

2019-20 ANNUAL REPORT



W.K. Kellogg
Biological Station
MICHIGAN STATE UNIVERSITY

A SINGULAR YEAR

DEAR FRIENDS AND NEIGHBORS,

It's safe to say that it's been an unusual year. Our fiscal year began in typical fashion in July 2019. But of course, by March 2020, fundamental parts of our daily lives had begun to change.

As a community, we cannot look back over the past 12 months without recognizing the myriad losses deeply felt and endured by so many of our friends, neighbors and colleagues. At KBS, the sustained distance between us and our wonderful volunteers—treasured members of our community—has been one such weight.

Through all the sudden changes forced by this pandemic, examples of the ingenuity and heart of this community, which I've seen over and over in my first six months as KBS director, were evident—Swiftly collected donations of masks and lab supplies for frontline healthcare workers. Tremendous efforts taken to keep the Bird Sanctuary, Conference Center and Manor House accessible and safe for the public. Safety guidelines meticulously drawn up and diligently followed. Careful cleaning of treasured spaces. Uninterrupted delivery of top-notch care for the animals that call KBS home and the stewardship of our lands. And so on.

KBS research has continued, safely and productively. Outstanding studies from the Basso, Evans, Fitzpatrick and Haddad labs are detailed in this report. This year brought more well-deserved accolades and awards for KBS graduate students and staff. And, in exciting news, the KBS Long-term Agroecosystem Research—LTAR—site was funded this year!

As we approach the end of this difficult year, I'm so thankful for everyone who supports KBS through their work, volunteerism, giving or membership. We look forward to sharing more excellent research, education and outreach in 2021.

With gratitude--
Fredric Janzen
KBS Director

THANK YOU

FOR YOUR GENEROSITY TO KBS IN 2019-20

Each year, contributions to KBS are made in memory or in honor of people whose lives have made lasting impacts. These gifts have been recognized in this list.

In memory of:

1. Carl Baker
2. James Corry
3. Lydia Fogiel
4. Linda Greenfield
5. Donald Hall
6. Wilbur "Joe" Johnson
7. George Lauff
8. Bradley Older
9. Quentin Peterson
10. Barbara Sluss
11. Donald Sly

In honor of:

12. Stu Bassett
13. Sarah Carroll
14. Christina Williams DeVries
15. Lisa Duke
16. D. Scott and Anita Dvorak
17. Lisa Dvorak
18. Judy Geary
19. Kay Gross
20. Kara Haas
21. Gary Mittelbach
22. Karol Peterson
23. Marilyn Purchase
24. Harvey J. Skulnick
25. A.J. and Cathy Todd
26. Roger Turner
27. Karen Wenk

\$10,000 and above

Patricia R. Chipman
David Grant Dvorak, M.D. and Karol J. Peterson 9, 11, 13, 16, 17, 20, 25, 27
John and Sharon Garside
Bill and Jeannette Maxey
Gene and Melissa McKay 19

\$5,000 to \$9,999

Gary G. Mittelbach and Katherine L. Gross 7
Thomas C. and Sharin E. Noall

\$1,000 to \$4,999

Kappy Boudeman
The Family of Richard A. Brunt
Ronald Gross and Adelaide Camillo
Hunter W. Cunningham and Jane A. Carstairs
Donald J. and Margaret A. Hall
Mr. and Mrs. Christopher T. Hamilton
Virginia and William Schultz
Joseph C. and Karen S. Seelig
Mr. and Mrs. Charles Stoddard 19
Bradley J. and Kathryn D. Sullivan
Michelle and Chris Tracy 14
Earl E. Werner

\$500 to \$999

David L. Strayer and Judith M. Bondus
David D. and Janet A. Cornell
Elizabeth K. Dapson
Ann and John Gallagher
Kyle E. Jaynes
Anita J. Johnson
Michael J. and Carol A. Klug
Amanda K. Meitz
Roger N. Turner, Jr. and Jeanne L. Turner
Catherine Wardley
James B. Allen and Louise D. Whitney 7
Jamie A. Wiersema

\$250 to \$499

David D. and Margaret M. Battjes
Sarah J. Carroll 6
Richard G. and Roslyn L. Cooper
Frankie N. Fagan

John M. and Sue Fleming
Jon P. Kaufmann, Jr. and Wendy L. Kaufmann
Pauline C. and Daniel L. Malecki
Douglas L. Mehlhorn and Alice M. Warner-Mehlhorn 26
Eric Prokuski
Lt. General and Mrs. Ronald F. Sams
Patrick J. and Sarah T. Sandell 19
Dr. Jeffrey K. Conner and Ms. Beth G. Silverman 7
Robert E. and Melicent VanPeenan
J. Richard and Cynthia K. Viel
Allen H. and Connie White
Andrea Zamansky

