

KBS K-12 Partnership 2018 Summer Institute – **TUESDAY**, June 26**The Natural History of Now!**

8:00am **Breakfast, Introductions, Announcements** Auditorium8:30am **Plenary Speaker: Dr. Jeffrey Conner**, Professor of Plant Biology
Why you (and your students) should care about adaptive evolution Auditorium

9:30am Concurrent Session Teasers

9:45am **Break**10:00am **Tuesday – Concurrent Session 1**

A. The snacks in your backyard: wild and edible plants of Michigan (All)	Bird
Organizers: Danielle Zoellner (KBS Academic Programs Coordinator)	Sanctuary

B. Pollination and native plants at the Bird Sanctuary (All)	Bird
Organizers: Sean Griffin & Matt Kolp (KBS Science Education & Outreach Fellows)	Sanctuary

12:30pm **Lunch** McCrary Dining Hall1:30pm **Tuesday – Concurrent Session 2**

A. Staying Afloat: Exploring how fish maintain buoyancy (ES)	Stack Bldg
Organizer: Sarah Johnson (KBS Undergraduate Research Assistant)	Room 141

B. Life In A Leaf: Unearthing the tiny world that lives inside a plant (MS & HS)	Stack Bldg
Organizer: Lana Bolin (KBS Graduate Student, Plant Biology)	Room 139

C. Buzzy buzzy bees and the process of pollination (ES)	Terrace
Organizer: Allison Young (MSU Graduate Student, Integrative Biology)	Room

2:30pm **Break**2:40pm **Tuesday – Concurrent Session 3**

A. I'd like to thank the writhing mass of gut bacteria inside me (HS)	Terrace
Organizer: John Guittar (KBS Postdoctoral Research Assistant)	Room

B. Be a Botanist: Creating a classroom herbarium (All Ages)	Stack Bldg
Organizer: Meredith Zettlemoyer (KBS Graduate Student, Plant Biology)	Room 141

C. The fungus among us! (MS)	Stack Bldg
Organizer: Robert Logan (KBS Graduate Student, Integrative Biology)	Room 139

3:40pm **Connecting Sessions to NGSS Crosscutting Concepts** Auditorium
Organizer: Kara Haas

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

Your feedback helps us improve our programming for you. Please take a moment to complete this online evaluation form.

Link to today's online evaluation form: [June 26 Evaluation \(http://bit.ly/KBSK12June26\)](http://bit.ly/KBSK12June26)



KBS K-12 Partnership 2018 Summer Institute – **WEDNESDAY**, June 27**The Natural History of Now!**

8:00am **Breakfast, Introductions, Announcements** **Auditorium**8:30am **Plenary Speaker: Todd Losee**, Wetland Scientist at Niswander Environmental **Auditorium**
*Michigan Wetlands Protection and Restoration*9:30am **Concurrent Session Teasers**10:00am **Wednesday – Concurrent Session 4**

A. Underwater Robotics (3rd Grade & Up) Organizer: Amy Cherry (Director of the Battle Creek Outdoor Education Center)	Terrace Room
B. Life: Shared Characteristics and Unique Adaptations (ES) Organizer: Sara McAda (KBS Undergraduate Research Assistant)	Stack Bldg Room 141
C. Physical Computing Projects & Tech Tools for Student Voice (All) Organizer: Matt Hawkins (Gull Lake Middle School Teacher, 5th Grade)	Stack Bldg Room 139

11:00am **Break**11:15am **Wednesday – Concurrent Session 5**

A. Squareland Mysteries: Field Journal of a Would-Be Scientist at KBS (5th Grade) Organizer: Dr. Catalina Bartlett (Assistant Professor, MSU Department of Writing, Rhetoric, & American Cultures)	Terrace Room
B. Behavioral Data Collection (All) Organizer: Dylan McKenzie (KBS Science Education & Outreach Intern)	Stack Bldg Room 141
C. Hidden in Plain Sight: Adaptations for Survival (MS & HS)) Organizer: Ava Garrison (KBS Graduate Student, Plant Biology)	Stack Bldg Room 139

