

Figure text

Figure 1: The Krycklan catchment

- (a) Location of sub-catchment and their outlets (red circles). The areas are color-coded based on their stream network connections, e.g., all sub-catchments of one color connect before reaching the white area. For further details of the catchment characteristics, see Table 1.
- (b) Soil map used in the hydrology model is based on the quaternary deposits map (1:100,000) and depth to bedrock map from the Swedish Geological Survey (2014), combined with field investigations.
- (c) Catchment topography, shown as meter above sea level (m.a.s.l.).

Figure 2: Model setup

- (a) Step by step of the particle tracking procedure.
- (b) Average depth to groundwater table. The main part of the model area has a calculated depth to the groundwater table between 0-3 m. Note that the top vertical layering of the saturated zone is 2.5 m at the soil surface and the thickness thereafter follows the soil layers (thickness increasing with depth) while the horizontal grid-size is 50x50 m.
- (c) Schematic illustration of particle tracking set up. Particles are added in each cell at the depth varying and transient groundwater table. The age of these particles is zero at the time of recharge. The particles then follow the groundwater flow while increasing in age. All particles that reaches a stream or lake receives an end age which is equal to time from recharge to discharge in the stream. MTT is calculated for each stream using these particles.

Figure 3: Average Na concentrations in the investigated streams as a function of the mire coverage. Data from Lidman et al. (2014).

Figure 4: Simulated travel time distribution of the groundwater in Krycklan. C16 is used as a visual reference in all panels. The figure includes all 14 investigated sub-catchments, color-coded as Fig. 1 and displayed in the legend in size order from left to right with C2 being the smallest and C16 the largest sub-catchment. The figure is divided into (a) all sub-catchments, (b) the sub-catchments of C13, (c) the sub-catchments of C12 and, (d) the sub-catchments of C14 and C15. The figure shows the full year distribution of particles.

Figure 5: aMTT and gMTT relationship

Figure 6 – Yearly discharge distribution of C16 (full-catchment). The discharge is divided into different source fractions, ranging from surface runoff to groundwater flow. The groundwater has been further divided into age groups which been calculated through the particle distribution for each month. The groundwater categories shown are; less than 3 months, less than 1 year, less than 5 years and more than 5 years.