

A close-up photograph of several blueberries on a branch, surrounded by green leaves. The berries and leaves are covered in small, clear dew droplets, suggesting a morning scene after rain or dew. The background is softly blurred, focusing attention on the foreground elements.

Kent Island Annual Report 2019

-Fred Field

Letter From the Director

What a great year it has been! On December 30, 2018, Ian and I experienced the birth of our son, Reid. Having Reid with us on Kent Island certainly changed our summer experience. Thankfully, Reid was very tolerant of being in a baby carrier grubbing for storm-petrels, capturing bumblebees and surveying plants. We are excited for him to grow up on Kent Island and follow in the footsteps of previous directors' children.

The 2019 summer on Kent Island saw research and writing by seven Bowdoin students, one undergraduate student from Bucknell University, and an undergraduate and a graduate student from the University of Guelph. This was also the inaugural summer of our Cannel Fellowship, which thanks to the late Peter F. Cannell '76's friends and family, will support a Bowdoin student each summer on the island. We had research visits by Professors from Kenyon College, Bucknell University, Williams College, the University of Windsor, University of Guelph, the Canadian Wildlife Service and Bird Studies Canada. We collected data to contribute to the storm-petrel, savannah sparrow, and tree swallow long-term datasets. In addition, we initiated a new long-term study on the plant-pollinator network of the island. We have finished the renovation of the Warden's House with the support of Patty and Andy Towle, and completed a full renovation of the Captain Gillett to be art studio space thanks to the Dorothy Ann Foundation and the Towles.

With the Gillett renovation I am committed to continuing to build the artist-in-residence program on Kent Island by bringing professional artists to the station whose work communicates science and environmental issues. I believe that these artists can serve as a much-needed bridge between the scientific community and the general public. This summer we were joined by Hallie Mueller (Bowdoin '06, Kent Island '04) whose work highlights the fragility of nature. Hallie was a wonderful mentor for all of our students in her perspective on Kent Island and our human relationship with nature. We look forward to bringing more professional artists to the station in the years to come.

In October, *The Henry L. and Grace Doherty Charitable Foundation, Inc.* awarded Bowdoin a \$1 million challenge grant to support a new Kent Island Postdoctoral Scholar. By funding a postdoc to do research on Kent Island each year, the Foundation's generous award will have a profound impact on the research program on Kent Island, particularly in the area of climate change. This new program will allow us to enhance and diversify our research, establish meaningful collaborations with other institutions and field stations engaged in this work, and provide an important resource for students interested in research careers in environmental change. Further details about the opportunities presented by this award will be forthcoming

As the snow falls in Maine we are already looking forward to summer 2020 on Kent Island!



-Patty Jones
Director of the Bowdoin Scientific Station on Kent Island
Assistant Professor of Biology
Bowdoin College

-Sylvia Bosco





Our Caretakers

The research we undertake on Kent Island and the experiences we provide for students are dependent on our Grand Manan caretakers--Allan Moses Ralph Griffin, Ernest Joy, Lester Tate, Rex Harris, Harry Green, Sydney Guptill, Myhron Tate, Bob Tate, Russell Ingalls and, now also, Chris Ingalls – who for 90 years have protected and cared for Kent, Hay and Sheep Islands. The Grand Manan community in general, but particularly the Ingalls family are our transport, our first responders, our carpenters and builders, and most importantly mentors and friends. We were thrilled to have Russell's son Chris, his wife Tiffany and their three children living on Kent Island this summer as Chris worked on the Gillett renovation and Russell and his crew finished the Warden's house renovation. We are so pleased to have Chris aboard and look forward to many more years of working with the Ingalls family and the Grand Manan fishing community. Thank you, we couldn't do it without you.

Petrels

This summer we had three fellows working full time on the long-term petrel data set. Two from Bowdoin (Manny Coleman and Neda Moussapour) and one from Bucknell (Brenna Prevelige). These three members of team storm-petrel also got lots of help checking burrows and banding birds from the rest of the summer fellows. Professors Bob Mauck (Kenyon) and Mark Haussmann (Bucknell) also visited the island throughout the summer to test new technology that will give us a better understanding of the lives these mysterious pelagic birds lead when not safely tucked in their burrows on Kent Island. To do this research, Bob and Mark are using tiny backpack accelerometers to understand the energetic costs of petrel foraging bouts, as well as energy expended in the burrows incubating and rearing chicks. The preliminary results collected in 2019 show promise. Bob and Mark are refining techniques and equipment for deployment during summer 2020.



