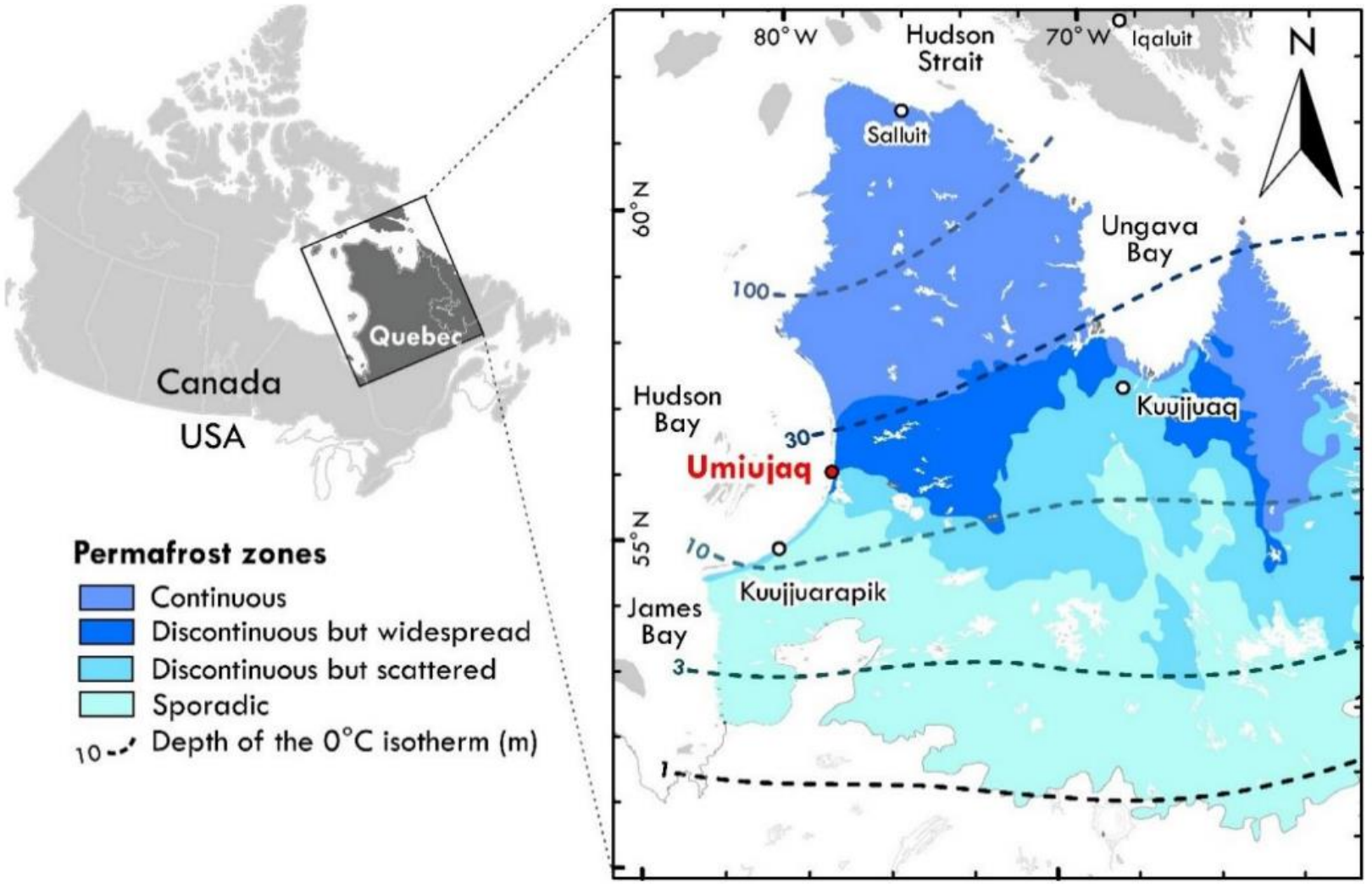
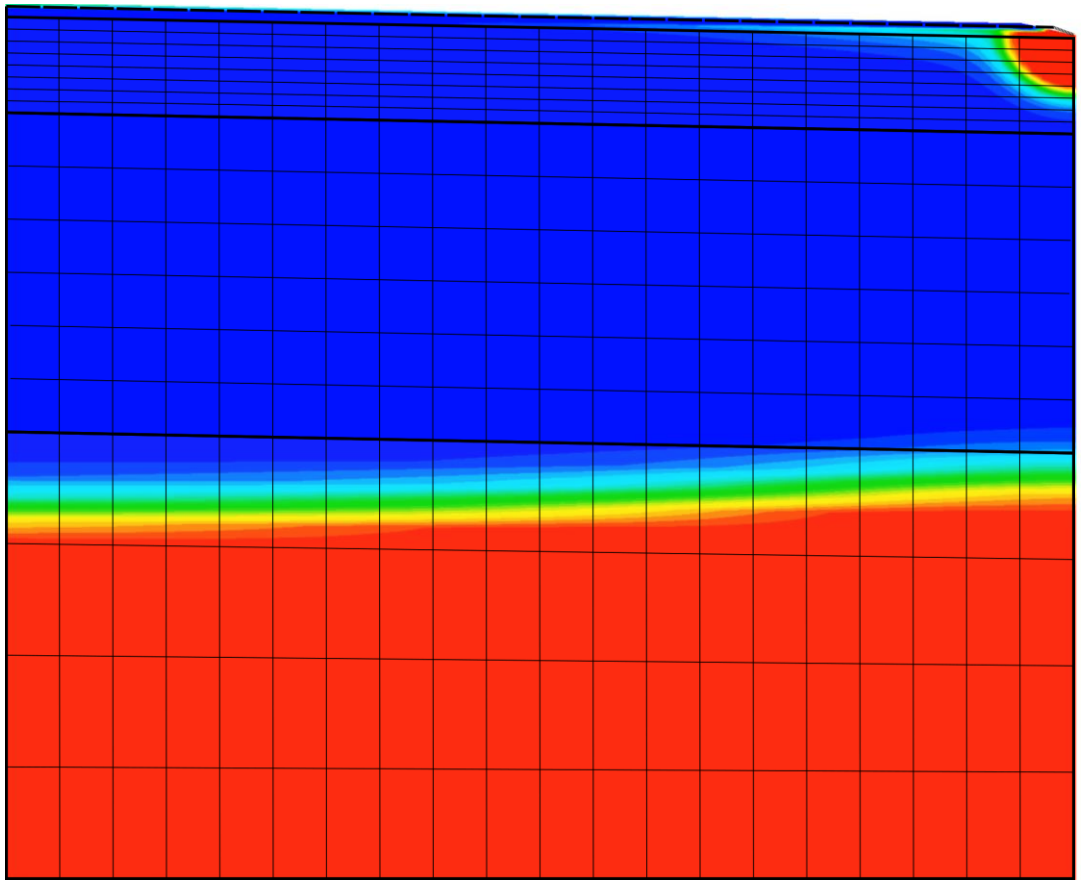