12:30pm **Lunch****McCrary Dining Hall**1:30pm **Wednesday – Concurrent Session 6**

<p>A. Keeping Tabs on Turtles: An Introduction to Mark-Recapture and Quantitative Population Biology (All) Organizer: Brendan Reid (KBS Postdoctoral Research Assistant)</p>	<p>Terrace Room</p>
<p>B. The Little Things that Run the World: studying ants to learn about foraging, teamwork, and competition (All) Organizer: Jackson Helms (KBS Postdoctoral Research Assistant)</p>	<p>Stack Bldg Room 141</p>
<p>C. Evidence for Human Evolution (MS & HS) Organizer: Heather Kittredge (KBS Graduate Student, Integrative Biology)</p>	<p>Stack Bldg Room 139</p>

2:30pm **Break**

2:40pm **Lightning Lesson Plans**

Auditorium

Teachers will share creative lesson plans in 10-minute 'lightning' presentations. There will be time for questions and brief discussion of each idea shared.

Kathryn Schwartz, KBS Intern in Science Education, *Ambitious Science Teaching (AST)*
 Mary Grintals, Centreville Middle School, *Poly Density Bottles*
 Susan Magnoli, KBS Graduate Student, *KBS BioBlitz*
 Jodie Lugar-McManus, Parchment High School & KBS RET, *RET Research Project*
 Heather Kittredge, KBS Graduate Student, *Microbes Ate My Underwear*

3:40pm **Connecting Sessions to NGSS Crosscutting Concepts**
 Organizer: Kara Haas

Auditorium

4:00pm **Evaluation & Adjourn**

Auditorium

Your feedback helps us improve our programming for you. Please take a moment to complete this online evaluation form.

Link to today's online evaluation form: [June 27 Evaluation \(http://bit.ly/KBSK12June27\)](http://bit.ly/KBSK12June27)



KBS K-12 Partnership 2018 Summer Institute – **THURSDAY**, June 28

The Natural History of Now!



Department of Forestry
 MICHIGAN STATE UNIVERSITY



W.K. Kellogg Experimental Forest Field Day

7060 N. 42nd St., Augusta, MI 49012

8:00am	Breakfast, Introductions, Announcements	Auditorium
8:30am	Plenary Speaker: Dr. Danielle Zoellner , KBS Academic Programs Coordinator <i>Pine forests of the Carolinas</i>	Auditorium
10:00am	Break	
10:15am	Load vans to travel to Kellogg Forest	Upper Parking Lot
10:30am	Forestry Overview Organizer: Kenneth (KJ) Kettler, Manager and Forester, W.K. Kellogg Experimental Forest	Kellogg Forest
10:45am	Forestry Basics and Tools Organizer: KJ Kettler	
	Dendrology Organizer: Shawn Kelly, USDA, NRCS Soil Conservation Technician	
12:15pm	Carpool/Load vans to travel to McCrary Dining Hall	Kellogg Forest Lot
12:30pm	Lunch	McCrary Dining Hall
1:15pm	Carpool/Load vans to travel to Kellogg Forest	Upper Parking Lot
1:30pm	Forestry Research Talks David Reed, MSU Postdoctoral Researcher, <i>Net Carbon Balance of Michigan Forests</i> Paul Bloese, MSU Tree Improvement Supervisor, <i>Cultivating Natural Resistance to Beech Bark Disease</i> Carl Brockman, Kellogg Forest Volunteer, <i>Maple Syrup Production</i> Fahimeh Baziari, Professional Aide to KBS and Kellogg Forest, <i>Native Pollinator Gardens</i>	Kellogg Forest
3:30pm	Return to KBS & Break/Snack	Kellogg Forest Lot
3:45pm	Connecting Sessions to NGSS Crosscutting Concepts Organizer: Kara Haas	Auditorium
4:00pm	Evaluation & Adjourn	Auditorium

Link to today's online evaluation form: [June 28 Evaluation](http://bit.ly/KBSK12June28)
(<http://bit.ly/KBSK12June28>)



Session Descriptions – Tuesday, June 26, 2018

The snacks in your backyard: wild and edible plants of Michigan

All ages

Organizer: Danielle Zoellner

Abstract: We will go over the basics of wild edible plants, and I will introduce you to some of our most common species that will likely be in your own "backyard". We will also discuss how you can incorporate edible plants into your teaching on several topics such as human health to invasive species impacts.

