

**PROJECT COMPLETION SUMMARY REPORT**  
**DISASTER MANAGEMENT & EMERGENCY RESPONSE TO FLOODING**  
**Researcher Links and Impact Workshop**  
**7th-13th August 2016**  
**Almaty, Kazakhstan**

**Prepared by**

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## Overview

The event brought together scientists, engineers and practitioners from across academia, industry, and non-government organisations to discuss, share and promote current research and recent developments across all aspects of engineering in disciplines such as Civil, Environmental, Hydrological, Geological, Social, Political Sciences, Earth Observation Satellite or Remote Sensing Technologies. The workshop was held in English, and focused on three specific themes related to forecasting, decision making and response to natural disasters:

- I) natural hazards from floods and seismic activity to landslides;
- II) Remote Sensing (Satellite) for monitoring and prediction of natural disasters; and,
- III) Disaster Risk Reduction and Resilience (DRRR).

**Theme I** dealt with natural hazards with a particular focus on flooding from seasonal glacial ice melt and seismic distortions resulting in landslides, with field work tracking and sensors applications, data collection and modelling.

**Theme II** dealt with remote sensing for real-time monitoring and prediction analysis, applications of the different international satellite data, including EU and Kazakhstan KazEOSat-1 and -2. Satellite data processing, data collection, modelling and visualization with web GIS tools application were also discussed.

**Theme III** dealt with Disaster Risk Reduction and Resilience (DRRR) and response. Public emergency preparedness researchers, emergency agency cooperation with scientists, multidisciplinary social-political science and engineering science cooperation experts related to DRRR were discussed.

## Workshop Plan

We designed the workshop programme to maximize collaboration; specifically to ensure that Kazakh delegates shared relevant information and perspectives about the 'in country' problems and opportunities;

- UK participants were enabled to provide their experience of science and professional activities in the field; and
- All delegates were supported and directed to be creative in finding solutions and develop partnership projects

Working with our hosts at AUPET, Almaty and Disaster Resilience Institute at Nazarbayev University (DRINU), Astana, we designed a 5-day programme encompassing plenary presentations (Days 1 and 2), field trips to previously affected sites that provided 'first hand' and engagement with 'on the ground' agencies (Days 3 and 4), a creative workshop (Day 5) structured to draw together key information and more detailed mining of information to shape

collaborative proposals. The planned workshop sessions were flexible to allow discussions to flow, take opportunities (including engaging other in-country stakeholders not only just attending the conference) as well as capturing the key elements that then built the priorities for further work and collaboration. The full programme as delivered is Appendix 2 to this report.

A key element in the plan was to generate a high profile for the workshop both in Kazakhstan and in the UK. DRINU developed a website that now hosts the presentations, digital images of the event and visits and other information that can be accessed by delegates and other interested parties. This provides a key resource for continuing the collaboration - to review the information presented, recall our colleagues activities and interests as well as form a comprehensive record of the event to support our future planned work programmes. Alongside the website, we used social media to reach out to wider communities in both countries, particularly using Twitter, through which we generated a reach to over 60,000 followers within 3 days. Our local hosts also posted 'bill board' sized posters on main highways in Almaty, and secured national TV coverage with interviews and filming of the workshop sessions. The website will continue to be used for knowledge exchange (many sources of information such as reports were identified during the workshop which will need to be assessed), online collaboration and proposal development.

Throughout the workshop, our hosts provided social activities and local 'guides' to generate the relationships and discussions in more informal settings. This included a visit before the workshop to 'Kok Tobe' – a hilltop amusement park with spectacular views over Almaty, and a visit to Almaty Observatory to see stars, planets and the Perseus Meteor Shower.



Image 1: Professor Jay Sagin, Nazarbayev University, being interviewed for Almaty TV.



Image 2: The Workshop attendees on day 1

### Workshop Day 1

The first day of the workshop was to set the scene and get a broad understanding of the problem. This included context and background to the issues and challenges being faced by Kazakhstan, to introduce the delegates to the workshop purpose and plan, and to introduce all delegates to each other in a plenary forum using short biographies on powerpoint slides.

