FutureWater

Curriculum Vitae

Name	G.W.H. Simons, PhD.
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Date of Birth	January 17, 1986
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Main Disciplines	Water Resources Management, Hydrological Modelling, Remote Sensing, Climate Change, GIS
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Key Qualifications

Dr. Gijs Simons is a water management and remote sensing / GIS expert with thirteen years of experience in managing and implementing international projects in the field of water resources management. Countries of work experience include Cambodia, Egypt, Ethiopia, Lao PDR, Madagascar, Mali, Morocco, Mozambique, Myanmar, Nepal, The Netherlands, Philippines, Spain, Sudan, Uganda, and Vietnam. Gijs has advanced skills in hydrological modelling, satellite image interpretation and GIS analysis using a variety of tools (e.g. SPHY, SWAT, WEAP, InVEST, ArcGIS, QGIS, PCRaster, Python, R, Google Earth Engine) on the full range of spatial scales from a single agricultural field to an entire river basin. Gijs is the lead author and co-author of many publications, both peer-reviewed papers and technical reports. In addition, he has developed and conducted multiple training courses and workshops on remote sensing, GIS and hydrological modelling.

Gijs is currently the managing director of the FutureWater office in Wageningen.

Educational Background

2013 – 2021	PhD: Tracking water reuse in river basins with multiple users, Delft University of Technology, Delft, The Netherlands
2007 – 2009	MSc Hydrology, Utrecht University, Utrecht, The Netherlands
2004 – 2007	BSc Earth Sciences with a specialization in Physical Geography, Utrecht University, Utrecht, The Netherlands

Professional Experience

2014 – present	Hydrologist and Managing Director, FutureWater, Wageningen, The Netherlands
2010 – 2014	Hydrologist and Remote Sensing Specialist, WaterWatch BV / eLEAF Competence Center, Wageningen, The Netherlands
2010	Hydrogeologist, IF Technology, Arnhem, The Netherlands

Overseas Professional Experience

Resident:	FutureWater Mekong office, Vientiane, Lao PDR (2018).
Resident (visiting researcher):	Thuy Loi University, Hanoi, Vietnam. Hydrological modelling of the Red River Basin in China and Vietnam (March - July 2015).
Non-resident assignments:	Cambodia, Egypt, Ethiopia, Madagascar, Mali, Morocco, Mozambique, Myanmar, Nepal, Philippines, Romania, Spain, Sudan, Uganda, Vietnam.

Selection of Assignments and Projects

Duration: 2022 - 2023 **Position:** Senior Water Resources and Climate Expert **Location:** Stung Treng and Kratie Provinces, Cambodia **Client:** UNDP Cambodia	***Enhancing IWRM and Climate Resilience in Vulnerable Urban Areas of the Mekong River Basin*** **Main Project Features:** This project looks to address gaps in data collection management and analysis, enhance institutional and technical capacity at the subnational level for integrated climate and flood risk management, enhance availability of resources for investment in water-related risk reduction, and aid the flow of risk knowledge and coordination across the borders of Cambodia and Lao PDR. Key outputs include (i) technical studies on flood propagation models, hydrometeorological disasters forecasting models, capacity assessment, and improvement of risk monitoring systems and early warning system (EWS), (ii) capacity building design for climate change risk assessments, and hazard/vulnerability mapping using open source software, and (iii) design and piloting of disaster risk management initiatives at the community level. **Activities Performed**: • Technical inputs to disaster risk assessment reports, flood modeling, and impact forecasting produced by consultant and IPs • Overall support on the design, implementation, and monitoring of climate risk-informed water resources management in 3S & 4Ps basins • Technical support on capacity building design for climate change risk assessments and hazard/vulnerability mapping using open source or freely available/subsidized software, and tailored to local context • Review and provide inputs to the tasks to be conducted by consultants and service providers through technical inputs to their ToR, work plans, and methodologies. Review reports from the consultants and government partners and provide technical advice to ensure quality • Technical inputs and interpretation of the results of technical studies on flood propagation models, hydrometeorological disasters forecasting models, capacity assessment, and improvement of the risk monitoring systems and early warning system
Duration: 2022 **Position:** Water management expert **Location:** Lower Mekong Basin **Client:** Mekong River Commission (MRC)	***Data Generation and Reporting for the MRC Mekong State of the Basin Report 2023*** **Main Project Features:** The Mekong State Of the Basin Report (SOBR) is published by the MRC every five years. It provides information on the status and trends of water and related resources in the Mekong Basin, from an economic, social and environmental perspective. This project involves the hydrological and satellite-based analyses concerning spatiotemporal dynamics and trends of water-related habitat conditions, salinity intrusion, and wetland extents in the Mekong Delta and the entire LMB. Outputs are converted into high-quality texts, as well as intuitive and attractive visuals for the SOBR 2023. **Activities Performed**: • Spatial data analysis and satellite data interpretation • Liaison with MRC and its member countries and dialogue partners • Preparation of high-quality figures, graphs and texts for insertion in the SOBR 2023
Duration: 2022 **Position:** Water management expert **Location:** Asia **Client:** FAO Asia	***'Follow the Water Method' Training and Guidance Development*** **Main Project Features:** Return flow and water reuse is currently insufficiently accounted for in agricultural water management. This project focuses on knowledge generation and exchange related to volumes and destinations of irrigation return flows, and how to incorporate this knowledge into decision making. **Activities Performed**: • Compiling a database of practical case studies reporting return flows and water reuse • Supporting the development of a decision support tool on irrigation return flows and water reuse for policy makers and practitioners

