



IWES

INNOVATIVE WATER & ENVIRONMENTAL SOLUTIONS

COMPANY PROFILE 2026

Science Driven Water Solutions

Addressing the world's most critical water challenges through cutting-edge research and innovative technology

Founded 2019 · Berlin, Germany
GFZ Potsdam Spin-off Organization
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COMPANY OVERVIEW

Who We Are

Innovative Water and Environmental Solutions (IWES) is an international research and consulting organization founded in June 2019 and registered in Berlin, Germany. As a Spin-Off of GFZ Potsdam, we combine scientific rigor with practical application to address the world's most pressing water and environmental challenges.

Our work spans hydrological modeling, remote sensing, climate impact assessment, disaster risk reduction, and the development of proprietary software tools that translate complex scientific data into actionable insights for governments, development organizations, and water authorities worldwide.

2019

FOUNDED IN BERLIN

8+

COUNTRIES
WITH ACTIVE
OPERATIONS

15+

YEARS COMBINED
SCIENTIFIC EXPERIENCE

6+

MAJOR
DEVELOPMENT
PROGRAM
PARTNERS

"Our commitment lies in conducting scientific research with robust practical applications — translating complex environmental data into solutions that protect communities and ecosystems."

02

02 – MISSION & VISION

MISSION

Our mission is rooted in conducting cutting-edge scientific research with a robust emphasis on practical implementation. We are dedicated to addressing the challenges posed by climate change and actively working toward the development of effective water security strategies for communities around the world.

VISION

We aim to lead the way in addressing the global challenge of water scarcity and climate change. By pioneering scientific research and translating these insights into operational tools and advisory services, we envision a future where our innovative approaches contribute to a sustainable and water-secure world.

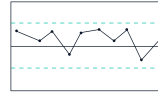
Where **science** meets
water security

What We Do



Mountain Hydrology & Cryosphere

Snow cover monitoring, glacier mass balance measurements, and hydrological forecasting using satellite data and the proprietary MODSNOW tool across Central and South Asia.



Climate Impact Assessment

Complex hydrological modeling for climate change impact assessment on water resources, including simulations applying IPCC CMIP5 climate scenarios through the end of century.



Disaster Risk Reduction

Flood forecasting, debris flow, landslide monitoring, and early warning system development for mountain hazards across Central and South Asia.



Water Security & Policy

Scientific advisory for transboundary water management, political dialogue facilitation, and agriculture sector water availability impact assessments.



Remote Sensing & GIS

Processing of satellite imagery, spatial data analysis, and development of GIS-based monitoring systems for environmental and hydrological applications.



Capacity Development

Training programs, technical workshops, and knowledge transfer for national hydrometeorological services, water organizations, and research institutes across Central and South Asia.

04

OUR SERVICES

What We Deliver

01

Consulting Services

- Climate impact studies
- Disaster Risk Reduction assessments
- Hydrological forecasting
- Flood and drought forecasting
- Glacier monitoring & field expeditions
- Water availability assessments

02

Software Development

- MODSNOW — snow & glacier monitoring tool
- Full software for natural sciences
- AI-driven hydrological forecasting
- Deep learning for remote sensing
- AI disaster risk prediction
- Big data hydrometeorological analytics

03

Capacity Building

- Technical training programs
- Institutional knowledge transfer
- Hydrometeorological station setup
- Database development
- Climate data processing
- R programming & data analysis

04

Remote Sensing & GIS

- Snow cover monitoring via satellite
- Processing of remote sensing products
- Spatial analysis & mapping
- Hydrological modeling
- Climate data bias correction
- General field investigations

05

Engineering Partnership

- Hydraulic engineering & flood protection
- Civil & structural engineering
- Infrastructure risk assessment in mountain regions
- Integrated engineering solutions for water-related infrastructure

05

MODSNOW PLATFORM

PROPRIETARY TECHNOLOGY

MOD SNOW

A satellite-based snow monitoring platform that tracks snow cover across entire river basins — automatically, every day, across 8 countries.

