



Developments in Integrated Water-Resource Analytical Techniques and Remote Sensing Applications in Support of Water Resource Assessments in Central Asian Countries

Astana, Kazakhstan, 14-18 September, 2015

Purpose: Explore developments in integrated water-resource analytical techniques and information and remote sensing applications in six central Asian countries in support of water resource assessment activities, and promote collaboration among international partners for the exchange of scientific expertise regarding surface water, ground water, and remote sensing applications.

Sunday, 13 September 2015

Participants arrive in Astana

Monday, 14 September 2015

09:00 – 09:30 Arrive at the Hilton Garden Inn Hotel/ Registration Tea/Coffee

09:30 – 10:00 Welcome to Workshop, Introductions by Participants

10:00 – 10:45 Opening Addresses

- Kazakhstan Ministry of Foreign Affairs, Representative (TBC)
- Oshakbayev Rakhim, Vice Minister, Ministry of Investment and Development, Republic of Kazakhstan
- John Mark Pommersheim, Deputy Chief of Mission, U.S. Embassy Astana
- Dr. Irina Pavlova, UNESCO Hydrologic Program, Paris Office
- Dr. Ingrid Maria Verstraeten, Chief, Europe, Russia, and Central Asia, U.S. Geological Survey International Programs

10:45 – 11:15 Keynote Address: “Water Resources Management in a Time of Extremes,” by Dr. Jerad Bales, Chief Scientist Water Resources, U.S. Geological Survey.

11:15 – 11:45 Media Event, Group Photograph Tea/Coffee Break

11:45 – 13:00 First Session

Techniques and Experiences in Integrated Water-Resource Data and Remote sensing applications: United States

“USGS Integrated Remote Sensing, Surface Water, and Groundwater Data Activities,” presented by **Dr. Kevin Vining, Thomas Mack, and Dr. Saud Amer**, U.S. Geological Survey

UNESCO presentation:

“The Global Groundwater Information System and its Various Components,” presented by **Dr. Eleftherios Andreas Antoniou**, IGRAC, Category II UNESCO CENTER.

13:00 – 14:00 Lunch Break

14:00 – 15:15 Second Session

Developments in Integrated Water-Resource Data and Remote sensing applications: Kazakhstan

1. **JSC Kazakhstan Garysh Sapary**, **“Presentation Kazakh ERS Program,”** presented by Professor O. Alipbeki.
2. Water Committee of Republic Kazakhstan, **“Information System for Water Resources Management,”** by Ismailova L.V.

15:15 – 15:45 Tea/Coffee Break

15:45 – 17:15 Third Session

3. State company Kazhydromet **“Surface Water Resources of Kazakhstan,”** by **Duyissenbina Z.K.**
4. State Company Kazhydrogeology **“Underground Water as the Strategic Resource of Kazakhstan,”** presented by **Akylbekova A. Zh.**
5. Geography Institute of Kazakhsyan **“Developing of Methods of Bathymetry for Mapping the Lakes in Kazakhstan,”** presented by **Bazhieva A.M.**
6. **“Dynamics of Lake Systems on the DZ,”**
7. National Center for Space Sciences and Technologies **“ERS Monitoring of Water Resources in Kazakhstan,”** presented by **Kaipov I.V.**
8. Republican State Enterprise South Kazakhstan Hydro Geological Melioration Expedition **“Experience of Using Satellite Pictures to Identify Salinization of Irrigated lands in the South Kazakhstan Oblast,”** presented by **Anzelm Karl Albertovich.**

17:15 – 17:45 Remarks from First Day, Close of First Day

18:00 – 19:30 Reception hosted by UNESCO

Tuesday, 15 September 2015

09:30 – 09:45 Opening Remarks

09:45 – 11:00 Fourth Session

Developments in Integrated Water-Resource Data and Remote sensing applications: Kyrgyz Republic.

1. **“Use of Remote Sensing Data Predicting Water Availability of the Kyrgyz Republic,”** presented by **Bazarbaeva Nazgul Ishenbaevna**, Chief Specialist Department Gidroprognozirovaniya Agency for Hydrometeorology under the Ministry of Emergency Situations.
2. **“Water Resources Response on Glacier Dynamics in Central Asia Transboundary River Basins,”** presented by **Tamara Tuzova**, Head researcher in the Laboratory of Mountain Lakes Institute of Water Problems and Hydropower of the National Academy of Sciences of the Kyrgyz Republic.
3. **“Geo-Information Database System of Issykul Region of Kyrgyz Republic,”** presented by **Baktybek Zhakeev**, Institute of Water Problem and Hydropower, Kyrgyz Academy of Sciences.

