



LCA water footprint methods and inventory datasets

What are the requirements?

Where are the gaps?

Stefanie Markwardt & Anna Hennecke

Methods vs Inventory

**Pfister
et al.
(2009)**

Assessing the environmental impacts of freshwater consumption in LCA.
Environ. Sci. Technol 43:
4098-4104

**Mila i
Canals
et al.
(2008)**

Assessing freshwater use in LCA: Part I.
Int J LCA 14: 28-42.

**Boulay
et al.
(2011)**

Categorizing water for LCA inventory
Int J LCA 16(7): 639-651

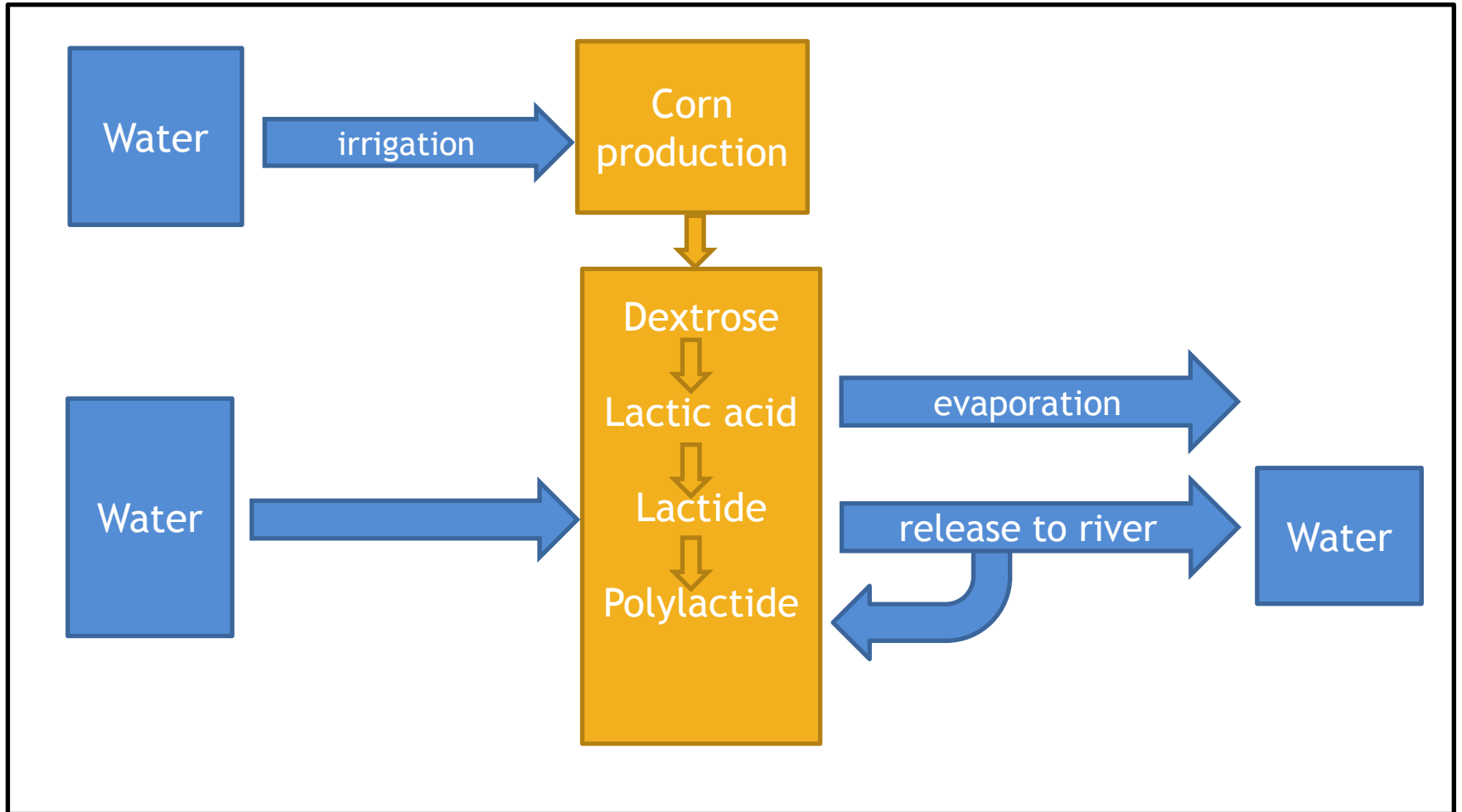
VS

Vink et al.(2010)

