

# From Temperate to Tropical Islands: Learning Biology through the Partners in the Parks Program

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This year we organized and/or participated in two excursions with students sponsored by a unique partnership between the National Collegiate Honors Council and the U. S. National Parks Service called the Partners in the Parks (PITP). This partnership, eight years strong, was founded by Joan Digby, Honors Director at LIU Post. This program is interdisciplinary in nature, and weaves the history of place with knowledge about biological ecosystems of the areas. The two excursions we led were to the Boston Harbor Islands National Recreation Area and Boston National Historic Park and the U.S. Virgin Islands National Park. Activities included camping in tents or staying in rustic cabins, cooking meals, learning about the ecology and geology of the areas, and the history of Boston and the U.S. Virgin Islands. Biology became especially relevant in the history of the U.S. Virgin Islands when pointing out that the decline of slavery and indentured servants was directly proportional to the decline of soil quality due to sugar cane growth on plantations. In Boston, students learned how the harbor became cleaner after an installation of a sewage treatment plant and how Spectacle Island was transformed from a dumpsite to a beautifully landscaped island complete with hiking trails after landfill restoration. Students also cleared invasive species from Peddocks Island under the direction of park rangers. On St. John in the U.S. Virgin Islands, students snorkeled and learned about coral reef, mangrove, and sea grass bed ecology, and about tropical plants indigenous to the area while hiking. The two experiential learning excursions were an effective way to infuse the curriculum with hands-on learning about biological concepts, ecosystems, sustainability, and stewardship.

**Keywords:** experiential learning, travel courses, invasive species

**Link to Original Poster:** <http://www.ableweb.org/volumes/vol-39/?art=72>

## Introduction

Students have benefited from learning biology through travel courses or excursions throughout time. Guinan et al. (2010), Nolan (2009), and Nolan and Biolsi (2012) describe various types of field experiences that they have conducted with students, mostly in a tropical setting. These courses serve to expose the students to environments that they might not necessarily see, and to connect with these environments in an immersive way. As the future caretakers of our planet, we hope the students gain an appreciation for these environments and will go beyond to help steward them through time. The two places discussed here include two very different National Parks. Professors

can write proposals to take students on one-week excursions to any site that contains National parks, or heritage sites. See <https://www.nchchonors.org/events/partners-in-the-parks> for examples.

Below is a description of the two programs that we conducted this past year in which we exposed students to the U.S. National Parks.

## Boston 2016—the Centennial of the U.S. National Parks Service

In this 2016 PITP excursion, students were immersed in the natural history of the Boston Harbor Islands National Recreation Site and the history of our

country in the Boston National Historical Park, the African American Heritage Site and the Charlestown Navy Yard. Students camped in the Boston Harbor Island in tents and traveled by ferry to Boston and surrounding areas.

As a former resident of Boston (KN attended Northeastern University from 1974-1979) and a frequent visitor (at least once a year) KN witnessed radical changes in the Boston waterfront, while being comforted that many historical sites have remained the same. The Boston Harbor, in which KN participated in several trips to the Boston Harbor Islands as well as a whale-watching trip, has been extensively cleansed of pollution. Much building has taken place (and is continuing to take place) at breakneck speed since the Big Dig has expanded area suitable for development due to landfill that was provided by this project.

This excursion exposed the students to a rapidly changing place while allowing them to learn about natural history and American historical sites that are urgent to preserve. The backdrop of the National Parks and the insight of the U.S. National Park Rangers helped make this experience very memorable to the students. From kayaking, to participating in invasive plant removal, to learning about the history of the American Revolution, African American heritage, and the immortalization of our shipping industry through the Charlestown shipyards, our students were very active and interactive for a week.

Through this program, the students gained an appreciation of our natural history and American history, and showed, through their journals, that they want to explore further in the future aspects we may have had only a chance to touch upon. As present and future citizens, they should have gained tools to help them look at their own worlds through lenses through which they examined Boston. They will have become better people because of these deeper explorations, and have discovered new insights about themselves as well as in others.

The timely publication *Bunker Hill* by Nathaniel Philbrick (2013) served as the backdrop for our entire experience. The book provided the students with history from the early American Revolution, and helped reveal why the Boston Harbor Islands were so strategic in that war and beyond.

Students from Virginia Tech, the University of Florida, Emporia State University, Eastern Kentucky University, and Hillsborough Community College, gathered at Long Wharf in Boston on a Sunday afternoon in August. We ferried to our camping destination (one can camp on three islands in the Boston Harbor Islands--- Peddocks is the only one that has water). We stayed on Peddocks Island for five nights in tents. Since there were no showers on Peddocks, and the last ferry leaves at 3:30 P.M. we decided to stay at the Constitution Inn in Charlestown for our last night.

