



# Entomological Collections Network

Annual Meeting  
Portland, Oregon  
November 15<sup>th</sup> - 16<sup>th</sup>, 2014

USA: OR: Multnomah County  
Portland, DoubleTree by Hilton  
45°31'49.52"N 122°39'18.81"W  
42m, 15-16.xi.2014,  
ECN 2014 Members

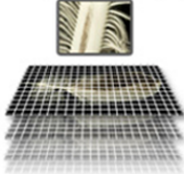
*Papilio machaon oregonia*  
W.H. Edwards, 1876  
DET: ECN Organizers



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# Entomological Collections Network

## Annual Meeting

Saturday, November 15 & Sunday, November 16, 2014

DoubleTree by Hilton, Holladay Room  
Portland, Oregon

### Saturday, November 15, 2014

7:30      **Registration and Coffee**

8:30      **Welcome and Announcements**

(Pamela Horsley, Floyd Shockley, Christy Bills, Katrina Menard)

### SESSION 1

## **Innovative Collecting Methods**

Organizer: Gavin Svenson

8:40 am      **The low watt revolution: LED replacement  
for HID light trapping?**

### **Gavin Svenson and Hans Clebsch**

*Department of Invertebrate Zoology, Cleveland Museum of Natural  
History, 1 Wade Oval Drive, Cleveland, OH 44106*

The greatest limitations for high intensity discharge (HID) light trapping are the power requirements and the weight of heavy magnetic or electronic ballasts. In addition, the increasing restrictions on baggage imposed by airlines are making gear choices a greater concern. Three years ago I presented that the ultimate HID bulbs are tuned metal halides, this is still true, but these remain dependent on the same heavy equipment as previous HID systems. In addition, the three past years of field testing has proven electronic ballasts and the bulbs to be more temperamental to environmental conditions than expected. Over the past two years, Hans and I began experimenting with LED systems in order to build a lightweight, water resistant light source that was attractive to insects. After a number of prototypes, we believe we have a viable system that can be built cheaply with a limited skill set in electronics.

Three systems will be outlined including a low wattage DC system (48 Watts), a low wattage AC system (48 Watts), and a high wattage AC system we call the “death star” (120 Watts). The low wattage DC system can be run multiple nights in serial (4 tested) off a single 12V car battery charge. In addition, systems utilize 12 LEDs that can be spectrally mixed to achieve the desired coverage (360nm-410nm). The systems can be used in conjunction with HID lights or alone. For praying mantis collecting, the only group I really care about, the LEDs performed equal to or better than the HID systems in Ethiopia and Rwanda. Results for micro-Hymenoptera are yet to be determined.

9:00 am      **Novel Collecting Techniques for Fireflies  
and other Bioluminescent Beetles**

**Marc A. Branham**

*Department of Entomology and Nematology, University of Florida,  
Gainesville, FL 32611*

Specific collecting techniques often yield taxa that are not usually collected by any other method. Several examples of taxa that are usually only collected by a single collection technique will be presented. Methods for modifying commonly used insect traps to increase the diversity of trap catch, as well as the design and successful use of several glowing decoys and light traps will be detailed and explained. The behavior of bioluminescent beetles will be summarized in reference to collecting techniques tailored towards specific beetle lineages that are often underrepresented in insect collections.

9:20 am      **Volatile attractants as a tool to collect  
cerambycids: ready for prime time**

**Annie Ray**

*Department of Biology, Xavier University, Cincinnati, OH 45207*

Volatile pheromones are a valuable tool for collecting longhorned beetles. Traps baited with “generic” sex or aggregation pheromones attract a large number of species of longhorned beetles, and this method shows promise as a sensitive and selective method for surveying and/or monitoring beetle populations. In addition, pheromones also attract predators and parasitoids of longhorned beetles, possibly because

pheromones may be used to locate potential hosts. Volatile pheromones of longhorned beetles are now commercially available, and traps baited with pheromones are an easy addition to the collecting “repertoire” of entomologists. Although some challenges still exist, it is clear that volatile attractants are finally ready for prime time.