Overview presentations were given by workshop co-lead Dr. Jonathan Pearson on the UK perspective of flood risk; Viktor Boiko, a former military general, member of the National Committee for Emergency Situations and national Kazakh expert who gave a critical review of the recent history of disasters and issues that needed to be addressed, and Dr Guiliano Punzo who presented a cautionary view on the role of the science of ‘complexity’ in understanding the causation and management of disasters. This session enabled knowledge exchange on the broader context of disaster management and emergency response to flooding and mud/landslides, their contributory factors and effectiveness of prevention and incident management approaches.

The presentations then moved to specific case studies in the UK and Kazakhstan, which gave delegates a closer understanding of the problem-solution equation. Clear examples of best practice (eg Lyme Regis landslip management, Jon Cartwright – Balfour Beattie) and innovation were shared, including one project which developed a clear community response to emergency evacuation of tall buildings at night – by using parked car headlights to show routes of escape.

The ‘problem’ theme of community communication and response was covered, and was seen as a crucial element in the delivery of any future solutions to reduce risk to life. Presentations also included identifying the high-risk areas in Kazakhstan where earthquakes, and land/mud slides can occur and the consequences of recent flood events.

The last session was closed with demonstrations by commercial surveying company Hexagon, presenting the latest satellite imaging techniques and data feeds, and with business partner Leica, the use of high resolution surveying techniques that can be used to measure land movement and help identify risk areas for future land/mud slides.

### Workshop Day 2

The second day continued the sharing of latest research and case studies, providing deeper knowledge sharing on the latest thinking in both UK and Kazakhstan. Dr. Pearson presented initial pilot programmes on being able to increase resilience in flood defences by retrofitting soft engineering structures to the defences to mitigate wave impacts. Case studies were also presented from recent disasters in Nepal, Kazakhstan and China to highlight the causes and consequences, and to help identify and mitigate future risks in the local area. Director of the DRI at Nazarbayev University, Dr. Jay Sagin, presented on how multidisciplinary approaches are key in emergency management, and some experiences of how this works in Kazakhstan.

A key guest presenter in our programme was Director Murat Kasenov, a government representative from the Committee for Emergency Situations. Director Murat presented a history of recent disasters in the local region, covering the impacts, mitigation measures, emergency planning producers and humanitarian management arrangements. Director Murat also shared a 30-minute documentary later that day, which brought home the devastation caused by catastrophic mudslides in Shymbulak and more recently in 2015 in the Kargalinka valley.



**Image 3:** Director Murat is sharing his experiences

The session moved to presentations on new technologies that could be used to improve the monitoring of the snow and terrain situation. The developing network of microsattellites presented by Planet.com offers 24/7 global coverage, and overcomes many of the disadvantages of the current satellite imagery, enabling semi-real-time decision-making. Engaging communities with information through social media, and in particular during emergency situations was presented by Simon Jeavons of Shoothill. Based on UK experience with the Environment Agency,

Simon presented the role and impact social media and web based platforms can have in transferring information that supports preparedness and response in emergency situations. Marta Roca from HR Wallingford, UK, gave a sound overview of flood risk management that summarized the processes and operational responses to flood risk, drawing many of the issues previously presented by Kazakh and UK delegates over the two days into a comprehensive assessment of issues and solutions.

The day closed with a hot-debrief workshop session led by Ant Parsons of ICE BLUE on the problems, issues and challenges that had been shared, and which the delegates then scored for their level of importance for various stakeholders to enable ranking for collaborative working and proposal/solution developing for the remaining part of the workshop – see table 1 below.

	Level of Importance (10 is high)		
	Government	Rural communities	City dwellers
<b>Governance - policy, accountability and responsibility</b>	10	8	8
<b>Planning and preparation</b>	9	9	6
<b>Community Resilience</b>	8	10	8
<b>Resilient infrastructure (Power, telecomms)</b>	9	8	10
<b>Monitoring and Modelling of state and risks</b>	10	10	10
<b>Early warning and informing</b>	10	10	7
<b>Organisational cooperation</b>	10	10	8
<b>Community Engagement</b>	10	10	5
<b>Prioritisation - costs and benefits</b>	10	6	9
<b>Communication Infrastructure</b>	10	5	5

### Field and Evidence Gathering Trips (Days 3 and 4)

Following the first two days of plenary sessions, the workshop moved to see first hand the sites where flood and mud/landslide management had taken place, and to engage with field-based staff from Kazselezashita. The first visit was to the Shymbulak and Medeo Dams. Catastrophic mud slides and floods, the most significant occurring in 1921 led to the construction of large scale dams (100m/high) that attenuate flow of water/mud down the steep valleys. The construction dates back to the 1970s yet they still provide the first line of defence for an important ski resort and economic activity, and housing communities in the valley and city below. A range of other management options that the response units of the Committee for Emergency Situations operate, including glacier temperature monitoring and water level (behind the dam) to support warning and informing the local agencies and communities, were discussed

with Director Murat and his local team, whilst enjoying spectacular views in this ‘alpine’ area.