11:00 – 11:30 Tea/Coffee Break

11:30 – 12:45 Fifth Session

Developments in Integrated Water-Resource Data and Remote sensing applications: Tajikistan

1. **“Main Factors Affecting the Mode of Surface Waters,”** presented by **Anvar Kodirov**, Institute of Water Problems, Hydropower Engineering and Ecology of the Academy of Sciences.
2. **“Problems of Reassessment of Operational Stocks of Mineral Water in Tajikistan,”** presented by **Dr. Razykov Bakhtiyor**, Ph. D. , Senior Scientist Laboratory of evaluation of seismic hazard and Geo IGSSS Academy of Science, Tajikistan Academy of Sciences.
3. **“The Impact of Climate Change and Agro-Climatic Resources on Maintenance of Food Security in the Central Asian Region and Creation of Adaptation Mechanisms,”** presented by **Inom Normatov**, Chief Scientific Researcher, Institute of Water Problems, Hydropower and Ecology.

12:45 – 14:00 Lunch Break

14:00 – 15:00 Sixth Session

Developments in Integrated Water-Resource Data and Remote Sensing applications: Afghanistan

1. **“Application of Remote Sensing to Monitor Water Scarcity and Food Security in the Region,”** presented by **Mohammad Fahim Zaheer**, Technical Manager, Famine Early Warning Systems Network (FEWS NET), Ministry of Agriculture, Irrigation and Livestock, Afghanistan

2. "Water Management in the Amu Darya Basin," presented by **Sayed Ali Sayed Ahmad Shah**, Advisor to the Minister Osmani for Water Management, Dam and GIS.

15:00 – 15:15 USAID Presentation

1. "The USAID PEER Program in Central Asia," presented by **Dr. Jason Porter** Research Advisor - SSA & South and Central Asia, U.S. Global Development Lab, Research Partnerships for Development Team, USAID, **and introduction of PEER representatives**

15:15 – 15:45 Tea/Coffee Break

15:45 – 17:00 Seventh Session

Developments in Integrated Water-Resource Data and Remote sensing applications: Uzbekistan

1. "Water Related Data, Information and Knowledge Management in Central Asia: SIC ICWC," **experience** presented by **Dr. Dinara Ziganshina**, Ph.D., Deputy Director, Scientific Information Center of Interstate Commission for Water Coordination in Central Asia
2. "Conjunctive Use of Surface and Groundwater – Challenges and Opportunities: Case Study from Uzbekistan and Tajikistan," presented by **Dr. Akmal Kamirov**, International Water Management Institute, Central Asia sub-regional office.

17:00 – 17:30 Remarks from Second Day, Close of Second Day

Wednesday, 16 September 2015

09:00 – 18:00 Eighth Session

Remote Sensing, Surface-Water and Groundwater Field Trip in and near Astana led by JSC Kazakhstan Gharysh Sapary, Kazhydromet and the Institutes of Geology and Hydrogeology in Coordination with Other Organizations.

- 09:30 – 11:00 Visit the National Space Center (JSC "NC "Kazakhstan Gharysh Sapary")**
- 11:30 -12:30 Visit the Kazhydromet Office**
- 13:00 – 14:30 Lunch at Kazygurt Restaurant, 9 Tlendiyeva St, Astana.**
- 15:00 – 16:30 Visit of hydrological station of Kazhydromet.**
- 17:30 –18:00 Visit of National Museum in Astana**
- 18:30 -20:30 Reception at US Embassy hosted by DCM Pommersheim**
- 20:30 Return to the hotel**

Thursday, 17 September 2015

Breakout group 1: Integrated Water-Resource Analysis of Flood Events

Presentations provided followed by group discussions of flood events from North Dakota (USA), Kazakhstan, and possibly other Central Asian countries. We will examine information regarding monitoring, data requirements, modeling, forecasting, and remote sensing. Tabletop exercises will be included. Inputs, comments, and discussions from participants are encouraged.

09:00 – 12:30 Overview of flooding events in North Dakota and Central Asia.

