



Capacity of landscape functions – a suitable target figure for catchment monitoring and assessment based on remote sensing data?

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For middle Europe more and more weather extremes seem to occur. In Rhineland-Palatinate, Middle West of Germany, very high rainfall amounts in the years 1983, 1993, 1995, 1997 and the beginning of the year 2003 lead extreme flood events, especially in smaller catchments. On the other hand the summer of 2003 was very dry and significant phenomena of water stress were observed at agricultural and forests all over the country. Are these events a direct response to the climatic change or an expression of human indicated decrease of landscape functions? Of course there is to annotate, that the problem not only include a temporal but also a spatial dimension. To provide a tool to estimate and assess the strength of different functions like the resistance against erosion, buffer capacity, groundwater protection or runoff regulation in certain landscapes and components, the workgroup of Marks, Müller, Leser and Klink published in 1989 the “Instruction to evaluate the capacity of landscape functions¹”. Meanwhile the discussion on landscape functionality moved on, new ideas came up, but the concept to assess individual landscape functions by there change, power or weakness seems to be alluring, particular in the case of lacking or fuzzy datasets. In this cases complex models will lead to inaccurate or even wrong results.

One of the main objects of the project WaReLa (water retention by land use), funded by the European Union (Interreg IIB) is to support the regional planning process in medium size catchments in terms of a sustainable catchment management with adapted land use measures. Because of a project area covering the low mountainous

regions of central Europe some of the needed information are not collected by classical or point measurements but by remote sensing methods. But for all efforts of gathering hydrological relevant data, the data base is still partial inconsistent. Hence the concept of assessing particular landscape functions was adapted to the projects requirements. The applicability of this approach was tested on the values land cover dynamics and soil moisture patterns, in other words on temporal and on a spatial figure respectively. For both aspects regular datasets from ERS-2, ENVISAT, QuickBird, Landsat, ASTER and Corona satellites were employed. Except for the field campaign to gather validation data for the soil moisture retrieval, used data sets and methodology has to be categorised operational related to data availability and repeatability of investigation.

¹⁾ Marks, R.; Müller, M.; Leser, H. & Klink, H. [Eds.] (1989): Anleitung zur Bewertung des Leistungsvermögens des Landschaftshaushaltes (BA LVL). - Forschungen zur deutschen Landeskunde, B. 229, Trier.