

# FLOOD MODELING USING HYDROLOGICAL TOOLS

## Objectives

- ✓ To prepare spatial database as related to flood risk analysis
- ✓ To carry out flood risk modeling using HEC-GeoRAS spatial tool along with ArcGIS and HEC-RAS GIS and modeling tools.

**Data:** Cartosat-1 stereo-pairs, Resourcesat-1 LISS-IV XS

1.  $Q = (1.486/n) * A * R^{2/3} * S^{1/2}$

Where,

- Q - Discharge
- A - Area of cross-section
- R - Radius
- S - Energy slope
- n - Manning's roughness coefficient

2.  $t_c = 0.01947 * L^{0.77} / S^{0.385}$

Where,

- $t_c$  = time of concentration (minutes)
- L = Maximum length of travel of water (m)
- S = Slope of catchment

3.  $i_{tcsp} = (K T^x) / (t_c + a)^n$

Zone	K	X	A	n
Northern zone	6.00	0.22	0.5	0.8

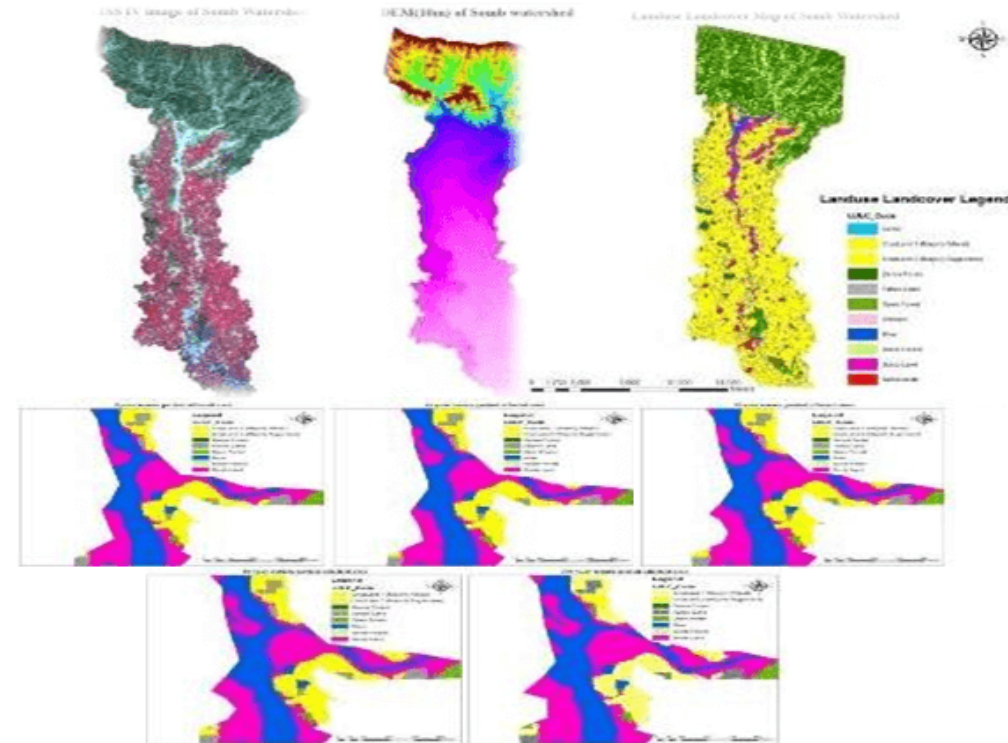
Estimated values for peak discharge for 5, 10, 25, 50 and 100 years profile are When, Area of catchment = 273.46 km<sup>2</sup> and C = 0.4721

Peak Discharge (m/s <sup>3</sup> )	5 years	10 years	25 years	50 years	100 years
	123.3147	143.6288	175.7067	204.6515	238.3645

## Conclusions

Large areas falling close to the Somb River flood-plain are under severe threat to floods for various return periods (i.e. 5 year, 10 year, 25 year, 50 year and 100 year flood)

- ✓ Tributary of Yamuna river.
- ✓ 30° 30' N, 70° 30' E.
- ✓ Approximately 832 sq.km



**Estimated Flood affected areas for different return periods**