Talk:

1. "*Satellite-Based, Hazard-Specific Disaster Monitoring System*," presented by *Dr. Saud Amer*

Presentation/Discussion Topics:

2. "*Climate and Hydrology of Central North America and Central Asia*," presented by *Dr. Kevin Vining* .
3. "*USGS Perspective on Data Acquisition and Dissemination During Flood Events*," presented by *Dr. Kevin Vining*
4. "*Discussion of Interagency Communication During Flood Events*," presented by *Dr. Vining and Participants*.
5. "*Discussion of Flood Forecasting Performed by the U.S. National Weather Service*," presented by *Dr. Vining and Participants*
6. **High Waters in Kazakhstan – Nikiphorova E.**

12:30 – 13:30 Lunch

14:00 – 17:00 Case studies of flood events

Presentation/Discussion Topics: *Dr. Kevin Vining and Participants*

1. Analysis and group discussions of 2009 and 2011 North Dakota floods.
2. "*Integrated Water-Resource Analysis of Groundwater Availability Presentation of UNESCO activities in remote sensing*," presented by *Dr. Irina Pavlova*, UNESCO Hydrology Program.
3. Analysis and group discussions of recent floods in Central Asia using available information from participants.
4. Investigate data from National Weather/Meteorological Service forecast models and USGS/KazHydromet results from field observations and measurements.
5. Examine remote sensing information prior to and during flood events.
6. Discuss importance of communication and data dissemination during flood events.
7. Discuss available tools and outcomes of past flood events in U.S. and Central Asia.

Breakout group 2: Integrated Water-Resource Analysis of Groundwater Availability

Examine groundwater availability issues in an area of interest in Central Asia, and present examples from the USA or other Central Asian countries, from a monitoring, data requirement, modeling, forecasting, and remote sensing perspective. Input, comments, and discussions from participants are encouraged.

09:00 – 12:30 Overview of data and information needs for assessment or developing a groundwater flow model to investigate groundwater availability or sustainability. Discussion will emphasize integrated use of remotely sensed information, and streamflow and groundwater information.

- 1. “Groundwater Model Development and Application, Example from an Integrated Assessment of Water Resources in the Kabul Basin Afghanistan,”** presented by **Tom Mack, USGS**
- 2. “Use of Remote Sensing for Integrated Groundwater Investigations”** presented by **Dr. Saud Amer**

- **12:30-13:30 Lunch**

14:00 – 17:00 Possible discussion of Central Asian case studies. Emphasis will be on identification of common data acquisition issues and analytical techniques, interactions with other agencies within each nation, modeling issues, and integration of remotely sensed data, water quality or isotope information, and streamflow information. An introduction to USGS software for creating groundwater flow models using integrated data will be provided if time permits.

Optional topics for possible presentation by participants and for group discussion: *Mack and Participants*

- Case studies of hydrogeology of Central Asian countries
- Discussion of groundwater data collection networks
 - Purpose of networks – such as long-term climate, monitoring drawdown, seasonal levels (droughts or high levels)
 - Extent of networks – basin, climate zone, country
 - How are data stored and used or analyzed
- Discussion innovative techniques for data collection, such as:
 - Remote sensing
 - Borehole or Surface geophysics
 - Talk - **“Use of a Passive Seismic Method for Investigation of Aquifer Thickness,”** case study from Afghanistan presented by **Tom Mack**
- Discussion of software for data analysis or modeling
 - Water level or stream-flow analysis techniques
 - Talk – **“Use of USGS’s Groundwater Toolbox for Streamflow Hydrograph Separation and Recharge Estimation,”** presented by **Tom Mack**
 - What groundwater models are being used and what are they used for?

- Tools for building groundwater flow models
Talk – “**Discussion of USGS’s ModelMuse Software for Creating MODFLOW Models,**”
presented by **Tom Mack**
- Discussion of other groundwater issues of interest, such as
 - Climate change and groundwater availability
 - Increased withdraws, competing uses such as public supply and agriculture

18:30 – 20:00 Organized dinner at Kishlak Restaurant, Kabanbai Batyr 19/1, for invited guests residing at hotel. Additional guests are welcome *but need to pay for their dinner.*

Friday, 18 September 2015

09:00 – 09:15 Opening Remarks

09:15 – 12:00 Subgroup discussion by themes on “Integration of Surface-Water, Groundwater, and Remote Sensing Data and Applications” followed by a panel presentation.

12:00 – 12:15 Questionnaire

12:15 – 12:30 Closing Remarks

- Kazakhstan, Alan Kazkenov
- UNESCO, Irina Pavlova
- US Embassy, Patrick Horne
- USGS, Dr. Ingrid Maria Verstraeten

12:30 Adjourn

Friday PM or Saturday AM return to home country depending on availability of flights.