Annual Report of the Gerace Research Centre

University of the Bahamas

2017-2018 School Year

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I. Introduction

Hello everyone,

It is once again time to let our distinguished faculty know what changes, modifications, and events have transpired during the previous season as well as what future plans we have in store. It is my pleasure to submit to you this (second) Annual Report of the Gerace Research Centre.

We were very fortunate to have gone through a hurricane season without any hits or close calls for the first year in quite some time. Our thoughts and prayers go out to those who were not so fortunate. We have already started taking off our hurricane shutters in preparation for this season's incoming groups.

As you will see in this report, we are trying to make as many improvements as possible with the limited funds we have. These improvements make the station more comfortable and safe for our visitors. Donations do go a long way and we would certainly appreciate any funds that you can spare. But our primary goal is to get as many young students here and excited about possible careers in field sciences. And the more students you bring us, the more we can do to improve the conditions and appeal of the Gerace Research Centre for future visitors.

As always, we at the Gerace Research Centre greatly look forward to your next visit to us here in San Salvador!

Thank you all very much,

Troy

II. Events

A. BAARK Pet Clinic

On January 19th through 21st , the Gerace Research Centre once again hosted a veterinary spay and neuter clinic sponsored by BAARK (Bahamas Alliance for Animal Rights and Kindness) with substantial help from Karen and Dave Brochu of Sandy Point. This year, additional pet services (including vaccines, check-ups, flea medication, and pet grooming) were provided at reasonable prices for pet owners as well as the spaying and neutering of stray animals. Advertising material was placed in advance around the island to let the local populace know about the clinic. We set the clinic up in Lab 7 near the garage. Volunteers from Sandy Point and Nassau did an incredible job setting up traps for stray dogs and cats and transporting the animals back and forth from the clinic. We also had some wonderful help from our visitors (particularly the students of the University of Florida who cared for recovering pets for an entire week and even adopted some of the puppies!). In total, 72 dogs and cats were spayed or neutered over the weekend, which brings our two-year total to 135!

B. Gerace Research Centre Family Fun Day (and furniture moving)!

At the end of most seasons, we usually beg for volunteers locally to help us set up the Lab Building which serves as the hurricane shelter for the northern part of the island. This includes moving beds and mattresses into the labs so that we are ready for any potential threats. This year, we decided to invite (bribe) the entire island to join us with free food, games for children, and a little bit of fun physical labor. We hosted the first GRC Family Fun Day picnic! We used up some of our leftover food supplies and made burgers, baked and barbecue chicken, pasta salad, and a few desserts and ice cream. While we did the cooking, the adults helped move mattresses into the lab a building, and the children played games. With everyone lending a hand, the beds were moved

into the hurricane shelter in record time. After that, everybody hung out, ate good food, and enjoyed some of our recreational equipment. Fortunately for us, this was the first time in quite a few years we didn't actually need to use the hurricane shelter. We certainly look forward to hosting Family Fun Day again next year.

C. San Salvador National Parks

The final details for the San Salvador National Parks and their management are being worked out. The San Salvador Living Jewels will act in coordination with the Bahamas National Trust to protect our new parks. A signing ceremony was held between these two organizations on October 19th, 2018. For more information, please visit: https://bnt.bs/

III. Improvements

A. Cafeteria

As promised last year, our new commercial stove top and oven arrived and was installed early in the season. In addition to this new upgrade, we also installed a brand new full-sized commercial griddle. We tore down some of the rusted old ductwork from around the cooking areas and gave the serving area new coat of paint. And we installed a new sink in the cafeteria area so that people will be able to wash their hands before eating. We are hoping to replace a very old walk-in refrigerator sometime in the near future.

B. Vehicles

1. *Maintenance*

A large concern over the past couple of years for our visitors has been the safety and reliability of our vehicles. And we have been working diligently to improve the vehicles

we have on the line. Each vehicle is serviced twice a year. All of our vehicles received new air filters, fuel filters, oil filters, brake pads, and spark plugs. They were all tuned up with fluid checks. Nearly all vehicles received new batteries last year. And you may have noticed that this year every single one of our vehicles has side and rear view mirrors installed for improved safety.