Pollination and native plants at the Bird Sanctuary

All ages

Organizers: Sean Griffin & Matt Kolp

Abstract: We'll be showing progress on the new self-guided tour for the Sanctuary's native gardens; this session will highlight the importance of pollination services with a walk through parts of the sanctuary and include ideas for inquiry-based lessons on plant-pollinator interactions.

Staying Afloat: Exploring how fish maintain buoyancy

Elementary School

Organizer: Sarah Johnson

Abstract: By observing why specific objects float and sink, we can simulate specialized organs in fish and sharks that allow them to stay buoyant.

Life In A Leaf: Unearthing the tiny world that lives inside a plant

Middle & High School

Organizer: Lana Bolin

Abstract: Did you know that there's a complex world of microbes living inside every leaf of every plant? These microbes help plants survive drought, ward off herbivores, avoid diseases, and much more - in fact, without this tiny army of microbes, a plant will have trouble surviving at all! In this lesson, which includes a low-cost hands-on activity, students will learn about symbiosis and the scientific method while observing the fascinating diversity of microbes hidden inside a leaf!

Buzzy buzzy bees and the process of pollination

Elementary School

Organizer: Allison Young

Abstract: In this lesson, students will play a game in which they act as honeybees pollinating cherry trees in different environmental conditions. Through the activity, students will learn (1) what pollination is and why it's important, (2) the role of insects (specifically bees) in pollination, and (3) how environmental conditions affect pollinators and therefore pollination success.

I'd like to thank the writhing mass of gut bacteria inside me

High School

Organizer: John Guittar

Abstract: In this talk, I'll describe how we are colonized by bacteria from our mothers and our

environments, and how these colonists keep us healthy and well-fed. Students will learn to think about humans not as individuals, but as walking ecosystems that are diverse and dynamic.

Be a Botanist: Creating a classroom herbarium

All Ages

Organizer: Meredith Zettlemoyer

Abstract: Come explore plant libraries! We'll be learning about plant diversity, why species go extinct, and the importance of historical collections by examining herbarium samples as well as collecting and making our own specimens.

The fungus among us!

Middle School

Organizer: Robert Logan

Abstract: Fungi are everywhere! In our yards, our houses, our workplaces, our food, and our medicines. In this session, we will examine several different fungi found in common environments (kitchens, backyards, grocery stores, and more!) and learn about their role in our lives.

Session Descriptions - Wednesday, June 27, 2018

Underwater Robotics

3rd Grade & Up

Organizer: Amy Cherry

Abstract: Students will be introduced to the history and uses of ROV's, given scientific background on buoyancy, and given a mission to complete. In small groups, students receive a bucket of vehicle "parts" including propellers, control box and motor. They are then challenged to create a vehicle that can drive in a lake.

Life: Shared Characteristics and Unique Adaptations

Elementary School

Organizer: Sara McAda

Abstract: What are the characteristics that all life shares? During this session students will learn about unique evolutionary advantages through the lens of life traits. Find out how basic needs like food and water are met in vastly different ways, but can make all the difference when it comes to survival.

Physical Computing Projects & Tech Tools for Student Voice

All ages

Organizer: Matt Hawkins

Abstract: The micro:bit is a pocket sized computer that is programmable with easy to learn block-based coding. Projects we will explore include soil moisture sensing, plant watering, and timing gates. Bring your own Chromebook or laptop for this hands-on activity. Bonus resources include tech tools Padlet and Flipgrid for sharing student responses and stories.