The afternoon field visit was to see first hand the recovery from a series of mudslides in 2015 in Kargalinka River. Here we saw the devastation following the landslide and the cascade effect of the mudslide flood downstream of a preventative dam in place in the valley. The hill top community on the edge of the steep-sided valley is perched on soil and rock that is unstable and we clearly recognized the challenge the emergency organisations have in providing early warning of sudden landslips, as well as cascade effects down the valley. The valley is now a major site of debris removal and



*Image 4: Field visit with government representatives*

construction of protective concrete channel walls, and in-river flow ‘baffles’ to slow the passage of floods and mud flow down the valley.

Day 4 was an all day visit to the high mountain Issyk Lake to see the consequences following a catastrophic rock fall, which changed the nature of the moraine lake dam, and led to many fatalities amongst visitors to the lake in 1963. Again, all delegates were able to engage with the local Kazselezashita officials responsible for lake water level monitoring and reporting.

### Workshop Day 5

The workshop Day 5 sessions were designed to finalise the key problems, to develop project areas that would help develop solutions and build collaboration between those delegates most interested and relevant to that research area. Led by Ant Parsons, table groups focused on 4 priority problems and project areas, and delegates circulated to co-create those project areas. A key element was to confirm problem definition, gather more detailed information from delegates based on more focused discussions, whilst designing and refining projects and themes, including stakeholder analyses. In parallel (and following an earlier offer during the conference) senior UK and Kazakh delegates met with the Red Crescent of Kazakhstan in Almaty (Image 5) with a view to develop a collaborative working with affected communities on the ground in these high risk areas.

The workshop concluded with a plenary session playing back to the delegates the developing proposals, and building the UK and Kazakh teams that would progress the proposals for funding in their respective countries.



**Image 5:** British Kazakhstani academics, humanitarian responders and local business leaders are discussing on how to utilize the Global Challenge Fund (GRCF) opportunities to build disaster resilient communities in Kazakhstan

## Key outcomes from the Workshop

### Knowledge Exchange: Understanding the problems

Over the 5 days together, both delegations worked very well to share knowledge of the local issues, and case studies of both impacts and best practice. The final outcome is a number of collaborative proposals, one of which (to be progressed through UK Research Councils call on the Global Challenge Research Fund) encompasses three of the key elements the delegates identified as significant barriers to effective management of disasters relating to flood, land and mud slides, as follows:

- It was clear that, due to the geography (glacier), terrain (steep sided valleys) and climate, Almaty City and outlying communities in the foothills remain at considerable risk of impacts on life and infrastructure, requiring almost continuous **data** through **remote monitoring and assessment**. The lack of sensor equipment and extensive network for monitoring land movement, glacier melt and water flow, particularly automated equipment and networks, means the local emergency organisations have a near impossible task to provide real-time information to support emergency responses. In addition, the data flow, and the 'risk management' framework into which these data would go is at a superficial level, being based on expertise and expert judgement, on risk matrices rather than quantitative modeling and assessment that would support decision-making. There is a clear need to enhance effective emergency management with better data and data management, through remote sensing, on-the-ground sensing, modeling and risk assessment tools that are in common use in the UK.
- The effectiveness of all stakeholders involved in mitigating and managing emergency situations, particularly the Committee for Emergency Situations, is challenged by how they work before, during and after an incident, how data is shared and used, and who is responsible for warning and informing. Whilst there are procedures in place for emergency working, **governance** was a continual topic from all workshop sessions. A group presentation by Geoff Brighty (ESA Ltd) to government emergency responders and humanitarian facilitators enabled comparisons of emergency working procedures between UK and Kazakhstan, and whilst there are similar structures in place at all levels, the working arrangements are different, leading to poor communication and coordination of activities in incidents. Linked to the data and information challenge, management of data in the governance chain is a critical element that needs a deeper review in order to both optimize what's in place now, and support future working with improved data.
- The ultimate outcome from emergency management is the saving of lives. From the plenary sessions, there was clear case study evidence that communities know they are at risk. However, their ability to respond to an impending incident is influenced by receiving many false alarm warning messages ('cry wolf') which leads to warnings being ignored, or messages to act (for example, to evacuate ahead of a mud slide) not being given because of the local or