Savannah Sparrows

2019 marked the conclusion of an exciting project the SAVS team began six years ago, focused on song learning in Kent Island savannah sparrows. Professors Dan Mennill and Stéphanie Doucet (University of Windsor) and Ryan Norris and Amy Newman (University of Guelph) and their graduate students used loudspeakers to tutor young savannah sparrows with different types of species-typical song. They conducted the first-ever experimental demonstration that wild birds learn their songs by imitating sounds they hear early in life. They also discovered that birds are more likely to learn songs that they were re-exposed to at the start of their first breeding season. The SAVS team published their findings in two papers in the journals *Current Biology* and *Animal Behavior*. Looking to the future, they will be recording the savannah sparrows across Kent, Hay, and Sheep Islands to understand how animal culture changes over time.



A wide-angle photograph of a vast field of small, purple, daisy-like flowers with yellow centers. The flowers are densely packed and stretch across the foreground and middle ground. In the background, there is a line of green shrubs or low trees under a bright blue sky with scattered white clouds. The overall scene is a natural, open landscape.

Pollinators

In response to the increasing awareness in the scientific community that insect populations world-wide are in dramatic decline, the summer of 2019 saw the beginning of a new long-term data set on Kent Island looking at the island-wide plant-pollinator network. With a monumental effort by Bowdoin student Hannah Scotch and the help of all the other summer fellows, 521 insects including butterflies, bees, flies, wasps, and beetles were collected on 21 species of flowering plants. We plan to repeat this data collection each year to understand the connections between plants and insects on the island and how those connections shift with time.

Island habitats offer a unique opportunity to study controlled populations. Kent Island provides the ability to study a plant-pollinator community without introduced European honeybees or a history of pesticide use. In addition, offshore islands are very similar to small patches of habitat in the increasingly fragmented landscapes that surround us, and can be informative in understanding the ecology of isolated populations. The limited ranges and limited resources of insects on Kent Island will help us understand how both plants and pollinators respond to habitat destruction.



This summer we had the great pleasure to welcome Hallie Mueller (Bowdoin '06, Kent Island '04) back to Kent Island. In reflecting on her work, Hallie says she used to make whimsical paintings depicting grandiose views in an attempt to convey the emotional saturation associated with being in natural places. As an avid climber and backpacker, she made art to share how it felt to experience that sense of overwhelming space and the magical inhuman energy that mystically moves through landscapes. Then in November 2018, Hallie suffered a sixty foot fall off of a cliff while rock climbing and suddenly all of that beauty made her feel vulnerable. She suffered pain and experienced healing in ways that made her feel a version of empathy for the natural world that she had never felt before. She says she became more aware of herself as part of the natural cycle.

Her paintings from this summer looked for a reflection in the shapes of a bird carcass or a stranded crab. She wonders if these complex, fascinating organisms feel self-pity or shame the way that we do. These shapes reinforce the complexity of our life-cycle—that beauty dies everyday—and yet we persist.. Hallie's asks the viewer to explore new reality that species are disappearing at alarming rates in the Anthropocene Era. See some of Hallie's work at <http://www.halliemueller.com/>

Hallie Mueller





Back row: Dan Mennill, Stéphanie Doucet, Ryan Norris, E. Newman-Norris, Eric Heisey, Jesse Dunn, Manny Coleman, Joey Burant, Max Muradian, Reid Jones Kyle, Ian Kyle

Front Row: M. Mennill, A. Mennill, Neda Moussapour, Hannah Scotch, Brie Cunliffe, Brenna Prevelige, Sylvia Bosco, Patty Jones

-Dan Mennill





Jesse Dunn ('20)

Bowdoin

2019 Peter Cannell Fellow

This summer was the inaugural year of the Peter Cannell Fellowship to support a Bowdoin research student on Kent Island. Jesse Dunn, a rising senior at Bowdoin from Waldoboro, Maine, was our first Cannell Fellow. His research was on the impacts of shell rot disease, most commonly seen in lobsters, on native Jonah crabs. In September 2017, Jesse visited Kent Island with the Bowdoin Marine Science Semester trip led by Professor Dave Carlon. The class observed a mass stranding of Jonah crabs (*Cancer borealis*) with shell disease in the intertidal zone of Kent Island. They published this observation as a note in the journal *Northeastern Naturalist*.

