

Production Water Cut = Yw

Ratio of [water production rate at surface](#) q_W to [liquid production rate at surface](#) $q_L = q_O + q_W$:

$$(1) \quad Y_W = \frac{q_W^\uparrow}{q_L^\uparrow}$$

It relates to [Water-Oil Ratio \(WOR\)](#) as:

$$(2) \quad Y_W = \frac{1}{1 + q_O^\uparrow/q_W^\uparrow} = \frac{\text{WOR}}{1 + \text{WOR}}$$

The simplest way to model the [production watercut](#) Y_W in a given well is the [Watercut Fractional Flow @model](#):

$$(3) \quad Y_{Wm} = \frac{1}{1 + \frac{M_{ro}}{M_{rw}} \cdot \frac{B_w}{B_o}} = \frac{1}{1 + \frac{k_{ro}}{k_{rw}} \cdot \frac{\mu_w}{\mu_o} \cdot \frac{B_w}{B_o}}$$

which provides a good estimate when the [drawdown](#) is much higher than delta pressure from gravity and capillary effects.

The model (3) can also be used in gross field [production analysis](#) and in this case the average reservoir saturation can be assumed homogeneous:

$$(4) \quad s_w(t) = s_{wi} + (1 - s_{wi}) \cdot \text{RF}(t)/E_S$$

This is a very simplistic [proxy-model](#) of [reservoir saturation](#) under an idealistic [waterflood](#) conditions and may mislead in specific cases.

The above model is very idealistic and has very limited applications.

In most practical cases it can only match the [production watercut](#) at late stage of the field lifecycle when it develops a fair waterflood sweep pattern and does not have thief production.

The most popular short-term [production watercut](#) models are given by the brute-force correlation with the flowrates [Watercut Correlation @model](#).

See Also

[Petroleum Industry](#) / [Upstream](#) / [Subsurface E&P Disciplines](#) / [Well Testing \(WT\)](#) / [Flowrate Testing](#) / [Flowrate](#)

[[WOR](#)] [[Watercut Diagnostics](#)] [[Watercut Fractional Flow @model](#)] [[Watercut Correlation @model](#)]

[[Surface flowrates](#)] [[Oil surface flowrate](#)] [[Gas surface flowrate](#)] [[Water surface flowrate](#)] [[Production Gas-Oil Ratio \(GOR\)](#)]

[[Waterflood Recovery \(WF\)](#)]

