The

World

Water

Quality

Assessment

First steps in an assessment to meet the global water quality challenge

Aruwa Bendsen (UNEP)

Ilona Bärlund, Martina Flörke, Jeanette Völker, Andrew Kaus, Marcus Malsy, Klara Reder, Olaf Büttner, Christiane Katterfeld, Désirée Dietrich, Alejandra Matovelle, Joseph Alcamo, Dietrich Borchardt

HELMHOLTZ CENTRE FOR ENVIRONMENTAL RESEARCH – UFZ

CESR Center for Environmental Systems Research

UNEP

UN WATER

Water quality challenge

- Wastewater production at least doubling by 2050 → Sewerage connections increasing
- But not wastewater treatment → More untreated wastewater to rivers and lakes

Health:

Health risk of contaminated rivers & lakes → contact with surface waters → washing, cleaning, drinking
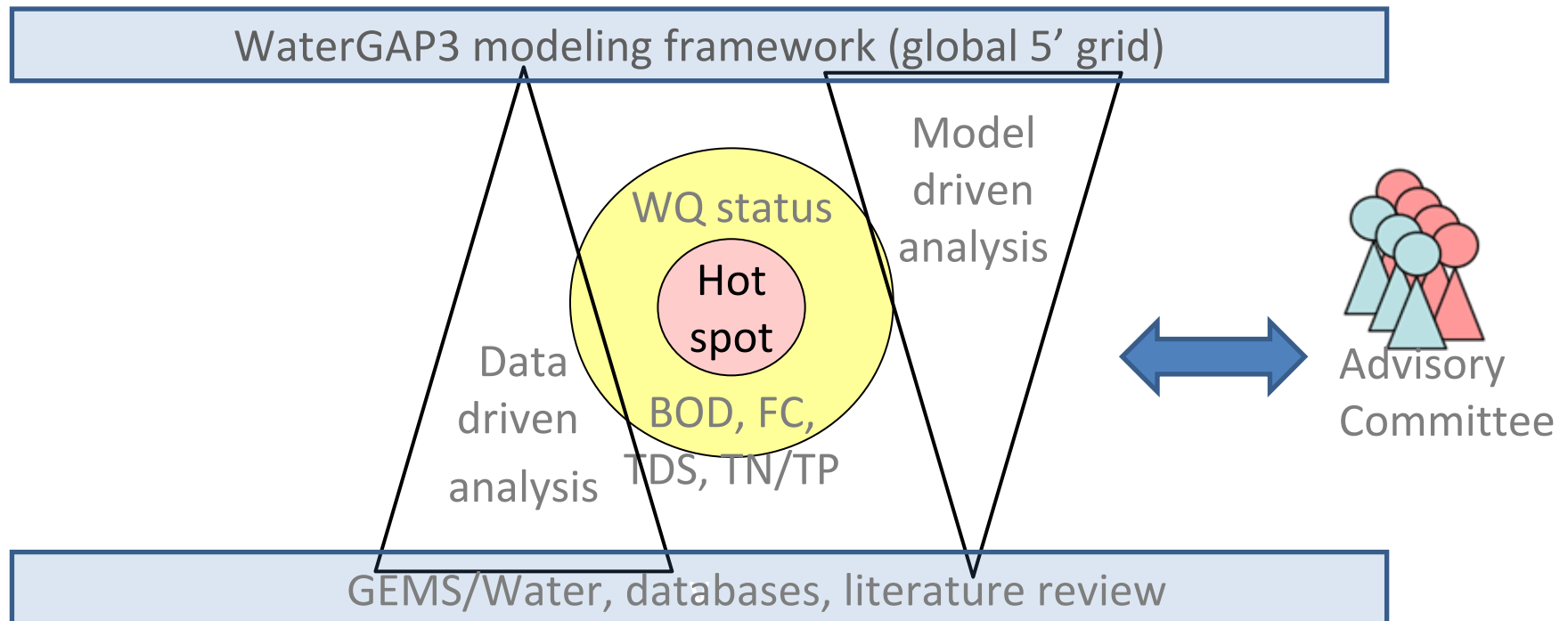
Food Security:

95% inland fishery production from developing world

200 million Africans consume fish regularly

About the assessment

- **Two-stage assessment**

- **Global coverage**, with focus on developing countries

- **Freshwater**, inland waters (running waters and lakes)

- **Identify current "hotspots"**

  - of **deteriorating water quality** (focus on BOD, FC, TDS, totN/totP)

  - **types, intensity and sources** of water pollution

  - of **potential impacts** relating to human health and food security (**freshwater fishery**)

