

Central Asia Regional Flash Flood Guidance System: Data Requirements



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Motivation of the Presentation

For countries that choose to participate in Central Asia Regional FFG System, they will receive a request for data. Objective of this presentation is to outline the data required and generally how it will be used.

DATA REQUESTED FOR SEEFFG SYSTEM DEVELOPMENT AND COMPLETION

(As available in each country)

Logistical Data (Metadata)

- Longitude and latitude coordinates (in decimal degrees) and elevation (in meters) of all sensors providing real time data and historical data, type of data, units of measurement and sensor.
- Longitude and latitude coordinates (in decimal degrees) of dams and reservoirs
- Evaluation of basin delineation: initial delineations based on hydrologic processing of the SRTM (90-m) resolution digital elevation data and hydrographic information from the Digital Chart of the World
 - Evaluation of the delineation results with local knowledge and expertise is required for final quality assurance
 - Delineation maps may be provided in GIS format, shapefile is preferred.

Spatial Digital Data or Maps (for areas of interest)

- Digitized stream network data
- Digitized country catchment boundaries data
- Land-use and land-cover data
- Soils data to include soil texture or FAO soil classification or soil properties data, and depth of upper soil and sub-soil

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- Local stream cross-sectional survey data for natural streams draining 10-2000km², including any reports of regional relationships between channel cross-sectional characteristics and catchment characteristics
- GIS map of bedrock and alluvial channels
- Population distribution data

Reports

- Flood Frequency Analysis (regional and local)
- Flash Flood Occurrence (regional and local)
- Stream geometry studies for small streams
- Climatological precipitation and flood studies

Historical Data

- Precipitation data (hourly, daily, monthly, climatology)
- Air temperature data (hourly, daily, monthly, climatology)
- Pan evaporation data (daily, monthly, climatology)
- Soil moisture data for top 1 meter of soil (weekly, monthly, climatology)
- Streamflow discharge data for local streams with drainage areas less than 2000 km² (hourly, daily, monthly, climatology)
- Spring discharge data
- Stream stage data (hourly, daily, monthly, climatology) and associated stage-discharge curves (rating curves), also for local streams

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Spatial Data

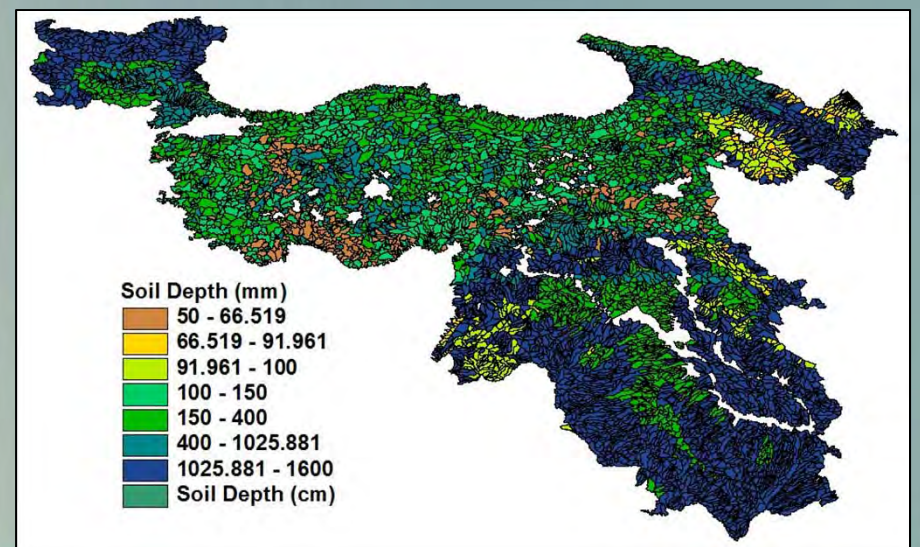
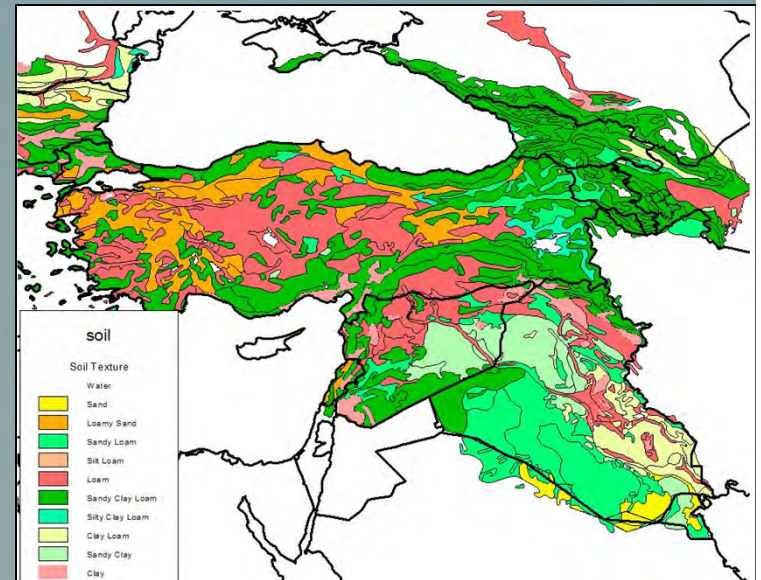
Purpose: Aide in parameterization of models
(*digital format preferred, country data*)

- ❑ Soils information (soil type, soil depth)
- ❑ Land cover / land use data
- ❑ Maps of bedrock, karst, alluvial channels

Purpose: Validation of watershed delineation and hydrologic network

- ❑ Digitized watershed boundaries
- ❑ Digitized stream network
- ❑ Channel surveys for small watersheds
- ❑ Coordinates of reservoirs (lat, lon)

