

Apr 18th, 3:25 PM

Clastic Sediments in Karst as a Vehicle for Contaminant Transport: Lithofacies and Transport Mechanisms

Rachel Bosch
Pennsylvania State University

William B. White
Pennsylvania State University

Follow this and additional works at: http://digitalcommons.wku.edu/mc_research_symp

 Part of the [Animal Sciences Commons](#), [Forest Sciences Commons](#), [Geology Commons](#), [Hydrology Commons](#), [Other Earth Sciences Commons](#), and the [Plant Sciences Commons](#)

Recommended Citation

Rachel Bosch and William B. White, "Clastic Sediments in Karst as a Vehicle for Contaminant Transport: Lithofacies and Transport Mechanisms" (April 18, 2016). *Mammoth Cave Research Symposia*. Paper 13.
http://digitalcommons.wku.edu/mc_research_symp/11th_Research_Symposium_2016/Research_Posters/13

This is brought to you for free and open access by TopSCHOLAR®. It has been accepted for inclusion in Mammoth Cave Research Symposia by an authorized administrator of TopSCHOLAR®. For more information, please contact topscholar@wku.edu.

Clastic Sediments in Karst as a Vehicle for Contaminant Transport: Lithofacies and Transport Mechanisms

Rachel Bosch and William B. White¹

¹ Pennsylvania State University

Abstract

Karstic aquifers carry a load of clastic sediment as part of their hydrologic function. Clastic sediments are an important part of the mechanism for storage and transport of contaminants; indeed, solid contaminants can be considered as a form of clastic sediment. Although the sources of clastic sediments have been well delineated, sediments from multiple sources are mixed and redistributed within the aquifer to produce the sediment deposits observed in caves or the load of sediment discharged from karst springs. As an aid to the interpretation of clastic sediments in karst aquifers, a facies concept has been devised based on the traditional criteria of sedimentary petrology. Facies are defined in terms of particle size, degree of sorting, and sedimentary structures. The deposits represented by each set of facies characteristics in turn can be interpreted in terms of depositional mechanisms. The facies interpreted as slackwater cave deposits, here referred to as *slackwater facies*, are laminated deposits of clay to silt laid down in passages filled with stagnant water either flooded by inputs from upstream or backflooded from surface streams. This mechanism provides two pathways by which microorganisms or metals can be adsorbed onto clay particles and carried into the aquifer. The facies interpreted as channel cave deposits, here referred to as *channel facies*, consist of silts, sands, gravels, and cobbles carried in major conduits mostly by high velocity storm flows. Flows that transport sediments resulting in channel facies also can carry solid contaminants at various size scales and can act as storage sites for contaminants over long periods of time. Calculations show that hydraulic conditions required for transport leading to deposition of channel facies are consistent with observed discharge characteristics of major conduits.