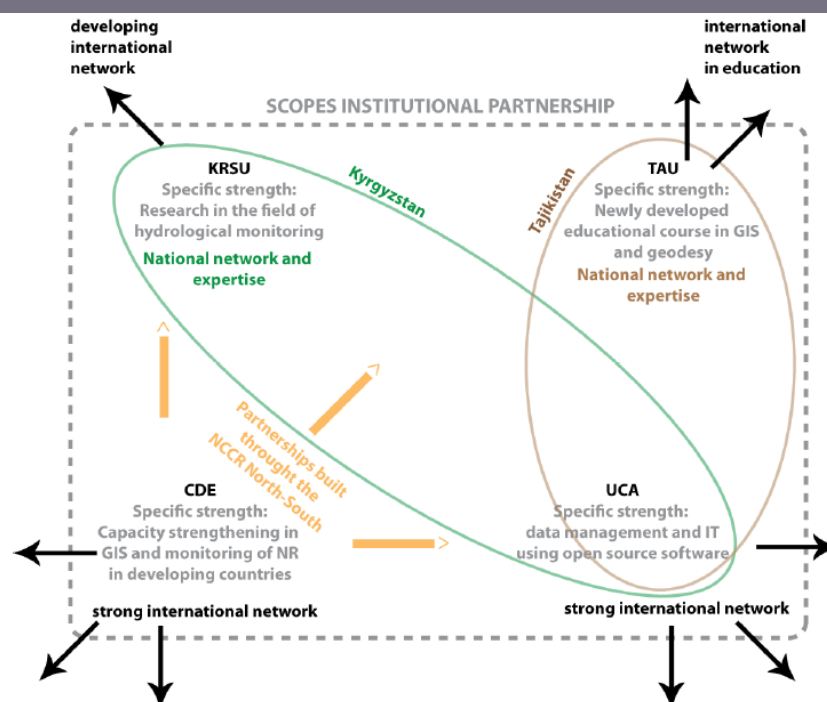


# Institutional Partnership: Geoprocessing for Natural Resource Monitoring – Capacity Strengthening in Tajikistan and Kyrgyzstan

Number of the IP: IZ74Z0\_128214

Interim scientific report 1 January – 31 December 2011

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 University of Central Asia (UCA)  
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## Abbreviations, Organisations and Internet-links

ACA*GIScience	Austria-Central Asia Centre for GIScience in Bishkek ( <a href="http://www.aca-giscience.org">www.aca-giscience.org</a> )
CAMP Alatoo	CAMP Alatoo Public Foundation ( <a href="http://camp.kg/?lang=en">http://camp.kg/?lang=en</a> )
CDE	Centre for Development and Environment at the University of Bern ( <a href="http://www.cde.unibe.ch">www.cde.unibe.ch</a> )
EARSeL	European Association of Remote Sensing Laboratories ( <a href="http://www.earsel.org">www.earsel.org</a> )
ESAPP	EASTERN AND SOUTHERN AFRICA PARTNERSHIP PROGRAMME (ESAPP), is a programme of the Swiss Agency for Development and Cooperation (SDC) and is executed by the Centre for Development and Environment (CDE) together with its partners. ( <a href="http://www.esapp.info">www.esapp.info</a> )
FSC	Swiss Government Scholarships for Foreign Students (FSC) ( <a href="http://www.sbf.admin.ch/htm/themen/bildung/stipendien/eskas_en.html">http://www.sbf.admin.ch/htm/themen/bildung/stipendien/eskas_en.html</a> )
GISCA	GIS in Central Asia, annual conference ( <a href="http://gisca11.aca-giscience.org/">http://gisca11.aca-giscience.org/</a> )
KRSU	Kyrgyz Slavic Russian University ( <a href="http://www.krsu.edu.kg">http://www.krsu.edu.kg</a> )
NCCR North-South	National Centre of Competence in Research (NCCR) North-South ( <a href="http://www.north-south.unibe.ch">www.north-south.unibe.ch</a> )
PAMS	Partnership Actions for Mitigating Syndromes are the practice-oriented component of the NCCR North-South ( <a href="http://www.north-south.unibe.ch/content.php/page/id/228">http://www.north-south.unibe.ch/content.php/page/id/228</a> )
TAU	Tajik Agrarian University ( <a href="http://www.tajagroun.tj/en">http://www.tajagroun.tj/en</a> )
TEMPUS GEM	Tempus project on “Geoinformatics: Managing Energy, Resources, Environment” ( <a href="http://tempusgem.zgis.net">http://tempusgem.zgis.net</a> )
TEMPUS	TEMPUS is a program of the European Commission. It supports the modernisation of higher education and creates an area of co-operation in countries surrounding the EU. ( <a href="http://ec.europa.eu/tempus">http://ec.europa.eu/tempus</a> )
UCA	University of Central Asia ( <a href="http://www.ucentralasia.org">www.ucentralasia.org</a> )
UNIGIS	The UNIGIS International Association is the world’s premier distance education initiative offering masters and diploma programmes in Geographical Information Science and Systems ( <a href="http://www.unigis.net/">http://www.unigis.net/</a> )

