Key Messages:
“Hydrological Services in Asia under Rapidly Changing Conditions”

Coordinators:
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Asia Pacific region has experienced rapidly changing hydrological conditions: more than any other region.

Hydrological Services need to respond by improving hydrological practices, and product and service delivery.

Session objectives and outputs:
- To explore the on-going hydrological efforts that could improve hydrological practices in Asia region
  ➔ Sharing of improved practices
- Provision of opportunities to develop collaborating projects among the Asia Pacific countries
  ➔ Develop a framework for collaboration
Background (2)

- Previous meetings for organizing the session
    - Session structure and participation discussed.
  - WMO CHy AWG Meetings (Feb. 2013, Geneva; and Sep. 2014, Prague)
    - WGHS results were reported.
- Organizations and speakers confirmed participation if session held (Nov. 2014)
- Korea MOLIT and WMO to support some speakers and panelists.
Speakers and Panelists

- Introduction and Opening (Dr. Sung Kim, KICT)
- Opening remarks (Mr. Ha-joon Park, Director General, Han River Flood Control Office, MLIT, ROK)
- Presentations
  - Dr. Paul Pilon (WMO Hydrological Services)
  - Dr. WANG Guoqing (Hydrological Practices under Climate Change)
  - Dr. Tai-Hoon Kim (Sediment Disasters)
  - Dr. Sergey BORSHCH (Floods)
  - Ms. Hwrin Kim (Water Resources Assessment)
- Panel Discussion
  - Dr. Wolfgang Grabs; Ms. GAO Ge; and Dr. Yeongsin ROH.
- Concluding remarks
  - Mr. Zhiyu LIU
Asia has seen the full range of deadly floods, storms, landslides, earthquakes, drought and extreme weather. Economic losses continue to rise exponentially. Asia has experienced human-induced changes including population growth, increased urbanization, land use changes, increased water use demands, increased climate variability, and climate change.

National Hydrological Services in the region are becoming increasingly important and need to improve capabilities in:
- data observations, their management and sharing,
- flood forecasting and warnings,
- water resource assessment,
- sediment (land slide and debris flow) disaster management,
- drought, flood and water resources management.
1 Hydrological practices under climate change

- Climate change results in generally more extreme events
  - storms, floods, droughts…
  - higher variability of available fresh water resources

- *Climate prediction model and products* can be used in extended stream flow prediction, which can help improve water resources management and planning

- *Climate change projection results* can be used in assessment of potential impacts of climate extremes, which can benefit water-related disaster management
Flood forecasting and warning

- FFW is an important activity of National Hydrological Services, which help inform disaster managers and the public so they may take appropriate measures for disaster preparedness and mitigation.
  - The use of advanced numerical weather prediction outputs in flood forecasts can improve the accuracy and lead time of FFW.
  - Advances have been made in the use of ensemble meteorological prediction, and probabilistic hydrological forecasts.

- Capacity building through implementation of the Flash Flood Guidance System (FFGS) project with global coverage, the Associated Programme on Flood Management, the Integrated Drought Management Programme, and promoting impact-based forecasts.
National Hydrological Services need to carry out water resources assessments to meet challenges posed by increased demand.

WRA helps water managers know the availability of water resources and supports integrated water resources management.

Tools and models are being developed to undertake dynamic assessment of the availability of basin-wide water resources, and such tools can be used for planning purposes.
We need to improve how we deal with sediment disasters so as to decrease the exposure of ordinary people to them.

Three perspectives:

- Issuance landslide/debris flow warnings based on improved monitoring and hazard assessment technologies

- Improvement in capacity for undertaking sediment disaster management through seminars, training, knowledge and technology sharing

- Improved dissemination of sediment-related disaster information and products, e.g. making available hazard and risk exposure maps, promoting provision of safety services
5 Other aspects

- Improving hydrological observations
  - Accuracy and coverage
  - Encouraging data sharing
  - Data rescue

- Strengthening cooperation and coordination among National Hydrological Services
  - Capacity building
Thank you