



## WULCA Task #3: Quantitative comparison of water impact assessment methods

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# Plan

- Project description
- Comparisons
- Results (→ preliminary!)
- Conclusion

# Project description and objective

- Midpoint indicators
  - Water scarcity (quantity)
  - Water stress (quantity and quality)
- Endpoint indicators on human health
  - Deprivation for domestic, agricultural and fisheries users (Pfister, Boulay, Motoshita)

***Objective: to understand the implications of modeling choices, data and hypothesis in scarcity indicators***

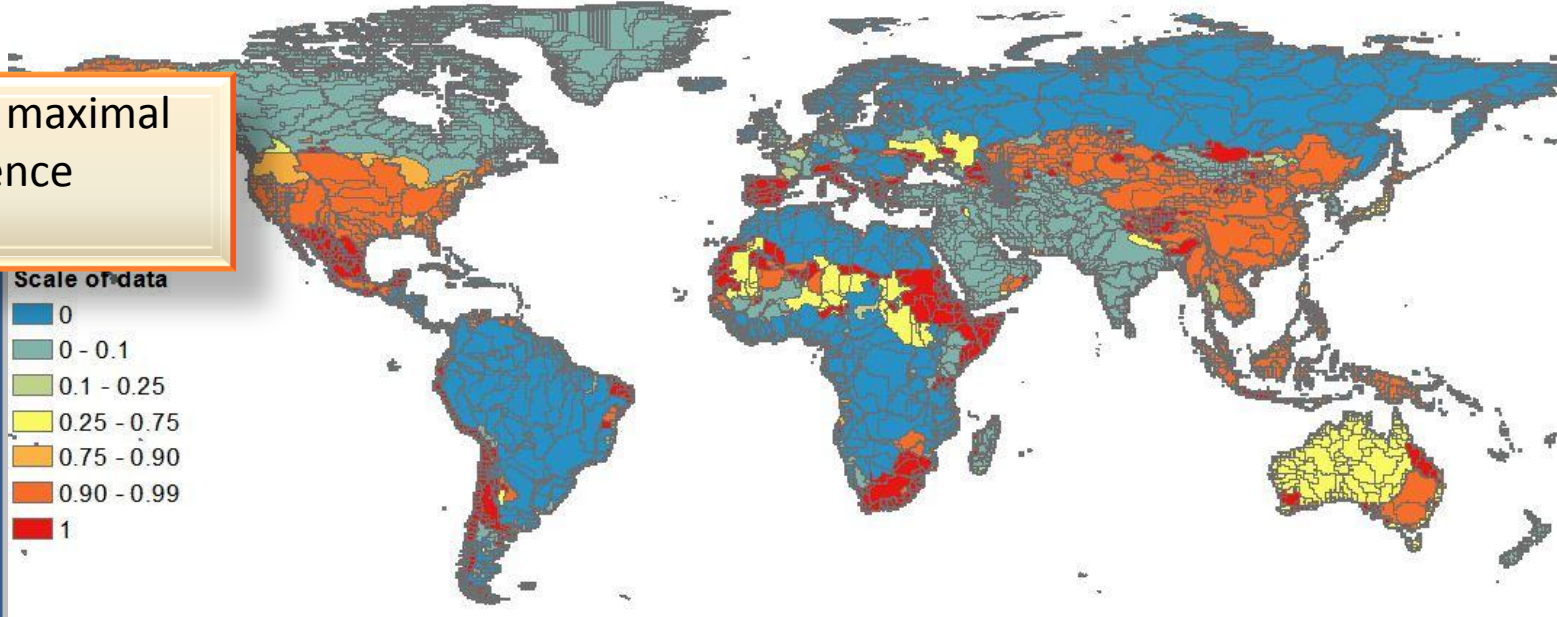
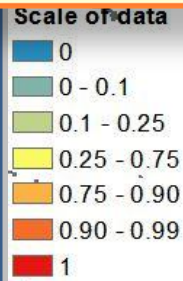
# Description

