



GRAND VALLEY
STATE UNIVERSITY

College of Liberal Arts and Sciences
Geology Department

July 9, 2019

Ron Olson, DNR-PRD
525 West Allegan,
Lansing, MI 30257

Dear Mr. Olson,

We have been following closely the sediment sampling plan for the Grand River proposed by Grand River Waterway in DEQ Permit # WRP014388. We have several concerns with the proposed sampling plan, the proposed sampling methods, and the data on which the plan was based. Dr. Peter Wampler (Grand Valley State University) has been working with students studying and mapping the Grand river since 2013 and Dr. Kory Konsoer (Louisiana State University) has extensive river surveying expertise and has been collaborating to collect bathymetry and hydraulic data on the Grand River between Fulton Street and the Bass River since 2016.

In 2013 we completed a report on the bedrock and other controls on grade within the Grand River (https://grandrapidswhitewater.org/wp-content/uploads/2013/04/S3Report_Churches_Wampler_2013.pdf). This study identified important bedrock and boulder field controls on river morphology and structure near Ada, upstream of Grand Rapids. This report also provided a comprehensive summary of the early geomorphic history and bedrock controls of the Grand River.

In Winter 2017 a complete set of 1906 depth maps were obtained from the Grand Rapids museum archives. These maps cover the section from Fulton street to Bass River with detailed depths recorded in April 1906. These depths were recorded on lines spaced roughly 250 feet apart for the entire reach. 1906 maps were scanned and digitized by an Advanced Geographic Information Systems class and a database of depth points was created.

In September, 2017 a hydrographic survey was conducted along the same transects as the 1906 survey using a boat-mounted acoustic Doppler current profiler (ADCP). The ADCP survey covered an 8-mile reach of the Grand River from the Riverview Airport in Jenison to Lamont. Just recently, in June 2019, we completed a 15-mile multibeam echo sounding (MBES) survey from the Fulton Street Bridge in Grand Rapids to the Lake Michigan Drive (M-45) bridge adjacent to the GVSU campus.

This MBES survey provided high-resolution bank-to-bank coverage of the river bed, and from this survey many of the training wall structures identified in the 1906 survey maps were apparent in great detail. These structures are also observable along the banks in some areas at low water levels.

To demonstrate the level of detail obtained by the MBES survey, we have included preliminary images of the bathymetric data gridded at 0.5 meter for a reach of the river near the Grand River Park Boat Launch in Georgetown Township, Michigan (Figure 1). These images clearly show the wall structures and their effect on the sediment bedforms in the channel, as well as their relationship to the channel islands. We also include an image showing the same area from the 1906 survey maps for comparison. The dredging bathymetry study and a selected panel from the proposed dredging plan are also provided for comparison.

Our primary concerns are summarized below:

1. The 2017 bathymetry survey performed by Edgewater Resources provided a limited view of the shape and morphology of the river. Significant areas near the edges of the river were not surveyed. The focus was on areas that would be dredged rather than providing a complete dataset for the bathymetry of the entire river. The Edgewater Resources study thereby misses portions of the channel that may be impacted by the dredging or have converted to upland due to sediment deposition and training wall structures installed in the late 1800's.
2. The dredging and sampling plan do not take into consideration the presence of late 1800's training walls depicted on the 1906 mapping (Figure 2). These walls are clearly controlling modern river velocities, bedforms, sedimentation, and erosion, and should be explicitly considered by any sampling or dredging plan. These walls are typically well preserved in the bed and banks of the river and may qualify as historic structures subject to State Historic Office preservation laws.
3. The current sediment sampling plan is focused on the dredging plan and locations where material will be removed rather than the geomorphic settings in the river that are likely to contain legacy sediments of different ages. These legacy sediments may be eroded into the active channel if dredging occurs. These legacy sediments need to be fully sampled to evaluate potential for storage and release of contaminated sediments that could occur if dredging were to take place, and portions of training walls were removed as outlined in the Edgewater Resources study. For example, in Figure 1 below, there is an island on the southern portion of the channel, which did not exist in the 1906 map. This island was formed from sediment deposition following the construction of the wall identified in the 1906 map, and therefore is composed of legacy sediment that could contain contaminants. The current proposed sediment sampling plan does not include sampling these islands and any contaminated sediment they may contain. Furthermore, the proposed dredging swath has the potential to erode the island. This is just one example of multiple islands in the Lower Grand River that have formed since 1906 as a result of the training walls. In addition to islands, many shallow off-channel sand bars were formed by training walls. These sand bars are likely to contain legacy sediments that could be eroded if dredging occurs.