Shell disease, an infection of the cuticle common to many crustaceans, has long been known to affect lobster, with important commercial implications for the fishery. Recently a more aggressive form known as epizootic shell disease has appeared, possibly due to warming water. Shell disease is not well documented in Jonah crabs, and it is unclear how the emergence of epizootic shell disease in lobster may be affecting crabs. Jesse monitored the Kent island intertidal for another stranding of infected Jonah crabs. In addition, Jesse joined our caretaker, Russell Ingalls, on his boat *Island Bound* to pull traps so that he could estimate the prevalence of shell disease in subtidal Jonah crabs caught as bycatch in lobster traps. Jesse found shell disease prevalence between 15 and 19% in lobster trap samples, and also noted that shell disease was more common in male crabs and shallow water. Many thanks to Russell and his crew for their help in data collection. We look forward to many more years of Cannell Fellows on Kent Island to honor Peter's memory, and thank the Cannell family and friends for supporting this student fellowship.

Sylvia Bosco ('21)

Bowdoin

As an artist-in-residence on Kent Island, Sylvia spent two months writing about her personal relationship with the non-human world and how that relationship has recently evolved. While she says her experience at Kent raised many interesting questions that she would like to explore, the most central one is this: how can humans develop a positive relationship with the nonhuman world? Sylvia found she had grown to perceive her relationship with the environment as inherently negative. As a human being, she could only expect to harm the non-human world; her sense of environmental ethics was therefore a half-hearted effort to reduce this harm whenever the opportunity arose. Going forward, Sylvia is attempting to understand her role in the environment as an agent with a capacity for both positive and negative effects. Her shift in perspective can be summed up in the following quote from *The Ecopoetry Anthology*, ed. Ann Fisher-Wirth and Laura-Gray Street: “The environmental crisis is made possible by a profound failure of the imagination.” By failing to imagine a world in which humans interact positively and sustainably with other life, Sylvia says she believes that we exacerbate the modern spiral into ecological doom. Correcting this spiral will take a profound shift in the human understanding of their own capabilities, as well as a serious effort to rebuild our relationship with the environment. On an individual level, Sylvia spent the summer writing that personal relationship back into positive existence. Her final collection, *No Tongue Can Tell*, is a documentation of that rebuilding process. It is an attempt to reconcile various roots, and to see where others lead. Most importantly, it is an attempt at learning what it means to be a human in a non-human world. Over the course of the summer, Sylvia developed a love and talent for plant identification. She became the go-to person for Hannah Scotch to check the identifications of plants for the plant-pollinator network. Sylvia’s poems, such as *Bird, Beating* (right) and those of the other artist-in-residence, Brie Cunliffe, will hold honored places on the walls of the Kent Island outhouse for many years to come.

Bird, Beating

Up from the earth, I pulled
my strange harvest:

a storm-petrel,
bird rendered as fruit,
as root/tube,
as beating life, soft
in my hands.

Yielded from only an hour’s work,
from finger-arm-shoulder extended
into that dark tunnel, and the recoil,
astonished, from sharp beak,
this bird
was sweeter to me than any words
I could write
attempting to describe it.

Yet,
the holding of this bird
-- the weight of it --
felt entirely unnatural.
It should not be allowed,
I thought,
for me to hold this.
To touch it, even.

The bird was trembling; so was I.

And we sat there with our fears,
the two of us, beating,
for a little while.





Neda Moussapour ('22)

Bowdoin

Neda was a member of team-storm petrel and conducted her independent project on variation in petrel egg size. In other bird species, egg size is correlated with lay date, hatch date, and offspring survival. Neda's independent project examined the relationship between egg volume and lay-date, hatch success, hatch-date, adult size, and chick size. Neda measured 130 petrel eggs this year. Neda found no significant correlations between egg size and lay-date or adult size. A previous Kent Island student, James O'Shea (Bowdoin '20, Kent Island '18) is expanding Neda's study to examine changes in egg size across decades for his honors thesis advised by Professor Patty Jones. James has found that over the last 15 years storm-petrel eggs on Kent Island have gotten 3% larger on average and lay date has shifted 9 days earlier. This summer, Neda could always be found with a smile on her face and was one of our most consistently wonderful cooks.

