Organization of Biological Field Stations

Supporting environmental research, education, and public understanding

February 15, 2021

INSIDE THIS ISSUE

"Every great advance in science has issued from a new audacity of imagination."

-John Dewey, philosopher and progressive educator

President's Message by Chris Lorentz

With the start of a new year and a new administration, hope springs eternal. Coupled with the rollout of the COVID-19 vaccine, there is reason to be optimistic in 2021. At the same time, we recognize that many of us are still enduring reduced or absent visitors, lingering furloughs, pending budget cuts, and other adverse impacts from the pandemic. The Board recognizes these challenges, and we are putting our efforts towards providing support for today and for tomorrow.

Recently, a group of OBFS members has created an online petition to highlight both the value of field stations and our current struggles. A related article was just published in *BioScience*, and a second one is being submitted to the *Chronicle of Higher Education* to call awareness to the state of FSMLs and the need to provide adequate support, particularly during this time. Simultaneously, we are working with AIBS and other partners to develop targeted asks for additional funding through NSF and other federal programs/legislation. It is our hope that these efforts will bring much needed financial resources to the OBFS community.

In addition, the final touches are being made on the new OBFS Strategic Plan, *Adapting to a Changing Climate; Supporting Resilient Stations for Today and for Tomorrow* (2021-2026). [continued on page 2]

President's Message by Chris Lorentz (continued)

Through input from our members, the Board has identified five priority areas for the Organization: 1) Collaboration, 2) Diversity, Equity, and Inclusion, 3) Member Support and Services, 4) Raising Awareness and 5) Sustainability. Through the goals, objectives and action items outlined in the plan, we are committed to being an "*indispensable resource for the Field Station community, enhancing the value and sustainability of its members, with fairness, integrity, transparency, and inclusivity.*"

As we prepare for the upcoming field seasons, still with many uncertainties at home and abroad, I hope you can take some comfort in the commonalities and collegiality of the OBFS community, and please know that the Board is working diligently on your behalf to help support all of us. Thank you and best wishes to everyone.

Virtual Field update and links

We encourage field station directors to share this information with their faculty this spring. The Virtual Field is helping faculty boost student observation, communication and critical thinking skills (2 min Virtual Field Introduction) by mimicking the high-impact transformational experiences that happen at field stations and marine laboratories. The following types of videos can be found at and uploaded to the site:

Ecosystem Exploration: 5-min videos take students to 20+ freshwater, terrestrial and marine ecosystems around the earth. Questions prompt students to find and describe evidence of ecosystem processes. (2 min Introduction to EE Videos)

Live from the Field: 1-hour live events with three researchers at field sites around the world. Students interact with researchers at live Q&A sessions. Questions prompt students to compare and contrast research in different disciplines and ecosystems.

Events and Materials: Field stations and marine laboratories share upcoming events and a wide variety of existing educational materials.

The Virtual Field is a collaborative project of the Organization of Biological Field Stations and is supported by a RAPID grant from the National Science Foundation in response to the COVID-19 pandemic. If you would like to sign up for The Virtual Field listserv, please send an email to sdoktay@ucdavis.edu with "Subscribe to The Virtual Field" as the subject line.

Promoting Human Diversity in Field Science

2021 Annual Human Diversity Award

Nominee Supporting Material Deadline: July 18, 2021

In addition to the honor and recognition of peers, the OBFS Human Diversity Award includes a permanent plaque for the winning station; an official award letter; a second traveling OBFS plaque that lists all previous winners and is housed for one year at the most recent recipients' facility; and recognition on the OBFS website. The award includes a travel reimbursement of up to $1000 for the awardee to attend the annual OBFS meeting. Travel awards can be rolled over to 2022 if we don't meet in person in 2021 or you cannot travel based on your institution's restrictions.

