

Sweden's droughts 2016-2018 actions taken and lessons learned -Groundwater

2018-11-08

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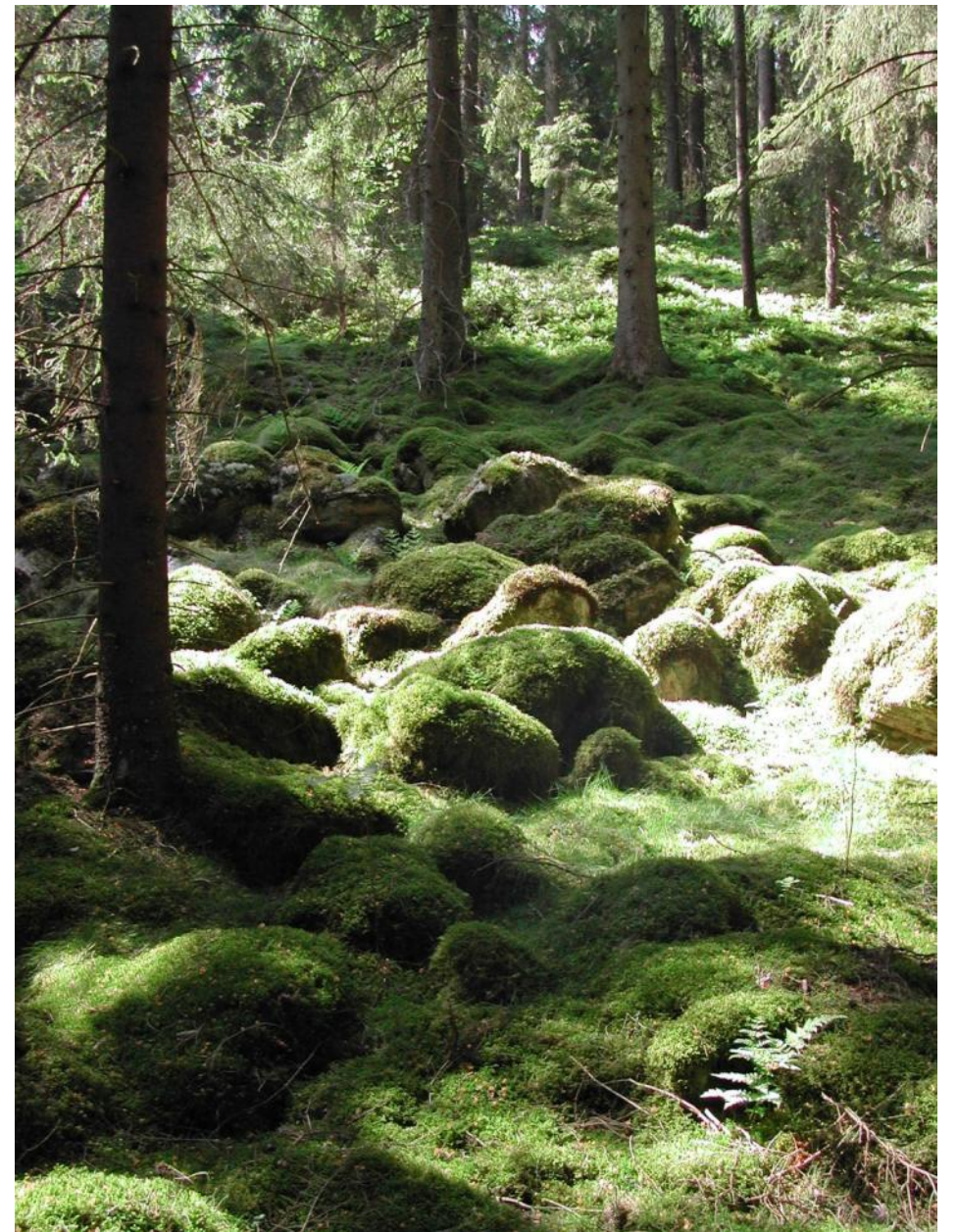
SGU

