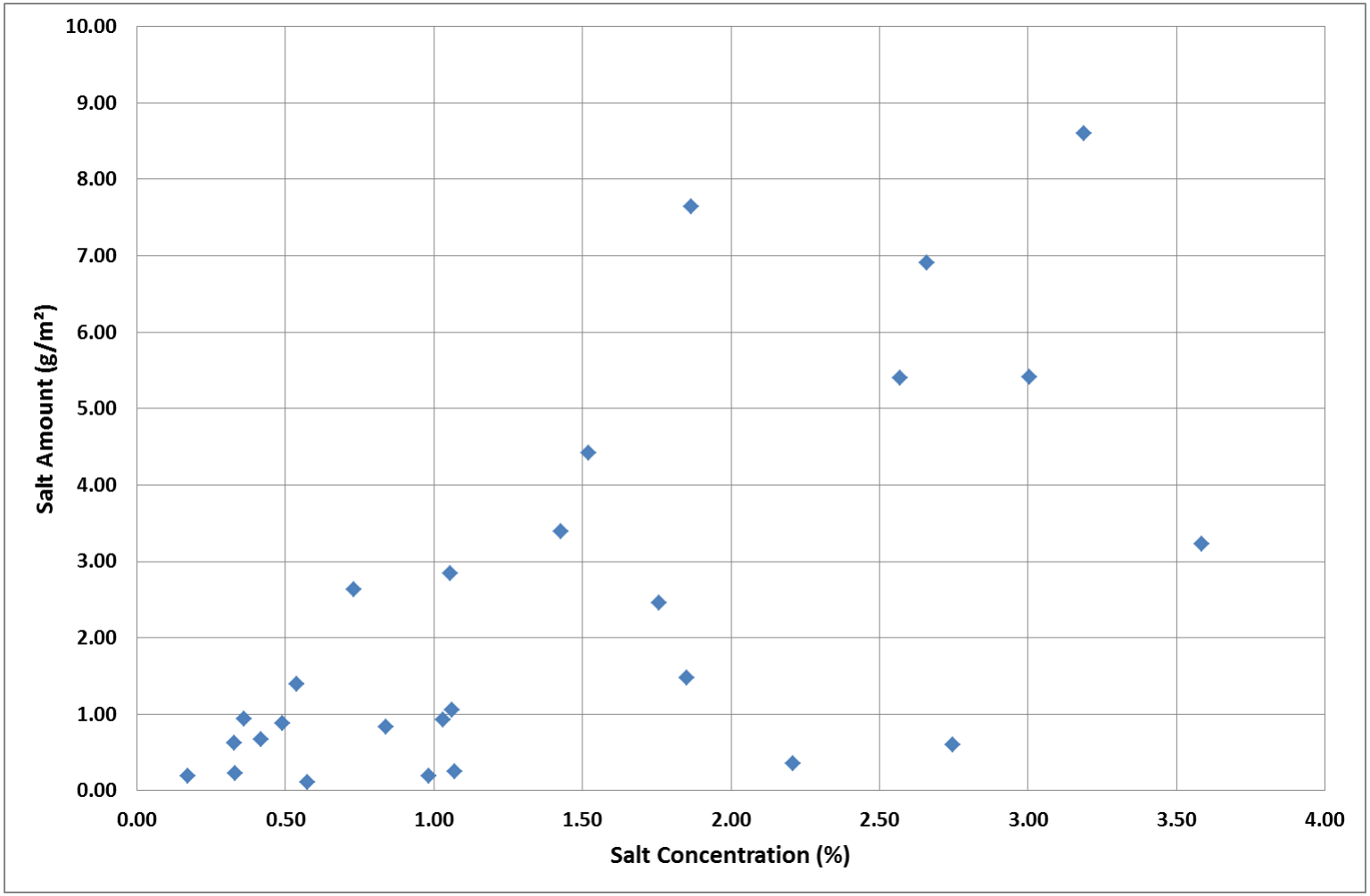
Friction vs. Layer Thickness



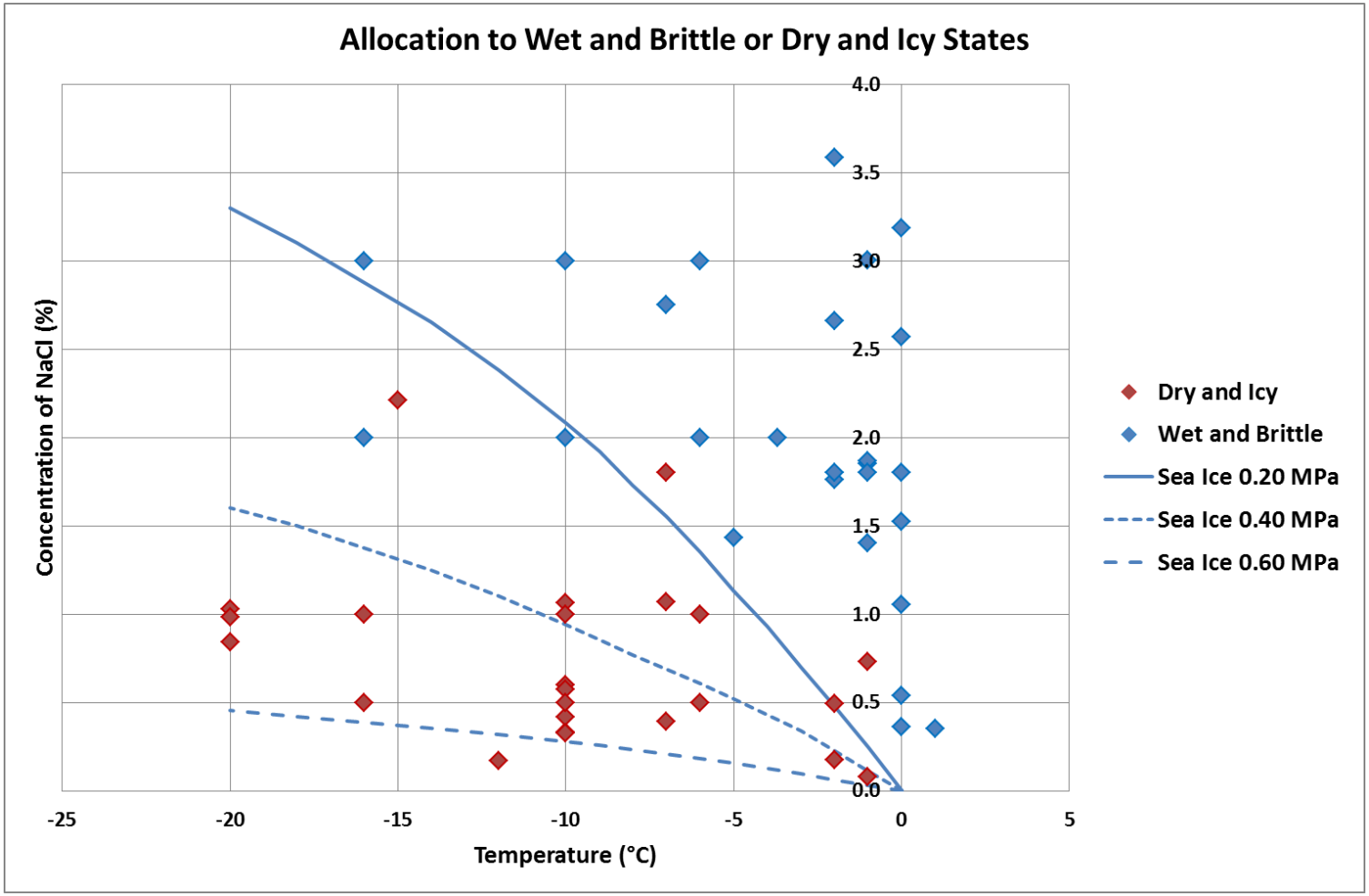
Concentration vs. Friction



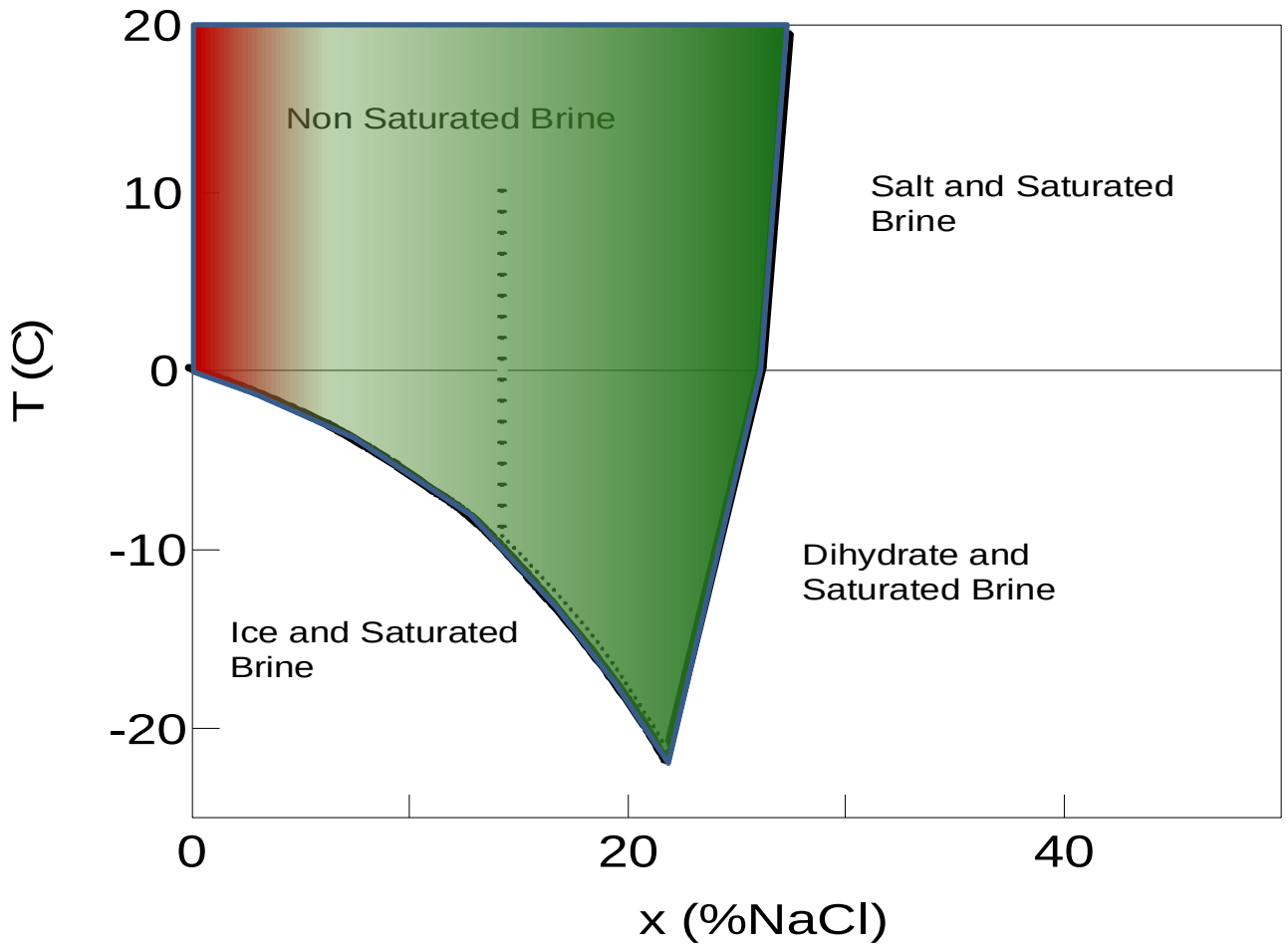
Salt Amount and Concentration



Strength of Salty Ice



Phase Diagram of NaCl



Conclusion

- Ice formed from salty solution is brittle
  - friction is higher than supposed
- Optimal winter maintenance
  1. Presalt at the right time!
     - avoid hard ice
  2. Follow development of friction!
     - refreezing is a slow process,
     - there is time to resalt
  3. Apply more salt, only if needed
     - right amount can be fairly low!
     - **0.1 mm * 1 % = 1 g/m²**