

# National Land Cover Developments

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The national Gap Analysis Program (GAP) has been a pioneer in broad-scale land cover mapping efforts. Beginning in the 1980s, GAP mapped land cover on a state-by-state basis for use in the mapping of wildlife habitat distributions. These projects were often the first attempts at land cover mapping conducted in the state and are often credited with expanding the local expertise necessary to do remote-sensing-based, land cover mapping projects. However, differences in source data and classification systems used by the individual states hampered efforts to use these data for regional assessments including analysis across the entire range of a wildlife species. Recently GAP has been working to update these early land cover mapping efforts by developing regional land cover mapping products. Regional land cover data were completed for the Southwest in 2004, the Southeast in 2007, and California and the Northwest in 2009. These projects use consistent base satellite imagery, the same classification systems and similar mapping methodology. Combining the completed regional GAP data with data created by the LANDFIRE project ([www.Landfire.org](http://www.Landfire.org)) using similar methodology has allowed for the creation of a seamless national land cover map.

## Goals

Land cover data is a key component in building predictive models of wildlife habitat distributions. The creation of high quality land cover maps furthers GAP's mission of "keeping common species common" by identifying those places in the country with sufficient good quality habitat to support wildlife. Current GAP land cover mapping efforts strive to maintain consistency in the mapping of large geographic areas, allowing for habitat modeling across entire species ranges and planning efforts at the national scale.

## Accomplishments

### Completion of Northwest and California Gap Ecological Systems Maps

This year updated land cover products were completed for the Northwest Region and California. Like all the regional GAP projects, these two projects map vegetation distribution patterns using Landsat 30 meter resolution imagery. This data resolution fulfills the need to capture rare vegetation types occurring in small patches while creating data of a size appropriate for national scale analysis.

The regional land cover maps all use the Ecological System classification system developed by Nature

Serve. Ecological systems were developed as a means of representing recurring groups of biological communities that are found in similar physical environments and that are influenced by similar dynamic ecological processes, such as fire or flooding. GAP has incorporated ecological systems into its mapping efforts because they were designed to provide a classification unit that is readily mappable from remote imagery and they are typically identifiable by conservation and resource managers in the field. Detailed descriptions of the mapped Ecological Systems can be found at <http://www.natureserve.org/explorer/>.

In addition to the Ecological Systems used to represent natural vegetation classes, the regional land cover mapping projects map land use classes which represent developed areas, agriculture areas and areas of harvested or introduced vegetation. The Northwest Regional Gap (NWGAP) project mapped the distribution of 184 Ecological Systems and 24 land use classes across the five-state project area. The California project mapped 129 Ecological Systems and 17 land use classes in that state. The minimum mapping unit used in both projects was 0.5 hectares.

### Development of a National Land Cover Map

Recently, the newly completed Northwest and California projects were combined with the Ecological System-level GAP data developed for the Southwest and Southeast. In portions of the continental U.S., where Ecological System level Gap data has not yet been developed, data from the LANDFIRE project compiled by Landscape was used. Combining these data allowed for the construction of a seamless representation of Ecological System distributions across the continental U.S. (Figure 1). The national land cover map represents the distribution of 551 Ecological Systems and modified Ecological Systems, which describe natural vegetation types, and 39 land use classes, which depict developed and disturbed land cover classes.