Sveriges geologiska undersökning
Geological Survey of Sweden



THE GEOLOGICAL SURVEY

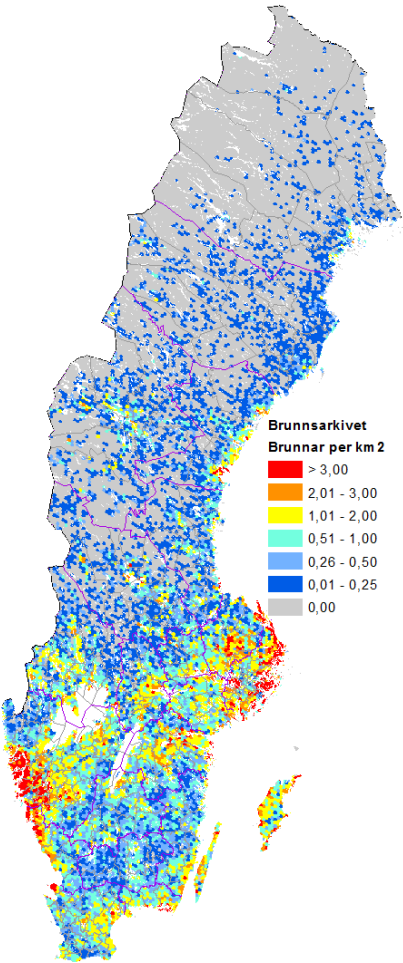
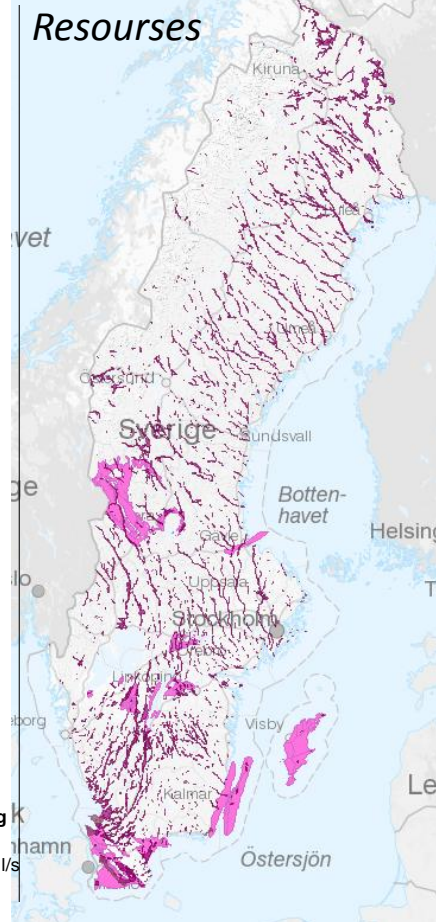
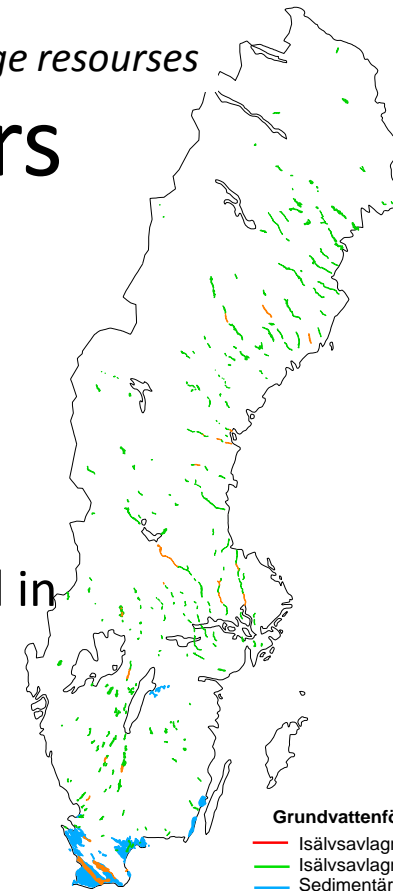
The Geological Survey of Sweden (SGU) is the national authority for issues relating to soil, bedrock and groundwater in Sweden



Groundwater resources/aquifers

- 3800 pcs
 - Most sand- and gravel deposits (eskers)
 - Some in sedimentary bedrock
 - Few in other resources in the bedrock and in moraine
 - The occurrence of large assets are limited
 - Overall good access but locally and periodically scarcity
- Drinking water in Sweden
 - 50 % is groundwater
 - About 10 % of population have private wells