# 1 General Information

## ***Institutional Partnership: Geoprocessing for Natural Resource Monitoring – Capacity Strengthening in Tajikistan and Kyrgyzstan, Number of the IP: IZ74Z0\_128214***

In 2010, activities began in a three-year partnership between the University of Central Asia (UCA), Kyrgyz Slavic Russian University (KSRU), the Tajik Agrarian University (TAU) and the Centre for Development and Environment (CDE) at the University of Berne to strengthen capacity in geoprocessing for monitoring natural resources in Kyrgyzstan and Tajikistan. The project, Institutional Partnership: Geoprocessing for Natural Resource Monitoring – Capacity Strengthening in Tajikistan and Kyrgyzstan, is funded by a research grant awarded by the Swiss National Science Foundation and the Swiss Agency for Development and Cooperation to Dr. Thomas Breu (CDE) as the main applicant, and CDE Senior Research and UCA Senior Research Fellow Dr. Bettina Wolfgramm as the project coordinator in Central Asia. Dr. Wolfgramm is overseeing the project, to increase GIS capacity in the region in a holistic and integrated manner by building skills and resources, as well as opportunities in research, education and data management. Activities include establishing GIS laboratories at UCA and KSRU, developing online data management systems, linking and networking of partners, and financial support for participation in conferences and trainings.

### ***The project team***

The Steering Committee consists of Dr. Thomas Breu (CDE, Berne, CH), Dr. Nataliya Ivanova (KRSU, Bishkek, KG), Dr. Islomkul Ikromov (TAU, Dushanbe, TJ), and Dr. Nasreen Dhanani (UCA, Bishkek, KG). The following table provides an overview on the partner teams and their team members:

### ***Summary of activities 2010***

The project started with a kick-off workshop in Bishkek, in February 2010. The SCOPES project is working according to its objectives in the fields of geoprocessing research and education, as well as spatial data management. One team workshop per year is planned and each of these are focusing on one of the project objectives. In 2010, the team workshop was on ***education in geoprocessing***, took place in August 2010 at TAU. Under the objective of strengthening education, two GIS laboratories were set up, one at KRSU and one at UCA, and maintenance work in the TAU lab was funded. In order to address the need for improved training materials in Russian, especially based on open source GIS software, an existing Modular Training Manual developed by CDE is being translated into Russian and exercises are adapted to examples in the region. SCOPES partners working as GIS lecturers felt a strong need in updating and improving their GIS knowledge. Two lecturers from TAU, one from KRSU and a researcher from UCA's Central Asian Faculty Development Program have registered in the UNIGIS distance learning MSc program, and the SCOPES coordinator from KRSU in the UNIGIS professional course. Activities for improving ***research using geoprocessing***, included conference visits at the international level (EARSeL annual conference 2010 in Paris) as well as in the region (GISCA 2010 in Bishkek). All participants presented orally or posters. Young researchers supported through SCOPES were Farrukh Nazarmavloev from UCA: his MSc thesis was conducted within CDEs research project in

Tajikistan. CDE / NCCR North-South co-organised a soil spectroscopy training at TAU, which included new approaches on digital soil mapping. Activities on the third objective of *building spatial data infrastructure* included the conference participation of Ainura Nazarkulova (UCA) at the GSDI 12th World Conference on Realizing Spatially Enabled Societies held in Singapore, from October 19-22, 2010. Introductory presentations into SDI were made by Ainura during the SCOPES team workshops.

Table 1 Overview on team members

	Insti-tution	Name	SCOPES function	Other affiliations	email
1.	CDE	Bettina Wolfgramm	Coordinator CDE	NCCR North-South, UCA	Bettina.wolfgramm@cde.unibe.ch
2.	CDE	Thomas Breu	Steering committee	NCCR North-South	Thomas.breu@cde.unibe.ch
3.	CDE	Chris Hergarten	CDE GIS Unit	PhD researcher NCCR North-South	Christian.hergarten@cde.unibe.ch
4.	NCCR N-S	Hasan Safarov	Phd student and photogrammetry lecturer at TAU	PhD researcher NCCR North-South, TEMPUS GEM	khasan_81@mail.ru
5.	NCCR N-S	Mira Arynova	PhD researcher	Regional Coordinator and PhD researcher NCCR North-South	mira.arynova@ucentralasia.org
6.	KRSU	Natasha Ershova	Coordinator KRSU	NCCR North-South Alumni	Natasha-er@yandex.ru
7.	KRSU	Natalia Ivanovna	Steering Committee	Regional Advisory Board NCCR North-South	n.ivanova@istc.kg
8.	KRSU	Galina Frolova	GIS lecturer		victorianoelia@yandex.ru
9.	KRSU	Farkhat Rakhmatullin	GIS lecturer		
10.	TAU	Zamira Kadirova	Coordinator TAU	TEMPUS GEM	kadirovaz@gmail.com
11.	TAU	Islomkul Ikromov	Steering Committee		
12.	TAU	Mirasil Mirzoev	GIS specialist	TEMPUS GEM	mirasilfazo@gmail.com
13.	TAU	Nozim Aliev	GIS lecturer	TEMPUS GEM	nnozim@gmail.com
14.	TAU	Behzod Abdullobekov	GIS lecturer	TEMPUS GEM	behzodtau@gmail.com
15.	TAU	Firdavs Kukanov	GIS lecturer	TEMPUS GEM	
16.	UCA	Emanuele Costa	Coordinator UCA, data management specialist	TEMPUS GEM	emanuele.costa@ucentralasia.org
17.	UCA	Nasreen Dhanani	Steering Committee	TEMPUS GEM, UCA is hosting the NCCR North-South regional office	nasreen.dhanani.ucentralasia.org
18.	UCA	Ainura Nazarkulova	SDI specialist on behalf of UCA	ACA*GIScience, TEMPUS GEM	nazarkulova@aca-giscience.org
19.	UCA	Suhaily Mamadramov	Natural hazard specialist		smamadramov@focushumanitarian.org
20.	UCA	Farrukh Nazarmavloev	Remote sensing specialist	FSC grant with CDE and UCA, NCCR North-South, TEMPUS GEM	Farrukh.Nazarmavloev@ait.ac.th

