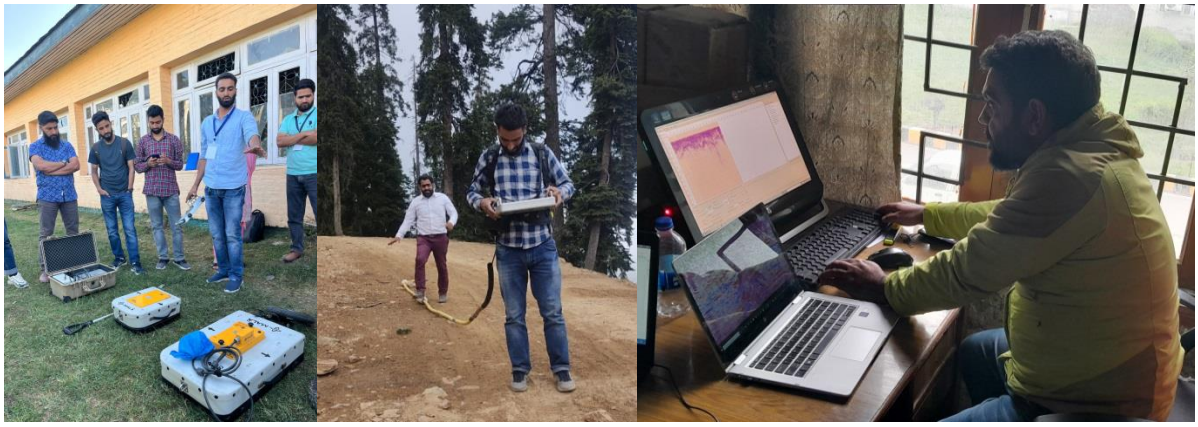
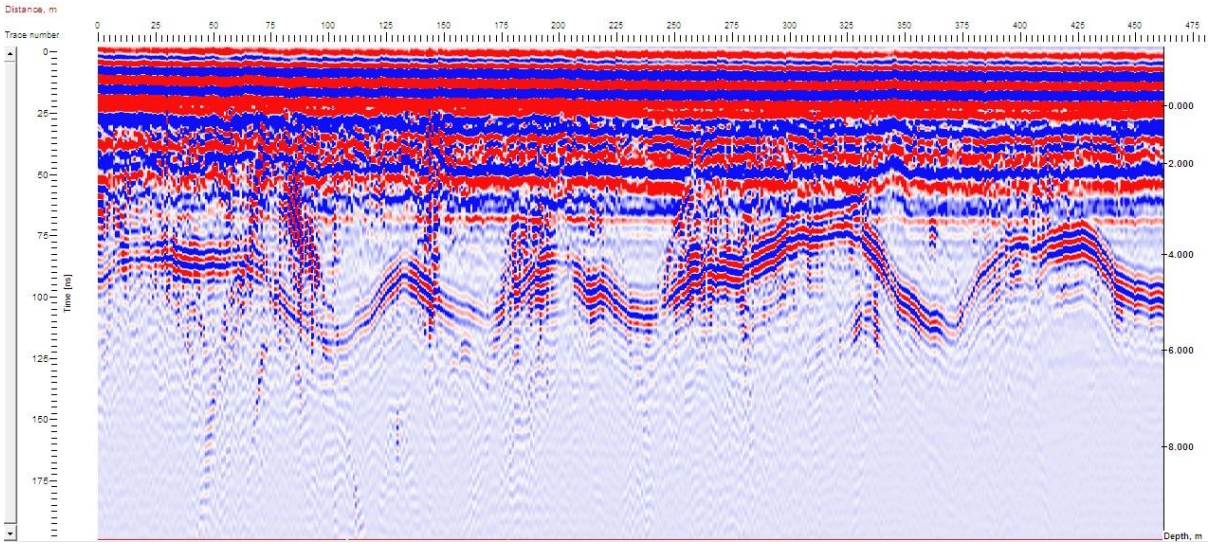
GROUND PENETRATION RADAR SYSTEM

(GPRS)