8+

Countries
operational

DAILY

Automated
satellite
updates

500M

Grid resolution

SWE

Snow water
equivalent
mapping

Snow Cover & Depth Monitoring

Operational monitoring of snow cover extent and snow depth across entire river basins using multi-source satellite data and modeling techniques.

Hydrological Forecasting

Seasonal water availability forecasting months in advance — enabling governments and water authorities to plan for flood and drought conditions.

Glacier Monitoring

Long-term tracking of glacier mass balance, shrinkage, and accumulation — providing critical data for climate change impact assessments.

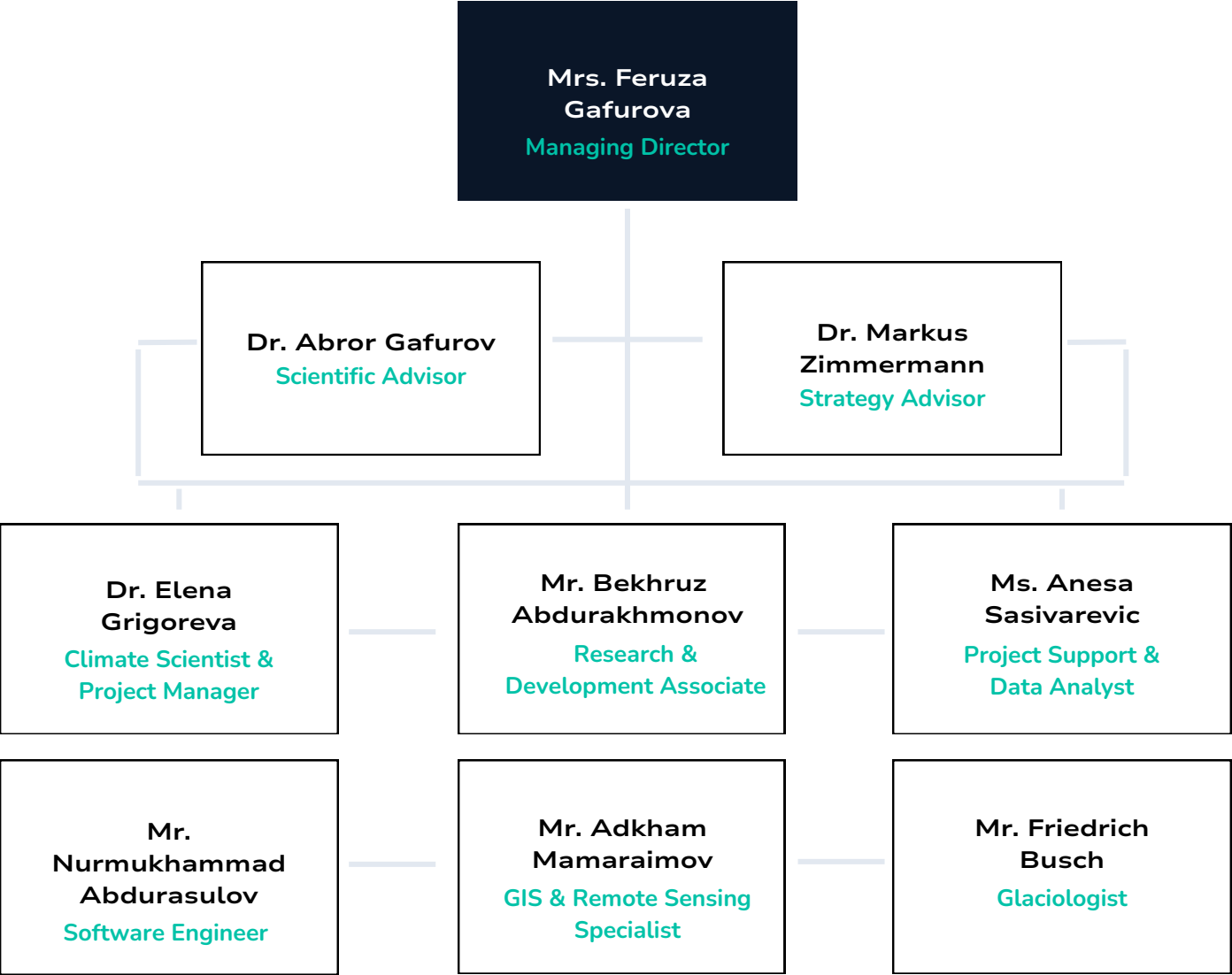
Transboundary Water Assessment

Assessment of water availability in shared river basins, supporting balanced and informed water distribution decisions across borders.



