

## CONSULTANCY SERVICES

SWHD has substantially contributed in various scientific and applied hydrological studies. Several consultancy projects funded by various central and state government organizations, public sector and corporate sector have been completed successfully and many more under progress. A few recently completed consultancy studies include:

- ❖ Water availability analysis and EFR estimation
- ❖ Design flood estimation for hydro-electric projects
- ❖ Hydrological study for institutional campus development
- ❖ Dam break analysis of various dams for preparation of EAP
- ❖ Estimation of design floods for bridges and other hydraulic structures
- ❖ Estimation of design basis flood and safe grade elevation for nuclear and thermal power plants
- ❖ Area drainage studies for nuclear and thermal power plants
- ❖ Hydrodynamic modelling of river for preparing flood mitigation plan
- ❖ Hydrological and hydraulic model study to assess impact of embanks and other reclamation works of riverfront development project
- ❖ Hydrological study of mining areas for integrated green field project
- ❖ Flood inundation modelling and flood hazard assessment.

## COLLABORATIONS / INTERACTIONS

Based on its recognition, several national and international organizations have collaborated with SWHD in various scientific programs of the division. In pursuance of R&D activities and in providing technical services to various organizations, the division has made collaborations with agencies including CWC, CGWB, GFCC, IMD, IITs, IITM, DST, MoES, MoEF and Indian Army etc. In addition, the division has been providing consultancy services to central and state government organizations, public and corporate sectors, which include NPCIL, NHPC, NTPC, NSPCL, THDC, AUD, VMSS, GMDA, NPGC, etc.

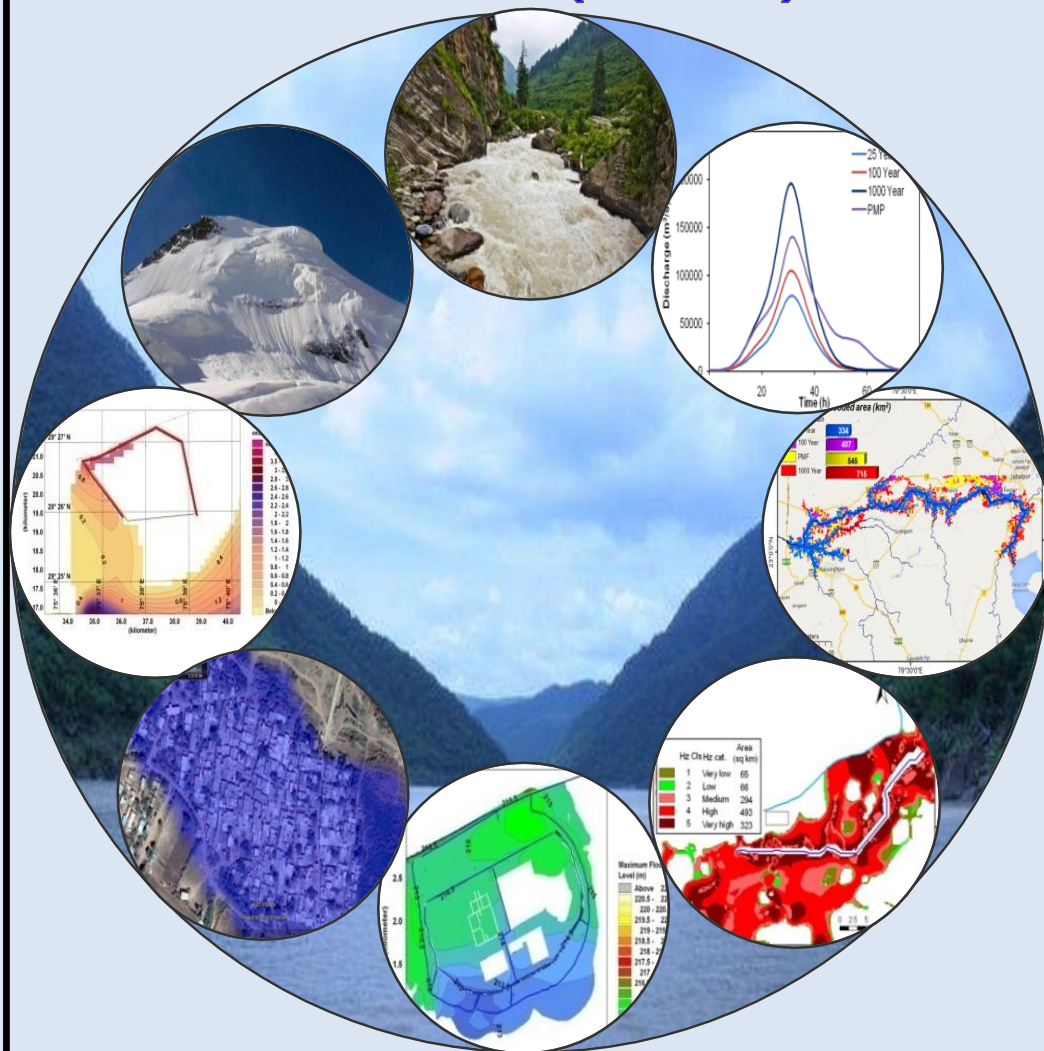
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# SURFACE WATER HYDROLOGY DIVISION (SWHD)



