Using NASA Remote Sensing Data to Reduce Uncertainty of Land-Use Transitions in Global Carbon-Climate Models: Data Management Plan

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The following Data Management Plan was part of the NASA ROSES 2012 Proposal *Using NASA Remote Sensing Data to Reduce Uncertainty of Land-Use Transitions in Global Carbon-Climate Models (summary)* submitted to the Terrestrial Ecology Program. It is presented as an example plan.

Data Management Plan

The proposed project will generate important new datasets of remote-sensing-based land-use transitions and their inherent uncertainty. Our plan for managing these datasets includes quality assessment, long-term archiving, and data sharing and dissemination (along with documentation and metadata), as described below. We will follow all guidelines in the NASA Earth Science Data and Information Policy, along with best practices for producing metadata and preparing datasets for public dissemination (Cook et al. 2001).

The data products generated through this study will be provided in both NetCDF and ASCII formats and will consist of:

1. Landsat-derived global maps of forest extent in year 2000 in each 0.5° × 0.5° grid cell.
2. Landsat-derived global maps of forest cover loss and gain in each 0.5° × 0.5° grid cell for years 2001 to 2010.
3. Gridded estimates of uncertainty in dataset 1 above.
4. Gridded estimates of uncertainty in dataset 2 above, for years 2005 and 2010.
5. Global, annual, 0.5° × 0.5°, fractional maps of all land-use states and transitions for years 1500 to 2100, constrained by datasets 1 and 2 above, and in a format that is widely used by ESMs.
6. Gridded estimates of uncertainty in dataset 5 above.

To assess the quality of our data products, we routinely execute a suite of automated diagnostics that ensure the data is technically complete. These diagnostics include a test that land area is conserved in each grid cell and region, that there are no negative values for land-use areas, that applying the transitions to the initial states gives the final states of the products, and that there are no land-use transitions on grid cells without land. The datasets generated in this project will also undergo this suite of diagnostics before being released to the public and additional diagnostics for quality assessment will be added as needed.

We have a long history of sharing our datasets through our website and email distribution lists, which are used extensively as a resource by members of the ESM community. In addition, the LUH datasets we prepared for the IPCC AR5 process are now hosted on the RCP Database website (http://www.iiasa.ac.at/web-apps/tnt/RcpDb/) and linked from the CMIP5 website. At the completion of this project, we will make our new land-use transition and uncertainty datasets widely available to the scientific user community through our website (http://luh.umd.edu). In addition, to assist with long-term archiving and public dissemination of the generated datasets, we will make the data available to the Oak Ridge National Laboratory Distributed Active

Archive Center. We have already made contact with the ORNL DAAC and they have agreed to host our datasets and provide necessary support for us to prepare our data to be hosted there (see attached letter of support). A copy of all data will also be stored on an external hard-drive, to be stored at an off-site location.

As with our previous datasets, we will also provide documentation for users. We will follow best practices for producing metadata along with descriptive variable and filenames, as outlined in Cook et al. 2001, and according to requirements for hosting data at the ORNL DAAC. We also routinely provide support to users of our data when they require assistance to incorporate our data into their models.

References

Cook, R.B., R.J. Olson, P. Kanciruk, and L.A. Hook. 2001. Best practices for preparing ecological and ground-based data sets to share and archive. Bull. Ecol. Soc. Am. 82(2): 138-141.
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