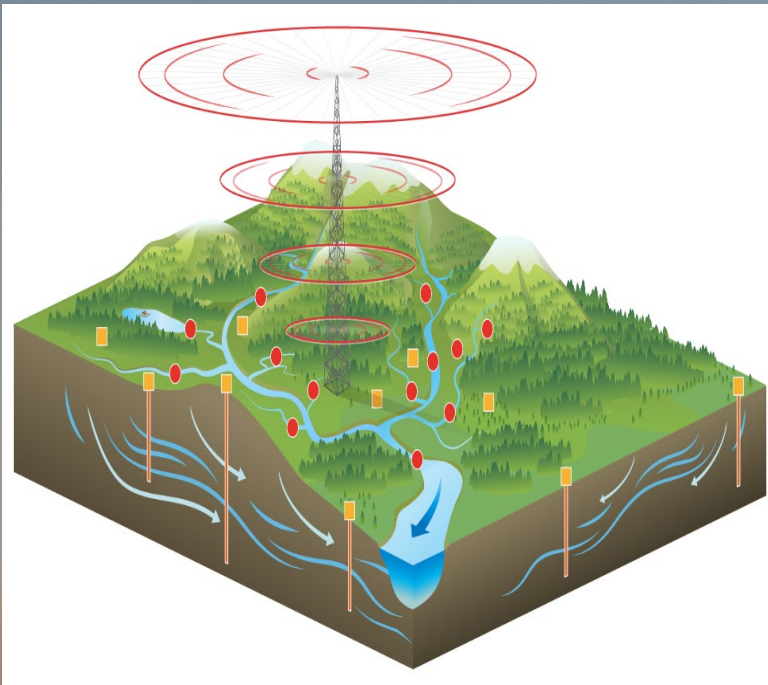


Collaborative water research in a forested boreal landscape: Examples for the Krycklan Catchment Study

Hjalmar Laudon, SLU
Hjalmar.Laudon@slu.se

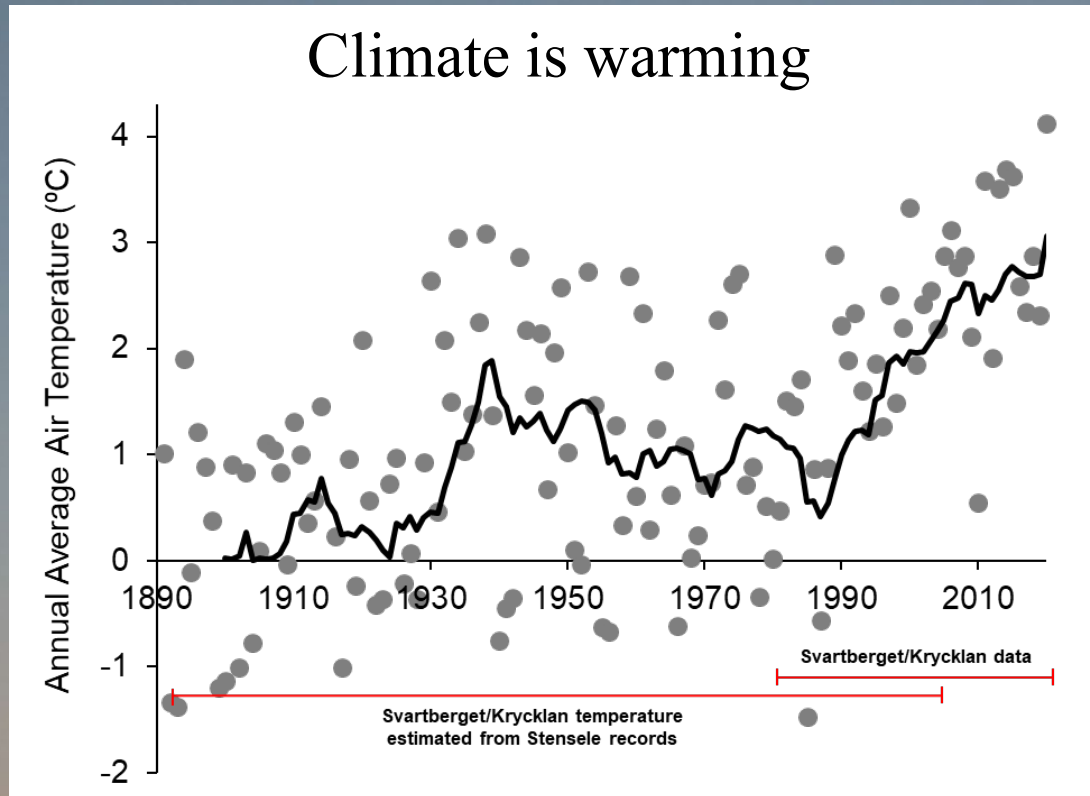
Krycklan – a field research infrastructure for system understanding of boreal ecosystem processes

..and over 200 scientists involved.

