

## **SEDIMENTATION AND GEOMORPHOLOGY – PLAN FOR 2005**

**Jim Pizzuto and Kathrine Skalak, Dept. of Geology, U. of Delaware**

### Study Area

South River and its floodplain from Waynesboro to Port Republic, VA.

### The Preliminary Sediment Budget – The Hypothesis to be Tested

Reconnaissance of the study area defined the following areas of sediment storage: “mature” floodplain, “immature” floodplain, channel bed, “near bank” and bank areas, and backwater areas. Estimates of the extent of fine-grained sediment storage in these areas, and estimates of fluxes between the storage areas based on literature values and preliminary field study, provided the basis for a preliminary budget of fine-grained sediment. During the next year, these estimates will be refined with actual data.

Some hypotheses to be are:

1. Bank erosion is a significant source of suspended sediment in the study area, though it is likely smaller than input from the total watershed area upstream of the study reach;
2. Suspended silt and clay entering the study area is stored for significant periods of time in the bed and “near-bank” regions before leaving the study area. It is expected that length of storage will be variable, but a mean value of this distribution should be on the order of 0.5 – 2 years.
3. Annual rates of sediment storage on “mature” and “immature” floodplains are low enough that they may be neglected in an annual budget.

### Tasks to be Completed

These hypotheses will be addressed by completing the following tasks:

1. Map the distribution of sediment storage areas at present and in the past;
2. Monitor current rates of bank erosion;
3. Measure floodplain accumulation rates;
4. Estimate suspended sediment supply from upstream reaches;
5. Measure the volume of silt and clay in storage on the streambed;
6. Obtain basic geomorphic data for the study reach;
7. Develop and test methods to assess rates of exchange of fine-grained sediment between the channel perimeter and the water column;
8. Begin development of a 1+ dimensional numerical model to predict the movement of fine-grained sediment through the study area on decadal timescales.