regional chain of command/multiagency working. In addition, there are examples of poor planning and development control, which leads to houses/communities growing in potentially high-risk areas, putting those occupants and emergency services at risk during critical incidents. A key theme is **working with communities** on a range of interventions, from warning and informing, to community-level emergency planning (for example establishing volunteer groups to support emergency evacuations and recovery; creating refuges for people). This theme draws from the other two themes in that the data generated to assess the risks can be used through web and social media to provide direct information to the community, and also that the community benefits from better, effective and closer working with local agencies (fire, police, municipal authorities), alongside National and local officials of the Committee for Emergency Situations.

**Developing partnership working and engagement with stakeholders**

The workshop brought together a broad range of delegates from the science, commercial, charitable and public sectors to share their experiences and perspectives on problems and to generate solutions and projects. Working ‘in country’ remains a significant requirement for future collaboration and through the sessions, field visits and side meetings, we have identified the key partners in developing a future collaboration. The close working with Kazselezashita enables us to develop wider relationships with local agencies and affected communities. In particular, we have identified a community at significant risk which has been recently working to enhance its community awareness and response. Through our on the ground relationships, we will have access to work with this community to develop and test innovative approaches to reduce their risk to life. Our hosts at DRINU will help us manage those relationships and facilitate the further development of plans in the coming months ahead of funding calls.

The workshop facilitators and many of the workshop participants were making good use of social media during the event and this resulted in a significantly increased exposure for the event. Twitter messages alone using the #KazFloodResponse reached a potential audience of over 60,000 people around the world – see below and Appendix 1 for further information.



### Significant learning points from the 5-day workshop

Building a delegation with UK science, public sector, third sector and technical/commercial research expertise was key to gaining a rounded understanding of the research and operational needs on emergency management. The blend of skills and knowledge enabled and facilitated better discussions, particularly to identify how processes do or do not work, and identify the key stakeholders with whom we will need to work. It also helped the UK understand the political situation and how to engage with the wider stakeholder network to be most effective in their political hierarchy.

The timing of the visit was also particularly important. The increasing openness by National-level Agencies, for example on data sharing and becoming more outward looking for support, enabled discussions that previously would be unthinkable. Over the week's discussions, we gained trust with Murat from the Committee for Emergency Situations, and we believe that this will be the fundamental relationship to continue to build with Nazarbayev University and AUPET. Dr. Jay Sagin, Director of the DRINU, remarked that the Kazakh delegates (representing many different organisations) themselves hadn't met previously together, and which also led to some 'robust' discussions following presentations as 'domestic' views and opinions were being shared and challenged. One conclusion from this is that workshops on this topic should be continued on a regular basis to sustain the growing appetite to improve the situation in Kazakhstan, and build deeper, long-lasting relationships with the UK, using this workshop forum as a platform to highlight 'in country' case studies delivered in partnership with UK partners. Flooding is a recognized leading area in the UK at Government, science, commercial and community levels and we can see a wider set of opportunities for meaningful collaboration.

### Development of solutions through collaborative working and projects

During the preparation stage of the workshop, we became aware of the Global Challenges Research Fund: Building Resilience (Closing date: 16:00 on 6 September 2016). The call is open to proposals addressing resilience to natural and man-made environmental hazards in a range of developing world contexts. The focus is on how to build resilience in relation to both sudden and slow-onset environmental hazards (eg land-degradation, deforestation, drought, hurricanes, climate change) taking into account the intersections and relationships with other contexts such as conflict and fragility, poverty and famine, urbanisation, economics and health / disease risks. Given the synergy, the final day of the workshop focused on the development of solutions through collaborative projects, at least one inter-disciplinary proposal will be submitted to this call (proposal value: ~£200k).