- 4 methods
  1. Boulay (simplified)
  2. Pfister
  3. Swiss Ecoscarcity
  4. Blue water scarcity (WFN)
- 5 questions
  1. Regional choices
  2. Consumption or withdrawal-based scarcity assessment
  3. Temporal variability
  4. Source of water (surface, ground or unspecified)
  5. Source of data
- 2 indicators
  1. Rank correlation coefficient (Spearman)
  2. Mean difference coefficient (Gini)

# Regional Choices – what is the most relevant scale of data and of results?

Scale of Data – maximal regional difference

**AvDiff: 0.35**



Scale of results – maximal regional difference

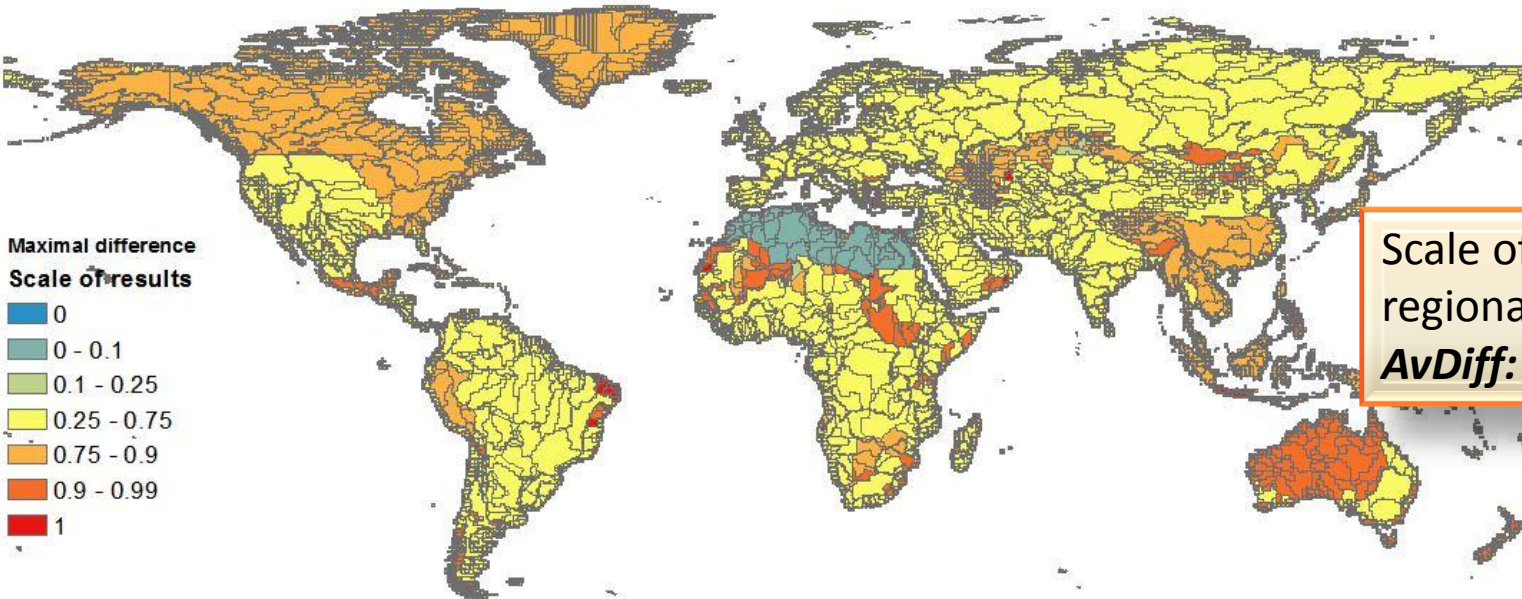
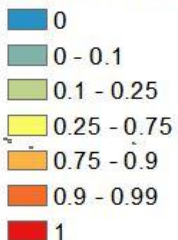
**AvDiff: 0.75**

x could be:



AL  
HAIR

Maximal difference  
Scale of results



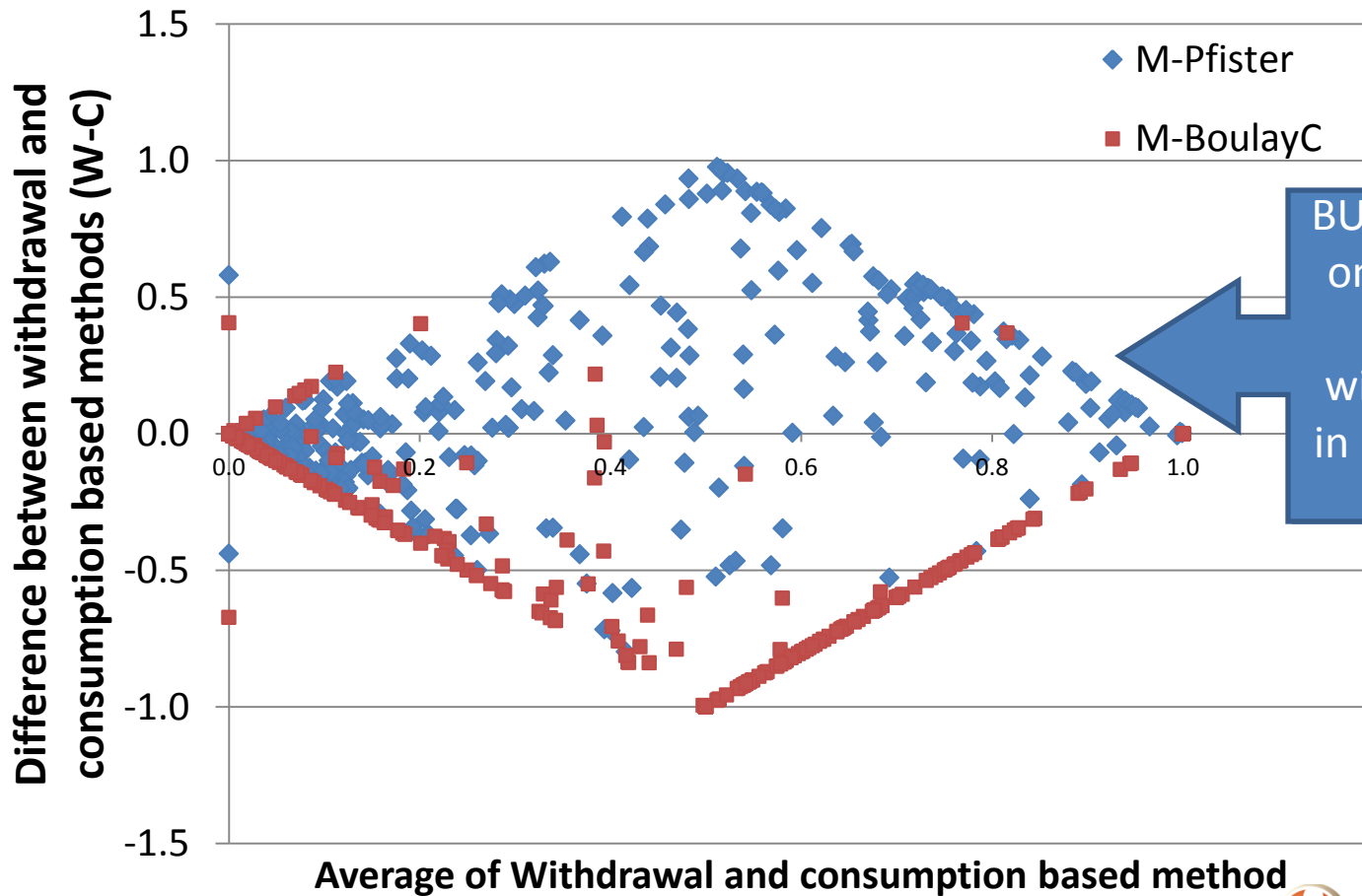
# Consumption vs withdrawal-based scarcity

## **Scarcity is fct() of:**

Withdrawal-to-availability ?

Consumption-to-availability ?