## 2 Overview of activities

### 2.1 Activities

#### Team activities 2011

The first section provides an overview on the overall team activities as numbered in the project proposal. Activities carried out by each of the teams are described in the sections following this general overview. In the last section, changes compared to the original work plan are listed.

#### A) Research activities

**A1) SCOPES Team workshop 2011:** The SCOPES workshop 2011 on “GIS for Research in Natural Resource Monitoring” was planned by CDE and organized by Natasha Ershova and her team from KRSU. The workshop took place from 28-31 October 2011 at the KRSU GIS laboratory. The program can be found in Annex 1.



*Figure 1 SCOPES team workshop 2011 at KRSU in Bishkek*

**A2) Creating links to international institutions and initiatives, networking among Central Asian institutions:** Table 2 below provides an overview on presentation and participation in conferences, workshops and trainings.

Table 2 Overview on team activities 2011

Institution	Name	2011 team workshop	Conference participation	Trainings (partly) SCOPES financed	UNIGIS student
CDE	Bettina Wolfgramm	Lead		TEMPUS GEM	
CDE	Chris Hergarten	Presentation	EARSeL Edinburgh		
NCCR N-S	Hasan Safarov	Presentation	GISCA 2011	TEMPUS GEM*	
NCCR N-S	Mira Arynova	Participation			
KRSU	Natasha Ershova	Presentation	GISCA 2011	Salzburg summer school	Professional diploma
KRSU	Natalia Ivanovna	Participation			
KRSU	Galina Frolova	Participation	GISCA 2011, Kaliningrad Conference		
KRSU	Farkhat Rakhmatullin	-	GISCA 2011		MSc program
TAU	Zamira Kadirova	Presentation	GISCA 2011, TEMPUS Networking meeting in Bishkek	TEMPUS GEM	MSc program
TAU	Islomkul Ikromov	-	Razjan conference		
TAU	Mirasil Mirzoev	Participation	GISCA 2011, Razjan coference	TEMPUS GEM, KRSU field practice	MSc program
TAU	Nozim Aliev	-	GISCA 2011	TEMPUS GEM	
TAU	Behzod Abdullobekov	-	GISCA 2011	TEMPUS GEM	
TAU	Firdavs Kukanov	-	GISCA 2011	TEMPUS GEM	
UCA	Emanuele Costa	-		TEMPUS GEM	
UCA	Nasreen Dhanai	-			
UCA	Ainura Nazarkulova	Presentation	GISCA 2011		
UCA	Suhaily Mamadraimov	-			MSc program
UCA	Farrukh Nazarmavloev	-	GISCA 2011		

\*TEMPUS GEM teacher trainings in Almaty and Dushanbe

**A3) Supporting young researchers:** Two tandem studies between Central Asian researchers and Swiss MSc students from CDE were initiated. Two MSc students from KRSU will conduct their study in collaboration with the PAMS project “Capacity building of water users on climate change risk management in Kyrgyz communities”. This Partnership Action is conducted within the framework of the NCCR North-South, and is lead by CAMP Alatoo Public Foundation, in cooperation with KRSU and the NCCR North-South Research Project RP11, lead by Bettina Wolfgramm. For a short description of the PAMS project see the NCCR North-South webpage: <http://www.north-south.unibe.ch/content.php/page/id/309>

Table 3 below provides an overview on these joint MSc studies to take place in 2012, the co-supervisors involved, the topic and students identified.