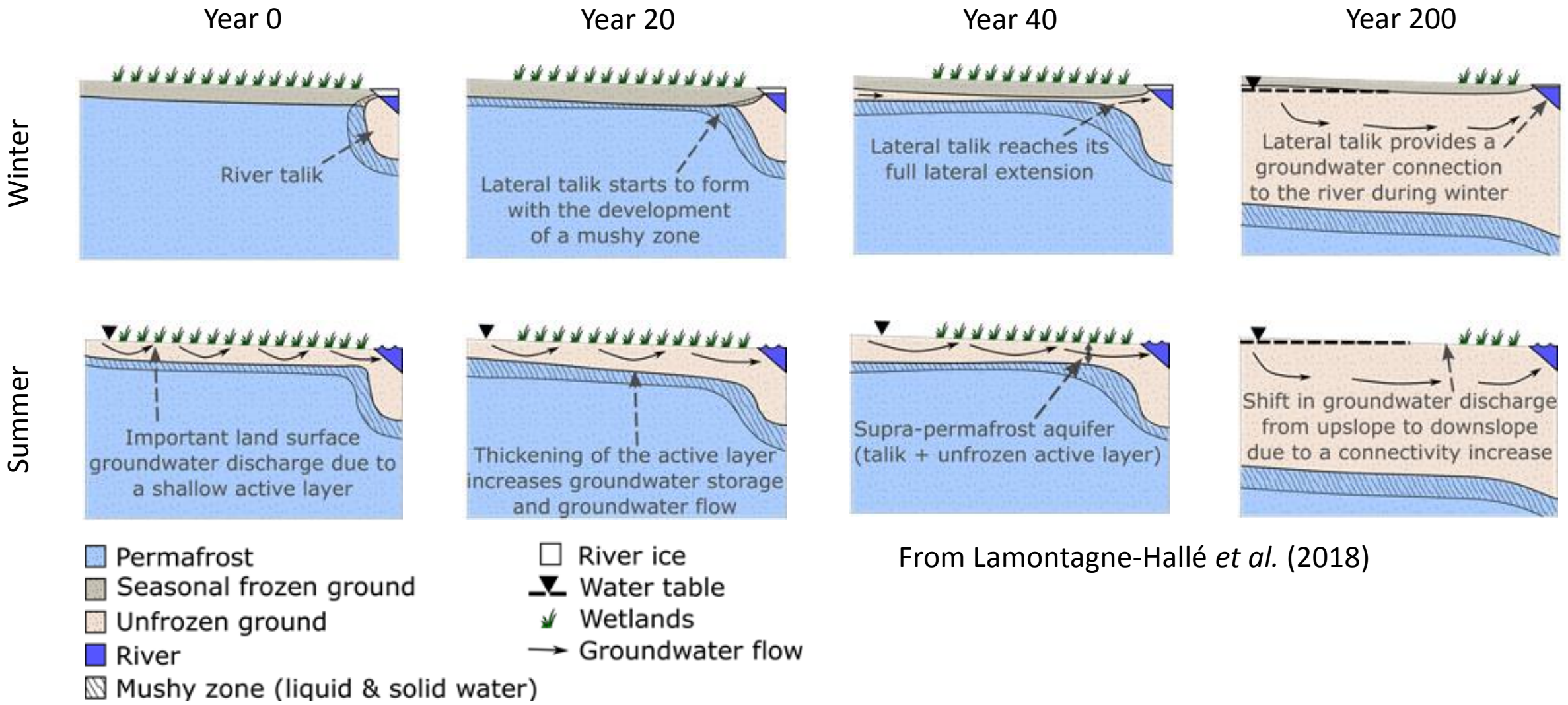


