

SAGATAGAN

The joy of returning “home”

Saint John's
OUTDOOR
UNIVERSITY

JOHN GEISSLER '99

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“Another definition of home is that it is the place we are proud of. It is the place we keep up, improve, showoff, defend. It is the place we regard as an extension of ourselves.” *Paul Gruchow, Images of Home*

During my freshman year at Saint John’s University, I was given a drip torch to light a prescribed prairie burn in Saint John’s Abbey Arboretum. The smoke cleared after that burn but something stayed lit inside me. Driven to promote environmental awareness and literacy, my journey as a natural resource steward and environmental education leader began while working with Fr. Paul Schwietz in the late 1990s. As a student and colleague of Fr. Paul, I was involved in the Habitat Restoration Project, the formal designation of the Abbey Arboretum, and the formation of the educational program that would later become known as Saint John’s Outdoor University.

Just two months after Fr. Paul convinced me to return to Saint John’s full time as environmental education coordinator, he suddenly and tragically passed away. In the next year as acting director, I had a steep learning curve to keep the vision of the program alive. With tremendous support from the monastic community, the colleges, and the advisory council, we were able to maintain ongoing stewardship efforts on the 2,500 acres of actively managed land.

We also continued with the strategic plan to develop and implement an environmental education program highlighting that

stewardship to diverse groups. We fundraised and built the boardwalks, conducted prescribed burns, continued to restore the oak savanna, hired and mentored CSB/SJU student staff and maintained an active membership willing to donate time, talent and treasure to this tremendous cause.

Following that year Tom Kroll was hired as the full-time director and land manager. After spending three years as education coordinator under Tom’s leadership, I left Saint John’s to pursue more professional training in environmental education and, newly married, to be closer to my wife.

In the spring of 2007, I completed a master’s degree in environmental education at the University of Minnesota-Duluth while working as a graduate assistant at Boulder Lake Environmental Learning Center (ELC). Immediately after finishing my degree, I was hired as director of Boulder Lake ELC with the charge of fostering connections to natural resource

stewardship utilizing an impressive 18,000 acre classroom (14,000 acre working forest surrounding a 4,000 acre hydropower reservoir).

The last ten years have been a wonderful opportunity for me to continue to refine the skills I



John Geissler is the new Outdoor U director and Abbey land manager beginning June 26, 2017. JOHN GEISSLER.

began learning nearly twenty years ago at Saint John's. The context is very similar except that there are three landowners (Minnesota Power, St. Louis County Land & Minerals, MN DNR) instead of one and the program is housed out of the University of Minnesota-Duluth. Supported once again with the key ingredients of incredible volunteers and partners, the program flourished.

Boulder Lake ELC was recently honored for our wide reaching work with K-12, college and community audiences as one of eight finalists for the Duluth Superior Area Community Foundation Touchstone Awards.

Further reflecting the efforts of the team (and just sneaking under the age requirement), I received the Duluth News Tribune "20 under 40" award that recognizes twenty young leaders having a profound impact on the community.

When I received the call from Abbey treasurer Br. Benedict Leuthner that I was chosen by the search committee for the position, I was overwhelmed with a joy difficult to describe. All of the wonderful past Saint John's experiences—walking through the rippling sea of tall grass prairie, the smell of the maple syrup boiling under a starlit night, the oak and maples in fall glory, the glimmer of Lake Sagatagan, the pines covered in snow, the church bells echoing throughout—were suddenly going to be a part of me again.

Initially on the job I will be doing a lot of listening and exploring to get a sense of current strengths and opportunities for growth. My strength and passion lies in making good ideas a reality through focus, collaboration and energy. I recently took the Gallup StrengthsQuest assessment instrument and my signature themes provide a great overview of my approach to life and work. These are part of the skill base that I can draw from as I enter this new position.

I am compelled to nurture and stretch the strengths in myself and others and am driven to identify the potential in others and situations. I feel a great sense of satisfaction when there is visible positive growth and draw on my positivity to motivate myself and others. I have an inner drive to achieve and place high value on responsibility and high ethics. These traits tell a small part of the story I bring to Saint John's, but I recognize them as familiar pieces of the Benedictine traditions Outdoor U and the Abbey



Incoming Outdoor U director John Geissler (pictured center) was previously the director at Boulder Lake Environmental Learning Center in Duluth, Minnesota providing environmental and land stewardship education to K-12, college and community audiences. JOHN GEISSLER.

Arboretum are already grounded in.

