In 60 years since the launch of Explorer 1, Earth observation data collected from both satellites and aircraft have revolutionized the field of Earth science and the study of Earth systems. Remote sensing has allowed scientists to observe our planet at temporal and spatial scales that are not possible with ground-based studies. As a result, products and information generated from remotely sensed Earth observations have contributed to our understanding of weather, climate, natural hazards, their impact on our quality of life, and long-term global environmental change.

Today, Earth system data of unprecedented quality and quantity is publicly available for research. NASA and NOAA’s data archives each contain over 24 petabytes (PBs) of Earth observations. As new missions are launched, this archive will continue to grow. By 2022, NASA’s archive is projected to increase to over 150 PB with an annual growth rate of nearly 50 PB per year. USGS, ESA, CNSA, JAXA, and other space agencies, as well as commercial small satellites, also contribute the ever-growing archive of Earth observation data. This long-term, continuously updated, global environmental record offers unique opportunities for Earth science research, but also presents significant challenges for data access and management.

This Special Issue will focus on the development and implementation of new technologies and modern techniques to address the challenges of managing, discovering and using Earth observations data for Earth science research and applications. Potential submissions would describe research and novel uses of technology to address existing and anticipated needs of the research and applied science community and increase scientific access to Earth observation data. Topics may include, but are not limited to:

- Software applications,
- Advanced search capabilities,
- Cloud-based data processing and transformations,
- Applications of machine learning,
- Development of new sensors,
- Analysis ready data, and
- Technology to further citizen science contributions to Earth science.

While the focus is on technological innovations, projects should address Earth science research and applications.