Brenna Prevelige ('20)

Bucknell

Brenna was our summer fellow from Bucknell University where she works in the lab of long-time Kent Island researcher Mark Hausmann. As well as collecting the storm-petrel demographic data, Brenna's independent project this summer was spearheading Mark and Bob Mauck's (Kenyon College) preliminary deployment of accelerometers on storm-petrels. Although well understood in terms of breeding and nesting, little is known about petrel foraging behavior. Accelerometers have the potential to shed light on foraging behavior and energy expenditure. By using the vector of the dynamic body acceleration, energy expenditure can be calculated and paired with mass measurements of birds post-foraging to determine food obtained per energy cost. This data, along with Hausmann lab analysis of oxidative stress, can determine the metabolic cost of flight and identify high-quality individuals who forage efficiently with minimal cost to self-maintenance and therefore future reproductive success. Brenna blended seamlessly into our predominantly Bowdoin group of students, emerging as a natural leader, and was the favorite of the Mennill-Doucet and Newman-Norris children for her spontaneous willingness to tickle and chase.





Hannah Scotch ('22)

Bowdoin

Hannah led the initiation of data collection for the plant-pollinator network. We hope that this will be a long-term research program for which we will collect data every year. Each day (when it was not too cold and rainy for the bees), Hannah packed up pollinator collecting kits and sent all of our summer fellows out in teams of two to collect insects on flowers all over the island. Students brought back live insects in jars and samples of plants that they had identified to the best of their abilities. Thanks to this project, all of our students learned to identify most of the flowering plants on the island and became experienced at using the Newcomb's Wildflower Guide. Hannah would then identify the insect, and over the course of an independent study with Patty this fall, Hannah has put together the first plant-pollinator network for Kent Island. The learning abilities of pollinators can impact the consistency with which they visit particular plants, and thereby has the potential to shape their role in plant-pollinator networks. To investigate the connection between learning and network connectedness, Hannah tested the color learning abilities of 5 frequently captured insect species (3 wasps and 2 bumblebees) in the lab on Kent Island. She and Patty are working on writing a manuscript describing how learning abilities of flower-visiting insects shape and are shaped by their connectivity in the Kent Island plant-pollinator network.

Brie Cunnliffe (‘22)

Bowdoin

As artist-in-residence, Brie explored the power of story rooted in place. Brie worked in genres including flash fiction, short story, creative nonfiction essay, drama, and poetry. Her final portfolio, organized as a map, grouped works of different styles and themes by the places on the island they are tied to, as an attempt to communicate the complex and interconnected truth of Kent Island. She and Sylvia Bosco displayed their work on campus over Parents’ Weekend in October in Smith Union, and Brie used a large map of Kent Island to tie her works together. Some of Brie’s works were grounded in the history of the island; while others speculated on the uncertain trajectory of a future threatened by climate change and environmental devastation. Much of her work stemmed from the research other fellows were engaged in this summer: essays on fisheries, poems of island forests and pollinator surveys, short stories about burrowing storm petrels. Brie says she “sought to explore the role of the landscapes that we walk through, the way they shape our sense of the world; the ways we see ourselves mirrored in them; the ways we coexist with or exploit their wealth; the ways we are changed by the beauty we witness. On a place like Kent Island, as we seek to better understand our world, whether through science or story, it is clear that all things are interconnected; my portfolio seeks to illustrate these ties.” Below is Brie’s poem inspired by field work with Max collecting forest survey data.

Rules for Island Forests (excerpt)

- V. Paper birch peels even when young
trees no taller than a raspberry vine
one tender year of stored sun and water
begin to tithe off their skin
slipping off rings
as if they could fool the feller
(as if they could shed the years
and so live forever)

VI. White spruce, when pressed, will yield
sweet sap in hidden caches
a fresh immortal perfume
advent on the tongue

VII. Below, the paired greens can bend and seem
clover or wood sorrel
whorled-wood aster or goldenrod
wild lily of the valley or false Solomon’s seal
there are little tells
shibboleths to speak
the names of things, set down
(presence or absence)
on the page

VIII. There are depths and tallies to be made
of presence/absence, of height
of dominant canopy
and a prophecy, too:
succession.
but before we can give that word,
know that—
- IX. Saplings grow best unchoked and sheltered
you will find them,
light-sick
by the thousands
in the new spruce grove

X. Know that the understory is returning
though the dominion of the ferns is slow to unravel
(it may linger a while.)
the spruces are threading out evergreen resurrection
in the wet shelter of the grove
and in the storm-written inner island
blowdown translated
is just more light
more room to grow

The question of succession—
guesswork, prophecy.
hope.