Large resources



Wells



Esker

Monitoring of groundwater levels

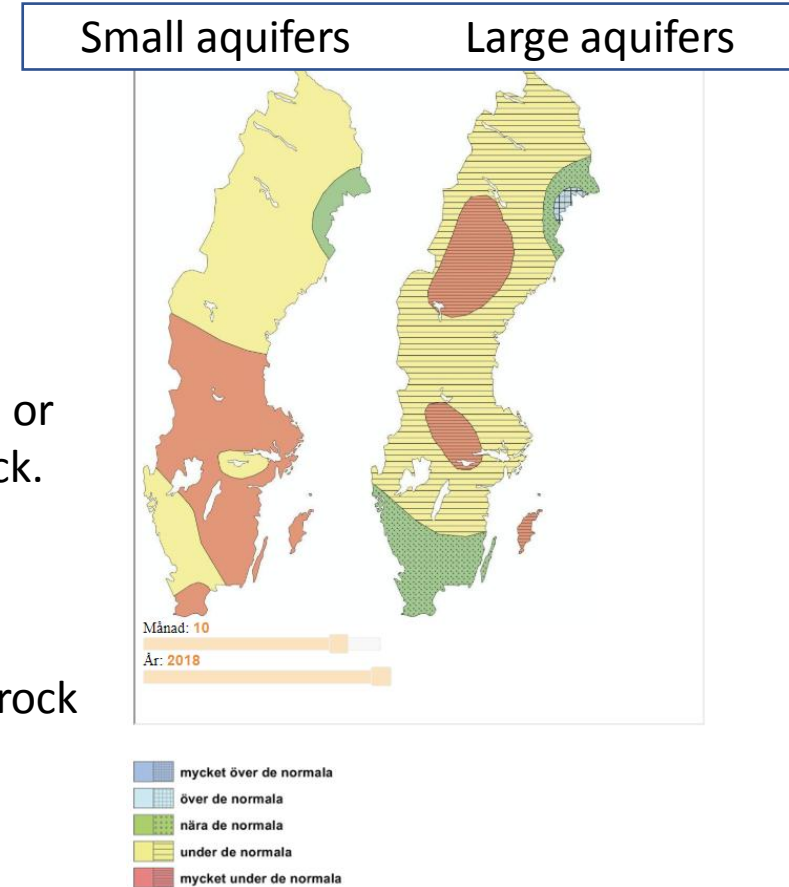
Started 1966

At present: About 300 sites



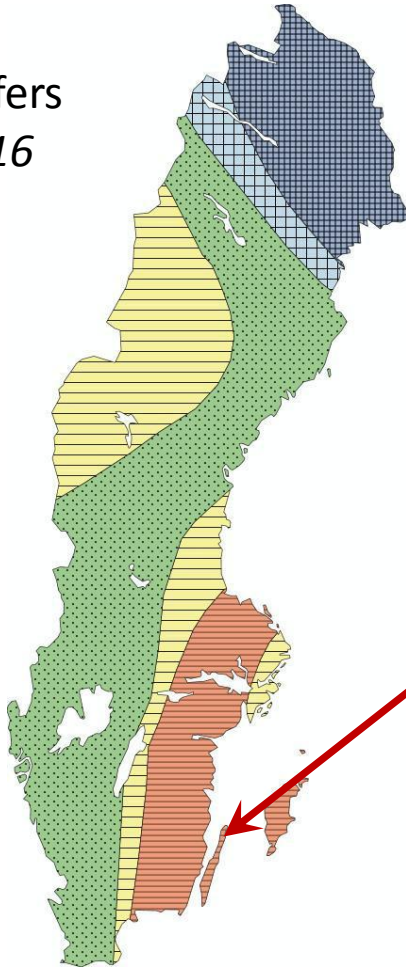
Small aquifers:
Usually glacial till or
crystalline bedrock.