From Dagenais (2017)

Groundwater modelling



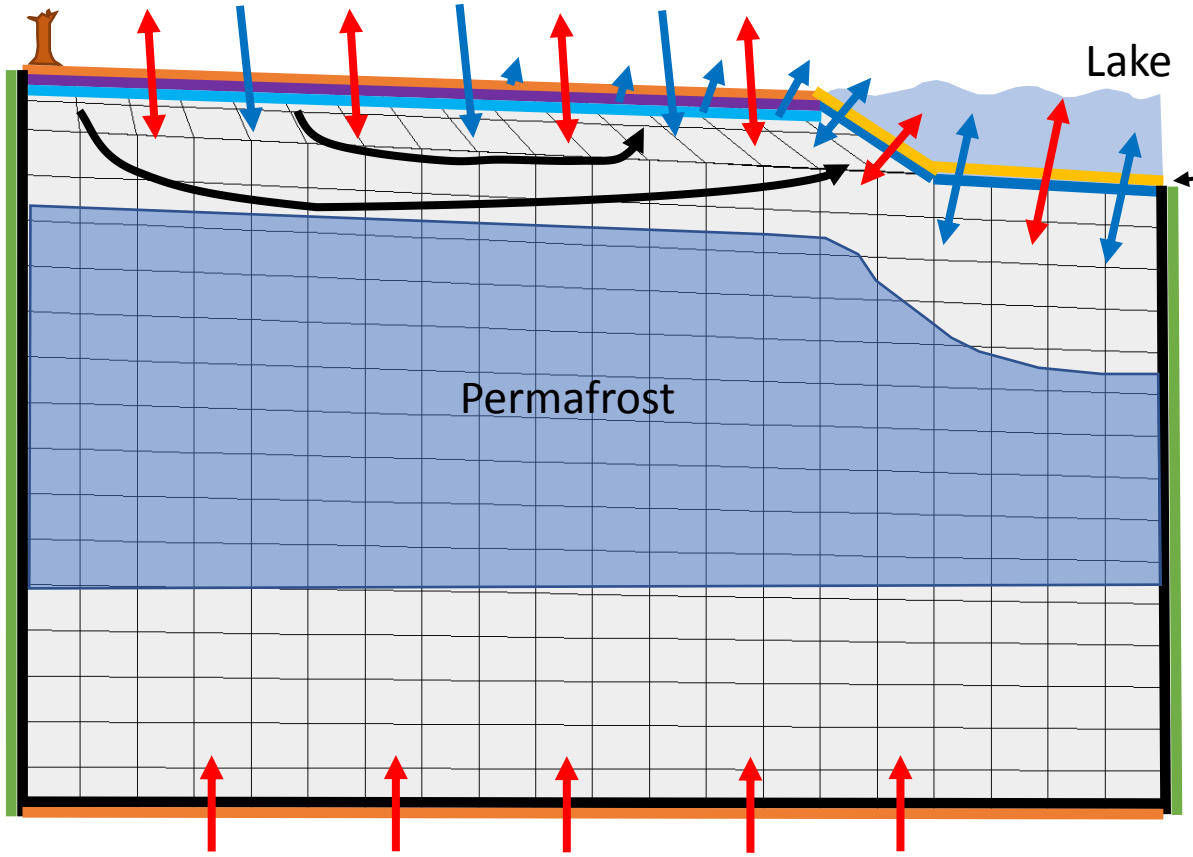
Impacts of permafrost thaw on Arctic hydrology



