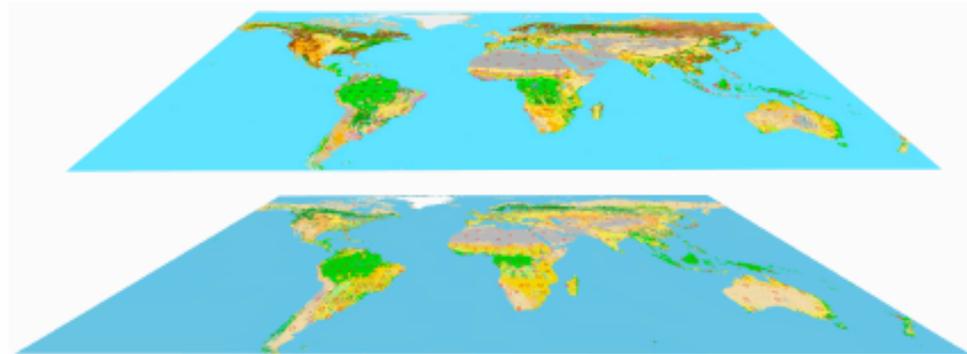# Accuracy assessment of land cover change maps?

- Little in the way of systematic experience or consensus protocols
  - To help you understand my perspective, let's go over the steps done to date with respect to accuracy assessment of land cover
    - Development of a system of classifiers used to characterize land cover
      - Life form, cover, leaf longevity ….
    - Compilation of "Best Practices" for Accuracy Assessment
    - Planning for a comprehensive land cover validation effort usable for the broader community

  Is the emphasis on map accuracy (and the associated uncertainty), or on estimates of the area of land cover change (and the associated uncertainty)?

"Best Practices Document" or "Least Worst Practices"

GLOBAL LAND COVER VALIDATION:

RECOMMENDATIONS FOR EVALUATION AND

ACCURACY ASSESSMENT OF

GLOBAL LAND COVER MAPS

2006

EUR 22156 EN

"Best Practices" document on land cover accuracy assessment
was based on two Workshop:
      March 2003 at JRC
      Feb 2004 at Boston University

Authors …..

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Recommendations and Conclusions

- Validation is important both during the production and after the completion of land cover maps – all land cover maps should be validated and validation material published. Validation is expensive.

- Statistically valid estimates of map accuracy are essential to validation of land cover products and their ultimate acceptance and use. Having the variance of these estimates is also important. Design-based sampling provides a flexible yet rigorous approach for accuracy assessment.

- A set of core analysis methods exist for accuracy assessment which should be routinely adopted as a baseline for reporting map accuracy. There is considerable room for building upon these core methods to pursue additional dimensions of map accuracy.

- Global land cover maps at coarse resolution pose unique challenges for accuracy assessment, including the high frequency of mixed pixels, difficulty in precise geolocation of map products and reference materials and logistical difficulties associated with field data collection.

- In the domain of validation of change detection there is considerable need for development of methods for separating land cover conversion from interannual variability in ecosystem response to climate variability. An additional problem is posed by lack of certainty regarding the historical status of landscapes.

- Considerable need for future research and development.

Issues in accuracy assessment of categorical land cover change

- Knowledge of the history of landscapes is largely unknown (typically using remote sensing to assess the accuracy of products derived via remote sensing)

- Complexity of error matrices increases (relative to accuracy assessment of land cover maps)

- Conventions on definitions of land cover change do not exist (the problems get worse with respect to forest degradation!)

