Current Country Activities related to AWCI:

Demonstration Project (DP): **Water balance study in the Selbe river basin, Tuul river, Mongolia**

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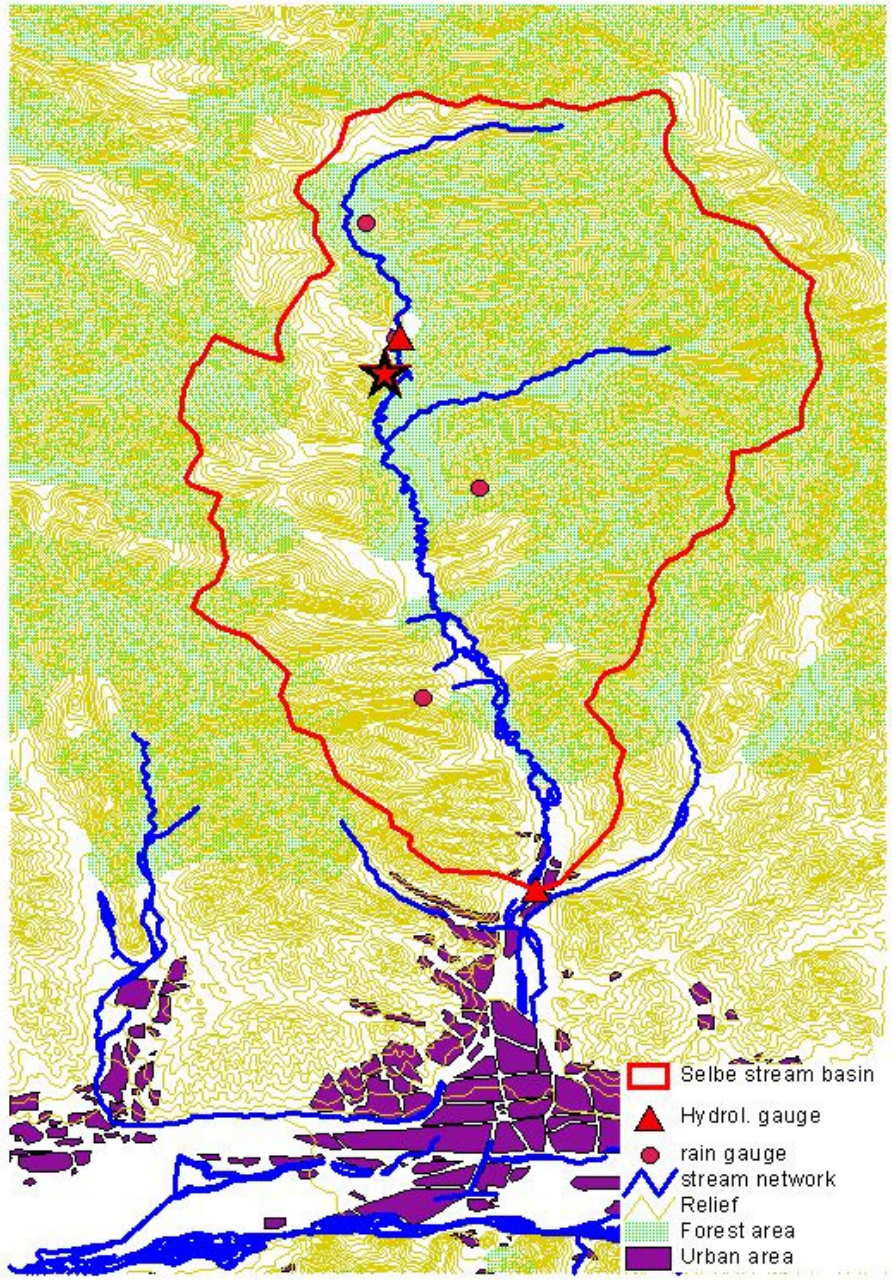
Main goal of the DP is to assist development, implementation and revision of Integrated River Basin Management plan in Selbe and Tuul river basins

Collaborator: Institute of Meteorology and Hydrology, Ulaanbaatar, Mongolia, Hiroshima University, Japan and National committees for UNESCO/ IHP, Mongolia and Japan,

Objectives: Long-term monitoring of water and energy cycles in the Selbe river basin

