



Assessing the status of riparian zones through satellite images

Riparian zones (river banks and lake shores) have an important ecological role. Researchers have developed a new indicator to assess the status of riparian zones based on their vegetation cover and used it to demonstrate the beneficial effects of extending agri-environmental measures to these zones.

The European Commission's Water Framework Directive¹ states that all EU surface waters must reach a good status by 2015. A rating of "good status" includes the condition of the riparian zones, which protect against erosion, provide breeding grounds and act as corridors for dispersal of species. Undisturbed or nearly undisturbed riparian zones are considered to have high ecological status and are important elements of Green Infrastructure².

The study evaluated an indicator of the status of riparian zones that measures the amount of permanent vegetation. Vegetation reduces leaching and erosion and provides cover for wildlife. The suitability of this indicator was assessed along the river network of Andalusia in southern Spain. The researchers derived the permanent vegetation fraction (PVF), i.e. the amount of vegetation that is permanently on the area, using high-resolution satellite images of the area over 16 years (1989-2004).

On the basis of the PVF they classified the riparian zones into 'favourable' and 'unfavourable'. This was compared with a classification based on field observations that designated riparian zones as 'natural' and 'very bad'. The comparison indicated that the PVF classification was 89 per cent accurate. The most intensively used agricultural areas of the river basin and mountainous areas were classified as unfavourable whilst lowland valleys and plains tended to be favourable.

The researchers applied this indicator to assess the impact of extending agri-environmental measures (AEM) to riparian zones. In Andalusia the most common AEM is to leave undergrowth and maintain high vegetation cover to control erosion in olive areas. The results indicated that riparian zones with an unfavourable status reached a higher PVF value if they were subject to AEMs. Furthermore, there was no difference in PVF between a favourable riparian zone without AEMs and an unfavourable riparian zone with AEMs, suggesting that implementing AEMs improves the status of unfavourable riparian zones to that of favourable riparian zones.

The study suggested that the indicator of PVF could be used in EU River Basin Management Plans and to assess the effectiveness of AEMs on erosion control in olive areas in Southern Spain.

1. See: http://ec.europa.eu/environment/water/water-framework/info/intro_en.htm

2. See: http://ec.europa.eu/environment/nature/ecosystems/index_en.htm

Source: Ivits, E., Cherlet, M., Mehl, W. & Sommer, S. (2010) Estimating the ecological status and change of riparian zones in Andalusia assessed by multi-temporal AVHRR datasets. *Ecological Indicators*. 9:422-431.

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