Large aquifers:
Usually eskers or
sedimentary bedrock

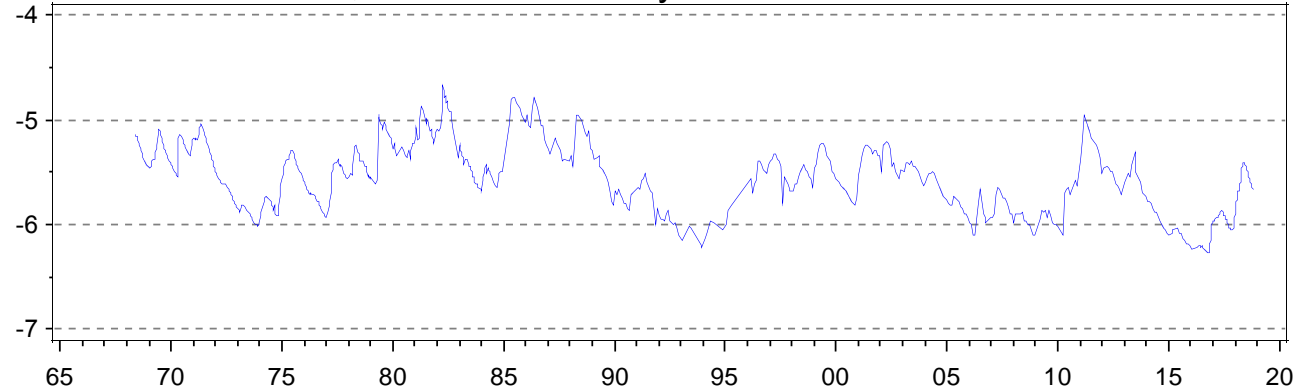


Extremely low groundwater levels 2016 – Large aquifers

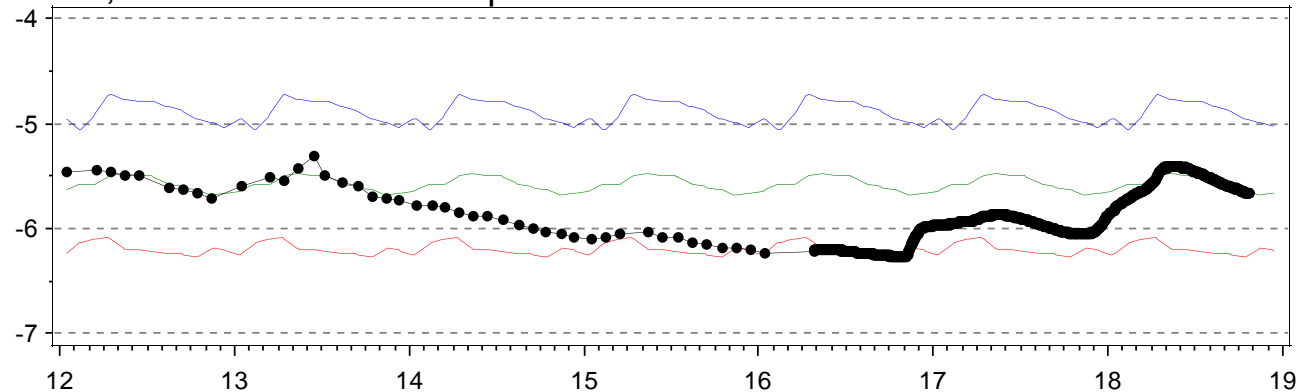
Large aquifers
August 2016



SGU, Grundvattennätet, Böda, station 7:9
Grundvattennivåer, meter under markytan

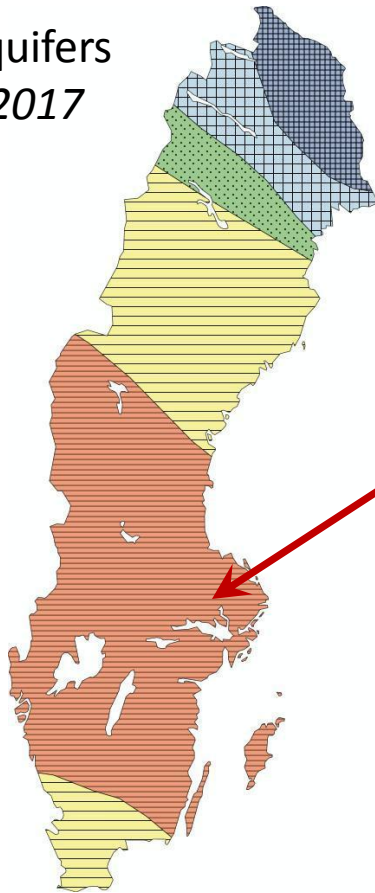


SGU, Grundvattennätet, Böda, Område 7, Station 9
Min, medel och max avser perioden 1970 - 2017

