**Water2Invest: Global facility for calculating investments needed to bridge the climate-induced water gap**

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**Introduction**

Decision makers responsible for climate change adaptation investments are confronted with large uncertainties regarding future water availability and water demand, as well as the investment cost required to reduce the water gap. Water2Invest aims to (i) join the impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity, (ii) integrate different climate databases and assess the joint impact of climate change and socio-economic change on water scarcity. However, it also includes advanced web-services for further systems integration. The technology is based upon standards set forth by the Open Geospatial Consortium:
- A web mapping service (WMS) enables web-based visualisation of map layers (Fig. 9).
- A web feature service (WFS) enables querying for specific details on water provinces.
- A web processing service (WPS) enables scenario analysis and querying of "what if" questions, e.g. increase in reservoir capacity, desalination plants, or drip irrigation (Fig. 10, 11).

**Water availability**

PCR-GLOBWB (Van Beek et al. 2009) provides water availability on a global scale until 2100 based on CMIP5 model output (Fig. 1). Monthly time series are derived for each of the 1400 water provinces (Fig. 2).

**Water demand and allocation**

Water demand by agriculture, industry, domestic, and the environmental is computed based on socio-economic scenarios of increase in population and gross domestic product. Using a Lagrangian relaxation optimization, water is allocated on a monthly basis over the four sectors. The water allocation model allocates the water based on priority and water supply pricing and simulates in which sector shortages may occur at what time (Figs 3-5).

**Investments and indicators**

Based on the unmet water demands, different measures may be taken to bridge the water gap for each water province (Fig. 6).

**Web mapping and user interaction**

To make investment decisions, insight in both the cost of measures and the impacts of these measures on water using sectors and ecosystems is required. To be able to prioritize adaptation options, the water scarcity is further processed into socio-economic impacts, such as economic loss of agriculture production. The change in river flow regime – the variations in both high and low flows – is assessed to understand potential environmental impacts. A scheme is developed to evaluate the strategies on robustness and flexibility under climate change and scenario uncertainty, and each measure is linked to possibilities for investment and financing mechanisms, with particular attention to private sector involvement (Fig. 7, 8).

The tool can be used by consultants, water authorities, non-governmental and commercial investors alike to test investment strategies, but could also be used by companies for advertisement water saving or crop water productivity technologies that can be evaluated on their effectiveness on the spot. checkout [www.water2invest.com](http://www.water2invest.com) by July 2013

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**References**