Table 3 Joint MSc studies to take place 2012

Project	Co-supervision	Topic	Students identified
PhD study Mirasil Mirsoev	Mirasil Mirsoev (TAU) Chris Hergarten, Bettina Wolfgramm (CDE)	Salinization mapping, the MSc announcement can be found in Annex 5.	CDE student: Johanna Zwahlen
PhD study Hasan Safarov	Bettina Wolfgramm, Hanspeter Liniger (CDE), Hasan Safarov (NCCR North-South)	WOCAT mapping, the MSc announcement can be found in Annex 6.	CDE student: Selina Studer
PAMS project "Capacity building of water users on climate change risk management in Kyrgyz communities" lead by CAMP Alatoo	Natalia Ershova (KRSU) Aida Gareeva (CAMP Alatoo) Bettina Wolfgramm (CDE)	- Climate change and its impact on the Sokuluk river flow. - Water distribution system	KRSU students: 1) Shevchenko Dar'ya 2) Karavaeva Nina

## B) Education and training activities

**B1) Setting up facilities for BSc, MSc and PhD students:** GIS laboratories had been set up at KRSU and UCA in 2010. In 2011 only very limited maintenance work took place.

**B2) Supporting tutors in the elaboration of training materials and offering of courses:** Ainura Nazarkulova (UCA) has coordinated the translation into Russian of the "Modular GIS Training", originally elaborated at CDE within the ESAPP program. The training material consists of 7 Modules, each consisting of three parts theory, applications, and exercises. The exercises are being adapted to Central Asia and to be based on Central Asian datasets. Furthermore, the material is revised in order to link up to the latest version of the open source GIS software "Quantum GIS". The current state of the translation is shown below. Chapters that have been finalized are already used in lectures.

- Chapters 2, 5 and 6 were translated by Ainura and UNIGIS students
- Chapters 3 and 4 were translated by KRSU
- Chapters still being translated are chapters 1 (TAU) and 7 (UCA, Farrukh)

**B3) Conducting field trainings:** SCOPES provided financial support for conducting the field practical training of KRSU in Sokuluk valley, Kyrgyzstan, summer 2011. SCOPES also supported the participation of Mirasil Mirsoev (TAU) in this training, as a way for KRSU and TAU lecturers to exchange experiences in the organisation of practical field trainings.

## C) Data management: Spatial Data Infrastructure

Activities related to data management, are the focus of year 2012.

## Centre for Development and Environment (CDE / NCCR North–South)

CDE team members have spent time in Tajikistan and provided assistance to the institutional partners. Christian Hergarten (spent June / July and October-December in Tajikistan) and Bettina Wolfgramm (spent 10 months in Tajikistan, January to February, and April to November) provided support and backstopping.

**Activity A1) SCOPES Team workshop 2011:** The SCOPES workshop 2011 on “GIS for Research in Natural Resource Monitoring” was planned by CDE. Bettina Wolfgramm presented examples of GIS studies conducted in Tajikistan focusing on land use change detection and its impact on soil fertility. Christian Hergarten provided theoretical and practical inputs on working with satellite imagery for natural resource monitoring.

### **Activity A2) Conference participation:**

- Chris Hergarten participated in the 7th SIG-Imaging Spectroscopy Workshop organised by the European Association of Remote Sensing Laboratories (EARSeL), which took place from 11-13 April 2011 in Edinburgh ([www.earsel2011.com](http://www.earsel2011.com)). He presented a poster on “Soil Degradation Assessment Using Imaging Spectroscopy”, which was co-authored by Farrukh Nazarmavloev (UCA) (for the poster see Annex 2).
- Hasan Safarov participated in the GISCA 2011 conference, together with participants from TAU, KRSU and UCA.

**Activity A3) Supporting young researchers:** CDE supported the application of Farrukh Nazarmavloev for a FSC Scholarship to start a PhD study. Since mid September 2011, Farrukh is based at CDE. He currently elaborating his workplan for a study on “Application of a soil spectral library as tool for soil fertility assessments on agricultural land of Tajikistan”.

### **Activity B2) Supporting tutors in the elaboration of training materials and offering courses**

- Hasan Safarov is part-time teaching at the Department of Hydro-melioration at TAU, and has elaborated a script on Photogrammetry in Tajik language. For his efforts Hasan Safarov was reimbursed.
- Bettina Wolfgramm was backstopping the organisation of the TEMPUS GEM Teacher Training in Dushanbe in September 2011. The farewell excursion was sponsored through the SCOPES project.
- Bettina Wolfgramm conducted a lecture at the Uni Bern on “*Geoinformation for sustainable land management*” based on examples from Tajikistan. The lecture took place on 16.12.2011, 10-12h, at the Institute of Geography in Bern. The lecture was also used to raise attention on the possibility to conduct an MSc study in Central Asia.

## Kyrgyz Russian Slavic University (KRSU)

**Activity A1) SCOPES Team workshop 2011:** KRSU provided the venue for the SCOPES workshop 2011. A session was held on the PAMS project, where Natalia Ershova presented the research work planned for updating of the hydrological model for the Sokuluk watershed.

