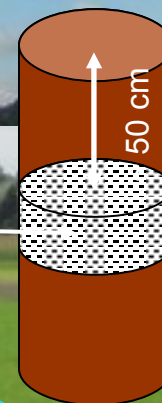
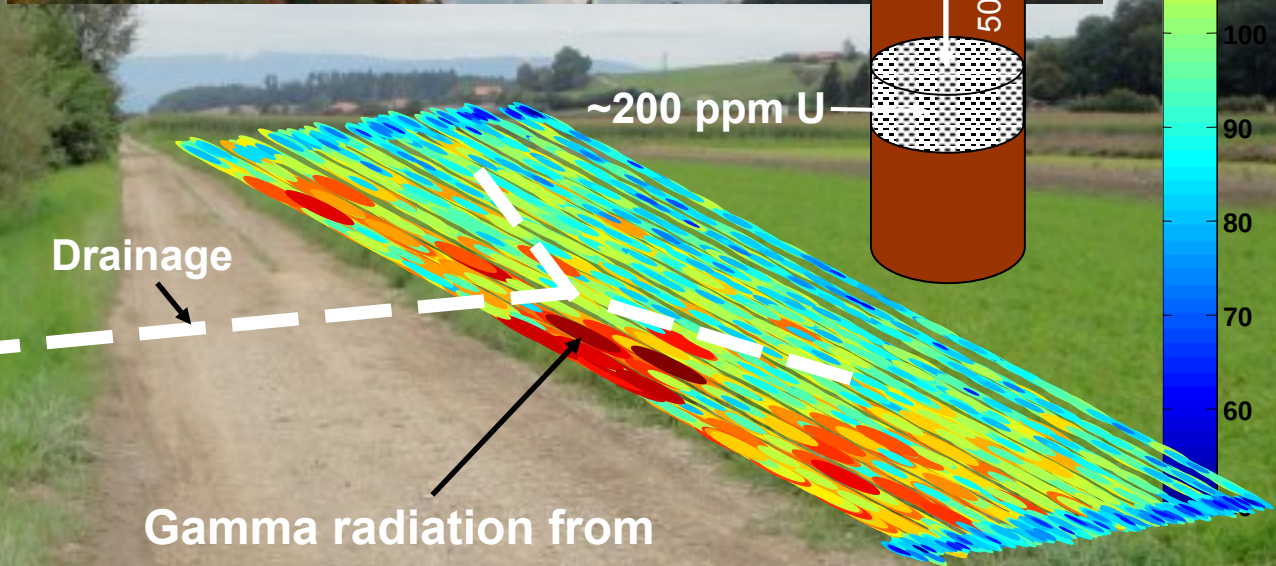
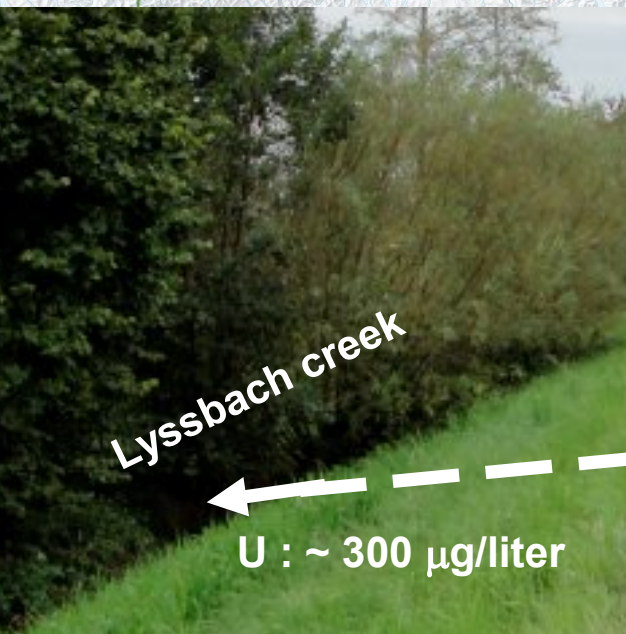


Uranium Accumulation in Swiss Plateau Mires

Heinz Surbeck *, Anja Pregler #, Philipp Steinmann ^, Simon Wertmüller °

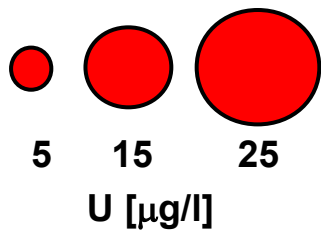


- * Nucfilm GmbH, Cordast, Switzerland
- # PSI, Villigen, Switzerland
- ^ Federal Office of Public Health, Berne, Switzerland
- ° Schenker Korner Graf AG, Luzerne, Switzerland



