

A scenic landscape photograph of a mountain valley. In the foreground, a calm lake reflects the surrounding green hills and the snow-capped mountains in the distance. The middle ground shows rolling green hills and a dense forest of evergreen trees. The background features majestic, rugged mountains with significant snow cover under a clear blue sky. The overall scene is peaceful and natural.

# State of Hydro-Meteorological observation and its sharing in Pakistan

**Dr. Bashir AHMAD**

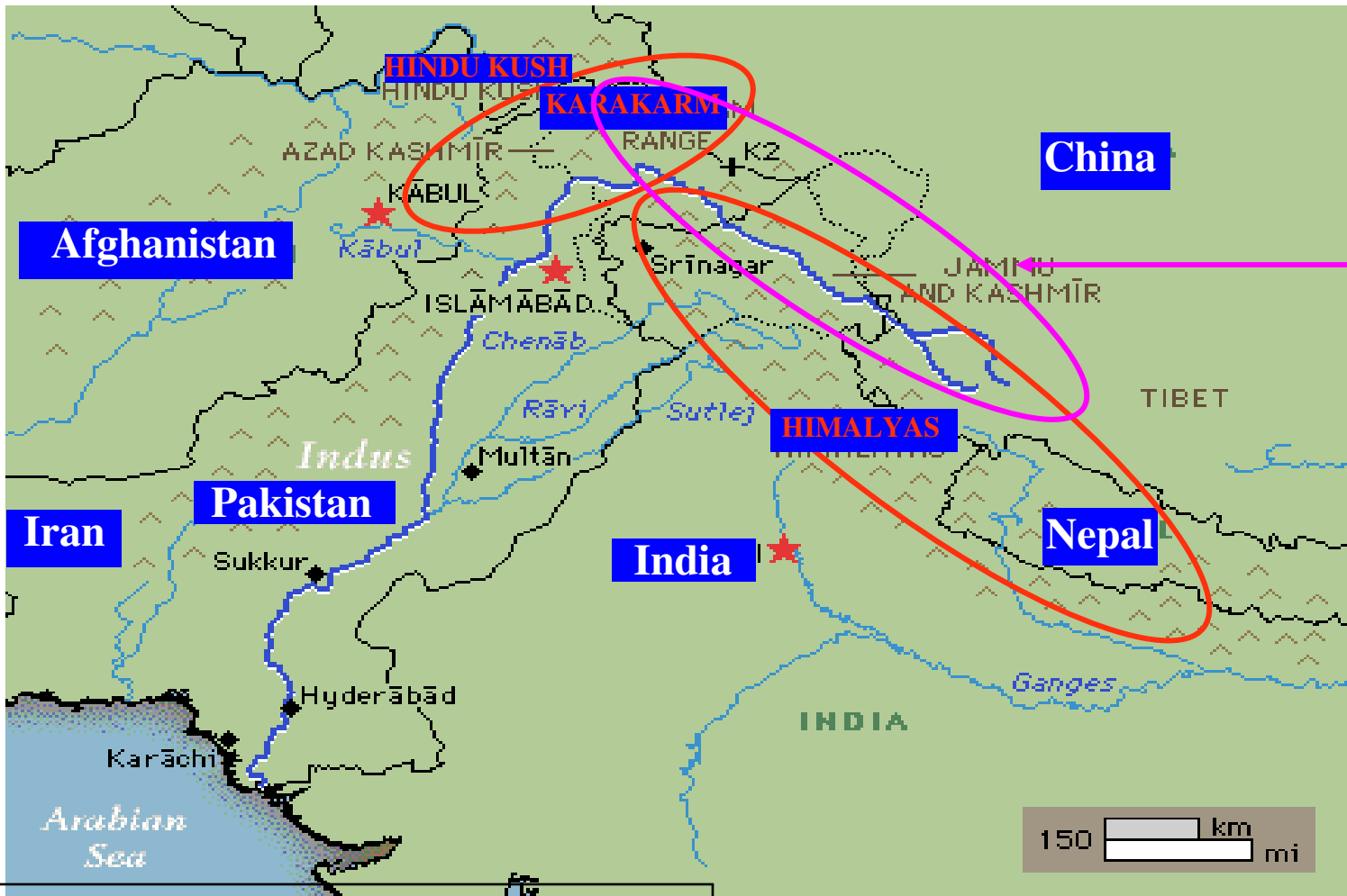
**Water Resources Research Institute  
National Agriculture Research Center  
Islamabad, Pakistan**



