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Article: Understanding Temperature and Moisture Equilibration: A Path Towards Sustainable Strategies for Museum, Library and Archives Collections (Abstract)

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Understanding Temperature and Moisture Equilibration: A Path Towards Sustainable Strategies for Museum, Library and Archives Collections

Jean-Louis Bigourdan

Presented at the PMG session of the 2016 AIC Annual Meeting in Montreal, Canada.

From 2010 to 2016, the Image Permanence Institute (IPI), a department of the College of Art and Design at Rochester Institute of Technology in Rochester, NY received funding from the U. S. National Endowment for Humanities for two consecutive three-year research projects, to investigate new methodologies for sustainable management of collections environments. Collections of enduring research value and cultural significance reside mainly in libraries, archives and museums that are under pressure to reduce their use of energy. While it is widely recognized that providing a proper environment is the most important element for preservation, HVAC operations are under scrutiny. In response, institutions are considering a variety of strategies to minimize energy use, such as moving from a static environmental management approach, where macro-environmental temperature and humidity settings remain stable and constant, to a dynamic approach involving methodical nightly, weekend, or seasonal settings adjustments. IPI's current research addresses the lack of systematic study of what happens to collection materials when short-term climate changes occur; it is also testing the efficiency of new environmental profiles that might combine potential energy savings with efficient humidity control. Looking to common material-enclosure configurations, such as books on shelves, prints and photographs in boxes, maps in flat-file cabinets, IPI's research explores several key questions: How do temperature and humidity changes propagate through objects and collections? How do seasonal changes affect collections? How can collection managers assess the risks or benefits of dynamic environmental changes that occur in a repetitive pattern over long periods of time? Which sustainable HVAC management approach has the greatest potential for the future? The thrust of this presentation is to report new findings regarding thermal and moisture transfer between materials and collection environments. These results will be based upon extensive laboratory testing and field experimentation. IPI's research will provide new and significant insights into the dynamic relationship existing between the changing conditions of the macro-environment, the micro-environment surrounding a collection object, and the object's core. Most notably, it will underscore the role of collections in controlling their own macro-environment. It is believed that the gained knowledge will enable and support profound changes in the way HVAC operations are managed.

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