Duration: 2021 - 2022 **Position:** Hydrologist / remote sensing expert **Location:** Global **Client:** United Nations Convention to Combat Desertification (UNCCD)	***Identification of Land Degradation and Climate Change Hotspots Globally*** **Main Project Features:** Productive capacities in drylands are threatened by climate change and land degradation, where changing precipitation and temperature potentially exacerbate processes of degradation. UNCCD aims to support reorientation of productive capacities towards sustainable patterns, in order to reverse the impact of land degradation and mitigate climate change impact. To this end, UNCCD is interested in the identification of regions and cash crops at a particularly high risk of land degradation and climate change impact. **Activities Performed**: - Methodological development - Spatial analysis of climate change impacts on croplands - Analysis of vulnerability to land degradation (remote sensing & GIS-based) - Reporting and generating attractive visuals
Duration: 2021 - 2024 **Position:** Project manager **Location:** Global **Client:** European Space Agency (ESA)	***InfoSequia-4CAST: Towards an operational satellite-based Drought Early Warning and Forecasting System for quantifying risks of crop and water supply failures*** **Main Project Features:** This activity concerns the development and piloting of InfoSequia-4CAST, which combines historical and up-to-date observations of satellite-based meteorological and agricultural drought indices with climate variability indices to generate seasonal outlooks of water supply and crop yield failure alerts. These impact-based indicators are computed using a simple, robust and easily understandable statistical forecasting-modelling framework that rests on the Fast-and-Frugal Tree (FFT) Machine Learning algorithm. By making use of multi-sensor state-of-the art satellite data fully integrated with FFT predictive models, InfoSequia-4CAST provides locally-specific, 3-6 months outlooks and warnings of crop yield and water supply failures to the end user through a simple, intuitive user interface. The product is targeted at the needs of water managers and humanitarian NGOs to address their specific requirements. **Activities Performed**: - Overall project coordination, contacts with client and partners and management of team of technical experts - Contribute to technical methodology on processing and integration of satellite-derived data, modelling instruments, and conversion to meaningful crop yield and water supply indicators
Duration: 2021 **Position:** Hydrologist / remote sensing expert **Location:** Lower Mekong Basin (LMB) **Client:** Mekong River Commission (MRC)	***Evaluating the Extent of Salinity Intrusion and the Riverine, Estuarine and Coastal Habitat Conditions in the Lower Mekong Basin*** **Main Project Features:** Detailed methodologies are developed for periodic implementation of regional studies on the extent of salinity intrusion in the Mekong Delta; and the condition of riverine, estuarine, and coastal habitats in the Lower Mekong Basin. A literature review is conducted to identify successful approaches from the Mekong Region as well as from other river basins. Based on this review, a suitable methodology is developed and tested by using the Google Earth Engine platform. The proposed methodologies rely strongly on usage of satellite remote sensing to allow for spatial monitoring as well as temporal consistency of the obtained values. **Activities Performed**: - Review of existing methodologies tested in the LMB and other river basins - An assessment of these methods regarding technical, economic and institutional aspects - Testing suitability of identified methods by in Google Earth Engine - Developing a recommended methodology for adoption by MRCS, including practical guidance documentation for its stepwise implementation.
Duration: 2021 **Position:** Eco- hydrology expert **Location:** Global **Client:** The Nature Conservancy (TNC)	***Technical Annexes on Nature-based Solutions for Water Security*** **Main Project Features:** TNC is producing technical modules and guidance documentation to enable water sector actors and their funders to invest in Nature-based Solutions for Water Security (NbS-WS). Part of the material being developed is a module on technical options, which will include annexes with key information for each of twelve NbS-WS, as well as overviews of important sources of information. This assignment supports TNC by developing these annexes and clarifying water security impacts for each NbS. A comprehensive review of literature

