

A lush green forest scene with tall trees and dense foliage, serving as the background for the report cover.

KENT ISLAND ANNUAL REPORT 2018

Letter From the Director

2018 marks my inaugural season as the thirteenth director of the Bowdoin Scientific Station on Kent Island. 2018 was a very busy summer with eleven undergraduate projects, six class trips, infrastructure projects, and the retirement of Mark Murray ('75). I would like to take a moment in the opening words of my letter to express my deepest thanks to Mark. Mark retired at the end of June after 25 years as the station's Caretaker and proverbial glue that bound the history and infrastructure of Kent Island together. Mark's influence can be felt and seen on every square inch of the island, and we wish him success as he takes on what comes next.

The 2018 summer on Kent Island abounded with artist pursuits, ambitious scientific projects, delicious food, and community. With over 100 visitors from 12 different undergraduate colleges, graduate programs, and Grand Manan High School, the diversity of perspectives and knowledge made for a truly enriching summer. It also laid bare just how important Kent Island is in the lives of all who have visited, and how vital it is to keep the strength of the island intact for generations to come. From declining petrel populations all over the North Atlantic to the effects of rockweed harvesting on intertidal communities, researchers on Kent Island are studying and communicating the subtle and not so subtle shift of the world around us. The addition of artistic viewpoints furthers our understanding and perspective. This summer saw our student artists in residence joined by a Bowdoin alum and Indiana University art professor Stefan Petranek, and the annual visit from a graduate program in poetry led by Alison Deming from the University of Arizona. I gained a lot of perspective this summer on the importance of this place and the gravity of the task of Director. For this opportunity I am humbly and wholly grateful.

A central focus of my summer was establishing my own research program. Students and I surveyed the pollinators on Kent Island, and studied their behavior on flowering plants. Kent Island offers a unique opportunity to study pollinator communities in an environment without pesticides, herbicides, fertilizers, and introduced species. I hope that the island will become a control site from which I can study pollinator behavior on a range of plant species including commercially important low-bush blueberry. I am very excited to bridge my work with bumblebees in the lab on campus with this unique environment.

In 2018 we also made great strides in improving and restoring the infrastructure of the island. Through the very generous gift of Patty ('76) and Andy Towle the island saw a fivefold increase in solar power generation with systems upgraded at both the dorm and lower lab. This enabled 2018 to be a summer when we did not turn the generator on once! The Warden's House renovations are also nearly complete with the basement fully secured, new siding, new roofing, new windows, and insulation. Interior renovations will be completed this upcoming spring.

As Ian has been saying in response to the question of how our summer went... "we'll do it again". What a great way to begin. We are looking forward to many fruitful years.

A large, elegant handwritten signature in white ink, reading "Patty Jones". The signature is written over a background of a blue body of water with a small boat visible in the distance.

-Patty Jones
Director of BSS Kent Island



-Ian Kyle



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Artist In Residence

Stefan Petranek is a Bowdoin grad ('97) and professor of photography at the Herron School of Art and Design at Indiana University. Stefan joined us this summer while on sabbatical to work on film projects that convey the impacts of rising sea levels due to climate change.

When Stefan was a Bowdoin undergraduate biology major, he visited the island on a class field trip. He was struck by the isolated beauty of the place and the Bay of Fundy's extraordinary tides. This summer he used the tides as a way to visualize rising sea levels in the videos he produced. His work conveys the power of the sea and the devastation of rising sea levels.

Stefan was a wonderful member of our community through his mentorship of students, participation in our island wide clean-up efforts, cooking meals with graduate students, and swimming in the basin. We hope he will come back again soon!



PETRELS

The Kent Island petrels were not only part of student projects, but also a collaboration with Canadian agencies and universities. Laura Tranquilla from Bird Studies Canada made several trips to attach GPS backpacks to determine foraging areas of petrels at sea, collect diet samples, and deploy geolocators to monitor overwintering habitat. Students also worked with Neil Burgess from Environment Canada to monitor mercury levels in petrels and gulls. Rob Ronconi and Sarah Wong with the Canadian Wildlife Service and Dalhousie University led an ornithology class that conducted a survey of petrels on Hay Island.