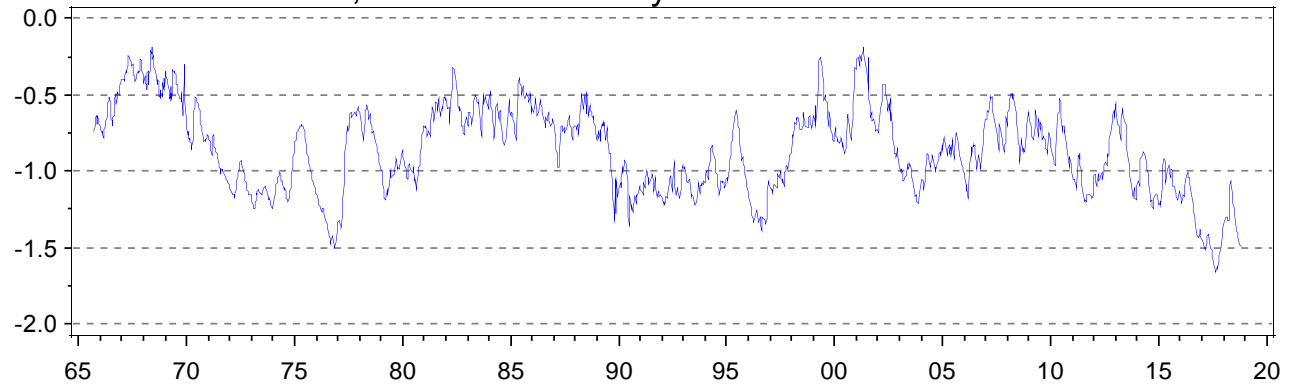


Extremely low groundwater levels 2017 – Large aquifers

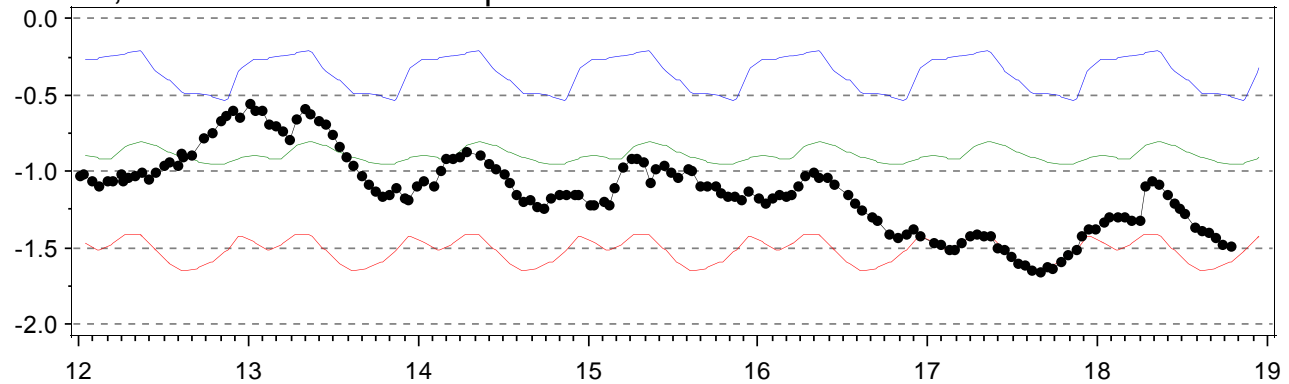
Large aquifers
August 2017



SGU, Grundvattennätet, Sala, station 20:1
Grundvattennivåer, meter under markytan

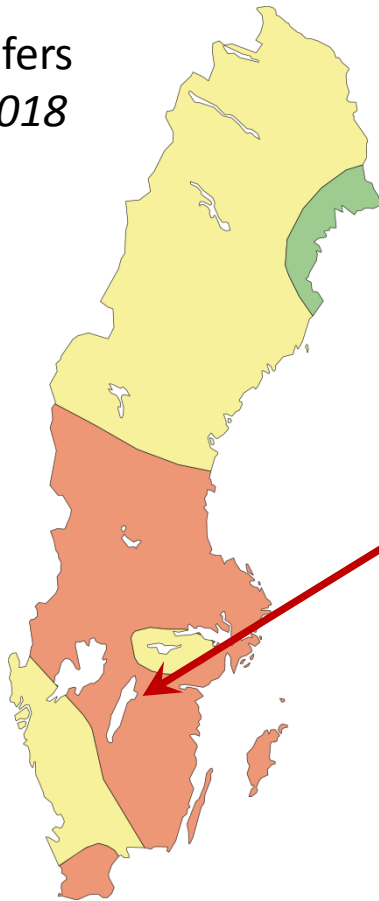


SGU, Grundvattennätet, Sala, Område 20, Station 1
Min, medel och max avser perioden 1970 - 2017

