KBS K-12 Partnership 2016 Fall Workshop – Wednesday, November 16

Go with the flow! Exploring the importance of connectivity in nature

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

8:30am **Plenary Speaker: Dr. Sarah Fitzpatrick**, Post-doctoral researcher, Kellogg Biological Station
Genetic re-wilding: how connectivity can rescue small populations. **Auditorium**

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

10:00am **Concurrent Session 1**

A. **Birds of Prey in Michigan** (All grade levels) Organizers: Sara DePew-Bäby & Lisa Duke (Bird Sanctuary Staff), live bird	**Terrace Room**
B. **Climate Models 101** (Middle & High School) Organizer: Robert Logan (KBS PhD Student)	**Stack Bldg Room 139**
C. **Microbial Connections: The Rise of Antibiotic Resistance** (Middle & High School) Organizer: Heather Kittredge (KBS K-12 Partnership Fellow)	**Stack Bldg Room 138**

11:00am **Break**

11:15am **Concurrent Session 2**

A. **Birds of Prey in Michigan** (All grade levels) Organizers: Sara DePew-Bäby & Lisa Duke (Bird Sanctuary Staff), live bird	**Terrace Room**
B. **Climate Models 101** (Middle & High School) Organizer: Robert Logan (KBS PhD Student)	**Stack Bldg Room 139**
C. **How Seeds Get Around – Inquiry Learning About Seed Dispersal** (Elementary School) Organizer: Sara Garnett (KBS K-12 Partnership Fellow)	**Stack Bldg Room 141**

12:15pm **Lunch** **McCrary Dining Hall**

1:15pm **Concurrent Session 3**

A. **Data Nuggets in the Classroom – Part 1** (All grade levels) Organizers: Cheryl Hach & Marcia Angle (Partner Teachers)	**Terrace Room**
B. **Microbial Connections: The Rise of Antibiotic Resistance** (Middle & High School) Organizer: Heather Kittredge (KBS K-12 Partnership Fellow)	**Stack Bldg Room 138**
C. **Teaching Science Outdoors** (Elementary School) Organizers: Kara Haas & Renee Bayer (Asst. Director for Outreach & Engagement, CREATE for STEM)	**Stack Bldg Room 141**

2:15pm **Break**

KBS W.K. Kellogg Biological Station · KBS LTER Kellogg Biological Station Long-term Ecological Research

2:30pm **Concurrent Session 4**

A. **Data Nuggets in the Classroom – Part 2** (All grade levels) Organizers: Cheryl Hach & Marcia Angle (Partner Teachers)	**Terrace Room**
B. **Tributary connectivity & Lake Sturgeon in the Great Lakes** (All grade levels) Organizer: Dr. Kim Scribner (Professor, Michigan State University)	**Auditorium**
C. **Connecting Landscapes in a Changing World** (Middle & High School) Organizer: Tyler Bassett (KBS K-12 Partnership Fellow)	**Stack Bldg Room 139**

3:30pm **Group Brainstorm – Teen Science Café** **Auditorium**

4:00pm **Evaluation & Adjourn** **Auditorium**

The evaluation form can be found online at this link: http://tinyurl.com/jhn5p4u

Or scan this code:

If you are unable to access the form at the moment, please let a workshop coordinator know.

Session Descriptions (listed in order they occur in the schedule overview)

Plenary: Genetic re-wilding: how connectivity can rescue small populations
Speaker: Dr. Sarah Fitzpatrick, Post-doctoral researcher, Kellogg Biological Station

Connectivity among animal and plant populations has helped shape the biodiversity patterns we see across the globe. Natural patterns of connectivity are increasingly altered by humans through invasive species, fragmentation, and climate change. How do these disruptions affect wild populations? Will restoring natural connectivity patterns rescue populations from the brink of extinction?