Uranium accumulation in a now drained wetland

Groundwater samples > 2 µg/l



Mt.Vully site

Lyssbach site

Lower Freshwater
Molasse (USM)

Upper Marine
Molasse (OMM)

Mt.Vully

Molasse

Alps

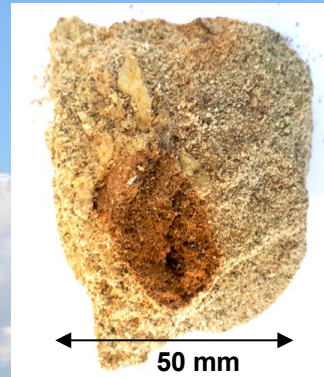
Uranium drinking water data from :
Stalder E, Blanc A, Haldimann M, Dudler V. Occurrence of uranium in Swiss drinking water. Chemosphere 2012; 86: 672, Use of raw data approved by Fribourg and Vaud Cantonal Labs.
+ own measurements
Background geological map : geomol.ch



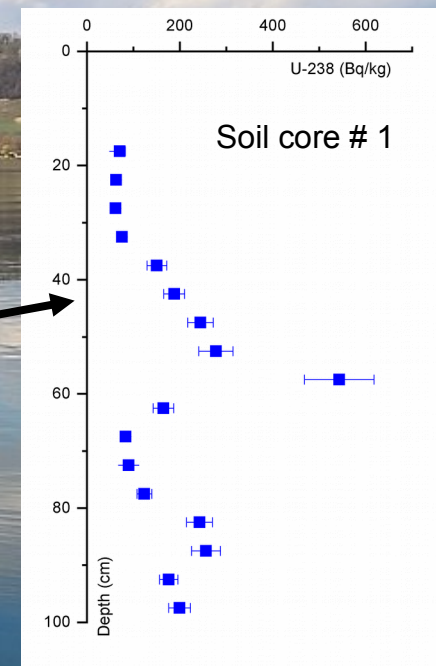
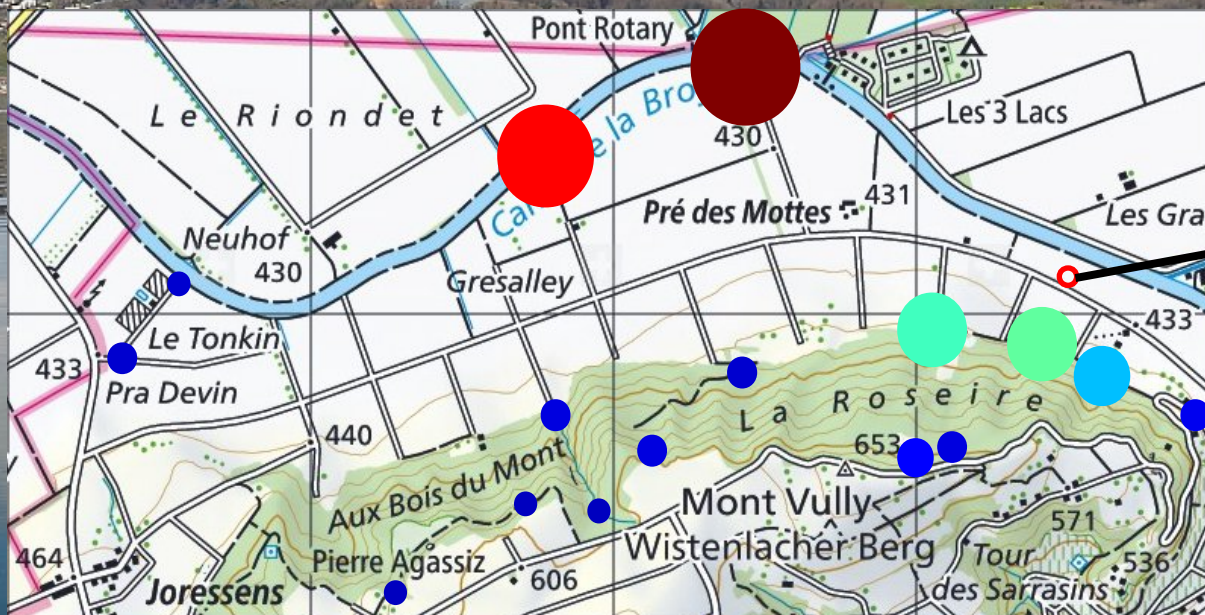
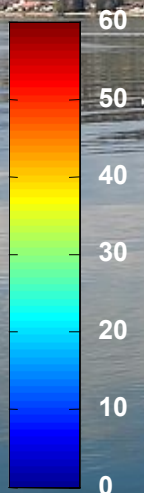
U rich fossils on top of Mt.Vully,
at USM / OMM interface