From Lamontagne-Hallé *et al.* (2018)

Boundary conditions

Heat flux from differences in air and surface temperatures & snow thickness
Recharge from precipitations & snowmelt + Drain (discharge if overpressured)

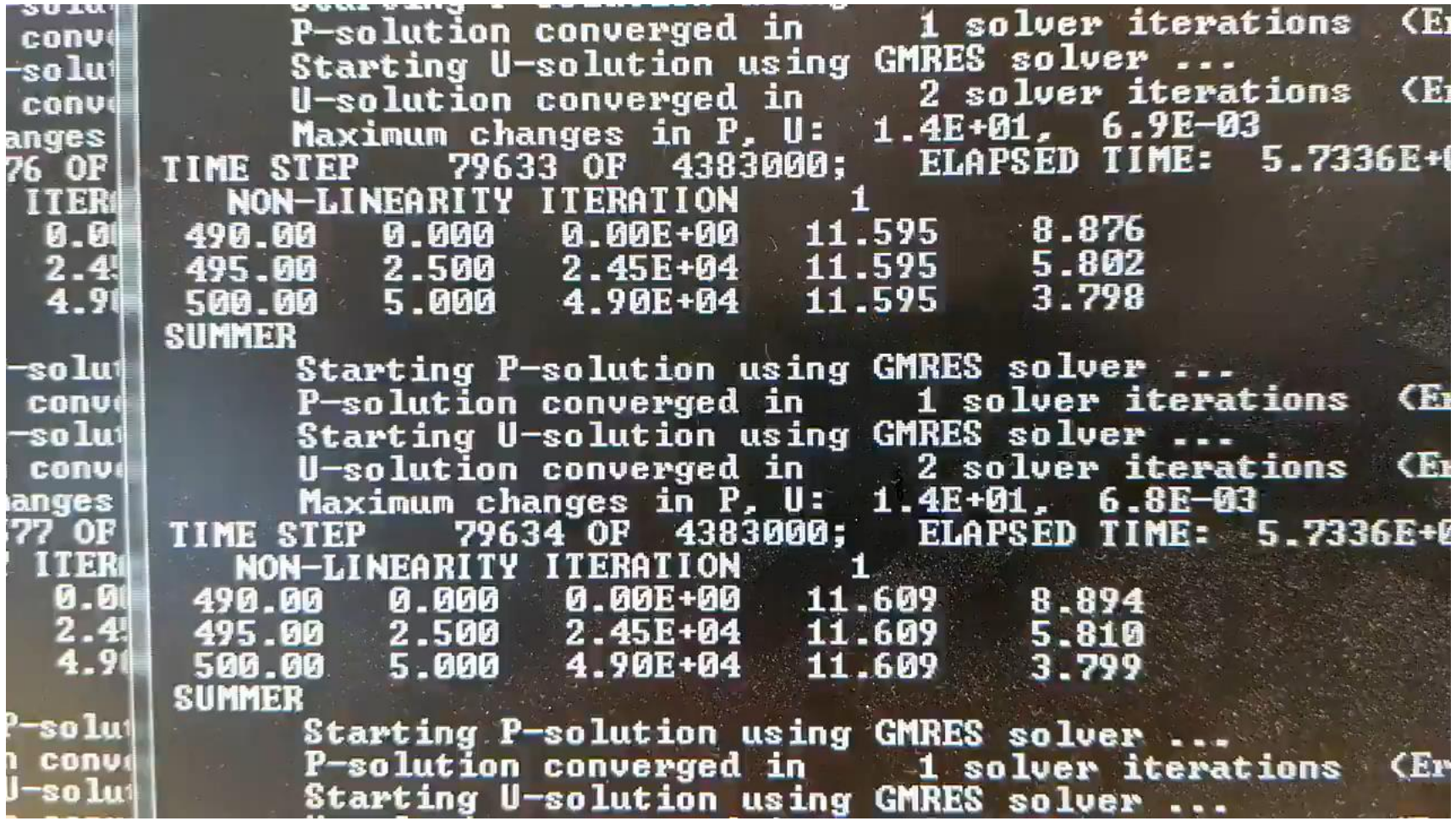


Time and depth dependent specified temperature at the bottom of the lake

Legend

- No water flow
- No heat transfer
- Specified recharge
- Specified heat flux
- Specified pressure
- Specified temperature
- Drain

- Water exchange
- Heat exchange
- Groundwater flow


P-solution converged in 1 solver iterations
Starting U-solution using GMRES solver ...
U-solution converged in 2 solver iterations
Maximum changes in P, U: 1.4E+01, 6.9E-03
TIME STEP 79633 OF 4383000; ELAPSED TIME:
NON-LINEARITY ITERATION 1
490.00 0.000 0.00E+00 11.595 8.876
495.00 2.500 2.45E+04 11.595 5.802
500.00 5.000 4.90E+04 11.595 3.798
SUMMER
Starting P-solution using GMRES solver ...
P-solution converged in 1 solver iterations
Starting U-solution using GMRES solver ...
U-solution converged in 2 solver iterations
Maximum changes in P, U: 1.4E+01, 6.8E-03
