

The National Land Cover Database

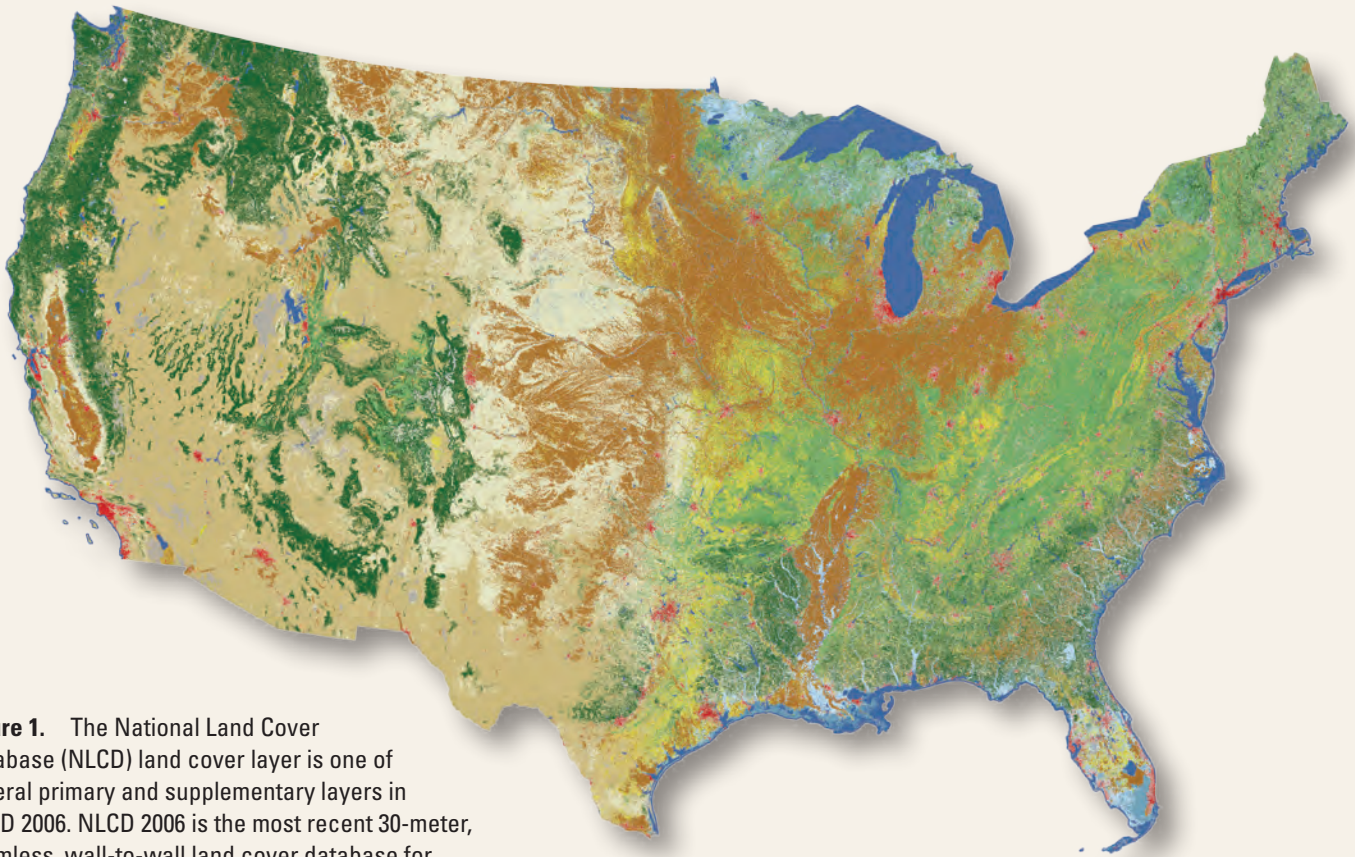
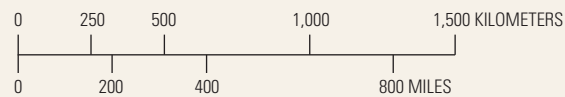


Figure 1. The National Land Cover Database (NLCD) land cover layer is one of several primary and supplementary layers in NLCD 2006. NLCD 2006 is the most recent 30-meter, seamless, wall-to-wall land cover database for the conterminous United States.



