

Preventing Buffalo River Bank Erosion with the help of Remote Sensing

Background:

River bank erosion (see Figure 1) contributes to large amounts of sedimentation in rivers, lakes and reservoirs. Besides loss of land, river bank erosion results in poor water quality. Noreen Thomas lives on the banks of the Buffalo River outside Moorhead, Minnesota and took action when she noticed the bank of the river caving in and moving closer to her home and farm.

Noreen was faced with a challenge when a neighbor petitioned to drain his fields into the river. She used remote sensing evidence to demonstrate how this increased flow would harm the river and potentially cause more erosion of the banks. Noreen went one step further and decided to use bioengineering techniques to stabilize the river bank near her home.

Use of Data:

Using current and historical images of the Buffalo River (Figure 2), Noreen convinced her county water board to reject draining more water into the river. Images dating back to the 1970s showed the river's severe meandering and how much land it had claimed in almost thirty years. She then used the images to find places along the river where erosion was the worst. Noreen's family then teamed with local Boy Scout troops to plant low growing bushes, trees and native grasses. The roots of these plants help to hold the soil in place. Within only a few months, the new plants grew roots and held the soil against the raging river.

Economic and Environmental Benefits:

Noreen's efforts saved the county thousands of dollars that would have eventually been used to engineer and reconstruct the bank. By using her remote sensing expertise and the knowledge of her home and the river, she protected hundreds of tons of valuable agricultural soil from being washed away. Noreen and her family enjoy the many birds and animals that now live in the plants and trees planted on the bank.

For this accomplishment and her many other community and educational endeavors, Noreen was honored as a finalist for the Patrick Madden Award for Sustainable Agriculture. This national prize awards producers active in community life and conservation of natural resources through farming. The remote sensing images that Noreen used were a vital part in educating the decision makers of the region and preventing further harm to the environment.



Figure 1. An example of river bank erosion in a Minnesota stream.



Figure 2. The confluence of the Buffalo and Red Rivers just north of Fargo, ND. Like the section of the river near the Thomas farm, the banks of this stream are well buffered from erosion by lush plantings which are evident in this ASTER satellite image from September 2003. (Image displayed in pseudo natural color, band combination red (R), infrared (IR), green (G)).