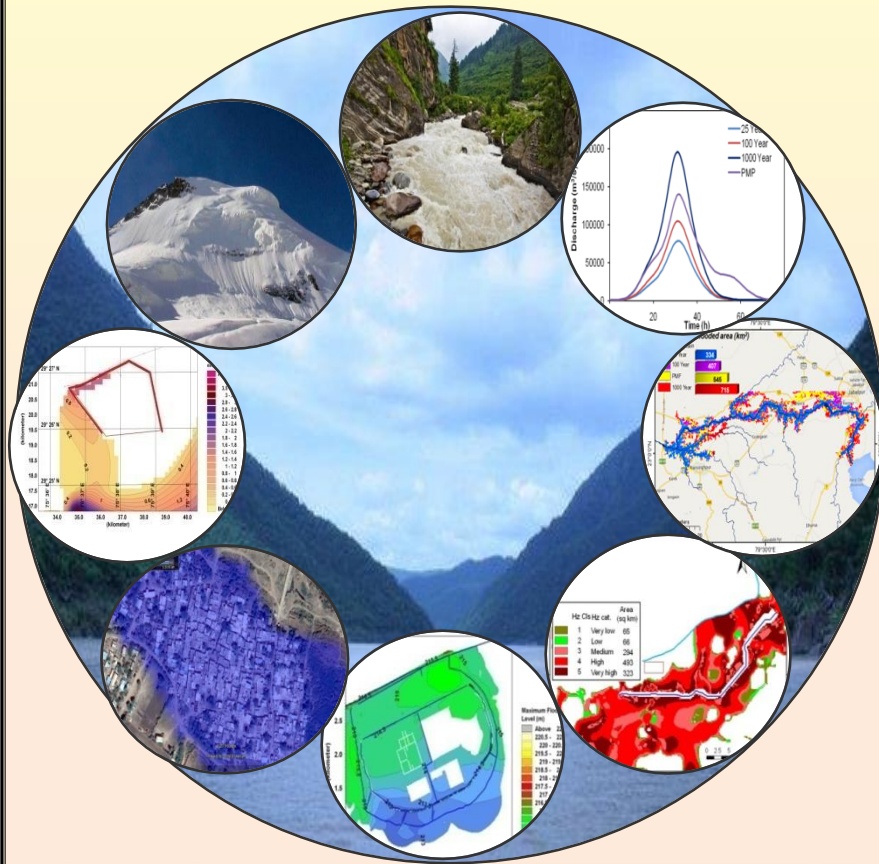


SURFACE WATER HYDROLOGY DIVISION



**NATIONAL INSTITUTE OF HYDROLOGY
ROORKEE**

ABOUT SURFACE WATER HYDROLOGY DIVISION (SWHD)

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 13 scientists and 6 scientific staff with multidisciplinary specializations such as hydrology, hydraulics, soil and water conservation, irrigation and drainage, agricultural engineering, computer aided design, physics, meteorology and RS & GIS applications etc. The packages such as HEC-HMS, NAM, SWAT, Mike-11, Mike Flood, Mike Hydro, HEC-RAS, ArcGIS, ERDAS etc. are being applied by the scientists of the division for solving hydrological and water resources problems.

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



• Hydrometeorological 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.



TRAINING/ AWARENESS PROGRAMMES

Under technology transfer programme various activities such as Seminars/Symposia/ Conferences/ Training Courses/ Workshops etc. are regularly organized by SWHD in the area of surface water hydrology in Roorkee as well as in other parts of the country for imparting the knowledge of the developed methods and techniques to the field engineers, researchers, and academicians etc.

CONSULTANCY SERVICES

SWHD has substantially contributed in the scientific 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 consultancy studies are under progress. Some of the recent 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 recognition of SWHD various national and international organizations have collaborated with the SWHD for various scientific programmes of the division. In pursuance of various R&D activities as well as providing technical services to the various organizations, the division has made interactions with various agencies like CWC, CGWB, GFCC, IMD, IITs, IITM, DST, MoES, MoEF and Indian Army etc. The division has been providing consultancy services to central and state government organizations, public and corporate sectors, which include NPCIL, NHPC, NTPC, NSPCL, THDC, NEEPCO, AUD, VMSS, GMDA, NPGC, etc.

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