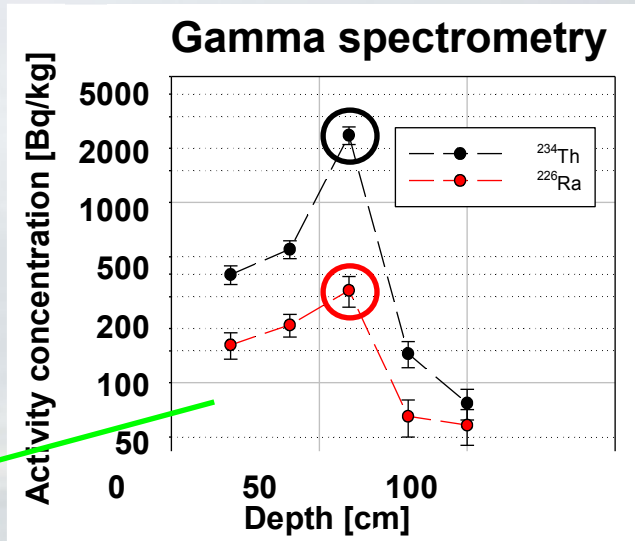
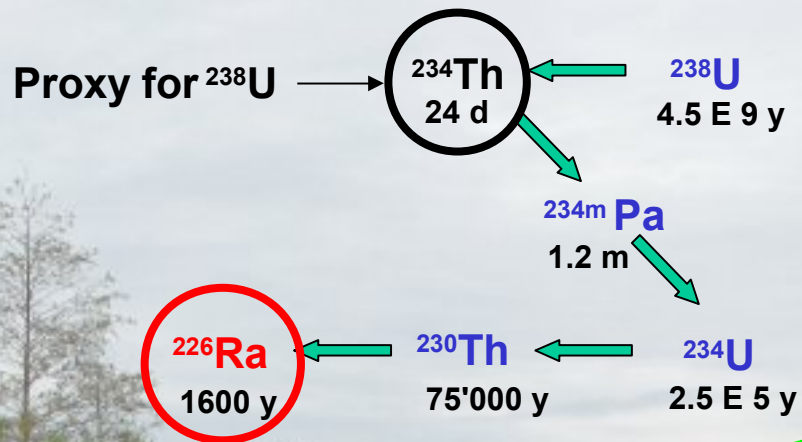
U: 1'800 ppm

U: 5'000 ppm



U [$\mu\text{g/l}$]





actual ^{238}U inventory

Groundwater recharge

leaching rate = $(0.4 \pm 0.1) \text{ \%}/\text{y}$

Drained since $(175 \pm 5) \text{ years}$

initial ^{234}U concentration

measured $^{226}\text{Ra}/^{234}\text{Th}$ ratio

calculated ^{226}Ra buildup

Mean age = $(7'000 \pm 1'000) \text{ y BP}$

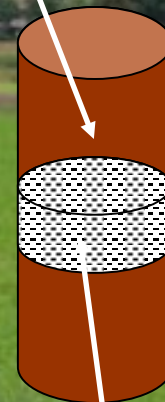
^{14}C age = $(7'570 \pm 70) \text{ y BP}$

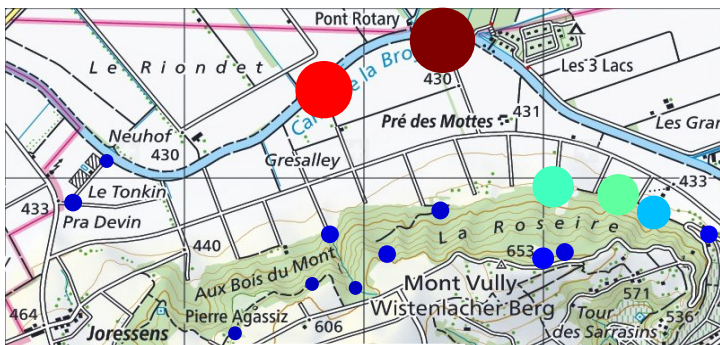
AMS measurement by Sönke Szidat, University of Berne

