

Remote Sensing and Earth Sciences

Dr. Mark van der Meijde, ITC

Earth scientists like to touch and feel the processes that are shaping the Earth's landscape and subsurface. This is, however, not always possible, but because of remote sensing also not always necessary. Remote sensing techniques can provide us with information to visualize the processes that are happening, or have happened, without the need to be where the action is. One can do remote sensing on the ground, e.g. with geophysical techniques or seismometers, from the air, through e.g. airborne geophysics or aerial photography, or from space, resulting in data acquisition from satellite platforms.

Especially the space borne data acquisition is of particular interest since it has almost unlimited spatial coverage. This facilitates study of objects that will otherwise stay out of reach; think about warzones, areas unreachable because of disasters, or very remote locations. Furthermore, it increases the possibilities to study very large areas, like continents, in a way that could never be reached through measurements on the ground with traditional equipment.

In this presentation the applicability of various sensors for earth science studies will be illustrated through several examples. These examples are all based on satellite remote sensing. Starting above the surface, applications of remote sensing techniques will be given for climatic and atmospheric studies, focusing on hurricanes, sea level changes and rainfall. Coming down to the surface, focus will change to remote sensing for disaster management issues such as earthquakes, tsunamis and erosion. And last, but definitely not least, the most challenging goal for remote sensing is the extraction of information on the subsurface. On a small scale looking into the problem of hydrocarbon pollution through leakages of pipelines to large scale structural mapping of the African continent.