

## Channel Change on the Upper White River Vermont: The role of climatic variability and landuse change on sediment mobility

Alluvial rivers are dynamic features, subject to changes in channel location, geometry and pattern in response to variations in climate and sediment inputs over time. Despite their dynamic nature, there is considerable concern over the stability of channels and the extent to which land management destabilizes rivers. Recent flooding in Vermont has led to extensive activity in river restoration and flood control planning.

This study seeks to provide context for river management and restoration activities by reconstructing long-term channel change on the Upper White River, Vermont. Using a fifty-year historical air photo series, we are reconstructing channel morphology and floodplain vegetation change. Historical streamflow records dating to 1916 document extreme floods in the region. Our analysis attempts to assess the relative importance of extreme flooding and floodplain landuse change on channel morphology.

This research is part of a broader effort to understand sediment dynamics in forested mountain watersheds of the northeastern U.S. Using a sediment budgeting approach, our efforts in the White River basin will identify and quantify sediment sources and flux rates and improve our understanding of the relative importance of hillslope and channel erosion on sediment yield in this landscape. This information will be useful for targeting restoration projects and in formulating adaptive management strategies within the basin and elsewhere.



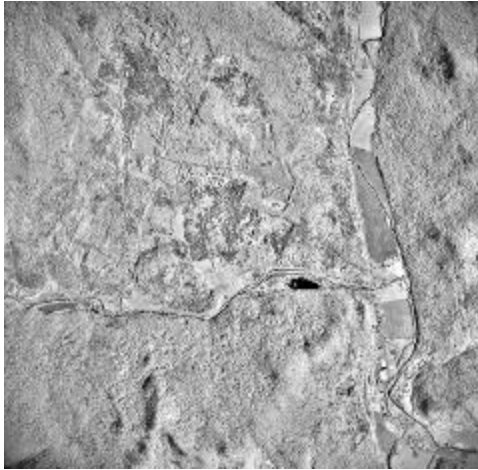
Upper White River basin (shown in blue) within the White River watershed (shown in brown), Vermont.

### For information contact:

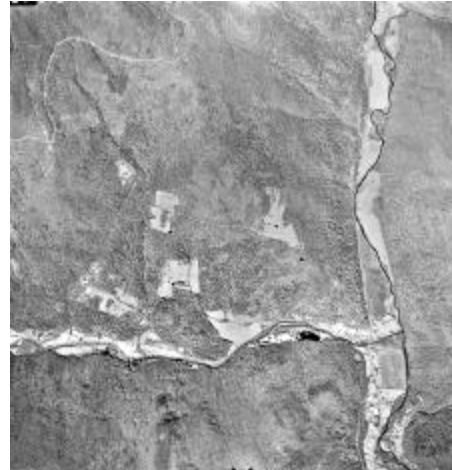
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1975



1990



Historical aerial photographs depicting a reach of the Upper White River and adjacent land use, 1975 and 1990.

### Research questions:

- What are the important sources of sediment and what are the time scales of erosion and transport within the White River basin?
- *How and where* has the Upper White River changed since the record floods of 1927 and 1936 and 1938 in the region?
- How does land use change within the floodplain correspond to recorded channel change?
- How might restoration strategies be targeted to address locations of historical channel instability?



Channel restoration project on the Upper White River, VT