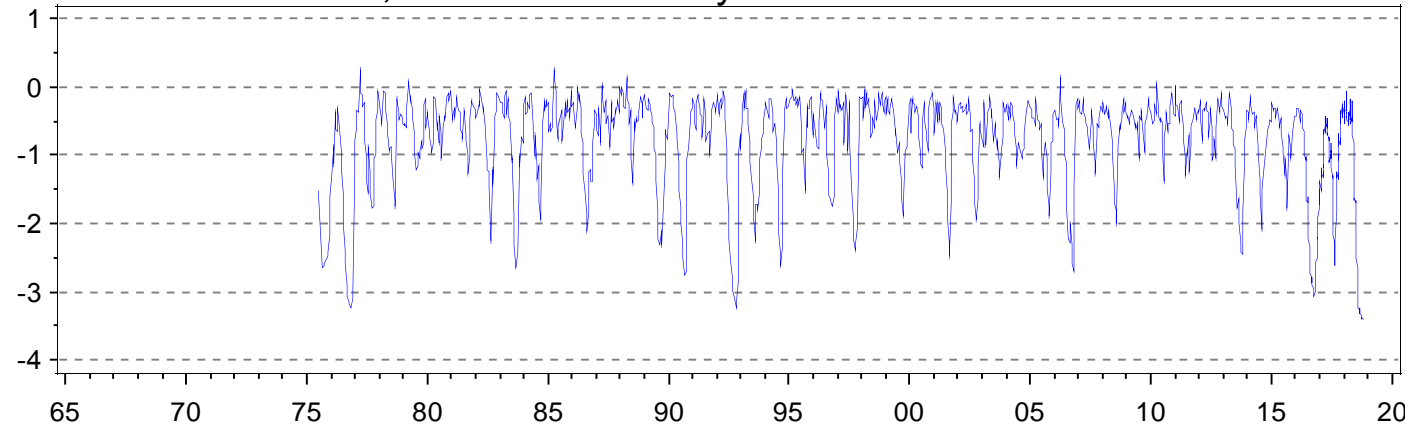


Extremely low groundwater levels 2018 – *small* aquifers

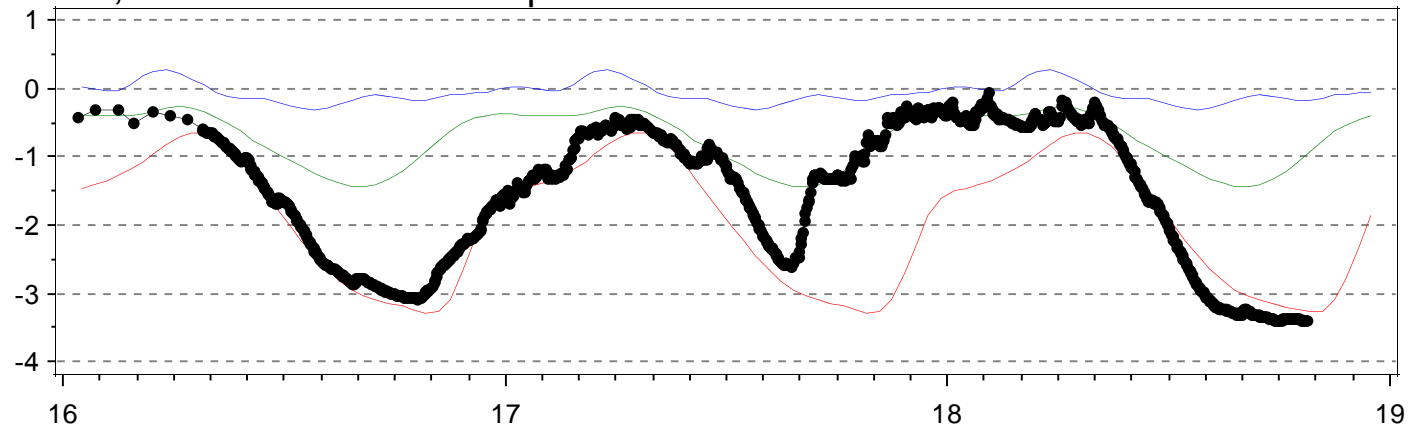
Small aquifers
October 2018



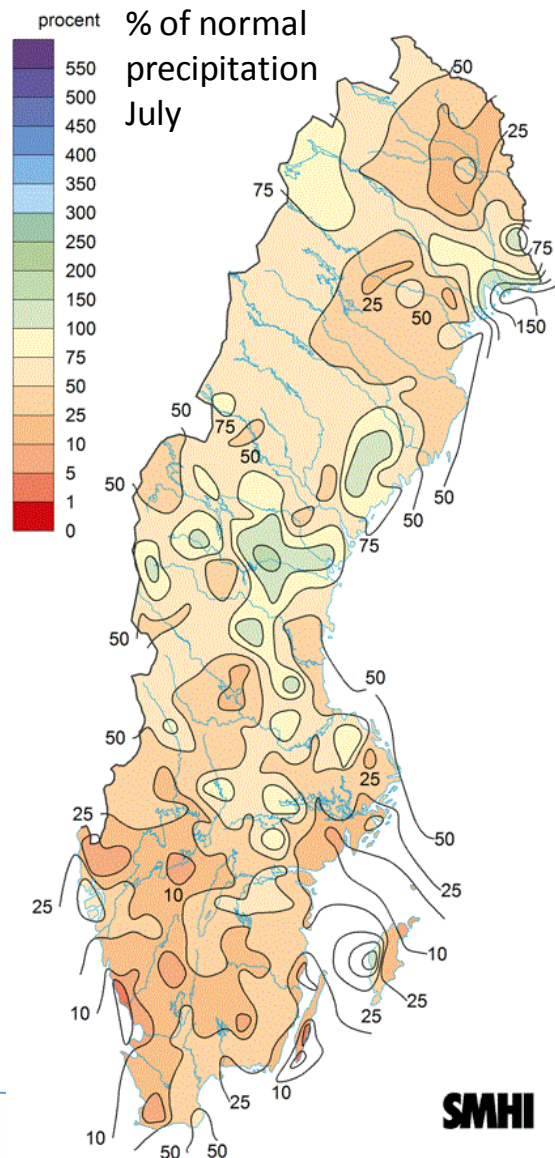
SGU, Grundvattennätet, Motala, station 60:46
Grundvattennivåer, meter under markytan



SGU, Grundvattennätet, Motala, Område 60, Station 46
