

Wednesday, August 5, 2015

8:00am **Breakfast, Introductions, Announcements - Auditorium**

8:30am **Speaker: Dr. Eben Gering**, Research Associate, Integrative Biology, MSU. *Poultry in paradise: evolutionary insights from Hawaii's feral chickens.* - **Auditorium**

9:30am **Concurrent Session Teasers - Auditorium**

10:00am **Concurrent Session 1**

- A. **Sandbox: Evolution and Feral Chickens?! in the classroom**, facilitator Kara Haas (KBS) Brainstorm ways to bring the science content from Dr. Gering's talk to your students - **Auditorium**
- B. 2 hour session - **Teaching Science Outdoors: Hands On, Hearts On, Heads On, GO!** (elementary track), Renee Bayer and Tali Tal (CREATE for STEM, MSU) – **Terrace Room**
 - a. Elementary teachers, particularly all former participants in Teaching Science Outdoors, are encouraged to attend. We will share examples of inquiry-based lessons from the classroom and roadblocks to getting students outside. We will take a step outside and practice and inquiry-based activity.
- C. 2 hour session - **Lake Turn-Over Event Turn! Turn! Turn!**, Connie High (Delton Kellogg) and Jake Nalley (KBS) – **Classroom 145**
 - a. Lakes are constantly changing. This session will demonstrate thermal stratification of lakes as the season changes through a simulated activity. It will focus on the physical properties of water, specifically density, during the stratification process. This demonstration culminates with the 'turn over' event that happens in the fall in Michigan lakes. Included will be a few demonstrations on the density of hot versus cold water as well as fresh versus salt water. These activities can be done as demonstrations or as an additional lab day with students. Participants will leave with a data set for students to graph and analyze as well.

11:00am **Break** (Auditorium)

11:15am **Concurrent Session 2** – 1 hour

- A. **Intro to the Agriculture and Ecology Student Activity Trail**, Misty Klotz (KBS) – **Auditorium**, The Ag & Ecology Student Activity trail is a great way to connect your students with the research and science of the Long Term Ecological Research program. In this session, learn more about sustainable agriculture by participating in some of the hands-on activities - outside!
- B. (continued) **Teaching Science Outdoors: Hands On, Hearts On, Heads On, GO!** (elementary track), Renee Bayer and Tali Tal, CREATE for STEM, MSU – **Terrace Room**
- C. (continued) **Lake Turn-Over Event Turn! Turn! Turn!**, Connie High (Delton Kellogg) and Jake Nalley (KBS) – **Classroom 145**

12:15pm **Group photo** behind the Manor House

12:30pm **Lunch** at McCrary Dining Hall

1:30 **Speaker: Dr. Tali Tal**, CREATE for STEM Institute, MSU and Technion, Israel. *A decade of research on out-of-school learning.*

2:30 **Concurrent Session 3** – 1 hour

- **Ecosystem services inventory in your school yard**, Bonnie McGill (KBS) and Susan Magnoli (KBS), Come along with two ecology graduate students, and we'll explain what ecosystem services are, how we measure them, and why they are (and are not) useful tools for scientists. We'll visit several ecosystem types where we will assess the different ecosystem services at play. Also, we'll discuss how different human activities affect ecosystem services. This lesson is easily adaptable to your own school yard and grade level. - **Auditorium**
- **Plastics. We made them. We recycle them. Now what?**, Cheryl Hach (Kalamazoo Area Mathematics and Science Center) and Marcia Angle (Lawton), Our session is designed to engage students using a real life problem of recycling plastics and separating them by density. Students will be challenged to engineer solutions necessary to differentiate similar substances. Critical thinking and pattern finding are necessary STEM and NGSS skills. So what about that word "plastics"? – **Terrace Room**

3:30pm **Break & Snack - Auditorium**

3:45pm **What's next for the KBS K-12 Partnership? - Auditorium**

4:00pm **Evaluation and Adjourn**

Thursday, August 6, 2015

8:00am **Breakfast, Introductions, Announcements - Auditorium**

8:30am **Speaker: Yu Man Lee**, Conservation Scientist/Zoologist, Michigan Nature Features Inventory, Michigan State University Extension. *Vernal Pools: Nature's Disappearing Act*.