At the beginning of the trip, KN brought four four-person tents with her as well as a cooler with

perishables (meat, veggies, and fruit) and charcoal for a barbecue. KN, with the assistance of RC, brought dry food (pasta, sauce), portable foods such as cereal bars and Pop tarts, and the old standbys, peanut butter, jelly, and Fluff. On Wednesday, we replenished our food at Whole Foods before boarding our ferry to the campsite. KN brought plastic dishes, labeled with their names, that the students took turns washing. This reinforced the idea that we were trying to recycle to reduce our negative impact of producing waste on the planet. We also had to carry our waste off the island, which we were able to do when we ferried into Boston.





**Itinerary at a Glance**

Day 1 Sun. 3:30 PM ferry to Peddocks Island	Arrival, meet at Long Wharf for 3:30 PM Ferry to Peddocks Island Set up tents. Get to Know You Barbecue. Evening: Circle about importance of natural parks to you. Write in journals.
Day 2 Monday Island Hopping between George’s and Spectacle Island	Ferry to George’s Island. Hikes and Ranger Interpretations. Ferry to Spectacle Island Sea kayaking program. Explore natural history. Ferry back to Peddocks. Evening: Campfire and Circle to discuss readings about history of Boston Harbor Islands, a Natural Recreation Site. What is the difference between wilderness areas and parks? Write in journals.
Day 3 Tues. 9:30 AM Ferry to Boston National Historic Park	Meet National Park Ranger at Faneuil Hall at 10:30 AM Tour of Faneuil Hall and walk the Freedom Trail to visit Paul Revere House and Old North Church. Walk past Old State House, site of Boston Massacre and Old South Meeting House, and Holocaust Memorial Lunch on their own in Quincy Market Dinner, Games, discussion of impressions of day Evening: Campfire Circle to discuss readings about American Revolution. What types of revolutions do we have today? What would you fight for? Write in journals.

Day 4. Wed. 9:30 AM Ferry to Boston	Black Heritage Freedom Trail; African American Museum; Ranger walk and talk Shop for food. 3:30 PM Ferry back to Peddocks. Discussion of race and American History. Compare and contrast various “freedoms” Evening: Write in journals
Day 5. Thurs. Stay on Peddocks—last day	Work with Park Ranger on Peddocks Island to clear invasive species. 10 AM—2PM, tour of chapel, explore island Evening: Dinner, last campfire, discussion of the week
Day 6. Fri. 9:30 AM Ferry to Boston/water shuttle to Charlestown	Break camp, Ferry to Boston, shuttle to Constitution Inn to leave our gear. Discussion of Bunker Hill book and quotes Bunker Museum/Bunker Monument -- Ranger lead tour 11AM---Lunch--Charlestown Navy Yard in PM—USS Constitution— USS Cassin Young Discussion of Boston and Cambridge as natural history magnets. Shower at Constitution Inn. Dinner in Cambridge—tour of Harvard Yard---back to hotel by 11 PM.
Day 7.Sat.	Breakfast and Depart

The above sketch was based on my modified proposal and itinerary that served as my proposal for the inaugural PITP Boston (Thiessen-Reily and Digby, 2016)

### Other Aspects of the Trip Related to Biology

In our hectic urban lives, it is important for us to see the connection of urban lands to biology. We taught biology in the context of ecosystems. We provided readings that contained inventories of organisms on the islands that included insects, birds, shore creatures, and plants. We pointed out that the Boston Harbor Islands act as a protection against storms and that the plants play a very big role in this protection.

We learned about the history of Spectacle Island--it had a brothel and a casino on it, was “busted” for those, and then a horse rendering glue factory was built on it, followed by its use as a landfill site. Lastly, it was capped with dirt from the Big Dig in Boston---especially at its two drumlin (hill) sites. The reason why it is called Spectacle Island is because it looks like a pair of spectacles---round at both ends connected by a narrower strip (sandbar). (Actually, Peddocks Island has a similar shape.) While the students were kayaking or sunbathing, KN took about a 3-mile round trip walk to the top of the tallest drumlin. Spectacular panoramic views of the various bays and islands in the Boston Harbor Islands assailed her. The transformation of Spectacle Island from a dumpsite to a beautifully landscaped island reinforced the possibilities of restoration biology for the students.

We had an “invasive plant clearing day” on Peddocks Island, which was led and organized by park rangers. We had our own task to do, which was to clear out mainly Japanese knotweed, an invasive plant, from the yurt area. We also learned how to identify other weedy species such as raspberry, pokeweed, and bur. We took samples of a few plants in test tubes to be dried later for an on-going DNA barcoding project at St. Francis College.

