PRODUCTION OF SEDIMENT FROM THE RUNNING SURFACE OF UNBOUND AGGREGATE ROADS IN SOUTHEAST OHIO, USA

Benjamin A. Silliman
School of Environment and Natural Resources
The Ohio State University
210 Kottman Hall
2021 Coffey Road
Columbus, OH 43210
Current:
Glen Helen Ecology Institute
405 Corry Street
Yellow Springs, OH 45387
Voice: +01 937 319 6139
Email: bsilliman@antiochcollege.edu

Elizabeth Myers Toman, Corresponding Author
School of Environment and Natural Resources
The Ohio State University
210 Kottman Hall
2021 Coffey Road
Columbus, OH 43210
Voice: +01 614 292 2265
Fax: +01 614 292 7432
Email: toman.11@osu.edu

ABSTRACT
Unbound aggregate roads are thought to be one of the largest anthropogenic sources of fine sediments in the stream channels of small watersheds. Sedimentation can reduce water quality in streams negatively impacting aquatic habitat as well as being a detriment to municipal drinking water sources. With the expansion of unconventional natural gas exploration and subsequent increase of the construction and use of unbound aggregate roads along with the continued use of these roads for timber extraction and recreation, the relationship between unbound aggregate roads and surface water quality needs to be addressed. This study measured the production of sediment from the road surface during controlled precipitation experiments to determine the mass of sediment that unbound aggregate roads within a small watershed could produce during one storm event. Sediment production was not related to road slope, strength, or drainage characteristics. The production of sediment from the road surface increased with wet traffic use. If the entire road network behaved as the sampled road segments, surface runoff from unbound aggregate roads could account for 32 % of the total suspended sediment exported from the watershed during a storm event. This study highlights the need to disconnect unbound aggregate roads from stream channels in order to prevent negative water quality impacts associated with sedimentation.