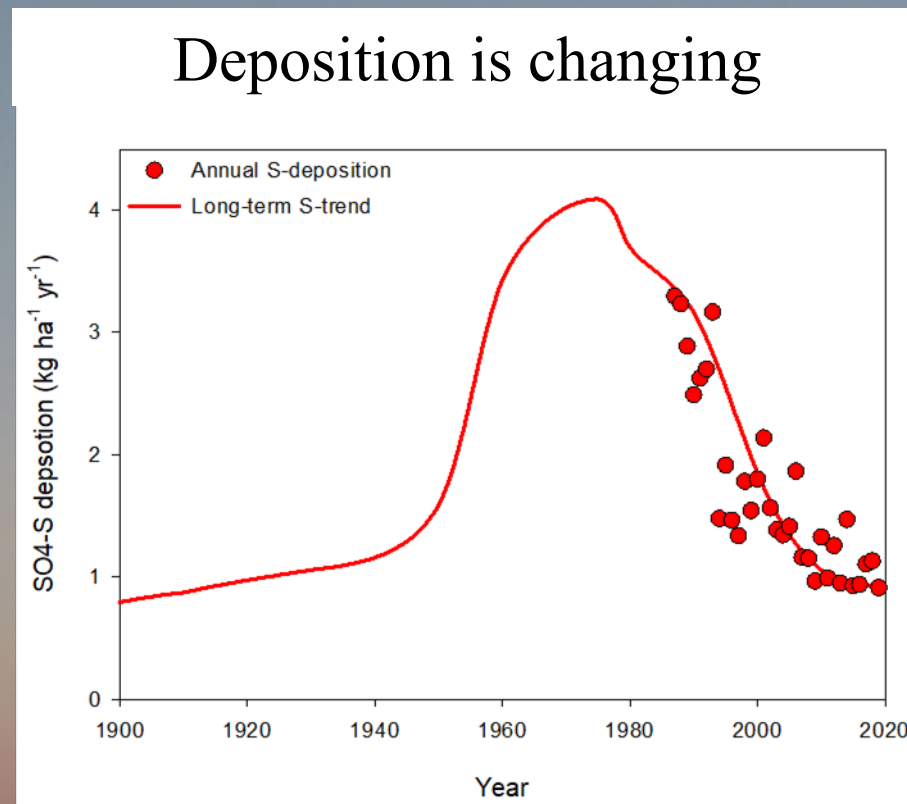


- 40+ years of research data
- 15 monitored catchments
- 200 groundwater wells
- ~1000 soil lysimeters
- >500 permanent soil and forest plots
- 150 m research tower for carbon, energy and water flux
- 2500 ha for experimental work
- Very skilled technical staff