	(policy documents, technical reports, scientific papers, etc.) and online sources is conducted to produce concise and well-structured outputs for incorporation into the technical module. **Activities Performed**: • Review of water security impacts, co-benefits, design-enabling factors, risks, and costs for each of the selected Nature-based Solutions • Synthesizing all relevant information into dedicated factsheets aimed at a broad audience
Duration: 2020-2021 **Position:** Erosion / remote sensing expert **Location:** Kyrgyzstan **Client:** World Bank	***Restoration Opportunities Assessment Methodology in Kyrgyzstan*** **Main Project Features:** The government of Kyrgyzstan has expressed its interest in forest landscape restoration (FLR). This project supports these ambitions, as well as several ongoing national and regional initiatives requiring identification of feasible and effective landscape and watershed restoration measures in Kyrgyzstan. The objective of the work is to perform at the national-level an analysis of feasible integrated landscape restoration and catchment area management measures, with a focus on reducing sediment flows into the Toktogul reservoir. The project combines (i) an innovative land degradation mapping approach based on remotely sensed / GIS data and local hydrometeorological and cartographical information, with (ii) the ROAM methodology for narrowing down feasible FLR measures in the landscape. **Activities Performed**: • Development of a comprehensive methodology for assessing land degradation and soil erosion patterns • Analyses of satellite-derived, GIS and locally-sourced environmental data • Mapping baseline conditions, vulnerability and risks related to land degradation, erosion and sedimentation in the Toktogul / Naryn River Basin and nationwide • In cooperation with local partner CAIAG, calibration and validation of above-mentioned mapping assessment
Duration: 2020-2021 **Position:** Hydrologist / project manager **Location:** Cambodia **Client:** Ministry of Water Resources and Meteorology (MoWRaM) / AFD	***WAT4CAM: Mekong-Bassac Hydrological and Hydraulic Study*** **Main Project Features**: The WAT4CAM program aims to apply IWRM principles towards achieving the strategies of the government of Cambodia. This project (WAT4CAM subcomponent 3.1) supports this objective by performing a detailed hydraulic and hydrological modelling study, of which the outcomes will be used in the implementation of irrigation scheme rehabilitation works. An integrated approach of models, satellite remote sensing and field surveys is applied to generate an advanced understanding of the complex dynamics of the hydrological system. Several capacity building sessions are organized to share this knowledge with MoWRaM technical staff and the other WAT4CAM components. **Activities Performed**: • Remote sensing analyses / flood extent and irrigation mapping • Technical support to hydraulic modelling team • Project management and coordination
Duration: 2020-2022 **Position:** IWRM expert / hydrologist **Location:** Philippines **Client:** Wetlands International	***Integrated Catchment Management in Cagayan de Oro River Basin, Mindanao*** **Main Project Features**: The Ridge to Coast, Rain to Tap: Sustainable Water Supply Project ("R2CR2T") is an integrated approach to addressing flooding and soil erosion in the Cagayan de Oro River basin on Mindanao in the Philippines. FutureWater is supporting the development of an operational Decision Support Tool to analyze scenarios related to reforestation and landscape restoration campaigns in the catchment, which are aimed at mitigating land degradation, downstream flood risk, and enhancing water availability in the dry season. **Activities Performed**: • Supporting development and application of hydrological model and Decision Support Tool for Sustainable Land Management • Reviewing project outputs
Duration: 2020 **Position:** Hydrologist / remote sensing expert **Location:** Cambodia **Client:** GIZ	***Transboundary water management between Thailand and Cambodia as part of the adaptation of the agricultural sector in North-Western Cambodia to climate change*** **Main Project Features**: This project takes an integrated approach to support the development of a water resource management plan for a transboundary rural region in Northwestern Cambodia / Thailand. The project involves extensive data

	collection and analysis related to agriculture, floods and droughts, and socio-economics, as well as scenario simulations using the Water Evaluation And Planning (WEAP) tool. These simulations serve to evaluate water resources availability and unmet demands (water shortages), under different water management strategies, storage development and climate change scenarios. **Activities Performed**: • Google Earth Engine-based drought risk mapping • Water resources modelling
Duration: 2020 **Position:** International consultant / team leader **Location:** Inle Lake, Myanmar **Client:** UNDP	***Boundary Demarcation and Ecosystem Services Mapping of Inle Lake Region*** **Main Project Features**: The assignment supports the newly established Inle Lake Management Authority (ILMA) by developing up-to-date, spatial datasets, which are to be included in the ILMA geodatabase. More specifically, the existing Inle Lake MAB boundary and zoning are confirmed and updated. Maps of land-use and different ecosystem services are produced and validated in close consultation with stakeholders. In addition, the development of communications and educational materials is supported, and key government staff is trained on ecosystem services mapping. **Activities Performed**: • Spatial data analysis / satellite data interpretation • Ecosystem services mapping • Capacity building • Project management
Duration: 2019 - 2020 **Position:** Senior consultant **Location:** Asia **Client:** FAO Asia	***Training Package and Technical Guidance for Water Productivity and Real Water Savings*** **Main Project Features:** The project goal is to compile an inventory of agricultural field interventions and develop a training package to evaluate Real Water Savings from irrigated fields, to system and basin scales. A guidance document is developed for field interventions by compiling a literature database containing published results of various interventions. Impacts on water savings and crop yields are summarized and translated into practical guidelines. The training package includes a user-friendly Real Water Savings evaluation tool, a comprehensive manual, case study applications, and a link with the inventory of field interventions. Training of decision makers is conducted in Cambodia, Iran, and Vietnam. **Activities Performed:** • Reviewing and providing input to knowledge products and the ReWAS assessment tool
Duration: 2019 **Position:** Team leader **Location:** Myanmar **Client:** Yangon Technological University **/** Nuffic	***Advanced cloud computing for water resources management in Myanmar*** **Main Project Features**: A 3-month course consisting of three training weeks and a period of remote support, focusing on hands-on training of university staff and government officials in the use of Google Earth Engine for water resources analyses. **Activities Performed**: • Development of training material • Project coordination
Duration: 2019 **Position:** Hydrologist **Location:** Cambodia **Client:** Asian Development Bank	***Rapid assessments on the status of water resources and eco-hydrological environments for the Tonle Sap and Mekong Delta River Basin Groups and river basin surface water resource assessments*** **Main Project Features**: The project enhances capacity for sustainable water resources management and strengthens capacity of the Ministry of Water Resources and Meteorology (MOWRAM) to manage and deliver irrigation services by performing (i) a rapid water resources assessment of the Tonle Sap and the Mekong Delta river basin groups; (ii) an ecological assessment of these two river basin groups to identify areas for development and conservation; (iii) detailed surface water resources assessments for five river basins within these groups. **Activities Performed**: • Collection and reviewing of relevant hydrological data and literature • Cooperation with the national and international modelling team to set up and run simulation models on hydrology and water allocation (WEAP) for Cambodian river basins • Scenario analyses and proposition of effective strategies for river basin management and irrigation development