Upper Indus

PAKISTAN  
LOW / HILLS / MOUNTAINS

1. KUWAIT
2. SAUDI ARABIA
3. QATAR
4. UNITED ARAB EMIRATES
5. TURKMENISTAN



U  
I  
B

Indus Basin International Areas		
Country/Region	Area (sq. km)	Area (%)
China	92,981	10
India	67,340	7
Kashmir	179,486	19
Afghanistan	75,628	8
Pakistan	529,135	56
<b>Total Area</b>	<b>944,569</b>	<b>100</b>

- 80 to 90% of the UIB becomes snow-covered during most of winter season
- In UIB, seasonally snow covered areas are typically between 1500 m and 5000 m
- Snowline retreats to elevation about 4500 - 5000 m during July and August

➤ **IB: Indus Basin**   ➤ **UIB: Upper Indus Basin**

# **In Pakistan the source of fresh water is rainfall, snowmelt and glacier melt**

- 70 % rainfall is from summer monsoons and rest is from westerly disturbances
- More than 70% of water resources are contributed by snowmelt and glacier melt

# **Water resources issues**

- Flood forecasting including snowmelt floods
- Landslide
- Sediment flow
- Few station in remote and difficult approach area



# **Pakistan Meteorological Department (PMD)**

**Pakistan Meteorological Department (PMD) is a federal agency with a mandate to monitor and analyze meteorological data. It maintains a network of about 200 metrological stations across the country**

## **Snow and Ice Hydrology Project (SIHP)**

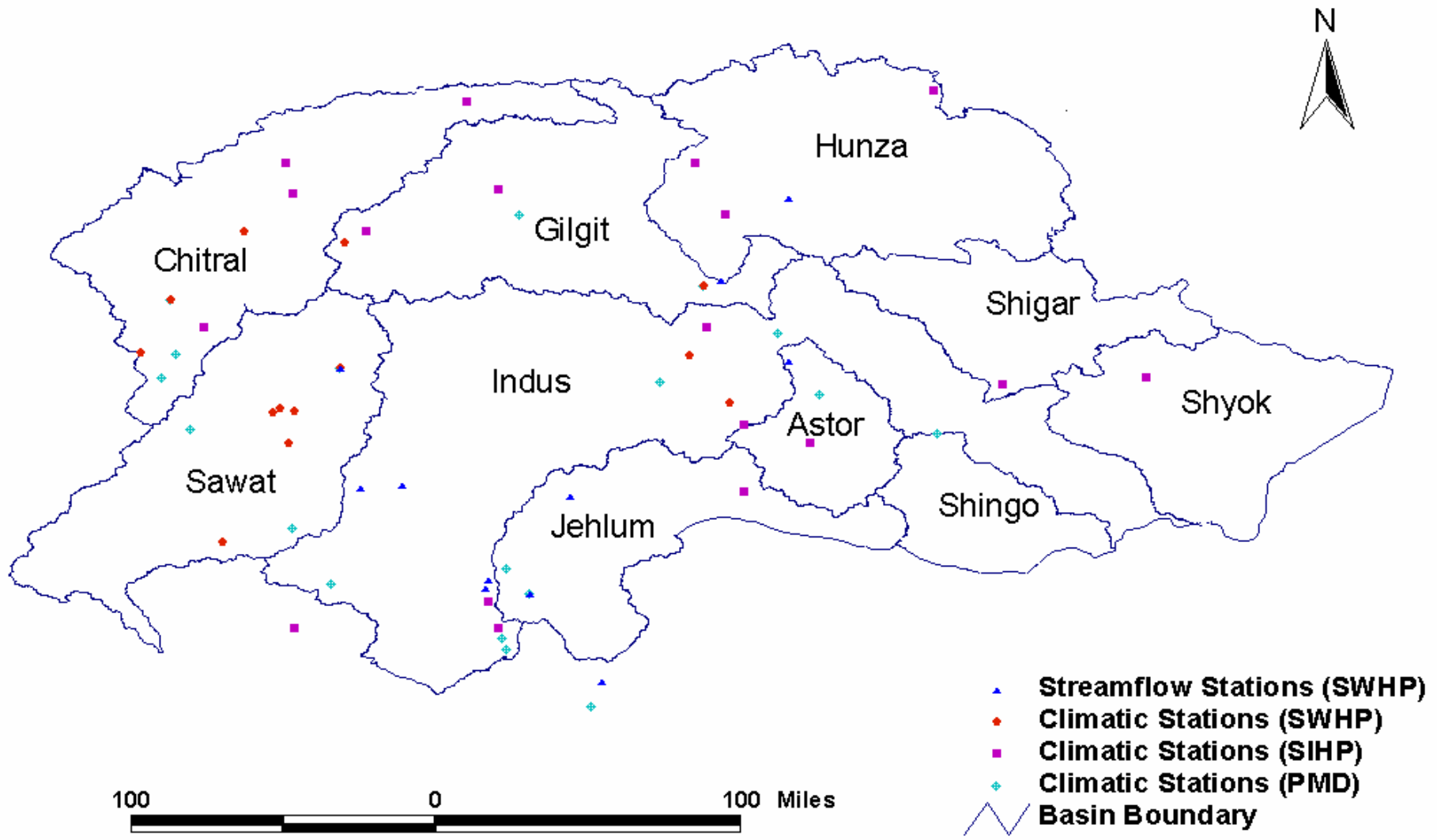
**It maintains a network of 21 stations at high altitudes in upper Indus Basin**

