



*Stress sub-working group meeting
November 28st, 2014*

Present: Anne-Marie, Masaharu, Sebastian W., Stephan, Markus, Manuele, Inga, Montse, Alessandro

The Goal is to find a agreements on remaining point.

3 indicators left:

- 1- DTA (incl special arid cases)
- 2- DTA * area/Availability
- 3- Area / (ava-demand)

Summary models choices:

Human demand: consumption rather than withdrawal

- general agreement
- Withdrawal might better reflect competition of water demand (e.g. once through cooling needs the volume even without consuming it)- Generally not main problem, more local issue
- but on monthly level withdrawal stored will be considered consumption if it is released next month. -> maybe not modelled

Temp resolution: monthly

- agreement

Geographical resolution: watershed, between 10000-25000 for the world (but model native resolution first)

EWR: Pastor et al. (monthly)

- Japanese (Hanasaki) model is very different -> averaging might not make sense
- Not sure how different the EWR are, but yearly average is quite similar
 - Hanasaki has 10-30% except for one condition -> Pastor is 30-45%
 - Japanese requires lower shares of low flow, while Pastor requires a higher share in dry season -> opposite direction.
 - **Email Hanasaki (Masaharu) and Pastor (Anne-Marie) and ask about the two models.**

Water availability model; Watergap

- Markus report on WATERGAP (from them)
 - Data will be available for now (only published next year)

- Main difference from version 3 is higher resolution
 - Drawback: agricultural model (default version is with 2 crop types), new versions have 18 crop types.
 - **Combining models is possible but difficult and maybe need harmonization of assumptions -> quite some work!**
 - **Multi-model average results (all should be uploaded end of this week -> rather early 2015)**
 - Last option best model building -> results expected in three years
- To be checked if multi- model average is also calibrated with flows in arid regions
 - Level of resolution can be watershed or grid cell

Comparison models: Sebastien:

- Total irrigation is similar in h08, watergap and LPJML.
 - WATERGAP: cropwat approach
 - Higher level of detail might not be so relevant for our purpose, very similar total estimate
 - Underlying uncertainties (i.e. irrigation amounts) are more relevant as shown by other publications of crop water consumption (Pfister et al. And Mekonnen and Hoekstra)
- Conclusion: go with WateGAP3?
 - Question natural vs actual runoff
 - We take natural runoff (without consumption but current land cover) -> WATEGAP can probably run calibrated with zero consumption.
 - Update will be easier if we do not create our own "mixed" model
 - Maybe rather go with WATERGAP as an expected value and then take uncertainty assessment to take into account other models (spec. European models)
- Basin level data of watergap 2.2 will be shared by WaTERGAP people (version 3 has 5 minutes resolution which is not much of a difference on watershed level)

Open question -> include existing infrastructure!

Indicator discussions

See slides for model results without scaling

- Also new map with combined DTA * area/avail
 - looks very good compared to other maps.
 - Can be seen as combination of competition/stress (DTA) and vulnerability/natural scarcity (area/A) which might make sense.
 - Direct multiplication give rather too high weight to area/A since scale is huge and very wet region cannot get scarce even if water resource is overused -> scaling question
- Area/(A-D): problem of negative (A-D) values

Also analyse data on log scales

Indicator -> between 0 and 1 -> probability of depriving other users

- Decide if minimal threshold at 0 or non-0 or none

- One way to describe the indicator could be “probability of depriving other users”
- Decide if maximal is set (probably yes)
- Decide on curve -> how?
 - Start with $DTA > 1$ -> maximal, in between linear or S curve scale
 - $(D-A) < 0$ -> maximal, in between linear or S curve scale
- Test quite some variants to further discuss

Next Meeting on Dec 18.

- First week, wait for data (Anne-Marie write workshop paper)
- 2nd week Data preparation by Anne-Marie, with support from Inga
- 3rd week Stephan and Anne-Marie will work on curves

Next steps:

- 1st week of January have some first indicators
- 12th January, Anne-Marie at JRC -> Start testing and continue improvements of the indicators