U.S. DEPARTMENT OF EDUCATION

GreenRibbonSchools

District Sustainability Award Nominee Presentation Form

CERTIFICATIONS

District's Certifications

The signatures of the district superintendent on the next page certify that each of the statements below concerning the district's eligibility and compliance with the following requirements is true and correct to the best of the superintendent's knowledge.

1. The district has been evaluated and selected from among districts within the Nominating Authority's jurisdiction, based on high achievement in the three ED-GRS Pillars: 1) reduced environmental impact and costs; 2) improved health and wellness; and 3) effective environmental and sustainability education.

2. The district is providing the U.S. Department of Education Office of Civil Rights (OCR) access to information necessary to investigate a civil rights complaint or to conduct a district wide compliance review.

3. OCR has not issued a violation letter of findings to the school district concluding that the nominated school district has violated one or more of the civil rights statutes. A violation letter of findings will not be considered outstanding if OCR has accepted a corrective action plan to remedy the violation.

4. The U.S. Department of Justice does not have a pending suit alleging that the school district has violated one or more of the civil rights statutes or the Constitution's equal protection clause.

5. There are no findings of violations of the Individuals with Disabilities Education Act in a U.S. Department of Education monitoring report that apply to the school district in question; or if there are such findings, the state or school district has corrected, or agreed to correct, the findings.

6. The district meets all applicable federal, state, local and tribal health, environmental and safety requirements in law, regulations and policy and is willing to undergo EPA on-site verification.

U.S. Department of Education Green Ribbon Schools District Sustainability Award 2019-2021

Name of Superintendent: Dr. oel Herbst
(Specify: Ms., Miss, Mrs., Dr., Mr., etc.) (As it should appear in the official records)

District Name: FAU Lab School District
(As it should appear on an award)

Address: 777 Glades Road

Telephone: 561-297-3975 Fax: 561-297-3939

Web site/URL: http://www.adhus.fau.edu/ E-mail: jherbst1@fau.edu

I have reviewed the information in this application and certify that to the best of my knowledge all information is accurate.

_____ Date: 1.8.19
(Superintendent's Signature)

U.S. DEPARTMENT OF EDUCATION
GreenRibbonSchools

Nominating Authority's Certifications

The signature by the Nominating Authority on this page certifies that each of the statements below concerning the district's eligibility and compliance with the following requirements is true and correct to the best of the Authority's knowledge.

1. The district is one of those overseen by the Nominating Authority which is highest achieving in the three ED-GRS Pillars: 1) reduced environmental impact and costs; 2) improved health and wellness; and 3) effective environmental education.
2. The district meets all applicable federal civil rights and federal, state, local and tribal health, environmental and safety requirements in law, regulations and policy and is willing to undergo EPA on-site verification.

Name of Nominating Agency: Florida Department of Education

Name of Nominating Authority: Commissioner Richard Corcoran

I have reviewed the information in this application and certify to the best of my knowledge that the school meets the provisions above.

02/08/19 Date:

Commissioner Richard Corcoran

SUBMISSION

The nomination package, including the signed certifications, narrative summary, documentation of evaluation in the three Pillars, and photos should be submitted online according to the instructions in the Nominee Submission Procedure.

OMB Control Number: 1860-0509
Expiration Date: March 31, 2021

Public Burden Statement

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless such collection displays a valid OMB control number. The valid OMB control number for this information collection is 1860-0509. Public reporting burden for this collection of information is estimated to average 37 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. The obligation to respond to this collection is required to obtain or retain benefit P.L. 107-110, Sec. 501, Innovative Programs and Parental Choice Provisions. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the U.S. Department of Education, 400 Maryland Ave., SW, Washington, DC 20202-4536 or email ICDocketMgr@ed.gov and reference the OMB Control Number 1860-0509. Note: Please do not return the completed ED-Green Ribbon Schools application to this address.

Florida Atlantic University (FAU) Lab School District
Green Ribbon District Sustainability Summary

The FAU Lab School District includes FAU High School, A.D. Henderson University School, the Karen Slattery Educational Research Center for Child Development, Pine Jog Environmental Education Center (EEC) and Palm Pointe Educational Research School.

In the journey to the top of the Green Schools mountain, students and staff have gained the power to observe what is around them, learn what changes can do, change what they can, and inspire those they meet along the way. In the Disney movie *Tarzan*, they say: "In learning you will teach and in teaching you will learn," and this is how FAU Lab Schools chooses to educate and engage their teachers, students, parents, and community partners.

Campus growth and culture has been an evolution creating a sense of normality for the lifestyle in which students "Go Green." A passion for the environment lives in students and allows them to learn and grow, both physically and metaphorically, in a green culture that is not merely something achieved for acknowledgements and awards. Students are encouraged to live their lives inside and outside of school as kinder and more ecologically-aware citizens.

FAU culture emphasizes being cognizant of the greater world around them with a focus on creating a learning environment that reflects, encourages, and enhances their outlook and outreach toward global citizenship. Hydroponic gardens as well as a butterfly reading garden have been added to the school grounds to encourage utilization of the lush outdoor areas and beautiful Florida weather. Additionally, FAU expanded two outside classroom gardens, including variable systems such as aquaponics, vertical hydroponics, horizontal hydroponics, raised bed gardens, barrel gardens, and a new research-based aquaponics lateral system. These gardens were built in the center of the school for all students to observe, learn, and participate in care and maintenance. There is also a WeatherSTEM station with a YouTube channel run by students.