### For further information contact:

Dr. Jonathan Pearson, Warwick University, [J.M.Pearson@warwick.ac.uk](mailto:J.M.Pearson@warwick.ac.uk)

Dr. Jay Sagin, Nazarbayev University, [zhanay.sagintayev@nu.edu.kz](mailto:zhanay.sagintayev@nu.edu.kz)

Ant Parsons, ALP Synergy Ltd, [Ant@alpsynergy.co.uk](mailto:Ant@alpsynergy.co.uk)

Geoff Brighty, ESA Ltd, [Geoff@envsustain.co.uk](mailto:Geoff@envsustain.co.uk)

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## Appendix 1: Visibility (Links to Materials and Supporting Information)

Workshop Website – [www.drinu.org](http://www.drinu.org)

Almaty TV coverage - <https://www.youtube.com/embed/00Jinw4zYMI>

TweetReach Snapshot to summarise Twitter activity and impact -  
<https://drive.google.com/open?id=0B9yhiKFO5IVTR05xVEd4RIhwNVE>

Storify of Twitter activity -

<https://storify.com/AlpSynergy/disaster-management-kazakhstan>

or for the slideshow

<https://storify.com/AlpSynergy/disaster-management-kazakhstan/slideshow>

Workshop Proceedings – the workshop articles were published in  
the VESTNIK Journal, [http://www.aipet.kz/university/vestnik/index\\_eng.htm](http://www.aipet.kz/university/vestnik/index_eng.htm)

## Appendix 2: Workshop Programme

DAY 1, AUGUST 8, 2016		
8:00 - 9:00	08:00 Breakfast, 09:00 Registration, Group Photo at 9:00	
Session 1: Chair – Geoff Brighty (ICE Blue)		
9:30 - 10:30	Hosts and Organizers	GB – welcome; British Council, The University of Warwick; Nazarbayev University; AUPET; Kazselezashita;
10:30 - 11:15	Delegate Introductions	Slide show of everyone’s Bio slide where they introduce themselves (two slides per person)
11:15 - 11:30	Break. Refreshment break and networking	
11:30 - 11:40	Ant Parsons	Collaboration – Communication tools: <a href="http://www.drinu.org">www.drinu.org</a> , Yammer, Google Drive, Twitter (#drinu #KazFloodResponse)
11:40 - 12:00	Jonathan Pearson	Flood Risk – a UK perspective (with Q&A)
12:00 - 12:30	Boiko Viktor	A look back at the recent history of disasters in Kazakhstan with Q&A
12:30 - 12:45	Guiliano Punzo	Avoiding reductionism in disaster prevention and the role of complexity
12:45 - 13:45	Lunch and networking	
Session 2: Chair –Geoff Brighty (ICE Blue)		
13:45 - 14:05	Bakhyt Baimukhanmetov	Some actual problems in the field of emergency management
14:05 - 14:25	Jon Cartwright	Lyme Regis: A UK Community on the Edge
14:25 - 14:45	Khaidarov Mukhtar	Issues of landslide risk reduction in Almaty
14:45 - 15:05	Aksholpan Kopesbayeva, Zarina Abdullina and Assem Zhakupbekova	Experimental platform for the development system of measuring technological parameters
15:05 - 15:25	Yertugan Umbetkulov	Evacuation of people from residential multi-story building at night with use of parked car
15:25 - 15:55	Refreshment break and networking	
15:55 -	Yury Satimov, Assel	Issues of prediction and prevention emergencies in

16:15	Mukasheva and Yelena Satimova	case of flooding and under flooding
16:15 - 16:35	Helena Danjko and Yelena Polzhik	High altitude platform stations in design solutions for monitoring and prediction of natural disasters
16:35 - 16:55	Bayzakova Sayagul, Demeuova Anel, Sanatova Tota and Abikenova Asell	Influence of climate change on the state floods in Kazakhstan
16:55 - 17:30	Hexagon Geo systems	Disaster Resilience software technologies
17:30 - 18:10	Hexagon Leica Geo systems	Disaster Resilience equipment technologies
18:10 - 18:30	Overview of the day, Close	
19:00	Dinner , Free time	