We stressed throughout the week that the Boston Harbor used to be polluted dumping ground that has recovered somewhat from some of its injuries. We discussed the biology of how sewage treatment plants work. We hope that the students will return to the area for further biological studies.



### *St. John, U.S. Virgin Islands National Park*

The island of St. John in the U.S. Virgin Islands is comprised of 56% U.S. National Parklands. This includes a mix of wet and dry tropical forest, as well as beaches and bays. The Virgin Islands Environmental Resource Station (VIERS) was built in the 1960's by the National Aeronautics and Space Administration (NASA) as a camp for the Tektite mission. This mission was to test the impacts of living underwater for an extended time in a Tektite housing station on the human body. There were twelve Tektite missions—the first included men only—subsequent missions included women. At VIERS, the late Randy Brown built a museum dedicated to this history (Tektite Underwater Habitat Museum- <http://www.islands.org/tektite/index.htm>).

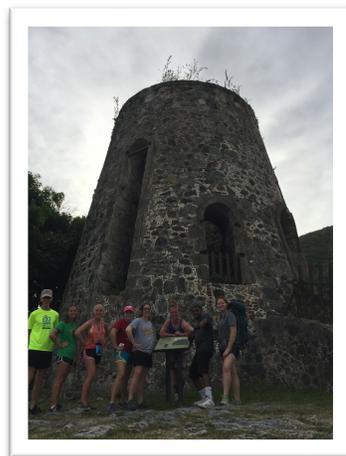
Virgin Islands University now owns this property, located in the U.S. National Park. VIERS provides a similar rustic experience to that of living on Peddocks

Island in the Boston Harbor islands, although we do get the greater protection of cabins. One can go to the VIERS website and contact the managers to arrange a trip to bring students there. They provide all the meals and help plan itineraries: <http://www.islands.org/viers/>, although the future of VIERS is currently uncertain because of catastrophic damage from two 2017 hurricanes.

Three-minute showers with water heated by solar panels are the norm. We focused on dry, tropical forest with its surprising cacti, and hiked up to some wetter forest that could support large species like kapok trees. We snorkeled in bays and in mangroves—always on the lookout for turtles. We were occasionally rewarded with a viewing of these incredible creatures with their astounding breath-holding capacity. Fish and coral were plentiful in the shallow edges of the bays. We learned that certain fish were more active at night, and we saw an occasional group of squid. The mangroves were in very shallow water and revealed an abundance of oysters, sponges, and tunicates on their tree roots. We also learned the differences between white, red, and black mangroves. We saw juvenile angel, puffer, butterfly and schoolmaster fish among the roots, sea pearls, mermaid wine glass algae and barracuda and sea stars in the turtle grass beds. We have also seen the invasive lionfish, and discuss how invasive species can take over an area.

Ital, a native St. Johnian, picks fresh specimens for his presentations on medicinal plants. Some of his plants were noni, ironwood, thyme, May apple, tamarind, false tamarind, wild coffee, sour sap, love plant, bay tree, thyme and calabash. (KN took a few leaf fragments back to the lab for DNA barcoding.)

The Three Kings celebration has been modified from its original, quite biological education purpose. Since St. John celebrates Three Kings Day, a Puerto Rican student informed me that on this day, January 6<sup>th</sup>, it is customary to give each other three gifts. We decided to each secretly pick a name of another student or teacher and to give that person three “biological” gifts. No money can be used—they must be gifts from the wild. The gift was supposed to be labeled with the Latin binomial name (common name was optional). Because we grew weary of “enforcing” this rule, now other gifts from nature are acceptable, including attractive arrangements of rocks, or sea salt. (Once RC re-gifted KN’s conch.) This “game” built quite a bit of camaraderie among the students. Another favorite game is to take a marker and mark a hermit crab, and then release the crabs at the edge of a large circle to see which one made it to the center first. Other biological information, albeit indirect, came from learning about how people were exploited in slavery to farm and process sugar cane. The farming of this commodity depleted the soil; bay leaves from the bay tree for bay rum cologne were a later economic alternative—they are still processed on the island of St. Thomas.