School culture has changed to one of promoting sustainability in all areas. Some highlights are the school's solar-powered walkway with a solar-powered backup generator designed to harness the readily available Sunshine State solar power. FAU's high school has gone even further building a solar/electric powered car from the frame up and using recycled materials for a new GT/EV vehicle.

Even in the less obvious events, FAU emphasizes promoting sustainability. For example, with fundraising/community service, students and staff now collect donated blankets to create care packages for cancer patients focusing on no waste, repurposing, no physical flyers, and digital notification. For their school-wide Color Run, the focus is again on having no waste, an environmentally safe color product, reusable water bottles, and all digital notification. FAU instituted additional water bottle filling stations and all students were provided refillable water bottles to both encourage consumption of water in lieu of sugary caffeinated beverages and decrease refuse.

Recycling programs are headed by the student-facilitated “Planet Patrol” marking on the charts of every classroom the number of recyclables collected and whether it was sorted properly. Awards are then given to the best classrooms based on data collected by the “Planet Patrol.” FAU schools have adopted a STEAM culture for all education and curriculum, and within that curriculum, have integrated environmental consciousness and environmental studies.

FAU schools participate in the Million Orchid growing project with FAU Pine Jog EEC and Fairchild Tropical Botanic Gardens. This program to restore Florida native orchids has been tremendously successful. Additionally, students are conducting university-level field research on a variety of subjects including studies on cancer cells, Bachman’s sparrows, mangrove restoration, ocean currents, geological effects of beach nourishment, carbon sequestration, alternative energy, invasive exotic species, and soft robotics to remove ocean debris. Partnerships have expanded the reach into and beyond the community with select program research presented at the White House and on Good Morning America.

FAU has grown, expanded, and stretched their program to reach far beyond where they started five years ago. They continue to strive for excellence, not as a reward, but as a culture. Already, students have created animatronic owls to preserve the natural habits of the native species, solar powered cars and go karts, and robots that will be able to harness energy from the ocean. Where will they go in the next five years? The sky's the limit, or maybe not.

Green Ribbon School District Application (2018-19)

District Name: Florida Atlantic University (FAU) Lab School District
Address: 777 Glades Road, Boca Raton, Florida, 33431
Websites: http://www.fau.edu/index.php; http://www.fau.edu/education/school-and-k12-programs/; ADHUS - http://adhus.fau.edu/; FAU High - http://www.fauhigh.fau.edu/; http://www.fau.edu/education/school-and-k12-programs/erccd/; Palm Pointe - http://tradition.fau.edu/; Pine Jog - http://www.pinejog.fau.edu/
Facebook page: facebook.com/ADHendersonFAUHigh/ **Twitter:** twitter.com/ADHUS_FAUHS
Superintendent Name: Dr. Joel Herbst
Phone Number: 561-297-3975
Superintendent Email Address: jherbst1@fau.edu
Lead Applicant Name: Kendra Palumbo
Lead Applicant Email: kpalumbo@fau.edu
Phone Number: 561-251-9344
Number of Elementary Schools: 2
Number of Middle Schools: 2
Number of High Schools: 1
Number of K-12 Schools: 1
Number of Other Schools: 1
Total Sq. Ft. 55,852 **Buildings** 424,249 total area 9.74 acre
Total Students Served: 2,651
How would you describe your district? Suburban
Does your district serve 40 percent or more students from disadvantaged households as measured by percent receiving FRPL? No **Percent FRPL:** 36%

Cross-Cutting Question: Participation in green school programs
If your district is participating in a local, state, or national program, such as Florida Green School Awards, EPA ENERGY STAR Portfolio Manager, Eco-Schools, Project Learning Tree or others, which asks you to benchmark progress in some fashion in any or all of the pillars, then indicate the program(s), level(s) achieved, and year(s):
2018 Green School of the Year Green Schools Recognition Program
2018 Green School of Excellence Green Schools Recognition Program
2018 DOE Blue Ribbon School
2018 Green Principal of the Year Finalist
2017 Green School of Excellence Green Schools Recognition Program
2017 Green Student of the Year Finalist
2017 Go Teach Grant Recipient for recycled barrel gardens
2016 Green School of Excellence Green Schools Recognition Program
2016 Green Teacher of the Year Finalist
2016 Green School of Excellence Green Schools Recognition Program
2015 Green School of Quality Green Schools Recognition Program

If your district received any awards for facilities, health or environment, list the award(s) and year(s): 2017 Disney Environmental Grant to create a school based composting program utilizing food waste to enrich our gardens.

Pillar I: Reduced Environmental Impact and Cost

Describe how your district is reducing environmental impact and costs by reducing or eliminating greenhouse gas emissions. Examples may include energy conservation program, 3R program, non-idling policy, reduced bus idling minutes, purchase of renewal energy credits, alternative transportation, green purchasing, etc.

Over the last five years, we have grown to implement a more diverse and inclusive energy conservation program. As part of this, we incorporate the use of occupancy sensors as a way to reduce energy consumption. The Department of Energy has stated that lighting accounts for 35-45% of a school's energy use. With these sensors, we are reducing lighting use by 35-90% depending on location and utilization of the area of the occupancy sensor. This act thereby reduces energy costs for both of our school buildings and our campus grid. With a total of 1,260 students in classrooms with occupancy sensors, the total savings estimate for the school as a whole is 6,017.76 kwh per day, which translates to a savings in the usage of coal to 2.4 tons of coal when using the average value of 2,500 kwh as 1 ton of coal (eia.gov), which has been reported at our SAC and PTO Meetings.

