

# Measurements for water

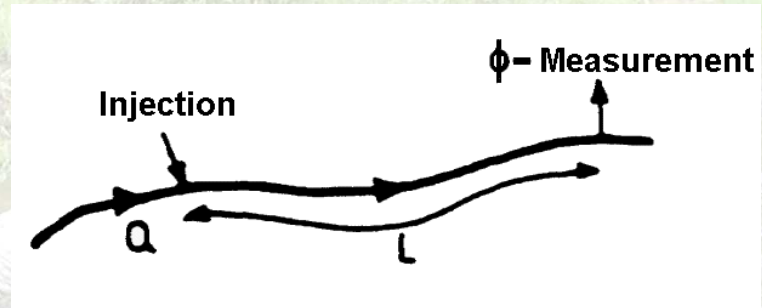
A.M.J. Coenders

Waterbalans: Discharge dilution



## Discharge & Streamflow measurements

### - Dilution gauging



Principle:

- ) Adding of known amount of tracer to the stream
  - Method 1: Constant rate injection
  - Method 2: Sudden injection
- ) Measurement of concentration downstream

$$L_{0,95} = \frac{0,4}{\alpha} \cdot \frac{C}{\sqrt{g}} \cdot \frac{B^2}{a}$$

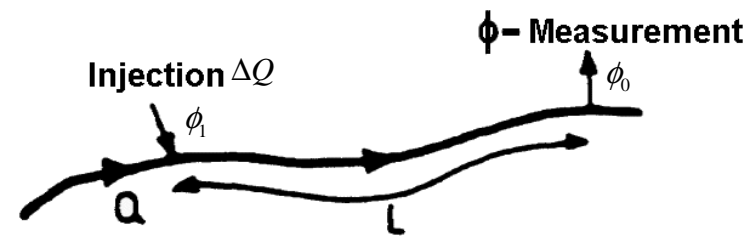
## Discharge & Streamflow measurements

- Dilution gauging, **constant rate injection**



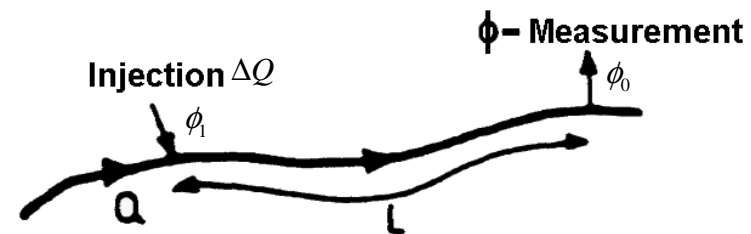
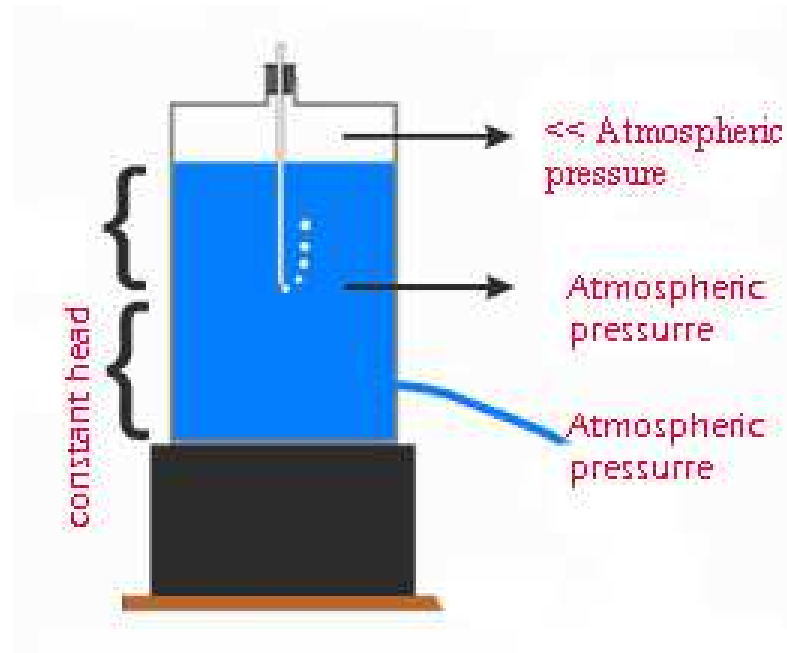
Mass-balance of the concentrations when  $\Delta Q \ll Q$ :

$$\phi_0 = \frac{\Delta Q}{Q} \phi_1$$



## Discharge & Streamflow measurements

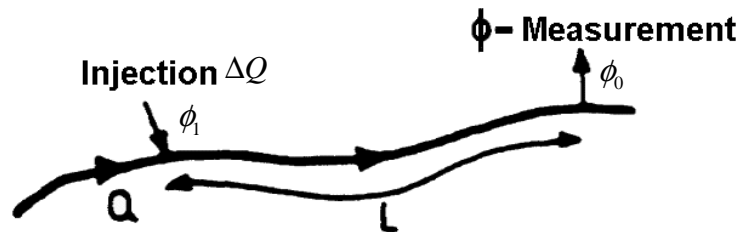
- Dilution gauging, **constant rate injection**



## Discharge & Streamflow measurements

- Dilution gauging, **mixing requirements**

$$L_{0,95} = \frac{0,4}{\alpha} \cdot \frac{C}{\sqrt{g}} \cdot \frac{B^2}{a}$$



## Discharge & Streamflow measurements

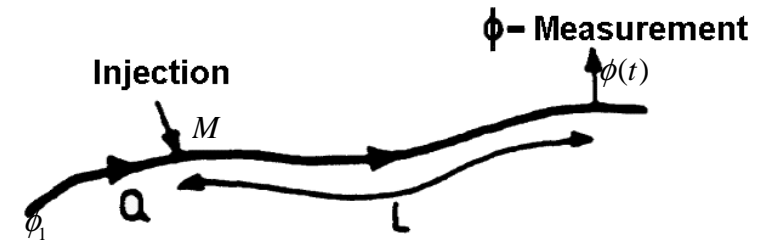
- Dilution gauging, **sudden injection**



## Discharge & Streamflow measurements

- Dilution gauging, **sudden injection**

$$M = Q \int_0^{\infty} \{\phi(t) - \phi_1\} dt$$



11-5-2002 V-notch "Rudi"