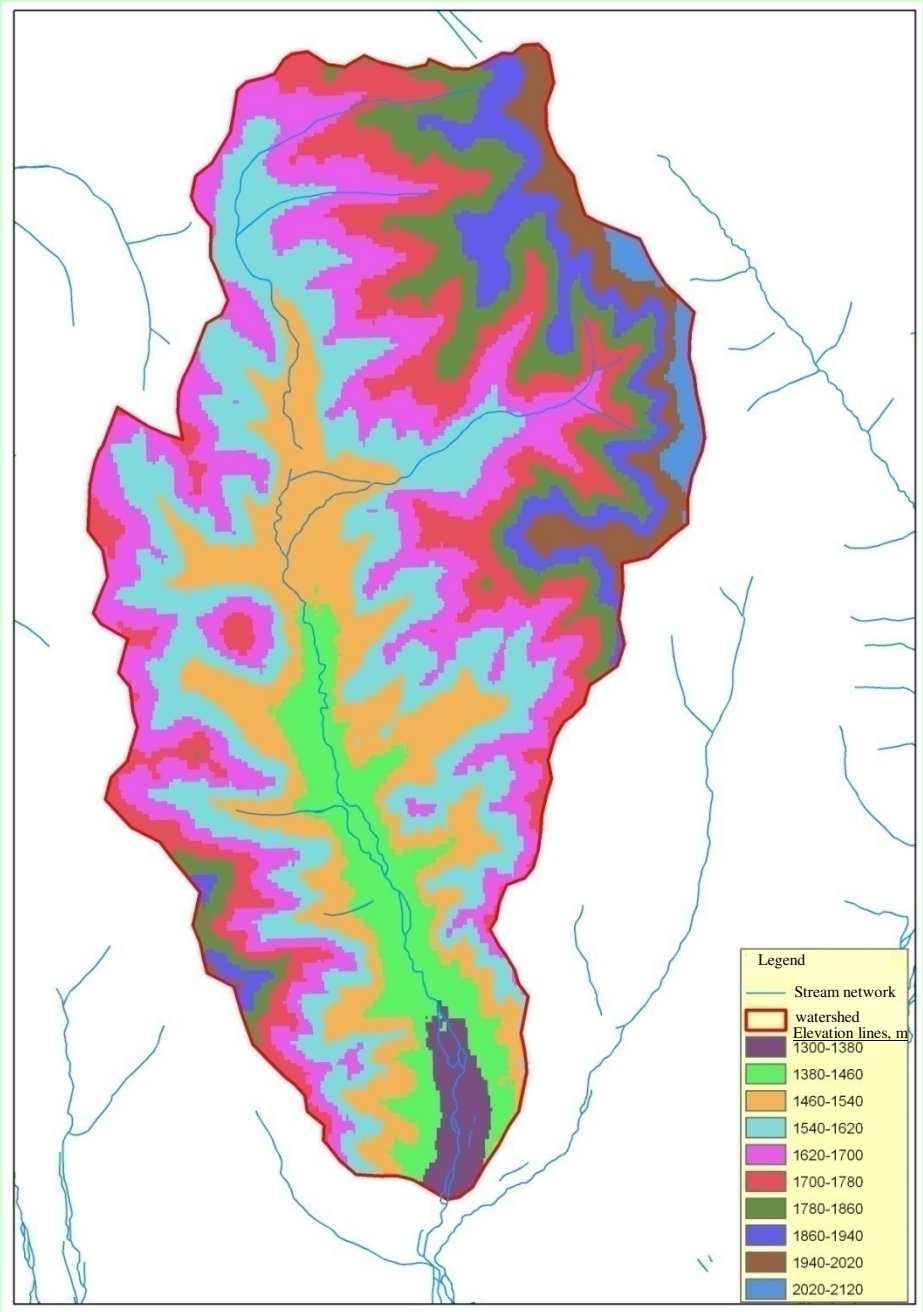
Introduction



Selbe stream, one of middle reach tributaries of the Tuul river, is located in the North of Ulaanbaatar. Its cathment area is round 300 sq.km and extends in between N 47î 55' till 48º 15' and E106º 50'-107º 00'.