ORGANIZATION & PERSONNEL

Organizational Structure



Our Work in Action

CLIENT: WORLD BANK


11
MONTHS

Enhancing Snow Accumulation and Snowmelt Monitoring in Central Asia

500M

GRID RESOLUTION

5
PILOT RIVER
BASINS
DAILY

SATELLITE UPDATES

CHALLENGE

Snow is a critical hydrological component in Central Asia. Winter accumulation in the Pamir and Tian Shan mountains feeds rivers vital for hydropower and agriculture, yet institutional monitoring data is extremely scarce across the region.

SOLUTION

IWES developed and deployed MODSNOW across five pilot river basins, creating spatial layers of Snow Water Equivalent (SWE), snow depth, and daily snowmelt data at 500m resolution — automatically updated using satellite imagery.

IMPACT

Delivered within the Central Asian Hydrometeorology Modernization Project (CAHMP), now operational across all five Central Asian countries and South Asian hydromet services in Nepal and Pakistan.

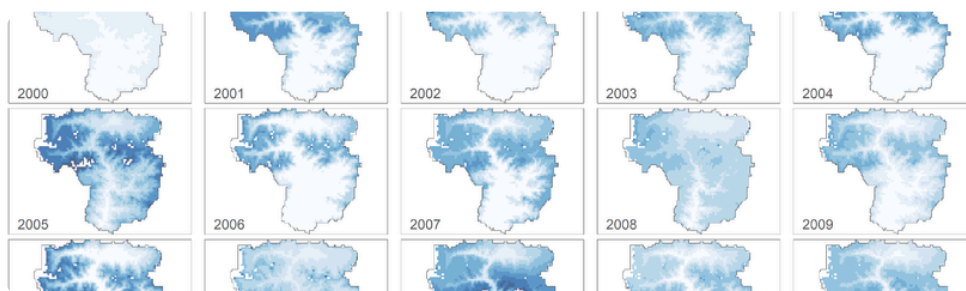


Image: MODSNOW

FbF Feasibility Study on Mudflow Scenarios in Kyrgyzstan, Tajikistan & Uzbekistan

FbFFORECAST-BASED
FINANCING**3**COUNTRIES
COVERED**EWS**EARLY WARNING
SYSTEM

CHALLENGE

Mudflows are a severe natural hazard in Central Asia, with limited meteorological data and no standardized modeling tools leading to unreliable qualitative forecasting.

SOLUTION

IWES identified mudflow hotspot areas using historical data, DEMs, land use, soil information, and MODSNOW climate data to determine high-risk periods linked to snowmelt and rainfall events.

IMPACT

Developed Early Warning System framework and guidelines for Forecast-based Financing (FbF) programs, enabling communities to take protective action before mudflow disasters occur.





Assessment of Tajikistan Disaster Preparedness Needs

DRM

DISASTER RISK
MANAGEMENT

POA

PLAN OF ACTION

PREPARED

WB FOLLOW-ON PROJECT

CHALLENGE

Tajikistan faces severe disaster risk from flash floods, mudflows, rockfalls, and avalanches, with outdated communication and information technology systems limiting emergency response capacity.

SOLUTION

IWES assessed current field conditions using a bottom-up approach, evaluated capacity building methodology proven across two decades of global projects, and developed a comprehensive Plan of Action with realistic, measurable goals.

IMPACT

World Bank initiated the PREPARED project directly based on IWES findings, supporting Tajikistan in building back better from 2021 floods and enhancing national disaster risk management capacity.



Operational Snow Monitoring using MODSNOW in Central and South Asia

SWE

SNOW WATER
EQUIVALENT

8

COUNTRIES
COVERED

DAILY

SNOW MONITORING

CHALLENGE

Snow is the primary water source across Central and South Asian river basins, yet real-time monitoring was largely absent across Nepal, Pakistan, Bhutan, and Central Asian states, limiting hydrological forecasting and drought early warning capacity.