The eco-profile for current Ingeo® polylactide production.
Industrial Biotechnology Vol.6 No.4:
212-224.

- Which inventory data do the methods require?
- Which data is given in the Ecoprofile?

Ecoprofile for Ingeo® polylactide production¹



¹Vink et al. 2010

Methods vs Inventory

Table 3. Gross water consumption required for production of 1 kg Ingeo 2009

Source	Use for processing (mg)	Use for cooling (mg)	Totals (mg)
Public supply	16 495 064	7 205 585	23 700 649
River canal	1 831	461 049	462 880
Sea	1 062	12 149	13 211
Well	48 240	0	48 240
Unspecified	21 341 920	3 220 774	24 562 694
TOTALS	37 888 117	10 899 557	48 787 674



WSI=0.178

WSI=0.9996

WSI=0.0385

Image © 2012 TerraMetrics

Nature Works LLC

Omaha

Lincoln

Nature Works LLC

USA



<http://www.ifu.ethz.ch/ESD/downloads/EI99plus>

Tour Guide

Data SIO, NOAA, U.S. Navy, NGA, GEBCO © 2012 Google

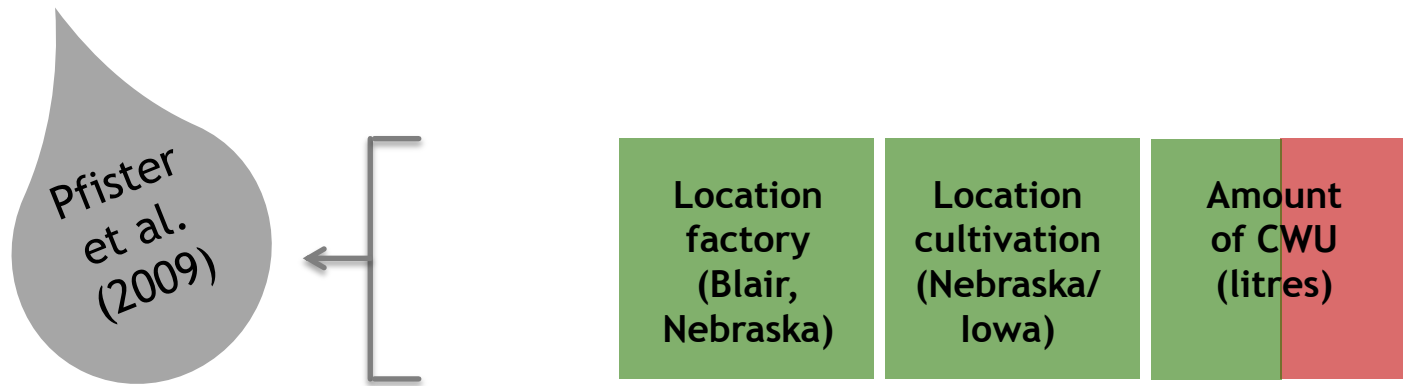
Image © 2012 TerraMetrics
US Dept of State Geographer

