

NEW WATER DATA IN ECOINVENT V3

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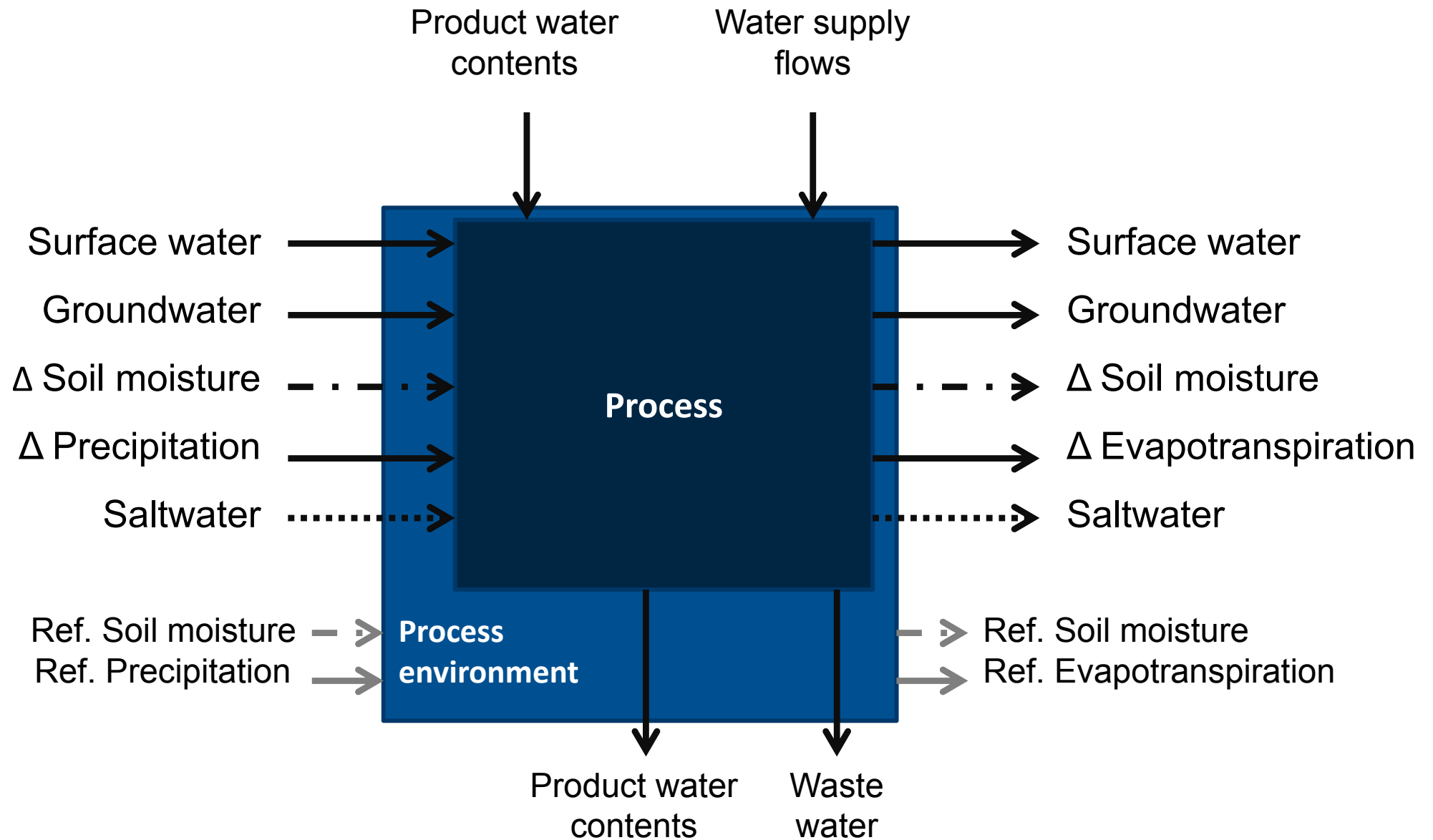


Relevance of water flows

- Increased demand for water footprinting
- Relevance of water consumption in agricultural products and power production
- Globally relevant but regional variability

- Abiotic resource perspective (freshwater):
 - Water consumption (mainly evaporation) relevant
 - Water quality as secondary resource impact
 - In-stream effects of infrastructure rather land use

Process water balance



Inventory problem:

- Currently:
 - ecoinvent v2 data on water withdrawals only
 - But: Water **consumption** relevant for most methods
 - No consistent consideration of outputs
- Requirements
 - Regionalized inventory for water consumption
 - Water functionality aspects (quality and origin/release)
 - Can be modeled as part of impact assessment based on origin location

Water in ecoinvent v3

- Only physical water flows are recorded
 - Water input from sea, surface water, groundwater and from air (precipitation)
 - Water output to sea to surface water and to air (evaporation)
 - Product integration (inputs and outputs, as flow properties)
- Quality issues are addressed by emission to water and resource use from water
 - Water quality to be calculated by impact assessment methods
- Regional information attached as shape file information
 - So far not beyond country level

Main sources for water flows

- Quantis water database (Quantis 2012)
 - Industrial water data mainly based on ecoinvent v2 and split of water flows:
 - Cooling vs process water (default split: 80% process)
 - Consumptive shares (adjusted by ecoinvent)
 - Process: default 15% but sector data applied to ~50% of datasets
 - Cooling: 50:50 mix of cooling pond and onces-through cooling
 - Crop data based on Pfister et al. (2011a)
 - Hydropower data based on Pfister et al. (2011b)
 - For 149 processes additional data was derived by Quantis
- New data sets (not consistently updated yet)

Water resource impact assessment

- Methods for impact assessment not included
 - Generally geographically explicit methods; not yet fully supported
 - No water archetypes defined as separate flows
 - Water scarcity nor water quality
 - Heat release to water excluded in v3
- Integration of regionalization
 - Advanced software tools required
 - Algorithms exist
 - Ongoing developments
 - Also required for integrating quality aspects
 - Required for supply chain assessment
 - Especially relevant for water flows of industrial products

Uncertainties

- No data without uncertainty information!
 - Water flows generally of low quality (low cost)
 - Basic uncertainty adjusted (k-factors):

	c	p	A
Water outputs	1.5	1.5	3
Water inputs	1.2	1.2	3

- Update of old ecoinvent datasets
 - Mainly sector specific-models and assumption based on process and cooling water shares
 - Default pedigree assessment :
(reliability, completeness, temporal, geographical, technological
“4,4,3,2,2” or “4,4,3,2,4” (final review step)

Main limitations

- General data quality
 - Ecoinvent consistently provides **uncertainty** information
 - Data lacks often only allow **estimations** of uncertainties and data quality
 - Especially for **water**, datasets are rare as consistent reporting is not available across industries
- Water content of flows:
 - Only stored as properties and not as flows to be used by standard software)
- Spatial distinction
 - Most dataset are not regionalized on high spatial resolution (only on **country or continental** level)
- Completeness of process data
 - Although >4000 processes, not whole economy can be modeled (missing processes)

Conclusions

- Great effort to create comprehensive water database in LCA framework
- Still improvements to come in future versions
- Uncertainty need to be properly considered
- Software development required for impact assessment inclusion.

THANKS FOR YOUR ATTENTION!

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The reports on water will be available on:
<http://ecoinvent.org/talkpages>