SOLUTION

IWES deployed MODSNOW across 8 countries, delivering daily automated monitoring of snow cover area, SWE, snow depth, and snowmelt at 500m resolution. Full training and capacity building provided to national hydromet services.

IMPACT

Operational across all partner countries including Nepal, Pakistan, and Bhutan — providing continuous real-time water availability data to governments and water authorities for the first time.

MODSNOW Dashboard

Select View:

Map View

RIVER BASINS

Select a river from the map

GRAPHS

Snow Cover Area

Snow Cover Dynamics

FORECAST

Forecast

LINKS

Download Instructions

Instructions - About - Privacy Policy

TSC - References - Impressum

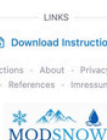


Image: modsnow.online



SAPPHIRE – Smart & Precise Prognostic Hydrology for Innovative Risk Management in Central Asia

10-DAY

FORECAST CYCLE

3PRIORITY
RIVERS**SDC**

SWISS FUNDED

CHALLENGE

Central Asian hydromet services struggled to process and operationalize high-frequency data from modern gauging stations, limiting their ability to manage hydrometeorological risks and water allocation effectively.

SOLUTION

IWES integrated MODSNOW into the SAPPHIRE framework, delivering daily snow depth, SWE, and snowmelt data for high-priority pilot basins, alongside decadal discharge forecasting for three river systems across partner countries.

IMPACT

Ongoing operational hydrological forecasting capability delivered to partner hydromet services across Central Asia, embedded within a Swiss SDC funded regional water management initiative.



Central Asian Flood Early Warning System (CAFEWS)

WAN

WIDE AREA
NETWORK

6

COUNTRIES
CONNECTED

EWS

EARLY WARNING
SYSTEM

CHALLENGE

No unified platform existed for timely climate-related data exchange among national hydromet services and emergency agencies across Central Asia, leaving the region without coordinated flood early warning capability.

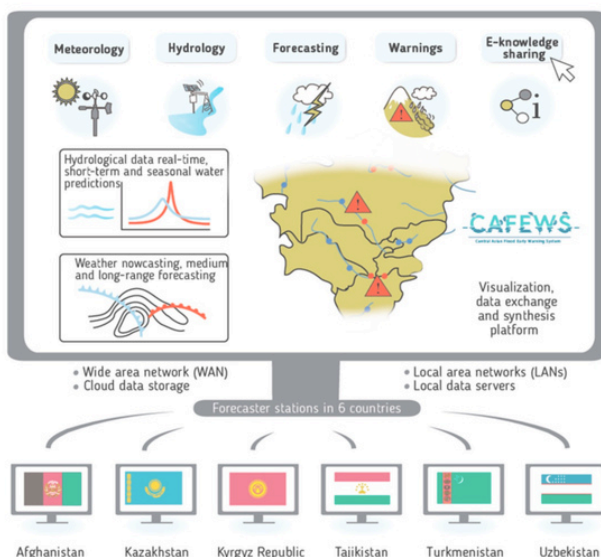
SOLUTION

IWES integrated MODSNOW alongside MCH and DWAT tools at each national hydromet service, supported by Wide Area Network installation and capacity development training across all Central Asian states and Afghanistan.

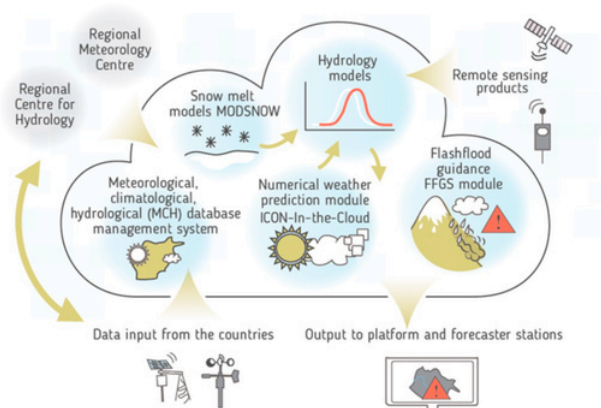
IMPACT

A functioning regional flood early warning system established for the first time, with real-time data exchange between hydromet services and emergency agencies across Central Asia.