\$100 to \$249

Harold L. Allen
Dean Baas
Don M. and Judith E. Baldwin 22
Raymond E. Barnes
Carmen R. Cid-Benevento 7
Laura C. Broughton
Barbara K. Burbank
James D. and Maureen L. Cable
Barbara Cohen
Jack H. and Barbara L. Cvengros
Patricia A. Czinder
William G. and Kathleen L. Davis
Thomas and Marge DeVisser
Bill and Debbie Duggan
Lisa J. Dvorak
Diane M. Cloutier and John Elandt
William J. and Lisabeth M. English
David and Tasha Federinko
Andrew C. and Cassandra Fogiel 3
Bruce Nanzer and Maria A. Gajewski 15
James H. and Judith E. Geary
Tiffany S. and Brandon K. Greenfield 4
Christopher F. Steiner and Emily L. Grman 7
Kara L. and Josh Haas
Stephen K. Hamilton
Jacob A. and Patricia I. Haring 10
Patrick A. Hartman 11
Larry T. and Noel A. Hayward
Natalie S. Dubois and Michael Hornish
Glenn and Christine H. Kabell
Sarah M. Emery and Bradley Kimbrough
Brian and Lorna Kneeland
William T. and Susan M. Liston
Charlene M. and Larry D. MacDonald
James E. MacVicar
Judith M. Maier
Carol R. Marbach
Judith I. and David A. Mauriello
Kathleen D. and Martin Merlino
Stephen and Christine Murray
Ronald J. and Susan G. Niedzielski
April D. Oakes

Roger J. Prior and Barbara A. Page
Sally Paul
Nelson E. and Phyllis G. Pelletier
Ralph L. Pernice
Brendan N. Reid
Philip E. and Deborah A. Rey
Douglas and Wendy W. Robbins
Ronald J. and Carol Sam 11
Randy and Deidre Schumaker
Janice M. Siegford
Mike Willy and Carole A. Stevens
Randy and Laura Stout
Philip E. and Katie A. Strong
Andrew M. Turner
Ruben Ulbrich
Taylor C. Ulbrich
Skip J. Van Bloem and Stefanie L. Whitmire
James A. and Linda S. Vansweden
William J. and Carol D. Venema
Lindsey A. Walters
David E. and Leila B. Weiss
Glenn B. Wengert, Jr. and Nancy K. Wengert
Gordon and Karen Wenk 7
Brook J. Wilke, Ph.D. 7
Thomas E. Miller and Alice A. Winn
Jack N. Wykoff

Businesses, foundations and organizations

Dorothy U. Dalton Foundation
The Dow Chemical Company Foundation
Irving S. Gilmore Foundation
GreenStone Farm Credit Services
Kalamazoo Area Wild Ones
Kalamazoo Bee Club
Kellogg's Corporate Citizenship Fund 18, 23
National Geographic Society
The Nature Conservancy
Shades of Lavender Farm
Soil Health Institute
Suzanne Upjohn Delaho Parish Foundation
The Wilburforce Foundation

We make every effort to ensure all donors are recognized. If you believe your name has been omitted, please contact our Development Office at (269) 671-2444. For a full list of this year's donors, including members, visit our website.

SEEDING EXCELLENCE

KBS GRADUATE STUDENT RESEARCHERS GARNER ACCOLADES, RECEIVE SUPPORT FOR RESEARCH AND TRAVEL FOR FIELDWORK.



At KBS, opportunities blossom into great accomplishments. This year, several members of our community were recognized for outstanding scholarship, research and leadership.

FUNDING EXPLORATION



KYLE JAYNES

In October 2019, Kyle Jaynes, a researcher in the Fitzpatrick Lab, was awarded a highly competitive Early Career grant through the National Geographic Explorers program.

The grant supports scientists and other professionals in the early stages of their careers by funding their fieldwork expeditions. Though he had to cancel his planned spring 2020 trip to Ecuador, Jaynes looks forward to returning to the field.

"I am beyond excited to receive this award," Jaynes said shortly after the award was announced. "This grant comes at a crucial time for me to collect data early on for my Ph.D. research, and it is a huge honor to become part of the Nat-Geo Explorer community."

TALKING POLICY

In February, Corinn Rutkoski, a graduate student in the Evans Lab, was selected to receive a 2020 Emerging Public Policy Leadership Award—EPPLA—from the American Institute of Biological Sciences. Among other honors, the award funds a trip to Washington, D.C. to participate in the AIBS Congressional Visits Day, which was originally planned for April 2020.

