HydroRift

Independent Hydro and Environmental Consultancy

HydroRift Geo Solutions
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About HydroRift Geo Solutions

HydroRift is an association of independent consultants, scientists and engineers, providing water related services through a network of national and international experts. Our concept uses the synergies of our combined expertise for the successful implementation of a variety of projects.

Our core value is to provide cutting edge technical and management input, custom tailored to our client's needs, in our areas of expertise: water related studies and assessments, water shortage, programming and modeling, baseline assessments, remote sensing an GIS, climate change, and river basin management. HydroRift's key expertise is in the field of quantitative methods, based on simulation models, geographic information systems and satellite observations.

HydroRift approach combines applicable research with custom tailored solutions, adapted to the situational needs in different countries. We ensure success and sustainability of our projects through stakeholder involvement and participatory approaches. Where is applicable capacity building is an important element in our work.

HydroRift focuses on work in East and North Africa and the Middle East with our expertise geared towards finding sustainable solutions in a variety of environments ranging from arid regions to wetlands, involving stakeholders through our well established links with local institutions.

Our mission is to improving the access to clean and safe water. Smart, sustainable and practical solutions to water issues, that's our ambition. Combining science, focus on result and professional drive with personal commitment. Together with our enthusiastic water experts we research and advise. Continuous contact with the owners and users of the water is our standard.

Our values: Our team is united by the core values of Safety, Team work, Respect and Integrity. We live these values to strengthen our relationships with our clients and within the communities in which we operate. They define who we are.

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Services

In particular, HydroRift has profound expertise in the following fields:

- Water Resources Management
- Geology and Geophysics and Wireline Logging
- Remote Sensing and GIS
- Hydroinformatics
- Hydrological Modeling
- Hydraulic Engineering
- Drilling Supervision
- Climate & Disasters

HydroRift applies a system specific approach to generate a practical understanding of the groundwater and surface water. This enables the identification of promising locations to create access to water, and helps to assess the long-term effects of measures on the environment.

Our products focus on:

Downscaling Climate Change Impact; Groundwater modelling; Groundwater potential mapping; Groundwater quality assessment; Borehole design services; Geophysical survey and analysis; Flood Mapping; Environmental Risk Assessment; suitability assessment; Stakeholder and policy analysis; Business Cases Water in Agriculture; Agrohydrology; Integrated Water Resources Management; Catchment management plan; Groundwater policy; Salinization risk assessment; Salinization mitigation; Controlled drainage; Online GIS & Mapping; Hydrological monitoring networks; Data management systems; Spatial Analysis & Mapping; Ecosystems services assessment; Catchment modeling.

Our Team

Nasreldin Hamid, Msc
Hydro-geophysicist

Nasr is Hydro-geophysicist with a solid grounding of experience in both academic and commercial environments with more than eight (8) years' work experience as a hydrogeologist, spanning a wide range of practical applications, from village-scale groundwater development in Somalia and Sudan to regional-scale water resources exploration and management in East Africa. With a firm grounding in the field-related aspects of hydrogeology, Nasr has managed the design and implementation of large-scale field programs involving geophysical surveying, geological and hydrological mapping, deep exploratory and production well drilling, environmental sampling, and hydraulic testing. Most recently, he managed the Eirgavo Aquifer Assessment Project in Somaliland, funded by NRC under groundwater development program in Somalia.

Chris Print, PhD
Hydrologist

Chris is international professional in water resources engineering and management with more than 27 years' experience. He has 25 years of experience in Somalia including consultancy, advisory and management positions in associated fields of water engineering, research and development for international and UN organizations in water and land resources, agriculture and irrigation sectors in developing countries, managing and coordinating development and emergency programmers in support of rural development, food security and nutrition, early warning, disaster risk reduction and resilience.