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Duration: 2019 **Position:** Trainer in hydrological modelling and remote sensing **Location:** Pokhara, Nepal **Client:** Institute of Forestry (IOF) / Nuffic	***Use of open-source platforms for hydrological modelling of data-scarce regions in Nepal*** **Main Project Features**: This three-week training is organized to build capacity at the IOF and other Nepali government departments in the use of publicly available remote sensing platforms (Google Earth Engine) and open-source hydrological modelling tools. **Activities Performed**: • Preparing training material and tutorials (land cover classification, water balance analyses, hydrological modelling) • Executing training and supervising participants
Duration: 2019 **Position:** Hydrology expert **Location:** Mandalay, Myanmar **Client:** Netherlands Commission for Environmental Assessment	***Review of ESIA Pyigyitagon Water Supply Project, Myanmar*** **Main Project Features**: The proposed Pyigyitagon Water Supply Project will cater for approximately 170,000 people and various businesses and industries in Pyigyitagon township, Mandalay. An Environmental and Social Impact Assessment of the development of the infrastructure and operation of the project was performed. This assignment includes the review of this ESIA in terms of hydrological aspects and advisory to the NCEA. **Activities Performed**: • Reviewing hydrological aspects of the ESIA • Reporting and advice to the NCEA
Duration: 2017 - 2020 **Position:** Hydrology and erosion modeler, trainer **Location:** Madagascar **Client:** World Bank	***Land use planning for enhanced resilience of landscapes (LAUREL) Madagascar*** **Main Project Features**: The result of this consultancy assignment is a prototype land use change simulation platform to be used by the government of Madagascar to characterize how land use is likely to evolve and assess the consequences of alternatives on the achievement of development objectives and environmental objectives. Key output variables include land use changes, forested area, carbon storage, river discharge, soil erosion rate, crop production and associated nutritional coverage and agricultural income. The platform is demonstrated for some of the country's land degradation hotspots. **Activities Performed***:* • Hydrological and erosion modelling • Assessing impacts of climate change and land management scenarios • Providing training in hydrological modelling to staff of relevant government departments
Duration: 2018 **Position:** Hydrologist and remote sensing expert **Location:** Kiwira Catchment (Tanzania), Nyamindi Catchment (Kenya) **Client:** IWaSP / GIZ	***The business case for investing in catchment conservation: case studies Nyamindi River Catchment, Kenya and Kiwira River Catchment, Tanzania*** **Main Project Features**: The assignment looks to apply a business case analysis methodology to small hydropower investments. In general, during the development and operations of hydropower facilities the benefits stemming from sale of electricity rarely benefits the communities living within the catchment or support the protection of the catchment in which the hydropower development sits. This can lead to unsustainable management of resources and increases the risks faced by the catchment communities, the facility and its investors. To substantiate the business case for investment in catchment conservation, hydropower potential of small hydropower projects is evaluated under different future scenarios related to SLM interventions, land degradation, climate change and water demand. **Activities Performed***:* • Remote sensing analysis of trends in land use change and land degradation • Hydrological modelling of SLM, climate change and water demand scenarios • Interpretation of results and Cost-Benefit Analyses (CBA)
Duration: 2018 **Position:** Project leader **Location:** Ghana **Client:** RVO, Netherlands government	***Enhancing irrigation water productivity and yields of pineapple farmers in Ghana*** **Main Project Features**: Study to determine the technical and economic feasibility of the development of an extension service for Ghanaian semi-commercial farmers based on flying sensor (drone) technology, crop models, and locally embedded data sharing and farmer advisory infrastructure. **Activities Performed***:* • Overall project coordination • Quality control of project output