First you must know what takes root
and if veins, lobes, branching, catkins and bark and riddles
leave you unsure,
taste and see.
the story is not over.





Max Muradian ('22)

Bowdoin

Max spent his summer surveying plots across Kent Island to understand how the plant life is recovering since the eradication of snowshoe hares in 2007. In 2008, Kent Island fellow Nathan Elliot (Bowdoin '09) surveyed plots across the entire island to set a baseline for forest succession immediately following hare removal. This summer, Max repeated Nathan's study, revisiting 371 of his 10 x 10m plot and replicating his survey methods. Like Hannah, Max has spent this fall doing an independent study with Patty to focus on data analysis and writing up his results. While birch seedlings were common in 2008, in 2019 balsam fir seedlings have become the most common. In agreement with studies from other sites, Max found that plots with sphagnum moss present have more seedlings than areas without sphagnum moss. The moss may hold water and nutrients enabling seedlings to germinate. In accordance with the removal of herbivores, 2019 had more saplings present in plots across the island than in 2008, with the most regeneration occurring in the balsam fir forest. Max also found that across the island there is a greater diversity of understory plant species than there was in 2008. We will look forward to surveying these plots again in another 10 years to see how they continue to change.

Manny Coleman ('22)

Bowdoin

Manny was the third member of team petrel this summer and spent much of his time collecting data for the long-term demography dataset. In the process, Manny became interested in how the different types of disturbances to petrels caused by researchers influences their breeding success. Since repeated researcher disturbance has been found to increase nest abandonment and reduce hatching success in many bird species, Manny studied whether different levels of disturbance would have similarly detrimental effects on storm-petrels. This is a difficult study to conduct, as determination of whether or not a nest has been abandoned inherently requires some disturbance of the nest. This data is very helpful for us as we work to minimize disturbance to all of the wildlife on Kent Island, but continue to collect invaluable data on these systems. We hope in the future that technology such as RFID tags will allow us to monitor which petrels are visiting which burrows each year with as little disturbance as possible.





Eric Heisey ('21)

Guelph

Eric is an undergraduate student at the University of Guelph. He is completing his honors thesis in the Norris lab, collecting data for Kent Island's long-term savannah sparrow nesting project. Eric could be found most days working with PhD student Joey Burant searching for nests and capturing sparrows in order to band individuals and record morphological measurements. He also helped survey nearby Sheep and Hay Island for dispersing sparrows. The data collected this summer will be used in his honors thesis, where he will investigate how pre-breeding temperatures affect plasticity in egg laying date. Eric is also an avid birder, and he recorded 131 bird species on Kent Island over a nine-week period. These observations were submitted to eBird, a citizen science database, to which decades of bird records from Kent Island have been submitted thanks in part to a recent effort by Brendan Murtha (Bowdoin '21, Kent Island '18), and Jeff Cherry (Bowdoin '79, Kent Island '79 & '80) to add Kent Island's and Chuck Huntington's historical records to eBird. Over the course of the summer Eric taught the other student fellows on Kent Island to identify the most common birds by song.