- Problems related to estimating small areas in maps
    - Overall accuracy statistics become somewhat meaningless

The complexity of assessment of change maps
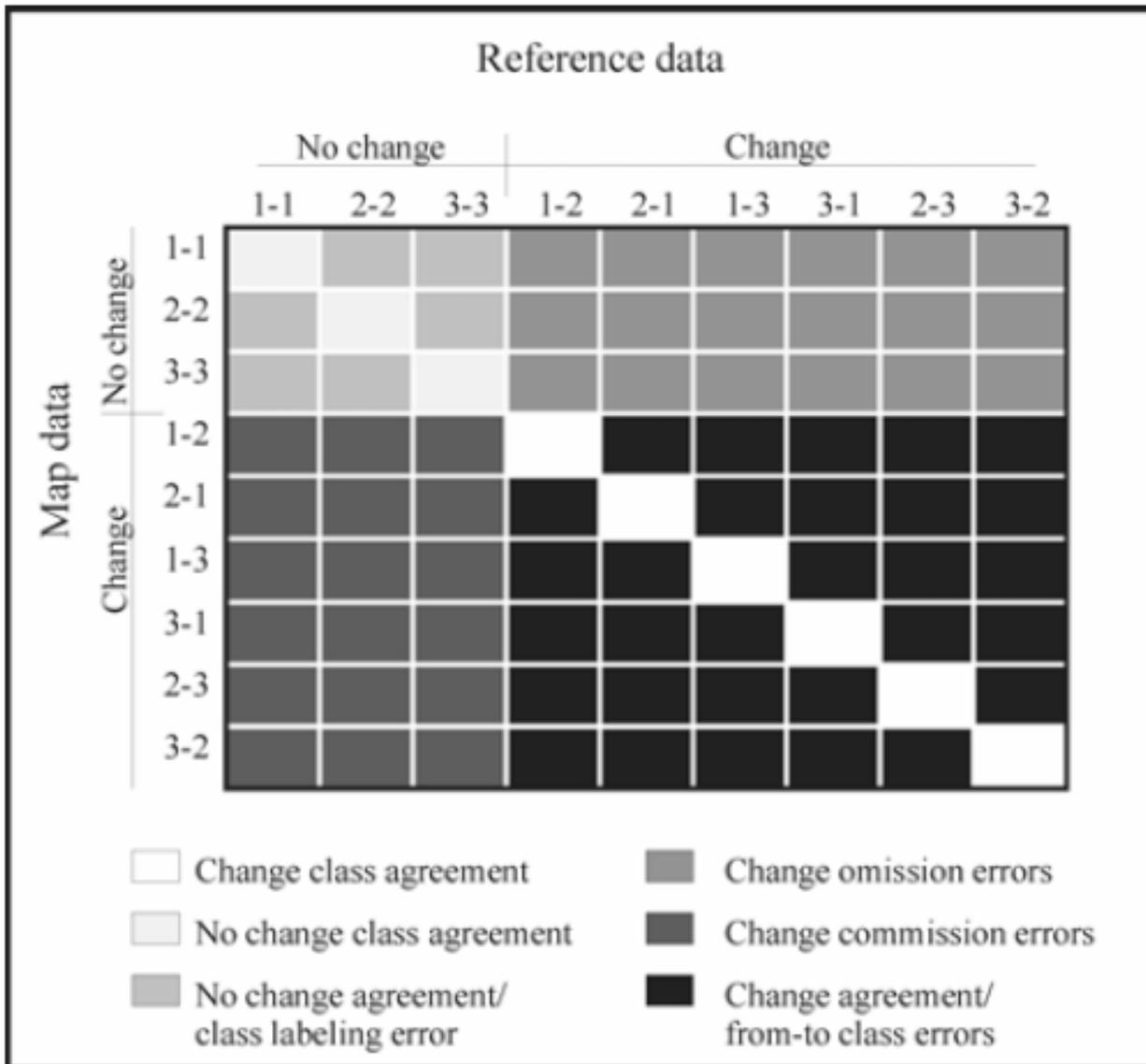
GOFC/GOLD Land Cover Validation Effort

- Global set of validation sites
- "living dataset"
- Usable for multiple maps at multiple resolutions
- Local interpretation (regional experts) of high resolution imagery (SPOT 5 2.5m data, hopefully)
- Based on LCCS set of land cover classifiers
- Possible users:
  - MODIS (500m)
  - GLOBCOVER (300m)
  - FRA 1 degree sample (based on Landsat)
  - Geo Land Cover

How to extend the accuracy assessment to include change?