  - **Identify main water quality data and information gaps**

Our data and model driven approach
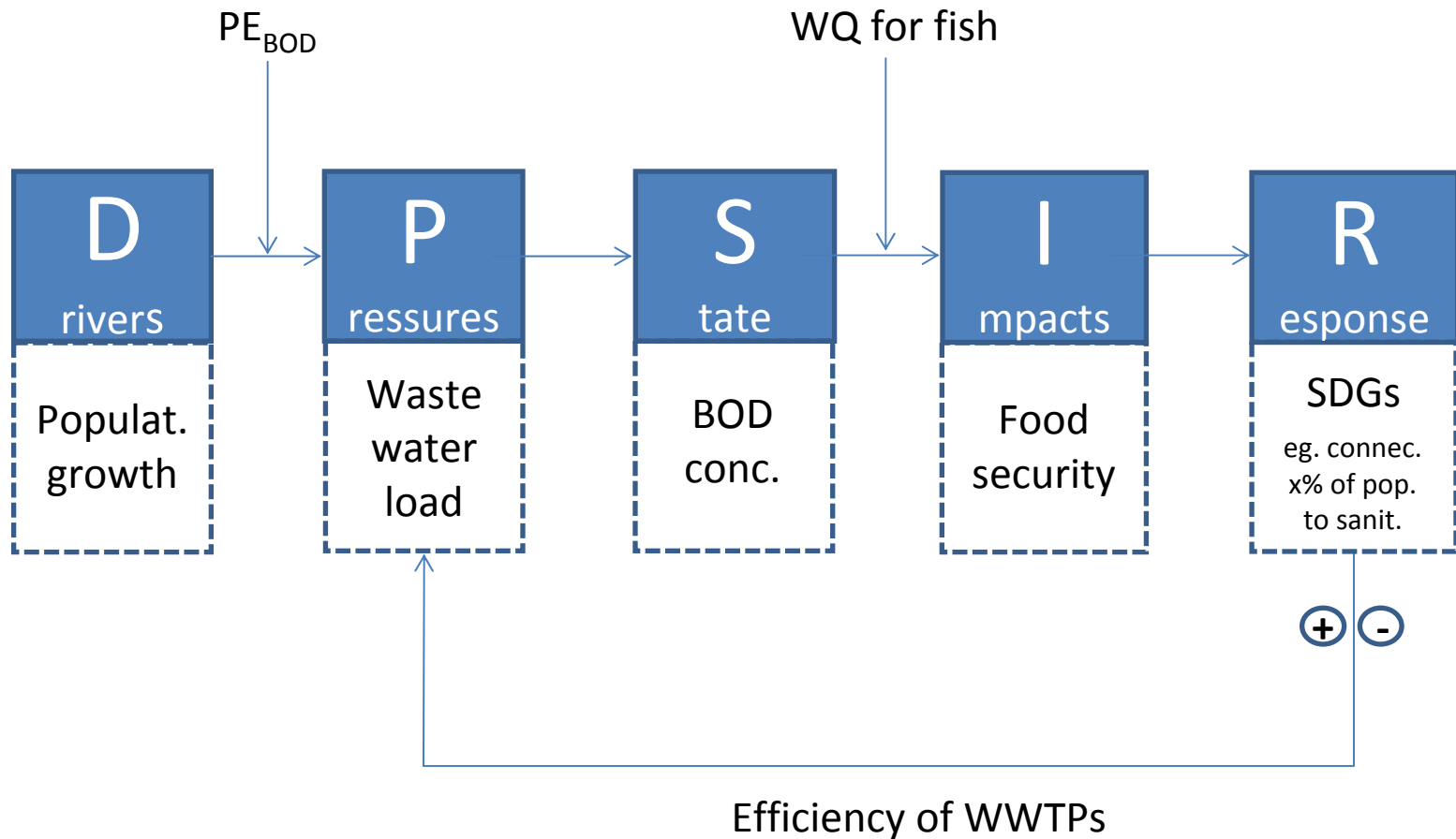

Global perspective – Top down

WaterGAP3 modeling framework (global 5' grid)
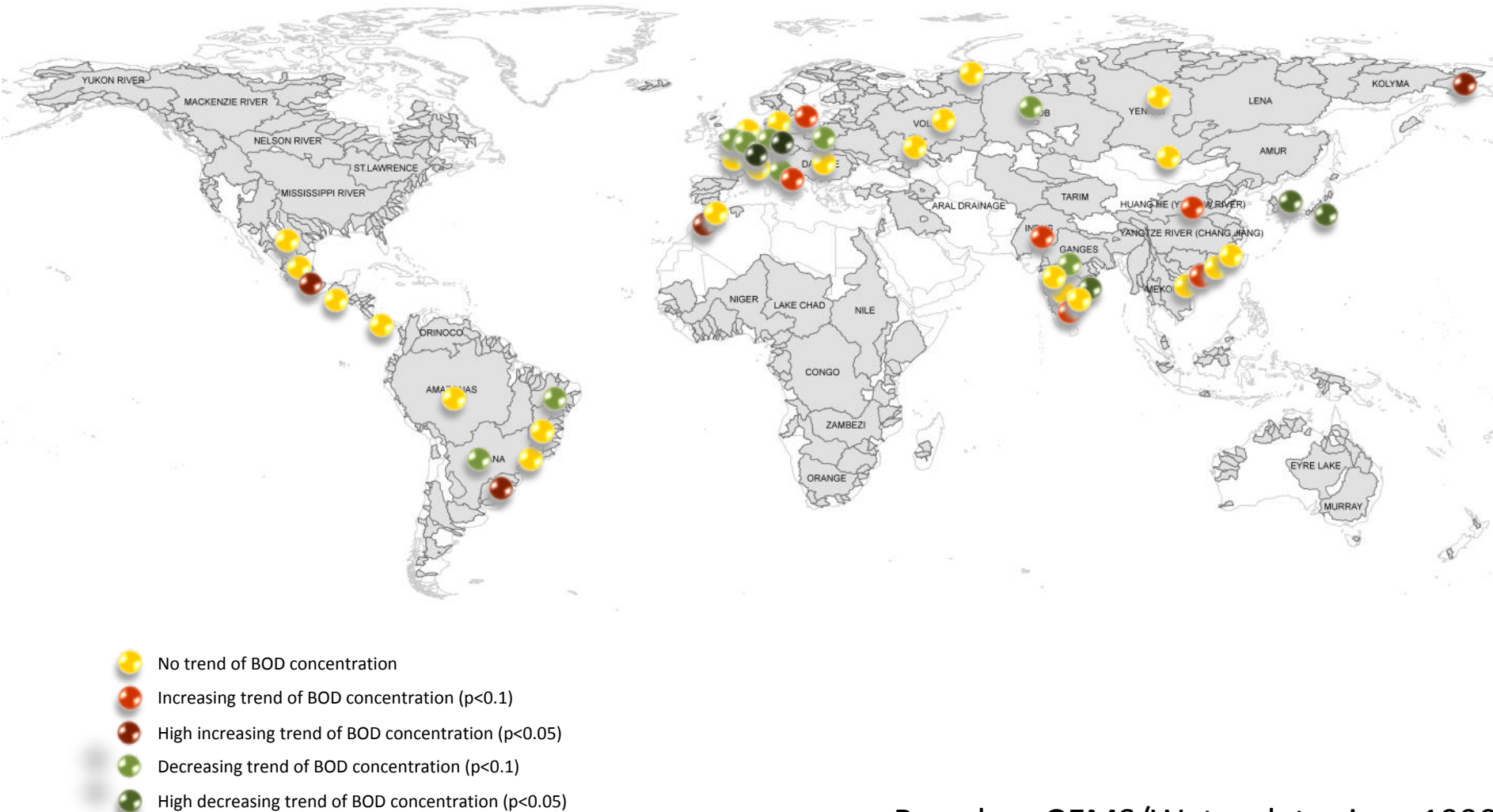
Model driven analysis

WQ status

Hot spot

Data driven analysis

BOD, FC, TDS, TN/TP

Advisory Committee

GEMS/Water, databases, literature review

Local/Regional perspective – Bottom up

Generic concept

- The **generic concept** behind the assessment:

PE_{BOD}

WQ for fish

D rivers	P ressures	S tate	I mpacts	R esponse
Populat. growth	Waste water load	BOD conc.	Food security	SDGs eg. connec. x% of pop. to sanit.