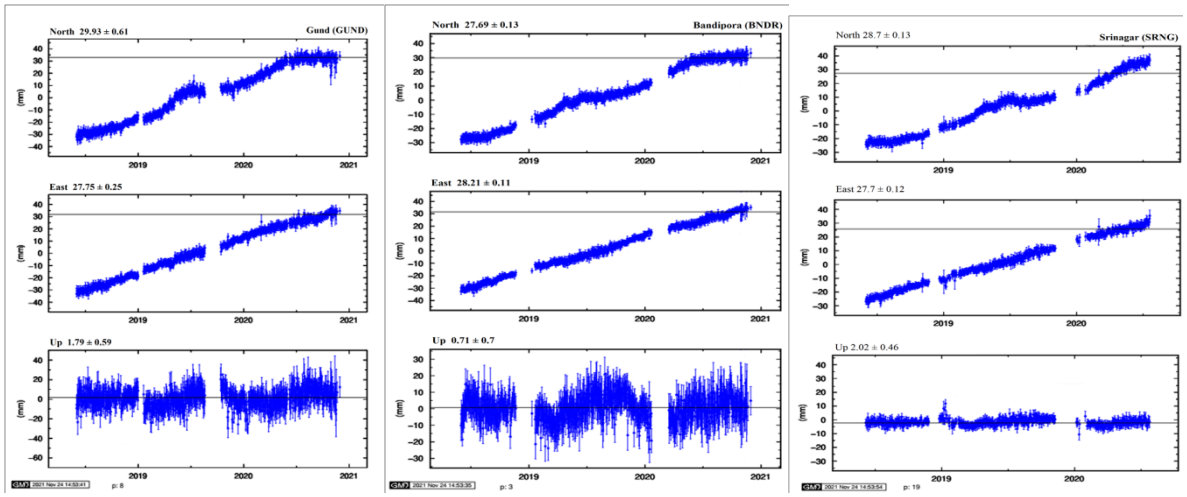


Established in year 2014 within the Department of Earth Sciences, the **Ground Penetration Radar system** (GPRS) facility signifies a pivotal advancement in subsurface geological exploration. Supported by the Ministry of Earth Sciences, Government of India, this cutting-edge facility was acquired through the leadership of Prof. Bikram Singh Bali, spearheading the project "Active Fault Delineation in Karewas of Kashmir using Ground Penetration Radar" Functioning as a versatile instrument, the GPRS facility facilitates a wide array of geological studies, ranging from sub surface active fault mapping to geomorphological investigations and seismic hazard assessments. Its arsenal of

high-frequency and high-resolution antennas, including the Rough Terrain Antenna (100 MHz RTA), 200 MHz, and 500 MHz variants, equips researchers with unparalleled capabilities for detailed subsurface analysis. Notably, the instrument's adaptable design, featuring both cart and wheel setups, ensures optimal manoeuvrability across diverse terrain, enhancing accessibility and effectiveness in field operations. By harnessing the power of GPRS technology, researchers are empowered to unravel the complexities of the Earth's subsurface with precision and depth.