**Activity A2) Conferences:** KRSU partners were actively participating in conferences and workshops.

- GISCA 2011, *Geoinformatics: Managing Environment, Resources and Risk*, 19-20 May 2011, Almaty, Kazakhstan (<http://gisca11.aca-giscience.org/>)  
Natalia Ershova, Galina Frolova and Farkhat Rakhmatullin participated in the workshop and the conference. Natalia Ershova presented on “Assessment of water resources in On-Orcha and Jergital river basins for sustainable water use”. Galina Frolova presented on “GIS techniques for analysis of avalanche zones in Kyrgyzstan”. (Annex 4)
- Galina Frolova participated in IX International Conference “Innovation in the science and education 2011” that was held in the Kaliningrad (Russia). It took place from 18-20 October 2011. The article titled RESEARCH of STREAMFLOW and SEDIMENT TRANSPORT, ARRIVING in the ANDIZHAN CHANNEL BASIN (authors G.P. Frolova, V.A. Bilenko, A.A. Nesterova) was presented.
- 31th EARSeL SYMPOSIUM, 31th May - 3rd June 2010, Prag, Czech Republic  
Natalia Ivanova and Galina Frolova planned to participate in the conference. 3 abstracts were submitted. As they could not get a visa for the Czech Republic in time, participation was cancelled. However, accommodation had already been paid and was not refunded.

**Activity A3) Supporting young researchers:** Two MSc students are supported in their work within the PAMS Sokuluk study. KRSU MSc student Shevchenko Dar'ya will conduct her study on “Climate change and its impact on the Sokuluk river flow. An analysis based on updated hydrological model PREVAH for Sokuluk river basin”. KRSU MSc student Karavaeva Nina will conduct her study on “Water distribution system in Sokuluk river basin in climate change condition”.

**Activity B1) Setting up facilities:** One hard drive of computers in the GIS laboratory established in 2010 was replaced.

**Activity B2) Supporting tutors by financing UNIGIS distance learning courses**

- Natalia Ershova has finished so far 4 Modules of the UNIGIS Professional course. She also participated in the “GISLERS” short Intensive Programme at University of Salzburg in Salzburg, Austria, which took place from 27 June - 8 July 2011. ([http://www.edu-zgis.net/index.php?option=com\\_content&view=article&id=487&lang=de](http://www.edu-zgis.net/index.php?option=com_content&view=article&id=487&lang=de))
- Rakhmatullin Farkhat has started well the UNIGIS MSc course. After some delay with delivering moduls due to conflicts with his university work, over the winter months he is planning to pick up on the work on the training moduls again.

**Activity B3) A Practical field training for KRSU students was conducted in summer 2011:** The training took place from 12 to 23 July 2011 in Sokuluk watershed, in Kyrgyzstan.

The work with the students focused on 1) hydrological measurement at different locations within the watershed, and 2) on land use description of sites according FAO land cover / land use classification. The training was led by Natalia Ershova. 18 Students participated in the training.

Figure 2 KRSU practical field training for students in summer 2011



## Tajik Agrarian University (TAU)

**Activity A1) SCOPES team workshop 2011:** Zamira Kadirova and Mirasil Mirsoev participated in the workshop.

**Activity A2) Conferences, meetings and trainings:** TAU partners were actively participating / co-organising conferences and workshops:

- GISCA 2011, *Geoinformatics: Managing Environment, Resources and Risk*, 19-20 May 2011, Almaty, Kazakhstan (<http://gisca11.aca-giscience.org/>)  
The team of lecturers from TAU participated in GISCA 2011. This included Zamira Kadirova, Mirasil Mirsoev, Nozim Aliev, Behzod Abdullobekov, and Firdavs Kukanov.
- The team also participated in the one week TEMPUS GEM Teacher Training in Almaty (<http://acagisc.blogspot.com/2011/05/geoinformatics-teacher-training-in.html>)
- TAU partners, organised the 2<sup>nd</sup> TEMPUS GEM Teacher Training, Sept 25 - Oct 1, 2011 in Dushanbe, Tajikistan.
- “Razjan Conference 2011”, Scientific readings about “Modern energy and resource saving technologies and agricultural production systems”, 8-11 December 2011 in Razjan, Russia. Mirasil Mirsoev and Islomkul Ikromov participated and presented their work on “Ameliorative conditions of the irrigated land in Vahsh district”. (Annex 3)

**Activity A3) Supporting young researchers:** Mirasil Mirsoev conducted field work for his PhD study in the Vakhsh district of Tajikistan. He received a small grant (5000 CHF) from the NCCR North-South Regional Coordination Office to support his field work. In this study he will collaborate with the CDE MSc student Johanna Zwahlen (see Table 3).

**Activity A4) Closing gaps in research infrastructure:** TAU covered maintenance expenses for their GIS lab through SCOPES financing. This included the coverage for internet costs for

specific months with high activities in the GIS laboratory, and a GIS-lab computer maintenance by an external IT-specialist in September 2011. Zamira Kadirova and Mirasil Mirsoev, who are involved in the UNIGIS distance learning courses, have also covered costs for personal internet connections through SCOPES funding.