## **Surface water Hydrology Project (SWHP)**

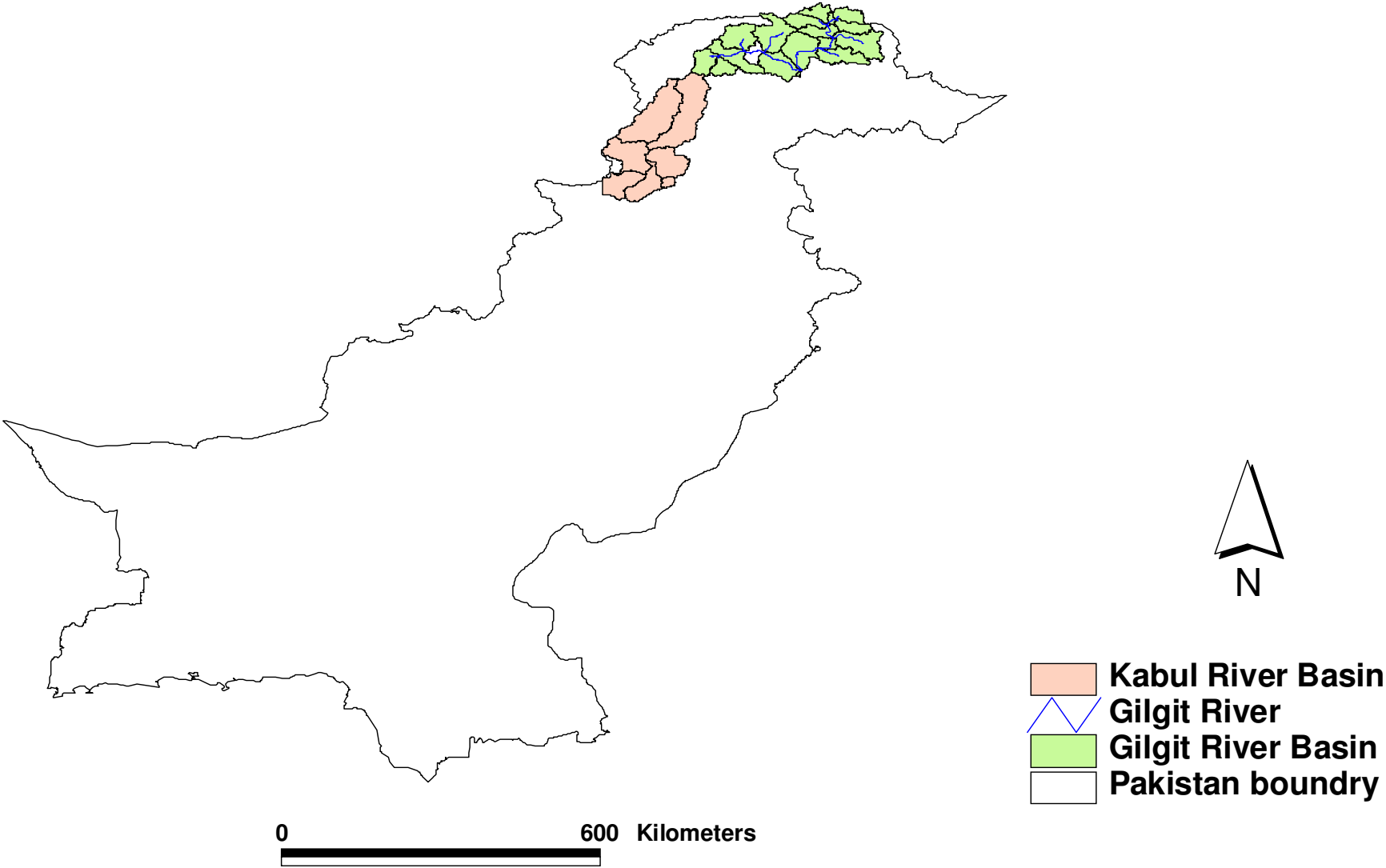
**It maintains a network of 80 metrological stations throughout the country**