In addition, this summer saw the return of Bob Mauck (Kenyon College) and Mark Hausman (Bucknell University) as they planned future experiments. Bob has a paper out this year in *Global Change Biology* on the effects of a warming climate on petrel populations with two other former Directors, Don Dearborn (Bates College) and Chuck Huntington, as coauthors.



-Patricia Jones

Savannah Sparrows

It was another busy summer for savannah sparrows! Dan Mennill, Stéphanie Doucet, Amy Newman, and Ryan Norris were back on Kent Island with their graduate students Ian Thomas and Joey Burant, continuing their long-term research on the savannah sparrow population. One study has been an intensive song-learning experiment to see if savannah sparrows can learn novel song types using acoustic playback, and whether birds need to be exposed to that playback both as chicks and when they return for their first breeding summer. Their paper “Wild birds learn songs from experimental vocal tutors” was published this fall in *Current Biology*, and shows that savannah sparrows do learn novel songs. This summer the SAVS team was also collecting more recordings of males singing novel songs, and continuing GPS tracking to assess sparrow migration, measuring stress hormones in sparrow blood, and examining factors impacting feather coloration.

-Dan Mennill





Pollinators

This summer Patty explored potential long-term research systems, starting studies on pollination of low-bush blueberry and blue flag iris. She identified the pollinator communities on both of these plants, and started two social learning experiments. One aspect of Patty's research program is understanding when animals use social information. It is well established that bumblebees join other bees at flowers under certain conditions in the lab. Little is known, however, about how often bees use this type of social information in the wild, and what consequences it might have for plant pollination. Using both dried pinned bees and model bees, Patty explored how the addition of these model bees to clusters of flowers affected recruitment of wild bees and seed set by the plant. She did these experiments using both iris and low-bush blueberry. Measurements of seed set are still underway, so stay tuned!





-Dan Mennill



Top: Mark Murray, Ian Thomas, Jess Kusher, Bob Mauck, Rachel Noone, JP Castells, Ali Gladwell, Joey Burant, Brendan Murtha, James O'Shea, Ryan Norris, Adam Silberberg, C. Wongconi, Sarah Wong, M. Wongconi, Rob Ronconi, M. Mennill, Dan Mennill, Stephanie Doucet
Bottom: Amy Newman, E. Norris, Hannah Konkell, Patty Jones, Ian Kyle, Danny Horne, Katie Galletta, A. Mennill



Danielle Horne ('20)

Bowdoin

Native pollinators are essential to pollination in agriculture and the environment. In order to understand what drives successful pollination, we must understand pollinator communities and behavior. Danny surveyed pollinator diversity and behavior on wild strawberry (*Fragaria vesca*), lowbush blueberry (*Vaccinium angustifolium*), and beach rose (*Rosa rugosa*). Danny also studied the behavior of different pollinator species foraging in the mixed floral communities of North Field.



-Hannah Konkel

James O'Shea ('20)

Bowdoin

James focused on two projects. First, he investigated how the proximity of nesting gulls affects levels of stress hormones in petrel blood. James hopes to complete the lab portion of this project with Mark Hausman at Bucknell University to analyze concentrations of cortisol in blood plasma from burrowing sites with varying densities of nesting gulls. James also worked with Brendan to create the breeding passerine survey for Kent Island. They hope to continue this work creating a breeding bird atlas of Kent Island to familiarize future students with the resident passerine species, and to provide data on breeding habitats and species richness.





-Hannah Konkel





Jessica Kusher ('19)

Kenyon

Jess is an undergraduate at Kenyon College. She led the collection of demographic data and banding efforts for the continuation of the long-term dataset on storm petrels initiated by Chuck Huntington. As part of her honors thesis at Kenyon advised by Bob Mauck Jess is studying how the sizes of petrel eggs have changed over time. Jess also played a crucial role in facilitating research by our collaborators from Bird Studies Canada, the Canadian Wildlife Service and Environment Canada by locating and monitoring burrows for them to study and assisting them with the attachment of GPS tags to determine petrel foraging routes.