The original truck bed of our newest truck (Truck Y) which was installed in April of 2017 rusted through very quickly. So we invested in a much more long-lasting galvanized steel plate for it. We removed the original benches (with the help of one of our faculty members…see below!) and the rusty flooring. And then we welded the sturdy galvanized metal plating on the floor and reinstalled the benches. We have just received another shipment of galvanized steel plating and we will be replacing the wooden bed of Truck A this year which has begun to rot.

Sadly, we lost two trucks this year. This is due too long term wear and rust in this bruta environment. One of our vehicles was pulled out of commission at the very start of last season. Truck S was pulled from the line because the degradation along the chassis was so bad. There was a risk that the chassis would give away completely and a break in the middle, collapsing between the cabin and truck bed while being driven. Truck R, a favorite among many of our faculty, has a chassis that is not only rusted but the cabin is collapsing through the chassis. There is no place to lift and weld the cabin back into place, so it is no longer safe for our visitors. While it is possible to recover the engines, both would require a new body at which point it would be cheaper just to get a new truck (see Section IV Vehicle Purchases). The truck beds and benches will be recycled.

2. *Breakdown Record*

In the last faculty update, we reported the number of times vehicles broke down in the field. This year we kept a written record in the garage of every vehicle that needed field

servicing and the issue. Please see the table below. Note that this record is only for vehicles that **did not** make it back to campus and thus stranded groups in the field until they could be reached by our maintenance staff. That means any vehicle that had an issue on campus and was pulled from the line or an issue was found while starting the trucks up in the morning was not recorded. This also means that for those of you who had an issue in the field and managed to get the vehicle back to campus through some creative ingenuity or had help from a friendly local, we did not count it (and we are extraordinarily grateful for your efforts to get them back to us!).

Date	Vehicle	Issue	Days Down
12/27/17	Truck B	Gear shift pin broke	0
01/05/18	Truck S	Would not start after being put into reverse, Solenoid died	4*
01/21/18	Truck B	Dead Battery	0
01/23/18	Truck B	Dead Battery (replaced with new one)	0
02/21/18	Truck B	Flat Tire	0
02/22/18	Truck B	Dead Starter	10
02/25/18	Truck A	Stalled	0
03/15/18	Truck L	Air in fuel line (lost prime)	0
05/07/18	Truck T	Fuel Pump Issue	0†
05/14/18	Truck Y	Steering Column broke loose	1
05/20/18	Porter	Flat Tire	0
* Examination of this vehicle's chassis showed extensive wear. It was subsequently pulled from service permanently			
† Fuel line had further issues while on campus later that week			

Most of the vehicles had minor issues that were quickly repaired and put back on the line the same day. This was fewer field breakdowns than last year, although we have been more reliant on our newer vehicles. As we continue to replace old vehicles, we anticipate these numbers will continue to drop.

C. Main Office Renovation

One of the nicest improvements from last year was the renovation of our Administrative Offices. Completed early last season, nearly all of our visiting faculty from last year had the chance to experience the upgraded and more modern look. We want to make you as comfortable as we can while you pay your bills!



D. Bathrooms

1. *Room Division*

As you are aware, many of our faculty rooms share a single bathroom between two rooms. While most people do not mind having to share a bathroom when we are busy, we do occasionally get requests for single rooms. And when we are busy with groups arriving and departing, it creates a challenge to assign the rooms such that men and women are kept separate between turnovers. And of course the single rooms are more appealing. To that end, we have been trying to split our shared bathrooms to provide more single housing starting with Rooms 18 and 19. This formally shared bathroom was one of the worst on campus with a very old rusted metal tub in it. By extending the bathroom slightly into one of the rooms and cutting a new window, we were able to install two separate showers and toilets with a solid frame dividing wall between rooms. We hope to repeat this process to some of the other joined bathrooms.

