

LADES is a french private laboratory which provides to water protection actors a new tool for groundwater management

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Results gave by LADES is limited to the conversion of gases concentration to an estimation of a mean apparent age. It is necessary to compare these data to the specific hydrogeological context of the sampling point. LADES could help you in this way.

Our partners :



« We'll never know the worth of water till the well go dry.»

Scottish proverb



LADES

Laboratoire
de datation
des eaux
souterraines

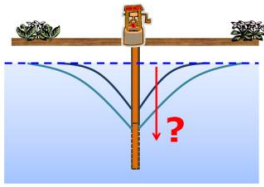
**Groundwater age
determination**

Through CFC and SF6 analysis



***A new tool for
sustainable water
management***

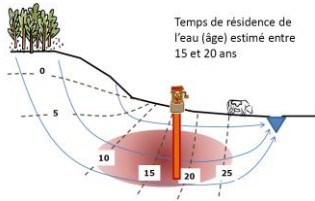
To manage water quantity : what is the stock and how will it vary ?



- ❖ What is the **groundwater renewal rate**? Is it stable during pumping ? Is the aquifer balanced?
- ❖ Is there any over-pumping ? Is there a risk of drying out ?
- ❖ What is the **percentage of recent (and vulnerable) water**

Age → renewal rate

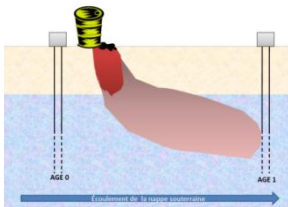
To manage water quality : will the groundwater quality remain constant ?



- ❖ How fast moving the water is between two wells ?
- ❖ What **delay** is needed to see the effect of a change in practices on groundwater and water quality?
- ❖ This tool helps to determine the **trends of water quality**

Age → transfer time

For pollution management : when did the pollutant infiltrate in aquifer ?

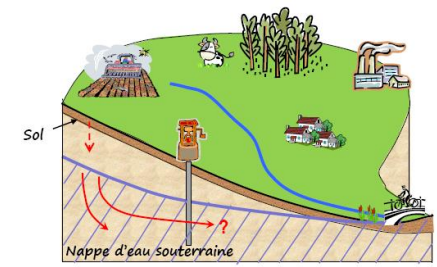


- ❖ It's often difficult to date the pollutant directly. Groundwater age helps to set numerical aquifer models and thus to determine the most probable period of pollution infiltration

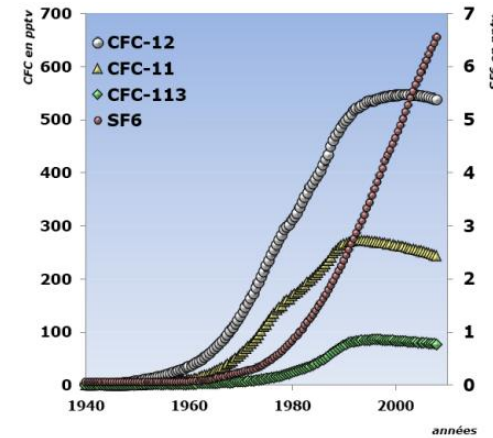
Age → model setting

HOW DOES IT WORK ?

Water circulates from the recharge area downstream. Its age is the time from the infiltration date to the time which the water is being sampled in a well, a river or a spring.



During infiltration groundwater records atmospheric signature



Atmospheric concentration evolution of the gases used for dating

Used tracers : CFC and SF6

CFC : chlorofluorocarbons (named also freons) are refrigerants, solvents or gas propulsors. They are also greenhouse and ozone-depleting gases and are now prohibited
SF6 : sulfur hexafluoride. Industrial gas for electric insulation. Could be produced by granitic rocks.

Innovating technology from hydrogeological research



Which allow us to detect traces from the picomole (10^{-12}) to the femtomole (10^{-15}) per liter

And sampling material which avoids any contamination