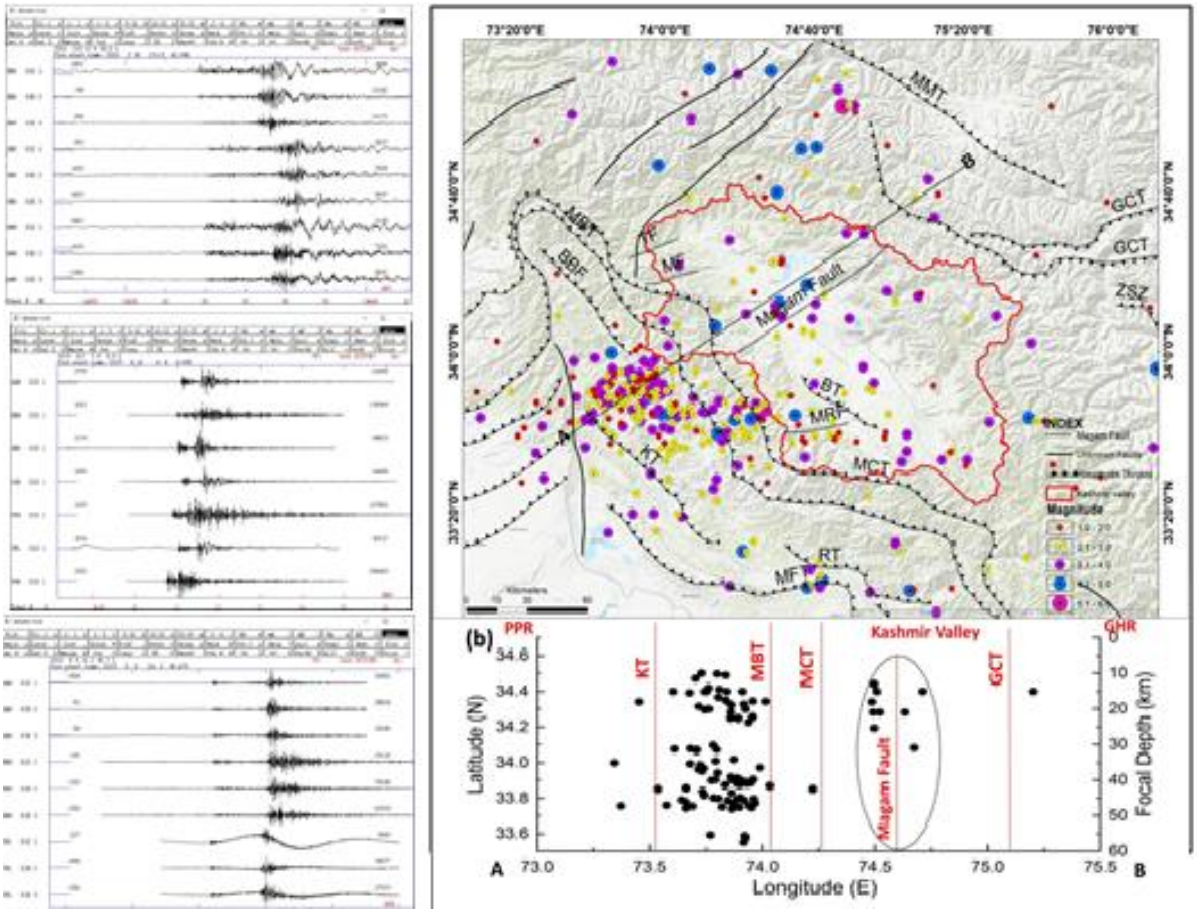
GLOBAL POSITIONING SYSTEM

(GPS)



The **GPS** facility was established at the Department Earth Sciences in year 2008 for crustal deformation and Earthquake hazard assessment studies. This instrument facility is with the support of Ministry of earth sciences Government of India. The instruments were purchased by Prof. Bikram Singh Bali (Principal Investigator) in the Project "Seismic Hazard assessment of Kashmir Himalayas using Geological, Seismological and geophysical data". The instrument has applications in Active fault studies, strain budget calculation, crustal deformation and Seismic Hazard assessment studies. Also, the instrument has capability in earthquake studies. We have sixteen GPS stations that are installed throughout Kashmir Valley. All the stations give us continuous data at an interval of 30 second.

BROADBAND SEISMOMETERS AND STRONG MOTION ACCELERATOR (SMA)



The **Broadband Seismometer and SMA** facility, established in 2017 at the Department of Earth Sciences, represents a pioneering effort in earthquake research within the Kashmir Valley. Both the instruments record low as well as high magnitude earthquakes at high recision. Supported by the Ministry of Earth Sciences, Government of India, this state-of-the-art instrument facility was made possible through the visionary leadership of Prof. Bikram Singh Bali, serving as the Principal Investigator of the project titled "Seismic Hazard Assessment of Kashmir Himalayas using Geological, Seismological, and Geophysical Data". Equipped with cutting-edge instruments, this facility opens up a multitude of avenues for studying seismic activity in the region. From investigating active faults to comprehensively analysing earthquakes and understanding crustal dynamics, the facility plays a pivotal role in advancing seismic hazard assessment studies. Spanning across the Kashmir Valley, the facility boasts sixteen continuous Broadband and four SMA stations strategically positioned to capture

vital seismic data. With a remarkable data capture rate of 15-second intervals, these stations provide an uninterrupted stream of information essential for in-depth analysis and forecasting. By leveraging this comprehensive network of instruments, researchers can delvelop deeper into the complexities of seismic activity, paving the way for enhanced understanding, preparedness, and mitigation strategies in earthquake-prone regions like Kashmir basin.

TOTAL STATION

In year 2022, the Department of Earth Sciences bought the **Total Station** instrument (C5 HP 3” E340429) with an accuracy of 1mm to 1.5mm,

acknowledging its significant utility in various Earth science applications. Recognizing its potential benefits, the department allocated funds to procure this valuable instrument.

A total station is an advanced surveying instrument that integrates electronic theodolite, electronic distance measurement (EDM), and data processing capabilities into a single device. Originally developed for land surveying and construction applications, total stations have found extensive use in various disciplines within Earth sciences due to their versatility, accuracy, and advanced functionalities. Total station technology has revolutionized the field of Earth sciences, offering precise and efficient methods for data collection, mapping, and analysis.

Total stations are indispensable tools for geological mapping, allowing researchers to accurately measure and record geological features such as rock outcrops, fault lines, and stratigraphic layers. In structural geology, total stations play a crucial role in measuring and analysing the orientation and geometry of geological structures such as faults, folds, and joints. By conducting precise structural surveys, researchers can elucidate the tectonic history and deformation mechanisms within Earth's crust, contributing to the understanding of regional geological frameworks. Total stations are employed in landslide monitoring to track the movement and deformation of slopes and landmasses over time. By establishing monitoring networks and conducting periodic surveys, researchers can assess the stability of landslide-prone areas, identify potential hazards, and implement mitigation measures to safeguard lives and infrastructure. By conducting detailed topographic surveys, researchers can analyse land cover changes, vegetation dynamics, and hydrological processes, contributing to the management and conservation of natural ecosystems.