## **Ev-K2-CNR**

**They have established one Automatic weather station in Karakoram**



# Potential Demonstration River Basins





# Gilgit Basin

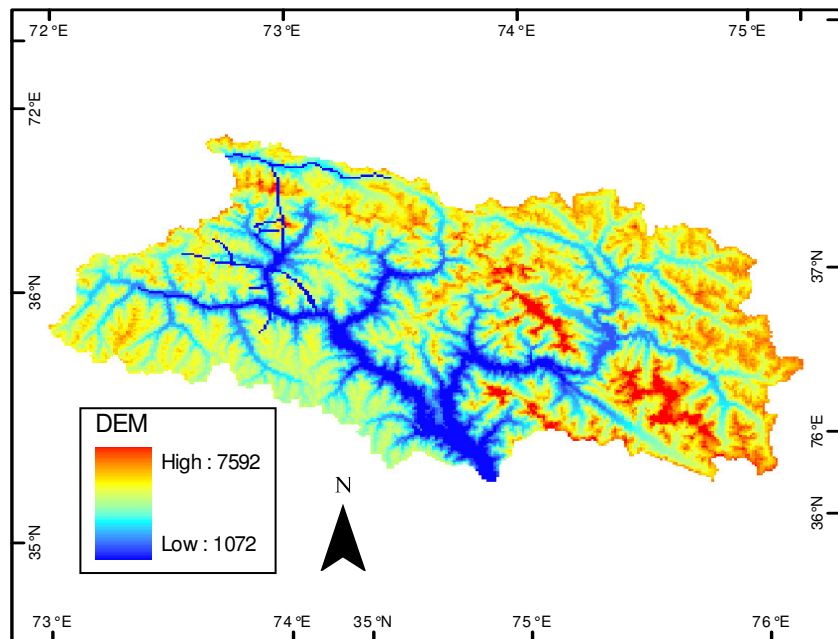


Gilgit  
Basin