Duration: 2018 **Position:** Water Resources Information Expert **Location:** Cambodia **Client:** Asian Development Bank	***Preparation of tender documents for setting up a National Water Resources Information System in Cambodia based on Water Accounting Plus*** **Main Project Features**: The foreseen IAIP project of ADB has two outputs: (i) efficiency and climate resilience of irrigation systems enhanced; and (ii) water resources management improved. Under the second output, the project will develop a water resources information system (WRIS) as a common platform for country-wide data of river flows and rainfall. The WRIS will be based on the Water Accounting Plus framework and will be housed in national water data management center that will be established by the project. Under this assignment, assistance was provided to MOWRAM to develop the terms of reference for the WRIS, including its establishment and operation. **Activities Performed***:* • Writing ToR documents for the implementation of the WRIS, including a capacity building program on WA+ and remote sensing • Cost estimation of required consultancy inputs
Duration: 2018 **Position:** Hydrologist and GIS expert **Location:** Upper Mekong Region (Myanmar, China) **Client:** Mekong River Commission	***Preparation of the Upper Mekong chapters of the Mekong River state of the basin report 2018*** **Main Project Features**: The Mekong State Of the Basin Report (SOBR) is published by the MRC every five years. It provides information on the status and trends of water and related resources in the Mekong Basin, from an economic, social and environmental perspective. The geographical scope of the 2018 Mekong SOBR is extended to include the Upper Mekong Basin in Yunnan (China) and Myanmar. **Activities Performed***:* • Literature review • Analysis of remotely sensed and other geospatial data • Liaison with MRC and relevant stakeholders in Myanmar and China • Preparation of high-quality figures, graphs and texts
Duration: 2017 - 2018 **Position:** Project manager, hydrology and remote sensing expert **Location:** Huambo, Angola **Client:** RVO, Netherlands government	***Remote sensing for land suitability assessment in Angola*** **Main Project Features**: This project demonstrates the potential of remote sensing to Angolan stakeholders by (i) producing trend analyses of agricultural land use and cropping seasons, (ii) mapping agro-ecological land suitability for specific crops, and (iii) evaluating irrigation potential spatially across Huambo Province. Local counterparts are the University of Huambo and the Provincial Agricultural Department. **Activities Performed***:* • Project management • Mapping of agro-ecological land suitability • Integration of remote sensing and a hydrological model for examining irrigation potential
Duration: 2017 - 2018 **Position:** Hydrologist and trainer **Location:** Myanmar **Client:** Partners for Water, Netherlands government	***Leapfrogging delta management: showcase operational rainfall monitoring*** **Main Project Features**: In response to the request of the NWRC in Myanmar, the interest of Dutch innovative enterprises, and the large investments which take place in Myanmar by international organizations, the main aim is to test and demonstrate innovative smart information solutions in the Delta and disseminate the results widely. One of these solutions is an operational rainfall mapping methodology that provides crucial inputs for flood forecasting and hydrological modelling applications. **Activities Performed***:* • Data analysis and downscaling of satellite-derived rainfall maps • Capacity building of Myanmar counterparts (NWRC, YTU, DMH) on topics related to hydrology and water management
Duration: 2017 **Position:** Hydrologist and remote sensing expert **Location:** Mozambique **Client:** ADVZ **/** HUB Lda, Mozambique	***Water productivity assessment for the APROVALE project*** **Main Project Features**: Project APROVALE ("Productive Water in the Zambezi Valley") is funded by the Dutch Ministry of Foreign Affairs and led by the Agency for Development in Zambezia (ADVZ). The project aims to strengthen the agricultural practices of local small commercial producers in the Zambezi Valley in order to combat climate change and ensure food security. Quantification of water productivity is essential for reporting on baseline conditions and monitoring future impact of the project **Activities Performed***:* • Data analyses (collected in-field, remotely sensed, GIS)

	• Agro-hydrological modelling for quantification of Water Productivity
Duration: 2017 **Position:** Course coordinator, lecturer **Location:** The Netherlands **Client:** Utrecht University	***Leading BSc. course Earth Observation and Data Analysis*** **Main Project Features**: The 10-week course of Earth Observation and Data Analysis is part of the curriculum of second-year BSc. Students of Utrecht University. It consists of weekly lectures and practicals covering the theoretical and practical fundamentals of remote sensing and processing of geospatial data. **Activities Performed**: • Coordination and organization of the course • Preparation of educational material • Providing lectures and supervising practicals
Duration: 2016 - 2017 **Position:** Hydrological modeler **Location:** The Netherlands **Client:** RVO, Netherlands government	***Smart coupling of models for improved estimation of actual evapotranspiration*** **Main Project Features**: Development of a methodology for automatic coupling of a hydrological model of The Netherlands to a surface energy-based evapotranspiration model, in order to improve the estimations of actual ET for regional water managers during clouded conditions **Activities Performed**: • Hydrological modelling and forecasting • Project management
Duration: 2016 - 2017 **Position:** Hydrological modeler **Location:** Spain **Client:** European Commission	***Improving prediction of hydrological extremes (IMPREX)*** **Main Project Features**: The IMPREX project is designed to support the reduction of Europe's vulnerability to extreme hydrological events through improved understanding of the intensity and frequency of future disrupting features that may be very different from today's reality. The goal is to substantially improve our forecasting capability of hydrological extremes and their impacts at short to seasonal time scales. **Activities Performed**: • Water accounting and remote sensing analysis • Hydrological modelling of Segura and Upper Tagus River Basins • Seasonal forecasting of reservoir inflows • Statistical analyses of model parameter sensitivity and forecasting uncertainties • Impact assessments of climate change scenarios
Duration: 2016 **Position:** Hydrological modeler **Location:** Kenya **Client:** IWMI	***Impacts of climate change and sustainable land management investments on water and sediment flows in the Upper Tana basin*** **Main Project Features**: The objective is to evaluate the impacts of climate change on investments in sustainable water and land management in the Upper Tana. More specifically, the analysis provides insight in how climate change can influence the biophysical effectiveness of different land management options in the Upper Tana, focusing on flows and sediments that influence downstream relying services, mainly hydropower. **Activities Performed**: • Hydrological modelling of different climate change and investment scenarios and assessment of their impacts (SWAT) • Co-authoring IWMI research report
Duration: 2016 **Position:** Hydrological modeler **Location:** Zambia **Client:** The Nature Conservancy	***Hydrological evaluation and ecosystem valuation of the Lukanga swamps*** **Main Project Features**: The Lukanga Swamp likely plays an important role in the hydrology of the Kafue River Basin, Zambia, in terms of both water quantity and quality. To better understand the Lukanga hydrological system and the ecosystem services that are provided, remote sensing and simulation models are combined to assess the main water fluxes, erosion, sediment loads, and flooding characteristics (extent, duration and number of floods). **Activities Performed**: • Hydrological modelling (SWAT) • Water balance analyses
Duration: 2016 **Position:** Project manager and remote sensing expert	***Survey of existing remote sensing-based information products for water managers*** **Main Project Features**: STOWA and the Dutch water boards are interested to fully exploit the potential of information products derived from remote sensing. To this