Apply at:

https://www.obfs.org/human-diversity-committee

Fieldwork Safety for At-Risk Groups

By Cora A. (Johnston) Baird, Site Director, Anheuser-Busch Coastal Research Center

Our stations share the essential goal of supporting successful connections with the field. To this end, we - the station directors and staff - do the work of ensuring that our visitors have safe and productive experiences while visiting the field. Recent discussions catalyzed by the events of 2020 have reminded us that researcher and student experiences in the field can vary dramatically depending on their identities and abilities and those of our stations and surrounding communities. Negative - and even dangerous - experiences, which may threaten their persistence in field sciences, can be overlooked if we haven't had similar experiences ourselves. How do we prepare to support visitors to navigate and survive experiences we may never have had?

An article published in October 2020 in Nature Ecology and Evolution, "Safe fieldwork strategies for at-risk individuals, their supervisors and institutions," provides a helpful guide for how we can support those mostly likely to encounter risk while in the field. The framework provided by Demery and Pipkin can be used as a tool for considering our operations and visitor support. At UVA's Coastal Research Center, our staff read the short article and used a staff meeting to brainstorm plans for further support of vulnerable visitors. Some improvements were implemented within a week, some are ongoing. We found that solutions that support vulnerable visitors will also support all our station users. Demery and Pipkin's brief article can provide a tractable way to get station staff involved in the work of making our stations more inclusive. On February 17th Cornell is hosting a panel discussion of the research, info at https://cals.cornell.edu/saferscience.

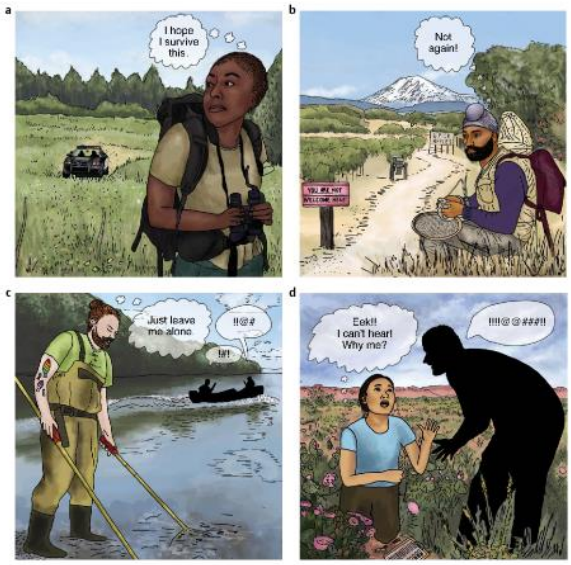

Fig. 1 | Example situations experienced by at-risk individuals in the field. a, A Black ornithologist is approached by law enforcement. **b**, A Sikh entomologist experiences a hateful landscape. **c**, A bisexual ichthyologist is accosted by hate speech. **d**, A deaf botanist is verbally abused due to her disability. Illustration by Callie Rodgers Chappell.

Congressional Visits Day: COVID style

by Lisa Busch

This year we have a new way to participate in the Congressional Visits Day (CVD). The American Institute of Biological Sciences (AIBS) is hosting a VIRTUAL advocacy event in April. The training is superb. Learn how to talk to congress and policy makers and then meet with congressional aides and members of Congress. The OBFS board has made participating in this event a priority by budgeting funds to send OBFS members each year. This year OBFS will pay for registration for FOUR people.

If you are selected, you will be expected to provide a presentation at the annual OBFS meeting in September about the experience.

Please send me an email with your name, address, field station, telephone number and if you have previously attended CVD before and when. Please indicate how long you have worked at your field station and if you are a graduate student.

We encourage applicants from a wide diversity of backgrounds and geographies.

Send the above information to lbusch@sitkascience.org by **February 20, 2021.**

Affiliates Notes by Paul Foster, OBFS Board Representative to AIBS

AIBS held its annual Council meeting[i] virtually on December 10, 2020. The theme was the bioeconomy, and the excellent talks were recorded and can be viewed here.[ii] AIBS former CEO Rob Gropp left the organization in November 2020. The current CEO is Scott Glisson.