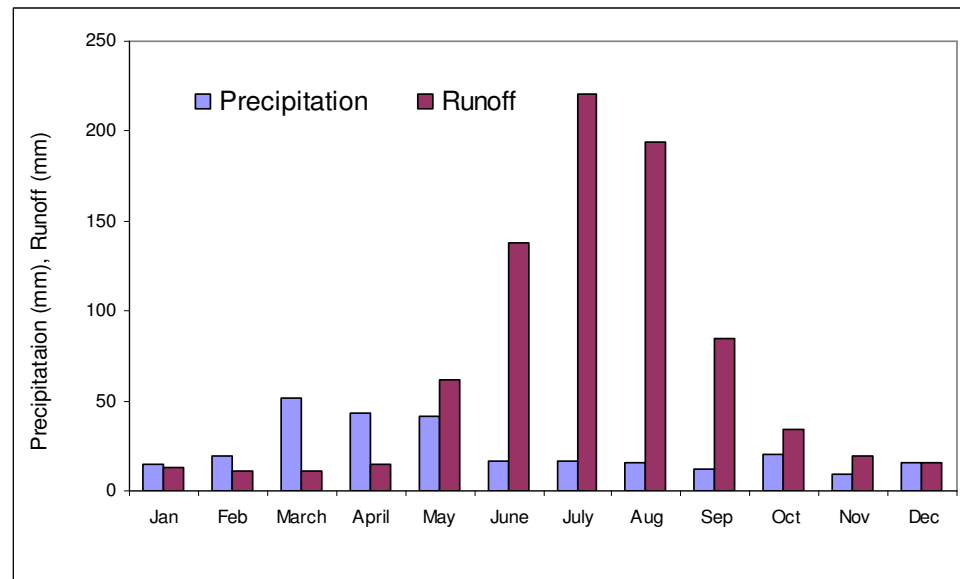
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➤ **UIB: Upper Indus Basin**

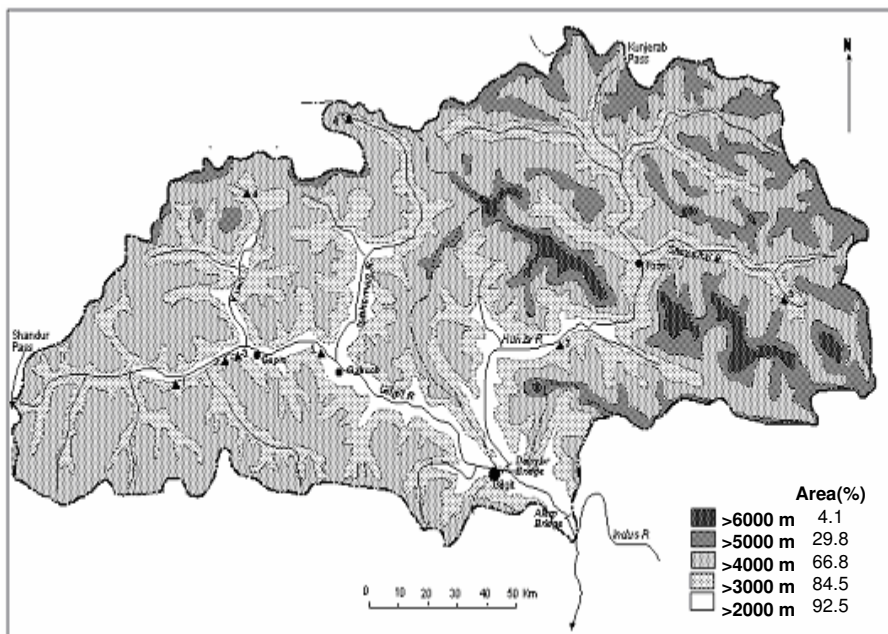
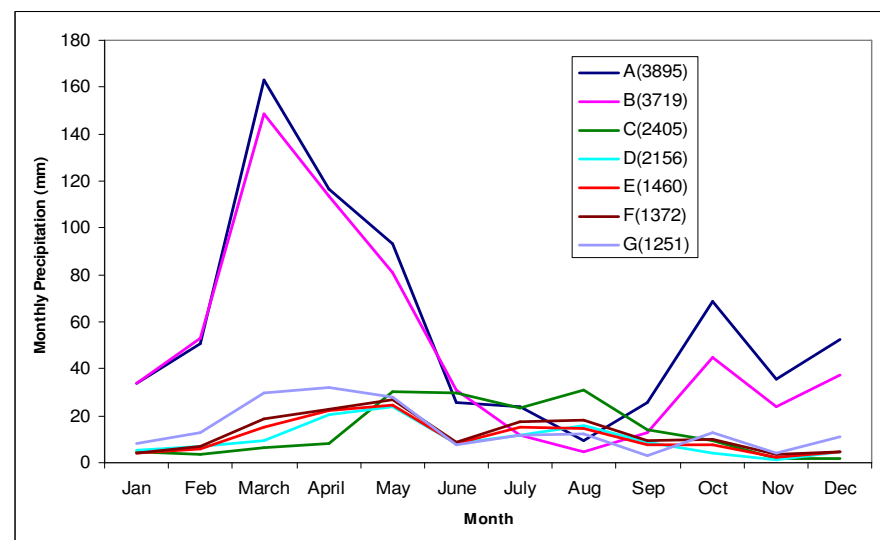
# Gilgit Basin



