

Land use and land cover change Is there a national agenda?

Mapping Sciences Committee

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Definitional vagueness

- ◆ Land use- human, cultural, intensity
- ◆ Land cover (best c. 80% accuracy)
- ◆ Zoning: Wish not fact
- ◆ Need: Consistent definitions
- ◆ Need: Effective schema, i.e. that match users needs
- ◆ Need: More accurate mapping
- ◆ Have: More timely, timeintegrated, higher resolution data
- ◆ Have: Integration power of GIS (e.g. dasymmetric maps, fusion)

Land Change

- ◆ Mapping/monitoring/assessing land use/land cover change requires
 - At least two full coverages, three for rates
 - Consistency of definition
 - Seamless coverage
 - Equivalent generality and detail
 - Accurate numbers
 - An understanding of drivers, e.g. roads
 - Useful (discipline specific? Classes), e.g. uses vs. species

Classification systems have been hierarchical, nested

- ◆ E.g. Anderson
- ◆ No shortage of classification schema
- ◆ Few cross-schema mappings
- ◆ Many mix land use and land cover
- ◆ Few relate to detailed city-level uses

Anderson et al. LULC Classification System

- ◆ 1 Urban or Built-Up Land
 - 11 Residential
 - 12 Commercial Services
 - 13 Industrial
 - 14 Transportation, Communications
 - 15 Industrial and Commercial
 - 16 Mixed Urban or Built-Up Land
 - 17 Other Urban or Built-Up Land
- ◆ 2 Agricultural Land
 - 21 Cropland and Pasture
 - 22 Orchards, Groves, Vineyards, Nurseries
 - 23 Confined Feeding Operations
 - 24 Other Agricultural Land
- ◆ 3 Rangeland
 - 31 Herbaceous Rangeland
 - 32 Shrub and Brush Rangeland
 - 33 Mixed Rangeland
- ◆ 4 Forest Land
 - 41 Deciduous Forest Land
 - 42 Evergreen Forest Land
 - 43 Mixed Forest Land
- ◆ 5 Water
 - 51 Streams and Canals
 - 52 Lakes
 - 53 Reservoirs
 - 54 Bays and Estuaries
- ◆ 6 Wetland
 - 61 Forested Wetlands
 - 62 Nonforested Wetlands
- ◆ 7 Barren Land
 - 71 Dry Salt Flats
 - 72 Beaches
 - 73 Sandy Areas Other than Beaches
 - 74 Bare Exposed Rock
 - 75 Strip Mines, Quarries, and Gravel Pits
 - 76 Transitional Areas
 - 77 Mixed Barren Land

LU Change Questions

- ◆ Is the United States losing prime farmland primarily to urbanization, and how fast?
- ◆ Is there a net loss of wetlands?
- ◆ How much carbon is being taken up by forest regrowth?
- ◆ What impact has irrigation had on farming nationally?
- ◆ What is the impact on land use on grazing on public land?
- ◆ Do farmland conservation acts work?
- ◆ What will be the impact of population loss or economic decline on a region's land use?

Grand solutions past

- ◆ Two examples:
 - ◆ GIRAS: LULC mapping nationally at 1:100,000 and 1:250,000 from photography
 - Error prone and not integrated nationally
 - ◆ Global Map: Japanese coordination by International Steering Committee
 - Participatory, with VMAP0 as base
- ◆ Many others

Questions

- ◆ Does the nation need a new land use mapping effort (not land cover)?
- ◆ Who are the users of LULC maps? What are the uses?
- ◆ How do we develop effective semantics?
- ◆ How do we use legacy data to assess change?
- ◆ Where does LULC fit within TNM?
- ◆ What federal/state/local agencies should be involved?
- ◆ What do we use instead of Landsat?
- ◆ What role should NRC (Geog. Sci., MSC) play?