

Land Cover Classification System for the Estimation of Carbon Storage in Terrestrial Ecosystems

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Abstract : The carbon cycle greatly influences global change, and the land cover changes contribute to the status and rate of the carbon budget in ecosystems. This paper proposes a land cover classification system for mapping land cover, the national ecological environment assessment, and estimating carbon storage in ecosystems. The classification system consists of basic land cover classes at levels I and II and auxiliary features at level III. The basic 38 classes characterizing land cover features are derived from 19 criteria referring to composition, structure, pattern, phenology, etc. The basic classes reflect the status of carbon storage in ecosystems. The auxiliary classes at level III complement the attributes of higher levels by 9 criteria. The 5 environmental criteria of temperature, moisture, landform, aspect and slope mainly reflect the potential and intensity of carbon storage in ecosystems. The disturbance of vegetation succession caused by land use type influences the vegetation carbon budget. The other 3 vegetation cover criteria, growth period, and species characteristics further refine the vegetation types. The hierarchical structure of the land cover map (the classes of levels I and II) is independent of the products of level III, which is helpful for land cover product management and applications. The classification system has been adopted in the Chinese national land cover database for the carbon budget in ecosystems at a 30 m scale.

Keywords : classification system, land cover, ecosystem, carbon storage, object based

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