CARBON STORAGE IN MOUNTAIN RIVERS

BACKGROUND
Published research emphasizes rapid downstream export of terrestrial carbon from headwaters, but few studies have investigated the volume of carbon storage along stream-riparian corridors.

RESEARCH
Research Activity: Recent studies are quantifying the spatial distribution of carbon pools along different valley types of headwater streams in Rocky Mountain National Park, Colorado. Findings show that low-gradient, broad valley bottoms with old-growth forest or active beaver colonies store the majority of above- and below-ground carbon. Estimates of riverine carbon storage represent a previously undocumented but important carbon sink.

Management Implications: These findings highlight the importance of headwater streams and associated riparian areas in watershed-scale carbon retention. Management to reduce the effects of climate warming on headwater river corridors is important to maintaining ecosystem services such as carbon storage in mountainous watersheds.

KEY FINDINGS
- Low-gradient, broad valley bottoms with old-growth forest or active beaver colonies store the great majority of above- and below-ground carbon.
- Estimates of riverine carbon storage represent a previously undocumented but important carbon sink.
- These results indicate that: 1) not all mountainous rivers rapidly export carbon; 2) not all valley segments are equally important in carbon storage; and 3) historical changes in riverine complexity have likely reduced carbon storage.

KEYWORDS: headwater stream, stream-riparian corridors, carbon pools

FURTHER READING
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Along unconfined stream segments with old-growth riparian forest, characterized by high stem densities and large diameter trees, large volumes of wood accumulate in the channel and on the floodplain, creating obstructions that contribute to carbon retention.