A review of the book, Ethics and Practice in Science Communication[iii] by Susanna Priest, Jean Goodwin, and Michael F. Dahlstrom was published in the August 2020 issue[iv] of *BioScience*. AIBS President and Director of the Oak Lake Field Station, Charlie Fenster notes that the book articulates arguments for the importance of scientists to communicate while the book review provides key points for arguing the importance of science communication to one's administrative superiors.

OBFS joined several other scientific societies in endorsing a letter written by current and past Presidents of AIBS entitled, A call to Action: Marshaling Science for Society.[v] The viewpoint outlines the attack on the use of scientific knowledge, how science should inform decision making, and ways of promoting science to act logically and rationally to limit the effects of COVID-19, climate change, pollution, and the loss of biodiversity.

OBFS President, Chris Lorentz, as well as others continue working with Kelly Swing (Tiputini Field Station, Ecuador) and Dave Wagner to publish viewpoints on the critical situation facing biological field stations and marine labs. The *BioScience* viewpoint[vi] was published on 27 January 2021. There is still time to sign the petition[vii] supporting field stations if you have not already. A related letter from OBFS was sent to congressional staffers of elected leaders on the House Committee on Science, Space, & Technology and the Subcommittee on Commerce, Justice, Science and Related Agencies.

ESA reported good news for the NSF budget[viii]. In the COVID appropriations omnibus bill enacted on December 27, 2020, the annual NSF budget was increased 2.5%. The budgets of other Federal departments and agencies faced mixed results. Among the most drastic was a 7.5% cut to the National Park Service. The Biden Administration will bring many changes in leadership across Federal departments and agencies. Similarly, the new Democrat majority in the Senate means changes in leadership across key committees there. For the latest updates visit the ESA Public Policy page[ix].

The International Union for Conservation of Nature (IUCN) World Conservation Congress will now be held from 3 to 11 September 2021 in Marseille, France. The event, originally scheduled for June 2020, was postponed twice due to the COVID-19 pandemic. The IUCN Congress[x] provides a platform for scientists, policy experts, business and government leaders and professionals from around the globe to come together to share their latest insights and forge new partnerships.

The Undergraduate Field Experiences Research Network (UFERN)[xi] annual meeting will be held virtually March 1, 2, and 5 from noon – 4:30 p.m. EST. UFERN is an NSF-funded Research Coordination Network (RCN) seeking to understand the impacts of field experiences and to build a community of practitioners working together with education researchers to share and develop effective practices that are inclusive of all students. The goal of the third annual network meeting is to advance research and practice of undergraduate field education through interdisciplinary collaborations. For more information click here[xii].

For comments, additions, and suggestions, please email me at pfoster@bijagual.org. The deadline for the next newsletter is April 15.

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[i] https://www.aibs.org/news/2020/200516-2020-aibs-council-meeting.html
[ii] https://youtu.be/95JTx9fE-hc
[iii] https://press.uchicago.edu/ucp/books/book/chicago/E/bo27760792.html
[iv] https://doi.org/10.1093/biosci/biaa027
[v] https://academic.oup.com/bioscience/article/71/1/7/5994419
[vi] https://academic.oup.com/bioscience/advance-article/doi/10.1093/biosci/biaa166/6117971
[vii] https://docs.google.com/forms/d/e/1FAIpQLSdHj4ktYfUzvQY_Iz2JQ9f0Ja_dPnmHytFloQvYqjSsMVZA0g/viewform
[viii] http://campaign.r20.constantcontact.com/render?m=1122476215901&ca=5d23ad88-8c58-4b64-bc7d-573a3676a622
[ix] https://www.esa.org/public-policy/
[x] https://www.iucn.org/news/secretariat/202012/iucn-world-conservation-congress-be-held-3-11-september-2021-marseille
[xi] https://ufern.net
[xii] https://ufern.us10.list-manage.com/track/click?u=a8c1c7a7d7696115d5712e214&id=baac99fdb1&e=7ee857155e