Our school wide program entitled "Save Energy, Save the Future" encourages our staff to make sure any unnecessary electronics are turned off when not in use and when not in their rooms; such as computers, overhead projectors, and other electronic classroom tools. The students are leaders in creating new projects to decrease the usage of power in our building and were the primary creators of the "Save Energy, Save the Future" program. The school has a solar-powered walkway that is designed to generate power for the building harnessing the solar power generated so readily in Florida. Our high school went even further in their design and construction of solar-powered vehicles. In addition to the full size GT/EV, our students have created and designed solar-electric charged go-karts, one in the middle school and one in the high school. The newest construction in the high school is an autonomous solar powered go-kart, as well as solar-powered race cars.

FAU Lab School District is extensive in its energy policy research as well as its implementation of energy programs. A variety of student led research projects have been initiated on the usage of alternative energy. This research engages our students in a variety of topics including the research of carbon sequestration as a process involved in carbon capture and the long-term storage of atmospheric carbon dioxide to assist in future planet health. The school also has a school-wide program to decrease the use of discernable power whenever possible through monitoring of and by each individual classroom. The reduced use of lights, turning them off during some instruction is encouraged to allow for balanced, diffuse, glare-free daylight from two or more directions in each classroom due to the architectural design of the building. This

allows for the classroom utilization of discernable power to be decreased to power usage for interior lighting of less than 1.2 watts per square foot. Our school is constantly changing and increasing our work for energy policy as well. Our solar sidewalk which is designed to charge a battery bank and provide backup power is being upgraded and redesigned as we continue to work to upgrade and enhance the Maximum Power Point Trackers (MPPT) in the near future for maximum efficiency. Student research also includes the development of an ocean energy turbine that aims to provide a stable power source to developing countries by using untapped energy from ocean currents called BEACON, Bringing Electricity Access to Countries Through Ocean Energy Collection. The energy programs of the school continue to grow and change with our continuous pursuit of knowledge and advancement focusing on our goal to "Save Energy, Save the Future."

Describe how your district is improving water quality, efficiency and conservation. Examples may include decrease in domestic water use, irrigation water use, reduction of storm water runoff, native landscaping, rainwater cisterns and/or rain barrels.

The incorporation of water conservation and alternative watering strategies is a campus-wide initiative. We have incorporated a cistern system to water our outdoor vegetation garden and to support hydro-organic gardening, and we use a separate rain barrel system for our raised bed and centrally located gardens. For the hydroponic NFT system, and both drip down systems, we use only rain water collected from the roof into a 1,000 gallon cistern. For the NFT system, the water is taken from the cistern and pumped into a 100 gallon tank, nutrients are added and the continuously circulated directly to the roots of the plants. For the wall garden and drip down systems, that water is on a timer and pumped directly to the plants. These systems save both land and water resources for a small-scale system of long-term sustainable agriculture. Student-designed conservation signage is utilized throughout our school, and we have reminder signs throughout the school to report any leaking or dripping faucets. Additionally, our distribution of reusable water bottles was a focus this year to work toward our goal of zero non-reusable water bottles on our campus. These water bottles are used with our filtered water bottle refilling fountains, which can also be used with most standard reusable water bottles. We evaluate that this program, based on student population and staff, is creating an approximate decrease of 6,250 water bottles per year based on the national average use (Edutopia).

Our students have reached out into the community with hands-on research and implementation projects such as an investigation on the Eco toxicity of impermeable surfaces to improve urban water quality and developing a device that skims our marine pollution. We also hold a "Drop Savers" water conservation poster contest and kick it off with a Google Expedition called "What happens to the poo when goes down the loo." Living in a state in which water pollution and conservation of our natural resources is such an essential part of our lives, has influenced our school culture to teach these values to our students and guide them to be more responsible with their water usage.

Describe how your district is reducing waste production. Examples may include green

purchasing, using post-consumer material office paper; reusable lunch trays; hands-free dryers; composting; 3R programs; reduced number of garbage dumpsters, green cleaning products, e-newsletter, ecologically beneficial uses of grounds; and methods of disposal for solid and hazardous wastes.

In the area of solid waste we have made numerous improvements and expansions to our efforts and reduction of our carbon footprint. “Reduce, Reuse, Recycle” is essential in our school reduction of solid waste. We have a recycled uniform program that redistributes and collects used uniform pieces, and additionally recycle and repurpose bottles, cans, paper, cardboard, magazines, newspapers, ink cartridges, building materials, and delivery materials to use for projects in our classrooms. Our school recycling program is headed by student “Planet Patrol,” who mark on the charts of every classroom the number of recyclables collected and whether it was sorted properly. Awards are given to best classrooms based on data collected by “Planet Patrol.” Additionally, the third grade measures snack waste and recyclables in the cafeteria to track progress and the High School utilizes a composting program, creating compost used within our gardens. Teachers repurpose items to utilize as storage and sorting containers for their classes. We also have our students repurpose plastic soda bottles for Carl Sagan day and utilize recycled soda bottles and cardboard to make the best water bottle rocket. From this, the unused, repurposed bottle bottoms are used as seed starters for our garden program.