Alpha spectrometry

$^{234}\text{U}/^{238}\text{U} = 1.23 \pm 0.02$

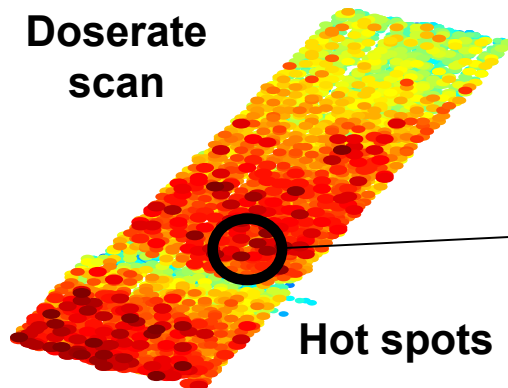
U conc. and flow
of drained
groundwater



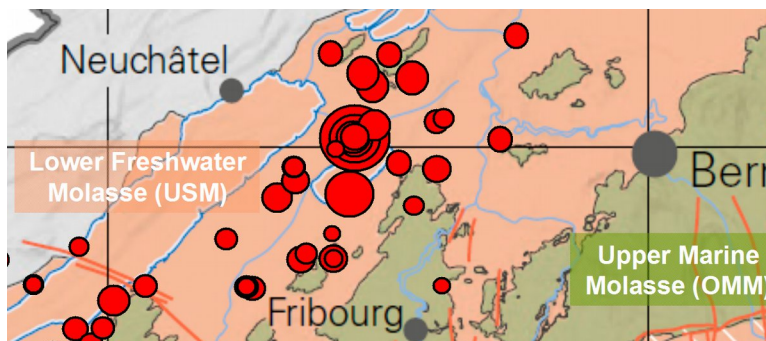
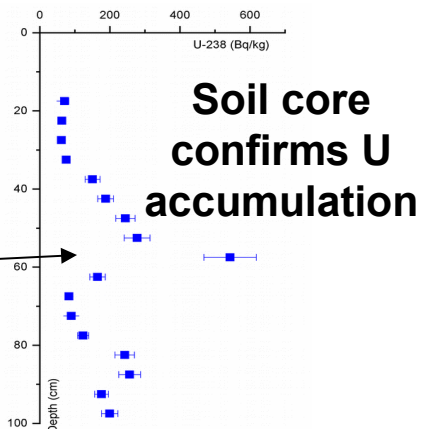


First hint

Doserate scan

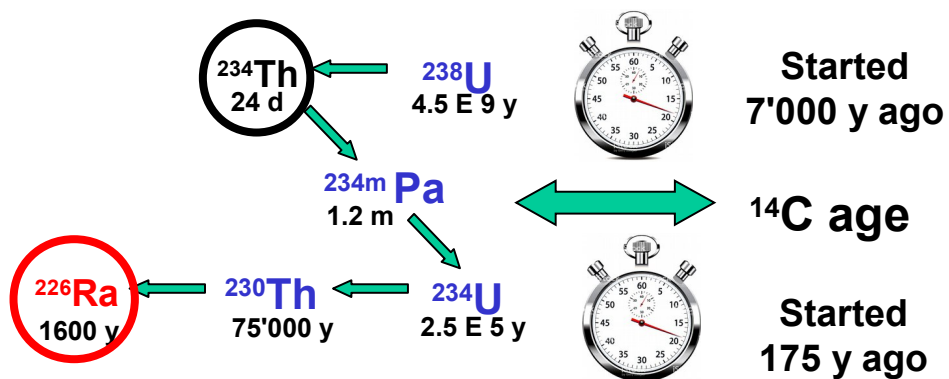


Hot spots

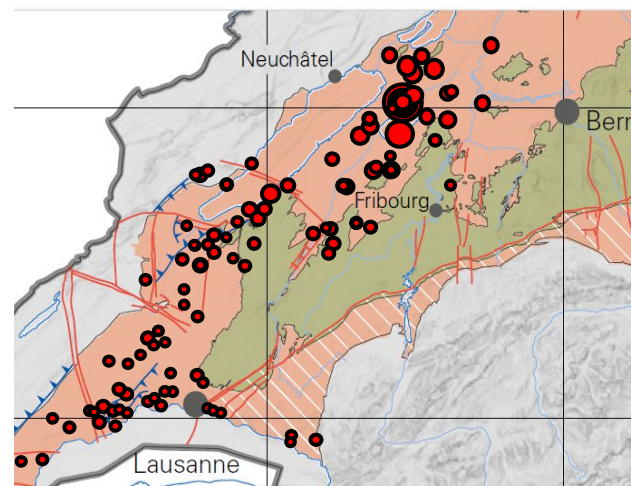


Origin

strong evidence for contribution from nearby USM / OMM interface



Disequilibrium in the ^{238}U series



Have a closer look at your backyard



Thank you for your attention

Many thanks for their help :

Domínique Biolley

Ricardo Perret

Rico Ryser

Franz Schénker

Franziska Schmidt