Vernal pools are small, isolated, ephemeral wetlands that play a critical role in supporting healthy forest ecosystems. Vernal pools provide habitat for plant and animals and important ecosystem services including nutrient cycling, water storage and infiltration, and groundwater recharge. However, because of their small size and isolation from permanent water, vernal pools can be difficult to identify on the landscape, and they receive little or no protection under current wetland regulations. Recently we conducted several projects to identify, map, assess, and monitor vernal pools in Michigan, including initiating a statewide citizen science-based vernal pool mapping and monitoring program. These efforts provide critical information to help us better manage and conserve these important and unique wetlands. - **Auditorium**

9:30am **Concurrent Session Teasers**

10:00am **Concurrent Session 4** – 1 hour

- **2 hour session - Integrating Soil Ecology into your Classroom**, Ashley Carroll (Gull Lake): Observe soil as an ecosystem! Session attendees will receive a variety of lesson materials and activities that they can modify to fit the needs of their classroom. Ashley will be sharing a lesson created over the 2015 summer as she completed a GLBRC Research Experience for Teachers at KBS. – **Classroom 145**
- **M & M's of Evolution – Misconceptions**, Jamie Bowman (Thornapple Kellogg), Jodie McManus (Parchment), Kathryn Schwartz (MSU/KBS), Diontae Matthews (MSU/KBS), Chris Symons (MSU/KBS): What are the misconceptions surrounding the Theory of Evolution? How do these misconceptions influence how you teach and how your students learn evolution? – **Terrace Room**
- **Sandbox: Vernal Pools in the classroom**, facilitated by Kara Haas (KBS) – **Auditorium** Brainstorm ways to bring the science content from Ms. Lee's talk to your students
- **2 hour session - Helping students make sense of large-scale data related to climate change**, Andy Anderson (MSU), Hannah Miller (MSU), Wendy Johnson (MSU) and Elizabeth Delossantos (MSU): In this two hour session we will introduce two new lessons in The Human Energy Systems unit of the Carbon TIME curriculum that are designed to help students interpret large-scale data on climate change. Participants will engage in the activities and discuss the opportunities and challenges of using large-scale data with secondary students. – **Classroom 139**

11:00am **Break**

11:15am **Concurrent Session 5** – 1 hour

- continued - **Integrating Soil Ecology into your Classroom**, Ashley Carroll (Gull Lake) - **Classroom 145**

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- **Ipads 101**, Ian Zaback (KBS, Science Education Intern) Have you used an ipad or tablet to collect data in the field or in the classroom? Do apps confuse you? If so, please join Ian for an introduction to ipads, google docs and helpful apps for the field or classroom. – **Auditorium**
- **Avida-ED: Evolution You Can See**, Fred Hingst (DeWitt) and Rick Schultz (St. Johns) This session will introduce the Avida-ED program to both middle school and high teachers. Included in the program will be everything from how to download the program to how to use in open inquiry. Teachers will receive access to the accompanying user manual and lesson plans. – **Terrace Room**
- continued - **Helping students make sense of large-scale data related to climate change**, Andy Anderson (MSU), Hannah Miller (MSU), Wendy Johnson (MSU) and Elizabeth Delossantos (MSU) – **Classroom 139**

12:15pm **Group photo behind the Manor House** (rainout date)

12:30pm **Lunch** at McCrary Dining Hall

1:30pm **Concurrent Session 6** – 2 hours

- **M & M's of Evolution – Modeling**, Jamie Bowman (Thornapple Kellogg), Jodie McManus (Parchment), Kathryn Schwartz (MSU/KBS), Diontae Matthews (MSU/KBS), Chris Symons (MSU/KBS): With modeling becoming a huge part of education this session will help you better understand exactly what models are and give you the chance to create evolution models to be incorporated into the classroom. – **Terrace Room**
- **A Game of Selection: ...You win or you die!** Michael Kuczynski (KBS): A firm understanding of evolution is absolutely essential to a student's success in any biology class. In this session we will focus on introducing the topic of evolution by natural selection. Participants will take part in several outdoor games/activities designed to demonstrate the key components of natural selection and the different forms of selection observed in nature. Take on the role of a population of foraging animals evolving to become more efficient feeders. Then, explore the different forms of selection (directional, stabilizing, disruptive) using variably 'colored paper organisms' living within different environments. In addition, participants will also be provided with a data driven evolution worksheet designed to help students practice their data interpretation and graphing skills while further building their understanding of evolution. – **Classroom 139**
- **A Look Into the Future: Heating Rings**, Shaun Davis (Thornapple Kellogg) and Mark Hammond (KBS): Learn about this climate change research being done here at KBS. We'll take a look at data nuggets, explore a few ways for students to create their own data sets, and make a trip out to the heating rings to learn about the current investigation. – **Classroom 145**