2. *Shower Floors*

As some of you noticed this season, the shower stalls in some of the faculty rooms were starting to leak water in substantial amounts. On some occasions this is left a massive puddle in the bathroom, the bedroom, and indeed through the wall into other people's rooms! This was occurring due to cracks in their plastic shower floors. As it turned out, duct tape and gorilla tape were not long-term solutions to the problem! The shower stalls we had in place looked nice and were easy to clean, but the plastic floors were weak and cracked easily with no sturdy framing underneath. Beyond the drainage pipe and a small wooden holding frame, there was nothing underneath to give the showers support (notice the original bathroom tiling in the image below where the plastic shower was cut out). So we have replaced nearly all of the faculty shower floors with poured concrete cement. We cut out the broken plastic, made a new frame and drainage pipe, filled in the cement frame curving it down into the drain and finally caulked the outer edges. While less aesthetically pleasing, this will prevent any future water leaks from the showers and they will last much longer. We plan to add small tile squares to the floors in the near future to add to the water resistance and appeal.

Cracked Shower Stall Floor

Plastic Removed

Final Cement Floor

3. *Lab Building Restrooms*

The one restroom in our lab building was very much outdated. The sink and toilet were old, there were random pipes running through it, it had no lights left working and the door was severely broken at the bottom. It was certainly not a comfortable situation for anyone who needed to use it (and I imagine most people do not…choosing instead to walk back to their rooms). As our lab building also serves as our hurricane shelter, having upwards of 100 people stuck in the building with that one bathroom no longer seemed feasible. But there was a lot of space in that room; certainly enough to split it into two restrooms with a hallway. And that is exactly what we did. The hallway

outside of the bathroom was not being utilized with the exception of an old nonfunctional water fountain. So there was also room to frame a third unisex bathroom. We had solid dividing walls built to frame and divide three rooms with new plumbing

and a new lighting system installed. This allowed us to build three complete unisex bathrooms with individual sinks in that area. We also installed a new water fountain by the restrooms. We would like to thank the students of the College of Saint Benedict & Saint John's University for donating time to put on the final paintjob in our beautiful new restrooms.

4. Shower Stalls

Additionally, we have begun replacing some of the flimsy plastic shower walls (the ones with no framework) of our faculty and graduate room bathrooms with solid walls. Frankly I am a bit surprised that some of these shower stalls have not yet tipped over with people inside them! We have removed the plastic stall entirely and poured a cement floor. Then solid, wood-framed exterior walls were constructed with plumbing piped within the walls. We adhered water-proof plastic sheets to the insides of the stalls and caulked the edges and corners.

E. Pump House

We have been very fortunate to receive funding from the University the Bahamas to renovate and improve the pump house. Over the years we have purchased additional equipment to back up all the vital pump house systems. The University of the Bahamas has assisted us with the purchase of new motors and a completely revamped electrical

grid. While the pump house is off-limits to visitors with the exception of guided tours and thus not very well known, it is certainly is our most vital system. Here is a basic description of how our water system works: Rain water from the catchment pools into a basin with a gravity-fed pipe. This pipe leads to a basement or cistern underneath the pump house. The raw rain water flows to that cistern and is pumped up into our first holding tank by our catchment pump. Water is then pumped through our filtration system which uses a copper micron mesh and slow-dissolve chlorine tablets. This filtration process occurs twice: once between Tanks 1 (raw water) and 2 (single filtered) and again between Tanks 2 and 3 (double filtered). All water that people drink at the GRC is from the double filtered tank. Our clean water from the Tank 3 is then pumped under high-pressure into our 1500 gallon pressure tank along with compressed air. This keeps the water under constant pressure so that it can be pushed everywhere on campus. As you might imagine, it is very important that we have backup system in place so that if something goes wrong with one piece of equipment we always have an emergency system left to provide fresh water to our visitors and the local population.

