

Technological changes which have occurred between 1995 and 2021 with geophysical surveys using remote sensing.

Between 1995 (the date of this publication; and 2023), there were significant technological changes and advancements in geophysical surveying principles and technological capabilities using remote sensing.

Some of the key technological changes during this period include:

1. **Satellite Technology:** The launch of numerous advanced Earth-observing satellites has greatly improved the spatial and temporal resolution of remote sensing data. Satellites like Landsat, Sentinel, and MODIS have provided high-quality data for various applications, including geophysical surveys.
2. **Hyperspectral Imaging:** Hyperspectral sensors on satellites and aircraft have become more prevalent, allowing for the collection of data in hundreds of narrow spectral bands. This technology enables more detailed analysis of Earth's surface composition and mineralogy.
3. **Lidar Technology:** Lidar (Light Detection and Ranging) systems have become more common and sophisticated. Airborne and satellite-based lidar systems provide high-resolution 3D information, enhancing the accuracy of topographic and bathymetric surveys.
4. **Synthetic Aperture Radar (SAR):** SAR technology has improved, offering higher-resolution imagery and more frequent revisit times. SAR can penetrate cloud cover and provide valuable data for land deformation, subsidence, and agriculture monitoring.
5. **Machine Learning and AI:** The application of machine learning and artificial intelligence has enabled more efficient data processing and interpretation. Algorithms can now automatically detect and classify geological features, speeding up the analysis process.
6. **Unmanned Aerial Vehicles (UAVs):** The use of drones for remote sensing has become more widespread. UAVs provide a cost-effective and flexible way to collect data at high spatial resolution, particularly in hard-to-reach areas.
7. **Global Navigation Satellite Systems (GNSS):** Accurate positioning and navigation using GNSS have become crucial for geophysical surveys. GNSS technology has improved in terms of accuracy and accessibility.
8. **Open Data Access:** Many remote sensing datasets are now freely available, making it easier for researchers and organizations to access and utilize geophysical data for a wide range of applications.
9. **Cloud Computing:** Cloud-based platforms and storage solutions have made it easier to process and store large volumes of remote sensing data. This has facilitated collaboration and data sharing among researchers.
10. **Interoperability and Standards:** Improved data standards and interoperability between different remote sensing platforms and software have streamlined the integration of data from multiple sources.
11. **Environmental Monitoring:** Remote sensing technology has been increasingly used for environmental monitoring, including tracking deforestation, urban expansion, and changes in land use, all of which impact geophysical surveys.
12. **Natural Disaster Monitoring:** Remote sensing has played a crucial role in monitoring and assessing natural disasters like earthquakes, floods, and wildfires, aiding in disaster management and response.

These technological changes have revolutionized the field of geophysical surveys using remote sensing, providing researchers and professionals with more accurate, timely, and accessible data for a wide range of applications, from mineral exploration and land use planning to environmental protection and disaster management.