



**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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# 01

## 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.

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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

# 03

FIELDS OF EXPERTISE

## 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.

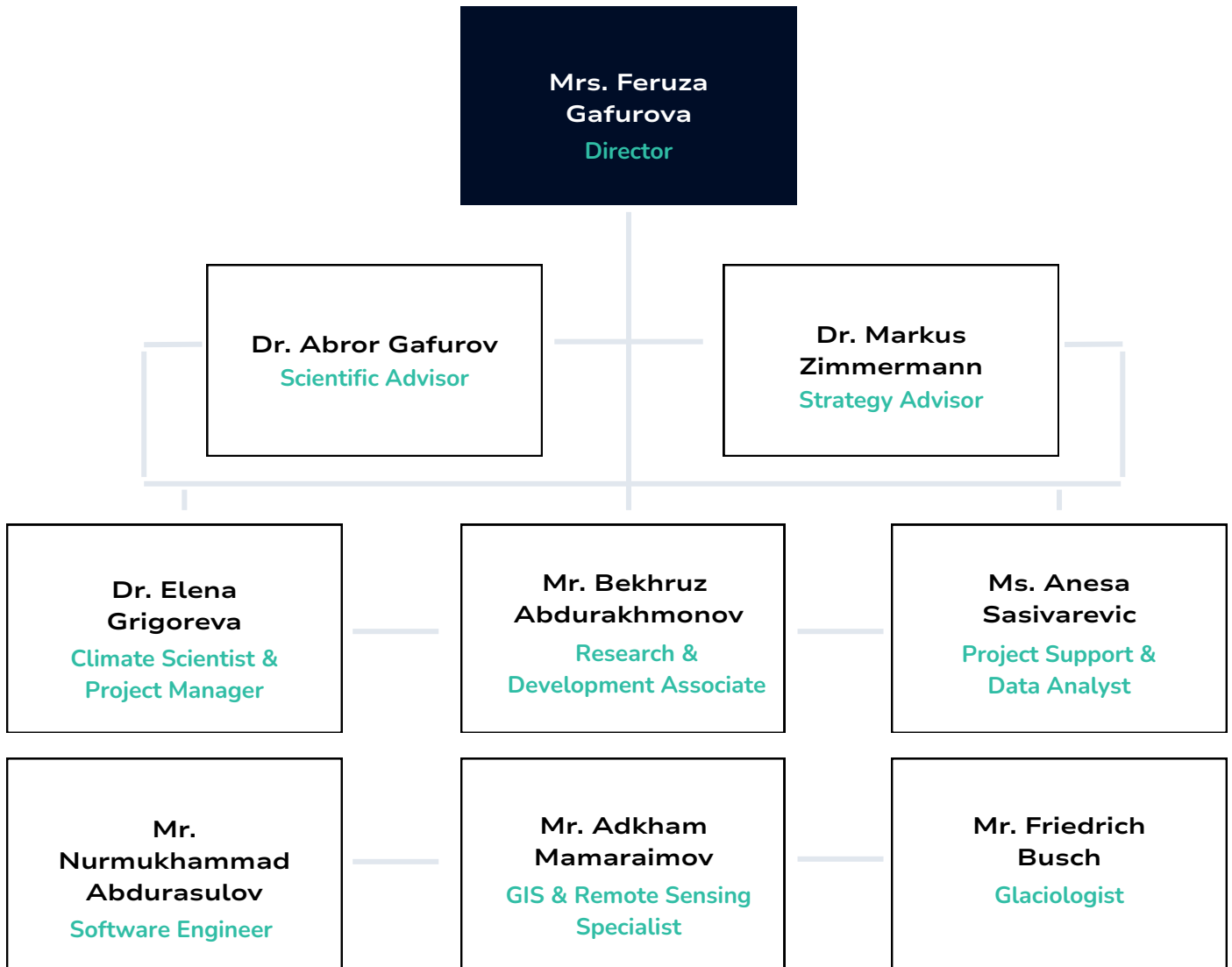
### Glacier Monitoring

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.

## Our Team



# 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.

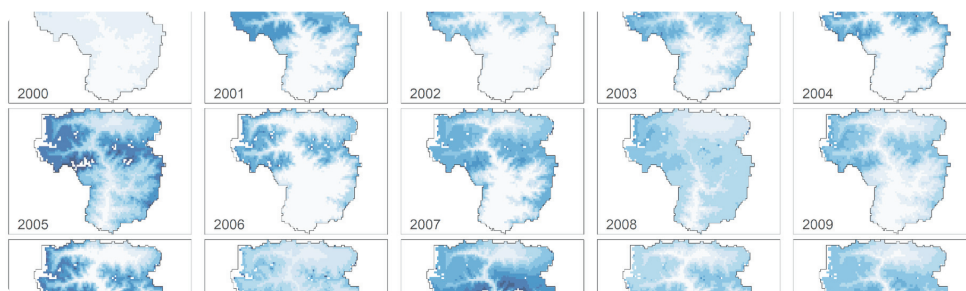


Image: MODSNOW



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

**FbF**FORECAST-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



Image: modsnow.online



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

**10-DAY**

FORECAST CYCLE

**3**

PRIORITY  
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.

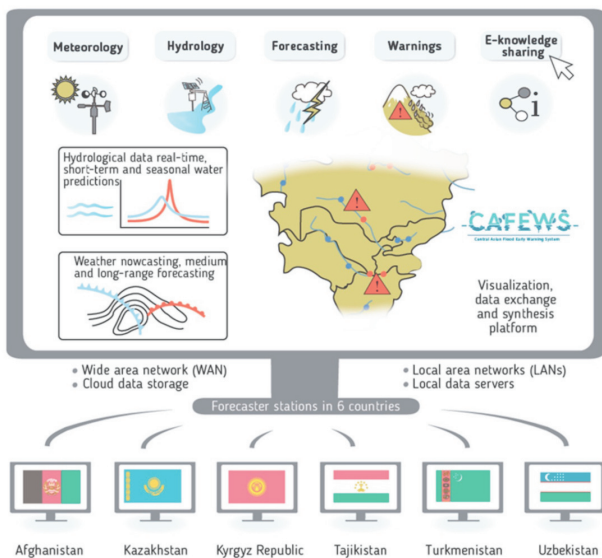
## SOLUTION

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.

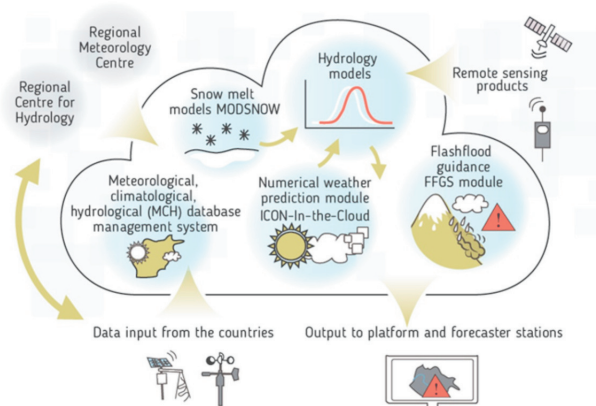
## IMPACT

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

**5**COUNTRIES  
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.



# 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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