(+) (-)

Efficiency of WWTPs

Data driven analysis – trends in BOD concentration

- 🟡 No trend of BOD concentration
- 🔴 Increasing trend of BOD concentration (p<0.1)
- 🔴 High increasing trend of BOD concentration (p<0.05)
- 🟢 Decreasing trend of BOD concentration (p<0.1)
- 🟢 High decreasing trend of BOD concentration (p<0.05)

Based on GEMS/Water data since 1990

Reported Catch for Inland Waters 2010

Fish consumption [kg/capita]
- no Data
- < 2.5
- 2.5 - 5.0
- 5.0 - 7.5
- 7.5 - 10.0
- > 10.0

Source: FAO Fish Stat J Database 2014
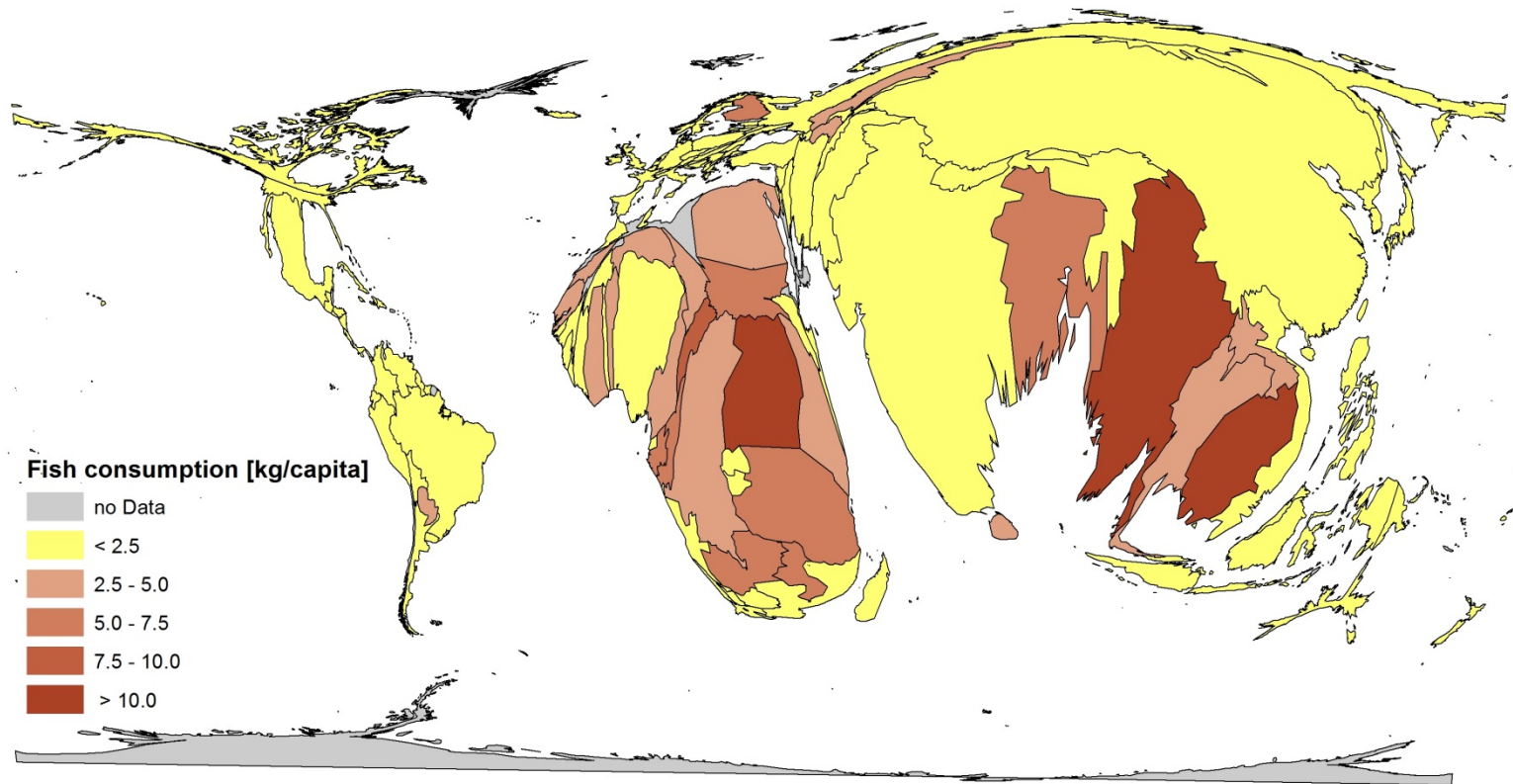
Model driven analysis: BOD '*hotspots'* potentially impacting food security

