

Determining trends in impervious cover for the Mobile Bay, AL region for 1974-2008, based on a Landsat time series

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This presentation will discuss the development and use of Landsat-based impervious cover products in conjunction with land use land cover change products to assess multi-decadal urbanization across the Mobile Bay region at regional and watershed scales. This nationally important coastal region has undergone a variety of ephemeral and permanent land use land cover change since the mid-1970s, including gradual but consequential increases in urban surface cover. This urban sprawl corresponds with increased regional percent impervious cover. The region's coastal zone managers are concerned about the increasing percent impervious cover, since it can negatively influence water quality and is an important consideration for coastal conservation and restoration work. In response, we processed multi-temporal Landsat data to compute maps of percent impervious cover for multiple dates from 1974 through 2008, roughly at 5-year intervals. Each year of product was classified using one single date of leaf-on and leaf-off Landsat data in conjunction with Cubist software. We are assessing Landsat impervious cover product accuracy through comparisons to available reference data, including available NLCD impervious cover products from the USGS, raw Landsat data, plus higher spatial resolution aerial and satellite data. In particular, we are quantitatively comparing the 2008 Landsat impervious cover products to those from QuickBird 2.4-meter multispectral data. Initial visual comparisons with the QuickBird impervious cover product suggest that the 2008 Landsat product tends to underestimate impervious cover for high density urban areas and to overestimate impervious cover in established residential subdivisions mixed with forested cover. Landsat TM and ETM data appears to produce more accurate impervious cover products compared to those using lower resolution Landsat MSS data. Although imperfect, these Landsat impervious cover products have helped the Mobile Bay National Estuary Program visualize basic urbanization trends for multiple HUC-12 watersheds of concern to them and their constituents.

Keywords: impervious cover trend analysis Landsat