Fridtjov Ruden, Msc
Hydrogeologist

Fridtjov Rude Cand.real has 40 years' experience as hydrogeologist, spanning a wide range of practical applications, from village-scale groundwater development in East Africa, via disaster and war-stricken zones in Ethiopia, Rwanda, Burundi and Somalia to regional-scale water resources exploration and management in Africa, Southeast Asia, Central America, Europe and China. Fridtjov has designed and implemented a series of drilling campaigns in Zambia, Tanzania and Ethiopia, and has worked in 13 countries in Africa and 21 countries worldwide.

Ahmednor Abdullahi, Msc
Hydrogeologist

Ahmdnor is a hydrogeologist specializing in water resources, specifically borehole citing, design and drilling for water supply. Ahmed has a BSc in Geological Sciences from AU, Sudan and MSc Hydrogeology from IHE-Deleft, The Netherlands. Ahmednor specializes as a field hydrogeologist within the water resources sector. He has been on various sites full time for 8 years for the construction, drilling, design and testing of several new abstraction drinking water supply boreholes. Ahmed also has experience working with groundwater quality and contaminant pathways in association to environmental impact assessments. He has specialist knowledge of arid and semi-arid hard rock areas with a particular interest in international development. His MSc thesis specialized on sea water intrusion and improving rural groundwater supplies in Somalia, focusing on geophysical exploration and matching the borehole design and construction technique to the geology to maximize the functionality potential.

Mahmoud Fayisal, Msc
Geologist and GIS

Mahmoud his Bsc in applied geology and Msc in Remote Sensing and GIS. He has worked on geological studies in Sudan and in Somalia and has been working in different positions, leading several projects. He has previously been Research in Remote Sensing Agency of Sudan. In the last years, he specializes in GIS analyses as well as remote sensing. In the project, Mahmoud works on surface geology, and structural mapping and subsurface modeling and simulation activities, data processing and interpretation.

Yasir Yousif, PhD
Geophysicsist

Yasir is a senior geophysicist with a solid grounding of experience in both academic and commercial environments focusing on geophysical exploration in different aspects including engineering geophysics, environmental geophysics, archaeological geophysics and borehole geophysics, and mapping. He has worked as a lead geophysicist on multidisciplinary geophysical surveys and investigations for a wide variety of clients, ranging from private to public to government agencies. Having worked in a variety of geophysical environments, Yasir has the innovation and initiative to introduce and implement methods from different fields, into situations where they have not been used previously.

Abdalla Abdi, Bsc
IT/Admin and Finance

Abdalla is IT specialist and has more than 8 years' experience in working with groundwater development projects ranging from humanitarian to commercial; national and international. He has a broad range of knowledge of the value-chain in projects related to geological work and has experience in management and financial support for a wide portfolio of projects. He also has experience in development and commercialization of new concepts based on groundwater development and GIS. He coordinates the fieldwork between Somalia and Kenya.

Randa Juma, PhD
Geologist / Remote Sensing and GIS

Randa her MSc in remote sensing applications for mineral exploration and structural geology from Al Neelain University in Sudan, as well as a PhD in Remote Sensing and GIS from Southwest Jiaotong University in China. She possesses strong analytical and communication skills. She has worked on geological studies in Sudan and China. In the last years, she specializes in GIS analyses and minerals exploration.

Tasneem Saeed, Msc
Hydrogeologist/Remote Sensing and GIS

Tasneem holds Msc in Remote Sensing and GIS from Sudan University, and has 7 years of experience working in both industry and academic research. Her background is in hydrogelogy. She works in Al Neelain University as GIS and water resources management lecture. She coordinates the fieldwork between Sudan, Somalia and Kenya.

Mobarak A.Babikir, Bsc
Geologist

Mobarak is experienced geologist with more than 9 years in the mining industry. His technical expertise covers green and brownfields exploration, resource and mine geology aspects along with project management and data science skills. He has been exposed to a broad spectrum of mineral deposit types including Porphyry Cu-Au, IOCG, hydrothermal gold, and VMS deposits.