It is my hope that with these gifts, I will continue to make the vision of Saint John's Outdoor University and the Abbey Arboretum seamlessly come to fruition. I welcome the opportunity to be a stable base that fosters sound stewardship, education, research and outdoor recreation.

One of my current colleagues once told me that if you want to grow, surround yourself with greatness. I can't think of any other community where I would be surrounded by more greatness to help me grow both personally and professionally. I am inspired by the place (Abbey Arboretum) and landowners (monastic community), past leadership, the current Outdoor U staff, the CSB/SJU community as a whole and the Benedictine tradition on which everything is grounded. I look forward to connecting/reconnecting with all the wonderful people that support this tremendous program and place. I feel like I am returning home.

JOHN GEISSLER is the incoming Outdoor U director and Abbey land manager. Our staff is excited to welcome him (back) to campus this summer. John tells us: "I am deeply honored to serve as the next Saint John's Abbey Land Manager/Director of Saint John's Outdoor University. This is a dream opportunity and I can hardly wait to utilize my talents, skills and energy to humbly contribute as much as I can to the Benedictine tradition of land stewardship, education and environmental respect."

Here Comes the Sun

KYLE RAUCH

This past year we saw a major expansion to the Saint John's Abbey Solar Farm. An additional 23 acres of Abbey property was developed into the Orion Solar Garden. The expansion, combined with the original four-acre solar field installed in 2009 (and expanded in 2014), produces over 3.5 megawatts of renewable, emission-free solar energy here at Saint John's.

The combined energy output provides almost 20% of Saint John's annual energy needs or simply put – enough energy to power over 600 American homes on an annual basis. This project is just the latest example of Benedictine stewardship, community outreach and the sustainable focus of Saint John's.

By the time you are finished reading this article, enough solar radiation will have hit the surface of the Earth to supply the yearly energy demands of the entire planet – all seven billion of us. The sun is our largest, most consistent form of energy and today we have the means to collect, store and distribute its ample supply. Solar energy technology – cells, panels and infrastructure – has evolved greatly over the past decade to the point where it is now economically competitive with more commonly used forms of energy such as fossil fuels, nuclear, and wind.

Better yet the technology is still improving with new, third generation perovskite semi-conductors, building-integrated photovoltaics (i.e. solar shingles and windows) and energy production efficiency all increasing in recent years. The efficiency of solar panels, which is the rate of energy transferred from photons (sunlight) to electrons (direct current electricity) continues to increase as new

materials and technology are applied. Some recent photovoltaic technology is over 20% in efficiency now (Saint John's is around 15% combined). The lifespan of panels is getting longer as well, with many operating at full efficiency for over 25 years.

The Orion Solar Garden broke ground in August 2016 and started producing power in early January 2017. Land that was growing corn last summer is producing electricity today – a mere four month turnaround. At the end of the 25-year lease, Saint John's and the company that owns the solar panels have the option to renew or remove. If the lease is not renewed, the steel posts and framing can be removed and repurposed and the solar panels themselves can be recycled with parts being applied to other solar technologies. There are no permanent fixtures to the solar array or landscape and no long-term environmental impacts on the site; therefore, reverting to corn or transitioning to another land-use is a definite possibility. The construction time and future adaptability of solar arrays make them unique among energy sources. As Aldo Leopold said, "The oldest task in human history is to live on a piece of land without spoiling it."

The Abbey solar array not only produces green power, it also produces environmental literacy. Over the past several years Outdoor U has led many solar tours for K-12 and college groups, township and county commissioners, utility officials, renewable energy developers and other educators to learn the science, economics and politics of solar energy.

The solar farm gives us the opportunity to study

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Saint John's Abbey Solar Farm provides many opportunities for research with three different installations of solar technology. The first four-acre installation (pictured in foreground) installed in 2009 automatically tracks the sun throughout the day. A second installation of non-tracking panels was installed in 2014 (top right) around the perimeter of the original installation. And in January 2017 the Orion Solar Garden added an additional 23 acres of solar technology (darker panels pictured in back). KYLE RAUCH.

"The oldest task in human history is to live on a piece of land without spoiling it." Aldo Leopold

various solar technologies in the three different installations (2009, 2014 and 2016), as well as provide educational outreach to our neighboring communities. Faculty at CSB/SJU are working with students to develop research projects comparing the different technologies utilized at Saint John's such as the fixed-panels with the tracking-panels and the polycrystalline-Silicon (first generation) panels with thin-film (second generation) panels that can be found on the different installations.