1. *Catchment System*

Every two years we go into the cistern underneath the pump house and the large screened basin in the catchment and clean out all the sediment and mud. That was done this season during a dry spell towards the end of spring. We also hired someone to clean the vegetation out of the lower section of the catchment. We have also received a brand new pump for the catchment system (which pumps rain water from the pump house cistern to the raw water tank). The one we currently have is extremely powerful but quite old (possibly an original from the Navy days!). But if it ever died, it would be very difficult for us to get the raw water from the catchment into the first holding tank. So this amazing new pump, when installed, will become our primary means of pumping rain water into the holding tanks.

2. *Filtration System*

In 2016 a motor on our filtration system burned out due to an incident with the electrical grid. As this was the only working motor on the system, it almost left the campus without filtered water. So we purchased two new motors (a replacement and a backup) to replace the one that burned out. We subsequently got the original motor repaired in Nassau. This year we repaired an older motor that was still connected to our filtration system (the original backup that was assumed to be unrepairable). This leaves us two connected motors and pumps on our filtration system with an additional two backup motors in reserve.

3. *Pressure System*

At the end of the season, thankfully after everyone had already left campus, the primary pump on our pressure system burned out. The backup pump had burned out earlier in the year and repairs on it had not been completed. Another older one connected to the system worked but was not strong enough for the pressure tank. Fortunately a new pump had been purchased a year ago and fit into place in the system without much difficulty. But this still only left one pump available. The one that had burned out was sent to Nassau for repairs and reinstalled as our backup pump. We purchased one additional pump which will be installed soon to replace the weak one. This will give us three connected pumps. And the pump that had burned out earlier in the year we will have as an emergency replacement when repairs on it are completed.

Primary Pump

Secondary Pump

New Pump

In addition to the pumps, a new air compressor and motor have been purchased so that the air pressure part of the system will have a backup. We have also gone through our pressure system to look for leaks. We cleaned and painted our pressurized tank to prevent rust (not to mention cleaned out all the vegetation to make the area look good). We also replaced the lines connecting the air compressor to the tank where air was slowly leaking out, thus maintaining pressure longer and reducing compressor run time.

4. *Electrical Grid*

One of the largest improvements to our pump house has been the rewiring of our electrical grid. This is thanks entirely to the University of the Bahamas. Not only are the modern components and proper conduit beneficial for our employee's safety while in the pump house, it also helps prevent damage to our equipment. As most of our motors are three-phase electric, when an old fuse burns out on one phase it leaves the motor running without enough electricity (causing it to overheat). This issue is called single phasing and as you can tell by how many motors have been damaged in the past few years, it is a serious issue. So in addition to the ongoing electrical upgrades, we have purchased devices that will monitor electrical flow to prevent future damage to our motors.

A Three-Phase Motor Monitor

F. Recreational Equipment

After hurricane Joaquin, you may have noticed that one of our basketball hoops was torn down leaving its twisted metal braces bent and distorted like a work of modern art. That left us with a functioning half-court; although the good hoop was still in pretty poor shape. So we built an entirely new basketball hoop for the one that was ripped down and then replaced and painted the old one for a functioning full court.

For the volleyball court, plastic netting was secured along the boundary fence to prevent volleyballs from rolling into the street. There is now a wide range of board games available in the game room for students (please make sure your students do not remove the games from the game room). We have installed a dartboard in the new snack bar like the one that used to be available for tournaments in the former snack bar.

And finally, we have added a brand new horseshoe pit area by the volleyball court. These are sand filled pits with solid wooden boxes (horseshoes available in the game room).


G. Student Wireless Access

As you may have noticed last year, students still do not have Wi-Fi access at the GRC. I promised faculty only to allow students Wi-Fi access if their bandwidth was separated from that of the faculty's which has not happened yet. While we await the technological upgrade to our system necessary to separate those two networks from the University of the Bahamas, we have set up a router in the computer lab that will provide an open, **bandwidth-limited** access point for students. We added a few more tables, electrical outlets, and plenty of chairs so that more students can utilize the computer lab at the same time. We also added a brand new ductless air conditioning unit (controlled by the station remotely) to the computer lab as this area will likely have much more utilization than before.