A landscape in transition

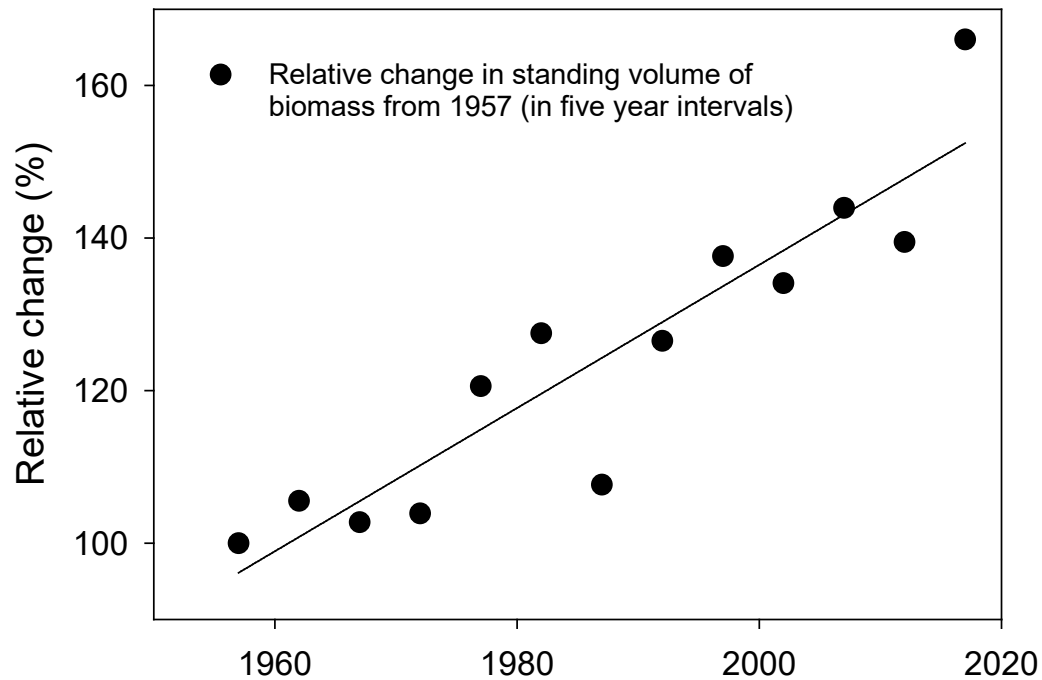


A landscape in transition



A landscape in transition

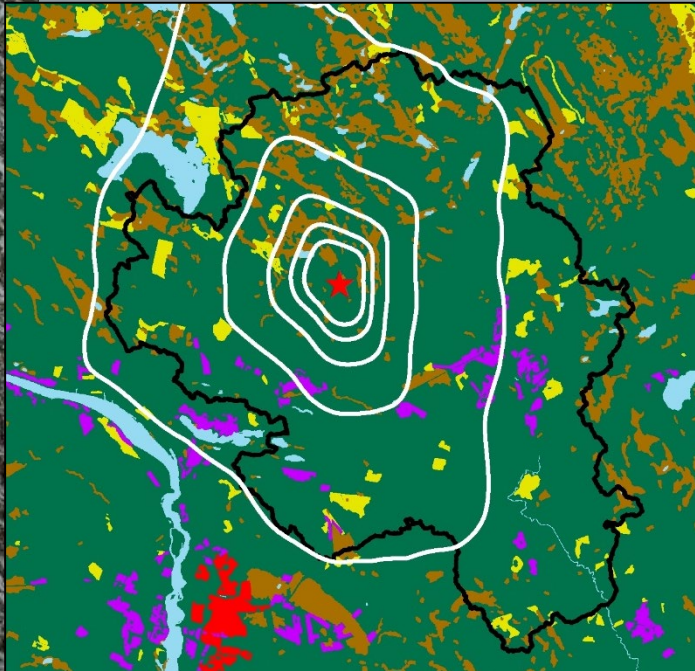
Tree biomass is increasing





Feder Sanfridsson Blomqvist

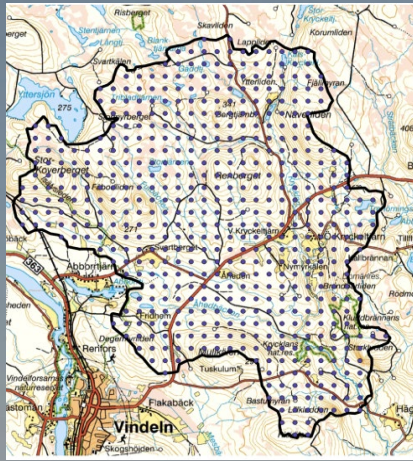
Krycklan - Atmosphere



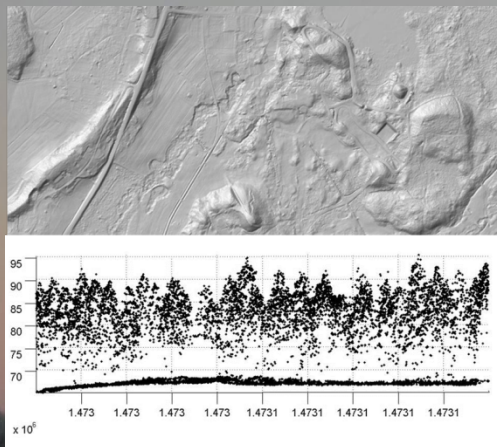
ICOS Integrated Carbon observation systems
150 m tower with gradient system for water and CO₂
Eddy flux systems (3, 20, 65 & 85 m)
Many additional measurements

Krycklan - Forest

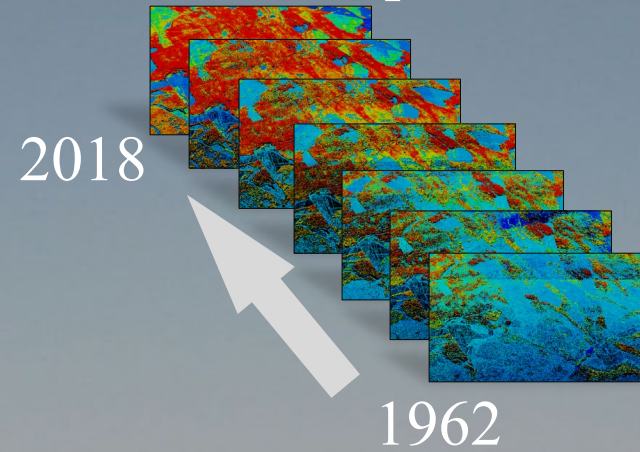
Forest/soil inventory



Airborn LiDAR



Forest development

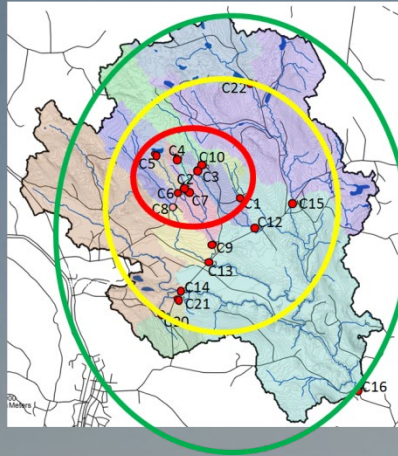


New radar tower



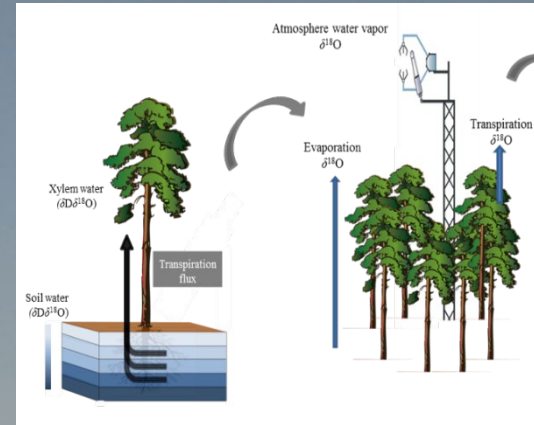
Krycklan - Water

Surface water

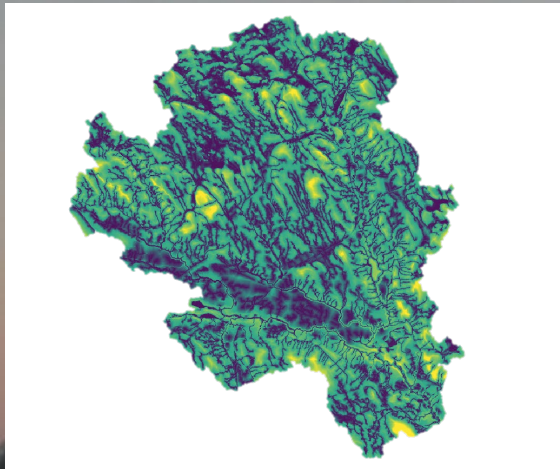


Catchment	Area (ha)	Forest (%)	Mire (%)	Lake (%)	Open (%)
C1	48	100	0	0	0
C2	12	100	0	0	0
C21	26	99	1	0	0
C7	47	82	18	0	0
C6	110	71	25	4	0
C5	65	54	40	6	0
C3	4	59	40	0	0
C4	18	56	44	0	0
C20	145	88	10	0	3
C8	230	88	12	0	0
C9	288	84	14	2	0
C10	336	74	26	0	0
C22	491	68	29	3	0
C12	544	83	17	0	0
C13	700	88	10	1	1
C14	1410	90	5	1	4
C15	1913	82	15	2	2
C16	6790	87	9	1	3

