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A historical land use data set for the Holocene; HYDE 3.2

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Land use plays an important role in the climate system (Feddema et al., 2005). Many ecosystem processes are directly or indirectly climate driven, and together with human driven land use changes, they determine how the land surface will evolve through time. To assess the effects of land cover changes on the climate system, models are required which are capable of simulating interactions between the involved components of the Earth system (land, atmosphere, ocean, and carbon cycle). Since driving forces for global environmental change differ among regions, a geographically (spatially) explicit modeling approach is called for, so that it can be incorporated in global and regional (climate and/or biophysical) change models in order to enhance our understanding of the underlying processes and thus improving future projections.

Integrated records of the co-evolving human-environment system over millennia are needed to provide a basis for a deeper understanding of the present and for forecasting the future. This requires the major task of assembling and integrating regional and global historical, archaeological, and paleo-environmental records. Humans cannot predict the future. But, if we can adequately understand the past, we can use that understanding to influence our decisions and to create a better, more sustainable and desirable future.

Some researchers suggest that mankind has shifted from living in the Holocene (∼emergence of agriculture) into the Anthropocene (∼humans capable of changing the Earth' atmosphere) since the start of the Industrial Revolution. But in the light of the sheer size and magnitude of some historical land use changes (e.g. collapse of the Roman Empire in the 4th century, the depopulation of Europe due to the Black Plague in the 14th century and the aftermath of the colonization of the Americas in the 16th century), some believe that this point might have occurred earlier in time (Ruddiman, 2003; Kaplan et al., 2010). Many uncertainties still remain today and gaps in our knowledge of the Antiquity and its aftermath can only be improved by interdisciplinary research, of which some examples will be given.

Here I will present the latest update (v 3.2) of the History Database of the Global Environment (HYDE) (Klein Goldewijk et al., 2011) with new quantitative estimates of the underlying demographic and agricultural developments for the Holocene.

References

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