

Water scarcity footprint metrics

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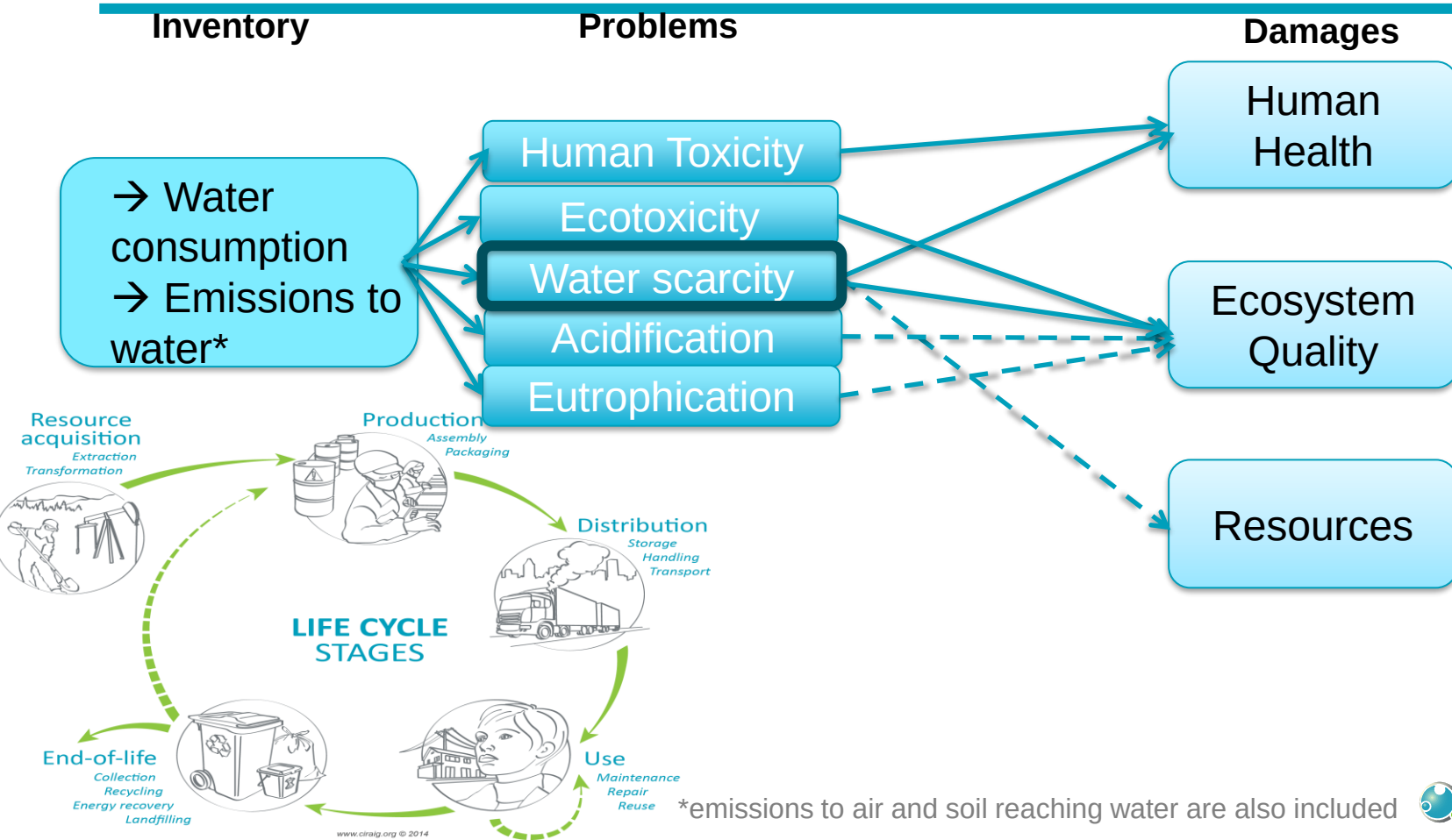
Polytechnique Montreal

