

EARTH OBSERVATION SYMPOSIUM (B1)  
Earth Observation Data Management Systems (4)

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IMPACT ON QUALITY AND PROCESSING TIME DUE TO CHANGE IN PRE-PROCESSING  
OPERATION SEQUENCE ON MODERATE RESOLUTION SATELLITE IMAGES

**Abstract**

Despite having many Earth orbiting remote sensing satellites, even with the completion of Sentinel 2 constellation the revisit time of satellites over a particular area will only come down to 5 days from 16 - 26 days revisit time of Landsat, SPOT and IRS satellites. This is still far-off from satisfying the need of daily high spatial resolution images required for crop monitoring and rapid changes in ecosystem. Generation of high spatial remote sensing time series by fusing high temporal moderate resolution images obtained from MODIS, MERIS, SPOT Vegetation with low temporal high resolution images obtained from Landsat, SPOT, IRS and Sentinels proved to be cost effective and efficient solution. Images obtained from different sensors cannot be used in the image fusion process directly. The images should be first pre-processed to make it consistent with each other in terms of projection system, pixel size. Usually the high temporal moderate resolution images will be reprojected and resampled to match the low temporal high resolution images. Since everyday moderate resolution images are used for the time series generation, this left us with pre-processing huge amount of image data. This makes the pre-processing operation highly time consuming. It also demands huge disk space for data storage and handling and high computing power for quick processing.

Several attempts were made to optimize the pre-processing run time and effective data handling. Pre-processing is a sequential process where the image is processed in several steps. In every individual pre-processing step the complete image data is being used for processing. The concerned study area in the image used in the subsequent image fusion process covers only a fraction of the image. This shows that large amount of image data which is not useful in the subsequent process is also being processed in pre-processing operations. This directly translates to longer pre-processing run time. In this paper a novel technique is proposed to optimize the run time by reducing the amount of image data used in the pre-processing steps. This is done by cropping the image in the first place and using the reduced image data in the pre-processing operations. The proposed method is tested using the Geospatial Data Abstraction Library (GDAL). In this paper different pre-processing sequences are applied on the MODIS 500m resolution data. The output from each sequence is analyzed to study the impact due to the change in pre-processing operation sequence and the results are presented.