- Brendan Murtha

John Paul Castells ('20)

Bowdoin

JP is a poet who used Kent Island as a place to reflect upon the next steps in his academic, poetic, and human journey. He came to Kent Island seeking clarity and inspiration for his poetry after a sequence of traumatic events in the previous year. He says that before coming to Kent Island he was thinking about the future as if his options were obstacles. His poetic work over the summer was focused on letting go of his fears. Fear of the future, of the editor, of the reader, and of life. JP greatly appreciates his time on Kent Island this past summer. He says that he has grown as a writer and as a person.





-Brendan Murtha





Adam Silberberg ('20)

Bowdoin

Adam explored techniques in impressionist landscape painting. Drawing on Zen poetry and haiku, in particular the absence of the artist from the treatment of the subject, his approach was to witness and document the passing of time in order to reflect on himself and his relationship with the world. The coastline is unique as a place of transition. Adam's work highlighted the importance of a personal and emotional relationship to a natural setting. He focused on self-reflection and slowing down. Adam explored a range of impressionist styles including those of Gauguin, Cezanne, O'Keefe, and Hopper. While focusing predominantly on oil paint, Adam also experimented with other mediums including charcoal, watercolor, and film photography.

- Brendan Murtha

Brendan Murtha ('21)

Bowdoin

Brendan worked on three ornithological projects. First was an extensive survey of black guillemot nest and abundance data to census the population of guillemots breeding on all three islands. In total he found 62 nests. Second, in a collaboration with James O'Shea, Brendan developed a survey to map the distribution, abundance, and relative density of breeding passerines on Kent Island and to link these metrics to habitat quality and succession. The survey was designed to be easily replicable and carried out in subsequent field seasons by future students. Finally, Brendan surveyed and banded adult and nestling tree swallows, recording lay, hatch, and fledge dates for each nest box. On Kent Island this summer there were nine breeding tree swallow pairs who fledged a collective total of 41 young.







Kyle D'Entremont ('19)

Dalhousie

Kyle is an undergraduate student at Dalhousie University in Nova Scotia. This summer Kyle worked with Ali Gladwell to conduct a census of the breeding population of Leach's storm petrels nesting on Kent Island for the first time since 2001. It has become increasingly important to regularly monitor storm petrel colonies as many colonies in the region have experienced a population decline of 10-30% in the last 20 years, which has resulted in the status of this species being up-listed to "vulnerable" by the IUCN in 2016. Kyle found that the Kent Island petrel population has declined 17% since 2001.



- Brendan Murtha

Hannah Konkel ('20)

Bowdoin

Hannah investigated the ectoparasites living on the Leach's storm petrel. Specifically, Hannah was interested in two separate questions: whether mating pairs have similar ectoparasite loads, and whether the storm petrel's ectoparasite loads are correlated with the genotype of their major histocompatibility complex (MHC), a component of their immune system. Hannah measured the parasite loads of the birds by inspecting flight feathers and recording the number of spots where ectoparasite damage was evident. Hannah hopes to work in the lab of Don Dearborn at Bates College to examine how the diversity of alleles of the MHC class II genes relates to the parasite loads of individual birds.



-Dan Mennill







Ali Gladwell ('19)

Dalhousie

Ali is also a student at Dalhousie University and worked with Kyle d'Entremont to census the Leach's storm petrel population on Kent Island. In addition to the census, she conducted research for her own thesis to investigate the relationship between storm petrel call activity and local nesting density. Ali deployed automated recorders in different sites every night to record the call activity and then censused local petrel density. Her hope is to establish that automated recorders can be an effective method for assessing petrel densities at sights where a census is not feasible. Ali is in the midst of analyzing over 300 hours of recordings, but she wishes she could be back emerging from the ferny jungle of Kent Island again!

- Kyle D'Entremont

Rachel Noone ('19)

Bowdoin

Rachel began her honors thesis in biology advised by Patty on the relative importance of diurnal and nocturnal pollination for lowbush blueberry. She used mesh bags to exclude pollinators either only at night, only during the day, all the time, or never. Her thesis also explores the impact of island dynamics on pollination success by evaluating seed set and fruit quality. Preliminary fruit progress checks suggested there are differences in patch conditions that affect fruit quality. Rachel is currently working hard in the lab on campus to assess the quality of resulting blueberry fruits. As part of this project Rachel is also collaborating with Stéphanie Doucet to examine color variation in flowers of different blueberry patches.





