

## Natural History Collections: Overview

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A session of contributed papers often appears to have no coherent theme or structure. Viewed as a whole, however, the papers presented to the Natural History Collections session do provide a wide-ranging and connected perspective on the topic.

The presentation by Gilbert and O'Connell opened a window on the challenges one faces in trying to find existing collections in a sea of museums, developing optimal strategies for searching and obtaining data from those collections, keeping abreast of locality and taxonomic name changes that inject sources of confusion through more than a century of collecting, and then using the resulting information for making judgments about biological diversity. An operational challenge Gilbert and O'Connell reported was coping with specimen fragility, presence of poisonous preservatives (arsenic), and the large investment of time needed while trying to use the more-accurate specimen labels as a key source of information rather than relying on the less-accurate catalogue records. These authors concluded by reporting that mathematical techniques they applied to analysis of voucher specimen data indicate that species inventory results have potential for objective evaluation of temporal change in species diversity.

The presentation by Bayless explored problems associated with not finding collections in a sea of ownerships. The author pointed out that, during the past 20 years, the National Park Service (NPS) has more strictly managed research specimens collected in parks, affecting both researchers and repositories with which researchers work. The crux of the problem appears to revolve around ownership of the specimens and the on-going debate appears to be impeding park goals to support science and consistently implement NPS guidance across the National Park System. Bayless suggested that solving the question of ownership, finding the means to support curation and storage of specimens, and improving partnership arrangements will benefit maxi-

mizing the contribution of specimens to all partners by maintaining specimens in high quality and in places where all users can access them.

Bischoff reported on recent partnership steps being taken for organizing efforts to cope with older collections that have been treated with arsenic, mercury, or other hazardous pesticides. She identified performers of a variety of actions, including research to develop testing methods for contaminants; research on use of microorganisms for decontamination of objects; creation of Material Safety Data Sheets for contaminated ethnographic/botanical objects; development of testing methods for organic pesticide residues on museum artifacts; research to develop tests for mercury; development of testing protocols for x-ray fluorescence analysis; data mining of museum records to identify pesticides used on collections; and study of museum worker exposure levels to pesticides. From this review, one can conclude that, for future collections, managers should use preservation tools that do not contaminate the collections; for contaminated collections from the past, managers should take steps to minimize the effects of the contaminants on people and on uncontaminated specimens.

The Palmer and Sappington presentation addressed a broader topic of why metadata and quality assurance efforts are important parts of natural resource data collections. These authors stressed four key concepts: data must be long-lived; data must be easily locatable and accessible; data must be of a quality and form that are usable, credible, and promoting of knowledge; and the data management system must maintain accountability. In addressing these concepts, they showed the importance of including quality assurance

steps to control the data acquisition process and to determine the uncertainty in the data and whether or not the data are appropriate to support management decisions. Although their focus was broadly on data, their message can be adapted by collections managers to improve the attention paid to proper collection of specimens and data about the specimens, to improve the care given to preserving the collections together with their associated data, and to developing usable metadata about the collections.

Irrespective of where collections are stored or who owns them, a presentation titled “The Role of Plant and Animal Voucher Specimens in Natural Resource I&M Programs” by Roy Woodward (not available for inclusion in these proceedings) stressed the importance of having physical collections and being able to retrieve them in the future for the purpose of confirming or reassessing findings from the past. Woodward observed that voucher collections increase the reliability of inventory and monitoring work conducted by many people over many years because these specimens represent the actual plants and animals that were observed in the past. In addition, the voucher specimens can provide the future raw material needed for estimation of past characteristics of organism gender and

health, and for chemical and genetic analyses that can reveal conditions from the past. The author observed that the keys to making voucher specimens useful in the future include collecting the correct parts of organisms now, collecting sufficient numbers of organisms to provide an adequate sample size, and storing the specimens properly to ensure long-term preservation and safety. Woodward also suggested that the process of making voucher collections needs to consider animal rights, visitor perceptions, impacts caused by the collecting, relationships to on-going studies, and adherence to standards and protocols. He also suggested that the collecting of vouchers needs to be guided through training, workshops, and other forms of sharing information.

These contributions to the Natural History Collections session revealed circumstances that users of collections and data about collections, such as park inventory and monitoring personnel, experience in trying to bring together information from many sources and collected over many years. These contributions also brought into focus the kinds of concerns that park collections managers will have to deal with no matter how they organize the location and management of their collections.