A soon-to-begin project will compare native prairie with a non-native, pollinator-friendly clover ground cover planted underneath the panels. This project will compare the wildlife benefits of each vegetative cover along with run-off and erosion rates, maintenance requirements and aesthetics.

After three different solar installations, what is next for the Abbey Solar Array? Currently, no plans are in mind to expand the solar field further. Perhaps in the future, as new technologies become available a new experiment will be attempted. Even a project to store Abbey energy with onsite batteries is a realistic possibility as these products come to market. For our education mission, we are in the beginnings of a plan to add an interpretive kiosk and observation deck to enhance the experience of visitors. As for replanting, the ground cover is being seeded this spring and a wild orchard of fruit trees and conifers is planned for the near future along the northern perimeter of the solar field to provide wildlife benefits, soil stability, and aesthetics.

Less than a decade ago with what was then the largest solar installation in Minnesota, Saint John's demonstrated that solar energy production is practical and feasible in central Minnesota. Today we see similar (community-scale) solar arrays popping up in nearby towns such as St. Joseph, Albany, Freeport and Paynesville. A huge, utility-scale (600-acre, 100-megawatt) array, capable of powering a small city is nearing completion east of Saint John's in Chisago County.

Could we see local, community-based solar projects supplementing energy supply for all communities across the map? The environmental, economic and technological forces are shining brightly towards yes. Think about what that might look like and what that could mean for our planet and people. It will take 127 million acres of solar panels, roughly the land area of Spain, to power the globe on solar energy alone. Saint John's is contributing 27 acres so far and as always, is thinking long-term on sustainable living here in central Minnesota.

KYLE RAUCH is the Outdoor U environmental education coordinator for college and community education. Our regular solar tour guide, he's often finding himself on bright side of life.

Saint John's Abbey Energy Solar Farm

- **2007:** SJU President Br. Dietrich Reinhart signs American College and University Climate Commitment with a goal of becoming carbon neutral by 2035.
 - Saint John's has reduced emissions by 56% since then.
- **2009:** Installation of 400 kW, four-acre solar field with tracking system
 - 1,820 solar modules
 - Automatically track the sun from east to west
 - 575 MWh annual energy production
 - 4% of SJU annual energy use and up to 20% in peak power conditions, enough energy to power 59 average American homes annually
 - 13.7% efficient (13.7% of photons that hit the panel are converted into electric energy)
- **2014:** A 182 kW addition to the solar field is installed
 - 616 south facing modules fixed at 35-degrees (do not track the sun)
 - 230 MWh annual energy production
 - 1.6% of SJU annual energy use and up to 8% in peak power conditions, enough energy to power about 25 average American homes annually
 - More efficient than the tracking system in the winter because the fixed tilt is at a more direct angle to the low winter sun.
- **2016:** Construction of Orion Solar Garden, a 3000 kW, 23-acre solar field.
 - 34,000 south facing modules fixed at 35-degrees (do not track the sun)
 - 5,100,000 kWh of electricity annually, of which SJU buys 40% (2,040,000 kWh)
 - 13.4% of annual energy use and up to 60% in peak power conditions, enough energy to power 525 average American homes annually

More information:

csbsju.edu/sju-sustainability/what-were-doing/renewable-energy

Animal Architects

ELLA GROTE '18

Humans are not the only species on Earth capable of building extraordinary homes and structures. The natural world is in fact full of ingenious animals that can achieve just as impressive feats of engineering. Architecture plays a vital role in animals' lives, revealing behavior as well as contributing to their survival. From dams to nests to body armor, these feats of animal ingenuity are remarkable.

Beavers

The largest North American rodent, the beaver is indeed an active woodcutter and builder. They are often referred to as the hydraulic engineers of the mammal world, second only to humans in their ability to manipulate and change their environment. Beavers build and maintain houses called lodges. One of the primary reasons beavers build dams is to surround their lodge with water for protection from predators.

Beavers typically start building dams in low lying areas with shallow, moving water. They will utilize natural or human-made objects such as a rock outcropping or a manmade stone wall, a constriction in the streambed, a tree stump, etc. to anchor their dams.

Once the dam is built, there are two main types of beaver lodges: the conical lodge and the bank lodge. The most recognized type is the conical shaped dwelling surrounded by water. It is made from sticks, mud and rocks. The second type of lodge is the bank lodge. It is typically excavated into the bank of a large stream, river or lake where the water is too deep or fast moving to build the classic conical lodge. Within each lodge beavers hollow out a chamber where they sleep, eat, groom each other and is where the baby kits are born and nursed each spring.