**Activity B2) Supporting tutors:** Zamira Kadirova and Mirasil Mirsoev are both registered with the UNIGIS MSc course. Due to limited GIS knowledge, English knowledge and familiarity with Western learning tools, the UNIGIS is a challenge for both lecturers. The UNIGIS team in Bishkek was ready to support the two Tajik colleagues. Thus, prolonged stays in Bishkek of Zamira Kadirova and Mirasil Mirsoev were supported by covering per diems from SCOPES funds. Such consultation by the UNIGIS team in Bishkek was facilitated from 12-16 December 2010, from 9-23 July 2011, from 13-16 October 2011, and after the SCOPES team workshop in November 2011.

TAU is an active partner in the TEMPUS GEM project. Participation of the young team of lecturers in the TEMPUS GEM teacher training in Almaty, Kazakhstan, was supported by paying additional per diems.

**Activity B3) Conducting field trainings:** In July 2011, Mirasil Mirsoev participated in the KRSU practical field training, in Sokuluk watershed, Kyrgyzstan.

## **University of Central Asia (UCA)**

**Activity A1) SCOPES team workshop 2011:** Ainura Nazarkulova participated in the workshop and presented module 6 of the GIS Modular Training Manual. The last day of the SCOPES team workshop 2011 was held at UCA's Bishkek office, where good internet access facilitated a session on "Online search of satellite image-archives".

**Activity A2) Conferences, meetings and trainings:** Farrukh Nazarmavloev participated in GISCA 2011. Farrukh Nazarmavloev presented results from his MSc thesis, which was co-supervised by Bettina Wolfgramm (CDE). The presentation was titled "Evaluation of EO-1 HYPERION imagery for assessment of soil organic carbon".

Ainura Nazarkulova has submitted an abstract on "Growing the Synapses – Minds for SDI. Spatial Data Infrastructures Awareness Training in Central Asia" to the Global Geospatial Conference 2012 GSDI-12, to take place in Quebec City from May 14-17, 2012 ([www.gsdi.org/gsdi13](http://www.gsdi.org/gsdi13)).

**Activity A3) Supporting young researchers:** Farrukh Nazarmavloev finished his MSc course at the Asian Institute of Technology (AIT) in Bangkok, Thailand, which was conducted within UCA's Central Asia Faculty Development Program (CAFDP). Farrukh applied for a Swiss Government Scholarships for Foreign Students (FSC), to continue his education within the CAFDP with a PhD study. His application was supported by Prof. Hans Hurni from CDE and the NCCR North-South Research Project RP11. The application was successful, and in September 2011, Farrukh moved for a 9 months stay at CDE to Berne, Switzerland.

**Activity B2) Supporting tutors:** Suhaily Mamadramov has progressed well in his UNIGIS MSc course. He will continue with the remaining modules in 2012. Ainura Nazarkulova has coordinated the translation into Russian of the “Modular GIS Training” and is actively using the modules in GIS lectures at different Universities. UCA is an active partner in the TEMPUS GEM program. Farrukh Nazarmavloev participated in the TEMPUS GEM teacher training in Almaty.

**Activity C) Data Management: Spatial Data Infrastructure:** Ainura Nazarkulova, together with CDE colleagues, is planning the activities for 2012, and the SCOPES team workshop 2012 on spatial data infrastructure.

## Changes compared to the original work plan

- Instead of six, only **two joint MSc studies** between Central Asian partner Universities and CDE were initiated. As discussed in the interim report for year 2010, in general, all partners are interested in such studies, in practice however, it has proven to be more difficult to arrange the tandem studies. The Swiss students have restricted time available for their field work making it difficult to coordinate their work plans. Topic wise the Central Asian MSc studies are restricted to disciplinary studies within their field of specialisation which creates difficulties in linking up different MSc students. Last but not least, administrative procedures on both sides and language problems (e.g. Tajik students nowadays generally only speak Tajik) create further hurdles.
- An **advisory board** has not been formally established, but information exchange with important GIS stakeholders in Tajikistan and Kyrgyzstan took place by way of participation in workshops, through other joint projects or on an informal basis. For more information on cooperation, please see chapter 2.2.
- An **online information platform** has not been established. All partner institutions agree that the web-site from ACA\*GIScience provides such a platform already.
- After detailed considerations, **no practical field trainings will be offered by TAU** of the type that KRSU is offering. TAU prefers more flexible one day field events.
- UCA’s SCOPE team coordinator, Emanuele Costa has himself started a PhD, and is now only part-time working for UCA. As a team coordinator Emanuele is replaced by David Gullette ([david.gullette@ucentralasia.org](mailto:david.gullette@ucentralasia.org)). Due to this change in 2011, UCA’s SCOPES activities were limited. However, planning for 2012 has been taken up, and UCA will make use of the different possibilities (conference visits etc.) made available through the SCOPES project. Ainura Nazarkulova is very actively involved in planning SCOPES activities on “Spatial Data Infrastructure” for the year 2012.

