SEASONS

SAGATAGAN Saint John's OUTDOOR UNIVERSITY

Beautiful Landscapes, Naturally

Kim Chapman & Jim Armstrong

an ecologist, a poet, a conversation

KIM: We live in a world where the shape and behavior of a thing impresses us as either beautiful or ugly. Whether we hate something or love it depends on our individual aesthetic sense, which is a product of experience and instinct—but also it depends on the nature of the thing itself, which we react to.

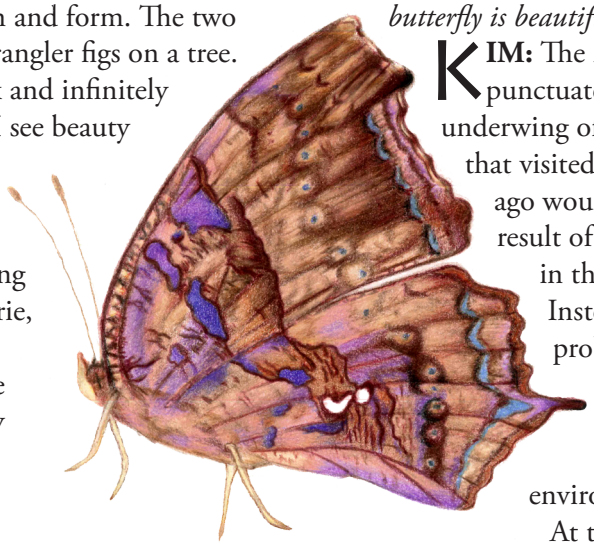
I believe that the natural world has an innate beauty based on function and form. The two intertwine as lianas of strangler figs on a tree. They interact in complex and infinitely varying feedback loops. I see beauty when I behold the dizzying array of wildflowers, wild grasses and sedges covering the dirt of a healthy prairie, or a woodland floor.

This beauty grabs me because it commands my attention. The detail and "unknowableness" of the scene is magnetic to human intelligence. We want to know, to comprehend, but can't until we study it in detail, delve into the complexity of the fabric. This is inherent beauty I believe we perceive instinctually; it is not learned.

JIM: *The relation of form to function in nature: there is a great mystery.*

It always seems to me there is a surplus, or a superfluity, to form in nature. I have just been outside, looking at a fritillary butterfly feeding on a milkweed flower. I'm sure you know this butterfly, one of the regal queens of the Minnesota sky in summer. The complex interaction of color and shape in the butterfly's wing, which is orange-tawny and which features, on the underside, a welter of blue spangles which William Morris would be envious of as sheer design.

It is hard to believe all that is necessary for mere survival and reproduction. There is nothing utilitarian about it. Likewise, one can argue that the heady scent of the milkweed flower is important to attract pollinators—yet it has none of the simplistic, cloying brashness of a synthetic dime-store perfume—it is strong but complex, beautiful to the nose as the butterfly is beautiful to the eye.



Question mark butterfly. Madeline Olson.

KIM: The minute silver comma punctuated with a dot on the underwing of the question mark butterfly that visited my yard a couple weeks ago would only by a miracle be the result of any "selection pressure" in the butterfly's environment. Instead, its namesake marking probably "came along for the ride" as a genetic hitchhiker on the back of a gene that WAS strongly favored by the environment.

At the same time, it gives lepidopterists a handle on the critter and the rest of us a chance to view something curious. It's not every day that the punctuation mark signifying uncertainty is branded in silver on the underside of a butterfly's wing. That is something worth seeing.

JIM: *You might say we like only what we are used to; we think nature is elegantly designed because we grew up with it. But that begs the question: why do we then find some things ugly? I would claim that the instinct to find nature's complexity can be so channeled as to lose sight of its original purpose. That is, part of the love of the beautiful is the love of order, of coherence: our brains are addicted to symmetry, simplicity, clarity.*

A beautiful form must make order happen for

continued on page 2

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us; that is clear. A kind of calm is inherent in our notions of beauty, though it is often coupled with an intensity or depth—which may even be disturbing. At any rate, civilized tastes may overexpose us to principles of human order so that we grow unused to the more subtle varieties found in nature, much as children given too many candies cease to like apples.