9:40 am      **Using buprestid monitoring tools for obtaining diverse collections of forest insects**

**Michael Domingue<sup>1</sup>, Warren Hellman<sup>2</sup>, Joseph Francese<sup>3</sup>, Melissa Fierke<sup>4</sup> & Claire Rutledge<sup>5</sup>**

*<sup>1</sup>Department of Entomology, Penn State University, <sup>2</sup>Washington State Department of Agriculture, <sup>3</sup>USDA-APHIS Center for Plant Health Science and Technology, <sup>4</sup>Department of Environmental and Forest Biology, SUNY-ESF, <sup>5</sup>Connecticut Agricultural Experiment Station*

In the past decade there has been intense research toward developing and improving monitoring tools for the emerald ashborer (*Agrilus planipennis*), a severe invasive forest pest in North America. Nearly all of these tools have been non-specific, allowing the collection of other buprestid beetles, and often a variety of the insects fauna, wherever they have been deployed. Here we review the diversity of insects collected using three main classes of traps. The first includes large color-based traps such as sticky prism traps and multi-funnel traps. The second class consists of a decoy-based techniques whereby real or synthetic females are placed in traps to target buprestid males. Finally, the sampling of nests of buprestid-hunting *Cerceris* wasps can provide collections of species associated with many host trees within an area. In addition to the diversity of insects caught, we will also discuss the conditions of the insects caught using these methods and the ease of application for collecting purposes.

10:00 – 10:20 am      **Coffee Break**

*Check out our **SPONSORS** at the back of the meeting room and in the **Broadway** room next door!*

10:20 am

**Do all dung beetles prefer dung? Tips and tricks for successful dung beetle collecting**

**Nicole Gunter**

*Department of Invertebrate Zoology, Cleveland Museum of Natural History, 1 Wade Oval Drive, Cleveland, OH 44106*

True dung beetles (Scarabaeidae: Scarabaeinae) are one of the most popular and charismatic groups of beetles. They have particular public appeal due to their environmental and agricultural roles, and scientifically they are often used in ecological surveys and biodiversity assessments. Dung beetles are readily collected with flight intercept-, pitfall- and light- traps and as such are common by-catch within invertebrate collections. Targeted collection of dung beetles most commonly involves baited pitfalls traps. Bait selection and trap design is always an interesting topic of discussion between scientists and ultimately comes down to project design. I will discuss some of the most common trapping methods, baits and preservatives and share hints for successful dung beetle collecting. Because dung beetles are common in museum collections, they make ideal candidates for distributional studies. A recent project to revise a genus of Australian dung beetle, *Lepanus*, utilized novel methods to explore biodiversity statistics for conservation planning. Over 16,000 specimens representing 2,242 unique species/ locality records were databased from the major museum holdings within Australia and linked to a molecular phylogeny in the program BIODIVERSE. Biodiversity statistics such as richness, absolute endemism, phylogenetic diversity and phylogenetic endemism were calculated and the results identified the IBRA region “Central Queensland” as a particular conservation concern due to its high phylogenetic endemism and minimal reserve areas. This project captures how digitisation projects can be incorporated into molecular systematics and conservation studies.

10:40 am

**“Micro-fogging” at the SEMC: the theory, practice, and results of 25 years with our heads in the clouds... of pyrethroids**

**Zachary H. Falin**

*Division of Entomology, Biodiversity Institute, University of Kansas, 1501 Crestline Drive, Suite 140, Lawrence, KS 66045*

“Micro-fogging”, the use of pyrethroid-based household aerosol sprays for the collection of arthropod specimens, has been used extensively by staff members of the Snow Entomological Collection (Division of Entomology, University of Kansas Biodiversity Institute) for over 25 years. I will provide a brief history and overview of the technique as well as illustrate some of its many uses, from the typical (fungus-logs) to the arcane (floating flood debris). Coincidentally, the SEMC has been data-basing nearly all newly collected specimens over the last 20 years, allowing for detailed analyses of the results of this technique. I will draw on nearly 700 micro-fogging events and 40,000 specimens to offer a generalized accounting of the taxonomic diversity recovered from various microhabitats using this technique (focusing on the Coleoptera), as well as highlight a few of the taxonomic windfalls it has produced for our collection.

