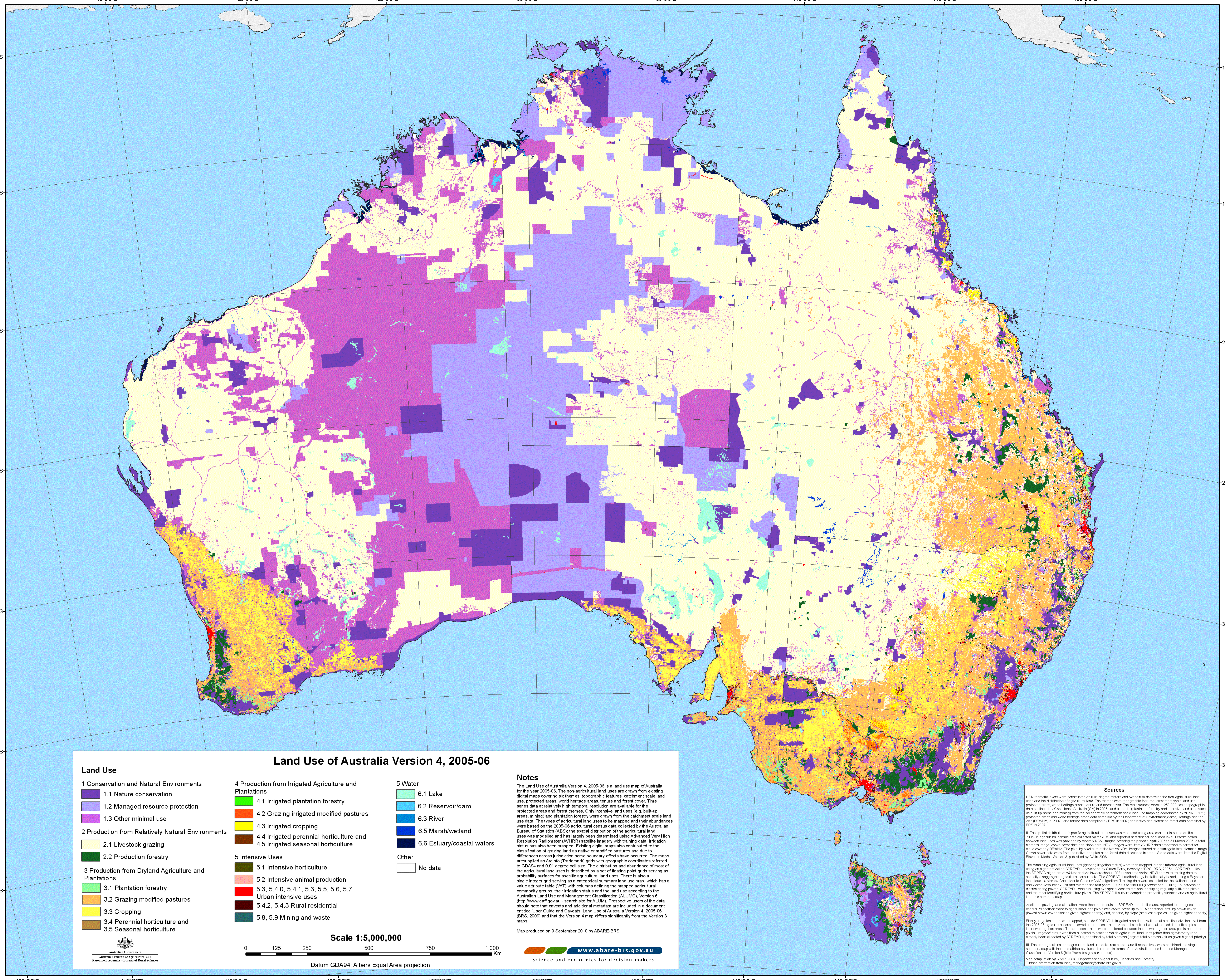

Land Use of Australia Version 4, 2005-06

Notes

The Land Use of Australia Version 4, 2005-06 is a land use map of Australia for the year 2005-06. The non-agricultural land uses are drawn from existing digital maps covering six themes: topographic features, catchment scale land use, protected areas, world heritage areas, tenure and forest cover. Time series data at relatively high temporal resolution are available for the protected areas and forest themes. Only intensive land uses (e.g. built-up areas, mining) and plantation forestry were drawn from the catchment scale land use data. The types of agricultural land uses to be mapped and their abundances were based on the 2005-06 agricultural census data collected by the Australian Bureau of Statistics (ABS); the spatial distribution of the agricultural land uses was modelled and has largely been determined using Advanced Very High Resolution Radiometer (AVHRR) satellite imagery with training data. Irrigation status has also been mapped. Existing digital maps also contributed to the classification of grazing land as native or modified pastures and due to differences across jurisdiction some boundary effects have occurred. The maps aresupplied as ArcInfo (Trademark) grids with geographic coordinates referred to GDA94 and 0.01 degree cell size. The distribution and abundance of most of the agricultural land uses is described by a set of floating point grids serving as probability surfaces for specific agricultural land uses. There is also a single integer grid serving as a categorical summary land use map, which has a value attribute table (VAT) with columns defining the mapped agricultural commodity groups, their irrigation status and the land use according to the Australian Land Use and Management Classification (ALUMC), Version 6 (http://www.daff.gov.au - search site for ALUM). Prospective users of the data should note that caveats and additional metadata are included in a document entitled 'User Guide and Caveats: Land Use of Australia Version 4, 2005-06' (BRS, 2009) and that the Version 4 map differs significantly from the Version 3 maps.

Map produced on 9 September 2010 by ABARE-BRS

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Science and economics for decision-makers

Sources

I. Six thematic layers were constructed as 0.01 degree rasters and overlain to determine the non-agricultural land uses and the distribution of agricultural land. The themes were topographic features, catchment scale land use, protected areas, world heritage areas, tenure and forest cover. The main sources were: 1:250,000 scale topographic data published by Geoscience Australia (GA) in 2006; land use data (plantation forestry and intensive land uses such as built-up areas and mining) from the collaborative catchment scale land use mapping coordinated by ABARE-BRS; protected areas and world heritage areas data compiled by the Department of Environment,Water, Heritage and the Arts (DEWHA) c. 2007; land tenure data compiled by BRS in 1997; and native and plantation forest data compiled by BRS in 2007.