4. The proposed “soil boring” sampling methods proposed appear to be more suitable for sampling an upland site rather than within an active waterway. Proposed methods will not fully sample fine materials that are a likely site for adsorption of contaminants of concern. In order to fully evaluate contaminants all size fractions and the water stored within the sediments should be sampled in a way that preserves the position of different sediment layers. It may be possible to obtain samples with a freeze-coring technique. Freeze-coring involves driving a hollow probe into the bed of the river and passing chilled gas or fluid through the hollow probe to create a frozen sample of the river bed. This sample is then pulled intact out of the bed and used to obtain complete samples of sediment layers and the water entrained in the sediment.

We have the following recommendations which we submit for your consideration:

1. Prior to sediment sampling a full geomorphologic evaluation of sedimentation and erosion using the modern bathymetry and 1906 mapping should be completed.
2. Geomorphic evaluation and sediment transport dynamics should be used to determine areas that store sediment of different ages so that legacy sediments can be sampled for contaminants as well as sediments within the proposed dredging areas.
3. A more detailed and appropriate sediment and water sampling methodology is needed that will capture sediment with a range of sizes and ages within the Grand River system.
4. Samples should be collected using a method that will ensure all size fractions and associated stored water will be sampled.
5. Sediment sampling locations should be chosen based on geomorphic data rather than proposed dredging locations.
6. A significantly larger number of samples are needed to adequately evaluate the stretch of river that could be impacted.

We are requesting that the proposed sediment sampling project be delayed until a thorough review of sampling methods, data, and study goals can be completed that will ensure that state funding will provide as much data as possible about sediment contaminants and characteristics. We would be happy to provide technical input and data to support this review. Please let us know if you have any questions or if we can provide any additional information to inform the proposed Grand River Sediment Sampling project.

Sincerely,



Dr. Peter J. Wampler
Professor of Geology
Faculty in Residence Frederik Meijer Honors
College
Grand Valley State University



Dr. Kory Konsoer
Assistant Professor
Department of Geography &
Anthropology
LSU Coastal Studies Institute
Louisiana State University