H. Iguana Feeder

We installed an iguana feeder early last season by the Iguana Conservation Center. For a minor charge of 50¢, students, faculty, and the Club Med tourists can feed the iguanas

anytime they please. Funds from this feeder and the nearby donation box go towards purchasing additional iguana food and making improvements to our Iguana Conservation Center.



IV. Vehicle Purchases

As mentioned earlier, we unfortunately lost two trucks this year due to age. On the plus side, we have acquired two new trucks for groups and one new truck for researchers!


The first truck, yet unnamed but currently referred to as the "food truck" (you can probably see why based on the back box), is equal in size to Trucks R and S. We consider this a medium size vehicle that can fit a group of around 16 when benches are installed.

The next truck, soon to be named Truck M, is a large Hyundai Mighty. This truck will have a back bed for similar in size to Truck B and Truck Y from last year (perhaps even a bit bigger) and will be able to fit upwards of 24 persons. In addition to its size, this truck has a lift gate that will very much come in handy for station maintenance (and sadly no, faculty will not have access to the lift gate).

Finally, after the great success we had in reliability and fuel-efficiency in our flatbed Hyundai Porter last year, we thought it would be good to purchase another one. Although we are not able to safely put benches on these trucks, they come in handy for our small researcher groups. So this time, we purchased a double-cabin Porter. This vehicle can seat six researchers with plenty of room in the truck bed to carry supplies!

All three of the vehicles are diesel and get great mileage (particularly the lighter Porter). The parts are a bit harder to come by for these trucks. But the substantially lower cost of getting used Japanese and Korean vehicles in the Bahamas as compared to vehicles from the US makes up for the challenges in finding parts.

In addition to these three new trucks (new to us, anyway) and thanks to another recent generous donation, we are purchasing locally a 15 passenger van at an incredible price. This vehicle will greatly help us on rainy days when we have airport runs.

V. GRC Finances

A. Student Days

This year, we had a total of 10,226 Student Days (this is the metric by which we measure attendance and is basically the number of visitors we have multiplied by the number of nights they stayed). This is slightly lower than last year (at ~10,450) and continues a pattern of lower numbers relative to past years. Our average annual Student Days (going back the last seven years for which we have comparable data) is ~13,000 (with a peak of around 14,800 in the 2012-2013 school year). We understand that student recruitment has been difficult lately with both money concerns and decrease interest in field sciences. So once again I want to thank you all for your efforts in getting your courses together and filled. We will continue to keep our costs down as best we can while providing you and your students a wonderful and safe field experience.

B. Budget

The Gerace Research Centre had a total income for the 2017-2018 school year of $686,628.50 (using our new University of the Bahamas aligned fiscal year of July 01, 2017 to June 30, 2018). Most of that income came from Room and Board (including AC

unit rentals) followed by miscellaneous Sales (library, snack bar, etc.) and then donated funds. The remainder of our income is from our vehicle usage fee, technology fee, travel insurance, and miscellaneous fees like credit card processing. Our expenses were $688,394.80. Our largest expense is staff salaries followed by food purchases. The investments we make in new equipment and construction at the GRC and the cost of repairs and maintenance to the GRC are our next two largest expenditures. This is followed by fuel (gas, diesel, and cooking propane), Bahamas National Insurance Board taxes, and library and snack bar purchases

Income	
Room and Board	83.2%
Sales	7.1%
Donations	3.8%
Vehicle Rentals	1.8%
Technology Fee	1.3%

Expenses	
Salaries	49.4%
Food	15.1%
Capital Investment	8.9%
Maintenance	7.7%
Fuel	3.5%
NIB Employer Contribution	2.6%

You'll notice that our expenses were almost $2,000 over our income this year. Most of our expenses follow very closely with the number of people we have visiting (we purchase less food and have less staff working the kitchen when there are fewer groups). This allows us to stay afloat during slow times, but only up to a point. Increasing costs (especially in fuel and food) have taken their toll on our budget this year. And these costs will only rise as the Bahamas VAT (value added tax) has gone up 4.5% this past July to a total of 12% on nearly all goods and services.

