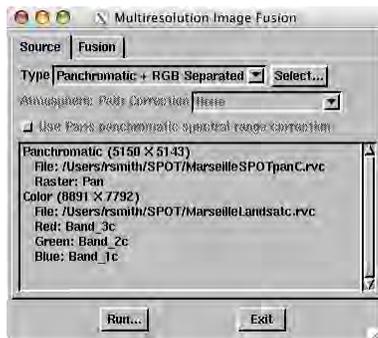


Multiresolution Fusion

Pan-Sharpening Landsat with SPOT Panchromatic

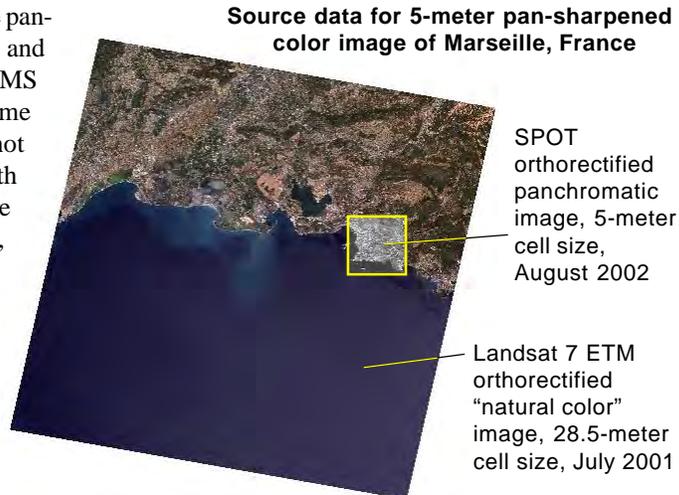
The Multiresolution Image Fusion process in TNTmips allows you to use panchromatic (pan) and multispectral (MS) images from different sources and sensors to produce pan-sharpened color images. The source pan and MS images need not match in spatial extents or be georeferenced to the same coordinate reference system, and the cell size of the pan image does not need to be an integer reduction of the MS image cell size (as is typical with pan and MS bands produced by the same sensor). The MS bands are automatically reprojected and resampled if necessary to match the extents, coordinate reference system, and cell size of the pan image. In the example shown on this page, a 5-m panchromatic SPOT image was used to pan-sharpen a portion of a natural-color Landsat 7 ETM band set with 28.5-m cell size. In this instance both images happened to be georeferenced to the same coordinate reference system, but this is not required.



Accurate cell-by-cell spatial registration of the pan and MS images is required to produce good pan-sharpening results without image artifacts. As a start, both source images must be accurately georeferenced. Orthorectified source images were used for the example shown here, as they provide the best registration of internal image features in areas with significant topographic relief by correcting for relief displacement effects that may differ in the pan and MS source images. (Orthorectified Landsat images are available for free download from the Global Landcover archive at <http://glcf.umiacs.umd.edu/portal/geocover/>.) Seasonal changes in vegetation and temporal changes in cultural features can also affect pan-sharpened images produced from source images acquired at different times; in this example summer images from successive years were used to reduce these temporal effects. Finally, the accuracy of color rendering in the pan-sharpened product decreases as the cell-size difference between the pan and MS images increases.



Same subarea of the 5-meter SPOT panchromatic source image.



Source data for 5-meter pan-sharpened color image of Marseille, France

SPOT orthorectified panchromatic image, 5-meter cell size, August 2002

Landsat 7 ETM orthorectified "natural color" image, 28.5-meter cell size, July 2001



Detail of a 5-meter, natural-color pan-sharpened image of Marseille, France created in the Multiresolution Image Fusion process from the source images described above.



Same subarea of the Landsat ETM 28.5-meter source image.