From the National Science Foundation: Every four years, the National Science Foundation (NSF) updates its Strategic Plan. As we prepare to do this in the 2021-2022 timeframe, we invite feedback on the Vision, Core Values, Strategic Goals and Strategic Objectives in NSF's current Strategic Plan. Go to the link below to read and comment:

https://www.nsf.gov/od/oia/strategicplan/feedback.jsp?fbclid=IwAR3zJTOw4BhQqm_MHSnx_i4y9z_Cg9E6hRdcxuvDq2e0Q9roV6AADlIrePo

Station Profile: Bermuda Institute of Ocean Sciences "When Saturdays Became Learning Days"

BIOS's education department creates internship for university students sidelined by pandemic

by Amy E. Nevala, BIOS Science Communications and Development Writer

When the ongoing pandemic scuttled Maya Leighton's plans this fall to attend a university overseas, she instead enrolled for a year at Bermuda College. There, a professor noted Leighton's commitment to marine sciences and suggested a unique opportunity. How about spending Saturdays at the Bermuda Institute of Ocean Sciences, learning about coral reefs, marine microplastics, plankton, and mangrove restoration on the island?

In October and November, Leighton and fellow Bermudian students Jihad Muhammed and Iziah Tucker joined BIOS marine science educator Kyla Smith for paid internships that allowed them to learn while contributing to four ongoing research projects conducted by BIOS faculty, staff, and fellow university students. Some Saturdays they sifted coastal sand for microplastics, then identified the sizes and classes of the plastic fragments. Other days they catalogued and repotted mangrove saplings or collected mangrove propagules from Walsingham Nature Reserve. They also deployed and recovered plankton nets and learned about the island's native corals while working on an ongoing project to catalogue reef species.

Leighton, 18, who graduated valedictorian from Mount Saint Agnes Academy in 2020, called the two-month experience "extremely valuable, because I believe no time should be wasted. Personally, I feel it beneficial to fill as much time as possible with experiences, like internships, in order to help with future endeavors, such as applying to a university, getting a job or working with scientists," she said. The internship affirmed her marine science study plans, which she said she hopes to continue at a university in the U.K. in the fall of 2021.

The program, informally known as the Ocean Academy Saturday Intern Program, was the brainchild of Smith and Kaitlin Noyes, BIOS's director of education and community engagement. They reached out to administrators at the island's two public high schools and Bermuda College to identify students keen on studying marine biology but stymied by the pandemic. "This year has been a circus for students, upending their higher education plans, so we put our heads together to figure out how we could provide a program that could give them some meaningful laboratory and field experience," Smith said. The program was funded as a component of the BIOS Curriculum Enrichment Program, which includes a consortium of financial supporters (including the Centennial Foundation, a supporter of BIOS's work in public schools).

Jihad Muhammad (in black shirt) and Osei Agyapong (an intern with BIOS's Ocean Academy program) collected samples then sifted them to sort plastics from sand, plants, rocks, and other organic materials.

Research at Kellogg Biological Station (Part 1)

By Cara Barnes, Communications Coordinator

Can populations avoid extinction amidst environmental change? NSF grant to fund new Fitzpatrick Lab study

Hickory Corners, Mich. — The dual perils of habitat loss and increased extreme climate events are putting stressors on plants and animals, particularly those found in small and isolated populations. It's often not clear what determines whether these populations will go extinct or rapidly adapt to stressful changes in their environments.

Sarah Fitzpatrick (pictured below left), Michigan State University W.K. Kellogg Biological Station and Department of Integrative Biology assistant professor, is set to investigate the genetic factors that facilitate or limit adaptation to environmental change, with the help of a recently awarded grant through the National Science Foundation Division of Environmental Biology's new Bridging Ecology & Evolution program.

