Geophysical Research Abstracts,
Vol. 10, EGU2008-A-08138, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-08138
EGU General Assembly 2008

An operational methodology for characterizing land use along river corridor from remote sensing imagery at large scale

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The European Water Framework Directive (WFD) aims at implementing strategies to restore the good ecological status of water bodies. Lots of local scale studies tend to support the idea that land use along river corridors, particularly riparian vegetation, has a significant influence on the ecological status of water-bodies. Restoration of riparian zones is often seen as a key action to improve ecological status, but the actual "buffering capacity" of these systems needs to be properly estimated before to take specific buffer policy decisions. This influence has to be investigated through large scale statistical analyses between surrounding pressures close to river and ecological status indicators.

The first objective of this study was to develop from remote sensing imagery an operational methodology to map long linear river corridor land use to compensate the lack of available accurate pressure information at this scale. Considering the size of these systems and the diversity of land cover, a rule-based object oriented classification using multi-source data including aerial photography (0.5 m) and SPOT 5 XS (10 m), was implemented. Land use on riparian buffers has been classified with a high total accuracy on the whole hydrographic network (about 2000 Km) of Herault watershed in the south of France. The second objective was to define and compute a set of synthetic spatial indicators of the river corridor land cover that can be linked to

the ecological status of rivers. Such indicators are representative of both riparian zone functions and alteration processes. To assess our approach, several spatial indicators, computed from resulting classifications and Corine Land Cover database, have been compared at different spatial extents.

Results of this study highlight the need for VHRS imagery for accurate quantification of the extent, configuration, and properties of land cover in the riparian buffer zone. The next step will be to test the functional link between biological assemblages and accurate spatial indicators compute from VHRS across large scale.