

7th Summer School

Water in the Aral Sea Basin under Climate Change - Management and policy challenges from data and knowledge perspectives

1 Dates & Venue

Dates: 14 – 25 June 2021



Venue: online via zoom

2 Description

The Summer School will introduce into innovative methods and tools for the analysis and monitoring of water and land resources in Central Asia. These methods are of great value in a framework of integrated water and land resources management.

The 2-week Summer School will combine theoretical lectures and practical exercises with discussion sessions on the implementation of new methods and tools in managing water and land resources in Central Asia. The programme will include an in-depth introduction into geographical information systems (GIS), an overview on remote sensing applications for land and water resources monitoring, an introduction into climatological data analysis and an introduction to GRACE. For the practical exercises in data analysis, the participants will use open source tools such as QGIS (www.qgis.org) for spatial analysis, and R (www.r-project.org) for statistical analysis.

The Summer School is organized within the frame of the CAWA-Green project as contribution to the Part of the Green Central Asia Initiative launched by the German Federal Foreign Office (Project period 2020-2022).

Programme details will be published at the CAWA Green Project www.cawa-project.net website in due time.

Language

The courses will be given in English, hence the knowledge of English language is a prerequisite to participation.

Lecturers

- Prof. Dr. Christopher Conrad (Martin Luther Universität Halle Wittenberg, Institute of Geosciences and Geography, Halle, Germany)
- Dr. Tilo Schöne (GFZ German Research Centre for Geosciences, Potsdam, Germany)
- Dr. Abror Gafurov (Section Hydrology, GFZ German Research Centre for Geosciences, Potsdam, Germany)
- Dr. Anastasia Lobanova (Potsdam Institute for Climate Impact Research, Potsdam, Germany)
- Dr. Muhammad Usman (Martin Luther Universität Halle Wittenberg, Institute of Geosciences and Geography, Halle, Germany)
- Dr. Milena Latinovic (Section Hydrology, GFZ German Research Centre for Geosciences, Potsdam, Germany)

Organizers

CAWa-Green- Project
www.cawa-project.net



German-Kazakh University
Master program "Integrated Water Resources Management"
Almaty, Kazakhstan
www.dku.kz, www.academic-waters.org



Martin-Luther University
Halle Wittenberg, Germany
<https://www.uni-halle.de>



Helmholtz Centre Potsdam
GFZ German Research Centre for Geosciences
Section Hydrology
Potsdam, Germany
www.gfz-potsdam.de



Potsdam Institute for Climate Impact Research (PIK)
Potsdam, Germany
www.pik-potsdam.de



In cooperation with:

**Deutsche Gesellschaft für internationale
Zusammenarbeit (GIZ) GmbH**
Bonn, Germany
www.giz.de



Contact to the organizers:

Almas Kitapbayev, German Kazakh University, kitapbayev@dku.kz
Astrid Krahn, GFZ German Research Centre for Geosciences, Potsdam, Germany,
krahn@gfz-potsdam.de

3 Participation and Funding

The Summer School addresses dedicated young professionals with interest in geoscientific tools for Integrated Water and Land Resources Management and its practical implementation. Eligible are participants from the following Central Asian countries: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, as well as Afghanistan.

4 Application

Interested students and researchers are expected to apply via the Summer School online application tool (<https://events.gfz-potsdam.de/online-cawa-green-summer-school-2021>). Applicants are requested to upload their CV and a motivation letter, which described their background and their expectations in detail. All documents have to be provided in English language.

Participants will be selected based on their application documents (motivation letter, CV).

Deadlines

Submission of application form and abstract	21 May 2021 (application extended !!!)
Notification of acceptance	04 June 2021

