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Open source data and modelling tools for water energy land nexus assessment

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2nd June 2018

*Indus Basin Knowledge Forum 2018,
International Institute for Applied Systems Analysis
Laxenburg, Austria*

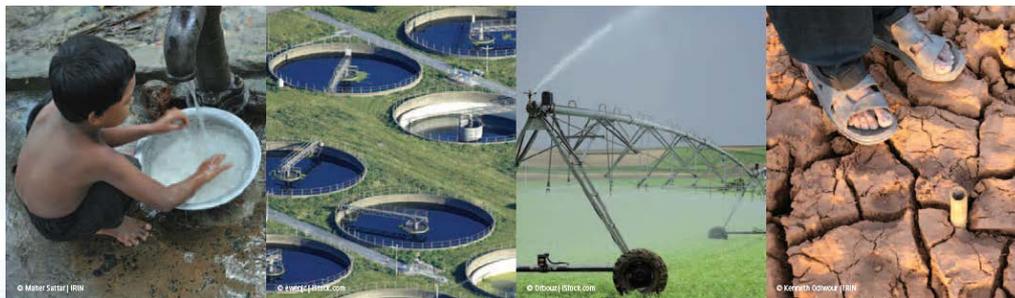


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ISIMIP & ISIpedia

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ISIMIP

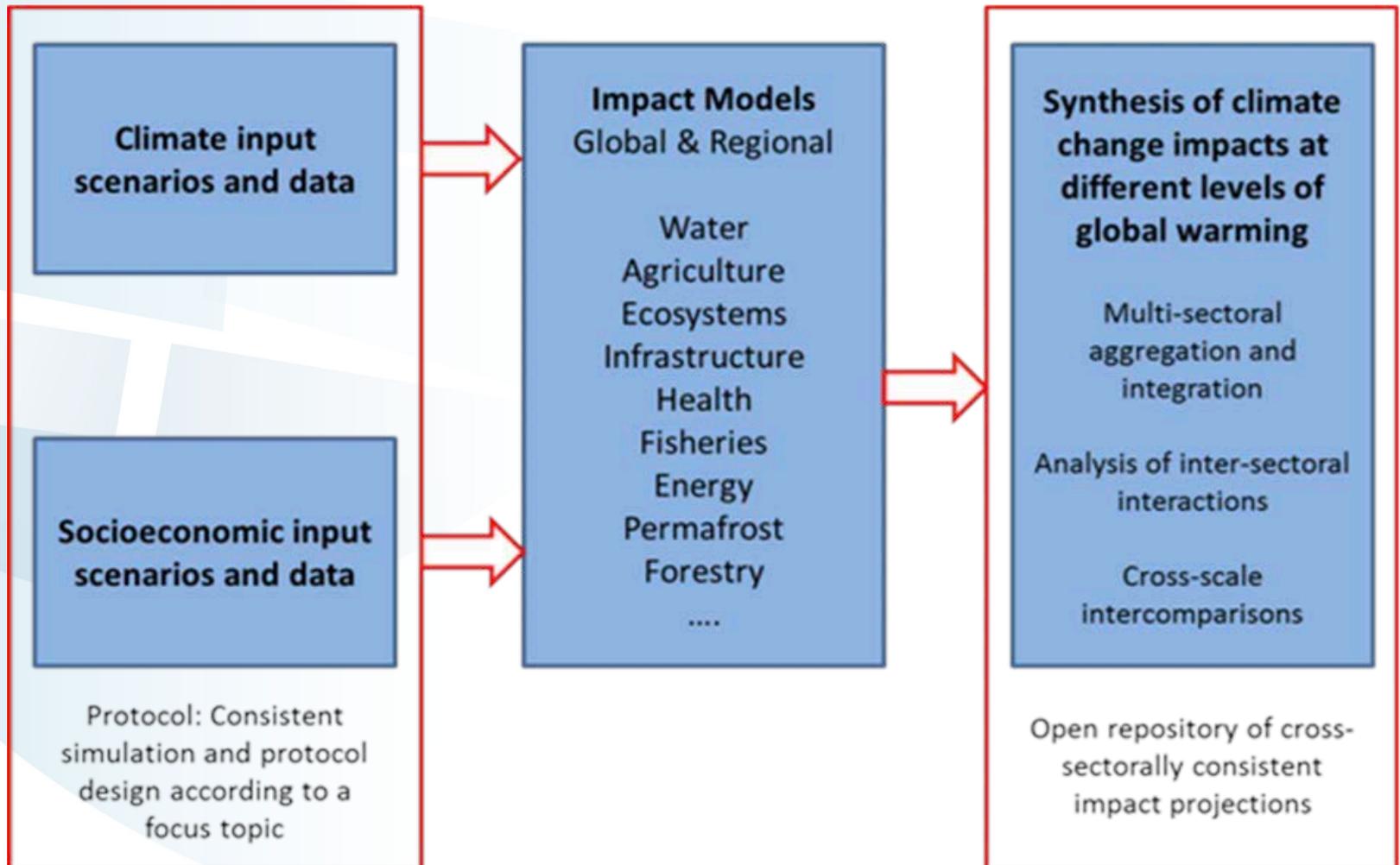


ISIMIP

Inter-Sectoral Impact Model
Intercomparison Project

ISIMIP Mission statement

ISIMIP aims to improve global and regional risk management by advancing knowledge of the risks of climate change through integrating climate impacts across sectors and scales in a multi-impact model framework.



Use of RCPs in ISI-MIP

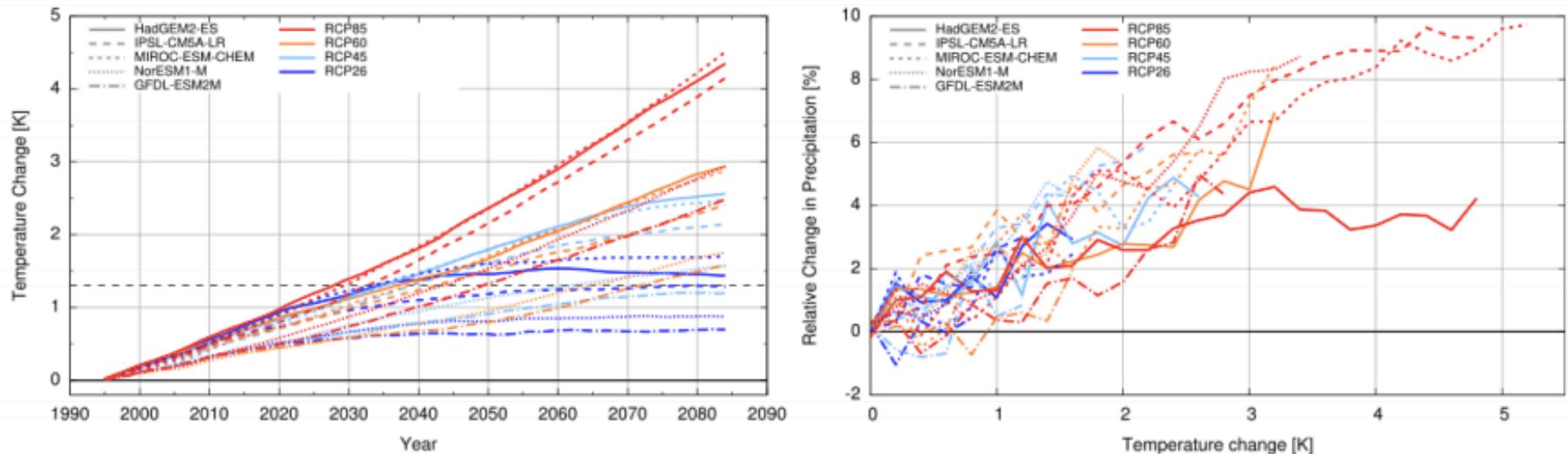


Fig. 1. (Left) GMT change (in degrees centigrade) with respect to the 1980–2009 average, averaged over 30-y window, centered on year shown. (Right) Relative change in land-averaged precipitation with respect to the 1980–2009 average, in terms of GMT change above present day (average of a 7-y interval around the year in which a given temperature change occurs). Each line represents one GCM and RCP.

- 5 GCMs chosen, which provided all necessary climate variables for all four RCPs.
- Attempt at 'representative' selection of GCMs, spanning the range of Δ GMT and precipitation changes, but selection mainly governed by what was available as at January, 2012.

The ISI-MIP *Fast Track*

December 2011 – January 2013

RCP climate projections

global: CMIP5
regional: CORDEX

Socio-economic input

SSP population & GDP

Impact models global & regional

agriculture water
natural ecosystems permafrost
coastal infrastructure health
energy fisheries

- ◆ Synthesis of impacts at different levels of global warming
- ◆ Quantification of uncertainties
- ◆ Representation of extreme events
- ◆ Model improvement
- ◆ Cross-scale intercomparison

- 'CMIP' for impact models.
- Consistent, bias-corrected climate-input data and socio-economic input.
- SSPs used to generate gridded population projections.
- Cross-sectorally consistent modelling protocol.



ISI-MIP2.1

Focus topic: Extreme events & variability

Much of the damage is caused by extreme events, not by gradual changes. How good are the models in reproducing the impacts of past extremes and variability?

Knowing this might help improve future projections.