Location of measurement sites in the Selbe river basin

Topography



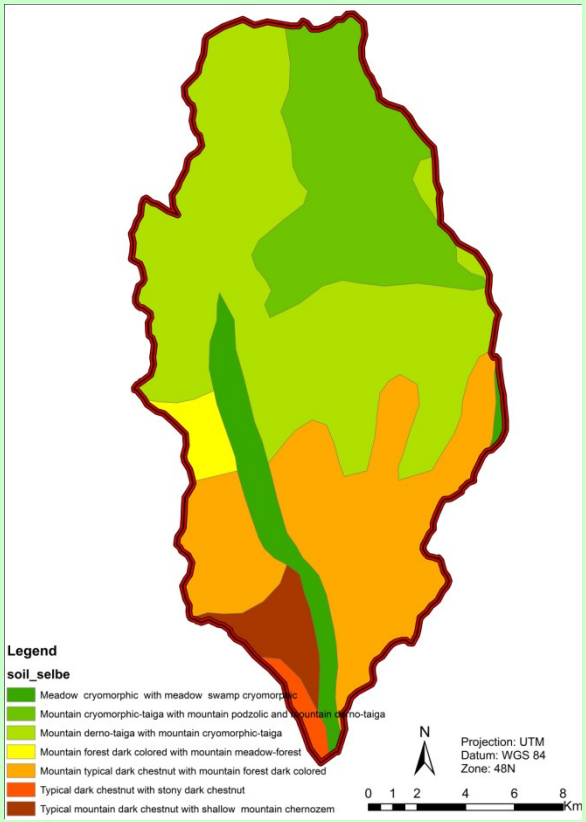
-Mountainous topography
-Its elevation ranges from 1300 till 2120 m.

Station	Cathment area, sq.km	Stream length, km	Basin mean elevation, m	River bed slope	Forest area, %
Sanzai	34.2	8.3	1620	0.021	63.7
Dambadarjaa	190	26.2	1510	0.012	54.6

Landscape feature in upstream area of watershed

Urban feature in middle and lowerstream area of watershed

Climate and Soil



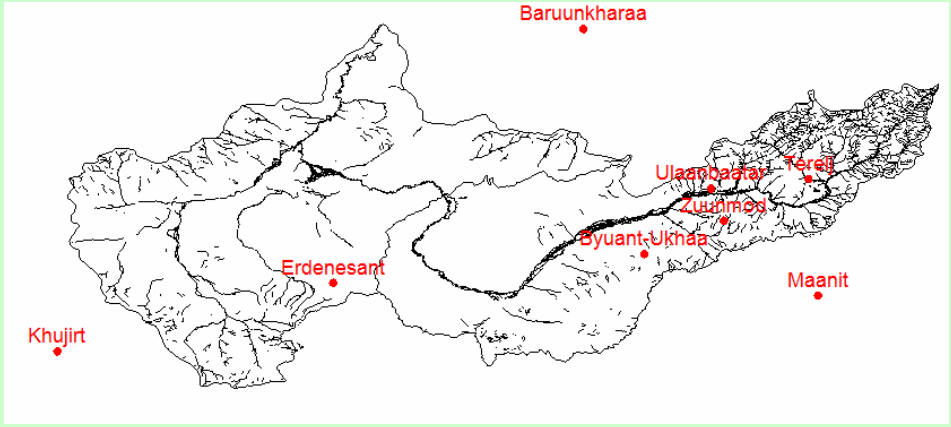
- Mean annual air temperature is -1.2 ^{o}C.
- Warm period with air temperature above 0^{o}C continues within 172-178 days in year.
- Annual min. temperature reaches -39.6 ^{0}C in January.
- Annual max. temperature reaches +34.5^{0}C in June or July.
- Annual mean precipitation is 258.5 mm and its 87.7 % occures during May-Sept. Daily max. rainfall totals as 71.6 mm.

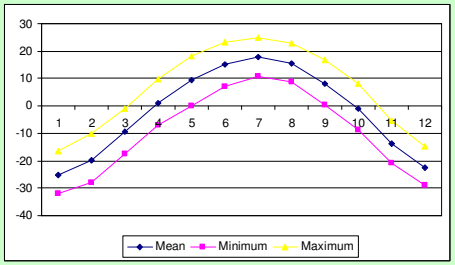
Hydrological and climate data have been uploaded to DIAS since 2004-2008.