KIM: Sometimes beauty is a consequence of deeper understanding. I know the grand palette of life-forms in a prairie landscape vests that habitat with stability and resilience. In a fierce drought, a prairie containing many species of plants still gives up a crop of grass and flowers. Animals graze—though not as many as before—bees gather nectar, and so on.

After the drought, it bounces back, grass grows abundant, and wildflowers bloom prolific. The phrase, "protective complexity" describes this well. The prairie will survive and flourish again after weathering adversity because its tremendous numbers of plant species contain some that keep growing despite the drought.

Death and resurgence of individuals and entire species sustains the larger system, seeing it through good times and bad. With natural elegance, diverse wild habitats sustain themselves despite change. It is not instinctive in me to appreciate this kind of beauty. I learned through my study of the ecology of wild habitats.

JIM: *I would say your education into ecological principles has served as an aesthetic re-education, teaching you to appreciate subtleties in the landscape your ancestors would have come by just in their daily lives. People who find natural landscapes unappealing may simply be threatened by the unknown: they can't make sense of what they are seeing, so what they are seeing seems ugly. Attention is crucial to the aesthetic response, and the mind cannot attend to what it cannot understand. Here we return to the idea of function, of course: the order you perceive is often functional. You see how the land is operating as process.*

At our "natural" best, we are forces of nature too. The ancient landscapes around the world testify to a fruitful interrelationship between human business and the wider natural business. In fact, nowhere on earth—saving perhaps Antarctica—was "nature" devoid of man's shaping hand, even before the industrial age. The prairies and woods of Minnesota were full of the signs of human habitation, the bur oak savanna maintained by regular firing, the garden beds and ceremonial mounds for native agriculture, the pathways worn deep in the earth. We have always shaped nature to our ends. But our ends and our means have usually been in better balance—and our ends have included spiritual as well as physical goals.

Flowers and grasses bloom in the Abbey Arboretum prairie, a "grand palette of life-forms" that gives the landscape both beauty and resiliency. SONYA GYLSEN.

KIM: That gets at the idea of a conservation rooted in local community concerns. Communities and individuals across America are experimenting with techniques based on principles of self-reliance and local control. Examples abound: buying fruits and vegetables in season from nearby growers, revitalizing brownfields made worthless and discarded in a previous fit of economic endeavor, preserving green space amid congestion, valuing and conserving the plants and animals that elevate a mere city or farm to an intriguing bastion of biodiversity.

Really, this is nothing more than a return to the "Neolithic village" of our origins, where everything you valued was found within traveling distance on foot—long-distance trading in exotic materials being a tiny fraction of the economy of the day. It doesn't matter that this village is located in the heart of New York City: it could and should operate to the benefit of the people living there, who control their own environment and destiny.

I believe that, whether you are a supply-side auto-dealer or an aging hippie selling solar panels, when given a choice between beauty and ugliness, beauty wins hands-down. It may be that there are degrees of beauty, but people innately respond to some level of it and prefer to keep some of it around because it makes their lives more enjoyable.

JIM: *Amen to that.*

KIM CHAPMAN, *an ecologist, and* JIM ARMSTRONG, *an English professor, have been talking with each other about the relationship of culture to nature for nearly 35 years. They have collected their essays in a new book:* Nature, Culture and Two Friends Talking.

Join Kim and Jim at Saint John's On Tuesday, July 14 for an evening dialog and hike in the Abbey Arboretum (see p. 7).

Observation By Hand

Madeline Olson '17

I am the type of college student that has more doodles in my notebooks than notes. The lined pages of my biology notebook are bursting with intricately sketched trees and fish, hands and eyes, and the various topics of each day's lecture. For me, drawing has always been the best form of learning and understanding and I always assumed I was a minority in this regard. But last summer my interest in scientific exploration and passion for all things artistic landed me at a conference for the association of medical illustrators. I was surrounded by hundreds of passionate professionals in business suits, yet I didn't feel out of place. All around me these esteemed professionals were taking notes the way I do: filling up sketchbook pages with elaborate doodles as the presenters spoke.