Preliminary Program

Monday, 14 June	
Welcome and Opening <i>Session head: Abror Gafurov, GFZ German Research Centre for Geosciences</i>	
 <i>Venue:</i>	
13:00	(Time shift 4h, 09:00 Germany) Technical Setup Opening / online log in / registration
14:00	Welcome speeches Ms Karin Marmsoler, Federal Foreign Office, Germany (TBC) Ms Caroline Milow, GIZ Tashkent (TBC) Overview about the Green Central Asia Initiative Ms Barbara Janusz-Pawletta, German-Kazakh University
14:30	Abror Gafurov Overview of the CAWA Green Project
15:00	Introduction round of the participants
Climate: Processes and statistical Analysis <i>Session head: Milena Latinović, GFZ German Research Centre for Geosciences</i>	
15:30	Lecture: The climate of Central Asia
16:00	Introduction to R
16:30	Break
Statistical Analysis of Climate observations – Part 1 <i>Session head: Milena Latinović, GFZ German Research Centre for Geosciences</i>	
	Exercise: First steps in R
	Introduction and Exercise: Analysis of climate observations
	Exercise: Analysis of climatic trends
	End
Tuesday, 15 June	
Introduction to Climatological Analysis – Part 2 <i>Session head: Anastasia Lobanova, PIK</i>	
13:00	Introduction: Climate Modelling
13:30	Hands-on: plots from DKRZ/Google Earth Engine
14:00	Lecture: CMIP5, CMIP6, CORDEX, Ensembles Approach
14:30	Hands-on: netcdf manipulation with R, plotting, panoply
16:30	Lecture: climate data for climate impact assessments
	End
Wednesday, 16 June	
Hydrology of Central Asia <i>Session head: Abror Gafurov, GFZ German Research Centre for Geosciences</i>	
13:00	Lecture: Regional Hydrology of Central Asia
13:30	Lecture: Snow cover monitoring (MODSNOW tool) and modelling
14:00	Exercise: Hydrological forecasting for user-defined basins: predictor selection
15:00	Break

15:30	Exercise: Hydrological forecasting for user-defined basins: linear model development
17:00	End
Thursday, 17 June	
Monitoring network	
<i>Session head: Tilo Schöne, GFZ German Research Centre for Geosciences</i>	
13:00	Climate and Environmental Monitoring in Central Asia
13:45	Exercise:
	Break
15:00	Environmental Data - Availability and Use of CAWa data
15:30	R Exercise using climate and remote sensing data:
	End
Friday, 18 June	
Introduction to GRACE/GRACE-FO data	
<i>Session head: Milena Latinović, GFZ German Research Centre for Geosciences</i>	
13:00	Introduction to GRACE/GRACE-FO missions
13:30	Total Water Storage Anomalies
	Break
14:00	Exercise: Subsetting GRACE data and extracting time-series
15:00	Exercise: R exercise?
	End
Monday, 21 June	
Remote Sensing and Geoinformation Sciences for Analysing Irrigated Land and Water Use in Central Asia and Afghanistan	
<i>Session head: Christopher Conrad, Muhammad Usman, Clara Athenstaedt, Martin-Luther-University of Halle-Wittenberg</i>	
13:00	Lecture: Monitoring the irrigation water use efficiency in the Aral Sea Basin
14:00	Discussion: Information Demand and Availability
14.45	Break
15:00	Lecture and Practical Course: General Introduction to WUEMoCA online tool (GUI and indicators)
16:30	Explanation of Homework -1: Repeat one Use Case from CAWa Green Channel
	End

Tuesday, 22 June	
GIS & Spatial Analysis Tools – Part 1	
<i>Session head: Muhammad Usman, Clara Athenstaedt, Martin-Luther-University of Halle-Wittenberg</i>	
13:00	Presentation and Discussion of Homework - 1: Use Case Examples in WUEMoCA
14:00	Lecture: Role of GIS in WRM, Open Source Tools
14:45	Break
15:00	Working with Shapefiles and Attribute Tables in QGIS, Spatial and attribute queries, symbology and legends – Lecture and Practical Course
16:30	Explanation of Homework - 2: Exporting excel data from WUEMoCA and performing attribute queries
17:00	End
Wednesday, 23 June	
GIS & Spatial Analysis Tools – Part 2	
<i>Session head: Muhammad Usman, Clara Athenstaedt, Martin-Luther-University of Halle-Wittenberg</i>	
13:00	Presentation and Discussion of Homework - 2
13:45	Raster data analysis: Mosaicking, clipping, working with terrain data
14:45	Break
15:00	Raster data analysis: Digitizing map data, sampling raster data using points or polygons – Lecture and Practical Course
16:30	Explanation of Homework - 3 : Importing shapefile into WUEMoCA for various analysis – User Polygon Toolbox of WUEMoCA
17:00	End
Thursday, 24 June	
Utilizing WUEMoCA and its data	
<i>Session head: Muhammad Usman, Clara Athenstaedt, Martin-Luther-University of Halle-Wittenberg</i>	
13:00	Explanation of Homework – 3: Importing shapefile into WUEMoCA for various analysis – User Polygon Toolbox of WUEMoCA
13:45	Using User Toolbox in WUEMoCA and exporting results in shape file
14:45	Break
15:00	Exercise: Exporting shapefile results in WUEMoCA and performing some spatial analysis using QGIS
16:30	Wrap up and outlook
17:00	End
Friday, 25 June	
Partners session	
13:00	Presentation from the Central Asian Journal for Water Resources (managing editor)
14:00	Discussion round
15:00	Wrap-up and outlook
	Closing Ceremony
	End

The preliminary program is subject to potential changes