European Resource Forum

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Water Footprint Framework – based on LCA (ISO 14046)

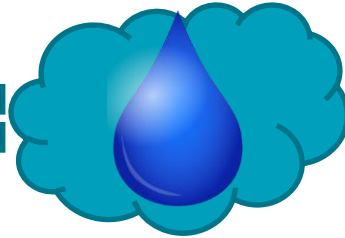


Water Scarcity Footprint



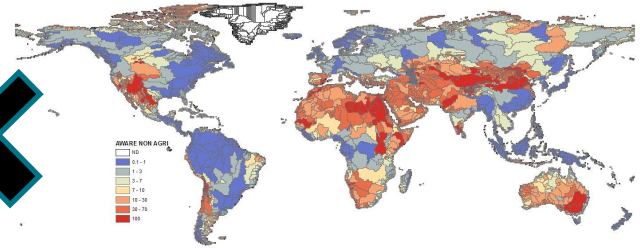
**Water scarcity
footprint
(m³ eq.)**

=



**Consumed water
(m³)**
(evaporated,
integrated into a
product, transferred
to another watershed
or the sea)

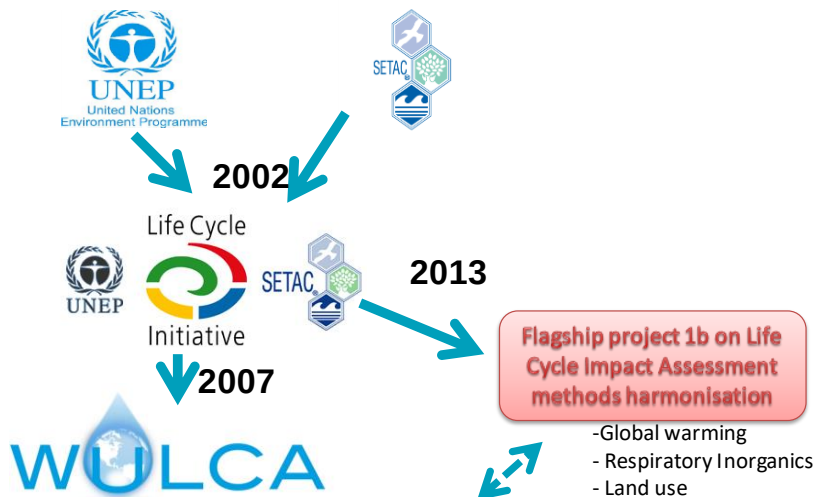
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**Scarcity Index
(m³ eq/m³
consumed)**