28°12'56.22" N 77°24'59.41" W Höhe -1109 m sichthöhe 3477.46 km

Methods vs Inventory

Table 3. Gross water consumption required for production of 1 kg Ingeo 2009

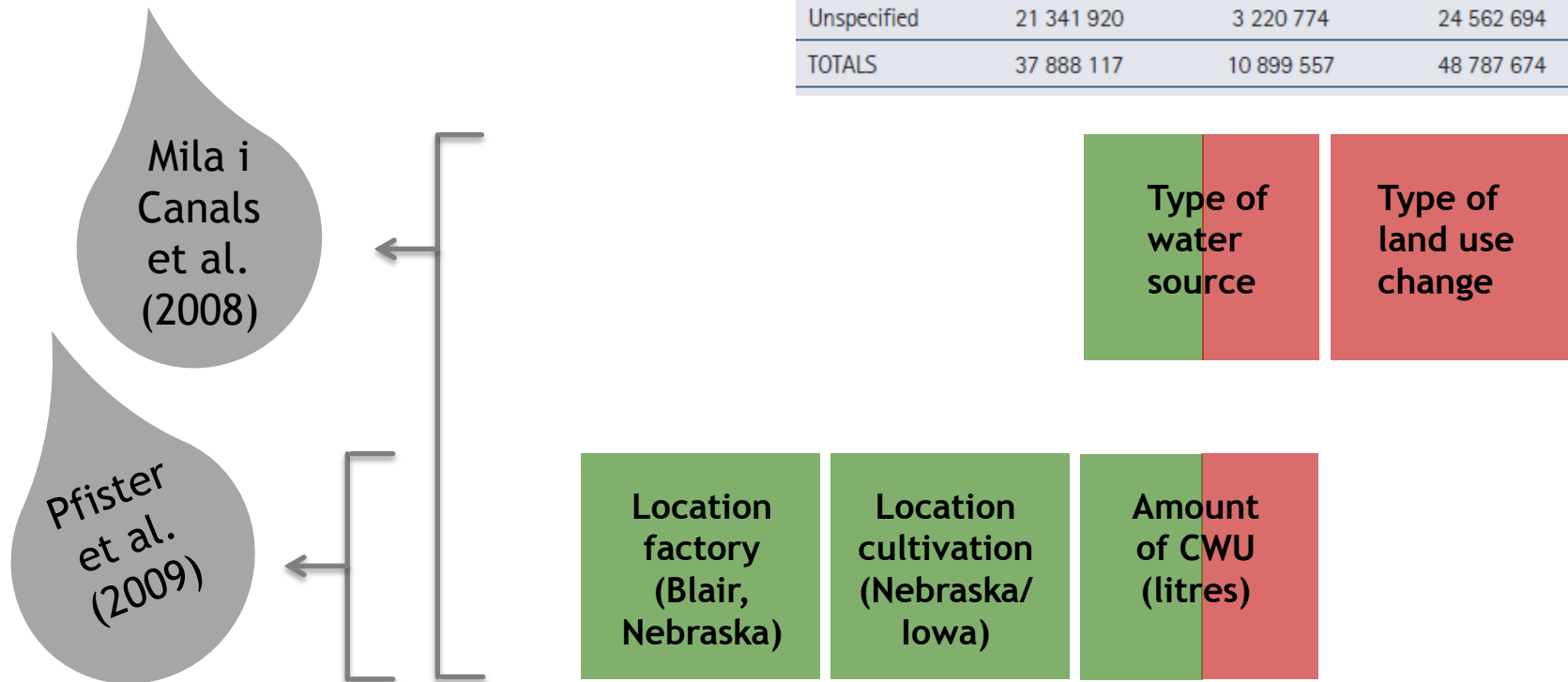
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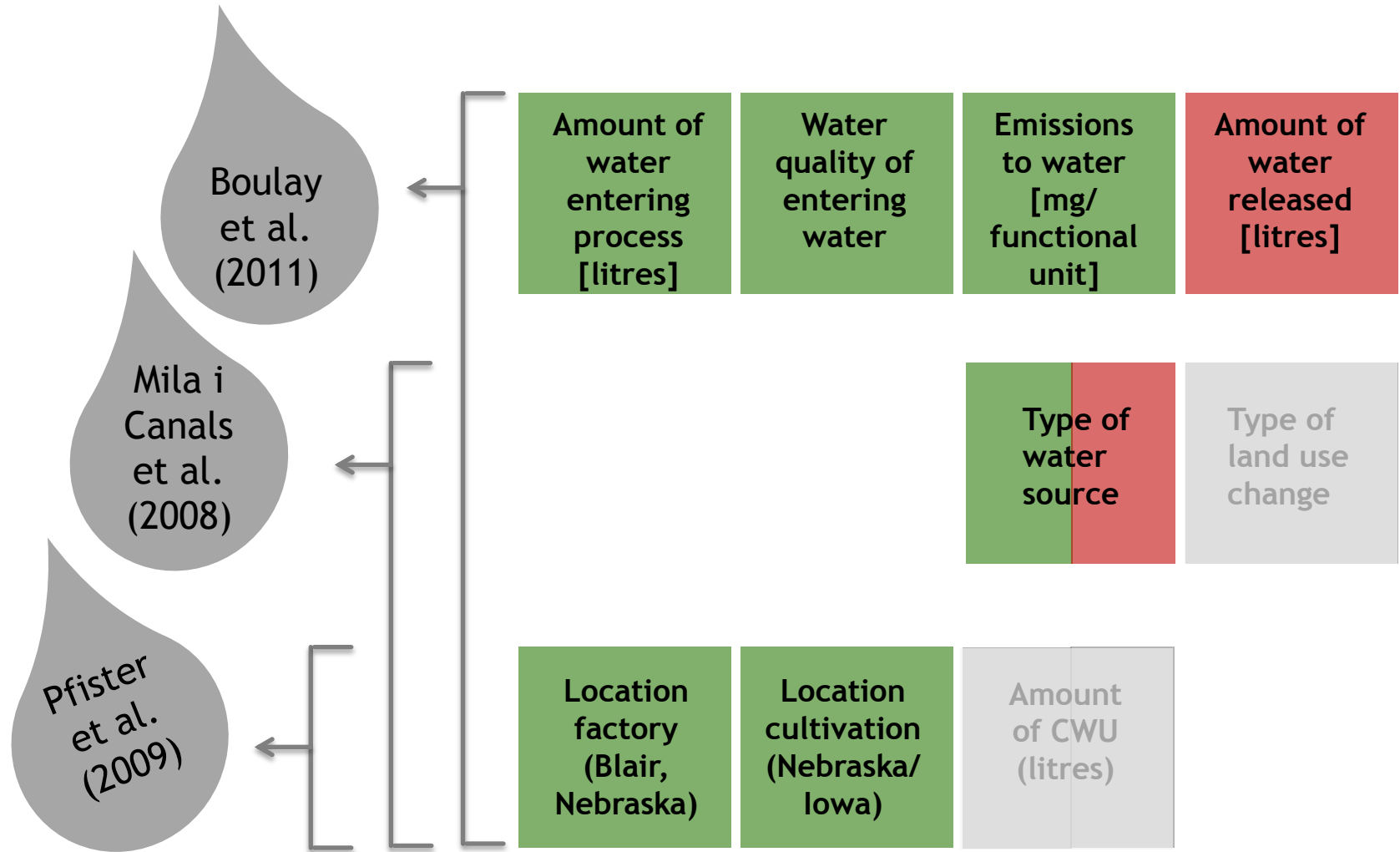
Methods vs Inventory

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Methods vs Inventory



Conclusions

- Main gap in inventory data set: quantity of water released → Would make impact assessment applicable according to Pfister and Boulay.
 - Easy to measure in industrial processes
 - Not straightforward for cultivation

- High uncertainty in cultivation part
 - Which type of water source is used?
 - Where it is exactly localised? -> Extreme range of WSI from 0.04 to 0.99 at border Iowa/Nebraska

The challenge is now how to get both sides together - the developer of the methods and the authors of the LCI datasets to receive comprehensive inventory data for applicable water footprint methods?

**Thank you
for your
attention!**



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