Mojahid Yahya Omer, Msc
Hydrogeophysicsist – Well Logger

Mojahid Yahya Msc in applied geophysics from faculty of petroleum and Minerals, Al Neelain University, Sudan with a solid grounding of experience in borehole drilling and well logging. He has worked as a lead geophysicist on multidisciplinary geophysical surveys and investigations for a wide variety of clients, ranging from private to public, government agencies to NGOs. Yahya has a depth of experience as team-leader on small to large-scale projects, with the responsibility to coordinate a project from conception right through to final report.

Abdelbaqi Eljack, Bsc
Senior Drilling Engineer

Experienced Senior Drilling Engineer / Drilling Supervisor with more than 15 years demonstrated history of working in the water boreholes industry. He is skilled in drilling engineering, planning and operations. He has strong engineering professional with focus on Petroleum Engineering from Sudan University of Science and Technology, Khartoum. He worked on various project including areas with high complexity in terms of drill-ability and wellbore instabilities in Somalia. He is decisive leader and independent thinker with strong problem solving and project management skills.

Abdishakour Dahir, Bsc
Civil Engineer

Abdishakour has Bcs in civil engineering from Banadir University. He is experienced civil engineer and structural designer with working experience water project in South Central Somalia. He has strong engineering professional skills in AutoCAD, analytical skills, highways, Microsoft Word, and construction.

Sara Hassan, Msc
Project Management Support Geo Activities

Sara has Bsc of in Industrial Engineering from Gaziantep University, Turkey, and now started her Msc in Project Management in American University in Nairobi. She is motivated project manager with experience in managing and working in different types of organizations and varying projects, excellent at juggling multiple tasks and working under pressure. She is technically savvy with outstanding business and project management skills. She coordinates the fieldwork between Somalia and Kenya.

Water Resources Management

HydroRift provides expert consultancy services in the field of Integrated Water Resources Management, Catchment Management and Hydrology, focusing on Somalia, Sudan and Kenya with special expertise in hydrology, hydrogeology and hydro-geophysics.

HydroRift connected team of geosciences specialists use various analytical methods and scientific techniques to collect and analyses data to help solve water-related challenges, such as environmental preservation, natural disasters, and water management. We work with clients to understand project challenges and apply imaginative thinking to find cost-effective solutions that will have a lasting community benefit.

Hydrogeology

Groundwater is a lifesaving resource in times of drought and a cost-effective way to store seasonal water supplies. With you, our hydrogeologists work alongside our engineers, environmental consultants, planners, surveyors and GIS consultants to arrive at integrated solutions. HydroRift has hydrogeological experience, in groundwater resource assessment, aquifer storage and recovery, aquifer depressurization, groundwater management and environmental assessment, salinity. We work together with you to develop solutions that are both innovative and cost-efficient.

- Groundwater exploration, resource assessment and development
- Hydrogeological and hydrological site characterization
- 3D geological modeling for complex sites
- Spatial water balance using GIS and recharge studies
- Water supply studies and implementation of well fields
- Water quality monitoring and evaluations
- Environmental Impact Assessments and management plans
- Numerical modeling (groundwater and surface water)
- Groundwater-surface water interaction
- Hydrogeological mapping

Integrated Water Resources Management

The sustainable management of water is one of the key challenges facing our society today. Integrated Water Management (IWM) is a strategy that brings together all facets of the water cycle water supply, sewage management, water treatment and storm water management to achieve strong triple bottom line benefits.

Our professionals understand the interrelation and importance of water reuse, storm water, groundwater and seawater as essential additions to the traditional water sources from dams and rivers. Our people can deliver IWM schemes to benefit organizations and communities through superior energy efficiency, low embedded energy materials and live able, sustainable community environments.

Water Allocation Planning

Water resources and water demand analysis including future projections forms the basis of water allocation planning which in an interactive process involving stakeholders and decision makers leads to optimized planning and water use considering optimization and equitable and sustainable use aspects based on social, economic and political decisions.