Min, medel och max avser perioden 1976 - 2017



May – August 2018: Extreme weather situation



SMHI



2017



2018

Photos from Rymdstyrelsen/Copernicus Sentinel data 2017* and 2018* for Sentinel data/Google

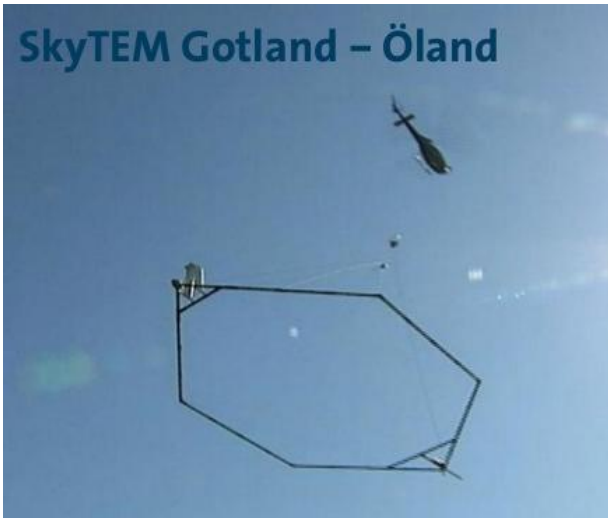
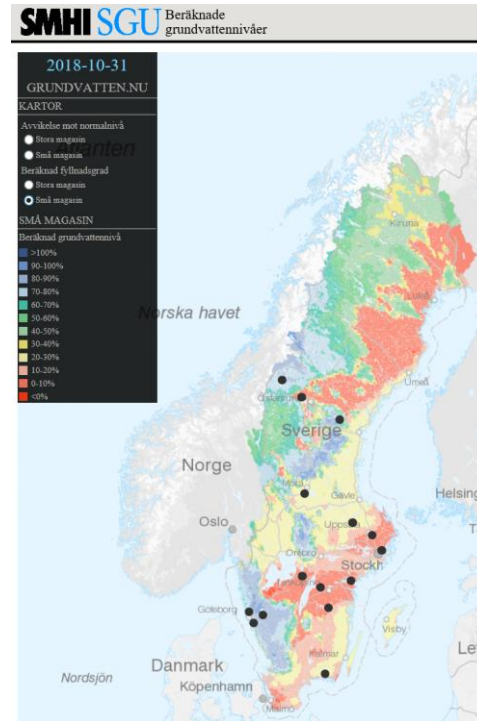
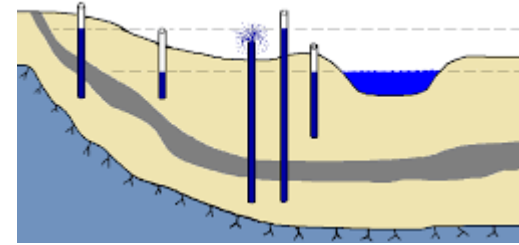
”Water Sweden”