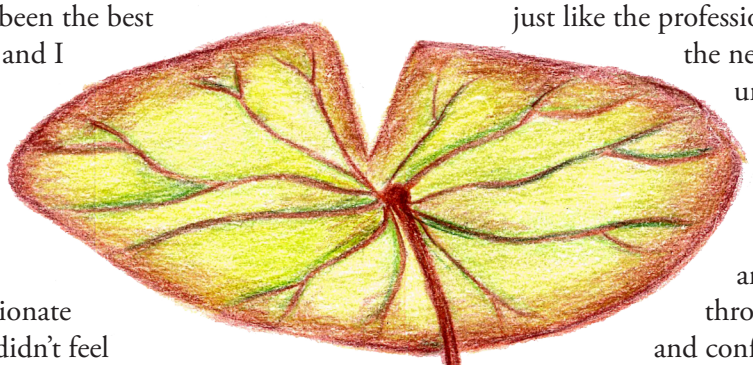
At the conference I learned that illustration expands into fields of natural science, biology, chemistry and physics, delving into concepts that need to be explored and communicated to the public. Scientific illustration captures and solves what a photograph often cannot. An animal that has gone extinct cannot be photographed, but with fossil evidence and a biological illustrator, an image can be constructed. The highly complicated molecular concepts of chemistry can be communicated to the average non-chemist through an illustration or an animation created by a scientific illustrator. The fantastical creatures from science fiction movies are drawn and animated by illustrators. A medical illustrator's work is shown in court, to depict the injuries from a car accident. In the case of two conjoined twins, a medical illustrator's image depicted their entanglement, educating some of the best surgeons in the world on how to separate them.

In a matter of days, an entire world of science and art that I didn't know existed appeared before me. I discovered that my passion for "observation by hand" was far from being a lost art. The simplicity of putting a pencil to paper fueled an entire career field of people who were determined to connect to their problems and their surroundings by drawing. Illustration, for me, had never been about abstract concepts, or a canvas of color hanging in someone's living room. Drawing is about communication, about understanding.

My biology doodles aren't just doodles anymore. I am creating a bridge between a concept and comprehension, just like the professionals. I no longer feel the need to suppress my urge to draw. Instead, I fully embrace it. I've shifted from my biology notebook to a sketchbook and now stumble through the frustration and confusion of figuring out what I'm observing and constructing a cohesive image.

I've discovered that the more I truly observe, the better my drawings become, and I begin to understand more about what I see. I use drawings to study for tests. If I can draw what I am seeing, then I know that I have learned and I understand my observations on a deeper level. Trekking across the forest trails and drawing a misshapen pine in front of me raises questions that I would not otherwise consider. Why is it shaped like that? Why are the needles that way? Drawing leads me to question and dissect what I see, turning a concept—a vague idea of nature and science—into comprehension simply by hashing out a sketch.

A photo often does not require such intricate observation, a page in a textbook may only offer an intellectual explanation. The depth of observation required to create an illustration yields an incomparable level of learning, whether you are the world's most gifted artist, or you consider yourself lacking in any sort of artistic skill. A scientific illustrator, and even the average person who ventures to open a sketchbook, has an opportunity to bridge the gap between concept and comprehension simply through observation. So I implore you: grab a pencil, grab a sketchbook and go take a look.



Water lily, underwater view. Madeline Olson.

Madeline Olson *is the summer office assistant for Outdoor U and is a junior biology major at the College of Saint Benedict. We have a feeling she'll be "doodling" a lot this summer!*

Floating Bog Islands

Dr. William Lamberts

In early May a large mass of aquatic plants parked itself on the SJU beach on Lake Sagatagan. Measuring some 20 by 100 yards, and a few feet thick, this huge clump of cattails, sedges and grasses, which many refer to as a "bog," had been spotted floating slowly northward over the previous few days.

With a permit from the Minnesota Department of Natural Resources, members of the Saint John's Abbey and volunteers spent several hours muscling it off the beach, anchoring it overnight in the shallows twenty feet offshore with wooden poles. The following day a crew of workers headed by Fr. Nick Kleespie used two motorboats to slowly push the floating bog island around "Prep point" to the east, and take it to its final resting place (it is hoped) just off the shore near the Saint John's Preparatory School soccer fields, staking it down more permanently with several long ironwood poles.