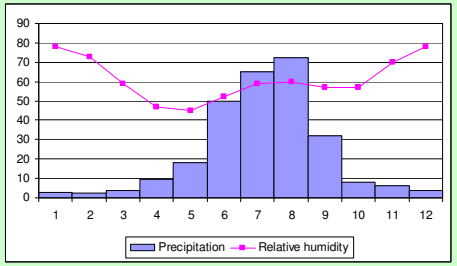
As follows:

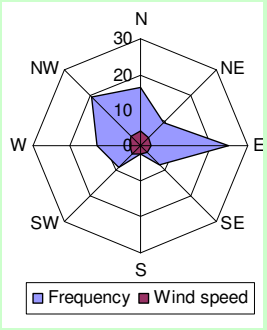
№	Station	Data type	Time period
1	Damba	Precipitation	May-Oct 2004
			May-Oct 2005
			May-Oct 2006
		Streamflow	May-Oct 2004
			May-Oct 2005
			May-Oct 2006
		Water level	May-Oct 2004
			May-Oct 2005
			May-Oct 2006
2	Ikh surguuli_University	Air temperature	Jan-Dec 2004
			Jan-Dec 2005
			Jan-Dec 2006
		Precipitation	Jan-Dec 2004
			Jan-Dec 2005
			Jan-Dec 2006
3	Takhilt_Ulaanbaatar	Air temperature	Jan-Dec 2004
			Jan-Dec 2005
			Jan-Dec 2006
		Precipitation	Jan-Dec 2004
			Jan-Dec 2005
			Jan-Dec 2006
4	Sanzai	Streamflow	May-Oct 2004
			May-Oct 2005
			May-Oct 2006
			May-Aug 2007
			Jan-Dec 2008
		Water level	May-Oct 2004
			May-Oct 2005
			May-Oct 2006

Tuul river basin of demonstration project and climate change assessment and adaptation









Example of Ulaanbaatar city

Geographical location:

Climate :

Temperature

- Annual temperature is 0.4-3.3^{0}C
- Absolute maximum temperature is 32.9-40.2^{0}C and minume varies temperature -36.7…-46.5^{0}C

Precipitation

- Annual precipitation is 222-275mm, and 68-78% of the total and precipitation falls as rain in summer
- Daily maximum precipitation reaches 43.8 -78.7mm

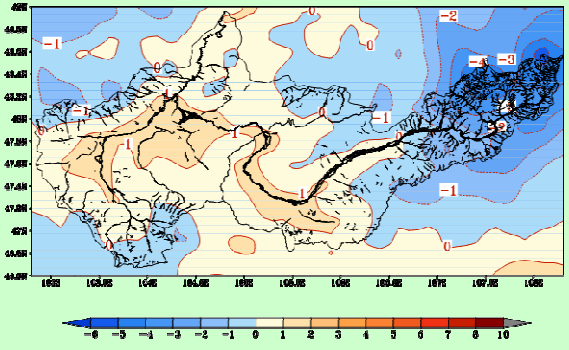
Data availability since 1980-2010

- 3 hourly climate data in above stations
- Hydrology

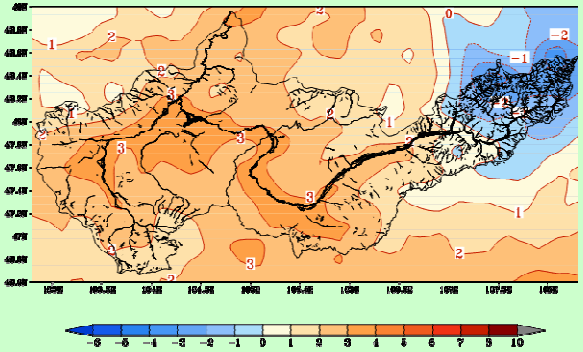
Climate change scenarios

- Tokyo University tool-statistical downscaling
- Dynamic downscaling using RCM

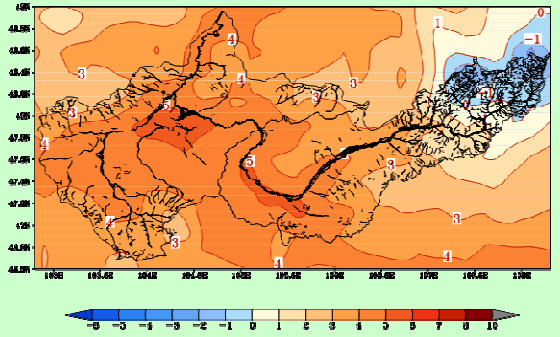
Preliminary study of climate change scenarios in Tuul river basin using HadCM3, A1B