Analysis includes the development and testing of various scenarios using water allocation modeling e.g. using WEAP software or other tools to facilitate decision-making. Related aspects include the legal base for water allocation, water licensing, water permitting and fee systems, monitoring, as well as institutional development and good governance.

Erosion & Sedimentation

Assessment and quantification of sediment entry pathways (agricultural/fluvial), estimation and measurement of erosion, sediment intrusion modeling.

Ecohydrology

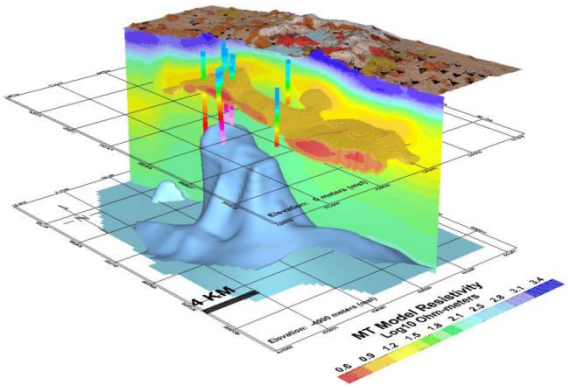
Evaluation of aquatic habitats for assessing and optimizing river utilization. Parameter functions are derived from biological databases and expert knowledge. In combination with hydrologic and hydraulic modeling results and data from remote sensing and mapping, GIS-based habitat assessments are carried out.

River Basin Management & Planning

Stakeholder consultations, trans-boundary supply demand analysis, optimization and development of investment options including urban and rural water supply, industry, irrigation and hydropower and ecological aspects.

Water Quality

Analysis and advice for water quality related problems and ecology aspects including remediation and mitigation options for pollution problems. Holistic approaches in solving environmental problems.



Geology, Geophysics and Wireline Logging

Our team applies geological principles to the civil engineering, mining and resources development industries. We work alongside our clients to deliver tailored solutions, to optimize the negotiation of your prevailing geological conditions, thereby minimizing both cost and project risk. Our geological services are fully integrated with the diverse skills base of HydroRift, as an international professional services provider.

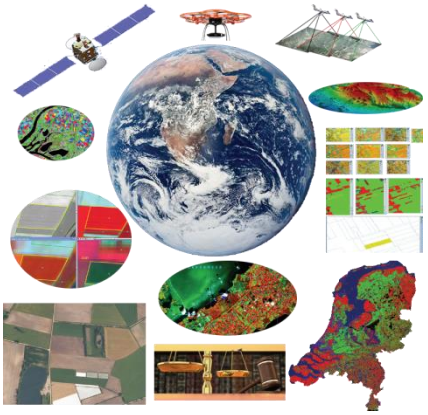
We provide comprehensive geotechnical, geological, geophysical and field/laboratory testing and construction phase services, through our connected global network of professionals. We draw on skills and experience from around the world to offer our clients the breadth and depth of a global network combined with knowledg e and experience to deliver locally.

- Surface and sub-surface investigations
- 3D Geological Modeling
- Mineral Exploration Planning and Execution
- Resource Modeling and Estimation
- Geological Studies
- Specialist rock testing laboratory
- Comprehensive geophysics (Resistivity, Seismic, ERT, Radar)
- Sample cuttings preparation and description
- Supervision and description of cores

Geotechnical & Civil Structures

HydroRift can provide comprehensive civil and geotechnical infrastructure development services under a design/build approach or as an integrated management team with our client. HydroRift can provide dedicated field engineers and quality assurance technicians for the duration of a project, from initial geotechnical investigations (drilling, sampling, lab testing, and instrumentation installation) and completion of design documents to field construction and implementation.

In many cases, lead design engineers are also involved with the construction quality assurance (CQA) and construction management aspects of the project to confirm quality in the constructed project.



