

Scientific cooperation of CAIAG to improve the capacity of Kyrgyzstan in water resources planning and management

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5th Tashkent Water Security Lectures. Integration of Scientific knowledge on water and land resources into policy dialogue on climate adaptation in Central Asia

CAIAG Partners







The observation network of Kyrgyz Hydromet consists of 78 hydroposts (3 automatic hydroposts), of which 50 hydroposts transmit information about water daily content. Meteorological parameters are monitored by 32 meteostations with manual measurements and 23 automatic meteostations (a number of observations for about 7 years).



Hydropost on the Chatkal river. March 2019. It is planned to restore work this hydropost.

There are developed methods for predicting the water content of rivers based on the assessment of the accumulation of seasonal snow reserves according to the hydromet network. But considering the high cost of maintaining an observation network, in the 90s almost half of them were closed, primarily in high-altitude hard-to-reach areas.

Mudflow on the Aravan-Say River on July 9, 2017.



Dangerous hydrological phenomena in Kyrgyzstan include floods, mudslides and hydrological drought. About 70 emergencies related to mudslides occur annually in the Republic. Settlements, transport communications, farmland, hydraulic engineering, irrigation facilities and other objects are being destroyed.

The water content of the mountain rivers of Kyrgyzstan is characterized by great variability year to year. And high-quality and reliable forecasts of the water content of rivers are important both for the planning of water resources by water management and energy companies, and also for carrying out preventive measures to protect the population from mudflow floods by the Ministry of Emergency Situations.



1 & 2 phases of the project CAWa

Forecast of river runoff based on the snow cover of MODIS satellite images processed in MODSNOW-Tool program for the 14 river basins





- The methodology of forecast of river runoff for the period of high water and months of seasonal snowmelt was introduced into Kyrgyzhydromet:
- space images MODIS are downloaded daily in automatic mode,
- they are processed in the MODSNOWprogram for removing clouds from the snow cover,
- forecast of runoff is calculated taking into account the snow cover.



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3 phase of the project CAWa

Application of statistical methods in hydrological forecasting

- Partners: GFZ, National Hydrometeorological Services, CAIIZ
- hydrological drought
- natural water availability with an emphasis on the upper reaches of rivers on the runoff formation zone
- Objectives:
- to improve the forecast of seasonal runoff improving
- the accuracy of forecasts extending
- the anticipatory time accounting for uncertainty
- Data and methods:
- global available data
- regional analysis of snow cover area
- statistical models



Volkswagen**Stiftung**

Projection of water availability on the future periods in the upper Shu (Chu) River Basin according the CMIP5 scenario for 2025-2049, 2050-2074, 2075-2100





Training on working with the Methodology "Forecast of river flow in the Naryn basin and water inflow to the Toktogul reservoir based on MODIS images" March 2015, Bishkek



Working meeting of specialists of national Hydrometeorological services of Central Asian countries with the support of the CAWa project. June 2016, Tashkent



Projections of future runoff changes were reported at the conference EGU. 2018



Training for teachers of the course on hydrological modeling and forecasting for Central Asian countries. August 2019, Almaty.



Educational material for the "Higher School of Master's and Doctoral Studies" in CAIAG December 2020 – May 2021

Trainings at the Potsdam Climate Institute (PIK) on hydrological modeling SWIM on July 2022.





The results were submitted to the Office of the Prime Minister of the Kyrgyz Republic, district state administrations and regional departments of the Ministry of Emergency Situations.

Summer school on glaciers' mass balance: measurements and analysis



Summer school is conducted annually in the last 3-4 years within CATCOS и CICADA projects with support of the Swiss Agency on Development and Cooperation (SDC) and UNESCO Cluster Bureau (Almaty) in Kyrgyzstan, Kazakhstan, Tajikistan and Uzbekistan by Freeburg University and CAIAG. Young specialists and post graduates from Central Asia (Afghanistan, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan and Uzbekistan) study in summer school. The international team of experts in the field of glaciers monitoring and capacity building, train the participants...

CAIAG conducts trainings for researchers and employees of government organizations

- ✓ geoinformation systems
- ✓ data management systems
- ✓ monitoring stations
- ✓ impact assessment climate change
- ✓ remote sensing methods
- Methodology of the hydrological forecasting and modelling
- ✓ Disaster risk management for government agencies, local communities