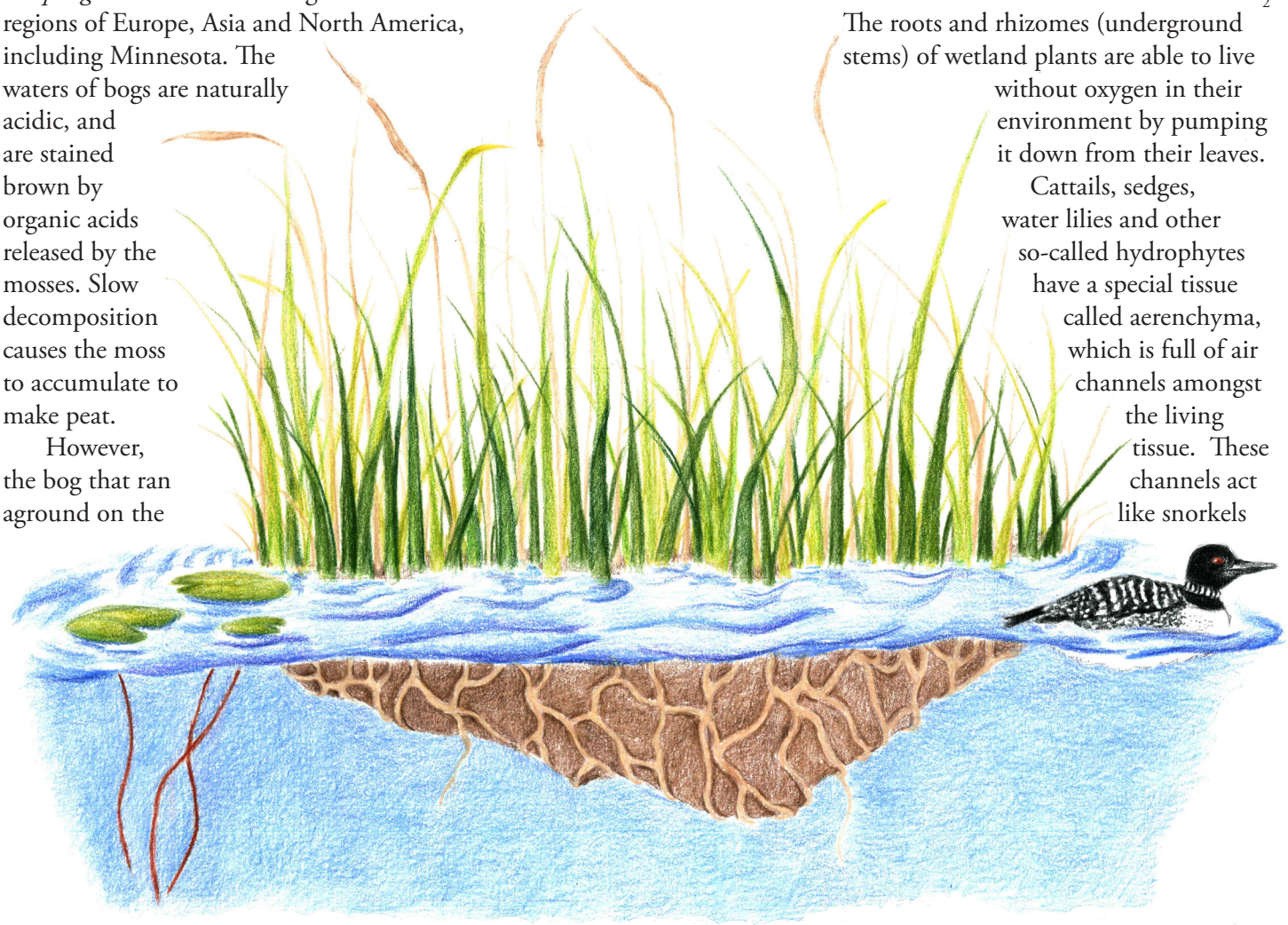
What is this bog and where did it come from? The word "bog" can mean many things. According to one use, bogs are wetlands that are dominated by peat moss or *Sphagnum*. This sort of bog is found in the northern regions of Europe, Asia and North America, including Minnesota. The waters of bogs are naturally acidic, and are stained brown by organic acids released by the mosses. Slow decomposition causes the moss to accumulate to make peat.