11:00 am      **Beyond the dip net: collecting aquatic insects in diverse habitats**

**Andrew Short**

*Division of Entomology, Biodiversity Institute, Department of Ecology & Evolutionary Biology, University of Kansas, 1501 Crestline Drive, Suite 140, Lawrence, KS 66045*

While locating aquatic habitats is relatively straightforward, effectively sampling the insects living within them can be challenging. Aquatic insects live in a tremendous array of specialized niches, and most require special attention and/or methods to ensure they are sampled adequately and efficiently. Here I will review techniques for collecting in both basic and complex aquatic environments including marshes, rivers, waterfalls, seepages, and micropools. While the emphasis will be on methods that maximize the collecting of beetles and bugs, the methods are generally applicable to any aquatic group.

11:20 am      **Sampling Leaf Litter Arthropods**

**Robert Anderson**

*Research and Collections Division, Canadian Museum of Nature, Ottawa, ON, Canada*

The use of berlese and winkler funnels for sampling leaf litter arthropods is reviewed. Variation in habitat selection and extent of sampling determine diversity of catch. Patterns of distribution in common vs rare

taxa and endemic vs. widespread taxa are contrasted using examples from the recent LLAMA (Leaf Litter Arthropods of Mesoamerica project). An overview of some of the rarer taxa of arthropods collected using these methods is presented.

11:40 am – 1:00 pm      **LUNCH BREAK**

1:00 - 1:05 pm      **Welcome Back and Announcements**

## **SESSION 2**

### **Harvesting the fruits of our labor: utilizing collections databases to advance 21st century entomology**

Organizers: Crystal A. Maier, Jennifer C. Thomas, and Derek A. Woller

1:05 pm      **From Museum Specimen Database to Ecological Statement**

#### **Christine Johnson**

*Curatorial Associate, Division of Invertebrate Zoology, American Museum of Natural History*

The goal of the Thematic Collections Networks, Tri-trophic Digitization Project (TCN-TTD) is to database and image, in part, plant-associated Hemiptera (“true bugs”), parasitoid insects associated with Hemiptera, and the plants on which Hemiptera feed, totaling approximately 2.5 million specimens from 18 insect and 14 plant institutional collections. Integrating these data with other extant datasets, particularly from diverse sources (databases, institutions) with diverse historical workflows and standards such as these, provide a unique opportunity to generate and test various biogeographical and ecological hypotheses. Here I present our progress to date on the digitization efforts and demonstrate the usefulness and some of the inherent challenges of these data with a relatively small dataset of treehoppers and their associated oak species derived from our efforts. I also demonstrate some simple tools to examine database data for quality problems.



1:25 pm

## **The Current State of Arthropod Biodiversity Data: Addressing Impacts of Global Change**

**Neil S. Cobb<sup>1</sup>, Katja Seltsmann<sup>2</sup>, and Nico Franz<sup>3</sup>**

<sup>1</sup>Northern Arizona University, <sup>2</sup>American Museum of Natural History,

<sup>3</sup>Arizona State University

We examined >5.6 million records of arthropods collected in North America to assess the number of species for which we could reliably predict how global change might affect their future distribution and abundance. We further examined patterns over time and space as well as relative efforts of digitization for higher-level insect taxa and ecological groups. Several important patterns emerged from the available records. The current rate of digitization would need to increase 10-fold in order to digitize all the current specimens by the year 2050. Only 11% of species have enough occurrence data to potentially model responses to climate change. Less than one percent of these species have been the focus of ecological niche modeling. Occurrence records are clustered near institutions with a strong entomological interests. The Apoidea, Heteroptera, and Papilionoidea have been the focus of digitization to a much greater extent than other insect groups. In terms of ecological groups, pollinators and herbivores are much better represented than predators and parasitoids. These patterns provide interesting insights for developing a strategy to expand the research impact from the estimated 250 million specimens found in North American research collections

1:45 pm

## **Entomological data in Arctos: Uses inside and out of the museum**

**Derek S. Sikes and Sarah Meierotto**

*University of Alaska Museum Insect Collection, University of Alaska Fairbanks, Fairbanks, AK*

Since my hire at the University of Alaska Museum Insect Collection in 2006, digitization of specimen data has been a high priority. We have recently surpassed 200,000 georeferenced records in Arctos (a GBIF, iDigBio data provider); 29,241 of these specimens have been cited or otherwise used in 22 peer-reviewed publications. This presentation will highlight some of the ways this dataset has been used, both inside the museum and out. These include numerous ways such data help with specimen management, curation tasks, and reporting, to how they have enabled research.