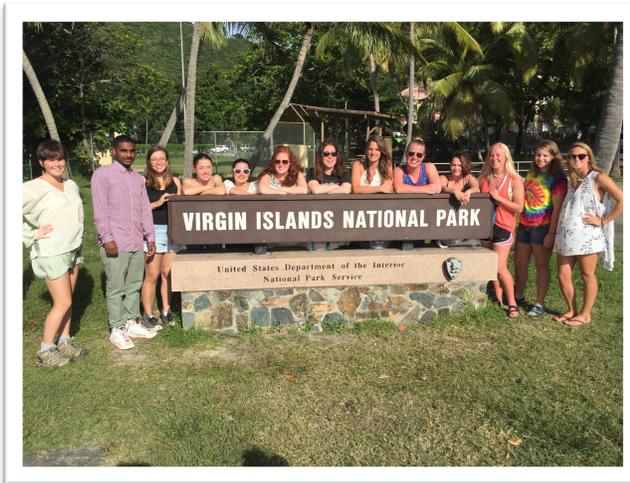


The Tektite Underwater Habitat Museum provided some interesting physiological information about how the effects of living underwater affect the body. Decompression sickness is also explored in exhibits in the museum, as well as the physiology of diving.

**Itinerary at a glance**

Day 1 Travel day	All students arrive at Charlotte Amale airport (STT) in St. Thomas. Group travels together by taxi to ferry to St. John; taxi to VIERS where there is dinner and circle ice breakers—short walk to Great Lameshur Bay dock to observe stars and bioluminescence
Day 2 Lameshur Bay Day	VIERS environmental sustainability orientation, snorkeling, hiking, kayaking, visit on-site mangroves— evening—discussion about importance of U.S. National Parks and our experiences with parks
Day 3 Coral Bay/East End Day	Taxi to snorkel in Princess Bay/Hurricane Hole mangroves; Lunch in Coral Bay—learn about history of town, snorkel in Hansen Bay—look for sea turtles— evening—fish ID and info and ecotourism discussion— Three Kings Day celebration
Day 4 Ram’s Head and Salt Pond day	Hike to Ram’s Head, Salt Pond--snorkel in Salt Pond Bay— evening---tour Tektite Museum—night snorkel
Day 5 Reef Bay and Sadie Sea day	Hike the Reef Bay trail (see giant kapok tree), snorkel off Sadie Sea vessel---evening—Ital Anthony—medicinal plants presentation
Day 6 North Shore Day	Annaburg ruins and sugar cane farming; snorkeling around Water Lemon Caye and in Cinnamon Bay---evening--- dinner in town
Day 7 Travel day	Pack up and leave by 8 AM





## Student Outline

### Objectives

If you participate in such an excursion, you will come out of your comfort zone. You will be exposed to insects, perhaps thorns from invasive species, and you will have to have different expectations of water use. In the U.S. Virgin Islands, you might find a lizard in your cabin. You will live in a group in close quarters. You might get homesick, but remember that you are away for only one week! But you will actually live in and experience ecosystems that you may not have done in the past. You will see stars, something we in the NYC region do not often see. Take it slowly if you are not used to hiking or swimming. Rest often. No judgment. Interact with your fellow students; often, your electronics will not work as well in these more remote places. But you will be so rewarded by seeing many wonderful plants and animals---enjoy them!!

If you are interested in participating in a Partners in the Parks program, visit the website

<https://www.nchchonors.org/events/partners-in-the-parks>. You would apply through that website. A one-week excursion, not including airfare, will cost between \$600-\$1000 and will include food, housing, and some reading materials.

### Discussion

These two very different programs have enriched the lives of the instructors, and, hopefully, the students. They have forced the instructors to take a good look around them, read up on the history of the two places, and come up with novel ideas of how to present the knowledge to the students. In Boston, discussions about the National Parks, the Boston Harbor restoration were conducted around a campfire and/or a picnic table. Discussions of ecotourism and the history of the U.S. Virgin Islands may take place on a dock under the stars. From looking at the students' journals, we have seen that these types of experiences are often life-changing for the students.

### Notes for the Instructor

As a professor, especially in an honors program, you are also allowed to participate in these excursions. Each excursion lists the itinerary and the list of equipment needed. If you would like to lead an excursion, you must write a proposal that is due in September before the year anticipated. Go to:

<https://www.nchchonors.org/events/partners-in-the-parks>  
or contact K. Nolan for more information.

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## Acknowledgments

Thanks to all the students who have made the Partners in the Parks program possible.

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Richard P. Conley has been married to Kathleen Nolan for 36 years. He has attended numerous field courses with her and assisted greatly with the preparation of the Boston 2016 Partners in the Parks program.

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### Citing This Article

Nolan KA, Biolsi K, Glider W, Conley RP. 2018. From Temperate to Tropical Islands: Learning Biology through the Partners in the Parks Program. Article 73 In: McMahon K, editor. *Tested studies for laboratory teaching*. Volume 39. Proceedings of the 39th Conference of the Association for Biology Laboratory Education (ABLE). <http://www.ableweb.org/volumes/vol-39/?art=73>

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