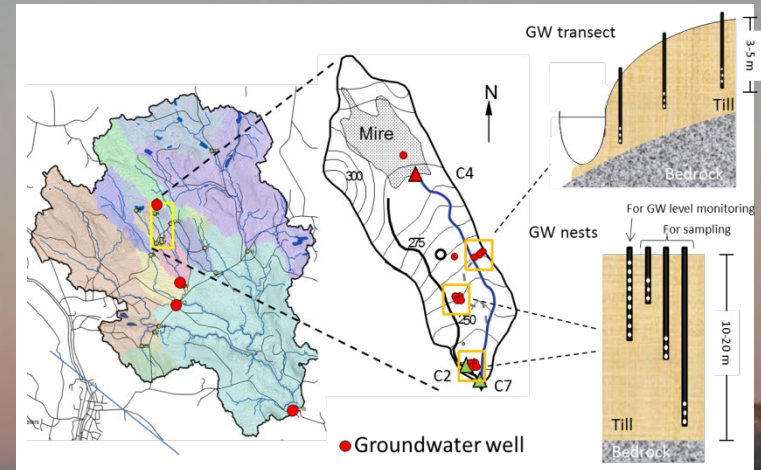
ET processes



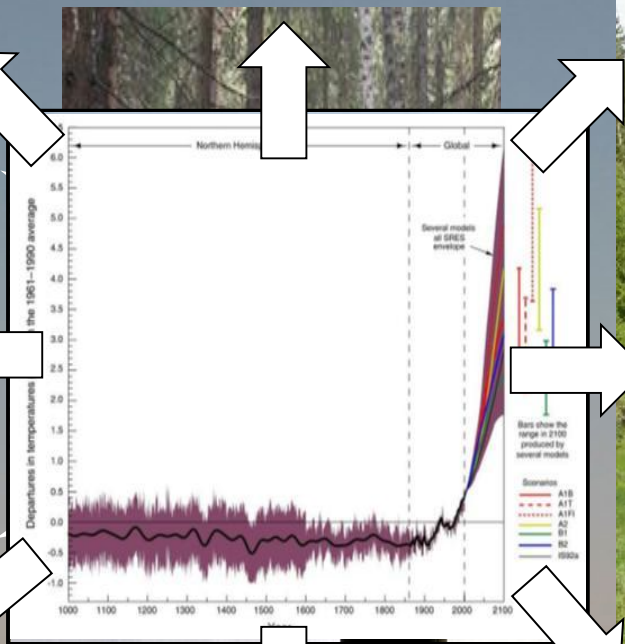
Landscape analysis



Groundwater



The Kryckan water program



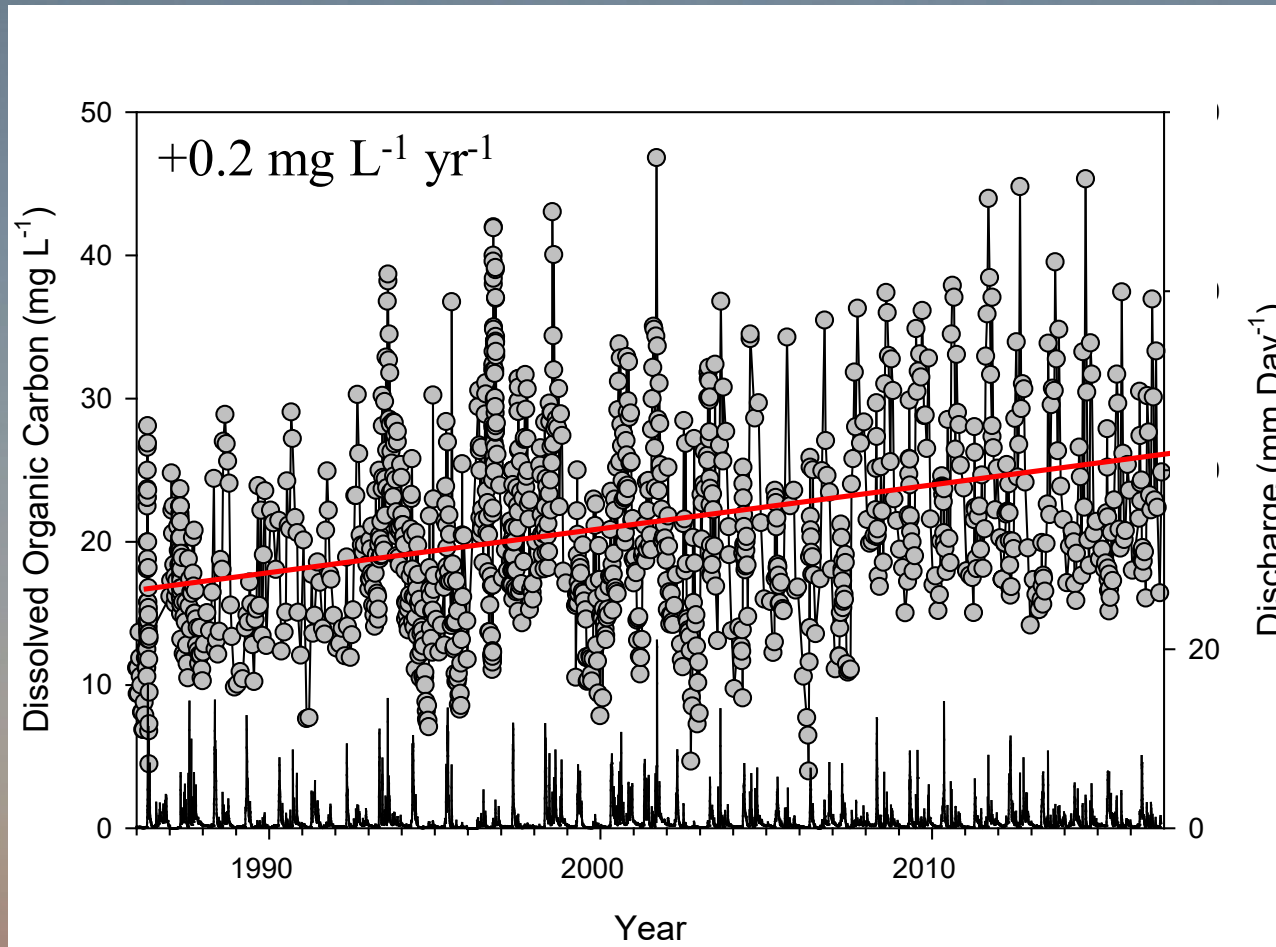


Fifty shades of brown

or rather,