	RCC	Av Diff
Pfister	83%	0.15
Boulay	82%	0.14

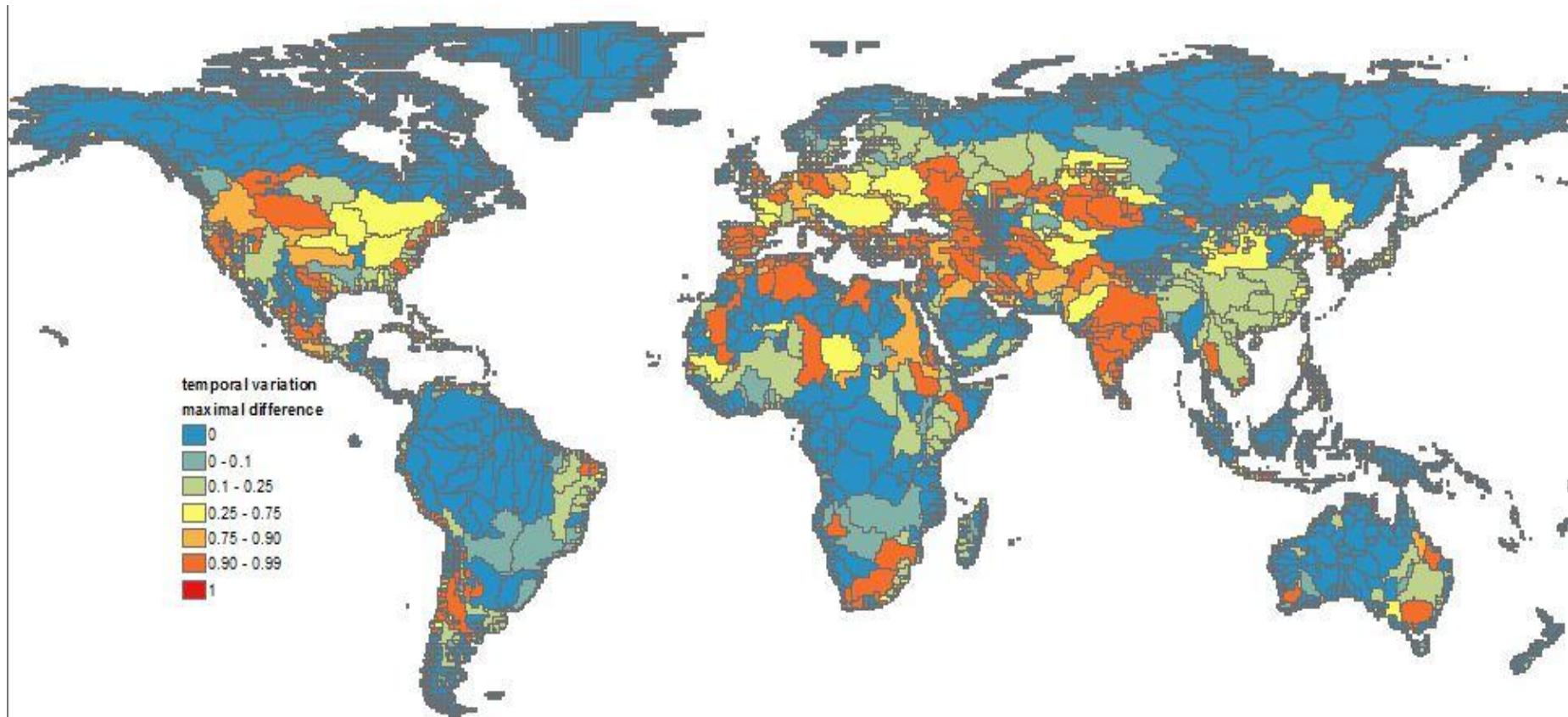


BUT...Scarcity based on consumption is higher (then withdrawal-based) in Boulay and lower in Pfister

# Temporal variation

*Comparing monthly versus annual assessment*

**RCC: 96%**  
**AvDiff: 0.03**



# Source of data

- Source of water:

- General
- Unspecified
- Surface
- Ground

Source	RCC	Mean Difference
Surface	97%	0.04
Ground	86%	0.09
Unknown	96%	0.04

- Source of data:

Using Pfister's consumption-based indicator to compare results with:

- WaterGap data
- WFN data

RCC	Mean Difference
82%	0.10



# Conclusion

- Source of water or regional variations only relevant in some regions
- Regional choices, source of data and consumption vs withdrawal-based scarcity significantly affect results, but:
  - Which data source is the most representative?
  - How should scarcity be defined when using consumption-to-availability ratios?
  - What is the most relevant spatial resolution?



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