Approx. 100 models (50 submitted)

Sectors:

- Agriculture (with AgMIP)
- Freshwater resources (global + regional models)
- Terrestrial ecosystems/biomes
- Forestry (regional models)
- Marine ecosystems & fisheries
- Energy supply & demand
- Health

Main ISIMIP website

<https://www.isimip.org/>

Accessing the data

<http://esg.pik-potsdam.de/>



ISlpedia - project

- 3-year ERA4CS project: led by PIK Potsdam
- **ISlpedia** open inter-sectoral impacts encyclopedia as a hub for multi-model, policy-relevant, climate-impact simulations and assessments.
 1. easily and freely-accessible repository of cross-sectoral and cross-disciplinarily consistent impact projections;
 2. dissolve long-term disciplinary boundaries that hinder comprehensive climate-change risk assessments;

ISpedia - structure

- **Three teams:**
 - Stakeholder Engagement Team (Climate Analytics): identify potential users of impacts data, engaging them in the selection of ISIMIP3 focus topic, initializing co-development of resulting data
 - ISIMIP team (PIK-Potsdam): cross-sectoral scientist team and sectoral coordinators responsible for the development of the cross-sectorally-consistent protocol,, provisioning of climate and SE data.
 - Assessment and Editorial Team (IIASA): design, development and editorial oversight of the content of the new ISpedia climate-impacts service portal developed in this project, with a view to servicing stakeholder requirements as collected by the SET.
 - Generating own assessments
 - Invite assessments from expert in the fields

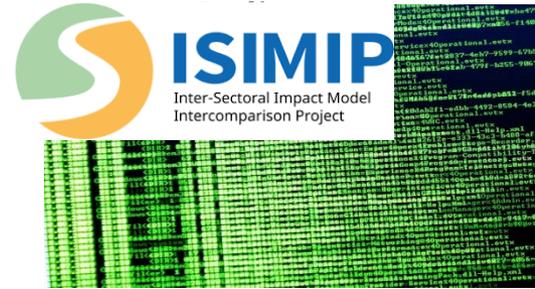
ISIpedia – kick-off workshop

In parallel with ISIMIP meeting
~20 stakeholders

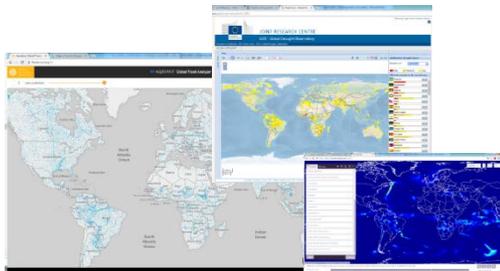
Urgent Questions & Focus Topics



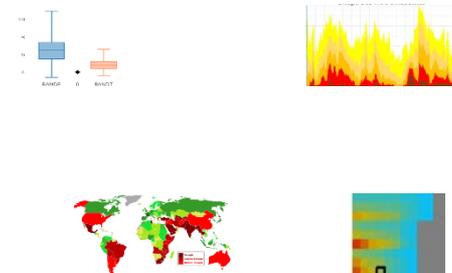
ISIMIP framework & Data

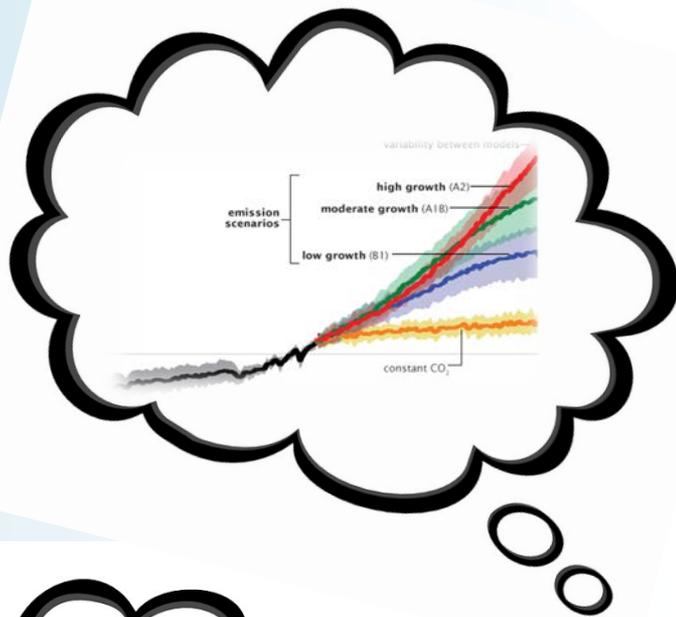


Portals and platforms



Metrics and Indicators





Policy Maker



ISIPEDIA

Stakeholder feedback

What focus areas are you most interested in?

What are the questions you cannot answer?

How can the design be more useful?

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