Fifty shades browner

DOC – dissolved organic carbon



Scale

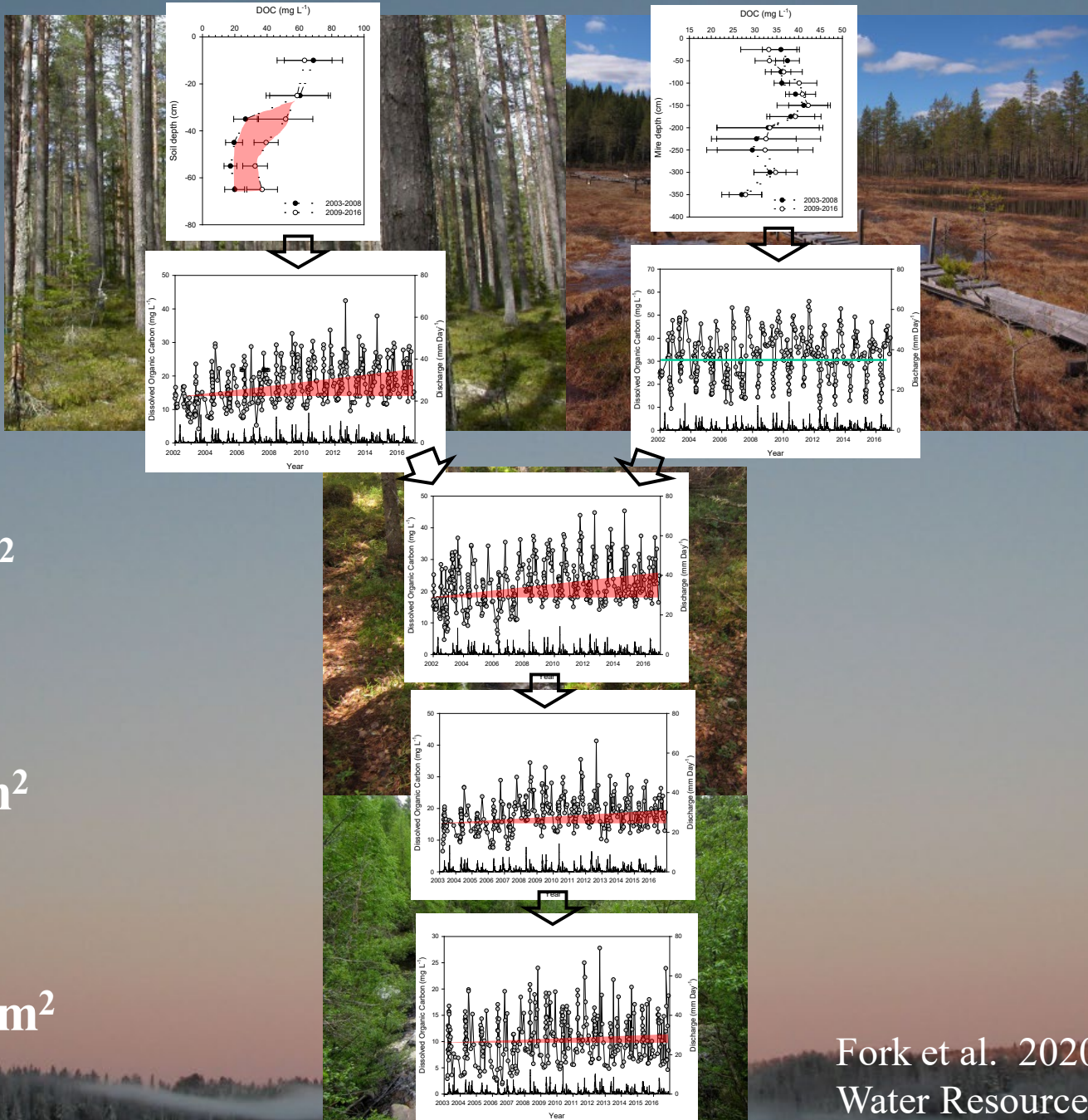
$\sim 1 \text{ m}^2$

$\sim 10 \text{ ha}$

$\sim 1 \text{ km}^2$

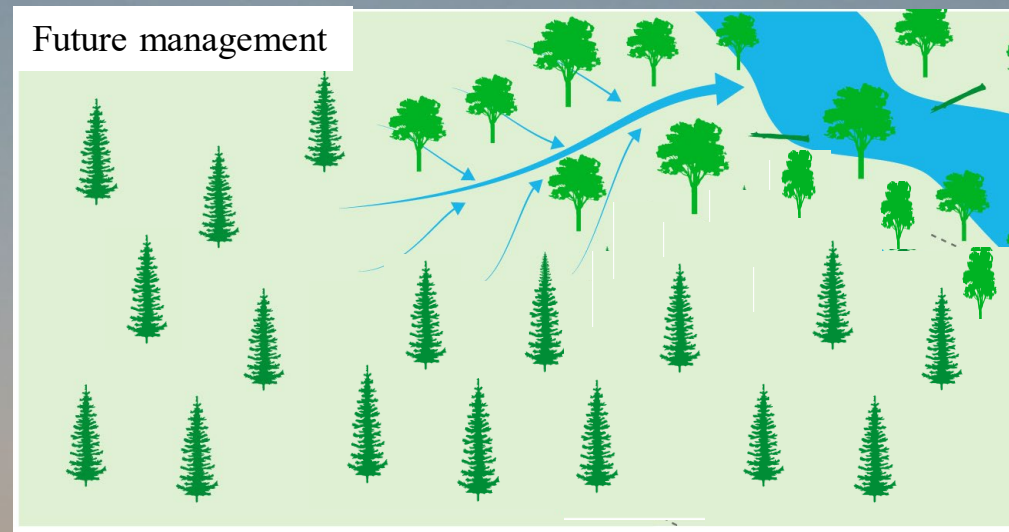
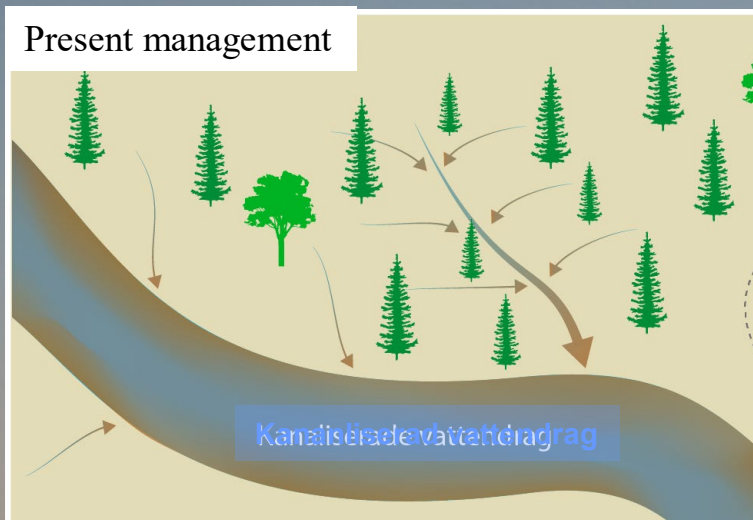