Genetic rescue to the rescue

The $858K grant will fund a study examining whether small populations that received an influx of new genes, through a process termed "genetic rescue," can adapt faster to a stressful environment and avoid extinction compared to those that have not. To get at that question, Fitzpatrick and her colleagues will study eastern mosquitofish (pictured below right) in a large array of outdoor mesocosm tanks, heated to stressful levels. Each population will have a known genetic background. "Mosquitofish are like the fruit flies of the vertebrate world," Fitzpatrick notes. "We can manipulate and study their evolutionary history and watch how that plays out in real populations in semi-natural conditions in real time."

The researchers plan to track changes in genes and in the number of fish in each tank over several years, and test whether populations that previously received new genes avoid extinction and resist heat better than populations with lower genetic diversity.

"This is important because genetic rescue is typically used as a last resort strategy when a population is on the brink of extinction," says Fitzpatrick. "But, if we can show that introducing new genetic variation can speed up adaptation to environmental change, it could have major implications for conservation and management of biodiversity."

Fitzpatrick is the principal investigator on the project, which is a collaboration between two of North America's premier biological field stations; MSU's W.K. Kellogg Biological Station and Archbold Biological Station, located in central Florida. Co-PIs are Archbold biologist Betsie Rothermel and Gideon Bradburd, MSU Department of Integrative Biology.

Research at Kellogg Biological Station (Part 2)

By Cara Barnes, Communications Coordinator

Kellogg Biological Station's Sarah Evans garners promotion, nabs major grant to study drought effects

Hickory Corners, Mich. — It's been an eventful month for Dr. Sarah Evans.

Evans, a W.K. Kellogg Biological Station faculty member with joint appointments in Michigan State University's departments of Integrative Biology and Microbiology and Molecular Genetics, was promoted to associate professor effective July 1, 2020.

"The KBS community congratulates Dr. Sarah Evans on her tenure designation and promotion to associate professor," says KBS Director Fredric Janzen. "It is richly deserved. Sarah has contributed substantially to her field and to KBS in so many ways, of course with her research, but also through her mentorship and other activities, including the promotion of science through the arts."

NSF funds study on soils' drought responses

Recently, the National Science Foundation's Division of Environmental Biology awarded Evans and her co-investigators a major grant to study the impact drought conditions have on the carbon cycling process of soils. The three-year, $1.4 million grant will enable Evans and her colleagues to study how soils respond to a dearth of rain, and then create predictive models that could inform responses to climate change.

"What's unique about this project is that it integrates measurements and modeling," Evans says. "Accurate predictions of carbon cycling and climate change will be essential for human adaptation and mitigation efforts." "Sarah was able to secure major funding and very quickly develop a large and productive lab as a new assistant professor, recalls Jeff Conner, KBS faculty member and former interim director. "She has already become a leader in the field of microbial ecology, where her work is distinguished by its strong foundation in fundamental ecological concepts as well as the breadth of crucial microbial-plant interactions studied."

About Kellogg Biological Station

As Michigan State University's largest off-campus educational complex, KBS has put its land-grant values into practice for nearly a century, providing the public with examples of science's crucial role in sustaining natural and managed communities. KBS students and faculty work to understand and solve real-world environmental problems for a better tomorrow. To learn more, visit kbs.msu.edu.

In the News

Shoals Marine Laboratory -Tern Conservation Program:

Sharing quarantine with endangered seabirds
This summer, during the COVID-19 pandemic, three scientists studying endangered seabirds found themselves on an island off the New Hampshire coast, which they shared with thousands of birds - and no one else. New Yorker magazine contributor Kelefa Sanneh talked with Liz Craig, Aliya Caldwell, and Beckley Stearns, from the Shoals Marine Laboratory (run by the University of New Hampshire and Cornell University), about their unique sojourn on the terns' breeding ground at Seavey Island.
https://www.cbsnews.com/video/sharing-quarantine-with-endangered-seabirds/