However, the bog that ran aground on the Sagatagan beach was another kind of bog. While it had no *Sphagnum*, it was largely made of undecomposed plant material, or peat. Referred to by many names around the world – sudd, Schwingmoor, camalote – floating islands of this sort are a fairly common phenomenon. In the Sudd region of South Sudan the Nile River flows through a vast wetland dotted with thousands of floating vegetation islands, which impede navigation so badly that a canal has been dug to avoid this part of the river.

The floating bog island that graced Lake Sagatagan probably began as a patch of emergent vegetation on the south end of the lake. Rooted in the mucky sediments of the bottom, such vegetation is common in sections of the shore where a gradual slope creates a shallow area where plants such as cattails and sedges can thrive. The sediments accumulate a lot of decomposing plant material (dead leaves and roots).

When bacteria break this detritus down, they consume any oxygen (O_2) dissolved in the water, making the sediments anaerobic. The smell of hydrogen sulfide (H_2S) common in wetland soils is an indication of the lack of O_2.

The roots and rhizomes (underground stems) of wetland plants are able to live without oxygen in their environment by pumping it down from their leaves. Cattails, sedges, water lilies and other so-called hydrophytes have a special tissue called aerenchyma, which is full of air channels amongst the living tissue. These channels act like snorkels



Floating bog with water lilies and Common loon. Madeline Olson.

Interested in learning more?

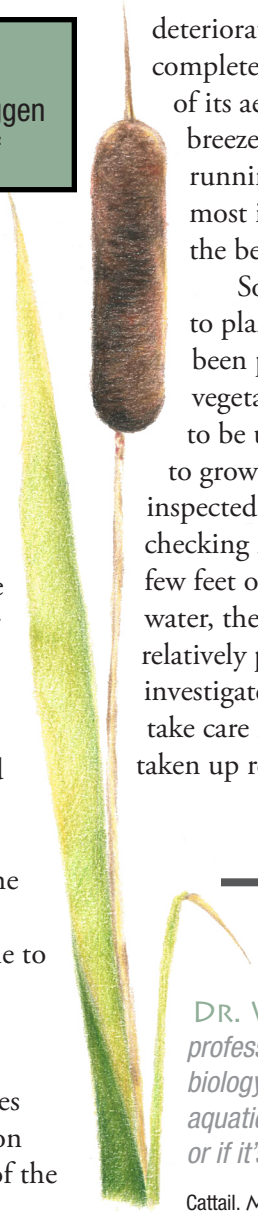
Floating Islands: An Activity Book, by Richard J. Heggen
http://www.unm.edu/~rheggen/FloatingIslands.pdf

for the plants, allowing O_2-rich air from the leaves to move down to the roots so their cells can "breathe." Plants that lack this adaptation will drown if their roots are flooded for too long. The presence of air in the roots and rhizomes of hydrophytes also makes them buoyant, and enables a mass of them to float if it becomes detached from the bottom of the lake.

It is not uncommon to see small clumps of cattails sailing across a lake, buoyed by their air-filled rhizomes. Cattails use this ability to colonize distant parts of the shoreline. It gets them there faster than if they had to spread only by growing. The floating bog island that ran aground on the beach was a different beast, however. It was most likely created when a large chunk of vegetation was plucked off the lake bottom by ice. When the ice formed on the surface of Lake Sagatagan last fall, the emergent vegetation was embedded in it. The water between the stems and leaves, and saturating the network of roots and rhizomes, was frozen down to a depth comparable to the thickness of the ice out in the open water.

When the ice sheet began melting and breaking up in the spring, it plucked an area of this vegetation from the shore. This can happen if the water level rises during ice-out, raising the ice and lifting the vegetation off the bottom, or if a strong wind pushes a portion of the deteriorating ice sheet offshore. After the ice melted completely the bog island continued to float because of its aerenchyma. Eventually it caught a northerly breeze and floated slowly away from the south shore, running aground on what is without a doubt the most inconvenient section of shoreline possible – the beach.

So what is its fate now? If all goes according to plan, the floating bog island will stay where it's been parked and incorporate itself into the shoreline vegetation near the Prep School. The plants appear to be unfazed by their voyage, and will continue to grow and spread in their new location. When I inspected the island a loon was floating nearby, possibly checking it out as a potential nesting site. Standing a few feet off the shore and surrounded completely by water, the bog is a great place to bring up chicks, being relatively protected from predators. If you paddle over to investigate the bog in the next few weeks, be sure to take care not to disturb any nesting birds that may have taken up residence there.