Our district encourages work submitted electronically in the high school with few exceptions and whenever possible in the lower grades. Based on the national average of 833 sheets of paper per class per year that is a reduction of **75%** for our school creating an approximate reduction of **37,485** sheets of paper per year with an approximate usage of **12,495** pieces of paper through grades K-12 (Edutopia). Our Lego wall of innovation allows messages and artwork to be recreated every week by a different grade to allow for a change of décor and of message every week in the front lobby walk in area. This area is made of all recycled Legos donated to our school. Reducing the solid waste that our school produces encourages our students to promote these acts at home for a better future.

Amount of waste production saved (calculated in cubic yards):
Our approximate waste production saved is a recycling rate of 62.5% due to reduction in usage of paper and the increase of electronic submission for assignments especially in the upper grades. This is including, but not limited to, the usage of all homework and assignments in 9-12 through electronic submission and the majority of work and tests in 6-8 in electronic format. FAU Lab School District has significantly reduced the carbon footprint as well in the area of plastic by providing filtered water bottle stations and issuing reusable water bottles to the students.

Describe how your district is using alternative transportation. Examples may include compact natural gas busses, hybrid vehicles, carpool program, parking designated for fuel efficient vehicles, percentage of student and staff walk/bike to and from school.

We have continued to make strides in the area of transportation when re-evaluating and rejuvenating our school policies. Examples of our green accomplishments in transportation includes families being encouraged to carpool whenever possible. To promote this, we have an online carpooling link to encourage rideshare. We also encourage children who live in close proximity to bike or walk to school in a safe manner, promoting health as well as reduced fossil fuel emissions. Our schools also observe the National Walk to School day. These initiatives have resulted in 561 students carpooling and 160 walking to school. Many of our high school students utilize public transportation to get to school or use bikes, skateboards or walking exclusively to go around campus. Our district has separate, closer parking for those families that drive low emission vehicles. All clubs and organized activities also utilize group transportation to cut down on individual vehicle usage.

Our school also focuses on developing the transportation of the future. Our newest advanced solar powered electric vehicle is called the FAU GT-EV. This car is now fully functional, as an all-electric vehicle capable of over 100 miles per hour and 0-60 mph in less than 4 seconds. Solar Cells were laminated to the rear spoiler of the GT-EV and rear deck of the GT-EV to operate battery cooling and extend battery life. We have installed a biodiesel generator to extend the range by creating a series hybrid. This innovative project addressed the real and relevant problem of transportation fuel efficiency. Additionally, our Middle School and High School both developed and created solar powered go-karts including one that is a solar powered autonomous go-kart. Our schools focuses on both increasing green transportation of today, and developing the green transportation of tomorrow.

Pillar II: Improve the Health and Wellness of Students and Staff

Describe how your district improves the health and wellness of students and staff by implementing a school environmental health program. Include integrated pest management, contaminant controls and ventilation, asthma controls, indoor air quality, moisture control, and chemical management.

Our District culture encourages and promotes health and wellness both mentally and physically while at school and at home. Our initiatives and actions include currently having zero vending machines on our campus to encourage our students to make healthier choices though fresh foods offered as opposed to processed foods from vending machines. Additionally, we have participated in both Alzheimer's walks and Relay for Life raising money and awareness for research and support. On our school campus, we have water bottle filling stations and all students were issued refillable water bottles to encourage a decrease in plastic waste and an increase in the consumption of water in lieu of caffeinated beverages with high sugar contents. We also have a CHANGE program providing a give-back program in grades 3-5 to the community. All students in grades K-9 are engaged in physical education daily and active engagement in sports within those physical education classes, which include organized sports, skill- building, and team-building activities. Our students participate in a wide variety of sports during their physical education classes including, but not limited to swimming, archery, soccer, softball, baseball, flag football, "Quidditch," basketball, track and field, yoga, floor hockey, pickleball, badminton, cricket, stunting, dance, volleyball, palates, rugby, Nerf ball

and handball.

Our administration also has outdoor education time built into the curriculum across all grades. Our students in ninth grade are required, but not limited to address all of the Sunshine State Standards and exhibit an improved level of health-related fitness throughout the course of the year through an engaging physical education program. Our school shares and encourages use by 100% of the staff and students in our gardens and the produce that is harvested. Our school-wide health initiative is posted throughout the lunchroom and in classrooms encouraging healthy lunch choices and giving healthy options to the children. Our students throughout all grades see the efficacy of sustainability and the usage of the foods that we are producing within our school gardens. Our high school maintains and cultivates an organic garden, growing fresh vegetables and herbs all utilized, donated, consumed by our own staff and students. Additionally, our students identify and initiate guided research that promotes health and well-being. Examples of this research include how our students have designed and implemented a Tilmap: An automated instrument to measure tumor infiltrating lymphocytes in cancer tumors and in another project, a SEAC: A system for early identification of airborne chemicals.

Describe policies, practices and procedures your district has in place to support the Coordinated School Health or Whole School, Whole Community, Whole Child (WSCC) approach. Examples may include completed Florida Healthy School District Assessment and/or recognition, innovative district wellness, physical education, and bullying prevention policies.

