Introduction
The Harvard Peabody Museum, Cambridge, Massachusetts, and the Aleutian Museum and Archaeological Repository, Kodiak, Alaska, recently collaborated to study and conserve several nineteenth-century full-sized skin-covered kayaks and one hundred associated Alaska Native ethnographic objects. This two-year project was partially funded through a grant from the Save America’s Treasures Program and included a public–interactive conservation workspace located in one of the museum’s galleries. The project allowed the rare opportunity to study objects from the Alaska Native collections in the Peabody Museum and to consult with Aleut colleagues to build knowledge of Alaska Native technologies. Material analysis using X-ray fluorescence (XRF), matrix-assisted laser desorption ionization time-of-flight mass spectrometry (MALDI-ToF-MS) and polarized light microscopy enabled better understanding of the technology of these objects. As part of this project, the museum’s collection of twenty small skin-covered kayak models from various Alaska Native groups was studied and conserved.

History & Description
In the Peabody Museum collection there are twenty skin-covered models and several small bags of associated kayak model accessories. The shape of the kayak’s bow and stern and method of stitching is unique to each cultural area and there are distinct bow styles represented in the collection.

Several Aleut and Unangan kayaks have been praised for their speed, sophisticated construction, and design. The bow shape of the Aleut style is thought to represent a sea otter lying on its back with its legs raised and the Aleut style bow represents a whale’s mouth. The Norton Sound kayaks are distinguished by the notches in the stern and bow and a wide cockpit. In the model collection, there are skirted Aleut kayaks (see Figure 1), three double hatchet kayaks (payaqshuk), ulusfakede) and nine triple hatched kayaks (paitake, ulusfak).

Many of the models in the Peabody collection were donated from other collections. Donors included the Arctic Institute of North America, the Boston Marine Society, the Peabody Museum and the Peabody Academy of Science, as well as private collectors such as Joseph Sturgis (1837-1865).

During their travels in Alaska, many sea captains acquired model kayaks and other souvenirs which they brought home with them. With the Peabody Museum’s founding in 1866, many of these mariner and historical societies gifted their object collections in the late 19th century.

Historical inscriptions on several models help to tell part of the story of their collection history. An inscription in iron gall ink on the side of model #1702 is shown in the image on the right in UV radiation. It reads “Presented by His Excellency Prince Makrotoff, Sitka April 25th, 1866.” This refers to the Russian Governor of Alaska, Prince Dmitri Petrovich Makarov (also spelled Makrotoff).

Material Identification
According to Aleut consultants, the frames of Aleut kayak models are usually constructed from red cedar and paddled and tied together without the use of nails. Sea lion thorn and seal skin were often used for covering materials. The skin was smeared with snow and often decorated with wool fibers. X-ray fluorescence analysis confirmed the red and orange paint tested on several models contained mercury which suggests the use of cinnabar. Examination under magnification revealed the use of vegetable fibers, snow, wood and gut skin on some of the models.

A peptide mass fingerprinting (PMF) method applied to collagen-based materials was used to identify skin, intestine, and sinew on the kayak models. This method described by Kirby uses enzymatic digestion to cleave proteins at specific amino acid sites forming a peptide mixture. Each peptide has a unique fingerprint and analysis by MALDI-ToF-MS results in a spectrum that can be compared to a database of known samples. One of the benefits of using this method for museum object identification is that only a microsample is needed for analysis.

Of the Aleut and Unangan kayak models sampled for PMF analysis, the source of skin most often found on kayak models (ten of eleven sampled) was sea lion and/or seal. Although no firm conclusions can be drawn from this limited sample set, it is likely that kayak models were made from scraps left over from the manufacture of larger kayaks, clothing, or other items. The source of the sinew used in stitching was found to be derived from several different animals, including white whale, sea otter, and sea lion. Whale was identified in ten of the thirteen models sampled and, in this sample set, appears to be the most frequent choice for stitching of models across all of the cultural groups.

Use & Philaupe
Model kayaks were often made as teaching tools for young people. The large amounts of precious materials were not consumed in the process. Later kayak models were sold as souvenirs to collectors and tourists. According to the Executive Director of the Aleutian Museum, Sven Haakanson, the models created for teaching are more like the full sized kayaks and the ones sold as souvenirs are not seen with the same attention to detail. Early kayak models may also have been used for ceremonial purposes to invoke good luck on a hunter’s next hunt and to engage the young.

Among the Aleuts it is said that such models were kept in hunters’ homes to inspire their safe return home” (Haakanson 1994, p. 31).

Conservation
Conservation treatment on the models ranged from surface cleaning to humidification and reshaping to fill in cracks and tears. Some of the models had missing parts or were stored with accessories that did not belong. After archival research and consulting with curators and traditional artists some of the parts could be identified and paired with the correct model. All of the models were heavily covered with soot. Some had extensive skin tears resulting in distortion and misalignment. All twenty models were documented, treated, and rehoused in archival boxes. One model #67-9-10/66 required a more complex treatment as shown below.

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