In order to breathe fresh air beavers often do not apply mud to the peak of the lodge, creating a ventilation shaft.



What at first glance looks like nothing more than a pile of sticks, is actually a complex structure designed and built by beavers (left). Beaver sign is often seen near water as these beaver-hewn trees near Lake Sagatagan demonstrate. OUTDOOR U ARCHIVES.

If you ever get an opportunity to visit a beaver lodge on a very cold winter day, look very closely and you may see the beaver's breath escaping from this chimney-like peak. Each lodge contains at least two water-filled tunnels leading from the chamber to the pond so the beavers can enter and exit the lodge underwater without being spotted by predators.

The walls of the conical lodge are very strong due to layers of mud and sticks, and are extremely insulated with bedding of reeds, grasses and woodchips. Even with subzero outside temperatures it will not drop below freezing inside the lodge due to retained body heat from the family of beavers.

On land, the beaver's short legs and wide body make them slow and vulnerable to their enemies. However, unlike most of their historic predators, beavers are excellent swimmers. As a result beavers evolved to have a strong preference to remain in or very close to the safety of the water. The need for safety is the primary reason beavers build dams to create ponds.

Once a pond is formed beavers do not have to travel far on land to gain access to new trees. The more area their dam floods, the more food they can safely access. Sometimes beavers will even excavate canals over a hundred feet long in order to bring water closer to stands of their favorite trees. This allows them to swim up close

to the trees and retreat to the water quickly if they sense danger. In addition, they use the canal to float edible branches back to the pond. No other animal with the exception of the human so significantly alters its habitat to suit its own needs and desires.

Ants

Many argue that ants rank with beavers as some of the best-known architects of the animal world. For example, give a colony of garden ants a week and a

CONTINUED ON PAGE 6

pile of dirt, and they'll transform it into an underground edifice about the height of a skyscraper in an ant-scaled city. Without a blueprint or a leader, thousands of insects moving dirt grain by grain with their mandibles can create a complex, spongelike structure with horizontal levels connected by a network of vertical tunnels. And unless the soil dries out dramatically, the tunnels and chambers can keep their form for years.

For humans it's hard to visualize what's happening underground – what these nests actually look like and how ants structure their lives around them. What scientists have discovered across various ant species is that ant-nest design has a basic theme that includes: porous turrets, vertical tunnels and horizontal chambers.

The "ant hills" or porous turrets that are visible above ground are built to ventilate the nest and maintain an even temperature inside. Additionally, established deep underground, ant nests are made up of multiple chambers and connecting tunnels - vertical tunnels for movement and transport, and horizontal chambers for work, storage and housing the brood. Each chamber has a different use; some store food while others are used as nurseries for the young and resting spaces for busy worker ants. Typically the queen ant is placed in the central chamber where she will lay her eggs.

But how ants manage to construct such well-planned underground structures remains somewhat of a mystery, because they do this without a blueprint, without a leader and in total darkness. An ant colony develops when each individual does its job in response to outside cues.

Some scientists argue that the rules for this behavior are somehow internally programmed and they result from the way the nervous system is organized. Each of thousands of earth-nesting ant species has a specific nest design, and each builds from a particular set of rules that are communicated to one another.

For such a small organism, ants have created an extremely intricate system to construct their homes. Next time you stumble upon an ant hill, remember what these animal architects are really capable of beneath the surface.

Mallards

Despite their commonality mallard ducks have been known to think outside the box when it comes to nest placement and construction. The sole purpose for their architectural abodes are to protect their young during the month-long nesting period. The nesting period encompasses only a fraction of the annual cycle of waterfowl, but it is perhaps the most influential time of the year for these populations.

During the nesting period, mallards are faced with

exhausting physical demands and constant danger while attempting to propagate their species. The number of ducks that ultimately join the fall flight hinges on the ability of nesting birds to overcome a host of challenges and threats. Clever nest construction is essential to the survival of the species.

After a hen selects a nesting site, in places such as overwater vegetation, trees, and artificial nesting structures, her next task is to create what is known as a nest bowl. Mallards often make a shallow depression in the ground called a scrape. Once a nest site has been chosen and the nest bowl has been created, the hen will begin laying her eggs, which are collectively known as a clutch. The incubation process begins as soon as the first egg is laid.

Female waterfowl typically incubate their eggs without any help from males. To line the nest, females add bits of vegetation and pluck feathers from their belly, creating a bare spot

known as a brood patch, which allows heat to be more effectively transmitted from their body to the eggs. They also rotate and shift the eggs in the nest to evenly distribute body heat

to the entire clutch. Female waterfowl lose a considerable amount of body mass during incubation.