School mission statement: The Alexander D. Henderson University School (ADHUS) is an elementary-middle school (K-8) and was legislated a developmental research school, effective July 1, 1991. ADHUS is a public school under the auspices of the State University System. ADHUS holds departmental status in the College of Education at Florida Atlantic University with the Director serving as a member of the College Executive Committee. The Dean of the College of Education is the designated Superintendent. The school has a three-fold mission of (1) being a demonstration site for teacher education; (2) developing curricula; (3) conducting research. The culture of our school is designed to expand and promote the continued wellbeing and environmentally sound educational environment for our students. Environmental research has become a standard for our students and our staff. Examples of our research that are integrated and applied programs sponsored and promoted by our administration are:

a) Alternative fuel and energy solutions
b) Solar powered full size vehicles, go karts, and model cars
c) Expanded aquaponics to five areas
d) Hydroponics with a cistern system for water
e) Conservation and repurposing of materials this year
f) Tilmap: An Automated instrument to measure tumor infiltrating lymphocytes in cancer
g) Evaluating the eco toxicity of impermeable surfaces to improve urban water quality
h) SEAC: A system for early identification of airborne chemicals
i) Developing a device that skims our marine pollution
j) Investigating the geological effects of beach re-nourishment
k) BEACON an ocean energy prototype that aims to provide a stable power source to developing countries by using untapped energy from ocean currents

I) Research of carbon sequestration

Our campus has environmental education posters throughout the campus for constant reinforcement and learning. Additionally, the school is a partner in the teacher education process of the College of Education, providing an ideal setting for the observation of current instructional styles and strategies and for educating future educators on green school initiatives. We utilize our green areas as pre-student teaching experiences of undergraduate elementary and secondary education students and encourage practitioners in the field through professional visitations, workshops, demonstrations, and teaching tapes. Our district is a site for statewide, in-service clinical educator training and allows for the presentation of all of our Green education enhancements. Our faculty have presented our programs at the FETC, NSTA, ISTE conferences on green education in action through STEAM, highlighting our environmental projects.

Our school district as a whole has required the STEAM program incorporate green education and environmental expansion as a core component of our school. We have most recently updated our five-year plan with an expansion including hands-on environmental research that can be implemented into the curriculum. We have added additional students to our green team and have set up sub-teams within the school to create a collaboration and allow for additional resources and completion of tasks. The requirements of being a green school is formally addressed at PTO and SAC meetings for all meetings, addressing continued research and involvement within the community as well as progress. FAU also works to incorporate new staff as they begin to participate within the program so that the program continues to sustain and grow.

Pillar III: Effective Environmental and Sustainability Education

Provide examples of interdisciplinary learning about the relationships between dynamic environmental, energy and human systems. Examples may include innovative environmental and sustainability curriculum (instruction and assessment); district environmental education programs and opportunities; career pathways; professional development for faculty and staff; and extra-curricular activities.

Through the guidance and knowledge of the previous four years, we have grown to learn from what we teach and teach what we have learned. Our faculty has presented our programs at the FETC, NSTA, ISTE national and state conferences on green education in action through STEAM and highlighting our environmental projects. In the area of professional development, our teachers recently attended a seminar at Pine Jog in conjunction with the Learn Green Institute (LGI) on teacher Environmental Science using creative methods. The class was taught by Bill Bigelow and it is called A People's Curriculum for the Earth. The activities taught were heavily based on environmental justice movements, designed to inspire and inform students to make a change in their environmental habits. Two of our faculty presented at the Latino Earth summer symposium at Pine Jog. This program educates educators on promoting "collaboration between educators and Latino communities by engaging youth and families in culturally based

ecological restoration. Environmental stewardship is integrated with culturally authentic resources, Spanish language curriculum, and citizen science process skills like data collection, analysis, habitat restoration, and water stewardship. Additionally, our Green Schools Coordinator works with mentoring numerous schools and assisting them in securing supplies needed for their programs.

On the student level, one of our students presented at the Social Innovation Summit in California presenting her continued research on ocean energy prototype that aims to provide a stable power source to developing countries by using untapped energy from ocean currents. Our student also presented the Tilmap: An automated instrument to measure tumor infiltrating lymphocytes in cancer at the 3M Science Symposium. Students presented and participated in World Thinking Day on the development of sustainability and goals for the future. Our students have presented at numerous science research conventions to present the ever-expanding environmental research that we are working on. Some examples include looking at bacterial infection during citrus greening disease to hopefully develop early detection indicators and potential treatments, investigating the biomechanics of lionfish spines, and researching new methods of carbon dioxide sequestration as a means to ameliorate future atmospheric emissions. Students work with the University departments as an interdisciplinary team fostering a sense of community.

To integrate subjects in the schools, all learning gardens and outdoor classrooms incorporate the natural world as well as utilize repurposed and recycled materials and supplies in an effort to reduce the carbon footprint that we create in the process of expansion. Our outdoor learning classrooms are located one centrally between the middle and elementary wings, one along the length of the high school with observation windows from all the classrooms and the reading garden at the front of the school. Our gardens and classroom areas are utilized and cared for daily by our students and staff at all grade levels. Students are encouraged to assist and design all new garden areas with guidance and direction of staff based on plant necessities and growth potential. Our green learning program concepts are encouraged to be integrated in all curricula; i.e. recycling utilization through art, math calculations of produce produced, poetry writing of the inhabitants of our gardens, scientific study of the plants and inhabitants of our gardens, engineering to create aquaponics that work more efficiently and produce a higher yield. We use plants that are native species found in Florida, strawberries, flowers, tomatoes and herbs. Marigolds and citronella are used for natural pesticides.