$\sim 10 \text{ km}^2$

$\sim 100 \text{ km}^2$

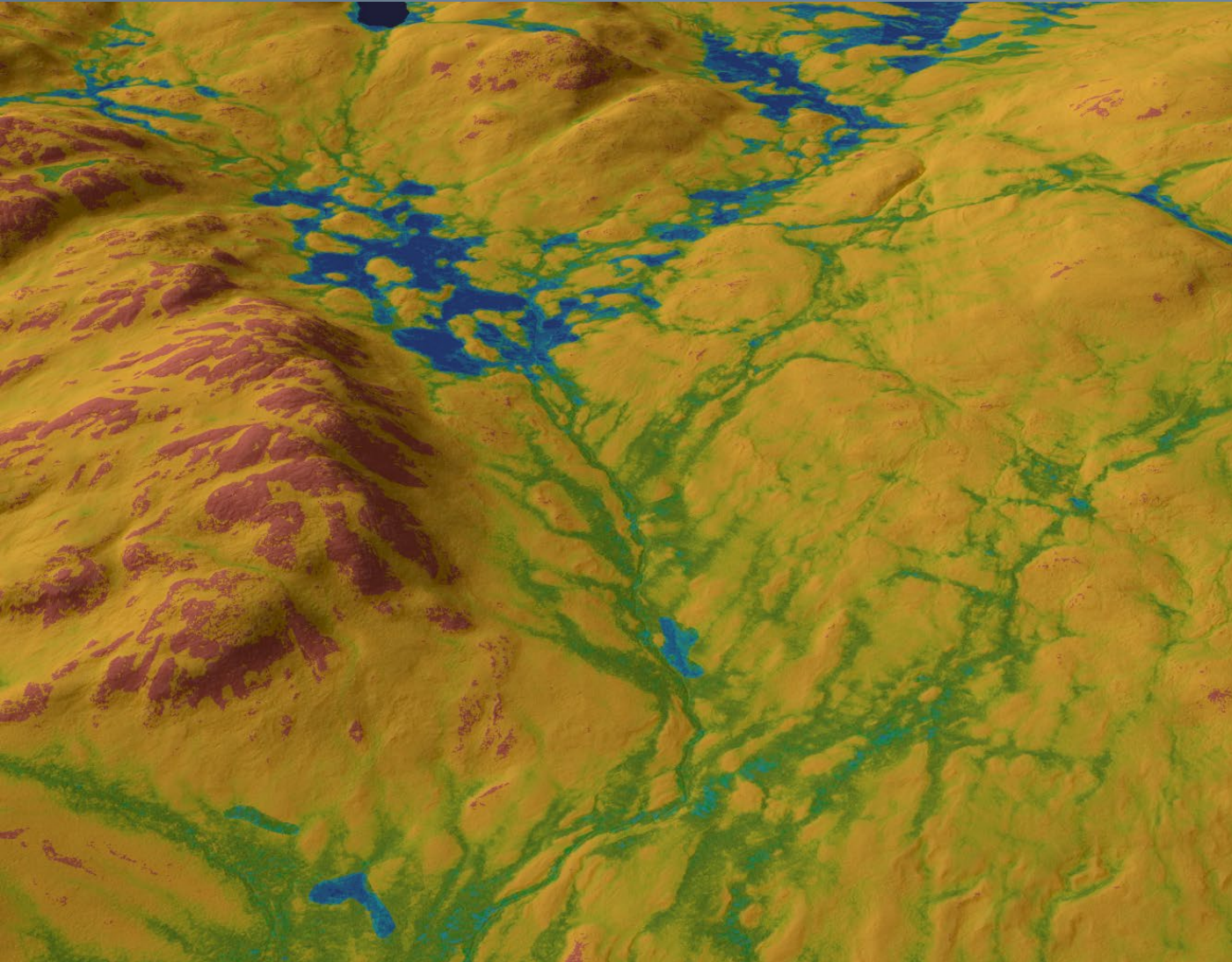


Potential counter actions #1

Replace current tree species from conifers to deciduous in near stream zones and discrete riparian input zones (DRIPs)