Cc: Bruce Watkins
Paul Petersen
Bonnie Broadwater

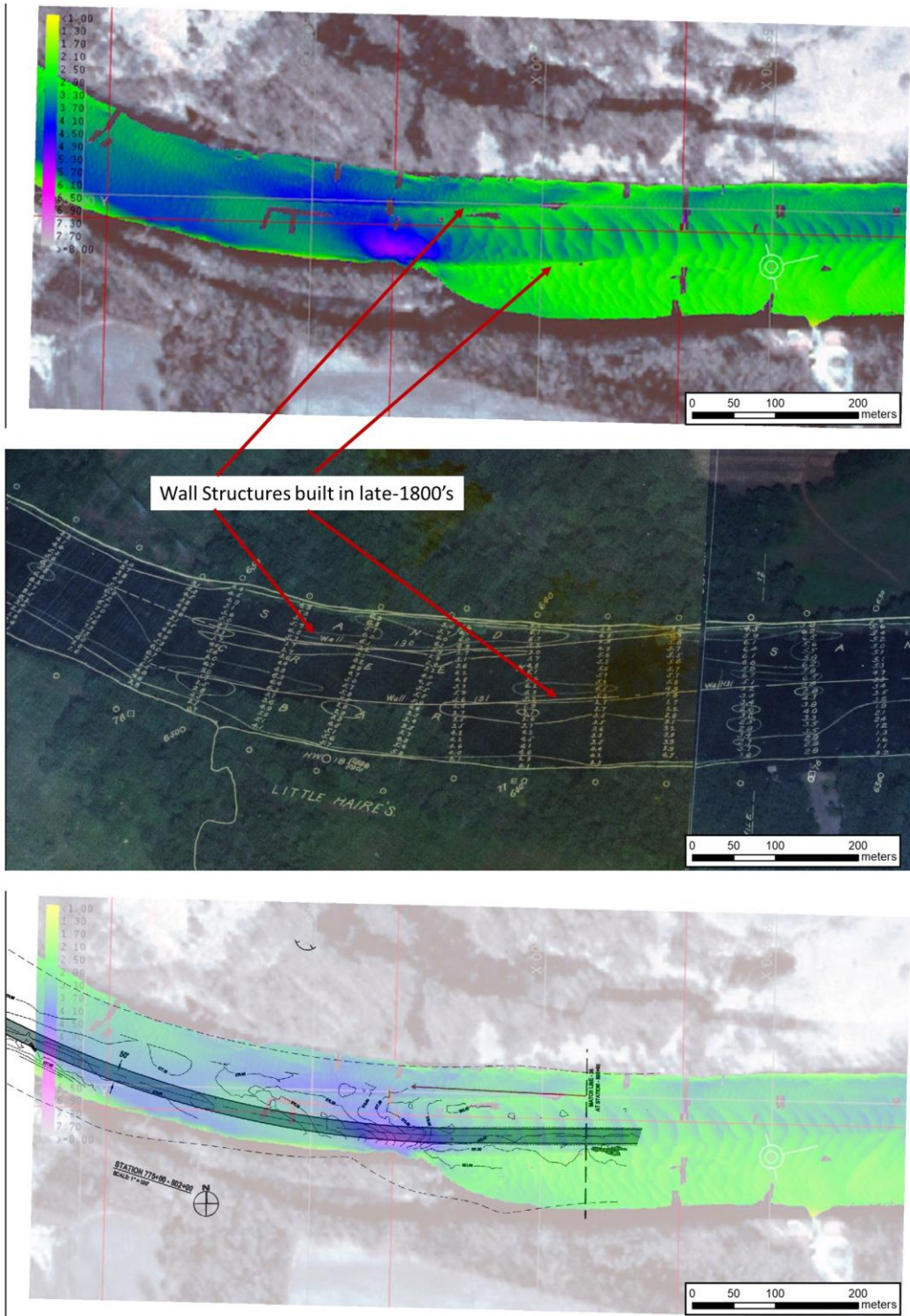


Figure 1: Top) Bathymetric map (0.5 meter horizontal resolution) for Grand River Park produced from a June 2019 multibeam echo sounding survey (MBES). Middle) 1906 survey map shown on current aerial photo. Bottom) Panel 13 from proposed sediment dredging plan shown on 2019 MBES survey. Note the clearly visible wall structures in the MBES survey and 1906 maps.



Historical Collections of the Great Lakes
Bowling Green State University

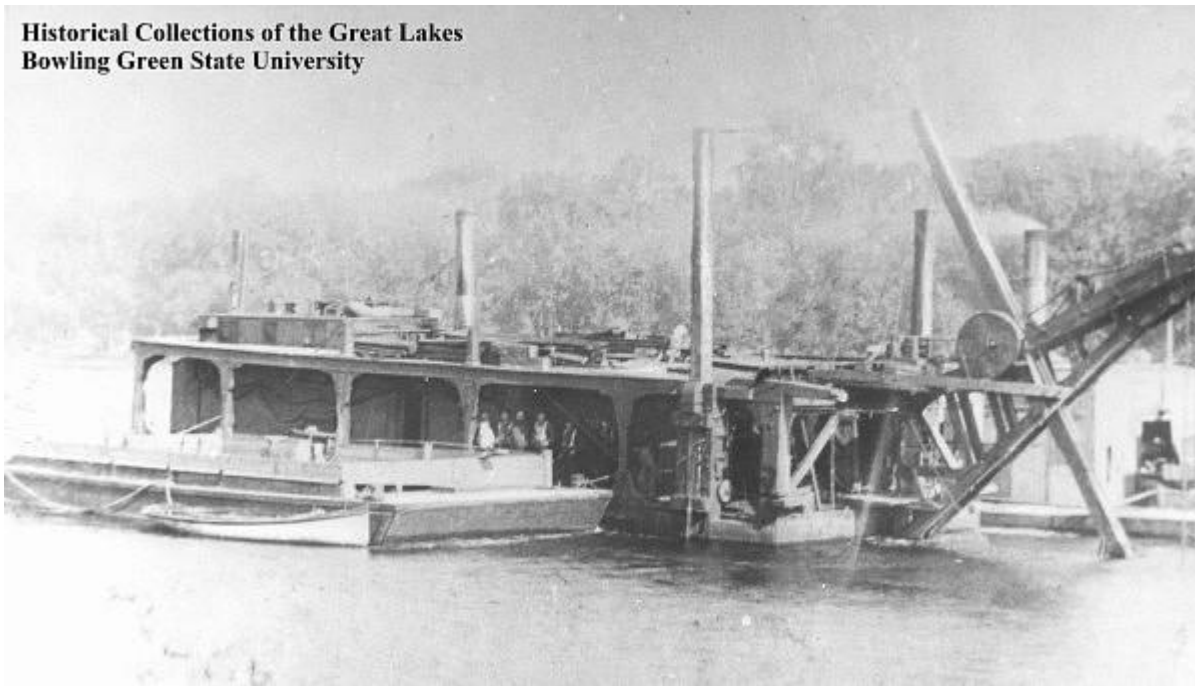


Figure 2. Top) Historic photos of installation of wooden pilings used to train the Grand River in the late 1800's. Bottom) Dredging vessel Colonel Farquhar circa 1905 used on the Grand River in the late 1800's.