CAFEWS: a system of systems



CAFEWS forecasting and modeling instruments





Climate Adaptation and Mitigation Program for Aral Sea Basin (CAMP4ASB)

TOT

TRAINING OF TRAINERS

5COUNTRIES
TRAINED**GIS**& HYDRO
MODELING

CHALLENGE

Limited technical capacity among Central Asian institutions to utilize GIS, hydrological modeling, and climate data tools, reducing the effectiveness of regional climate adaptation investments.

SOLUTION

IWES developed and delivered Training of Trainers workshops across the region, integrating GIS, R programming, hydrological modeling, and climate change impact assessment curricula into university programs.

IMPACT

Strengthened technical capacity across Central Asian research and educational institutions, with acquired skills integrated into university curricula and ongoing monitoring evaluated by IWES.



Guidelines for Natural/Multi-Hazard Structural Mitigation in High Mountainous Regions of South and Central Asia

IRM

INTEGRATED RISK
MANAGEMENT

4

COUNTRIES
COVERED

GLOF

GLACIAL LAKE
OUTBURST

CHALLENGE

Mountain settlements in South and Central Asia face severe multi-hazard risks including rockfall, debris flow, avalanche, flash flood, and glacial lake outburst floods, with no systematic framework for structural risk mitigation.

SOLUTION

IWES jointly developed a comprehensive Integrated Risk Management framework covering pre-assessment, risk assessment, evaluation, and both structural and non-structural mitigation strategies for high mountainous regions.

IMPACT

Guidelines now serve as the primary reference tool for planners and engineers working on development projects in hazard-prone mountain areas across Pakistan, Afghanistan, Tajikistan, and Kyrgyzstan.



Photo credit: Denis Zhang/Unsplash



Impact of the Qush Tepa Canal on the agricultural sector in Uzbekistan

AMU DARYA
PRIMARY RIVER

ECONOMIC
FOCUS

SCENARIO
MODELING

CHALLENGE

The Qush Tepa Canal in northern Afghanistan is projected to divert a significant volume of water from the Amu Darya, the primary source of irrigation water for Uzbekistan's agricultural sector.

SOLUTION

IWES and Berlin Economics built a linear optimization model to quantify the canal's economic impact on Uzbekistan's agricultural sector across multiple water reduction and climate change scenarios.

IMPACT

The report delivered to the German Economic Team provided economic projections and policy recommendations, including irrigation efficiency measures and land-use reforms to mitigate reduced water availability.





Technical Assistance on Irrigation Norms in Uzbekistan – Central Asia Water and Energy Program (CAWEP)

HYDROMODULE

ZONING FRAMEWORK
REVIEWED

SOVIET ERA

NORMS UNDER
REVISION

REMOTE SENSING

MODIS & SENTINEL
INTEGRATION

CHALLENGE

Uzbekistan's irrigation sector operates on Soviet-era hydromodule norms that do not reflect current climate conditions or cropping patterns, driving excessive water consumption, soil salinization, and systemic inefficiency.

SOLUTION

IWES reviewed irrigation norms and hydromodule zoning across Uzbekistan and Central Asia, evaluated MODIS, Sentinel, and SEBAL-based approaches, and proposed a hybrid model combining satellite data with farmer participation.

IMPACT

The study gave the World Bank's CAWEP programme a technical roadmap for modernizing irrigation governance in Uzbekistan, supporting a shift toward satellite-informed, performance-based water allocation.



Photo credit: IWES

08

OUR PARTNERS & CLIENTS

Trusted By

GFZ POTSDAM

THE WORLD BANK

USAID

UNDP

SWISS SDC

GERMAN RED CROSS

AGA KHAN AGENCY FOR
HABITAT

AGROHOUSE

BENDER INGENIEUR-GMBH

OIKO

NDR CONSULTING

ECLAREON

DSM CONSULTING

DEKONTA IC

INTEGRA

HYDROSOLUTIONS

CAREC

Let's Work Together

IWES is open to consulting projects, research collaborations, and partnerships with development organizations, governments, and water authorities worldwide.

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