PROPELLING GRADUATE RESEARCH

In April, several current and future KBS graduate researchers earned coveted National Science Foundation fellowships. Congratulations to Stephanie Clark, Caleb Krueger, Corinn Rutkoski, Moriah Young and Allison Zahorec (pictured above, left to right).

The NSF Graduate Research Fellowships Program, or GRFP, is the oldest graduate fellowship of its kind. The program supports exemplary graduate students in NSF-supported disciplines—science, technology, engineering and mathematics—who are pursuing research-based master's and doctoral degrees.

The heart of KBS is its community: people who devote their time, energy and talents make this place as special as it is.

KBS SCIENTISTS, MICHIGAN FARMERS TEAM UP TO ADVANCE SUSTAINABLE AG

KBS LTAR SITE FUNDED & READY TO GROW

The W.K. Kellogg Biological Station has been designated a funded member of the USDA's Agricultural Research Service Long-term Agroecosystem Research Network, or LTAR, a partnership of 18 premier long-term research sites across the United States.

The research undertaken at KBS will focus on production, farmer decision-making, soil and water protection, climate regulation, pollination and pest regulation, economics, and biodiversity.

"What's new and exciting about LTAR is its emphasis on a long-term partnership between scientists and stakeholders, such as farmers and others interested in agricultural outcomes, to design durable, sustainable farming systems in Michigan and beyond," said Phil Robertson, University Distinguished Professor in MSU's Department of Plant, Soil and Microbial Sciences and KBS LTAR director.

"This allows us to take our long record of fundamental research at KBS to inform practical questions of implementation and outcomes."



KELLOGG FARM HUB FOR COLLABORATION

The past year at the W.K. Kellogg Farm and Pasture Dairy Center saw partnerships and projects involving community members, area farmers, and researchers from MSU's main campus.

In 2019, KBS grew its first demonstration plot of industrial hemp and wrote a guide on production of the crop in Michigan, to assist Michigan farmers deciding whether to grow industrial hemp in 2020 and beyond.

The Farm is now housing some 60 steers for a study that looks at how the nutritional content of grass-fed cattle—levels of fatty acids like omega 3s—might be affected by adding supplemental feed like hay, grass silage and soybean hulls.



FROM LEFT: L. ZABIK, HOWARD STRAUB III, BROOK WILKE, J. APPLEBY

In September 2019, Kellogg Farm was re-verified by the Michigan Agriculture Environmental Assurance Program, or MAEAP. The voluntary program assists farms in taking proactive steps to reduce environmental impacts, and recognizes operations that meet set requirements.

MAPPING THE PATHS TO PRECISION FARMING

BASSO LAB



Dr. Bruno Basso's lab examines the ecosystems of row crop production systems, with the aim of helping farmers implement "climate-smart agriculture solutions" that can reduce cost, increase yields and lessen negative environmental impacts.

The lab's research has helped form a broad range of partnerships, from family farms in Michigan and around to the world to Caney Fork Farms, owned by the family of former Vice President Al Gore. Basso was invited by Gore to be a panelist at the 2019 Climate Underground Conference.

Basso's lab's work has been featured this year in many academic journals and other publications, including MSU Today, Big Ten Network and Forbes Magazine.

"We are primarily concerned with helping farmers see their fields in a new manner, helping them make better decisions to improve yield, reduce cost and improve environmental impact."

Understanding how evolutionary and ecological processes lead to patterns of adaptation, fitness and persistence in small populations is a main focus of research undertaken by Dr. Sarah Fitzpatrick's lab.

Over the past year, lab members have published numerous articles on assisted gene flow and the usefulness of genetic rescue—introducing individuals from a different geographical location to benefit a small fragmented group of the same species—as a conservation measure.

Trinidadian guppies helped Fitzpatrick and her colleagues explore the effects of assisted gene flow at the individual, population and ecosystem levels. Next, studying mosquitofish (pictured), they'll look at genetic factors that facilitate or limit adaptation to environmental change, thanks to a \$850K grant from the NSF's Bridging Ecology & Evolution program.

"If we can show that introducing new genetic variation can speed up adaptation to environmental change—it could have major implications for conservation."

