

3D RECORDING OF A 19-CENTURY OB RIVER SHIP

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ABSTRACT:

A 3D recording of a 19-century wooden ship discovered on the bank of the river Ob (Western Siberia) was performed in autumn 2015. The archaeologized ship was partly under water, partly lying ashore, buried under fluvial deposits. The 3D recording was performed in October, when the water level was at its lowest after clearing the area around the ship. A 3D recording at the place of discovery was required as part of the ship museumification and reconstruction project. The works performed were primarily aimed at preserving as much information about the object as possible.

Given the location and peculiar features of the object, a combination of close-range photogrammetry and aerial photography was considered to be the best possible solution for creating a high-quality 3D model.

The dismantled ship was delivered to Nizhnevartovsk Museum of Local History in October 2015. The ship is going to be reassembled using the created 3D model to be exhibited in the museum. The resulting models are also going to be used to make a virtual 3D reconstruction of the ship in the future. We shot a stereoscopic video for Nizhnevartovsk Museum of Local History to let visitors see the place of discovery and explore the ship in greater details. Besides, 3D printing allowed for creating a miniature of the ship, which is also going to be included in the exposition devoted to this unique discovery.

1. INTRODUCTION

The Ob is a major river in Western Siberia, 3,650 km long. The river has its origins in the Altay Mountains and flows into the Kara Sea (Arctic Ocean). As a transport artery, the Ob played a great part in the Russian colonization of Siberia. It was only in 1844 that the first steamboat appeared on the Ob. Before that, towing, kedge anchors and sailing had been used. Unfortunately, the history of Ob shipbuilding during the exploration of Siberia has never been an object of any serious research so far.

A relatively well-preserved wooden ship dating back to the early 19th century was discovered on the bank of the Ob anabranch Kiryas in 1997 (Fig. 1). Fluvial sediments had filled the ship, conserving it.

This unique discovery is the only large Siberian wooden ship from the early 19th century that has been preserved until now. Regular inspections that followed the discovery showed gradual deterioration of the ship. Five frames had come off and got lost during spring ice drifts over the last five years alone. The ship urgently needed to be saved from further destruction.

It was impossible to transform the ship into a museum right where it was discovered, because it was a hard-to-reach area with no population centers around, or access roads, or any infrastructure required for tourism development. It was decided to clear the sediments, dismantle the ship and transport its parts to Nizhnevartovsk, where it would be assembled for exhibition in the local museum. A 3D model of the ship and its surroundings was elaborated in September 2015 to document the full context of discovery. The ship model produced at the place of discovery will be used for reassembly and restoration in the museum. Virtual reconstruction of this historic ship is also going to be provided on the basis of the created 3D model.



Figure 1. Location map of Kiryas ship

2. OBJECT OF RESEARCH AND TERRAIN CONDITIONS

Given the location and peculiar features of the object, a combination of close-range photogrammetry and aerial photography was considered to be the best possible solution for creating a high-quality 3D model.

The flat-bottomed ship measures 34x7 m (Fig. 2). The maximum height of the hull preserved is 1.7 m. The planks of the bottom and the side slopes are connected with 39 preserved frames made of stump wood. The front part and the left hull of the ship have been affected the least. The ship was found partly on land, filled with sediments, and partly underwater. When the river level went down in autumn, the ship would get the most exposed.

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