Except for occasional forays into nearby wetlands to preen and replenish energy reserves, the birds spend almost all their time tending the nest. Therefore, thanks to the architectural design of the nest and perhaps a little luck, the eggs are able to hatch successfully. Fortunately they know how to creatively incorporate elements from their surroundings into their nesting ingenuity.



A clutch of mallard eggs is kept safe in a shallow depression in the ground, lined carefully with vegetation and feathers. OUTDOOR U ARCHIVES.

ELLA GROTE is a senior psychology major at the College of Saint Benedict and is a student naturalist at Outdoor U. She's looking forward to sharing the world of animal architects with kids during our summer library programs (see page 7).

Get Involved

SAINT JOHN'S OUTDOOR UNIVERSITY

SUMMER LIBRARY PROGRAMS:

ANIMAL ARCHITECTS

Free and open to the public

In conjunction with area public libraries' summer reading program, Saint John's Outdoor U is bringing our *Animal Architects* program to a library near you! We're ready to help you use your sense of wonder to explore some of the world's most talented architects - animals! Bring your curiosity...we'll bring the rest! Programs are currently scheduled at the following libraries (check your local library for details):

Albany	Cold Spring	Monticello	St. Michael
Becker	Delano	Richmond	Staples
Buffalo	Howard Lake	Royalton	Swanville
Clearwater	Little Falls	Sauk Centre	Upsala

Dates and times vary

June 19 - August 11

Saint John's Outdoor University Staff:

JOHN GEISSLER

Saint John's Outdoor U Director
Abbey Arboretum Land Manager

SARAH GAINNEY

Assistant Director

Envr. Education Coordinator

KYLE RAUCH

Assistant Director

Envr. Education Coordinator

JENNY KUTTER

Department Coordinator

Editor, *Sagatagan Seasons*

ASHLEY WALKER

Environmental Education Fellow

DAN VOGEL

Abbey Arboretum Forest Technician

TAP TAKEOVER @ THIRDSTREET BREWHOUSE

Good beer. Good food. Live music. Great community.

Open to the public

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. Food will be available for purchase from Smoke'n'Motion food truck. Mark your calendars and bring your friends and neighbors to Cold Spring on a Friday in August. Good beer and conversation required. Dancing optional.

Friday, August 4

4:00 - 8:00 p.m.

thirdstreetbrewhouse.com

Coming this fall...

COLLEGEVILLE COLORS

Where art and nature invite you for a walk.

FREE this year thanks to sponsorship by ST. CLOUD SUBARU!

Spend the afternoon hiking in the woods of Saint John's Abbey Arboretum as you enjoy the fall colors, artwork, live music, nature activities, and more along the Chapel Trail - rain or shine!

Sunday, October 1

1:00 - 4:00 p.m.

BANFF MOUNTAIN FILM FESTIVAL WORLD TOUR

Tickets on sale beginning September 18

Journey to exotic locations, paddle the wildest waters and climb the highest peaks. The Banff Mountain Film Festival World Tour begins immediately after the Film Festival held every November in Banff, Alberta, Canada. Attend one or both nights of inspiring films.

Wed. & Thurs., November 15 & 16

7:30 p.m.

Pellegrine Auditorium, SJU

MEMBER & VOLUNTEER OPEN HOUSE

Invitations will be mailed by early November

Celebrate the holiday season with good food, entertainment and conversation with friends, new and old. Fundraiser valet service, silent auction and other opportunities to support Outdoor U and the Abbey Arboretum at the best party of the year.

Friday, Dec. 8

Save the dates...

Langlauf Nordic Ski Race

Sunday, Jan. 21

Living in the Avon Hills Conference

Saturday, Feb. 10

Ski & Spirituality Retreat

Friday - Sunday, Feb. 16-18

Maple Syrup Festivals

Saturdays, Mar. 24 & Apr. 7

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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.

IN THIS ISSUE...

- The joy of returning "home" p. 1-2
- Here Comes the Sun p. 3-4
- Animal Architects p. 5-6

GOOD BEER. GOOD FOOD. LIVE MUSIC. *Great community.*

Saint John's

Friday, August 4
OUTDOOR TAKEOVER
@ THIRD STREET BREWHOUSE

TAP
PROCEEDS
BENEFIT
OUTDOOR U!

219 Red River Ave.

Cold Spring, Minn.