## 2.2 Co-operation

Co-operation among SCOPES project partners is progressing satisfactorily. Staff members from TAU, KRSU and UCA are involved in the UNIGIS distance learning programs and have collaborated for this. Natalia Ershova (KRSU) has been very supportive in providing accommodation for TAU colleagues when staying in Bishkek for UNIGIS consultations. Mirasil Mirsoev (TAU) participated in field practical training organised by KRSU. Representatives of all SCOPES project partner institutions have participated in the GISCA 2011. Scientific background material and information on upcoming conferences or availability of grants is shared via email or skype.

Co-operation is also facilitated through the NCCR North-South network: The on-going NCCR North-South research project on land resource potentials, is working on soil digital mapping approaches. This has facilitated collaboration with Mirasil Mirsoev and his work on the irrigated areas in the Vakhsh basin, where the soil spectroscopy approach will be applied through a CDE MSc student. Furthermore, under the lead of CAMP Alatoo Public Foundation, a grant was obtained for a Partnership Actions for Mitigating Syndromes (PAMS), which are the practice-oriented component of the NCCR North-South. The project title is “*Capacity building of water users on climate change risk management in Kyrgyz communities (transferring scientific knowledge and jointly testing opportunities for adaptation)*”. It allows the KRSU team to update the hydrological models established in the Sokuluk watershed 10 years ago. The model outputs are the starting point for participatory work at the community level for the planning of climate change adaptation measures. Finally, the NCCR North-South Programme is organising the 3rd International Conference on Research for Development (ICRD) to take place from 20 to 22 August 2012 in Berne, Switzerland. From the different SCOPES partner institutions, abstracts were submitted to ICRD.

Co-operation with partners outside the 4 SCOPES partner institutions is also very active:

- The TEMPUS GEM project (for a more detailed description of the project see section 3.3) has facilitated co-operation among SCOPES partner Universities, but also with additional 5 Universities from the Central Asia region.
- Cooperation with the Austria-Central Asia Centre for GIScience in Bishkek (ACA GIScience, <http://www.aca-giscience.org/>) is continuing, especially also through the UNIGIS program and the TEMPUS GEM project. This is also true for the Centre for Geoinformatics at the University of Salzburg, Austria, which has the lead in the UNIGIS and the TEMPUS GEM programs.

## 2.3 Involved individuals

Table 4 List of involved individuals

Name	Country of origin	Country of work/study	Age	Sex	Remarks
Bettina Wolfgramm	Switzerland	Tajikistan	37	Female	
Thomas Breu	Switzerland	Switzerland	49	Male	
Chris Hergarten	Switzerland	Switzerland (Tajikistan)	38	Male	
Hasan Safarov	Tajikistan	Tajikistan	30	Male	
Mira Arynova	Kyrgyzstan	Kyrgyzstan	38	Female	
Natasha Ershova	Kyrgyzstan	Kyrgyzstan	44	Female	
Natalia Ivanovna	Kyrgyzstan	Kyrgyzstan	57	Female	
Galina Frolova	Kyrgyzstan	Kyrgyzstan	52	Female	
Farkhat Rakhmatullin	Kyrgyzstan	Kyrgyzstan	28	Male	
Zamira Kadirova	Tajikistan	Tajikistan	53	Female	
Islomkul Ikromov	Tajikistan	Tajikistan	54	Male	
Mirasil Mirzoev	Tajikistan	Tajikistan	28	Male	
Nozim Aliev	Tajikistan	Tajikistan	26	Male	
Behzod Abdullobekov	Tajikistan	Tajikistan	28	Male	
Firdavs Kukanov	Tajikistan	Tajikistan	29	Male	
Nasreen Dhanani	Canada	Kyrgyzstan	51	Female	
Emanuele Costa	Italy	Kyrgyzstan	40	Male	
Ainura Nazarkulova	Kyrgyzstan	Kyrgyzstan	39	Female	
Suhaily Mamadramov	Tajikistan	Tajikistan	31	Male	
Farrukh Nazarmavloev	Tajikistan	Thailand	36	Male	Farrukh was granted a Swiss Government Scholarships for Foreign Students (FSC) to continue his education with a PhD study



## 3 Practical issues

### 3.1 Major practical problems

**Visa applications:** Visa for conference visits have to be planned well ahead of time. For various countries Kyrgyz citizens have to travel to embassies in Almaty, Kazakhstan, to obtain visa.

The planned conference participation of the KRSU senior researchers Natalia Ivanovna and Galina Frolova had to be cancelled due to difficulties in obtaining a visa for the Czech Republic. The Czech embassy in Kyrgyzstan did not accept a invitation letter sent via email or fax, but requested an original invitation letter from the conference organizers to be sent to the embassy via postal services. However, postal delivery was too slow for the visa to be ready in time for the conference.

**Participants of UNIGIS distance learning courses** have faced two main challenges: Internet connection in Central Asian countries is either slow or very expensive. Funds from the SCOPES project were thus used to pay for most suitable solutions in internet access at TAU. Similar solutions (private connection through G3 antennas) were also discussed for KRSU UNIGIS participants.