RAD-7 RADON METER

In 2019, under the visionary leadership of Prof. Gh Jeelani, the Department of Earth Sciences University of Kashmir embarked on a groundbreaking project sponsored by the BRNS. The project, titled "Geochemical and isotopic study of Dal Lake: Implications for Eutrophication," aimed to delve deep into understanding the intricate dynamics of one of Kashmir's most iconic water bodies. To facilitate precise measurements of radon levels crucial for the study, the department acquired the state-of-the-art RAD-7 Radon meter from Durridge. This instrument proved to be an invaluable asset, offering accurate and reliable data essential for unravelling the complexities of Dal Lake's ecosystem. With the RAD-7 Radon meter at their disposal, researchers were able to conduct thorough analyses, shedding light on the underlying factors contributing to eutrophication

and paving the way for informed conservation efforts.RAD-7 Radon meter (Durridge)

FLAME PHOTOMETER

In 2019, as part of the BRNS-sponsored project titled "Geochemical and isotopic study of Dal Lake: Implications for Eutrophication," Prof. Gh Jeelani led a team of researchers in investigating the complex dynamics of Dal Lake's ecosystem. To accurately quantify the concentration of key elements essential for understanding nutrient dynamics and eutrophication processes in the lake, the team acquired a Flame Photometer. This sophisticated instrument enabled precise measurements of various elements in water samples, providing crucial insights into the sources and pathways of nutrient inputs contributing to the lake's eutrophication. With the Flame Photometer at their disposal, the researchers were

able to uncover valuable information guiding conservation efforts aimed at preserving the ecological balance of Dal Lake for future generations.

ION CHROMATOGRAPH

In 2018, Prof. Gh Jeelani spearheaded a pioneering project under the sponsorship of MoES, focusing on the critical issue of groundwater security in the Indus basin of Ladakh. Titled "Groundwater security of Indus basin (Ladakh) in present and future climate and land scenarios," the project aimed to assess the impact of climate change and land use on groundwater resources. To conduct comprehensive analyses of ion concentrations vital for understanding groundwater quality, the Department of Earth Sciences acquired an Ion Chromatograph. This sophisticated instrument facilitated precise measurements

of various ions present in groundwater samples, enabling researchers to discern trends, identify sources of contamination, and assess the overall health of the aquifers in the Indus basin. Its application proved instrumental in providing actionable insights for sustainable water resource management strategies tailored to the unique challenges faced by the region.

LED FLUORIMETER

In 2015, under the auspices of a BARC-sponsored initiative led by Prof. B. S Bali, the Department of Earth Sciences at the University of Kashmir embarked on a pivotal investigation titled "Spatial distribution of uranium and associated water quality parameters in groundwater/drinking water in Srinagar." At the heart of this endeavour lay the Led Fluorimeter, a sophisticated instrument deployed to meticulously assess uranium concentrations and other pertinent water quality indicators. With its advanced capabilities, the Led Fluorimeter facilitated

precise measurements, enabling researchers to map out the spatial distribution of uranium in Srinagar's groundwater and drinking water sources. Prof. Bali and his team leveraged this invaluable data to not only delineate areas of concern but also to devise strategies for safeguarding public health and ensuring access to safe drinking water for the local populace.

SPECTROPHOTOMETER

In the pursuit of unravelling the intricate ecosystem dynamics of Dal Lake and its implications for eutrophication, Prof. Gh Jeelani led a dedicated research endeavour sponsored by BRNS in 2019. Central to this exploration was the acquisition of a Spectrophotometer, a cutting-edge instrument vital for quantifying various chemical constituents crucial to understanding the lake's health. With its precision and versatility, the Spectrophotometer enabled the

research team to analyse water samples with unprecedented accuracy, unveiling critical insights into nutrient levels and pollutant concentrations driving eutrophication processes. Empowered by this technology, Prof. Jeelani and his team contributed significantly to the understanding of Dal Lake's ecosystem, laying the groundwork for informed conservation strategies to mitigate its degradation and ensure its preservation for future generations.

RESISTIVITY METER

In 2017, buoyed by DST sponsorship, the Department of Earth Sciences at the University of Kashmir embarked on a transformative exploration titled "Role and importance of baseflow under coupled hydrodynamics of surface and groundwater." headed by Dr Sarah Qazi, this endeavour sought to unravel the intricate interplay between surface and groundwater dynamics crucial for holistic water resource management. At the heart of this pursuit lay the Resistivity Meter, a cutting-edge instrument deployed to delve deep into the subsurface, unveiling the secrets hidden beneath. With its unparalleled ability to map subsurface

resistivity variations, researchers gleaned invaluable insights into baseflow dynamics, shedding light on its pivotal role in sustaining freshwater ecosystems. Empowered by this technology, the team underlined the significance of baseflow in maintaining hydrological balance and advocated for its integration into sustainable water management practices.