**NATIONAL INSTITUTE OF HYDROLOGY  
ROORKEE**



## ABOUT THE DIVISION

Surface Water Hydrology Division (SWHD) is one of the six major scientific divisions of National Institute of Hydrology, Roorkee. Its main focus is to carry out basic, applied and strategic research in the area of surface water hydrology.

## VISION

A comprehensive understanding and modelling of various hydrologic processes associated with surface water hydrology for optimal planning, development and management of the water resources for sustainable development and well being of the society.

## MAJOR AREAS OF RESEARCH

- ❖ Hydrological modelling
- ❖ Water availability analysis
- ❖ Flood estimation and management
- ❖ Hydrodynamic modelling of rivers for preparing flood mitigation plans
- ❖ Regional hydrology and predictions in ungauged basins
- ❖ Estimation of design basis flood and safe grade elevation
- ❖ Dam break flood wave simulation
- ❖ Snow and glacier melt runoff modelling
- ❖ Glacier lake outburst flood studies
- ❖ Urban hydrology and forest hydrology
- ❖ Watershed management
- ❖ Drought mitigation and management
- ❖ Applications of soft computing techniques in hydrology
- ❖ Flood inundation modelling and flood hazard assessment
- ❖ Impact of climate change on water resources



## RESEARCH AND DEVELOPMENT FACILITIES

### Manpower and Capabilities

Scientific manpower of SWHD comprises of 9 scientists, 4 scientific staff & 1 administrative staff. Scientists and scientific staff are specialised in various areas including hydrology, hydraulics, soil & water conservation, irrigation & drainage, agricultural engineering, physics, meteorology and RS & GIS applications. The packages such as SWAT, MIKE-11, MIKE Flood, MIKE Hydro, HEC-RAS, HEC-HMS, NAM, ArcGIS, ERDAS etc. are being used by the scientists to solve hydrological and water resources problems.

### Snow & Glacier Laboratory

Especially meant for analysis and modelling of snow and glacier melt runoff, the laboratory displays glaciological research exhibition facility viz. Mountaineering and hydrological equipments used in the field, sediment samples collected from different parts of glaciers, display of results related to hydrological aspects of different glaciers, problems of high altitude region

## TRAINING / AWARENESS PROGRAMMES

Several technology transfer activities including Seminars / Symposia / Conferences / Training Courses / Workshops etc. are regularly organized by SWHD both in Roorkee and other parts of the country. The division has the facilities to conduct these activities both in online and offline mode. Such activities benefit the field engineers, researchers, academicians etc.

of the Himalaya etc. A weather display unit has been installed at the main building for display of current and recorded weather parameters.



### Meteorological Observatory

SWHD is maintaining an observatory of the Institute at Bhojwasa (Gangotri Glacier). It is well equipped with various ground-based equipments e.g. automatic weather station, automatic water level recorder, ORG, SRRG, hygrograph, dry & wet bulb thermometer, thermograph, Evaporimeter, anemometer etc.