TIME STEP 79634 OF 4383000; ELAPSED TIME:
NON-LINEARITY ITERATION 1
490.00 0.000 0.00E+00 11.609 8.894
495.00 2.500 2.45E+04 11.609 5.810
500.00 5.000 4.90E+04 11.609 3.799
SUMMER
Starting P-solution using GMRES solver ...
P-solution converged in 1 solver iterations
Starting U-solution using GMRES solver ...


ALASKA
YUKON
CANADA
UNITED STATES
Wrangell-St. Elias
National Park
and Preserve
Asi Keyi
Territorial
Park
Kluane Wildlife Sanctuary
Burwash Landing
Destruction Bay
Kluane Lake
KLUANE NATIONAL
PARK RESERVE
OF CANADA
Mount
Logan
Haines
Junction
Whitehorse
KLUANE
NATIONAL
PARK
Kluskhu
PACIFIC OCEAN
Tatshenshini-
Alsek Park
Skagway
BRITISH
COLUMBIA
Glacier Bay
National
Park and
Preserve
Juneau
Protected Areas
around KNP & R
World Heritage Site
ALASKA
(USA)
NORTHWEST
TERRITORIES
YUKON
BRITISH
COLUMBIA
KLUANE NATIONAL
PARK & RESERVE


Legend
GPS benchmark
Relative humidity sensor
2017 Geophysical line
2018 Geophysical line
DGPS transect
Alluvial plain
Bedrock or landslide deposits
Glacier
Meadow
Moraine
Rock glacier
Watershed boundary
Icing in June 2017
0
500
1,000
2,000
3,000
4,000
Meters