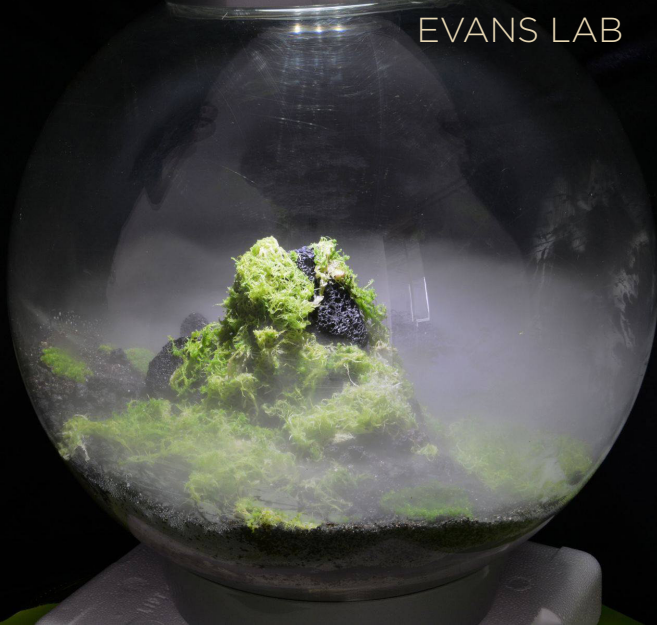
COMING TO THE GENETIC RESCUE

FITZPATRICK LAB



DECODING THE MYSTIQUE OF FOG

EVANS LAB



Dr. Sarah Evans' lab studies how microscopic organisms—like bacteria, fungi and archaea—respond to their environment.

The Evans Lab published several studies over the past year, on topics including how non-rainfall moisture (think fog or dew) contributes to plant decomposition.

This summer, Evans secured a \$1.4 million grant to study how soils respond to drought, then create predictive models that could inform responses to climate change. She also was awarded a 2020 Outstanding Faculty Mentor Award from the MSU Graduate College.

Lab members also got creative with their science, showing several pieces at the 2019 KBS art-science exhibit, partnering with community organizations to create an online nature journaling class, and collaborating on the installation "Fog of Dawn" (pictured), which was on display at Science Gallery Detroit.

Dr. Nick Haddad's lab applies ecological principles to the conservation of biodiversity and advocates for actions that can help overcome negative effects of habitat fragmentation, such as the use of habitat corridors.

Summer 2019 marked the release of Haddad's book, "The Last Butterflies: A Scientist's Quest to Save a Rare and Vanishing Creature."

"The rarest butterflies are at the leading edge of an insect apocalypse. The causes of their decline and the needs for their restoration can inform conservation of Monarchs, other butterflies and insects in general."

Since, Haddad and colleagues have published several studies—affirming that habitat corridors help conservation efforts, exponentially over time; that transitioning corn fields to perennial biofuel crops can reap significant ecological benefits and satisfy energy needs; and that management practices, like prescribed burning, can increase resiliency in areas vulnerable to natural disasters.

MAKING NATURAL CONNECTIONS

HADDAD LAB





W.K. Kellogg
Biological Station
MICHIGAN STATE UNIVERSITY

3700 E. Gull Lake Dr.
Hickory Corners, MI 49060

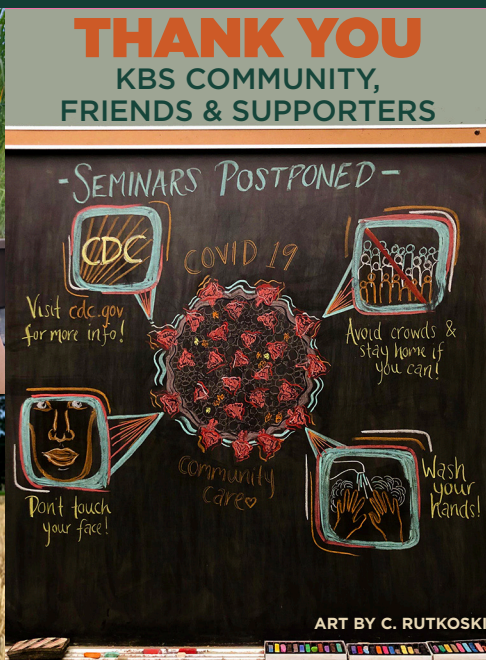
ANNUAL REPORT WRITING AND DESIGN: CARA BARNES, JULIE DOLL
PHOTOGRAPHY: KBS STAFF, KURT STEPnitz **EDITING:** SARAH CARROLL, FRED JANZEN



ROBERTSON LAB



KELLOGG FARM



FOR MEETING THIS MOMENT WITH
CREATIVITY, GENEROSITY & HEART.



BRUDVIG LAB



BIRD SANCTUARY