3:30pm **Break & Snack** (Auditorium)

3:45pm **Data Nuggets update**, Melissa Kjelvik (KBS)

4:00pm **Evaluation and Adjourn**



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Friday, August 7, 2015

8:00am Breakfast, Introductions, Announcements – **Auditorium**

8:30am Concurrent Session Teasers

9:00am Concurrent Session 7 – 1 hour

- **Part 1:** Leaf pack curriculum, Cheryl Hach (Kalamazoo Mathematics and Science Center), Marcia Angle (Lawton), Kara Haas (KBS) – **Terrace Room**
- **Ecosystem services inventory in your school yard**, Bonnie McGill (KBS) and Susan Magnoli (KBS), Come along with two ecology graduate students, and we'll explain what ecosystem services are, how we measure them, and why they are (and are not) useful tools for scientists. We'll visit several ecosystem types where we will assess the different ecosystem services at play. Also, we'll discuss how different human activities affect ecosystem services. This lesson is easily adaptable to your own school yard and grade level. - **Auditorium**

10:00am **Break**

10:15am **Concurrent Session 8** – 2 hours

- **Use of historical aerial photographs and thematic maps to study local community's (schools) land use changes**, Mark Hammond (KBS) and Kara Haas (KBS) Maps can tell us a lot about the land, join us to study two aerial maps of the Gull Lake area dated 1938 and 2005! You will observe the map and develop questions and then learn how to quantify the land use and make a pie chart. Together we will share our findings and brainstorm how they could be used in the classroom. MSU has an archive of aerial maps and most school locations have an interesting land use history. MSU has an archive of images across our state, we would like to gauge interest in getting maps for individual school districts and seeking funding to produce them. – **Terrace Room**
- **A Game of Selection: ...You win or you die!**, Michael Kuczynski (KBS) A firm understanding of evolution is absolutely essential to a student's success in any biology class. In this session we will focus on introducing the topic of evolution by natural selection. Participants will take part in several outdoor games and activities designed to demonstrate the key components of natural selection and the different forms of selection observed in nature. In one game participants will have the opportunity to take on the role of a population of foraging animals evolving to become more efficient feeders. In another activity we will explore the different forms of selection (directional, stabilizing, disruptive) using variably colored paper organisms living within different environments. In addition to these fun outdoor activities participants will also be provided with a data driven evolution worksheet

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designed to help students practice their data interpretation and graphing skills while further building their understanding of evolution. – **Classroom 139**

12:30pm **Lunch** at McCrary Dining Hall

1:30pm **Speaker, Dr. Steve Hamilton**, Professor of Ecosystem Ecology and Biogeochemistry, Kellogg Biological Station, MSU. *The Kalamazoo River oil spill: Catastrophe and recovery*

Five years ago the largest inland oil spill in North American history happened in the Kalamazoo River below Marshall, and cleanup extended through last year. In this talk I will give an overview of the spill and its ecological impacts, how the cleanup was conducted, and the current status of the river ecosystem.

2:30pm **Concurrent Session 9** – 1 hour

- **Sandbox: Kalamazoo River in the classroom**, facilitator Kara Haas: Brainstorm ways to bring the science content from Dr. Hamilton's talk to your students. - **Auditorium**
- **Part 2: Leaf pack curriculum**, Cheryl Hach (Kalamazoo Mathematics and Science Center), Marcia Angle (Lawton) – **Terrace Room**
- **Intro to the Agriculture and Ecology Student Activity Trail**, Misty Klotz (KBS) – **Classroom 145**, The Ag & Ecology Student Activity trail is a great way to connect your students with the research and science of the Long Term Ecological Research program. In this session, learn more about sustainable agriculture by participating in some of the hands-on activities - outside!

3:30pm Break & Snack (Auditorium)

3:45pm Wrap up

4:00pm Evaluation and Adjourn