VI. Information for the Upcoming Season

A. The 3rd Joint Natural History and Geology Conference

Once again the GRC will be hosting a Joint Natural History and Geology Conference. The conference will be held from Thursday night, June 20th (opening ceremony) to Monday night, June 24th (closing ceremony) with departing flights on the morning of Tuesday June 25th. The chairs of this year's conference will be Dr. David Griffing and Dr. Mark Kuhlmann of Hartwick College. We will be meeting at the Geological Society of America conference to discuss possible field trips. So feel free to contact me with suggestions. More information will be coming soon.

B. Vehicle Usage Fee

Given the challenges in recruiting students for field courses, we are still trying to keep costs low. But as the costs of goods go up, particularly gas and diesel, we found it necessary to increase something. This year we focused on the vehicle usage fee. Rather than increase the total maximum rate (which would have put a substantial burden on

small groups and researchers who already carry the brunt of this fee), we modified the scale at which the fee is applied. We added a new range and adjusted the fee scale (see table).

Previous Vehicle Rental Cost			Updated Vehicle Rental Cost (2018-2019)	
1 to 3 people	$60.00		1 to 3 people	$60.00
4 to 6 people	$45.00		4 to 6 people	$48.00
7 to 9 people	$30.00		7 to 9 people	$36.00
10 to 12 people	$15.00		10 to 12 people	$24.00
13+ people	free		13 to 15 people	$12.00
			16 people or more	free

This means that small to mid-sized groups will have to pay a little extra to rent GRC vehicles and that you need to bring a larger total group size to receive a free vehicle (now 16 persons or more).

C. Lab Building Renovation

This year we received an offer of donation from the family of Dr. William Lindsay Jr. to make a major upgrade to our campus in his name. After going through a few proposals, the family has selected to provide substantial funding for the renovation of our Lab Building (T-Building). Upgrades will begin this upcoming season going lab by lab to improve and modernize our classrooms and conference room. They have approved a budget for new lab ceiling projectors, tiled floors, improve drop ceilings, substantial repairs to the walls and paneling, and a host of other modifications. We are tremendously grateful for the generosity of the Lindsay family. Look forward to those changes in the near future.

D. GRC Recreation Centre

We are often asked by students if there is a place on campus to work out. While it still surprises me at these young students have the energy after long days in the field to want to get more exercise, having a place set up for the health benefit of our students as well as our staff has always seemed like a good idea. While such a project is low priority compared to the other maintenance needs of the station, we have been trying to set aside some time during our slow periods to build a permanent workout area. So look forward to this new project being completed within the next year or two.

VII. Donations

A. Amazon Smiles Program

Do you want to help Gerace Research Centre? Amazon offers a new program where a portion of your purchases goes to supporting nonprofit organizations. And all you have

to do is buy items on Amazon! Use the following link (I suggest bookmarking it) and search for Bahamas Educational, Cultural and Science Foundation to set that as your preferred charity. Then all you have to do is buy items on Amazon like you normally do through their "Smile" website. The GRC can then request funds from the BECS foundation to pay for new improvements to the station.

https://smile.amazon.com/

Every year people offer to bring us items that the GRC can use. So we have been setting aside some items on Amazon under a GRC Wish List. These items are mostly things that can be carried in a suitcase. So if you would like to bring us something, feel free to check out this list (and while you are at it, you can log into Amazon Smiles and get a small donation to us from Amazon for you purchases as well!).

https://www.amazon.com/hz/wishlist/dl/invite/7h0DL82

B. Direct Donations

As always, your donations are greatly appreciated particularly now with our increasing costs. In fact, all of the GRC vehicle purchases in the past two years have been due exclusively to generous donations! If you wish to donate to the GRC for any specific projects, please feel free to get in touch with us. All donations are tax-deductible through the BECS Foundation in the United States. We are also looking to develop a "gofundme" site for specific station improvements as well. So stay tune!

You all make the Gerace Research Centre the wonderful place that it is. Your time, effort, generosity and love of this place make it unlike any other field station in the world. So thank you all again for your continued support!