Jasper Ridge Biological Preserve

New colleagues, new friends, new collaborations, and new educational materials!
Jorge Ramos, Associate Director for Environmental Education, Jasper Ridge Biological Preserve, Stanford University, Ben Bravos, Preserve Resources Manager, Center for Environmental Inquiry, Sonoma State University, and Angie Patterson, Ph.D. candidate at Columbia University, and Master Science Educator at Black Rock Forest upped their virtual educational game by diversifying the knowledge used for The Virtual Field into an array of activities and classes.
https://jrbp.stanford.edu/news/new-colleagues-new-friends-new-collaborations-and-new-educational-materials

The Center for Advancing Informal STEM Education (CAISE) blog

For the past five years, an interdisciplinary team of social and natural scientists and educators from Texas A&M University and Colorado State University has been working to understand how field stations, long unrecognized as informal learning institutions (ILI), provide STEM learning opportunities to the general public and moreover, how field stations fit into the broader ILI landscape. Read their results gleaned from 223 interviews with FSMLs describing informal educational programs and their impacts.
https://www.informalscience.org/news-views/informal-stem-learning-biological-field-stations

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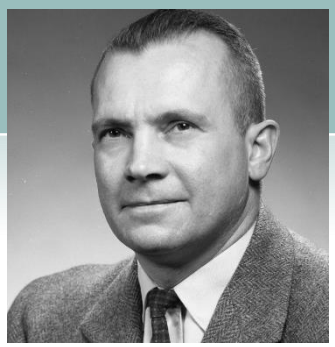
Can't wait to travel?

Do some armchair traveling to the location of our 2022 Annual Meeting at Central Michigan University's Biological Station on Beaver Island; located on the largest island in Lake Michigan.

CMU's Beaver Island sunrise to sunset



George Lauff, left
Jim Layne, right

In Memoriam by Art McKee

George Lauff

George Lauff (former Kellogg Biological Station Director) was a scientist, educator, and administrator who was effective from the state to national level as well as across many biological disciplines. I first met George in the mid-70s at ESA meetings and NSF reviews and was impressed by his mix of common sense, creativity, and leadership skills, enough so that I asked him to serve on our National Advisory Board of the Andrews Experimental Forest. He accepted and was quickly selected by the Board members to serve as chair, which he did for several years. George quickly became a mentor and friend, offering what proved constructive advice for the expanding research program at the Andrews Forest and wisely coaching me how to handle a potentially delicate situation with the Dean of the College that housed the Program.

That interaction with George led to being invited by him in the late 1970s to participate in the early Long Term Ecological Research (LTER) planning workshops that NSF had asked him to lead. LTER's initial structure was largely a result of George's leadership of these planning workshops. Thirty-five-plus years later, LTER remains a continuing legacy of George's organizational and research design skills.

There was, however, a serious interest of George's that predated LTER by many years, and to which he was a huge contributor: the Organization of Biological Field Stations. A survey of the archived minutes of OBFS meetings from the early 1970s through the 1980s makes it clear that George was a significant force shaping the evolution of OBFS: actively inviting marine labs to join OBFS; personally taking on the role of contacting/recruiting field stations that others suggested should be invited; and serving on the NSF panel for what evolved into today's Field Station and Marine Lab Special Competition (FSML). One example of George's leadership in OBFS stands out. Today's Field Station and Marine Lab (FSML) funding program used to be divided into two separate programs with field stations and marine labs enjoying funding on alternate years. In 1983, a U.S. Senator whose state had a major marine lab, directed NSF to eliminate the biennial program for field stations and make the support for marine labs an annual event.

Upon learning about this threat to field stations, George quickly drafted a proposal for a workshop to prepare a white paper that would argue for continuing NSF's support for both field stations and marine labs on alternate years. That proposal was funded, and a workshop was held in October of 1984 at George's Kellogg Biological Station, which produced a report entitled, Research Needs of Biological Field Stations.[1] I remain proud to have been a participant in that workshop, and was impressed by George's guidance through the development of the white paper – he knew how to bring the participants to consensus and draft the argument in a targeted, effective way. It was submitted to NSF in the late Winter/early Spring of 1985 and triggered lengthy discussions. Those discussions resulted in NSF combining the two competitions into an annual one that would address the needs of both field stations and marine labs, which continues to this day. More at https://www.kbs.msu.edu/2019/08/lauff-obituary/

[1] Workshop: Research Needs of Biological Field Stations. 21-25 Oct 1984.