Cattail. Madeline Olson.

Dr. William Lamberts is an associate professor of biology at CSB/SJU and is the current biology department chair. We don't know if his interest in aquatic ecology gives him a ready excuse to go canoeing, or if it's the other way around. Does it really matter?

Learn, Teach, Learn. Repeat.

There are people who love learning. There are people who love teaching. There are people who love nature and being outside. Our outgoing environmental education fellow, Ella Gray, easily fits in all of those boxes.

Ella started at Outdoor U after completing thirteen months with the Peace Corps teaching biology to secondary school students in Mozambique. She leaves her year with us to pursue a graduate degree in Forest and Natural Resources Management at the State University of New York (SUNY) College of Environmental Science and Forestry.

Her organizational skills and daily preparedness have, and will continue, to serve her well. But it is her knack at anticipating the needs of her colleauges as well as those of her students that we will sorely miss. As one teacher said: "Ella did a great job with the students who were of a higher cognitive ability, gearing her instruction to their level very well. She was willing to answer their questions and was patient with them..." We wish Ella nothing but the best in New York, and know she'll be back to visit soon.

Outgoing environmental education fellow Ella Gray studies plants with summer student staff on the Boardwalk Loop. MJ Bach.

Learning to Love the Land

Natalie Stoneburner '16

As an environmental studies major, avid outdoorswoman, self-proclaimed naturalist, constant climate monitor and dedicated *Grist* reader, I entered my junior year at the College of Saint Benedict overflowing with guilt and anger over the current state of our natural world. I understood the importance of environmental conservation and preservation, but felt helpless over my inability to convince others of its importance.

That anger and helplessness, along with fantasies of untouched wilderness and my own romantic ideas of living out of a tent for three months, drove me to travel to Patagonia with Round River Conservation Studies during fall 2014. I craved an opportunity to help create a tangible, positive change. The chance to be a part of Round River's conservation projects was a way for me to fight the environmental degradation that fueled my exasperation.

Natalie Stoneburner spent the 2014 fall semester with Round River Conservation Studies in Patagonia. During a 27-day hike through mountains and fjords, she (re)discovered a motivator for environmental protection: a deep love of land. Natalie Stoneburner.

One of the most challenging and spectacular experiences of my time in Patagonia took form while hiking for 27 days through the fjords of Bernardo O'Higgins National Park. Two park guards from CONAF, the Chilean equivalent of the forest service, accompanied our group as we hiked through miles of wilderness never before seen by humans. Much of this remote land (a rough fourteen hour boat ride from the closest tiny town) was only de-glaciated within the last two decades.

The goal of this expedition was to track huemul, a critically endangered deer species endemic to southern Patagonia. The main driver of huemul decline is fragmentation due to their high sensitivity to human activity. Our goal was to gain a better understanding of where huemul live, feed and migrate. CONAF could then create new hiking trails in the park that avoided huemul habitat.

We conducted our study in three major fjords of Bernardo O'Higgins. Using GPS, we plotted huemul sightings and tracks. To get from one fjord to the next, we hiked through bog, old growth forests and rocky ridges to access mountain passes averaging 2,000 feet in elevation change. We navigated our way from fjord to fjord, often having to backtrack when we reached uncrossable points that were flooded or too steep. Our days spent hiking were long, wet and challenging, but the spectacular scenery and unique wildlife kept our spirits high.

It was while tracking huemul in the fjords that I learned the true solution to the anger and guilt that led me on my Patagonian adventure in the first place. Somewhere between the quicksand, icy ridges, language barriers, wet feet, oatmeal breakfasts and detailed studies of natural history, I fell in love with the landscape around me.

Patagonia taught me about who I am and about conservation and how humans relate to the environment more than any other three months of my life. But the lesson I will carry with me forever is perhaps the strongest method of environmental protection: love of land. I know now the urgency with which we must—somehow—get others to love nature. Because in the end, you're not going to protect something until you love it.

This epiphany changed many things about how I live back at CSB/SJU. I work as a student naturalist at Outdoor U, which means I help children learn about the workings of nature. I teach classes on subjects such as insects, watersheds, maple syrup and plants. While the curriculum is important, since my time abroad I place a higher importance on one universal lesson embedded within all of the trips.