Location: The Netherlands **Client:** STOWA, Dutch water boards	end, they require an elaborate database of all products currently on the market that could benefit water managers. The aim of this project is to create a database of all relevant technical properties of the existing products, including estimates of their technology readiness levels and market readiness levels. **Activities Performed***:* - Creating a database of available remote sensing products, based on surveys, interviews and expert knowledge - Providing expert opinion on specific properties of these products - Writing publications
Duration: 2016 **Position:** Remote sensing expert and project leader **Location:** The Netherlands **Client:** Institute for Physical Safety, The Netherlands	***Satellite information for wildfire management*** **Main Project Features**: The occurrence of wildfires and their behavior in The Netherlands is simulated by a spatial model incorporating several environmental properties. However, the spatially distributed input information is currently not dynamic, has low reliability and does not comply with the definitions of fuel classes. Within this project, an operational service is developed and evaluated that consists of several data layers related to vegetation type, density and moisture content, with the aim to enable a more accurate prediction of wildfire behavior. **Activities Performed***:* - Vegetation classification - Satellite image analysis - Project coordination
Duration: 2015 - 2016 **Position:** Hydrological modeler **Location:** Vietnam, China, Lao PDR **Client:** CGIAR Water Land and Ecosystems Program, Greater Mekong	***Inclusive development paths for healthy Red River landscapes based on ecosystem services*** **Main Project Features**: The project develops equitable and economically viable pathways for the land and water resources of the Red River Basin that maximize social and environmental benefits. The project develops these pathways through multilevel stakeholder dialogues, using scenario thinking, and supports this process with the development of tools and frameworks for governing water and land, including Water Accounting. **Activities Performed***:* - Hydrological modelling of different land use change / climate change scenarios in the Red River Basin - Quantification of hydrological ecosystem services in the Red River Basin - Writing scientific paper - Lead author of the white paper: *On Spatially Distributed Hydrological Ecosystem Services – Bridging the Quantitative Information Gap using Remote Sensing and Hydrological Models* - Capacity building
Duration: 2015 **Position:** Trainer in hydrological modeling **Location:** Vietnam **Client:** NUFFIC-NICHE	***Improvement of higher education in water management in view of climatic change in Vietnam*** **Main Project Features**: This project is executed by a consortium led by TU Delft, and aims to strengthen the education offer in IWRM at two universities in Hanoi **Activities Performed***:* - Providing a hydrological modelling course to Vietnamese water professionals - Creating material for hydrology education at TLU
Duration: 2015 - 2016 **Position:** Trainer **Location:** Mozambique **Client:** ARA-Centro, ARA-Centro-Norte, ARA-Norte, ARA-Sul, funded by NUFFIC	***Training in water resources and allocation models to support decision making for ARAs*** **Main Project Features**: Training of the staff of three Mozambican water boards (ARAs) in using water resource and water allocation models for strategic and operational decision support (flood prediction, climate change scenarios, land use changes, etc.). **Activities Performed***:* - Providing hydrological modelling courses at different locations in Mozambique - Preparing educational material and providing distance-support
Duration: 2015 **Position:** Hydrological modeler **Location:** Vietnam, China	***IWRM in the Red River basin: demonstration of remote sensing and models for optimized reservoir management*** **Main Project Features**: Implementing a flow forecasting system for basin-wide management of multi-purpose reservoirs based on hydrological and hydraulic modelling, in cooperation with different Vietnamese stakeholders and potential end users