DAY 2, AUGUST 9, 2016		
08:00 -	08:00 Breakfast, 09:00 Start	
Session 3: Chair – Jay Sagin (Zhanay Sagintayev) (NU)		
9:00 - 9:20	Jonathan Pearson	Improving Resilience through ‘retro-fitting’
9:20 - 9:50	Viktor Blagovechshenskiy	Seismogenic landslide risk zoning in the surrounding of the Almaty city
9:50 - 10:10	Abdimuratov Zhubanish, Nurjamal Bekmuratova and Adilbekov Askar	Preventive measures to reduce the damage from some secondary factors of earthquakes
10:10 - 10:30	Komal Raj Aryal	Revisiting cascading effects of the 2015 Nepal Gorkha Twin earthquakes
10:30 - 10:50	Liadi (Kola) Mudashiru	Earthquakes without Frontiers (EwF): Disaster Risk Reduction and Resilience (DRRR) and applying it in the context of China, Nepal and Kazakhstan
10:50 - 11:20	Refreshment break and networking	
11:20 - 11:40	Sergey Konshin, Tatyana Golubeva and Sergey Zaitcev	The research of automated radio system for transmitting notification information on seismic hazard and seismic monitoring data
11:40 - 12:10	Kazselezashita ( Kasenov Murat )	Disaster Resilience: History of Medeo, Shymbulak, Karagalinka and Issyk lake
12:10 - 12:30	Zhanay Sagintayev	Multidisciplinary collaboration for disaster resilience
12:30 - 12:50	Elena Ash	Satellite Imaging
12:50 - 13:10	Nazym Tylegenova	Aral Sea region desertification study
13:10 - 13:30	Dina Kaskina	Application of geodesy equipment for disaster resilience projects
13:30	Lunch and networking	

- 14:30		
Session 4: Chairs – Ant Parsons & Geoff Brighty (ICE Blue)		
14:30 - 14:50	Kanat Samarkhanov and Selvina Aliyeva	GIS and RS for analysis of disasters and emergency situations
14:50 - 15:10	Farida Zhandauletova, Zhanar Orzhanova and Gulnar Sadikova	Causes and consequences of the global flood problems
15:10 - 15:30	Simon Jeavons	Shoothill: Making waves using Social Media to disseminate flood warnings
15:30 - 15:50	Sarafutdinova Gulshat	Disaster Monitoring System
15:50 - 16:10	Marta Roca Collell	Risk management process for extreme weather event impacts
16:10 - 16:30	Stephano Utili	Geotechnical modeling for geohazard risk prediction and mitigation
16:30 - 16:50	Refreshment break and networking	
16:50 - 17:00	Kazselezashita	Briefing for next two days site visits: It is expected that everybody will join the trips on Wednesday. But that some delegates may choose to be working on proposals on Thursday instead of doing the trip; People, who decide to stay in the hotel and work on the project proposals, will also need to inform. We will need to manage properly food for camping and transportation bus
17:00 - 17:30	Key problems and Challenges Ant Parsons presentation and plenary discussion	What are the key problems / challenges? Review of key problems and challenges, summary so far with Q&A (a presentation created during the event based on what has been presented and discussed)
17:30 - 17:50	Stefano Utili, Jonathan Pearson	Introduction to some of the future funding opportunities we want to work towards
17:50 -	Potential Solutions (and Proposals) Ant	Creative Workshop sessions to identify a wide range of potential solutions to the problems. Group working

18:50	Parsons to introduce then group working	with facilitation to help get the best ideas which can be then developed over the next 3 days into collaborative proposals. This can continue in the bar up to dinner time if delegates wish.
19:00	Dinner, Free time	

<b>DAY 3, AUGUST 10, 2016</b>		
08:00	08:00 Breakfast	
<b>Session 5: Chair – Kazaselezashita</b>		
9:00 - 13:00	Kazaselezashita (Kasenov Murat, Raymbekova Janar)	Guided tour to Shymbulak and Medeo dams
13:00 - 14:00	Lunch and networking	
14:00 - 16:30	Kazaselezashita (Kasenov Murat, Raymbekova Janar)	Guided tour to Kargalinka River area
19:00	Dinner , Free time	

<b>DAY 4, AUGUST 11, 2016</b>		
8:00	08:00 Breakfast	
<b>Session 6: Chair – Kazaselezashita</b>		
9:00 – 13:00	Kazaselezashita (Kasenov Murat, Raymbekova Janar, Moldasynov Kanat) Kazaselezashita (Kasenov Murat, Raymbekova Janar, Moldasynov Kanat)	Guided Tour to Issyk Lake, history of the disappeared Issyk Lake
13:00 - 14:00	Lunch and networking	
14:00 - 16:30	Kazaselezashita	Community engagement and site visits including briefing
<b>Session 7: Chairs – Ant Parsons &amp; Geoff Brighty (ICE Blue)</b>		
16:30 - 17:00	Geoff Brighty	Review of the site visits and ideas arising
17:00 - 18:30	Ant Parsons	Refreshment of the Plenary Creative Workshop sessions and discussion of outline proposals. Group working.
19:00	Dinner, Free time	