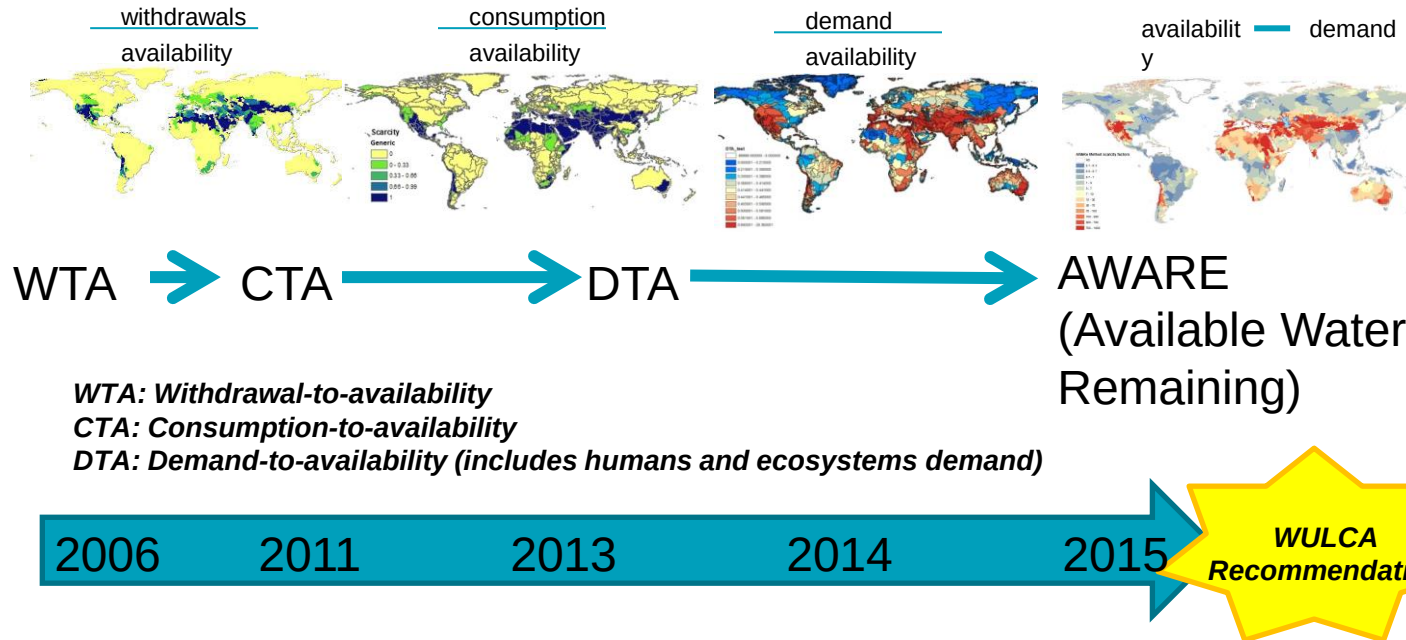
Methodological Consensus Water Scarcity AWARE methodology

- 2 year work process
- > 100 hours of meeting
- 48 experts consulted in workshops
- 33 experts and stakeholders surveyed
- 3 publications



**Goal: Promote method development and harmonisation
of water use impact assessment in LCA**

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Water Scarcity Footprint

The question the indicator aims to answer

“What is the *potential of depriving* another user of water (human *or* ecosystems) when consuming water in this area”

Boulay A-M, Bare J, De Camillis C, Döll P, Gassert F, Gerten D, **Margni M**, et al.
2015. *Consensus building on the development of a stress-based indicator for lca-based impact assessment of water consumption: Outcome of the expert workshops.* The International Journal of Life Cycle Assessment:1-7.

AWARE Characterization Factor

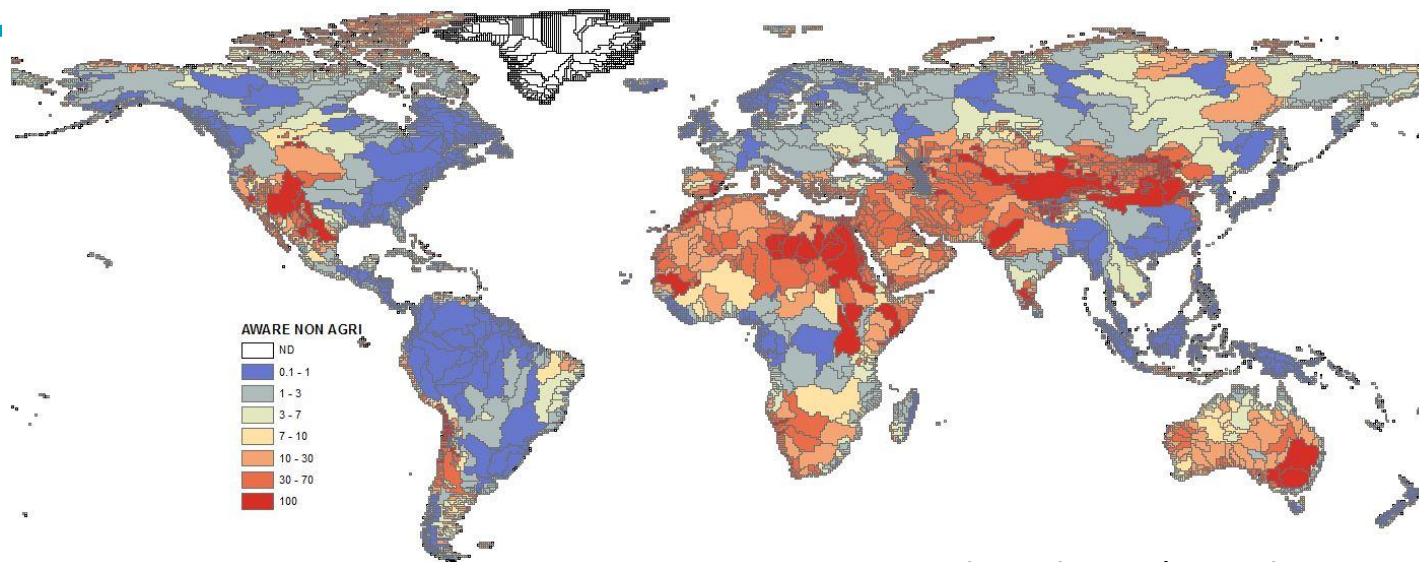
$$CF = Fn\left(\frac{1}{\text{Available Water Remaining}}\right)$$