2:05 pm      **The need for the R function: self-cleaning  
(data)**

**Marianna V. P. Simões**

*Division of Entomology, KU Natural History Museum, University of  
Kansas, Lawrence, KS*

Providing remote access to the specimen level information associated with the collections is of paramount importance. The trend in recent years of digitize biodiversity information (BI) on species-level, and the increasing willingness to share, has enabled unprecedented access to it. Therefore, the world of information available for addressing questions related to biodiversity, ecological landscapes and possibilities for the study of spatial patterns of biological diversity, for both basic and applied purposes, are changing dramatically. However, there are significant challenges and limitations intricately associated with the digitized BI that can introduce significant noise to analysis, such as outdated taxonomy, misidentification of species and faulty georeferencing. Therefore, it is important to bear in mind two important factors before using digitized BI: expertise in the group and the importance data cleaning.

2:25 pm      **Reconstructing the Past: Pre-European  
Settlement Distributions of Stoneflies  
(Plecoptera) in the Midwest, USA**

**R. Edward DeWalt<sup>1</sup>, Yong Cao<sup>1</sup>, Jason L. Robinson<sup>1</sup>,  
Tari Tweddale<sup>1</sup>, Scott A. Grubbs<sup>2</sup>, and Leon Hinz<sup>1</sup>.**

*<sup>1</sup>University of Illinois, Prairie Research Institute, Illinois Natural History Survey, 1816 S Oak St., Champaign, IL, 61820, dewalt@illinois.edu, yongcao@illinois.edu, <sup>2</sup>Western Kentucky University, Biological Sciences, Bowling Green, KY, 42101, scott.grubbs@wku.edu*

The pre-European settlement distribution of regional stonefly species was reconstructed using over 30,000 species-level stonefly (Plecoptera) records from new collections and 25 regional museum for much of the Midwest. We used Maxent software, presettlement vegetation, physical, variables, and current climate data at the USGS HUC12 watershed scale to accomplish our objective. Predicted species distributions closely followed observed richness and predicted assemblage richness was highest in areas known to be richest in

stoneflies. We will validate models using a subset of “best sampled” HUC12s picked for their close conformation to regional species pools based on observed HUC6 scale assemblages. These models provide a baseline against which climate related changes in species distributions and assemblage richness can be measured.

2:45 pm      **Mutually Beneficial Symbiosis of Data**

**Jennifer C. Thomas, Derek A. Woller, and Crystal A. Maier**

*Division of Entomology, KU Natural History Museum, University of Kansas, Lawrence, KS*

While the onus of museum stewardship traditionally falls on the collections managers, the care of the data and specimens is the duty of all those who rely on entomology collections. Researchers, collections staff, and large data repositories all have a responsibility to keep both specimens and data safe, clean, accessible, and well cared-for. Additionally, all have a responsibility to contribute to this symbiotic relationship and add value to the specimens and information contained within. Here, we provide perspectives on collections management, the research side of things, and data aggregation, and discuss the possibilities and suggestions for ways in which improvements can be made.

3:05 pm      **BIG4 - Biosystematics, Informatics and Genetics of the big 4 insect groups: a new collections-based PhD training consortium in systematic entomology**

**Alexey Solodovnikov**

*Natural History Museum of Denmark, Biosystematics Section, Universitetsparken 15, DK-2100 Copenhagen*

“BIG4” is a new 4 years program (2015-2018) funded by the European Union to train 15 PhD students in modern systematic entomology with the focus on the four biggest insect groups (Coleoptera, Hymenoptera, Diptera and Lepidoptera) . “BIG4” is formed by several leading labs from various European institutions and two private companies coordinated from the Natural History Museum of Denmark. Although each student will

be tied to a particular host institution from the “BIG4”, a cross-disciplinary training program amalgamating methods of genomics, phylogenetics, informatics, taxonomy, semantic biodiversity publishing and citizen science will be provided for her/him by the entire consortium. All students of the “BIG4” will have an opportunity to spend significant time outside their main host lab, to learn from other labs with different methodological strengths. Also, during their PhD program, all students will have a series of common workshops and summer schools covering various aspects of systematics and related biodiversity science disciplines. This talk will be a mini-introduction to the concept, people and suggested PhD projects of the “BIG4” training consortium, to spread the word and ignite potential applicants for the PhD positions that are soon to be announced