DAY 5, AUGUST 12, 2016	
08:00	08:00 Breakfast
Session 8: Chairs – Ant Parsons & Geoff (ICE Blue)	
9:00 - 11:00	Overview of the previous days; Development of new proposals
11:00 - 11:30	Refreshment break and networking
11:30 - 13:00	Continue to work on cooperative proposals
13:00 - 14:00	Lunch and networking
14:00 - 15:30	Continue to work on cooperative proposals
15:30 - 16:00	Refreshment break and networking
16:00 - 18:00	Workshop review, Close
18:00	Dinner , Free time
20:00	Visit to <a href="#">JSC “National Center of Space Research and Technology”</a> Astrophysical Institute to watch the night sky via powerful telescope
24:00	Back to the Edelweiss Hotel

### Appendix 3: Workshop Attendees

Name	Home Institution	Area of research	Country of residence
Jonathan Pearson	Associate Professor, School of Engineering (Civil), University of Warwick, CV4 7AL	Flood Risk Management: A UK perspective Creating Resilience through Retrofitting	the UK
Prof Stefano Utili	Associate Professor, School of Engineering (Civil), University of Warwick, CV4 7AL	Geotechnical modelling for geohazard risk prediction and mitigation	the UK
Dr Geoff Brighty	Managing Director, Environmental Sustainability Associates Ltd	Review of the site visits and ideas arising	the UK
Ant Parsons	Director, ALP Synergy Ltd	Workshop Design and Facilitation, Innovation and Sustainability	the UK
Dr Marta Roca	Principal Engineer, Flood Management, HR Wallingford	Risk management process for extreme weather event impacts	the UK
Jonathan Cartwright	Project Manager, Balfour Beatty	The application of real-time monitoring techniques to ensure the safe completion of coastal protection works within an active landslide zone	the UK
Dr Giuliano Punzo	ENCORE The Engineering Complexity Resilience network, University of Sheffield	Avoiding reductionism in disaster prevention and the role of complexity	the UK
Dr Liadi (Kola) Mudashiru	PDRA & Project Manager, Geo Chemistry, Durham University	Earthquake without Frontier (EwF): Disaster Risk Reduction and Resilience (DRRR) and applying it in the context of China, Nepal and Kazakhstan	the UK
Dr Komak Raj Aryal	Affiliated Researcher, School of Biology, Newcastle University, UK	Revisiting cascading effects of the 2015 Nepal Gorkha Twin earthquakes	the UK
Simon Jeavons	chief operating officer, Shoot Hill	“Shoot Hill: Making waves using Social Media to disseminate flood warnings”	the UK

Helena Pater	University of Applied Sciences Groningen	Natural disaster events	Netherlands (Self-Funded)
Elena Ash	Sales Executive	Satellite Imaging	Russia (Self-Funded)
Aksholpan Kopesbayeva	AUPET, Head of Department of Electronics	Automation of production on the basis of microprocessor-based systems	Kazakhstan
Татьяна Голубева	a software engineer in Almaty University of Power Engineering & Telecommunications	Development of automated systems of control and management of operation of complex technological systems	Kazakhstan
Евгений Зайцев	PhD student in Almaty University of Energy and Communications	Development of automated systems of control and management of operation of complex technological systems	Kazakhstan
Sergey Konchin	Radio engineer, PhD of technical sciences in the field of automation of control systems, academic professor in the field of radio engineering and communications	Development of automated systems of control and management of operation of complex technological systems	Kazakhstan
Venera Junisbekova	PhD student at Kazakh National Research Technical University named after K.I. Satpayev and sector head at LLP Institute of Ionosphere (scientific institute)	Remote sensing and photogrammetry	Kazakhstan
Nurjamal Bekmuratova	Senior Lecturer, Almaty University of Power Engineering & Telecommunications	Reduction of risk Disaster and Emergency, disasters.	Kazakhstan
Abdimuratov Zhubanish	Senior Lecturer, Almaty University of Power Engineering & Telecommunications	Reduction of risk Disaster and Emergency, disasters.	Kazakhstan
Adilbekov Askar	Senior Lecturer, Almaty University of Power Engineering & Telecommunications	Reduction of risk Disaster and Emergency, disasters.	Kazakhstan
Umbetkulov Yertugan	Head of «Electical stations, networks and systems» Almaty University of Power Engineering and Telecommunications	Natural and man-made disasters	Kazakhstan
Helena Danjko	Doctor PhD, senior teacher,	wireless communications,	Kazakhstan