As mentioned in chapter 2.1, especially for the colleagues from TAU, the requirements with regard to language proficiency (English), familiarity with Western learning tools and previous knowledge in GIS, were a challenge. Furthermore, backstopping from the UNIGIS team in Bishkek, for students from Tajikistan is not as easily accessible as for students based in Bishkek.

Thus, to facilitate interaction between the Tajik UNIGIS participants and Kyrgyz participants as well as the UNIGIS team, stays in Bishkek were supported financially. Further, it was negotiated with the University of Salzburg, that the time frame of the Tajik participants for submitting UNIGIS modules, was prolonged. The experiences with the Tajik participants are important in the discussion for UNIGIS in Central Asia on how to design arrangements for future UNIGIS students.

**Financial reporting by CDE:** Bettina Wolfgramm, the SCOPES project coordinator is based in Dushanbe Tajikistan. Communication gaps between CDE in Dushanbe and at the main office in Bern, caused problems with the financial reporting 2010. Communication on SCOPES financial reporting for 2011 was much better facilitated, as Bettina Wolfgramm spent December 2011 and January 2012 at CDE, among other purposes for project reporting.

### 3.2 Money transfer

SCOPES funds to the partners in Kyrgyzstan and Tajikistan were transferred as follows:

**KRSU, Bishkek, Kyrgyzstan:** In 2010 and 2011, money was transferred from CDE through the NCCR North-South regional coordination office (RCO) in Bishkek to KRSU. For 2012 the partners discussed transferring money to a project account managed by Natalia Ershova. However, according to Kyrgyz law, the KRSU team would need an agreement between CDE and the sub-department of *Hydro Technical Constructions and Integrated Water Management* at KRSU. However, since the sub-department is not a legal body, they are not eligible to establish an agreement as required by the Kyrgyz banks. Thus, it was decided that also in 2012, the money transfer will go through the NCCR North-South RCO in Bishkek.

**TAU, Dushanbe, Tajikistan:** Money is transferred through the CDE/NCCR North-South office in Dushanbe, Tajikistan.

**UCA, Bishkek, Kyrgyzstan:** Money is transferred directly from CDE to UCA accounts in Bishkek.

Expenses, such as payment of conference registration and UNIGIS registration were so far directly covered by CDE. In future, these shall be organised by partners in the region themselves, in order for them to get familiar with the procedures.

### **3.3 Important developments/changes in the scientific landscape of the involved partner countries**

Not directly in the scientific landscape, but in the educational landscape, the TEMPUS GEM project should be considered as an important development in the field of geoprocessing for natural resource monitoring. It is expected that it will provide improved education in GIS for students and future scientists.

**TEMPUS GEM:** The project has been developed and is being jointly coordinated by the Centre for Geoinformatics at the University of Salzburg, Austria and the Austria-Central Asia Centre ACA GIS Centre for Geoinformatics as the focal point for partners in Central Asia. The project is working in Kazakhstan, Kyrgyzstan and Tajikistan, and is reaching out to a large number of GIS actors in Central Asia. This includes mainly Universities (7), but also the ministries of Education in all 3 partner countries and industry partners. The project is active with trainings and video-conferences and has been creating a lot of interest among University staff involved in GIS.

With the international, interdisciplinary postgraduate curriculum in Geoinformatics that was developed and now implemented in a first step by ACA\*GIScience in Bishkek, and eventually at other partner universities in Central Asia, the range of possibilities for obtaining GIS education will be markedly improved for students in Kyrgyzstan, Kazakhstan and Tajikistan.

A manual on spatial data infrastructure (SDI) was elaborated in English as a tutorial (25 pages) for the TEMPUS GEM partners by ACA\*GIScience, and especially Ainura Nazarkulova, under the global SDI small grants program. The manual will be made available to the SCOPES partners.

## 4 Annexes

### 4.1 Workshop materials

*Annex 1 SCOPES workshop 2011 – GIS for Research in Natural Resource Monitoring, 28–31 October 2011, Bishkek, Kyrgyzstan*

### 4.2 Conference materials

*Annex 2 Chris Hergarten, Farrukh Nazarmavloev. 2011. Soil Degradation Assessment Using Imaging Spectroscopy. Poster presented at EARSeL 2011 in Edinburgh.*

*Annex 3 Invitations for Mirasil Mahmadvazirovich Mirsoev and Islomkul Istamovich Ikromov to participate in the scientific readings about “Modern energy and resource saving technologies and agricultural production systems”, dedicated to the memory of a correspondent and scientist Mr Bochkarev, which took place from 8–11 December 2011 in Razjan, Russia.*

*Annex 4 Agenda of the Fifth Central Asia GIS Conference – GISCA’11 “Geoinformatics: Managing Environment, Resources and Risk”, May 19–20, 2011, at the Faculty of Geography, Kazakh National University named after Al-Farabi, Almaty, Kazakhstan*

### 4.3 MSc announcements

*Annex 5 Soil salinization assessment in the lowlands of Tajikistan based on a soils spectral library approach*

*Annex 6 Integrated spatial assessment for Sustainable Land Management “SLM-planning” in the loess hill of central Tajikistan using WOCAT mapping tools*