-Jesseca Kusher



Katie Galletta ('21)

Bowdoin

This summer Katie examined the impacts of removing *Ascophyllum nodosum* (rockweed) from the rocky intertidal zone. Rockweed harvesting is a contentious issue in Maine and the Canadian Maritimes, as it is largely unregulated and its long-term ecological impact is still understudied. After locating 18 plots that were cut in 2014, Katie assessed the invertebrate and algal communities in harvested and control plots four years later. Each survey consisted of recording algal data such as frond height and species richness, and the total number of invertebrates found in the innermost 1m² of the plots. She surveyed each plot three times over the course of the summer, for a total of 54 surveys (in which Katie counted 12,781 snails!).



-Patricia Jones





- Dan Mennill



- Dan Mennill



-David Israel



Solar Upgrade

This spring saw the installation of a new solar system for our main power generation at the dorm. The existing solar system was transferred to the lower lab and wharf. Overall the solar charging capacity for the island increased fivefold. Thank you to Patty ('76) and Andy Towle for their generous contribution that made this project possible.



-Unknown



Wharf

The wharf saw a major overhaul a few years back except for the section closest to the shore. This summer saw the new posting, joisting, and decking of that section. The wharf continues to be the lifeline as well as being one of the most iconic sights on the island. With vigilance and committed effort it will remain for years to come.

Warden's House

From inside-out and from top-to-bottom the Warden's House has seen nearly every inch of the structure repaired or renewed: new roof, new siding, fully reinforced foundation, new windows, new wiring, and insulation for the first time. The work was begun last summer by Mark Murray ('75) and continued this summer by the Ingalls family and some help from our summer fellows. Next spring the interior renovation will be completed so stay tuned on social media for pictures of the finished product. This epic undertaking was also made possible by a contribution by Patty ('76) and Andy Towle.