The culture of our school is to share our experiences and research whenever possible to create and encourage change. Our engineering team has presented their solar powered vehicles at the Florida Energy Summit. Our green schools leader presented our schools programs at the Governors Summit. We also had our solar powered vehicles and other engineering green initiatives on display at the Museum of Science for the month of February. Students shared their environmental research at National Forbes 30 under 30 event. Numerous state and local legislators have come to see our ever growing program and our coordination between students of all interests and backgrounds working toward common goals.

Demonstrate how your district uses the environment and sustainability as a context for learning science, technology, engineering and mathematics content, knowledge and thinking skills.

We have a school-wide approach to environmental integration within all subject matter and all disciplines. We have adopted a STEAM culture to all education within our buildings. Within the STEAM curriculum, we have integrated environmental consciousness and environmental studies. The following are our integration efforts related to the environment and sustainability as it aligns with the Sunshine State Standards.

- K-2 All plants and animals, including humans, have internal parts and external structures that function to keep them alive and help them grow and reproduce. (English and Science)
- K-2 Recognize that some books and other media portray animals and plants with characteristics and behaviors they do not have in real life. (English)
- K-2 Identify the beneficial and harmful properties of the Sun. Sources of energy have continuously altered the features of Earth by means of both constructive and destructive forces. (Health, Science, English)
- K-2 All life, including human civilization, is dependent on Earth's water and natural resource. Recognize that water, rocks, soil, and living organisms are found on Earth's surface. (Science, Math)
- K-2 Describe the need for water and how to be safe around water. Make observations of living things and their environment using the five senses. Students can identify the major parts of plants, including stem, roots, leaves, and flowers. (Math, Science, Health, English)
- K-2 Humans continue to explore the composition and structure of the surface of the Earth. (History, Engineering, Science, Math, Reading)
- K-2 Both human activities and natural events can have major impacts on the environment. (Health, Science, English, History) Describe how small pieces of rock and dead plant and animal parts can be the basis of soil and explain the process by which soil is formed. Classify soil types based on color, texture, the ability to retain water, and the ability to support the growth of plants.
- K-2 Air and water are in constant motion that result in changing conditions that can be observed over time, erosion experiments and observation of our live WeatherSTEM station.
- K-12 Investigate, by observing and measuring, how the Sun's energy directly and indirectly warms the water, land, and air. Also adopted as a school wide event for the solar eclipse.
- K-2 State the importance of preparing for severe weather, lightning, and other weather related events. Students measure and compare temperatures taken every day at the same time.
- K-2 Discuss that people use electricity or other forms of energy to cook their food, cool or warm their homes, and power their cars. (History, Engineering, Science, Math, Reading)
- 3-5 Recognize that humans need resources found on Earth and that these are either renewable or nonrenewable. Within this concept our students are working on

creating our cardboard arcade. 4th grade has made this an elective class to repurpose recyclables to arcade games, which is a completely student designed student built recyclable arcade made out of what would otherwise be considered garbage. (English, Math, Science, Writing, Engineering)

- 3-5 Students are educated in describing structures in plants and their roles in food production, support, water and nutrient transport, and reproduction. They investigate and describe how plants respond to stimuli (heat, light, gravity), such as the way plant stems grow toward light and their roots grow downward in response to gravity. (English, Math, Science)
- 3-5 The great diversity of living things & how changes in the environment can affect survival. Differences give individuals an advantage in surviving & reproducing. (English, Science)
- 3-5 Students learn to classify animals into major groups (mammals, birds, reptiles, amphibians, fish, arthropods, vertebrates and invertebrates). Identifying the native species that are residing in our gardens. (English, Math, Science, Writing)
- 3-5 Students classify flowering and non-flowering plants into major groups such as those that produce seeds, or those like ferns and that produce spores, according to their physical characteristics. (English, Math, Science, Writing)
- 3-5 Students learn that plants and animals, including humans, interact with and depend upon each other and their environment to satisfy their basic needs. Recognize that plants use energy from the Sun, air, and water to make their own food mosses.(Science, Math)
- 3-5 Students are capable of identifying resources available in Florida.
- 3-5 Students built their own solar powered miniature race cars to learn about harnessing the sun's power. (Engineering, Math, English, Writing, and Science).
- 3-5 Compare and contrast the major stages in the life cycles of Florida plants and animals. (Science, English)
- 3-5 Recognize how air temperature, barometric pressure, humidity, wind speed and direction, and precipitation determine the weather in a particular place and time. (Math/Science)
- 6 – 9 Students are involved in multiple ecological projects including Seaperch an underwater robotics program where students build underwater submarine robots. utilizing recycled materials.(Engineering, Science, Math)
- 6-9 Students cover concepts that all life, including human civilization, is dependent on Earth's internal and external energy and material resources.(Engineering ,Science, Math)
- 6-9 Students are able to describe and give examples of ways in which Earth's surface is built up and torn down by physical and chemical weathering, erosion, and deposition. (Science, English, Writing)
- 6-9 Students recognize that there are a variety of different landforms on Earth's surface such as coastlines, dunes, rivers, mountains, glaciers, deltas, and lakes and relate these landforms as they apply to Florida. (Science, English, Writing)
- 6-12 Energy conservation being a major component in our school, our middle school; students learn how energy provided by the sun influences global patterns of atmospheric movement and the temperature differences between air, water, and

land. This year building their own solar powered go-kart as well as an autonomous Solar Go-Kart.(Eng/Sci/Math/Writing)
- 10-12 Determine their own course of science and environmental exploration as our school is set to have these students work within the college campus for their classes.