3:10 - 3:30 pm

**Coffee Break**

3:30 pm

**Toward an online digital teaching collection of aquatic macroinvertebrates using interactive, gigapixel technology (Ephemeroptera, Plecoptera, and Trichoptera)**

**John Wenzel<sup>1</sup>, Marti Louw<sup>2</sup>, John C. Morse<sup>3</sup>**

*<sup>1</sup>Center for Biodiversity and Ecosystems, Carnegie Museum of Natural History, Powdermill Nature Reserve, 1847 Route 381, Rector, PA 15677;*

*<sup>2</sup>Learning Research and Development Center, Center for Learning in Out-of-School Environments, 3939 OHara Street, University of Pittsburgh, Pittsburgh, PA 15260; <sup>3</sup>The Clemson University Arthropod Collection, School of Agricultural, Forest, & Environmental Sciences, Clemson University, Clemson, SC 29634-0310*

One great challenge in teaching insect identification is to provide appropriate morphological specimens for reference. Preserved material is degraded by use, and beginning students often cannot learn or interpret information by themselves without an instructor presenting the specimen in a certain view, with a particular aspect indicated. Web-based keys are often accompanied by images to assist with evaluating contrasting couplets when running through keys, but these do not replace having a correctly identified specimen under the microscope for general examination while learning. To address these issues, we are building a digital teaching collection based on gigapixel images. This technology effectively turns any computer screen into a

microscope, permits students to survey specimens, highlights structures of diagnostic significance at various taxonomic levels, and provides supporting material including video clips and interviews with experts. One of our primary goals is to establish a user-friendly, interactive platform that can be extended to other applications. We demonstrate a functional prototype based on a dozen specimens of Ephemeroptera, Plecoptera, and Trichoptera.

3:50 pm      **Mobilizing Dark Data: Raising the Profile of Small Collections through Activities of the Small Collections Network (SCNet)**

**Gil Nelson<sup>1</sup> and Christy Bills<sup>2</sup>**

*<sup>1</sup>iDigBio/Florida State University; <sup>2</sup>Invertebrates Collections Manager, Natural History Museum of Utah/ECN*

In an early press release announcing the first round of Advancing the Digitization of Biodiversity Collections (ADBC) awards (July 8, 2011), the National Science Foundation (NSF) several times referenced the importance of what it called “dark data”—data that are essentially inaccessible to most biologists, policy-makers, and the general public. As NSF-funded digitization initiatives for biodiversity collections continue to make significant progress, it is clear that the darkest of these dark data might well be held in small repositories, at least some of which reside outside of the mainstream collections community. The premise of the Small Collections Network is that these collections contain valuable data, share similar challenges, and that their data are at risk of being left out of biodiversity research. We will address the goals and activities of SCNet and what it hopes to accomplish, including some of the issues related to small collections accessibility and digitization.

4:10 pm      **Got data? Need data skills? Check out [datacarpentry.org](http://datacarpentry.org)**

**Deborah Paul**

*iDigBio, Florida State University, iDigInfo, Tallahassee, FL*

Researchers collect and use an ever-increasing amount of biological specimen data. Is this data well-documented? Is it discoverable and re-useable by others? How do you ensure that? Are you able to share

and manipulate large amounts of data for re-producible analysis together with your colleagues? Data Carpentry seeks to reach out to the broader science community to teach introductory data and computational literacy skills. As collaborative, interdisciplinary science becomes the norm and the datasets and data formats grow in size and complexity, #datacarpentry strives to provide skills crucial to effective scientific data collection, data use, and data re-use. Join me to find out more about our goals, our audience, our recent workshops, and opportunities to take a course, become an instructor, and influence our course content.