2011-2030

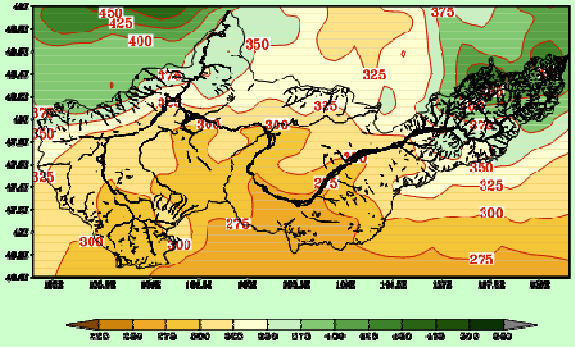


2046-2065

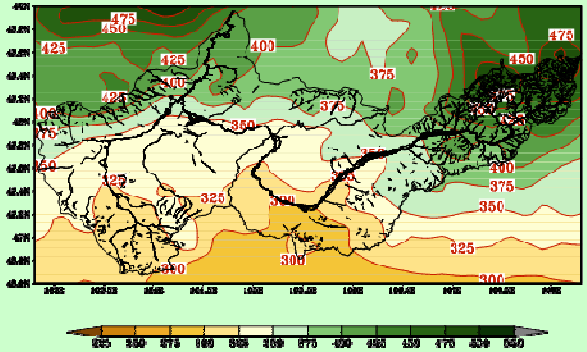


2080-2099

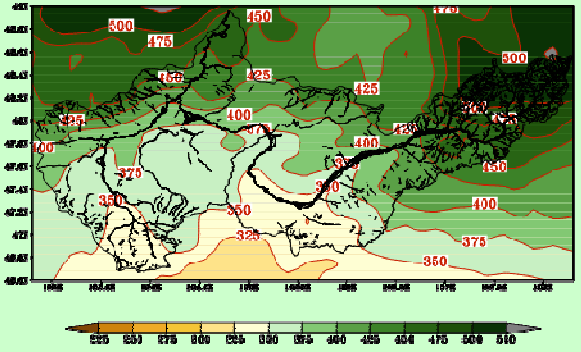
Annual mean temperature, ^{0}C



2011-2030



2046-2065



2080-2099

Annual precipitation, mm

Strengthening Integrated water resource management:

Major river basins where proposed to establish river basin Consuls and plans

The Current Availability and Use of Data in Decision Making in the Basin

-What are the different water-related decisions made on an annual basis in the basin, and who makes the decisions?

❖National water agency, River basin authority, River basin Consul (involving local government, NGO, public representatives) make decision

❖ Hydrological, meteorological and remote sensing (MODIS and other) and hydrological and climate models and data analysis results are used in decision making.

❖There are many gaps encountered in using these data and models (limited data, environmental changes are very fast, data collection, calibration and validation of models are very hard and slow process, and etc.).

❖ Extending real time hydro-meteorological observation network in upstream sites in a basin to cope with data needs and services for extreme events such as floods.

❖Greatest impediment to successful management of the basin is real time or near time data collection.

The Current Availability and Use of Data in Decision Making in the Tuul and Selbe river basin

Strategy, countermeasures and data availability

- Socio-economic scenarios (long-term development goals, programs)
- Climate change scenarios at regional and basin scale
- Land use scenarios (options)
- Impact assessment results on ecosystems and vulnerability analysis
- Adaptation policy
- Impact of climate change and anthropogenic pressures on water resources and its integrated management

What we expect from GEOSS / WCI

GEOSS Water Cycle Integrator is *a proposal to CEOS and GEO, proposed by Prof. Toshio Koike,* Japan GEO WG Chair, *develops a holistic coordination capability of the following function* in cooperation with various partners:

- observation integration
- science and model integration
- data integration & analysis
- cross-Socio Benefit Areas and Community of Practices
- management system integration
- sustained education framework

Use of GEOSS products, (MOLTS, Satellite (GPM, soil moisture (MAVEX), glacier (ALOS), lake, natural disaster monitoring), down scaling and modeling and prediction) and WCI achievements