FAO-UNESCO Soils Map



Real-Time Gauge Data

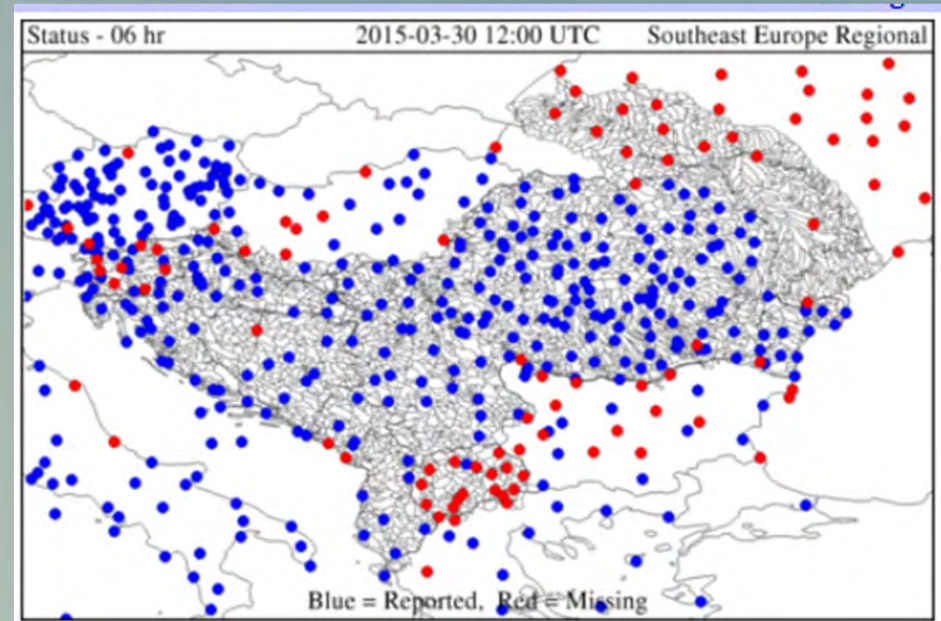
Real-time gauge data includes:

- (1) precipitation
- (2) temperature
- (3) snow depth or SWE
- (4) stream discharge

Needs:

- Logistical data (metadata) including latitude/longitude coordinates of automated stations
- If stations are not included on GTS, discussion of accessibility and transfer to Regional Center

Example from Southeast Europe



Purpose: provides real-time information to (a) rainfall processing to account for precipitation bias and (b) the real-time hydrologic modeling components (snow, soil water, FFG).

Historical Data

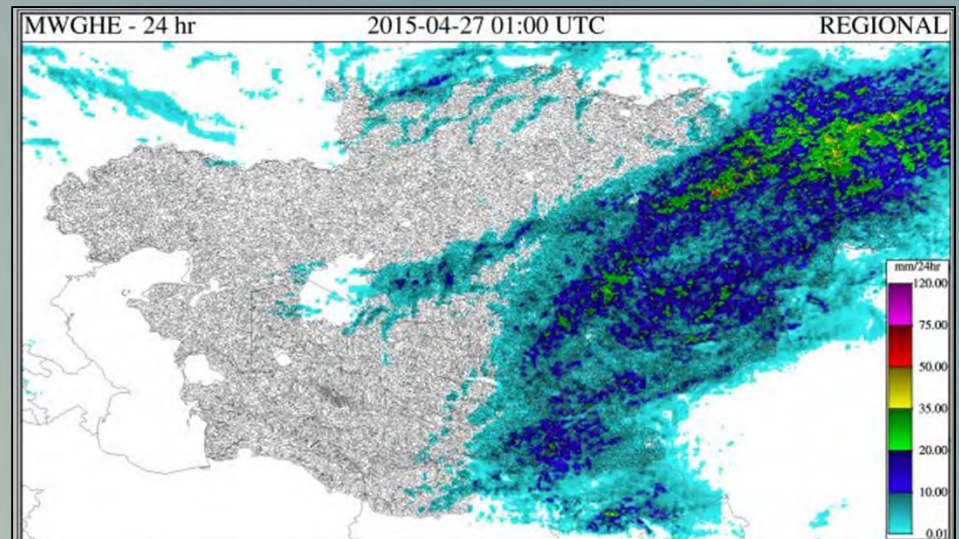
Variety of historical data is required.

All types of station require:

- ❑ Logistical data (metadata) including latitude/longitude coordinates of automated and manual stations

(1) Precipitation data

- ❑ hourly or 6-hourly *preferred*, or daily
 - period: 2012-present
 - analysis of bias in satellite rainfall (climatological bias adjustment)
- ❑ hourly, daily *preferred* (monthly)
 - calibration of hydrological modeling components
 - estimation of climatology



Historical Data

(2) Temperature

- Historical data, hourly, daily *preferred* (monthly, climatology)
 - estimation of climatology
 - estimation of diurnal cycle
 - estimation of potential evapotranspiration
 - calibration of snow modeling component

(3) Pan evaporation

- Historical data (daily, monthly, climatology)
 - estimation of climatology
 - estimation of potential evapotranspiration

(4) Radiation, Humidity, Wind data

- Historical data (daily, monthly, climatology)
 - estimation of potential evapotranspiration

Historical Data

(5) Snow Water Equivalent

- Historical data (as available)
 - calibration/validation of snow modeling component

(6) Soil moisture data (top 1 m of soil depth)

- Historical data (weekly, monthly, climatology)
 - calibration of soil modeling component

(7) Stream discharge data (or stream stage plus rating curves)

- Historical data, hourly, daily *preferred* (monthly)
 - validation of soil modeling component

(8) Spring discharge data

- Historical data (as available)
 - calibration of soil modeling component

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Please send me questions on Data Requirements:
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THANK YOU