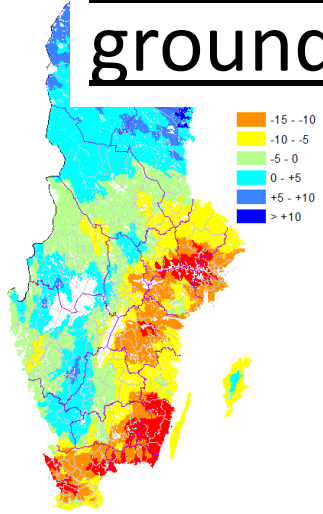
Actions made



Actions made, long term

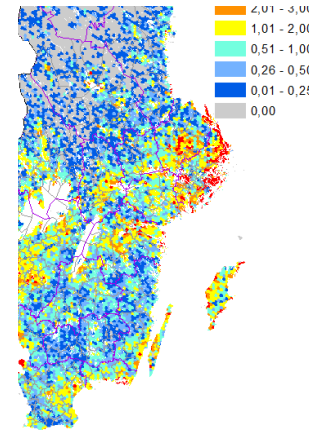
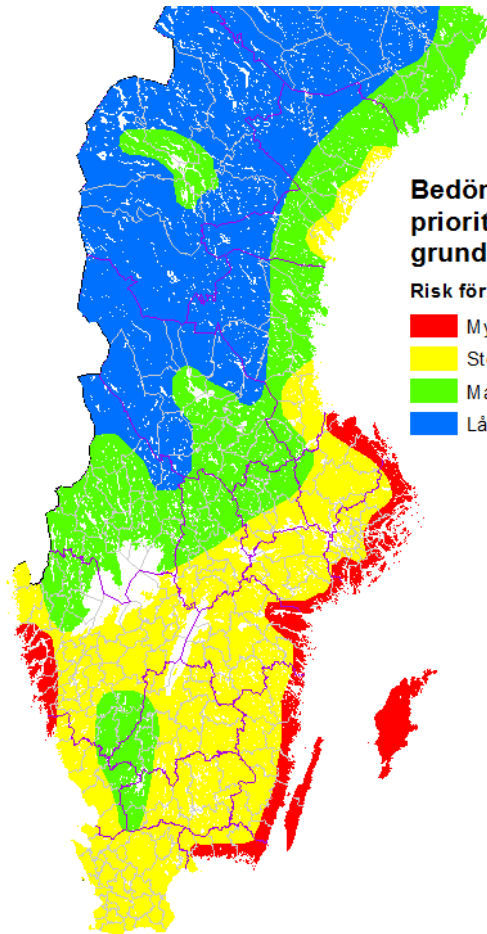
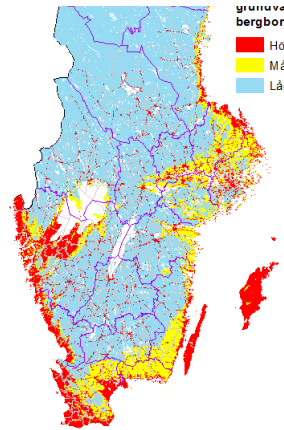


Areas with increased risk that access to groundwater does not meet the needs of groundwater.

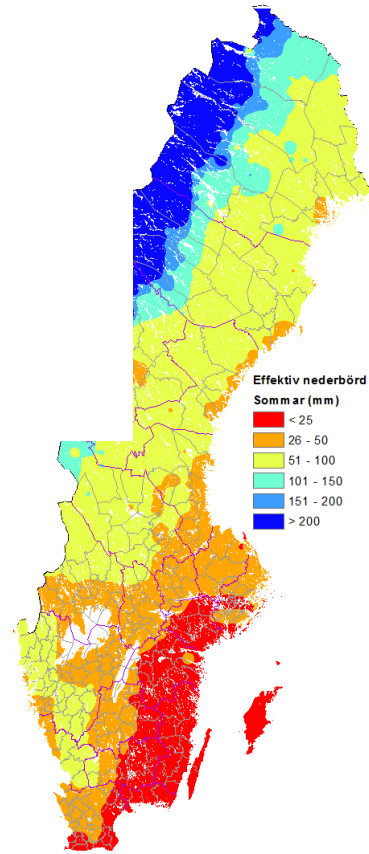


Change in groundwater recharge in moraine

Risk for saline water



Wells



Effective precipitation

Thank you.