The National Land Cover Database (NLCD) serves as the definitive Landsat-based, 30-meter resolution, land cover database for the Nation. NLCD provides spatial reference and descriptive data for characteristics of the land surface such as thematic class (for example, urban, agriculture, and forest), percent impervious surface, and percent tree canopy cover. NLCD supports a wide variety of Federal, State, local, and nongovernmental applications that seek to assess ecosystem status and health, understand the spatial patterns of biodiversity, predict effects of climate change, and develop land management policy. NLCD products are created by the Multi-Resolution Land Characteristics (MRLC) Consortium, a partnership of Federal agencies (see logos below) led by the U.S. Geological Survey. All NLCD data products are available for download at no charge to the public from the MRLC Web site: <http://www.mrlc.gov>.

EXPLANATION

NLCD 2006 class legend

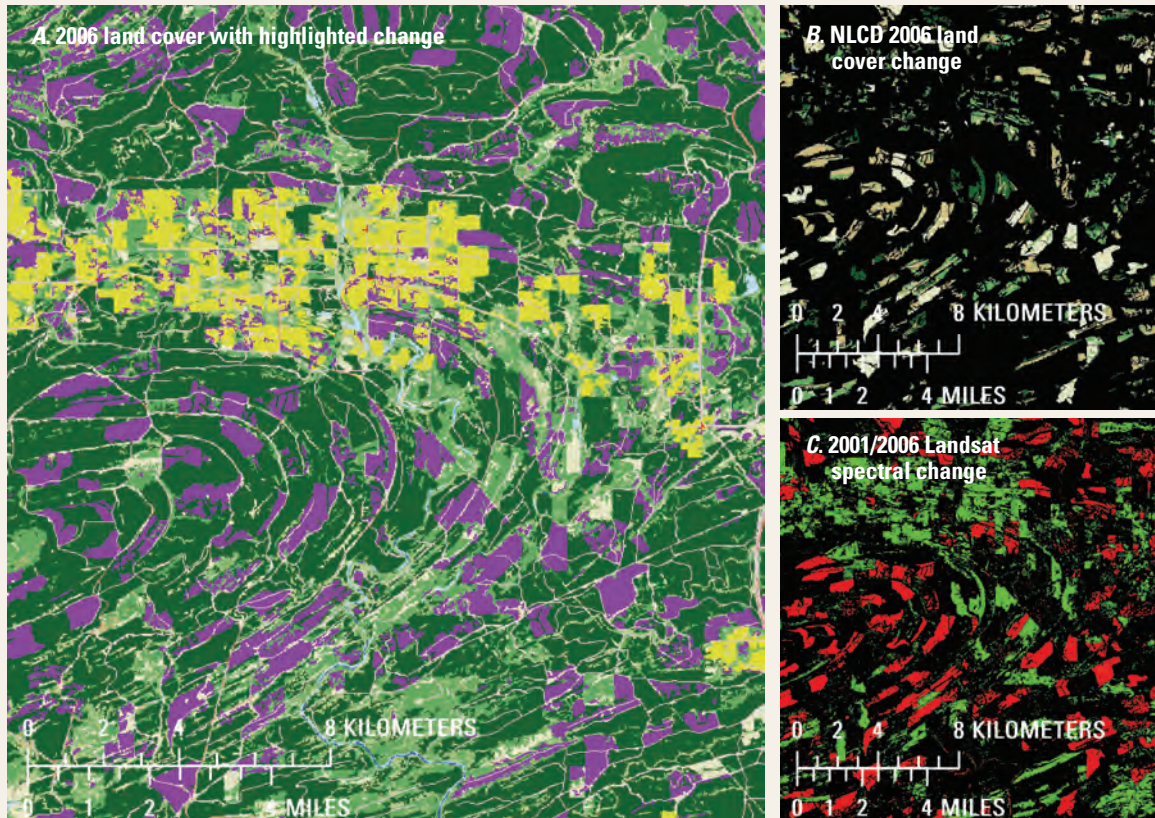
	Open water		Evergreen forest
	Perennial ice/snow		Mixed forest
	Developed, open space		Shrub/scrub
	Developed, low intensity		Grassland/herbaceous
	Developed, medium intensity		Hay/pasture
	Developed, high intensity		Cultivated crops
	Barren land		Woody wetlands
	Deciduous forest		Herbaceous wetlands



NLCD 2001–2006 Land Cover Change

NLCD analysis of land cover change across the conterminous United States from 2001 to 2006 revealed that approximately 1.68 percent [135,560 square kilometers (km²)] of the total land area changed (Fry and others, 2011). The highest proportion of land cover changes occurred in the Pacific Northwest and in the Southeast, with the least change in the desert southwest. Evergreen forest, shrub/scrub, and grassland/herbaceous accounted for a large portion of land cover change loss in 2001, with 35,951 km², 23,667 km², and 20,774 km²,

respectively, changing to a different class. The top three land cover class gains in 2006 were the same but in different relative proportions, with 33,564 km² changing to shrub/scrub, 33,233 km² to grassland/herbaceous, and 19,231 km² to evergreen forest. Net gains and losses by land cover class also were calculated. Substantial net loss was mapped in all three forest classes. Agricultural, woody wetlands, water, and perennial ice/snow classes also showed a net loss in areal extent from 2001 to 2006. Considerable net gain was shown for grassland/herbaceous and shrub/scrub classes. Net gain also was observed in all developed classes, barren land, and herbaceous wetlands.