Remote Sensing and GIS

As technology progresses, satellites increasingly offer a reliable source of spatially distributed information on a variety of environmental variables. By using the reflective properties of the earth's surface and atmosphere, it is possible to monitor (among others) vegetative cover, rainfall, land surface temperature and actual evapotranspiration through time. Sensors like Landsat ETM, MODIS, NPP VIIRS and Sentinel offer a range of options on different spatial and temporal scales. HydroRift makes use of open-access datasets like these in consultancy studies, for operational decision support systems, and for feeding, calibrating and validating hydrological models.

Remote Sensing

Satellites now provide an archive of imagery that covers multiple decades. These extensive historical records allow us to identify trends and spatial patterns in different factors associated with water resource management, such as water supply, water consumption and crop growth. We analyze these trends and patterns to support policy makers in identifying appropriate measures at different locations in their management area. A number of satellites pass over quite frequently, making their data especially useful for operational decision support systems. We collect these data as soon as it comes available, process it using our models, and disseminate the resulting information to the end user of the system

Online GIS & Mapping

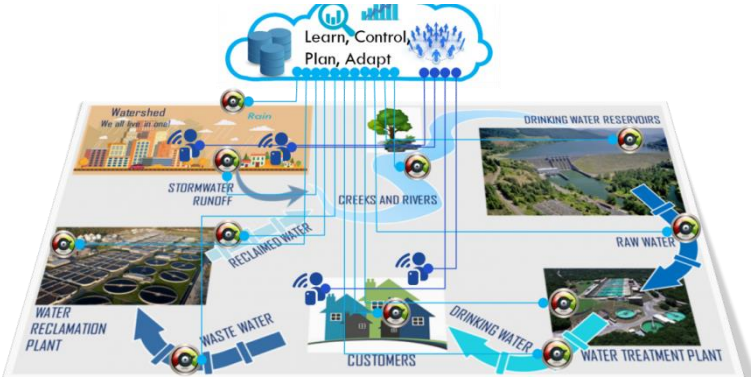
Development of managed online GIS database- and water information systems focusing on information provision and decision support. Development of custom built Python scripts. Data repositories and online GIS systems including quality management. Functionality for different levels of users.

Spatial modeling

Analysis of spatially distributed hydrological conditions and assessment of disaster risks on broad scales covering river basins or entire regions. GIS based hydrological modeling using Python scripts, runoff and erosion analysis for flood risk assessments and erosion quantification.

Drone surveys and mapping

Aerial surveys for fast and cost effective acquisition of detailed land cover and topographic datasets to be utilized for further image analysis using drones.

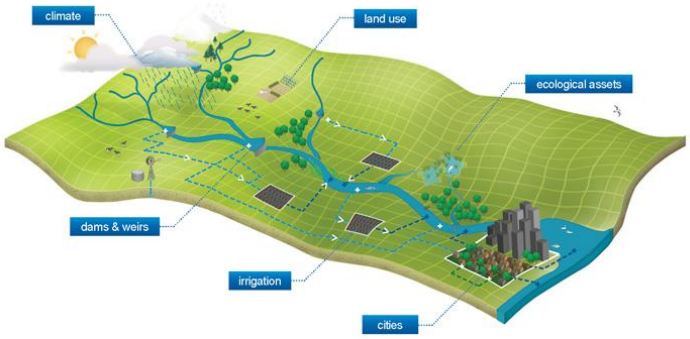


Hydroinformatics

Hydroinformatics products aim at integrating data from different sources in decision supporting information products. HydroRift integrates Geographical Information Systems (GIS), Remote Sensing data, output from simulation models and other data in information and communication applications that can be used for decision support at various levels, ranging from small-scale operational services to large river basin scale strategic decision support tools.

The abundance of climatological, hydrological, and remote sensing data in the public domain nowadays calls for superior data analysis, data handling, data management and data integration methodologies to translate scientific data to knowledge products that are informative, intuitive, understandable and supportive in decision making.