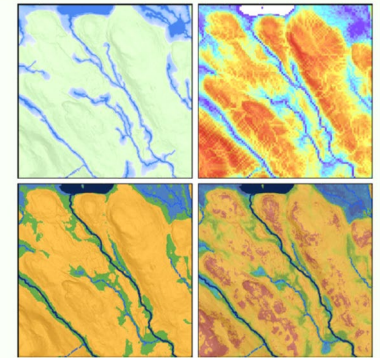
Prediction of wet areas



ARBETSRAPPORT XXXX-2021

En handledning om hur man kan använda markfuktighetskartor i skogsbruket

Engelsk rubrik

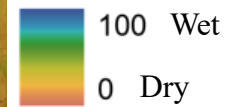


Ovan vänster: Depth-to-Water-karta, ovan höger: Metric markfuktighetsindexet, nedan vänster: SLU Markfuktighetskarta klassad, nedan höger: SLU Markfuktighetskarta. Illustration: A. Ågren



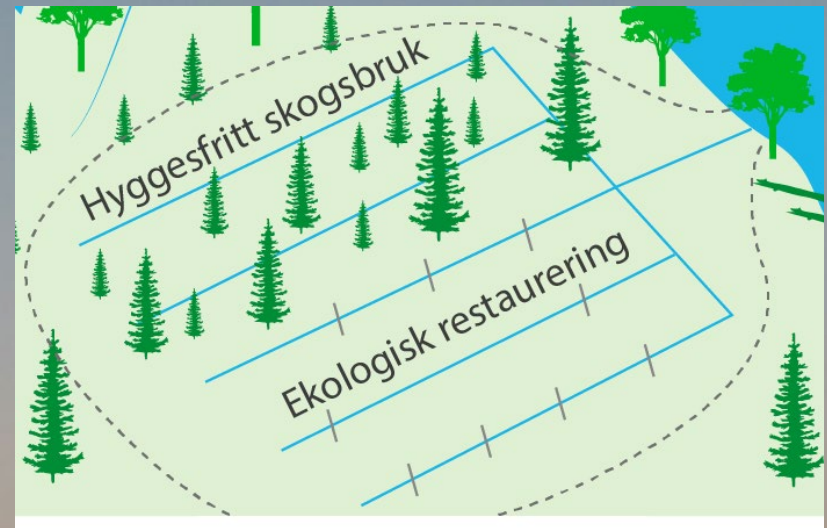
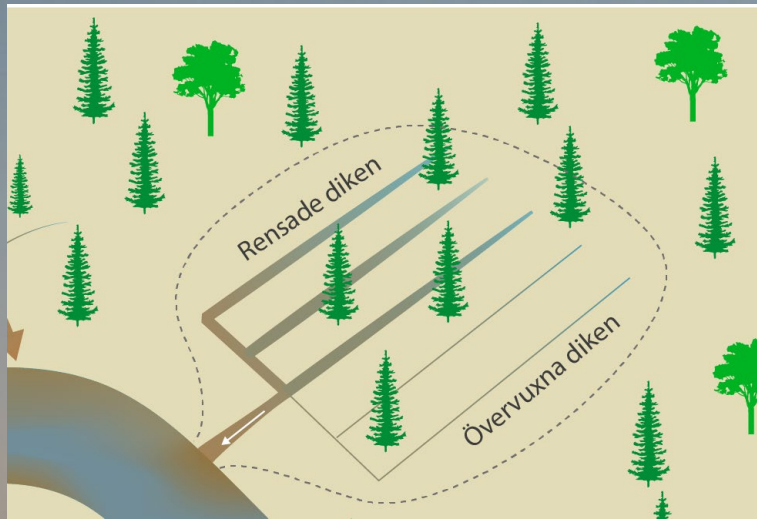
Eva Ring
Anneli M. Ågren
William Lidberg
Fredrik Johansson
Isabelle Bergkvist
Lars Högbohm