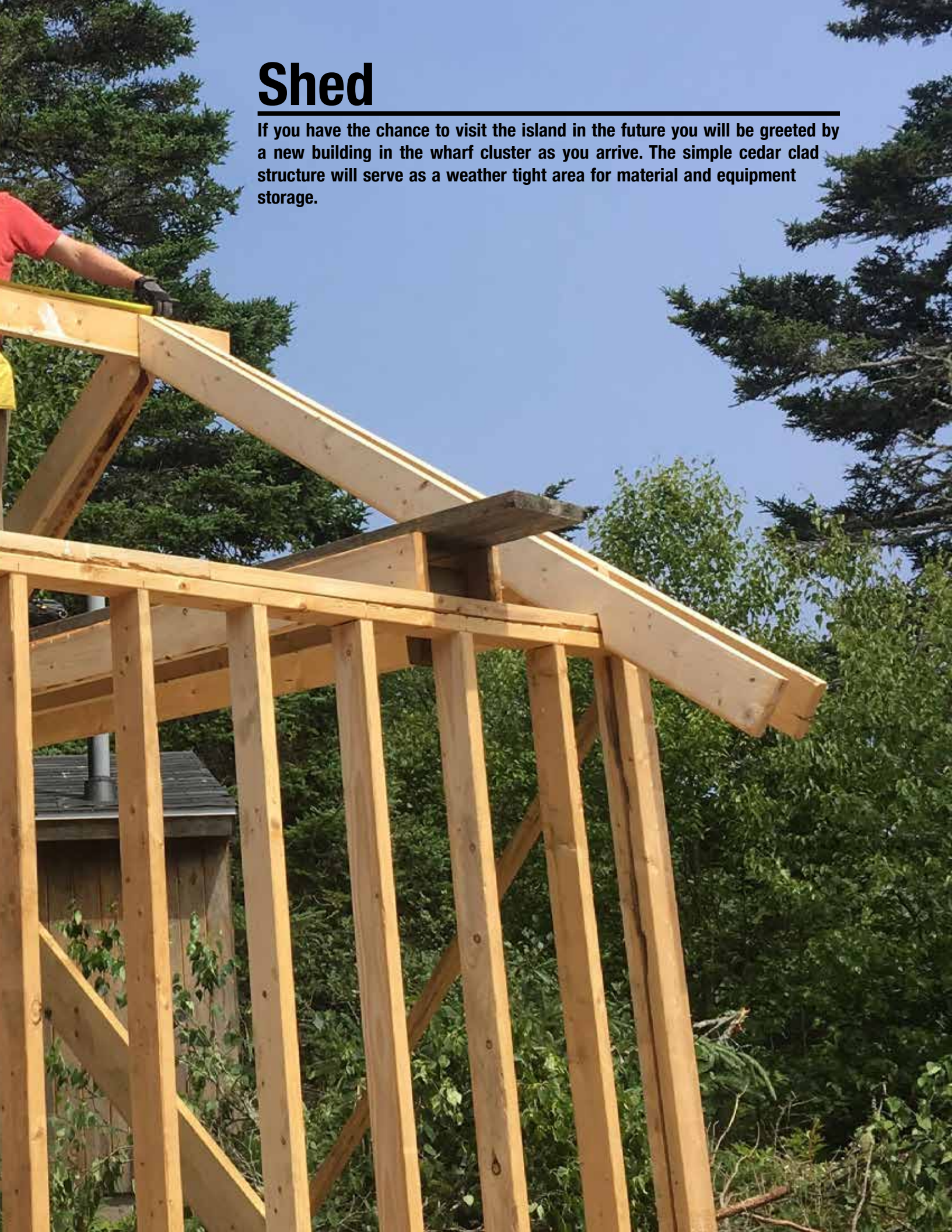
-Ian Kyle



-Patricia Jones

Shed

If you have the chance to visit the island in the future you will be greeted by a new building in the wharf cluster as you arrive. The simple cedar clad structure will serve as a weather tight area for material and equipment storage.





- Dan Mennill





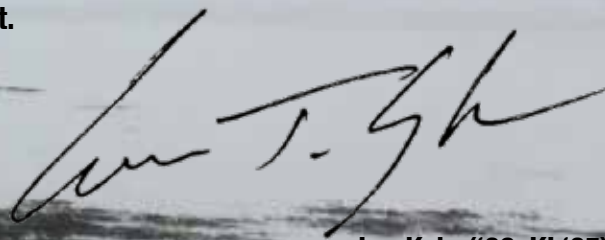
- Fred Field

Professor of Insular Polytechnology

This year marks the end of an era that began twenty-six years ago when a boat builder and carpenter came to the Bay of Fundy. It is an era of too many accomplishments to list and with a lifetime of stories to tell. Kent Island will be forever grateful for the labors of Mark Murray ('75), his legacy and contributions are felt both on and off our tiny island.

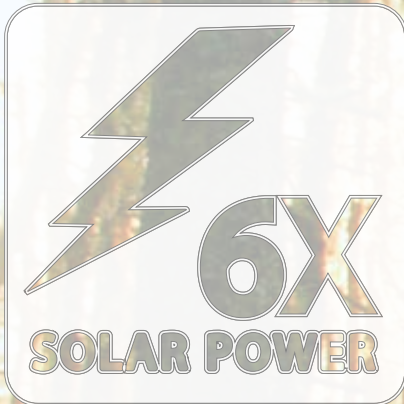
I came to Kent Island first an undergraduate fellow in the summer of 2005. During that summer Mark took me under his wing. I stole away anytime I saw Mark heading for the wharf and many an afternoon was spent scavenging weir poles from the shores of Three Island's harbor. That flotsam was put to good use during the hard but rewarding work of maintaining the infrastructure that is the backbone of Kent Island's success. This too Mark allowed me to have a hand in and, without realizing it, forever cemented my ties to Kent Island. But Mark also taught me many lessons about responsibility and humility that I would not fully appreciate for many years. He has the all too rare skill to both question and listen, to challenge and teach, and to aid without enabling. Perhaps what I admire most deeply and will miss the most is his unfathomable ableness. He is a wordsmith, historian, craftsman, captain, teacher, bard, naturalist, and friend.

As Susannah remains safely moored in the basin, and the SeaHaus prowls the weir, we wish Mark a much-deserved retirement.

A handwritten signature in black ink, appearing to read "Ian Kyle", is positioned over a background of water and a distant shoreline.

-Ian Kyle ('06, KI '05)
Assistant Director BSS Kent Island

Like a FIAM he's HTB
"The tide is everything"



-Brendan Murtha