-Eric Heisey

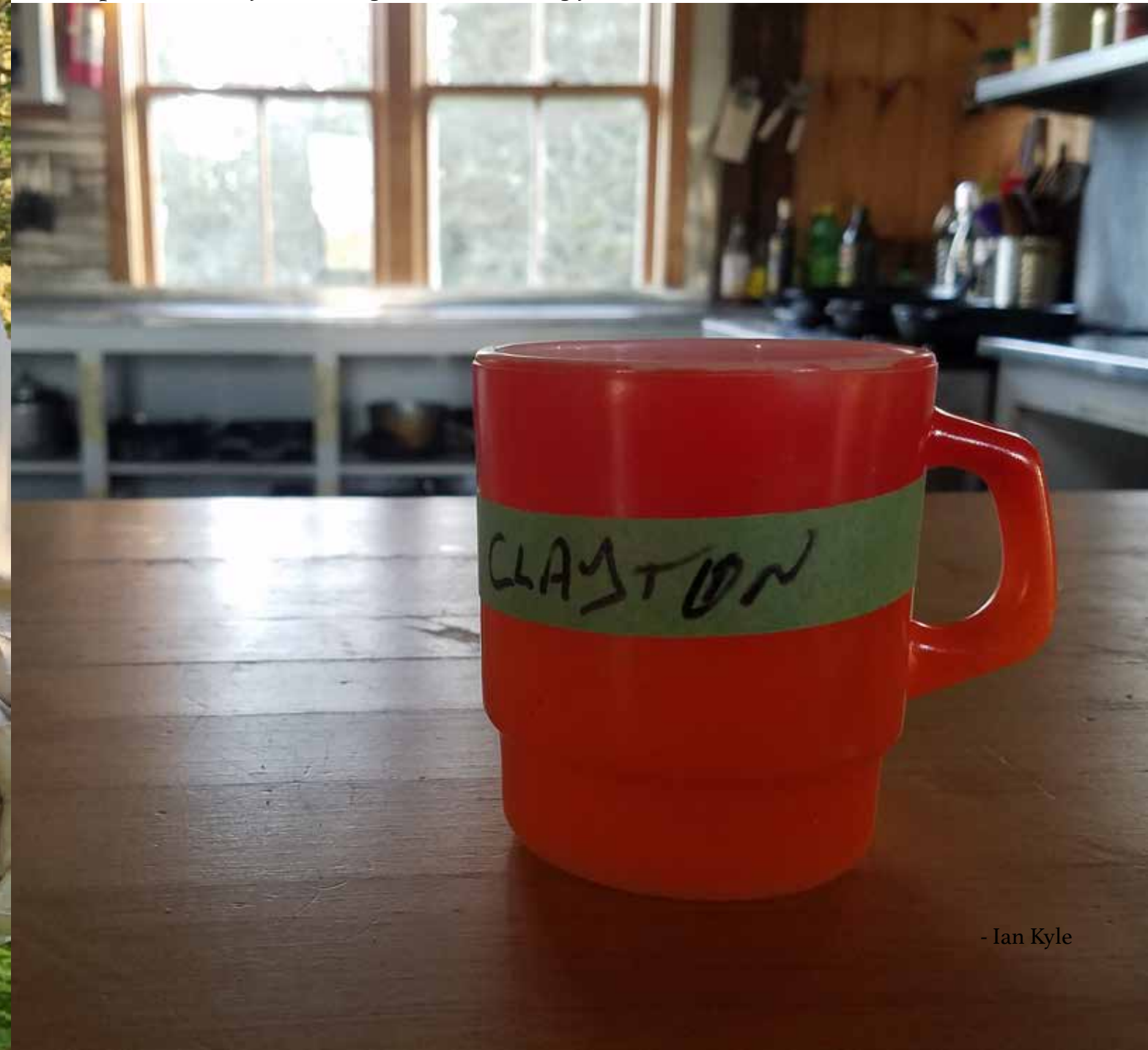


Clayton Rose ('80)