I hope that, more than anything, the students who come to the Abbey Arboretum learn how to feel comfortable within and respect nature. I hope those feelings develop into a deeper love for natural places as the students grow. I hope to teach these kids how to love the land. I hope they learn to love it the way I learned to love the fjords, that their love is strong enough to overcome frustration, guilt and indifference. In our fight for environmental stability, this is our best tool.

Natalie Stoneburner *is a student naturalist for Outdoor U and is a senior at the College of Saint Benedict. We have so much to learn from her before she graduates in 2016.*

Get Involved

Saint John's Outdoor University

Nature, Culture, and two friends talking

Tuesday, July 14
6:30 - 8:30 p.m.

Free - Students (any age) & Outdoor U members
$5 - Nonmembers, nonstudents

natureculturetalking.com

Ecologist Kim Chapman and poet Jim Armstrong, co-authors of a new book, Nature, Culture, and Two Friends Talking, will use an essay about emotional response to sudden change in the landscape and an essay on land stewardship to frame a discussion of how people and nature interact. Aftewards they will lead a hike in the Abbey Arboretum examining plants, birds and other natural features along the trails.

MN Master Naturalist Class Prairies & Potholes

Monday-Friday, July 13-17
8:30 a.m. - 5:00 p.m.

$275, includes materials. Scholarships available.

minnesotamasternaturalist.org

The MN Master Naturalist program is akin to the Master Gardener program and is geared toward adults who are curious and enjoy learning about the natural world and sharing their knowledge with others. Complete a 40-hour course during one week in July, studying natural history, environmental interpretation and conservation stewardship of the prairie/pothole biome. Limited on-campus lodging options available.

Tap Takeover @ ThirdStreet Brewhouse

Friday, August 7
4:00 - 8:00 p.m.

Good beer. Good food. Good music. Great community.
Open to the public

thirdstreetbrewhouse.com

Outdoor U is storming the brewhouse and taking over the taps at our summer fundraising and community-building event! Proceeds from tap sales support Outdoor U programs thanks to ThirdStreet Brewhouse. Mark your calendars and bring your friends and neighbors to Cold Spring on a Friday in August. Good beer and conversation required. Dancing optional.

Outdoor Nation Campus Challenge

Sept. 6 - Oct. 17

oncampuschallenge.org

Get outside. Win awesome gear.
Help CSB/SJU become a REPEAT national champion.

Help CSB/SJU and our surrounding community defend our National Outdoor Championship this falll! In 2014, we stormed the challenge, handily defeating nine other schools across the country to be named the most outdoorsy campus in America. This year the competition is earlier, shorter and there are 58 other schools vying to take our title. Prepare to document your outdoor activities - on your own or as part of a class or event - during the six-week challenge this fall and help us prove yet again that our community and our outdoor spirit is unparalleled in the U.S.

Nature for the Nation: A Walking Play

Sept. 18 - 20

csbsju.edu/fine-arts

Presented by TigerLion Arts in collaboration with CSB/SJU Fine Arts Programming, Outdoor U and the Abbey Arboretum

Outdoor U Members get 20% off Regular and Senior ticket prices!

An extraordinary, family-friendly experience in the Abbey Arboretum!. *Nature for the Nation* is the mythic telling of Ralph Waldo Emerson and Henry David Thoreau's mutual love affair with the natural world. *Nature* is performed outdoors as a "walking play." A professional ensemble of actors takes the audience on a hike through the oak savanna as scenes unfold around them. Bagpipes, ancient flutes, drums and rich choral arrangements are intricately woven into the script. Learn more about the production: www.tigerlion.org/nature.

Saint John's Outdoor University
2346 Science Drive
P.O. Box 3000
Collegeville, MN 56321-3000

Main Office:
104 New Science Center

320.363.3163
OutdoorU@csbsju.edu
www.csbsju.edu/OutdoorU

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SAGATAGAN SEASONS

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Saint John's OUTDOOR UNIVERSITY

The Program

Saint John's Outdoor University provides environmental and outdoor education through classes, events and initiatives with the Abbey Arboretum, Saint John's University and the College of Saint Benedict.

The Place

Saint John's Abbey Arboretum is more than 2,500 acres of lakes, prairie, oak savanna and forest owned by Saint John's Abbey and surrounding Saint John's University.

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