Birds of Prey in Michigan All grade levels
Organizers: Sara DePew-Bäby (WK Kellogg Bird Sanctuary)
Lisa Duke (WK Kellogg Bird Sanctuary)

Join the Kellogg Bird Sanctuary staff for an exciting meet-and-greet with a live bird of prey and learn why raptors are unique hunting and flying machines. This program is recommended for all ages and can accommodate up to 60 people. At the end of the session you will have the chance to take a picture with one of the birds!

Climate Models 101 Middle & High School
Organizer: Robert Logan (KBS PhD Student)

It seems like every week we hear about new predictions of how climate change will affect our world in the coming decades. But how do we know what's going to happen in the future? In this session, we will explore how scientists use models to predict future changes in climate including the math that underlies these models and connections with biology.

Microbial Connections: The Rise of Antibiotic Resistance Middle & High School
Organizer: Heather Kittredge (KBS K-12 Partnership Fellow)

This session will provide educators with background information and an activity they can use to explore antibiotic resistance. Participants will model the evolution of resistance using marshmallows and M&Ms. Additional resources provided include relevant news articles and a worksheet to accompany the activity.

How Seeds Get Around – Inquiry Learning About Seed Dispersal Elementary School
Organizer: Sara Garnett (KBS K-12 Partnership Fellow)

In this lesson, students will learn the characteristics that help seeds disperse and the variety of ways seeds get around! Dispersal is important for plants because it helps young organisms avoid competing with their parents for resources and escape seed predators. Different species of plants produce seeds with different adaptations for dispersal. This topic connects to many K-4 topics, including organisms'

needs in their environments, competition, adaptation, survival, reproduction, and plant life cycles. Additionally, this lesson helps students practice multiple important inquiry skills that encompass many steps of the scientific method.

Data Nuggets in the Classroom – Parts 1 & 2 All grade levels

Organizers: Cheryl Hach (Kalamazoo Area Math & Science Center)
Marcia Angle (Lawton Community Schools)

This double session will focus on the use of Data Nuggets to improve student skills with Claims - Evidence and Reasoning by intentionally using strategies that scaffold into good thinking and writing about authentic science research. We will provide a graphic organizer to help learners organize their thoughts and will provide teachers with examples of what good responses look like and how to assess student work.

Teaching Science Outdoors Elementary School

Organizers: Kara Haas (KBS Science Education & Outreach Coordinator)
Renee Bayer (Asst. Director for Outreach & Engagement, CREATE for STEM, MSU)

During this session participants will go outside to compare seasonal change in a variety of habitats. Following these observations we will debrief and discuss how to use the Heads On, Hands On, Hearts On model to guide us when planning and carrying out lessons in the outdoors. Session participants will also practice the language and three-dimensional design from Michigan Science Standards.

Tributary connectivity & Lake Sturgeon in the Great Lakes All grade levels

Organizer: Dr. Kim Scribner (Professor, Depts. of Fishers & Wildlife & Integrative Biology, MSU)

This session will expose educators to general concepts in aquatic ecology, information about coupled Great Lake-tributary ecosystems, and charismatic lake sturgeon. Participants will also become familiar with K-12 e-learning educational materials developed from a long-term ecological research project and outreach/education program on lake sturgeon in the Black River in Michigan. We will explore a robust dataset on lake sturgeon and discuss how researchers use a stream-side facility to conduct experiments. We will also explore the concept of adaptive management and discuss the need to communicate information to citizen groups and students.

Connecting Landscapes in a Changing World Middle & High School

Organizer: Tyler Bassett (KBS K-12 Partnership Fellow)

Changes to landscapes as a result of human activities often result in habitat fragmentation. These alterations generally have negative consequences for biodiversity and the way ecosystems function. We will discuss how the size of a habitat patch and the way plants and animals disperse between habitat patches are important considerations in conservation. The lesson includes opportunities for students to practice graphing and interpreting data, and an activity where students are challenged to engineer the best disperser for given environment types.