Squareland Mysteries: Field Journal of a Would-Be Scientist at Kellogg Biological Station

5th Grade

Organizer: Dr. Catalina Bartlett

Abstract: This session will focus on the process of developing a novel for 5th-grade students. Such topics will include how to connect storytelling element and science, the field journal as a model for exploring some values of science, and a hands-on activity.

Behavioral Data Collection

All ages

Organizer: Dylan Mckenzie

Abstract: Ever wonder how to collect field data on large mammals? Come to this session to learn when to use various sampling methods from scan and focal to random and systematic sampling. As an added bonus, attend this session to learn how these techniques have been used by MSu scientists to learn about Hyenas in Kenya!

Hidden in Plain Sight: Adaptations for Survival

All ages

Organizer: Ava Garrison

Abstract: In a short lecture, students will learn about how animals and plants use camouflage to avoid predation and herbivory, and how those adaptations can affect population and community composition. An activity following the lecture will allow students to simulate the role of camouflage in seed predation and community composition.

Keeping Tabs on Turtles: An Introduction to Mark-Recapture and Quantitative Population Biology

All ages

Organizer: Brendan Reid

Abstract: Estimating population sizes and survival rates is fundamental to ecology and conservation biology. This session will present a framework for teaching the basics of mark-recapture methodologies that can be fit to a wide variety of different teaching formats (from single class sessions to long-term field monitoring projects). Teachers can tailor the specifics of the lesson (such as the degree of math and probability involved) to the ability level of the students, and the study organisms are charismatic, engaging, and of great conservation concern: TURTLES!!!!

The Little Things that Run the World: Studying Ants to Learn About Foraging, Teamwork, and Competition

All ages

Organizer: Jackson Helms

Abstract: What happens to dead insects, dropped pieces of food, and other edible materials in nature? In most parts of the world they are eaten by ants—earth's dominant predators and scavengers of small things. In the race to harvest resources within their territories, ant colonies use many strategies to discover food or take it from others. In this session we will learn about animal foraging behavior, teamwork, and competition, all while examining the hidden world beneath our feet.

Evidence for Human Evolution

Middle and High School

Organizer: Heather Kittredge

Abstract: What does it mean to be human? In this session, we will review materials from the human origins exhibit at the Smithsonian museum of natural history. The materials include fossil and genetic evidence of human evolution and will allow students to conclude for themselves how all the evidence fits together to explain the origins of human life.

Session Descriptions - Thursday, June 28, 2018



Department of Forestry
MICHIGAN STATE UNIVERSITY

W.K. Kellogg Experimental Forest Field Day

Forestry Overview

All ages

Organizer: Kenneth Kettler, Kellogg Forest Manager

Abstract: The Kellogg Forest is overseen by MSU's Forestry Department and has continual research on site since its creation in the 1920s. Learn about current management practices at the Forest.

Forestry Basics & Tools

All ages

Organizer: Kenneth Kettler, Kellogg Forest Manager

Abstract: Learn to use tools and methods used by foresters to measure trees and determine forest stand health.

Dendrology

All ages

Organizer: Shawn Kelly, USDA, NRCS Soil Conservation Technician

Abstract: Learn basic tree biology and tree identification skills.

Forestry Research Talks

All ages

David Reed, MSU Postdoctoral Researcher, *Net Carbon Balance of Michigan Forests*

Paul Bloese, MSU Tree Improvement Supervisor, *Cultivating Natural Resistance to Beech Bark Disease*

Carl Brockman, Kellogg Forest Volunteer, *Maple Syrup*

Fahimeh Baziari, Professional Aide to KBS and Kellogg Forest, *Native Pollinator Gardens*

Abstract: Observe actual research plots for several ongoing projects at the Kellogg Forest. Hear first hand, from researchers, the questions they are asking and the research methods used to seek answers to keep today's forests healthy and productive.