February 2010

BOD [mg/l]
- < 4
- 4 - 8
- > 8

August 2010
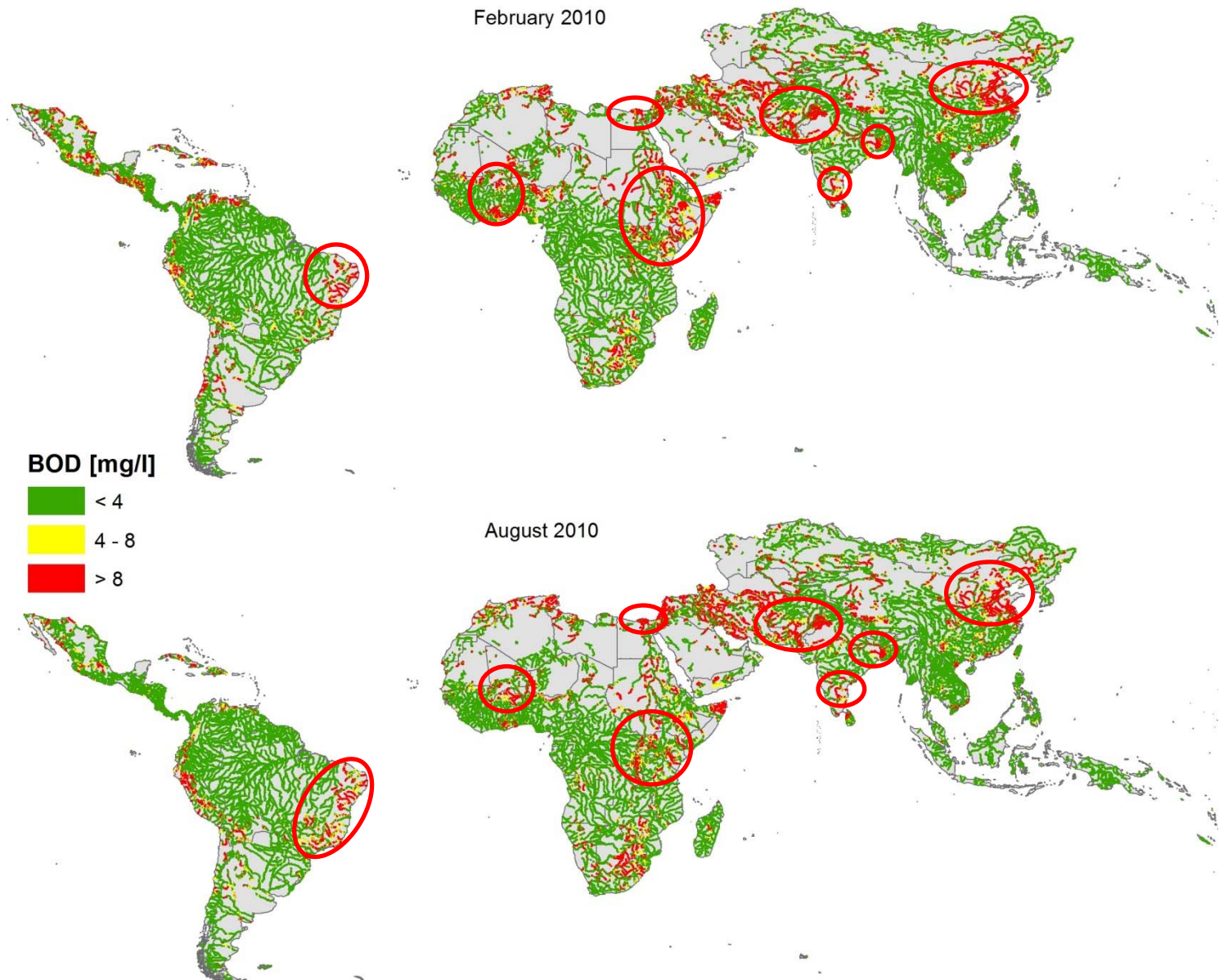
Summary and next steps

- Merging data driven analysis ('**trends**') and model driven analysis ('**in-stream concentrations impacting resident fish community'**) to
  - ➢ give the "big picture"
  - ➢ point out "hotspots" of deteriorating water quality and areas potentially at risk

- Preliminary results (data gaps, assumptions)

- The report at the end of Phase 1 (May 2015) "**The world's water quality: A pre-study for a worldwide assessment**"
  - ➢ overview of key issues, methodology, involvement of partners

MESSAGE FOR RIVER BASIN ORGANISATIONS
•Wastewater collection is not enough, the wastewater collected must also be treated.
•Water quality deterioration affecting food security is a worldwide problem, but highly diverse at regional scales.
•Solutions, measures etc. have to be adjusted to river basins.

ACTION POINT FOR BASIN ORGANIZATIONS FORUM
•The WWQA is highly dependent on valid water quality data for classification, trend analysis and validated modelling work.
•Make selected data series available for this purpose.
•Our „counter value" would be the provision of credible model and data driven assessment for river stretches and at river basin scale.

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