Simulating the formation and decay of supraglacial lakes in south-west Greenland

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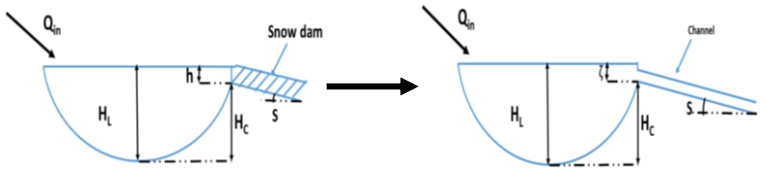
- Supraglacial melt water (SMW) affects ice sheet motion (Christoffersen et al., 2018; *Nature*)
  - From SGLs
- Till date no ice sheet model has a process-based unit that can model the evolution of SGLs.
- MII Greenland
  - Meltwater Ice sheet Interaction Greenland
  - Development of a process-based supraglacial hyd. Unit
  - Development of a process-based sub-glacial hyd. Unit

- Hydrofracture $K_I = 1.12R_{xx}\sqrt{\pi d} - 0.683\rho_i g d^{1.5} + 0.683 g b^{1.5}$
  - Lake
  - Non-lake

van der Veen, 2008;GRL

- Channel incision

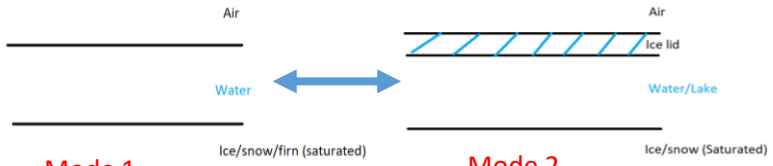


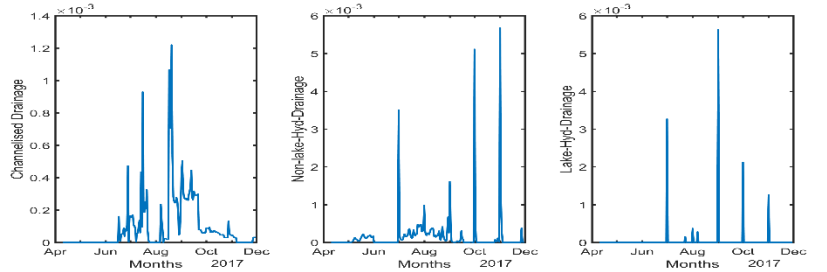
Kingslake et al., 2015; JoG

- Surface water routing
- Drainage via crevasses
  - SGLs
  - Surface meltwater (Non-lake)
- Drainage via channel incision
- Lake refreezing

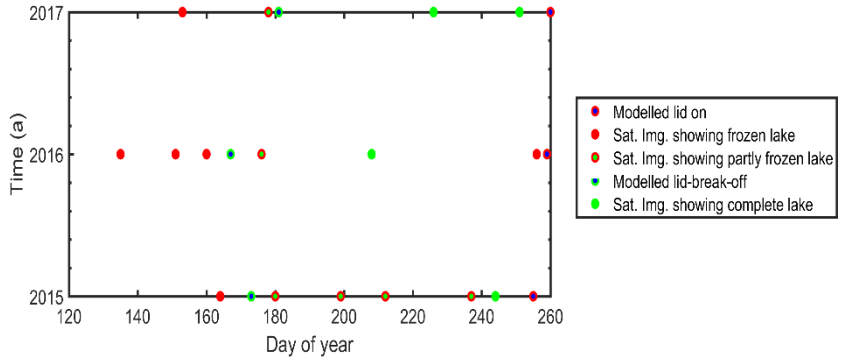
- Lake refreezing

Buzzard et al., 2018;JAMES



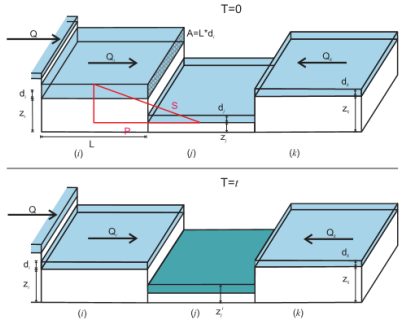


(2017)

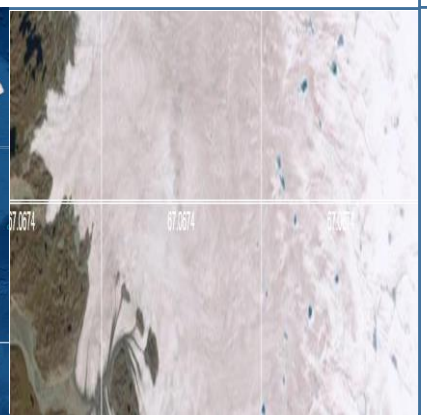


(Just outside the study area)

- Surface water routing



Leeson et al., 2012; Cryosphere



Future work:

- Integrating the model into BISICLES ice sheet model