University of Chicago

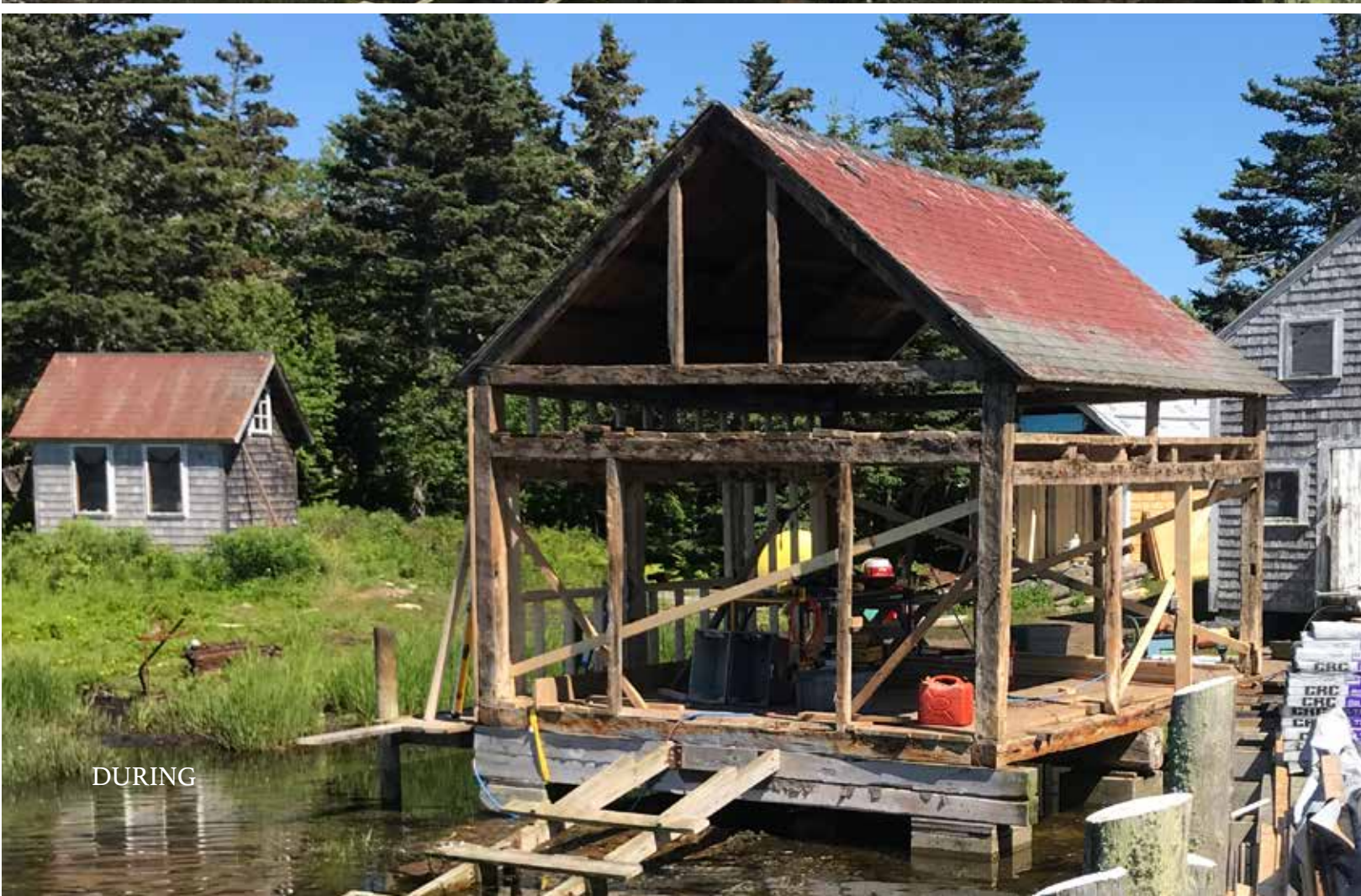
15th and current President of Bowdoin College

Clayton Rose, the current president of Bowdoin College, made his first visit out to Kent Island this summer. Clayton grew up in California but spent his teen summers backpacking in Montana, therefore he was prepared for, and comfortable in, the rustic living conditions on Kent Island. Over his three-day trip Clayton enjoyed the boat ride out aboard Russell Ingalls' Island Bound, and participated in grubbing for storm-petrels (left) and capturing pollinators. Clayton was found in the kitchen making grilled cheese and doing dishes with the student fellows. He took a rainy afternoon to walk the island from end to end. We really enjoyed having Clayton visit and discussing with him the unique role of Kent Island summer fellowships in a Bowdoin education. We hope to have Clayton visit again in the coming years.





