INTERNATIONAL INSTITUTE FOR CONSERVATION OF HISTORIC AND ARTISTIC WORKS (IIC)

Going Digital

IIC is moving towards more accessible, digital publications. *News in Conservation* is now published in a digital-only format (as of the August 25, 2011 issue.) Members will receive an email reminder whenever the new-format, screen-friendly version is posted on the IIC website and will also receive information by email when transcripts of "Dialogues for the New Century," student posters, and other web-based publications become available.

The IIC Advocate Award—First Award Made

This award is given in recognition of those who use their influence, resources and talents to support the efforts of heritage preservation. We congratulate the first recipient of the IIC Advocate Award, Anna Somers Cocks. This award recognizes her work to promote conservation through the growing presence of conservation news and reporting in the *Art Newspaper*, her tireless efforts as chairperson of the Venice in Peril Foundation, and her ongoing scholarship and public support of heritage conservation world-wide. More details about this award can be found on our website (http://www.iiconservation.org/about/adv_award.php).

THE UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION (UNESCO) WORLD HERITAGE PROGRAMME

The United Nations Institute for Training and Research (UNITAR)

The United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Programme aims to preserve exceptional areas of outstanding cultural or natural significance to the common heritage of humanity. World Heritage Sites, while inscribed on an international list, remain the responsibility of the States Party in which it is located. Maintenance of the list is administered by the UNESCO World Heritage committee, which is comprised of 21 States Parties, appointed for four-year terms.

The United Nations Institute for Training and Research (UNITAR) Series on the Conservation and Management of World Heritage Sites was instituted in 2003 and has since completed nine annual cycles. Uniquely well-placed in the eternally resonant city of Hiroshima which possesses two World Heritage Sites, the series seeks to utilize UNESCO's Convention concerning the protection of the world's cultural and natural heritage more effectively by focusing on national policy making and planning, and on exchanging know-how on best practices and case studies.

The 2011 Session was held on July 4-8, 2011 and was attended by 26 participants representing 19 countries.

The series offers a set of innovative approaches to heritage conservation, including:

- A values-based management approach examining the significance of the properties to be conserved;
- The fusion of cultural and natural heritage management
- The recognition of both the tangible and intangible aspects of heritage values.

The theoretical focus of the 2011 session was UNESCO's new *Preparing World Heritage Nominations* manual and the utilization of such in regards to management, decision-making, and policy formulation. The practical focus of the session examined comparative analysis as a key element in the nominations process. Through discussion with practitioners and experts, comparative analysis has been highlighted as a major challenge in the preparation of many nominations, and one in which UNITAR's unique training methodologies and approach to world heritage management would be particularly beneficial.

Following in-depth explanations and case studies examining the current state of the world heritage regime, UNESCO's Operational Guidelines, the themes behind values-based management, and the *Preparing World Heritage Nominations* manual and comparative analysis, participants were split into groups and, utilizing a real-world example of a potential world heritage site, they worked on developing a nominations dossier. The interaction between representatives of different cultures, of academia, government, and sites themselves is highlighted as one of the most beneficial elements of the intensive week in Hiroshima.

The theoretical and practical sessions were augmented by study visits, and participants were granted exclusive access into Hiroshima's Atomic-bomb *(genbaku)* Dome to examine and discuss the policy planning, as well as the conservation and management of this most iconic structure. Participants were also welcomed to the Itsukushima Shinto Shrine by a senior priest, who outlined the history and management of the site before the group was granted access to observe the traditional techniques being employed in the maintenance of the shrine itself.

UNITAR intends to hold the 2012 Session in April next year and will be launching a Call for Applications in late 2011. Any questions regarding the modalities of the course may be directed towards Mr. Berin McKenzie, Specialist at UNITAR.