All grades have incorporated environmental topics and conservation as well, beyond just the science classroom. Some of our hands-on areas include aquaponics, vertical gardens, hydroponics, vermicomposting, red mangrove restoration, and a butterfly research lab. We have numerous activities and hands-on learning centered on environmental science as well as applied research by our students. Some examples of these are:

- "Who Polluted the Potomac?"– designed to engage students and self-reflect on behaviors that negatively affect the environment.
- Preservation of Biodiversity – Students explore and identify the criteria that qualify an area for preservation and decide what amount of space is enough to allow for sustainability of an ecosystem.
- Students are engaged in invasive species research; define the ecological problem and apply the scientific method to explore possible solutions to the problem through researching a human-induced ecological issue in which an invasive species has been introduced to a nonnative environment. Then, students share their results with the local organizations such as Gumbo Limbo.
- Students participate in World Thinking Day working with community leaders to create sustainability goals and correlating with environmental topics and issues in our community.
- Students participated in the PepsiCo Recycle rally having students track data for our recycling program.
- HS Abiotic Factors and Plant Selection – Through research, students decide which plants will thrive in our garden. They collected data about abiotic factors in our region. Then, planted selected plants that can grow successfully in our garden.
- HS Exploring Plant Diversity – students explore a small, local ecosystem and survey its plant diversity. Identify as many plants as possible/infer the conditions in which these plants thrive.
- Mushroom Farming – students design an experiment to determine the effect of light on the growth of a fruiting body by exploring how the amount of available light affect mushroom growth.
- Engineering lab solar power - The lab studies advances within the field and designs by our students including a solar powered car system, solar power golf carts, and solar power autonomous vehicles, presented at Florida Energy Summit.

Our district's culture encourages students to expand and conduct environmental research that can be applied in the bigger picture such as projects on carbon sequestration, alternative energy solutions, invasive toxic species, use of soft robotics to remove ocean debris device that skims our marine pollution, as well as mapping for cancer research, SEAC: A system for early identification of airborne chemicals, geological effects of beach re-nourishment, and developing an ocean energy prototype that aims to provide a stable power source to developing countries by using untapped energy from ocean currents.

Our campus is designed with many outdoor learning areas that are utilized every day by our classes. Our Principal encourages outdoor activity where students are engaged in outdoor learning activities every day of the week. All classes are encouraged to participate in hands-on practice of ecological education within our gardens, horticulture projects, and learning phenology. Through our expanded STEAM program, students are given extensive, hands-on interactive projects school wide, with environmental research and activities utilizing knowledge-based learning in gardens and identification, usage of produce from gardens, and a joint venture with Gumbo Limbo in a Mangrove restoration project. All grades have a minimum of one field-based or outdoor investigation and most have numerous during the year encouraging students to expand their knowledge beyond the classroom. Hands-on aquaponics includes a 400 gallon circulating freshwater tank with fish, gravity feed filtration, and hydroton lava rock allowing students aquaponics situational exposure. The Middle School also participated in the aforementioned environmental excursion to work at Gumbo Limbo sending in ICW to identify native juvenile organisms. Students' field research includes working with Cancer cells, Bachman sparrow, mangrove restoration, ocean currents, geological effects of beach re-nourishment, carbon sequestration, alternative energy, invasive exotic species, and soft robotics to remove ocean debris. Additionally, over three-fourths of high school students study off campus gaining experience in depth research and community involvement. This allows them to utilize their knowledge on a global stage and in the community. Students use and build a completely recycled cardboard arcade open to the community. All of this incorporation is designed to encourage and harness the development of a greener future for our students.

Describe how your district promotes civic/community engagement projects integrating environmental and sustainability topics (green technologies, career pathways, civic skills, community partnerships).

Our schools focus extensively on working with the community with our close ties to numerous organizations and the University as a whole. We have utilized a fundraising system in our schools that is event-based and environmentally conscious. Some of these environmentally friendly fundraisers include the collection of donated blankets to create care packages for cancer patients, a color run school-wide using ecologically safe and reused materials, and the "Troopons" expired coupons program for soldiers, where expired coupons are cut and sorted and sent to troops overseas where they are accepted**.** With the Troopns program, FAU was able to send over **5000** coupons to soldiers overseas that would have otherwise been trash with a total weight of refuse of over **50 lbs** of trash saved and provided financial gain to the troops. Green fundraising efforts run by our PTO include our Twice is Nice Sale where families donate used uniforms to resell and raise funds for programming within the school. Based on our success with one bin for "funraising" we upgraded to two bins to keep up with the demand created by donations. Within all of these programs, we use online notification systems limiting our paper waste. We also donated 250 plants to the Relay for Life at the fairgrounds to give every cancer survivor a plant using recycled pots from community partners.

Partnerships within our campus and the community are numerous and cover a wide range of community programs, a key part of the success of our program. Within our school, alliances

between our students in different grade levels and our faculty help promote green education. Our Planet Patrol is comprised of students who work to collect, maintain, and measure all recyclable items. While some schools have a sweeper and a washer in the cafeteria, our classes also have a recycling person in charge of monitoring that recyclables go into the correct areas. Our green team includes multiple subject area teachers, administrators, SAC, PTO, students and parents. They all are working towards the goal of creating a greener environment that educates our students on a variety of environmental topics, issues, and solutions. Our High School and Middle school students initiate and develop new and inspiring innovations within the green education spectrum.