4:30 pm **The Fossil Insect Collaborative Year 2:  
data acquisition, publication, and use**

**<sup>1</sup>Talia S. Karim, Dena M. Smith<sup>1</sup>, Susan H. Butts<sup>2</sup>,  
Alton Dooley<sup>3</sup>, Michael S. Engel<sup>4</sup>, Brian D. Farrell<sup>5</sup>, David  
A. Grimaldi<sup>6</sup>, Sam W. Heads<sup>7</sup>, & Christopher A. Norris<sup>2</sup>**

*<sup>1</sup>University of Colorado Museum of Natural History; <sup>2</sup>Yale Peabody Museum; <sup>3</sup>Virginia Museum of Natural History; <sup>4</sup>Biodiversity Institute, University of Kansas; <sup>5</sup>Museum of Comparative Zoology; <sup>6</sup>American Museum of Natural History; <sup>7</sup>Illinois Natural History Survey*

Over the course of four years, the Fossil Insect Collaborative TCN project aims to digitize just under 500,000 specimens held in the collections of seven institutions in the United States. For most TCN members, year 1 was spent setting up or migrating databases, establishing institutional web-based collections searches, developing digitization workflows, purchasing equipment, and finally data acquisition. A total of 10,540 images and 94,323 digital database records were in existence at the end of year 1 and of those, 36,579 specimen records were also edited (e.g., determination updated). At least four of the seven TCN members have started publishing fossil insect records and images via their institutional websites and GBIF. The project data portal, iDigPaleo, which will aggregate and publish data from the TCN, is underdevelopment and a beta version should be online later this fall or early winter. Our TCN is also working on several outreach and education initiatives, including the AR flashcard project based out of ASU and supported by iDigBio.

*Wanna chat?* Please go to the **Weidler-Halsey** or **Broadway** rooms and catch up with everyone without disturbing the meeting!

4:50 pm

**From pro tem to visibility: my 30 years  
managing the NMNH Pyraloidea Collection  
(Lepidoptera)**

**M. Alma Solis**

*Research Entomologist, Systematic Entomology Laboratory, USDA,  
National Museum of Natural History (NMNH)*

In 1989 I was hired as a Research Entomologist with the Systematic Entomology Laboratory, USDA, at the National Museum of Natural History (NMNH). Concurrently I became Curator of the Pyraloidea, one of the largest collections of Lepidoptera with over 350,000 specimens. This provided a unique challenge to plan a long-term strategy that would have tangible results for use by others, as well as expand my knowledge about this group of insects. Almost every moth specimen provided a unique puzzle morphologically, nomenclaturally, and/or geographically because three-quarters of the collection was unsorted. The remaining part of the collection was based on a 19th century Hampsonian classification. Every day this collection has presented at least one new question to unlock.

5:10 pm

**ECN BUSINESS MEETING**

*Special Presentation:*

**The Entomological Society of America's Science Policy  
Initiative: Advocacy and Opportunities for Collections**

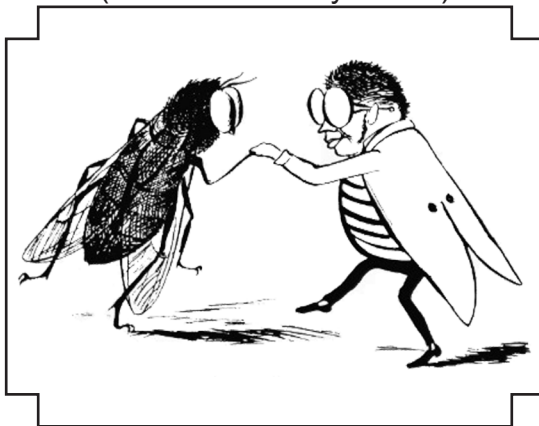
**Frank Zalom**

*2014 ESA President, Department of Entomology and Nematology,  
University of California, Davis, CA 95616*