HydroRift team knows what data is available, how to access it, and how to translate data into useful integrated products. We can combine data with objective-specific hydrological simulation models in hydroinformatics products. Developing simulation models, visualizing spatial information and analysis results are among our key expertise. We are specialized in visualizing and converting complex results of numerical models to comprehensible information for policy makers.



Hydrological Modeling

Why do we need models?

It is well-known that the number and diversity of water-related challenges are large and are expected to increase in the future. Current and future water-related challenges are location and time specific, and can vary from impact of glacier dynamics, economic and population growth, floods or extended and more prolonged droughts, amongst others. In response to these challenges, hydro logical models have been developed to analyze, understand, and explore solutions for sustainable water management, in order to support decision makers and operational water managers.

The application and development of hydrological models are key activities of FutureWater. This allows us to increase our knowledge about hydrological processes, and provide sustainable solutions for integrated water resources management. In general, we develop and apply hydrological models for two main reasons: process understanding and scenario analysis.

Process understanding

To understand hydrologic processes, a large amount of detailed quantitative measurements are required at different spatial and temporal scales. The strength of hydrological models is that they can provide output at high temporal and spatial resolutions, and for hydrological processes that are difficult to observe on the large scale that they are generally applied on. Hydrological models therefore enable us to gain insight into hydrologic processes using a limited number of measurements.

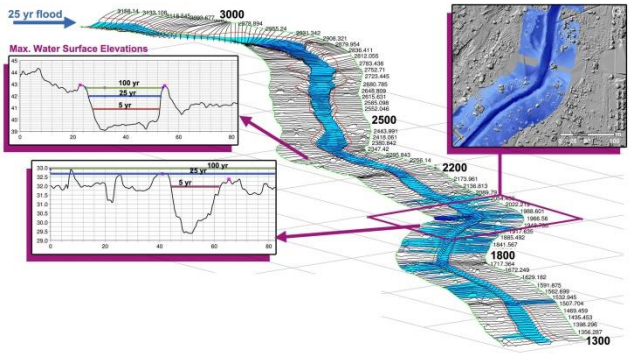
Scenario analysis

The most important aspect of applying models is in their use in exploring different scenarios, expressing for example possible effects of changes in population and climate on the water cycle. Models are also applied at the operational level to explore interventions to be used by water managers and policy makers. Examples of this are changes in reservoir operation rules, water allocation between sectors, investment in infrastructure such as water treatment or desalination plants, and agricultural and irrigation practices.

Using hydrological models in scenario analyses we attempt to solve the question “What if…?”. Data and statistics are crucial to evaluate the past and present, but models are critical to investigate options for the future.

Models that we use

HydrRift does not focus on the use of a single hydrological model, but has a variety of models and techniques available. The model that is eventually selected depends on the problem to be addressed and/or the question to be answered. The spatial scale is essential in this context as is the amount of physical detail required for the specific project. Usually one model does not suffice and a combination of two or three models is required. We are frequently used by like HEC-RAS, SWAT, SWAP and WMS.



Hydraulic Engineering

HydroRift provides engineering and consultancy services for ports, harbors, river training works and sustainable infrastructure projects.

River Engineering

Design and construction supervision of river training works, intakes, piers, and bridge abutments. Erosion protection, flow channeling and slope stabilization, rehabilitation of dikes and emergency flood engineering.

Irrigation Engineering

Mountainous regions, braining rivers and seasonal rivers are examples where the off take of irrigation water poses significant challenges. We have experience in a variety of environments and approaches to solve irrigation problems including hydrological aspects, structure design and on-farm water management.

Hydraulic modeling

Hydraulic modeling is used for understanding the hydraulic behavior of river systems in various aspects including water level fluctuations, current velocities and flow rates under different conditions that are used to conduct flood assessments, shipping studies, structural designs, erosion assessments and environmental studies. In our approaches we use state of the art modeling software considering 1-D, 2-D and 3-D approaches depending on the assessed problems.