Jim Layne

During much of Jim Layne's tenure as Executive Director of the Archbold Biological Station, he was an active member of the Organization of Biological Field Stations. Jim served OBFS in many capacities and was a significant force helping shape OBFS's evolution. His quiet demeanor was occasionally misread by newcomers as disinterest in OBFS proceedings, but when Jim offered his advice and counsel, they took notice and changed their opinion.

Today's OBFS Standing Committees (e.g., Finance and Membership, Governance, Organizational Development, etc.) have evolved from those that Jim established when he was President in the 1980s. He correctly assessed the previous policy of establishing short-term, ad hoc committees as being reactionary, dealing with issues after-the-fact in what were often ineffective ways and not providing the organization with needed long-term planning and guidance. The subsequent growth and development of OBFS and its improved relationship with NSF was fostered, in no small part, to Jim's leadership. Learn more about his legacy at https://archboldedublog.org/2018/04/03/dr-james-n-layne-collection-a-look-at-the-ecological-history-of-highlands-county/

Events

NEON-OBFS Live from the Field event:
Carbon Storage and Cycling

Monday, April 12th
11am-12 pm PST/2 pm-3 pm EST

Registration Link: https://cei.sonoma.edu/carbon

OBFS will be partnering with the National Ecological Observatory Network (NEON) to host one of four Live from the Field events this spring semester. NEON is a long-term, continental-scale, ecological observation facility funded by NSF and operated by Battelle that offers a variety of open ecological data from 81 field sites across the United States. At this event, three researchers will talk about how they used or are using NEON data from different NEON field sites to examine carbon storage and cycling. More specifically, Dr. Geoffrey Parker, Principal Investigator and Senior Scientist for the Smithsonian Environmental Research Center, will be discussing *Tracking stocks and changes of forest carbon with remote sensing;* Dr. Angela Possinger, Postdoctoral Associate at Virginia Tech, will be discussing *Soil carbon cycling and soil carbon-climate feedbacks;* and Dr. Will Wieder, Research Scientist, National Center for Atmospheric Research & University of Colorado Boulder, will be discussing *Measuring and modeling carbon cycle changes at Niwot Ridge, Colorado*. Save the date and stay tuned for more! Learn more at https://thevirtualfield.org

We would love to feature your field station! Send articles (350 words) and photos to newsletter@obfs.org

Next deadline is April 15, 2021

Newsletter team: Editor, Sarah Oktay; compiler & reviewer, Vanessa Trujillo; content & reviewers: Lisa Busch, Philippe Cohen, Paul Foster, Chris Lorentz, Stacy McNulty, Lara Roketenetz, and Rhonda Struminger.

Growing Threats to the Scientific and Educational Legacies of Research Stations and Field Courses

Kelly Swing, Elizabeth Braker, Peggy Fiedler, Ian Billick, Christopher Lorentz, and David Wagner. *BioScience*, biaa166, https://doi.org/10.1093/biosci/biaa166
Published: 27 January 2021

Share and sign the petition "Field Stations and Field Courses Imperiled by Financial Concerns"

https://docs.google.com/forms/d/e/1FAIpQLSdHj4ktYfUzvQY_Iz2JQ9f0Ja_dPnmHytFloQvYgjSsMVZA0g/viewform

A comparative study between outcomes of an in-person versus online introductory field course

Alexandra I. Race, Maria De Jesus. Roxanne S. Beltran, and Erika S. Zavaleta. *Ecology and Evolution*
https://doi.org/10.1002/ece3.7209 Published Feb. 8, 2021