II. The spatial distribution of specific agricultural land uses was modelled using area constraints based on the 2005-06 agricultural census data collected by the ABS and reported at statistical local area level. Discrimination between land uses was provided by monthly NDVI images covering the period 1 April 2005 to 31 March 2006, a total biomass image, crown cover data and slope data. NDVI images were from AVHRR data processed to correct for cloud cover by DEWHA. The pixel by pixel sum of the twelve NDVI images served as a surrogate total biomass image. Crown cover data were from the native and plantation forest data discussed in step I. Slope data were from the Digital Elevation Model, Version 3, published by GA in 2008.

The remaining agricultural land uses (ignoring irrigation status) were then mapped in non-timbered agricultural land using an algorithm called SPREAD II, developed by Simon Barry, formerly of BRS (BRS, 2006a). SPREAD II, like the SPREAD algorithm of Walker and Mallawaarachchi (1998), uses time series NDVI data with training data to spatially disaggregate agricultural census data. The SPREAD II methodology is statistically based, using a Bayesian technique - a Markov Chain Monte Carlo (MCMC) algorithm. Training data were collected for the National Land and Water Resources Audit and relate to the four years, 1996-97 to 1999-00 (Stewart et al., 2001). To increase its discriminating power, SPREAD II was run using two spatial constraints: one identifying regularly cultivated pixels and the other identifying horticulture pixels. The SPREAD II outputs comprised probability surfaces and an agricultural land use summary map.

Additional grazing land allocations were then made, outside SPREAD II, up to the area reported in the agricultural census. Allocations were to agricultural land pixels with crown cover up to 80% prioritised, first, by crown cover (lowest crown cover classes given highest priority) and, second, by slope (smallest slope values given highest priority).

Finally, irrigation status was mapped, outside SPREAD II. Irrigated area data available at statistical division level from the 2005-06 agricultural census served as area constraints. A spatial constraint was also used; it identifies pixels in known irrigation areas. The area constraints were partitioned between the known irrigation area pixels and other pixels. 'Irrigated' status was then allocated to pixels to which agricultural land uses (other than agroforestry) had already been allocated by SPREAD II, prioritised by total biomass (largest total biomass values given highest priority).

III. The non-agricultural and agricultural land use data from steps I and II respectively were combined in a single summary map with land use attribute values interpreted in terms of the Australian Land Use and Management Classification, Version 6 (http://www.brs.gov.au/landuse).

Map compilation by ABARE-BRS, Department of Agriculture, Fisheries and Forestry
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