Observations – Obstacles (opportunities)

- 3 main sensors being used– AVHRR, Landsat, JERS/SAR also AVRIS, Aerial Photos,
- Commercial data buy not working, yet; QC/peer review? How do it better??
- Difficulties associated with putting together historical datasets useful for LCLUC
- Lots of individual case studies – lack of strategy to obtain adequate regional/global coverage to cover range of hot spots of change, to scale up
- New opportunities through MODIS, etc for broader coverage datasets and potential to track changes – need some exposure to possibilities (e.g. through training and demos of say MODIS in LCLUC)
- Potential for nested approaches using multiple-resolution data needs to be fully explored, however technical problems of positional errors a major problem limiting easy scaling up.
- Historical perspective – new sensors are better but they miss out on helping the historical data build up required for LCLUC - need continuity in different sensors
- Meteorological observations a major constraint in modeling studies especially in developing parts of the world
- Desirable to have access to long term 1-km data that is in foreign hands – NASA should assist with negotiating access
- Future concern – Landsat follow-on – potential for costs to go back up!

Observations – Obstacles (opportunities)

- Difficult to scale up from plot measurements to pixels in TM: locational difficulties – inherent obstacle that should be recognized

- Individual processing – huge individual effort devoted to image processing, using differences methods.

- Physical data generally ok, but imbalance in the social science data (roads, etc) – need data bundles that would be made available to a broad community. Some regional examples exist.

Observations – Advances

- People made it over the RS methods to look at content of their products. This should include other techniques within the program
- Advances in produce a global products: global maps, land condition (degradation)
- Move towards quantitative from qualitative (e.g. percent tree cover/shrub cover)
- Change in land condition (versus just land cover change – moving from class to quantity)
- Errors and uncertainties – while generally recognized, need more explicit treatment and assessment (sensitivity analysis …)
- Advances made in integrating social science and physical data and working across scales

Synthesis Topics – for Book

- *Methods for the RS – classification and change detection, product merge across scales, treatment of uncertainty, recommended methods in the context of applications and questions. Go beyond techniques. Emphasize secific questions/needs of this project*

- Critical comparison of different classification schemes being used and some recommendations about what needs to be done/improved, issues of different definitions and how to address questions in the context of the different classifications and how we can move towards harmonization

- Lessons learned and new in RS (e.g. atmospheric correction …)

- *Scales of Change – what observations are needed to deal with different changes and questions, local to landscape/regional and from physical to social/applications eg biodiversity*

- Use of Land Cover Data in relation to other variables (e.g. nitrogen on ground to landscape using remote sensing – a merge between land cover and land use)

Recommendations

- Consider usefulness of derived products versus individual investigator deriving own products. Would derived products be useful to investigators or would each need to develop own methods/products?

- Consider creation of integrated data bundles/data information systems to assist in analysis and modeling (at regional level?). Should include socio-economic data and RS products. Build on existing data and information systems, regional networks, LBA experience.

- Prepare for TERRA to scale from local to regional scales, develop regional assessments, and identify needs for LCLUC studies in particular areas.

- Recommend a workshop on methods for the remote sensing analysis and new technologies (Terra, radar) at the beginning of the projects so investigators can get to the science.

- Recommend individual projects to put their data (and models) online

- Opportunities for paired compare&contrast studies between regions, including applying methods and models from one region to another

- Critical to have continuity of Landsat data and access and to use data fusion for temporal and spatial continuity

Observations on observations

Major effort in projects on RS analysis in order to address the science objectives

Projects generally used Landsat data, supplemented with aerial photos, hyperspectral etc.

Most projects carried out land cover classifications, moving towards using RS for describing land cover "condition"