EXPLANATION

NLCD 2006 class legend

 No change area	 Developed, medium intensity	 Shrub/scrub
 2006 change overlay	 Developed, high intensity	 Grassland/herbaceous
 Open water	 Barren land	 Hay/pasture
 Perennial ice/snow	 Deciduous forest	 Cultivated crops
 Developed, open space	 Evergreen forest	 Woody wetlands
 Developed, low intensity	 Mixed forest	 Herbaceous wetlands

Figure 3. An example of land cover change products from 2001 to 2006 in a portion of Landsat path 26, row 36 in McCurtain County, Oklahoma. The primary change in this area is a complex pattern of shrub, grass, and forest change patches typical of a forest harvest landscape: *A*, National Land Cover Database (NLCD) 2006 land cover with change areas highlighted in magenta; *B*, NLCD 2006 land cover change product; *C*, NLCD 2006 maximum potential spectral change supplementary layer. Green patches indicate areas of biomass increase and red patches indicate areas of biomass decrease. Additional modeling steps eliminate areas of spectral change that do not represent thematic land cover change to create the final product.



Land Cover Accuracy Assessment

Large complex national databases such as NLCD are most accurate when used to support regional and national analysis rather than local applications. NLCD strives to conduct formal accuracy assessments to provide users feedback on product accuracy. Users need to know that product accuracy can vary by regional geography and specific class type. Rigorous thematic land cover product accuracy assessments have been completed for NLCD 1992 and 2001 (Stehman and others, 2003; Wickham and others, 2004; Wickham and others, 2010), with a similar assessment in progress (2012) for NLCD 2006. Results of land cover product accuracy assessments have indicated that NLCD 1992 has an overall Anderson Level I (Anderson and others, 1976) class accuracy of 80.4 percent and an Anderson Level II class accuracy of 55.7 percent (Stehman and others, 2003; Wickham and others, 2004). For the conterminous United States, NLCD 2001 has an improved Anderson Level I class accuracy of 85.3 percent and an Anderson Level II class accuracy of 78.7 percent (Wickham and others, 2010). For the NLCD 2001 Alaska land cover classification, the overall thematic accuracy was 83.9 percent at Anderson Level I and 76.2 percent at Anderson Level II (Selkowitz and Stehman, 2011).

Land Cover Applications

NLCD supports thousands of applications in the private, public, and academic sectors, and offers the only national database portraying land cover change spatially as a comprehensive “wall-to-wall” 30-meter cell database. The broad spectrum of programmatic and user support for NLCD stems from this complete national spatial coverage. NLCD is used for a vast array of topical applications such as the assessment of ecosystem status and health, understanding spatial patterns of biodiversity, understanding climate change, and developing land management policy. It is a critical data layer in national assessments of biological carbon sequestration, water-quality monitoring, wildfire monitoring and modeling, and biodiversity conservation efforts.

NLCD data can be accessed through the Internet in two different ways. Large regional and national files can be downloaded from the MRLC Web site (<http://www.mrlc.gov>), or user specified areas can be viewed and downloaded using The National Map Viewer tools (<http://www.nationalmap.gov>). Additional MRLC and NLCD programmatic information is available on the MRLC Web site.

Future Directions

NLCD strives to be the future primary land change monitoring “wall-to-wall” database for the United States, capable of delivering critical data for understanding the locations, magnitudes, and effects of land cover change. NLCD products will likely remain on a 5-year product cycle (initial planning for NLCD 2016 is already underway), with future product cycles determined by new requirements, remote sensing data availability, technological improvements, and funding. Ongoing NLCD research will continue to assess and characterize land change monitoring patterns, explore the addition of new products and analyses into NLCD (such as percent shrub and

percent bare ground), and provide new delivery, visualization, and analysis tools to improve product understanding and user access.

Selected References

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General information about the Multi-Resolution Land Characteristics Consortium and the National Land Cover Database is available online at <http://www.mrlc.gov/>.

For more specific NLCD project information

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