This year reaching out into the community to drive change through our new research coordination program has encouraged students to develop and implement real-life changes. Beginning at a local level for development, these projects have stretched as far as the White House and to the nation on Good Morning America!

Our students this year have far exceeded what one might think a student could accomplish, as they have developed many items with the assistance and support of our community partners. The students have released research such as Tilmap: An Automated instrument to measure tumor infiltrating lymphocytes in cancer tumors, a system for evaluating the eco toxicity of impermeable surfaces to improve urban water quality, SEAC: A system for early identification of airborne chemicals, a developing device that skims our marine pollution, an investigation on the geological effects of beach re-nourishment, BEACON: an ocean energy prototype that aims to provide a stable power source to developing countries by using untapped energy from ocean currents with the communities support. Our students are a key component in the development and expansion of the programs that we utilize and develop.

We encourage our students to give back to the community and back to the environment. Students within our high school have over 2,000 hours in County Parks and Recreation Departments working on park cleanups and maintenance.

Community service provided by our students are as follows:

- Volunteered for Loggerhead marine life center by collecting supplies.
- Volunteered and did community service for West Africa Relief and Morikami Gardens helping maintain the gardens.
- Collected and prepared shoes for third world children made out of recycled jeans and milk jugs in collaborating with Sole Hope. Some of our National Honor Society students volunteered for Habitat for Humanity working on landscaping and structural building.
- High school and middle school students participated in a day long Beach Cleanup at Gumbo Limbo.
- Facilitated a used school supply drive for students in need in our area utilizing gently used supplies and backpacks.
- Participated in the Walk to end Alzheimer's and in Relay for Life.
- High school students collected and bundled gently used and new blankets for cancer patients in the hospital.

Our community partners are quite extensive, and we have been very fortunate to have many people on board to support our green initiatives. In addition to our partnerships with Relay for Life and Gumbo Limbo, Sea Perch Sea Owls partnered with FAU Harbor Branch Oceanographic Institute, FAU's Ocean and Mechanical Engineering department, FAU's AUVSI Roboboat team, Resolve Marine Group, Advanced Green Technologies, and the U.S.S. Sea Owl Association. These sponsorships enabled ADHUS in its effort to expand the SeaPerch program to other grades levels as well as neighboring schools and lead to the research and discovery and invention of soft underwater robotics to remove ocean debris. Our Electric Solar Generated Car project has also been fortunate enough to also be supported by our local community as well as beyond our immediate surrounding companies. These companies see the potential in the creation of these energy fuel efficient vehicles and have stepped forward to support them. The sponsors include U-pull it, Advanced Green Technologies, Do It Best, FAU College of Engineering and Science, Advanced Roofing, and the Breakers of Palm Beach. All of these companies are providing not only funding and/or supplies, but also their expertise in the area of engineering and desire to go green.

We received funding from the Palm Beach County Educational Foundation Grant funding for various green projects. We also had support from Home Depot supply donation and plant donations to expand our surface area of our outdoor green classroom and Whole Foods grants for the funding of our gardens. Our outreach into the community also extended to working, with permission of the State of Florida DEP, on the Red Mangrove restoration project. Additionally, Scott's provides all of the soil for our gardens. Palm Beach County WeatherStem has a site with a weather station setup on our campus that has its own website emitting and transmitting all current weather conditions in the area of the school. (http://palmbeach.weatherstem.com/fau). Our students also have presented their research at Florida Undergraduate Research Conference (FURC) to bring their socially responsible and groundbreaking research to a large audience. A Walmart donation program designed by one of our students allows them to donate the plants and supplies that they are no longer going to use to our school to be used in our gardens program. Our school works with our neighbors to foster a sense of community and purpose for our students with the idea of "going green."

U.S. Department of Education

Green Ribbon Schools

2018-19 TECHNICAL REVIEW

Nominee	**Florida Atlantic University (FAU) Lab School District, 777 Glades Road, Boca Raton, Florida, 33431**	
Evaluation Issues	**Approvable**	**Special Notes**
Florida Department of Environment Protection: Check all records available regarding environmental violations for this school. Reviewer Name and Title: ***Jennifer Glass Davis, Business Planning Program Manager, South East District, Florida Department of Environmental Protection***	**YES** 1/15/19	This site has no known environmental issues at this time.
Florida Department of Health: Check Radon Monitoring Records: Reviewer Name and Title: ***Joseph Kidder, Radon and Indoor Air Program; Bureau of Environmental Health; Division of Disease Control & Health Protection; Florida Department of Health***	**YES** 1/14/19	Florida law requires schools to test for radon levels every five years. Radon test has been conducted and is verified as being in compliance.
Florida Department of Agriculture and Consumer Services: Check compliance with regulations related to National School Lunch Program Reviewer Name and Title: ***Lisa Church, Supervisor of Implementation, NSLP, SSO, SMP, Division of Food, Nutrition and Wellness, Florida Department of Agriculture and Consumer Services***	**YES** 1/18/19	NSLP Compliance verified.
Florida Department of Education: Check compliance with USDOE Individuals with Disabilities Education Act (IDEA) Reviewer Name and Title: ***Leanne Grillot, Program Specialist, Bureau of Exceptional Education & Student Services, Florida Department of Education***	**YES** 1/14/19	No violations of IDEA.