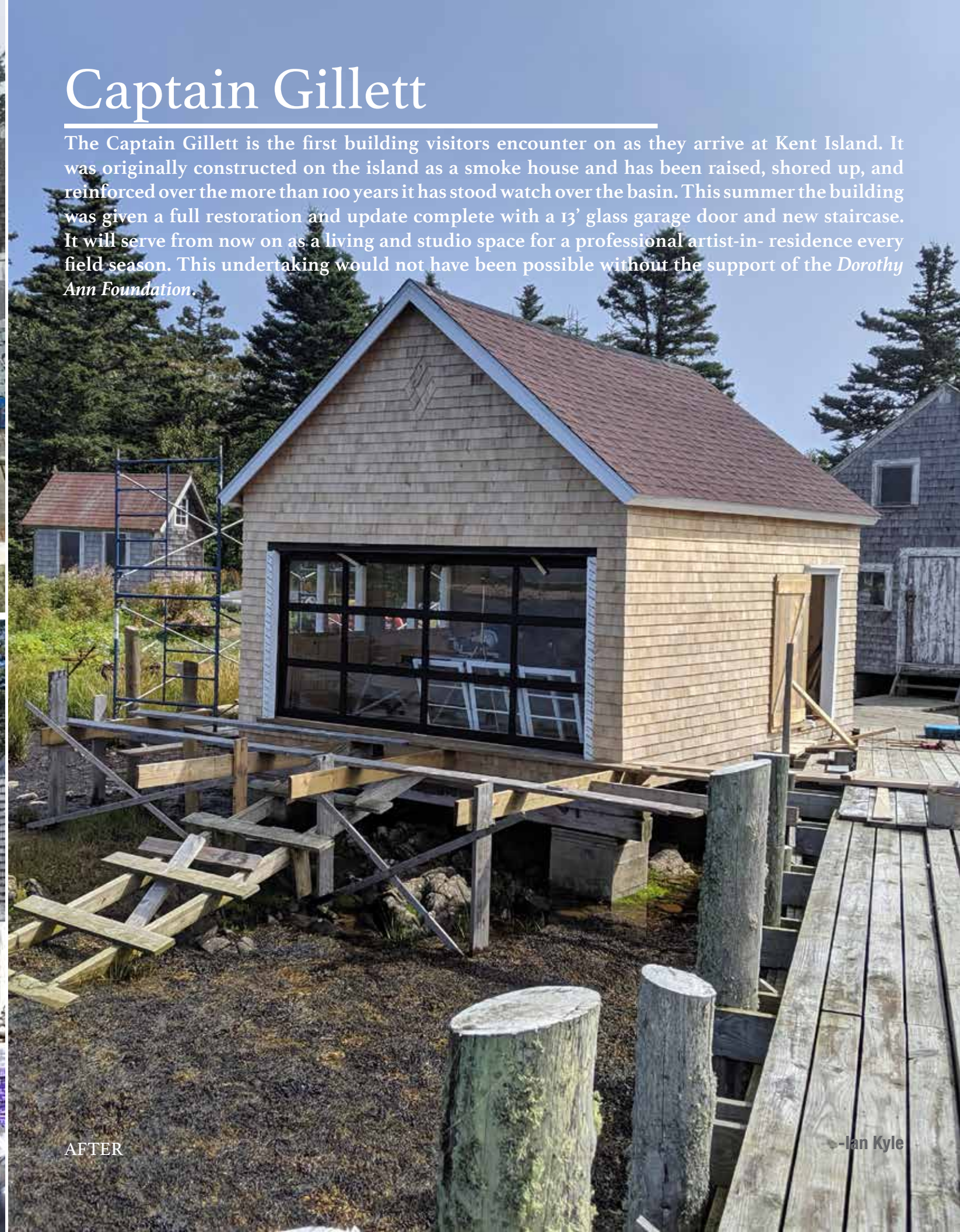
BEFORE



DURING

Captain Gillett

The Captain Gillett is the first building visitors encounter on as they arrive at Kent Island. It was originally constructed on the island as a smoke house and has been raised, shored up, and reinforced over the more than 100 years it has stood watch over the basin. This summer the building was given a full restoration and update complete with a 13' glass garage door and new staircase. It will serve from now on as a living and studio space for a professional artist-in- residence every field season. This undertaking would not have been possible without the support of the *Dorothy Ann Foundation*.



AFTER

-Ian Kyle

Doherty Kent Island Postdoctoral Scholar

The Henry L. and Grace Doherty Charitable Foundation, Inc.

In October 2019, *The Henry L. and Grace Doherty Charitable Foundation, Inc.* awarded the College a \$1 million challenge grant to support a new Doherty Kent Island Postdoctoral Scholar Program. This fund and its match will support a recent PhD graduate to be a 2-year postdoctoral scholar at Bowdoin and on Kent Island. The fellow will teach one course per year at Bowdoin and will conduct research on Kent Island for the summer. This postdoc will alternate between a researcher whose specialty is working with seabirds, and a pollinator researcher; for both, we expect their area of interest and expertise would include climate change. One of their important roles will be fostering collaboration between Kent Island and other institutions and field stations. Further details about the opportunities presented by this award will be forthcoming.







-Fred Field