SLU Markfuktighetskarta

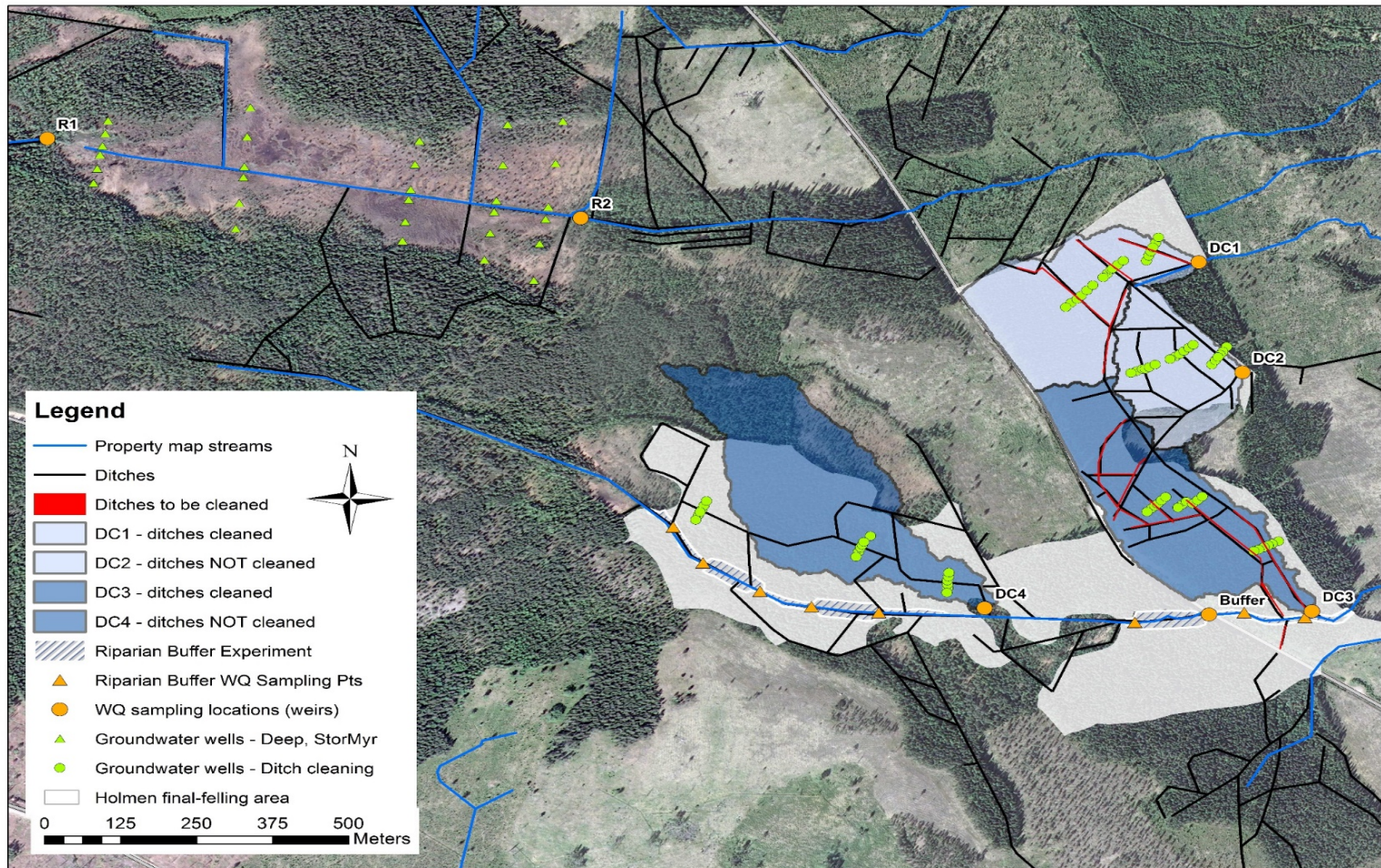


Potential counter actions #2

From ditch-cleaning to continuous cover forestry and wetland restoration



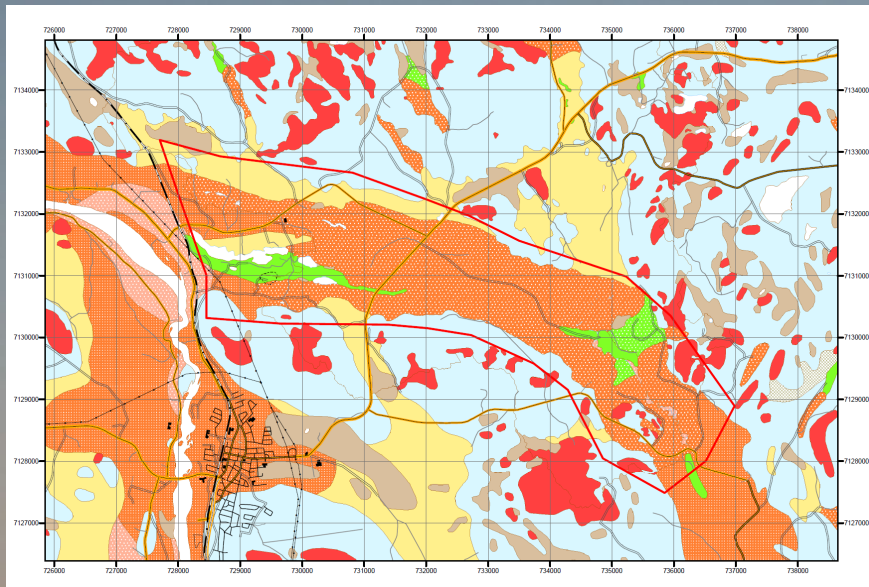
Trollberget – the new infrastructure for wetland restoration and ditch-cleaning



Interest in what is below our feet

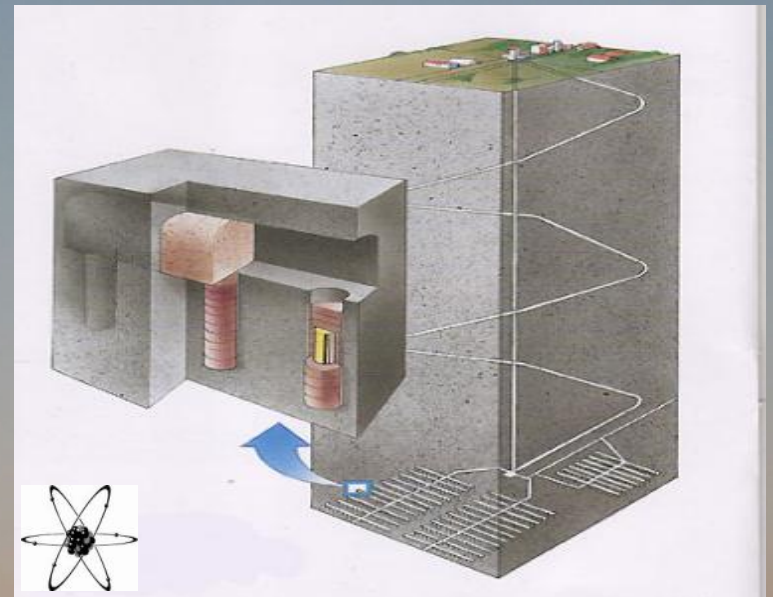
SGU

Swedish Geologic Survey



SKB

Swedish Nuclear Waste program



Sept 15-22, 2021

Watershed Ecology and Biogeochemistry

WEB 2021





KRYCKLAN NEEDS YOU!

Data freely available at
www.slu.se/Krycklan

Krycklan is part
of SITES funded
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och Lili Lamms
Minne

Future
Forests



Kempe-
stiftelserna



Knut och Alice
Wallenbergs
Stiftelse