Geophysical Research Abstracts
Vol. 14, EGU2012-9561, 2012
EGU General Assembly 2012

Vegetation dynamics in a large braided river (Tagliamento River, Italy)

M. Barban (1), G. Monegato (2), N. Surian (1), and L. Ziliani (1)
(1) University of Padova, Department of Geosciences, Padova, Italy , (2) C.N.R. - I.G.G., Torino, Italy

Vegetation has often a crucial role on braided river dynamics in humid environments. The aim of this work is to investigate island dynamics and, specifically, the controls of such dynamics. We started exploring the relation between islands dynamics and flow regime, testing the hypothesis if islands erosion is associated with floods of specific magnitude. Besides geological (e.g. groundwater depth) and geomorphological (e.g. channel confinement and evolutionary trajectory of channel morphology) controls were taken into account to explain vegetation dynamics.
The study was conducted on a 14 km reach of the Tagliamento River (northeastern Italy). Changes in channel morphology and vegetation cover were analyzed over a time period of 25 years, from 1986 to 2011, using 8 sets of aerial photographs (1986, 1993, 1997, 1999, 2003, 2005, 2009, 2011). Ten types of fluvial features were digitized within the fluvial corridor which includes the active channel, floodplain and recent terraces. Vegetation was distinguished in three categories according to its height and tree canopy: herbaceous vegetation and shrubs, shrubs and trees of low-medium height, high trees. The extent of the last two categories, that is extent of vegetated patches where trees are dominant, ranged between 4% (in 2005) and 11% (in 1986) of the whole active channel.
Preliminary analyses were focused on the dynamics of such vegetation patches, considering the extent of vegetated areas that were eroded and flow regime for each sub-period (e.g. 1986-1993). Erosion of vegetation occurred during all sub-periods but with different magnitude. Three sub-periods were characterized by less intense erosion (annual rates of erosion varying between 4% and 5%) while during the other four sub-periods annual erosion rates were in the range 11% - 15%. Correlations of those erosion rates with flow regime (i.e. cumulative discharges above a defined threshold) suggest that vegetation erosion is strictly connected to occurrence of flows of medium-high magnitude (e.g. a good statistical correlation was found considering only the floods with a recurrence interval higher than 1.1 yr). On the other hand there is evidence that significant erosion occurred also during a period (1997-1999) with moderate flows.
Further analyses of these data will be needed to better define the relations between vegetation dynamics and flow regime in this braided river, in particular aiming to recognition of specific discharge threshold which are more relevant in such dynamics. Besides, the preliminary results of this study suggest that other controls (e.g. geological and geomorphological conditions) should be included for a more comprehensive explanation of vegetation dynamics.