—Mr. Berin McKenzie, Specialist at UNITAR
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Health & Safety

NIOSH Sets Exposure Limits for Nano-Titanium Dioxide

The National Institute for Occupational Safety and Health (NIOSH) set two recommended exposure limits for titanium dioxide (TiO_2) on April 18, 2011, one for fine and one for ultrafine materials. The two new limits are:

- **Fine particles**— 2.4 milligrams per cubic meter (mg/m^3) and
- **Ultrafine or nanoparticles**— 0.3 milligrams per cubic meter (mg/m^3)

"Fine" is defined by NIOSH as those particles collected by a respirable particle sampler which has a 50% collection efficiency for particles of 4 microns with some collection of particles up to 10 microns in diameter. These particles are most likely to deposit deep in the lung's alveoli.

"Ultrafine" is defined as the fraction of respirable particles with particle diameters under 0.1 microns (100 nanometers) also called nanoparticles. The NIOSH recommended exposure limit for ultrafine particles is the first such limit set for nanoparticles.

The new limits were set forth in NIOSH Current Intelligence Bulletin 63, "*Occupational Exposure to Titanium Dioxide*," which also reviewed carcinogenicity data, exposure monitoring techniques, and control strategies. NIOSH found insufficient human data to suggest fine titanium dioxide causes cancer, pointing to a lack of workplace studies. However, animal studies of ultrafine TiO_2 particles showed an increased incidence in tumors that NIOSH concluded constituted sufficient evidence.

Table 1: IARC Information on Titanium-Containing Paint Product MSDSs

Type of Paint	Maker	IARC 2B listed?	Date of MSDS
Acrylic	Golden Artist Color	YES	2/10/2010
Radiant Oils (white)	Gamblin	NO	2/24/2007
Oils	Grumbacher	NO	6/23/2008
Oils (general MSDS)*	Williamsburg	NO	5/2/2011
Artist Oil	Winsor & Newton	NO	2/12/2008

*General MSDS says all colors have no hazards except cadmium, cobalt, lead & nickel

"The potency of ultrafine TiO_2, which has a much higher surface area per unit mass than fine TiO_2, was many times greater than fine TiO_2, with malignant tumors observed at the lowest dose level of ultrafine TiO_2 tested (10 mg/m^3)."

The ultrafine TiO_2 particles often clump together, prompting some toxicologists to assume that they behave like larger particles. However, NIOSH states that these agglomerated ultrafine particles still should be treated as ultrafine because they behave biologically like ultrafine particles, indicating that the amount of surface area is a major factor in the toxicity of TiO_2.

NIOSH added that its findings suggest other poorly soluble, low-toxicity particles, such as coal dust and barium sulfate, among others, could pose hazards similar to those of TiO_2.

Comment: *NIOSH listed TiO_2 as a carcinogen for decades before the International Agency for Research on Cancer (IARC) rated it in February 2006. The IARC rating is "2B," that is, possibly carcinogenic to humans based on sufficient animal data.*

Once IARC lists a substance, Occupational Safety and Health Administration (OSHA) requires the rating be included in the information on material safety data sheets (MSDS) of products containing TiO_2. OSHA gives manufacturers three months to revise their MSDS to incorporate any significant new data. The *Labeling of Hazardous Art Materials Act*, which addresses chronic hazards through the *ASTM D 4236 Standard*, requires chronic hazard information, (such as cancer status), to be transmitted on labels.

Art material manufacturers now have had five years to update their MSDS and labels. Unfortunately, many art manufacturers have not updated their MSDS to include IARC ratings for TiO_2.

A quick look at the MSDS on the products in Table 1, page 15, is revealing.

It is clear that the *ASTM D 4236 Standard* and the *Art Materials Labeling Act* are failing to give artists even the basic information that OSHA requires they have. As per previous articles in *ACTS FACTS*, the time has come to repeal the labeling act and, instead, let art materials be covered under the *Federal Hazardous Substances Act* and have their MSDS regulated under OSHA rules.