## Monthly runoff and precipitation comparison

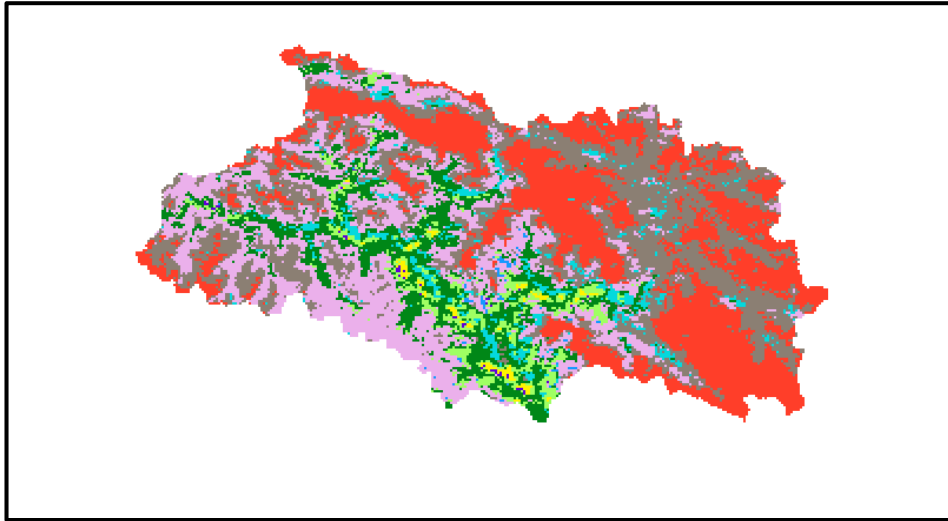


## Inter-station and seasonal precipitation variability



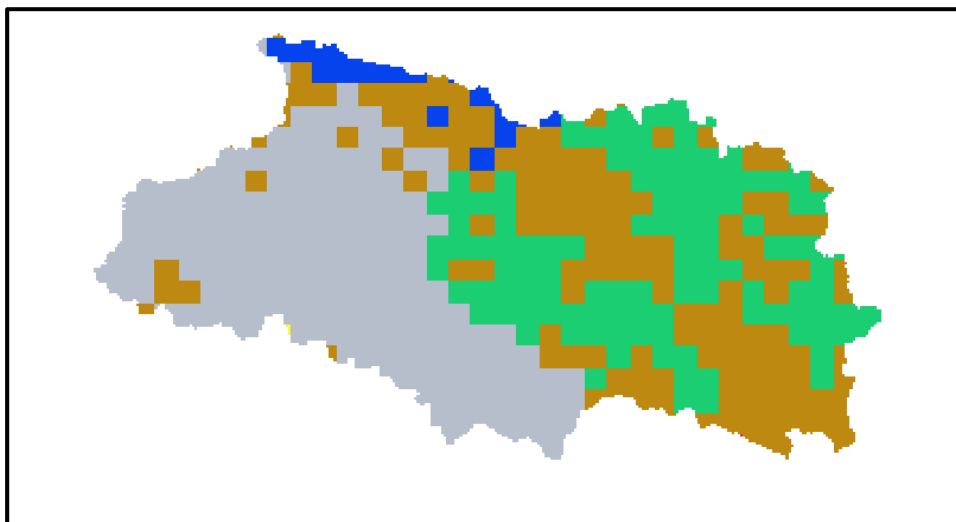
# Gilgit Basin

## Land Use Map of Gilgit River Basin



- Wooded Tundra
- Wooded wetland
- Barren / sparsely vegetated
- Mixed Shrub / grassland
- Irrigated cropland
- Non irrigated cropland
- Grassland
- Shrubland
- Snow / Ice