Client: Netherlands government, National Remote Sensing Dept Vietnam	**Activities Performed**: • Hydrological modelling of the Red River Basin (SPHY) • Managing a small team of hydrologists • Coordination of work packages "Data & Validation" and "Hydrological Modelling
Duration: 2014 - 2015 **Position:** Hydrologist **Location:** The Netherlands **Client:** Province of Noord-Brabant	***SWIMM - Soil Water evaluation system based on Integrated Measurements and Modelling*** **Main Project Features**: Developing and implementing an information system for drought monitoring in nature reserves based on hydrological modeling and remote sensing **Activities Performed**: • Processing and combining large geospatial and statistical datasets from different sources • Setting up and running a raster-based hydrological model (SPHY) for long-term simulation of soil water processes and groundwater levels • Disseminating spatiotemporal hydrological information through a smartphone app and website
Duration: 2014 - 2015 **Position:** Hydrological modeler **Location:** Netherlands **Client:** TKI, Netherlands government	***Ground water for crops: towards a decision support system for optimal crop production through efficient water management*** **Main Project Features**: Exploring opportunities for a DSS that identifies threats of water shortage and water excess, based on actual soil moisture content and weather forecasting. The SWAP and SPHY models are being fed continuously with field measurements and remote sensing data. For the pilot farms with a Climate Adaptive Drainage (CAD) system installed, farmers can subsequently manage groundwater levels for optimized crop water conditions. **Activities Performed**: • Calibration of a spatial hydrological model based on 1-D SWAP results and soil moisture / groundwater level measurements • Scenario simulation (with and without CAD) • Forecasting of soil moisture content to advice CAD operation
Duration: 2014 **Position:** Hydrologist and remote sensing specialist **Location:** Vietnam **Client:** Netherlands government, National Remote Sensing Dept Vietnam	***Water and climate services for transboundary water management and disaster risk management*** **Main Project Features**: Demonstrating the potential of hydrological models and remote sensing for an operational online decision support system for Red River water policy makers **Activities Performed**: • Downscaling of weekly rainfall information using satellite-derived data • Constructing spatial drought impact, vulnerability and risk products based on analyses of rainfall and NDVI time series, as well as soil, land use, terrain information, and ground observations • Presenting the rainfall and drought information products through an online platform • Capacity building of Vietnamese counterparts
Duration: 2014 - 2015 **Position:** Hydrologist **Location:** Romania **Client:** Partners for Water, Netherlands government	***Online field-specific irrigation advice Romania*** **Main Project Features**: Piloting an irrigation decision support system based on-field measurements, simulation modelling of soil moisture and evapotranspiration deficit for a large farm in Western Romania **Activities Performed**: • Configuring, calibrating and running a hydrological model • Remote sensing image interpretation
Duration: 2013 - 2014 **Position:** Project manager and remote sensing expert **Location:** Pilot areas in Egypt, Ethiopia and Sudan **Client:** IFAD	***Smart ICT for weather and water information and advice to smallholders in Africa*** **Main Project Features**: Innovative approaches are tested and piloted to supply farmers in Africa with information on their crops via smart ICT technologies such as web portals and SMS services. The project aims at lowering the information access barrier in rural Africa and helping farmers in increasing their productivity by providing relevant, field and crop specific information during the growing season. Data components include crop growth, water use efficiency, nitrogen content, weather data and irrigation advice. **Activities Performed**:

	• Project coordination • On-site capacity building of local farmers, extension officers and policy makers • Managing internet data portals and operational SMS service • Managing a small team working on tool development and data processing • Participating in tool and information package development
Duration: 2011 - 2013 **Position:** Project manager, remote sensing expert **Location:** Egypt **Client:** World Bank	***Assessing the effects of farm-level irrigation modernization on water availability and crop yields in the Nile Delta*** **Main Project Features**: Evaluating impacts of World Bank funded irrigation improvements in the Nile Delta on consumptive use, crop yields and biophysical / economic water productivity of smallholder farms. **Activities Performed***:* • General project coordination and communication with client, subcontractors and Egyptian government • Land use classification based on satellite information • Irrigation efficiency analysis based on satellite information, hydrological modelling results (SWAP) and farmer surveys • Analysis of economic water productivity and salinity issues • Capacity building during workshops at the Ministry of Agriculture and Land Reclamation, Cairo
Duration: 2012 **Position:** Remote sensing expert **Location:** Morocco **Client:** FAO	***Land and water productivity in the Doukkala irrigation scheme, Morocco*** **Main Project Features**: Mapping of water consumption, agricultural production and water productivity in the Doukkala irrigation scheme (Morocco) based on remote sensing for identification and upscaling of best practices. **Activities Performed***:* • Crop classification • Training of local water managers in using remote sensing for assessing land and water productivity, El Jadida, Morocco
Duration: 2011 - 2012 **Position:** Project manager, hydrologist and remote sensing expert **Location:** New Zealand **Client:** Environment Canterbury	***Assessment of water consumption from the irrigated Canterbury Plains*** **Main Project Features**: Satellite image processing and evapotranspiration modeling, managing an operational system of data delivery, and Water Accounting to assess the sustainability of water use in the river basins of Canterbury, New Zealand. **Activities Performed***:* • Project coordination • Satellite image processing and evapotranspiration modelling • Managing an operational system of data delivery • Water Accounting to assess the sustainability of water use in the river basins of Canterbury
Duration: 2010 - 2011 **Position:** Project manager and remote sensing expert **Location:** Mali **Client:** Office du Niger / Netherlands Embassy in Mali	***Irrigation performance of the Office du Niger irrigation system*** **Main Project Features**: Delivery of spatial information on the performance of the Office du Niger irrigation system, and assisting local water managers in interpreting these data in the context of an envisaged future operational monitoring system. **Activities Performed***:* • Overall project coordination and communication with governmental donors and local authorities • Computing and interpreting spatial water consumption, rice yield and water productivity based on satellite information and field data • Providing course material and capacity building at L'Office du Niger, Ségou, Mali.
Duration: 2010 **Position:** Remote sensing and water management expert **Location:** Okavango River Basin **Client:** FAO	***Water accounting in the Okavango basin*** **Main Project Features**: Pilot project for construction of a universal Water Auditing framework for river basins. **Activities Performed***:* • Satellite image processing and land use classification • Modelling of water consumption and biomass production of conserved ecosystems and agriculture • Setting up a water balance for the basin and identifying options for sustainable land and water management through development and application of a new framework for water resources accounting