	department of TCS, AUPET	access networks, and satellite communication systems.	
Boiko Viktor	National Expert on Disasters Risk Reduction	Issues of national security and assessment and reduction of disasters risks.	Kazakhstan
Yelena Polzik	Associate Professor, department of TCS Almaty University of Power Engineering & Telecommunications	Wireless communications, satellite communication system, and satellite navigation systems	Kazakhstan
Satimova Yelena	Ph.D., Associate Professor, Department of "Computer and informational communication security" Almaty University of Power Engineering & Telecommunications	Some issues of emergency monitoring at threat of flooding	Kazakhstan
Mukasheva Assel	assistant, MSs Department of "Computer and informational communication security" Almaty University of Power Engineering & Telecommunications	Some issues of emergency monitoring at threat of flooding	Kazakhstan
Tursunova Aisulu	Head of the Laboratory of Water Resources of Kazakhstan Institute of Geography	Water resources assessment	Kazakhstan
Willem Muhren	Head of Information Management Unit, United Nations Office for the Coordination of Humanitarian Affairs, Regional Office for the Caucasus, Central Asia and Ukraine	Disaster preparedness and response	Kazakhstan
Khaidarov Mukhtar	Researcher, Earth science, geophysics, seismology, environment	Seismic monitoring and short-term forecasting	Kazakhstan
Viktor Blagovechshenskiy	doctor of geographical sciences	Estimation and mapping of natural hazards and risks.	Kazakhstan
Sagatdinova Gulshat	Researcher, JSC "National Center of Space Researches and Technologies"	Disaster monitoring	Kazakhstan
Sadikova	Assistant in AUPET.	High Efficiency Automation	Kazakhstan

Gulnar		systems	
Zhanar Orzhanova	professor of Power Stations and Networks Chair , AUPET	Global flood problems	Kazakhstan
Zhandauletova Farida	associate professor in AUPET	Global flood problems	Kazakhstan
Gani Balbayev	associate professor in AUPET	Intellectual Robotic Systems.	Kazakhstan
Azamat Kaldybayev	Researcher at Institute of Ionosphere, National Center for Space Research and Technology	GIS and RS methods	Kazakhstan
Y. K. Satimov	AUPET	Information security	Kazakhstan
A.Abikenova	AUPET	Climate and global warming	Kazakhstan
Baizakova	AUPET	Climate and global warming	Kazakhstan
Demeyova	AUPET	Climate and global warming	Kazakhstan
Sanatova	AUPET	Climate and global warming	Kazakhstan
Kanat Samarkhanov	Engineer at Kazakhstan Gharysh Sapary National Company JSC.	Photogrammetric processing	Kazakhstan
Bakhyt Baimukhanbetov	UNDP, National Expert	Issues of national security and assessment and reduction of disasters risks.	Kazakhstan
Prof. Jong Kim	Professor, Nazarbayev University	Natural disasters	Kazakhstan
Dina Kaskina	Teaching Assistant at Nazarvayev University	Applications of Geodesy equipment for Disaster Resilience projects/GIS and RS	Kazakhstan
Zhanay Sagintayev	Assistant Professor, Department of Civil Engineering, Nazarbayev University	Multidisciplinary research cooperation to improve Disaster Resilience	Kazakhstan
Aidar Sagintayev	web master, GIS geodatabase expert, National Laboratory Astana, Nazarbayev University	open source GIS software tools to monitor and model Emergency events	Kazakhstan
Selvina Aliyeva	Tourism Manager at E;senal Travel Astana	Geomorphology of arid lands	Kazakhstan
Nazym Tulegenova	Research Assistant at Nazarbayev University	Remote sensing /water resources	Kazakhstan
Abzal Zhamalov	Technical Director (CTO), LLP ICS Integris Capital Solution	Hexagon Geosystems	Kazakhstan
Alexandr Dianov	Specialist in Leica Geosystems	Leica Geosystems	Kazakhstan