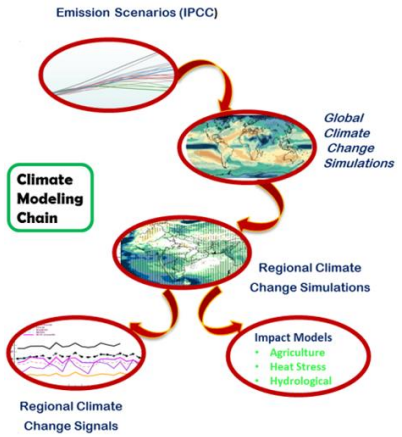
Flood modeling

Flood modeling delivers detailed information about flood scenarios including flood extent, inundation depth and depending on methodology current velocities and inundation time. We carry out flood modeling ranging from detailed high resolution analysis at local scale for flood risk assessments to broad basin-wide flood analysis. Linking flood modeling to satellite data we provide real time flood risk analysis. Considering future climate scenarios develop potential future flood risks under climate change conditions. Our analysis aim at understanding flood risks and threats e.g. for flood risk- and flood consequence assessments.

Drilling Supervision

Good supervision of water well drilling is essential for the provision of long-lasting water wells. For borehole drilling supervision and management HydroRift providing the following:

- Assist clients in the process of applying for necessary borehole drilling permits/authorization letters to enable drilling to commence.
- Preparation of Drilling Technical Specifications, borehole drilling Bill of Quantities (BOQs), conditions of borehole drilling contract, drilling tendering and tender evaluation (to select suitable drilling contractors)
- Supervision of Borehole Drilling and construction/installation works, Development, Test Pumping and installation of permanent pumping plants.
- Analysis of test Pumping data and selection of suitable borehole pumps for installation,
- Inspection of contractor's work and Certification of contactor's Bill of Quantities (BOQs)
- Geological logging
- Geophysical logging (where required)
- Water quality assessment and monitoring
- Supervision of installation works for permanent pumping plants, testing and commissioning of projects to clients.
- Preparation of borehole drilling and completion reports, etc



Climate Change

As changes in the Earth's climate become more evident instances of water shortage and excess are becoming increasingly frequent throughout the world. Weather conditions vary from place to place and from time to time. However our climate has never seen such quick and drastic changes in a short period as in the past two decades. Our challenge lies in understanding the negative and positive aspects of climate change and how to react and adapt on these changes in the best possible way. HydroRift investigates the basis of current climate change scenarios and their uncertainties and suggests how our water management could adapt in the best possible way. To do so we make use of simulation models and have developed downscaling methodologies for climate change scenarios to analyze water management options for the future.

Disaster Risk Management

Assessment and analysis of on-site conditions regarding the threats and risks in a disaster prone environment considering drivers as well as vulnerabilities of environmental conditions and the affected population. Development of risk and impact profiles, development of sustainable prevention, adaptation and mitigation options and strategies as well as implementation plans. Institutional assessments, support, development and capacity building related to disaster management capacity, implementation of support tools, including e.g. emergency plans and mapping products for identification of e.g. flood risks, potential climate impacts and vulnerabilities.

Climate Change Impact

Consideration of climate change scenarios and impacts on water resources assessments. Downscaling of global scenarios under consideration of regional and local effects including land use changes. Data assessments and evaluation. Policy development and institutional support.

Climate Change Downscaling

Downscaling of Global Climate Model (GCM) data using statistical or dynamical tools based on IPCC RCP 4.5 or RCP 8.5 approaches. Calibration of climate predictions to local conditions taking into consideration regional and local particularities.

Flood Mapping, Risk, Impact and Mitigation

Assessments of flood risks, potential flood impacts and possible mitigation options. Design of monitoring networks and control schedules as well as emergency plans, design of decision support tools, flood defense structures and mitigation options.

Equipment's and Instruments

HydroRift is supplier for the best-known manufacturers of equipment and portable instruments starting form water and wastewater analysis instruments, geophysical instruments, drilling rigs and consumables…etc

Contact

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