FutureWater

Language skills

Language	Speaking	Reading	Writing
English	Fluent	Fluent	Fluent
Dutch	Mother Tongue	Mother Tongue	Mother Tongue
French	Moderate	Moderate	Moderate
German	Basic	Moderate	Moderate

Computer skills

Simulation models:	Spatial Processes in HYdrology (SPHY), SWAT, AquaCrop, WEAP, InVEST, SEBAL
Programming:	Python, PCRaster (proficient), R (basic)
GIS / Remote Sensing:	ArcGIS, QGIS, Erdas Imagine, Google Earth Engine

Students supervised

Name	Level	Institute	Year	Title
Rex Steward	MSc.	Wageningen University and Research	2018	Cost-benefit assessment of SLM interventions in Madagascar based on hydrology and erosion modelling
Maurits Kruisheer	MSc.	Vrije Universiteit Amsterdam	2018	Mapping global irrigated area from water consumption estimates using the Google Earth Engine
Agnindhira Napitupulu	MSc.	Delft University of Technology	2016	Comparing different methods for quantifying storage changes in river basins
Joris de Vos	MSc.	Delft University of Technology	2014 - 2015	Determine reservoir operation rules from space and modelling with SPHY: a case study of the Tuyen Quang catchment and reservoir
Maren Wehling	BSc.	VHL University of Applied Sciences	2014	Online parcel-oriented irrigation advice Romania

Publications

Peer-reviewed publications:

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Samain, B., **Simons, G. W. H.,** Voogt, M. P., Defloor, W., Bink, N.-J., and Pauwels, V. R. N., 2012. Consistency between hydrological model, large aperture scintillometer and remote sensing-based evapotranspiration estimates for a heterogeneous catchment, Hydrol. Earth Syst. Sci., 16, 2095-2107, doi:10.5194/hess-16-2095-2012

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Simons, G.W.H., Bastiaanssen W.G.M., Ngo, L.A., Hain, C.R., Anderson, M. and Senay, G.B., 2016. Integrating Global Satellite-Derived Data Products as a Pre-Analysis for Hydrological Modelling Studies: A Case Study for the Red River Basin. Remote Sensing, 8, 279; doi:10.3390/rs8040279

Simons, G.W.H., Bastiaanssen, W.G.M., Cheema, M.J.M., Ahmad, B., 2019. A novel method to quantify consumed fractions and non-consumptive use of irrigation water: application to the Indus Basin Irrigation System of Pakistan. Agricultural Water Management, 236; doi:10.1016/j.agwat.2020.106174

Simons, G.W.H., Droogers, P., Contreras, S., Sieber, J., Bastiaanssen, W.G.M., 2020. Virtual Tracers to detect sources of water and track water reuse across a river basin. Water, 12(8), 2315; doi:10.3390/w12082315

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Amarnath, G., **Simons, G.W.H.**; Sharma, Bharat; Mohammed, Y.; Gismalla, Y.; Smakhtin, V. 2013. Smart-ICT for weather and water information and advice to smallholders in Africa. In: UNESCO-IHE Institute for Water Education. Conference on New Nile Perspectives Scientific Advances in the eastern Nile Basin, Khartoum, Sudan 6-8 May 2013. Advance copy of extended abstracts. Delft, Netherlands: UNESCO-IHE Institute for Water Education. pp.117-125

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Bastiaanssen, W., Poortinga, A., Han, L.T., Fenn, M., **Simons, G**., Ngo, L.A., Nguyen, N.H., Van Eekelen, M., Rebelo, L-M, Jenny, H., Van der Gijn, J., and Rutten, M., 2016. Water Accounting for a comprehensive analysis of river basin processes and management options within an emphasis on Vietnam. in: Water Security in a Changing Era, National Center for Water Resources Planning and Investigation (NAWAPI), Hanoi, Vietnam, 2015

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Van Delden, H., Fleskens, L., Baartman, J., Irvine, B., Van Lynden, G., **Simons, G.,** Vanhout, R., 2018. Exploring alternatives for mitigating land degradation and enhancing livelihoods in tropical regions. International Congress on Environmental Modelling and Software, Fort Collins, Colorado, USA

Van Delden, H., Fleskens, L., Baartman, J., **Simons, G.,** Vanhout, R., 2019. Providing evidence-based support for poverty alleviation and sustainable development in tropical regions. 23rd International Congress on Modelling and Simulation, Canberra, Australia

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Bartholomeus, R.P., **G.W.H. Simons**, G.A.P.H. van den Eertwegh, 2015. Anticipating on amplifying water stress: Optimal crop production supported by climate-adaptive water management. KWR Watercycle Research Institute report 2015.062

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