The 590 different Ecological Systems and land use classes depicted across the continental U.S represent a level of classification detail that exceeds the level required by some users. For this reason two summary levels were developed to allow for analysis, visualization and summarization at different levels of detail. Level 1 contains eight classes and generalizes to the level of vegetative physiognomy i.e. grassland, shrubland, forest. Level 2 incorporates information on elevation and climate to develop 43 classes for the continental U.S. The full 590 classes represent Level 3. The three levels are hierarchical allowing the user

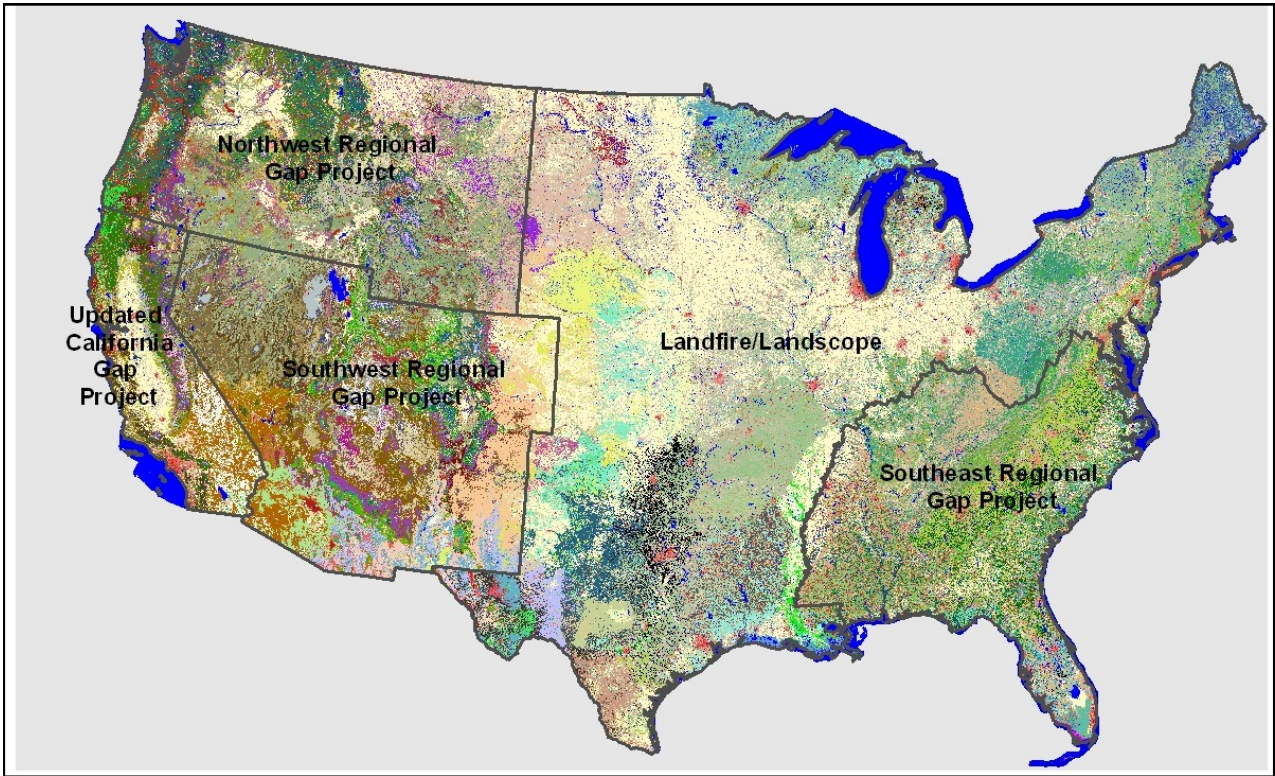


Figure 1. The national land cover map and the data sources used in its compilation.