The 2013 ESA Governing Board approved the establishment of a Science Policy Program that provides a mechanism by which our Society can identify and advocate for issues that can have a positive impact on our membership and discipline. During 2014, we began to establish a process for identifying Grand Challenges impacting the human condition for which entomologists can have a major impact. Challenges can be identified to the Science Policy Capability Committee, the membership of which is identified by each ESA Section, who would recommend for further consideration. A goal is to have our Society develop Science Policy Statements that are of general

interest to membership, vetted by our membership, and adopted by the Governing Board that can become the basis for advocacy to agencies, institutions, foundations and other organizations to support positions and activities that increase our influence, connections, globalization and social consciousness. The significance of entomological collections as fundamental to our discipline and indeed to the greater scientific enterprise is obvious to us, but this is not necessarily appreciated by decision-makers or the general public they represent. In my short tenure, ESA has been requested on several occasions to react to impending threats to governmental or institutional support for collections, and to respond to suggestions that imaging, for example, could be an adequate substitute for preservation of specimens. I suggest that a proactive approach is much more effective than reacting to policies or decisions that have already occurred. The Entomological Collections Network, in concert with the SysEB Section, could identify the need for an ESA Science Policy Statement detailing the fundamental role that entomological collections serve to support activities addressing Grand Challenges affecting the human condition including, but not exclusive of, climate change, hunger, vector-borne disease, invasive species, biodiversity, and genetic resource preservation. Representing the experts in the field, it could also offer to support drafting the statement. Such a statement, endorsed by the largest entomological society in the world and supported through its advocacy efforts, can serve as a powerful mechanism for educating decision-makers to the vital role of collections in addressing many of the Grand Challenges facing society.

**6 - 7 pm    Cocktail Hour**  
(outside Holladay Room)



**7 - 9 pm    ECN Dinner & Mixer**  
(Holladay/Multnomah Room)



**Sunday, November 16, 2014**

7:30 - 8:00 am      **Coffee**

8:00 - 8:05 am      **Welcome and Announcements**

**SESSION 3**

**Collections Management Panel Discussion**

*While uses of collections and new technologies are continually advancing, many aspects of collections management are tried and true. Join our panel of experts in a discussion of the latest methods in arthropod specimen management, including curation, conservation, materials, and shipping.*

Organizer: Peter Oboyski

8:05 am      **Peter Oboyski**

*Collections Manager & Senior Museum Scientist, Essig Museum of Entomology, University of California, Berkeley*

8:15 am      **David Furth**

*Collection Manager, Smithsonian Institution*

8:25 am      **Christine Johnson**

*Curatorial Associate, Division of Invertebrate Zoology, The American Museum of Natural History*

8:35 am      **Katrina Menard**

*Curator of Recent Invertebrates, Collections Division, Sam Noble Oklahoma Museum of Natural History*

8:45 am      **Richard Brown**

*Professor of Entomology & Director, Mississippi Entomological Museum, Mississippi State University*

8:55 am      **Maxwell V. L. Barclay and Beulah Garner**

*Coleoptera Curators, Natural History Museum, London SW7 5BD*

9:05 am      *Discussion and Symposium wrap up*

10:10 - 10:20 am      **Coffee Break**

10:20 am      **Rehabilitation and revitalization of the  
Purdue Entomological Research  
Collection (PERC)**

**Nearns, E.H., Powell, G.S., and J.M. Zaspel**

*Purdue Entomological Research Collection, Department of Entomology,  
Purdue University, 901 W. State St., West Lafayette, IN 47907 USA*

The Purdue Entomological Research Collection (PERC) is the largest and most important collection of insect specimens in the state of Indiana. Since its establishment in 1896, the PERC has acquired numerous historical collections of great significance to the systematic entomology community. Among the most important components of the collection are the Blatchley type specimens and the world's largest and most comprehensive collection of Ephemeroptera. The PERC currently contains approximately two million specimens, about half of which are pinned specimens. Also included are approximately 28,000 slides and 11,000 dragonflies and damselflies in archival envelopes. Current efforts within the PERC are focused on three main priorities: replacement of substandard storage, development of a specimen-level database using Specify 6.5 software, and integration of historical and new collections. Here, we report our current progress in these areas and discuss future goals for proper maintenance of our holdings and enhancing our value to the research community.