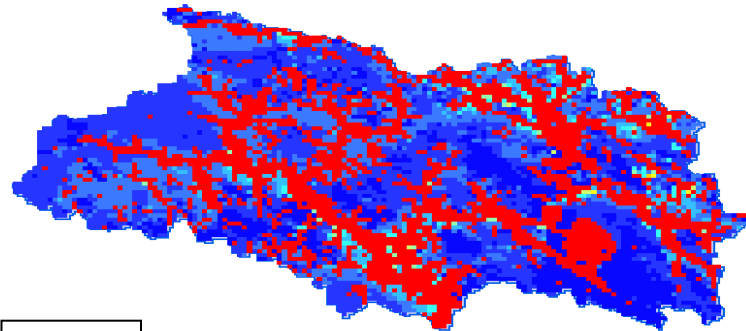
## Soil Map of Gilgit River Basin



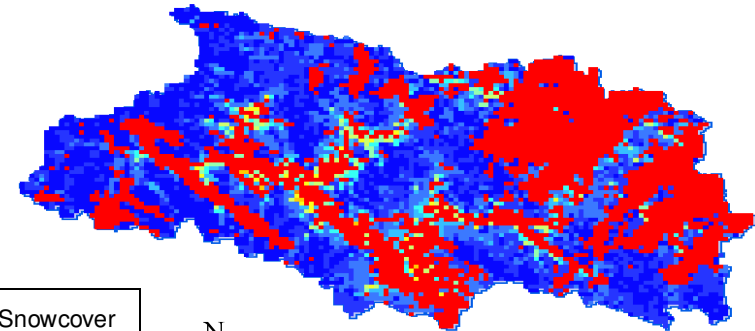
- Type 1
- Type 2
- Type 3
- Type 4
- Type 5
- Type 6

# Snowcover 1997

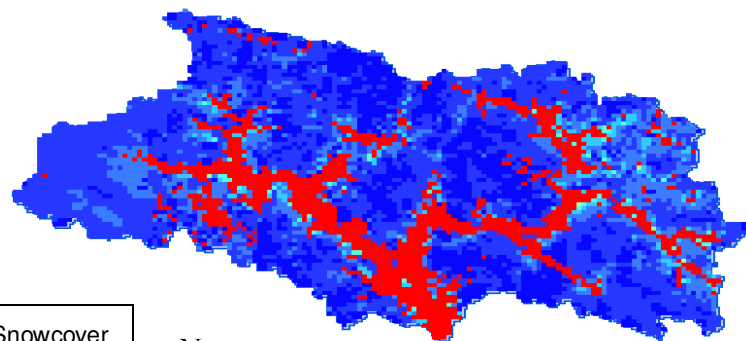
Snowcover on January 01, 1997



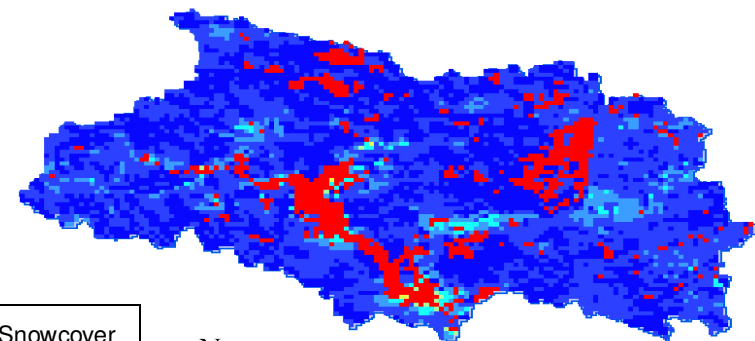
Snowcover on February 11, 1997



Snowcover on February 21, 1997



Snowcover on March 01, 1997



- **Snow and Ice Hydrology Project (SIHP)**
- **Pakistan Metrological Department**
- **Water Resources Research Institute (WRRI),  
National Agricultural Research Center (NARC),  
Islamabad**
- **Pakistan Council of Research in Water Resources  
(PCRWR)**
- **Global Change Impact Study Center, Islamabad**
- **Ev-K2-CNR**
- **International Water Management Institute, Lahore**
- **Global Change Impact Study Center, Islamabad**

Thank you