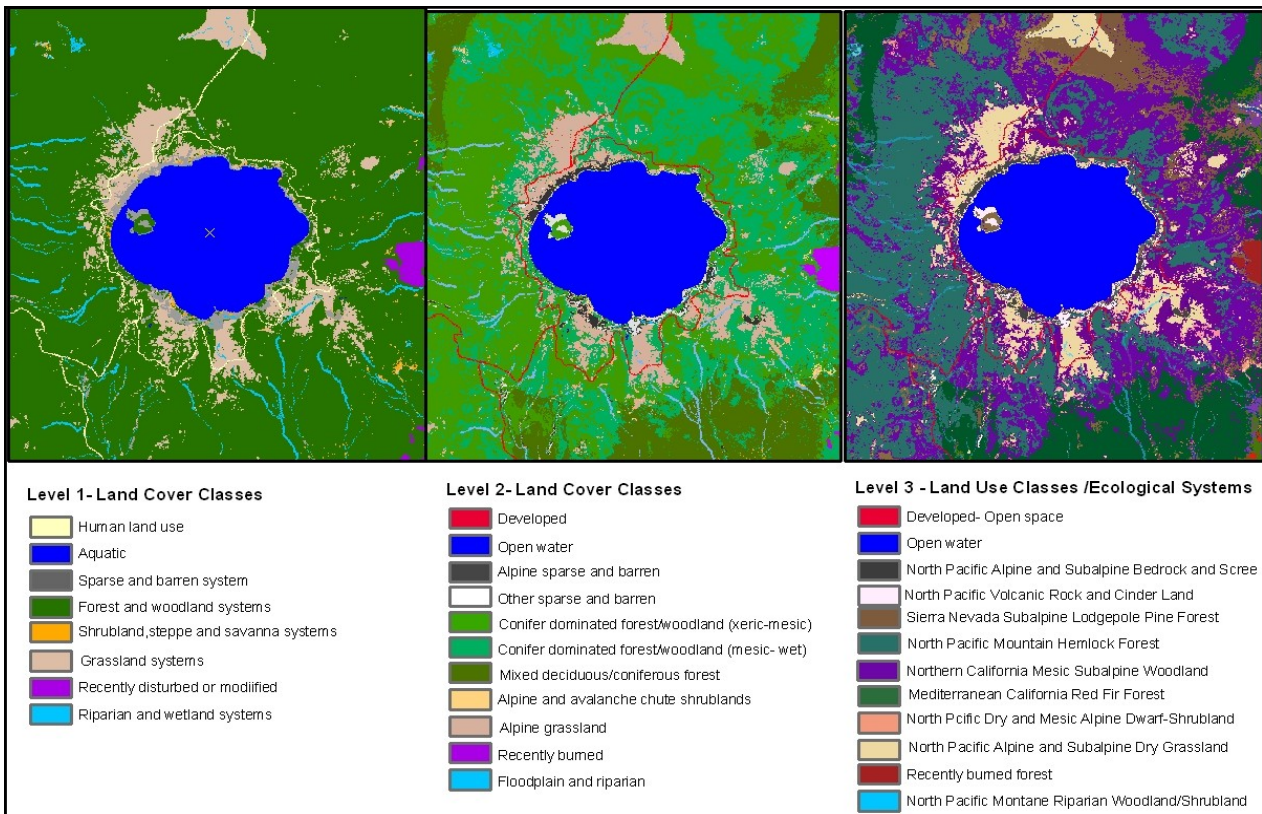


Figure2. Level 1, 2 and 3 land cover classes surrounding Crater Lake, Oregon

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to collapse and expand to fit the classification detail needed for their project (Figure 2).

### **Goals for the Upcoming Year**

During the next year, GAP will be working to improve the national land cover data set by working with vegetation ecologists and other natural resource experts to identify mapping errors and to improve and standardize the mapping of Ecological Systems across the country.

Also during the next year we will be conducting the first national scale Gap Analysis. A Gap Analysis involves intersecting land cover data and stewardship data to evaluate the protection status of the Ecological Systems. - This will allow us to identify Ecological Systems that may be underrepresented in lands managed for biodiversity conservation. Gap Analysis data can be used to improve wildlife management and conservation planning efforts.

To fulfill the NBII mission to facilitate the widest possible access to and use of biological data and information, GAP is developing an online Land Cover Explorer tool. This new online tool will facilitate the exploration of Ecological System distribution patterns at multiple scales and will allow users to calculate statistics on the types of vegetation occurring within a state, county or ecological zone.