10:40 am      **Stuart M. Fullerton Collection of  
Arthropods at the University of Central  
Florida**

**Hojun Song**

*Assistant Professor and Curator of the Stuart M. Fullerton Collection of  
Arthropods (UCFC), Department of Biology, University of Central Florida,  
4000 Central Florida Blvd. Orlando, FL 32816-2368*

The Stuart M. Fullerton Collection of Arthropods at the University of Central Florida (UCFC) is a regionally focused research collection whose core mission is to document the biodiversity of insects and related arthropods in Central Florida. With more than 510,000 specimens in its holdings, most of which have been collected within the past 20 years,

UCFC has arguably the best material in terms of recently collected Central Florida insects, with a strong emphasis on Hymenoptera (bees and wasps) and Coleoptera (beetles), about 90% of which have been identified at least to the genus level. The UCFC is a leader in effort to digitize natural history collections as it represents one of very few collections that have a completely digitized collection and specimen-level data available for sharing. In this presentation, I provide a brief historical overview of the UCFC from its unique origin, its growth and the collection's specimen-level databasing efforts over the years. The UCFC is currently seeking a new curator and this presentation serves as an opportunity to draw attention to this little known but very important natural history collection.

11:00 am      **Growing and modernizing the Clemson University Arthropod Collection**

**Michael S. Caterino**

*John and Suzanne Morse Chair of Arthropod Biodiversity, Director, Clemson University Arthropod Collection, School of Agricultural, Forest, and Environmental Sciences, 277 Poole Agricultural Center, Clemson University, Clemson, SC 29634-0310*

The Clemson University Arthropod Collection (CUAC) contains just over 1 million specimens, representing a breadth of past and present specialties in the university's entomology faculty. The most globally significant holdings are the caddisfly (Trichoptera) and black fly (Simuliidae) collections. However, aquatic insects and medically important arthropods in general are both very well represented. Directorship of the CUAC recently changed hands, and this has spurred innovation and renovation, as well as a renewed investment by Clemson University. A complete overhaul of the collection's physical and virtual infrastructure is underway.

11:20 am      **Digitization at the USNM: Where we are at**

**Patricia Gentili-Poole<sup>1</sup> and Jessica Bird<sup>2</sup>**

*Collections Information Manager<sup>1</sup> and Data Manager<sup>2</sup>, Entomology, Smithsonian Institution*

Close to 350,000 records are available on the Web, grouped in inventories for ease of management and retrieval. Currently focused on

compiling a Species Inventory, we are looking at the Specimen Inventory for ways to speed up the capture of the estimated 20+M specimen/lot records to represent the scientific value of ~35M specimens in the collection. We developed a workflow to digitize the pinned collection by capturing one image of the specimen and labels, creating a catalog record, and crowdsourcing the label data transcription. 44,047 bumble bees were imaged and catalogued in 8 weeks, the data transcription is on-going.

11:40 am

## MEETING WRAP UP & DISCUSSION

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### Acknowledgements

Thank you so much to our personal sponsors. Their generosity helps to ensure the continued success of our meetings and is greatly appreciated by ECN and its members.

*Bernice DeMarco, Terry Erwin, Chris Fall, Louise Fall, Mike Ferro, David Furth, Christine Johnson, Jacqueline Miller, Floyd Shockley, Alma Solis, Catherine & Maurice Tauber, Margaret Thayer, Derek Woller, Guanyang Zhang*

### ECN 2014 Meeting Organizers:

Pamela Horsley, Katrina Menard, Floyd Shockley, Christy Bills

### ECN Social Media Team:

Guanyang Zhang, Derek Hennan, Morgan Jackson (thanks for insect playlist too!) and ECN Organizers

Awesome new *ECN logo* courtesy of: **Amplify Media**

We are very thankful for our partnerships with iDigBio and the Entomological Society of America. Thanks to ESA for their continuing support of ECN and iDigBio for graciously providing the resources to live broadcast this year's meeting.



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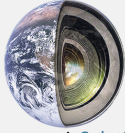
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**Notes:**

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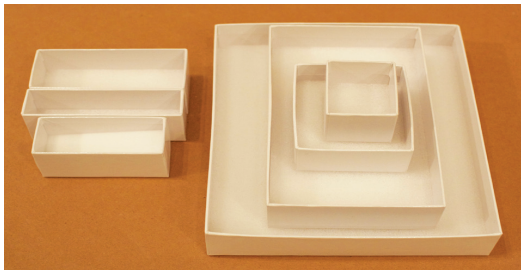
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