Note: *This information was derived from BNA-OSHR, 41(17), 4-28-11, pp 375-6, & NIOSH Current Intelligence Bulletin 63, Occupational Exposure to Titanium Dioxide.*

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New Materials & Research

Metrics for Museum Transport: Calculating the Carbon Footprint of Museum Loans

Recent discussions about sustainable practices in museums have focused on loans of collections and associated greenhouse gas production. In striving to meet their educational mission, museums are concerned with economic and environmental impact of transporting collections around the globe. Now, an important tool is available to help institutions measure the carbon footprint of outgoing loans.

Several months ago, Simon Lambert received the ICROM Student Conservator of the Year award for his development of methodology that estimates the environmental impact of museum loans. His work is published in *Museum Management and Curatorship* (Vol. 26, No. 3, August 2011, 1–27) and can be found on-line at www.icrom.org or http://tinyurl.com/3etnvu4.

Lambert offers a precise explanation of how carbon footprinting can be used as a new assessment tool by museums. He describes the Greenhouse Gas Protocol Corporate Standard (GPCS) and carefully explains how museums can define their emissions sources, such as including emissions produced by supporting third parties. This sets a precedent for reporting and assessment of other activities, and allows for comparisons in representing the true cost of sending collections on the road. The complex nature of weighing decisions based on one aspect (total greenhouse gas impact) is codified. Considerations of risk, cost, and educational value for each loan can be weighed for this factor.

Carbon footprint calculation methodology is broken down into eight steps:

1. Define the objective
2. Express who manages greenhouse gas emissions (GHG)
3. Map operations
4. Define exclusions and assumptions
5. Select GHG conversion factors
6. Calculate the footprint
7. Evaluate environmental performance
8. Report findings

Following and understanding each step takes the decision-making process out of the realm of discussion and weighing options, and moves it into the performance-based world of progress reporting. The process requires time and focused energy, and Lambert's use of outgoing loans of the Amgueddfa Cymru (National Museum Wales) as an example allows readers to see how the metric can be successfully applied to a single institution.

Understanding how each step impacts the resultant environmental "bottom line," particularly when comparing year-to-year, loan-to-loan, and institution-to-institution is important in clarifying the overall situation. For example, Step 2 illustrates how lenders (outgoing loans) control the loan process—via ownership, policies, procedures, and conditions, and therefore manage the carbon emissions generated by the loan. Step 4, defines exclusions and assumptions, classifying the components that are measurable, including time, wrapping materials, packing cases, transport, and couriers. Establishing quantities in a consistent fashion allows for comparisons when they are overlaid with various operations that are described in Step 3 according to loan destinations, such as the UK, Continental Europe, and International Overseas.

Results of the pilot study carried out at the Amgueddfa Cymru are telling. Not surprisingly, transport accounts for over 95% of GHG production, nearly half of that for couriers. Four objects were loaned for every ton of carbon produced. Note that the metric calculation accounts for the fact that this museum has reused packing cases for 20 years, so plywood and construction materials were not considered. Lambert also offers comparisons; in the year examined (2006), the overall carbon footprint of outward loans (53 tons) is equivalent to 20 trans-Atlantic business-class flights, the personal annual footprint of six UK residents, or one hour of operations of the UK postal service.

The article concludes with excellent suggestions about how to reduce carbon emissions generated by lending operations, such as reusing packing materials, and leasing cases or crates. Asking our shipping companies to offer reusable crates is a new concept in the US, and until they are widely available, museums must struggle to store and reuse crates whenever possible. Another obvious reduction in carbon emissions can be realized using strategies to minimize fuel use by filling trucks (encouraging shuttle-type transport) and combining multiple couriers from various institutions into single loan courier trips (encouraging several institutions to trust a single one for oversight during transport). Reducing transport and travel, particularly by air, is key to reducing carbon emissions.

Museums should measure their success based on three important aspects: social value, economics, and environmental impact. A careful read of Lambert's paper offers specific information regarding the cost of loans, but more importantly it shows us how complex environmental impact evaluations can be. He offers an excellent model for how institutions can incorporate environmental stewardship into their decision-making processes.

—Patricia Silence, Colonial Williamsburg Foundation
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