Available Water Remaining = AVAILABILITY – DEMAND = AMD

➔ UNDERLYING ASSUMPTION: *The more water remaining per area, the lower the potential to deprive another user*

$$CF_{\text{units}} = \frac{m^3 \text{ world eq}}{m^3 \text{ region } i}$$

NOTE: equation valid for CF between cutoffs of 0.1 and 100



→ Representing non-agricultural use (equal 12 months average)

Consensus: the AWARE method

Available Water Remaining: Based on inverse of availability minus demand

For more details, factors, and related developments:

www.wulca-waterlca.org/aware.html

AWARE

Background

Description

Download AWARE Factors

Sub-national AWARE

Input data (WaterGAP)

Non-Marginal AWARE

Sector-specific AWARE factors

Regionally-adapted factors

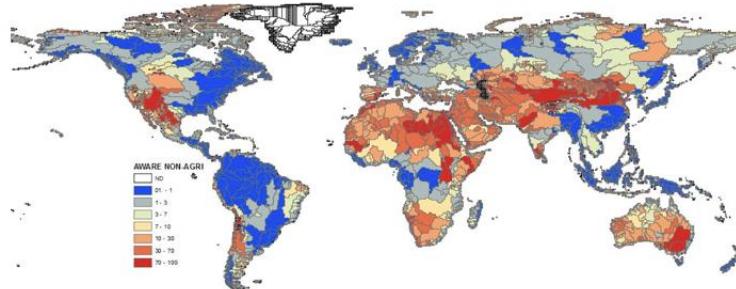
Case studies and applications

FAQ

Description

AWARE is to be used as a water use midpoint indicator representing the relative Available Water REmaining per area in a watershed, after the demand of humans and aquatic ecosystems has been met. It assesses the potential of water deprivation, to either humans or ecosystems, building on the assumption that the less water remaining available per area, the more likely another user will be deprived.

It is first calculated as the water Availability Minus the Demand (AMD) of humans and aquatic ecosystems and is relative to the area ($m^3 \cdot m^{-2} \cdot month^{-1}$). In a second step, the value is normalized with the world average result ($AMD = 0.0136 m^3 m^{-2} month^{-1}$) and inverted, and hence represents the relative value in comparison with the average m^3 consumed in the world (the world average is calculated as a consumption-weighted average). Once inverted, $1/AMD$ can be interpreted as a surface-time equivalent to generate unused water in this region. The indicator is limited to a range from 0.1 to 100, with a value of 1 corresponding to the world average, and a value of 10, for example, representing a region where there is 10 times less available water remaining per area than the world average. The map below shows the factors at annual level per watersheds (normal average over 12 months).



Dedicated partners



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Thank you for your attention

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